Preface

Thank you for purchasing the ACE1000 series integrated elevator controller.

The ACE1000 is a new-generation integrated elevator controller mainly developed and manufactured by Shenzhen ALPHA Electric Co., Ltd. It includes a complete set of elevator control system that consists of integrated main control board(**MCB** for short, including multiple PG cards and IO expansion board), 1.1KW～45KW inverter base, car roof control board(including expansion board), car command board(including expansion board), multiple car digital display boards, LCD multi-media player, multiple hall call boards, car voice board, easy portable keyboard, Chinese/English LCD keyboard, unintended car movement protection system board(**UCMP** for short), PC supporting software, mobile phone supporting software, etc.

To ensure the perfect use of the product and the safety of yours, please read through and understand the user manual carefully and follow along with it before using our product. Please keep it in proper place for reference to future maintenance.

- **ACE1000 Product features**
  - ✧ Developed, manufactured and tested according to the latest national standard issued by the elevator industry in July 2016(China).
  - ✧ The EMC inspection report and CE certification report issued by domestic professional test agencies.
  - ✧ UCMP and control cabinet type test inspection reports issued by domestic professional test agencies.
  - ✧ Sales and service network throughout the country and professional service team.
  - ✧ Synchronous and asynchronous integration, logic control, frequency conversion, serial communication and commissioning function integration.
- **ACE1000 Technical specifications**
  - ➢ Maximum elevator speed is 4m/s, maximum total number of floors is 48.
  - ➢ Maximum number of parallel control is 4, maximum number of group control is 8.
  - ➢ Leveling accuracy ±5 mm
  - ➢ Adaptive power range: 1.1kw~45kw. Covering the range of 220V/380V household villa lifts to high-speed lifts.
  - ➢ 220% rated current can last 3 seconds, 180% to 10 seconds and 150% to 120 seconds.
  - ➢ Main control board IO: Maximum-40 inputs(3~4 AC110V), Maximum-10 outputs
  - ➢ Communication interface number of main control board: 3 port CAN, 1 port RS485/RS422 (on the board), 1 port RS422 (Extended)、1 port RS232.
  - ➢ Supported encoder types: ABZ, UVW, SIN-COS.
  - ➢ Elevator startup without weighing-devide compensation, static tuning of parameters, multi-stage speed, direct stop technology.

- **ACE1000 Technical characteristic**
  - ✓ High-performance classical high-end core architecture DSP+MCU+CPLD, efficient real-time operating system to deal with multi-task processing, software and hardware redundancy security design, safety circuit that can directly turn off IGBT output, more secure and reliable system.
  - ✓ Fully independent intellectual property rights of logic and frequency conversion drive control technology, advanced elevator vector frequency conversion drive control technology.
  - ✓ MCU and DSP concentrate on one board to increase the reliability of data exchange and provide double protection for security.
  - ✓ The product finalization has passed the type test and the related national standard inspection, the safety and stability of our products are in the leading position in this area.
  - ✓ CPLD is used for hardware security protection, and many kinds of error logic have been prevented at the electronic board level.
  - ✓ Three independent CAN buses are used in internal call(for car), external call(for hall) and parallel/group control to improve the anti-interference ability of serial communication.
  - ✓ Various debugging tools are available: full debugging on the main board, easy portable keyboard debugging, Chinese/English LCD keyboard debugging, PC software debugging, mobile phone debugging.
  - ✓ The number of input/output ports is abundant and extensible. Most of the functions of input/output ports and high and low electrical level attributes can be customized by users.
  - ✓ Support start compensation with weighing-device and no weighing-device, simplify the adjustment process of elevator comfort.
  - ✓ No need to open brake when doing static identification on the synchronous motor, just do dynamic identification on asynchronous machine parameters.
  - ✓ Automatically generate the best running speed curve, identify the ultra-short floor, and directly stop at the floor.
  - ✓ With the help of PC software, elevator parameters and frequency conversion parameters can be uploaded, downloaded, compared, checked and backed up integratedly. The integration of elevator parameters of EXCEL setting software, logic specification and frequency conversion parameters of setting software can complete the setting of factory parameters at one time. Professional elevator condition monitoring and analysis software helps to quickly eliminate elevator faults and check elevator performance.
  - ✓ Fault processing with classification and graduation, preserving the latest 100 fault details. Large records, rich information and clear location.
  - ✓ The functions of elevator operation data black box and special fault instantaneous state capture, convenient for maintenance and event recovery.
  - ✓ Using Chinese/English LCD keyboard, the elevator can be debugged in the car, convenient for the adjustment of elevator comfort and monitoring of operation status.

- ✓ Strict hierarchical management password control to prevent unauthorized personnel from tampering with parameters, increase data security.
- ✓ All control boards use high-quality electronic devices, mature and stable circuit schemes and production processes, and the EMC performance of hardware has been tested and passed by third-party authority.
- ✓ Value-added products are rich, including plenty of serial products, hand-held debugging tools, PC monitoring software, energy feedback devices and so on.
- ✓ Adapt to different specifications of traction machine produced by different brands and manufacturers.
- ✓ It can deal with all kinds of abnormal conditions. According to the abnormal conditions, it can automatically level the floor, make a forced landing, correct the floor, close the output and so on. It can ensure the safety of elevators and passengers in the event of fire fighting, power failure, earthquake, lightning strike, signal failure and mechanical failure.
- ✓ Wide range fluctuation of input voltage for all series of inverter base: -15%～+15%.
- ✓ Full series of inverter base have built-in braking units and external braking resistance interface.
- ✓ The key components of inverter base are designed according to large margin, which can improve the life and reduce the failure rate.
- ✓ Full series of inverter base adopt independent duct heat dissipation design.
- ✓ Full series of inverter base have passed CE certification.

- **Warnings and Signs**

It is strongly suggested that you must read the manual carefully to ensure your safety and avoid property damage. Our company has no responsibility for any injury or loss caused by illegal operation.

- **Qualified professionals**

The operation of the product/system in this document is only allowed for qualified personnel who meet the requirements of the work.Special attention should be paid to safety specifications and warnings in the Manual while you follow along with it for proper operation of the equipment. The personnel must receive necessary safety and use training, have related experience and hold qualification certificate for elevator operator before performing operations.

- **Disclaimer**

We have carefully checked the contents of the manual, but due to a certain amount of deviation, the hardware and software may not correspond to manual totally. The information in this document is subject to change without prior notice in order to improve reliability, design and function. To illustrate the details of the product, most of the legends in this manual are in the state of removing the hood or safety cover. Before using this product, please make sure that you have packed the shell and cover according to the regulations, then do exactly what the manual says.

- **Copyright**

- **Target readers**

Elevator control design technicians, elevator installation and maintenance personnel, product pre-sale and after-sale technicians, users and so on.

- **Company profile**

Established in 2000, ALPHA Inverter Co.,Ltd is a national high-tech enterprises that is concern withe the R&D, production, sales and service of industrial automation equipment, new energy automotive power assembly system and key components.

Our company is headquartered in Shenzhen, Guangdong. Our East China base is located in Jiaxing, Zhejiang. Covering an area of 50,000 square meters, we have many automatic production lines, R&D and reliability laboratories, and have passed the ISO 9001:2008 quality system certification. Alpha is continuously introducing advanced technology at home and abroad, establishing alliances with many scientific research institutions and institutions of higher learning. We take technology as the leading professional innovation, obtaining a great number of inventions, designs and utility models.

In the field of industrial automation, we are committed to providing a complete set of solutions for mechanical equipment customers with powerful functions, flexible control and excellent performance. Our products have been widely used in machine tools, textiles, metallurgy, lifting, oil deposit, plastics, chemical engineering, municipal administration, etc. At present, the main products are inverter, induction servo, permanent magnet synchronous motor, PLC, HMI, elevator integrated controller, electro-hydraulic servo, etc.

In the field of new energy automobiles, we are committed to pursuing the key technologies of energy conversion and utilization efficiency. We have full coverage of the manufacturers of power assembly system and core parts of new energy automobiles. Our strong portfolio of products includes motor controller, motor, vehicle controller, battery management system, on-board charger, DC/DC power supply, air pump motor controller, steering pump motor controller, etc.

Alpha marketing and service outlets are all over the country, with more than 30 offices and more than 50 joint insurance centers. The products are also exported to Europe, America, Africa, Southeast Asia and other regions. The company has a professional pre-sales, in-sales, and after-sales technical service team to provide customers with professional services throughout. We will take high-quality products and high-quality service to satisfy you.

Contents

Chapter 1: Instructions

1.1 Upon unpacking, checking:

- Whether the controller is damaged during transportation.
- Whether the nameplate model is consistent with your order.
- If you find any omission or other problem, please contact the supplier or Alpha immediately.

1.2 Application scope

ACE1000 integrated elevator controller supports the elevator (excluding escalator) driven by asynchronous motor and synchronous motor. The adaptive motor capacity is 1.1~45 kW. The capacity of inverter base has left enough margins to select corresponding motor power. Inverter base contain three kinds of voltage grade products: single-phase AC220V, three-phase AC220V and three-phase AC380V (please check the cross-references of inverters for details). The maximum supporting floor is 48 floors, the maximum height of single floor is 10m, and the rated speed is 0.25~4.0m/s. The maximum number of parallel control is 4, and maximum number of group control is 8. It can be widely used in new and upgraded passenger elevators, cargo elevators, hospital elevators, villa elevators, etc.

1.3 Attentions

1.3.1 Handle

⚠ Caution

1. Handle lightly, otherwise there is a risk of damage to the controller.
2. Do not touch the components of the controller with your hands, otherwise there is a danger of electrostatic damage.
3. Do not touch the controller with wet hands, otherwise there is a danger of damage to the controller.

1.3.2 Install

⚠ Danger

1. Please install it on metal and other non-combustible materials, otherwise there is a risk of fire.
2. Do not put combustibles nearby, otherwise there is a risk of fire.
3. Do not install in the environment containing explosive gases, otherwise there is a risk of fire or explosion.
4. The protective boards on each component can not be removed at will. These boards are specially designed by the manufacturer to protect each component. Removal will increase the probability of accidental damage to the components.

5. Do not let the cover plate and the panel bear pressure when installing, otherwise there is a danger of damage to the controller.

6. It is strictly forbidden to install it in water pipes or other occasions where water droplets may spatter and wet environment, otherwise there is a danger of damage to the controller.

7. Do not drop foreign objects such as screws, gaskets and metals into the controller, otherwise there is a danger of damage to the controller.

1.3.3 Wiring

⚠ Caution

1. Do not confuse input/output terminals, bus terminals and brake resistance terminals, otherwise the converter may be damaged.

2. Confirm that the input power supply has been completely disconnected and all kinds of indicators LED on the integrated drive controller have extinguished before wiring and other operations, otherwise there is a risk of damage to the circuit board or the controller and electric shock.

3. Power terminal and wire must be firmly connected, otherwise there is a risk of damage to the controller.

4. Do not touch the terminal of the controller or printer control circuit board with your hands when the power is on, otherwise there is a danger of damage to the controller and electric shock.

5. Hoistway cables and traveling cables need good grounding.

6. Hoistway cables and traveling cables should be paid attention on the separation of strong line(including door-motor power supply, safety circuit, door-lock circuit, lighting circuit, etc.) from feebleness line (including communication line, DC 0V, DC 24V, leveling run signal, end station forced deceleration switch, end station limit switch, etc.). Serial communication line must adopt twisted pair, with the strand spacing between 20-30 mm. Shielded twisted pair should be used conditionally, and the shielding floor should be grounded at a single point.

7. If strong lines are parallel to feebleness lines (which are common on traveling cables), strong lines must be distributed on one side and feebleness lines on the other, and they must be separated by ground wires.

8. Rotary encoder wiring can not be extended. Wiring terminals should be fastened. Make sure you use shielded wire and it must be grounded! Otherwise, it may result in poor anti-interference ability of encoder, affect lift operation comfort, cause motor noise, and possibly make elevator not running normally.

9. The PE end of the control cabinet shell, the ground end of the inverter, the motor shell and the car body must be grounded.

10. Hall caller box, lock box and fire-fighting box should also be grounded, otherwise the signal transmission may be affected.

1.3.4 Routine maintenance

⚠ Caution

1．Maintenance operation must be carried out after reliable disconnection of power supply and confirmation of discharge by multimeter, otherwise there is danger of damage to the controller and electric shock.

2．Only professional personnel can replace parts. It is strictly forbidden to leave wires or metal objects in the machine. Otherwise, there are dangers of damage to the controller, electric shock, fire and so on.

3．After replacing the main control board, encoder, inverter base and traction machine, the parameters must be modified or self-learning, otherwise there is danger of the abnormal running of the elevator.

4．Controller fittings should be removed or plugged in the case of power failure. Hot-plug is strictly prohibited, otherwise there is a risk of damage to the controller.

1.3.5 Insulation inspection and testing

⚠ Caution

1．Insulation inspection should be done before the motor is first used and placed for a long time. When inspecting, it is necessary to separate the motor connection from the controller and ensure that the insulation resistance is not less than 5M ohms.

2．Please do short circuit test of the elevator motor and cable before power on. It is also necessary to carry out this test regularly in daily maintenance.

1.3.6 Derating

⚠ Caution

In areas over 1000 meters above sea level, the heat dissipation effect of the controller will become worse due to the thin air. Please refer to the standard for derating.When the ambient temperature of the computer room is too high and can not be reduced, it also needs to derate. When the ambient temperature of the computer room exceeds 45℃, it needs to be reduced by 10% for every exceeding 5℃. The highest is 60℃.

Charpter 2: Product information

2.1 Naming rule and model description

2.1.1 Naming instructions for controller

Taking A C E 1000-3 022 X B-P as an example:

A	The first A stands for ALPHA
C	The second C represents the Controller product
E	The third E stands for Elevator integration products
1000	The fourth to seventh digits represent the seried of elevator controllers, currently 1000 series.
3	The eighth digit represents the rated voltage. S2: Single-phase 220V, 2: three-phase 220V, 3: three-phase 380V.
022	The ninth to eleventh digits represent power. 2R2:2.2KW, 022:22KW.
X	The twelfth letter represents the energy feedback sign. R: with energy feedback, X: without energy feedback.
B	The thirteenth letter represents the brake unit identification. B: with brake unit, X: without brake unit.
P	The fourteenth letter represents the type of encoder. P: Photoelectric Encoder, E: Endat Encoder, □(blank): Sine-cosine Encoder.

2.1.2 Cross-references for inverter

Model ACE-	Rated capacity（kVA）	Rated input current（A）	Rated output current（A）	Adaptive motor power（kW）	Air circuit-breaker rated current（A）	Contactor rated current（A）	Power-wire diameter (mm^2)
Single-phase 220V, range: 220-240V							
S21R1XB	2	9.2	5.2	1.1	16	10	2.5
S21R5XB	2.9	13.3	7.5	1.5	16	10	2.5
S22R2XB	3.9	17.9	10.3	2.2	25	16	2.5
S23R7XB	5.9	25.3	15.5	3.7	32	25	4
S25R5XB	8.6	34.6	22.5	5.5	40	32	6
Three-phase 220V, range: 220-240V							
22R2XB	4	11	9.6	2.2	25	16	2.5
23R7XB	5.9	17	14	3.7	32	25	4
25R5XB	10	29	27	5.5	40	32	6
Three-phase 380V, range: 380-440V							
32R2XB	4	7	6	2.2	16	10	2.5
33R7XB	5.5	10.7	9	3.7	25	16	2.5
35R5XB	7.5	15.5	13	5.5	25	18	2.5
37R5XB	11	18	17	7.5	32	25	4
3011XB	15	26	25	11	40	32	6
3015XB	18.5	35	32	15	50	38	6

318R5XB	22	39	37	18.5	63	40	10
3022XB	30	47	45	22	80	50	10
3030XB	37	63	60	30	100	65	16
3037XB	45	78	75	37	100	80	25
3045XB	55	93	90	45	160	95	35

Note: When inverters with AC220V power supply voltage match the traction machine with AC380V rated voltage, maximum speed will be limited under the rated speed.

2.1.3 Sizing table for elevator power

Motor	Asynchronous motor/cargo elevator			Synchronous motor/passenger elevator													
Floor	2～5	6～10		2～10		11～20			21～30			31～40			41～48		
Speed / Load	0.5	0.75	1.0	1.0	1.25	1.25	1.5	1.75	1.75	2.0	2.25	2.25	2.5	3.0	3.0	3.5	4.0
450	1.5	2.2	3.0	3.0	3.7	3.7	4.5	5.2	5.2	6.0	6.7	6.7	7.5	9.0	9.0	10.5	12.0
630	2.1	3.1	4.2	4.2	5.2	5.2	6.3	7.3	7.3	8.4	9.4	9.4	10.5	12.6	12.6	14.6	16.7
800	2.7	4.0	5.3	5.3	6.6	6.6	8.0	9.3	9.3	10.6	12.0	12.0	13.3	15.9	15.9	18.6	21.3
1000	3.3	5.0	6.6	6.6	8.3	8.3	10.0	11.6	11.6	13.3	14.9	14.9	16.6	19.9	19.9	23.2	26.6
1150	3.8	5.7	7.6	7.6	9.5	9.5	11.5	13.4	13.4	15.3	17.2	17.2	19.1	22.9	22.9	26.7	30.6
1275	4.2	6.4	8.5	8.5	10.6	10.6	12.7	14.8	14.8	16.9	19.1	19.1	21.2	25.4	25.4	29.6	33.9
1350	4.5	6.7	9.0	9.0	11.2	11.2	13.4	15.7	15.7	17.9	20.2	20.2	22.4	26.9	26.9	31.4	35.9
1600	5.3	8.0	10.6	10.6	13.3	13.3	15.9	18.6	18.6	21.3	23.9	23.9	26.6	31.9	31.9	37.2	42.5
1800	6.0	9.0	12.0	12.0	14.9	14.9	17.9	20.9	20.9	23.9	26.9	26.9	29.9	35.9	35.9	41.8	47.8
2000	6.6	10.0	13.3	13.3	16.6	16.6	19.9	23.2	23.2	26.6	29.9	29.9	33.2	39.8	39.8	46.5	53.1

Speed (m/s), load (Kg), motor power (Kw). The calculating power of the motor is the minimum power required by the elevator tractor.It should be selected according to the actual power data of the product provided by the tractor manufacturer. The selected power must be larger than or equal to the calculating power in the above table.

2.2 Interface technical specifications

2.2.1 Main control board interface

Type	Property	Number	Remarks
Input point	AC/DC110V	3	Safety circuit, door Lock
	DC24V	27+10	Expansion board 10
Output point	Relay contact output	6+4	Expansion board 4
CAN	CAN	3 independent	Internal call, external call and parallel/group control
RS485/ RS422	RS485 or RS422	1+1	Monitoring, Internet of Things,etc.
DB9 interface	RS232	1	Debugging with PC and LCD keyboard serial port, compatible with DB9 of standard RS232.
Encoder card	UVW incremental type	Share 1	Corresponding PG card
	SIN/COS	Share 1	Corresponding PG card
	Push-pull and OC output incremental type	Share 1	Corresponding PG card
RJ45	SPI	1	Easy portable keyboard
30PIN/8PIN		1	IO expansion board
40PIN		1	Frequency converter base unified interface

2.2.2 Main control board LED

Power indicator	I0 status indicator	Keyboard assistance	Function indicator
LED54:3.3V Power pilot light	X01～X40:Input point level	LED33:Current floor number	LED1:Hardware failure - * **Note**
LED62:External 24V light	Y01～Y10:Output point status	LED34:ACD status codes.	LED2:Sealing wave indicator
		LED35:Current speed	LED43:DSP wave-making indicator
		LED36:Output voltage	LED44:DSP Failure

			indicator
		LED37:Output current	LED55: operating system Running
		LED38:Output frequency	
		LED39:Busbar voltage	
		LED40:Car load(%)	

Note: Hardware failure: Inverter under-voltage, over-voltage, over-current, module failure.

2.2.3 Car roof control board+Car roof expansion board

Type	Property	Number	Remarks
Input point	high-level effective	16	Expansion board 8
	Adjustable under effective level input	4	Exclusive for door-motor signals, adaptive to various door-motors
Output point	Relay contact output	8	Including lighting and fan control, expansion board 4
CAN interface	CAN bus	1	Communication between internal call bus and main control board
AD interface	0~10V analogue inputs	1	Start compensation with weighing-device on the expansion board

2.2.4 Car command board+Command expansion board

Type	Property	Number	Remarks
Input point	Call button	48	20+(5)+16(First)+12(Second) The command board has at least 20-floor buttons, and 5 custom buttons can be set as floor buttons.So the command board can carry up to 25-floor buttons. One expansion board has 16 floors and can be connected in series with two.
	Light button	8	Open, close,time- extend opening, 5 custom buttons(It can be used as attendant mode, VIP purpose, fire protection, independence, attendant reversing, etc., or as F21-F25 internal call button).
	Disjoint input	4	Standby
Output point	Disjoint output	4	Standby, electronic switch output, maximum 40mA
	Buzzer	1	Build-in command board
Digital display interface	SPI	1	Connect with standard car digital display board, etc.
CAN interface	CAN	1	Communication between internal call bus and main control board
RS232 interface	RS232	2	Car floor adjustment, stop-announcing system, etc.

2.2.5 Standard external call board series

Type	Property	Remarks
Digital display module	LED lattice（7×5）	One direction, Two-digit number
Red luminous block	Hollow-out fonts have been affixed	Overhaul, full display
Buzzer	Standard	1
Power supply + communication	DC24V power supply, CAN communication	Sharing 4 PIN connectors
Button interface	4	Call-up button, call-down button, lift-stopping input, fire protection input, up-announcing arrival lamp, down-announcing arrival lamp, disabled call-up, disabled call-down. Some interfaces are shared.

2.2.6 Inverter

Interface type	Property	Remarks
Monitor Port	40PIN ribbon cable	Connect with the corresponding port of the main control board
Power input	R, S, T three-phase/L, NC, N single-phase	AC380V/220V
Drive output	U, V, W three-phase	Inverter output is connected with three-phase motor
Brake resistance interface	(+)、PB	Connect with brake resistance
DC electric reactor interface	P1、(+)	Short junctions between P1 and (+) need to be removed before external DC reactor is connected.
DC Busbar positive and negative terminals	(+)、(−)	**It is absolutely forbidden to connect the brake resistance here!**
Ground containment vessels	PE	When connecting the ground, it requires grounding resistance (<10 ohm).

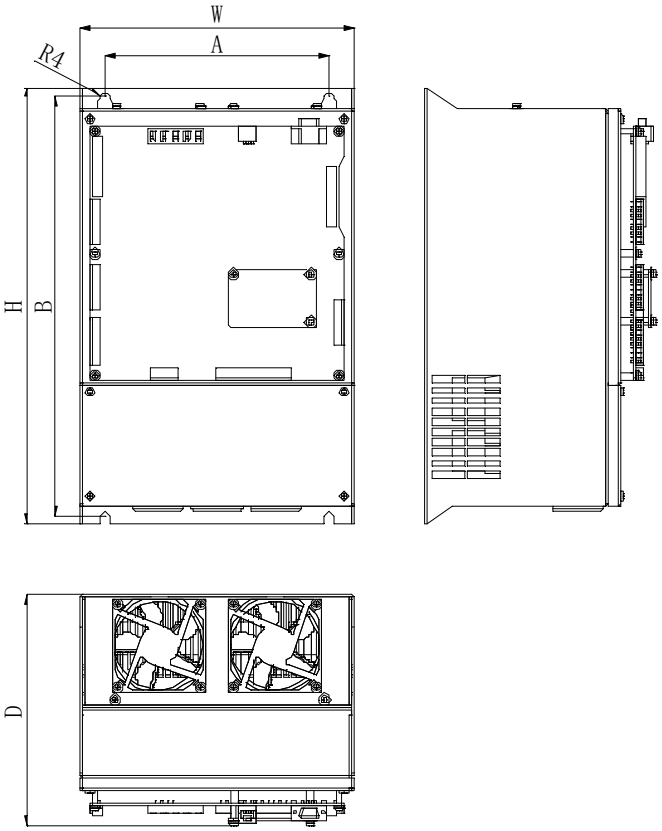
2.3 Elevator functions

No.	Name	No.	Name
1	All calls response entirely	2	Door stop (no opening and closing)
3	Only down calls response	4	Random/Floor-by-floor running
5	Protection for undervoltage and overvoltage of power supply	6	Keyboard call holding
7	Protection for overcurrent and overheat of inverter	8	External call prohibition
9	Protection for phase shortage of input power and output short circuit	10	Real time
11	Protection for fault detection of encoder	12	Time sharing and floor dividing service
13	Overload indication, alarm and protection	14	Automatic control of door-opening time
15	Overspeed protection	16	Prolong door-opening time control
17	Protection for door lock short circuit	18	Running times sum up
19	Sliding protection for tractive steel wire cable	20	Running time sum up
21	Protection for Elevator door touch panel	22	Door opening in advance of car stop
23	Protection for Elevator door light screen	24	Inching to re-level with door-opening
25	Protection for Elevator door machine overload	26	Automatic/manual detection for brake valid torque
27	Protection for abnormal door opening and closing time	28	UCMP function and test
29	Protection for disconnection of door lock and safety circuit when running	30	Auxiliary/double brake control
31	Protection for forced deceleration	32	Double detection for brake holding
33	Fault classifying and hierarchical processing	34	Car IC card control function
35	Automatic fault detection and alarm	36	Hall IC card control function
37	Automatic record and statistics of faults	38	External call message displays in the car
39	Low-speed self-rectifying operation in fault	40	Lift attendant operating function
41	Automatic re-selectimg the next floor in door-opening fault	42	Double car command board operation function
43	Alarm when stopping in non-door area	44	VIP passenger dedicated function
45	Automatic correction of abnormal floor location(floor error)	46	Special facilities for the physically disabled
47	Parallel and group management control	48	Automatic ID setting of external call board
49	Non-call, self-returning to home landing floor	50	Button-conglutination judgement of internal and external call, opening and closing door
51	Car stand-by dispersedly in parallel and group control mode	52	Judgment of absence of external call board

No.	Name	No.	Name
53	High-low-feet compensation in parallel and group control mode	54	External call board analogs displaying door opening and closing action
55	Peak load operation mode under parallel and group control mode	56	Internal and external call communication protocol can be encrypted
57	Examine and repair running mode (maintenance mode)	58	External call board buzzer function
59	Emergency electrical operation supported	60	Custom-defined special digital display
61	Self-measurement of the floor height	62	Call for help from the car to the hall
63	Earthquake control operation	64	Full CAN communication among control boards
65	Automatically return to home landing floor in fire condition	66	IO point status monitoring
67	Firefighter operation	68	IO terminal customization
69	Parking of lift (manual or time control)	70	IO port number can be expanded
71	Power failure emergency service	72	Elevator debugging and adjustment in car
73	Double doors control (including through door and independent door)	74	Chinese/English LCD keyboard debugging (parameter backup)
75	Set a limit to operating times by user	76	Serial communication debugging
77	Straight going/passing when in full-load	78	Mobile phone debugging
79	Anti prank for internal call	80	Full debugging on the main control board
81	Automatic elimination of the reversed internal calling instructions	82	Easy portable keyboard debugging
83	Cancellation of incorrect instructions in car	84	Wireless/remote monitoring interface (GBT24476-2017 China)
85	Skip floors without stopping	86	Integrated upload/download elevator parameters
87	Start-up compensation with weighing-device	88	Easy-transfer parameters to the new when replacing main control board
89	Start-up compensation without weighing-device	90	Backup/recovery of off-chip parameters from/to main control board
91	Arrival light/bell in car	92	Static self-learning of motor parameters
93	Arrival light/bell in hall	94	Auto multi-segment speed and ultra-short floor height recognition
95	Voice announcing system in car	96	Direct stopping at the floor leveling
97	Energy-saving control of lighting and fan in car	98	Black box record of operating status
99	Special statistics for the convenience of maintenance	100	Hierarchical password control of elevator parameters
101	Signal satisfaction test/check	102	Security floor at night
103	Backup-recovery of default factory parameters	104	Door opening and closing test independently
105	Troubleshooting of elevator emergency stop	106	Open the door on the leveling floor before the elevator is corrected to the terminal floor
107	Automatic brake-loosing rectifying	108	Elevator external call turning to internal call service specially
109	Faults reset conditionally and Intelligently	110	Door-opening standby for passengers
111	Normal opening door change to inching action door when emergency	112	Safety circuit section detection.
113		114	
Note: Some of the functions are not listed here. For details of each, please consult Alpha technical support engineer.			

2.4 Product appearance and size

2.4.1 Inverter size

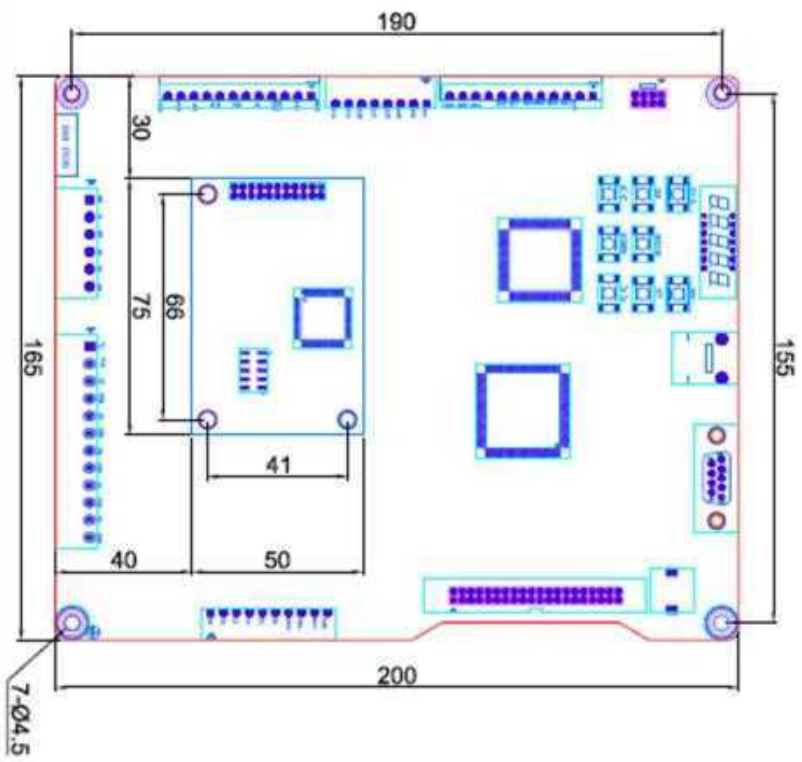


Inverter model	A	B	H	W	D	Installation aperture
S21R1XB	150	334	350	235	166	8
S21R5XB	150	334	350	235	166	8
S22R2XB	193	360	375	235	206	8
S23R7XB	193	360	375	235	206	8
S25R5XB	193	360	375	235	206	8
22R2XB	150	334	350	235	166	8
23R7XB	150	334	350	235	166	8
25R5XB	193	360	375	235	206	8
32R2XB	150	334	350	235	166	8
33R7XB	150	334	350	235	166	8
35R5XB	150	334	350	235	166	8
37R5XB	193	360	375	235	206	8
3011XB	193	360	375	235	206	8
3015XB	230	440	460	285	276	8

Inverter model	A	B	H	W	D	Installation aperture
318R5XB	230	440	460	285	276	8
3022XB	230	440	460	285	276	8
3030XB	250	550	565	300	280	8
3037XB	250	550	565	300	280	8
3045XB	250	550	565	300	280	8

Note: Dimension unit is mm.

2.4.2 Main control board size (mm)

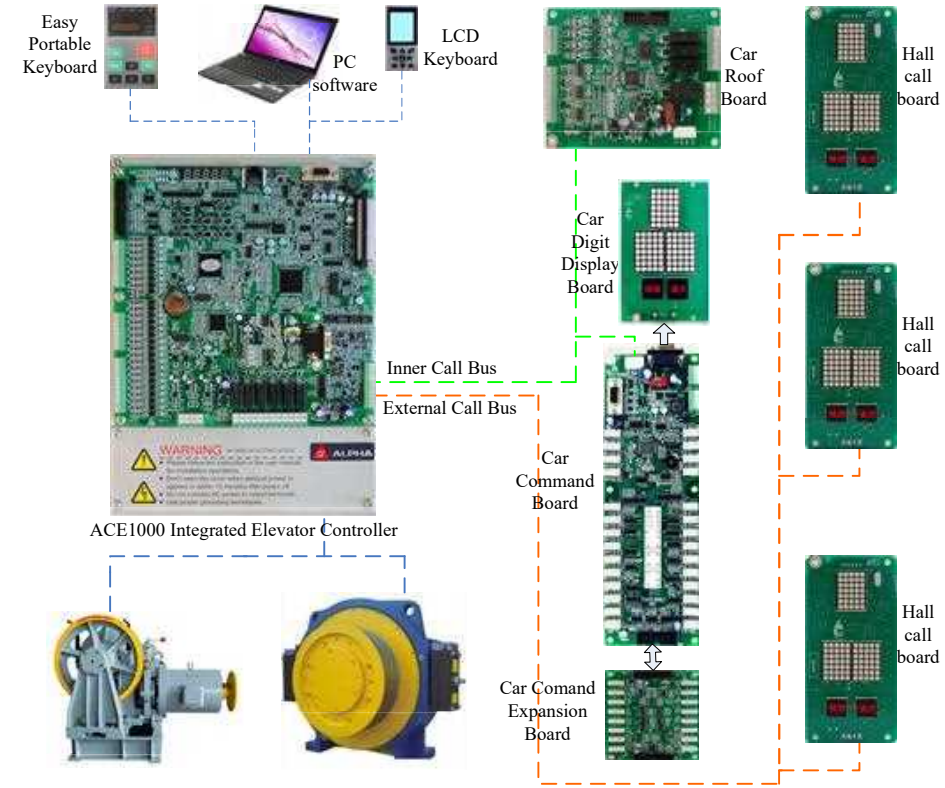


2.4.3 Encoder expansion card

When using the incremental encoder of UVW, the expansion card of UVW encoder is needed; when using the sincos encoder, the expansion card of sincos encoder is needed; when using push-pull and OC output incremental encoder, the expansion card of push-pull and OC output incremental encoder is needed. The interface between all kinds of coder cards and the main control board is a unified 22/24PIN socket, and the shape and location size of all kinds of coder cards are the same (see the part of the main control board size).

SIN/COS PG card (DB15)	UVW PG card (DB15)	ABZ PG card
		

2.5 System configuration diagram



Note: Parallel and group control and expansion board are not shown in this figure.

Charpter 3: Product interface description

3.1 Main control board interface description

3.1.1 Serial bus interface

- Main control board：8～10PIN，BCH-350H-8/10， 3 CAN、1 RS422 or RS485。

PIN No.	Signal name		Signal level	Instructions
1	CAN0H	CAN0H	According to CAN bus standard	Used for digital communication of internal call in car. With terminal resistance.
2	CAN0L	CAN0L		
3	CAN1H	CAN1H		Used for parallel and group control communication,. The terminal resistance uses jump cap (CON1 default is ON position).
4	CAN1L	CAN1L		
5	CAN2H	CAN2H		Used for external call communication. With terminal resistance.
6	CAN2L	CAN2L		
7	422A(R+)	485+	According to RS422/RS485 bus standard	Used for community monitoring, wireless monitoring, internet of things and so on. The terminal resistance uses jump cap (CON2 default is ON position). Note: Old version terminal corresponds to RS422, New version terminal corresponds to RS485 and External P24V input.
8	422B(R-)	485-		
9	422Y(T+)	EXT 24V		
10	422Z(T-)	EXT COM		

- IO expansion boards for main control board:5PIN,BCH-350H-5,1 RS422.

PIN No.	Signal name	Signal level	Instructions
1	422A(R+)	According to RS422 bus standard	Used for community monitoring, wireless monit oring, internet of things and so on. The terminal resistance uses jump cap (CON3 default is ON position).
2	422B(R-)		
3	422Y(T+)		
4	422Z(T-)		
5	COM		

Note: When external devices only support RS485 but not RS422 communication, or only support RS422 but not RS485 communication, please use RS422<-> RS485 relay conversion module. When RS422 docks with RS422, the transfer and receive signal line should cross (A<->Y, B<->Z).

3.1.2 Serial debugging interface

DB9 RS232 interface can communicate directly with PC serial port and Chinese/English LCD keyboard (note: not all 9PIN standard serial port), and can supply external power to the debugging device with + 5V and + 15V.

3.1.3 Easy portable keyboard interface

RJ45 interface (standard Ethernet cable , SPI communication), can provide external power to the keyboard with + 5V.

3.1.4 Signal input terminal description

- 110V high voltage input (4/6PIN TP508H-00V-4P/6P terminal), optocoupler isolation type

PIN No.	Signal name	Signal level	Instructions

0	AM	Zero line /COM	Reference level	Some versions do not have this interface
1	X1	AC/DC110V	Safe circuit	
3	X2	AC/DC110V	Car door lock (or series door lock signal)	
3	X3	AC/DC110V	Hall door lock (or door lock short circuit signal 1)	
4	X41	AC/DC110V	Door lock short circuit signal 2	Some versions do not have this interface
5	AM	Zero line /COM	Reference level	Some versions do not have this interface

- 24V input (TP381H-00V-12P, TP381H-00V-8P, TP381H-00V-10P terminal), optocoupler isolation type

PIN No.	Signal name	Signal level	Instructions
1	P24V	24V	External DC24V power input
2	GND	0V	External DC24V reference level
3	X4	DC24V	Leveling door area
4	X5	DC24V	Upper limit
5	X6	DC24V	Lower limit
6	X7	DC24V	Level 1 upper forced deceleration
7	X8	DC24V	Level 1 lower forced deceleration
8	X9	DC24V	Level 2 upper forced deceleration(If this signal is not used, connect this port to DC24V)
9	X10	DC24V	Level 2 lower forced deceleration(If this signal is not used, connect this port to DC24V)
10	X11	DC24V	Level 3 upper forced deceleration(If this signal is not used, connect this port to DC24V)
11	X12	DC24V	Level 3 lower forced deceleration(If this signal is not used, connect this port to DC24V)
12	X13	DC24V	Upper inching request then re-leveling
13	X14	DC24V	Lower inching request then re-leveling
14	X15	DC24V	Feedback point of main operating contactor
15	X16	DC24V	Feedback point of brake-holding switch
16	X17	DC24V	Custom property
17	X18	DC24V	Custom property
18	X19	DC24V	Custom property
19	X20	DC24V	Custom property
20	X21	DC24V	Custom property
21	X22	DC24V	Custom property
22	X23	DC24V	Custom property
23	X24	DC24V	Custom property
24	X25	DC24V	Custom property
25	X26	DC24V	Custom property
26	X27	DC24V	Custom property
27	X28	DC24V	Custom property
28	X29	DC24V	Custom property
29	X30	DC24V	Custom property
30	X31/NC	DC24V	Custom property
31	AIN	-	-10V~+10V Differential analog input
32	AIP	+	

- IO expansion boards for main control board:24V input (TP381H-00V-10P terminal), optocoupler isolation type

PIN No.	Signal name	Signal level	Instructions
1	X31	DC24V	Custom property(Some versions do not have this interface)
2	X32	DC24V	Custom property
3	X33	DC24V	Custom property
4	X34	DC24V	Custom property
5	X35	DC24V	Custom property
6	X36	DC24V	Custom property
7	X37	DC24V	Custom property
8	X38	DC24V	Custom property
9	X39	DC24V	Custom property
10	X40	DC24V	Custom property(Some versions do not have this interface)

Note: IO expansion boards for main control board communicates with the main control board through CN5, using 30PIN wiring.

3.1.5 Signal output terminal description

- Relay Output (TP508H-00V-12P Terminal)

PIN No.	Signal name	Function	Instructions
1	Y1	Brake-holding contactor	Relay contact output. Maximum 5A/250VAC or 3A/30VDC, action delay 5ms, maximum operating frequency 300 times/minute, contact life 100,000 times (see relay specifications).
2	1M		
3	Y2	Main operating contactor	
4	2M		
5	Y3	Custom property	
6	3M		
7	Y4	Custom property	
8	4M		
9	Y5	Custom property	
10	5M		
11	Y6	Custom property	
12	6M		

- IO expansion boards for main control board: Relay Output (TP508H-00V-10P Terminal)

PIN No.	Signal name	Function	Instructions
1	Y7	Custom property	Relay contact output. Maximum 5A/250VAC or 3A/30VDC, action delay 5ms, maximum operating frequency 300 times/minute, contact life 100,000 times (see relay specifications).
2	7M		
3	Y8	Custom property	
4	8M		
5	Y9	Custom property	
6	9M		
7	Y10	Custom property	
8	10M		
9	GND	External DC24V reference level	
10	P24V	External DC24V power input	

Note: IO expansion boards for main control board directly communicates with the main control board through CN5, using 30PIN wiring.

3.2 Inverter base interface

3.2.1 Power line interface

See the main circuit I/O and ground terminals section.

3.2.2 Control line interface

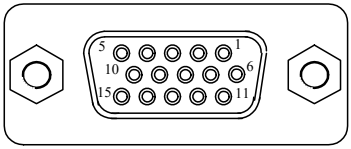
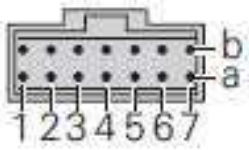
uses 40PIN line to insert horn socket to connect with the main control board, all power levels of the interface is exactly the same.

3.3 Encoder interface

ACE1000 supports SIN/COS encoder, UVW encoder, ABZ differential encoder, push-pull and OC output incremental encoder. It needs to use corresponding encoder interface card. The first three kinds of encoder interfaces all adopt DB15 plug mode. Interface with the main control board is CN11.

3.3.1 SIN/COS encoder interface

The commonly used SIN/COS encoder is Heidehan ERN 1387. The number of 14 pins terminal in this encoder is defined as follows:

Main control board PG card, DB15-negative	Encoder connection line , DB15 -positive
	
Encoder connection line, terminal-negative	1387 encoder, terminal-positive
	

The corresponding relationship between the SIN/COS encoder interface of ACE1000 and the 14 pins terminal of ERN1387 encoder is shown in the following table. Please confirm carefully whether the encoder connection line used is correct.

DB15 terminal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1387 terminal	5a	NC	4b	4a	6b	2a	5b	3b	1b	7b	1a	2b	6a	NC	NC
Signal Property	B-	NC	R+	R-	A+	A-	0V	B+	5V	C+	C-	D+	D-	NC	NC

3.3.2 UVW differential Encoder Interface

DB15 terminal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Signal Property	A+	A-	B+	B-	Z+	Z-	U+	U-	V+	V-	W+	W-	5V	0V	NC

Note: UVW differential encoder card is also suitable for common ABZ differential encoder in asynchronous motor.

3.3.3 Push-pull and OC output incremental encoder interface

Definition	PIN1	PIN2	PIN3	PIN4	PIN5	PIN6	PIN7	PIN8	PIN9	PIN10
Property	A+	A-	B+	B-	Z+	Z-	VCC	GND	NC	PE

Note: The encoder power voltage of 5V/12V is selected by CON3 jumper cap. When the signal output is not differential, it must connecte to the "A-/B-/Z-" correspondingly while the "A+/B+/Z+" is suspended.

3.4 Car roof control board interface

It communicates with the main control board through CAN serial communication line and shares one CAN bus with the car command board. See the chapters of the supporting products.

3.5 Car command control board interface

It communicates with the main control board through CAN serial communication line and shares one CAN bus with the car roof control board. See the chapters of the supporting products.

3.6 Hall call board interface

It communicates with the main control board through CAN serial communication line. Independent CAN bus. See the chapters of the supporting products.

3.7 Elevator parallel and group control interface

The main control boards of each elevator communicate with each other through CAN serial communication. Independent CAN bus. Direct parallel connection within 4 (Included). Group control board is needed for more than 4.

3.8 Elevator monitoring interface

It communicates with the main control board through RS422/RS485 serial communication line. Used for community monitoring, wireless monitoring, Internet of things and so on. Both on-board RS422 and expanded board RS422 can be used for elevator monitoring and other functions.

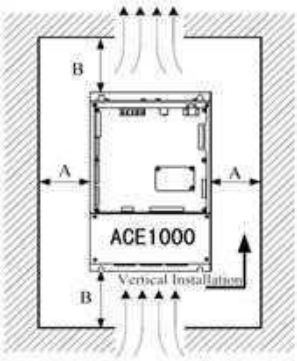
Charpter 4: Product installation and wiring

4.1 Installation instructions

4.1.1 Installation of drivers

Generally, the driver should be installed in vertical. The attentions are as follows:

(1) Environmental temperature: - 10℃~55℃. If the ambient temperature is higher than 40℃, the driver should be derating used(see the derating instructions for details);
(2) The humidity of the installation site should be less than 90%, and there should be no condensation;
(3) Do not install in places of dust and metal powder;
(4) There is no corrosive or explosive gas in the installation site;
(5) Vibration is less than 5.9m/s 2 (0.6G) in the installation site;
(6) Without direct sunlight in the installation site;
(7) Installation space requirements:



Power level	A	B
1.1~18.5kw	≧10mm	≧100mm
22~45kw	≧50mm	≧100mm

Note: Suitable for installation in separate motor-room or no motor-room.

4.1.2 Wiring of drivers

⚠ Danger:

1. Make sure that the power supply is disconnected before starting the wiring.
2. Only professionals can be in charge of the wiring work.
3. Don't confuse input and output terminals, otherwise the inverter may be damaged.
4. Make sure that the input power supply is completely disconnected before wiring and other operations, otherwise there is a risk of damage to the controller and electric shock.
5.Check whether the AC power supply voltage is in accordance with the rated voltage of the inverter.
6. Inverters should not be tested for withstanding voltage.
7. Please select brake components according to specifications.
8. Tighten the terminal screw according to the specified tightening torques.

The following points should also be paid attention to in the process of driver wiring:

- Be sure to wire the circuit breaker (MCCB) or fuse at the input terminals (R, S, T) of the power supply and driver power supply. Refer to 2.1.2 for the selection of circuit breakers (MCCB).
- Be sure to use grounding wire. The grounding wire should be 3.5mm^2 or above multi-strand copper core wire, and the grounding resistance should be less than 10Ω.
- The strong and feebleness lines must be separated by a certain distance, and do not go parallel.
- Guarantee the high reliability of each line and connection.
- After completing the wiring of the circuit, please check the following points:
  a. Are all lines correct?
  b. Is the feedback signal wiring of encoder correct?
  c. Is there a missing line?
  d. Is there a short circuit or grounding short circuit between terminals and wires?
- If you want to change the wiring after the power on, you should first cut off the power supply.

Note: It takes some time for the filter capacitor of the main circuit DC part to discharge completely. In order to avoid danger, it is necessary to wait for the charge indicator (CHARGE) to be extinguished and then test with a DC voltmeter to confirm that the voltage value is less than the safe DC voltage 36V before operation.

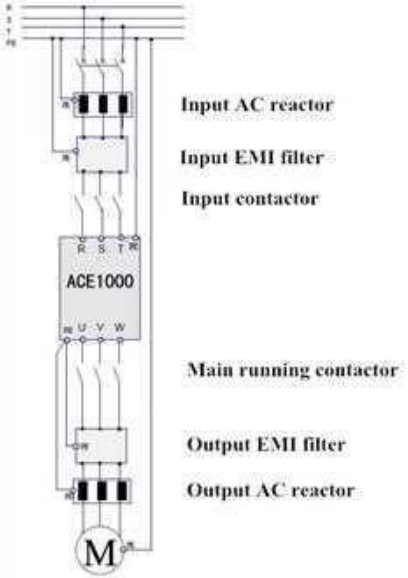
4.2 Wiring of main control board

The main control board IO port and serial communication port are connected by Phoenix BCH terminal (or compatible terminal) which is commonly used in the market. All input ports on board are optocoupler isolation. The input signal must be able to provide more than 10mA drive capability. It is recommended that the input core should be 0.25mm^2 or above. The shielded twisted pair is recommended for the serial communication lines used for internal and external call, parallel and group control and remote monitoring, and the core should be 0.3mm^2 or above. The output port on board is relay contact output. When selecting the output point, attention should be paid on the type and capability of contact drive. If inductive loads happen on the direct drive contactor/relay, be sure to make parallel connections of fly-wheel diodes to load terminals. Encoder interfaces use standard DB15 connectors. Encoder cores must be above 0.15mm^2 with shielding wires.

Encoder lines, serial communication lines and input and output signal lines must be kept at a certain distance from power lines and motor lines (recommendation is more than 20 cm). Do not tie them together or penetrate the same slot.

4.3 Connection of power equipment

4.3.1 Power wiring diagram



External equipment wiring diagram

4.3.2 Power wiring considerations

1. The power supply shall be in accordance with the rated voltage of the driver.

2. Be sure to wire the circuit breaker (MCCB) or fuse（ELCB） at the input terminals (R, S, T) of the power supply and driver power supply. Refer to 2.1.2 for the selection. MCCB or ELCB can not be used to control the start and stop of drivers.

3. Input AC reactor: AC reactor can be selected to improve the input power factor and reduce the high harmonic current.

4. Input EMI filter: EMI filter can be selected to suppress the high frequency noise interference from the driver power wires.

5. Input contactor: It is recommended to use the input contactor. It can cut off the power supply when the protection function of the system is operated(such as when the safety circuit is disconnected), which prevents the breakdown from expanding. But do not use this contactor to control the start and stop of the motor.

6. Main running contactor: Output side contactor should be used according to elevator safety specifications.

7. Output EMI filter: EMI filter can be selected to suppress the interference noise and leakage current from the output side of the driver.

8．Output AC reactor: It can suppress the radio interference of the driver. When the motor wiring is too long (more than 20 meters), overcurrent caused by distributed capacitance of conductor can be prevented.

9．See the capacity of circuit breakers, power conductors and power contactors specifications in Chapter 2.13.

4.3.3 Power circuit and ground terminal

⚠ Danger:
1. Make sure that the ground terminal PE of the converter is connected, otherwise there is a rsk of electric shock or fire accidents. 2. AC power supply can not be connected to the output terminals (U, V, W), otherwise there is a risk of accidents. 3. DC terminals (+), (-) can not directly connect brake resistance, otherwise there is a risk of fire accidents.

- **Name and function description of base terminal**

See chapter 2.2.5.

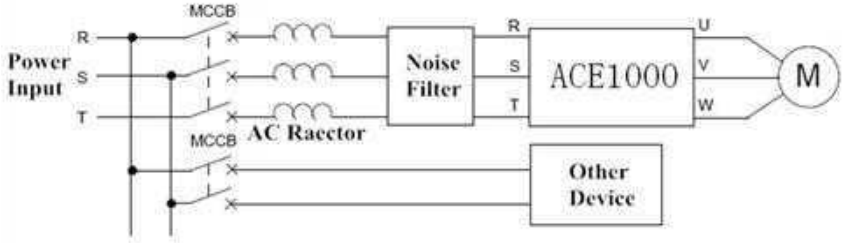
- **Main circuit power input terminals (R, S, T)**

When the main circuit power input terminals (R, S, T) are connected to 3-phase AC power supply by circuit protection circuit breaker (MCCB) or fuse, there is no consideration of the phase sequence. When connecting single-phase 220V power supply, please connect according to the label on the driver. Refer to 2.1.2 for the selection of circuit breakers.

1．In order to effectively cut off the power supply and prevent the breakdown from expanding when the protection function of the system operates, it is suggested to install an electromagnetic contactor on the input side to control the power supply of the main circuit.

2．Three-phase input type should not be connected to single-phase power supply or phase shortage input.

3．In order to reduce the conduction interference of the driver to the power supply, noise filters can be installed on the power side. The wiring is shown as follows:



Power input filter installation diagram

- **Driver output terminals (U, V, W)**

The driver output terminals U, V, W should be connected to the U, V and W terminals of the three-phase motor in correct phase sequence. If the motor rotates in the wrong direction, please modify the frequency conversion parameter P5_F0.03 (running direction).

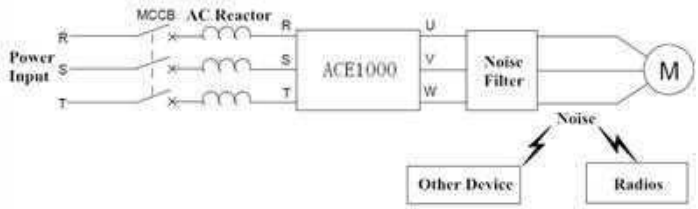
1. It is absolutely forbidden to connect the input power supply with the output terminals U, V and W.

2. Capacitors and surge absorbers cannot be connected to the output side of the driver.

3. It is absolutely forbidden of the short circuit or grounding of the output circuit.

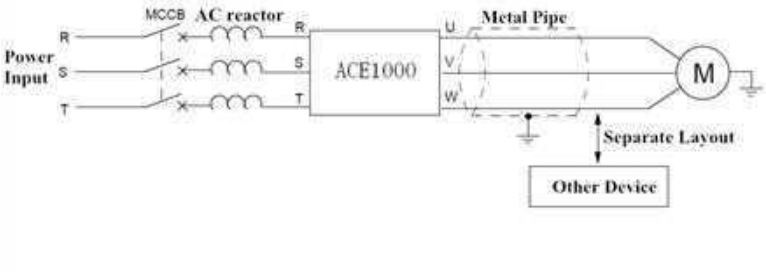
4. Suppress the output side interference noise:

① The special noise filter for driver is selected on the output side. As shown in the following figure:



Driver output filter installation diagram

② Put the driver output lines U, V, W through the grounding metal tube and install them separately from the signal line. As shown in the following figure:



Driver output filter installation diagram

When the wiring between driver and motor is too long, the distributed capacitance between the lines will produce high frequency current, which may cause overcurrent tripping protection of the driver. At the same time, the leakage current will increase, resulting in poor current display accuracy. Therefore, the wiring length between the driver and the motor should not exceed 20 meters. If the wiring is too long, install the filter, reactor at the output side or reduce the carrier frequency.

- **DC reactor connection terminals (P1, (+))**

DC reactor can improve power factor. If DC reactor is needed, the short circuit block between P1 and (+) should be removed first (the default configuration is with short connection block). If the DC reactor is not needed, please do not remove the short circuit block between P1 and (+), otherwise the driver will not work properly.

- **External brake resistance connection terminals ((+), PB)**

The ACE1000 driver is equipped with internal brake unit. In order to release the energy feedback during braking operation, the brake resistance must be connected at (+) and PB terminals. Brake resistance wiring should be heat-resistant and fire-resistant, and the length should be less than 5 meters. The temperature of brake resistance increases with the release of energy, so safety protection and heat dissipation should be paid attention to.

- **Grounding terminal (PE)** ⏚

In order to ensure safety and prevent electric shock and fire accidents, the grounding terminal PE of the driver must be well grounded, and the grounding resistance should be less than 10Ω. The driver should have a separate grounding terminal, and the grounding wire should be thick and short. The grounding wire should be 3.5mm^2 or above multi-strand copper core wire, and special yellow-green grounding wire is the best. When multiple drivers are grounded, it is suggested that common ground wire should not be used as far as possible to avoid the formation of a loop of grounding wire. PE must also be connected to temporary power supply during elevator installation and commissioning.

- **Reference for brake component configuration (DBR)**

controller model	Adaptive motor power(KW)	Maximum brake resistance（Ω）	Minimum brake resistance（Ω）	Power（W）
S21R1XB	1.1	135	85	300
S21R5XB	1.5	95	60	450
S22R2XB	2.2	70	50	600
S23R7XB	3.7	45	30	1100
S25R5XB	5.5	45	30	1600
22R2XB	2.2	72	45	600
23R7XB	3.7	50	40	1100
25R5XB	5.5	45	30	1600
32R2XB	2.2	230	100	600
33R7XB	4	150	85	1100
35R5XB	5.5	105	75	1600
37R5XB	7.5	82	62	2500
3011XB	11	55	40	3500
3015XB	15	43	35	4500
318R5XB	18.5	34	24	5500
3022XB	22	25	20	6500
3030XB	30	20	15	9000
3037XB	37	16	12	11000
3045XB	45	14	10	13500

4.3.4 Connection of power feedback device

Please refer to the instructions for the use of the energy feedback device or consult the technical support engineer of Alpha Company.

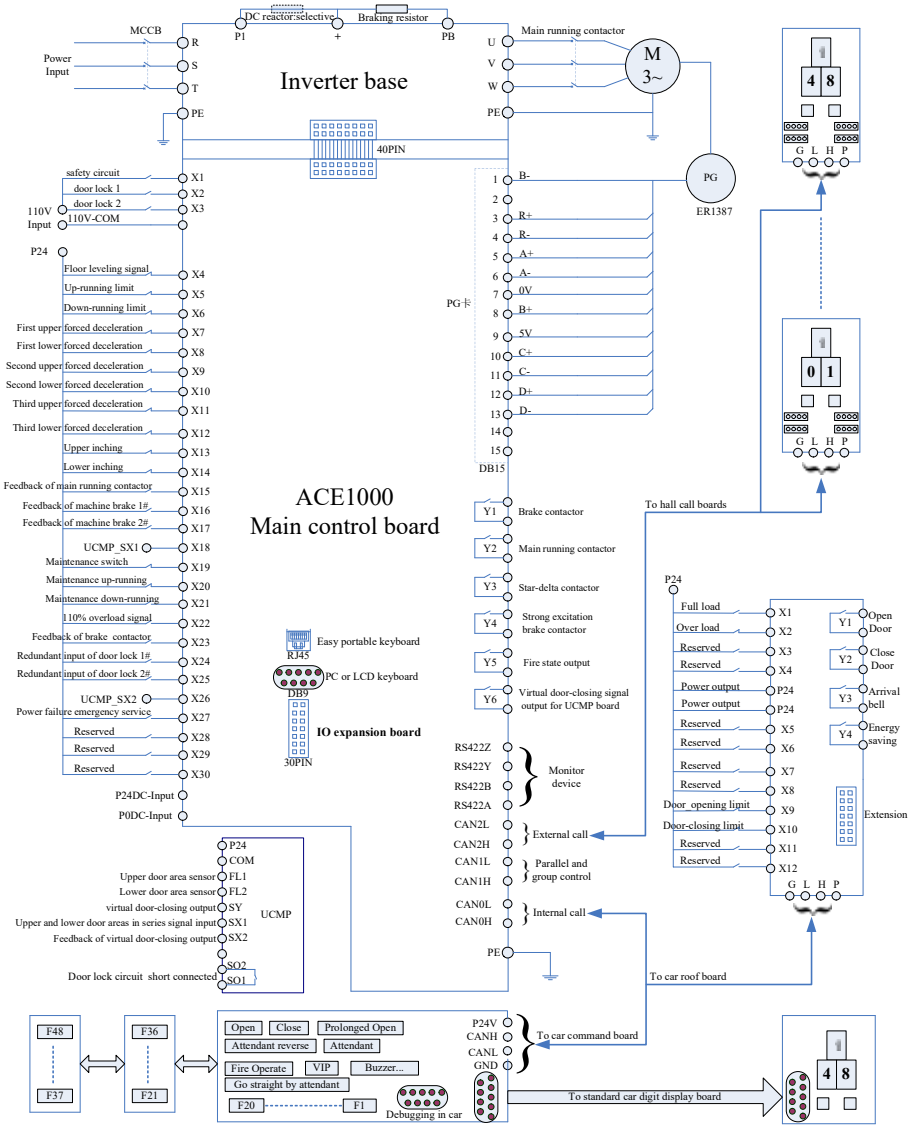
4.3.5 Connection of Blackout Emergency Device(ARD)

Please refer to the relevant sections of the application plan description or consult the technical support engineer of Alpha Company.

4.4 Electrical wiring diagram

Please ask the manufacturer for the reference electrical system supporting drawings or download from the official website of Alpha.

4.5 Complete control system diagram



Chapter 5: Elevator debugging with keyboard

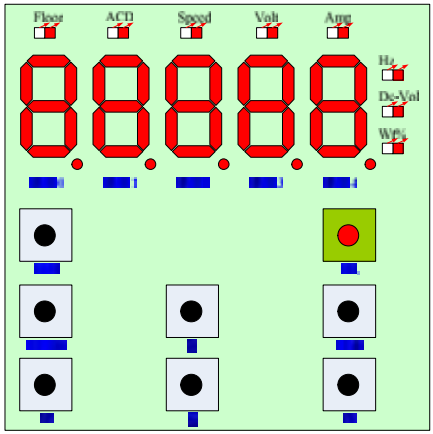
5.1 Brief introduction

There are at least five methods to complete elevator debugging for ACE1000 integrated control system: on-board debugging, easy portable keyboard debugging, Chinese/English LCD keyboard debugging, mobile phone APP software debugging, computer PC software debugging. On-board debugging and easy portable keyboard debugging methods are exactly the same, which is also the main content of this chapter; Chinese/English LCD keyboard debugging methods will be explained in subsequent chapters; mobile phone software debugging and computer PC software debugging methods can be referred to the instructions provided by the software, which will not be explained here.

ACE1000 integrated control system can set parameters, monitor status, inquire faults and control operation of the control system through 8 keys on the main control board/easy portable keyboard, 5 digital tubes and 8 Led lamps. It can meet the requirements of elevator installation, maintenance, monitoring and daily use. Familiarity with the function and operation of this keyboard is the prerequisite for mastering ACE1000 control system. Therefore, it is recommended that you read the instructions carefully before debugging.

The layout and functions of the main control board/easy portable keyboard are shown in the following chart:

Display	Digital tube	Display information about current operations (menus, data)
	Independent LED lamp	Prompt current content, unit
Keys	**MENU**	Main menu key (root directory)
	▲INC/UP	Increase key (valid on flickering bit), long pressing for continual increase
	▼DEC/DOWN	Decrease key (valid on flickering bit), long pressing for continual decrease
	<<LEFT	Shift to the left, flickering bits can be modified with the Increase and Decrease keys
	>>RIGHT	Shift to the right, flickering bits can be modified with the Increase and Decrease keys
	ESC	Escape, exit, failure reset key (valid under P0 menu)
	ENT	Enter, set, operation confirmation key
	STOP/START	Special function key: Keyboard mode: START /STOP motor Distance mode: OPEN/CLOSE door



Keyboard layout sketch

Note:The 8 separate Led lights on-board keyboard are on the left side of the digital tubes

Note 1: LED0~LED4 represent five "8" digital tubes , and Led lamps represent eight independent light-emitting diodes.

Note 2: The functions of LEFT and RIGHT keys in P4 and P5 in data looking up state can be controlled by P4-C1.49 parameter. The keys can be divided into two ways: short pressing and long pressing (more than 200 ms). They can enter the data modification state (digital tube flickering) or turn pages directly (that is, to continue to look up data from the current data group to the adjacent data group), similar to using up, down, left and right keys on a PC desktop to locate cells in EXCEL.

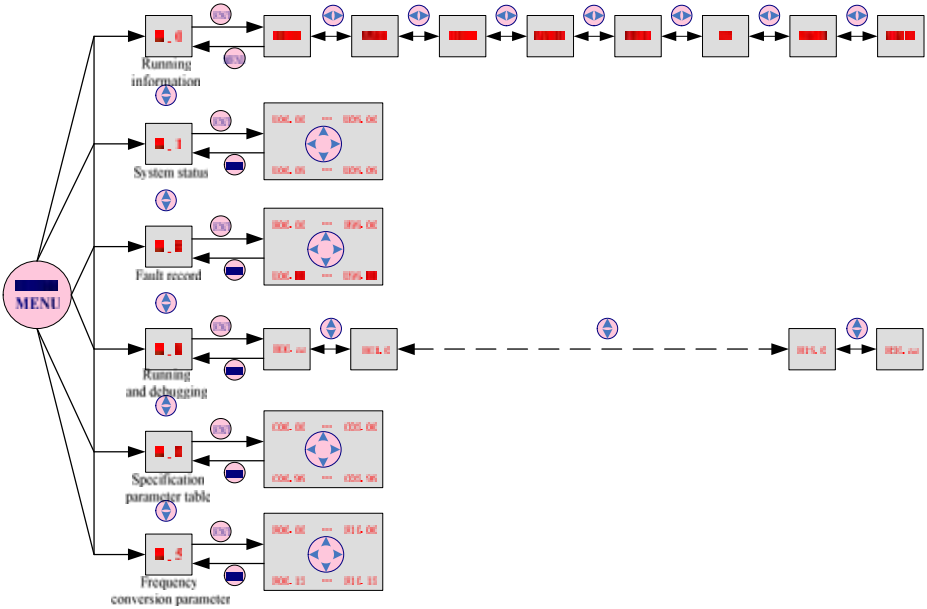
Note 3: START/STOP keys belong to functional flip type keys, which do not distinguish between long pressing and short pressing, and flip as soon as the key is released. *When entering the P5 menu function in keyboard control mode (F00.01=0), this key has the function of starting and stopping the motor (X1~X42 needs to be pulled out and in maintenance mode); After the last stop command is given, the key must be released completely for more than 5 seconds before the motor can be started again. *When entering the menu function in distance control mode (F00.01=1), this key is equivalent to the open/close door button in the car (8 Led lamps flickering indicating the key status). Chinese/English LCD keyboard also has this key and its function is exactly the same.

Note 4: In P4 and P5 parameter display state, pressing ENT key directly without modifying parameter value is equivalent to pressing ▼ key once.

Note 5: Since the use of the main board keyboard matches exactly with that of the easy portable keyboard, all subsequent references to the main control on-board keyboard (the on-board keyboard for short) are also applicable to the easy portable keyboard, and vice versa.

5.2 General description

The overall structure of ACE1000's function menu is as follows:



1. On-board debugging is divided into six parts: **P0** (running information monitoring), **P1** (system status checking **U**), **P2** (fault record query **E**), **P3**(running/debugging control **H**), **P4** (specification parameter reading/writing **C**), **P5**(frequency conversion parameter reading/writing **F**). Each part is subdivided into second or third grade menu and the specific functions of the menu are invoked by pressing the ENT key.

2. **P0** subdivides into eight basic running information functions: FLOOR, ACD, SPEED, VOLTAGE, CURRENT, FRENQUCY, DC-VOLTAGE, WEIGHT (%) .Corresponding to eight Led lamps prompt. They are:

- FLOOR: **Floor information** (FLOOR light flickering)
- ACD: Elevator status **code information** (ACD light flickering)
- SPEED: Elevator real-time **speed information** (SPEED light flickering, unit m/s)
- VOLTAGE: Inverter real-time **output voltage information** (VOLTAGE light flickering, unit V)
- CURRENT: Inverter real-time **output current information** (AMP light flickering, unit A)
- FRENQUCY: Inverter real-time **output frequency information** (HZ light flickering, unit Hz)
- DC-VOLTAGE: Inverter real-time **busbar voltage**(DC-Volt light flickering, unit V)

- WEIGHT(%):Elevator real-time **weighing information** (WT% light flickering, unit %).

When the main control system detects the elevator fault, the current **fault code and the running information alternately display under P0**. If there are multiple faults at the same time, the running information will be displayed after all faults are displayed in turn.

1. **P1** is subdivided into 10 groups(100 units) of status monitoring from U00.00 to U09.09. The groups are:

- U0: Effective state of input/output variables
- U1: Effective state of input/output terminals
- U2: Summary of Elevator Calls
- U3: Elevator communication status
- U4: Fault record of safety circuit and door opening and shutting
- U5: Summary analysis of fault graduation
- U6: Summary analysis of fault classification
- U7: Summary analysis of fault time-division
- U8: Analysis of button-conglutination of internal and external call, and absence of external call board
- U9: Signal satisfaction check

Each group above is subdivided into 10 monitoring units from 0 to 9 (see the follow-up details for specific units). When looking up the specific monitoring unit, **the LED0 circle flickers the current group number (with decimal point) and unit number (without decimal point) . The vertical line of the LED1 ~ LED4 displays the 16 points status monitored by the current unit (corresponding to No.01 ~ No.16 point in turn from left to right, then from top to bottom).**

2. **P2** is subdivided into **100 fault records**(E00.yy~E99.yy), and each record is subdivided into **32 fault information**(Exx.00~Exx.31). Before entering Exx.yy function from P2 menu, the total number of current faults will display 600 ms.

3. **P3** is subdivided into 24 debugging control functions(H00~H23),They are:

H0 Clear all debugging settings	H13 Floors height self-measurement
H1 Elevator maintenance from keyboard	H14 No overload detection
H2 Run to the bottom floor	H15 Restore off-chip/default parameter to current state
H3 Run to the middle floor	H16 Backup the current parameter to off-chip memory
H4 Run to the highest floor	H17 Transfer elevator parameters to another main control board
H5 Run to any internal call floor	
H6 Run to any upper call floor	H18 Synchronous motor detection for braking torque
H7 Run to any lower call floor	H19 UCMP Functional Test
H8 Keyboard call holding	H20 Door opening and closing test
H9 Running test mode	H21 Comparison of current parameters with factory default parameters
H10 External call prohibition	
H11 Door stops running	H22 Elevator status when using backup power for brake loosening
H12 Motor parameter self-learning	H23 Clear all fault records

4. **P4** is subdivided into six groups(C00.yy~C05.yy), each group is subdivided into 100 specifications parameter (including Reserved). The operation of locating method is similar to a two-dimensional table of 100×6.

P4_C0: Basic parameters	P4_C1: Extended function	P4_C2: Time parameters	P4_C3: Floor display	P4_C4: IO terminal definition	P4_C5: Other information
C0.00	C1.00	C2.00	C3.00	C4.00	C5.00
…	…	…	…	…	…
…	…	…	…	…	…
C0.99	C1.99	C2.99	C3.99	C4.99	C5.99

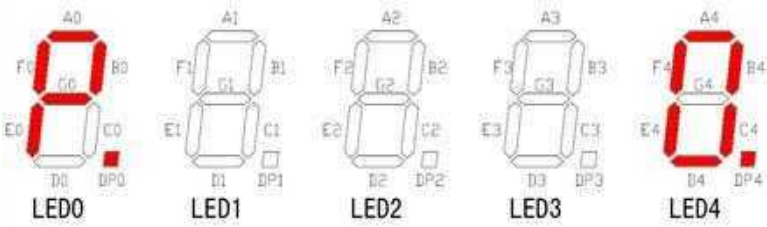
5. **P5** is subdivided into 11 groups of frequency conversion function codes(F00.yy~F10.yy), and each group is subdivided into several parameters (see the chapter of description of frequency conversion function parameters for specific parameters). The operation of locating method is similar to a two-dimensional table of (xx)×11. The groups are: **F0-basic parameter, F1-inverter base parameter, F2-motor parameter, F3-encoder parameter, F4- vector control parameter, F5-speed parameter, F6-hoistway parameter, F7-start&stop control parameter, F8- detection and fault parameter, F9-display parameter, and F10-extended parameter.**

P5_F0	P5_F1	P5_F2	P5_F3	P5_F4	P5_F5	P5_F6	P5_F7	P5_F8	P5_F9	P5_F10
F0.00	F1.00	F2.00	F3.00	F4.00	F5.00	F6.00	F7.00	F8.00	F9.00	F10.00
…	…	…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…	…
F0.12	F1.08	F2.17	F3.05	F4.14	F5.22	F6.60	F7.14	F8.24	F9.15	F10.15

5.3 The way to use the functionality

5.3.1 Operation of P.x

Press the MENU key at any time, it will exit to the root menu(P.X). The LED digital tube shows: P._ _ _X, the decimal point of the LED 4 flickers, as follows:



X represents the current menu number (or mode number P0~P5). Pressing INC and DEC keys at this time can add or subtract 1 from X. When you reach the mode number X and you want to enter, press ENT key to enter the corresponding menu function. After entering each mode, the display content is different.

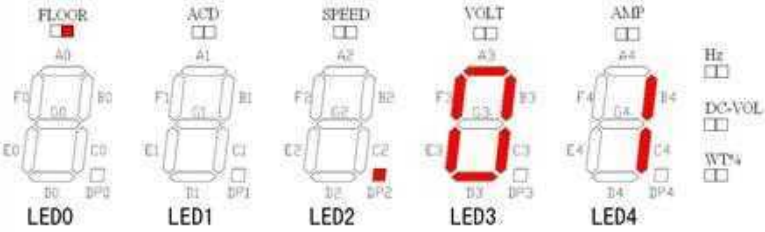
The basic running information is displayed under P0, the unit status monitoring menu U0X.0X under P1, the fault recording menu Exx.yy under P2, the elevator debug control function menu Hxx.yy under P3, the specification parameter function menu Cxx.yy under P4, and the frequency conversion control function menu Fxx.yy under P5.

When the LED digital tube displays mode number P._ _ _0 and its subfunctions, press ESC key 300ms to perform the function of **resetting the current fault** of elevator (8 Leds will illuminate in sequence). In other cases, pressing ESC key is to exit the current function or menu, and return to the state of displaying mode number P._ _ _X.

5.3.2 P0 function description (Running Information)

- **Running status information display:**

Press MENU key, LED digital tube display: P._ _ _X, (continuously) press INC or DEC key, make mode number X add or subtract to 0, then press ENT key, LED digital tube display as follows(portable keyboard):



The flickering FLOOR-LED above displays that the current monitoring subfunction type is floor monitoring function. LED0 fixedly displays elevator running direction (currently no direction) and car leveling status. LED 1 fixedly displays input status of safety circuit and door-lock of hall and car and others. LED2～LED4 is related to the subfunctions of current monitoring. LED 2 in the figure shows the output status of main running contactor and braking contactor. LED3 and LED4 in the figure show that the current floor of elevator is floor 1. Press INC/DEC key to switch the subfunctions of monitoring (8 Leds flicker to show the subfunctions of current monitoring).

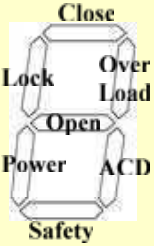
- **Use UP,DOWN keys to call:**

When the elevator is in normal state(ACD = 0x27), under any sub-function interface of P0, the elevator can be directly called by "UP/DOWN key+ ENTER key" on the keyboard. Press UP key once means call to one upper floor, and DOWN key once means call to one lower floor. It can be pressed repeatedly (non-long pressing), but time delay between every pressing should be no more than one second. For example, the car is on the 5th floor, first press UP key 4 times, then DOWN key 1 time, then press ENTER key, which is equivalent to giving the elevator an internal call instruction to the 8th floor (5 + 4-1 = 8).

Note: This function is controlled by logic specification parameter P4C1.49_Bit11.

- **Corresponding to different sub-functions, the LED content displayed is shown in the table below.**

<table>
<tr><th>8-Led</th><th>LED0</th><th>LED1</th><th>LED2</th><th>LED3</th><th>LED4</th></tr>
<tr><td>FLOOR: Floor display</td><td> 

●A0, B0, F0 on (up arrow) represents the elevator is executing the upward instructions.
●C0, D0, E0 on(down arrow) represents that the elevator is executing downward instructions.
●G0 on (floor leveling) represents the car in the leveling state.</td><td> 

●The "close" on indicates the closing limit input/arrive.
●The "open" on indicates the opening limit input/arrive.
●The "safety" on indicates safety circuit input/arrive.
●The "lock" on indicates the door-lock signal input/arrive.
●The "power" on indicates normal power supply input/arrive.
●The "state" on indicates the "normal state " mode input/arrive.
●The "overload" on indicates that there is no overload signal input/arrive.</td><td> 

●The "Close" on indicates that the output of the shut-door relay is valid.
●The "open" on indicates that the output of the open-door relay is valid.
●The "command" on indicates that the output of running instructions is valid.
●The "speed" on indicates that the output of the speed mode is valid.
●The "brake-holding" on indicates that the output of the brake-holding relay is valid.
●The "running" on indicates that the output of main running relay is valid.
●The "safety" on indicates that the output of safety relay is valid.</td><td colspan="2">Current floor (Physically)</td></tr>
<tr><td>ACD: Status code</td><td colspan="2">ACD code (see the later instructions)</td></tr>
<tr><td>SPEED: Real time speed</td><td colspan="4">Elevator real-time running speed, unit m/s, including 3 decimal places.</td></tr>
<tr><td>VOLT: Output voltage</td><td colspan="4">Inverter real-time output voltage, unit V, no decimal point.</td></tr>
<tr><td>AMP: Output current</td><td colspan="4">Inverter real-time output current, unit A, including 1 decimal.</td></tr>
<tr><td>Hz Output frequency</td><td colspan="4">Inverter real-time output frequency, unit Hz, including 1 decimal.</td></tr>
<tr><td>DC-VOL: Busbar voltage</td><td colspan="4">Inverter real-time busbar voltage, unit V, no decimal point.</td></tr>
<tr><td>WT%: Car load</td><td colspan="4">Elevator car real-time weighing percentage, no decimal point. For example: 25 represents 25% of the full load, 110 represents 110% of the full load.</td></tr>
</table>

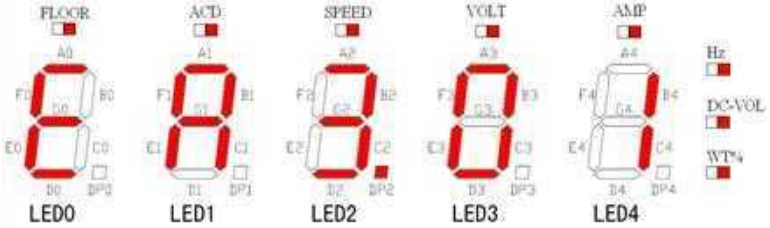
- **ACD CODE——Elevator status code, such as normal, fault, adjustment and commissioning…**

0x00 initialization; 0x01AN operation; 0x02 earthquake control door-open standby; 0x03 failure stop; 0x04 maintenance operation; 0x05 earthquake control completed; 0x06 earthquake control; 0x07 earthquake low speed; 0x08 near-leveling correction operation; 0x09 floor height measuring; 0x0A floor height measuring; 0x0B blackout self-rectifying completed; 0x0C blackout self-rectifying; 0x0D earthquake fire once; 0x0E fire once; 0x0F fire twice; 0x10 call back completed; 0x11 one week after earthquake; 0x12 emergency back-call return; 0x13 fire protection; 0x14 fire protection back; 0x15 rectifying operation arrived; 0x16 rectifying operation; 0x17 rectifying back completed; 0x18 rectifying back; 0x19 fire control completed; 0x1A fire control; 0x1B room temperature abnormality completed; 0x1C room temperature abnormality; 0x1D disaster prevention overload operation completed, refuge floor; 0x1E self-generating control completed; 0x1F self-generating control; 0x20 disaster prevention overload operation completed, non-refuge floor; 0x21 disaster prevention overload running; 0x22 operation prohibition; 0x23 parking completed; 0x24 VIP purpose; 0x25 lift attendants manual operation; 0x26 reserve operation; 0x27 normal; 0x28 air conditioning drainage; 0x29 near floor operation stopping; 0x2A emergency back-call return; 0x2B emergency call; 0x2C operation limit; 0x2D standby; 0x2E standby; 0x2F standby.

Note: Some ACD codes are temporarily standby.

- **Fault display:**

Take an example: The safety circuit occurs the fault of disconnection at present. Its fault grade is A and the fault code is 3.01. It is shown as follows:



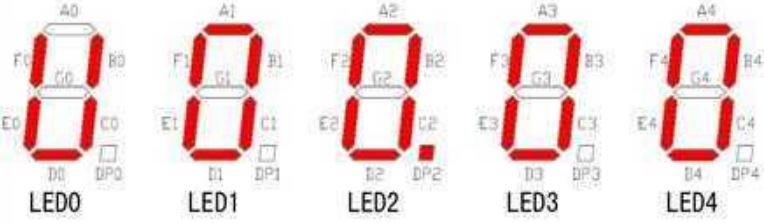
Note: All 8 Led lights are on to warn faults on.

- **Reset the current fault:**

Under P0 and its sub-menu, pressing ESC 300 ms can reset the current fault. However, it should be noted that some of the faults that still exist in the condition of the fault will generate the same fault code immediately, and some of the faults can only be cleared after system restarted.

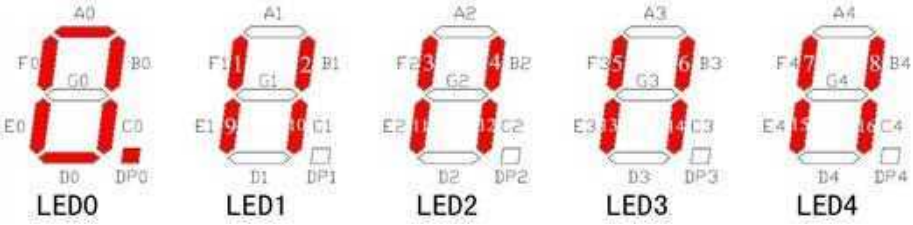
5.3.3 P1 function description (Status Monitoring and Statistics)

Press MENU key, LED digital tube display: P._ _ _X, (continuously) press INC or DEC key, make mode number X add or subtract to 1, press ENT key, LED digital tube display the current unit number Uxx.yy, such as below:



Press the LEFT/RIGHT key, the flickering of LED2 indicates that the monitoring group number is in a modifiable state, and that of LED4 indicates the monitoring unit number is in a modifiable state. When LED 2 flickers the current monitoring group number can be modified by pressing INC/DEC key, and when LED4 flickers the current monitoring unit number can be modified by pressing INC/DEC key. After setting up the group and unit numbers that need to be monitored, press ENT key to enter the corresponding unit monitoring function.

The display of P1 can be divided into four types according to the content: ● fault code, ● number, ● vertical line, ● number and vertical line alternation. The vertical line has 16 sections as shown in the following picture LED1~LED4 (pay attention to the position of 1～16 in the figure):



LED0 alternately displays the group number and unit number of the current monitoring (note: "group number" with decimal point, "unit number" without decimal point), LED1 ~ LED4 shows the ON / OFF status or statistics of 16 monitoring points. Pressing the INC/DEC key can directly go to the adjacent monitoring "unit number". Long pressing the LEFT/RIGHT key 200 ms can directly go to the adjacent "group number". Especially when looking up U2.03 ～ U2.08 data, short pressing the LEFT/RIGHT key can go to the adjacent subunit numbers(1～16) in current unit number .

- The corresponding relationship between 16 vertical segments of LED1~LED4 and 16 monitoring points is as follows:

LED1(Low)		LED2		LED3		LED4(High)	
Monitoring point 1	Monitoring point 2	Monitoring point 3	Monitoring point 4	Monitoring point 5	Monitoring point 6	Monitoring point 7	Monitoring point 8
LED1-F1	LED1-B1	LED2-F2	LED2-B2	LED3-F3	LED3-B3	LED4-F4	LED4-B4
Monitoring point 9	Monitoring point 10	Monitoring point 11	Monitoring point 12	Monitoring point 13	Monitoring point 14	Monitoring point 15	Monitoring point 16
LED1-E1	LED1-C1	LED2-E2	LED2-C2	LED3-E3	LED3-C3	LED4-E4	LED4-C4

For example, for U02.00 monitoring point 1 is the 1st floor, monitoring point 16 is the 16th floor, for U02.01, monitoring point 1 is the 17th floor, monitoring point 16 is the 32nd floor, for U02.02, monitoring point 1 is the 33rd floor, and monitoring point 16 is the 48th floor.

- The corresponding monitoring contents of each monitoring group and unit are as follows: 100 in total from U00.00 to U09.09. (Unlisted unit is Reserved)

Function code	Function definition	Remarks
P1.U00	Effective state of input/output **variables**	16 vertical lines to display
U00.00	State of input variables numbered 01~16	On when the variable judges valid. Serial number of variables is in Appendix IV.
U00.01	State of input variables numbered 17~32	
U00.02	State of input variables numbered 33~48	
U00.03	State of input variables numbered 49~64	
U00.04	State of input variables numbered 65~80	
U00.05	State of input variables numbered 81~96	
U00.06	State of output variables numbered 01~16	
U00.07	State of output variables numbered 17~32	
U00.08	State of input variables numbered 97~99 State of output variables numbered 33~40	On when the variable judges valid. In97-99 is in the upper row, Out33-40 is in the lower row.
U00.09	Reserved	
P1.U01	Effective state of input/output **terminals**	16 vertical lines to display
U01.00	Input terminal X01~X16 status	On when the terminal judgs valid. When the terminal is valid, the corresponding variable state defined to the terminal is also valid, and vice versa when the terminal is invalid, the variable state defined to the terminal is also invalid.
U01.01	Input terminal X17~X32 status	
U01.02	Input terminal X33~X48 status	
U01.03	Input terminal X49~X64 status	
U01.04	Input terminal X65~X80 status	
U01.05	Output terminal Y01~Y16 status	
U01.06	Output terminal Y17~Y32 status	
U01.07	Main control board X1~X16 level state	It has nothing to do with whether this point is defined/used in P4C4. Y0~Y8 is in the lower row of U01.09.
U01.08	Main control board X17~X32 level state	
U01.09	Main control board X33~X40/X41 level state, and Y0~Y8 level state	
P1.U02	Elevator call and fault hierarchical summary	Vertical lines, alternations, digits
U02.00	Call state of 01~16 floors	16 vertical lines to display. On when the corresponding floor has calls to respond.
U02.01	Call state of 17~32 floors	
U02.02	Call state of 33~48 floors	
U02.03	Call times of 01~16 floors	Times are displayed in decimal digits, and 16 floors are represented by the position of 16 vertical lines. Times are displayed alternately with floors. Floor can be switched with left and right keys. Power down data preservation.
U02.04	Call times of 17~32 floors	
U02.05	Call times of 33~48 floors	
U02.06	Times of faults occurring on each floor of 01~16 floors	
U02.07	Times of faults occurring on each floor of 17~32 floors	
U02.08	Times of faults occurring on each floor of 33~48 floors	
U02.09	Two floors with the most call times	Digits to display. Power down data preservation.
P1.U03	CAN serial communication state	Digits, vertical lines
U03.00	CAN0 communication quality	Digits to display, number of valid data packets received per second
U03.01	CAN1 communication quality	
U03.02	CAN2 communication quality	
U03.03	Whether the communication from 01 to 16 floor of the hall call board is OK or not	16 vertical lines to display, the corresponding location is on when the data package of the

Function code	Function definition	Remarks
U03.04	Whether the communication from 17 to 32 floors of the hall call board is OK or not	floor is received within 5 seconds.
U03.05	Whether the communication from 33 to 48 floors of the hall call board is OK or not	
U03.06	MCU-DSP communication quality	Digits to display, times of communications per second.
U03.07	Off-chip EEPROM reading and writing quality	Digits to display, times of reading and writing failures since power on.
U03.08	Off-chip FLASH reading and writing quality	Digits to display, times of reading and writing failures since power on.
U03.09	Whether the parallel and group control communication of elevator 1-8 is OK. Car roof board, Car command board, Hall call board, Parallel/group control (general).	The upper row: Parallel/group control communication state of 8 elevators corresponding to 8 vertical lines. The lower row: The lower four bits correspond to Car roof board, Car command board, Hall call board, Parallel/group control (general) communication status in sequence.
P1.U04	Fault record of safety circuit and door opening and shutting	16 vertical lines to display
U04.00	The elevator occurs a safety circuit fault when passing through floor 01~16	On when the corresponding floor occurs failure. Power down data preservation.
U04.01	The elevator occurs a safety circuit fault when passing through floor 17~32	
U04.02	The elevator occurs a safety circuit fault when passing through floor 33~48.	
U04.03	Failed when open the door on floor 01~16	
U04.04	Failed when open the door on floor 17~32	
U04.05	Failed when open the door on floor 33~48	
U04.06	Failed when close the door on floor 01~16	
U04.07	Failed when close the door on floor 17~32	
U04.08	Failed when close the door on floor 33~48	
U04.09	Reserved	
P1.U05	Summary analysis of fault graduation	Digits to display
U05.00	Total times of grade A failures in elevator	Power down data preservation.
U05.01	Total times of grade B failures in elevator	
U05.02	Total times of grade C failures in elevator	
U05.03	Total times of grade D failures in elevator	
U05.04	Total times of grade E failures in elevator	
U05.05	Total times of grade F failures in elevator	
U05.06	Total times of grade G failures in elevator	
U05.07	Two floors with most times of door lock and safety circuit failures	
U05.08	Two floors with the most door-opening failures	
U05.09	Two floors with the most door-closing failures	
P1.U06	Summary analysis of fault classification	Digits, fault codes
U06.00	Total times of class 1 failure in elevator	Digits to display, Power down data preservation.
U06.01	Total times of class 2 failure in elevator	
U06.02	Total times of class 3 failure in elevator	
U06.03	Total times of class 4 failure in elevator	
U06.04	Total times of class 5 failure in elevator	
U06.05	Total times of class 6 failure in elevator	
U06.06	Total times of class 7 failure in elevator	

Function code	Function definition	Remarks
U06.07	Total times of class 8 failure in elevator	
U06.08	Fault codes that appear most frequently in elevator	Faults codes to display, Power down data preservation.
U06.09	Fault codes that appear second most frequently in elevator	
P1.U07	Summary analysis of fault time division	Digits to display
U07.00	Total times of elevator failures today	Power down data preservation.
U07.01	Total times of elevator failures yesterday	
U07.02	Total times of elevator failures the day before yesterday	
U07.03	Total times of elevator failures 3 days before	
U07.04	Total times of elevator failures 4 days before	
U07.05	Total times of elevator failures 5 days before	
U07.06	Total times of elevator failures 6 days before	
U07.07	Total times of elevator failures 7 days before	
U07.08	Total times of elevator failures 8 days before	
U07.09	Total times of elevator failures 9 days before	
P1.U08	Analysis of conglutination of internal and external call button, and absence of external call board	16 vertical lines to display
U08.00	Button- conglutination of internal and external call board in floor 1~16.	The internal and external call button is pressed for more than 60 seconds.
U08.01	Button- conglutination of internal and external call board in floor 17~32.	
U08.02	Button- conglutination of internal and external call board in floor 33~48.	
U08.03	Absence of external call board 1~16 floors	The external calling board of the floor loses communication for more than 60 seconds.
U08.04	Absence of external call board 17~32 floors	
U08.05	Absence of external call board 33~48 floors	
U08.06	Reserved	
U08.07	Reserved	
U08.08	Reserved	
U08.09	Reserved	
P1.U09	Signal satisfaction check	16 vertical lines to display, corresponding to P4C1.49 function
U09.00	Motor pole angle learning	16 vertical lines are used to indicate whether the signal is complete or valid.
U09.01	Maintenance operation	
U09.02	Floor height self-learning	
U09.03	Normal running	
U09.04	Inching to re-level with door-opening	
U09.05	Detection for braking torque	
U09.06	Self-rectifying running	
U09.07	Door opening and shutting	
U09.08	Reserved	
U09.09	Reserved	

Note: The signal satisfaction check, except for the "door opening and shutting", use all on represents condition satisfied completely, and some of which are on after the start of running.

- 16 monitor points of U00.00/U01.00: Input variable 1~16, main control board input X1～X16.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Variable 1 /X1:	Variable 2/X2:	Variable 3/X3:	Variable 4/X4:	Variable 5/X5:	Variable 6/X6:	Variable 7/X7:	Variable 8/X8:

Safety circuit	Door-lock of car	Door-lock of hall	Leveling area	Upper limit	Lower limit	Upper-first forced deceleration	Lower-first forced deceleration
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Variable 9/X9: Upper-second forced deceleration	Variable 10/X10: Lower-second forced deceleration	Variable 11/X11: Upper-third forced deceleration	Variable 12/X12: Lower-third forced deceleration	Variable 13/X13: Up inching request	Variable 14/X14: Down inching request	Variable 15/X15: Feedback of main running contactor	Variable 16/X16: brake-holding sensor switch

- 16 monitor points of U00.01/ U01.01: Input variable 17~32, main control board input X17～X32.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Variable 17/X17	Variable 18/X18	Variable 19/X19	Variable 20/X20	Variable 21/X21	Variable 22/X22	Variable 23/X23	Variable 24/X24
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Variable 25/X25	Variable 26/X26	Variable 27/X27	Variable 28/X28	Variable 29/X29	Variable 30/X30	Variable 31/X31	Variable 32/X32

- 16 monitor points of U00.02/U01.02: Input variable 33~48, main control board input X33～X42, car roof control board input X43～X48.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Variable 33/X33	Variable 34/X34	Variable 35/X35	Variable 36/X36	Variable 37/X37	Variable 38/X38	Variable 39/X39	Variable 40/X40
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Variable 41/X41	Variable 42/X42	Variable 43/X43	Variable 44/X44	Variable 45/X45	Variable 46/X46	Variable 47/X47	Variable 48/X48

- 16 monitor points of U00.03/U01.03: Input variable 49~64, car roof control board input X49～X62, command board input X63～X64.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Variable 49/X49	Variable 50/X50	Variable 51/X51	Variable 52/X52	Variable 53/X53	Variable 54/X54	Variable 55/X55	Variable 56/X56
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Variable 57/X57	Variable 58/X58	Variable 59/X59	Variable 60/X60	Variable 61/X61	Variable 62/X62	Variable 63/X63	Variable 64/X64

- 16 monitor points of U00.04/U01.04: Input variable 65~80, command board input X65～X75.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Variable 65/X65	Variable 66/X66	Variable 67/X67	Variable 68/X68	Variable 69/X69	Variable 70/X70	Variable 71/X71	Variable 72/X72
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Variable 73/X73	Variable 74/X74	Variable 75/X75	Variable 76	Variable 77	Variable 78	Variable 79	Variable 80

- 16 monitor points of U00.05: Input variable 81~96

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Variable 81	Variable 82	Variable 83	Variable 84	Variable 85	Variable 86	Variable 87	Variable 88
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Variable 89	Variable 90	Variable 91	Variable 92	Variable 93	Variable 94	Variable 95	Variable 96

- 16 monitor points of U00.06/U01.05: Output variable 1~16, main control board output Y1～Y10, car roof control board output Y11～Y16.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Variable 1/Y1	Variable 2/Y2	Variable 3/Y3	Variable 4/Y4	Variable 5/Y5	Variable 6/Y6	Variable 7/Y7	Variable 8/Y8
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Variable 9/Y9	Variable 10/Y10	Variable 11/Y11	Variable 12/Y12	Variable 13/Y13	Variable 14/Y14	Variable 15/Y15	Variable 16/Y16

- 16 monitor points of U00.07/U01.06: Output variable 17~32, car roof control board output Y17～Y18, command board output Y19～Y25.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Variable 17/Y17	Variable 18/Y18	Variable 19/Y19	Variable 20/Y20	Variable 21/Y21	Variable 22/Y22	Variable 23/Y23	Variable 24/Y24
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Variable 25/Y25	Variable 26	Variable 27	Variable 28	Variable 29	Variable 30	Variable 31	Variable 32

- 16 monitor points of U00.08: Input variable 97~99, Output variable 33~40.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
IN Variable 97	IN Variable 98	IN Variable 99	no	no	no	no	no
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
OUT Variable 33	OUT Variable 34	OUT Variable 35	OUT Variable 36	OUT Variable 37	OUT Variable 38	OUT Variable 39	OUT Variable 40

- 16 monitor points of U9.00: static self-learning on the synchronous motor pole angle

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Normal power on distance mode	Grade A fault	Grade B fault	Grade E fault	ACD maintenance status	Maintenance input confirmation	Self-learning request	Main contactor and its feedback
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Safety feedback	Safety Circuit	Door lock	Door lock feedback	No up direction	No down direction	Reserved	Reserved

- 16 monitor points of U9.01: maintenance running mode

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Normal power on distance mode	Grade A fault	Grade B fault	Grade E fault	ACD maintenance status	Maintenance input confirmation	Brake holding and feedback	Main contactor and its feedback
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Safety feedback	Safety Circuit	Door lock	Door lock feedback	Up to the upper limit	Down to the lower limit	Run direction	Reserved

- 16 monitor points of U9.02: floor height self-learning

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Normal power on distance mode	Grade A fault	Grade B fault	Grade E fault	ACD maintenance status	Safety feedback	Door lock and feedback	upper and lower limit, first forced deceleration

Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Enter floor height and exit maintenance	Brake holding and main contactor	brake-holding sensor switch	First forced deceleration, leveling floor start	Floor height self-learning state	Speed mode	Direction and running instructions	Inverter into height measuring mode

- 16 monitor points of U9.03: Normal running

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Normal power on distance mode	Grade A fault	Grade B fault	Grade C fault	Grade D fault	Grade E fault	Safety feedback	ACD maintenance status
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Door lock and feedback	Door-closing terminal	Internal and external calling signal	Main contactor and Brake holding	Exit floor height and pole angle mode	Direction preselection	Speed and direction instructions	Running instructions not cut

- 16 monitor points of U9.04: Inching to re-level with door-opening

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Normal power on distance mode	Grade A fault	Grade B fault	Grade C fault	Grade D fault	Grade E fault	Safety feedback	ACD normal status
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Leveling floor Physically	Upper and lower door area sensor	Inching direction sensor	Door-opening terminal	No overload	Main contactor and brake holding	Running instructions not cut	Direction speed running instructions

- 16 monitor points of U9.05: Synchronous tractor braking torque test

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Normal power on distance mode	Inverter fault	Safety circuit	Door-lock of hall and car	Leveling floor Physically	Maintenance confirmation	No direction preselection	Not terminal station
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
No pole angle learing	running direction and control mode	No brake holding	No running instructions	No speed	No ER3.07	Reserved	Reserved

- 16 monitor points of U9.06:Self-rectifying correction running(find leveling floor)

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Normal power on distance mode	Grade A fault	Grade B fault	Grade E fault	ACD maintenance status	Safety feedback	No leveling floor or no terminal station	No upper and lower limits at the same time.
Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Safety circuit	Hall door lock	Car door lock	Door lock feedback	Main contactor and brake holding	Self-rectifying direction	Running instructions not cut	Direction speed running instructions

- 16 monitor points of U9.07: Open and close door

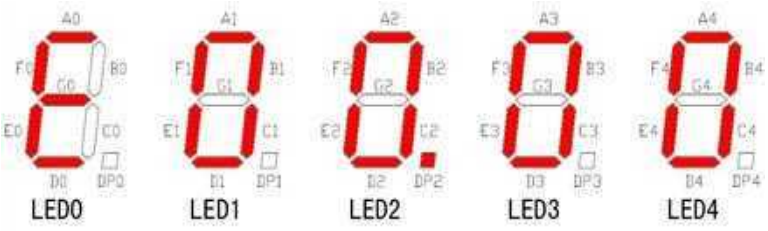
Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Safety feedback	Leveling floor	No Door stops running	Door parameter permit opening	Door-opening permitting area	Hall call of the floor	Door-closing termial	Door-opening terminal

Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
Overload	Open and extend the door-opening time input	Door-closing prohibition	Door machine over torque, light curtain, touch panel	Floor height measurement mode	Door-closing button	Door-opening prohibition	door-opening time exhausted

Note: When doing signal satisfaction check, please find the corresponding signal of unlighted segment and check it according to the prompt of the table above.

5.3.4 P2 function description (Fault record)

Press MENU key, LED digital tube display: P._ _ _X, (continuously) press INC or DEC key, make mode number X add or subtract to 2, press ENT key, LED digital tube display the total number of current faults 600 milliseconds, then display the menu of faults, shown as below:



Press the LEFT/RIGHT key, LED1~LED4 flickers to indicate that it is in a modifiable state. Press INC/DEC key when the digital tube flickers to select the fault record number and the fault information number. LED1~LED2 corresponds to the fault record number; and LED3~LED4 corresponds to the fault information number. Then press ENT key, it will display the corresponding fault information. Fault record number is E00～E99 totally 100, each fault record is divided into 32 fault information of Exx.00～Exx.31.

- The structure of P2 fault record/information is shown in the following table. It can be located by the up, down, left and right keys. When shifting the fault record/information display by the up, down, left and right keys, the fault menu name (Exx.yy) will be displayed for 600 ms first.

E00 fault	E01 fault	E02 fault	…	…	E97 fault	E98 fault	E99 fault
E00.00	E01.00	E02.00	…	…	E97.00	E98.00	E99.00
E00.01	E01.01	E02.01	….	….	E97.01	E98.01	E99.01
…	…	…	…	…	…	…	…
E00.30	E01.30	E02.30	…	…	E97.30	E98.30	E99.30
E00.31	E01.31	E02.31	…	…	E97.31	E98.31	E99.31

- There are 32 fault information (Exx.00~Exx.31) included in each fault record, which are displayed in 3 ways, binary, decimal, hexadecimal, according to the information type. The binary display way here use 16 vertical lines of LED1~LED4 corresponds to 16 bits of binary number, which is similar to the P1 function displaying binary number mentioned above. Some informations are combined of two independent messages, each message will occupy two

"7-segment digital tube" (message 1 use LED1~LED2, message 2 use LED3~LED4). The fault information is as follows in this table:

Information number	Information name	Display mode	Remarks
EXX.00	Fault Code	decimal	Take "EA3.01" as an example, "A" is the fault grade, "3" is the fault class, and "01" is the fault subcode.
EXX.01	Year and month	decimal	Occupy two tubes in turn
EXX.02	Date and hour	decimal	Occupy two tubes in turn
EXX.03	Minute and second	decimal	Occupy two tubes in turn
EXX.04	Current floor and advancing floor	decimal	Occupy two tubes in turn
EXX.05	Speed	decimal	m/s
EXX.06	Output voltage	decimal	V
EXX.07	Output current	decimal	A
EXX.08	DC bus voltage	decimal	V
EXX.09	Output frequency	decimal	HZ
EXX.10	Car load、speed 2	decimal	%, m/min, Occupy two tubes in turn
EXX.11	P1-U00.00	binary	State of input variable 01~16
EXX.12	P1-U00.01	binary	State of input variable 17~32
EXX.13	P1-U00.02	binary	State of input variable 33~48
EXX.14	P1-U00.03	binary	State of input variable 49~64
EXX.15	P1-U00.04	binary	State of input variable 65~80
EXX.16	P1-U00.05	binary	State of input variable 81~90
EXX.17	P1-U00.06	binary	State of output variable 01~16
EXX.18	P1-U00.07	binary	State of output variable 01~16
EXX.19	P1-U00.08	binary	State of input variable 97~104 at upper State of output variable 33~40 at lower
EXX.20	P1-U09.07	binary	See "16 monitor points of U9.07: Open and close door"
EXX.21	Sum calls up F1~F16	binary	Sum internal and external calls up from floor 01~16
EXX.22	Sum calls up F17~F32	binary	Sum internal and external calls up from floor 17~32
EXX.23	Sum calls up F33~F48	binary	Sum internal and external calls up from floor 33~48
EXX.24	P3 settings	binary	Bit0: P3.H01 keyboard mode maintenance Bit1: P3.H08 Internal call holding from keyboard Bit2: P3.H10 External call prohibition Bit3: P3.H11 Door stops running Bit4: P3.H13 Floor height self-measurement Bit5: P3.H14 No overload detection Bit6: P3.19 UCMP test Bit7: P3.H20 Door opening and closing test Bit8: P3.09 Running test Bit9: P3.H21 Comparison of parameters Bit10: Door opening and closing limit are cancelled Bit11: Running is limitted Bit12: Password 1 status Bit13: Password 2 status Bit14: Password 3 status Bit15: Reserved
EXX.25	Other states	binary	Bit0: Power up OK Bit1: Output enabled Bit2: Up-running Bit3: Down-running Bit4: Parallel control state OK Bit5: CAN0 communication OK

Information number	Information name	Display mode	Remarks
			Bit6: CAN1 communication OK Bit7: CAN2 communication OK Bit8: Returning to home landing Bit9: Fault reset automaticly Bit10: In car call for help Bit11: Auto brake loosening Bit12 : Brake torque testing Bit13 : Open door at door area before floor correction Bit14 : Open door at Grade-A faults Bit15 : MCU-DSP communication OK
EXX.26	MCU instruction	binary	Bit0: Decelerate in inching Bit1: Low speed Bit2: Middle speed Bit3: Decelerate Bit4: High speed Bit5: Run Bit6: Downwards Bit7: Upwards Bit8: Motor parameters self-learning Bit9:Power failure emergency service Bit10:Hoistway floor height self-learning Other bits:Reserved
EXX.27	DSP state	binary	Bit0:Over speed at forced Deceleration position Bit1:Inching Bit2: 500 mm apart from floor leveling Bit3: 250 mm apart from floor leveling Bit4: 125 mm apart from floor leveling Bit5: Inverter output power Bit6: Inverter ready Bit7: Inverter stop output power Bit8: Distance control mode or keyboard control mode Bit9: Running direction inverse Bit10: Encode direction inverse Bit11: Motor parameters self-learning L、 Bit12: Motor parameters self-learning H、 Bit13: Hoistway floor height self-learning Bit14: Inverter power off Bit15: Inverter alarm
EXX.28	ACD code and current fault grade collecting	hexadecimal	ACD code and fault grade collecting occupy two tubes in turn. The current fault grade collecting need to converte into binary digit: Bit0: Fault reset Bit1: Grade-G faults Bit2: Grade-F faults Bit3: Grade-E faults Bit4: Grade-D faults Bit5: Grade-C faults Bit6: Grade-B faults Bit7: Grade-A faults Other bits:Reserved
EXX.29	Append information	hexadecimal or decimal	The information is used for further fault diagnosis and location, and may vary according to different faults. For example, when EXX.00 = EA2.06, the EXX.29 records the error information of IO point definition; when EXX.00 = EA2.10, the EXX.29 records the error information of inverter parameter checking result; when EXX.00 = EA2.18, the EXX.29 records the wrong

Information number	Information name	Display mode	Remarks
			location of all kinds of home landing.
EXX.30	Reserved	hexadecimal	Reserved
EXX.31	Reserved	hexadecimal	Customized

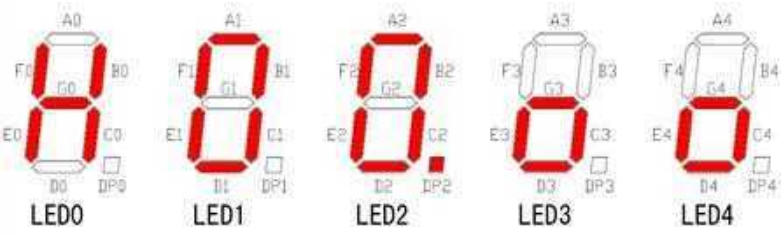
- EXX.29 Fault append information description: (not mentioned for reserved)

EA2.06: (decimal) IO point definition error	If the higher two digits are "00", the lower two digits indicate the location where IO defines is beyond the limit, such as "00.20" means that P4_C4.20 defines the excess.
	If the higher two digits are not "00", the higher two digits and the lower two digits indicate the location of the IO definition duplication, for example, "12.34" means that the definitions of P4_C4.12 and P4_C4.34 are duplicated.
EF2.10: (hexadecimal) Inverter parameters checking error	The hexadecimal digits should be converted to 16-bit binary digits: Bit0: Inverter parameter initialization error, Bit1: Rated speed error Bit2: Wrong stage number of forced deceleration Bit3: First upper forced deceleration switch installation position error Bit4: Second upper forced deceleration switch installation position error Bit5: First lower forced deceleration switch installation position error Bit6: Second lower forced deceleration switch installation position error Bit7: Inverter parameters acquisition error Bit8: Light load value of car and full load value of car errors Bit9: MCU and DSP total number of floors are inconsistent Bit10~ Bit15: Reserved
EG2.18: (hexadecimal) Home landing settings in non-service floor	The hexadecimal digits should be converted to 16-bit binary digits: Bit0: Non- call home landing 1 Bit1: Non- call home landing 2 Bit2: Non-call dispersion landing 1 Bit3: Non-call dispersion landing 2 Bit4: The rush hour on duty floor Bit5: The rush hour off duty floor Bit6: Fire home landing Bit7: Parking home landing Bit8: Security floor at night Bit9~ Bit15: Reserved
EG3.08: (hexadecimal) Brake torque learing end in advance	The hexadecimal digits should be converted to 16-bit binary digits: Bit0: Detected rotation Bit1: Mode error Bit2: Safety circuit disconnection Bit3: Leaving the leveling floor Bit4: Maintenance state error Bit5: Reserved Bit6: Reserved Bit7: Reserved Bit8: Insufficient of positive direction torque (clockwise) Bit9: Insufficient of negative direction torque (counterclockwise) Bit10~ Bit15: Reserved
EA5.22: (hexadecimal) Unintended car movement	The hexadecimal digits should be converted to 16-bit binary digits: Bit0: The floor leveling signal changes when braking Bit1: Speed up when braking Bit2: Run away from the door area with door-opening Bit3: External detection equipment input Bit4~ Bit15: Reserved

Note: When the total number of fault records in P2 is 0, a fault clearance operation will re-record all the current faults into P2 once.

5.3.5 P3 function description (Elevator Debugging and Testing)

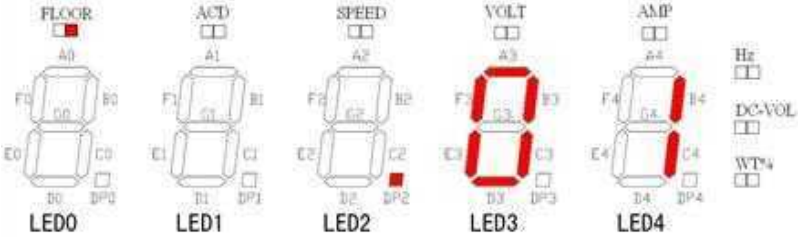
This part includes 24 running control functions from H00 to H23, which are used to control elevator running during installation and maintenance daily. Press MENU key, LED digital tube displays: P._ _ _X, (continuously) press INC or DEC key, make mode number X add or subtract to 3, press ENT key, LED digital tube displays as follows (default access to H00 function):



The function number is displayed on the LED1~LED2. When function number flickers, press INC/DEC key to modify function number. Each function number corresponding to the display on the LED3~LED4 is not necessarily the same. These two bits show the parameters or operation status needs to be inputted to the selected function. When the function number flickering, press ENT key will enter the corresponding function. After entering, LED1~LED2 stops flickering. LED3~LED4 flickers to indicate the corresponding parameters currently inputted to the function above, such as target floor, enabling/opening (1), prohibition/closing (0), setting (go), waiting for setting (oo), and so on. In LED3~LED4 flickering, Press ENT key will execute the selected function with the parameter inputted.

When the LED3 ~ LED4 flickers, if what displays on it cureently is a value, it can be modified by pressing the INC/DEC key, and after that ENT will execute the function/task. If what dispalys on it is the two small circles in the figure above, it indicates that this function only has two states(setting and not setting), and automatically clears after setting the action.

After the Hxx function is performed, the display of the LED digital tube is the same as the eight sub-functions of P._ _ _0, as shown in the following illustration:



Press ESC to exit the above display and enter menu Hxx.yy, then press ESC again to return to the menu of P. 3. The meaning of each Hxx control function is shown in the table below.

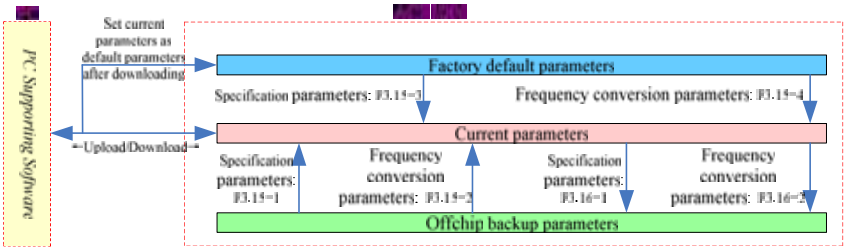
Function code	Function Name	Input parameter range	Remarks
P3.H00	Clear all debugging settings	oo->go: Execution	Clear to zero automatically after execution
P3.H01	keyboard mode maintenance, that is Elevator maintenance status from keyboard instruction	0： Cancel/No execution 1： Enter the maintenance mode	Interlock with the floor height self-measurement, and automatically clear to zero when another one is selected. In this mode, the INC and DEC buttons of the easy/onboard keyboard or LCD keyboard can be used to control the elevator up and down.
P3.H02	Run to the bottom	oo->go: Execution	Clear to zero automatically after execution
P3.H03	Run to the middle	oo->go: Execution	Clear to zero automatically after execution
P3.H04	Run to the top	oo->go: Execution	Clear to zero automatically after execution
P3.H05	Run to any inner call floor	0：Check and set the car command board working mode 1～Top：Run to any inner call floor	Clear to zero automatically after execution, compensation floors need to consider.
P3.H06	Run to any upper call floor	0：Check and set external call board ID 1～Top：Run to any upper call floor	Clear to zero automatically after execution, compensation floor need to consider.
P3.H07	Run to any lower call floor	0：Check and set external call board ID 1～Top：Run to any lower call floor	Clear to zero automatically after execution, compensation floor need to consider.
P3.H08	Internal call holding from keyboard	0：Cancel/No execution 1：Call holding setting	Set up call holding first, and then use the keyboard to carry out the internal call (P3.05 not P3.06/07).
P3.H09	Running test	0：Cancel/No execution 1：Random running mode 2：Running up and down floor by floor 3：Running up floor by floor and down to the bottom directly 4：Running down floor by floor and up to the top directly	The times of runs is controlled by P4C1.17 (set 65535 for infinite runs), and the interval between runs is controlled by P4C2.43. The times run already is recorded to P4C5.60, and automatically quit after the times of tests has been finished.
P3.H10	External call prohibition	0：External call permitting 1：External call prohibition	Automatic disconnection with parallel and group control mode
P3.H11	Door stops running	0：Cancel/No execution 1：Door stops running	No door opening/closing
P3.H12	Motor parameters self-learning	0：No execution 1：Static self-learning on the synchronous motor pole angle 2：- 3：- 4：-	Clear to zero automatically after execution.After the synchronous motor learning is completed, the learning result will display for 3 minutes. It supports keyboard control mode(F0.01=0) and distance control mode(F0.01=1) learning, but the required conditions are different. The distance control mode needs under the condition of safety circuit, stop-leveling and door-closing. See chapter 5.4.8 and 5.4.9.
P3.H13	Floor height self-measurement	0：Cancel/No execution 1：Enter floor height self-measurement mode	Interlock with keyboard mode maintenance, please execute at the bottom leveling floor, press INC(∧) after closing the door. After learning, you need to set this parameter to 0 or re-energize to exit the mode.
P3.H14	No overload	0：Normal overload detection	Available for elevator testing only, and the

Function code	Function Name	Input parameter range	Remarks
	detection	1：No overload detection	internal and external call-board display is not affected by this setting.
P3.H15	Restore backup specifications or frequency conversion parameters to current	0->go：No function 1->go：Off-chip specifications parameter→current 2->go：Off-chip frequency conversion parameter→current 3->go：Factory default specifications parameter→current 4->go：Factory default frequency conversion parameters→current	Need to enter the maintenance mode (P3.H01=1), if the execution success the display is “go”, or else execution failure the display is “EA” and it will report Er2.13. Note: ACE1000 will be reset actively once H15 = 1 or 3 succeeds. * remarks 2.
P3.H16	Back up the current specification or frequency conversion parameters to off-chip memory.	0->go：No function 1->go：Current specifications parameters→off-chip 2->go：current frequency conversion parameters→off-chip	Need to enter the maintenance mode (P3.H01=1), if the execution success the display is “go”, or else execution failure the display is “EA” and it will report Er2.13. * remarks 2.
P3.H17	Transfer this elevator parameters to another main control board	0->go：Transfer P4C0 parameters 1->go：Transfer P4C1 parameters 2->go：Transfer P4C2 parameters 3->go：Transfer P4C3 parameters 4->go：Transfer P4C4 parameters 5->go：Transfer P5 frequency conversion parameters	A dedicated DB9 data cable (shared with the standard digital display board in car wiring) is required to connect two main control boards, and an “EA” or ER2.15 is displayed when an error occurs. For safety reasons, please disconnect the input of safety circuit signal of two main control boards. Note: Do not use the function to transfer parameters to the Chinese/English LCD keyboard. The P3.H17 function of the Chinese/English LCD keyboard itself is more powerful.
P3.H18	Synchronous motor detection for braking torque	0->go: Execution the test without opening any motor brake 1~6->go: Open the corresponding Y1 ~ Y6 relays to perform the test	Clear to zero automatically after execution. It supports keyboard control mode(F0.01=0) and distance control mode(F0.01=1) detecting but the required conditions are different.
P3.H19	UCMP Functional Test	0： No execution 1： Enter UCMP Functional Test	Exit automatically after 180 seconds. See UCMP test method chapter.
P3.H20	Door opening and closing test	0：Cancel/no execution 1：Enter door opening and closing test	The times of tests is controlled by P4C1.72 (set to 65535 for unlimited times), and the time interval is controlled by P4C2.54. When P4C2.15 set time arrives and the door is not opened, it is judged that the door opening fails, when P4C2.16 set time arrives and the door is not closed, it is judged that the door closing fails. When the current opening/closing door fails, the buzzer sounds once in the car. The number of door opening failures is recorded to P4C5.57, and the number of door closing failures is recorded to P4C5.58. The total number of times tested has been recorded to P4C5.59. After the times of test is completed, the door opening/closing test state is automatically exited. It must be carried out when the car is leveling floor; when it is used in the field, for

Function code	Function Name	Input parameter range	Remarks
			the safety, the maintenance switch on the control cabinet should be on first, and the personnel leave the door area.
P3.H21	Comparison of current parameters with factory default parameters	0: Contrast P4C0; 1: Contrast P4C1; 2: Contrast P4C2; 3: Contrast P4C3; 4: Contrast P4C4; 5: Contrast P5	When looking up P4 and P5 parameters in this mode, the difference points are automatically found in the current parameter group and displayed. Press the down direction key, next difference points are searched in order. * remarks 3.
P3.H22	The system uses the back-up DC power supply for manual electric brake loosening	0：Cancel/no execution 1：Enter back-up DC power supply mode	After the elevator power is cut off, the backup DC12V~24V power supply is used to supply power to the main control board and the leveling sensor. After setting this mode, you can see the current sliding direction, speed, floor and leveling information from the onboard/simple keyboard in the process of loosening the brake. It is designed for manual electric loosening brake of elevator without machine room.
P3.H23	Clear all fault records	oo->go: Execution	Clear to zero automatically after execution.

Note 1: The debugging settings clearance of H00 include keyboard maintenance, call holding, running test, external call prohibition, door stops running, floor height selt-measurement, no overload detection, door opening/closing test, etc. When using internal call holding function, H08 should be set first, then use the keyboard to carry out the internal call; when using floor height self- measurement function, H13 should be set 1, then press the INC key until the elevator door closed. During the execution of H18 and H19, the buzzer sounds in the car; during the execution of H12 and H18, the frequency conversion parameters of P5 could not be read by DB9 serial port; H22 clears the historical fault information recorded by the main control board, instead of resetting the current fault. All debugging functions will automatically quit after power down and restart.

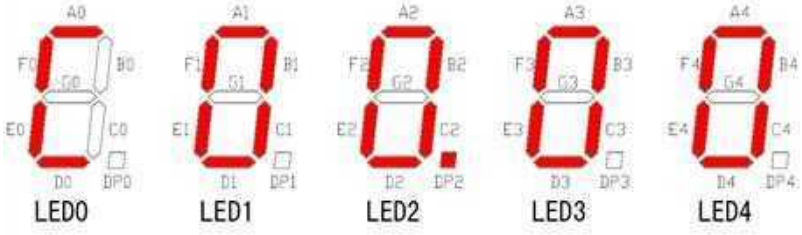
Note 2: The following figure shows the relationship between the default parameters (D), current parameters (C), backup parameters (B) and parameters of the PC operating software (A) in ACE1000.



Note 3: P3.H21 Usage: In the maintenance mode, execute P3.H21=0～5. If the factory default parameters of the elevator are stored correctly in the main control board, the system will successfully display "go" (requiring stopping the elevator first and entering the maintenance mode, and showing "EA" if the execution fails). Then, it looks up the parameters in P4CX.00(input parameter=0～4) or P5F0.00 (input parameter=5). The system firstly compares the default parameters of the No. with the current ones. If the parameter value is the same, the No. will automatically add 1 and then compare the next parameter (during which the menu name being compared is scrolling). When the difference occurs, the menu name will stop scroll and displays "menu name-default value-current value" in turn. (Now you can change the current parameter by pressing left/right keys into the modification state). Press the down direction key, system will continue to find the next difference point in the current group until all the searches are completed. It will display "menu name-default value-current value" at the last No. of this group. After the P5Fx comparison is completed, please continue to enter other P5Fy groups which need to be compared. This comparison mode will automatically exit after 30 minutes, or execution P3H0 or P3H17 (it can exit this mode immediately).

5.3.6 P4 function description (Reading and Writing of Specification Parameters)

Press the MENU key, LED digital tube display: P._ _ _X, (continuously) press the INC or DEC key, make the mode number X add or subtract to 4, press the ENT key, LED digital tube displays as follows (default enterto the C00.00 function):

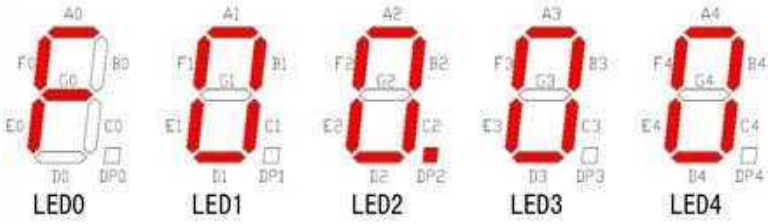


The P4 is the specification parameters (table), including C00 ~ C05 six categories (groups), each category is subdivided into No.00 ~ No.99 (including reserved parts). When displaying P4 menu, LED0 display "C", LED1 ~ LED2 represents the function category, and LED3 ~ LED4 represents the function number under the current function category. The modification of specification parameter directly affects the function and safe operation of elevator, so the modification needs to pass the system secondary password (C05.12). All the parameters of the specification are operated in the same way: After entering P4, first set the specification parameter menu name to be operated by LEFT/RIGHT and INC/DEC keys, press ENT to enter and read back the current specification setting value; if you want to modify, press LEFT/RIGHT key for a long time to make one of LED0~LED5 into flicker, which means it can be modified, and then press INC/DEC to modify the digit. After the new value is set, press ENT to confirm/validate. Since the values in many specifications parameter are limited in some

numerical range, you cannot input a data exceeding the range. When looking up the parameters (without flickering digit), pressing the INC/DEC key can jump directly to the adjacent menu Number under the same category (group), and pressing the LEFT/RIGHT key can jump directly to the adjacent category (group). See detail on the relevant chapters.

5.3.7 P5 function description (Reading and Writing of Frequency Conversion Parameters)

Press the MENU key, LED digital tube display: P._ _ _X, (continuously) press the INC or DEC key, make the mode number X add or subtract to 5, press the ENT key, LED digital tube displays as follows (default enterto the F00.00 function):



The functions under the P5 menu are all frequency conversion parameters control functions, including eleven categories (groups) of F00-F10, each of which is subdivided into several parameters (including reserved parts). When displaying P5 menu, LED0 dislay "F", LED1 ~ LED2 represents the function group, and LED3 ~ LED4 represents the function number under the current function group. Since the modification of frequency conversion control parameters directly affects the function and safe of elevators, the modification needs to pass the system secondary password (C05.12) and the frequency conversion special password (F00.00 reserved). All the frequency conversion control parameters are operated in the same way: After entering P5, first set the frequency conversion control parameters menu by LEFT/RIGHT and INC/DEC keys, press ENT to enter and read back the current value; if you want to modify, press LEFT/RIGHT key for a long time to make one of LED0~LED5 into flicker, and then press INC/DEC to modify the digit. After the new value is set, press ENT to confirm/validate. Since the values in many specifications parameter are limited in some numerical range, you cannot input a data exceeding the range. When looking up the parameters (without flickering digit), pressing the INC/DEC key can jump directly to the adjacent menu Number under the same category (group), and pressing the LEFT/RIGHT key can jump directly to the adjacent category (group). See detail on the relevant chapters.

5.3.8 Hierarchical password description

1. Cryptographic hierarchical control: first-level cryptographic authority < second-level cryptographic authority < third-level cryptographic authority; Input first-level password, only the first-level password authority is opened. Input second-level password, the first-level and second-level password authority is opened. Input third-level password, the first-level, second-level and third-level password

authority is opened at the same time. First-level password privileges-using P1, P2, P3 functions; second-level password privileges-adding P4, P5 modification functions; third-level password privileges-increasing manufacturers' special functions (such as modifying elevator serial number, reading and writing specifications by address, etc.).

2. Password function enabling method: when the password is set to non-zero, the current password control right can be used immediately by performing the function of P3.H00 or by re-energizing the system.

3.Password function disabling method: modify the password to 0.

4. Authorization time after password input: after each password input, the system unlocks the current password permission and times it. When the time finishes, the authorization of the corresponding password permission is revoked and automatically enters the encryption control state. The authorization time of passwords at all levels is controlled by the corresponding items in the specification parameter P4C2.

5. Password unlock instructions: When performing the corresponding functions, 8 independent LED lights flash to indicate the level of current password: first-level password passing through-one column, second-level password passing through-two columns, third-level password passing through-three columns. 8 Led lights are all out without any permission.

6. Times of password retries: in order to prevent the exhaustive method of violently cracking the password, each level of password limits the times of retries. Once the times of single power-on retries reaches the limit, it needs to be re-powered to retry. At the same time, the system restricts the total times of retries. A higher level of password is needed to unlock a certain level of password retries after the total times of consecutive errors reaches the limit value. After the total times of third-level password retries reaches the limit value, the main control board needs to be returned to the factory to unlock.

7. The password of ACE1000 is stored in MCU and encrypted. It can not be decrypted by replacing off-chip EEPROM. Do not decrypt the password after it is locked. The only way is to seek a higher level password or return to the factory for processing.

8. Password range: 0x00000~0xFFFFF, five-digit hexadecimal number. The password authorization and retry limit are as follows:

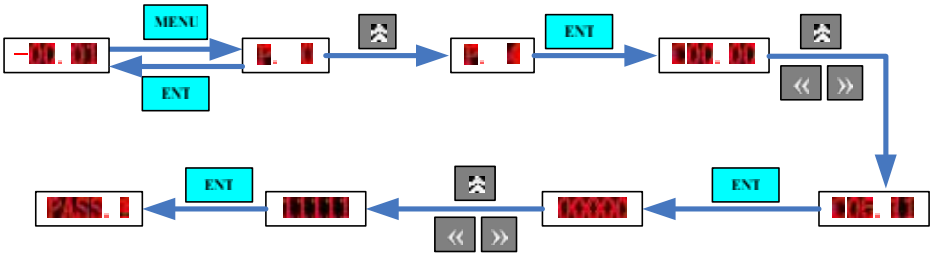
	First-level password	Second-level password	Third-level password
Authorization time (specification parameter control)	P4_C2.40	P4_C2.41	P4_C2.42
Times of a power-on retries (fixed)	10	5	1
Total times of retries (fixed)	100	50	10

Note: Please keep all levels of passwords in good order to avoid inconvenience caused by the need to return to the factory to decrypt.

5.4 Operation example

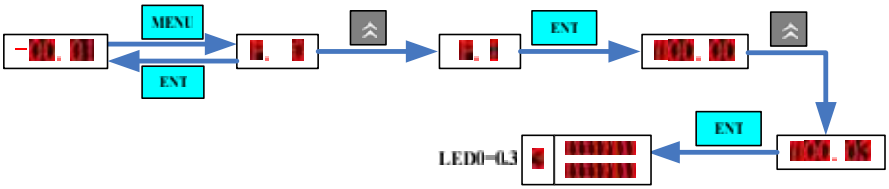
5.4.1 Password unlock: P4C5

Take the first-level password as an example: input the first-level password of the system, assume that the password is "11111", then unlock the password locking state:



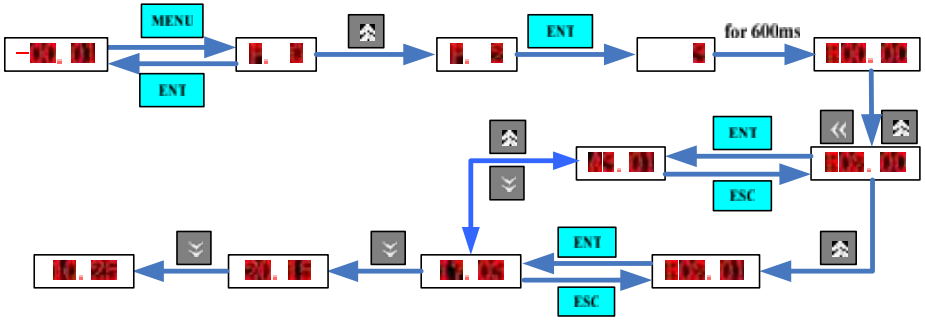
5.4.2 Check input state: P1

Take the main control board X1-X16 input valid state U0.03=0b1111111111111111 as an example:



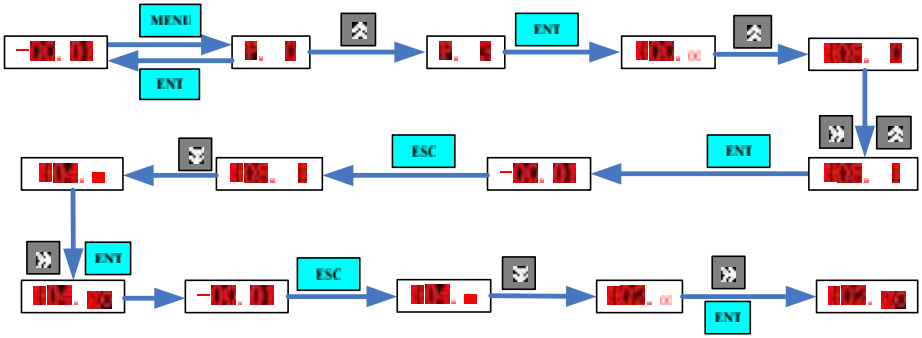
5.4.3 Check historic fault information: P2

Take fault codes and fault occurrence time of the previous two times as an example E2.00~E2.03: (Take A3.01 as an example)



5.4.4 Keyboard call-hold setting: P3

Take controling the elevator to run automatically between the lowest and highest floors (unlimited times) as an example:



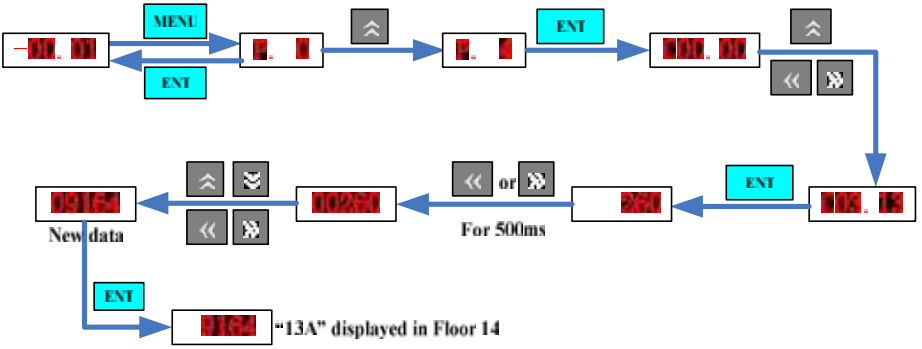
5.4.5 Modify floor digital display: P4C3

Take the external call board display "13A" of the 14th floor as an example:

1. Check the "elevator digital display code table" to get the dot matrix plate value 9164, the display meanwhile is "13A".

2. Input the second-level password of the system according to the first example, and pass.

3. Press the keys as follows:



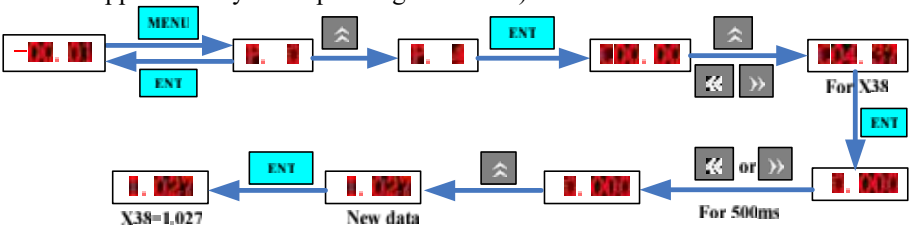
5.4.6 Modify IO definition: P4C4

Take defining the unused X38 input signal as "normally closed, phase sequence protection input" as an example:

1. Looking up the elevator IO varable table, we can get the code of "normally closed, phase sequence protection input" as 1.027, and the code of "normally open, phase sequence protection input" as 0.027, and the specification parameter position of input point X38 is C4.37.

2. Input the second-level password of the system according to the first example, and pass.

3. Press the keys as follows: (Note: Some numbers that are not allowed to be set will be skipped directly when pressing INC/DEC)



5.4.7 Modification frequency conversion parameters: P5

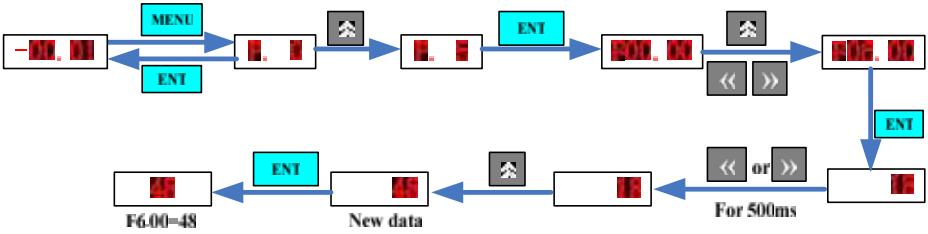
Taking setting the total floors of the elevator (physical floors) to 48 floors as an example:

1. Look up the "Summary table of functional parameters"of P5 to get the information that F06.00 should be set to 48.

2. Input the second-level password of the system according to the first example, and pass.

3. If there is frequency conversion special password of F00.00, please refer to the first example to input the password and pass (reserve).

4. Press the keys as follows:



5.4.8 Synchronous motor pole angle self-learning

Please refer to Chapter 7 "Debugging for elevator control system".

5.4.9 Maintenance operation by keyboard (middle-speed mode)

Use when elevator installation and maintenance.

Prerequisite: hoistway is smooth and has installed upper and lower position-limit switch, upper and lower direction-limit switch, upper and lower forced deceleration switch, safety circuit, hall door lock and car door lock signal. The pole angle of the motor is correct and the inverter is in the distance control mode (F0.01=1).

Steps:

1. Enter P3_H01 and set "1: Keyboard Mode Maintenance" , turn to the display of the floor.

2．Press the INC key and display the upward arrow waiting for the main contactor and motor to start after the car door is closed, and the motor stops after the key is released.

3．Press the DEC key and display the down arrow waiting for the main contactor and motor to start after the car door is closed, and the motor stops after the key is released.

4．Modify the direction of running in P5_F0.03 if running backward.

Note: Maintenance priority: car roof maintenance > car maintenance > room control cabinet button maintenance> keyboard maintenance. The system will automatically enter/exit the keyboard maintenance mode under the conditions of brake torque test, floor height self-learning, door open/close test, etc. Both the on-board keyboard and the LCD keyboard have the same function, and the keyboard maintenance function automatically exits after the elevator power is cut off. Please pay attention to safety.

5.4.10 Floor height self-learning(middle-speed mode)

Please refer to Chapter 7 "Debugging for elevator control system".

5.4.11 Normal running(high-speed mode)

After installation or maintenance, please call the car inside and outside each floor to run, and experience whether the elevator comfort-degree and level-accuracy meet customer requirements.

Prerequisite: Finish motor pole angle learning, maintenance operation, floor height learning, installation of all the internal and external call board and finishing debug of door-machine.

Steps:

1．Remove all short wiring temporarily used during elevator installation and maintenance.

2．First run the car to the middle floor in maintenance mode. Until the one by one single-floor call running finished normally can the car run between the terminal floors.

3．In running, attention should be paid to check whether the internal and external call boards are effective, whether the internal and external call boards display is correct, if it is parallel control elevator, we need to see if parallel function is normal, and the comfort and the leveling condition in start-up, stop and running (for elevator comfort degree and level accuracy adjustment, see the relevant chapters).

4．In order to ensure the correct signal connection of the elevator, test the following main functions (including selection) after the elevator normally runs: non-leveling stop self-rectifying to leveling floor, adjust from staggered floor to the bottom/top floor, safety circuit emergency stop, door opening in advance of car stop, Inching to re-level, parking, lift attendant, VIP running, fire protection, power blackout self-rectifying, door light screen and touch-pad, parallel control, auto back to home landing floor, overload and so on. After testing, it is suggested to clear all the fault records with P3_H22 then check and set the real-time of the main control board in P4_C2.00~P4_C2.06.

5．Modify the passwords to prevent irrelevant personnel from modifying elevator parameters and affecting the safe running of the elevator.

5.4.12 Replace MCB and setting elevator parameters manually

It is better to use the matching PC software or Chinese/English LCD keyboard to copy parameters when changing boards on site. Without these two tools, parameter transfer function of P3.H17 can be used (DB9 wiring of standard digital display board in car can be used here). Before changing the board, please consult to confirm whether the version of the main control program and frequency conversion program is the same as the old one or can be replaced. Please refer to the relevant instructions for the operation method.

If conditions only permit using the onboard keyboard to read out the parameters one by one and write them to the new board, please focus on the following parameters:

Logic Specification Parameters	Server floor parameters in P4_C0 and IO definition parameters in P4_C4.
Frequency Conversion Parameters	F0.03、F0.07、F0.08、F0.09、 F1.00、F1.03、F1.04、 F2.00~ F2.05、 F3.00~ F3.03、 F4 F5.00、F5.12、F5.13、F5.16、 F6.00、F6.05、F6.12-F6.58 must be relearned F7.02、F7.03、F7.04、F7.08、F7.09、F7.10、F7.13、F7.14、 F9.06(Current floors could not be mistaken)

Note: F3.03 Synchronous motor pole angle can be re-learned, but it is recommended to use the old board data which have been used normally.

5.4.13 Parameter transfer function and method

Tools required: 9-core interconnection, public-to-public DB9 data line (shared with the standard digital display board wiring in car)

Required privileges: Data sending board needs first-level password privileges; Data receiving board needs second-level password privileges.

Steps:

- Connect the DB9 serial port of two main control boards with the DB9 data line above. In the case of using standard digital display board wiring, only need one main control board to draw electricity from the inverter base. (It is suggested that the data transmission board directly draw electricity from the inverter base of the control cabinet).
- Input the corresponding password on the two main control boards to obtain the operation privileges.
- The sub-functions of P3.17 are performed in turn: H17.0->go (transfer P4C0 parameter), H17.1->go (transfer P4C1 parameter), H17.2->go (transfer P4C2 parameter), H17.3->go (transfer P4C3 parameter), H17.4->go (transfer P4C4 parameter), H17.5->go (transfer P5 frequency conversion parameters).
- Execution result check: when each sub-function is executed, the percentage of current completion is displayed on the LED3 and LED4, ranging from 00 - A0

(0%-100%). When the function is completed correctly, it automatically exits. If the current parameter transfer fails, the system will automatically terminate this function, and display "ER" on LED3 and LED4 for about 1 second, then report EG2.15 fault (the IO port of data transmission board is required to power on normally). If "ER" is not displayed and EG2.15 fault is not reported, when each sub-function of H17 is executed, the parameter transfer is completely successful.

Follow-up operation: After the parameter transfer is completely finished, please carry out the maintenance running test. After it is tested normal, maintenance run the car to the lowest floor level then re-learn the floor height(necessarily). After the floor height self-learning, run high-speed test using internal and external call board. It can be put into normal use after all these test finish.

5.4.14 Keyboard control mode(F0.01=0, factory mode)

Prerequisites: the power lines of the inverter and the motor, the control lines of the inverter and the main control board are well connected, the brake of the traction machine is loosened, and the star-delta circuit is removed (if there is a separate star-delta contactor, which is very important!). All input terminals of the main control board and the main control expansion board is pulled out, and the corresponding parameters such as the motor magnetic pole angle are correct.

Steps:

1. Get the second-level password permission first.

2. Enter P5_F0.01 to set "0: keyboard control", enter P5_F0.02 to set direct control of the inverter speed, and enter P5_F0.03 to set the direction of run.

3. Enter any menu function under P5, press START/STOP key, then the motor will run in the setting direction and speed, and the motor will stop when the START/STOP key is pressed again. When the motor is running, 8 Leds on the keyboard flicker; and 8 Leds go out when the motor stops. The starting and stopping of the motor may be seemed slowly, you can see the waveform indicator light of LED43 on the main control board to operate.

4. The relevant operation information can be checked under P5_F9 when the motor is running,

Note:

1. Under keyboard control mode, the motor is not controlled by hoistway signal and elevator main control logic, and does not control any output relay. It only sends start or stop instructions to the motor. Therefore, this operation is prohibited in the hoistway or other field, and the output current should be prevented from short-circuit fault at the star-delta circuit.

2. Under keyboard control mode, on-board keyboard, easy portable keyboard and Chinese/English LCD keyboard can control motor start-stop and debug frequency conversion parameters. Do not use these debugging tools at the same time in order to avoid malfunction or safety problems.

Chapter 6: Elevator parameter making and operating

6.1 Brief introduction

The elevator parameter making and operating software is the special PC software for ACE1000 parameters making, downloading/uploading, checking, comparing and backing up. The software user interface is simple and easy to use, and the operation speed is fast. It can complete the setting, reading and writing of all elevator parameters at one time. The software described in this chapter focuses on the production of elevator parameters and upload/download method in elevator production plants, while "*ACE1000 Monitor*" software emphasizes on use in the field (see the section of "Instructions for supporting products").

The main functions of this software are as follows:

- Elevator logic specification parameters and frequency conversion parameters writing, manufacturing and automatically generating.
- Elevator parameters uploaded to PC (XLSM, TXT).
- Elevator parameters (XLSM, TXT) downloaded to the main control board.
- Compare the similarities and differences between the current elevator parameters and PC backup parameters.
- Check whether the parameters filled in the PC meet the basic requirements of elevator.
- Upload/download parameters from/to Chinese/English LCD keyboard.

6.2 Software applicable population

1. Elevator parameter setting personnel applicable for elevator manufacturer electrical workshop: Make elevator logic specifications table and frequency conversion parameters according to the customer order requirements, and then download the parameters to ACE1000 main control board.

2. Installation, debugging and maintenance personnel: modification, contrast, backup parameters on site.

3. Elevator electrical technicians: read parameters on site to check and debug some special parameters.

4. For the sake of safety, unrelated personnel must not change any elevator parameters.

6.3 Software characteristics

- The software consists of two parts: **EXCEL file for parameter making and PC software for parameter operation(ACE1000-SPEC)**.
- System requirements: Windows XP +Excel 2007 and the above, need enabling EXCEL macro.
- Software installation method: Free of installation but need to be registered to the operating system. There are two methods of registration: automatic registration and manual registration. See LIB directory in the software package for details.

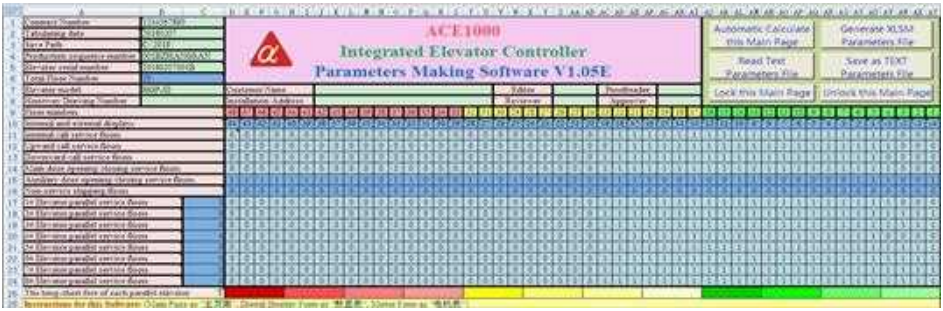
- Relevant tools: Universal USB-RS232 serial port line.
- Software authorization: All ACE1000 Elevator Integration Controller customers are allowed to download freely and use freely forever. The latest version of the software downloading address: www.szalpha.com.
- Elevator parameters include two parts: logic specification parameters (P4) and frequency conversion parameters (P5). They correspond to elevator logic control function and motor frequency conversion drive function respectively. Most parameters can be automatically calculated and generated by formula and software macro.
- Elevator parameter setting: After the elevator parameters are made in EXCEL, they are saved separately according to the working serial number, and then read by the operation software. The parameters are downloaded to the main control board through PC serial port or USB-RS232 serial port.
- Elevator parameter reading: The elevator parameters are uploaded to PC memory by using parameter operating software through PC serial port or USB-RS232 serial port, and then the parameters are written into EXCEL/TXT file. At the same time, the setting and reading parameters are compared, checked, saved and so on.

6.4 Instruction to parameter making software

6.4.1 Using EXCEL file to make parameters

The parameter making EXCEL file contains 9 pages: main interface, P4C0, P4C1, P4C2, P4C3, P4C4, P5, digital display table, and motor table. Only cells with blue backgrounds in each page need to be filled in, and most of the content that needs to be filled in has been automatically calculated by the formula or button function. EXCEL uses "macro" to realize calculation, reading, comparison, etc. Please enable EXCEL's "macro" function first when using. For the sake of software security, this EXCEL form is locked by default. If you need to unlock specific content, please contact customer service. Since the original calculation formula or "macro" in the EXCEL form is deleted by mistake once, the corresponding automatic calculation of the table contents function will not be realized. Therefore, it is recommended that the user copy the backup from the original EXCEL file of the manufacturer every time to fill in the new parameters.

1. **Main page UI:**



- Instructions of filling in

"Save Path" can not be empty, to ensure that the harddisk partition exists, colon is in English (if the save path does not exist, a new directory path will be created); "Elevator serial number" can not be empty, when clicking "**Generate XLSM parameters file**" or "**Save as TXT parameters file**", it will be saved in the file name "Elevator serial number" under "Save Path". Click "**Read TXT parameters file**" and select the TXT parameter file, it will read the parameters from the TXT file into the "Read results" column in P4C0～P5 pages.

The filling of "Total Floor Number" will affect the total floors of internal and external call display, service floors and the total number of floors in F6.00. The total number of floors should be filled in according to the number of physical leveling plates. The service floors in the table below will be calculated automatically after filling in this value. C17~C24 fills in the "high-low feet"/"long-short feet" situation of each elevator in the elevator group, the longest "feet" should be filled in 0, the others should be filled in the difference of floors between itself and the longest "feet" elevator. Filling in the "internal and external display" page, you need to click "use the internal and external call settings on the main page" on the P4C3 page, after that it can take effect.

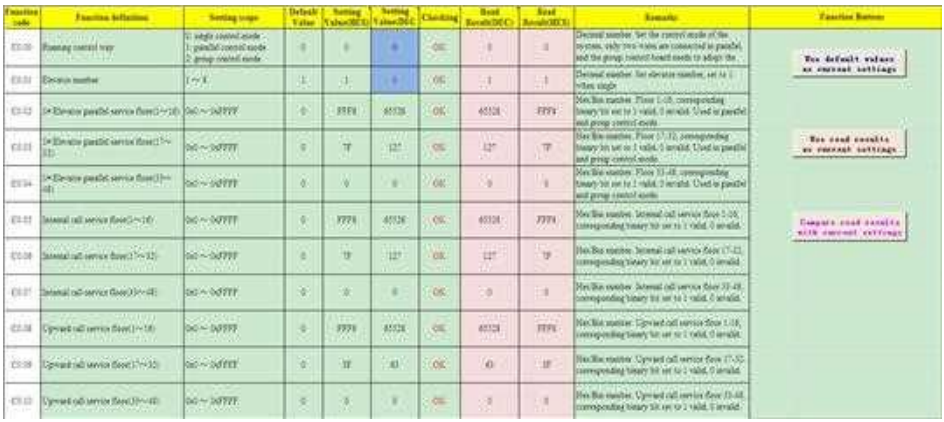
If the automatically generated service floors do not meet the requirements, it can be filled in manually after "**Unlock this Main Page**", and the internal and external call display can also be manually changed in P4C3 page according to the "actual display content" column in the "digital display form". After the elevator parameters are made, it is suggested to click "**Lock this Main Page**" to prevent the unintentional modification. Any time you click on "**Automatic caculate this Main Page**", you will regenerate the calculation formula to calculate the service floors on the this page.

- System number representation method description:

In ACE1000 system, the opening of floor-related service functions is controlled by 0 and 1 (0 closing/1 opening). If you need to turn on a floor-related service function, please set it to 1, or 0 if you want to turn it off. The above method of operation is the same as that of binary representation in computer science. Different floor orders correspond to different binary bits. The 1 indicates that the floor is valid, and the 0 indicates that the floor is invalid. For example, the elevator with 18 floors has 18 binary digits corresponding to control the related service functions of 18 floors. Let's take the elevator internal call service floor as an example to illustrate the binary digits: (high digits on the left)"11,1101,1111,0111,0101" (low digits on the right), which means the

internal call service is valid on the 1st, 3rd, 5th, 6th , 7th, 9th, 10th, 11th, 12th, 13th, 16th, 17th, 18th floor, but not on the 2nd, 4th, 8th, 14th floors. In order to simplify the writing of binary digits, it is necessary to convert them into hexadecimal digits (0-9, 10 as A, 11 as B, 12 as C, 13 as D, 14 as E, 15 as F). The method is that every four binary digits correspond to one hexadecimal digit from the lowest digit, so the hexadecimal of the internal call service floor above is represented as "3DF75". Since the ACE1000 main control board has only five digital tubes on the board, even using hexadecimal digits is not enough to represent the 12-bit hexadecimal digits corresponding to the maximum 48 floors at one time, so the 48 floors are divided into three segments (F48-f33, F32-F17, F16-F1), each 16 floors corresponds to four-bit hexadecimal digits. No existing floors above set as 0, so the complete hexadecimal number is "0000,0003,DF75". This three segments representation is also the number we see in the P4C0: internal call service floor F1-F16: C00.05=DF75; internal call service floor F17-F32: C00.06=0003; internal call service floor F33-F48: C00.07=0000. (See appendix for detailed binary conversion)

1. P4C0 page: basic parameters



Instructions of filling in：

Please fill in the blue background part. Other parameters are automatically acquired and calculated from the main interface. The "Setting value check" column automatically checks according to the setting value that users fill in, and prompts the results of the check. The "Read results" column stores the parameters uploaded from the integrated controller or read from the TXT specification file. The "NO:" and "CHECK" columns are used to verify the data inside the software, users should not edit them. Click "**Use default values as current settings**" in the upper right corner to restore all the fillable parameters in this page to default values. Click "**Use read results as current settings**" to fill in the "read results" to "Set values" column. Click "**Compare read results with current settings**" to compare the settings and read values and then place all the differences in red bold font in "set values" column.

Note: When it is necessary to read the parameters of one main control board into EXCEL and then download them to another main control board. Since the read results

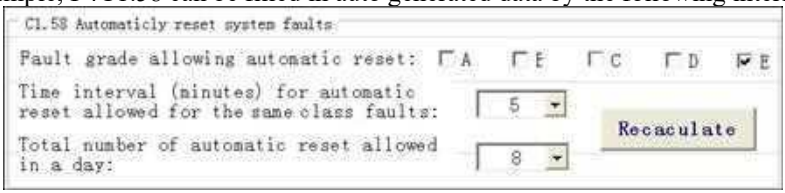
are stored in the "**Read result**" column instead of the "**Setting value**" column, please select "**Reading result**" instead of the "**Setting**" before downloading the parameter to main control board in parameter operating software of PC. If the elevator parameters only need to be copied from one main control board to another, it also can be accomplished by using the parameter upload-download function of the Chinese/English LCD keyboard, the parameter transfer function of the main control board P3.17, or the TXT format parameter table.

2. P4C1 page: extended parameters

Instructions of filling in:

Please fill in the blue background part. Other parameters are automatically acquired and calculated from the main interface. The "Setting value check" column automatically checks according to the setting value that users fill in, and prompts the results of the check. The "Read results" column stores the parameters uploaded from the integrated controller or read from the TXT specification file. The "NO:" and "CHECK" columns are used to verify the data inside the software, users should not edit them. Click "**Use default values as current settings**" in the upper right corner to restore all the fillable parameters in this page to default values. Click "**Use read results as current settings**" to fill in the "read results" to "Set values" column. Click " **Compare read results with current settings** " to compare the settings and read values and then place all the differences in red bold font in "set values" column.

In the page of P4C0, P4C1 and P4C2 specification parameters, some functional parameters are controlled by different bits. In order to facilitate users who unfamiliar with binary bits to fill in these contents, we provides a fast way to fill in these contents. For example, P4C1.58 can be filled in auto generated data by the following interface:



Users only need to click the "**Recalculate**" button after selecting the required functions in the check-box and drop-down list (Note: If you don't click the "recalculate" button, it can only modify the bits you just operated but not wholely).

In addition, at the bottom of the P4C1 page, there is a separate digital conversion table for users to use, as shown below:

(High)Binary data(Low)	Decimal	HEX	Remarks
1001100001	307	133	The numerical conversion and calculation Table are used to help customers with numerical conversions. After the data are correctly filled in the blue cells of a certain decimal system, the results of the other two corresponding number systems are automatically calculated in the corresponding positions of the same row. Note: the number of binary digits filled in C105 ~ C107 should not exceed 16 bits, and should not be filled in with any separator and punctuation mark. The decimal number D108 ~ D110 can only be a positive integer 0 ~ 65535. The hexadecimal number for E111 ~ E113 can only be 0000 ~ FFFF.
1111001000010011	63283	F213	
1111111111111111	65535	FFFF	
1111111111111111	65535	FFFF	
0000000011101010	234	EA	
1111011111100000	63456	F7E0	
1111000100100011	61731	F123	
1111001111011001	62417	F3D1	
0000000010010110	38	0026	

3. P4C2 page: Time parameters

	A Function code	B Function definition	C Setting scope	D Default Value	E Setting Value	F Checking	G Read result	H Remarks	I Function buttons
2	C2.00	MCB time: year	00~99	0	0	OK	0	Starting from 2000	
3	C2.01	MCB time: month	01~12	1	1	OK	1	Month	Use default values as current settings
4	C2.02	MCB time: date	01~31	1	1	OK	1	Date	
5	C2.03	MCB time: hour	00~23	0	0	OK	0	Hour	Use read results as current settings
6	C2.04	MCB time: minute	00~59	0	0	OK	0	Minute	
7	C2.05	MCB time: second	00~59	0	0	OK	0	Second	
8	C2.06	MCB time: day	00~06	0	0	OK	0	Week	Compare read results with current settings
9	C2.07	Self-return home landing/distributed landing floor time	5~3600s	60	60	OK	60	Second	
10	C2.08	Fan and lighting auto-off time	15~3600s	180	180	OK	180	Second	
11	C2.09	External call door opening and holding time	1~60s	4	4	OK	4	Second	
12	C2.10	Internal call door opening and holding time	1~60s	3	3	OK	3	Second	
13	C2.11	Open-door holding time for disabled person service	1~60s	15	15	OK	15	Second	
14	C2.12	Entered door opening and holding time	1~600s	180	180	OK	180	Second	
15	C2.13	Reserved	0~65535	0	0	OK	0	Second	
16	C2.14	Maximum distance floor running time-consuming	5~60s	45	45	OK	45	Second	
17	C2.15	Automatic door closing time in open timeout (Ex4.01)	1~60s	15	15	OK	15	Second	

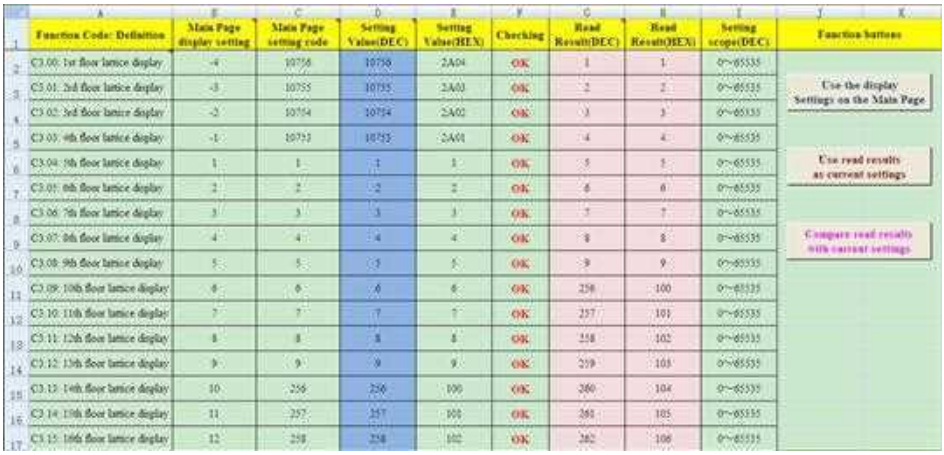
Instructions of filling in：

Please fill in the blue background part. Other parameters are automatically acquired and calculated from the main interface. The "Setting value check" column automatically checks according to the setting value that users fill in, and prompts the results of the check. The "Read results" column stores the parameters uploaded from the integrated controller or read from the TXT specification file. The "NO:" and "CHECK" columns are used to verify the data inside the software, users should not edit them. Click "**Use default values as current settings**" in the upper right corner to restore all the fillable parameters in this page to default values. Click "**Use read results as current settings**" to fill in the "read results" to "Set values" column. Click "**Compare read results with current settings**" to compare the settings and read values and then place all the differences in red bold font in "set values" column.

Note:

- C2.00~C2.06 is the real-time of the main control board, which can not be set here but in parameter operating software of PC.
- The format of start time and end time is to merge the number of clocks and minutes into 4-bit integers, such as 8:30 into 0830, 21:15 into 2115.

4. P4C3 page: digital display parameters



Function Code: Definition	Main Page display setting	Main Page setting code	Setting Value(DEC)	Setting Value(HEX)	Checking	Read Result(DEC)	Read Result(HEX)	Setting scope(DEC)	Function buttons
C3.00: 1st floor lattice display	-4	10756	10756	2A04	OK	1	1	0~65535	Use the display Settings on the Main Page
C3.01: 2nd floor lattice display	-3	10755	10755	2A03	OK	2	2	0~65535	
C3.02: 3rd floor lattice display	-2	10754	10754	2A02	OK	3	3	0~65535	
C3.03: 4th floor lattice display	-1	10753	10753	2A01	OK	4	4	0~65535	
C3.04: 5th floor lattice display	1	1	1	1	OK	5	5	0~65535	Use read results as current settings
C3.05: 6th floor lattice display	2	2	2	2	OK	6	6	0~65535	
C3.06: 7th floor lattice display	3	3	3	3	OK	7	7	0~65535	
C3.07: 8th floor lattice display	4	4	4	4	OK	8	8	0~65535	Compare read results with current settings
C3.08: 9th floor lattice display	5	5	5	5	OK	9	9	0~65535	
C3.09: 10th floor lattice display	6	6	6	6	OK	256	100	0~65535	
C3.10: 11th floor lattice display	7	7	7	7	OK	257	101	0~65535	
C3.11: 12th floor lattice display	8	8	8	8	OK	258	102	0~65535	
C3.12: 13th floor lattice display	9	9	9	9	OK	259	103	0~65535	
C3.13: 14th floor lattice display	10	256	256	100	OK	260	104	0~65535	
C3.14: 15th floor lattice display	11	257	257	101	OK	261	105	0~65535	
C3.15: 16th floor lattice display	12	258	258	102	OK	262	106	0~65535	

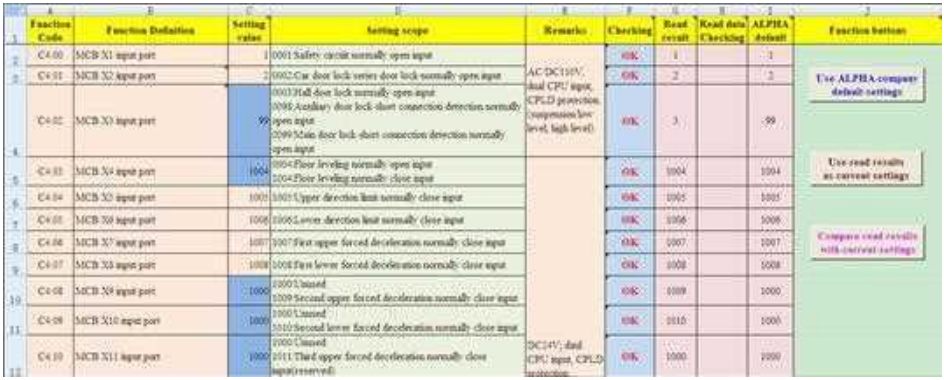
Instructions of filling in：

It is suggested that both standard display and non-standard display should be filled in from the main interface, and then click "**Use the internal and external call display settings from the main interface**" to fill in the column of "**Current settings**".

Please fill in the blue background part. Other parameters are automatically acquired and calculated from the main interface. The "Setting value check" column automatically checks according to the setting value that users fill in, and prompts the results of the check. The "Read results" column stores the parameters uploaded from the integrated controller or read from the TXT specification file. The "NO:" and "CHECK" columns are used to verify the data inside the software, users should not edit them. Click "**Use read results as current settings**" to fill in the "read results" to "Set values" column. Click " **Compare read results with current settings** " to compare the settings and read values and then place all the differences in red bold font in "set values" column.

For non-standard custom digital display, please refer to the relevant examples in the special digital display settings section of this chapter.

5. P4C4 page: IO definition



Instructions of filling in：

A part of the IO port of ACE1000 control system is fixed (for security reasons), most of the IO port can be customized by users (including the main control board, car roof control board, car command board). The IO port definition corresponding values of closed attributes are obtained by adding 1000 to the corresponding values of open attributes. The "Setting value check" column automatically checks according to the setting value, and prompts the results of the check. The "Read results" column stores the parameters uploaded from the integrated controller or read from the TXT specification file. The "NO:" and "CHECK" columns are used to verify the data inside the software, users should not edit them. Click "**Use default values as current settings**" in the upper right corner to restore all the fillable parameters in this page to default values. Click "**Use read results as current settings**" to fill in the "read results" to "Set values" column. Click " **Compare read results with current settings** " to compare the settings and read values and then place all the differences in red bold font in "set values" column.

6. P5 page: hoistway, frequency conversion drive and motor parameters

Instructions of filling in：

Please fill in the blue background part (Some control parameters can only be obtained by self-learning of motor and hoistway). The "Over-limit check" column automatically checks according to the settings, and prompts the results of the check. The "Read results" column stores the parameters uploaded from the integrated controller or read from the TXT specification file. The "NO:" and "CHECK" columns are used to verify the data inside the software, users should not edit them. Click "**Use default values as current settings**" in the upper right corner to restore all the fillable parameters in this page to default values. Click "**Use read results as current settings**" to fill in the "read results" to "Set values" column. Click "**Compare read results with current settings**" to compare the settings and read values and then place all the differences in red bold font in "set values" column.

In addition, customers can customize the default values of several frequency conversion parameters commonly used by their companies as buttons to click directly. Customers in need please contact Alpha customer service.

7. Digital display form page: Internal and external call digital display form

ACE1000 standard internal and external call display content is unified, if need different internal and external call display content, please contact Alpha customer service for customization.

	A	B	C	D	E	F	G		I	J	K	L
1	Actual display content	Ten-bit display	One-bit display	Ordinal number to ten-bit	Ordinal number to one-bit	Setting value(DEC)	Setting value(HEX)			No.	Coding(HEX)	Display font
2	Lattice Digital Display Summary for Internal and External Call boards									Basic font Summary		
3	0	0	0	0	0	0	0			0	0	0
4	1	0	1	0	1	1	1			1	1	1
5	2	0	2	0	2	2	2			2	2	2
6	3	0	3	0	3	3	3			3	3	3
7	4	0	4	0	4	4	4			4	4	4
8	5	0	5	0	5	5	5			5	5	5
9	6	0	6	0	6	6	6			6	6	6
10	7	0	7	0	7	7	7			7	7	7
11	8	0	8	0	8	8	8			8	8	8
12	9	0	9	0	9	9	9			9	9	9
13	10	1	0	1	0	256	100			10	A	A
14	11	1	1	1	1	257	101			11	B	B
15	12	1	2	1	2	258	102			12	C	C
16	13	1	3	1	3	259	103			13	D	D
17	14	1	4	1	4	260	104			14	E	E
18	15	1	5	1	5	261	105			15	F	F
19	16	1	6	1	6	262	106			16	10	G
20	17	1	7	1	7	263	107			17	11	H
21	18	1	8	1	8	264	108			18	12	I
22	19	1	9	1	9	265	109			19	13	J
23	20	2	0	2	0	512	200			20	14	K
24	21	2	1	2	1	513	201			21	15	L
25	22	2	2	2	2	514	202			22	16	M
26	23	2	3	2	3	515	203			23	17	N
27	24	2	4	2	4	516	204			24	18	O

Instructions of filling in：

The "Actual display content" column is the display content that users can choose directly. After filling "Actual display content" in the "Internal and external call display" cells of main interface page, the "Main page settings code" in the P4C3 page will automatically change accordingly.

If the display content you need is not in the "Actual display content" column, please fill in the blue background part of the table according to the "Display font" in "Basic font Summary" (in terms of tens and ones separately). Then one new display content will be created in the "Actual display content" column for your choice.

	A	B	C	D	E	F	G
1	Actual display content	Ten-bit display	One-bit display	Ordinal number to ten-bit	Ordinal number to one-bit	Setting value(DEC)	Setting value(HEX)
218	43A	43	A	54	10	13834	360A
219	43B	43	B	54	11	13835	360B
220	43C	43	C	54	12	13836	360C
221	43D	43	D	54	13	13837	360D
222	43E	43	E	54	14	13838	360E
223	43F	43	F	54	15	13839	360F
224	43G	43	G	54	16	13840	3610
225	1LF	1	LF	1	39	295	127
226	dn2	dn	2	38	2	9730	2602
227	13SA	13	SA	45	57	11577	2D39
228				0	0	0	0
229		0	0	0	0	0	0
230		0	0	0	0	0	0
231		0	0	0	0	0	0
232		0	0	0	0	0	0
233		0	0	0	0	0	0
234		0	0	0	0	0	0
235		0	0	0	0	0	0

Up to 64×64 display contents can be synthesized with the support of the "Basic font Summary". If you have new content that cannot be obtained using the combination of the fonts in the "Basic font Summary", and the two "Custom font" provided are still not enough, please contact our customer service to customize the non-standard.

8. Motor table page: common parameters of elevator traction motor

This page does not participate in any elevator parameter calculations and does not need to be filled in. It is only for user reference to fill in some motor parameters.

6.4.2 Creating special digital display with predefined character

Take the example of changing the digital display of the 14th floor to "13+".

- "13+" can not be found in "Digital display table" - "Actual display content" column, so "Creation" should be carried out according to " Basic unit character form ".
- Look up the "Digital display table" - "Basic unit character form": cell L48 is 13, cell L44 is +, so you can manually "Create" the "13+".
- In the "Digital display table", find the first blue fillable line of "Ten-bit display" and "One-bit display", and fill in "13" and "+"respectively, as shown in the following figure:

	A	B	C	D	E	F	G
1	Actual display content	Ten-bit display	One-bit display	Ordinal number to ten-bit	Ordinal number to one-bit	Setting value(DEC)	Setting value(HEX)
221	43D	43	D	54	13	13837	360D
222	43E	43	E	54	14	13838	360E
223	43F	43	F	54	15	13839	360F
224	43G	43	G	54	16	13840	3610
225	1LF	1	LF	1	39	295	127
226	dn2	dn	2	38	2	9730	2602
227	13+	13	+	45	41	11561	2D29
228				0	0	0	0
229		0	0	0	0	0	0
230		0	0	0	0	0	0
231		0	0	0	0	0	0
232		0	0	0	0	0	0

- Fill in "13+" at the corresponding cell of the 14th floor in the "Main interface" - "Internal and external call display" line, as shown in the following figure:

Floor sequence number:	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Internal and external display	16	15	**13+**	13	12	11	10	9	8	7	6	5	4	3	2	1

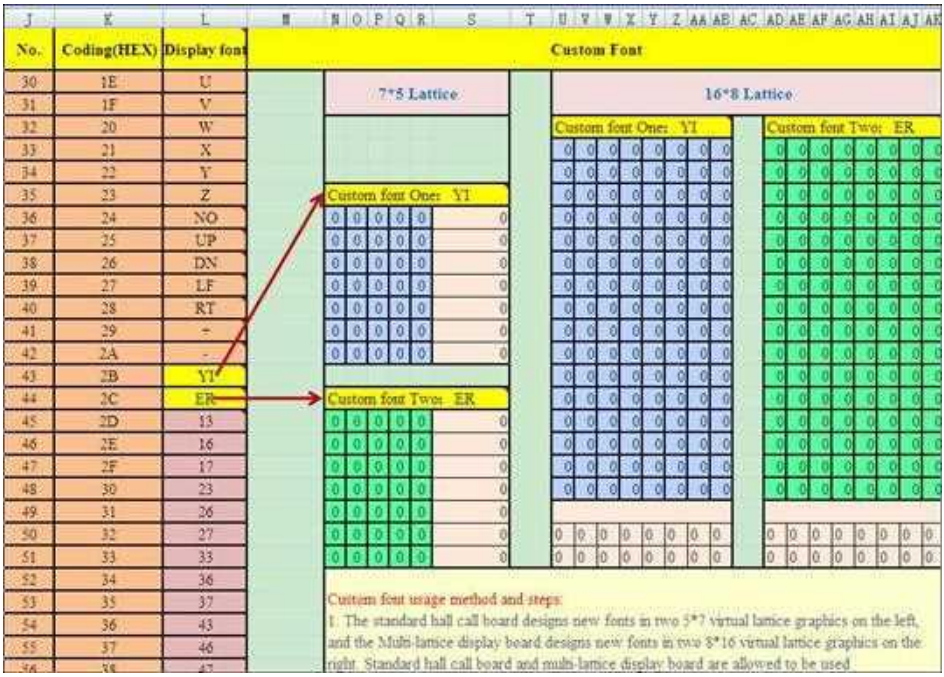
- On the P4C3 page, check "Setting value" corresponding to C3.13has become to"13+",and its "Check result" is OK.

Function code: definition	Internal and external display on main interface	Settings look-up table on main interface	Current Settings (DEC)	Current Settings (HEX)	Settings check
C3.12 : Lattice display of 13th floor	13	259	259	103	OK
C3.13 : Lattice display of 14th floor	13+	11561	11561	2D29	OK
C3.14 : Lattice display of 15th floor	15	261	261	105	OK

6.4.3 Creating special digital display with custom character

Take the example of changing the 1st floor digital display under the standard digital display board to Chinese font "出口":

- Firstly, locate the L46 and L47 cells in the "Digital display form". You can see the two virtual digital display lattices indicated by the arrow on the right side of the table, as follows:



- Design new fonts: Fill in 1 or 0 in the dot matrix of "Custom font 1" and "Custom font 2" as required, as shown above.
- In the blue cells B225 and C25 and below of the "Digital display table", use YI and ER respectively to combine the required new digital display content YIER (YI stands for custom font 1, ER stands for custom font 2). As shown in the picture:

	A	B	C	D	E	F	G
1	Actual display content	Ten-bit display	One-bit display	Ordinal number to ten-bit	Ordinal number to one-bit	Setting value(DEC)	Setting value(HEX)
223	43F	43	F	54	15	13839	360F
224	43G	43	G	54	16	13840	3610
225	1LF	1	LF	1	39	295	127
226	dn2	dn	2	38	2	9730	2602
227	13SA	13	SA	45	57	11577	2D39
228	13÷	13	÷	45	41	11561	2D29
229	YIER	YI	ER	43	44	11052	2B2C
230		0	0	0	0	0	0
231		0	0	0	0	0	0

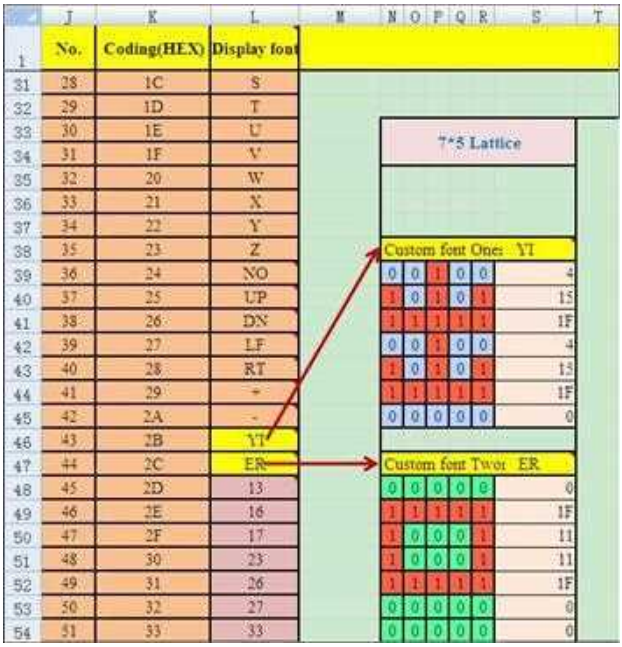
- In the main interface, "internal and external display:" lines fill in the new digital display content "YIER" acquired in the previous step corresponding to 1st floor. As shown in the picture:

Floor sequence number:	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Internal and external display	16	15	13	13	12	11	10	9	8	7	6	5	4	3	2	YIER

- On the P4C3 page, in the "**Settings look-up table on main interface**" column corresponding to the digital display of 1st floor checking, the invalid content warning like "#N/A" cannot appear, and "Setting value check" should be "OK", as shown below:

	A	B	C	D	E	F	G	H	I
1	Function Code: Definition	Main Page display setting	Main Page setting code	Setting Value(DEC)	Setting Value(HEX)	Checking	Read Result(DEC)	Read Result(HEX)	Setting scope(DEC)
2	C3.00: 1st floor lattice display	YIER	11052	10756	2A04	OK	1	1	0~65535
3	C3.01: 2rd floor lattice display	-3	10755	10755	2A03	OK	2	2	0~65535
4	C3.02: 3rd floor lattice display	-2	10754	10754	2A02	OK	3	3	0~65535
5	C3.03: 4th floor lattice display	-1	10753	10753	2A01	OK	4	4	0~65535
6	C3.04: 5th floor lattice display	1	1	1	1	OK	5	5	0~65535
7	C3.05: 6th floor lattice display	2	2	2	2	OK	6	6	0~65535
8	C3.06: 7th floor lattice display	3	3	3	3	OK	7	7	0~65535

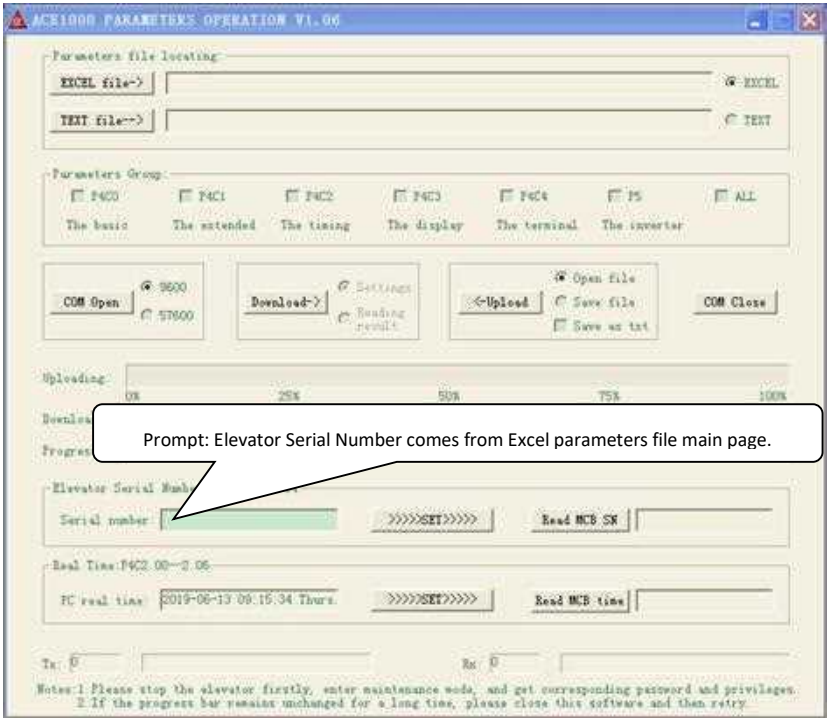
1. Then click "Use the internal and external call display settings on the main interface" button on the the P4C3 page, and go back to the "Digital display table" to see the actual effect of custom fonts as follows:



- Save EXCEL and download P4C3 parameters to the main control board. The system will display the custom non-standard digital display "出口" on the 1st floor after the next power-on.
- Ultra-thin external call digital display board and multi-lattice digital display external call board also support custom font. The method is similar. Different kinds of multi-lattice board are allowed to be used for custom font in the same elevator at the same time.

6.5 Instruction of parameter operating software

6.5.1 Software user interface



6.5.2 Parameter download method

1．onnect PC with DB9 serial port on the main control board by serial port line or USB-232 serial port line and power up. Make EXCEL file that need to be downloaded according to the above-mentioned "Parameter making software using method" (When using USB-232, please install the serial driver program first).

2．Parameter file location: click on the "EXCEL file - >" button to select the prepared EXCEL file, and select the "EXCEL" round radio button on the right side of the file name (TXT format operation method is consistent).

3．Parameter grouping selection: tick to select the parameter group that needs to be downloaded. Note: The system will only prompt the user whether to set the current download parameters as elevator factory default parameters after the selection of all parameters is downloaded.

4．Open the serial port, and then handshake and communicate with the main control board:

- Please confirm that the selected baud rate below the "Serial port detection opening

handshake" button is the same as that set in the main control board P4C1.39.

Port / C1.39Setting value	Expansion RS422	On-board RS485	On-board RS232
XX0	9600~76800	9600~76800	9600
XX4	9600~76800	9600~76800	57600

- then click on the " Serial port detection opening handshake " button, and the software completes the current serial port detection, opens, and establishes the handshake with the main control board in turn.
- If the current PC has multiple serial ports available, please note whether the current open "serial port" number is correct. If the open serial port number is not connected in step 1, you can click this button again until it is correct. After the button function is successfully executed, the following information will be prompted in turn:

- If the communication handshake fails, please check whether the physical connection between PC and the main control board, the serial port number of PC currently used, and the baud rate is consistent. Then try again until the communication handshake succeeds!

5. Click "Download from the computer to the main control board/keyboard". The software first reads the parameter file(EXCEL or TXT). If EXCEL format parameter is used/selected, you can further select "Setting value" or "Read result value" to download. Please click "OK" to start downloading after it finishes, as follows:

Part of groups to download

All groups to download

6. Download progress bar and the current progress bar indicate the relevant download progress, until you see pop-up "parameter download completed!" information box, as follows:

7. When all parameter groups(ALL) are selected, the system automatically backs up a TXT parameter file to the current directory, and prompts the user to set factory default parameters of elevator after downloading.

8. After completing the download process, in order to confirm that the download is completely successful, please check the download results according to the prompt method.

6.5.3 Parametric upload and contrast method

1. Connect PC with the main control board according to the "parameter download method" mentioned above (successful handshake needed). Select EXCEL specification parameter table file to save uploaded parameters (provide a blank TXT file when saving as TXT), then select the parameters group to upload.

2. Click on the "Open File" or "Save directly" round radio button on the right side of the "Upload to FILE from the main control board/keyboard" button.

3. Option "Save as TEXT" can upload parameters to EXCEL and generate a backup TEXT parameter file.

4. Click on the "Upload to file from main control board/keyboard" button to start uploading parameters. The upload progress bar and the current progress bar indicate the relevant upload progress.

5. Wait for the upload process, until you see the pop-up "parameters upload completed, please click OK to perform file operation", then click "ok" to wait for the completion of file operation, as follows:

6. After the file operation is completed, the "EXCEL parameter file operation is completed!" appears. As shown in the following figure:

7. Click "OK". If "Open File" is selected, the EXCEL specification sheet will be opened automatically. If "Save directly" is selected, the EXCEL file will not be opened but saved directly.

8. After the parameter upload is completed, open the EXCEL file. The uploaded parameters are stored in the "Read Results" column on the P4C0~P5 page. If the "Read result" is inconsistent with the previously saved "Setting value", the result will be showed up in red bold font. In addition, any time you click the "**Contrast current settings and read results**" button on the page, the difference between "Setting value" and "Read result" will be displayed in red bold font in the "Setting values" column.

6.5.4 TXT parameter file backup, upload and download

1. Upload to TXT: When performing parameter upload operation, only a blank TXT file is provided instead of EXCEL specification parameter file in "Parameter file location". After parameter upload, the read parameters are saved to the specified TXT file.

2. Uploading to EXCEL and backing up TXT at the same time: When performing parameter uploading operation, the EXCEL parameter file is provided in "Parameter file location" and "Save as TEXT" is ticked before uploading. After uploading parameters, a .TXT file with the same name as the specified EXCEL file will be automatically generated in the specified EXCEL file list (file name automatically appends the real time).

3. EXCEL is saved as TXT directly: Click on the button "Save as TXT parameter file" on the main interface of EXCEL file, it will save a TXT parameter file to the designated directory (cell B3) with the elevator serial number (cell B5) as the file name.

4. Download TXT parameters: According to the "**Parameter download method**" guide, when choosing the download parameter file, click "TEXT specification - >" to specify the. TXT file to download.

5. After reading the TXT format parameters into EXCEL, it is stored in the "read results" column of P4C0-P5 pages, which can be compared with the "setting values" or written into the "setting values" column by clicking corresponding button.

Notes: TXT parameter file can be opened and looked up, but not edited. Any editing may cause errors in data validation or affect the normal operation of elevators. Therefore, the TXT text editor can not be used to produce elevator parameter files. The elevator parameters in TXT format are only used as a means of transition or backup.

6.5.5 Synchronize PC time to main control board

Generally, after downloading the parameters, click the button of ">>>>>Settings>>>>>“ in the column of "Time settings", the software will automatically set the real-time of your computer to the main control board. After the time setting is completed, the software automatically reads out the time on the main control board in real time.

6.5.6 Reading and writing of elevator serial number

When downloading the EXCEL parameter table, the software automatically reads the elevator serial number in EXCEL to the edit box on the left side of the "Serial number settings" column. Click the "Read the serial number of the main control board" button to read the elevator serial number. When you need to set the serial number, click the ">>>>>Settings>>>>>" button in the "Serial number setting" column. Before downloading the elevator serial number, manual editing is allowed, but only the number of hexadecimal digits (0-9 and A-F) should be filled in, and the length should not exceed 12 bits.

6.6 Notes for Software Use

- When filling in the parameter table to make EXCEL file, please copy a backup from the EXCEL file provided by the original factory to fill in, so as to avoid the calculation formula in EXCEL file being damaged by misoperation, affecting the setting result and causing accidents!
- Before downloading parameters, please check whether "settings value check" is "OK" in each table. Only all is OK, it is allowed to download.
- In the process of parameter upload/download, the software needs to occupy more hardware resources. Please close other irrelevant software as far as possible. It is known that some anti-virus software will mistakenly report background operation EXCEL file as Trojan virus and shut down some windows processes needed for software operation, even resulting in software crash.
- If the parameter upload/download progress bar remains unchanged for a long time, it may be that the serial communication is abnormal. Please close the software to check the serial port and try again.
- If the upload or download process occurs "Because another program is running, this operation can not be completed...", please click the "Retry" button.
- The software checks the upload and download parameters, and if the verification fails, it will be shown. such as: "P5 data validation error, please click"OK", then it will not do file operation, please click ‘Cancel’ to continue operation, and then check whether the parameters are wrong".

Chapter 7: Debugging for elevator control system

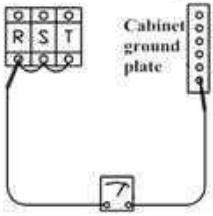
This chapter will write following the order of elevator debugging process. Please refer to this order to install and debug elevator controllers.

7.1 Pre-operation inspection

Before using ACE1000 control cabinet on site, please check according to the following instructions and diagrams.

7.1.1 Control cabinet insulation and withstand voltage test

When measuring insulation resistance of motor with mega-ohmmeter (DC 500V mega-ohmmeter), the input power supply should be removed and the motor and controller should be disconnected. High voltage (>500V) testing is strictly prohibited. Do not test the control circuit with an insulated resistance meter (the control circuit is measured with a multimeter). Refer to the following figure:



7.1.2 Standard resistance of each circuit insulation

Circuit name	Standard value(MΩ)
Main circuit terminals U、V、W、R、S、T	>1
Brake circuit	>0.5
220V power supply circuit	>0.5
Lighting circuit	>0.5

7.1.3 Hybrid voltage check

Voltage (V)	Power supply circuit	Lighting circuit	220V Power supply circuit	Braking circuit	Control power supply circuit	Signal circuit
Signal circuit						
Control circuit						
Braking circuit						
220V Power supply circuit						
Lighting circuit						
Power supply circuit						

Instructions of filling in:

1．Hybrid voltage refers to the voltage between one circuit and the secondary side of the other circuit without power supply. Hybrid voltage should be about 0V when it is

normal, but sometimes due to voltage induction, hybrid voltage will have a voltage value of 2-3V and enough to light up some LED lights. This is a normal phenomenon, and generally it will not trigger the 24V signal of external IO by mistake.

2. Fill in with ○ and × respectively. 0 represents hybrid voltage (greater than 2-3V) and × represents no hybrid voltage. When the hybrid voltage exists in the circuit, the relevant circuit wiring should be checked and processed to eliminate the hybrid voltage in the power supply circuit.

7.2 Static tuning of synchronous motor (magnetic pole angle learning)

After the installation and fixation between the synchronous traction machine and its encoder, ACE1000 needs to know the installation pole angle of the encoder (P5_F3.03) to drive the motor correctly. The motor can be statically tuned before the first running of the motor (if the correct pole angle parameter is available, it can also be manually written into F3.03). In order to facilitate motor tuning in the wired control cabinet and avoid the short circuit of the three-phase output of the driver on the star-delta contactor, please use P3.12 function for motor tuning (it is not recommended to directly use F2.07 and F2.08 functions). In order to verify whether the tuning result is correct, it is necessary to use up/down maintenance mode to jog the motor after tuning, so the system needs some I/O signal cooperation to complete the tuning process. P3.12 can be executed in F0.01 = 1 "distance control mode" or F0.01 = 0 "keyboard control mode". Since the maintenance running mode can not be used to jog the motor in "keyboard control mode", we recommend tuning in "distance control mode".

Precautions for static tuning of synchronous motor:

1. After the encoder is newly installed, replaced or disassembled, motor tuning must be carried out again; for only replacing the main control board, it is recommended to manually write the original F3.03 parameters that have been used normally into the new main control board. Before the pole Angle is confirmed to be correct, do not take the high-speed running, and take the low-speed running should always pay attention to the operation of the motor. In case of any abnormality, press the emergency stop button to stop the machine immediately to prevent the motor-running from flying.

2. Due to the diversity of the traction machine, the self-learned pole Angle may fall between several cells (each cell is about ±15°), so it is necessary to verify whether the pole Angle is correct after tuning. After each tuning, make the motor rotate for more than one week in the maintenance mode, then power off and power on again, and then make the motor rotate for more than one week in the maintenance mode **again**. It can only be successful if the above mentioned both motor rotation is normal. If the rotation is not normal (jitter, abnormal noise, abnormal speed, fault stop), the rotation shall be stopped **immediately** and re-tuned (check wiring and parameters first).

3. It is required to tune the motor at different rotor positions for more than three times, and the results verified successfully in accordance with the above requirements are generally within a ± 15 ° range. It is recommended to take the average value and fill in F3.03. This is especially important for the situation that the current is too large or the motor output power is discounted when the elevator is running.

4. The F3.03 tuned out by the wrong F3.02 cannot normally rotate the motor (generally the motor rotor is not moving, or it will get stuck immediately after moving a little). At this time, any two motor power lines can be exchanged or modified F3.02, after that, tune again. It should be noted that after the modification of f3.02, sysytem must be powered on again or tuned before use. The encoder direction F3.02 is fixed after the traction machine connects the power line, which is a prerequisite for learning the magnetic pole Angle F3.03 correctly. Therefore, a set of "control system + traction machine" which has been debugged for the slow running must ensure that the power line wiring sequence, F3.02 and F3.03 remain unchanged to continue normal driving.

5. On the premise of confirming the correct wiring of UVW and encoder running direction(F3.02), if the encoder pole angle(F3.03) learned from any position of the rotor cannot rotate the motor normally, please try to reduce the PI(proportion/integral) parameters in F4 (by half).

6. If the pole angle has been learned and passed the high-speed and low-speed test during the factory inspection of the elevator, it is generally unnecessary to re-tune at the hoistway site. When tuning the motor at the hoistway site, please be sure to: check the safety of hoistway and mechanical equipment, press the emergency stop button to disconnect the safety circuit, manually release the motor holding-brake and turn the car to stop at the level position of the middle floor of hoistway (at least non end station is required), and add half load to the car (in order to balance with the counterweight), then close the hall and car door and release the emergency stop switch after entering the maintenance mode.

Synchronous machine static tuning method and steps:

<table>
<tr><td rowspan="10">Public conditions</td><td colspan="2">The power lines of the frequency converter and the motor are connected according to UVW (If the traction machine has special wire sequence requirements, please wire according to its instructions).</td></tr>
<tr><td colspan="2">The frequency converter is connected with the control cable of the main control board.</td></tr>
<tr><td colspan="2">The encoder is connected to the main control board by the DB15 line. Please refer to Chapter 3 "encoder interface" for line sequence requirements.</td></tr>
<tr><td colspan="2">P24 and COM in the main control board CN2 (Note: required for relay action on the MCB, otherwise, please remove the star-delta contactor first to prevent short circuit of output).</td></tr>
<tr><td colspan="2">Pass the second level password of P4 C5.12.</td></tr>
<tr><td colspan="2">Correctly set the F1.00-F1.02 converter parameters.</td></tr>
<tr><td colspan="2">Correctly set F2.00=1 (permanent magnet synchronous motor), F2.01 ~ F2.05 motor nameplate parameters.</td></tr>
<tr><td colspan="2">Correctly set the encoder parameters F3.00 ~ F3.02 (Note: please debug parameter F3.02 according to Precautions 4).</td></tr>
<tr><td colspan="2">Confirm the current F2.07=0, F2.08=0.</td></tr>
<tr><td colspan="2">Clear the frequency conversion fault ER1.xx currently reported.</td></tr>
<tr><td>Control model</td><td>F0.01=0 "keyboard control mode" (can only be tuned, not run in maintenance mode)</td><td>F0.01=1 "Distance control mode" (can be tuned and run in maintenance mode).</td></tr>
<tr><td rowspan="4">Input signal required for tuning (provided by test bench or hoistway)</td><td rowspan="4">Safety loop signal</td><td>Safety loop signal (emergency stop button must not be short-circuited to be controllable).</td></tr>
<tr><td>Car door lock, car door lock redundant signal (required if defined).</td></tr>
<tr><td>Hall door lock, hall door lock redundant signal (required if defined).</td></tr>
<tr><td>Main running contactor feedback signal (should be provided by the control cabinet correctly).</td></tr>
</table>

		The running direction signal must be invalid.
Additional requirements for maintenance operation (provided by test bench or hoistway))	Does not support	Hoistway upper and lower limit signals must be invalid (required).
		First level up and down forced deceleration signal (not necessary but affecting maintenance speed).
		Brake contactor feedback signal (shall be provided correctly by the control cabinet).
		Leveling signal (it is not necessary but it can avoid the fault of long running distance of leveling).
		Maintenance signal + maintenance up / down signal.
Unnecessary conditions		Internal and external calling communication, parallel and group communication, other signals not mentioned.
Description of tuning process	Set P3.12=1, then the star-delta and mian running contactor will act in turn, then press the ENTER key to start the tuning.	Set P3.12=1, then press the ENTER key, then the star-delta and mian running contactor will act in turn, and then start the tuning.
	After the end of the photoelectric encoder tuning, it is necessary to manually rotate the motor rotor (loosen the brake to slip off the car or operating in maintenance mode) to learn the pole Angle. While the SinCos encoder can be learned without rotating the motor rotor. After learning, the on-board keyboard will display the pole angle before and after learning in turn. You can also enter F3.03 to view the learned pole angle. In the process of tuning, if the system detects any abnormality, it will report ER1.24 “tuning fault”. Please confirm the relevant parameters and wiring, and then tune again.	

The ACE1000 controller also supports semi-automatic mode motor tuning, and the required conditions are consistent with the above conditions. The steps are as follows:

- Confirm that the wiring of control cabinet, motor and encoder is correct, the safety circuit is OK, and turn on the maintenance switch to enter the maintenance mode.
- Set parameters correctly: F1.00 ~ F1.02 converter parameters, F2.00 = 1 (permanent magnet synchronous motor), F2.01 ~ F2.05 motor parameters, F3.00 ~ F3.02 encoder parameters.
- If there is a frequency converter fault (ER1. xx), please clear it first, and then power off the control cabinet.
- Power on the control cabinet again, press and hold the maintenance up and down buttons for about 5 seconds, and the system will automatically enter P3.12 for motor tuning.

7.3 Maintenance operation (low speed running)

1．Check with keyboard and LED on the main control board: upward/downward limit switch signal, safety circuit, door lock signal, maintenance signal.

2．Turn on the maintenance switch on the control cabinet. For safety, low-speed test operation for the first time must be performed in the motor room using cabinet switchs. If the maintenance switch of the car roof or car is on, the maintenance operation of the motor room will be invalid (maintenance operation priority: car-roof > car-inside >motor room cabinet > P3_H01 keyboard).

3．Press the upward maintenance button on the control cabinet.

4．If the encoder fails, or there is shaking, abnormal noise, abnormal speed in the operation of the motor, or the output current observed through the keyboard is too large, please exit the operation immediately, and confirm the connection of the motor and the encoder, inverter parameters, and then refer to chapter 7.2 for static tuning of the magnetic pole angle.

5．If the motor runs normally but in the opposite direction (such as pressing the upward button but the elevator goes down), the direction of the motor can be changed by the function code F0.03.

6．Press the downwward maintenance button on the control cabinet.

7．Observe whether the input and output signals are normal during the maintenance operation.

8．In the maintenance operation, it is possible to test whether the emergency stopping switch in the control cabinet is correct.

9．After maintenance operation test in the motor room is completed, the maintenance operation test of the car roof and the car inside can be carried out.

Note: ACE1000 has four maintenance operation modes, and the priority is: car roof maintenance > car-inside maintenance > motor room maintenance > keyboard / serial port maintenance. If the car-inside maintenance and motor room maintenance are not defined in the X input, the car roof maintenance, car-inside maintenance and motor room maintenance can be electrically connected in series according to priority and connected to the X definition terminal of car roof maintenance. Car roof maintenance and car-inside maintenance support point-to-point communication and CAN bus communication (connected to car-roof control board or car-command board). Motor room maintenance only supports point-to-point communication. Keyboard / serial port maintenance is the function of P3.H01 (it can be set with onboard keyboard or PC and LCD keyboard with serial port).

7.4 Self-learning of hoistway parameters

1．Make sure that the upper and lower direction-limit switches, forced deceleration switches, and the floor-leveling plate of each floor have been installed correctly.

2．View the P1 menu through the keyboard to confirm that the input status of upper and lower direction-limit switch, forced deceleration switch and floor-leveling sensor to the main control board is normal.

3．Make sure that the top of the car has no tools and other debris that may fall, which hinders the high-speed operation of the elevator and the unhindered way of hoistway.

4．Use the motor room maintenance method to make the car stopping at the lowest leveling position.

5．Before self-learning of hoistway parameters, the correct number of floor-leveling plates should be written in F6.00, the distance between any two adjacent leveling plates should be less than 10 meters, and the series of forced deceleration switch should be set correctly in F6.05.

6. If there are only two floor leveling plates (F6.00 is 2, only two floors) in the hoistway, please set F6.02 as the correct value (set as half of the length of the floor leveling plate, if the length of the plate is 250mm, set F6.02 as 125). If there are more than two plates in the hoistway, the system can automatically detect and acquire without user setting F6.02.

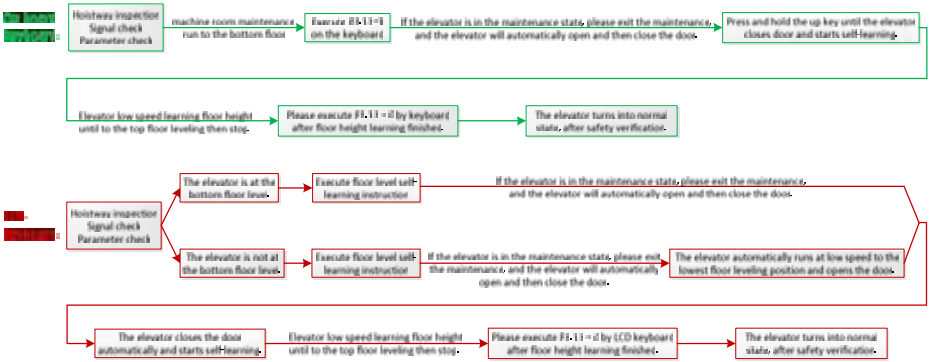
7. Set P3.13=1 to enable measuring the elevator floor height. Hold the INC key until the elevator starts. After the elevator starts, the INC key can be released. At this time, the elevator runs from the bottom floor to the top floor at low speed.

8. The elevator arrives at the floor leveling position of the top floor, car stops but door does not open, and the self-learning of the hoistway is completed if in the case of no self-learning fails are reported.

9. Check that F6.02 and F6.12-F6.58 (1-47 floors) have preserved the corresponding data. Note: floor height data refers to span, which is one floor less than the total number of floors.

10. Set P3.13=0 to exit the floor height measurement mode, so far the floor height measurement is completed.

Flow chart:



Note:

1. When the elevator is being measured the floor height, do not change the operating state of the elevator (ACD code). Otherwise, the floor height self-measurement of the elevator will be stoped and the operation will be failed.

2. When using the keyboard for daily use, it is necessary to avoid entering the floor height measurement mode, which will result in the loss of all floor height data. After the floor height data is lost, the system faults such as "EA1.32 not meeting to the lowest floor running conditions" when calling.

3. When the elevator is being measured the floor height, do not have other mode inputs such as fire fighting, parking, earthquake, etc. (especially on-site interference).

4. In order to avoid some undetected parameter setting errors or hoistway problems leading to abnormal conditions. It is better not to call the elevator in the car for the first time after learning the floor height, and do not run from end to end station.

7.5 High-speed running test

High-speed running test will be carried out after floor height measurement is completed. Through the maintenance operation in the motor room, the car runs to the middle floor, and the maintenance switch of the car inside and the car roof is set to normal state. The car roof and the car are nobody on or in. In the motor room, the keyboard is used to call the elevator running, and confirm whether the elevator acceleration and deceleration are normal, the running is stable, the current is normal, and so on. Finally, tests the internal and external calls.

Note: People in the motor room should be careful of abnormal elevator running, if abnormal situation occurs, they should stop the elevator by emergency stop switch at once.

7.6 Floor leveling adjustment with crawl-speed

ACE1000 system defaults to a single floor leveling plate as a reference, which is to start decelerating at the setting deceleration speed after obtaining the leveling plate signal. Therefore, the floor leveling result depends on the journey of the car after the leveling plate signal is on, and the journey depends on the initial speed of the car when it has just obtained the leveling plate signal and the deceleration in the process of decelerating. The way to adjust the floor leveling result is to adjust the crawl speed (F5.13) and parking deceleration speed (F5.12). Crawl speed is the speed when the car enters the edge of the leveling plate (just obtain the signal). The parking deceleration speed is the negative acceleration in the process from crawl speed to zero speed. Increasing the crawl speed F5.13 will lengthen the distance from the edge of the leveling plate to stop walking, which is suitable for the adjustment of the under-leveling floor; and vice versa, shorten the walking distance, which is suitable for the adjustment of the over-leveling floor. F5.12 can also adjust the running distance of decelerating process. Increasing F5.12 to shorten the running distance on the leveling plate, which is suitable for the over-leveling floor. Decreasing F5.12 to lengthen the running distance on the leveling plate, which is suitable for the under-leveling floor. In addition, F5.12 will affect the comfort during the course of parking.

- The method of adjusting the floor leveling precision (adjusting parameters):

1. Place the elevator on the lowest floor of the building.

2. Give the elevator the instructions to run up one floor, and pay attention to feel the comfort of the elevator when it stops. If the comfort is not good, adjust the parking deceleration speed (F5.12) until the comfort of the elevator is good when it stops. Because increasing F5.13 can improve the efficiency of the elevator, if the F5.13 value is increased, the comfort of the elevator when it stops is still good, it should increase F5.13 appropriately.

3. After completing step 2, place the elevator on the middle floor of the building.

4. Give the elevator an instruction to run up one floor. After the elevator is on the leveling position of the floor, measure the deviation(E) between the car sill and the hall door floor sill (the E write as positive when the car sill is higher than the hall door floor sill, and the E write as negative when the car sill is lower than the hall door floor sill).

If E > 0, the crawl speed (F5.13) need be reduced; if E < 0, the crawl speed (F5.13) need be increased;

5．Repeat steps (3) and (4) until the deviation between the car sill and the hall door sill is - 5mm < E < 5mm.

- Floor leveling fine tuning (adjusting the leveling plate up or down):

1．Make the elevator stop from the top to the bottom floor by floor under normal running, and record the E1 of each floor.

2．Make the elevator stop from the bottom to the top floor by floor under normal running, and record the E2 of each floor.

3．Repeat steps (1), (2) to confirm that the error of E1 between each floor is 2~4mm at each stop, and the error between E2 of each floor is 2~4mm at each stop;

4．Confirm that △E=E1-E2=0.00±3mm for each floor station;

5．If the above requirements are not met, adjust the leveling plate of each floor under the maintenance status:

A. If the value of △E is positive, then adjust the leveling plate down the value of △E.

B. If the value of △E is negative, then adjust the leveling plate up the value of △E.

1．After adjusting the leveling plate, the hoistway self-learning procedure should be re-carried out.

2．Perform a leveling check again to confirm that the leveling accuracy is 0.00 ± 5 mm;

3．Repeat steps 1-7 if the error exceeds (+5mm).

- Floor leveling adjustment supplementary function:

After completing the above steps, if you want to reduce the crawl speed (F5.13), you can adjust F5.13 and F6.03 (the leveling plate supplementary) at the same time. The steps are as follows:

1．Reduce the crawl speed F5.13 appropriately;

2．When the elevator runs to the next floor, the elevator will be in under-leveling state(i.e. when it goes up, the car sill is lower than the hall door floor sill; when it goes down, the car sill is higher than the hall door floor sill), and the deviation value at this time is recorded as △E mm.

3．Set F6.03 as △E ;

4．When the elevator runs to the next floor, the elevator car should be able to accurately level the floor. If there is a slight deviation, please fine-tune F5.13 or F6.03.

Note: It is recommended that the setting value of F6.03 should not exceed half of F6.02 (floor leveling plate length). If it is found that neither the upper nor the lower movement can reach the desired level, please re-adjust the crawl speed F5.13 and the parking deceleration speed F5.12 again.

7.7 Comfort degree adjustment in elevator starting

7.7.1 Pre-torque automatic compensation without weighing sensor

When the ACE1000 system uses SIN/COS encoder, it can realize the function of automatic pre-torque compensation without weighing device. The adjustment process is as follows:

1. Set F7.02=2 to start-up compensation function without weighing.
2. Set F7.00 to be bigger than or equal to 0.600 seconds;
3. On the basis of factory settings, gradually fine-tune F7.10 to adjust the effect of start-up compensation without weighing; If the backward slip is obvious after opening the brake, gradually increase the value of F7.10, so that the backward slip is small enough and the motor does not shake; if the motor shake is obvious, appropriately reduce the F7.10 ;
4. F7.08, F7.09 generally does not need to be adjusted. If the motor has obvious abnormal noise, please gradually reduce the values of F7.08 and F7.09.
5. If the above parameters can not meet the requirements of starting comfort, the speed feed-forward parameter F4.10 can be modified appropriately.

7.7.2 Pre-torque compensation using weighing sensor

1. Set F7.02=1, and ensure that F7.03, F7.04, F7.05, F7.13, F7.14 are set correctly;
2. Adjust the parameters according to the table below:

Load condition	Operation direction	Start-up condition	Modification method
Empty load	Upward	Sudden start	Increase F7.07
		Backward slip	Reduce F7.07
	Downward	Sudden start	Increase F7.07
		Backward slip	Reduce F7.07
Full load	Upward	Sudden start	Increase F7.06
		Backward slip	Reduce F7.06
	Downward	Sudden start	Increase F7.06
		Backward slip	Reduce F7.06

Note: Input analog weighing signal (0~10V) into the AD port of the car roof expansion board.

Chapter 8: Instructions for supporting products

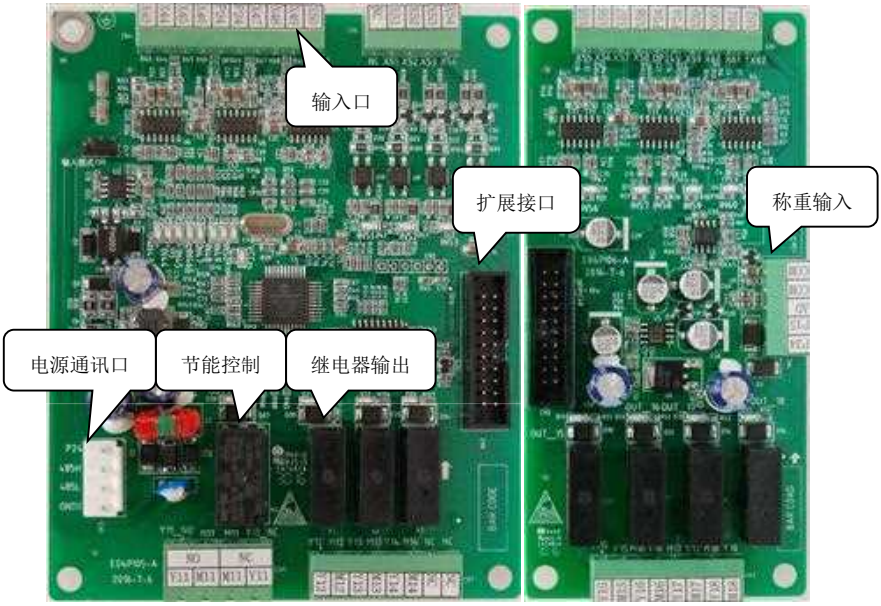
8.1 ACE-TB-A/E: Car roof and expansion board

8.1.1 Brief introduction

Car roof control board (including expansion board) uses CAN bus communication. There are 8 + 8 input points, 7 + 4 relay output points, one 0 V~ 10V analog weighing input port, and 1 RS232 debug interface. Size specifications (including components) are shown in the following table:

Name model	Length	Width	Thickness	Screw hole
Car roof board : ACE-TB-A	125mm, locating hole distance 116mm	100mm, locating hole distance 92mm	About 20mm	φ5×4
Car roof expansion board :ACE-TB-E	125mm, locating hole distance 116mm	60mm, locating hole distance 52mm	About 20mm	φ5×4

Electronic board frontal physical map:



ACE-TB-A **ACE-TB-E**

8.1.2 Interface illustration

- **Power supply and CAN communication interface:**

Power interface: maximum current 2A, power reverse protection, CAN interface, socket type: CH3.96-4 (White)

PIN	Signal name	Signal level	Illustration
1	V+	24V	24V POWER
2	CANH	CAN	CAN communication
3	CANL	CAN	CAN communication
4	V-	0V	power GND

- **Input terminal description:**

Input current: > 5mA, filter time: 10ms; socket model: TP381H-00V-4P, TP381H-00V-10P					
PIN	Signal name	Numbering in P4C4	Signal level	Illustration	Remarks
1	X43	C4.42：X43	24V/0V		Car roof board
2	X44	C4.43：X44	24V/0V		Car roof board
3	X45	C4.44：X45	24V/0V		Car roof board
4	X46	C4.45：X46	24V/0V		Car roof board
5	P24		24V	24V power output	Car roof board
6	P24		24V	24V power output	Car roof board
7	X47	C4.46：X47	24V/0V		Car roof board
8	X48	C4.47：X48	24V/0V		Car roof board
9	X49	C4.48：X49	24V/0V		Car roof board
10	X50	C4.49：X50	24V/0V		Car roof board
1	X55	C4.54：X55	24V/0V		Car roof expansion board
2	X56	C4.55：X56	24V/0V		Car roof expansion board
3	X57	C4.56：X57	24V/0V		Car roof expansion board
4	X58	C4.57：X58	24V/0V		Car roof expansion board
5	P24		24V	power putput	Car roof expansion board
6	P24		24V	power output	Car roof expansion board
7	X59	C4.58：X59	24V/0V		Car roof expansion board
8	X60	C4.59：X60	24V/0V		Car roof expansion board
9	X61	C4.60：X61	24V/0V		Car roof expansion board
10	X62	C4.61：X62	24V/0V		Car roof expansion board

- **Output terminal description:**

Relay contact output. Maximum 5A/250VAC or 3A/30VDC, action delay 5ms, maximum operation frequency 300 times/minute, contact life 100,000 times (see relay specifications). Socket models: TP508H-00V-4P, TP381H-00V-8P.					
PIN	Signal name	Numbering in P4C4	Signal level	Illustration	Remarks
1	11M	C4.85：Y11	24V/0V	Energy saving control	Car roof board
2	Y11-NO		24V/0V		Car roof board
3	Y11-NC		24V/0V		Car roof board
4	11M		24V/0V		Car roof board
1	Y12	C4.86：Y12	24V/0V	Custom property	Car roof board
2	12M		24V/0V		Car roof board
3	Y13	C4.87：Y13	24V/0V	Custom property	Car roof board
4	13M		24V/0V		Car roof board
5	Y14	C4.88：Y14	24V/0V	Custom property	Car roof board
6	14M		24V/0V		Car roof board
7	Y15	C4.89：Y15	24V/0V	Custom property	Car roof board
8	15M		24V/0V		Car roof board
9	Y16	C4.90：Y16	24V/0V	Custom property	Car roof board
10	16M		24V/0V		Car roof board

Relay contact output. Maximum 5A/250VAC or 3A/30VDC, action delay 5ms, maximum operation frequency 300 times/minute, contact life 100,000 times (see relay specifications). Socket models: TP508H-00V-4P, TP381H-00V-8P.					
PIN	Signal name	Numbering in P4C4	Signal level	Illustration	Remarks
11	Y17	C4.91：Y17	24V/0V	Custom property	Car roof board
12	17M		24V/0V		Car roof board
1	Y18	C4.92：Y18	24V/0V	Custom property	Car roof expansion board
2	18M		24V/0V		Car roof expansion board
3	Y19	C4.93：Y19	24V/0V	Custom property	Car roof expansion board
4	19M		24V/0V		Car roof expansion board
5	Y20	C4.94：Y20	24V/0V	Custom property	Car roof expansion board
6	20M		24V/0V		Car roof expansion board
7	Y21	C4.95：Y21	24V/0V	Custom property	Car roof expansion board
8	21M		24V/0V		Car roof expansion board

- **AD weighing input:**

0~10V voltage input type, socket type: TP381H-00V-5P			
PIN	Signal name	Signal level	Illustration
1	P24V	24V	24V power supply output, power supply for sensor (sensor power supply scheme 1)
2	P15V	15V	15V power supply output, power supply for sensor (sensor power supply scheme 2)
3	AD_IN	0~10V	Analog weighing signal input (negative voltage input is not supported)
4	GND	0V	Provide ground to the sensor
5	GND	0V	Provide ground to the sensor

Note: Voltage-mode sensors with a maximum output voltage of less than 10V can be directly connected. Current-mode sensors need to be converted to 0-10V voltage and then input. Generally, the relationship between sensor output and car-load is required to be the linear relationship . The maximum current of P15V/P24V output power supply in long-time work time up to 300 mA.

8.2 ACE-CB-A/E: In-car command boad and expansion board

8.2.1 Brief introduction

Car command board (including expansion board) uses CAN bus communication. It supports 48-floor internal call, 5+4 custom buttons with lights, 4 individual input points, 4 individual output points, buzzer, debugging interface in the car, voice station interface and digital display interface in the car. If the compensation floor is set in P4C1.04, the floor button sorting in the command board needs to take it into account. For example, P4C1.04=2, the bottom physical call button interface is located in FL3.

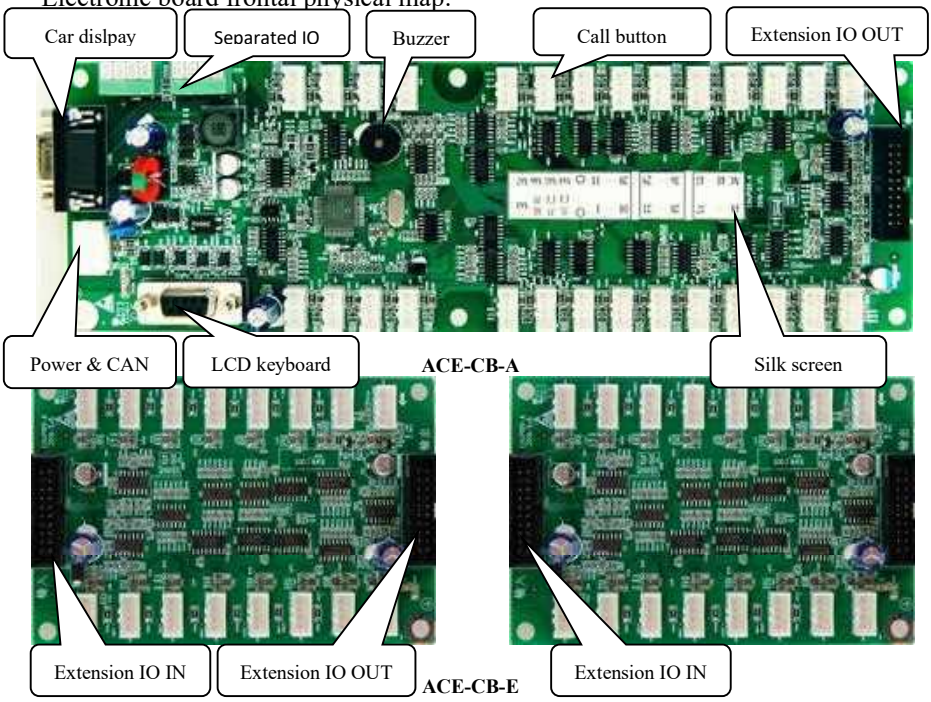
The command board in the car can be set as one of the five working modes of "Main door/ZM", "Auxiliary door/FM", "Main disability/ZC", "Auxiliary disability/FC", "Simplified main door/Z2". The default mode is "Main door/ZM". ACE1000 system allows simultaneous access in one elevator: one "Main door/ZM", multiple "Simplified main door/Z2", one "Auxiliary door/FM", one "Main disability/ZC", one "Auxiliary disability/FC" command board. When elevators need to

be equipped with multiple main door call command boards, only one of them can be set as "Main door/ZM" and the other as "Simplified main door/Z2". The command board set as "Simplified main door/Z2" has the same function as the command board set as "Main door/ZM", but only call button and opening/closing button are valid. The "Auxiliary door/FM" and "Auxiliary disability/FC" modes are only used when the elevators have independent double-door, do not set these two modes when it is dependent through-door.

Size specifications (including components) are shown in the following table:

Name model	Length	Width	Thickness	Screw hole
ACE-TB-A: Command board	250mm, locating hole distance 118mm、124mm	80mm, locating hole distance 72mm	About 20mm	φ5×6
ACE-TB-E: Command expansion board	120mm, locating hole distance 116mm	80mm, locating hole distance 72mm	About 20mm	φ5×4

Electronic board frontal physical map:



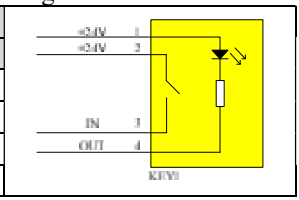
8.2.2 Interface illustration

- **Power supply and CAN communication interface:**

Power interface: maximum current 2A, power reverse protection, CAN interface, socket type: CH3.96-4 (White)			
PIN	Signal name	Signal level	Illustration
1	V+	24V	24V POWER
2	CANH	CAN	CAN communication
3	CANL	CAN	CAN communication
4	V-	0V	GND

- **Call button interface:** compatible with external call button interface, command board contains 20 + 5 floor call buttons, each expansion board contains 16 floor call buttons, up to 20 + 16(first EX) + 12(second EX) = 48 floors, the second expansion board can also be customized with the remaining four button interfaces.

Power interface: maximum output current 40 mA, socket type: XHS2.5-4A			
PIN	Signal name	Signal level	Illustration
1	V+	24V	P24V power
2	V+	24V	P24V power
3	IN	24V	Button input
4	OUT	24V	Indicator output



- Custom button interface with light: 8 on command board + 4 on second expansion board.

Terminal name	Numbering in P4C4	Default definition	Remarks
	None	Door closing (fixed)	Command board
	None	Door opening(fixed)	
	None	Extend-time door opening (fixed)	
X63_F21	C4.62	Fire control	
X64_F22	C4.63	bypass by attendant	
X65_F23	C4.64	Independence from group	
X66_F24	C4.65	elevator attendant mode input	
X67_F25	C4.66	switch directions by attendant	
X72	C4.71	Standby	The last four interfaces of the second expansion board
X73	C4.72	Standby	
X74	C4.73	Standby	
X75	C4.74	Standby	

Remarks:

(1) Call for help from car inside to hall outside——Press the opening door button in the car for 2 seconds. If the elevator does not open the door, it will show "HELP" on all the external calling boards and buzzer will ring for 30 seconds.

(2) When X63 ~ X67 is defined as 0 in P4C4, it can be used as F21 ~ F25 internal call button in order.

- Separate input interface: (TP381H-00V-4P)

PIN	Signal name	Numbering in P4C4	Signal level	Illustration
1	X68	C4.67：X68	24V/0V	Custom standby input
2	X69	C4.68：X69	24V/0V	Custom standby input
3	X70	C4.69：X70	24V/0V	Custom standby input
4	X71	C4.70：X71	24V/0V	Custom standby input

- Separate output interface: (TP381H-00V-4P)

PIN	Signal name	Numbering in P4C4	Signal level	Illustration
1	Y22	C4.96：Y22	24V/0V	Custom standby output, electronic switch output
2	Y23	C4.97：Y23	24V/0V	Custom standby output, electronic switch output
3	Y24	C4.98：Y24	24V/0V	Custom standby output, electronic switch output
4	Y25	C4.99：Y25	24V/0V	Custom standby output, electronic switch output

- **Floor expansion interface:** With 20 pins Ox horn socket and wiring, two command expansion boards can be extended sequentially, each containing 16-floor call button, which supports up to 48-floor call.

8.2.3 Setting up working mode

There are three ways to set the working mode of the command board: ①Chinese/English LCD keyboard mode,②Command board jumper cap mode and ③Check setting mode. Among them, ② and ③ both need to connect the standard digital display board in the car. After the working mode of the command board is determined, it is suggested to remove the jumper cap CN81.

Method ①: Connect the Chinese/English LCD keyboard with DB9 on the command board and call the corresponding menu to operate.

Method ②:First insert jumper cap CN81 and then power on. At this time, the standard digital display board shows the current working mode (ZM, FM, ZC, FC, Z2). Press the "Extend-time door opening" button to transform among the above five working modes within 3 seconds after power on. After setting up, remove the jumper cap or no longer press the "Extend-time door opening" button within 3 seconds.

Method ③: After the main control board performs the function of P3.H05=0, the command board enters the checking setting mode for 10 minutes. The current working mode (ZM, FM, ZC, FC, Z2) and the current floor are displayed in a cycle on the standard digital display board. Press the "Extend-time door opening" button to transform among the above five working modes, and then execute P3.H05= "non-zero" after setting.

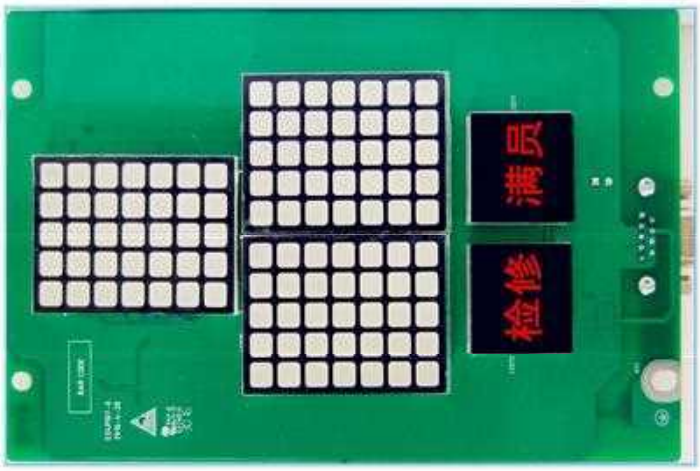
8.3 ACE-CD-A: Standard digital display board in car

8.3.1 Brief introduction

The standard digital display board in the car is connected with the car command board through DB9 connector. The communication wiring length can not exceed 300 cm and the standard wiring length is 50 cm. In addition to floors and direction arrows, there are overload and maintenance lights. The display content of the digital display board in the car is the same as that of the standard hall outside call board. Its size is as follows:

Name model	Length	Width	Thickness	Screw hole
ACE-CD-A: Digital display board in car	185mm, locating hole distance 176	115mm, locating hole distance 75mm	About 20mm	φ5×4

Electronic board frontal physical map:



8.4 ACE-HC-A: Standard external/hall call board

8.4.1 Brief introduction

The standard hall external call board contains an arrow and two-digit display, full/overload and maintenance indicator light (Note: Different versions of indicator lights will be different. If there is no maintenance indicator, the function of maintenance indicator will be replaced by "In work" in the floor lattice. If there is no full/overload indicator, the function of full/overload indicator will be replaced by "OverLoad" in the floor lattice. Full-load or overload is distinguished by buzzer in the car). Buzzer and four call button interfaces are also onboard (can simultaneously use the main upward call, the main dowanward call, the disabled upward call, the disabled downward call).

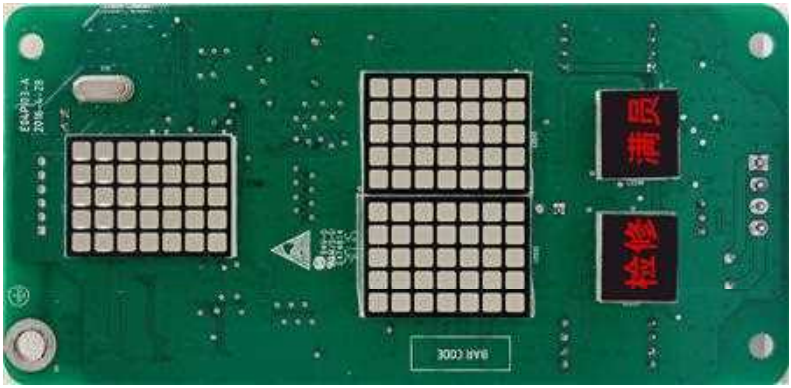
Arrows and floor numbers support scrolling display and can analog door openinng/closing action and elevator speed; buzzer will ring in the disabled call input, elevator specific faults, and call for help in car(controlled by specification parameter); arrow lattice displays "E" when elevator faults; floor lattice displays "HELP" when there is calling for help; and floor lattice displays “OFF”in elevator parking, fire fighting and earthquake state; in the process of maintenance, running power from battery, non-door area stopping, automatic open brake relief, self-rectifying correction, the corresponding Chinese/English prompts are scrolling displayed.

Custom fonts are also supported (see Chapter 6, "Creating special digital display with custom character")

Size specifications (including components) are shown in the following table:

Name model	Length	Width	Thickness	Screw hole
ACE-HC-A: Standard hall external call board	143mm, locating hole distance 135mm	70mm, locating hole distance 55mm	<15mm	φ5×4

Electronic board frontal physical map:



8.4.2 Interface illustration

- **Power supply and CAN communication interface:**

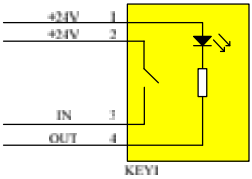
Power interface: maximum current 1A, power reverse protection, CAN interface, socket type: CH3.96-4 (White)			
PIN	Signal name	Signal level	Illustration
1	V+	24V	24V POWER
2	CANH	CAN	CAN
3	CANL	CAN	CAN
4	V-	0V	GND

- **Button interface: (compatible with call button in car command board)**

There are four button interfaces on the standard external calling board, which are: “J38 upward calling”, “J37 downward calling”, “J36(double function) disabled uopward calling/elevator parking input and hall outside up-arrival bell output”, “J35(double function) disabled downward calling/fire fighting input and hall outside down-arrival bell output”. The double function interfaces can be distinguished by setting whether the external calling board in disable call mode or not. The maximum output current of all buttons is 40mA, so we should pay attention to the current capability when making hall outside arrival bell output.

Note: Normally, the elevator parking switch with double-doors/through-doors should be switched on at the same time before it is in full operation; the elevator parking input is related to the definition of P4C1.51_Bit5, and the fire control input can only take effect when the fire control back to home landing function is not defined in the P4C4.

Power interface: maximum output current 40 mA, socket type: XHS2.5-4A			
PIN	Signal name	Signal level	Illustration
1	V+	24V	24V power
2	V+	24V	24V power
3	IN	24V	Button input
4	OUT	24V	Light output



8.4.3 Using illustration

1. Hall external call board uses CAN bus for communication. It can be used as an external call board or as a digital display board in car. Before using it as an external call board, the floor ID should be set to 1~48 according to the current floor. When using as an internal digital display board in car, the floor ID should be 0 (default is 0).

2. Add the compensation floors when setting the external call board ID: ID = physical floor by leveling plate + compensation floors (P4_C1.04).

3. Use as digital display board in car: CN31 jumper cap of "mode selection" should be inserted.

4. Use as an external call board: CN31 "mode selection" jumper cap should be removed, and floor ID should be set correctly (see the following instructions for setting method).

5. There are three methods to set the floor ID: ◎automatic setting "A", ◎manual setting "M", ◎check setting "C". The disabled call mode and the auxiliary door mode are also in operation in these three ID settings, and the factory defaults to the main door calling mode.

6. "Manual setting" floor ID method:

● Prerequisite: First insert jumper cap into CN31, then power on, that is, enter the "Manual setting" state.

● Method: The external calling board enters the state of "Manual setting" of floor ID. M is displayed in the direction lattice, and the current floor ID and working mode are flashed in the floor lattice. Press the upward or downward key within 3 seconds after power-on (no elevator call at this time), modify the current floor ID, and after the settings pull the jumper cap out of CN31 to complete this operation.

● Others: When CN31 jumper cap is inserted, the ID will be set to 0 and the setting mode will exit automatically if the call button is not pressed within 3 seconds after power-on, which can be used as the digital display board in the car. Note: The main and auxiliary doors and the main and disabled call can also be modified under this method.

7. "Automatic setting" floor ID method: (Note: double-doors/through-doors are not applicable)

● Prerequisite: Remove CN31 jumper cap, current floor ID is 0 (factory default). Note: If the ID is not 0, CN31 jumper cap can be inserted, and the ID is cleared automatically after 5 seconds of re-power on. If the ID is cleared, CN31 jumper cap should be pulled out immediately (or after power off, CN31 jumper cap can be pulled out and re-power on) then we can enter the "Automatic setting" state.

● Methods and steps: From the bottom to the top, insert the external call board one by one(automatic identification time of each floor takes 3 to 5 seconds). In the process of identification, the "up/down arrows" display on floor lattice and the arrow lattice display "A". After recognition, the ID and the current working mode are flashed in the lattice for about 5 seconds. At this time, if the ID of automatic identification is found to be incorrect, the upward and downward calling keys can modify it (Note: the main and auxiliary doors and the main and disabled calls can also be modified at this time). After

the button is stopped for 5 seconds (that is, the button pressing interval should not exceed 5 seconds), it will enter the normal working state.

● Description: When automatic recognition is carried out, it is processed according to the algorithm of filling the gaps one by one from bottom to top. It is suitable to install external calling board at two terminal stations firstly, and then install upward one by one from the second floor. It is also suitable for replacing an external calling board during maintenance. If the ID of automatic identification is incorrect and has not been corrected manually at the end of recognition, it can be corrected by manual setting or checking setting method. If there is a skipping floor, you can temporarily set the top floor to the skipping floor ID manually and then install it floor by floor.

8. "Check settings" floor ID method: (double-doors/through-doors are applicable)

● Prerequisite: Pull out CN31 jumper cap.

● Methods and steps: Execute P3.H06=0(go) or P3.H07=0(go) in the main control board. All external call boards into ID check state for 60 minutes, and flash their own ID and current working mode at the floor lattice, short pressing upward and downward call key can modify the ID, save it automatically after modification. Re-execute P3.H06 or P3.H07= "non-zero value" (go), and the external call board immediately enters the normal use state.

● Others: In order to facilitate the operation in this state, the elevator can be called to current ID floor by pressing the upward or downward buttons for 0.5 seconds (equivalent to the normal external call). Note: The main and auxiliary doors and the main and disabled call can also be modified under this method.

9. Setting method of disabled call and auxilliary door (Note: No auxilliary door is needed for through-doors):

By setting the disabled mode, the standard hall call board can have the call button interface for disabled person using. By setting the auxilliary door mode, the front door and the back door can be distinguished as independent double-doors. The disabled call mode and the auxilliary door mode do not conflict, that is, the auxilliary doors can be also set the disabled call button.

● Disabled call setting method: Standard external call board is set or cancelled by pressing J35 button under ID setting condition. If the current floor ID and the letter "CZ" are displayed circularly in the floor lattice, the disabled call function of external call board is enabled. Similarly, pressing J35 button, if the floor lattice does not display the letter "CZ", the disabled person call function is disabled.

● Auxiliary door setting method: Standard external calling board is set or cancelled by pressing J36 button under ID setting condition. If the current floor ID and the letter "FM" are displayed circularly in the floor lattice, the function of auxiliary door of external calling board is enabled. Similarly, pressing J36 button, if the floor lattice does not display the letter "FM", the auxilliary function is disabled.

● J35 and J36 buttons are used as the disabled upward call button and the disabled downward call button respectively if the disabled call function is enabled on the external call board. At this time, the functions of "elevator parking input and up arrival

bell ring" and "elevator fire control and down arrival bell ring" are automatically cancelled. It is suggested that a standard external call board should be added to the home landing floor which needs the functions of "elevator parking input and up arrival bell ring" and "elevator fire control and down arrival bell ring".

●If the external call board enables the auxilliary door function, the J38 and J37 buttons are used as the auxilliary door upward call and downward call, and the J36 and J35 continue to be the "elevator parking input and up arrival bell ring" and "elevator fire control and down arrival bell ring" function (Unless the disabled person call function is set).

10．Notes: When leaving the factory, the floor ID is all defaulted to 0. When the CN31 jumper cap is inserted and powered on, the current floor ID will be displayed in the floor lattice. After seeing the ID clearly, pull out the power supply immediately or pull out the CN31 jumper cap if you don't need to modify it, because the current floor ID will be cleared after 4 seconds.

11．Terminal resistance configuration: The terminal resistance has been configured by default at the main control board when it leaves the factory. The external call boards need only configure the terminal resistance at the bottom of the physical floor (Shorten1-2 PIN of CN32 by jumper cap, the "terminal resistance" is enabled).

12．Use example 1--as the digital display board in the car: insert CN31 jumper cap and install the external calling board in the car.

13．Use example 2--as the external call board: If the board is not yet powered on and the CN31 jumper cap has been pulled out, install the external call board upward floor by floor by using the "Automatic setting" method, and then immediately see if the elevator is Ok in door-opening (or check each floor with the "check setting" method after all the external call board is installed). If the floor ID has been changed to non-zero, insert CN31 jumper cap first. After 4 seconds of power-on display, floor ID is automatically cleard to 0, then pulls out CN31 jumper cap, and then install external calling board upward floor by floor.

14．Use example 3--The ID of a certain floor is set incorrectly, which causes the external call to run the wrong floor. This floor can be set separately according to the "manual setting" floor ID method. Other correct floors can be ignored.

15．Use example 4--When the elevator is equipped with compensation floors or skipping floors, the ID "Automatic setting" method can not be used directly. It is suggested that the ID should be set by "check setting" method or "manual setting" method.

16．Use example 5--The external call board has been connected to each floor but the ID has not been set and the internal call is ready for normal use: use the “Check settings” method. After P3.H06=0(go) is executed on the main control board, the external call board on all floors display their IDs, and then check the ID of the external call board from the top floor down floor by floor. Use the upper and lower call buttons to modify the incorrect ID, after the current floor is checked, press the upward call or downward call button for 0.5 seconds to call the elevator and then enter the next floor to check. After all checks, return to the motor room and execute P3.H06= "non-zero

value" (go), or re-power on after power failure.

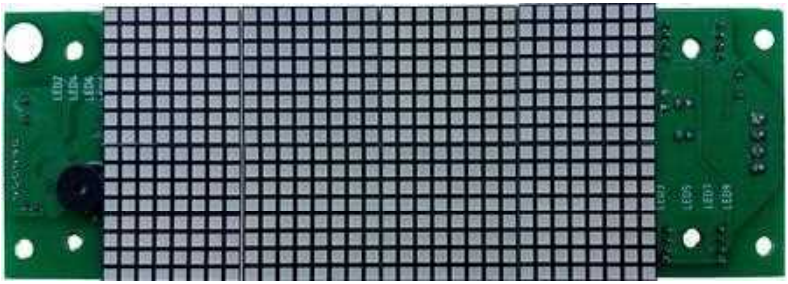
8.5 ACE-HC-B: Multi-lattice external call digital display board

The ACE-HC-B is a 16×32 dot matrix, multi-lattice board that can be set up for horizontal/vertical screens to meet more complex and higher-end display requirements. ACE-HC-B can be used both as an external call board and as a digital display board in the car. It can be displayed in both vertical and horizontal screens (horizontal/vertical screens are set by a jumper cap, see the jumper pin electronic silkscreen). ACE-HC-B can display two complete Chinese (or other 16×32 character) at the same time, including four call buttons, and a buzzer with its own. It uses the CAN bus interface to access internal and external calls bus. The interface, function and usage of ACE-HC-B and ACE-HC-A are the same. Please refer to the standard hall call board chapter.

Dimensional specifications (including components) are shown in the following table:

Name and model	length	width	thickness	Screw hole
ACE-HC-B: Multi-lattice external call digital display board	189mm, locating hole distance 179mm	65mm, locating hole distance 50mm	<15mm	φ5×4

ACE-HC-B Electronic board frontal physical map:



8.6 ACE-HC-C: Ultra-thin hall call board

The standard hall call board has a corresponding ultra-thin version of ACE-HC-C.

Dimensional specifications (including components) are shown in the following table:

Name and model	length	width	thickness	Screw hole
ACE-HC-C	144mm	70mm	8.5mm	Φ4×4

The interface definition is as follows:

Terminal name	Function definition	Pin definition			
		PIN1	PIN2	PIN3	PIN4
JP1	Power supply, communication terminal	+24V_IN	CAN-H	CAN-L	COM_IN
JP2	Up call button	+24V	+24V	Up button input	Up button light output

JP3	Down call button	+24V	+24V	Down button input	Down button light output
JP4	parking input / fire input	parking input	+24V	+24V	Fire input
JP5	Up/down arrival bell or light output	up-arrival bell output	+24V	+24V	down-arrival bell output

Functions and usage between ACE-HC-C and ACE-HC-A are the same. The thickness is about 8.5mm. It does not have overload and maintenance indicator lights, because it can display special characters "In Work" and "Overload" on the floor lattice. All of the electrical interface direction is parallel to the board surface.

8.7 ACE-HC-CM: Ultra-thin mini display board

On the basis of ACE-HC-C, delete the direction indication dot matrix, the maintenance and overload indicator light, and the up/down arrival bell output port, and reduce the size of the whole board to obtain the ultra-thin mini type external call/display board ACE-HC-CM. The running direction of the elevator alternates with the current floor. There is no up/down arrival bell ring function. It can be used as the normal call or the disabled call (other than one) when used outside the hall. The other aspects are basically the same as the ultra-thin hall call board ACE-HC-C. ACE-HC-CM includes call-up button interface, call-down button interface, parking and fire control input interface, power and CAN communication interface, mode selection jump cap and terminal resistance jump cap, and power indicator and CAN communication indicator. See electronic silkscreen on the board, and all interface directions are parallel to the board surface. For details, please refer to the chapter of the standard hall call board. The terminals definition is as follows:

Terminal name	Function definition	Pin definition			
		PIN1	PIN2	PIN3	PIN4
JP1	parking input / fire input	parking input	+24V	+24V	Fire input
JP2	Up call button	+24V	+24V	Up button input	Up button light output
JP3	Down call button	+24V	+24V	Down button input	Down button light output
JP4	Power supply, communication terminal	+24V	CAN-H	CAN-L	COM

The dimensions of the ACE-HC-CM are shown in the table below:

Name and model	length	width	thickness	Screw hole
ACE-HC-CM	67mm, locating hole distance 57mm	74mm, locating hole distance 64mm	<9.5mm	φ5×4

ACE-HC-CM Electronic board frontal physical map:

8.8 ACE-BI-A: Hoistway bottom maintenance control board

ACE-HC-CM can be used as Hoistway bottom maintenance control board with the ACE-BI-A software written. Its terminals are defined as follows:

Terminal name	Function definition	Pin definition			
		PIN1	PIN2	PIN3	PIN4
JP1	maintenance input	Maintenance input	+24V	+24V	Backup
JP2	Up running button	+24V	+24V	Up button input	Up button light output
JP3	Down running button	+24V	+24V	Down button input	Down button light output
JP4	Power supply, communication terminal	+24V	CAN-H	CAN-L	COM

The functions of ACE-BI-A are as follows:

- JP1-PIN1 input low level (normally closed attribute), and the system enters hoistway bottom maintenance mode. Maintenance priority sequence: hoistway bottom maintenance > car roof maintenance > machine room maintenance > keyboard maintenance. After entering the hoistway bottom for maintenance, other maintenance switches and buttons do not work. After entering the hoistway bottom maintenance mode, the dot matrix digital displays "Inspect", while the digital display is closed at ordinary times.
- In hoistway bottom maintenance mode, JP2-PIN3 inputs high level, elevator goes up in maintenance speed, and dot matrix digital displays "Up Arrow". During this period, the small buzzer on the board will sound.
- In hoistway bottom maintenance mode, JP3-PIN3 inputs high level, elevator goes down in maintenance speed, and dot matrix digital displays "Down Arrow". During this period, the small buzzer on the board will sound.
- Maintenance go up and down interlocks. If the maintenance up and down buttons are input at the same time, the elevator will not respond.

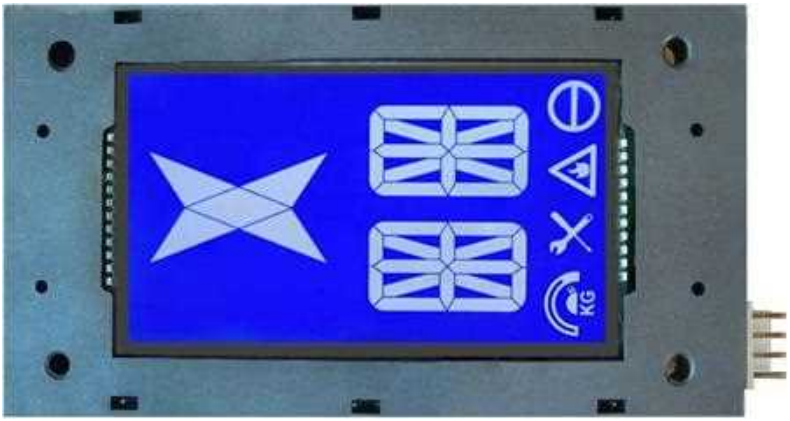
8.9 ACE-HC-DX: Monochromatic LCD external call display board

The monochrome LCD external call display board has 4.3 inches and 6.4 inches. Among them, the 4.3-inch product has blue screen white characters and black screen yellow characters. The 6.4-inch products only contain blue-white screens. The product comes with a buzzer and four call button interfaces. The screen contains the running direction and two-digit display. The bottom line has four indications: "overload", "maintenance", "fire control" and "fault stop" (see the figure below). The buzzer will sound when the board is in the disabled person using mode, the elevator has a specific fault, and the car is calling for help. When the elevator has malfunction, the arrow dot shows "X" and the "fault stop" indicator on the bottom line is lit. When the elevator stops in the non-door area the symbol of "XX" is displayed. "H"-"E"-"L"-"P" is sequentially displayed on the floor matrix when the car is calling for help. "P"-"O"-"F"-"F" is sequentially displayed on the floor matrix when the elevator is in battery supply running mode. "S"-"A"-"F"-"E" is sequentially displayed on the floor matrix when the elevator is in automatical rectifying and correction mode.

Dimensional specifications (including components) are shown in the following table:

Name model	length	width	thick	Screw holes
ACE-HC-D4: 4.3 inches monochromatic LCD external call display board	143mm,Positioning pitch：118mm	79mm, Positioning pitch：60mm	About 15mm	φ5×4
ACE-HC-D6: 6.4 inches monochromatic LCD external call display board	180mm,Positioning pitch：160mm	131mm, Positioning pitch：105mm	About 15mm	φ5×4

4.3 inches LCD outside call board front physical map:



The interface of the monochrome LCD external call display board is compatible with the standard hall call board, and the usage is basically the same. Please refer to the standard hall call board chapter. Different from the standard hall call board, the monochrome LCD external call display board has an energy-saving mode, which can

automatically reduce the backlight brightness during the standby period of the elevator (can also extend the life of the liquid crystal). Waiting time before entering energy-saving mode when the display is static can be set, as follows:

- Prerequisites: ① Plug in the "mode selection" jumper cap and then power on the ACE-HC-D. ② When the power is on, the floor ID of the ACE-HC-Dx is 48.
- When the above preconditions are met, the ACE-HC-Dx enters the complete manual setting state (first set the energy saving time, second set the floor ID).
- Set the energy saving time: the floor high position flashes "＋" and "×", the floor low position flashes to display the current time code: 0 (do not enter energy saving mode), 1 (enter after 1 minute, default), 2 (enter after 2 minutes) , ...,8 (enter after 8 minutes), 9 (enter after 9 minutes), A (enter after 10 minutes), B (enter after 11 minutes), ..., F (enter after 15 minutes).
- Press the up and down buttons to modify the number displayed on the floor low position (0~F). After selecting, release the button and wait for 5 seconds to enter the next step.
- Set the floor ID: The four status indicators at the bottom line of the screen are sequentially cycled to indicate that it is currently in the ID setting state.
- Press the Up/Down call buttons to set the floor ID, press the disabled person Up/Down call buttons to set the main door/auxiliary door mode and the normal call/disabled call mode (the same as the standard hall call board).
- Pull the jumper cap out of "Mode Selection" to complete this operation, and the ACE-HC-Dx enters the normal working mode.

Notes:

1．When entering the manual setting state, if the current floor ID is not 48, the energy saving time setting state will not be entered. Therefore, the floor ID should be set to 48 and then power on again. Let ACE-HC-Dx enter the manual setting mode to enter the energy saving time setting first. Generally, after setting the energy saving time, the floor ID can be changed to the correct number.

2．When using ACE-HC-Dx as an external call board, it is recommended to enable the specification parameter P4C1.51_BIT6 "synchronize the hall call board display with the lighting in the car" to achieve maximum energy saving and long life of the LCD.

8.10 ACE-HC-EX: True color LCD external call display board (Non-advertising machine)

8.10.1 Breif introduction

ACE-HC-EX adopts industrial-grade true color LCD screen with backlight life of more than 30,000 hours, its brightness can reach more than 500nit. Its own TF card interface is used for background image and background music replacement (do not insert TF card in normal use). Up/Down arrival bell ring and voice reporting floor functions are as standard (directly connected to 8Ω1W speaker). In the event of an elevator failure, the ACE-HC-EX can display prompt text and play comfort voice. The

interface and usage of the ACE-HC-EX is the same as that of the standard hall call board. It has a buzzer and four call button interfaces, including "mode selection" and "CAN terminal" jumper cap. The display background image of ACE-HC-EX and the color of various display controls can be selected by the user. The background image has been preset at the factory. The user can choose to use a fixed background or different background to automatically replace it by time. If you need to use your own picture or advertising voice as the background, you can use the TF card to download the file according to the specified name and file format or contact us.

- Dimensions (including components) are shown in the following table:

Name model	length	width	thick	Screw holes
ACE-HC-E4(Vertical screen only): 4.3 inches True color LCD external call display board				
ACE-HC-E5-L/V(Horizontal and vertical screen): 5.0 inches True color LCD external call display board				
ACE-HC-E6-L/V(Horizontal and vertical screen): 6.4 inches True color LCD external call display board				

- ACE-HC-EX screen display effect physical map:

8.10.2 Setting method

ACE-HC-EX provides a higher-end visual effect, and its setting method is also very simple. The entire setup process has Chinese/English operation prompts. The complete property settings of ACE-HC-EX include the following:

1. Waiting time of automatically reduce the backlight brightness.

2. Select the background image, select the top text color, select the arrow color, select the floor number color, select four labels (maintenance, opening/closing door, etc.) color, bottom text background color, bottom text color,
3. Whether to use the un/down arrival bell ring function.
4. Whether to use the voice reporting floor function, (if this step selects "0", step 5, 6 will not appear)
5. The number of underground floors in the parallel and group control mode, the volume of the voice reporting floor, whether to broadcast the opening/closing door, whether to broadcast the running direction.
6. Whether to play background music (supporting music up to 200 seconds), background music volume.
7. Floor ID. (The last step can change the floor ID to the actual required ID)

The conditions of entering the full property setting:

1. Power on after plugging in the mode jumper cap (enter manual setting mode).
2. The floor ID saved internally at power-on is 48 (you can change the floor ID to 48 and then repower the board to meet this requirement).

Enter the setting state (including manual setting mode, automatic ID recognition mode, check setting ID mode) without satisfying the complete attribute setting conditions can only modify the floor ID, main door/auxilliary door, normal call/disabled person call, thus this is consistent with the standard hall call board.

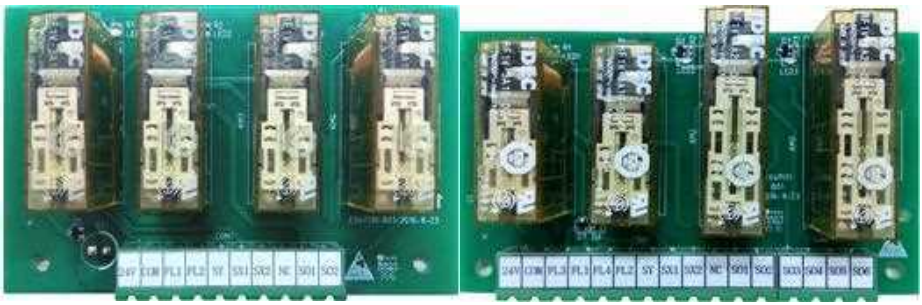
8.11 ACE-UCMPB-A/C: Unintended car movement protection system board

8.11.1 Brief introduction

The UCMP board is mainly used to prevent the car from accidentally leaving the door area when the door is opening, and to provide the door-lock short circuit detection function. UCMP functions include "Detection Subsystem" + "Self Monitoring Subsystem" + "Brake Subsystem". The UCMP configuration scheme of the ACE1000 is shown in the following table:

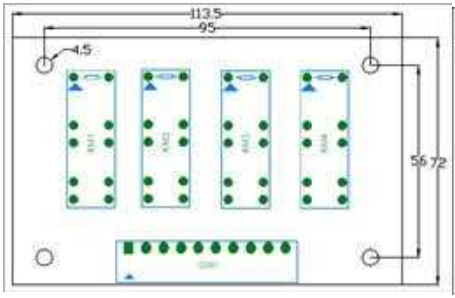
<table>
<tr><th colspan="2">Synchronous motor</th><th>Asynchronous motor</th></tr>
<tr><td colspan="2">The brake can be used as a UCMP brake component, no additional brake required.</td><td>Brake cannot be used as a UCMP brake component, need additional brake.</td></tr>
<tr><td>No opening door in advance of car stop,
no inching and re-leveling with the opening door</td><td>Opening door in advance of car stop as standard,
Inching and re-leveling with the opening door function as optional.</td><td>Opening door in advance of car stop as standard,
Inching and re-leveling with the opening door function as standard.</td></tr>
<tr><td>Self-monitoring subsystem</td><td>Detection subsystem + self-monitoring subsystem</td><td>Detection subsystem + brake subsystem</td></tr>
<tr><td>Self-monitoring subsystem:
The traction machine needs to come with own brake feedback signal, no need to add peripheral products, completely realized by the controller software, and the brake torque detection supports manual detection and automatic detection.</td><td>Detection subsystem: ACE-UCMPB-A + two door-area sensors + two re-leveling sensors (optional).
Self-monitoring subsystem: The traction machine needs to come with own brake feedback signal, no need to add peripheral products, completely realized by the controller software, and the brake torque detection supports manual detection and automatic detection.
Note: After adding two door-area sensors, only the opening door in advance of car stop function is added, and after adding two re-leveling sensors, there is a inching and re-leveling with the opening door function.</td><td>Detection subsystem: ACE-UCMPB-C + two door-area sensors + two re-leveling sensors + auxiliary door-lock signal.
Brake subsystem: refers to additional brakes, such as steel rope clamps, rail clamps, etc.</td></tr>
</table>

- Electronic board physical map:

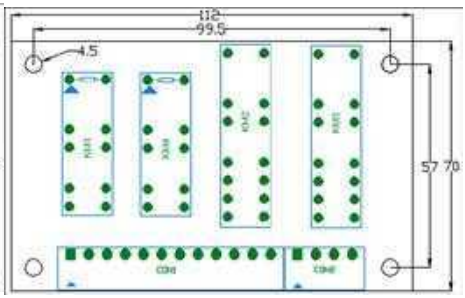


ACE-UCMPB-A **ACE-UCMPB-C**

- Electronic board size chart:



ACE-UCMPB-A



ACE-UCMPB-C

8.11.2 Interface and wiring

- UCMPB-A board interface

Terminal name		Port description
1	24V	24V power supply positive terminal
2	COM	24V power supply common
3	FL1	Upper door area signal (from sensor)
4	FL2	Lower door area signal (from sensor)
5	SY	Virtual Door-closing input (from main control board output)
6	SX1	Door area signal output (to the main control board)
7	SX2	Virtual Door-closing feedback output (to the main control board)
8	NC	Not connected
9	SO1	Door-lock circuit short connection output
10	SO2	

- UCMPB-C board interface

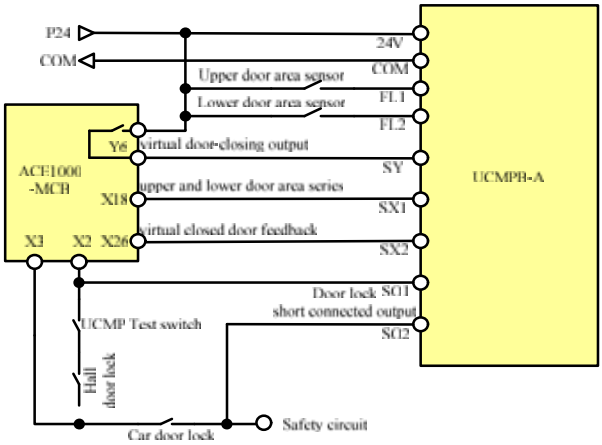
Terminal name		Port description
1	24V	24V power supply positive terminal
2	COM	24V power supply common
3	FL3	Upper re-leveling signal (from sensor)
4	FL1	Upper door area signal (from sensor)
5	FL4	Lower re-leveling signal (from sensor)
6	FL2	Lower door area signal (from sensor)
7	SY	Virtual Door-closing input (from main control board output)
8	SX1	Door area signal output (to the main control board)
9	SX2	Virtual Door-closing feedback output (to the main control board)
10	NC	Not connected
11	SO1	Door-lock circuit short connection output
12	SO2	
1	SO3	Auxiliary door-lock switch input
2	SO4	
3	SO5	Additional brake control output
4	SO6	

- Sensors selection scheme

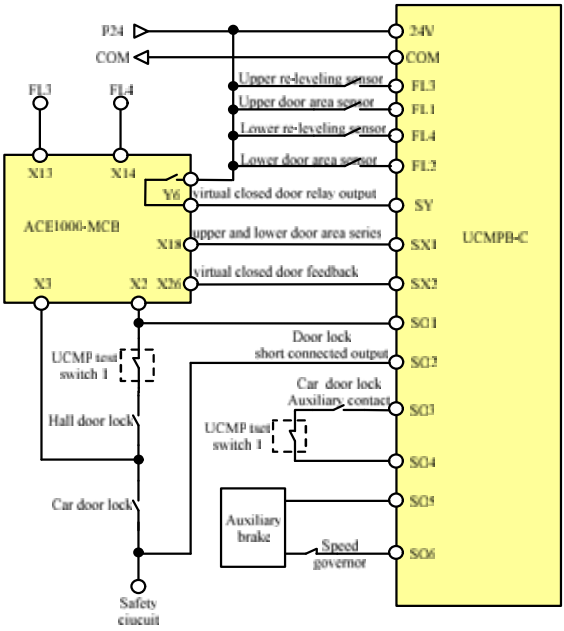
Option	Detection unit	Upper re-leveling switch	Upper door area switch	Floor-leveling switch	Lower door area switch	Lower re-leveling switch
Option 1	No need	No need	No need	Unlimited	No need	No need

Option 2	ACE-UCMPB-A	Unlimited	Normally open	Unlimited	Normally open	Unlimited
Option 3	ACE-UCMPB-C	Normally open	Normally open	Unlimited	Normally open	Normally open

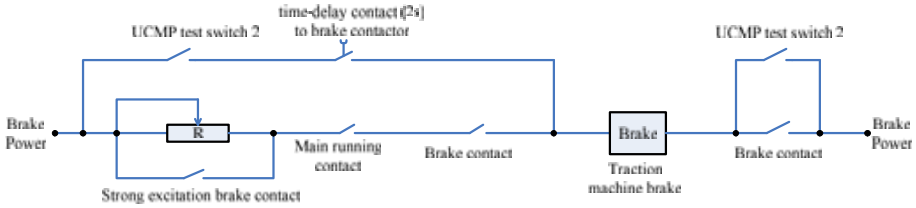
- Wiring diagram



Synchronous m otor UCMP wiring



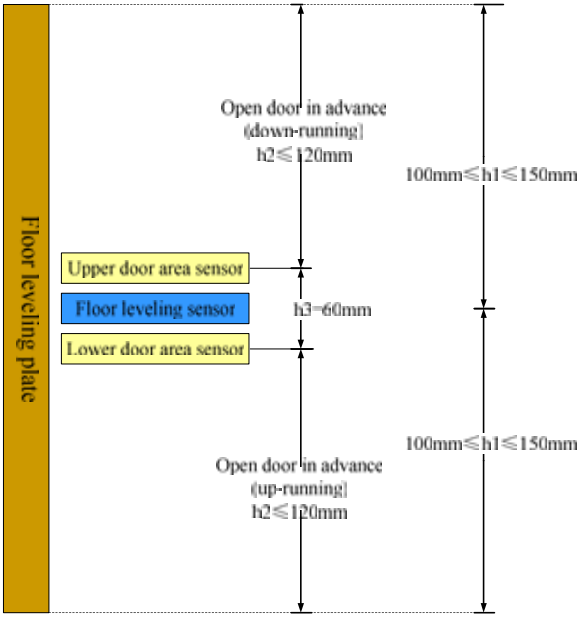
Asynchronous motor UCMP wiring (additional brakes)



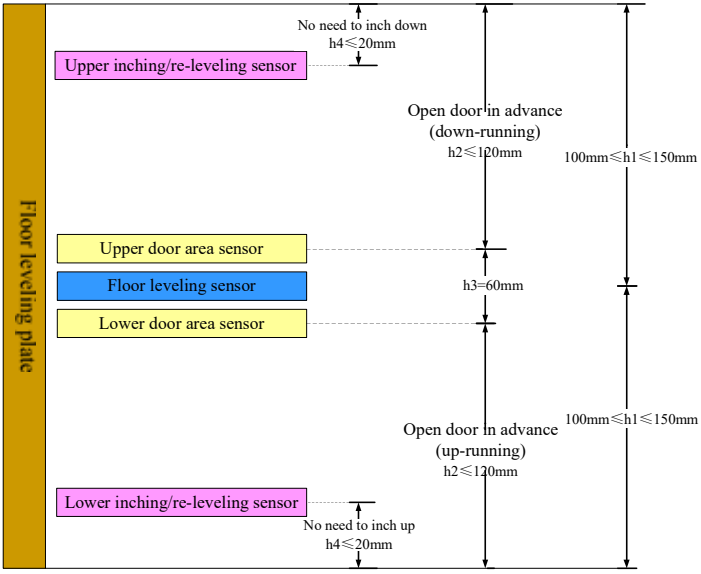
Asynchronous motor brake control wiring

8.11.3 UCMP switch and leveling sensor installation

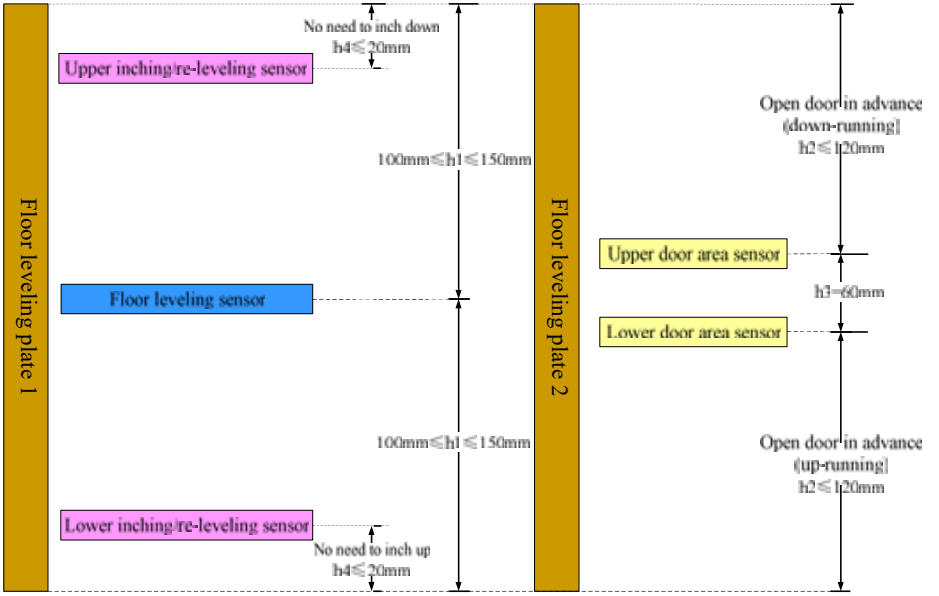
- Only opening door in advance of car stop function



- With opening door in advance of car stop and inching and re-leveling with the opening door functions



- When the sensor size is relatively large: use two identical leveling plates to install in parallel



Remarks: The length of h2 is also the maximum travel allowed when the car is in inching and re-leveling.

- Switch function and installation instructions

Switch name	Function Description	Installation Notes
Floor leveling switch (Variable_No.: In_04)	The area where the leveling sensor enters the leveling plate is called the "leveling area". The position of leveling plate determines the height of each floor. The leveling signal is the basis for the elevator to run the leveling.	The length in vertical direction of the leveling plate is required to be less than that of the hall door coupling-plate. When the car door is opened/closed after the car is leveled, the hall door can be opened/closed also.
Upper door area switch (Variable_No.: In_18)	The area where the upper and lower door area switches enter the leveling plate at the same time is called the "door area", which is the basis for the elevator car to open the door. After leaving the "door area", the car is forbidden to open the door. If the door is opened to leave the "door area", control sysytem report to EA5. 22 fault.	If the distance between the two switches is too small, the door opening area will be too close to the leveling edge. If the distance is too large, the door openable area will become too small. Generally, the door area is slightly smaller than the leveling area.
Lower door area switch (Variable_No.: In_19)		
Upper re-leveling switch (Variable_No.: In_13)	Whether the elevator is inching and re-leveling. The simultaneous "ON" of the two switches in the leveling plate indicates that the current leveling is good and there is no need to re-level; only one leveling switch is in the leveling plate and the "door area" is effective, car needs to be re-leveled again.	When the car is completely leveled, the two switches are at the two ends of the leveling plate. The distance between the switch and the end of the leveling plate determines the allowable amount of floating up and down of the car.
Lower re-leveling switch (Variable_No.: In_14)		

Note: When the upper and lower door area switches are connected in series, the corresponding In_79 input variable is used. Please check if the switch wiring is correct according to the input variable number given here.

8.11.4 System parameter description

function code	Settings	Description
P3.19	0: no action 1: Enter the UCMP test status	Exit automatically after 180 seconds
P4-C4.03	0004/1004	X4= leveling sensor normally open / normally closed input
P4.C4.12	0013	X13= upper re-leveling sensor normally open input
P4.C4.13	0014	X14= lower re-leveling sensor normally open input
P4.C4.17	0079	X18 =upper and lower door area series normally open input
P4.C4.25	0028	X26= virtual closed door feedback normally open input
P4.C4.80	0007	Y6= virtual closed door relay output
P4.C1.09	0/1	Whether to use the opening door in advance of car stop function
P4.C1.10	0/1	Whether to use inching and re-leveling with the opening door function

8.11.5 UCMP Test Method

ACE-UCMPB-A	ACE-UCMPB-C
➢ **Test procedure:** ● The elevator stops at the door area, keeps the door closed, and the maintenance switch input is valid. ● Set the P3.H19=1 to enable the UCMP test function. The buzzer sounds during the test. ● Unplug the UCMP-TEST plug and disconnect the input signal of the elevator hall and car door lock. ● Manually press and hold the maintenance up or down button on the cabinet, the virtual closed-door relay output. The relay between the SO1 and SO2 picks-up, and the door-lock signal are shorted. At this time, the elevator normally starts the maintenance running. ● After the car runs off the door area, the UCMP board outputs the protection, disconnects the SO1-SO2 contact circuit, causing the brake contactor and the main running contactor to disconnect and immediately stop the elevator. At this time, the elevator reports EA5.22 (UCMP failure), and the elevator stops running before the fault is manually cleared.	➢ **Test procedure:** ● The elevator stops at the door area, keeps the door closed, and the maintenance switch input is valid. ● Set P3.H19=1 to enable the UCMP test function. The buzzer sounds during the test. ● Two UCMP-TEST1 plugs are unplugged, the elevator hall and car door-lock serial signal input and the auxiliary door-lock signal input to the UCMPB-C are disconnected; then the two plugs are inserted into the UCMP-TEST2 position as shown in "Wiring diagram". ● Manually press and hold the maintenance up or down button, and the elevator will start the maintenance running normally. ● When the elevator runs off the door area, the UCMP board outputs protection, and the additional brake circuit is disconnected, causing the additional brake (rope-clamp device, rail-clamp device) to stop the car. ● After the brake contactor is disconnected for 2S, the brake coil is de-energized and the brake is closed. ● Since UCMP-TEST1_1 and UCMP-TEST1_2 have been disconnected, the ACE1000 controller will detect the door opening when the car leaves the door area and immediately report to EA5.22 (UCMP fault).
➢ **Reset step:** ● Reset the UCMP-TEST plug switch. ● Set P3.H19=0 (or automatically return to zero after 3 minutes), turn off the UCMP test function, and the buzzer stops. ● The system is powered off and powered on again. At this time, the fault EA5.22 is not cleared. You need to press the fault clear button twice in the maintenance mode to clear it. ● The elevator automatically runs to the floor level to open the door and resume normal use.	➢ **Reset step:** ● Reset the two UCMP-TEST plug switches. ● Set the main control P3.H19=0 (or automatically return to zero after 3 minutes), turn off the UCMP test function, and the buzzer stops. ● The system is powered off and powered on again. At this time, the fault EA5.22 is not cleared. You need to press the fault clear button twice in the repair state to clear it. ● The elevator automatically returns to the floor level to open the door and resume normal use.
➢ **Note:**	

- P3.H19 cannot be set to 1 when it is not in the maintenance state or the door-lock signal is invalid.
- The clearing of EA5.22 fault needs to re-power, and perform twice fault clearing operations in maintenance mode.

8.11.6 Synchronous traction motor brake torque self-monitoring

The traction motor needs to bring its own brake feedback contact, no need to add peripheral products, completely realized by the controller software, the brake torque detection supports manual detection and automatic detection.

➢ **Related parameters**

function code	Function definition	Predetermined area	default	Remarks
P3H18	Synchronous traction motor brake torque test	oo->go:execute	oo	Perform manual testing
F10.06	Brake torque detection time	1～20	5	Unit: second
F10.07	Brake torque detection percentage	50～150	120	Unit: %
F10.08	Pulse that rotates when the traction motor brake torque is insufficient	1～10	1	Unit: number of pulses
F10.09	Angle of rotation when the traction motor brake torque is insufficient	1～5	1	Unit: degree(°)
F10.10	Brake torque test result	0～150	0	After the test result is passed, the same percentage as F10.07 is displayed, otherwise 0 is displayed.
C2.51	Brake torque automatic detection cycle	0～120	15	Unit: day, set to 0 means no automatic detection

➢ **Manual test method**

1．The elevator stops at the non-terminal floor, the car is level, and the door-lock is closed.

2．Turn on the maintenance switch on the control cabinet, and the hall call board displays "In Work".

3．Execute P3.H18=GO. Entering the test state, the buzzer sounds in the car.

4．The star-delta contactor and main running contactor output, and the brake contactor does not output.

5．The system outputs torque according to the related parameter (F10.07), first forward output test, and then reverse output test.

6．If the test fails, stop the test immediately and give the test result F10.10=0.

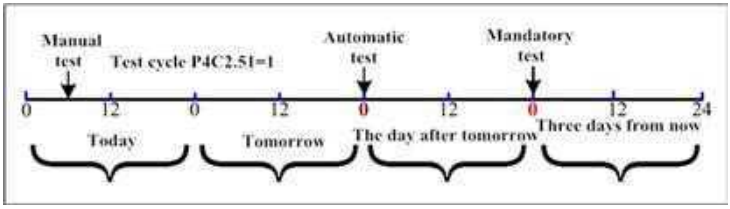
7．After the test is finished, the buzzer stops, F10.10 shows the test result. If the result of F10.10 is not between 80~120, it will immediately report to EA3.06 (the brake torque detection is unqualified), the elevator stops running.

8．After the EA3.06 fault occurs in the system, it can only be reset until the brake torque detection is passed.

➢ **Automatic test method**

Set P4C2.51 (automatic detection cycle of brake torque), and automatically detect the brake torque if the brake torque detection condition is satisfied after the time reaches the set period. If the test fails, report ER3.06 fault, stop the elevator running, this fault will not be reset unless the brake torque test is passed. The day when the automatic test result is not qualified for 3 times within one day, will no longer automatically test.

Detection cycle description: Take the test cycle P4C2.51=1 day as an example, as shown below:



Detection process description: After the automatic detection starts, it will automatically enter the keyboard maintenance state and beep in car, and the external call board will display "In Work" for about 30S, and then stop beeping in car after the test ends. If the test result is passed, the normal state is restored and the door is opened once. If it fails, the EA3.06 fault is reported and stops elevator.

Automatic detection conditions:

Normal detection (on the last day of C2.51 setting, report EG8.18): The elevator stops at the non-terminal floor and enters the energy-saving state (fan and lighting are off). If the elevator stops at the terminal floor, it will automatically return to non-terminal floor and wait for the elevator to enter the energy-saving state before starting the detection.

Mandatory detection (exceeding the time set by C2.51 or EA3.06 fault): When the elevator stops at any floor leveling with door closing, it immediately starts the detection.

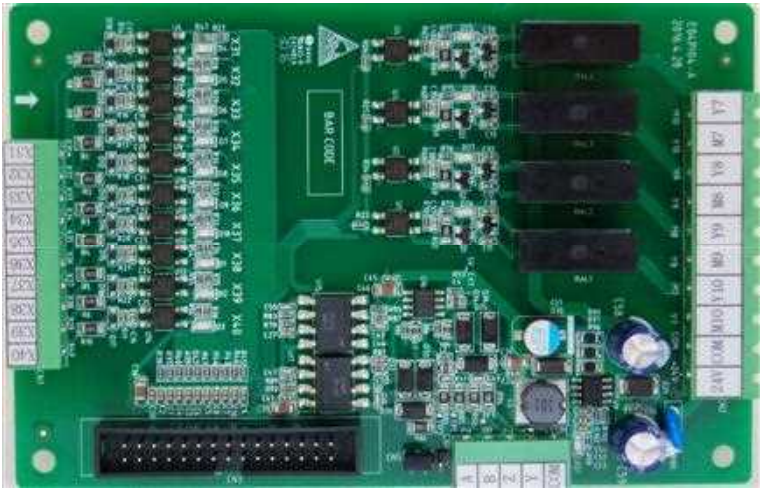
8.12 ACE-IO-A: IO expansion board

When the 30 inputs and 6 outputs provided on the main control board are not enough, the IO expansion board can be extended by 10 input ports, 4 output relays, and 1 RS422 interface. The input and output on the expansion board can be customized. The IO expansion board and the main control board are connected by 30PIN cable (the parallel port technology is used to expand IO, and the real-time performance is consistent with that on the main control board).

The electronic board size specifications (including components) are shown in the following table:

Name and model	length	width	thick	Screw holes
ACE-IO-A: IO expansion board	130mm, Positioning pitch 120mm	85mm, Positioning pitch 75mm	<18mm	φ4×4

1) Front view of the electronic board:



ACE-IO-A

8.13 ACE-KB-A: Easy portable keyboard

The easy portable keyboard can be regarded as a copy of the onboard keyboard. Their buttons and digital display are exactly the same. The easy portable keyboard communicates with the main control board using the standard RJ45 network cable. The cable line length can be up to 3 meters, which is convenient for on-site use. For details, please refer to "Elevator adjustment and commissioning" related chapters. The keyboard size is: 100 × 50 × 15mm, as shown below:

8.14 ACE-KB-B: Chinese/English LCD keyboard

8.14.1 Breif introduction

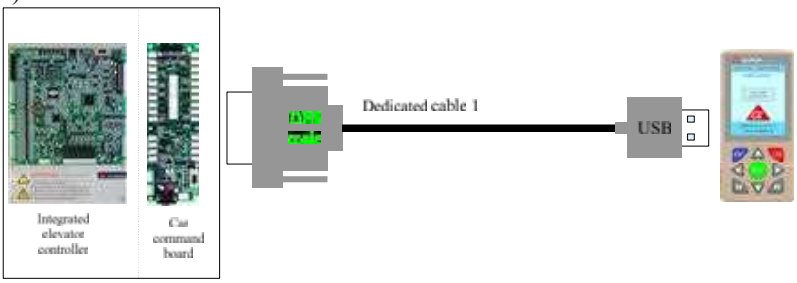
The LCD keyboard ACE-KB-B is an elevator debugging tool for the full Chinese/English interface. It is an optional accessory for the ACE1000 system. It can completely replace the onboard keyboard and easy portable keyboard, and provides more functions than the easy portable keyboard. The ACE1000 system supports simultaneous access LCD keyboard and easy portable keyboard. The LCD keyboard can provide more information and more convenient operation functions for the user. ACE-KB-B uses the tree menu structure to call all functions. The menu structure is basically the same as the onboard keyboard/ easy portable keyboard. Most of the operations have Chinese/English prompts and button reminders. It is more intuitive and simple to use (basically it can be obtained to right now get started). Users can use ACE-KB-B to perform parameter setting, status monitoring, view real-time curve, fault query, statistical query, debug elevator, control elevator running, parameters generation/uploading/downloading /backup /comparison and so on. In addition to being connected to the elevator main control board, the ACE-KB-B can also be used in the car to connect with the car command board (such as adjusting elevator comfort, etc.).

The ACE-KB-B exchanges data with the main control board, command board or PC through the RS232 interface, and automatically completes the communication handshake with the docking device. If the communication handshake is unsuccessful, all subsequent communication functions cannot be used (the PC software needs to initiate a handshake when the PC is connected), so be sure to confirm the handshake successfully when using ACE-KB-B.

The shape and buttons of the ACE-KB-B are shown below:

8.14.2 Hardware connection

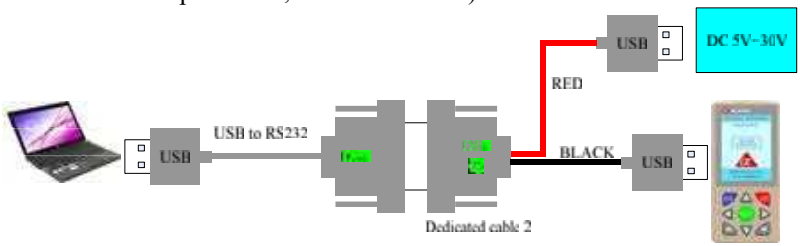
1) Connect to the main control board/car command board: A "dedicated cable 1" (as shown below) is required, the USB port is connected to ACE-KB-B, and the DB9 terminal (male) is connected to the main control board/car command board DB9 plug (female).



Notes when used in the car:

- The data update speed and keyboard response speed will decrease;
- Some functions in P3 are not available in the car;
- The parameter modification function of P4/P5 must be accessed in the elevator stop and maintenance state;
- Part of the P4/P5 parameters need to repower the main control board before it can be valid (for the sake of safety, it is not recommended to modify such parameters in the car);
- You cannot use the DB9 serial port on the main control board when LCD keyboard is used in the car.

2) Connect with PC (upload and download elevator parameters with PC online): Need another "dedicated cable 2" (as shown below), USB red or white cable is connected to DC5V~30V power supply (can be directly from computer USB port or mobile phone charger), USB black wire is connected to ACE-KB-B, DB9 (female) is connected with PC RS232 interface (If the PC does not have DB9 serial interface, you need to add a universal USB-232 adapter cable, as shown below) .



8.14.3 Button Description

: Menu exit/return button is key "ESC". When the current menu is in a non-top menu, pressing this button will return to the parent menu; or exit from the current function, edit state and return to the corresponding menu.

 : The menu enters/determines button is key "ENTER". When the ENT key is pressed, the user interface will enter the submenu or call the corresponding function if it is already the last level menu. In addition, the ENT key is also used for some data input confirmation functions.

 : The menu selection moves up one line/current data bit by adding 1 is key "UP". When pressed for more than 0.5 seconds, the system continues to select the previous line menu at a speed of about 0.1 second/line.

 : The menu selection moves down one line/current data bit by decrementing 1 is key "DOWN". When pressed for more than 0.5 seconds, the system continues to select the previous line menu at a speed of about 0.1 second/line.

 : The current edit bit of the data is shifted left by 1 bit/page to the left is key "LEFT". When reading a modifiable data, press this button for the first time to enter the data modification editing state.

 : The current edit bit of the data is shifted right by 1 bit/page to the right is key "RIGHT". When reading a modifiable data, press this button for the first time to enter the data modification editing state.

 : The menu selects a big step up/adjacent menu function to jump directly/page to the left is key "PAGE UP/LEFT". Pressing this key once is equivalent to pressing the "UP" key 10 times, and it is used usually when there are many current menu items. Some menu functions can directly jump to the previous line menu function by pressing the key, no need to return to the menu interface.

 : The menu selects a big step down/adjacent menu function to jump directly/page to the right is key "PAGE DOWN/RIGHT". Pressing this key once is equivalent to pressing the "DOWN" key 10 times, and it is used usually when there are many current menu items. Some menu functions can directly jump to the next line menu function by pressing the key, no need to return to the menu interface.

 : Special function button is key "START/STOP". 1. When entering the menu function of P5 in the keyboard control mode (F0.01=0), press this button to control the motor start, stop and inverter fault reset, provided that X1~X40 on the main control board is pulled out; 2. When in P0 menu function in the distance control mode (F0.01=1), pressing this button is equivalent to the opening and closing door buttons in the car; 3. When the LOGO screen is displayed on the LCD keyboard, press this button to re-calibrate the screen display; 4. When the list item is displayed line by line, this button is used as the "on/off" or "selected/deselected" button of the currently function; 5. Press this button during the checking of P2 fault detail information will save the information to the keyboard EEPROM.

8.14.4 Screen Characteristics

The ACE-KB-B uses a 240×320 pixels industrial-grade true color screen with a backlight. The English and digital fonts are 12 x 24 pixels, and the Chinese font is 24 x 24 pixels. All functions of ACE-KB-B are accessed by using the tree menu. All menu functions are operated by the four basic key "ESC+ENT+UP+DOWN". Under the menu interface: up to 10 lines × 9 rows 24 x 24 pixels character menu names can be displayed on one screen, and the menu names exceeding 9 rows will be scrolled after being selected. Under the function interface: different menu functions have different display modes. Generally, the currently executed menu name and page number are displayed on the top line, and the bottom line displays the currently available button prompts.

8.14.5 Menu structure

The overall menu structure of ACE-KB-B is as follows:

<table>
<tr><th>Root directory</th><th>Level 1 menu</th><th>Level 2 menu</th><th colspan="2">Level 3 menu / description</th></tr>
<tr><td rowspan="25">ACE 1000</td><td rowspan="9">P0 Running information</td><td>Current floor</td><td colspan="2" rowspan="8">At the same time, it displays information such as elevator running state, brake state, door state, forced deceleration signal, position limit signal, fault signal, overload, and so on. Press "PAGE UP/LEFT" or "PAGE DOWN/RIGHT" key can jump directly between these functions.</td></tr>
<tr><td>Elevator status code (ACD)</td></tr>
<tr><td>Current speed</td></tr>
<tr><td>Output voltage</td></tr>
<tr><td>Output current</td></tr>
<tr><td>Output frequency</td></tr>
<tr><td>DC bus voltage</td></tr>
<tr><td>Current load</td></tr>
<tr><td>Current fault summary</td><td colspan="2">View all current fault codes</td></tr>
<tr><td>Reset current fault</td><td colspan="2">Clear the current fault that can be cleared</td></tr>
<tr><td rowspan="16">P1 Status checking</td><td rowspan="3">I/O Variable status</td><td>Input variable status (12 × 8)</td><td rowspan="16">Use "LEFT" or "RIGHT" key to turn pages</td></tr>
<tr><td>Output variable status (5 × 8)</td></tr>
<tr><td>110V Input variable status(6)</td></tr>
<tr><td rowspan="2">X/Y Terminal valid status</td><td>Input terminal status (10 × 8)</td></tr>
<tr><td>Output terminal status (4 × 8)</td></tr>
<tr><td rowspan="6">X/Y Terminal electrical level state</td><td>X01 terminal level</td></tr>
<tr><td>…</td></tr>
<tr><td>X40 terminal level</td></tr>
<tr><td>Y01 terminal level</td></tr>
<tr><td>…</td></tr>
<tr><td>Y08 terminal level</td></tr>
<tr><td rowspan="3">Call state</td><td>Floor 01 call status</td></tr>
<tr><td>…</td></tr>
<tr><td>Floor 48 call status</td></tr>
<tr><td rowspan="3">CAN communication status</td><td rowspan="3">CAN communication quality</td><td>CAN0 receives data every second</td></tr>
<tr><td>CAN1 receives data every second</td></tr>
<tr><td>CAN2 receives data every second</td></tr>
</table>

Root directory	Level 1 menu	Level 2 menu	Level 3 menu / description	
ACE 1000			Hall call board communication status	Floor 01 status
				…
				Floor 48 status
			Parallel and group control communication status	Elevator 01 status
				…
				Elevator 08 status
		Button-conglutination position	Floor 01 button conglutinated	Use "LEFT" or "RIGHT" key to turn pages
			…	
			Floor 48 button conglutinated	
		Missing position of the hall call board	Floor 01 call board missing	
			…	
			Floor 48 call board missing	
		Signals satisfaction checking	Motor parameter self-learning	Check if the elevator signals or conditions are met to run in various modes.
			Maintenance operation	
			Floor height self-learning	
			Normal running	
			Inching to re-leveling	
			Brake torque test	
			Self-rectifying running	
			Door signal checking	
		Other communication, read and write quality	MCU-DSP packets per second	
			EEPROM read and write errors	No preservation power down
			FLASH read and write errors	No preservation power down
	P2 fault recording information	last time	Use "LEFT" or "RIGHT" key to turn pages, "UP" or "DOWN" key to move the current line, "ENTER" key to view more detailed information, "PAGE UP/LEFT" or "PAGE DOWN/RIGHT" key to go directly to the adjacent fault information, and "START/STOP" key to store the fault information to the keyboard local.	
		last second time		
		last third time		
		…		
		last 98th time		
		last 99th time		
	P3 Elevator Debugging	H00: Clears all debug settings	Refer to section 5.3.5 P3 Function Description	
		H01: Enter elevator maintenance mode from keyboard instruction		
		…		

<table>
<tr><th>Root directory</th><th>Level 1 menu</th><th>Level 2 menu</th><th colspan="3">Level 3 menu / description</th></tr>
<tr><td rowspan="20">ACE 1000</td><td rowspan="12"></td><td rowspan="12">H17: parameters upload and download
Note: H17 is different from that of the easy portable keyboard</td><td>No.01 parameters</td><td rowspan="12"></td><td>Upload all parameters</td></tr>
<tr><td>No.02 parameters</td><td>Download all parameters</td></tr>
<tr><td>No.03 parameters</td><td>Upload by group</td></tr>
<tr><td>…</td><td>Download by group</td></tr>
<tr><td>…</td><td>Edit by group</td></tr>
<tr><td>…</td><td>Parameter comparison between MCB and this No.</td></tr>
<tr><td>…</td><td>Parameter comparison: between No.x and No.y</td></tr>
<tr><td>No.15 parameters</td><td>Upload factory default parameters → No.x</td></tr>
<tr><td>No.16 parameters</td><td>Upload off-chip backup parameters → No.x</td></tr>
<tr><td colspan="2">Clear No.x parameters</td><td>When x is 01~16, the corre sponding keyboard storage parameters are cleared. When set to 00, No.01~16 parameters are all cleared.</td></tr>
<tr><td>H18: brake torque detection</td><td colspan="3" rowspan="6">Refer to section 5.3.5 P3 Function Description. H21 first reads the two sets of elevator parameters to be compared to the LCD keyboard memory, and then displays them together for viewing. The difference points are indicated in red font, and the current parameters of the elevator can be modified in this view interface.</td></tr>
<tr><td>H19: UCMP function test</td></tr>
<tr><td>H20: Continual opening and closing door</td></tr>
<tr><td>H21: Elevator parameter comparison</td></tr>
<tr><td>H22: uses back-up DC power supply for manual electric brake loosening</td></tr>
<tr><td>H23: Clear fault records</td></tr>
<tr><td rowspan="6">P4 Specification parameter</td><td>C0: basic parameter</td><td colspan="3" rowspan="6">Refer to section 5.3.6 P4 Function Description</td></tr>
<tr><td>C1: extension parameter</td></tr>
<tr><td>C2: time parameter</td></tr>
<tr><td>C3: digital display parameter</td></tr>
<tr><td>C4: custom I/O parameter</td></tr>
<tr><td>C5: other parameter</td></tr>
<tr><td rowspan="3">P5 Frequency conversion parameter</td><td>F0: basic parameters</td><td colspan="3" rowspan="3">Refer to section 5.3.7 P5 Function Description</td></tr>
<tr><td>…</td></tr>
<tr><td>F10: extended function parameters</td></tr>
<tr><td>Statistics</td><td>Calling times each floor</td><td colspan="3">Count the call times of each floor</td></tr>
</table>

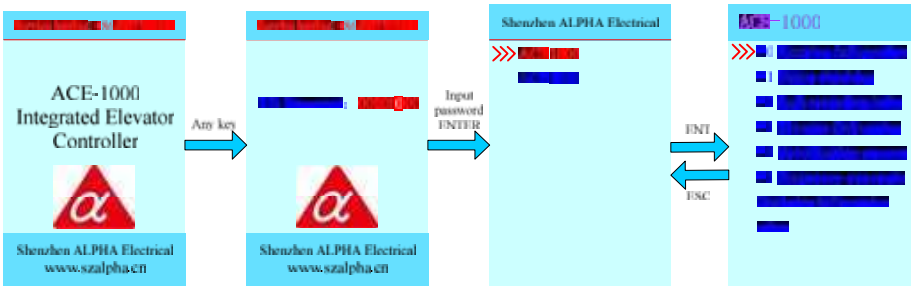
Root directory	Level 1 menu	Level 2 menu	Level 3 menu / description
ACE 1000	information	Failures times each floor	Count the total number of failures on each floor
		Safety-circuit fault floor	The elevator occurs a safety circuit fault when passing through these floors
		Door opening failure floor	Failed when open the door on these floors
		Door closing failure floor	Failed when close the door on these floors
		Fault statistic in grade	Total times of grade A failures in elevator
			…
			Total times of grade G failures in elevator
		Fault statistic in class	Total times of Class 1 failures in elevator
			…
			Total times of Class 8 failures in elevator
		Fault statistics by the day	Total times of elevator failures today
			…
			Total times of elevator failures 9 days before
		The most two faults	Fault codes that appear most frequently in elevator
			Fault codes that appear second most frequently in elevator
		The most two floors with the door-lock failure or safety-circuit failure	The floor with the most failures
			The floor with the second most failures
		The most two floors with door opening failure	The floor with the most failures
			The floor with the second most failures
		The most two floors with door closing failure	The floor with the most failures
			The floor with the second most failures
	other	Keyboard version	View the software version of the keyboard
		Keyboard time	View keyboard time and synchronize keyboard time to main control board
		Modify this keyboard password	Keyboard power-on password control
		Elevator parameter exch ange between PC and keyboard	No.01 parameters { PC → Keyboard (dedicated cable 2) Keyboard → PC (dedicated cable 2)
			…
			No.16 parameters
		Binary conversion	Binary conversion
			Decimal conversion
			Hexadecimal conversion
		I/O variable table	P4C4 parameter (IO definition) can refer to this table
		I/O variable timing diagram	Optional 8 IO variables to draw real-time timing diagrams, up to 24 seconds each screen
		Fault code table	Fault code and related instructions
		Basic font coding table	Basic font coding
		Elevator running real-time curve	Real-time speed curve
			Real-time output voltage curve
			Real-time output current curve (10A)
			Real-time output current curve (30A)

Root directory	Level 1 menu	Level 2 menu	Level 3 menu / description	
ACE 1000			Real-time output current curve (60A)	
			Real-time output current curve (120A)	
			Real-time output frequency curve	
			Real-time DC bus voltage curve	
		Car command board work mode setting	0: main door normal, 1: auxiliary door normal, 2: main door disability, 3: auxiliary door disability, 4: main door simplification	
		Elevator emergency stop fault state capture	Set up fault capture	
			Read fault capture information	
		Main control board MCU-ID		
		Floor parameter generator	According to the number of floors, no-service floor, the compensation floor, the bottom floor digital number, the tens/digit display, etc., the specification parameter required for modifying the floor or digital display is automatically generated and written into the main control board. Convenient for on-site use.	
		Standard digital display generator		
		Custom digital display generator		
		Door service floor generator	The main and auxiliary door service floors are intuitively generated and written to the main control board.	
		Establish a handshake with ACE1000	ACE-KB-B will actively complete the communication handshake when entering the main menu. After executing P3.15=1 or 3, please use this function to shake hands again.	
		Running limit	For details, please consult the Alpha company for sale.	
		Elevator fault record in formation storing in keyboard	Er01 information	View the 16 fault details saved to the keyboard EEPROM in the P2 function.
			…	
			Er16 information	
		Elevator installation and Debugging process	Signal check	When installing the elevator, please check and debug the elevator according to the process from top to bottom in this menu. Note: If the motor parameters have been factory tuned, skip this step.
			Communication check	
			Motor parameter tuning	
			Brake torque detection	
			Maintenance operation	
			Floor height self-learning	
			Express debugging	
			Floor leveling adjustment	
			Comfort adjustment	
			test normal run	
		LCD Keyboard instructions		

8.14.6 Operating instructions and examples

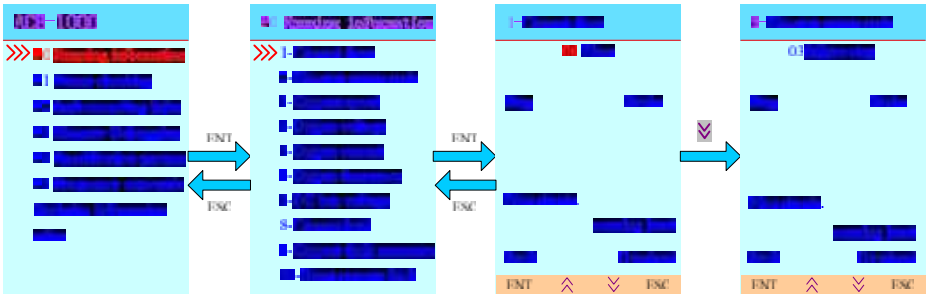
1. Power on display interface and password login

Example 1: When the ACE-KB-B is powered up normally, the first one is the LOGO interface. Press any key other than the special function key to enter the keyboard power-on password interface, as shown below: (If the keyboard password system is not set, it will prompt you to set the keyboard password as soon as possible)



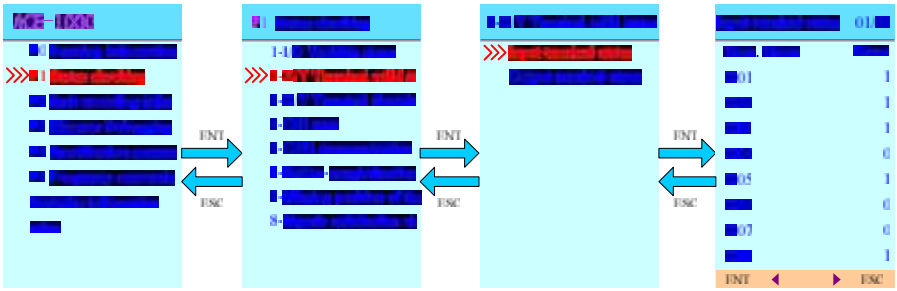
2. P0 operation information (read only)

Example 2: View current floor information and then jump directly to query elevator status code (Also call as ACD)

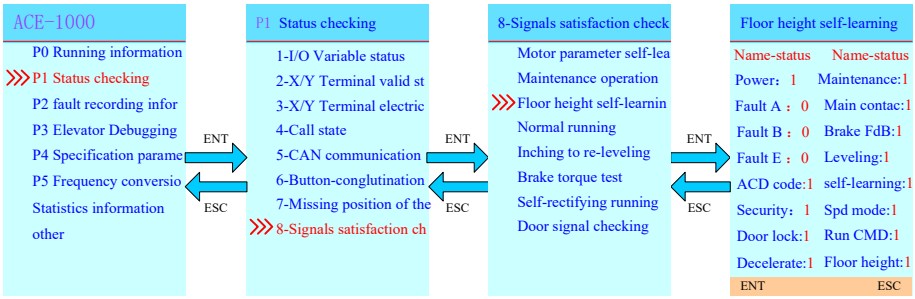


3. P1 status view (read only)

Example 3: View the input terminal X1 ~ X8 signal status: press "LEFT" or "RIGHT" to turn the page, the current page / total number of pages is displayed in the upper right corner of the screen.



Example 4: Viewing the signal satisfiability of floor height self-learning (the floor height self-learning can only be successfully initiated when all 16 states displayed are 1)

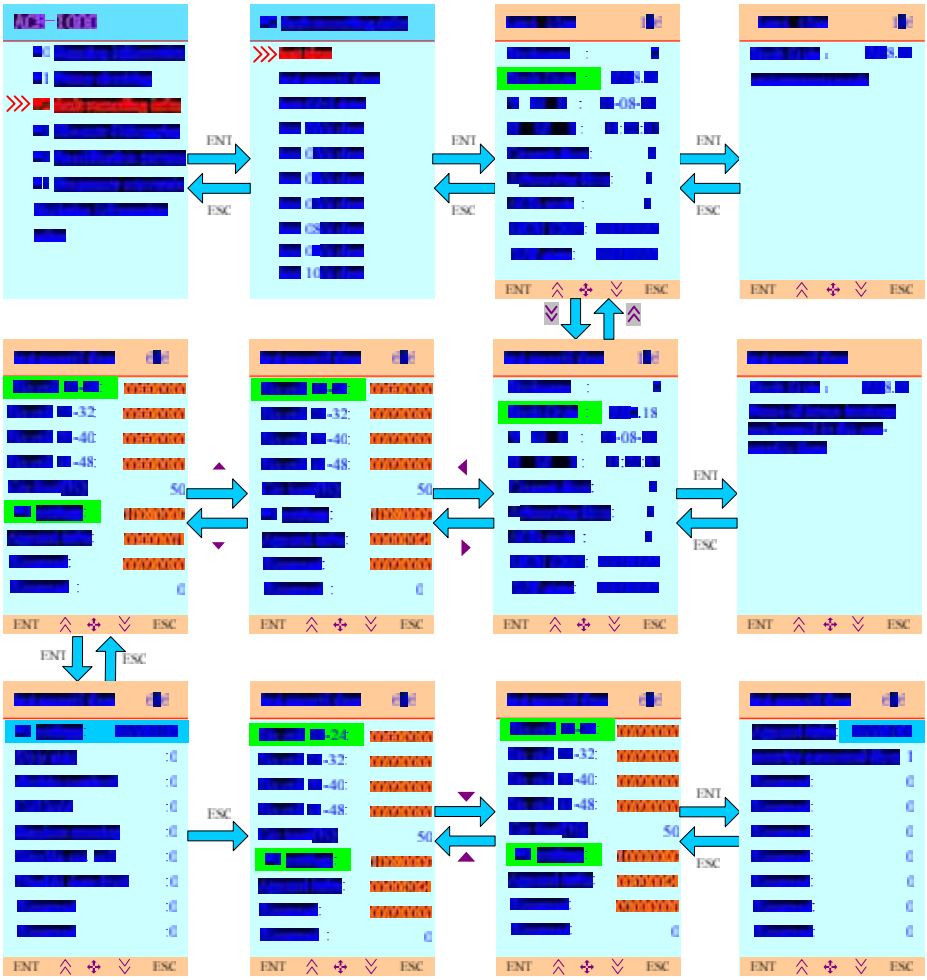


4. P2 detailed fault record (read only)

You can view the current 100 fault records, each of which has a detailed record. Enter the fault record detailed interface, press "<<" or ">>" to jump to the previous fault or the next fault, press ">" or "<" to view other details page of the fault, press "∧" or "∨" to select the upper or lower information line and then press "ENT" to call up its more detailed information.

When Er2.06, Er2.10, Er2.18, Er3.08, Er5.22 and other faults occur, more detailed fault location information is recorded in "Additional Information High" and "Additional Information Low".

Example 5: Failure EG2.18 (home landing is set at the non-service floor), to see which home landing is located in the non-service floor, the specific steps are as follows:



5. P3 elevator commissioning

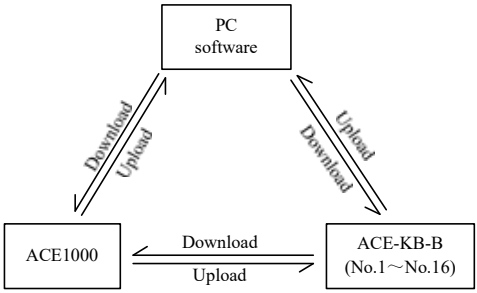
Except for P3.17 which is inconsistent with the onboard/easy portable keyboard functions, other functions in the P3 directory are identical or similar to those of the onboard/ easy portable keyboard. The following highlights the P3.17 features of ACE-KB-B:

ACE-KB-B's P3.17 can back up 16 complete elevator parameters, each of which can be uploaded / downloaded in whole, uploaded / downloaded by group, edited by group. The 16 parameters locate in the P3.17 and "Elevator parameter exchange between PC and keyboard" are shared the same EPPROM storage address, that is, the same number parameter is available for P3.17 and "Elevator parameter exchange between PC and keyboard", these two menu functions operate the same number

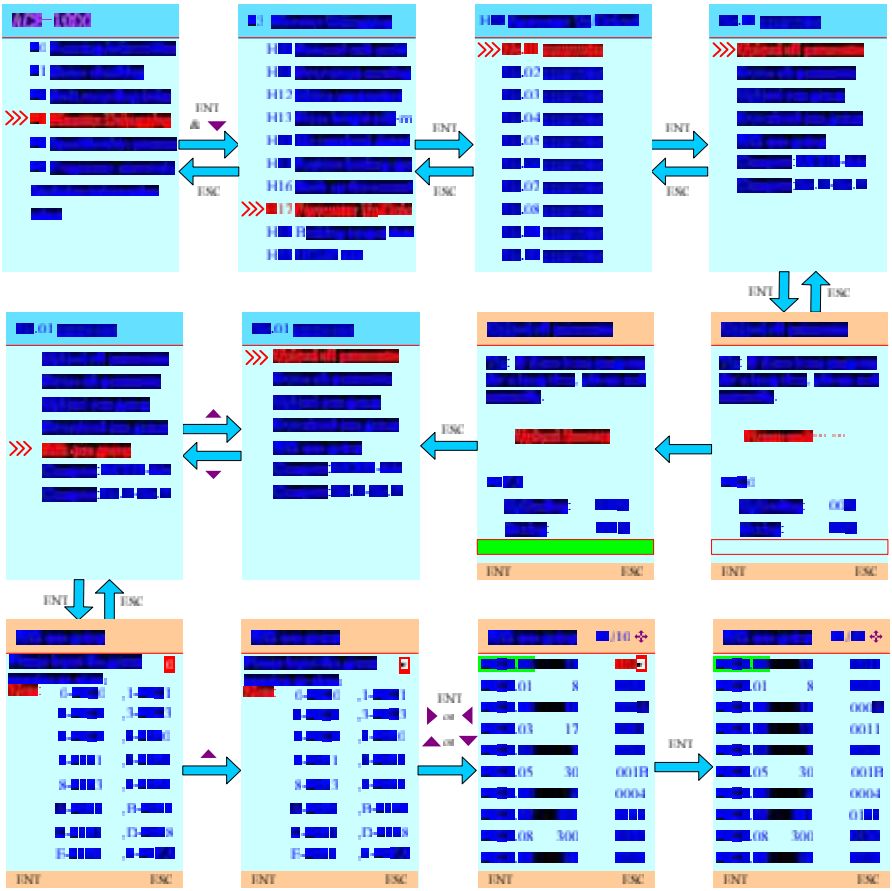
parameter independently. Therefore, the elevator parameters on the PC can be downloaded to the ACE-KB-B first, and then the corresponding number parameters in the ACE-KB-B are downloaded to the ACE1000 main control board, and vice versa.

In addition, the 16 parameters backed-up on the LCD keyboard can be compared with the current parameters of the main control board, or between any two backup parameters on the LCD keyboard. Use this function, you can view the difference between the current parameters of the elevator and the backup parameters on the LCD keyboard; you can also compare the parameters of any two elevators (first upload them to the LCD keyboard and then perform the comparison function between the two backup parameters).

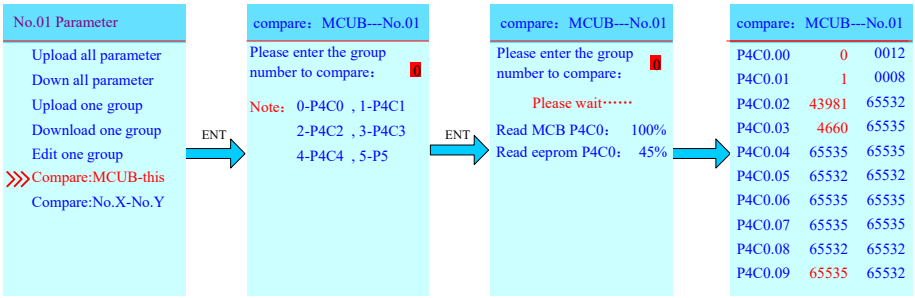
The transmission of parameters between PC, ACE-KB-B and ACE1000 integrated controller is as follows:



Example 6: Upload the elevator parameters from the main control board to the “No.01 parameters” of ACE-KB-B, and then view and edit them.



Example 7: Compare the current parameters of the elevator with the parameters of the LCD keyboard No. 01 (this parameter can be obtained from the PC, or it can be uploaded from a main control board before). Execute menu P3.H17—"No.01 parameters"—"Parameter comparison: MCUB---No.01" function, the steps are as follows:

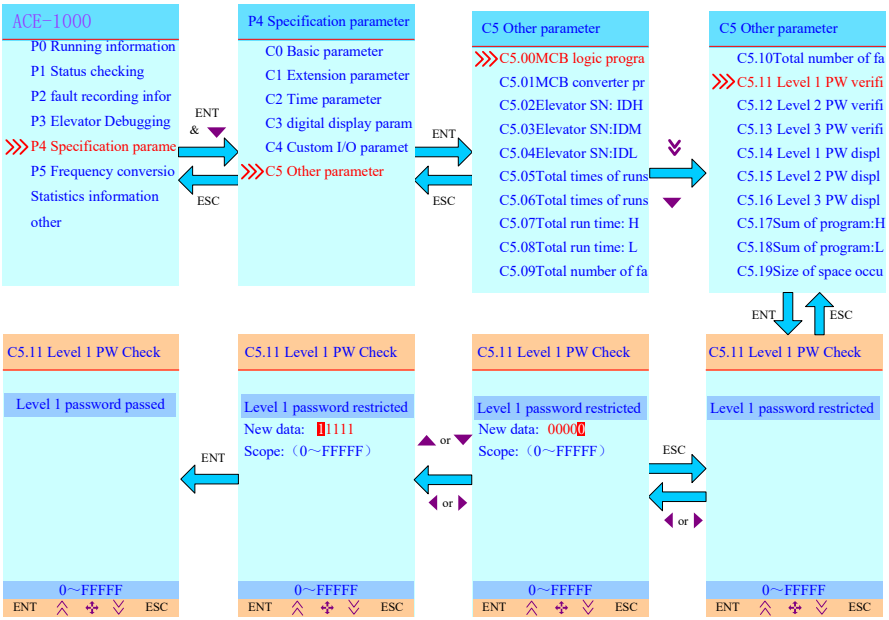


Press "PAGE UP/LEFT" and "PAGE DOWN/RIGHT" keys to view the difference of other page parameters, and then perform P4C1, P4C2, P4C3, P4C4, P5 parameter comparison.

Note: Use “Upload Factory Default Parameters” or “Upload Off-Chip Backup Parameters” in P3.17 to the current No., and then execute “"Parameter comparison: MCUB---No.xx” function. An intuitive comparison between the current parameters and factory default parameters / off-chip backup parameters can be realized on the LCD keyboard.

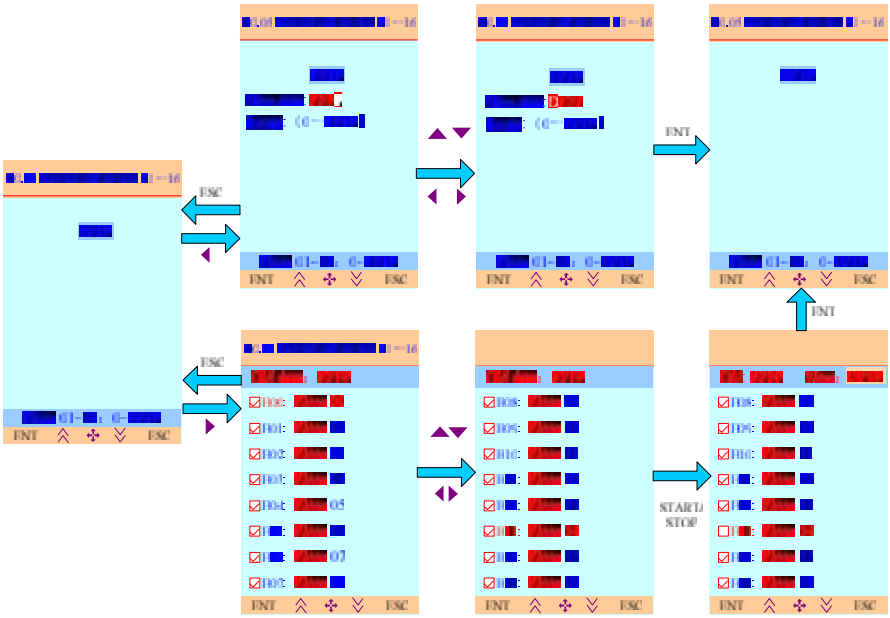
6. P4 specification parameters

Example 8: Assume that the current main control board first level password is 11111, and enter the first level password into ACE-KB-B to obtain the elevator first level operation authority.



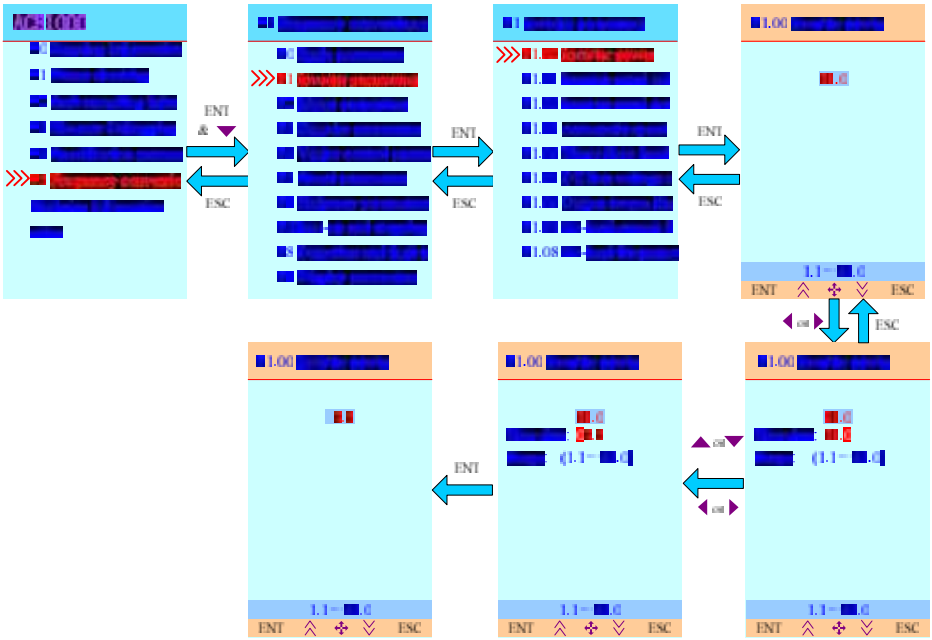
Example 9: Modifying the 14th floor of the internal call service floor (P4C0.05) is not serviceable. The ACE-KB-B hexadecimal specification parameters can be modified in two ways: directly modify the hexadecimal number (called by "LEFT" key), or modify by BIT selection (called by "RIGHT" key). First read the P4C0.05 parameters according to the above example, and then modify them according to the above two methods:

Note: The function that is modified by BIT selection after bit expansion is applicable to all specification parameters of PC40, P4C1, and P4C2 that need to be decomposed into bits, such as P4C0.31, P4C1.13, P4C1.38, P4C1.39, P4C1.48, P4C1.49, P4C1.51, P4C1.52, P4C1.58, P4C1.59, P4C2.52, P4C2.53, etc.



7. P5 frequency conversion parameters

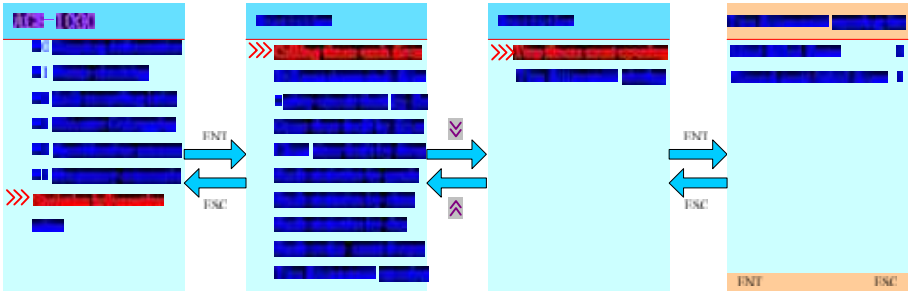
Example 10: The power of the inverter base was changed from 11.0 kW to 7.5 kW. (Note: some speed parameter modifications will be affected by mechanical parameters)



8. Statistics information (read only)

Count the number of calls, the number of failures, and the graduation and classification of faults. The specific functions are as follows:

Example 11: The fault code EF4.01 is a door open timeout fault, and the statistics function is used to quickly and accurately locate the fault to the most floors.



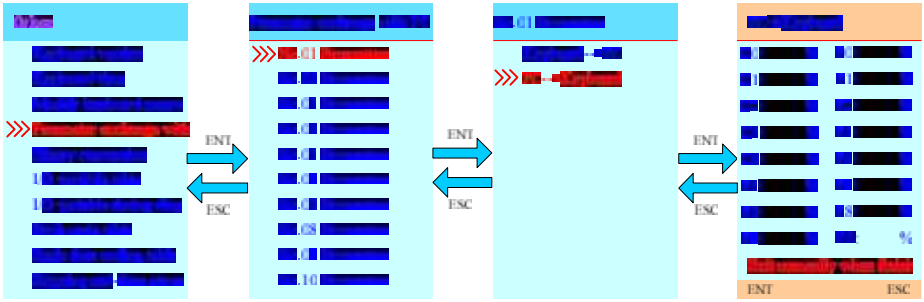
It can be found that the 4th floor has the most open door failure, followed by the 3rd floor. Maintenance personnel can work in a targeted manner based on this information.

9. Other

Example 12: LCD keyboard communicates with PC, upload and download elevator parameters.

Connect ACE-KB-B to the PC via "dedicated cable 2"(USB cable color needs to be distinguished), either download the PC elevator parameters to the keyboard or

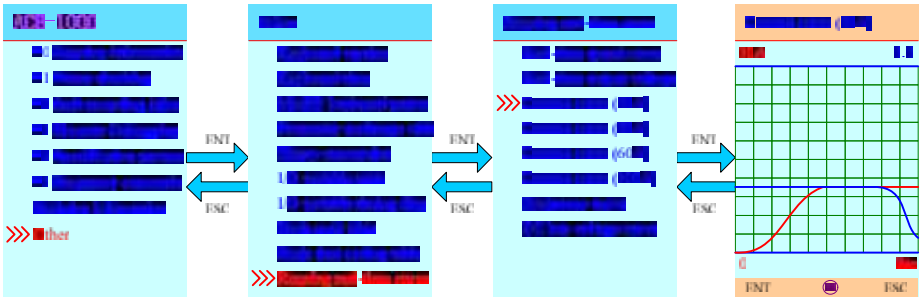
upload the elevator parameters in the keyboard to the PC. When uploading/downloading parameter, please execute the keyboard function first and then open the PC software and follow the steps as the keyboard prompted. The communication handshake should be successful before uploading or downloading. How to download parameters from the PC to the keyboard:



After performing the above steps, open the elevator parameter operation software ACE1000 PARAMETERS OPERATION on the PC, and execute the "Download from Computer to MCB/Keyboard" function as normal. During the parameter downloading process, there is a percentage progress display on the ACE-KB-B interface. When the parameter acquisition is completed, please exit manually. If "Parameter checking error" is prompted on PC after downloading, please upload the newly downloaded parameters to PC for comparison before using.

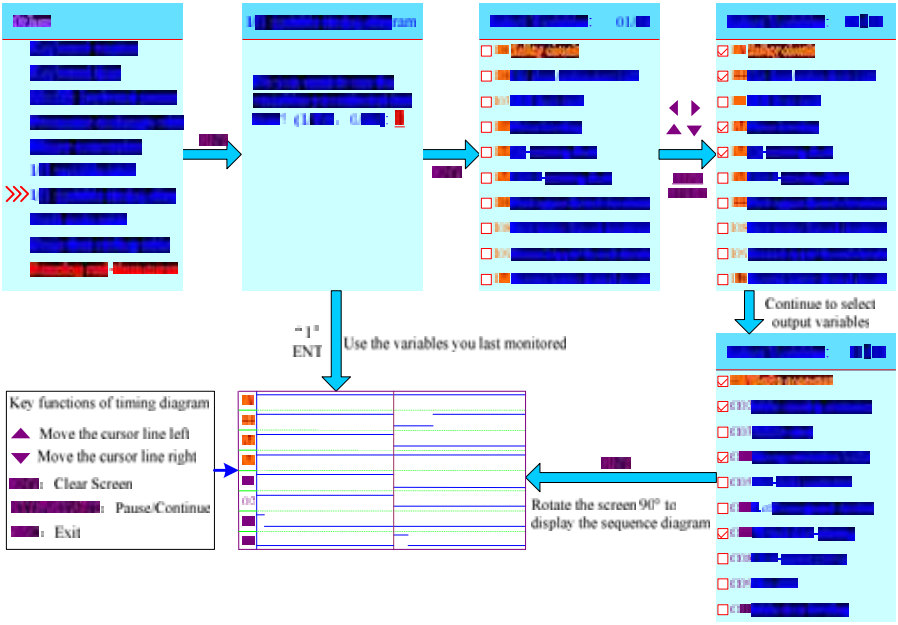
Note: When performing these two functions, the "Communication handshake fails" message prompted by the LCD keyboard when power on can be ignored.

Example 13: View the real-time output current curve of the elevator: the curve is drawn from left to right in real time. After drawing for 10 seconds, change to another color and continue drawing in real time (red and blue alternate). Press "ENT" to clear the screen during drawing. Once, press the "START/STOP" key to pause/continue drawing. There are four options for the maximum value of the Y-axis when drawing the current curve (10A, 30A, 60A, 120A), please select according to the maximum value of the actual current.



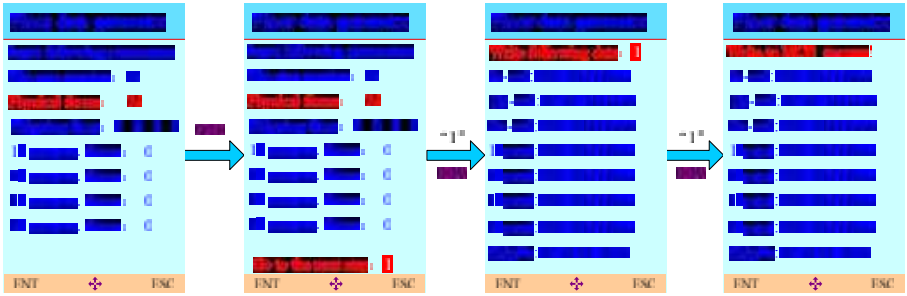
Example 14: View IO Variable Real-Time Timing Chart: This function allows the customer to select 1 to 8 IO variables from the IO variable table (14 pages in total) as

the monitoring object (if the next time you monitor the same variables, you can select again), get the real-time timing diagram of the variable status (horizontal display), and continuously view the timing chart of the last 24 seconds (12 seconds before and after the color distinction). The selected monitor variables are distinguished by color and number at the head of the timing chart. Press the "ENT" button to clear the screen once in real time. Press the "START/STOP" button to pause/continue to draw. Press the "UP" and "DOWN" buttons to move a vertical cursor line to compare the variables timing (similar to an oscilloscope cursor).

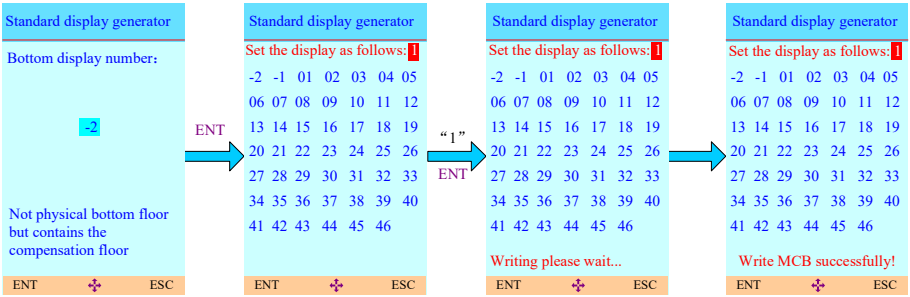


Example 15: Generate the Elevator Floor Parameters: This function allows the user to generate a new elevator parameters on site, including "floor data generator", "standard digital display generator", "custom digital display generator", "door floor service generator", and so on. To call these functions, only fill in or select a few simple parameters to generate the corresponding specification parameters, and then download to the main control board.

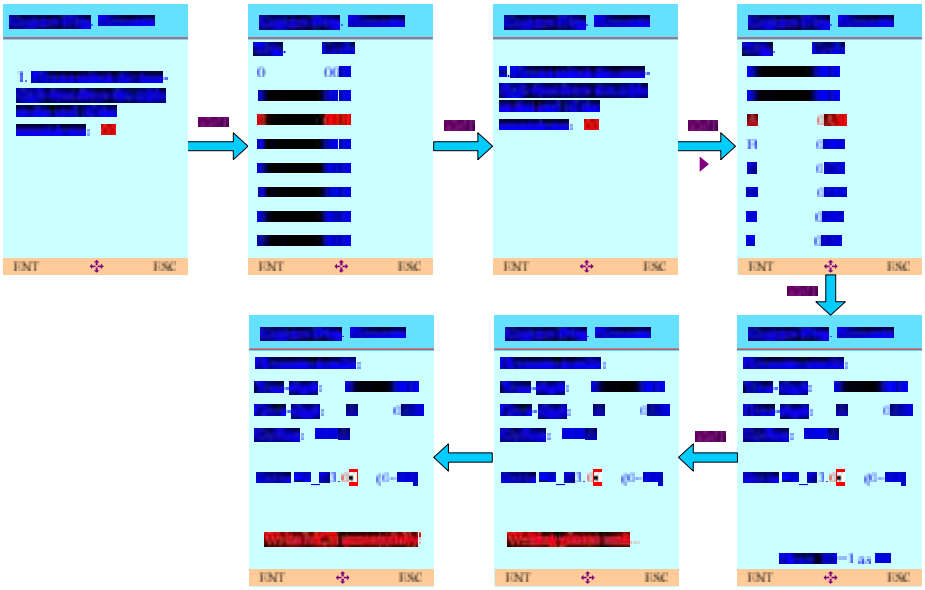
◎ Floor data generator: “UP/DOWN” key jumps between each parameter name or edits the parameter from increment or decrement. “LEFT/RIGHT” key enters parameter editing.



◎Standard digital display generator: fill in the bottom floor digital number (minimum to -9), and generate digital display on the other floors in order.



◎ Custom Digital Display Generator: Select ten-bit font and one-bit font in the table of 64 fonts in turn, generate digital display encoding and write to a certain floor.



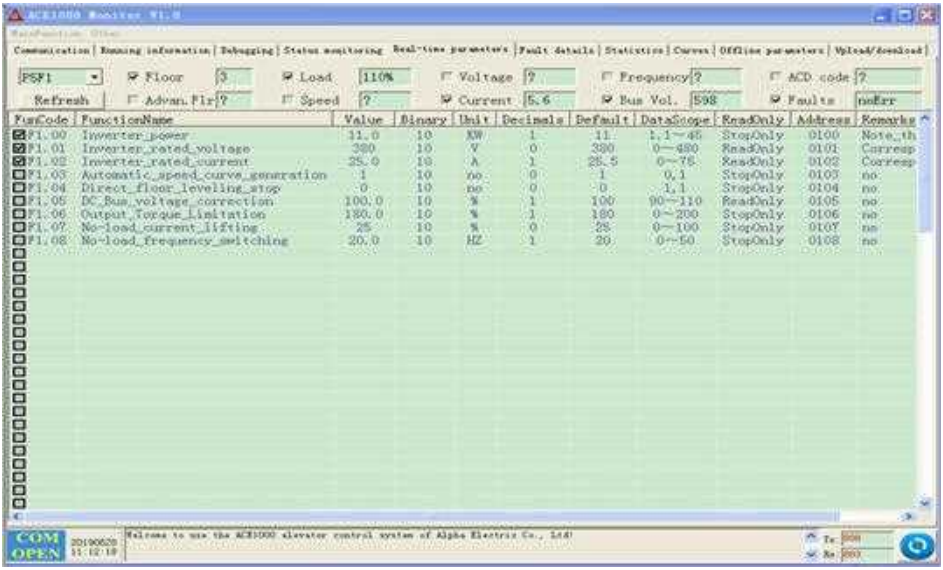
◎door service floor generator: First fill in the total number of floors and door opening mode, and then select the front and rear door floors that need to open and close from the table.

8.15 Voice report/broadcast machine

Support to arrival floor broadcast, open/close door broadcast, up-run and down-run broadcast, background music / advertising words broadcast, and so on. Also, broadcast comfort and guidance information when the elevator is out of service. For details, please refer to the product manual. For customers who require non-standard voice, please contact ALPHA for voice customization. In addition, our true color LCD external call display board ACE-HC-EX comes standard with the voice broadcast function, which is more cost-effective than the separate voice broadcast machine.

8.16 PC Supporting Software (ACE1000 Monitor)

The main control board can communicate with the RS232 serial port on the PC through the DB9 interface (CN10) to realize elevator running information monitoring, elevator debugging, IO terminal status monitoring, elevator parameters reading and writing, fault detailed information viewing, statistical information viewing, offline parameters editing, parameters comparison, parameter upload/download, simple oscilloscope and other functions. PC supporting software, mobile APP, and LCD keyboard share the CN10 interface, so they cannot be used at the same time. The ACE1000 Monitor software can run on mainstream operating systems including Windows XP to Windows 10. Since the popular computer basically does not have an RS232 serial port, you can use a universal USB-232 adapter cable to connect the computer to the ACE1000. For detailed information and instructions for using the ACE1000 Monitor software, please refer to the PDF manual that comes with the software. The following figure is a screen shot of the real-time data reading and writing function:



Note: All supporting PC software of ACE1000 is released in a separate installation package. After successful installation, ACE1000-SPEC, ACE1000 Monitor, parameter-making EXCEL file and related instructions will be copied to the installation directory, and a shortcut will be generated. Updates to the latest version of the software installation package will be published in real time on the website of ALPHA Electric Co., Ltd. or can be obtained from the agent.

8.17 Mobile phone App

After inserting the wireless communication module on the DB9 interface of the main control board CN10 (ACE-MPH-A, optional), communicate with the Bluetooth/WIFI module on the mobile phone for debugging. For details, please refer to the manual of the related product.

8.18 Elevator advertising machine

The ACE1000 can be used with 7-inch, 8-inch, 10.4-inch, 12.1-inch, 15-inch and other sizes true color LCD digital display advertising machines. It can display floor, direction, time, temperature, full/overload, maintenance, fire, fault and other information. Advertising content can be changed in a variety of ways, please refer to the relevant product manual for details.

8.19 Elevator Internet of Things

The ACE1000 complies with the GBT 24476-2017 Elevator IoT technical specification. IoT terminals that meet this standard can be directly connected to the ACE1000 main control board. In addition, the ACE1000 has its own IoT protocol and terminal, which can provide more information than what is required by GBT 24476-2017. For customers with such requirements, please visit the Alpha Electric website or consult the dealer.

8.20 IC card function

The ACE1000 system can be adapted to the mainstream elevator IC card controller products on the market, and realizes functions such as controlled external call, controlled internal call or simultaneous control of internal and external calls. In addition, the cryptosystem, fingerprint system, intelligent visitor system, indoor call system, two-dimensional code system, face recognition system, voice recognition system, etc. can all be used in the ACE1000 system. Users who need these functions can refer to the relevant product manual. For technical support, please contact Alpha Electric's after-sales service team or consult the dealer.

8.21 Power failure emergency device

ACE1000 can be adapted to the mainstream elevator power failure emergency device (ARD) products on the market. The emergency power supply mode can be three-phase 380V, three-phase 220V, single-phase 380V, single-phase 220V, basically as long as the voltage level is the same. Please refer to the corresponding ARD product manual and the electrical diagram recommended by ACE1000. For technical support, please contact Alpha Electric's after-sales service team or consult your dealer.

8.22 Other supporting products

In addition to the above-mentioned common standard *s*upporting products, the ACE1000 system has other *s*upporting products not described here. Please refer to the relevant product manual. For the latest information, please visit the Alpha Electric website or consult your dealer.

Chapter 9: Elevator parameters instructions

9.1 P4: Specification parameter

The specification parameter is a configuration table of basic information and functions of the elevator. The specification parameters can be used to control the "ON" and "OFF" of all functions of the elevator. The specification parameter table of ACE1000 is divided into six categories: basic parameter -C0, extended parameter -C1, time parameter -C2, floor display -C3, IO terminal function -C4, and other system information -C5. The specification parameter modification needs to be performed in the case of stopping the elevator, and the corresponding password needs to be input first to obtain the modification authority.

9.1.1 Basic parameter: P4C0

Function code	Function definition	Setting scope	Remarks	Functional specification
C0.00	Running control way	0: single control mode 1: parallel control mode 2: group control mode	Decimal number	Set the control mode of the system, only two wires are connected in parallel, and the group control board needs to adopt the group control mode.
C0.01	Elevator number	1 ～ 8	Decimal number	Set elevator number, set to 1 when single
C0.02	1# Elevator parallel service floor(1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid, 0 invalid. Used in parallel and group control mode.
C0.03	1# Elevator parallel service floor(17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 17-32, corresponding binary bit set to 1 valid, 0 invalid. Used in parallel and group control mode.
C0.04	1# Elevator parallel service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid, 0 invalid. Used in parallel and group control mode.
C0.05	Internal call service floor(1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Internal call service floor 1-16, corresponding binary bit set to 1 valid, 0 invalid.
C0.06	Internal call service floor(17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Internal call service floor 17-32, corresponding binary bit set to 1 valid, 0 invalid.
C0.07	Internal call service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Internal call service floor 33-48, corresponding binary bit set to 1 valid, 0 invalid.
C0.08	Upward call service floor(1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Upward call service floor 1-16, corresponding binary bit set to 1 valid, 0 invalid.
C0.09	Upward call service floor(17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Upward call service floor 17-32, corresponding binary bit set to 1 valid, 0 invalid.
C0.10	Upward call service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Upward call service floor 33-48, corresponding binary bit set to 1 valid, 0 invalid.
C0.11	Downward call service floor(1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Downward call service floor 1-16, corresponding binary bit set to 1 valid, 0 invalid.

Function code	Function definition	Setting scope	Remarks	Functional specification
C0.12	Downward call service floor(17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Downward call service floor 17-32, corresponding binary bit set to 1 valid, 0 invalid.
C0.13	Downward call service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Downward call service floor 33-48, corresponding binary bit set to 1 valid, 0 invalid.
C0.14	Main door opening/closing service floor(1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Main door opening/closing service floor 1-16, corresponding binary bit set to 1 valid, 0 invalid.
C0.15	Main door opening/closing service floor(17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Main door opening/closing service floor 17-32, corresponding binary bit set to 1 valid, 0 invalid.
C0.16	Main door opening/closing service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Main door opening/closing service floor 33-48, corresponding binary bit set to 1 valid, 0 invalid.
C0.17	Non-call and self-returning to home landing	0: The function is cancelled 1~Top floor: Non-call self-returning to floor	Decimal number	The compensation floor P4C1.04 should be added. Relating to C1.08.
C0.18	Elevator parking home landing	0: The function is cancelled. 1~ Top floor: parking floor.	Decimal number	Set the elevator parking floor, Elevator park at the floor when the parking switch is on.
C0.19	Fireman home landing	0: Firefighting function cancelled. 1~Top floor: Set this floor as fireman home landing floor	Decimal number	Elevator returns to the floor right now, when the hall firefighting switch is on.
C0.20	Weighing device for motor starting torque compensation	0: Switch weighing 1: Car analog weighing 2: No analog weighing 3: MCB analog weighing	Decimal number	Set the weighing device mode, corresponding to P5F7.02.
C0.21	Door-motor type	0: DC door motor 1: Frequency converter door motor 2: Hand-held door	Decimal number	
C0.22	Light curtain enable	0: The light curtain is invalid. 1: The light curtain is valid and timeout does not affect. 2: The light curtain is valid, but it does not work after timeout.	Decimal number	Set the light curtain function of the car door
C0.23	Touch panel enable	0: Touch panel is invalid 1: Touch panel is valid	Binary number	Set the touch panel function of the car door
C0.24	Door auto-reverse when over-torque	0：Door auto-reverse is invalid 1：Door auto-reverse is valid	Binary number	Car door auto-reverse when over-torque
C0.25	Straight going with full-load	0: invalid 1: valid	Binary number	When the elevator is fully loaded, it does not respond to the external call signal but only responds to the internal call signal function.
C0.26	Reserved		Binary	

Function code	Function definition	Setting scope	Remarks	Functional specification
			number	
C0.27	Braking feedback detection	0：Braking feedback detection is invalid 1：Braking feedback detection is valid	Binary number	Set up the braking detection signal feedback function of the traction machine
C0.28	Car door-lock and hall door-lock in series	0：Car door-lock and hall door-lock seperate 1：Car door-lock and hall door-lock in series	Binary number	Set the connection way of the car door-lock and the hall door-lock
C0.29	Automatic selection of floor correction direction	0: Maintain downward self-rectifying. 1: Automatically select the direction of self-rectifying.	Binary number	Set the direction of self-rectifying when the elevator performs floor correction
C0.30	Upward and downward call control ways	0：Upward and downward call unified response. 1：Only downward call unified response, no downward call. 2：Only upward call unified response, no upward call.	Decimal number	When setting 1 or 2 in this parameter, it is related to non-call and self-returning to home landing function. The floor above the home landing only responds to the downward call, and the floor below the home landing only responds to the upward call.
C0.31	The second-level forced deceleration switch installing condition	0x0 ～ 0xFFFF	Hex/Bin number	When the rated speed is greater than 2 m/s, the second-level forced deceleration switch must be installed. The bits are used to indicate the second-level forced deceleration switch installation. When the lift is leveling in floor 1 or top, if the second-level forced deceleration switch signal is on, the Bit0 is set to 1; otherwise it is set to 0. When the lift is leveling in floor 2 or hypo-top, if the second-level forced deceleration switch signal is on, the Bit1 is set to 1, otherwise it is set to 0. Bit2~Bit15 are reserved.
C0.32	When correcting to the terminal floor, the door should be opened in the door area first.	0: In the case of grade D failure, the elevator will be corrected to the terminal floor before opening the door. 1: In the case of grade D failure, the elevator is first corrected to open the door in the first floor area, and then to the terminal station.	Binary number	**Note:** Double doors elevator and elevators with a no-service skipping floor are prohibited from enabling this function.
C0.33	When a grade A fault occurs in the door zone, it is allowed to open the door by pressing the door opening button.	0: In any case of grade A fault, door opening is not allowed even in the door zone. 1: In the case of grade A fault in the door zone, the door can be opened	Binary number	Note: Failures such as disconnection of safety circuit, faults of door zone sensor, dislocated floors and unintended car movement are not allowed to open the door.

Function code	Function definition	Setting scope	Remarks	Functional specification
		once by pressing the open button on the premise of safety.		
C0.34	Automatic brake loosening to rectify the car to the door area.	0 ～3	Decimal number	0: Disable this function. 1: Enable this function only in power failure emergency service mode. 2: Enable this function only in grade A and grade B faults. 3: Enable this function in power failure emergency service mode, in grade A and grade B faults.
C0.35	MCB X01 ~ X16 input point software filtering enable.	0x0 ～ 0xFFFF	Hex/Bin number	bit0: X01,～,bit15: X16. The input point with bit set to 1 enables 40ms software filtering, while the input point with bit set to 0 does not enable.
C0.36	MCB X17 ~ X32 input point software filtering enable.	0x0 ～ 0xFFFF	Hex/Bin number	bit0: X17,～,bit15: X32. The input point with bit set to 1 enables 40ms software filtering, while the input point with bit set to 0 does not enable.
C0.37	MCB X33 ~ X42 input point software filtering enable.	0x0 ～ 0xFFFF	Hex/Bin number	bit0: X33,～,bit9: X42. The input point with bit set to 1 enables 40ms software filtering, while the input point with bit set to 0 does not enable.
C0.38	Using virtual up and down-running limit signals of hoistway	0: No virtual upper and lower running limit signals are used. 1: Use the floor leveling signal and the upper and lower inching signals to simulate. 2: Use the upper and lower inching signals to simulate. 3: Use the upper and lower inching signals at the far end to simulate. 4: Use the floor leveling signal to simulate.	Decimal number	When this function is enabled, the upper / lower running limit switches of hoistway may not be installed. However, it should be noted that these limit signal cannot be simulated if the elevator is powered on at the upper/lower running limit position. In addition, when using this function, the X5 and X6 input terminals on the main control board need to be short circuited to the 24V power supply.
C0.39	The second fire base station	0 ～ 48	Decimal number	Switching the first or second fire base station through the X input terminal.
C0.40	Function control of villa elevator	0x0 ～ 0xFFFF	Hex/Bin number	Bit0: Use of manual door function. Bit1: Enable virtual function of door opening and closing terminal. Bit2: When the light curtain signal comes into effect in running, stop immediately. Bit3: When the elevator is running, if the light curtain signal takes effect, it will immediately slow down and stop. Bit4: Normally open mode is used for electric lock control. Bit5: Normally closed mode is used for electric lock control. Bit6: Normally open mode is used for electromagnetic door knife control. Bit7: Normally closed mode is used for electromagnetic door knife control

Function code	Function definition	Setting scope	Remarks	Functional specification
				Bit8: ER7. 06 fault disable
C0.41	Internet of things function enable(sent by CAN bus)	0x0 ～ 0xFFFF	Hex/Bin number	Each elevator has a unique internet of things function enabling code, which takes effect after 3 minutes.
C0.42	Disable remote calling elevator	0x0 ～ 0xFFFF	Hex/Bin number	Bit0: Disable serial communication to call elevator. Bit1: Disable the Internet of things to call the elevator.
C0.43	Yn Position of the second holding brake relay	0 ～ 6	Decimal number	0、1、2: No second holding brake relay; 3～ 6: One of Y3～Y6 is defined as the second holding brake relay, Correspondingly.
C0.44～C0.99	Reserved	0x0 ～ 0xFFFF	Hex/Bin number	

9.1.2 Extended Function: P4C1

Function code	Function definition	Setting scope	Remarks	Functional specification
C1.00	Double doors control	0: Single door 1: through double-door 2: Independent double-door	Decimal number	Note: The lift with through double-door is not need to set the internal and external call board working in "auxilliary door/FM" mode.
C1.01	Auxiliary door opening/closing service floor (1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid, 0 invalid. For through double-door and Independent double-door mode.
C1.02	Auxiliary door opening/closing service floor(17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 17-32, corresponding binary bit set to 1 valid, 0 invalid. For through double-door and Independent double-door mode.
C1.03	Auxiliary door opening/closing service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid, 0 invalid. For through double-door and Independent double-door mode.
C1.04	High-low-feet compensation floors in parallel and group control mode	0: No compensation floor or high/long feet side setting. 1～16: Low/short feet side setting (that is virtual floors).	Decimal number	When the parallel and group control lifts has long and short feet, you need to set this parameter as it is, and it must be 0 at any other times.
C1.05	2# Elevator parallel service floor(1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid, 0 invalid. For the elevator number (C0.01) is 2 in parallel and group control mode.
C1.06	2# Elevator parallel service floor(17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 17-32, corresponding binary bit set to 1 valid, 0 invalid. For the elevator number (C0.01) is 2 in parallel and group control mode.
C1.07	2# Elevator parallel service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid, 0 invalid. For the elevator number (C0.01) is 2 in parallel and group control mode.
C1.08	Non-call and self-returning to	0: Function cancelled. 1~top floor: Set	Decimal number	For the parallel and group control mode, relating to C0.17.

Function code	Function definition	Setting scope	Remarks	Functional specification
	dispersion landing	non-call and self-returning to dispersion landing floor		
C1.09	Inching and re-leveling with opening door	0: Function invalid 1: Function is valid	Binary number	Set up the function of inching and re-levelling with opening door
C1.10	Door opening in advance of car stop	0: Function invalid 1: Function is valid	Binary number	Set up the function of opening the door in advance when the elevator enters the leveling floor but does not stop.
C1.11	Power failure emergency service with backup power battery	0: Function invalid 1: Function is valid	Binary number	Set the power failure emergency service, automatically run to the nearest floor leveling to open the door, you need to configure the backup power battery cabinet.
C1.12	Voice report and broadcast	0: Function invalid 1: Function is valid	Binary number	Set the voice report and broadcast function.
C1.13	Arrival bell ring (real-time control)	0x0000～0xFFFF, The system uses real-time to control the turn-on and turn-off of the function, and uses the binary bits for detailed control.	Hex/Bin number	0x0000: Function is not enabled; 0x3000: Function is enabled all day; 0x2000: Function is only enabled during the day(07:00~20:59); 0x1000: Function is only enabled during the night(21:00~06:59); 0x0XXX: XXX corresponds to the lower 12 bits of the binary and divides the 24 hours in a day into 12 bits for control; ◎The low 12 bits are as follows: Bit0: 00:00~01:59 time period Bit1: 02:00~03:59 time period Bit2: 04:00~05:59 time period Bit3: 06:00~07:59 time period Bit4: 08:00~09:59 time period Bit5: 10:00~11:59 time period Bit6: 12:00~13:59 time period Bit7: 14:00~15:59 time period Bit8: 16:00~17:59 time period Bit9: 18:00~19:59 time period Bit10: 20:00~21:59 time period Bit11: 22:00~23:59 time period
C1.14	Mistaken internal call cancel	0: Function invalid 1: Function is valid	Binary number	Due to the mis-operated internal call, long press the mis-operated call button to cancel the call.
C1.15	Number of the mischief floor calls	0: The anti-prank function is invalid 2～top floor: Number of the mischief floor calls	Decimal number	Set the number of calls to determine the effect of the prank, 0 is invalid, set the number n means that if there are more than n+1 prank signals, it will cancel the call. This feature is controlled by C1.59_Bit6.
C1.16	External call and corresponding inner call button flash	0: Function invalid 1: Function is valid	Binary number	When the external call is "ON", the internal call button flickers in the same floor.
C1.17	Times of test runs	Setting it to 65535 indicates unlimited times running.	Decimal number	When P3.H09 is set to non-zero, the test run function is valid, relates to C2.43.
C1.18	Non-service skipping floor function	0: Function invalid 1: Function is valid	Binary number	Set up elevator non-stop floor function, such as floors with only levelling plate but no doors.

Function code	Function definition	Setting scope	Remarks	Functional specification
C1.19	Skipping floors (1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid (non-service), 0 invalid (service).
C1.20	Skipping floors (17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 17-32, corresponding binary bit set to 1 valid (non-service), 0 invalid (service).
C1.21	Skipping floors (33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid (non-service), 0 invalid (service).
C1.22	The rush hour on duty floor	0: The function is invalid 1～Top floor: Rush hour on duty standby floor	Decimal number	Set the function of rush hour on duty service, elevator standby floor. If this function is enabled, when the elevator finishes the last call, it immediately closes the door and returns to the standby floor.
C1.23	The rush hour off duty floor	0: The function is invalid 1～Top floor: Rush hour off duty standby floor	Decimal number	Set the function of rush hour off duty service, elevator standby floor. If this function is enabled, when the elevator finishes the last call, it immediately closes the door and returns to the standby floor.
C1.24	Time sharing service (A)	0: Function invalid (i.e. non-timesharing). 1: Time-sharing service only for internal call. 2: Time-sharing service only for external call. 3: Time-sharing service for internal call and external call.	Decimal number	If this function is on, during the set time, the elevator only responds to the floor set by the time-sharing service. It can be set separately for internal and external calls. See C2.31~C2.36.
C1.25	Time sharing service (A) floors(1~16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.26	Time sharing service (A) floors(17~32)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 17-32, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.27	Time sharing service (A) floors(33~48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.28	Time sharing service (B)	0: Function invalid (i.e. non-timesharing). 1: Time-sharing service only for internal call. 2: Time-sharing service only for external call. 3: Time-sharing service for internal call and external call.	Decimal number	If this function is on, during the set time, the elevator only responds to the floor set by the time-sharing service. It can be set separately for internal and external calls. See C2.31~C2.36.
C1.29	Time sharing service (B) floors(1~16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.30	Time sharing service (B) floors(17~32)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 17-32, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.31	Time sharing service (B) floors(33~48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.32	Time sharing service (C)	0: Function invalid (i.e. non-timesharing).	Decimal number	If this function is on, during the set time, the elevator only responds to the floor set by the time-sharing service. It can be set separately

Function code	Function definition	Setting scope	Remarks	Functional specification
		1: Time-sharing service only for internal call. 2: Time-sharing service only for external call. 3: Time-sharing service for internal call and external call.		for internal and external calls. See C2.31~C2.36.
C1.33	Time sharing service (C) floors(1~16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.34	Time sharing service (C) floors(17~32)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 17-32, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.35	Time sharing service (C) floors(33~48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid (service), 0 invalid (non-service).
C1.36	Re-close door times in the case of closing failure	1 ～ 9999	Decimal number	Set the times of successive door closing failures. After the number arrivals, ER4.04 fault is reported.
C1.37	Re-open door times in the case of opening failure	1 ～ 9999	Decimal number	Set the times of successive door opening failures. After the number arrivals, ER4.03 fault is reported.
C1.38	CAN Communication distribution (Internal call, external call, parallel and group control)	0x000 ～ 0x777	Hex number	Three hex-digit numbers correspond to three independent CAN bus, low digit (LED4) corresponds to CAN0, middle digit (LED3) corresponds to CAN1, high digit (LED2) corresponds to CAN2. A digit is set to "1" corresponding CAN bus to distribute for internal call, "2" to distribute for external call, and "4" to distribute for parallel and group control.
C1.39	UART communication rate (baud rate) selection (0:9600,1:19200, 2:38400,4:57600, 8:76800)	0x000 ～ 0x888	Hex number	Three hex-digit numbers correspond to three serial ports, low digit (LED4) corresponds to on-board RS232, middle digit (LED3) corresponds to on-board RS485, and high digit (LED2) corresponds to extended RS422. A serial port set to 0 uses 9600 BPS, set to 1 uses 19200 BPS, set to 2 uses 38400 BPS, set to 4 uses 57600 BPS, and set to 8 uses 76800BPS.
C1.40	3# Elevator parallel service floor(1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid, 0 invalid. For the elevator number (C0.01) is 3 in parallel and group control mode.
C1.41	3# Elevator parallel service floor(17～32)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 17-32, corresponding binary bit set to 1 valid, 0 invalid. For the elevator number (C0.01) is 3 in parallel and group control mode.
C1.42	3# Elevator parallel service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid, 0 invalid. For the elevator number (C0.01) is 3 in parallel and group control mode.
C1.43	4# Elevator parallel service floor(1～16)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 1-16, corresponding binary bit set to 1 valid, 0 invalid. For the elevator number (C0.01) is 4 in parallel and group control mode.
C1.44	4# Elevator parallel	0x0 ～ 0xFFFF	Hex/Bin	Floor 17-32, corresponding binary bit set to

Function code	Function definition	Setting scope	Remarks	Functional specification
	service floor(17～32)		number	1 valid, 0 invalid. For the elevator number (C0.01) is 4 in parallel and group control mode.
C1.45	4# Elevator parallel service floor(33～48)	0x0 ～ 0xFFFF	Hex/Bin number	Floor 33-48, corresponding binary bit set to 1 valid, 0 invalid. For the elevator number (C0.01) is 4 in parallel and group control mode.
C1.46	Speed coefficient H	0x0 ～ 0xFFFF	Hex number	Reserved parameters, do not edit.
C1.47	Speed coefficient L	0x0 ～ 0xFFFF	Hex number	Reserved parameters, do not edit.
C1.48	External call board buzzer	0x0 ～ 0xFFFF	Hex/Bin number	Enable the buzzer with binary bits: Bit15: class-8 faults; Bit14: class-7 faults; Bit13: class-6 faults; Bit12: class-5 faults; Bit11: class-4 faults; Bit10: class-3 faults; Bit9: class-2 faults; Bit8: class-1 faults; Bit7: grade-A faults; Bit6: grade-B faults; Bit5: grade-C faults; Bit4: grade-D faults; Bit3: grade-E faults; Bit2: Hall door opening with car door closed (when C0.28=0,relates to ER8.16), or unintended car movement; Bit1: Synchronized car buzzer; Bit0: 1-Fault buzzer rings long; 0-Fault buzzer only rings for 3 minutes.
C1.49	Key and display function control of on-board and easy portable keyboard	0x0 ～ 0xFFFF	Hex/Bin number	Bit0~Bit7: Set the display of P1_U09.XX to replace the display of P0, XX+1= (data of Bit0~Bit7). Bit8: The current fault automatically displays under the P0 and P3 menu. Bit9: Whether the menu and data alternately display under the P4 and P5 menu. Bit10: In P4 and P5 data display state, the LEFT/RIGHT key function is differed in the long press and short press. When Bit10=0, short press to go to the adjacent group, long press to enter the data modification state; when Bit10=1, short press to enter the data modification state, long press to go to the adjacent group. Bit11: Whether to use the UP/DOWN key to directly call the elevator. Bit12: Whether the fault is detected when the main control board is incompletely powered. Bit13~15: Reserved.
C1.50	Permission times of fault-resetting by calling for help in car	0 ～ 100	Decimal number	The times in a day that a long press of the car door-opening button (displaying the call for help information on the hall call board) is allowed to clear the current fault (equivalent to executing the fault clearance on the main control board).
C1.51	External/hall call board detailed function control	0x0 ～ 0xFFFF	Hex/Bin number	Bit0: Whether the hall call board has display when the safety circuit is disconnected; Bit1: Whether to simulatively display the door opening and closing;

Function code	Function definition	Setting scope	Remarks	Functional specification
				Bit2: Whether the arrow moves when the elevator car moves; Bit3: Whether the floor and direction are displayed during the maintenance; Bit4: Whether to enable call hall for help in the car; Bit5: Whether the parking switch on hall call board is valid at any floor; Bit6: Whether the hall call board display is extinguished with the car lighting; Bit7: Whether the corresponding hall call board button flickers when the elevator arrives; Bit8 ~15: Reserved.
C1.52	Buzzer in car enables	0x0 ～ 0xFFFF	Hex/Bin number	Bit0: Whether the buzzer in car will sound,when the door touch panel or light curtain is triggered for a long time; Bit1: Self-rectifying running with buzzer ; Bit2: Maintenance running with buzzer ; Bit3: Power failure emergency service running with buzzer. Bit4: Earthquake control with buzzer; Bit5: Fire control with buzzer; Bit 6: Grade-C faults with buzzer; Bit7: Door enforced-closing with buzzer; Bit8: Elevator ACD code/state transition with buzzer; Bit9: Whether the buzzer in car will sound before the elevator door is closing/opening in maintenance state. Bit10: When the car roof / bottom sound and light alarm, the car buzzer rings. Bit11: Opening the door when the brake torque detection is over time. Bit12~Bit15: Reserved.
C1.53	Rated speed	0 ～ 240	Decimal number	Reserved parameters, do not edit.
C1.54	Security service floor at night	0 ～ top floor	Decimal number	Set 0 to disable the function. If the function is enabled by non-zero, during the set time (C2.52), the lift returns to the night security service floor for standby every time immediately after the call service.
C1.55	The distance to run after entering the floor leveling plate when in self-rectifying	0 ～ 250mm	Decimal number	When in self-rectifying, after entering the floor leveling plate and continuing to run the distance length specified by C1.55, then the running command will be cancelled, which is used to improve the leveling accuracy and avoid the case where the car door is opened but the hall door can not open. Due to the effects of inertia and mechanical brake delay, this value should be appropriately reduced compared to the actual distance required. Note: If this value is set too high, lift may not stop when passing the floor area, which

Function code	Function definition	Setting scope	Remarks	Functional specification
				is in self-rectifying running.
C1.56	The distance to run after entering the floor leveling plate when in power failure emergency service.	0 ～ 250mm	Decimal number	When in power failure emergency service, after entering the floor leveling plate and continuing to run the distance length specified by C1.56, then the running command will be cancelled, which is used to improve the leveling accuracy and avoid the case where the car door is opened but the hall door can not open. Due to the effects of inertia and mechanical brake delay, this value should be appropriately reduced compared to the actual distance required. Note: If this value is set too high, lift may not stop when passing the floor area, which is in power failure emergency service.
C1.57	Elevator stand by with door opening	0 ～ 2	Decimal number	0: Do not turn on this function 1: Open the doors and stand by only at the home landing floor 2: Open the doors and stand by at all floors
C1.58	Automaticly reset system faults	0x0020 ～ 0xF8FA	Hex/Bin number	·· The four digital tube (LED1~LED4) corresponds to four hexadecimal numbers, of which "high two digits", "third digit" and "lowest digit" are respectively controlled. · "High two digits" digital tube controls the fault grade of automatic resetting, the fault grade is from high to low corresponding to different binary digits: Grade A - Bit15, Grade B - Bit14, Grade C - Bit13, Grade D - Bit12, Grade E - Bit11. For example, Bit14=1 means that automatic reset is allowed for Grade B faults. · The "third digit" digital tube is the time interval that allows automatic reset, in minutes (2 to F corresponds to 2 to 15 minutes). If the time interval has not yet arrived and a new fault of the same class has occurred, automatic fault reset function will be disabled. · The "lowest digit" digital tube is the number of automatic resets allowed in a day (0 to 10).
C1.59	Internal call board detailed control	0x0 ～ 0xFFFF	Hex/Bin number	Bit0: Whether the corresponding internal call button light flashes when the elevator arrival (need to enable C1.13 function). Bit1: Whether the open door button light flashes when the elevator opens the door. Bit2: Whether the close door button light flashes when the elevator closes the door. Bit3: Whether the open door button light is on when the elevator opens the door. Bit4: Whether the close door button light is on when the elevator closes the door. Bit5: Whether the car digital display prompts when the elevator stops in the non-door area. Bit6: Whether to use the weighing signal to

Function code	Function definition	Setting scope	Remarks	Functional specification
				judge the internal call prank. Bit7: Whether to use the door light curtain signal to judge the internal call prank. Bit8: Whether the car digital display prompts when the system has detected fault. Bit9: Whether to enable the elevator door machine turn to the inching state (refer to the application description section for details). Bit10: The digital display in the elevator car goes out together with the lighting in the car. Bit11: The main control board sends the current real-time on the elevator In-calling CAN bus. Bit12~15: Reserved.
C1.60	Floors called separately by the main and auxiliary internal command boards in the independent double door(F1～F16)	0x0 ～ 0xFFFF	Hex/Bin number	When C1.00=2(independent double door), the floor corresponding to 1 here will open the corresponding main door or auxiliary door according to the call instruction form the main or the auxiliary internal command boards, the floor corresponding to 0 here will open the main and auxiliary door at the same time.
C1.61	Floors called separately by the main and auxiliary internal command boards in the independent double door(F17～F32)	0x0 ～ 0xFFFF	Hex/Bin number	When C1.00=2(independent double door), the floor corresponding to 1 here will open the corresponding main door or auxiliary door according to the call instruction form the main or the auxiliary internal command boards, the floor corresponding to 0 here will open the main and auxiliary door at the same time.
C1.62	Floors called separately by the main and auxiliary internal command boards in the independent double door(F33～F48)	0x0 ～ 0xFFFF	Hex/Bin number	When C1.00=2(independent double door), the floor corresponding to 1 here will open the corresponding main door or auxiliary door according to the call instruction form the main or the auxiliary internal command boards, the floor corresponding to 0 here will open the main and auxiliary door at the same time.
C1.63	Floors called separately by the main and auxiliary hall command boards in the independent double door(F1～F16)	0x0 ～ 0xFFFF	Hex/Bin number	When C1.00=2(independent double door), the floor corresponding to 1 here will open the corresponding main door or auxiliary door according to the call instruction form the main or the auxiliary external/hall call boards, the floor corresponding to 0 here will open the main and auxiliary door at the same time.
C1.64	Floors called separately by the main and auxiliary hall command boards in the independent double door (F17～F32)	0x0 ～ 0xFFFF	Hex/Bin number	When C1.00=2(independent double door), the floor corresponding to 1 here will open the corresponding main door or auxiliary door according to the call instruction form the main or the auxiliary external/hall call boards, the floor corresponding to 0 here will open the main and auxiliary door at the same time.
C1.65	Floors called	0x0 ～ 0xFFFF	Hex/Bin	When C1.00=2(independent double door),

Function code	Function definition	Setting scope	Remarks	Functional specification
	separately by the main and auxiliary hall command boards in the independent double door (F33～F48)		number	the floor corresponding to 1 here will open the corresponding main door or auxiliary door according to the call instruction form the main or the auxiliary external/hall call boards, the floor corresponding to 0 here will open the main and auxiliary door at the same time.
C1.66	The times of a door is allowed to continuous obstruction of opening and closing	3～100	Decimal number	When the door is blocked (door machine over-torque), ER4.18 is reported after the number of consecutive retries reaches the specified value here.
C1.67	Conversion of external call service to internal call service(F01~F16)	0x0 ～ 0xFFFF	Hex/Bin number	Converting the external call service on designated floors to the internal call service can solve the problem of passenger hall call service with different front and rear doors in different floors.
C1.68	Conversion of external call service to internal call service(F17~F32)	0x0 ～ 0xFFFF	Hex/Bin number	
C1.69	Conversion of external call service to internal call service(F33~F48)	0x0 ～ 0xFFFF	Hex/Bin number	
C1.70	Percentage correction for light load and full load judgment when using no weighing device startup compensation	0 ～ 50	Decimal number	In the case of C0.20=2 and F7.02=2, it is used to judge the load percentage which is need in straight going with full-load and internal call to prevent practical joke functions. The larger this number, the more sensitive the judgement for load.
C1.71	lift attendant mode detailed control	0x0 ～ 0xFFFF	Hex/Bin number	Bit0: the external call is automatically registered as the internal call. Bit1: the external call automatically corresponds to the internal call button flash. Bit2: whether to close the door in inching action mode. The other bits are reserved.
C1.72	Door opening/closing test times	1～65535	Decimal number	Corresponding to P3.20 door opening/closing test function, 65535 for unlimited times.
C1.73	Whether the overspeed faults is enabled at the forced deceleration switch.	0x0 ～ 0xFFFF	Hex/Bin number	Bit3~Bit0: When the hall door lock signal and the car door lock signal enter the main control board separately, the judgment threshold times of the door lock short circuit are judged by the algorithm. Set to 0, do not enable Er4.20. Bit4: Whether or not Er5.04 uses MCU + DSP dual judgment. Bit5: Whether or not Er5.05 uses MCU + DSP dual judgment. Bit6: Er5.08 forced deceleration overspeed fault judgment enable. Bit7: Er5.17 forced deceleration overspeed fault judgment enable. Bit8: Er5.18 forced deceleration overspeed fault judgment enable. Bit9~Bit15: Reserved.

Function code	Function definition	Setting scope	Remarks	Functional specification
C1.74	Backup power mode level signal estimation deviation	0 ～ 12 (Decimetre)	Decimal number	Level ± C1.74
C1.75~C1.99	Reserved	0x0 ～ 0xFFFF	Hex/Bin number	

Note: When using the flashing prompt function of the internal and external call button light before arrival, please set C1.13 and C2.53 first.

9.1.3 Time parameter: P4C2

Function code	Function definition	Setting scope	Remarks	Functional specification
C2.00	MCB time: year	00～99	Year	Main control board real-time, starting from 2000
C2.01	MCB time: month	01～12	Month	Main control board real-time
C2.02	MCB time: date	01～31	Date	Main control board real-time
C2.03	MCB time: hour	00～23	Hour	Main control board real-time
C2.04	MCB time: minute	00～59	Minute	Main control board real-time
C2.05	MCB time: second	00～59	Second	Main control board real-time
C2.06	MCB time: day	00～06	Week	Main control board real-time. 0 represents Sunday
C2.07	Self-return home landing/distributed landing floor time	1～3600	Second	Setting the time for elevator no-call return to home landing or distributed landing floor
C2.08	Fan and lighting auto off time	1～1300	Second	Setting the time for elevator no-call fan and lighting auto off (for energy saving)
C2.09	External call door opening and holding time	1～60	Second	Set the elevator door opening hold time in external call
C2.10	Internal call door opening and holding time	1～60	Second	Set the elevator door opening hold time in internal call
C2.11	Open-door holding time for disabled person service	1～60	Second	The car command board was set up working mode as disabled person mode ("ZC" and "FC"). After detecting the disabled person call to reach the target floor, the parameter is used to control the opening time.
C2.12	Extened door opening and holding time	1～600	Second	Set the door opening hold time in pressing the door opening extension button
C2.13	Reserved	0～65535	Second	
C2.14	Maximum distance floor running time-consuming	5～60	Second	Set the time-consuming of maximum distance floor. If the elevator runs continuously for more than the time and there is no floor leveling signal input, the hoist ropes slipping fault will be reported.
C2.15	Automatic door closing time in open timeout (Er4.01)	1～60	Second	Set the automatic shutdown time after reporting ER4.01 fault.
C2.16	Automatic door opening time in close timeout (Er4.02)	1～60	Second	Set the automatic door opening time after reporting ER4.02 fault.
C2.17	Door opening limit fault judgment time (Er4.09)	0～10	Second	Set the judging time of ER4.09.

Function code	Function definition	Setting scope	Remarks	Functional specification
C2.18	Door closing limit fault judgment time (Er4.10)	0～10	Second	Set the judging time of ER4.10.
C2.19	The on duty rush hour begins (day)	0～6	Week	
C2.20	The on duty rush hour ends (day)	0～6	Week	
C2.21	The on duty rush hour 1 begins	00.00～23.59	Hour，minute	Morning working time
C2.22	The on duty rush hour 1 ends	00.00～23.59	Hour, minute	
C2.23	The on duty rush hour 2 begins	00.00～23.59	Hour, minute	Afternoon working time
C2.24	The on duty rush hour 2 ends	00.00～23.59	Hour, minute	
C2.25	The off duty rush hour begins (day)	0～6	Week day	
C2.26	The off duty rush hour ends (day)	0～6	Week day	
C2.27	The off duty rush hour 1 begins	00.00～23.59	Hour, minute	Morning off time
C2.28	The off duty rush hour 1 ends	00.00～23.59	Hour, minute	
C2.29	The off duty rush hour 2 begins	00.00～23.59	Hour, minute	Afternoon off time
C2.30	The off duty rush hour 2 ends	00.00～23.59	Hour, minute	
C2.31	Time sharing service A: time starting point	00.00～23.59	Hour, minute	
C2.32	Time sharing service A: time finishing point	00.00～23.59	Hour, minute	
C2.33	Time sharing service B: time starting point	00.00～23.59	Hour, minute	
C2.34	Time sharing service B: time finishing point	00.00～23.59	Hour, minute	
C2.35	Time sharing service C: time starting point	00.00～23.59	Hour, minute	
C2.36	Time sharing service C: time finishing point	00.00～23.59	Hour, minute	
C2.37	Simulated door opening time (without door limit switch)	0～3050	Second	◎Thousand bit is set to 1 to enable the simulation function of door closing terminal, thousand bit is set to 2 to enable the simulation function of door opening terminal, thousand bit is set to 3 to enable the simulation function of door opening terminal and door closing terminal; ◎The hundred bits should be set to 0; ◎The lowest two bits are the simulation time of opening and closing the door, 0～50 seconds. It is used when the door opening and closing terminal/limit is not installed during the installation and commissioning of the elevator. Please turn off this function after it is put into normal use.

Function code	Function definition	Setting scope	Remarks	Functional specification
C2.38	Ring of parallel and group control is sounded when the door closing timeout.	5～100	Second	The elevator in parallel and group control mode reminds the door-closing timeout.
C2.39	Start timeout, the parallel and group control rescheduling	10～300	Second	When in parallel and group control mode, the first assigned elevator does not start on time, and another one is reassigned to service.
C2.40	Effective time of first-level password unlocking	1～273	Minute	Set the time when the first-level password is checked through
C2.41	Effective time of second-level password unlocking	1～273	Minute	Set the time when the second-level password is checked through
C2.42	Effective time of third-level password unlocking	1～273	Minute	Set the time when the third-level password is checked through
C2.43	Test run time interval	0～30000	Second	Set the interval between two runs at random/floor by floor running.
C2.44	Parking of lift start time	00.00～23.59	Hour, minute	Set the (no-service) parking start time every day
C2.45	Parking of lift finish time	00.00～23.59	Hour, minute	Set the (no-service) parking finish time every day
C2.46	Start time of only down calls response (1)	00.00～23.59	Hour, minute	Set the start time of entering the only down calls response at regular time every day
C2.47	End time of only down calls response (1)	00.00～23.59	Hour, minute	Set the end time of entering the only down calls response at regular time every day
C2.48	Start time of only down calls response (2)	00.00～23.59	Hour, minute	Set the start time of entering the only down calls response at regular time every day
C2.49	End time of only down calls response (2)	00.00～23.59	Hour, minute	Set the end time of entering the only down calls response at regular time every day
C2.50	Door light curtain or touch panel signal valid duration is timeout, buzzer sounds	0 ～ 1800	Second	The time length to remind the buzzer that the light screen or touch panel are blocked. Whether the buzzer rings after the time arrives is also affected by C1.48 Bit0.
C2.51	Automatic detection period of tractor-braking torque	0～120	Day	No automatic detection of braking torque is carried out when it is set to 0.

Function code	Function definition	Setting scope	Remarks	Functional specification
C2.52	Time-sharing control of night security floor	0～65535		Using binary bit corresponding time control, please convert the binary number to decimal and then fill in. Bit0: 00:00~00:59night security floor valid Bit1: 01:00~01:59night security floor valid Bit2: 02:00~02:59night security floor valid Bit3: 03:00~03:59night security floor valid Bit4: 04:00~04:59night security floor valid Bit5: 05:00~05:59night security floor valid Bit6: 06:00~06:59night security floor valid Bit7: 07:00~07:59night security floor valid Bit8: 20:00~20:59night security floor valid Bit9: 21:00~21:59night security floor valid Bit10: 22:00~22:59night security floor valid Bit11: 23:00~23:59night security floor valid Bit12~Bit15: Reserved If all 16-bit binary bits are 0 (i.e. fill in 0), the night security floor time-sharing control function will not be enabled.
C2.53	Specific control of arrival light/bell	0000 ～ 9999		The upper two digits are the speed threshold (m/min) and the lower two digits are the continuous time. The two higher digits indicate the speed drops below this value, and the two lower digits indicate how long the ring/light will last(in 40ms), and if the two lower digits are 0, the ring/light will last until the elevator door closes (the end of door opening).
C2.54	Door opening/closing test interval	0～2400	Second	P3.20. Door opening/closing test interval
C2.55	Start-up delay time of power failure emergency service	1～60	Second	The time interval between the completed power on from backup battery control cabinet and elevator start-up self-rectifying to level operation.
C2.56	Limitation of automatic barke-loosing rectifying time of duration.	20~300	Second	If timeout, but it does not reach the leveling floor, the automatic barke-loosing will be terminated (turning to power failure emergency service or waiting for manual rectifying).
C2.57	Unlocking duration of electric plug-in lock of manual door	1～60	Second	

Function code	Function definition	Setting scope	Remarks	Functional specification
C2.58	Slowly withdraw the torque of the motor when stopping	0 ～ 1000	Millisecond	Please set this value in multiples of 40.
C2.59	Length of time for UCMP board to short-circuit door lock during normal door opening	0～20000	Millisecond	For door lock short-circuit detection, please set it as an integral multiple of 40ms. It requires C2.59>C2.60>C2.61.
C2.60	The time interval between the front and rear doors of the through door opening.	0～20000	Millisecond	The rear door will not open until the front door is opened for a period of time (C2.60). Please set it as an integral multiple of 40ms.
C2.61	Er4.15 Judgment time	0～8000	Millisecond	Please set it as an integral multiple of 40ms.
C2.62~C2.99	Reserved			

9.1.4 Floor display: P4C3

ACE1000 system internal and external call digital display content is the same.

Function Code	Definition	DEC Setting scope	Default value
C3.00	1st floor lattice display	0～65535	1
C3.01	2rd floor lattice display	0～65535	2
C3.02	3rd floor lattice display	0～65535	3
C3.03	4th floor lattice display	0～65535	4
C3.04	5th floor lattice display	0～65535	5
C3.05	6th floor lattice display	0～65535	6
C3.06	7th floor lattice display	0～65535	7
C3.07	8th floor lattice display	0～65535	8
C3.08	9th floor lattice display	0～65535	9
C3.09	10th floor lattice display	0～65535	256
C3.10	11th floor lattice display	0～65535	257
C3.11	12th floor lattice display	0～65535	258
C3.12	13th floor lattice display	0～65535	259
C3.13	14th floor lattice display	0～65535	260
C3.14	15th floor lattice display	0～65535	261
C3.15	16th floor lattice display	0～65535	262
C3.16	17th floor lattice display	0～65535	263
C3.17	18th floor lattice display	0～65535	264
C3.18	19th floor lattice display	0～65535	265
C3.19	20th floor lattice display	0～65535	512
C3.20	21th floor lattice display	0～65535	513
C3.21	22th floor lattice display	0～65535	514
C3.22	23th floor lattice display	0～65535	515
C3.23	24th floor lattice display	0～65535	516
C3.24	25th floor lattice display	0～65535	517
C3.25	26th floor lattice display	0～65535	518
C3.26	27th floor lattice display	0～65535	519
C3.27	28th floor lattice display	0～65535	520
C3.28	29th floor lattice display	0～65535	521
C3.29	30th floor lattice display	0～65535	768
C3.30	31th floor lattice display	0～65535	769

Function Code	Definition	DEC Setting scope	Default value
C3.31	32th floor lattice display	0～65535	770
C3.32	33th floor lattice display	0～65535	771
C3.33	34th floor lattice display	0～65535	772
C3.34	35th floor lattice display	0～65535	773
C3.35	36th floor lattice display	0～65535	774
C3.36	37th floor lattice display	0～65535	775
C3.37	38th floor lattice display	0～65535	776
C3.38	39th floor lattice display	0～65535	777
C3.39	40th floor lattice display	0～65535	1024
C3.40	41th floor lattice display	0～65535	1025
C3.41	42th floor lattice display	0～65535	1026
C3.42	43th floor lattice display	0～65535	1027
C3.43	44th floor lattice display	0～65535	1028
C3.44	45th floor lattice display	0～65535	1029
C3.45	46th floor lattice display	0～65535	1030
C3.46	47th floor lattice display	0～65535	1031
C3.47	48th floor lattice display	0～65535	1032
C3.48~54	Custom font L1~7 (standard digital display)	0～65535	0
C3.55~70	Custom font R0~15 (16×32 lattice)	0～65535	0
C3.71~99	Reserved	0～65535	0

9.1.5 Internal and external digital display code table

Display content	Tens (High bit)	Ones(Low bit)	Setting value	Display content	Tens (High bit)	Ones(Low bit)	Setting value
0	0	0	0	M0	22	0	5632
1	0	1	1	M1	22	1	5633
2	0	2	2	M2	22	2	5634
3	0	3	3	M3	22	3	5635
4	0	4	4	M4	22	4	5636
5	0	5	5	M5	22	5	5637
6	0	6	6	M6	22	6	5638
7	0	7	7	M7	22	7	5639
8	0	8	8	M8	22	8	5640
9	0	9	9	M9	22	9	5641
10	1	0	256	B0	11	0	2816
11	1	1	257	B1	11	1	2817
12	1	2	258	B2	11	2	2818
13	1	3	259	B3	11	3	2819
14	1	4	260	B4	11	4	2820
15	1	5	261	B5	11	5	2821
16	1	6	262	B6	11	6	2822
17	1	7	263	B7	11	7	2823
18	1	8	264	B8	11	8	2824
19	1	9	265	B9	11	9	2825
20	2	0	512	H0	17	0	4352
21	2	1	513	H1	17	1	4353
22	2	2	514	H2	17	2	4354
23	2	3	515	H3	17	3	4355
24	2	4	516	H4	17	4	4356
25	2	5	517	H5	17	5	4357
26	2	6	518	H6	17	6	4358
27	2	7	519	H7	17	7	4359

Display content	Tens (High bit)	Ones(Low bit)	Setting value	Display content	Tens (High bit)	Ones(Low bit)	Setting value
28	2	8	520	H8	17	8	4360
29	2	9	521	H9	17	9	4361
30	3	0	768	P0	25	0	6400
31	3	1	769	P1	25	1	6401
32	3	2	770	P2	25	2	6402
33	3	3	771	P3	25	3	6403
34	3	4	772	P4	25	4	6404
35	3	5	773	P5	25	5	6405
36	3	6	774	P6	25	6	6406
37	3	7	775	P7	25	7	6407
38	3	8	776	P8	25	8	6408
39	3	9	777	P9	25	9	6409
40	4	0	1024	R0	27	0	6912
41	4	1	1025	R1	27	1	6913
42	4	2	1026	R2	27	2	6914
43	4	3	1027	R3	27	3	6915
44	4	4	1028	R4	27	4	6916
45	4	5	1029	R5	27	5	6917
46	4	6	1030	R6	27	6	6918
47	4	7	1031	R7	27	7	6919
48	4	8	1032	R8	27	8	6920
49	4	9	1033	R9	27	9	6921
-1	39	1	9985	1G	1	16	272
-2	39	2	9986	2G	2	16	528
-3	39	3	9987	3G	3	16	784
-4	39	4	9988	4G	4	16	1040
-5	39	5	9989	5G	5	16	1296
-6	39	6	9990	6G	6	16	1552
-7	39	7	9991	7G	7	16	1808
-8	39	8	9992	8G	8	16	2064
-9	39	9	9993	9G	9	16	2320
A	0	10	10	1F	1	15	271
B	0	11	11	2F	2	15	527
C	0	12	12	3F	3	15	783
D	0	13	13	4F	4	15	1039
E	0	14	14	5F	5	15	1295
F	0	15	15	6F	6	15	1551
G	0	16	16	7F	7	15	1807
H	0	17	17	8F	8	15	2063
I	0	18	18	9F	9	15	2319
J	0	19	19	1M	1	22	278
K	0	20	20	2M	2	22	534
L	0	21	21	3M	3	22	790
M	0	22	22	4M	4	22	1046
N	0	23	23	5M	5	22	1302
O	0	24	24	6M	6	22	1558
P	0	25	25	7M	7	22	1814
Q	0	26	26	8M	8	22	2070
R	0	27	27	9M	9	22	2326
S	0	28	28	17A	95	64	24384
T	0	29	29	17B	95	65	24385
U	0	30	30	17C	95	66	24386
V	0	31	31	17D	95	67	24387

Display content	Tens (High bit)	Ones(Low bit)	Setting value	Display content	Tens (High bit)	Ones(Low bit)	Setting value
W	0	32	32	17E	95	68	24388
X	0	33	33	17F	95	69	24389
Y	0	34	34	17G	95	70	24390
Z	0	35	35	23A	101	128	25984
3A	3	10	778	23B	101	129	25985
3B	3	11	779	23C	101	130	25986
3C	3	12	780	23D	101	131	25987
3D	3	13	781	23E	101	132	25988
3E	3	14	782	23F	101	133	25989
13A	91	64	23360	23G	101	134	25990
13B	91	65	23361	33A	111	128	28544
13C	91	66	23362	33B	111	129	28545
13D	91	67	23363	33C	111	130	28546
13E	91	68	23364	33D	111	131	28547
13F	91	69	23365	33E	111	132	28548
13G	91	70	23366	33F	111	133	28549
BG	11	16	2832	33G	111	134	28550
MG	22	16	5648	43A	121	128	31104
GG	16	16	4112	43B	121	129	31105
F0	15	0	3840	43C	121	130	31106
F1	15	1	3841	43D	121	131	31107
F2	15	2	3842	43E	121	132	31108
F3	15	3	3843	43F	121	133	31109
F4	15	4	3844	43G	121	134	31110
F5	15	5	3845				
F6	15	6	3846				
F7	15	7	3847				
F8	15	8	3848				
F9	15	9	3849				
G0	16	0	4096				
G1	16	1	4097				
G2	16	2	4098				
G3	16	3	4099				
G4	16	4	4100				
G5	16	5	4101				
G6	16	6	4102				
G7	16	7	4103				
G8	16	8	4104				
G9	16	9	4105				

Note: The internal and external call display of ACE1000 is unified. Please consult our technical support engineer for the special display content not listed in the table above.

9.1.6 Input/output terminal definition: P4C4

Function Code	Function Definition	Data scope	Remarks
C4.00	MCB X1 input port(110V)	0001:Safety circuit normally open input	AC/DC110V, dual CPU input, CPLD protection. (suspension/low level, high level)
C4.01	MCB X2 input port(110V)	0002:Car door lock/series door lock normally open input	
C4.02	MCB X3 input port(110V)	0003:Hall door lock normally open input 0097: Safety circuit section detection 0098:Auxiliary door lock short connection detection normally open input 0099:Main door lock short connection detection	

Function Code	Function Definition	Data scope	Remarks
		normally open input	
C4.03	MCB X4 input port	0004:Floor leveling normally open input 1004:Floor leveling normally close input	DC24V, daul CPU input, CPLD protection. (suspension/low level, high level)
C4.04	MCB X5 input port	1005:Upper direction limit normally close input	
C4.05	MCB X6 input port	1006:Lower direction limit normally close input	
C4.06	MCB X7 input port	1007:First upper forced deceleration normally close input	
C4.07	MCB X8 input port	1008:First lower forced deceleration normally close input	
C4.08	MCB X9 input port	1000:Unused 1009:Second upper forced deceleration normally close input	
C4.09	MCB X10 input port	1000:Unused 1010:Second lower forced deceleration normally close input	
C4.10	MCB X11 input port	1000:Unused 1011:Third upper forced deceleration normally close input(reserved)	
C4.11	MCB X12 input port	1000:Unused 1012:Third lower forced deceleration normally close input(reserved)	
C4.12	MCB X13 input port	0000:Unused 0013:Upper inching normally open input 1013:Upper inching normally close input	
C4.13	MCB X14 input port	0000:Unused 0014:Lower inching normally open input 1014:Lower inching normally close input	
C4.14	MCB X15 input port	0015:Feedback of main contactor normally open input 1015:Feedback of main contactor normally close input	
C4.15	MCB X16 input port	0016:Feedback of brake 1 normally open input 1016:Feedback of brake 1 normally close input When the two brakes (left and right) feedback switches are used in series, it is connected here.	
C4.16	MCB X17 input port	0000:Unused 0017/1017:Feedback of brake 2 0018/1018:Upper door area signal 0019/1019:Lower door area signal 0020/1020:Main door opening area 0021/1021:Auxiliary door opening area 0022/1022:Feedback of safety relay 0023/1023:Feedback of main brake-holding contactor 1 0024/1024:Star-delta contactor feedback 0025/1025:Feedback of strong excitation brake contactor 0026/1026:Redundant feedback of hall lock 0027/1027:Redundant feedback of car door 0028/1028:Virtual door-closing output feedback(for Inching) 0029/1029:Power failure emergency service request 0030/1030:Earthquake control mode 1031:Machine-Room-Less maintenance mode	DC24V, single CPU input.(suspension/low level, high level)
C4.17	MCB X18 input port		
C4.18	MCB X19 input port		
C4.19	MCB X20 input port		

Function Code	Function Definition	Data scope	Remarks
C4.20	MCB X21 input port	input 0032:Machine-Room-Less maintenance mode upward-run input 0033:Machine-Room-Less maintenance mode downward-run input 1034:Car roof maintenance mode input 0035:Car roof maintenance mode upward-run input 0036:Car roof maintenance mode downward-run input 1037:Car maintenance mode input 1038:Overload input 0039/1039:Fire fighter operation,can return to the home landing and then perform firefighter operation (in the car) 0040/1040:Fire fighting control——Can return to the home landing only 0041/1041:Main door opening input 0042/1042:Main door closing input 0043/1043:Main door safety touch-panel. It is recommended to use normally closed 0044/1044:Main door light curtain input 0045/1045:Main door machine over-torque input 0046/1046:Main door opening limit input 0047/1047:Main door closing limit input 0048/1048:Auxiliary door opening input 0049/1049:Auxiliary door closing input 0050/1050:Auxiliary door safety touch-panel input. It is recommended to use normally closed 0051/1051:Auxiliary door light curtain input 0052/1052:Auxiliary door machine over-torque input 0053/1053:Auxiliary door opening limit input 0054/1054:Auxiliary door closing limit input 0055/1055:Prolonged main door-opening input 0056/1056:Light load input 0057/1057:Full load input 0058/1058:Parking of lift input 0059/1059:Need no service floors input 0060/1060:Independent running input 0061/1061:VIP user input 0062/1062:Lift attendant operation input 0063/1063:Lift attendant reversing(goes up and down) 0064/1064:Lift attendant starting up(can replace by door closing input) 0065/1065:Lift attendant straight going input 0066/1066:Lift attendant upward run 0067/1067:Lift attendant downward run 0068/1068:Car roof main door closing 0069/1069:Door machine self-checking 0070/1070:Tractor motor overheating 0071/1071:On duty peak hours input 0072/1072:Off duty peak hours input 0073/1073:Only up calls response input	
C4.21	MCB X22 input port		
C4.22	MCB X23 input port		
C4.23	MCB X24 input port		
C4.24	MCB X25 input port		
C4.25	MCB X26 input port		
C4.26	MCB X27 input port		
C4.27	MCB X28 input port		
C4.28	MCB X29 input port		
C4.29	MCB X30 input port		
C4.30	MCB X31 input port		
C4.31	MCB X32 input port(Extended)		
C4.32	MCB X33 input port(Extended)		

Function Code	Function Definition	Data scope	Remarks
C4.33	MCB X34 input port(Extended)	0074/1074:Only down calls response input 0075/1075:Unintended car movement detection 0076/1076:Phase order protection 0077/1077:Safety circuit redundant contactor 0078/1078:Door-lock bypassed input 0079/1079:Upper and lower door areas in series input 0080/1080:Night security floor input 0081/1081:Prolonged auxiliary door-opening input 0082/1082:Automatic brake-loosing rectifying feedback 0083/1083:Altering fireman home landing Car alarm bell input 0084/1084:Alarm bell input in elevator car 0085/1085:Electric lock feedback input 0086/1086:Feedback input of electromagnetic door knife 0087/1087:Upper inching input 2 0088/1088:Lower inching input 2 0089/1089:Feedback of main brake-holding contactor 2 0090/1090: Overheating of external devices (braking resistance, etc.) 0091/1091: Holding brake coil short circuit 0092/1092:Car lighting and fan switch 0093/1093～0096/1096:Reserved	
C4.34	MCB X35 input port(Extended)		
C4.35	MCB X36 input port(Extended)		
C4.36	MCB X37 input port(Extended)		
C4.37	MCB X38 input port(Extended)		
C4.38	MCB X39 input port(Extended)		
C4.39	MCB X40 input port(110V)	0:Unused 0097:Safety circuit section detection 0098:Auxiliary door lock short connection detection normally open input 0099:Main door lock short connection detection normally open input	
C4.40	MCB X41 input port(Reserved)	Unused	Unavailable
C4.41	MCB X42 input port(Reserved)	Unused	Unavailable
C4.42	Car roof board X1 input port/X43	0000:Unused 1034:Car roof maintenance mode input 0035:Car roof maintenance mode upward-run input 0036:Car roof maintenance mode downward-run input 1037:Car maintenance mode input 1038:Overload input 0039/1039:Fire fighter operation,can return to the home landing and then perform firefighter operation (in the car) 0040/1040:Fire fighting control——Can return to the home landing only 0041/1041:Main door opening input 0042/1042:Main door closing input 0043/1043:Main door safety touch-panel. It is recommended to use normally closed 0044/1044:Main door light curtain input	DC24V. (suspension/low level, high level)
C4.43	Car roof board X2 input port/X44		
C4.44	Car roof board X3 input port/X45		
C4.45	Car roof board X4 input port/X46		
C4.46	Car roof board X5 input port/X47		
C4.47	Car roof board X6 input port/X48		
C4.48	Car roof board X7 input port/X49		
C4.49	Car roof board X8 input port/X50		

Function Code	Function Definition	Data scope	Remarks
C4.50	Car roof board X9 input port/X51(Reserved)	0045/1045:Main door machine over-torque input 0046/1046:Main door opening limit input 0047/1047:Main door closing limit input 0048/1048:Auxiliary door opening input 0049/1049:Auxiliary door closing input 0050/1050:Auxiliary door safety touch-panel input. It is recommended to use normally closed 0051/1051:Auxiliary door light curtain input 0052/1052:Auxiliary door machine over-torque input 0053/1053:Auxiliary door opening limit input 0054/1054:Auxiliary door closing limit input 0055/1055:Prolonged main door-opening input 0056/1056:Light load input 0057/1057:Full load input 0058/1058:Parking of lift input 0059/1059:Need no service floors input 0060/1060:Independent running input 0061/1061:VIP user input 0062/1062:Lift attendant operation input 0063/1063:Lift attendant reversing(goes up and down) 0064/1064:Lift attendant starting up(can replace by door closing input) 0065/1065:Lift attendant straight going input 0066/1066:Lift attendant upward run 0067/1067:Lift attendant downward run 0068/1068:Car roof main door closing 0069/1069:Door machine self-checking 0070/1070:Tractor motor overheating 0071/1071:On duty peak hours input 0072/1072:Off duty peak hours input 0073/1073:Only up calls response input 0074/1074:Only down calls response input 0075/1075:Unintended car movement detection 0076/1076:Phase order protection 0077/1077:Safety circuit redundant contactor 0078/1078:Door-lock bypassed input 0079/1079:Upper and lower door areas in series input 0080/1080:Night security floor input 0081/1081:Prolonged auxiliary door-opening input 0082/1082:Automatic brake-loosing rectifying feedback 0083/1083:Altering fireman home landing 0084/1084:Alarm bell input in elevator car 0085/1085:Electric lock feedback input 0086/1086:Feedback input of electromagnetic door knife 0087/1087:Upper inching input 2 0088/1088:Lower inching input 2 0089/1089:Feedback of main brake-holding contactor 2 0090/1090: Overheating of external devices (braking resistance, etc.)	Unavailable
C4.51	Car roof board X10 input port/X52(Reserved)		
C4.52	Car roof board X11 input port/X53(Reserved)		
C4.53	Car roof board X12 input port/X54(Reserved)		
C4.54	Car roof board X13 input port/X55		DC24V, (suspension/low level, high level)
C4.55	Car roof board X14 input port/X56		
C4.56	Car roof board X15 input port/X57		
C4.57	Car roof board X16 input port/X58		
C4.58	Car roof board X17 input port/X59		
C4.59	Car roof board X18 input port/X60		
C4.60	Car roof board X19 input port/X61		
C4.61	Car roof board X20 input port/X62		
C4.62	Car command board X4 input port/X63_F21		
C4.63	Car command board X5 input port/X64_F22		
C4.64	Car command board X6 input port/X65_F23		
C4.65	Car command board X7 input port/X66_F24		
C4.66	Car command board X8 input port/X67_F25		
C4.67	Car command board XX1 input port/X68		DC24V, (suspension/low level, high level)
C4.68	Car command board XX2 input port/X69		
C4.69	Car command board XX3 input port/X70		
C4.70	Car command board XX4 input port/X71		
C4.71	Command expansion board XK1 input port/X72		
C4.72	Command expansion board XK2 input port/X73		

Function Code	Function Definition	Data scope	Remarks
C4.73	Command expansion board XK3 input port/X74	0091/1091: Holding brake coil short circuit 0092/1092:Car lighting and fan switch 0093/1093～0096/1096:Reserved	
C4.74	Command expansion board input port/X75(Reserved)		
C4.75	MCB Y1 output port	0001:Main brake contactor driving output	Relay
C4.76	MCB Y2 output port	0002:Mian running contactor driving output	
C4.77	MCB Y3 output port	0000:Unused 0001:Main brake contactor driving output 0002:Mian running contactor driving output 0003: Safety relay driving output 0004:Strong excitation brake contactor output 0005:Star-delta contactor output 0006:Power failure emergency service operation output 0007: Virtual door-closing output (for Inching) 0008:Door machine power supply relay output 0009:Fire control confirmation signal output 0010:Main door leveling floor signal output 0011:Auxiliary door leveling floor signal output 0012:Main door opening signal output 0013:Main door closing signal output 0014:Auxiliary door opening signal output 0015:Auxiliary door closing signal output 0028:Elevator failure signal output 0029: Unintended car movement /hoist rope gripper control output 0030:Target floor relay output 0031:Hand-operated door lock output 0032:Elevator upward running 0033:Elevator downward running 0034:Car call for help output 0035:Automatic rectifying signal output 0036:Car sound and light alarm 0037:Control output of electromagnetic door knife 0038: Alarm filtering 0039～0040:Reserved	
C4.78	MCB Y4 output port		
C4.79	MCB Y5 output port		
C4.80	MCB Y6 output port		
C4.81	MCB Y7 output port(Extended)		
C4.82	MCB Y8 output port(Extended)		
C4.83	MCB Y9 output port(Extended)		
C4.84	MCB Y10 output port(Extended)		
C4.85	Car roof board Y1 output port/Y11	0025:Car lighting/fan output(AC220V)	Relay
C4.86	Car roof board Y2 output port/Y12	0000:Unused 0010:Main door leveling floor signal output 0011:Auxiliary door leveling floor signal output 0012:Main door opening signal output 0013:Main door closing signal output 0014:Auxiliary door opening signal output 0015:Auxiliary door closing signal output 0016:Main door opening light output 0017:Main door closing light output 0018:Auxiliary door opening light output 0019:Auxiliary door closing light output 0020:Prolonged door opening light output 0021:car buzzer/flash output 0022: Merged arriver bell ring/light output in car 0023:Voice broadcast direction output 0024:Voice broadcast floor output	
C4.87	Car roof board Y3 output port/Y13		
C4.88	Car roof board Y4 output port/Y14		
C4.89	Car roof board Y5 output port/Y15		
C4.90	Car roof board Y6 output port/Y16		
C4.91	Car roof board Y7 output port/Y17		
C4.92	Car roof board Y8 output port(Extened)/Y18		

Function Code	Function Definition	Data scope	Remarks
C4.93	Car roof board Y9 output port(Extened)/Y19	0025:Car lighting/fan output(AC220V) 0026:Upward arriver output in car 0027:Downward arriver output in car 0028:Elevator failure signal output 0029: Unintended car movement /hoist rope gripper control output 0030:Target floor relay output 0031:Hand-operated door lock output 0032:Elevator upward running 0033:Elevator downward running 0034:Car call for help output 0035:Automatic rectifying signal output 0036:Car sound and light alarm 0037:Control output of electromagnetic door knife 0038: Alarm filtering 0039～0040:Reserved	
C4.94	Car roof board Y10 output port(Extened)/Y20		
C4.95	Car roof board Y11 output port(Extened)/Y21		
C4.96	Command board Y1 output port/Y22		Electronic switch
C4.97	Command board Y2 output port/Y23		
C4.98	Command board Y3 output port/Y24		
C4.99	Command board Y4 output port/Y25		

Note_1: Normal open/close properties of signals are usually related to the hardware input and output modes of the circuit board itself.

Note_2: IN92 car lighting and fan switch are variable controlled by input counting. 0 – lighting on and fan on, 1 - lighting on and fan off, 2 - lighting off and fan on, 3 - lighting off and fan off, the cycle follows. Provided that Y11 and Y12 are defined as OUT25 car lighting fan output.

9.1.7 Other information of system: P4C5

Function Code	Function Definition	Data scope	Remarks
C5.00	MCB logic program version number	-	Read only
C5.01	MCB inverter program version number	-	Read only
C5.02	Elevator serial number-IDH	-	A level 3 password is required, and a level 2 password can only be set for the first time.
C5.03	Elevator serial number-IDM	-	A level 3 password is required, and a level 2 password can only be set for the first time.
C5.04	Elevator serial number-IDHL	-	A level 3 password is required, and a level 2 password can only be set for the first time.
C5.05	Total times of runs-H	-	Read only
C5.06	Total times of runs-L	-	Read only
C5.07	Total run time-H	-	Read only, hour
C5.08	Total run time-L	-	Read only, minute and second
C5.09	Total number of failures-H	-	Read only
C5.10	Total number of failures-L	-	Read only
C5.11	Level 1 password verification (control P1~P3 function)	0～0xFFFFF	If the password fails to pass the verification, “no_PS” and “00000” will be displayed alternately. Press the modify key (LEFT/RIGHT) to enter the corresponding level password, and then “PASS1/2/3” will be displayed after the verification.
C5.12	Level 2 password verification (control P4~P5 modification)	0～0xFFFFF	
C5.13	Level 3 password verification (control factory special features)	0～0xFFFFF	
C5.14	Level 1 password display and modification	0～0xFFFFF	The “no_ PS” is displayed when the corresponding level-1/2/3 password verification (C5.11/C5.12/C5.13) fails. After passing, the current level-1/2/3 password will be displayed, and then press the modify key
C5.15	Level 2 password display and modification	0～0xFFFFF	

Function Code	Function Definition	Data scope	Remarks
C5.16	Level 3 password display and modification	0～0xFFFFF	(LEFT/RIGHT) to enter a new password.
C5.17	Sum of program-L	-	Read only
C5.18	Sum of program-H	-	Read only
C5.19	Size of space occupied by specification parameter table	-	Read only
C5.20	Specification parameter variable address (low 16 bits)		Need a level 3 password to pass
C5.21	Contents in C5.20 address	0～0xFF	Need a level 3 password to pass
C5.22	Content in (C5.20+1) address	0～0xFF	Need a level 3 password to pass
C5.23	Date of last braking torque test	Month,date	Read only
C5.24	Start-up times of MCU		Read only
C5.25	Correction coefficient OF MCB real-time	0～0xFF	0x00:The MCB has accurate time and no correction is required. 0x10:The MCB is about 40 seconds slower every day. 0x20:The MCB is about 80 seconds slower every day. 0x30:The MCB is about 120 seconds slower every day. 0x40:The MCB is about 160 seconds slower every day. 0x50:The MCB is about 200 seconds slower every day. 0x60:The MCB is about 240 seconds slower every day. 0x70:The MCB is about 280 seconds slower every day. 0x7F:The MCB is about 320 seconds slower every day. ---------- Fast and slow dividing line---------- 0x80:The MCB is about 320 seconds faster every day. 0x90:The MCB is about 280 seconds slower every day. 0xA0:The MCB is about 240 seconds slower every day. 0xB0:The MCB is about 200 seconds slower every day. 0xC0:The MCB is about 160 seconds slower every day. 0xD0:The MCB is about 120 seconds slower every day. 0xE0:The MCB is about 80 seconds slower every day. 0xF0:The MCB is about 40 seconds slower every day. **Note:** The low bit is set to 0~F for fine tuning. This parameter must be re-powered to be valid after modification.
C5.26	Fault automatic reset counts		Execute P3_H00 to clear this number
C5.27	Software variable update date	0～0x99C31	The date of execution of “EEPASS” provided that the real-time has been set. Format: YY-M-DD.
C5.28～C5.45	Temporary calibration data of PC software for uploading/downloading specification and frequency conversion parameters	0～65535	Read only , do not save on power-off.
C5.46	Total system power-on time (hours)	0～99999	Record the total running time (life) of the main control system, and provide a strong basis for the overhaul of the system. Read only and save on power-off.
C5.47	MCB Y1 action times	0～99999	Corresponding to the times of brake contactor actions, it provides data support for maintenance.
C5.48	MCB Y2 action times	0～99999	Corresponding to the times of main running contactor actions, it provides data support for maintenance.
C5.49	MCB Y3 action times	0～99999	Provide data support for maintenance.
C5.50	MCB Y4 action times	0～99999	Provide data support for maintenance.
C5.51	MCB Y5 action times	0～99999	Provide data support for maintenance.

Function Code	Function Definition	Data scope	Remarks
C5.52	MCB Y6 action times	0～99999	Provide data support for maintenance.
C5.53	MCB Y1 action times	0～99999	Corresponding to the times of energy-saving relay (for car light and fan) actions, it provides data support for maintenance.
C5.54	MCB Y2 action times	0～99999	Provide data support for maintenance.
C5.55	MCB Y3 action times	0～99999	Provide data support for maintenance.
C5.56	MCB Y4 action times	0～99999	Provide data support for maintenance. C5.47～5.56 read only and save on power-off.
C5.57	P3.20 The times of failures in opening	0~65535	Door opening/closing test result
C5.58	P3.20 The times of failures in closing	0~65535	Door opening/closing test result
C5.59	P3.20 Total times of door opening/closing	0~65535	Door opening/closing test result
C5.60	P3.09 Total times of runs	0~65535	Current running test result
C5.61	Reasons for buzzer sounding in car-L	0～0xFFFF	Bit0: Close door 1; Bit1: Door touch panel is invalid; Bit2: Grade E fault; Bit3: Close door 2; Bit4: Overloaded; Bit5: Forced close door 1; Bit6: Forced close door 2; Bit7: End of the prolonged door open; Bit8: Parallel and group control forced close door; Bit9~15: Reserved.
C5.62	Reasons for buzzer sounding in car-M	0～0xFFFF	Bit0: Special mode Bit1: Self-rectifying mode Bit2: Overload + Fire Bit3: Maintenance + Fire Bit4: Power failure emergency service Bit5: Door light curtain blocked for a long time Bit6: Maintenance up/down running Bit7: Brake torque detection Bit8: Insufficient or overdue of braking torque test Bit9: Automatical faults reset Bit10: ACD state code changes Bit11: maintenance mode door opening/closing Bit12: Illegally pull the door Bit13: The hall and car door may be shorted disconnection Bit14: Door opening/closing test error Bit15: Grade-D fault correction before the leveling floor to open the door
C5.63	Reasons for buzzer sounding in car-H	0～0xFFFF	Bit0:Power failure emergency service mode opening door or Grade-A fault opening door Bit1: Power failure emergency service cabinet has just been powered. Bit2:Automatic brake loosing rectifying Bit3: Long press the closing door button to enter the inching door mode when opening the door. Bit4~15:Reserved
C5.64	Total time of battery discharge in power failure emergency service	0～9999	It is expressed in decimal notation and the unit is minute. It can be saved on power-off.

Function Code	Function Definition	Data scope	Remarks
C5.65	Last call help time in car (month,date)	0～9999	Two digital tubes each
C5.66	Last call help time in car (hour,minute)	0～9999	Two digital tubes each
C5.67	Last auto clear system fault time (month,date)	0～9999	Two digital tubes each (Includes intelligent active + call help in car)
C5.68	Last auto clear system fault time (hour,minute)	0～9999	Two digital tubes each (Includes intelligent active + call help in car)
C5.69	The first fault code in fault status continuous capture function.	0～999	Continuous status capture can be carried out for three different fault codes (for example, EA3.01 is set to 301, and only the first status will be captured if the fault occurs repeatedly). When the fault code set in P4C5.69～P4C5.71 occurs, the system will save the elevator status in 5 seconds before the fault to off-chip flash chip continuously, and the user can read out and analyze the data through the special serial port software provided by ALPHA company. After the capture, please execute P3H0 or power on again when you need to capture again.
C5.70	The second fault code in fault status continuous capture function.	0～999	
C5.71	The third fault code in fault status continuous capture function.	0～999	
C5.72	In-call communication protocol encryption.	0～1	If it is set to 1, it can't be turned off again. Please use it carefully.
C5.73	Time consumed by 2 ms task execution.	0～65535	Unit: ms
C5.74	Time consumed by 10 ms task execution.	0～65535	Unit: ms
C5.75	Time consumed by 40 ms task execution.	0～65535	Unit: ms
C5.76	Time consumed by 160 ms task execution.	0～65535	Unit: ms
C5.77	Time consumed by 500 ms task execution.	0～65535	Unit: ms
C5.78	2.5V voltage sampling value of main control board.	0～65535	
C5.79	AD sampling value of rope head weighing.	0～255	
C5.80	AD sampling value of the car weighing	0～255	
C5.81	Fault grade process test enable (by bit)	0～0xFFFF	Bit0: grade_A, Bit1: grade_B, Bit2: grade_C, Bit3: grade_D, Bit4: grade_E, Bit5: grade_F
C5.82～C5.99	Reserved		

9.2 Frequency conversion parameters: P5

9.2.1 Frequency conversion parameter table illustration

The words F×.×× means the No."××" function code of the group "×" in the function table. Such as "F1.02" is expressed as the No.02 function number of group 1: "rated current of frequency converter". Function codes are classified by groups. To view and modify the parameters of a function code, first find the corresponding group, and then find the function number in the group.

In the "Change" column of this menu:

"O"	Indicate that the parameter can be	"*"	Indicates actual detection or fixed parameters, and

	changed during operation.		cannot be changed.
"×"	Indicates that the parameter can not be changed during operation.	"—"	Indicate that the manufacturer has set or reserved parameters, and the user cannot change it.

- For the sake of safety, all frequency conversion parameters belonging to "O" are also required to be modified in the elevator stop state.
- **Important hint 1:** After moving the floor leveling plate or the forced deceleration switch, please re-learn the floor height of hoistway.
- **Important hint 2:** After modifying the following parameters, the floor height data may be automatically cleared by the system, please re-learn the floor height of hoistway.

F0.07	Traction wheel diameter D	F3.00	Encoder type
F0.08	Traction machine reduction ratio i	F3.01	Encoder pulse number
F0.09	Traction machine winding method r	F6.00	Total number of floors

9.2.2 Summary table of P5F×

F0 —Basic parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F0.00	User password(Reserved)	0～9999	1	0	○
F0.01	Command mode selection	0: Keyboard control mode 1: Elevator/distance control mode	1	1	×
F0.02	Keyboard control mode running speed	0.000～F5.00 (valid only when F0.01 = 0)	0.001m/s	0	○
F0.03	Running direction	0: Direction is consistent 1: Direction reversal	1	0	×
F0.04	Maximum output frequency	10.00Hz～60.00Hz	0.01Hz	50.00Hz	×
F0.05	Carrier frequency	6.0KHz～10.0KHz	0.1KHz	8.0KHz	×
F0.06	Input power supply phase number	1: single phase, 3: three phase	1	3	×
F0.07	Traction wheel diameter D	50～1000	1mm	400	×
F0.08	Traction machine speed reduction ratio i	1.0～50.0	0.1	1.0	×
F0.09	Traction machine winding method	1～5	1	2	×
F0.10	Traction machine mechanical parameter	Calculated according to MP=∏*D/(i*r)	0.1	Calculated value	*
F0.11	Parameter update control	0: no operation 1: Reserved 2: Reserved 3: Inverter parameters P5F4 ~ P5F8 restore the internal default value of the program.	1	0	×
F0.12	Software version number	0.000~9.999	0.001	1.000	*

F1 —Inverter parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F1.00	Inverter power	1.1Kw～45.0kW	0.1KW	11.0	×
F1.01	Inverter rated voltage	0～480V	1V	380	—
F1.02	Inverter rated current	0～75.0A	0.1A	25.5	—
F1.03	Automatic speed curve generation	0～1	1	1	×
F1.04	Direct floor leveling stop	0～1	1	0	×

Function Code	Function Name	Data scope	Smallest unit	Default	change
F1.05	DC Bus voltage correction	90.0～110.0%	0.1%	100.0%	—
F1.06	Output torque limitation	0.0%～200.0%	0.1%	180.0%	×
F1.07	No-load current lifting	0%～100%	1%	25%	×
F1.08	No-load frequency switching	0～50.0HZ	0.1 Hz	20.0Hz	×

F2 —Motor parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F2.00	Motor type	0: Asynchronous Motor 1: Permanent magnet synchronous motor	1	1	×
F2.01	Motor Power	2.2～37.0KW (Standard) After setting motor type and power, F2.02, F2.03, F2.09~F2.17 will automatically select the closest manufacturer setting value.	0.1KW	11	×
F2.02	Motor rated voltage	50～480V	1V	380	×
F2.03	Motor rated current	1.0～75.0A	0.1A	27.0	×
F2.04	Motor rated frequency	1.00Hz～120.00Hz	0.01Hz	28.00Hz	×
F2.05	Motor rated speed	1～3600r/min	1r/min	168r/min	×
F2.06	Motor pole pairs	Actually calculated by F2.04, F2.05	1	10	*
F2.07	Motor tuning (Synchronous motor pole angle learning) protection	0: Forbid F2.08 operation 1: Allow F2.08 operation	1	0	×
F2.08	Motor tuning selection	0: No operation 1: Static tuning 2: Dynamic tuning	1	0	×
F2.09	Straight-axis inductance	0.1～999.9mH	0.1mH	Adapted motor value	×
F2.10	Quadrature axis inductance	0.1～999.9mH	0.1mH	Adapted motor value	×
F2.11	Back EMF	1～400V	1V	Adapted motor value	×
F2.12	Stator resistance	0.001～9.999 Ohm	0.001 Ohm	Adapted motor value	×
F2.13	Stator inductance	0.1～999.9mH	0.1mH	Adapted motor value	×
F2.14	Rotor resistance	0.001～9.999 Ohm	0.001 Ohm	Adapted motor value	×
F2.15	Rotor inductance	0.1～999.9mH	0.1mH	Adapted motor value	×
F2.16	Mutual inductance	0.1～999.9mH	0.1mH	Adapted motor value	×
F2.17	No-load excitation current	0～75.0A	0.1A	Adapted motor	×

Function Code	Function Name	Data scope	Smallest unit	Default	change
				value	

F3 —Encoder parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F3.00	Encoder type	0：Incremental encoder with UVW 1：SinCos encoder	1	1	×
F3.01	Encoder pulse number	500～9999	1	2048	×
F3.02	Encoder running direction reversal	0: Direction is consistent 1: Direction reversal	1	0	×
F3.03	Encoder pole angle	0～359.9°, calculated after motor tuning	0.1	0	×
F3.04	Reserved	0～4096	1	0	×
F3.05	Floor height divider coefficient	0～4096	1	Calculated value	*

F4 —Vector control parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F4.00	Upward-running low speed proportion	0～9.999	0.001	0.800	○
F4.01	Upward-running low speed integral	0～0.999	0.001	0.600	○
F4.02	Upward-running high speed proportion	0～9.999	0.001	0.800	○
F4.03	Upward-running high speed integral	0～0.999	0.001	0.600	○
F4.04	Downward-running low speed proportion	0～9.999	0.001	0.800	○
F4.05	Downward-running low speed integral	0～0.999	0.001	0.600	○
F4.06	Downward-running high speed proportion	0～9.999	0.001	0.800	○
F4.07	Downward-running high speed integral	0～0.999	0.001	0.600	○
F4.08	Low speed switching frequency	0.00～60.00Hz	0.01Hz	8.00Hz	×
F4.09	High speed switching frequency	0.00～60.00Hz	0.01Hz	20.00Hz	×
F4.10	Speed feedforward parameter	0～0.200	0.001	0.100	×
F4.11	Torque current proportion	0～0.999	0.001	0.100	○
F4.12	Torque current integral	0～0.999	0.001	0.050	○
F4.13	Excitation current proportion	0～0.999	0.001	0.100	○
F4.14	Excitation current integral	0～0.999	0.001	0.050	○

F5 —Speed parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F5.00	Elevator rated speed	0.250～3.000m/s (affected by F0.04, F0.10, F2.04 and F2.05)	0.001m/s	1.500m/s	×
F5.01	Curve 1 maximum speed	0～F5.00	0.1m/s	0.250	×
F5.02	Curve 2 maximum speed	0～F5.00	0.1m/s	0.500	×
F5.03	Curve 3 maximum speed	0～F5.00	0.1m/s	0.750	×
F5.04	Curve 4 maximum speed	0～F5.00	0.1m/s	1.000	×

F5.05	Curve 5 maximum speed	0～F5.00	0.1m/s	1.500	×
F5.06	Acceleration	0.200～1.000 m/s^2	0.001m/s^2	0.600 m/s^2	×
F5.07	Start-up JERK (the time rate of change of acceleration)	0.200～1.000 m/s^3	0.001m/s^3	0.400 m/s^3	×
F5.08	End JERK (the time rate of change of acceleration)	0.200～1.000 m/s^3	0.001m/s^3	0.350 m/s^3	×
F5.09	Deceleration	0.200～1.000 m/s^2	0.001m/s^2	0.600 m/s^2	×
F5.10	Start-up JERK (the time rate of change of deceleration)	0.200～1.000 m/s^3	0.001m/s^3	0.350 m/s^3	×
F5.11	End JERK (the time rate of change of deceleration)	0.200～1.000 m/s^3	0.001m/s^3	0.400 m/s^3	×
F5.12	Stopping JERK (the time rate of change of deceleration)	0.200～1.000 m/s^3	0.001m/s^3	0.350 m/s^3	×
F5.13	Crawl speed	0.020～0.300 m/s	0.001m/s	0.175 m/s	×
F5.14	Inching and re-leveling speed	0.010～0.050 m/s	0.001m/s	0.040 m/s	×
F5.15	Backup battery running speed	0.000～0.500 m/s	0.001m/s	0.100m/s	×
F5.16	Maintenance running speed	0.000～0.500 m/s	0.001m/s	0.250m/s	×
F5.17	First forced deceleration site speed percent	0～100.0%（*F5.00）	0.1%	90.0%	×
F5.18	Deceleration at first forced deceleration site	0.500～1.500 m/s^2	0.001m/s2	1.000m/s^2	×
F5.19	Second forced deceleration site speed percent	0～100.0%（*F5.00）	0.1%	97.0%	×
F5.20	Deceleration at second forced deceleration site	0.500～1.500 m/s^2	0.001m/s2	1.000m/s^2	×
F5.21	Third forced deceleration site speed percent	0～100.0%（*F5.00）	0.1%	97.0%	×
F5.22	Deceleration at third forced deceleration site	0.500～1.500 m/s^2	0.001m/s2	0.700 m/s^2	×

F6 —Hoistway parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F6.00	Total number of floors	2～48	1	15	×
F6.01	Level accuracy fine-tuning	0～40	1mm	20	×
F6.02	Leveling plate length	30～500	1mm	125	×
F6.03	Leveling plate correction	0～500	1mm	0	×
F6.04	Stopping distance margin	0～60	1mm	10	×
F6.05	Stage number of forced deceleration	1～3	1	2	×
F6.06	First lower forced deceleration location	0～1999mm	1mm	Actual detection value	*
F6.07	Second lower forced deceleration location	0～3999mm	1mm	Actual detection value	*
F6.08	Third lower forced deceleration location	0～5999mm	1mm	Actual detection value	*
F6.09	First upper forced deceleration location	0～1999mm	1mm	Actual detectio	*

Function Code	Function Name	Data scope	Smallest unit	Default	change
				n value	
F6.10	Second upper forced deceleration location	0～3999mm	1mm	Actual detection value	*
F6.11	Third upper forced deceleration location	0～5999mm	1mm	Actual detection value	*
F6.12	Floor height 1	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.13	Floor height 2	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.14	Floor height 3	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.15	Floor height 4	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.16	Floor height 5	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.17	Floor height 6	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.18	Floor height 7	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.19	Floor height 8	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.20	Floor height 9	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.21	Floor height 10	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.22	Floor height 11	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.23	Floor height 12	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.24	Floor height 13	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.25	Floor height 14	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.26	Floor height 15	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.27	Floor height 16	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.28	Floor height 17	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.29	Floor height 18	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.30	Floor height 19	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.31	Floor height 20	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.32	Floor height 21	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.33	Floor height 22	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.34	Floor height 23	0～60000, Pulses number has been	1	0	×

Function Code	Function Name	Data scope	Smallest unit	Default	change
		divided by divider coefficient			
F6.35	Floor height 24	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.36	Floor height 25	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.37	Floor height 26	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.38	Floor height 27	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.39	Floor height 28	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.40	Floor height 29	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.41	Floor height 30	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.42	Floor height 31	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.43	Floor height 32	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.44	Floor height 33	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.45	Floor height 34	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.46	Floor height 35	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.47	Floor height 36	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.48	Floor height 37	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.49	Floor height 38	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.50	Floor height 39	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.51	Floor height 40	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.52	Floor height 41	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.53	Floor height 42	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.54	Floor height 43	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.55	Floor height 44	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.56	Floor height 45	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.57	Floor height 46	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.58	Floor height 47	0～60000, Pulses number has been divided by divider coefficient	1	0	×
F6.59	Floor height sum check (H)	0～65535	1	0	*
F6.60	Floor height sum check (L)	0～65535	1	0	*

F7 —Start-up and stopping control parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F7.00	Starting zero speed time	0.000～3.000s	0.001s	0.800s	×
F7.01	Ending zero speed time	0.000～3.000s	0.001s	0s	×
F7.02	Start-up pre-torque selection	0: Pre-torque is invalid 1: Pre-torque with the weighing decice 2: Pre-torque without the weighing decice	1	0	×
F7.03	Elevator balance factor	40.0%～60.0%	0.1%	50.0%	×
F7.04	Compensation chain installation	0: Not installed 1: Installed	1	1	×
F7.05	Steel wire rope compensation gain	0～0.100	1	0.010	×
F7.06	Drive side gain	0～0.999	0.001	0.300	×
F7.07	Brake side gain	0～0.999	0.001	0.300	×
F7.08	Current proportion without the weighing decice	0～1.999	0.001	1.000	○
F7.09	Current integral without the weighing decice	0～0.199	0.001	0.040	○
F7.10	Speed proportion without the weighing decice	0～0.299	0.001	0.080	○
F7.11	Reserved	—	—	0	—
F7.12	Current car load display	0～255	1	0	*
F7.13	Car empty load setting	0～255	1	0	×
F7.14	Car full load setting	0～255	1	255	×

F8 —Detection and fault parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F8.00	Input phase shortage detection enablement	0，1 (0 means no fault detection)	1	1	○
F8.01	Output phase shortage detection enablement	0，1 (0 means no fault detection)	1	1	○
F8.02	IPM overheat protection enablement	0，1 (0 means no fault detection)	1	1	○
F8.03	Encoder fault protection enablement	0，1 (0 means no fault detection)	1	1	○
F8.04	Encoder fault detection time	0.0～5.0s	0.1s	2.0s	×
F8.05	Speed feedback filter coefficient	0～63	1	0	○
F8.06	Speed filter switching frequency	0～99.99	0.01 Hz	6.00	×
F8.07	Speed error detection width	1.0～20.0% (Elevator rated speed)	0.1%	15.0%	×
F8.08	Speed error detection time	0.100～5.000s	0.001s	1.000s	×
F8.09	Current detection circuit fault enablement	0, 1 (0 means no fault detection)	1	1	○
F8.10	Current feedback filter coefficient	2～32	1	2	×
F8.11	Motor overload protection enablement	0, 1 (0 means no fault detection)	1	1	○
F8.12	Motor overload protection coefficient	20.0～110.0% Set the action level (%) = motor rated current / inverter rated current × 100	0.1%	100.0%	○

Function Code	Function Name	Data scope	Smallest unit	Default	change
		Overload protection actual conversion current = sampling current / overload protection action level			
F8.13	Software overcurrent protection enablement	0, 1 (0 means no fault detection)	1	1	○
F8.14	Software overcurrent protection coefficient	20.0～200.0% Inverter rated current	0.1%	180.0%	○
F8.15	Bus overvoltage detection threshold	300～800	1V	750	○
F8.16	Bus undervoltage detection threshold	180～800	1V	410	○
F8.17	Reserved	—	—	0	—
F8.18	Reserved	—	—	0	—
F8.19	Last failure type (subcode)	0~40:(See fault codes and countermeasures for details)	1	0	*
F8.20	Last second failure type (subcode)	0~40:(See fault codes and countermeasures for details)	1	0	*
F8.21	Last third failure type (subcode)	0~40:(See fault codes and countermeasures for details)	1	0	*
F8.22	Running speed at last failure	0～4.000m/s	0.001m/s	0	*
F8.23	Actual current at the last fault	0.0～999.9A	0.1A	0.0	*
F8.24	Bus voltage at last fault	0～999V	1V	0	*

F9 —Display parameters

Function Code	Function Name	Data scope	Smallest unit	Default	change
F9.00	Running speed	0.000～4.000m/s	0.001m/s		*
F9.01	Output voltage	0～600V	1V		*
F9.02	Output current	0～200.0A	0.1A		*
F9.03	Output power	1～200%	1%		*
F9.04	Running speed	0~4000RPM	1RPM		*
F9.05	Output frequency	0～60.00Hz	0.01Hz		*
F9.06	Current floor	Current floor	1		*
F9.07	Current location	0～999.9m	0.1m		*
F9.08	DC bus voltage (V)	0～800V	1V		*
F9.09	Power module temperature at power-on	0～120.0℃	0.1℃		*
F9.10	Power module temperature	0～120.0℃	0.1℃		*
F9.11	Deceleration distance	0～99.99m	0.01m		*
F9.12	Forced deceleration distance	0～99.99m	0.01m		*
F9.13	Shortest running distance	0～99.99m	0.01m		*
F9.14	Elevator current location H	0~65535	1		*
F9.15	Elevator current location L	0~65535	1		*

F10 —Extended function parameter

Function Code	Function Name	Data scope	Smallest unit	Default	change
F10.00	Start-up crawl speed	0～5 (mm/s, recommend 2mm/s if necessary)	1mm/s	0	×
F10.01	Start-up crawl time	0～2000 (ms, recommend 1000ms if necessary)	1ms	0	×
F10.02	Cancel the slope torque reduction function	0, 1 (1 means that the slope torque reduction function is not used after	1	0	×

Function Code	Function Name	Data scope	Smallest unit	Default	change
		the brake is applied, and the PWM output is cut off immediately after stopping)			
F10.03	Reserved	0～9999	0		×
F10.04	Reserved	0～9999	0		×
F10.05	Reserved	0～9999	0		×
F10.06	Brake torque detection time	1～20	1 second	5	×
F10.07	Brake torque detection percentage	50～150	50%	120	×
F10.08	Pulse of rotation when braking torque is insufficient	1～10	1	1	×
F10.09	Angle of rotation when braking torque is insufficient	1～5	1° degree	1	×
F10.10	Brake torque test result	0～150	%	0	×
F10.11	Stopping JERK2 (the time rate of change of deceleration).	0.200～1.000 m/s^3 It is only used when the elevator goes down.	0.001m/s^3	0	×
F10.12	Current control in static studying of magnetic pole angle.	3～10 Only motors below 3.7KW need to set this parameter, which should be set to 0 in other cases.	1	0	×
F10.13	Reserved	0～9999	0		×
F10.14	Reserved	0～9999	0		×
F10.15	Reserved	0～9999	0		×

9.2.3 Basic parameters: P5F0

F0.00 User password (reserved)	Setting scope：0000～9999【0】

The system default F0.00 is 0000, that is, no user password. Change the F0.00 to a non-zero number to set the password. After encryption, the system requires verification of the user's password each time before modifying the function code. If you want to cancel the user password, you need to take two steps. First, enter the password correctly, and then enter 0000 as the password to cancel the user password.

F0.01 Command mode selection	Setting scope：0~1 【1】

Set how the driver accepts run commands (start, stop) and run speed commands.

0: Keyboard control mode

1: Elevator/Distance control mode

Keyboard control mode: On the one hand, it can receive on-board/easy portable keyboard control, and on the other hand, it can receive serial port control of LCD keyboard or PC.

Elevator/Distance control mode: According to the inernal and external call situation of the elevator, the running speed of ACE1000 is based on the principle of distance to achieve the accurate stopping of the elevator.

F0.02 Keyboard control mode running speed	Setting scope：0-rated speed【0】

This function only works when F0.01 = 0 (keyboard control mode). It defines the initial value of speed setting when the driver is controlled by keyboard. This function

code can be modified in operation to change the running speed. Once set up, it is stored in the EEPROM and saved on power off.

F0.03 Motor running direction	Setting scope：0、1 【0】

0: Direction is consistent

1: Direction reversal

This command is valid for all control modes. Modifying this function code can change the direction of motor running, but the encoder parameters P5F3 are not affected.

F0.04 Maximum output frequency	Setting scope：10.00 ～60.00Hz 【50.00Hz】

Set the maximum output frequency of the driver, which must be greater than the rated frequency of the motor.

F0.05 Carrier frequency	Setting scope：6.0～10.0KHz 【8.0KHz】

The carrier frequency is the pulse frequency at which the driver outputs the PWM wave. Correctly adjusting this parameter can reduce the motor noise, avoid the resonance of the mechanical system, reduce the leakage current of the output circuit wiring to the ground, and reduce the interference to the outside world.

The effect of carrier frequency on the motor:

Carrier frequency	Motor noise	Output current waveform	Leakage current	Interference
Low ~ high	Big ~ small	Bad ~good	Small ~ big	Small ~ big

When the carrier frequency is generally set above 6.0 KHz, silent operation can be achieved. It is recommended to operate at a lower carrier frequency within the noise tolerance. If the carrier frequency is greater than 8.0 KHz, the drive needs to be derated by 5% for every 1.0 KHz increase.

F0.06 Input power supply phase number	Setting scope：1，3 【3】

1: single phase

3: three phase

Note: After modifying the input power supply phase number F0.06, it is usually necessary to modify the F8.15 overvoltage threshold and the F8.16 undervoltage threshold.

F0.07 Traction wheel diameter D	Setting scope： 50～1000 【400mm】
F0.08 Traction machine reduction ratio i	Setting scope： 1.0～50.0 【1.0】
F0.09 Traction machine winding method r	Setting scope： 1～5 【2】
F0.10 Traction machine mechanical parameter	Actual calculated value 【*】

F0.10 is calculated according to the parameters of the traction machine set by F0.07~F0.09, which reflects the correspondence between elevator speed and motor rotating speed. The traction machine parameters must be set correctly or the actual speed of the elevator will be inconsistent with the set speed or danger may occur.

The calculation formula of the mechanical parameters of the traction machine is as follows:

$$F0.10 = \frac{\pi \times F0.07}{F0.08 \times F0.09}$$

The relationship between the mechanical parameters of the traction machine and the elevator speed is:

$$\text{elevator speed}(m/s) = \frac{\text{motor rotating speed}(rpm) \times F0.10}{60 \times 1000}$$

F0.11 Parameter update control	Setting scope：0、1、2、3 【0】

0: no operation

1: reserved

2: reserved

3: Inverter parameters P5F4 ~ P5F8 restore the internal default value of the program.

Note:

- After the above 1 to 3 operations are completed, the value of F0.11 is automatically restored to 0.
- The internal default value of the program is the test parameters provided by the program, not the factory default parameters set by the elevator manufacturer. The floor hoistway and speed parameters are usually inconsistent with the actual situation, so they can only be used after modification and self-learning according to the actual situation. **Please use this function carefully!**

F0.12 Software version number	Setting scope：0.000～9.999 【*】

F0.12 is used to display the software version number, which cannot be changed by the user.

9.2.4 Inverter parameters: P5F1

F1.00 Inverter power	Setting scope：2.2 kW～37.0kW【11.0 kW】
F1.01 Inverter rated voltage	Setting scope：0～480V【380V】
F1.02 Inverter rated current	Setting scope：0～75.0A【27A】

Please set F1.00 according to the inverter base. F1.01~F1.05 is automatically set to the factory default value according to F1.00, which is only for read-only viewing. Note: The value of F1.00 must be set correctly, otherwise it may cause abnormal operation.

F1.03 Automatic speed curve generation	Setting scope：0～1
F1.04 Direct floor leveling stop	Setting scope：0～1

Setting F1.03 to 1, it means that the system generates running curves by itself; when set to 0, it uses 6 curves set by F5.00 ~ F5.05.

Setting F1.04 to 1, the system adopts direct stopping at the floor leveling, no crawling section when stopping, F6.02 (leveling plate length) must be set correctly when direct stopping; F1.04 is set to 0, it is crawling stop, can be used F5.12 and F5.13 to adjust the leveling accuracy.

F1.06 Output torque limitation	Setting scope：0.0%～200.0%【180.0%】

The torque limit value F1.06 is the percentage of the rated current of the inverter. If the torque limit is 100%, the torque current limit is the rated current of the inverter.

If the adapted motor rated current is less than the inverter current, this value needs to be set smaller appropriately. For example, if the rated current of the inverter is 27A

and the matching motor current is 14A, if you want to limit the inverter output to 180% of the rated current of the motor, then F1.06=(14*1.80)/27=93.3%.

The larger the output torque, the larger the output current. Usually, the hardware overcurrent of the system is 230% of the rated current of the driver, and the output current is the Pythagorean of the output torque current and the excitation current. Excessive torque limitation may result in the system is prone to overcurrent faults; too small a torque limitation may cause the operating speed and acceleration/deceleration to deviate from the set value.

F1.07 No-load current lifting for Asynchronous motor	Setting scope：0%～100% 【25%】
F1.08 No-load frequency switching for Asynchronous motor	Setting scope：0.0～50.0HZ 【20.0】

F1.07 and F1.08 are parameters for asynchronous motors, which are used to boost the no-load current (F2.17) to enhance the load capacity of the inverter at low frequencies. After the no-load current is increased, the excitation current is F2.17 plus the lifting amount. The lifting amount is calculated as: when the frequency is 0, the lifting amount is F1.07, when the frequency is greater than or equal to F1.08, the lifting amount is 0, and the linear interpolation method is used when the frequency is between 0 and F1.08.

9.2.5 Motor parameters: P5F2

F2.00 Motor type (nameplate)	Setting scope：0、1【1】
F2.01 Motor Power(nameplate)	Setting scope：2.2～37.0kW 【11 kW】
F2.02 Motor rated voltage(nameplate)	Setting scope：10～480V 【313V】
F2.03 Motor rated current(nameplate)	Setting scope：1.0～200.0A 【27A】
F2.04 Motor rated frequency(nameplate)	Setting scope：1.00～60.00Hz 【28.00Hz】
F2.05 Motor rated speed(nameplate)	Setting scope：1～3600r/min 【168r/min】
F2.09 Straight-axis inductance(for synchronous machine)	Setting scope：0.1～999.9mH
F2.10 Quadrature axis inductance(for synchronous machine)	Setting scope：0.1～999.9mH
F2.11 Back EMF(for synchronous machine)	Setting scope：1～400V
F2.12 Stator resistance(for asynchronous and synchronous)	Setting scope：0.001～9.999 欧 ohm
F2.13 Stator inductance(for asynchronous machine)	Setting scope：0.1～999.9mH
F2.14 Rotor resistance(for asynchronous machine)	Setting scope：0.001～9.999 ohm
F2.15 Rotor inductance(for asynchronous machine)	Setting scope：0.1～999.9mH
F2.16 Mutual inductance(for asynchronous machine)	Setting scope：0.1～999.9mH
F2.17 No-load excitation current(for asynchronous machine)	Setting scope：0～75.0A

F2.00 motor type: 0-asynchronous motor; 1-permanent magnet synchronous motor.

Please set the parameters of F2.01~F2.05 correctly according to the nameplate of the traction machine. If the motor type and power are changed, the set value of the motor parameters of the F2 group will be automatically changed to the data of the three-phase standard motor. Please set/modify it manually based on this. If the difference between the adapted motor and the standard motor parameter is too large, it may affect the performance of the control system.

Among them, F2.09~F2.11 are only used for synchronous motor control; F2.13~F2.17 is only used for asynchronous motor control.

F2.06 Motor pole pairs	Actual calculated value 【*】

F2.06 is automatically calculated according to F2.04 and F2.05 and cannot be modified. It is only for users to check and proofread. If F2.06 does not match the actual pole pairs of the motor, please check if the values of F2.04 and F2.05 are set correctly.

F2.07 Motor tuning (Synchronous motor pole angle learning) protection	Setting scope：0、1
F2.08 Motor tuning selection	Setting scope：0、1、2

The motor can be parameter tuned by setting the F2.08 function code, but it is limited by the F2.07 function code. F2.08 can be set only when F2.07=1. Currently, the ACE1000 only supports static tuning of the synchronous motor (F2.00=1,F2.08=1) to obtain the magnetic pole angle (F3.03). For the specific tuning process, please refer to the relevant content in Chapter 7.

9.2.6 Encoder parameters: P5F3

F3.00 Encoder type	Setting scope： 0，1 【0】

This parameter is only for synchronous motors. The asynchronous machine uses ABZ differential photoelectric encoder by default. When the synchronous motor is equipped with UVW encoder or asynchronous machine, this value is set to 0; when the synchronous motor is equipped with SIN/COS encoder, this value is set to 1.

F3.01 Encoder pulse number	Setting scope： 500～9999 【8192】
F3.02 Encoder running direction reversal	Setting scope： 0，1 【0】

F3.01: Set the number of pulses per revolution of the encoder, according to the encoder nameplate. When using the ERN1387 SIN/COS encoder, this value is set to 2048. The encoder pulse number must be set correctly or the motor will not operate normally.

F3.02: Please confirm whether the direction represented by the wiring order of the driver output and the encoder A-B phase is consistent. If so, set F3.02 as "0". Otherwise, it is "1". Changing this parameter can easily adjust the wiring sequence of power output lines without rewiring. If this value is set incorrectly, the magnetic pole angle of the synchronous machine cannot be correctly learned and the motor cannot operate normally. This value has nothing to do with the motor running direction (F0.03).

After changing the parameters of F3.00~F3.02, please power up again to learn the motor magnetic pole angle and floor height data.

F3.03 Encoder pole angle (for synchronous machine)	Setting scope：0～359.9°【0】

After the synchronous motor is statically tuned, the inverter will automatically calculate this parameter and store it in the function code. The parameter is writable.

F3.05 Floor height divider coefficient	Actual calculated value 【*】

In order to prevent the number of floor recording pulses from overflowing during the self-learning operation, the ACE1000 calculates F3.05 according to F3.01 before self-learning. This parameter does not need to be changed by the user.

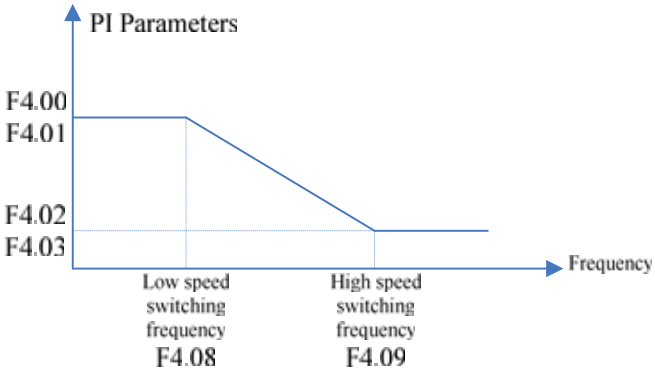
In the floor height self-learning process, if the actual number of pulses recorded in a certain floor is greater than 60000 after divided by F3.05, the ACE1000 will report a self-learning fault (EA1.33). At this time, the user needs to determine whether the maximum floor height (ie, the maximum distance between the two adjacent leveling plates) is greater than 10 meters. In the case of more than 10 meters, please add a

leveling plate in the middle then use the no-service skipping floor method(see P4C1.18~ P4C1.21 parameter).

9.2.7 Vector control parameter: P5F4

F4.00 Upward-running low speed proportion	Setting scope：0～9.999 【0.400】
F4.01 Upward-running low speed integral	Setting scope：0～0.999 【0.070】
F4.02 Upward-running high speed proportion	Setting scope：0～9.999 【0.300】
F4.03 Upward-running high speed integral	Setting scope：0～0.999 【0.070】
F4.04 Downward-running low speed proportion	Setting scope：0～9.999 【0.400】
F4.05 Downward-running low speed integral	Setting scope：0～0.999 【0.070】
F4.06 Downward-running high speed proportion	Setting scope：0～9.999 【0.300】
F4.07 Downward-running high speed integral	Setting scope：0～0.999 【0.070】
F4.08 Low speed switching frequency	Setting scope：0～60.00Hz 【0】
F4.09 High speed switching frequency	Setting scope：0～60.00Hz 【5.00Hz】

When the elevator is going up, F4.00 and F4.01 are the PI adjustment parameters when the running frequency is lower than F4.08, and F4.02 and F4.03 are the PI adjustment parameters when the running frequency is higher than F4.09. When the operating frequency is between F4.08 and F4.09, the PI adjustment parameters are weighted averages of F4.00, F4.01, and F4.02, F4.03. When both F4.08 and F4.09 are 0, only F4.02 and F4.03 are valid. As shown below:



PI parameter selection diagram

When the elevator goes down, the PI parameter selection is similar to that of the upward. By adjusting the PI parameters, the dynamic response characteristics of the system can be improved. To improve the dynamic response characteristics of the system, the proportional parameter and the integral parameter can be increased. However, if the proportional parameter and the integral parameter are too large, the system will be influenced.

Usually adjust the proportional parameter first, to ensure that the system does not oscillate, increase the proportional parameter as much as possible, and then increase the

integral parameter so that the system has both fast response characteristics and a little overshoot.

F4.10 Speed feedforward parameter	Setting scope：0～0.200 【0.100】

Properly setting F4.10 can improve speed following performance and improve ride comfort degree. Larger setting F4.00~F4.07 parameters can also improve speed followability, but may cause the system to oscillate and produce mechanical noise.

Whether F4.10 is set properly can be judged by observing whether there is speed overshoot. For example, the rated speed of the elevator is 1.500m/s. If F4.10 is too small, the maximum actual running speed observed through the keyboard may be 1.510m/s. This maximum speed only appears in the acceleration section to the uniform speed section. It will appear for a short period of time, then it will fall back quickly and stabilize to 1.500m/s. At this time, it needs to be slightly adjusted to F4.10 (recommended value is 0.01 each time), then run and observe again until the maximum overshoot speed is small. Generally, the rated speed is less than or equal to 1.500m/s, and the overshoot should be less than 0.005 (that is, the maximum speed value observed by keyboard is less than 1.505); the rated speed is less than 2.500m/s, and the overshoot should be less than 0.010; the rated speed is more than 2.500m/s, and overshoot should be less than 0.015.

F4.11 Torque current proportion	Setting scope：0～0.999 【0.100】
F4.12 Torque current integral	Setting scope：0～0.999 【0.050】
F4.13 Excitation current proportion	Setting scope：0～0.999 【0.100】
F4.14 Excitation current integral	Setting scope：0～0.999 【0.050】

F4.11 and F4.12 are PI regulator parameters for the torque-current loop. Increasing F4.11 or F4.12 can speed up the dynamic response of the system to the output torque; reducing F4.11 or F4.12 can enhance the stability of the system. If F4.11 or F4.12 is too large, the system will easily oscillate; if F4.11 or F4.12 is too small, the system torque output capability will be affected.

The effects of F4.13 and F4.14 are similar.

For most applications, it is not necessary to adjust the PI parameters of the current loop. It is recommended that users do not change these parameters freely.

9.2.8 Velocity parameters: P5F5

F5.00 Elevator rated speed	Setting scope: 0.250~Traction machine maximum speed【1.500m/s】

F5.00 refers to the rated speed on the elevator nameplate. The setting scope of elevator rated speed is:

0.250 ≤ F5.00 ≤ maximum speed of the traction machine, wherein the maximum speed of the traction machine is calculated as follows:

$$\text{maximum speed of the traction machine}(m/s) = \frac{F2.05 \times F0.10}{60 \times 1000}$$

In the case of meeting the speed curve distance requirement, the highest actual running speed of the elevator is the rated speed. All speed settings in the function code should be less than the rated speed of the elevator.

F5.01 Curve 1 maximum speed	Setting scope：0～F5.00 【0.250】
F5.02 Curve 2 maximum speed	Setting scope：0～F5.00 【0.500】

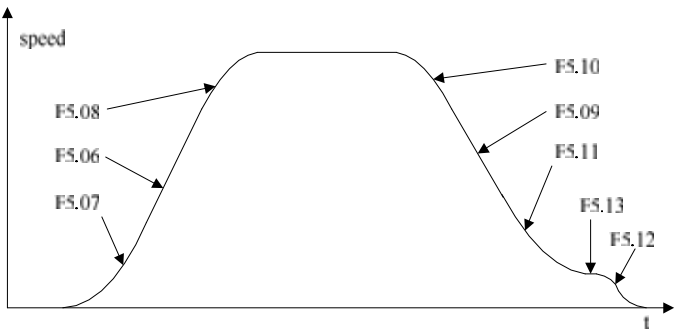
F5.03 Curve 3 maximum speed	Setting scope：0～F5.00 【0.750】
F5.04 Curve 4 maximum speed	Setting scope：0～F5.00 【1.000】
F5.05 Curve 5 maximum speed	Setting scope：0～F5.00 【1.500】

Set the running curve for elevator/distance control mode. When F1.03 is set to 0, we use F5.01~F5.05 to set the speed curve. Up to 6 curves can be set: F5.01~F5.05, F5.00 (requires gradual increase), where F5.00 defaults to the highest speed curve. When in elevator/distance control mode, the ACE1000 driver selects the optimal speed curve to run according to the running distance. The distance to the target floor is detected in real time during running, and the corresponding speed is controlled according to the distance, that is, the running speed is a function of the distance.

The minimum speed (F5.01) setting must be guaranteed: the shortest running distance (S) of the speed curve ≤ the minimum floor height. When the ultra-short floor cannot be serviced, please reduce F5.01~F5.05.

F5.06 Acceleration	Setting scope：0.200～1.000 m/s^2 【0.600】
F5.07 Start-up JERK (the time rate of change of acceleration)	Setting scope：0.200～1.000 m/s^3 【0.600】
F5.08 End JERK (the time rate of change of acceleration)	Setting scope：0.200～1.000 m/s^3 【0.350】
F5.09 Deceleration	Setting scope：0.200～1.000 m/s^2 【0.600】
F5.10 Start-up JERK (the time rate of change of deceleration)	Setting scope：0.200～1.000 m/s^3 【0.350】
F5.11 End JERK (the time rate of change of deceleration)	Setting scope：0.200～1.000 m/s^3 【0.600】
F5.12 Stopping JERK (the time rate of change of deceleration)	Setting scope：0.200～1.000 m/s^3 【0.350】
F5.13 Crawl speed	Setting scope：0.020～0.300 m/s 【0.150】

F5.06~F5.13 sets the "S shape" speed curve. The S curve can prevent the impact when the elevator starts and stops, increasing the comfort degree. The S curve setting is divided into acceleration, JERK (acceleration and deceleration) , deceleration, as shown in the following figure (when set to direct stop at floor level, the S curve does not have the curve segment composed of F5.13 and F5.12):



S curve diagram

When the acceleration and JERK acceleration parameter value increase, the S curve becomes steeper, and when the parameter value decreases, the S curve becomes slower; the deceleration section is the same.

Before the elevator stops, the elevator runs at a small distance at the crawl speed to eliminate the inaccurate factors of the leveling floor caused by the sliding of the steel

wire rope and the delay of the leveling floor signal. The stopping JERK is used when the crawl speed is falling to zero. When F1.04 is set to 0 (crawl speed stop), the leveling accuracy of the elevator can be adjusted through F5.13 and F5.12. For details, please refer to Chapter 7 for related content.

F5.14 Inching and re-leveling speed	Setting scope：0.000～0.050m/s 【0.040m/s】

F5.14 is used to set the speed of elevator when inching to re-level the floor.

F5.15 Backup battery running speed	Setting scope：0.000～0.100m/s 【0m/s】

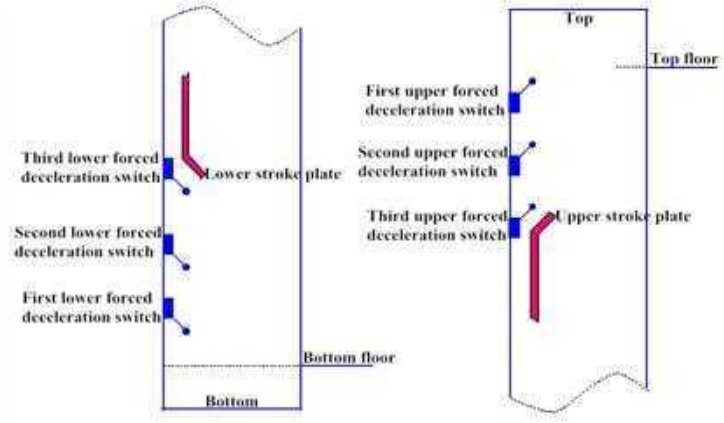
F5.15 sets the speed at which the elevator runs when the backup battery power supply is used (power faiure emergency service).

F5.16 Maintenance running speed	Setting scope：0.000～0.500m/s 【0.250m/s】

F5.16 sets the speed at which the elevator runs during maintenance operation.

F5.17 First forced deceleration site speed percent	Setting scope：0～100.0% Rated speed	【90.0%】
F5.18 Deceleration at first forced deceleration site	Setting scope：0.020～1.500m/s^2	【1.000m/s^2】
F5.19 Second forced deceleration site speed percent	Setting scope：0～100.0% Rated speed	【97.0%】
F5.20 Deceleration at second forced deceleration site	Setting scope：0.020～1.500m/s^2	【1.000m/s^2】
F5.21 Third forced deceleration site speed percent	Setting scope：0～100.0% Rated speed	【97.0%】
F5.22 Deceleration at third forced deceleration site	Setting scope：0.020～1.500m/s^2	【0.700m/s^2】

In the low-speed elevator, there is usually only one pair of forced deceleration switches, while the high-speed elevator may have two pairs or three pairs of forced deceleration switches to ensure the normal deceleration of the elevator. The corresponding positions when there are three forced deceleration switches are as follows:



Three forced deceleration switch diagram

The following is an elevator upward running, with three pairs of forced deceleration switches as an example to illustrate the upward forced deceleration process (the principle of downward forced deceleration is the same as it):

When the elevator approaches the top terminal station, the upper forced deceleration switch 3 first acts. At this time, if it is detected that the actual running speed of the elevator is greater than F5.21×F5.00, it indicates that the elevator is not

normally decelerating, and the elevator immediately operates deceleration according to F5.22. When the elevator continues to move up to the upper forced deceleration switch 2, if it is detected that the actual running speed of the elevator is less than F5.19×F5.00, operates F5.22 deceleration continually, otherwise decelerate with F5.20. When the elevator continues to go upward to the upper forced deceleration switch 1, if the elevator detects that the actual running speed is less than F5.17×F5.00, it will continually decelerate at the previous deceleration, otherwise it will operate F5.18 immediately then decelerate to F5.13 (crawl speed) to stop.

When setting the function code:

- F5.17 < F5.19 < F5.21 ;
- F5.18 > F5.20 > F5.22 .

In addition to the above functions for detecting according to the setting value, the ACE1000 system can automatically detect the speed when passing each forced deceleration switch, and judge whether the speed is abnormal according to the speed and the distance between forced deceleration switch and the terminal station (recorded during hoistway self-learning). If the speed is abnormal, the forced deceleration is performed at the deceleration set by F5.09 to prevent the elevator from being topped or bottomed.

☆Note: After the forced deceleration switch position is moved, please redo hoistway self-learning.

9.2.9 Hoistway parameters: P5F6

F6.00 Total number of floors(number of physical leveling plates)	Setting scope：2～48 【8】

The total number of floors refers to the number of floors from the bottom to the top (including the basement), that is the floor numbers of physical leveling plates. For example, a building with 2 underground floors, 20 floors above ground, and no skipping floor: F6.00=22.

F6.01 Level accuracy fine-tuning	Setting scope：0～40mm 【20mm】

F6.01 is valid only when F1.04 is set to 1 (direct stop at floor level). When the floor level is deficient, the value is slightly increased. When the floor level is overstepped, the value is slightly reduced. Users generally do not need to adjust this parameter.

F6.02 Leveling plate length	Setting scope：30～500mm 【125】

The length of the leveling plate shown in F6.02 is half of the actual length. It is automatically recorded during hoistway self-learning, and the user generally does not need to modify it (if the difference between value obtained from self-learning and the actual value is large, please set it to the actual value correctly). If it is a two-floor elevator system, please set this value correctly before the hoistway self-learning.

F6.03 Leveling plate correction	Setting scope：0～500mm 【0】

F6.03 is valid only when F1.04 is set to 0 (crawl speed stop). By adjusting this function code, the crawl speed (F5.13) can be reduced while ensuring the leveling accuracy and the comfort degree. Please refer to Chapter 7 for details.

F6.04 Stopping distance margin	Setting scope：0～60mm 【10】

F6.04 is valid only when F1.04 is set to 1 (direct stop at floor level). This parameter is used to compensate for the wire rope slip and position tracking error during deceleration and stop. If the car has obvious shake when entering the floor leveling area, please adjust this value appropriately. Users generally do not need to adjust this parameter.

F6.05 Stage number of forced deceleration (Pairs)	Setting scope：1～3 【2】

Please set F6.05 according to the actual force deceleration switch pairs of the hoistway before hoistway self-learning.

F6.06 First lower forced deceleration location	Actual detection value 【*】
…	…
F6.11 Third upper forced deceleration location	Actual detection value 【*】

The function code in the above table is used to store the position of the forced deceleration switch obtained during the self-learning of the hoistway, and the user does not need to change it. The position of the forced deceleration switch must meet the following requirements. If it is not met, please adjust the forced deceleration installation position according to this requirement and re-learn the floor height. The distance "S" between the forced deceleration switch and the end floor leveling plate must meet the following conditions:

$$F9.11 > S > \frac{V}{2a}$$

S: forced deceleration distance; V: elevator rated speed (F5.00); a: deceleration in forced deceleration (F5.18, F5.20, F5.22)

The forced deceleration distance "S" corresponding to different rated speeds is as follows:

Rated speed(m/s)	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	3.5	4
First forced deceleration switch distance(m)	0.4	0.4	0.4	0.7	1.0	1.5	2.0	2.0	2.0	2.0	2.0	2.0
Second forced deceleration switch distance(m)	non	non	non	non	non	non	non	2.5	4.0	4.0	4.0	4.0
Third forced deceleration switch distance(m)	non	non	non	non	non	non	non	non	non	6.0	8.0	11.0

Note:

- When the elevator runs to the terminal floor and passes through the level 1 forced deceleration position, if the elevator overspeed the elevator brake will immediately operate. In order to prevent the topping or bottoming, the brake mechanical delay should be calculated according to 0.4s. The deceleration after the brake is calculated according to 1.500 m/s^2. The calculated stopping distance need to be less than the first forced deceleration switch distance, and there must be a certain margin.
- The above table is calculated under the forced deceleration F5.18=F5.20=1.000m/s^2; the elevators in different configurations are slightly different, and the results in the table are for reference only.

F6.12 Floor height 1	Setting scope： 0～60000 【0】

F6.13 Floor height 2	Setting scope： 0～60000 【0】
…	…
F6.58 Floor height 47	Setting scope： 0～60000 【0】

The function code in the above table is used to store the value of the height pulse number of each floor divided by F3.05, and the unused floor will be cleared. The parameter values of F6.12~F6.58 are automatically recorded when the hoistway is self-learning, and the user is not allowed to modify it.

F6.59 Floor height sum check (H)	Setting scope： 0～65535 【*】
F6.60 Floor height sum check (L)	Setting scope： 0～65535 【*】

F6.59 and F6.60 are sum check for the floor height. If the checks are wrong and the data of floor heights are cleared, users need to re-learn the hoistway floor height.

9.2.10 Start-up and stop control parameter: P5F7

F7.00 Starting zero speed time	Setting scope：0.000～2.000s 【1】
F7.01 Ending zero speed time	Setting scope：0.000～2.000s 【0】

The starting zero speed time refers to the time from when the drive receives the running command to the start of the normal running speed S curve (the drive keeps running at zero speed during this time). If you use the non-weighing device start compensation function (ie, F7.02 is set to 2), please set F7.00 to be greater than 0.6s.

The ending zero speed time is the time that the drive continues to run at zero speed after the elevator runs to zero speed (stop).

In the zero speed stage, the traction machine can release the brake and the motor has already output force but does not rotate.

F7.02 Start-up pre-torque selection	Setting scope：0、1、2 【0】

Using the starting up with pre-torque function, the torque corresponding to the car load can be output in advance to relieve the starting shock. The ACE1000 supports pre-torque automatic compensation of no weighing sensor (including maintenance, self-rectifying, and normal start). At this time, it is best to use SIN/COS encoder.

0: Pre-torque is invalid. Do not use pre-torque function.

1: Pre-torque compensation uses the weighing sensor signal.

2: Pre-torque compensation do not use the weighing sensor, the system automatically performs pre-torque compensation according to the position of the car after the brake opened (during F7.00).

F7.03 Elevator balance factor	Setting scope：40.0%～60.0% 【50.0%】

The elevator balance factor F7.03 is the percentage of the rated load when the elevator car and the counterweight are balanced. When using the weighing signal for pre-torque compensation (ie, F7.02 is set to 1), the system determines whether the motor is operating in the braking or driving state based on the set value of F7.03 and the weighing sensor signal.

F7.04 Compensation chain installation	Setting scope：0、1 【1】
F7.05 Steel wire rope compensation gain	Setting scope：0～0.100 【0.010】

When F7.04 is equal to 0, it means that the compensation chain is not installed; when it is equal to 1, it means that the compensation chain is installed.

F7.05 sets the gain of the steel wire rope compensation when the compensation chain is not installed; the larger value the more compensation. When F7.04 is set to 1, F7.05 does not work.

F7.06 Drive side gain	Setting scope：0.000～0.999 【0.300】
F7.07 Brake side gain	Setting scope：0.000～0.999 【0.300】

F7.06 and F7.07 are torque gains when starting compensation using the weighing sensor signal, and are valid only when F7.02 is set to 1. Please refer to the relevant chapter for detailed instructions.

F7.08 Current proportion without the weighing decice	Setting scope：0.000～0.999 【1.000】
F7.09 Current integral without the weighing decice	Setting scope：0.000～0.999 【0.040】
F7.10 Speed proportion without the weighing decice	Setting scope：0.000～0.999 【0.060】

F7.08, F7.09, and F7.10 are PI parameters for automatic compensation of pre-torque without weighing sensor. They are valid only when F7.02 is set to 2. Please refer to the relevant chapter for detailed instructions.

F7.12 Current car load display	Setting scope：0～255 【*】
F7.13 Car empty load setting	Setting scope：0～255 【0】
F7.14 Car full load setting	Setting scope：0～255 【255】

F7.12 shows the value converted from car load weighing, read-only. Check that the F7.12 value is set to F7.13 in the no-load condition of the car as the car empty load setting; when the car is fully loaded, check that the F7.12 value and set to F7.14 as the car full load setting.

When F7.02 is set to 1, the percentage of the current load corresponding to the rated load of the car is calculated proportionally according to the values of F7.12, F7.13 and F7.14, and the starting compensation torque is calculated according to the setting values of F7.06 and F7.07.

9.2.11 Detection and fault parameter: P5F8

F8.00 Input phase shortage detection enablement	Setting scope：0、1 【1】
F8.01 Output phase shortage detection enablement	Setting scope：0、1 【1】
F8.02 IPM overheat protection enablement	Setting scope：0、1 【1】
F8.03 Encoder fault protection enablement	Setting scope：0、1 【1】

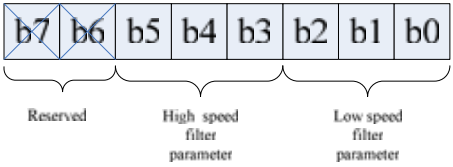
F8.00, F8.01, F8.02, and F8.03 respectively control whether the detection of EA1.08, EA1.09, EA1.11, and EA1.25 is enabled. Setting to 0 means that the fault detection is not performed.

F8.04 Encoder fault detection time	Setting scope：0.0～5.0s 【2.0】

Set the continuous detection time of encoder disconnection and encoder reverse fault.

F8.05 Speed feedback filter coefficient	Setting scope：0～63 【0】
F8.06 Speed filter switching frequency	Setting scope：0～99.99Hz 【6.00】

F8.05 is the filter coefficient for high speed and low speed feedback, as shown below:



High speed and low speed filter parameter respectively occupies a 3-bit binary.For example, high speed filtering needs 3 times, the corresponding binary number is “011B”, and the bits corresponding to the bit Bit5~Bit3 is "011"; the low speed filtering needs 1 time, and the corresponding bit Bit2~Bit0 is "001"; the entire 6-bit binary number "011001B" is converted to a decimal number of "25", which is the set value of F8.05.

F8.06 is used to set the switching point of high speed and low speed filtering.

F8.07 Speed error detection width	Setting scope：0.0%～20.0%【15%】
F8.08 Speed error detection time	Setting scope：0.100～5.000s【1.000】

F8.07 sets the width of the speed error detection, which is the percentage of the rated speed of the elevator. When the error between the given speed and the feedback speed exceeds the set value of F8.07, F8.08 starts counting, and when the timing is reached, the abnormal speed (EA1.34) is reported.

F8.09 Current detection circuit fault enablement	Setting scope：0、1 【1】

F8.09 controls whether the detection of EA1.19 is enabled. Setting to 0 means that the fault detection is not performed.

F8.10 Current feedback filter coefficient	Setting scope：2～32 【2】

The current feedback filter coefficient is used to filter the DC component after the current sampling operation to enhance the system anti-interference. Users generally do not need to modify.

F8.11 Motor overload protection enablement	Setting scope：0、1 【1】
F8.12 Motor overload protection coefficient	Setting scope：20.0%～110. 0%【100. 0%】

F8.11 controls whether motor overload protection is enabled. F8.12 sets the overload protection factor.

When the driver and motor have the same capacity (Power), the motor overload protection factor can be set to 100%. If the output current is less than 150% of the rated driver current, the motor overload is not protected.

When the driver capacity is larger, a reasonable motor overload protection factor should be set. The overload protection factor is determined by the following formula:

$$motor\ overload\ protection\ factor = \frac{motor\ rated\ current}{inverter\ rated\ current} \times 100\%$$

F8.13 Software overcurrent protection enablement	Setting scope：0、1 【1】
F8.14 Software overcurrent protection coefficient	Setting scope：20%～200% 【180%】

F8.13 controls whether the software overcurrent protection function of the inverter is enabled. When F8.13 is enabled, the current is greater than 1.8 times (F8.14) of the rated current of the inverter or the motor, and the duration exceeds 20 milliseconds, the software overcurrent fault is reported.

F8.15 DC Bus overvoltage detection threshold	Setting scope：300～800 【750】
F8.16 DC Bus undervoltage detection threshold	Setting scope：180～800 【420】

When the DC bus voltage detection value exceeds the range of F8.16 to F8.15, the bus undervoltage or overvoltage fault is reported. The default values of F8.15 and F8.16 are corresponding to the input power supply of three-phase AC380V; when the input power is single-phase AC220V and three-phase AC220V, F8.15 should be set to 400V, and F8.16 should be set to 200V.

F8.19 Last failure type (subcode)	Display only frequency conversion fault subcode 0~40, no "EA1."
F8.20 Last second failure type (subcode)	Display only frequency conversion fault subcode 0~40, no "EA1."
F8.21 Last third failure type (subcode)	Display only frequency conversion fault subcode 0~40, no "EA1."
F8.22 Running speed at last failure	m/s
F8.23 Actual current at the last fault	A
F8.24 DC Bus voltage at last fault	V

ACE1000 system can memorize the last three fault types (F8.19 ~F8.21) and the last fault running speed, current, and DC bus voltage even in the keyboard control mode. F8.19~F8.21 only display the fault subcode, and the fault grade and class number (EA1.XX) are not displayed. For details and troubleshooting methods, see the relevant sections.

9.2.12 Status display parameters: P5F9

F9.00	Running speed（m/s）【*】
F9.01	Output voltage（V）【*】
F9.02	Output current（A）【*】
F9.03	Output power（%）【*】
F9.04	Running speed（RPM）【*】
F9.05	Output frequency（Hz）【*】

F9.00~F9.05 are inverter/motor running status parameters.

F9.06 Current floor	Setting scope：1～48 【1】

F9.06 shows the current floor of the elevator. When the elevator is stopped, the current floor can be changed by keyboard or RS232 serial port. If the current floor is wrong, it is recommended that the user change F9.06 when the elevator is in the leveling position. If you change F9.06 between two floors (non floor leveling), you need to wait until the elevator runs to leveling to confirm that F9.06 is correct.

Note: When F9.06 is wrong, it is very dangerous to call the elevator!

F9.07	Current location（m）【*】
F9.08	DC bus voltage（V）【*】
F9.09	Power module temperature at power-on（℃）【*】
F9.10	Power module temperature（℃）【*】
F9.11	Deceleration distance（m）【*】
F9.12	Forced deceleration distance（m）【*】
F9.13	Shortest running distance（m）【*】
F9.14	Elevator current location H 0～65535 【*】
F9.15	Elevator current location L 0～65535 【*】

The current position (F9.07) refers to the distance of the car from the pit and is for reference only.

The deceleration distance (F9.11) is the minimum distance required for the elevator to decelerate from the rated speed in the presetting S-curve to zero speed. **F9.11 is used to guide the installation of the forced deceleration switch. It must be satisfied during installation: forced deceleration switch distance < deceleration distance (F9.11).** If the forced deceleration switch is installed outside the F9.11, it will cause the linear deceleration or even the triggering of safety logic to perform the brake immediately before decelerating according to the presetting S-curve.

The forced deceleration distance (F9.12) is the linear deceleration distance calculated from the forced deceleration 1 (F5.18).

The shortest running distance (F9.13) is the shortest running distance calculated by the F5.01 speed curve. When setting the speed curve, ensure that the minimum running distance is not greater than the minimum floor height, which is also related to the setting of F1.03.

F9.14 and F9.15 are used to indicate the current position of the elevator (represented by the number of pulses after frequency division). The method is as follows: the current position of the elevator = F9.14×65536 + F9.15.

9.2.13 Extended function parameters: P5F10

F10.00 Start-up crawl speed	Setting scope：0～5 mm/s【0】
F10.01 Start-up crawl time	Setting scope：0～2000ms【0】

In some elevator systems, due to the large difference between the static friction coefficient and the dynamic friction coefficient, when the elevator starts, there will be a sudden acceleration feeling (the friction system suddenly becomes smaller when the elevator system is switched from static friction to dynamic friction, resulting in overshoot of the speed). Set F10.00 and F10.01 correctly, give the elevator a very low crawl speed before the elevator runs, to overcome the static friction and reduce the feeling of acceleration. When it is necessary to set, it is recommended to set F10.00 to 2 mm/sec and F10.01 to 1000 ms.

If the feeling of sudden acceleration is not obvious at startup, it is recommended that both F10.00 and F10.01 are set to 0 to avoid increasing the start-up time or causing conflicts to report some faults.

F10.02 Cancel the slope torque reduction function	Setting scope：0～1【1】

Some traction machines, when the PWM output is suddenly cut off after the brake action, there will be obvious noise and vibration. At this time, it is necessary to use the slope torque reduction function of the motor, that is, after the brake action, slowly reduce the output current to a certain value, and then cut off PWM to eliminate noise and vibration. When this function is required, F10.02 is set to 0; when this function is not required, F10.02 is set to 1.

F10.06 Brake torque detection time	Setting scope：1～20 【5】
F10.07 Brake torque detection percentage	Setting scope：50～150【120】
F10.08 Pulse of rotation when braking torque is insufficient	Setting scope：1～10 【1】
F10.09 Angle of rotation when braking torque is insufficient	Setting scope：1～5 (°) 【1】
F10.10 Brake torque test result	Setting scope：0～150%【0】

F10.06~F10.10 is the control parameter for the synchronous traction machine brake torque detection.

F10.06 is the length of time for detecting the torque (unit: second, system test once in both directions)

F10.07 is the detection torque percentage of the rated torque;

F10.08 is judged to be insufficient brake torque when a specified number of pulses are detected;

F10.09 is judged to be insufficient brake torque when it detects that the motor shaft has rotated a specified angle;

F10.10 is the result of the brake test. If the number of pulses and the angle of rotation do not reach the values specified by F10.08 and F10.09, the result is given by F10.07, otherwise the result is 0. All results less than 80% will regard as unqualified.

Chapter 10: Fault diagnosis and countermeasure

10.1 Handling method and flow of elevator fault

10.1.1 Fault processing flow

（1） When the elevator is powered on, the MCU/DSP detects the input and output signals in each program running cycle, and judges whether the running state of the elevator is normal. When the fault condition is satisfied, the main control board determines that the elevator has a fault at this time, and generates a fault flag.

（2） The system converts the fault flag into an elevator fault code, and records the fault code and the running state of the elevator in EEPROM. The recorded fault code and running state include (fault information):

1. The fault grade, fault class, and subcode.
2. The time of elevator failure.
3. The status code (ACD code) and instructions of elevator failure.
4. The input and output status of the elevator failure.
5. The speed, output voltage, output current, DC bus voltage and output frequency of the elevator failure.
6. The current floor and advancing floor where the elevator is located when the failure happens.
7. The status of internal and external call registration of elevator failure.
8. The special debugging function of elevator failure.
9. Fault aided information is used to locate the fault source accurately, which may not record the same contents for different faults.

（3） According to the fault grade, the process is different handled. The elevator failures can divide into 7 grades and 8 classes.

- Fault classes include: 1-inverter, 2-control system, 3-safety circuit, 4-opening/closing door, 5- running abnormality, 6-external device, 7-communication abnormality, 8-special operation.
- Fault grades include: Grade-A, Grade-B, Grade-C, Grade-D, Grade-E, Grade-F, Grade-G.

（4） When abnormality occurs in the elevator, the corresponding protection function operates, and the onboard keyboard flashes to display the fault code (P0 mode only). If more than one fault occurs at the same time, all the current unhandled faults will be cyclically displayed.

10.1.2 Fault graduation

Fault grade	Processing method
Grade-A	The elevator stops immediately, the safety relay is disconnected, and all operations are prohibited.
Grade-B	The elevator stops immediately, the safety relay is disconnected, and re-closes after 3 seconds. Restart is prohibited. If the elevator stops at door area, the door can be opened.
Grade-C	The elevator stops immediately, the safety relay is disconnected, and re-closes after 3 seconds. Low speed self-rectifying running is allowed. After reaching the door area, the door open and prohibiting high speed running.

Grade-D	The elevator stops immediately if it is running at high speed. The safety relay is disconnected, and re-closes after 3 seconds. Then the car self-rectifies to terminal floor in low speed. After reaching the terminal floor, the door open and the elevator restore to normal state.
Grade-E	The elevator stops at the nearest floor if it is running at high speed, then processes as Grade-B faults.
Grade-F	Disconnect from parallel and group control, and record.
Grade-G	Record only.

When the elevator occur multiple faults at the same time, the fault handling graduation shall be the highest. When the elevator fails at A, B, C and D grades, the safety relay, main running contactor and brake contactor shall act immediately, and the elevator shall stop immediately. If the elevator fails at B, C and D grades, the safety relay will close again after release for 3 seconds. If the C grade fault occurs in the maintenance operation, the maintenance shall stop immediately, and 3 seconds later continued maintenance operation is allowed. If the elevator safety circuit is disconnected (EA3.01), the digital display at all halls will be off immediately (controlled by P4C1.51). If the elevator has a serial communication failure in the car or car roof, the normal running elevator will stop at the nearest floor, and then it can run at maintenance mode only.

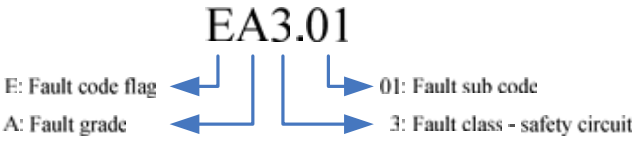
10.1.3 Fault clearing/resetting ways

The maintenance and removal methods of different faults are usually different. ACE1000 has the following four ways:

Mode Ⅰ	Fault condition disappears → fault clear
Mode Ⅱ	Fault condition disappears + manual clear → fault clear
Mode Ⅲ	Fault condition disappears + power on again → fault clear (eg. encoder fault)
Mode Ⅳ	Fault condition disappears + power on again + manual clear → fault clear (eg. UCMP fault)

10.1.4 Fault code description

The fault code of ACE1000 includes three types of information: fault grades, fault classes and fault sub code. The following is an example of "safety circuit fault-EA3.01":



When elevator fault occurs, the user can check it according to the following inverter fault table and logic fault table, and record the fault phenomena in detail. For technical support, please contact the manufacturer or agent.

10.2 Elevator inverter fault diagnosis and countermeasure

When exception occurrs in driver, the protection function acts, and the driver blockades the PWM output, then the fault code is displayed on the keyboard when in P0 mode. All possible types of frequency conversion faults in ACE1000 system are shown in the table below, and the display range of fault codes is EA1.01～EA1.40 (all inverter fault classified as Grade A Class 1 faults).

Fault code	Fault name	Possible reasons	countermeasures
EA1.01	Accelerated operating overcurrent	● Too much acceleration ● Low power suuply voltage ● Driver power is too low ● Driver short circuit to the ground	● Reducing acceleration ● Check the input power supply ● Change a driver with high power ● Check whether the driver is short-circuited to the ground
EA1.02	Decelerated operating overcurrent	● Too much deceleration ● Load inertia torque is too high ● Driver power is too low ● Driver short circuit to the ground	● Reducing deceleration ● Add appropriate energy consumption brake circuit ● Change a driver with high power ● Check whether the driver is short-circuited to the ground
EA1.03	Constant speed operating overcurrent	● Sudden change or abnormality of load ● Low power suuply voltage ● Driver power is too low ● Encoder wiring breaks or occurs failure suddenly in high speed mode ● Driver short circuit to the ground	● Load checking or reduce the sudden change of load ● Check the input power supply ● Change a driver with high power ● Check the encoder and its wiring ● Check whether the driver is short-circuited to the ground
EA1.04	Accelerated operating overvoltage	● Abnormal input voltage ● When the instantaneous stop occurs, restart the motor which is still rotating	● Check the input power supply ● Avoid shutdown then restart immediately
EA1.05	Decelerated operating overvoltage	● Too much deceleration ● Load inertia is too large ● Abnormal input voltage	● Reduce deceleration ● Decreasing the resistance value of braking resistor according to the power ● Check the input power supply
EA1.06	Constant speed operating overvoltage	● The input voltage occurs abnormal change ● Load inertia is large	● Add input reactor ● Add appropriate energy consumption brake circuit
EA1.07	Factory reservation	-	-
EA1.08	Input phase shortage	● R, S, T input with phase shortage	● Check the input voltage ● Check the wiring
EA1.09	Outout phase shortage	● U, V, W output with phase shortage ● Serious asymmetry of load in three-phase ● Inverter output + 15V, - 15V damage	● Check output wiring ● Seeking services
EA1.10	Power module fault	● Driver instantaneous overcurrent ● Three-phase output short circuit with interphase or grounding ● Blockage of duct or damage of fan ● Excessive ambient temperature ● Inner wiring or connector loosening ● Damage of inner power supply ● Power module bridge shoot-through ● Control board abnormality	● See the overcurrent countermeasure ● Rewiring ● Clean up the air ducts or replace fans ● Reduce ambient temperature ● Check and reconnect ● Seeking services
EA1.11	Power module radiator overheating	● Excessive ambient temperature ● Blockage of duct ● Damage to Fan ● Abnormal power module or inverter output +24V damage	● Reduce ambient temperature ● Clean up the air duct ● Replace fans ● Seeking services
EA1.12	Factory reservation	-	-
EA1.13	Inverter overload	● Overload summary from software and hardware	● Check if the power of the inverter is adequate
EA1.14	Motor overload	● Overlow voltage of power supply	● Check power supply voltage

Fault code	Fault name	Possible reasons	countermeasures
		● Incorrect setting of rated current of motor ● Blockage or sudden change of load in motor ● Long-term low-speed operation. ● The motor power is too low	● Check the rated current of the motor ● Check the load and adjust the torque lifting. ● Adjust the direction of encoder ● Choose the right motor
EA1.15	Parameter overrun	● The learnt hoistway parameters exceed the limit ● Parameters read from EEPROM exceed the limit	● Attempt to manually modify the overrun value ● Redo floor height self-learning ● Re-energized the inverter ● Seeking service
EA1.16	EEPROM read-write failure	● Control parameter setting exceeded the limit ● Error in control parameters reading-writing ● E2PROM damage	● Read all frequency conversion parameters to check if there is abnormality ● Attempt to manually change outliers ● Re-energized the inverter ● Seeking service
EA1.17	Software judge overloading	● The running current reaches 1.8 times of the rated current of the inverter and lasts for more than 10 seconds.	-
EA1.18	Inner contactor not close	● Overlow voltage of power supply ● Contactor damage ● Damage of power-on snubber resistance ● Damage of control circuit ● Inverter output + 24V damage	● Check the voltage of power supply ● Replace contactor or seek service ● Replacing snubber resistance or seek service ● Seeking services
EA1.19	Current detection circuit fault	● Poor contact of control board connector ● Inverter output + 15V, - 15V damage. ● Damage of current sampling device ● Abnormal amplifier circuit	● Check the connector ● Seeking services
EA1.20	Factory reservation	-	-
EA1.21	Factory reservation	-	-
EA1.22	Factory reservation	-	-
EA1.23	Factory reservation	-	-
EA1.24	Motor parameter tuning/self-learning error	● Mismatch between motor capacity and driver capacity ● Improper setting of motor rating parameters ● Excessive deviation between the tuned parameters and standard parameters ● Tuning timeout	● Replace driver model ● Set rated parameters according to motor nameplate ● Check motor wiring ● Check encoder direction (F3.02)
EA1.25	Encoder failure	● Encoder wiring fault ● The encoder signal is abnormal. ● The traction machine brake was not opened. ● CPLD or other hardware seal PWM output	● Tighten the encoder and the terminal. ● Check the encoder connection and reconnect. ● Adjust the direction of encoder ● Check the traction machine brake
EA1.26	Factory reservation	-	-
EA1.27	Inverter brake unit failure	● Breakdown of IGBT brake module ● The resistance value of braking	● Check the IGBT brake module ● Increase brake resistance

Fault code	Fault name	Possible reasons	countermeasures
		resistor is too low	
EA1.28	Error in parameter setting	● Error in setting rated parameters of motor ● Mismatch between motor capacity and driver capacity	● Use reasonable parameter matching motor
EA1.29	Factory reservation	-	-
EA1.30	Elevator overspeed	When the speed of the elevator is detected to be 1.2 times higher than the rated speed of the elevator, the fault will be reported. ● The PI parameters of the speed loop are not set properly, and the start-up process is overshoot too much. ● Error setting the number of PG pulses. ● Insufficient drive torque causes the elevator out of control.	● Rationally set the PI parameters ● Check PG pulse number settings ● Change the driver with larger capacity
EA1.31	Simultaneous input failure of multiple operating modes	There are two input modes in operation at the same time: ● During the normal running, there are maintenance instructions. ● During the normal running, there are inching to re-level instructions. ● In the process of maintenance operation, there are self-learning instructions. ● In the process of maintenance operation, there are inching to re-level instructions. ● During normal operation, there is signal of power failure emergency service.	Seeking services
EA1.32	Dissatisfy minimum floor height operating conditions	● The setting value of P5F5.01~5.05 is too large ● The minimum floor height is too small ● Not yet floor height self-learning	● Reducing the setting value of P5F5.01~5.05. ● Check the floor height data
EA1.33	Floor height self-learning fault	● No lower forced deceleration switch signal at the beginning of self-learning or no upper forced deceleration switch signal at the end of self-learning. ● Running instructions during self-learning is downsward. ● Floor height pulse overflow (>10m) during the self-learning. ● The current position is not at the bottom at the beginning of learning ● PG fault in self-learning.	● Check the upper and lower forced deceleration switch signal ● Start-up from the bottom floor. ● Set PG pulse number according to the reality
EA1.34	Abnormal elevator speed	When the difference between the current running speed and the current setting speed exceeds P5F8.07, and the duration reaches P5F8.08, the fault is reported. ● PI parameter setting of speed loop is too small	● Rationally set PI parameters. ● Check the wiring, re-learn the synchronous motor magnetic pole angle and select a larger capacity driver. ● Check the traction machine brake.

Fault code	Fault name	Possible reasons	countermeasures
		● The elevator runs out of control due to errors in magnetic pole angle, phase shortage output, or insufficient drive torque. ● The traction machine brake is not opened	
EA1.35	Over-long running distance in floor leveling area	● Steel wire rope slips in floor leveling area	● Check the floor leveling signal and whether the traction machine wheel is slippery.
EA1.36	Undervoltage of power supply	-	Check whether the power supply voltage meets the requirements
EA1.37	External signals dissatisfy operating conditions	● Disconnection of safety circuit during running ● Disconnection of hall door lock or car door lock during running	Check whether there is poor contact with external signals.
EA1.38	Output short circuit	-	Check whether there is a short circuit in the output of the inverter
EA1.39	Abnormal handshake signal with MCU	● Abnormal running of MCU ● Abnormal communication between MCU and DSP	● Power on again after power off ● Seeking services
EA1.40	Factory reservation	-	-

Note: Main control board LED1 indicates four types of inverter hardware failure: under-voltage, over-voltage, over-current, module fault.

10.3 Elevator logic fault diagnosis and countermeasure

The display range of elevator logic fault codes is Ex2.XX ~ Ex8.XX. When the elevator controller detects the abnormality, the fault protection function of the corresponding grade takes effect, and the fault code is displayed on the MCUB keyboard (P0 menu). All possible logic fault types of ACE1000 system are shown in the table below.

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
Control system fault Er2	1	A	II	MCU fault	Abnormal MCU operating system	● Exclude external strong interference sources. ● Seeking services
	2	A	II	DSP fault	Software cause: DSP communication flag has no change for more than 80 milliseconds. Hardware cause: DSP pulse detection circuit report.	Troubleshooting the EA1.xx fault and confirming that DSP is working.
	3	A	II	Communication error between MCU and DSP	●DSP work abnormally ●Abnormal communication	● Exclude external strong interference sources. ● Seeking services
	4	E	I	Inverter pre-alarm	The inverter alarm more than 3 seconds.	Check the overheating and overload condition of the inverter.
	5	A	III	On-chip EEPROM abnormal operation	Overtime or check fails when writing on-chip EEPROM	Retry the operation, EEPROM is not initialized or it has bad sector, if the problem always occurs please contact the manufacturer.

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
	6	A	III	System IO port use abnormally	Input and output port definition of the system does not meet the requirements	Find the misdifined IO port and redefine it. If there are multiple IO definition errors at the same time, please exclude and re-energize one by one.
	7	A	III	Program sum check fault	The calculated application sum check is inconsistent with the recorded data.	Check the version of the program and seek services
	8	A	III	Specification parameter capacity fault	Specification parameter occupying exceeds the EEPROM space.	Power on again and seek services
	9	A	III	Specification parameter invalid	Specification parameter address or sum check abnormalities	● Back up the correct parameters with P3.16 to off-chip EEPROM and then perform EEPAS operation. ● Seeking services.
	10	F	I	Error setting of frequency conversion parameters	Hoistway parameters in P5 violate the convention	Check the frequency conversion parameters and re-learn the hoistway floor height
	11	E	II	Off-chip EEPROM reading and writing errors		Retry after power off, if the problem always occurs please contact the manufacturer.
	12	F	II	Off-chip FLASH reading and writing errors		Retry after power off, if the problem always occurs please contact the manufacturer.
	13	E	II	Error in the process of writing specification parameter		First confirm that the elevator is in stop and the password permission is passed. If the problem always occurs please contact the manufacturer.
	14	G	I	Elevator parameters have not been backed up	No default factory parameters were detected, or specification parameters were not backed up off-chip.	Execute P3.16 to backup the current parameters to Off-chip EEPROM, and ask the manufacturer to set default factory parameters according to the method described in Chapter 6.5.2.
	15	G	II	Errors in specification or frequency conversion parameter transferring process		Confirm whether the password permission is passed first, check whether the data line is OK, and the elevators are in stop.
	16	G	I	RTC circuit fault	The problem is found in RTC circuit power-on check	Check the on-board battery of the main control board and seek help from the manufacturer.
	17	B	I	MCU speed parameter initialization abnormality		Power on again, please contact the manufacturer
	18	G	I	Some of home landings are located in the non-service floor		Check home landing settings according to EXX.29 content prompts.
	19	G	I	Error setting of	Some servable floors do not	Check the service floor settings

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
				service floors for main and auxiliary doors of double door elevator	have main and auxiliary doors setting at the same time.	of main and auxiliary doors in C0.14-16 and C1.01-03 specifications. Avoid the situation that there is no main and auxiliary door at the same time, or exclude the floor from the internal call, the up call, and the down call service floor.
	20	A	I	Incorrect or inconsistent setting of elevator key parameters	It is detected that the key parameters of the elevator are beyond the range or the specifications setting are in conflict with the frequency conversion setting.	● Check the rated speed, the forced deceleration switches, and the mechanical parameters in P5. ● The total number of floor in P5F6.00 must be consistent with the internal and external call service floors in the specification parameter.
	21	C	II	IO read / write failure of main control board extension module.	Read / write timeout of spi-io expansion board of main control board.	● Power off and check the connection line of the expansion board. If the fault is not solved, please contact the manufacturer.
Safety circuit faults Er3.	1	A	I	Safety circuit disconnection	The safety circuit input disconnection is detected.	Check the input circuit loop of the safety circuit.
	2	A	II	Safety relay short circuit	More than 500 milliseconds.	Check the safety relay and its feedback circuit.
	3	A	II	Safety relay disconnection	More than 500 milliseconds.	Check the safety relay and its feedback circuit.
	4	F	I	Instantaneous failure of Safety Circuit when in elevator running	More than 40 ms	Check the input circuit loop of the safety circuit.Whether being affected by elevator running.
	5	A	II	Safety circuit redundant relay and safety circuit input are not consistent	More than 500 milliseconds	Check whether the wiring is correct and the relay contacts are damaged
	6	A	I	Synchronous traction machine brake torque is insufficient or the test cycle has passed		Re-test the braking torque and the result should be more than 80%.
	7	A	I	Error in the process of synchronous traction machine brake torque testing		Check if P5F0.01 and P5F0.03 are correct, and then retest.
	8	G	II	synchronous traction machine brake torque testing is terminated in advance	During the testing process, the motor rotation, the safety circuit disconnection, leveling floor signal disappearing and maintenance state exiting were detected.	Check whether the encoder is well installed, the shield of the encoder line is connected and grounded, and re-learn the braking torque.
	9	G	II	Disconnection of safety circuit or door lock in		Check door lock and safety circuit

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
				elevator running		
	10	A	Ⅰ	Safety circuit section detection disconnection		Check the input circuit loop of the safety circuit section detection.
	11	D	Ⅰ	Abnormal installation position of hoistway upper / lower limit switch		Check the relative installation position of the upper / lower limit switch, the floor leveling and the forced deceleration switch.
Door opening and closing faults Er4.	1	F	Ⅰ	Elevator door opening timeout	After the door opening command is output for 15 seconds (P4C2.15), when the car door lock is disconnected, the door opening limit signal is not OK.	● Check the door opening relay actions. ● Check the door opening limit switch is working normally.
	2	F	Ⅰ	Elevator door closing timeout	After the door closing command is output for 15 seconds (P4C2.16), the door closing limit signal is not OK.	● Check the door closing relay actions. ● Check the door closing limit switch is working normally.
	3	B	Ⅱ	Multiple times of opening timeout continually	P4C1.37 set the times	● Check whether the door machine is working properly. ● Check the door opening limit and door lock switch.
	4	F	Ⅰ	Multiple times of closing timeout continually	P4C1.36 set the times	● Check whether the door machine is working properly. ● Check the door closing limit and door lock switch.
	5	B	Ⅱ	Hall door lock short connection	When the door opening, the car door lock input has been disconnected, but the hall door lock still valid duration for more than 1 second.	● Check whether the door machine is working properly. ● Check the door opening /closing limit and door lock switch.
	6	B	Ⅱ	Car door lock short connection	When the door opening, the hall door lock input has been disconnected, but the car door lock still valid duration for more than 1 second.	● Check whether the door machine is working properly. ● Check the door opening /closing limit and door lock switch.
	7	B	Ⅱ	Hall door lock and its redundant relay signal inconsistent.	More than 480 ms.	Check whether the hall door lock relay and its contact is normal.
	8	B	Ⅱ	Car door lock and its redundant relay signal inconsistent.	More than 480 ms.	Check whether the car door lock relay and its contact is normal.
	9	F	Ⅰ	Door opening limit fault	Door opening limit and door lock signals are illogical for 2 seconds (P4C2.17).	Check door opening limit and door lock signal of hall and car.
	10	F	Ⅰ	Door closing limit fault	Door closing limit and door lock signals are illogical for 2 seconds (P4C2.18).	Check door closing limit and door lock signal of hall and car.
	11	F	Ⅰ	Instantaneous failure of hall door lock in elevator running	More than 40ms	Check the hall door lock switches; especially during the car passing the hall door lock is opened.

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
	12	F	Ⅰ	Instantaneous failure of car door lock in elevator running	More than 40ms	Check the car door lock switch; especially during the car running the car door lock is opened.
	13	B	Ⅱ	Door machine failure or door lock short circuit	Door lock signal and door opening/closing command are not logical for 3 seconds	● Check whether the door machine is working properly. ● Check the door opening /closing limit and door lock switch.
	14	F	Ⅰ	Long-term action of door touchpad or light screen	Someone blocked the door touchpad or light screen for a long time.	Check the door action and the sensor
	15	B	Ⅱ	Door lock short connection is detected when the car door lock is connected in series with the hall door lock	The door lock short connection signal is valid when the MCB virtual door-closing relay is output; or the door lock short connection signal does not connect to MCB input port.	● Check whether the door lock signal wiring is correctly connected ● Check the setting of P4C0.28.
	16	E	Ⅰ	Door opening and closing limits signal take effect simultaneously		● Check whether the wiring is wrong or disconnected ● Eliminate signal interference.
	17	C	Ⅰ	When the car door closes, the hall door is opened or cannot be closed.		Close the hall door and car door again
	18	A	Ⅱ	Continuously door opening or closing is blocked (door machine over torque), or the door blocked signal lasts too long.	During the process of opening or closing the door, the door-blocked signal from the door machine is received, and the times of consecutively retrying reaches P4C1.66.	Clear the door blockers and door machine failure, and then re-close or open the door to right place.
	19	G	Ⅰ	The car door is pulled open by external force	Disconnection of car door lock detected without opening instruction	Automatically clear after the buzzer sounds
	20	G	Ⅰ	Hall door lock or car door lock may be short connected	When the car door lock and the hall door lock are used in the non-series mode, an abnormality is detected in both signals.	Remove the possible door lock short jumpers. If reporting this fault, the buzzer sounds in the car when the door is opened.
	21	F	Ⅰ	Door light curtain malfunction	No light curtain signal was detected when the elevator opened the door for 5 consecutive times.	Check door light curtain.
Abnormal operation faults Er5	1	B	Ⅱ	Elevator running reverse fault	The motor rotating direction does not coincide with the running command direction for more than 1 second.	● Check the elevator running direction, whether the two directions will report this failure. If so, change the order of motor output wiring or P5F0.03. ● Check the settings of the start-up torque compensation. ● Check the encoder wiring.
	2	B	Ⅱ	No feedback of	The encoder pulse is not	● First check whether the

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
				motor speed after issuing running instructions	detected for 1 second after the run command is issued.	traction machine is rotating. ● If the traction machine rotates, please check the encoder and its wiring. ● If the traction machine does not rotate, please check: 1. P5F7.00, 2.Whether the traction machine brake can be opened, 3. Check the three-phase wiring between the converter output port and the traction machine, 4.Whether the driver has voltage output.
	3	B	II	DSP detects abnormal elevator speed	The current speed deviation is greater than the set value for more than 400 ms.	● Check PI parameters of inverter. ● Check synchronous motor pole angle. ● Check the connection of encoder.
	4	B	II	Overspeed when elevator running at the low speed	The speed of motor running at low speed is more than 0.5m/s.	● Check P5F5.13~5.16 ● Check whether the encoder works normally.
	5	B	II	Overspeed when elevator running at the high speed	The running speed was detected to exceed 15% of the rated speed.	Check the setting of mechanical and speed parameters
	6	B	II	Starting speed is abnormal	Elevator start-up speed less than 5m/min duration more than 10s	Check whether the frequency conversion parameters are abnormal or the hardware module fails.
	7	D	I	Abnormal crawl speed time	When the elevator decelerates for leveling floor, it runs for more than 10 seconds at a speed of less than 5m/min.	● Re-learn the hoistway floor height. ● Check the leveling plates and the leveling sensor.
	8	C	I	Overspeed when passing the forced deceleration switch	When the car reaches the position of the forced deceleration switches, the elevator speed is higher than the setting value.	● Check whether the installation position and action of the forced deceleration switches are normal. ● Re-learn the hoistway floor height. ● Check the inverter deceleration parameter setting.
	9	D	I	Floor error (current calculated floor mismatch the actual floor)	Check the following conditions: ●The position difference between the physical floor-leveling signal and the calculated floor leveling area (from encoder pulses) is greater than 125mm. ● When the first forced deceleration switch signal is valid, the calculated floor by the MCU&DSP is not the terminal floor. ●The position status	● Check whether the hoistway cable has a grounding terminal, and whether the forced deceleration switch signal is easily interfered. ● Let the elevator automatically takes position correction (self-rectifying).

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
					detected at power-on does not match the position status recorded before power-off.	
	10	D	Ⅰ	Abnormal position because of emergency stop at high-speed mode	Emergency stop when the elevator running speed is greater than 120 m/min.	Elevator self-rectify to the terminal floor for position correction.
	11	A	Ⅱ	Steel wire rope slip in floor leveling area	During the running of the elevator, the floor leveling signal is valid for more than 5 seconds.	● Check the floor leveling sensor. ● Check whether the steel wire rope is slippery.
	12	B	Ⅱ	Steel wire rope slip in non-floor leveling area	During elevator running, there is no floor leveling signal input for 45 seconds (P4C2.14) after leaving the door area.	● Check the floor leveling sensor. ● Check whether the steel wire rope is slippery. ● Check if the up and down direction limit switches are normal. ● Check the distance determined by P5F5.13× P4C2.14, and the maximum interfloor distance.
	13	C	Ⅱ	Abnormal floor height self-learning/self-measurement	When finishing the floor height self-learning, the actual measured floors do not match the floors set in the specification parameter.	● Check whether the first upward forced deceleration switch signal and floor leveling signal are normal. ● Check whether the floor specification parameter settings are correct.
	14	E	Ⅰ	Too many times of self-rectifying operation	The times of self-rectifying operation in 30 minutes is more than 12.	Check the cause of self-rectifying.
	15	C	Ⅰ	Abnormal inching and re-leveling running distance	The distance of inching running exceeds 150mm.	Adjust the distance between the upper re-leveling sensor and the lower re-leveling sensor.
	16	F	Ⅰ	Overtime of inching and re-leveling running.	Inching and re-leveling running lasts for more than 10 seconds.	Check the upper re-leveling sensor and the lower re-leveling sensor signal.
	17	F	Ⅰ	The DSP detects the abnormal speed when passing the forced deceleration switch.		● Check if the installation position and action of the forced deceleration switch are normal. ● Re-learn the floor height. ● Check the inverter deceleration parameter setting.
	18	D	Ⅰ	The MCU detects the abnormal speed when passing the forced deceleration switch.		● Check if the installation position and action of the forced deceleration switch are normal. ● Re-learn the floor height. ● Check the inverter deceleration parameter setting.
	19	A	Ⅰ	Too high speed when entering the terminal leveling plate.	The speed is too high when the first forced deceleration switch signal and the floor leveling signal are valid simultaneously.	● Check if the installation position and action of the forced deceleration switch are normal. ● Re-learn the floor height. ● Check the inverter deceleration parameter setting.

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
	20	D	Ⅰ	Floor change more than 1suddently		● Check whether the forced deceleration signal is normal ● Let the elevator automatically takes position correction (self-rectifying).
	21	A	Ⅰ	Failure to enter maintenance mode or the maintenance switch was on at high speed running status.	Failure to enter maintenance mode due to maintenance switch	Check whether the input signal is logical.
	22	A	Ⅳ	Unintended car movement	●The car leaves the door area with door open. ●The movement of the car position is detected when the brake is not opened.	After eliminating the source of the fault, power on again, and perform fault-resetting operation twice in the maintenance mode.
	23	A	Ⅰ	Abnormal running in middle speed mode	Mismatch between operation mode and input signal	Check whether the maintenance and self-rectifying state are normal.
	24	G	Ⅱ	Traction motor slip or encoder signal is interfered for a long time.	When the elevator stops, the speed feedback is not equal to zero.	As soon as possible to confirm whether the motor brake torque is enough and whether the brake is stuck. Whether the working power supply is subject to serious electromagnetic interference, whether the encoder wiring is reliable and shielded.
external device faults Er6	1	A	Ⅱ	Short connection failure of main running contactor	The drive output of the main running contactor is disconnected, but the auxiliary contact feedback input of the main running contactor is still on for more than 1 second.	● Check the drive circuit of the main running contactor. ● Check the main running contactor and its feedback circuit.
	2	B	Ⅱ	Main running contactor disconnection failure	The drive output of the main running contactor is valid for more than 1 second, and the auxiliary contact feedback input of the main running contactor is still invalid.	● Check whether the main running contactor is closed and whether the auxiliary contacts are normal. ● Check whether the drive output of the main control board is normal.
	3	A	Ⅱ	Short connection failure of brake contactor	The drive output of the brake contactor is disconnected, but the auxiliary contact feedback input of the brake contactor is still on for more than 0.5 seconds.	● Check the drive circuit of the brake contactor. ● Check the brake contactor and its feedback circuit. ● The wiring between the brake contactor and the main running contactor may be reversed.
	4	B	Ⅱ	Brake contactor disconnection failure	The drive output of the brake contactor is valid for more than 1 second, but the auxiliary contact input of the brake contactor is still invalid.	● Check whether the brake contactor is closed and whether the auxiliary contacts are normal. ● Check whether the output drive of the main control board is normal.

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
	5	B	II	Short connection failure of traction machine brake feedback switches	The drive output of the brake contactor is invalid, but the traction machine brake feedback signal is still on. And it lasts more than 1.5 seconds. (Need to set P4C0.27=1)	Check whether the traction machine brake feedback switch operates normally.
	6	B	II	Disconnection failure of traction machine brake feedback switches	The drive output of the brake contactor is valid, but the traction machine brake feedback signal is still off. And it lasts more than 1.5 seconds. (Need to set P4C0.27=1)	Check whether the traction machine brake feedback switch operates normally.
	7	D	I	Abnormal installation position of elevator forced deceleration switch	Abnormal operation of upper and lower forced deceleration switch.	Check whether the operation of the upper and lower forced deceleration switch is normal.
	8	F	I	Analog weighing sensor fault	The MCU detected that the car weighing signal exceeded the measuring range.	● Check whether the weighing device is normal. ● Check whether the communication between MCB and car roof board is normal.
	9	E	I	Failure of door area sensors for inching and door opening in advance.	The signal of the door area switches remains valid for more than 200 milliseconds after leaving the open door area. Judged only when P4C1.09=1 and / or P4C1.10=1.	Check the door area sensors.
	10	F	I	Upper re-leveling sensor or lower re-leveling sensor failure	The upper re-leveling sensor or lower re-leveling sensor signal remains for more than 200 milliseconds after leaving the open door area. Judged only when P4C1.09=1.	Check the upper re-leveling sensor and lower re-leveling sensor
	11	D	I	DC 24V power supply disconnection in elevator running	External DC24V power off in running.	Let the elevator automatically takes position correction (self-rectifying).
	12	A	I	AC 110V power supply disconnection in elevator running	External AC110V power off in running.	Let the elevator automatically takes position correction (self-rectifying).
	13	B	I	Input power supply phase sequence is abnormal	External phase sequence relay detects abnormality (Use input variable No.76)	Check the power supply
	14	F	I	Button-conglutination of hall call board	Some external call button is continuously pressed for more than 60 seconds	Check P1.08.00~ P1.08.02 state to position
	15	F	I	Button-conglutination of car command board	Some internal call button is continuously pressed for more than 60 seconds	Check P1.08.00~ P1.08.02 state to position
	16	A	II	Star-delta contactor short connection	The drive output of the star-delta contactor is	Check the drive circuit and feedback circuit of star-delta

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
				failure	invalid, but the feedback contact input is still on, lasting for more than 500 milliseconds.	contactor.
	17	B	II	Star-delta contactor disconnection failure	The drive output of the star-delta contactor is valid, but the feedback contact input is still off, lasting for more than 500 milliseconds.	Check the drive circuit and feedback circuit of star-delta contactor.
	18	E	I	Main motor or door motor overheating	Motor temperature sensor sends out overheat signal for 20 seconds (Use input variable No.69/ No.70)	● Pay attention to the ventilation and cooling in the machine room. ● Check whether the rated power of the motor is enough.
	19	F	I	Strong excitation contactor for the traction machine brake coils is disconnected or short connected	●The strong excitation contactor has been operated, but its feedback is invalid for more than 500 ms. ●The strong excitation contactor has not been operated, but its feedback has been valid more than 500 ms.	Check whether the strong excitation relay on the MCB, and the strong excitation contactor and its feedback on the control cabinet are working properly.
	20	C	III	Automatic brake loosening relay (for emergency service) is short connected or disconnected.	Feedback of automatic brake loosening relay is inconsistent with output of automatic brake loosening relay for 500 ms.	Check whether the automatic brake loosening relay and its feedback contact are normal.
	21	F	I	Button-conglutination of door opening/closing		Replace the conglutinated button
	22	B	I	Virtual door-closing relay disconnection fault		Check the virtual door-closing relay circuit and its feedback
	23	A	I	Virtual door-closing relay short connection fault		Check the virtual door-closing relay circuit and its feedback
	24	G	II	Main power failure in elevator running		Check the power supply and voltage.
	25	C	I	The output of electric lock is inconsistent with the feedback	>500ms	Check the electric lock output and feedback
	26	A	I	The output of the electromagnetic door knife is inconsistent with the feedback	>300ms	Check the output and feedback of electromagnetic door knife
	27	E	I	Brake resistance overheating	Over 80 ° C	Take heat dissipation measures
	28	B	II	Holding brake coil short circuit fault		Check the holding brake coil circuit and eliminate the fault
communication fault Er7	1	E	I	Car command board serial communication	Communication is disconnected for more than 3 seconds	● Check the wiring and terminal resistance of the communication circuit.

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
				abnormal		● Check P4C1.38 ● Seeking services for EMC problem.
	2	F	I	Hall call board serial communication abnormal	Communication is disconnected for more than 10 seconds	● Check the wiring and terminal resistance of the communication circuit. ● Check P4C1.38 ● Seeking services for EMC problem.
	3	F	I	Parallel/group control communication abnormal	Communication is disconnected for more than 3 seconds	● Check the wiring and terminal resistance of the communication circuit. ● Check P4C1.38 ● Seeking services for EMC problem.
	4	E	I	Car roof board serial communication abnormal	Communication is disconnected for more than 3 seconds	● Check the wiring and terminal resistance of the communication circuit. ● Check P4C1.38 ● Seeking services for EMC problem.
	5	G	III	Button-conglutination of the onboard button.	More than 10 minutes.	● Check if the button is normal ● Seeking services
	6	F	I	Communication failure of circuit board in elevator pit	Communication is disconnected for more than 10 seconds	● Check the wiring and terminal resistance of the communication circuit.
Operation prompt failure Er8	1	G	I	Maintenance operation mode		
	2	G	I	Keyboard control mode		
	3	G	I	Self-rectifying running state		
	4	G	I	Power failure emergency service mode		
	5	G	I	VIP mode		
	6	G	I	Fire protection state		
	7	G	I	Parking of lift state		
	8	G	I	Car attendant mode		
	9	G	I	Automatic running state (test running, keyboard call holding)		
	10	G	I	External call prohibition		
	11	G	I	Door stop (no opening and closing) state		
	12	G	I	Cancel door opening and closing limits signal state		
	13	G	I	Floor height self-learning mode		
	14	G	I	Cancel overload		

Class	Sub code	Grade	Clear	Fault name	Fault cause	Processing method
				detection state		
	15	G	I	Rush hour running state		
	16	G	I	External call buzzer cancellation		Please set P4C1.48_Bit2
	17	G	I	Time sharing service mode		
	18	G	I	Braking torque test		
	19	G	I	UCMP test		
	20	G	I	Door opening/closing test mode		
	21	G	I	Reserved		
	22	G	I	Reserved		
	23	G	I	Reserved		
	24	G	I	Maintenance interval timeout	No maintenance for more than 15 days	Power cut and restart
	25	G	I	Reserved		
	26	G	I	Reserved		
	27	G	I	Reserved		
	28	G	I	Normal opening door change to inching action door state		
	29	G	I	◎Automatic brake loosening for emergency service state; ◎Manual electric brake loosening under backup DC power supply mode.		
	30	G	I	Only down calls response mode		
	31	G	I	Door locks bypass state		
	32	G	I	At night security floor service mode		

Note: please refer to P2 function code for details of fault record. Some function codes correspond to additional fault information to help accurate fault source location.

Chapter 11: Application schemes

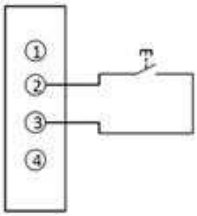
11.1 Elevator attendant function

➢ **Functional specifications:**

- This function is suitable for occasions where a dedicated elevator attendant is responsible for controlling the elevator operation in the elevator. The elevator attendant completely controls the running service of the elevator through the "attendant" switch, the "direction reverse" button, the "close door" button, and the "straight going/passing" button in the car.
- After entering the attendant state, the elevator will wait for calling with opening door and display "attendant" on the hall call board; the internal call can be registered directly; the call from the hall cannot be directly registered (default), but the attendant is prompted by different internal button flashes of the external call requirement; the hall call button is flashing before the attendant responds, and it will be lighted after the attendant responds.
- The elevator has a pre-selection dirction immediately after the internal call registration, and the attendant can press the " direction reverse" button to change the current elevator direction;
- In the attendant state, the elevator will not automatically close the door, and the attendant needs to press the "close" button until the door is closed and the elevator will start running (default).
- After the automatic registration of the external call is set (P4C1.71_bit0), the system automatically registers the external call as the internal call. When the call is not required, the attendant can press the "straight going/passing" button.
- In the parallel and group control state, the elevator automatically exits the parallel and group control after entering the attendant mode, which does not affect the operation of other elevators.
- Cannot be used simultaneously with VIP function.

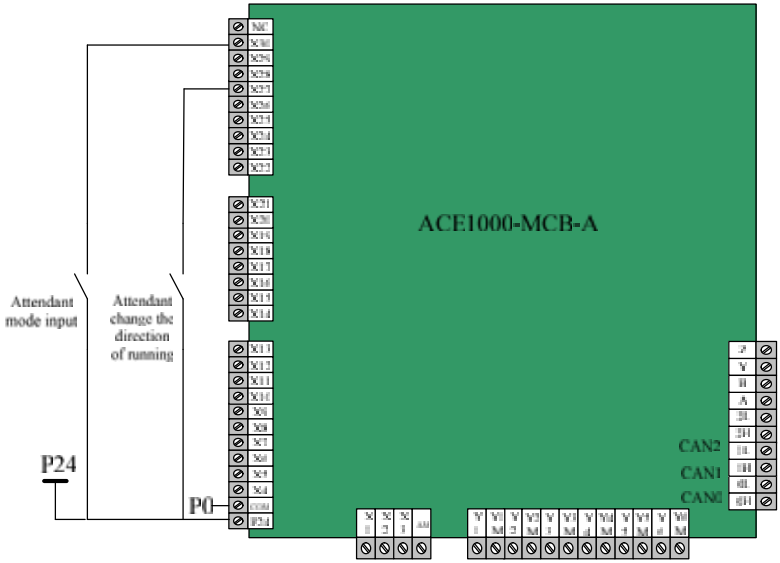
➢ Wiring: Custom terminals can be used on the car command board or the main control board.

Scheme 1: Connect to the car command board IO

Car command board	Terminal name		Function definition	Terminal connection
	X64-F22		The attendant mode input.	

	X65-F23		Changes running direction once in attendant mode.	

Scheme 2: Connect to the main control board IO



Wiring diagram of connecting to the main control board

- **Parameters：**

Function code	Function definition	Scope setting
C1.71_Bit0	Attendant mode automatically register and respond to external calls, all external calls according to the current direction of running transfer to the corresponding internal calls for service.	
C1.71_Bit1	External call is displayed in the form of internal button flash in attendant mode at car. All the external calls are flashing on the corresponding internal call button. The flashing of the upward and downward calls is different.	
C1.71_Bit2	Whether or not to inching action door in attendant mode: 0-close the door in inching way, 1- automatically close the door when press the closing button once.	
C1.71_Bit3~15	Reserved	
Wiring scheme 1:		
C4.63	X64-F22 Command board input	0062：Attendant input NO signal 1062：Attendant input NC signal
C4.64	X65-F23 Command board input	0063：Attendant reversing NO signal 1063：Attendant reversing NC signal
Wiring scheme 2:		
C4.26	Main control board input X27	0063：Attendant reversing NO signal 1063：Attendant reversing NC signal
C4.29	Main control board input X30	0062：Attendant input NO signal 1062：Attendant input NC signal

11.2 Fire protection function

➢ **Functional specifications:**

This function is suitable to control the operation of elevators in the event of building fire. The elevator automatically returns to the fire home landing to open the door, which ensures the personal safety of elevator passengers. Fire control function is divided into fire control function and firefighter operation function.

Fire control function:

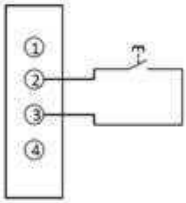
- Elevator do not respond to internal calls and external calls.
- When the direction of running is opposite to the direction of the home landing, it will stop nearby and return to the home landing without opening the door.
- After the elevator stops at the home landing, keep the door open.
- Automatically exits from the parallel and group control mode.

Firefighter operation function:

- Elevator do not respond to external calls, only internal calls, and only one calling instruction can be registered at one time.
- The elevator does not open and close the door automatically. The opening and closing actions are performed by manually pressing the button.
- The door light screen signal input is invalid, but the door touch panel signal input is valid.

➢ **Fire control wiring:**

Scheme 1: External call board for fire control input

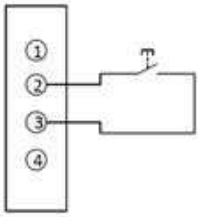
Hall call board	Terminal name	Function definition	Terminal connection
	J35	Entering the fire control mode. The elevator must return to the fire control home landing and open the door before exiting the fire control mode.	

Scheme 2: Main control board for fire control input

Main control board	Function definition
	When an input point on the main control board is defined as a fire protection forced landing input, turn on the signal elevator will enter the fire-fighting forced landing mode.

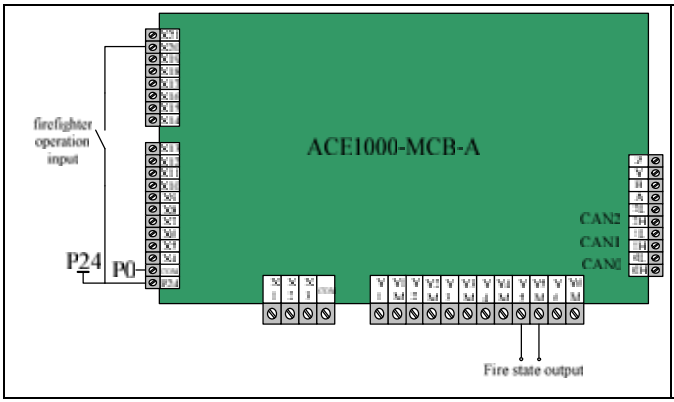
- **Firefighters operation wiring:**

Scheme 1: Command board for firefighter operation input

Car command board	Terminal name	Function definition	Terminal connection
	X67-F25	The firefighter operation mode input.	

Scheme 2: Main control board for firefighter operation input

Main control board	Function definition



When an input point of the main control board is defined as firefighter operation input, turn on this signal, elevator will enter the firefighter operation function mode.

➢ **Parameters:**

Function code	Function define	Data scope	remarks
C0.19	Fire home landing	0: Fire function cancellation 1~Top floor: Set this floor as fire home landing	
C4.19	MCB X20 input definition	0040: Fire control NO signal 1040: Fire control NC signal	X17 ~ X40 are optional.
C4.20	MCB X21 input definition	0039: Firefighter operation NO signal 1039: Firefighter operation NC signal	X17 ~ X40 are optional.
C4.79	MCB Y5 input definition	0009: Fire confirmation output	Y3 ~ Y6 are optional.

- Abot Input Settings:
  1. Fire control signals can be input through the fire protection switch of the external call board (any floor) or through the main control board (the fire control signals on the external call board are automatically invaild after the custom fire control input port on the main control board). Firefighter operation signal can be input through the car command board firefighter operation switch, or through the main control board, customized by users.
  2. Fire home landing can be set to any floor through C0.19. If C0.19 is set to 0, fire protection function will be cancelled.
- About Output Settings:

Fire confirmation output signal can be customized on the main control board Y3 ~ Y10 relay.

11.3 Parking of lift function (Suspension of service)

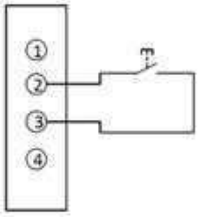
➢ **Functional specifications:**

1. After the elevator responds to the last call signal, it automatically closes the door and returns to the elevator home landing.
2. When there are forward signals from the lower floors, the elevator responds, and returns to the home landing automatically then.

3. After reaching the home landing and opening the door, the digital display board in the car and the external call board display are completely off, and the fan and lighting in the car are off at the same time. Then the door is closed, and the open door button light flashes to indicate the completion of the elevator parking. When in double doors situation, it is recommended that the parking switch of the front and rear doors be switched on simultaneously.
4. The function can be set up by real-time control, or can be realized by elevator parking switch on the hall call boards.

➢ **Wiring**

Signal input of elevator parking on hall call boards

hall call board	Terminal name	Function definition	Terminal connection
	J36	The elevator parking mode input	

➢ **Parameters:**

Function code	Function define	Data scope
C0.18	home landing for elevator parking	0: The function is cancelled 1~ top floor: Set the home landing of parking.
C2.44	Parking start time	00.00～23.59 Timing automatic parking
C2.45	Parking finish time	00.00～23.59 Timing automatic parking

11.4 Full load and overload detection

➢ **Functional specifications:**

Overload process:

1. The buzzer sounds.
2. The elevator does not close the door, and door closing button is invalid. If the elevator has closed the door, it won't alarm during running, but buzzing after the door opens on the destination floor, and then the elevator do not close the door until the overload state disappeared.
3. Both the external call board and the digital display in car show "Full/Overload".

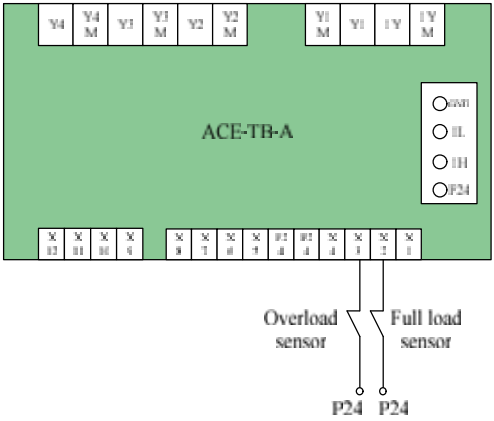
4. The overload switch must use the normal closed signal. The overload signal can be inputted to the car roof board or the main control board. It is recommended to input the main control board.

Full load process:

1. Both the external call board and the digital display in car show "Full/Overload".
2. In response to the internal call signal, if the straight going/passing when in full-load function is enabled, it does not respond to the external call signal, but the external call signal can be registered.
3. It is suggested that full-load switch input is used to obtain more accurate full-load signal. Full-load signal is recommended to input the car roof board.

➢ **Wiring**

Overload and full load signals input to the car roof board, and the input terminals can be customized.



➢ **Parameters:**

Overload input and full load input can be set on the main control board, car roof board or car command board, that is, between X17 and X75.

Function code	Function define	Data scope	remarks
Overload and full-load signals input to the main control board:			
C4.19	MCB X20 input	0057:Full load input NO signal 1057:Full load input NC signal	The MCB X19~X40 (any input port) can be defined as full-load signal input.
C4.20	MCB X21 input	1038:Overload input NC signal	The MCB X19~X40 (any input port) can be defined as overload signal input.
Overload and full-load signals input to the car roof board:			
C4.42	Car roof board X1 (X43)input	0057:Full load input NO signal 1057:Full load input NC signal	The car roof board X1~X20 (any input port) can be defined as full-load signal input.
C4.43	Car roof board X2 (X44) input	1038:Overload input NC signal	The car roof board X1~X20 (any input port) can be defined as overload signal input.

11.5 Time-sharing and floored service

➢ **Functional specifications:**

Time-sharing floored service: for elevator specific time period, service designated floor inside/outside call command function. ACE1000 supports up to three components of time-sharing service, internal and external calls can be set separately.

- **Parameters:**

Function code	Function define	Data scope
C1.24	Time sharing service (A)	0: Time sharing service (A) running function invalid (i.e. non-timesharing) 1: No internal call service for the floors which is outside the setting floor of C1.25~C1.27. 2: No external call service for the floors which is outside the setting floor of C1.25~C1.27. 3: No internal and external call service for the floors which is outside the setting floor of C1.25~C1.27.
C1.25	Time sharing service (A) floors(1~16)	0x0 ～ 0xFFFF
C1.26	Time sharing service (A) floors(17~32)	0x0 ～ 0xFFFF
C1.27	Time sharing service (A) floors(33~48)	0x0 ～ 0xFFFF
C1.28	Time sharing service (B)	0: Time sharing service (B) running function invalid (i.e. non-timesharing) 1: No internal call service for the floors which is outside the setting floor of C1.29~C1.31. 2: No external call service for the floors which is outside the setting floor of C1.29~C1.31. 3: No internal and external call service for the floors which is outside the setting floor of C1.29~C1.31.
C1.29	Time sharing service (B) floors(1~16)	0x0 ～ 0xFFFF
C1.30	Time sharing service (B) floors(17~32)	0x0 ～ 0xFFFF
C1.31	Time sharing service (B) floors(33~48)	0x0 ～ 0xFFFF
C1.32	Time sharing service (C)	0: Time sharing service (C) running function invalid (i.e. non-timesharing) 1: No internal call service for the floors which is outside the setting floor of C1.33~C1.35. 2: No external call service for the floors which is outside the setting floor of C1.33~C1.35. 3: No internal and external call service for the floors which is outside the setting floor of C1.33~C1.35.
C1.33	Time sharing service (C) floors(1~16)	0x0 ～ 0xFFFF
C1.34	Time sharing service (C) floors(17~32)	0x0 ～ 0xFFFF
C1.35	Time sharing service (C) floors(33~48)	0x0 ～ 0xFFFF
C2.31	Time sharing service A: time starting point	00.00～23.59
C2.32	Time sharing service A: time finishing point	00.00～23.59
C2.33	Time sharing service B: time starting point	00.00～23.59
C2.34	Time sharing service B: time finishing point	00.00～23.59
C2.35	Time sharing service C:	00.00～23.59

Function code	Function define	Data scope
	time starting point	
C2.36	Time sharing service C: time finishing point	00.00～23.59

Instructions:

C1.24~C1.35 sets up three specific control methods of time-sharing service (internal and external calls can be separately controlled) and corresponding time-sharing service floors. During the period setting by C2.31-C2.36, elevators serve internal/external call floors according to the corresponding floors of C1.25-C1.27, C1.29-C1.31 and C1.33-C1.35, while other floors are not served. If the real-time error of elevator is large, please correct the clock in P4C5.25.

11.6 Test running functions

- **Functional specifications:**

The test running functions (under the P3 menu) is designed for the convenience of maintenance and debugging. It is mainly divided into:

- Internal and external call test
- Random/floor-by-floor run test
- Close part of function (external call, door opening/closing, overload)
- Self-learning of motor parameters and hoistway parameters
- Parameters operation.
- UCMP, braking torque test

Note: Before calling the elevator to run in high-speed mode, please ensure that the hoistway is unobstructed, and that the safety circuit, the door lock circuit and the protection switch of the hoistway protection function are normal.

- **Parameters:** See chapter of "P3 Functional specifications".
- **Functional explanation:**

P3.00 Clear all debugging settings: Clear all debugging settings under P3, clear some statistics under P1, and make the system password valid immediately.

P3.01 Elevator maintenance by keyboard instruction: Directly enter the maintenance mode through the keyboard, its maintenance priority is the lowest, using the keyboard upward and downward keys to control the elevator maintenance running up and down.

P3.02～P3.07 Keyboard to call elevator: Simulate the internal and external call board to call the elevator.

P3.08 Call holding: Let the elevator run between the designated floors. This function is only valid for the floors set in P3.02-P3.05. It is necessary to set P3.08=1 before using P3.02~P3.05 to carry out the call.

P3.09 Testing run: Setting P3.09 as non-zero means entering the random/floor-by-floor running mode, automatically exiting after reaching the times set by P4C1.17, and P4C2.43 controls the time interval of testing run.

P3.10 External call prohibition: It is used to prevent someone from calling the elevator into the car during debugging process.

P3.1Door stop: In order to improve the efficiency of test running, the door stopping function can be set up. After the elevator arrives, it will not open the door any more, and directly carry out the next running.

P3.12 Motor parameters self-learning:

P3.13 Floor height self-learning: When the elevator is on the bottom leveling floor, it closes the door automatically after executing P3.13. And then press the upward button of the keyboard to start learning the floor height. After the elevator runs to the top leveling floor at the maintenance/middle speed, it stops. After the completion of the floor height learning, please set P3.13=0 manually to enter the normal high-speed mode.

P3.14 Cancel overload detection:

P3.15～ P3.16: The parameters of elevator are backed up from in-chip to off-chip or recovered from off-chip to in-chip.

P3.17 Parameters transfer: Without the assistance of PC or LCD keyboard, the P4 and P5 parameters can be transferred from one MCB to another MCB. The appropriative DB9 line of the standard digital display board in car is needed to facilitate the transfer of elevator parameters when replacing MCBs.

P3.18 Synchronous machine brake torque test: According to the set parameters, the braking torque is automatically tested in both positive and negative directions (clockwise and counterclockwise).

P3.19 UCMP Functional Test: Simulate the elevator car to open the door and immediately stop the elevator when leaving the door area.

P3.20 Door opening/closing test: The elevator does not respond to the call, and the door is opened and closed continuously according to the setting times and time interval.

P3.21 Comparison of current parameters with factory default parameters: When there is no LCD keyboard or PC in the field, all the differences that do not meet the factory default parameters can be quickly found and displayed by this function. The premise is that the default parameters have been written into the main control board (see about "Parameter download method").

P3.22 Clear faults record: Clear up the fault information and the times of faults recorded in P2. If new faults occur after 100 records, the earliest recorded faults will be deleted one by one to no more than 100.

11.7 Anti prank of internal calls

- **Functional specifications:**

If the load in the car is less than 20% of the rated load or nobody enters/exits the car when door opened, and the inner call registered is more than P4_C1.15, the system considers that it is in a state of prank and cancels all the calls in the car after the first internal call service is completed.

- **Parameters:**

Function code	Function define	Data scope	Remarks
C1.15	Number of the mischief floor calls	0: The anti-prank function is invalid 2～top floor: Number of the mischief floor calls	The elevator is in a light load state or nobody enters/exits the car when door opened, exceeding this value is

			considered a prank.
C1.59_BIT6			Use "in a light load state" condition
C1.59_BIT7			Use "nobody enters/exits the car" condition

11.8 Disabled people service

➢ **Functional specifications:**

Disability function is specially designed for the disabled people in wheelchair to use the elevator. Setting the car command board as the disability mode can support the disability function in the car, and setting the hall call board as the disability mode can support the disability function in the hall. ACE1000 can support both front door disability and back door disability modes.

1. When arriving at the target floor of disability calls in the car, the elevator door opening and holding time is automatically extended to the time set by P4_C2.11.
2. When there is a door-opening request from the disability door-opening button in the car, the elevator door opening and holding time is automatically extended to the time set by P4_C2.11.
3. When arriving at the target floor of disability calls in the hall, the elevator door opening and holding time is automatically extended to the time set by P4_C2.11.
4. When any button on the disabled internal and external call board is pressed, the corresponding buzzer will ring.
5. After the registration of the disability calls is ok, the corresponding main call registration lights are on at the same time, but the main call registration does not affect the lights of the disability call registration.
6. Automatically cancel the function of opening the door in advance when the disability internal and external calls reach the target floor.

➢ **Wiring:**

- Car command board disability mode

After the car command board is set to disability mode, all the internal call instructions and opening-door button are changed into disability instructions.

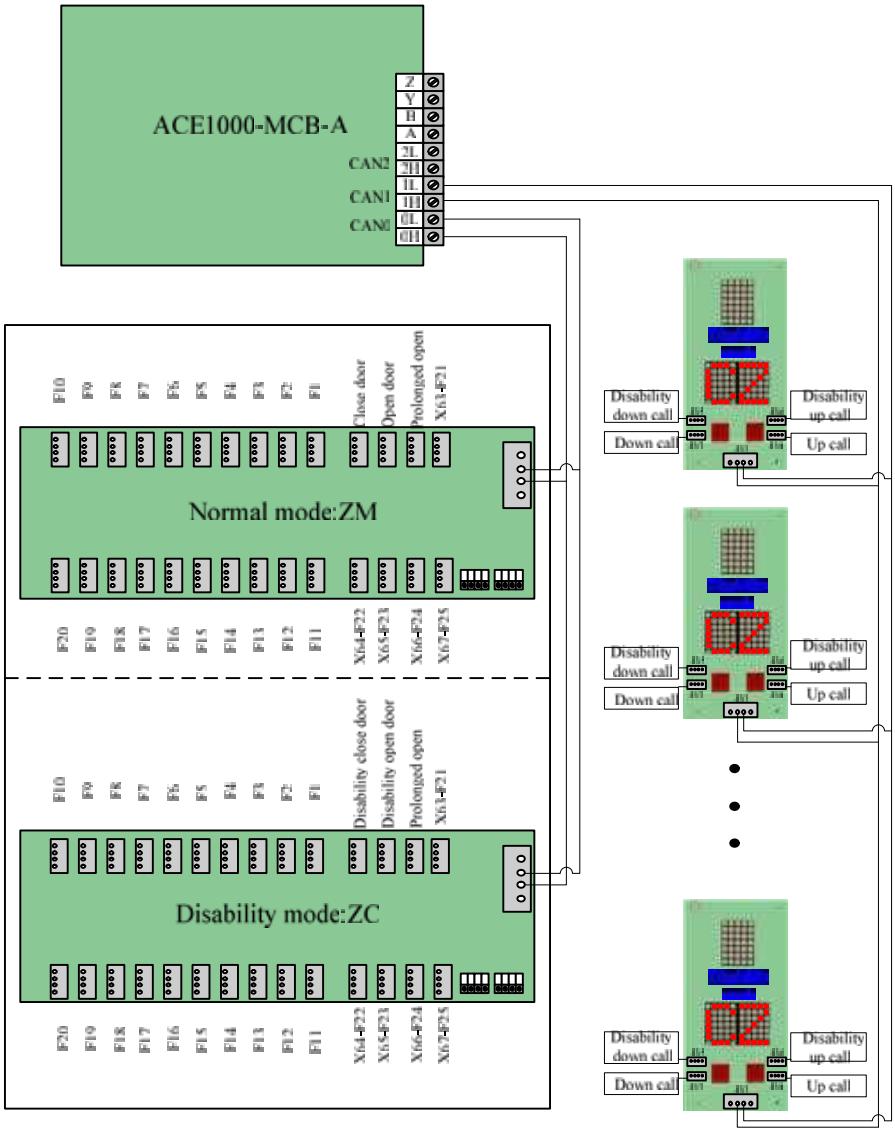
- Hall call board disability mode

After setting the hall call board to disabled mode, the original "elevator parking/up arrival" and "fire control/down arrival" interfaces automatically change to "disabled call-up" and "disabled call-down" button interfaces. Therefore, the disability call function can be realized without the special disability call boards (Usually,an additional external call board is required in the elevator parking and fire home landing).

➢ **Parameters:**

Disability call function needs to set car command board and hall calling board as disabled working mode, without the need for specification parameters to enable the function. Both the car command board and the hall calling board can be set as one of the four working modes of "the main door calling/ZM", "the main door disability calling/ZC", "the auxiliary door calling/FM" and "the auxiliary door disability calling/FC". The method of setting the disabled working mode refers to the instructions for the use of the car command board and the hall calling board.

Function code	Function define	Data scope
C2.11	Open-door holding time for disabled person service	1～60s



Wiring diagram of car command board and hall call board for disability function

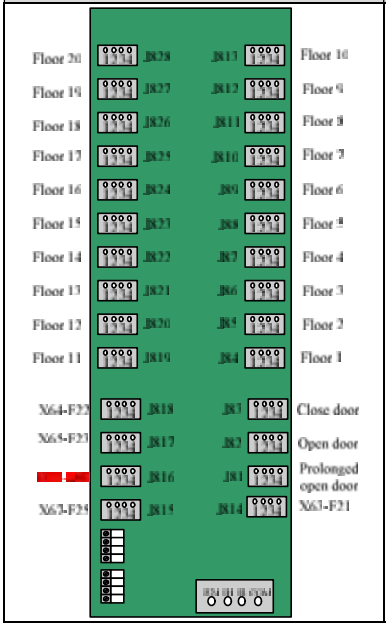
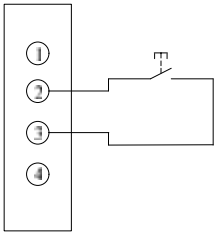
11.9 VIP service

➢ **Functional specifications:**

This function is suitable for the occasion of serving only for the calling command in the car. VIP personnel make the elevator enter the VIP special service mode by operating the "VIP" key or IC card in the car.

- The elevator does not respond the call from external call board, and there is no direction of running and floor display on the hall call board, only responds to the call inside the car.
- The elevator does not automatically close the door. Every time the elevator starts, it needs to press and hold the opening door button manually. Only after the elevator starts, it can be released.
- After reaching the destination floor, the door opens automatically without closing, and keeps the door open.
- It should not be used in conjunction with the attendant function.

➢ **Wiring**

Car command board	Terminal	Function	Wiring
	X66-F24	VIP service mode input.	

➢ **Parameters:**

Function code	Function define	Data scope	Remarks
C4.65	Car command board X66-F24 input port	0061:VIP input NO signal 1061:VIP input NC signal	Can also be defined in any input port of X17~X40 on the main control board.

11.10 UCMP function

Please refer to the UCMP chapter for details.

11.11 Synchronous machine brake torque detection

Please refer to the UCMP chapter for details.

11.12 Synchronous motor star-delta scheme

➢ **Application background:**

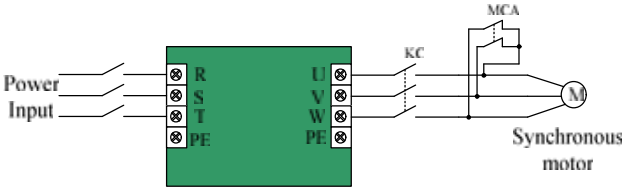
Synchronous motor star-delta scheme makes permanent magnet synchronous motor U, V, W three-phase short connection form a star circuit, which transforms the motor into a generator to consume kinetic energy. Even if the brake is completely invalid, the speed of the car slip can be limited to be very small.

➢ **Scheme introduction:**

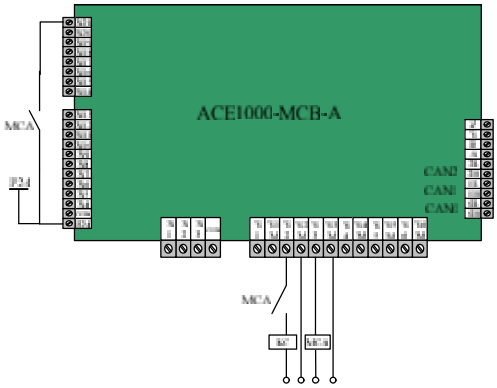
Scheme 1: Use the normally closed auxiliary contacts of the main running contactor as the star-delta contact, but in the worst condition, the star-delta contact may be seriously over current.

Scheme 2: Use a separate normally closed contactor as the star-delta contactor, and connect the contactor's normally opened contact in series with the coil circuit of the main running contactor, so as to ensure that the output short circuit will not be caused. It is recommended to use this scheme.

➢ **Wiring**



Power line wiring diagram



Wiring diagram of connection with MCB

➢ **Parameters:**

Function code	Function define	Data scope	Remarks
C4.20	MCB X21 input	0024: Star-delta contactor feedback NO	Any input port of X17 ~ X40 on

		signal input 1024: Star-delta contactor feedback NC signal input	the MCB can be defined as star-delta feedback input.
C4.76	MCB Y2 output	0002:Main running contactor drive output	
C4.77	MCB Y3 output	0005:Star-delta contactor drive output	Any output port of Y3~Y10 on the MCB can be defined as star-delta drive output.

11.13 Power failure emergency service

➢ **Functional specifications:**

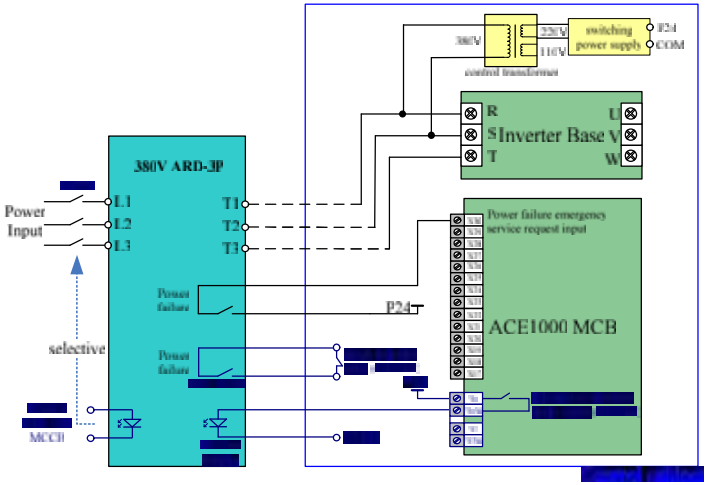
In order to avoid passengers trapped by elevator in the case of power failure, the ARD device can be automatically put into operation within seconds when the power outage occurs. It provides emergency power to the elevator control system to make the elevator car move slowly to the floor leveling area and open the door to release passengers. For the automatic brake loosening rectifying function in the mode of power outage, please refer to the "automatic brake loosening rectifying scheme".

➢ **Application scheme:**

Please use the ARD (auto rescue device) device whose output voltage corresponding to the input voltage of ACE1000. In addition to supplying power to ACE1000, ARD has another signal that is necessary: the power outage signal of ARD output should be connected to a custom input point in the main control board X17~X40 of ACE1000 (= 0029/1029).

- If the phase sequence relay is used in the elevator control cabinet, please bypass the phase sequence relay with another output signal of ARD.
- If ARD needs the main control board to output a power failure self-rectifying operation signal, please customize it in the main control board Y3 ~ Y10 relay output (= 0006).
- If ARD needs a MCCB (Air switch) auxiliary signal, please take the auxiliary contact from the machine room power switch (not the elevator cabinet) to deal with it.

➢ **Wiring (take ARD-3P as an example to illustrate)**



Wiring diagram of 3-phase 380V elevator power failure ARD

➢ **Parameters:**

Function code	Function define	Data scope	Remarks
C4.29	MCB X30 input	0029:Power failure ARD NO signal input	Required, X17~X40 custom
C4.80	MCB Y6 output	0006:Power failure ARD running output	If the ARD needs this signal, Y3~Y10 can be customized.
C2.55	ARD operation delay	1~60 seconds	Time interval between the start of ARD power supply and the emergency running of the elevator
F5.15	Elevator running speed with ARD	0.01~0.3m/s, 0.1m/s is recommended	The ARD may not work when the speed is too high.

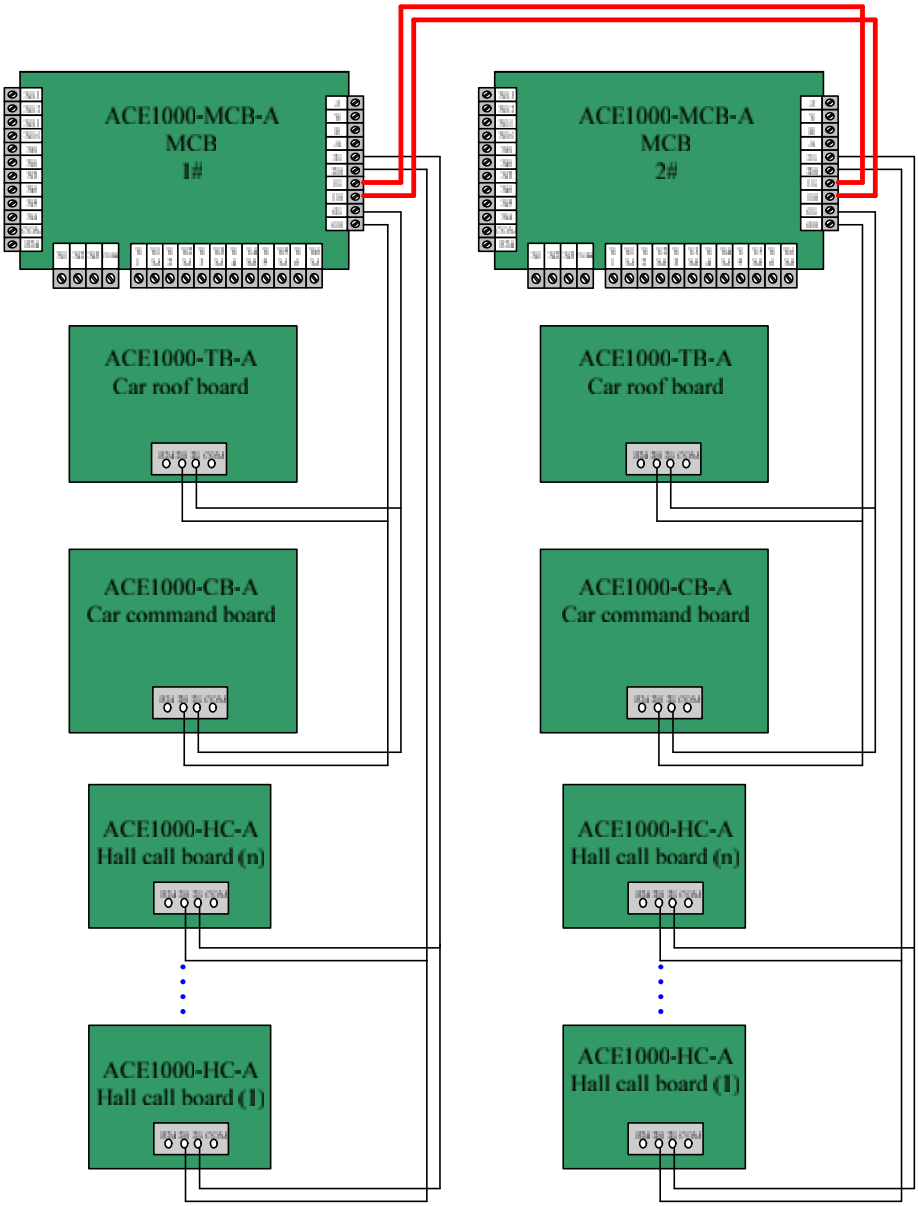
11.14 Elevator parallel and group control scheme

➢ **Functional specifications:**

Four (inclusive) elevators only need two lines to achieve parallel and group control, and more than four must be installed with group control boards to achieve group control.

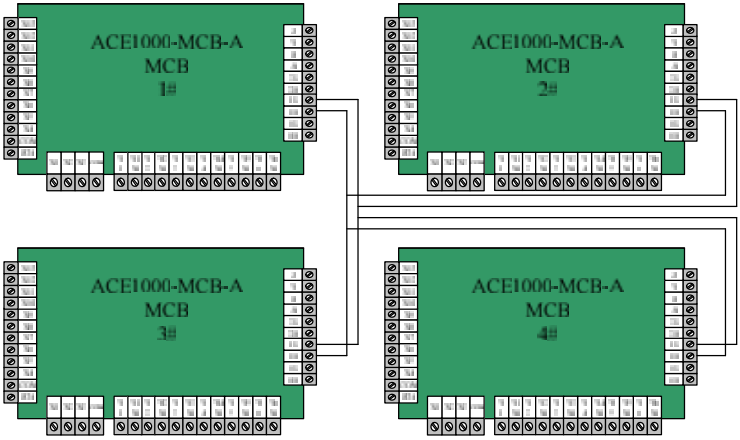
➢ **Wiring:**

◆ Parallel wiring of two elevators:



Wiring diagram of parallel scheme of two elevators

◆ Group control wiring of four elevators:



Wiring diagram of group control scheme of four elevators

➢ **Illustration:**

1. In the same physical floor, each elevator must be equipped with a leveling plate. If one of the elevators does not serve at the floor, this elevator must also install a leveling plate on the floor. Users can set up a skipping service floor to keep the elevator away from the floor.
2. ID address of hall call board: physical floor + compensation floor (P4C1.04), and the same leveling floors have the same hall call board ID.

➢ **Parameters:**

Function code	Function define	Data scope	Remarks
C0.00	Running control way	0: single mode 1: parallel control 2: group control	
C0.01	Elevator number	1 ～ 8	1～8 successively.
C1.04	High-low-feet compensation floors in parallel and group control mode	0: No compensation floor or long foot side setting. 1-16: Short foot side setting (virtual floors).	When it is non-high-low feet parallel or group control, fill in 0. Even if this elevator is long foot, also fill in 0. If the elevator is short foot, fill in the number of floors that differ this elevator from the longest foot elevator (do not fill in negative numbers but in positive numbers).
C0.02	1# Elevator parallel service floor(1～16)	0x0 ～ 0xFFFF	As long as parallel or group control elevators, it needs to fill in all elevators parallel service floor parameters. For example: two elevators are controlled in parallel mode, the parameters of 1# elevator and 2# elevator need to be set to C0.02~C0.04,C1.05~C1.07 parameters correctly. If one elevator is not set up, there will be reported parallel communication failure. Four elevators in parallel means it needs to set all parameters of parallel service floor.
C0.03	1# Elevator parallel service floor(17～32)	0x0 ～ 0xFFFF	
C0.04	1# Elevator parallel service floor(33～48)	0x0 ～ 0xFFFF	
C1.05	2# Elevator parallel service floor(1～16)	0x0 ～ 0xFFFF	
C1.06	2# Elevator parallel service floor(17～32)	0x0 ～ 0xFFFF	
C1.07	2# Elevator parallel service	0x0 ～ 0xFFFF	

Function code	Function define	Data scope	Remarks
	floor(33～48)		
C1.40	3# Elevator parallel service floor(1～16)	0x0 ～ 0xFFFF	
C1.41	3# Elevator parallel service floor(17～32)	0x0 ～ 0xFFFF	
C1.42	3# Elevator parallel service floor(33～48)	0x0 ～ 0xFFFF	
C1.43	4# Elevator parallel service floor(1～16)	0x0 ～ 0xFFFF	
C1.44	4# Elevator parallel service floor(17～32)	0x0 ～ 0xFFFF	
C1.45	4# Elevator parallel service floor(33～48)	0x0 ～ 0xFFFF	

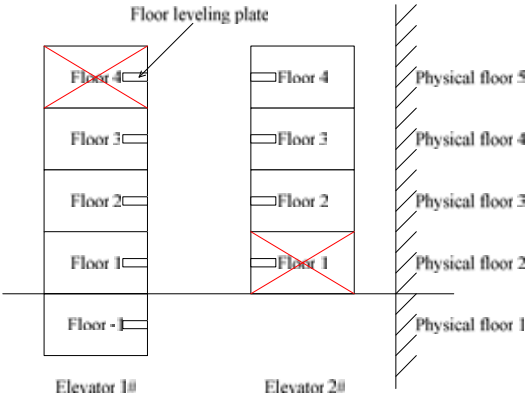
Note: Parallel service floors can be set directly on the main interface page of Parameter making software (Excel).

- **Example of parallel control schemes for high-low feet**

1# elevator has an underground floor, four floors above ground, but only serves -1,1,2,3 floor.

2# elevator has no underground floor, four floors above ground. The service floors are on 2nd, 3rd and 4th floor.

Illustrated in the following figure:



Parameters：

Function code	1# elevator setting	2# elevator setting
C0.00: Running control way	1	1
C0.01: Elevator number	1	2
F6.00: Total number of floors	5	4
C1.04: High-low-feet compensation floors	0	1
C0.02: 1# Elevator parallel service floor(1～16)	1F	1F
C0.03~C0.04:	0	0
C1.05: 2# Elevator parallel service floor(1～16)	1E	1E

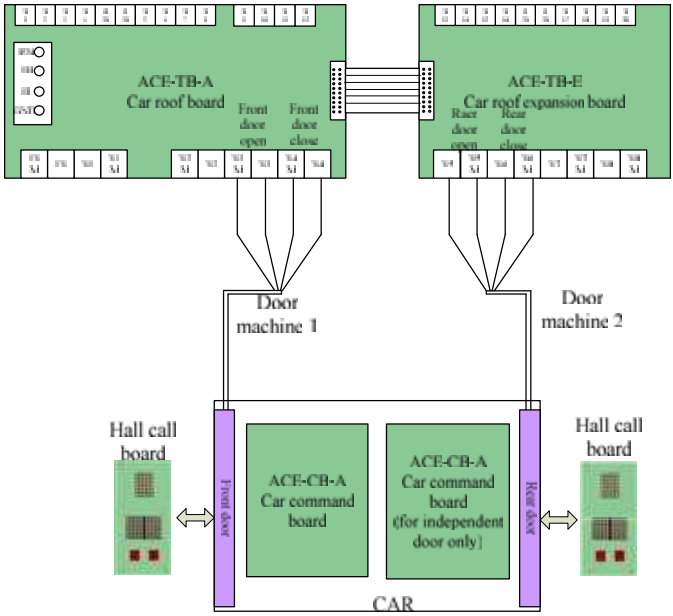
C1.06~ C1.07:	0	0
C0.05: Internal call service floor	1F	1E
C0.08: Upward call service floor	0F	0E
C0.11: Downward call service floor	1E	1C
C1.18:Non-service skipping floor function	1	1
C1.19:Skipping floors (1～16)	10	02
C1.20~C1.21:	0	0

11.15 Double-door service

➢ **Functional specifications:**

Include through-door and independent door. The through-door function is applicable to buildings with front and rear doors; the specifications parameters control which floor to open which door According to customer's requirements, different door can be opened in different floor (usually only one command board). Independent door are based on through-door, and then front and rear doors are served according to the front and rear door's call (usually two car command boards, two hall call boards in the same floor). In addition, ACE1000 can configure through-door or independent door of different floors according to the specification parameter P4C1.60-P4C1.65.

➢ **Wiring:**



➢ **Parameters:**

Function code	Function define	Data scope	Remarks
C1.00	Double doors control	0: Single door 1: through	●Single door serves according to the internal call service floor;

Function code	Function define	Data scope	Remarks
		-door 2: Independent -door	●The internal and external call boards of through-door do not need to distinguish between the main door and the auxiliary door; ●The internal and external call boards of independent door need to distinguish between the main door and the auxiliary door.
C0.14	Main door opening/closing service floor(1～16)	0x0 ～ 0xFFFF	These parameters must be properly configured for double doors. ER2.19 is related to the configuration here.
C0.15	Main door opening/closing service floor(17～32)	0x0 ～ 0xFFFF	
C0.16	Main door opening/closing service floor(33～48)	0x0 ～ 0xFFFF	
C1.01	Auxiliary door opening/closing service floor (1～16)	0x0 ～ 0xFFFF	
C1.02	Auxiliary door opening/closing service floor(17～32)	0x0 ～ 0xFFFF	
C1.03	Auxiliary door opening/closing service floor(33～48)	0x0 ～ 0xFFFF	
C1.60	Floors called separately by the main and auxiliary internal command boards in the independent double door(F1～F16)	0x0 ～ 0xFFFF	C1.00 needs to be set to 2. If internal calls do not need separate by front door and rear door, only one car command board is need.
C1.61	Floors called separately by the main and auxiliary internal command boards in the independent double door(F17～F32)	0x0 ～ 0xFFFF	
C1.62	Floors called separately by the main and auxiliary internal command boards in the independent double door(F33～F48)	0x0 ～ 0xFFFF	
C1.63	Floors called separately by the main and auxiliary hall command boards in the independent double door(F1～F16)	0x0 ～ 0xFFFF	
C1.64	Floors called separately by the main and auxiliary hall command boards in the independent double door(F17～F32)	0x0 ～ 0xFFFF	
C1.65	Floors called separately by the main and auxiliary hall command boards in the independent double door(F33～F48)	0x0 ～ 0xFFFF	

Note: It is recommended to add the IO expansion board when using the DC door machine, and define the main and auxiliary door opening and closing outputs on the IO expansion board. When the double door is independent, the internal calls of the front and rear doors should be connected to the same CAN bus; the external call of the front and rear doors should also be connected to the same CAN bus. The internal and external calls are preferably separated on different CAN buses, but it should be noted that the CAN2 bus does not support the independent double door function.

11.16 No main running contactor scheme

If customers need this scheme, please contact the manufacturer directly.

11.17 No serve to skipping floor

- **Functional specifications:**

For some reason, customers do not need to stop at a certain floor. This function can be used to prohibit the elevator from stopping at that floor. After setting skipping floor, all the calling instructions of this floor are invalid, and the self-rectifying operation will not stop at this floor.

- **Parameters:**

Function code	Function define	Data scope
C1.18	Non-service skipping floor function	0: Non-service skipping floor function invalid 1: Non-service skipping floor function valid
C1.19	Skipping floors (1～16)	0x0 ～ 0xFFFF
C1.20	Skipping floors (17～32)	0x0 ～ 0xFFFF
C1.21	Skipping floors (33～48)	0x0 ～ 0xFFFF

11.18 Inching to re-levele with door opening

- **Functional specifications:**

For elevators with large lifting height, after the elevator reaches the target floor, the load of the car will change due to the entry and exit of passengers and cargo. When the load of the car changes greatly, the traction wire rope will produce large expansion deformation (lengthen or shorten), which will lead to the deviation of the position of the elevator car. So the elevator need to automatically do inching and re-leveling operation at a very low speed in the open state, make the car return to the floor leveling position and facilitate passengers to enter and leave the car.

- **Application scheme**

In July 1, 2016, the new national standard (China) requires that elevators with inching and re-leveling function must be equipped with UCMP module. Please refer to the section of UCMP.

11.19 Rush hour service for commuters

- **Functional specifications:**

This function is used in buildings with high elevator usage during commuting time. The most crowded floor is the peak floor. The elevator returns to the peak floor immediately after the current call. The elevator only responds to the internal call and forward external call signals. Usually rush hour service function is combined with only down calls responsing function, so as to improve the operation efficiency of the elevator.

- **Parameters:**

Function code	Function define	Data scope
C1.22	The rush hour on duty floor	0: The function of on duty rush hour is invalid 1-Top floor: On duty rush hour standby floor
C1.23	The rush hour off duty floor	0: The function of off duty rush hour is invalid 1-Top floor: Off duty rush hour standby floor
C2.19	The on duty rush hour begins (day)	0～6
C2.20	The on duty rush hour ends (day)	0～6
C2.21	The on duty rush hour 1 begins	00.00～23.59
C2.22	The on duty rush hour 1 ends	00.00～23.59
C2.23	The on duty rush hour 2 begins	00.00～23.59

Function code	Function define	Data scope
C2.24	The on duty rush hour 2 ends	00.00～23.59
C2.25	The off duty rush hour begins (day)	0～6
C2.26	The off duty rush hour ends (day)	0～6
C2.27	The off duty rush hour 1 begins	00.00～23.59
C2.28	The off duty rush hour 1 ends	00.00～23.59
C2.29	The off duty rush hour 2 begins	00.00～23.59
C2.30	The off duty rush hour 2 ends	00.00～23.59
C0.30	Upward and downward call control ways	0：Upward and downward call unified response. 1：Only downward call unified response, no downward call. 2：Only upward call unified response, no upward call.
C2.46	Start time of only down calls response (1)	00.00～23.59
C2.47	End time of only down calls response (1)	00.00～23.59
C2.48	Start time of only down calls response (2)	00.00～23.59
C2.49	End time of only down calls response (2)	00.00～23.59

Note: In addition to using real-time control, the rush hour and only down calls responsing function can also be controlled through IO port.

11.20 Call for help from car to all hall

- **Functional specifications:**

This function is used when the elevator fails to open the door. The trapped person presses the open door button for more than 2 seconds in the car. The control system generates a call for help signal and lasts for 30 seconds. At this time, the word "HELP" and the trapped floor are displayed on all the hall call board. At the same time, the buzzer on the hall call board rings, promptly reminding the waiting elevator personnel that someone is trapped in the elevator, so that they can notify the rescue personnel to carry out rescue as soon as possible.

11.21 Parameters transfer to another board

- **Functional specifications:**

This function is suitable for replacing the main control board. The parameters of the old board can be transferred directly to the new board to improve work efficiency. When the parameters are transferring, both boards need to be powered on. The main control board receiving the parameters needs to obtain the second-level password privileges first. Then the CN10 of the two boards is connected together by special DB9 connection line, and the operation is completed by operating the keyboard on the old board.

- **Parameters:**

Function code	Function define	Data scope	Remarks
P3.17	Transfer elevator parameters to another main control board	0->go:Transfer P4C0 parameters 1->go:Transfer P4C1 parameters 2->go:Transfer P4C2 parameters 3->go:Transfer P4C3 parameters 4->go:Transfer P4C4 parameters 5->go:Transfer P5 parameters	A dedicated DB9 data line (shared with the standard digital display board wiring in car) is needed to connect the two MCBs. The MCB will display "EA" and report ER2.15 when transfer error occurs.

11.22 Elevator black box

- **Functional specifications:**

ACE1000 is equipped with elevator black box function (using on-board large capacity FALSH chip), which can record the elevator's running status every second, including elevator ACD status code, floor, speed, output voltage, output current, output frequency, bus voltage, car load, input port status, output port status, door opening/closing status, real-time fault, elevator calling situation, running instructions, etc. It continuously record elevator information for more than 72 hours. New record automatically covers old record. If you need to read the information of elevator black box, please contact us.

11.23 No car roof control board scheme

- **Functional specifications:**

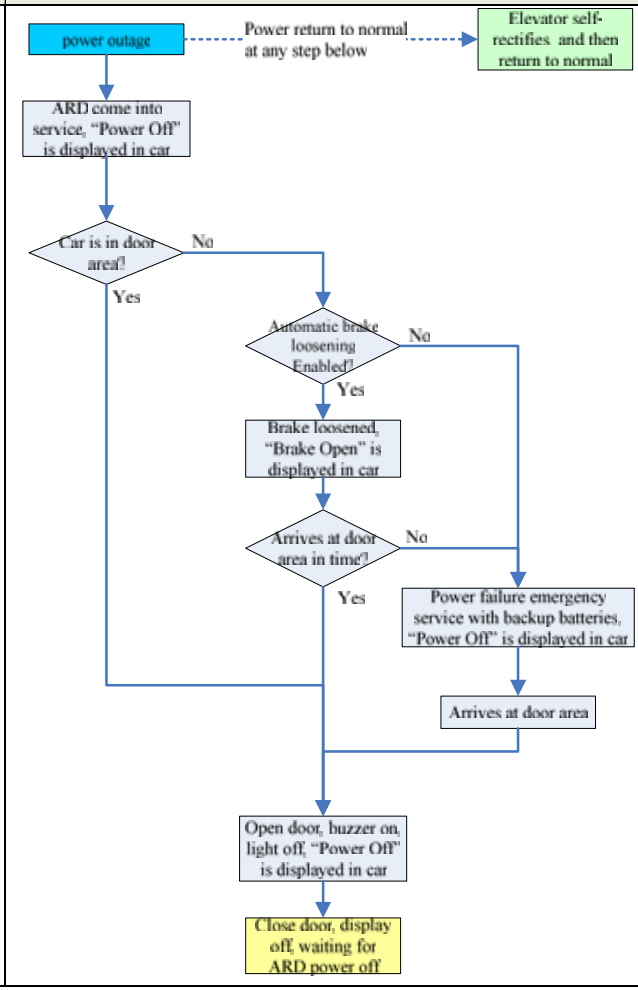
The ACE1000 car command board comes with four customizable independent input ports (X68-X71) and independent output ports (Y19-Y22). The input can be defined as door opening limit, door closing limit, door light screen and overload; the output can be defined as door opening output, door closing output, energy-saving output, integrated arrival bell output (by adding four small relays can meet the control functions of most elevators). This scheme can save more space and cost for users without the need of car roof board and car roof expansion board. For details, please consult the technical support engineer of Alpha.

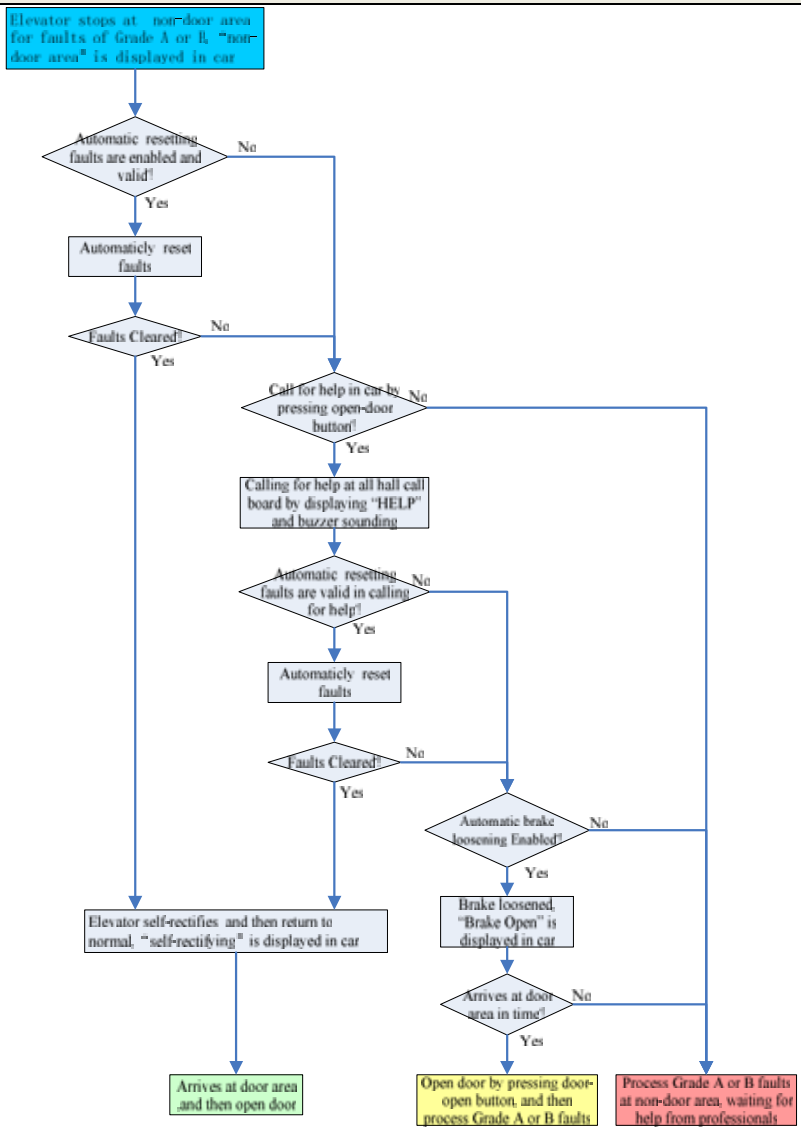
11.24 Automatic brake loosening for self-rectifying

- **Functional specifications:**

Elevator automatic brake loosening for self-rectifying function: When the frequency converter does not work and the main running contactor is not closed, the elevator control system actively opens the elevator brake so that the car can slip to the leveling floor to realize the automatic rectifying function. After loosening the brake, the car will run up or down according to the difference between the side of the car and the counterweight. If the two side weight are basically balancing, the car remain still (which will lead to the failure of automatic rectifying). In order to ensure that the speed of elevator is not out of control after automatic loosening of the brakes, it is required that the elevator must equip with permanent magnet synchronous tractor and correctly installed with star-delta contactor, so that the elevator motor enters the power generation state and the power output is in short-circuit mode. ACE1000 supports the brake loosening for self-rectifying in power outage mode and Grade "A+ B" failure mode. The use of brake loosening for self-rectifying in power outage mode can reduce the power consumption of the backup battery. Grade "A+ B" failure mode mainly aims at the situation of frequency converter failure. Whether the automatic brake loosening for self-rectifying can be started correctly depends on the elevator's state at that time, such as safety circuit, maintenance switch, door locks, slipping, brake torque, encoder status, etc. In addition, the elevator is required to operate normally in high-speed mode more than once after power-on or exiting from maintenance. If the car speed is too fast

or too slow after the elevator traction machine loosens the brake, it will lead to the early termination of the automatic brake loosening (i.e. rectifying failure). The automatic brake loosening for self-rectifying function of ACE1000 system under Grade "A+ B" failure mode is also related to the automatic clearance of faults and the calling for help function in the car. The corresponding function flow chart is as follows:

Function	Flow Chart
Automatic brake loosening for self-rectifying in power outage ARD mode	

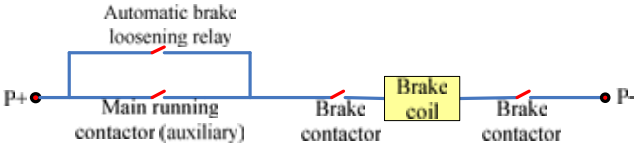
Function	Flow Chart
Automatic brake loosening for self-rectifying in Grade "A+ B" fault mode	

- **Wiring:**

Please refer to "Power failure emergency service" for power outage ARD wiring.

For safety reasons, a normally open auxiliary contact of the main running contactor is connected in series with the traction machine brake coil circuit to ensure that the brake can be opened only when the frequency converter works. Automatic

brake loosening for self-rectifying function belongs to **special emergency condition** (During this period the buzzer sounds in the car). The brake needs to be opened without closing the main running contactor. Therefore, a "0035 automatic brake loosening output" relay is defined on the main control board to bypass the auxiliary contacts of the main running contactor in series with the brake coil circuit. Please refer to the following figure:



➢ **Parameters:**

Function code	Function define	Data scope	Remarks
C0.34	Automatic brake loosening to rectify the car to the floor leveling.	0～3	0: Disable this function. 1: Enable this function only in power failure emergency service mode. 2: Enable this function only in grade A and grade B faults. 3: Enable this function in power failure emergency service mode, in grade A and grade B faults.
C2.56	Limitation of automatic barke-loosening rectifying time of duration.	20～300s	When the brake loosening time reaches this setting value, if it does not reach the door area, the brake loosening will stop (i.e. rectifying failure).
C4.80	MCB Y6 output	0035	Y3~Y10 can be customized.

Note: The automatic brake loosening for self-rectifying function is a special working condition designed to reduce battery loss and avoid being trapped in the car in the cases of elevator breakdown. It is only allowed to perform this function once after each power-on. For safety reasons, it is suggested to paste relevant operational precautions in the elevator car and machine room about this function.

11.25 Opening door change to inching door

➢ **Functional specifications:**

Generally, the protection function of the door-machine opening over-torque is relatively poor. In order to reduce the harm of entrainments from the gap between the car wall and the door, the opening door change to inching door function of ACE1000 can be used. After enabling this function, in the process of normal opening the elevator door (not yet in place), continuously press the closing button for more than 1 second, and that the elevator door will enter an inching action state for 30 seconds (buzzer will remind in the car before entering and exiting this state, door light curtain signal or opening/closing button signal will lengthen this time), during these moments the door open/close button can be used for the inching action of opening/closing only.

There is no need to add or modify wiring.

➢ **Parameters:**

Function code	Function define	Data scope	Remarks
C1.59_BIT9	Opening door change to inching door	0、1	0:Disable 1:Enable

Chapter 12: Normal maintenance

⚠ Cautions:

1. Maintenance of the inverter base should be done after the input power is cut off and wait for at least 15 minutes when the charging indicator lights out and the internal capacitance discharges are completed.
2. Maintenance of the main control board and switching power supply should be carried out after the LED and indicator lights are completely extinguished.
3. Release the static electricity before operation, and make sure no touch with the chip pins.
4. It is strictly forbidden to unplug or change any wiring when power connecting, otherwise there is the danger of damaging chips and equipment.
5. Never make any change to the integrated elevator controller by yourself. Otherwise, there is a risk of electric shock, short-circuit explosion and injury.
6. It is strictly forbidden to leave wires or metal objects inside the integrated elevator controller. Otherwise, there is a risk of fire.

12.1 Guarantee

We will provide warranty services when the followings occur in ACE1000 series integrated elevator controller and related products:

In normal use, failure or damage will be guaranteed according to the "Three Guarantee Policies" (from the date of leaving the factory, and the product barcode must be clear); a reasonable fee will be charged if the warranty period exceeds. However, due to the failure caused by the followings, even during the warranty period, a certain fee will be charged:

- Problems caused by intentional damage, destructive testing, failure to use in accordance with instructions, unauthorized self-repair or modification.
- Problems caused by using beyond the standard specifications and not derating according to the requirements.
- Damages caused by falling, taking in water or transportation after purchase.
- Damage caused by earthquakes, fires, floods, lightning strikes, abnormal voltages or other natural disasters and associated problems of disasters.

12.2 Product inquiry

If you find any product damage, failure or other problems, please contact us on the following items.

- Product model
- Sequence code of software and hardware on PCBA
- Product barcode
- Purchasing date
- Purchasing way

The problems to be described include: damage, unclear problems and failure phenomena.

12.3 Routine inspection

The shell can not be removed when the controller is powered on and running, so the operation status of the controller can only be checked by external visual inspection. Check the following points:

- Whether the operation environment meets the standard conditions;
- Whether the operation performance meets the standard conditions;
- Whether there are abnormal sound and oscillation from the integrated elevator controller;
- Whether the operating current of the controller exceeds the rating of the controller or the motor;
- Whether the input voltage is within the allowed scope;
- Whether there is abnormal noise, oscillation, odor, heat, etc.
- Whether the cooling fan is working properly and whether there is abnormal noise
- Whether the electromagnetic contactor does not close firmly or make abnormal noise, whether the shape expands or breaks when it acts
- Whether the capacitances, protective devices and chips on the circuit board show signs of burning down
- Whether the terminal screws are loose and the insulation around cable is cracked.

12.4 Replacing damaged parts

- Cooling fan: Life is related to the operation environment (dust, humidity, temperature, oscillation and so on). Normal life is more than 5 years.
- Electrolytic Capacitors for Filtering: Life is related to the operation environment (dust, humidity, temperature, power quality and so on). Normal life is more than 5 years.
- On-board relay: Life is relayed to frequency of use and so on. Normal life is more than 100,000 times.
- Button battery: Normal life is 3-5 years.

If the above parts are damaged, please contact our company for replacement. We advise not trying replacing them by user in order to avoid damage to personal or equipment safety.

Appendix 1: Elevator functions description

No	Function Name	Description
1	All calls response entirely	According to the floor calling instruction in the car and the floor calling instruction outside the hall, a comprehensive analysis and processing are carried out to automatically select the direction and respond to the instruction in turn. It can automatically register the instruction in the car and outside the hall, automatically close the door and start running, and answer one by one in the same direction; when there is no calling instruction, the elevator automatically closes the door or automatically returns to the home landing to close the door. When there is a call signal on a certain floor, the response is automatically started.
2	Only down calls response	The external call above the home landing only responds to the call-down, while the external call below the home landing only responds to the call-up. The other functions are the same with the normal control.
3	Protection for undervoltage and overvoltage of power supply	Inverter automatically protects the under-voltage and over-voltage of the input power supply.
4	Protection for overcurrent and overheat of inverter	Inverter automatically protects overcurrent (hardware protection + software protection) and module overheating.
5	Protection for phase shortage of input power and output short circuit	Inverter automatically protects three-phase input power supply phase shortage and three-phase output short circuit.
6	Protection for fault detection of encoder	Inverter automatically protects the encoder from cutting off, type and parameter inconsistencies and other faults.
7	Overload indication, alarm and protection	The overload is judged by 110% load switch. The buzzer sounds in the car when overload, the doors do not close, and the overload information is displayed on the internal and external call boards.
8	Overspeed protection	When the upward or downward speed of the elevator car reaches 1.15 times of the rated speed, the software of the elevator protects the elevator from overspeed and stops the elevator.
9	Protection for door lock short circuit	It is forbidden to restart after the elevator detects the short connection of the car door lock or the hall door lock. After the elevator is powered on, the door is automatically opened and closed to check the lock once.
10	Sliding protection for tractive steel wire cable	The steel wire rope is protected from slipping in the door area, slipping in the non-door area, and slipping in the power failure emergency service mode.
11	Protection for Elevator door touch panel	In the process of door-closing, the elevator will automatically open the door when receiving the door touch panel action signal, which can be used simultaneously with the door light curtain.
12	Protection for Elevator door light screen	In the process of door-closing, the elevator will automatically open the door when receiving the door light curtain action signal, which can be used simultaneously with the door touch panel.
13	Protection for Elevator door machine overload	The elevator door opens automatically when receiving the over torque signal from the door machine controller during the closing process.
14	Protection for abnormal door opening and closing time	If the door lock signal and the door terminal signal do not meet the requirements after the specified time is exceeded, the protection will be carried out: try to close the door again after the automatic opening of the door, and try to open the door again after the automatic closing of the door. The time for judging abnormal opening and closing doors and the number of retries are controlled by the specification parameters.
15	Protection for disconnection of door lock and safety circuit when running	When the car is running, if the door lock or safety circuit break down suddenly, the elevator stops right now. After three seconds, try to start again.
16	Protection for forced deceleration	When the car is approaching the terminal floor, it judges whether the current speed enters the normal S-curve deceleration according to the upper and lower forced deceleration signals, otherwise the direct deceleration or the immediate brake will be executed.

No	Function Name	Description
17	Fault classifying and hierarchical processing	Fault handling is graded (A-G), classified (1-8) records, and fault clearance is processed in different ways according to specific faults (I-IV).
18	Automatic fault detection and alarm	Automatic fault detection, automatic display on the keyboard after fault detection, and can display fault warning on internal and external call boards, also can control the buzzers to send out alarm sounds.
19	Automatic record and statistics of faults	Automaticly record of the latest 100 fault details, and do graded, classified and statistics.
20	Low-speed self-rectifying operation in fault	If the car stops in the non-door area for any reason, after the safety situation is turned to normal, the automatic low-speed self-rectifying operation runs to the door area to open the door.
21	Automatic re-selectimg the next floor in door-opening fault	After the elevator fails to open the door three times, it automatically goes to the adjacent floor to open the door.
22	Alarm when stopping in non-door area	The elevator stops in the non-door area, and the buzzer sounds in the car during self-rectifying operation.
23	Automatic correction of abnormal floor location(floor error)	When the elevator detects the possible position abnormality (floor err), it automatically looks for the first-level forced deceleration switch signal to the terminal floor for floor correction.
24	Parallel and group management control	With only two lines, up to four elevators can be connected in parallel control mode (based on the principle of minimum waiting time). A Group control board can manage up to eight elevators according to a variety of dispatching strategies.
25	Non-call, self-returning to home landing floor	If there is no call signal beyond the setting time, the elevator will automatically return to the home landing to wait for service.
26	Car stand-by dispersedly in parallel and group control mode	In parallel and group control mode, in addition to returning to the home landing, the elevator can also return to the designated middle floor to realize multiple elevators scattered in different floors waiting for service.
27	High-low-feet compensation in parallel and group control mode	Parallel and group control mode allows the bottom floor of different elevators not at the same physical floor.
28	Peak load operation mode under parallel and group control mode	Real-time control or input terminal control can be used to control the parallel and group control mode elevators to enter the rush hour state, so as to realize the peak load operation, and can be used simultaneously with the function of only down calls responsing to maximize the carrying capacity of the home landing.
29	Examine and repair running mode (maintenance mode)	Users are allowed to distinguish the repair of car, car roof and cabinet by different input terminal; and also can distinguish the repair of car, car roof and cabinet by electric interlocking. In addition, there are keyboard mode maintenance functions.
30	Emergency electrical operation supported	The elevator is allowed to run in maintenance mode by short connecting a part of the safety circuit or the door lock circuit, and the buzzer in the car sounds during the operation.
31	Self-measurement of the floor height	When the elevator is on the lowest floor leveling, it can enter the self-learning mode of floor height. The elevator automatically runs to the top floor at the maintenance speed, and records the height of each floor for the operation of distance control mode.
32	Earthquake control operation	When the elevator receives the signal of the earthquake sensor, it controls the elevator in running to stop and open the door automatically on the floor of the nearest service floor and then enter the earthquake control mode.
33	Automatically return to home landing floor in fire condition	When a building is in fire, the elevator will automatically return to the fire home landing floor to open the door by operating the fire switch, so as to ensure the personal safety of the elevator passengers.
34	Firefighter operation	Turn on the firefighter operation switch, the elevator runs to the fire home landing floor and open the door. At this time, the call commands outside the hall are invalid. Firefighters enter the car and call a floor then press the closing door button to start. Each time the elevator can only be carried out with one internal call command. When the elevator reaches the target floor, all registered internal call commands will be cleared once to improve the elevator's response ability. It includes two stages of "Ruturning to fire home landing" and "Firefighter

No	Function Name	Description
		operating".
35	Parking of lift (manual or time control)	The elevator can be controlled by real-time or external call board parking switch to return to the parking home landing after the last call instruction has been served and then stop the service.
36	Power failure emergency service	Provide temporary electricity through emergency backup battery power supply, let the elevator stopped in the non-door area runs to the door area to open the door.
37	Double doors control (including through door and independent door)	There are two kinds of control mode, through door and independent door. Through door: Open different door (front door or back door) on different floors according to the specification parameter. Independent door: Open different door (front door or back door) on different floors according to the calling instructions from the front door or back door.
38	Set a limit to operating times by user	It is used in conjunction with password control function to control elevator operation authority. LCD keyboard is required.
39	Straight going/passing when in full-load	When the car load exceeds 80%, it will no longer respond to the call outside the hall.
40	Anti prank for internal call	There are two methods: A. Judging the prank operation according to the load and the number of internal calls in the car, automatically clearing all internal calls after the first internal call arrives; B. Judging whether there are no people entering or exiting according to the action of the door light curtain, and three consecutive internal calls without entering or exiting will be regarded as prank, automatically clearing all internal calls.
41	Automatic elimination of the reversed internal calling instructions	After completing the last floor service in the current direction, all of the internal calling instructions on the opposite direction are automatically cleared.
42	Cancellation of incorrect instructions in car	Press 3 seconds on the call button of incorrect registration to cancel the call registration.
43	Skip floors without stopping	Virtual floors due to too high floor height or some specifical floors are uaually set as skipping floors, any service of the elevator will be avoided from these floors.
44	Start-up compensation with weighing-device	In order to compensate the starting moment and improve the starting comfort of the car, an analog weighing sensor is needed.
45	Start-up compensation without weighing-device	The starting moment is compensated according to the sliding quantity of the elevator car at the moment of opening the brake, so as to improve the starting comfort. No analog weighing sensor is needed; usually a sin-cos encoder is needed.
46	Arrival light/bell in car	Before the elevator reaches the destination floor, a light or sound in car remind the passenger to arrive at. The speed threshold and duration can be controlled by specification parameter.
47	Arrival light/bell in hall	Before the elevator reaches the calling floor, a light or sound in hall remind the hall passenger to come on. The speed threshold and duration can be controlled by specification parameter.
48	Voice announcing system in car	Broadcast the voice information such as the elevator door opening and closing, start, and reaching the floor.
49	Energy-saving control of lighting and fan in car	When the time of elevator waiting for service reaches the specified time, the lighting and fans in the car are automatically off to save energy.
50	Special statistics for the convenience of maintenance	Real-time statistics of elevator call times on each floor, door opening and closing failure times on each floor, fault grade and classification statistics on each floor, etc.
51	Door stop (no opening and closing)	Setting the door stop function when debugging, the elevator no longer opens and closes the door, so as to improve the efficiency of running test.
52	Random/Floor-by-floor running	For running test and floor checking.
53	Keyboard call holding	After enablement, remember the floors called by the keyboard, and run among

No	Function Name	Description
		the floors all the time.
54	External(hall) call prohibition	After enablement, the external call service is prohibited to prevent passengers from entering.
55	Real time	The system comes with a button battery to maintain real time, providing time service for some functions that need real-time control, and the time error can be corrected to 2.5 seconds/day.
56	time sharing and floor dividing service	Enable or disable internal and external calls for different floors at different times.
57	Automatic control of door-opening time	Automatically adjust to the door-opening time according to the internal call, external call, disability call, home landing call and so on.
58	Prolong door-opening time control	By pressing the prolonged opening-time button in the car (car command board), the time for opening the door is automatically prolonged, and the time length can be controlled by the specification parameter, which is convenient for the freight elevator or the disabled.
59	Running times sum up	The system automatically counts the times of elevator running, external recorder is not needed.
60	Running time sum up	The system automatically counts the total time of elevator running, external recorder is not needed.
61	Door opening in advance of car stop	It is necessary to add the UCMP board and the door area switches to realize the opening of the door in advance of the elevator stop. It can improve the running efficiency.
62	Inching to re-level with door-opening	After the elevator opens the door at door area, the rope is elongated or shortened due to the load change (passengers entering or exiting), which results in the leveling accuracy out of range. The elevator runs to the accurate leveling position at a very low speed with door opening. Need to add UCMP board, door area switches, re-leveling switches.
63	Automatic/manual detection for brake valid torque	Synchronous traction machine braking torque needs to be checked regularly. You can run the test manually or set the time to automatically detect it.
64	UCMP function and test	UCMP test mode is specially used to test whether the external UCMP board and its wiring and function are correct.
65	Auxiliary/double brake control	Define an auxiliary brake output on the MCB. The relay contact is inserted into the rope gripper and the up-running overspeed protection control loop, which can provide additional protection for the UCMP in software.
66	Double detection for brake holding	The elevator traction machine can be equipped with two sets of independent electromechanical brakes that apply braking force to the brake wheels. Each brake is equipped with monitoring devices and circuits, which feedback the working status of each brake to the MCB for the elevator safety protection.
67	Car IC card control function	The system allows the use of IC card devices to authenticate passengers and serve specific floors in the car.
68	Hall IC card control function	The system allows the use of IC card devices to authenticate passengers and serve specific floors in the hall.
69	External call message displays in the car	The hall call status/information is flashed on the car command board floor buttons (parameter control).
70	Lift attendant operating function	In an elevator operated by an attendant, the attendant controls the door closing and running directions of the elevator. The hall call status/information is flashed on the car command board floor buttons, and the attendant decides whether to provide service for it.
71	Double car command board operation function	CAN bus communication is adopted in the car, which allows more car command boards connect to the bus with different working modes, such as "Main door/ZM", "Auxiliary door/FM", "Main disability/ZC", "Auxiliary disability/FC", "Simplified main door/Z2".

No	Function Name	Description
72	VIP passenger dedicated function	In the VIP operation state, the elevator does not register the call command outside the hall. The external call board has no floor and direction display, and only responds to the call command in the car. You need to press and hold the door-closing button until the elevator starts every time.
73	Special facilities for the physically disabled	In disability mode, the door opening time is automatically lengthened and the door opening in advance of car stop function is cancelled.
74	Automatic ID setting of external call board	There are various ways to set the hall call board ID. It supports manual setting, automatic setting, check mode setting, etc. It can also set the disability call and auxiliary door call mode.
75	Button-conglutination judgement of internal and external call, opening and closing door	After the button conglutination is found, the relevant fault is reported and the conglutination position is recorded.
76	Judgment of absence of external call board	After detecting that an external call board is missing, the relevant fault is reported and the missing location is recorded.
77	External call board analogs displaying door opening and closing action	Simulate the actual opening and closing action of the elevator door on the arrow matrix of the hall call board.
78	Internal and external call communication protocol can be encrypted	The internal and external call communication protocol itself has been encrypted, and a special internal and external call communication protocol can be customized for large customers.
79	External call board buzzer function	External call board has buzzer, which can be used for fault alarm, call for help in car, disability call prompt, etc.
80	Custom-defined special digital display	The system provides sixty-four (7×5) standard fonts for the customer to define the digital display content. In addition, the user can also customize two (7×5) or (16×16) fonts for special digital display content.
81	Call for help from the car to the hall	When the door-opening button in car is long pressed but the door doesn't open, all of the hall call boards sound alarm and display "HELP".
82	Full CAN communication among control boards	Three independent CAN buses are used for internal call, external call and parallel and group control to improve anti-interference ability.
83	IO point status monitoring	IO points level status and IO variables status can be monitored to facilitate the searching for the peripheral signal faults.
84	IO terminal customization	Most of the functions of input terminals and the high and low level effective state can be customized by users.
85	IO port number can be expanded	The IO terminal quantity of the main control board, the car roof board and the car command board can be expanded to make non-standard function conveniently.
86	Elevator debugging and adjustment in car	Use Chinese/English LCD keyboard to support elevator adjustment and commissioning in car, mainly to adjust the comfort degree.
87	Chinese/English LCD keyboard debugging (parameter backup)	In addition to providing on-board keyboard and easy portable keyboard, the system also has a more powerful LCD keyboard with full Chinese/English user interface. Note: The protocol is encrypted.
88	Serial communication debugging	ACE1000 can communicate with PC to upload/download specifications and inverter parameters, and also realize PC debugging and other functions.
89	Mobile phone debugging	After adding Bluetooth/WIFI module, ACE1000 can communicate with mobile phone and realize the same function as PC communication.
90	Full debugging on the main control board	The onboard keyboard supports all elevator debugging and operation functions, which are the same as the easy portable keyboard.
91	Easy portable keyboard debugging	Easy portable keyboard use standard LAN cable (RJ45 connector), so the handheld mobile debugging can be easily operated.
92	Wireless/remote monitoring interface (GBT24476-2017 China)	The main control board has its own RS422/485 interface for monitoring function. It can also extend one RS422/485 interface. It is suitable for community monitoring, remote wireless monitoring, internet of things and so

No	Function Name	Description
		on.
93	Integrated upload/download elevator parameters	Through PC software, Chinese/English LCD keyboard and mobile phone software (APP), the elevator specifications and inverter parameters can be uploaded / downloaded at one time.
94	Easy-transfer parameters to the new when replacing main control board	By using standard digital display board wiring in car, all parameters on the old board can be transferred to the new board without any other tools (except for floor height data), which is convenient for replacing the MCB on site.
95	Backup/recovery of off-chip parameters from/to main control board	Elevator parameters can be saved in the MCU on-chip and off-chip EEPROM at the same time to realize on-chip to off-chip backup and off-chip to on-chip recovery.
96	Backup and restore of factory default parameters	When the parameters are written by the elevator factory, a copy of the default parameters can be set and saved in off-chip. After that, the factory default parameters can be restored to the elevator when needed.
97	Static self-learning of motor parameters	Synchronous motor does not need to open the brake for static self-learning magnetic pole angle.
98	Atuo multi-segment speed and ultrashort floor height recognition	The speed nodes of S-curve can be set automatically according to the running distance, and the ultrashort floor height can also be recognized.
99	Direct stopping at the floor leveling	When stopping, there is no traditional crawl speed running, and stopping directly to the exact floor leveling position.
100	Black box record of operating status	Real-time record the elevator state in minutes and seconds, such as running status, IO status, fault records and so on.
101	Hierarchical password control of elevator parameters	Elevator parameters are controlled by three-level password, allowing different people to hold different levels of password, different levels of password authority is different.
102	Security floor at night	After the security floor at night function is enabled by switch or timed mode, the elevator can respond to one external call only when the car is in security floor standby. Before responding to the external call at security floor, the door is opened first and then the call can be served. It returns to the security floor for standby immediately after finishing a call service.
103	Signal satisfaction test/check	In the mode of motor pole angle learning, maintenance operation, floor height self-learning, normal running, inching to re-level, brake trque test, self-rectifying operation, power failure emergency service, etc., the system can check whether the required signal meets the corresponding operating conditions. It can help the user quickly find the cause of most of the problems.
104	Door opening and closing test independently	It is specially used for repeated opening and closing test of door machine and elevator door, and at the same time, the test results are automatically counted.
105	Elevator emergency stop fault troubleshooting	After setting this function, all IO States and main variables in the program can be captured when the elevator suddenly stops from running.
106	Open the door on the floor leveling before the elevator is corrected to the terminal floor.	In the event of a floor fault that needs to be corrected to the terminal floor, the door is opened when the correction operation reaches the first door area, and then the floor correction is continued to the terminal floor.
107	Automatic brake-loosing rectifying	In the event of power failure emergency service and failure of frequency converter, the synchronous tractor actively loosens the brake to let the car low-speed slide to the floor leveling position to open the door and release passengers.
108	Elevator external call turning to internal call service	The elevator external call service on the designated floor is treated as internal call service. It is suitable for some cases of inconsistent setting of double-doors in parallel elevators, so as to avoid external call service being assigned to an elevator that cannot be opened.
109	Faults reset conditionally and Intelligently	According to the fault class and the time interval, the specified grade of fault can be cleared automatically. The number and time interval of automatic cleaning are controlled by parameters。
110	Door-opening standby for passengers	Elevators are allowed to stand by on home landing or on all floors.

No	Function Name	Description
111	Normal opening door change to inching action door when in emergency	When the elevator opens normally, if it receives a continuous closing-door button signal in the car, the elevator door will automatically turn to an inching state for a period of time to avoid or reduce the harm caused by small items (such as children's hands) in the left and right door seams during the automatic opening process.
112	Safety circuit section detection	In addition to the general safety circuit, it also provides the safety circuit section detection function.

Note: Due to space reason, some functions are not listed here. Most functions are just simply explained. For details, please consult the manufacturer.

Appendix 2: Common measures of EMC

1. Grounding measures: the motor and controller/cabinet need to be grounded. The ground wire must be connected even if a new building uses temporary power, and all kinds of cable shield must be well grounded. Good grounding is important when the encoder line is long.
2. Wiring method: power supply line, motor line, and control signal line must be laid separately and separated enough distance to prevent real load interference. Power and motor wires are best inserted into the grounded metal pipe, especially encoder lines and motor wires can not be tied together into the cable slot. Control signal line and power line should not go parallel; if you have to do that, please separate more than 20 cm and use high quality shielding line.
3. Encoder line: shielded twisted pair must be used, preferably the whole one provided by the original factory (not extended), the DB15 terminal of encoder line must be tightened, and not too close to the power line and transformer when traveling inside the control cabinet, and do not enter the same slot with motor line outside the control cabinet. If the traction machine is poorly grounded, it is not recommended to connect the encoder shield wire to the traction case to avoid interference.
4. Traveling cables: when the traveling cables are distributed, all kinds of signal lines can not be connected with power lines such as lighting and power supply of door machine. You can seperate them by ground wires. The CAN communication line in the cable should also be equipped with twisted-pair shielding wire. In special cases, the strong line in the cable can be added with single-phase power filter on the control cabinet.
5. CAN communication: terminal resistors must be installed at both ends of CAN bus. When CAN nodes are too more, another one or two terminal resistors can be tried. Twisted shielded wires must be used and CANH must be twisted with CANL in cable distribution; do not twist with other wires. When there are too many external call board nodes, the 24V power supply of the farthest call board board must be guaranteed not less than 20V (one or two switching power supply can be added).
6. If the starting and stopping of one elevator will affect the normal operation of another one in parallel control mode, please install a filter and electric reactor on the power supply lines of the two controllers. The filter must be reliably grounded.
7. After installation and commissioning of elevator, power-off the control system, use multimeter detects whether the shielding wire of encoder is connected to the ground and whether the shielding wire of CAN communication is connected to the ground. Whether the resistance between CANH and CANL of three independent CAN buses on the main control board is between 40 ohm and 60 ohm, otherwise the terminal resistance may be set incorrectly; whether the resistance between CANH and CANL, and 24V power supply and ground is large enough, otherwise the wiring may be wrong.

Appendix 3: Input and output variable table

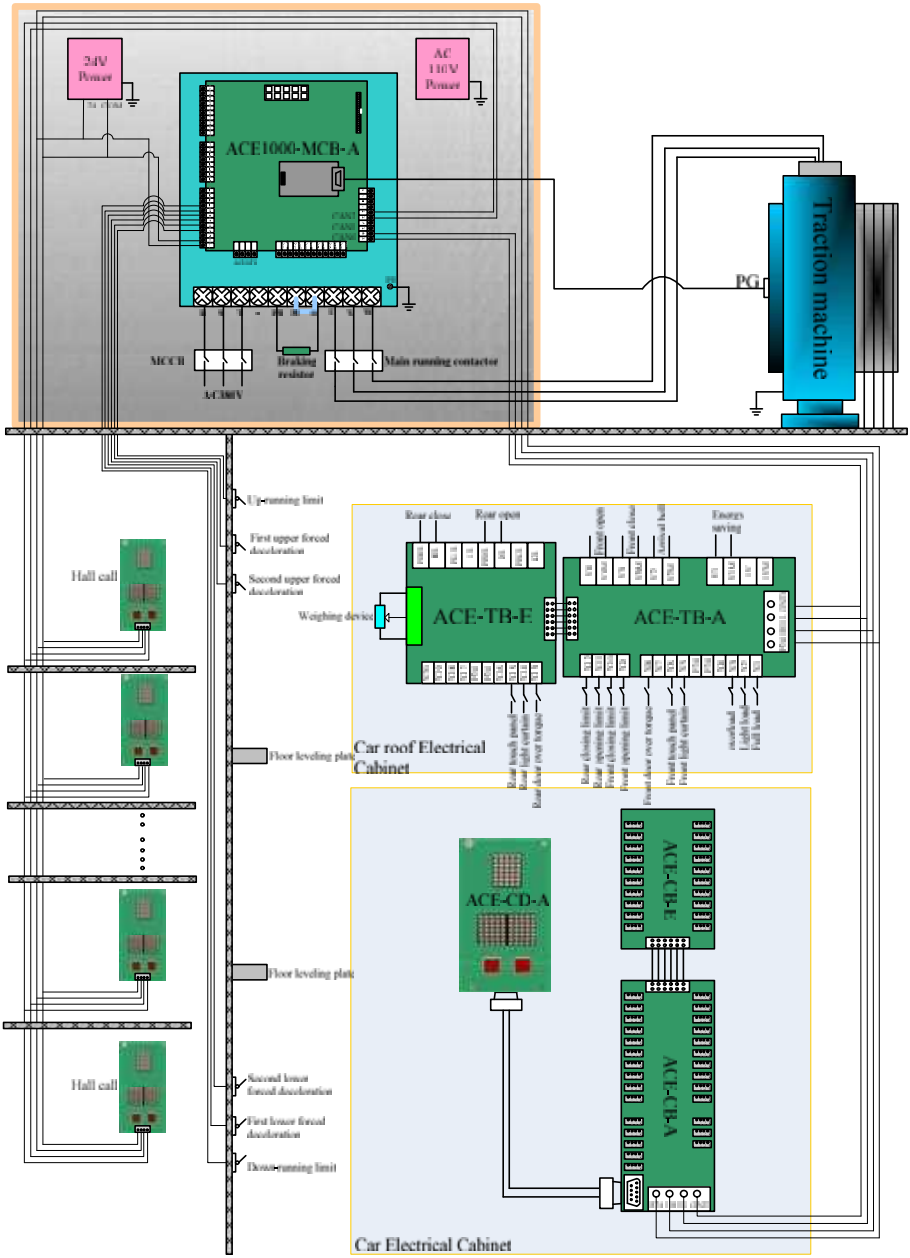
Input variables:			
01: Safety circuit input	02: Car door lock / series door lock input	03: Hall door lock input	04: Floor leveling signal input
05: Up-running limit signal input	06: Down-running limit signal input	07: First upper forced deceleration switch input	08: First lower forced deceleration switch input
09: Second upper forced deceleration switch input	10: Second lower forced deceleration switch input	11: Third upper forced deceleration switch input	12: Third lower forced deceleration switch input
13: Upper inching sensor input	14: Lower inching sensor input	15: Feedback of main running contactor	16: Feedback of machine brake 1# monitoring
17: Feedback of machine brake 2# monitoring	18: Upper door area sensor input	19: Lower door area sensor input	20: Main door opening area signal input
21: Auxiliary door opening area signal input	22: Feedback of safety relay	23: Feedback of brake contactor	24: Feedback of star-delta contactor
25: Feedback of strong excitation brake contactor	26: Redundant input of hall door lock	27: Redundant input of car door lock	28: Feedback of virtual door-closing output to UCMP board
29: Power failure emergency service request	30: Earthquake control request	31: Maintenance switch input in no-machine room mode	32: Maintenance up-running request in no-machine room mode
33:Maintenance down-running request in no-machine room mode	34:Maintenance switch input in car roof mode	35:Maintenance up-running request on car roof	36:Maintenance down-running request on car roof
37: Maintenance switch input in car mode	38: 110% overload signal input	39: Firefighter operation switch input	40: Fire mode return to home landing switch input
41: Main door open button input	42: Main door close button input	43: Main door touch panel signal input	44: Main door light curtain signal input
45: Main door opening/closing over torque signal input	46: Main door opening limit signal input	47: Main door closing limit signal input	48: Auxiliary door open button input
49: Auxiliary door close button input	50: Auxiliary door touch panel signal input	51: Auxiliary door light curtain signal input	52: Auxiliary door opening/closing over torque signal input
53: Auxiliary door opening limit signal input	54: Auxiliary door closing limit signal input	55: Prolonged main door-opening button input	56: 20% light load signal input
57: 80% full load signal input	58: Parking of lift switch input	59: Exist no service floors switch input	60: Independent running switch input
61: VIP operation mode input	62: Attendant operation mode input	63: Attendant change the direction of running button input	64: Attendant starting up button input
65: Attendant straight going/passing button input	66: Attendant upward running button input	67: Attendant downward running button input	68: Main door close switch input on car roof operation
69: Door motor overheating signal input	70: Motor overheating signal input	71: On-duty rush hours switch input	72: Off-duty rush hours switch input
73: Only upper call response switch input	74: Only lower call response switch input	75: Unintended car movement signal input	76: Power phase order protection signal input
77: Safety circuit redundancy signal input	78: Door lock bypass switch input	79: Upper and lower door areas in series signal input	80: Night security floor switch input
81: Prolonged auxiliary door-opening button input	82: Feedback of automatic brake loosening relay output	83: Altering fireman home landing	84: Alarm bell input in elevator car
85: Electric lock feedback input	86: Feedback input of electromagnetic door knife	87: Upper inching input 2	88: Lower inching input 2
89: Feedback of main brake-holding contactor 2	90: Overheating of external devices	91: Holding brake coil short circuit	92: Car lighting and fan switch

93:Reserved	94:Reserved	95:Reserved	96:Reserved
97: Safety circuit section detection	98:Auxiliary door lock short connection detection signal input	99:Main door lock short connection detection signal input	100:Reserved
Output variables:			
01: Brake contactor control output	02: Main running contactor control output	03: Safety relay control output	04: Strong excitation brake contactor control output
05: Star-delta contactor control output	06: Power failure emergency service state output	07: Virtual door-closing signal output for UCMP board	08: Door-motor power supply relay control output
09: Fire state output	10: Main door leveling floor signal output	11: Auxiliary door leveling floor signal output	12: Main door opening relay control output
13: Main door closing relay control output	14: Auxiliary door opening relay control output	15: Auxiliary door closing relay control output	16:Main door opening light signal output
17: Main door closing light signal output	18: Auxiliary door closing light signal output	19: Auxiliary door closing light signal output	20: Prolonged door-opening light signal output
21: Buzzer/flash in car relay control output	22: Merged arrival bell relay control output	23: Running direction broadcasting relay control output	24: Floor broadcasting relay control output
25: Energy saving (Car lighting and fan control) relay output	26:Upward arrival relay control output	27:Downward arrival relay control output	28:Elevator failure relay control output
29:Rope gripper contactor control output	30:Target floor relay control output	31:Hand-operated door lock drive relay control output	32:Elevator upward running signal output
33:Elevator downward running signal output	34:In car call for help relay control output	35:Automatic brake loosening relay control output	36: Car sound and light alarm
37: Control output of electromagnetic door knife	38: Alarm filtering	39:Reserved	40:Reserved

Note 1: Normally open input signal defined as 0.0XX, normally close input signal defined as 1.0XX, output signal dafine as 0.0YY.

Note 2: Input variable No. 1 is abbreviated as In01 or I01, Output variable No. 1 is abbreviated as Out01 or O01, and so on.

Appendix 4: System wiring diagram



Appendix 5: Warranty

User name:	
Installation Address:	Installation Company:
Contact:	Telephone:
E-mail:	Fax:
Model:	Number(bar code):
Purchasing date:	Fault date:
Purchasing route:	Agent:

Elevator configuration:

Rated Speed:	Motor Brand and Model: □Synchronization, □Asynchronization
Rated Load:	Location: □machine room, □no machine room
Motor power:	Encoder type: □sine and cosine, □UVW, □ABZ
Elevator floors: Service floors: Service Doors:	Door machine controller: □direct current, □Frequency Conversion
UCMP function:	Leveling sensor: □photoelectric, □magnetic isolation
Special configuration:	

Fault description：

Maintenance records：