GST-IFP4E Intelligent Fire Alarm Control Panel

Installation and Operation Manual

Issue 1.03

ERP: 30311056

CONTENTS

Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

- ✧ Do not attempt to install, service, or operate this unit until this manual is read and understood.
- ✧ This equipment must be installed in accordance with these instructions and the appropriate national, regional and local regulations specific to the country and location of the installation. Consult with the appropriate Authority Having Jurisdiction (AHJ) for confirmation of the requirements.
- ✧ GST-IFP4E Fire Alarm Control Panel (FACP) shall only be installed and serviced by trained specialist.
- ✧ Disconnect all sources of power before servicing. The control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized.
- ✧ Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, and printed circuit board location.

Preface EN 54 Information

EN 54 √

✧ GST-IFP4E Intelligent Fire Alarm Control Panel (FACP) complies with the requirements of EN 54-2: 1997 +A1:2006 and EN 54-4: 1997 +A1:2002 + A2:2006. In addition to the basic requirements of these standards, the panel conforms to the following optional requirements.

Option		EN 54-2 Clause
Indication	Alarm counter	7.13
	Fault signals from points	8.3
	Total loss of the power supply	8.4
Control	Delays to outputs	7.11
	Dependencies on more than one alarm signal	7.12.1 7.12.2
	Disablement of addressable points	9.5
Outputs	Output to fire alarm devices	7.8
Test	Test condition	10

Notes: The panel has two fire alarm output ports, one is an active output and the other is relay output, in the event of a system failure, it ensures that one of them can output normally

EN 54 √

✧ The power supply of GST-IFP4E FACP complies with EN 54-4 requirements.

	EN 54-4 Clause
Power supply from the main power source	5.1
Power supply from the standby power source (battery)	5.2
Charger	5.3
Faults	5.4

EN 54 N/A

✧ In addition to functions required by EN54-2, the panel supports a number of ancillary functions that are not required. These are outlined below:

Ancillary Function	Manual Section
Thermal Printer	1.4.6
RS232/USB Output	1.4.9
GST-IFPx-Def Defining Tool	1.7
Fire Alarm Output	2.5.4
RS485 Output	2.5.12

1 Product Introduction

GST-IFP4E is an Intelligent Fire Alarm Control Panel (FACP) designed for medium- to large-scale facilities. It complies to EN54 standard with features of easy installation, operation, and maintenance. The FACP integrates an ARM9-Cotex CPU with inbuilt Linux OS. Its friendly and graphical screen can be touchable in operation.

Inventory

The FACP is delivered with all components installed. When the shipment is received, check to make certain that all accessories have been included:

- ✧ Cabinet key
- ✧ Manual

1.1 Standard Features

The FACP provides the following:

- ✧ Advanced Protocol mode with 1~6 loops which meets Class A requirements.
- ✧ 242 addressable devices (include sensors, modules and manual call points) per loop.
- ✧ Maximum 1452 zones can be indicated, and maximum 160 zones can be indicated using LED. Can be configured to indicate additional 480 zones (not approved). The rest of the zones will be indicated on the LCD.
- ✧ Can be programmed to indicate 3000 zones using both LED and LCD when used with other GST-IFP4E panels in a network configuration (Not approved) .
- ✧ One Alarm Output and one programmable Sounder/AUX Output. They are Power Limited and share total max 2.5A current.
- ✧ Built-in three fixed relays: Alarm, Supervisory and Fault.
- ✧ Built-in two programmable relays which can be set as Alarm, Supervisory, Fault, Mains Fault, Isolate, Silence Alarm, Reset function.
- ✧ Battery charger supports up to 65 amp hour sealed lead-acid batteries
- ✧ Ethernet interface for GMC communication system.
- ✧ EIA-485 communication interface for passive and mimic repeaters.
- ✧ LCD display unit of 800×480，7.0 inch color TFT LCD.
- ✧ Capacitive Touch screen.
- ✧ History file with 10,000 alarm events, 10,000 supervisory events and 100,000-other events capacity.
- ✧ Advanced history filters allow sorting by event, time, date, address etc.
- ✧ Up to 1000 powerful Cause & Effect Equations.
- ✧ Network operation.
- ✧ Ground fault detection.
- ✧ Password and key-protected nonvolatile memory.
- ✧ User programmable password.

- ✧ Field-programmable on panel, or by external computer with GST-IFPx-Def Defining Tool and connected via Ethernet / USB port on SD-400E LCD Drive Board.
- ✧ The list of components is shown in the table below:

Model	Description
PSU-250E	Power supply unit
SD-400E	LCD Screen Driver Board
NC-400E	NAC Card
MB-400E	Mother Board
MP-400	MCU Mounting Board
IB-400	Indicator Board
KB-400E	Keypad Board
SM-400	Standard Membrane
SC-400	LCD Screen
MP-401E	CPU Card
CA-400E-R/W/G	Red/Milky/Grey Cabinet
BZ-400	Buzzer
BR-400	Circuit Breaker
LK-400	Key and Lock
DR-400	Transparent Glass Door

Optional modular units are shown in the table below:

Model	Description
LC-401E	Single Loop Card
LC-402E	Dual Loop Card
P-9966EA	CAN Class A network card
P-9983EA	Fiber-optical Class A Network Card
P-9956E-Modbus	Modbus Card
P-9981E	Zone Display Panel
P-9981FE	Zone Display Panel
P-9982E	Zone Display and Control Panel
P-9982FE	Zone Display and Control Panel
ZC-400E	Zone Display and Control Board
ZC-400FE	Zone Display and Control Board

ZD-400	Blank Zone Display Plate
ZD-401	Zone Display Plate without Button
ZD-402	Zone Display Plate with Button
OP-400E	Operation Panel
PS-400E	AC-DC Converter WSD-U250D27+30III
PB-400E	Power Supply Board
PR-400B	Thermal Printer for GST-IFP4E

1.2 System Limitations

System expansion must take into consideration the following:

- ✧ The physical limitations of the cabinet configuration.
- ✧ The electrical limitations of the system power supply.
- ✧ The capacity of the secondary power source (standby batteries).

1.3 Basic Components

A basic FACP requires at least the following components:

- ✧ **A WSD-U250D27+30III Main Power Supply**

  Supply power to the whole panel and connected devices. Monitor the status of AC power, battery and charger, switch power between AC power and battery.

- ✧ **A Battery**

  The FACP uses only sealed lead-acid batteries that must meet the requirements of annex M of EN 62368-1 for standby power. Maximum battery capacity is 65 Ah (ampere-hour). Minimum battery capacity depends upon your system configuration; absolute minimum is 38 Ah.

- ✧ **A Display and Keypad Module**

  This module includes LCD, Touch screen, display driver board, LED, Keypad board. It provides information in graphic and word, and customers can operate the panel using real keys and touch screen.

- ✧ **A Main Box Module**

  This module is the heart of the FACP. It includes a mother board, a CPU card and a NAC card.

- ✧ **An Enclosure with door**

  The enclosure can conclude a power supply, a host cabinet and two batteries of 12V/38Ah. A display and keypad module and 8 ZCPs can be installed on the door.

1.4 Optional Components

1.4.1 LC-401E Single Loop Card

Single Loop Card has one completely Class A SLC compatible with Digital Protocol Bus. The loop can connect maximum 242 devices. Users can add up this card to extend loop if necessary.

1.4.2 LC-402E Dual Loop Card

Dual Loop Card has two completely Class A SLC compatible with Digital Protocol Bus. Each loop can connect maximum 242 devices. Users can add up this card to extend loop if necessary.

1.4.3 P-9966EA CAN Class A Network Card

The network card is essential accessory for the FACP to be networked by inserting the card into the slot of the panel's motherboard. Many separate FACPs can form a fire alarm network through the card. Each panel supports Max three network cards working simultaneously. Please refer to Section 2.5.9 for wiring and setting information.

1.4.4 P-9981E Zone Display Panel

Zone Display Panel is used to indicate a related zone, or device states of fire, fault and isolation. Each zone display panel can show 20 zones or devices, and every 2 indicators for one zone or device. The user can write or print descriptions on a label for a zone, and then put the label into the transparent box of the zone display panel.

1.4.5 P-9982E Zone Display and Control Panel

Zone Display and Control Panel is used to indicate a related zone, or device states of fire, fault and isolation. It can also be used to disable, enable, start and stop the related devices. Each zone display panel can show 20 zones or devices, and every 2 indicators and 1 key for one zone or device. The user can write or print descriptions on a label for a zone, and then put the label into the transparent box of ZCP.

1.4.6 PR-400B Thermal Printer

PR-400B Thermal Printer is optional. It can be directly connected to the FACP through RS232. This printer, with its panel embedded, can be installed on the front panel of the FACP. It can print running record of the FACP. It's easy to operate and convenient for checking.

1.4.7 CA-400E-R or CA-400E-G Cabinet

Either CA-400E-R or CA-400E-G Cabinet is required. The CA-400E-R Cabinet is red and the CA-400E-G is gray.

1.4.8 P-9983EA Fiber-Optical Class A Network Card

P-9983EA card is optional for GST-IFP4E control panel, providing two LC single-mode fiber interfaces. This card provides the same function as P-9966EA CAN Class A network card. Transmission distance is longer when this card is used to network control panels.

1.4.9 P-9956E-Modbus Modbus Card

P-9956E-Modbus Modbus Card is optional for supplementary use in GST-IFP4E control panel, providing standard Modbus interface for temporarily transmitting messages between the third party devices and the control panel. P-9956E-Modbus Modbus Card has the type of RS485.

1.4.10 External battery cabinet

As the control panel requires the battery with the capacity over 38Ah, an external battery box can be used. The battery with large capacity can be placed in the box. The largest capacity for the battery in the box is 65Ah.

1.5 Peripheral Devices

FACP is compatible with a series of addressable GST products, which are intelligent sounder strobe complying with EN 54-3, heat detector complying with EN 54-5, photoelectric smoke detector complying with EN 54-7, intelligent manual call point complying with EN 54-11, intelligent reflective beam detector complying with EN 54-12, input and output module complying with EN 54-18, and loop isolator complying with EN 54-17.and Compatible Voice Evacuation System Master Panel.

1.6 Accessories

✧ GST Series Hand Held Programmer

P-9910B Hand Held Programmer can read the address, sensitivity and device type and program device type of addressable detectors and modules.

The handheld programmer has to be separately ordered.

1.7 Defining Tool

GST-IFPx-Def Defining Tool is used for setting panel and network configuration, editing and downloading definition of device and Cause & Effect equation. Before the system starts operation, you need to set panel and network configuration, define the device and Cause & Effect using this software on a computer, and then download them to the FACP.

2 Installation

This chapter describes the installation of the FACP. The steps below are guidance for installation of the FACP.

1 Check if you have received all items ordered.
2 Install the cabinet.
3 Install the component (basic and optional).
4 Power up the FACP and check if it can be normally started.
5 External connection.
6 Check the lines.
7 Setup FACP and define devices using GST-IFPx-Def Defining Tool on a PC and download them to the FACP according to engineering configuration.
8 Check and commission peripheral devices.

2.1 Component Inspection

Before installation, check the following items:

✧ **Check Engineering Requirement**

Check the packing list according to engineering requirement. The main items to be examined are: installation and operation manual, key to the FACP, battery wires, terminal resistor and etc.

✧ **Check Internal Components and Interconnection inside the FACP**

All basic internal parts have been connected (including power supply box, mother board, main board, interface board and main front panel) before the FACP leaves the factory. Therefore, you can mainly check the optional units ordered and the connection among parts, including the connection between mother board and power supply, mother board and key board, the connection of the zone indication panel with Indicator board, etc. Please refer to Appendix A for the internal connection diagram.

2.2 Install the Cabinet

2.2.1 Install the cabinet of panel

The cabinet mounts using three 12mm-diameter holes located in the back box. Carefully unpack the system and check for shipping damage. Mount the cabinet in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the panel. Locate the cabinet at a proper height above the floor with the hinge mounting on the right.

Ambient conditions for installation of the FACP:

Temperature: -5℃~+50℃

Relative humidity: ≤95%, non-condensing

The FACP can be flush-mounted or wall-mounted. The dimensions for wall-mounting are shown in following Fig. 2.1

✧ Mark and predrill holes in the wall for the three keyhole mounting bolts using the dimensions illustrated in following Fig. 2.1.

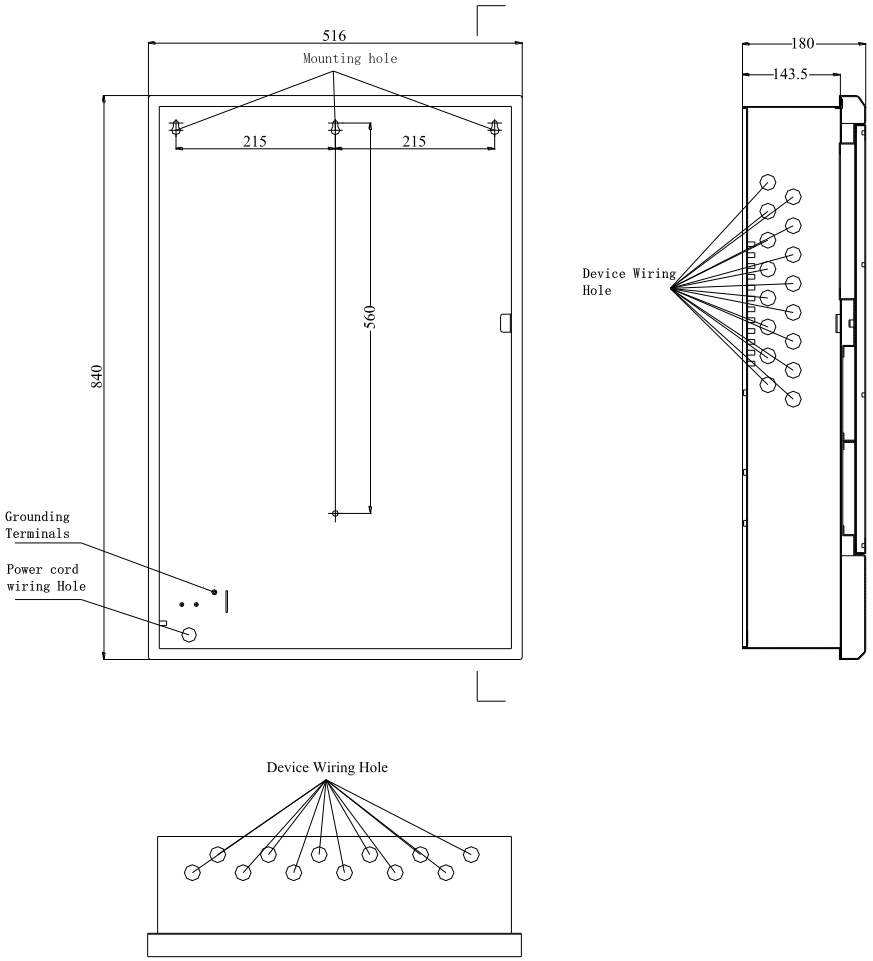


Fig. 2.1

✧ Install three fasteners in the wall with the screw heads protruding.

✧ Using upper 'keyhole' place back box over the three screws, level and secure.

Hole distance for flush-mounting: 815mm x 490mm x 144mm. Dimensions for flush-mounting are shown in following Fig. 2.2.

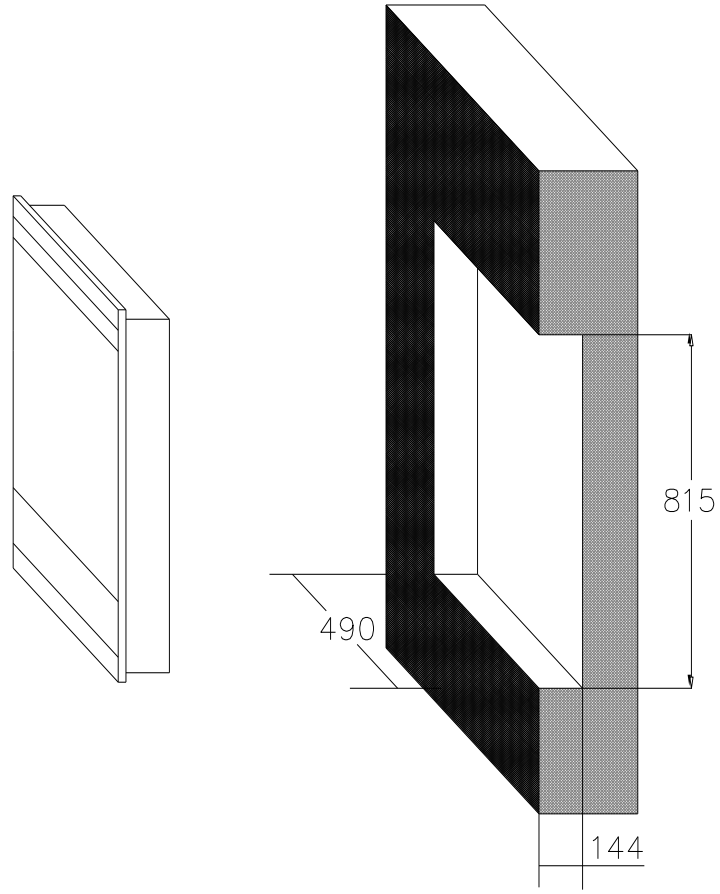


Fig. 2.2

2.2.2 Install the cabinet of battery

User needs the external cabinet of battery when battery capacity is more than 38Ah.The battery cabinet is installed below the panel cabinet as Fig. 2.3. The wiring from battery cabinet is connected to panel through knockout. This connection is recommended. User can choose other knockouts to connect the two cabinets according actual situation. The battery cabinet can be flush-mounted or wall-mounted also. The installation dimensions between the cabinet of battery and the panel should be preferably less than 20cm. The dimensions for wall-mounting are shown in following Fig. 2.4. Dimensions for flush-mounting are shown in Fig. 2.5Hole distance for flush-mounting: 560mm x 490mm x 144mm.

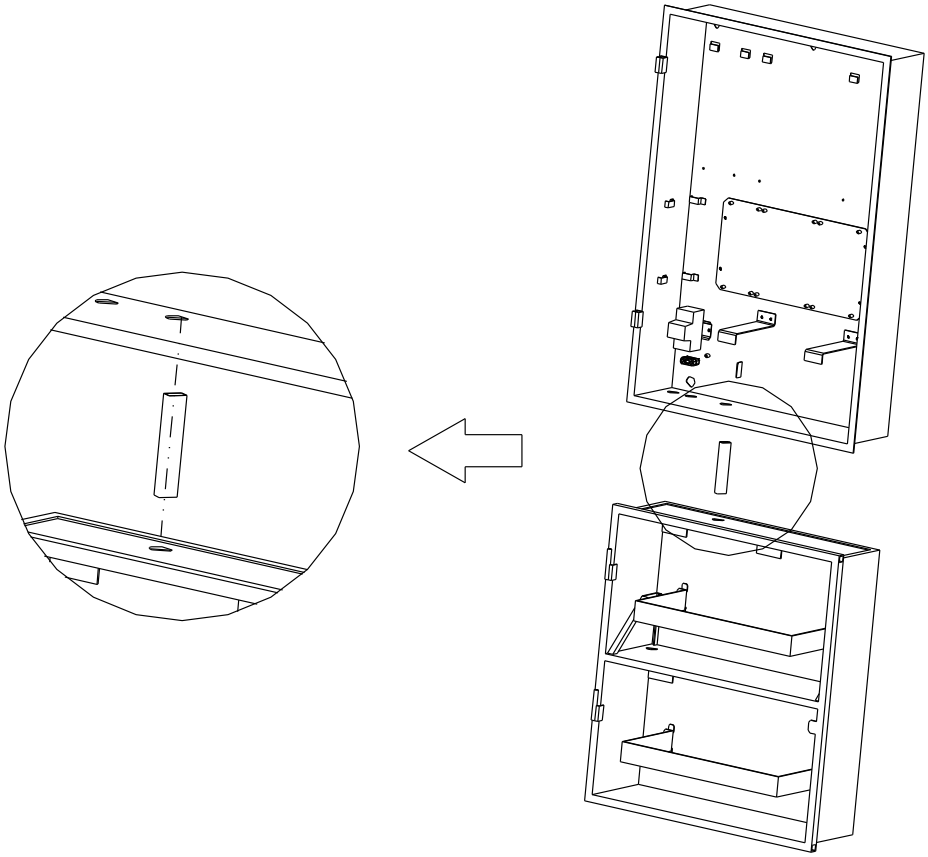


Fig. 2.3

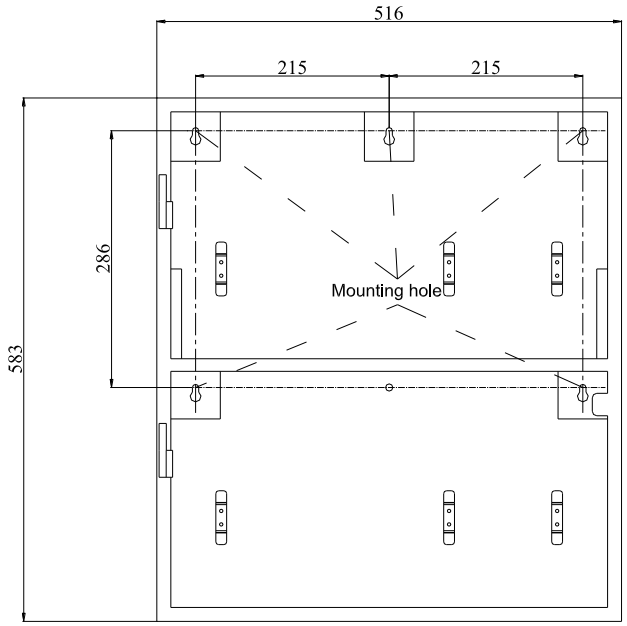


Fig. 2.4

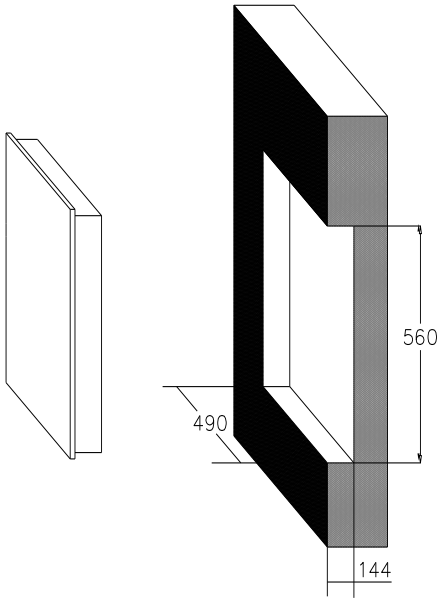


Fig. 2.5

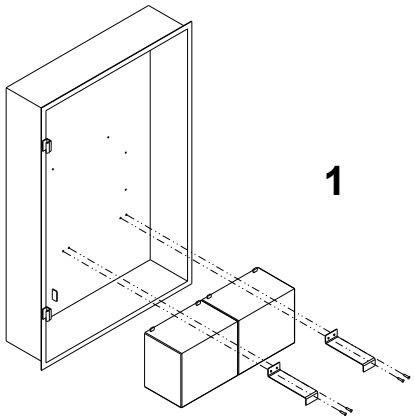
2.3 Install Components

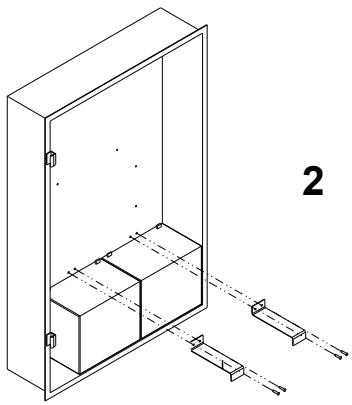
WARNING: Disconnect all sources of power before servicing. The panel and associated equipment may be damaged by removing and/or inserting cards, modules or interconnecting cables while this unit is energized.

2.3.1 Battery Power

2.3.1.1 Small Capacity Battery (no more than 38Ah)

The small capacity battery is installed in the panel. The following graphics Fig. 2.6 show how to install the battery inside the cabinet.





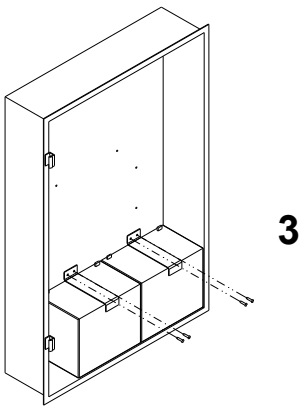
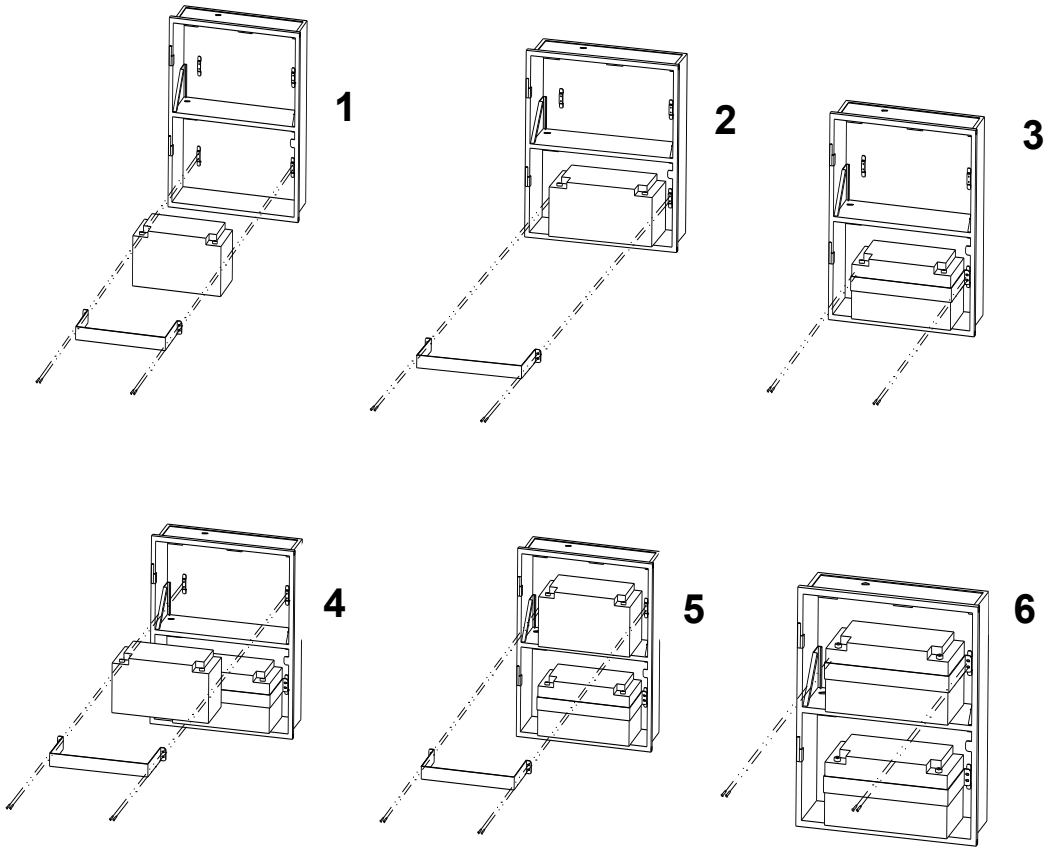


Fig. 2.6

First, put two batteries on the right bottom side of the cabinet, then align the holes of battery holders with the holes on the cabinet, finally, fasten the battery holders through screws.

2.3.1.2 Large Capacity Battery (more than 38Ah)

The large capacity battery is installed in the external battery cabinet. The following graphics Fig. 2.7 show how to install the battery inside the cabinet.



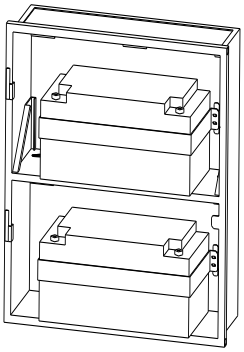


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Fig. 2.7

WARNING: Battery contains sulfuric acid, which can cause severe burns to the skin and eyes and can destroy fabrics. If contact is made with sulfuric acid, immediately flush the skin or eyes with water for 15 minutes and seek immediate medical attention.

2.3.2 Installing Circuit modules

Circuit modules are plugged into the inside of FACP, as shown below Fig. 2.8~Fig. 2.10.

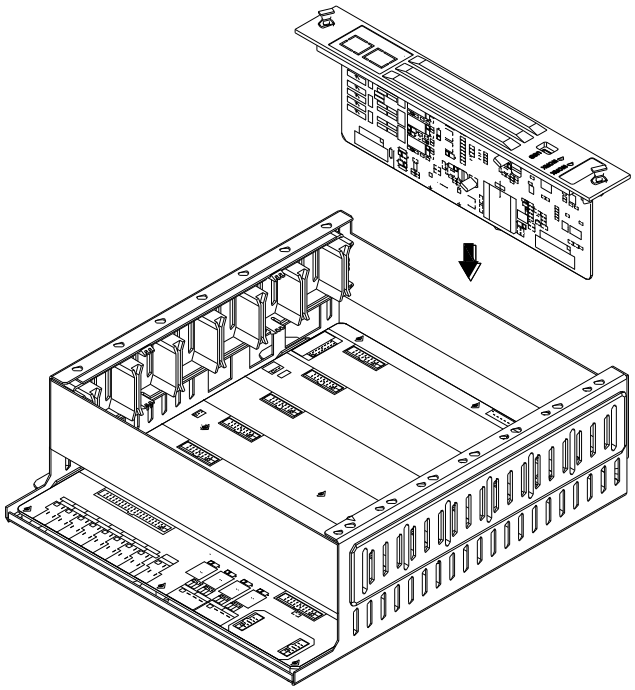


Fig. 2.8

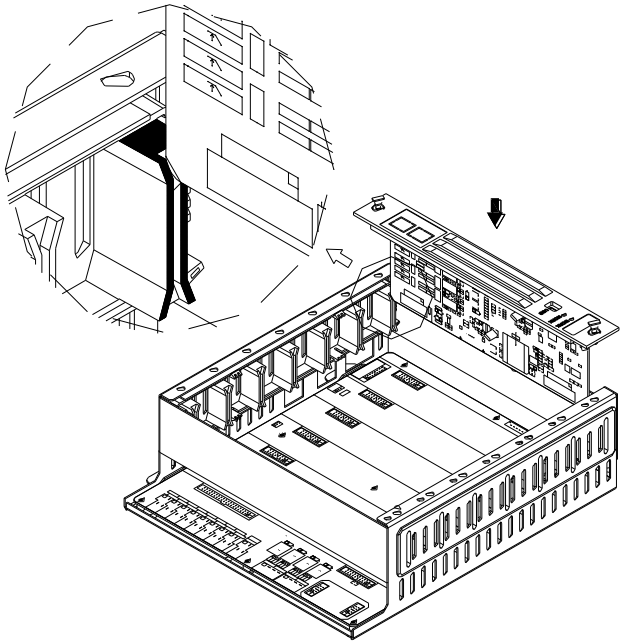


Fig. 2.9

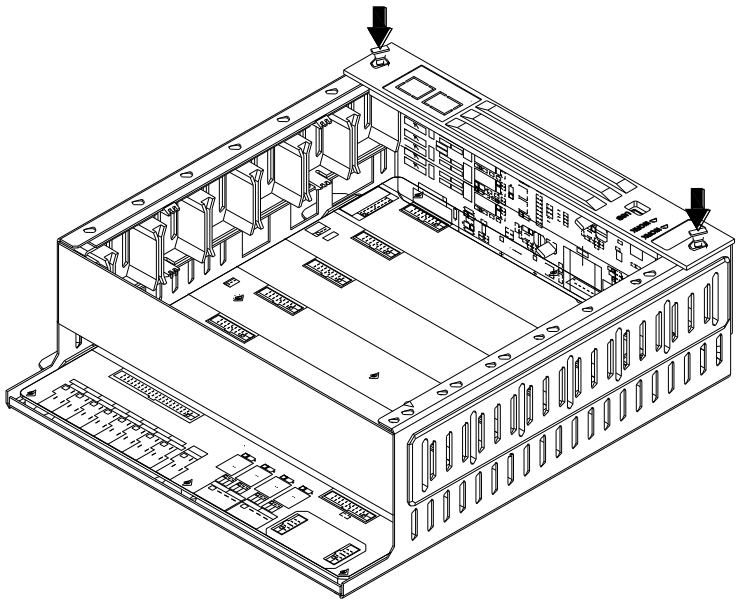


Fig. 2.10

First, aligh the circuit module (board) with the slot inside the cabinet; Second, slide down two sides of the circuit board along the guide rail; Third, press it down to the end and lock it by pressing small buttons on the two sides.

The circuit board is disassembled according to the following Fig. 2.11.

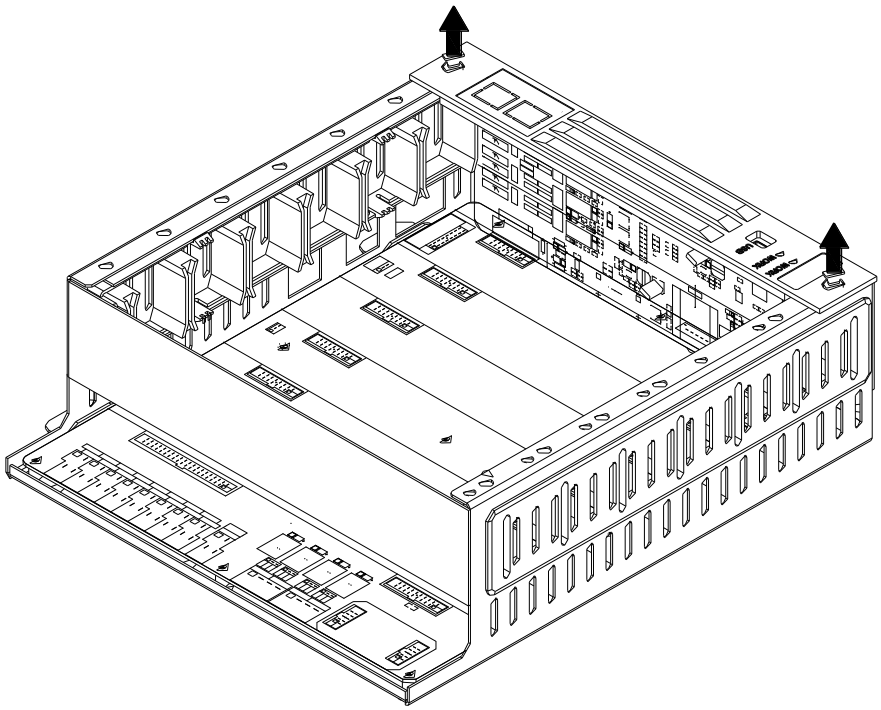


Fig. 2.11

First, pinch two small buttons; Second, pull them up to unlock; Third, continue to pull up with strength. Finally, the board is disassembled.

Note:

✧ **All circuit modules do not support hot swapping**

2.3.3 Installing Zone Display and Control Panel

Zone display and control panel is installed on the cabinet door. The following Fig. 2.12 shows how to install it.

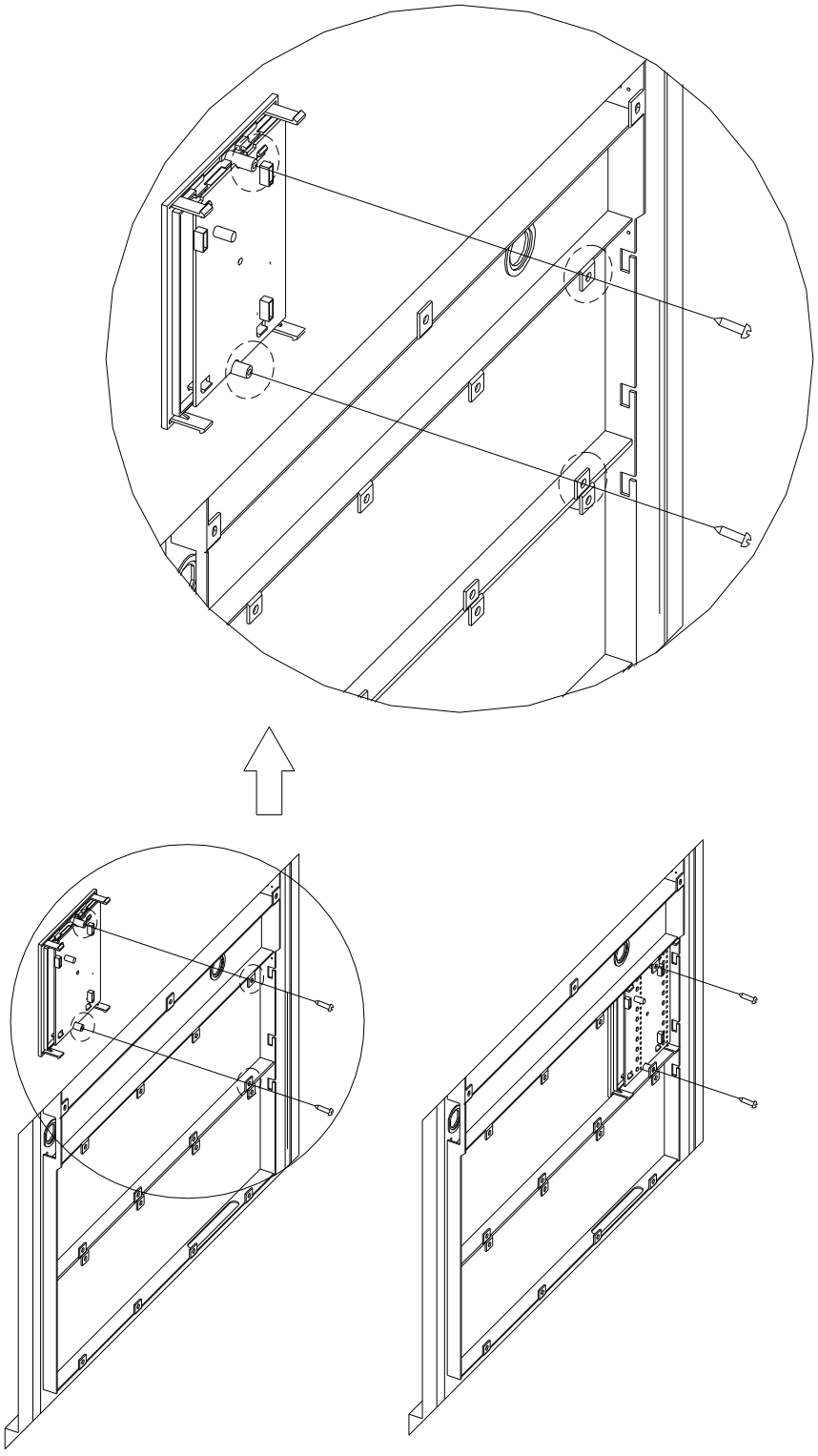


Fig. 2.12

First, Align the snap of the zone display and control panle with the slot on the door; Second, Hook the zone display and control panel with the door; Finally, fix the panel with screws.

2.3.4 Installing Glass Door

The following Fig. 2.13-Fig. 2.15 shows how to install the glass door on the cabinet.

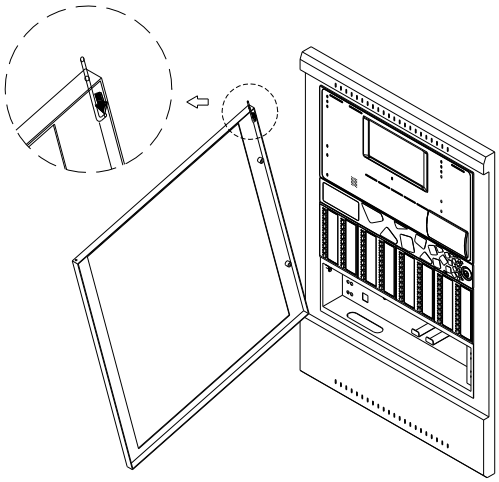


Fig. 2.13

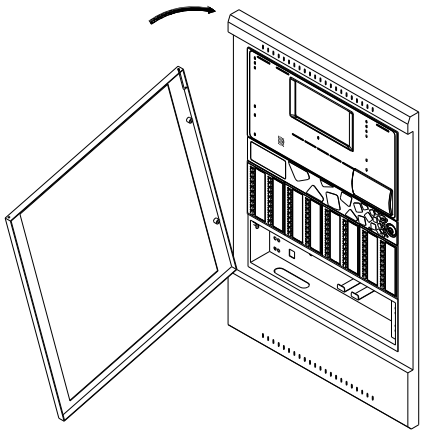


Fig. 2.14

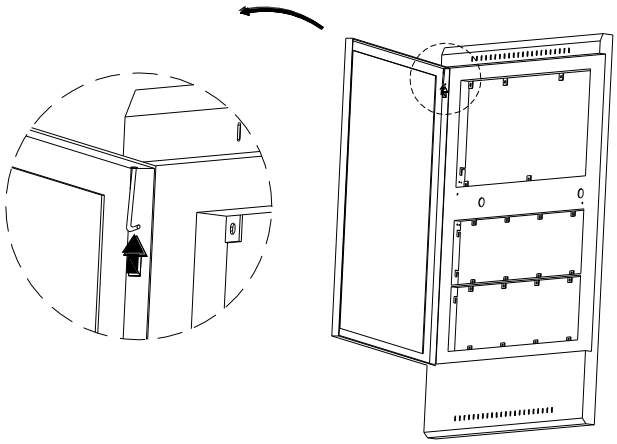


Fig. 2.15

Put the glass door on the cabinet after pulling down the latch which is on the left upper corner of the glass door. The glass door is installed after releasing the latch and making it go through the latch hole.

2.3.5 Installation of Labels on the Front Panel

Installation steps Fig. 2.16-Fig. 2.19 are shown below for labels on the front panel.

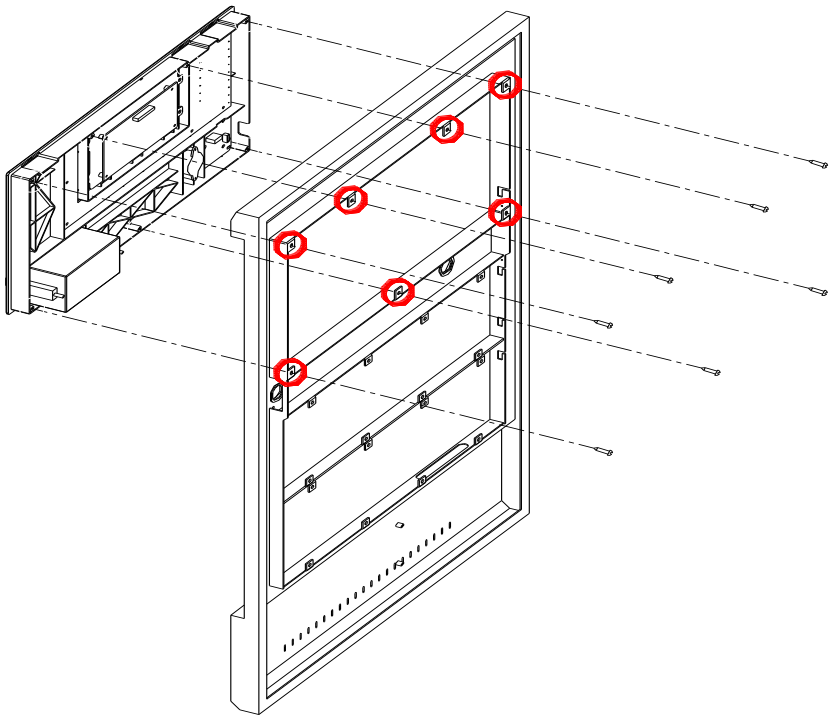


Fig. 2.16

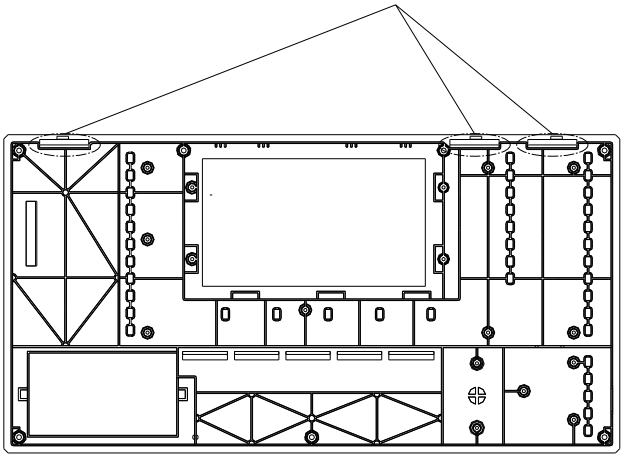


Fig. 2.17

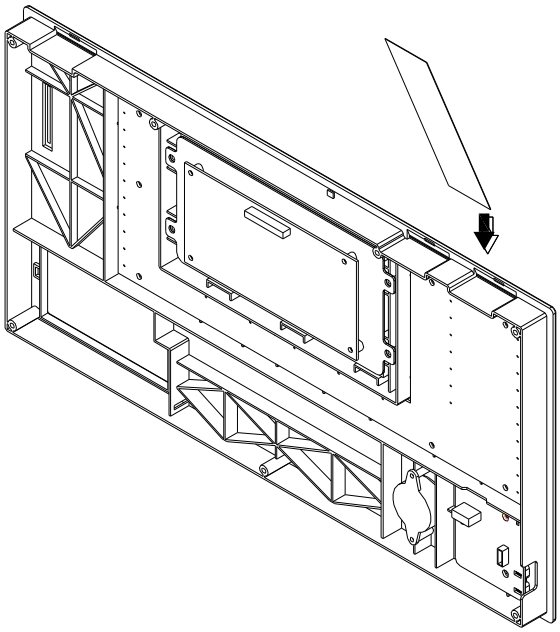


Fig. 2.18

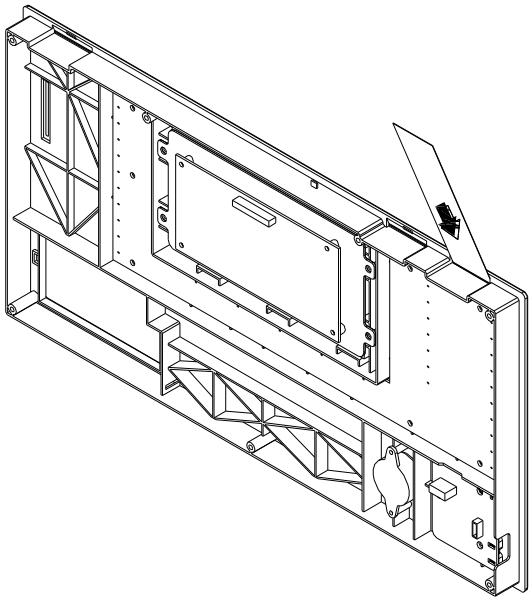
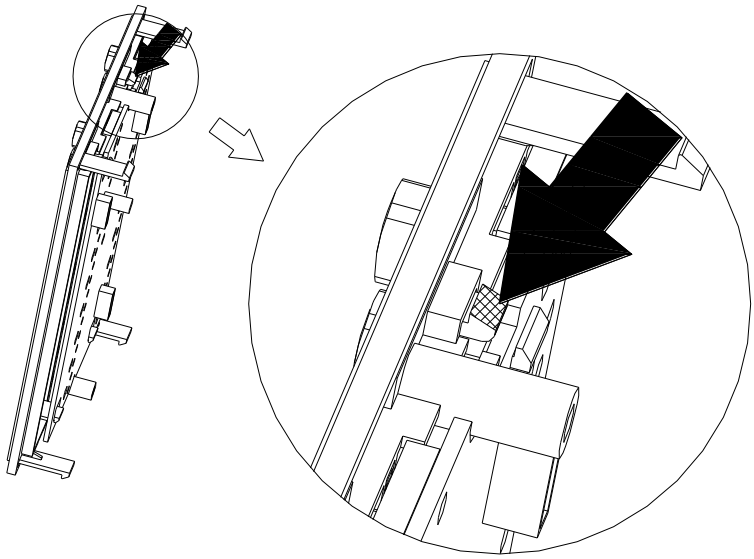


Fig. 2.19

Take the front panel from the cabinet door as shown in Fig. 2.16. The lable is inserted along the lead-in groove(as shown in Fig. 2.17) after aligning the label with the label hole. Keep the lable vertical so that it can be down to the bottom as shown in Fig. 2.18 and Fig. 2.19.

2.3.6 Installation of Labels on the Zone Display and Control Panel (ZCP)

Installation steps Fig. 2.20 are shown below for labels on the ZCP.



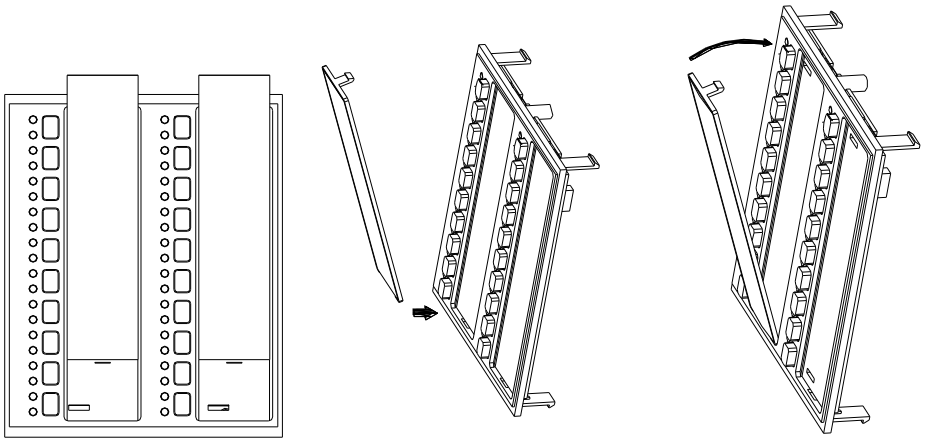


Fig. 2.20

Take the transparent baffle from the ZCP by using a small screwdriver. Put the printed label into the slot for ZCP label and then restore the transparent baffle.

Maximum 8 locations can be installed with P-9981, P-9982, P-9981F or P-9982F Zone display and control modules. Any unused location shall be covered by ZD-400 blank faceplate.

2.4 Start-up Check

After installation, apply power to the FACP. Connect the battery plug onto the power board, and then turn on the mains switch in the cabinet and check if the FACP can self-test. The procedures are as follows.

- ✧ Powering on the FACP, All LEDs light up, LCD displays GST logo. Initiation of the system takes about 85s~90s.
- ✧ Self-test of LEDs on the front panel and ZCPs.
- ✧ Self-test of internal cards.
- ✧ Self-test of printer.
- ✧ Reset of the system.

Start-up check is done if the FACP switches on normally after undertaking above steps.

2.5 External Connection

2.5.1 AC Power Connection

Use 14AWG (2.00mm^2) or larger wire with 600 volt insulation rating. Make certain that the AC mains circuit breaker is off before wiring any connections between the mains and the FACP. Power supply wires should be connected to the terminal as shown in Figure below Fig. 2.21.

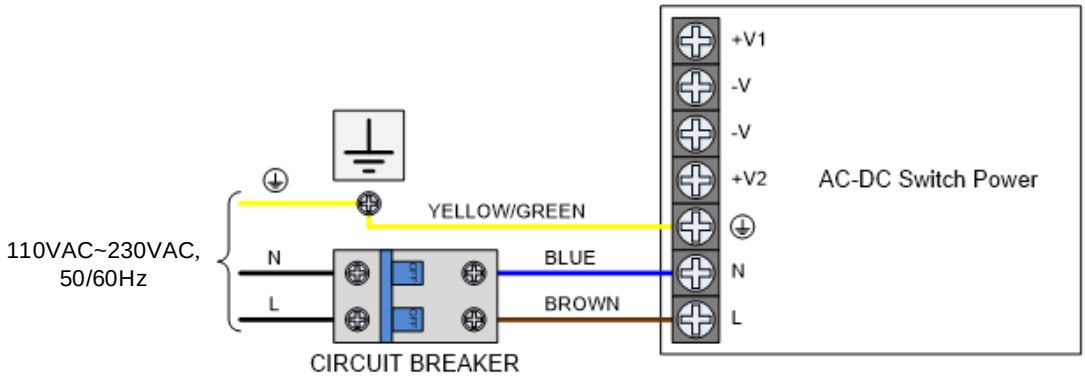


Fig. 2.21

Note:

- ✧ **Verify all cables are correctly connected before connecting power supply.**
- ✧ **Please make sure the mains power is in line with the rated voltage marked on the panel's label.**

Connect a wire from the grounding stud in the cabinet to a known solid earth ground in the buildings. Refer to Fig. 2.1 for location of the stud. This connection is vital for maintaining the FACP's immunity to unwanted transients generated by lightning and electrostatic discharge. Apply AC power to the panel only after the system is completely installed and visually checked. The FACP shall be connected to a dedicated 15 Amp branch circuit.

2.5.2 Battery Connection

Batteries wire is connected to XT3 of power box, as shown in the Figure below Fig. 2.22.

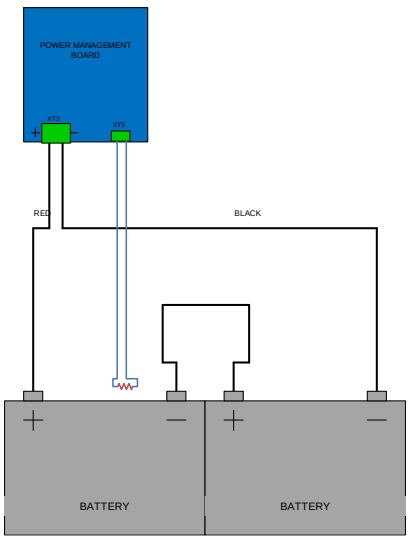


Fig. 2.22

Before connecting the batteries to the FACP, make certain that the interconnect cable between the batteries is not connected. Do not connect the interconnect cable until the system is completely installed. Observe polarity when connecting the batteries.

Connecting to the XT4 port is a thermistor used to measure the ambient temperature of battery, please place the thermistor near the battery.

Note: Do not make the final battery connections until the installation is completed.

Caution: Do not connect power to your device until you have completed all input and output connections. Failure to do so may result in injury!

2.5.3 Signaling Line Circuits (SLC) Connection

Each SLC includes four wires: O+ (bus output positive), O- (bus output negative), I+ (bus input positive), and I- (bus input negative). The wire from O+ is connected back to I+ and the wire from O- back to I-. SLC only has one connection of Class A.

When connecting with DC-9503E/DC-9504E Loop Isolator, each SLC can connect up to 50 Isolators. Maximum 32 detectors/MCPs/modules can be protected between two isolators. The connection is shown below Fig. 2.23. If shielded cable is used, connect the shielded layer to ground terminal.

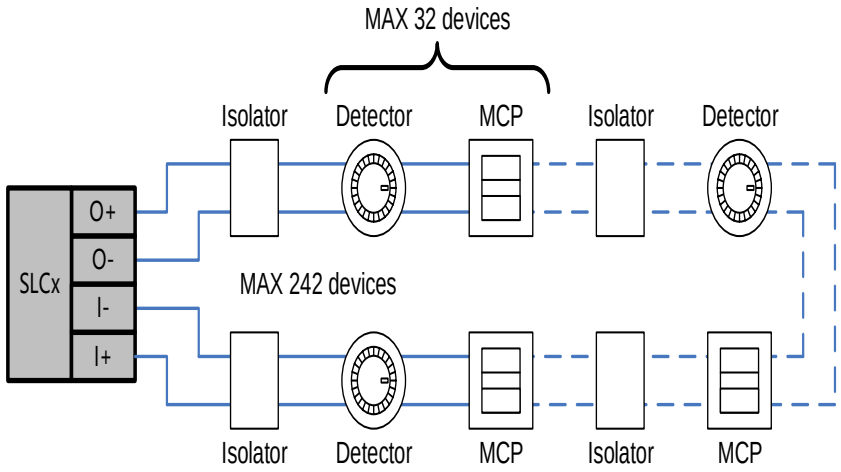


Fig. 2.23

When not connecting with C-9503E/DC-9504E Loop Isolator, the connection of SLC is shown below Fig. 2.24.

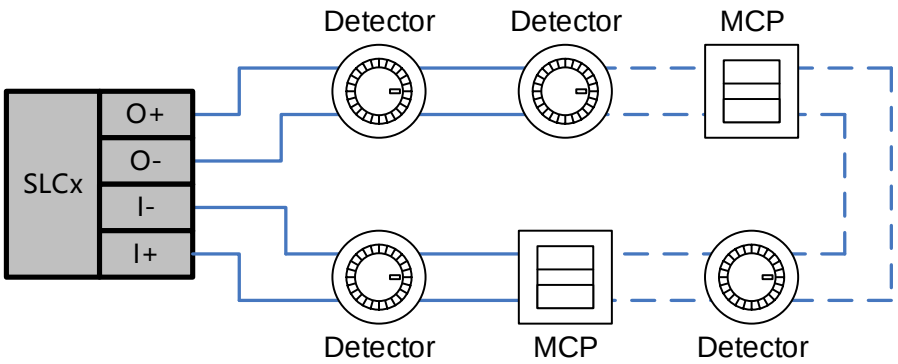


Fig. 2.24

2.5.4 Alarm Output

It outputs according to settings when there is fire alarm. It can be disabled, and does not output when fire alarm occurs in disabled state. It can be included into Cause & Effect

equation. The total maximum current in alarm for Alarm Output cannot exceed 2.5A. Circuits are regulated, supervised and power-limited.

Connection of Alarm Output is shown below Fig. 2.25. If shielded cable is used, connect the shielded layer to ground terminal.

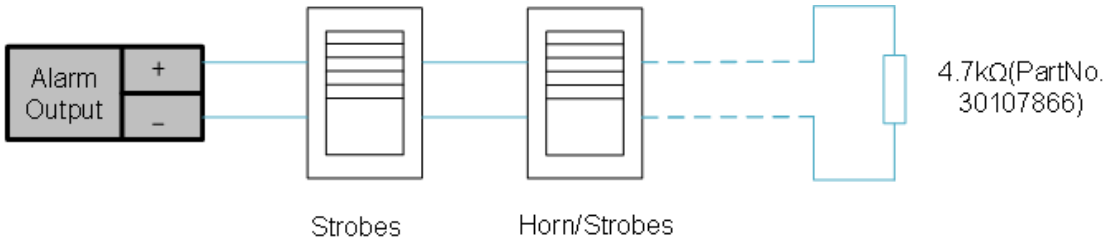


Fig. 2.25

2.5.5 Sounder Output/ AUX

This interface can be set as Sounder Output or Auxiliary Power Output. When it is used as Sounder Output, the connection is the same as Fig. 2.25 and it outputs according to settings when there is fire alarm.

When it is used as AUX, it outputs as a 24V power. The connection is shown below Fig. 2.26. If shielded cable is used, connect the shielded layer to ground terminal.

Circuits are regulated, supervised and power-limited.

Note: This output interface shares total maximum 2.5A current with Alarm Output，and if one of the Alarm Output and Sounder Output line is grounded, the panel will report Input/Output interface ground fault.

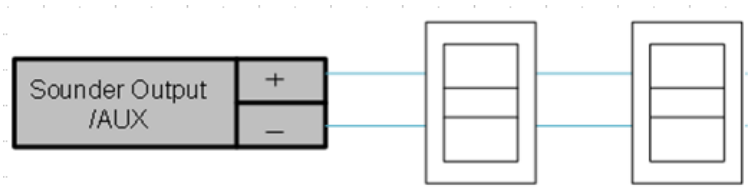


Fig. 2.26

2.5.6 Relays (For Common Use)

Relays labelled as “Alarm”, “supervisory” and “Fault” are designated as “Common”. Other relays are designated as “Programmable”.

The relay outputs can be set to normally open/close contact output. When connecting ***COM*** and ***NOx*** with a jumper, this relay output is set to normally open contact output, shown as Fig. 2.27.when the jumper connecting ***COM*** and ***NCx***, the relay output is set to normally closed contact output. If shielded cable is used, connect the shielded layer to ground terminal.

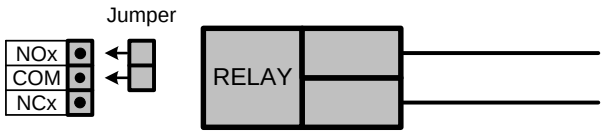


Fig. 2.27

2.5.7 EIA-485: RPTR

The EIA-485 (RPTR) wiring diagram is as following Fig. 2.28. If shielded cable is used, connect the shielded layer to ground terminal.

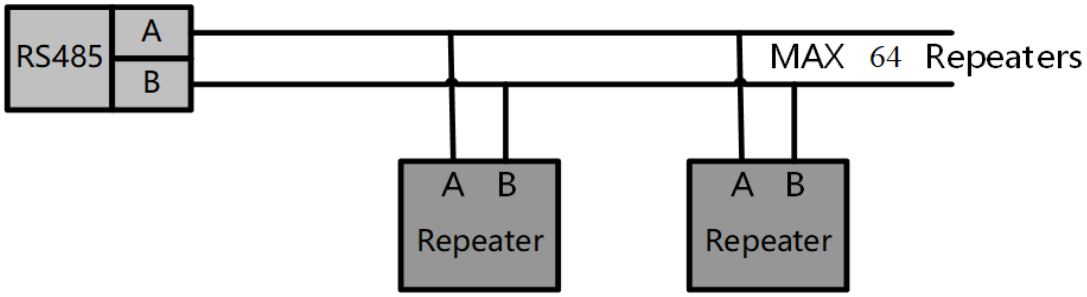


Fig. 2.28

2.5.8 INPUT

The INPUT interface wiring diagram is as following Fig. 2.29. If shielded cable is used, connect the shielded layer to ground terminal.

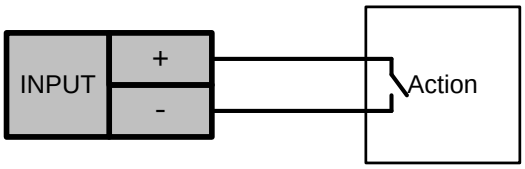


Fig. 2.29

2.5.9 CAN Class A Network Connection

P-9966EA CAN Class A Network Card can be plugged into L5/L6, S1 or S2 slot of MB-400E Mother Board. Maximum three P-9966EA CAN Network Cards are to be used in a panel. When plugged on slot L5/L6, connect external network wires on terminals L5I and L5O.When plugged on slot S1, connect external network wires on terminals S1I and S1O. When plugged on slot S2, terminals S2I and S2O are to be used. If shielded cable is used, connect the shielded layer to ground terminal.

Fig. 2.30 shows the connection when P-9966EA is plugged into S2 slot.

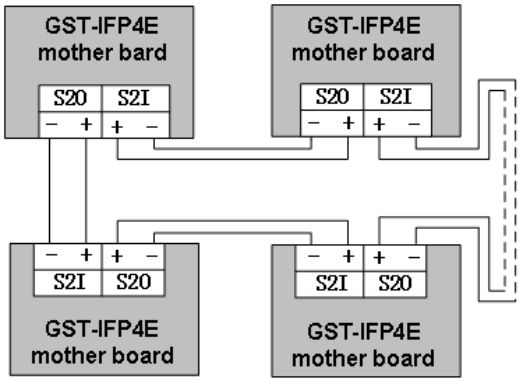


Fig. 2.30

2.5.10 Fiber Optical Class A Network Connection

P-9983EA Fiber-Optical Class A Network Card can be plugged into L5/L6, S1 or S2 slot of MB-400E Mother Board. Maximum three P-9983EA Fiber-Optical Class A Network Cards are to be used. The position for the fiber interface is on the fiber network card. Fig. 2.31 shows the connection between the P-9983EA Fiber-Optical Class A Network Card.

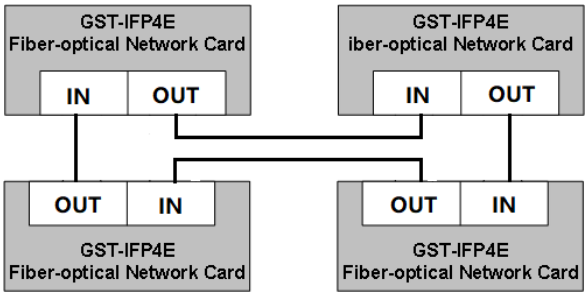


Fig. 2.31

2.5.11 Hybrid Network Connection

User can set a hybrid network. For example Fig. 2.31, on the mother board of No1 GST-IFP4E, a P-9983EA Fiber-Optical Class A Network Card is plugged into S2, two P-9966EA CAN Network Cards are plugged into S1 and L5/L6. No1 GST-IFP4E and No2 GST-IFP4E make up a CAN network. At the same time, No1 GST-IFP4E and No3 GST-IFP4E make up a CAN network also. As a P-9983EA is plugged into S2, a fiber network can be made up by No1 GST-IFP4E and No4 GST-IFP4E. The quantity of the GST-IFP4E in the whole network that shows in Fig. 2.32 is no more than 240.

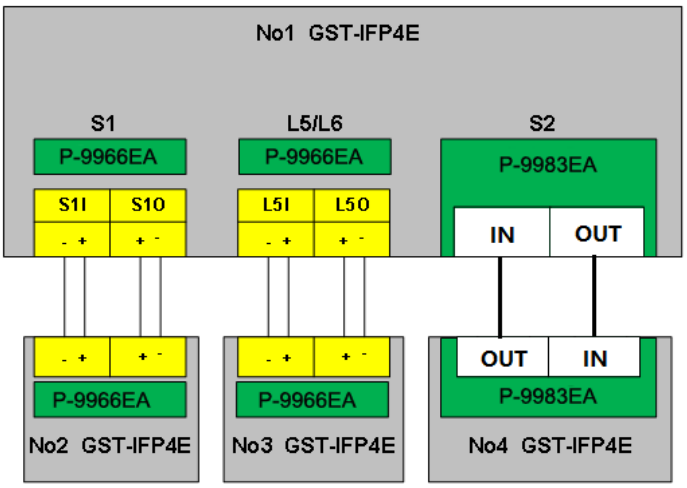


Fig. 2.32

2.5.12 Modbus Card Connection

P-9956E-Modbus Card has RS485 interface, it can be plugged into L5/L6, S1 or S2 slot of MB-400E Mother Board. Only one P-9956E-Modbus Card is to be used. When plugged on slot L5/L6, connect external network wires on terminals L5I and L5O.When plugged on slot S1, connect external network wires on terminals S1I and S1O. When plugged on slot S2, terminals S2I and S2O are to be used. If shielded cable is used, connect the shielded layer to ground terminal.

2.5.13 Power-limited Wiring Requirements

Power-limited and nonpower-limited circuit wiring must remain separated in the cabinet. All power-limited circuit wiring must remain at least 0.25" (6.4mm) away from any nonpower-limited circuit wiring, and nonpower-limited circuit wiring must enter and exit the cabinet through different knockouts and/or conduits. The typical wiring diagram for the FACP is shown below Fig. 2.34 and the typical wiring diagram for the battery cabinet is shown below Fig. 2.35.

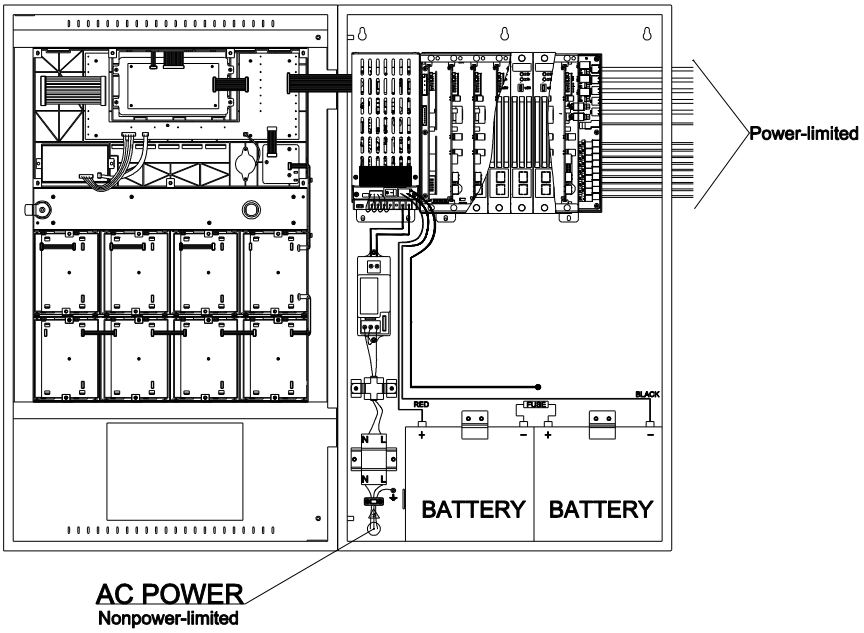


Fig. 2.34

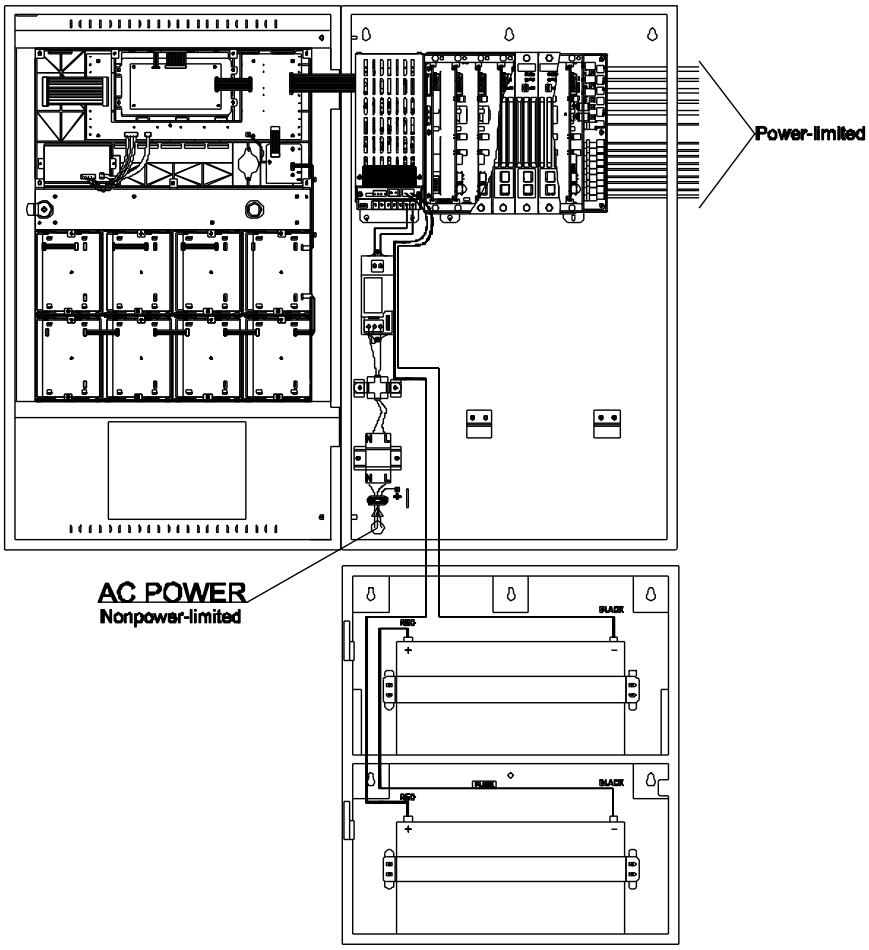


Fig. 2.35

2.6 Connection Inspection

Check the circuit connected with the FACP. Measure the insulation resistance between loops and between loops and ground, which should be more than 20MΩ. Measure the load of detection loops, which should be more than 1kΩ. The resistance between cables of Alarm Output, Sounder Output /AUX should be equal to the end-of-line resistance(4.7kΩ).

2.7 Setup FACP and Define Devices

Refer to Section 4 for FACP programming and configuration.

2.8 Field Device Commission

After connection, definition and download of device and Cause & Effect equations, you can power up the FACP and start commission. The following steps are for reference.

1 Complete the labels of zone indication panel.

2 Test all the detectors and make sure their positions are correct.

3 Check all device definition and modify the improper definitions.

4 Check all Cause & Effect equations, modify improper equations, and test automatic action of the system by Cause & Effect equation.

3 Indication & Control

The keys and LED indicators of FACP are shown below Fig. 3.1.

Fig. 3.1

3.1 LED Indicators

Note:

Unless otherwise specified, all LEDs are yellow.

Except for POWER LED, all LEDs go out when the FACP is reset.

- **POWER**: Green steady LED. It lights steady when the FACP is powered up.
- **PRE-ALARM**: Red steady LED. It lights steady when there is pre-alarm message; it goes out as the pre-alarm message disappears.
- **GENERAL Fault**: Yellow steady LED. It lights steady when there is fault message; it goes out as the fault is removed.
- **SYSTEM Fault**: Yellow steady LED. It lights steady when any card is fault and after remove the card fault, users need to reboot the panel
- **SUPERVISORY**: Yellow steady LED. It lights steady when any supervisory message exists.
- **DISABLE**: Yellow steady LED. It lights steady when any disabled message exists; It doesn't light without disabled messages.
- **AC Fault**: Yellow steady LED. It lights steady when there is AC fault; it goes out as the fault is removed.
- **BAT Fault**: Yellow steady LED. It lights steady when there is battery fault; it goes out as the battery fault is removed.
- **CHARGER Fault**: Yellow steady LED. It lights steady when there is charger fault.
- **ALARM OUTPUT FLT/DIS**: Yellow LED. It flashes when ALARM OUTPUT port is fault;

it goes out as the fault is removed. If ALARM OUTPUT is disabled, the LED lights steady.

- **SOUNDER OUTPUT FLT/DIS**: Yellow LED. It flashes when SOUNDER OUTPUT port is fault; it goes out as the fault is removed. If SOUNDER OUTPUT is disabled, the LED lights steady.
- **LOOP SOUNDER FLT/DIS:** Yellow LED. It flashes lights when SOUNDER port is fault. It goes out as the fault is removed. If SOUNDER is disabled, the LED lights steady.
- **FIRE ALARM:** Red steady LED. It lights steady when there is an alarm message.
- **ALARM OUTPUT ACTIVATED**: Red steady LED. It lights steady when ALARM OUTPUT outputs
- **SOUNDER OUTPUT ACTIVATED**: Red steady LED. It lights steady when SOUNDER OUTPUT outputs; it goes out as SILENCE ALARM key is pressed.
- **GROUND Fault:** Yellow steady LED. It lights steady when there is ground fault; it goes out as the fault is removed.
- **DETECTOR DIRTY**: Yellow steady LED. It lights steady when the detector is dirty; it goes out as the dirt is reported.
- **DELAY MODE**: Yellow steady LED. It lights steady when the FACP enters delay mode; it goes out as the FACP exits delay mode.
- **TEST MODE**: Yellow steady LED. It lights steady when the FACP enters test mode; it goes out as the FACP exits test mode.
- **MAINTENANCE**: Yellow steady LED. It lights steady when the FACP enters maintenance mode; it goes out when the maintenance is completed.
- **FIRE ALARM INFORMATION**: Red LED. It flashes when an alarm message is not confirmed. It lights when all alarm messages have been confirmed.
- **SUPERVISORY INFORMATION**: Yellow LED. It flashes when a supervisory message is not confirmed; it lights when all supervisory messages has been confirmed.
- **Fault INFORMATION**: Yellow LED. If flashes when a fault message is not confirmed. It lights when all fault messages have been confirmed; it goes out as all fault messages are cleared.
- **DISABLE INFORMATION**: Yellow steady LED. It lights steady when a disabled message exists; it goes out as the message is disposed.
- **STATUS INFORMATION**: Yellow steady LED. It lights steady when any message exists except fire alarm, supervision, fault, isolation; it goes out as all messages are disposed.
- **MANUAL ALARM**: Red steady LED, It lights steady when the MANUAL ALARM key is pressed.
- **ACKNOWLEDGE:** Yellow steady LED. It lights steady when all real messages have been confirmed. It goes out as a new message occurs.
- **SILENCE ALARM**: Yellow steady LED. When a sounder or a notification appliance is activated, the LED lights steady as SILENCE ALARM key is pressed. It goes out as

another new sounder is activated or MANUAL ALARM key is pressed.

- ✧ **SILENCE BUZZER**: Yellow steady LED. It lights steady when the buzzer of the FACP is silenced. It goes out as the buzzer sounds again.
- ✧ **RESOUND**: Yellow steady LED. It lights steady when ***RESOUND*** key is pressed. It goes out when any sounder is silenced again.
- ✧ **EVAC:** Red steady LED, It lights steady after ***EVAC*** key is pressed for evacuation.
- ✧ **RESET**: Yellow steady LED. It lights steady when the FACP is being reset; It goes out when the FACP completes reset.
- ✧ ☼/☾ **SWITCH**: Yellow steady LED. It lights steady when the FACP is in Day mode; it goes out in Night mode.

3.2 Functional keys

- ✧ **FIRE ALARM INFORMATION**: Fire alarm information screen is displayed when there is fire alarm information and this key is pressed.
- ✧ **SUPERVISORY INFORMATION**: Supervisory information screen is displayed when there is supervisory information and this key is pressed.
- ✧ **Fault INFORMATION**: Fault information screen is displayed when there is fault information as this key is pressed.
- ✧ **DISABLE INFORMATION**: Disable information screen is displayed when there is disable information as this key is pressed.
- ✧ **STATUS INFORMATION**: Status information screen is displayed when there is status information as this key is pressed.
- ✧ **MANUAL ALARM**: Pressing the key shall activate alarm process, referred to section 6.1.3.
- ✧ **ACKNOWLEDGE**: The current information is confirmed to be selected if this key is pressed.
- ✧ **SILENCE ALARM**: All activated SOUNDER OUTPUT can be silenced when this key is pressed.
- ✧ **SILENCE BUZZER**: the indication sound from the FACP can be silenced if this key is pressed.
- ✧ **RESOUND**: All silenced notification appliances can be reactivated, when ***this*** key is pressed.
- ✧ **EVAC**: For starting the field sounders for evacuation.
- ✧ **RESET**: The FACP will be reset as this key is pressed.
- ✧ ☼/☾ **SWITCH**: The FACP can be switched between day or night mode if this key is pressed.

3.3 Service / Program Keys:

Key	Description

Number Key of 0~9	Press number keys to input numbers.
▲	UP cursor. Press this key to move the cursor to previous or scroll up lists in a continuous loop.
▼	DOWN cursor. Press this key to move the cursor to next or scroll down lists in a continuous loop.
▶	RIGHT cursor. Press this key to switch the cursor to next box or select options to the right.
◀	LEFT cursor. Press this key to switch the cursor to previous box or select options to the left.
⮌	CANCEL key. Press this key to cancel an operation or exit a menu.
↵	ENTER key. Press this key to select a displayed item or confirm an operation.
⌫	BACKSPACE key. Press this key to delete an input number or letter.
␣	SPACE key. Press this key to input a space character.
⚙	MENU key. Press this key to call the main menu list.

3.4 User Interface

The FACP has a touch screen with graphical icons. The FACP enters ***System Normal*** screen as Fig. 3.2 below after correct installation and wiring.

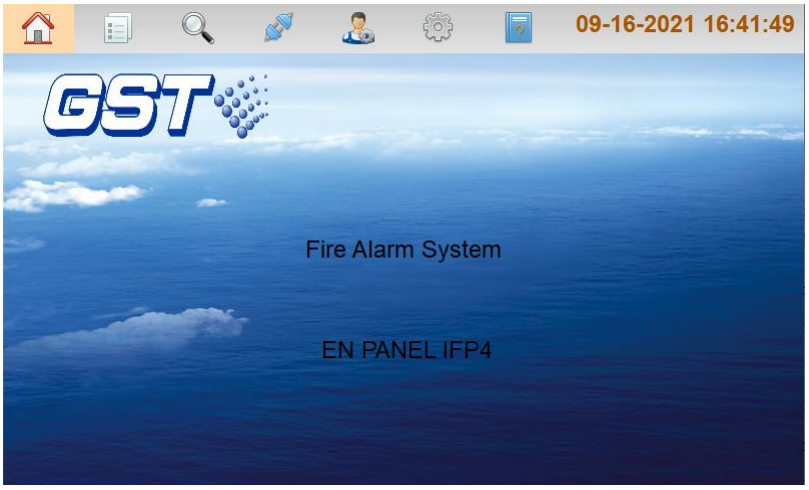


Fig. 3.2

Alarm: when fire alarm signal is on the screen, the FACP will pop up fire alarm (first alarm) message with black words in red background, including alarm time, device address, device type and related description and so on. Alarm message taking the highest priority is displayed on the main screen and other messages are displayed the quantity on related tabs on the screen. Clicking each tab can check details. Refer to the figure below Fig. 3.3.

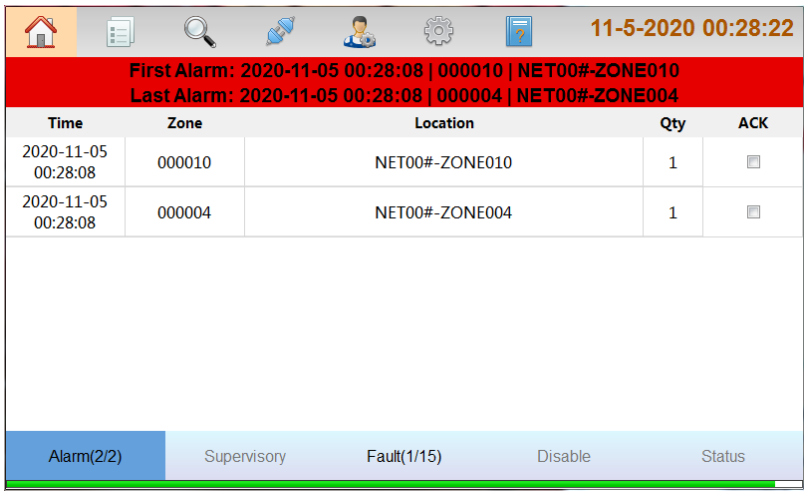


Fig. 3.3

The quantity of alarm messages will be displayed if there are many such messages. Clicking ***Alarm*** tab can view details as shown the figure below Fig. 3.4.

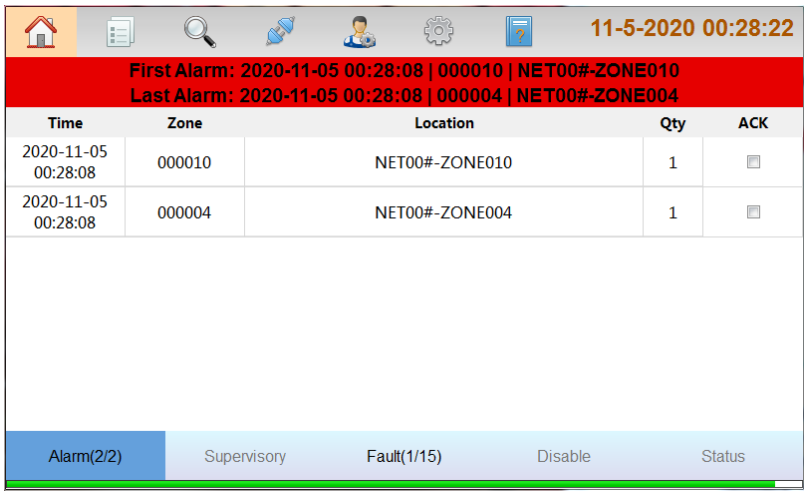


Fig. 3.4

Supervisory: supervisory messages take lower priority than Alarm messages. The supervisory messages will be displayed if there is no alarm. Clicking ***Supervisory*** tab can view details.

Fault: fault messages take lower priority than supervisory messages. The fault messages will be displayed if there is no Alarm or supervisory messages. Clicking ***Fault*** tab can view details.

Fault messages have many types such as internal fault and loop device fault. Clicking on the related types can view the details.

Disable: there are disabled messages if some devices are disabled. Clicking ***Disable*** tab can view the details as shown in the figure below Fig. 3.6.

Status: clicking ***Status*** tab can view other status messages of the FACP.

4 Operations

4.1 Programming on FACP

Configurations and definitions can also be programmed directly on the FACP.

Clicking the button  inputs Engineering password to enter ***Panel Setup*** menu (tree diagram) as shown below Fig. 4.1.

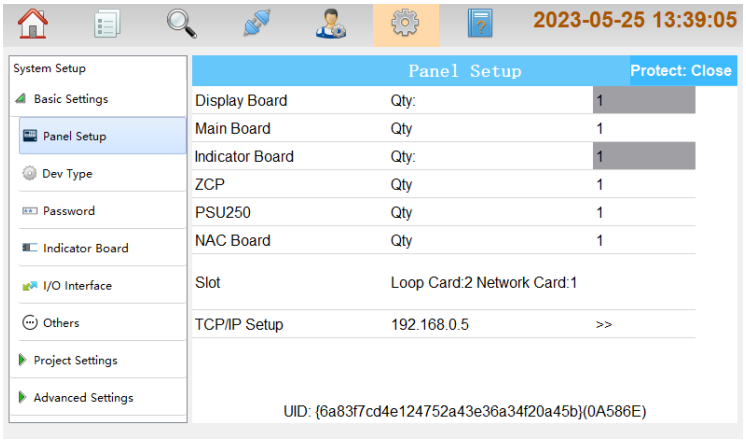


Fig. 4.1

4.1.1 Basic Settings

- Panel Setup: in the ***Basic Settings*** menu, clicking ***Panel Setup*** shows all cards integrated in the FACP on the right for users to set cards quantity by manual.
  - ✧ Display Board: 1 (by default)
  - ✧ Main Board: 1 (by default)
  - ✧ Indicator Board: 1 (by default)
  - ✧ ZCP: user defined (0 ~ 32)
  - ✧ PSU250: 1 (by default)
  - ✧ NAC Card: 1 (by default)
  - ✧ Slot: Loop Card:0 (by default)
  - ✧ TCP/IP Setup

  Clicking ***Slot*** enters the screen of Slot Definition as shown in Fig. 4.2. In the menu, the listed slots are corresponding to those five slots of mother board on the control panel. Users can set types of cards such as: Single Loop Card, Double Loop Card, Network Card, Modbus Card, DACR Card, None.

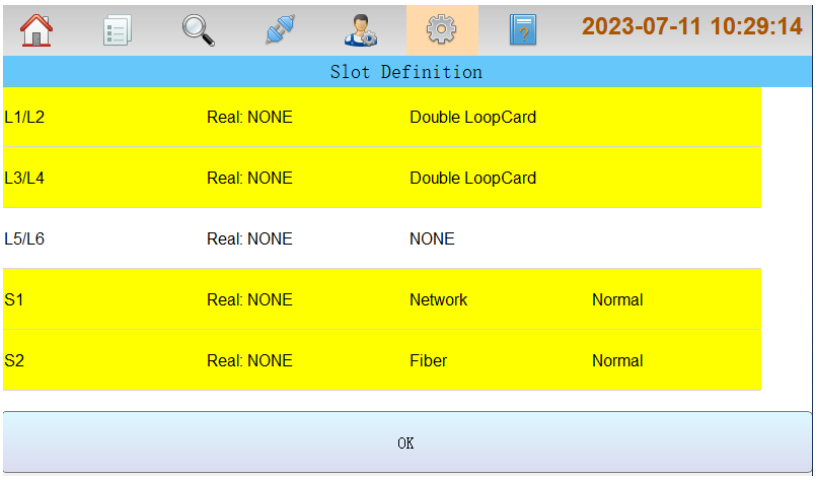


Fig. 4.2

- Device Type: clicking Device Type in Basic Settings menu as shown in Fig. 4.2.1, users can set the name and picture of the device type. Only the highlighted device types can be defined. The gray ones cannot be defined. Clicking Model Type as shown in 4.2.2, users can define the device type of a specific model. For example, I-9300 Addressable Input Module can be set as FLOW SWITCH, ZONE VALVE etc. Clicking Add, choosing the device type and clicking Save can add device types, as show in Fig 4.2.3.

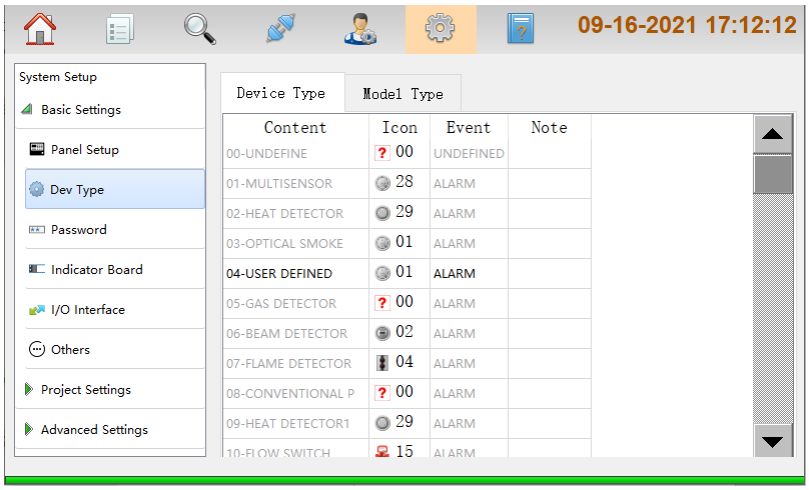


Fig. 4.2.1

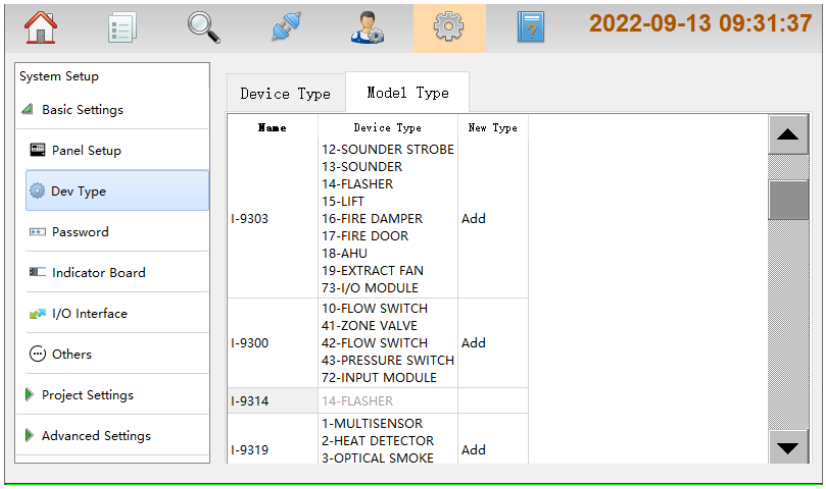


Fig. 4.2.2

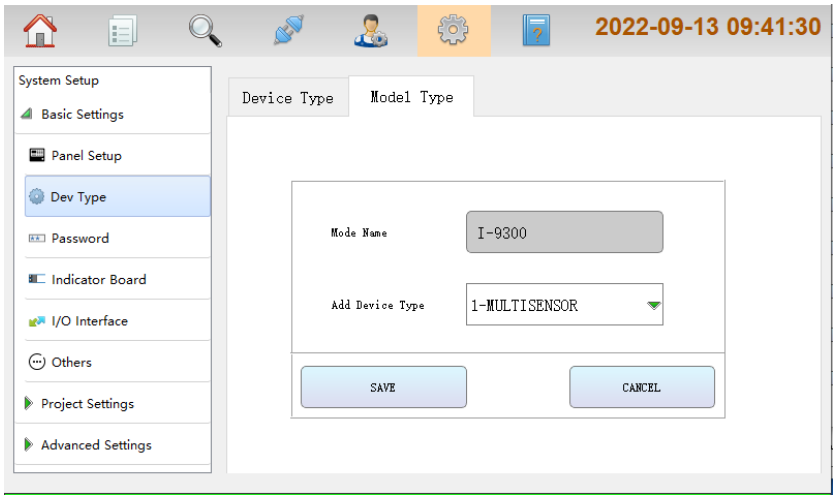


Fig.4.2.3

- Password: the panel has 4 access levels. Level 1 is used to view historical records and engineering information without entering a password. Level 2 (user password) is used to configure user settings and operating devices such as start, stop and so on. Level 3 (engineering password) is used to configure engineering information. Level 4 (upgrade password) is used to update software. Level 2 to 4 requires entering password.

  clicking ***Password*** in ***Basic Setting*** menu enters the screen for adding and setting passwords as shown in the figure below Fig. 4.3. There are two types of passwords including ***User Password*** and ***Engineering Password*** can be set, After setting, pressing ***OK*** can save the settings. Maximum 10 users can be added.

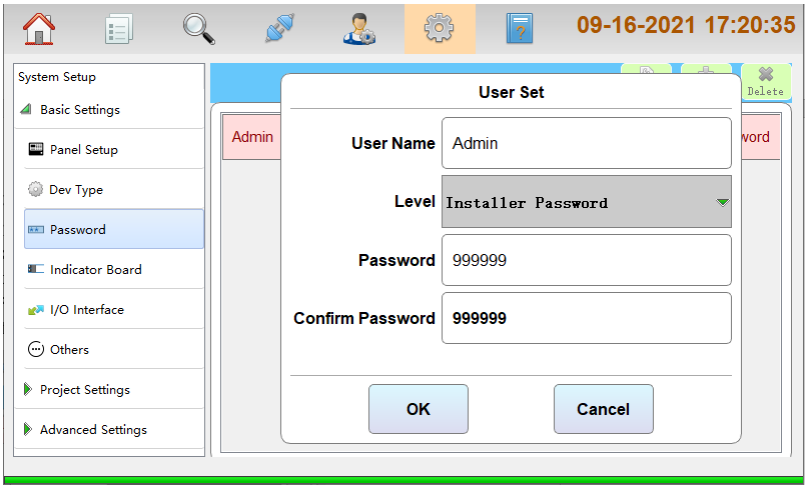


Fig. 4.3

➢ Indicator Board: Clicking ***Indicator Board***, Indicator Info can be displayed on the right of the screen, including Defined Led Qty. and Defined Led Key Qty. Refer to Fig. 4.4 for details.

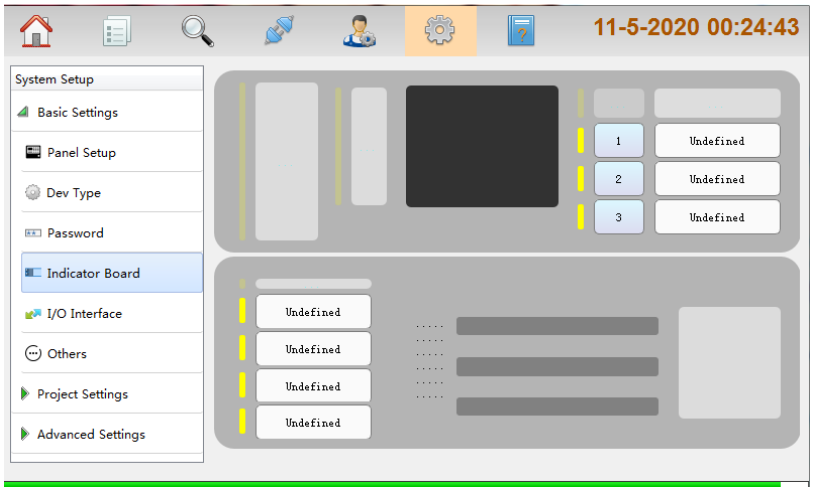


Fig. 4.4

Clicking the message in Indicator Info can enter the screen to define Fascia Button/LED Definition as shown in Fig. 4.5.

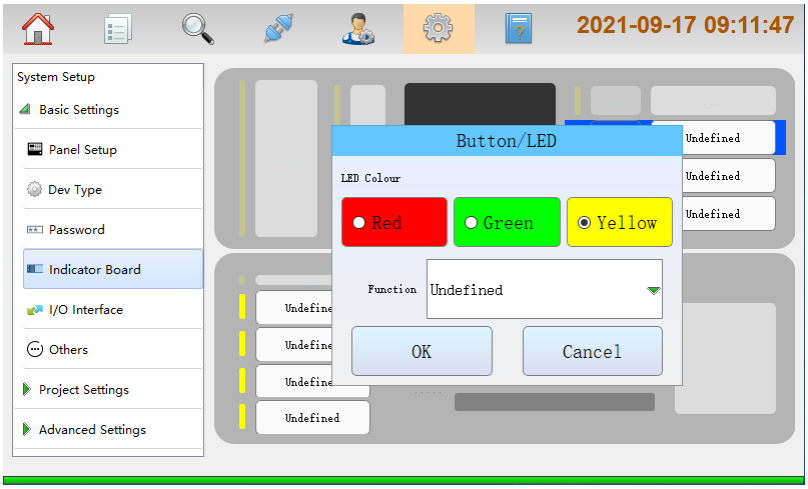


Fig. 4.5

- I/O Interface: clicking ***I/O Interface*** in ***Basic Setting*** menu, all output interfaces are displayed on the right of the screen and users can edit each interface specifically. Refer to the following figure Fig. 4.6-4.8.

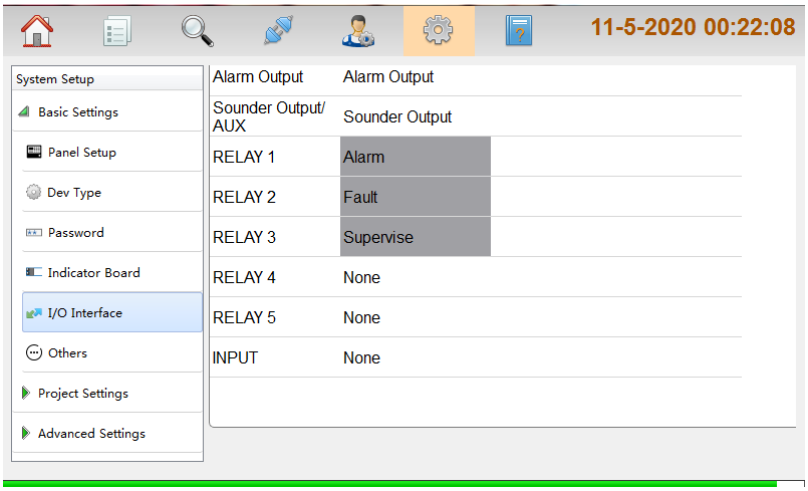


Fig. 4.6

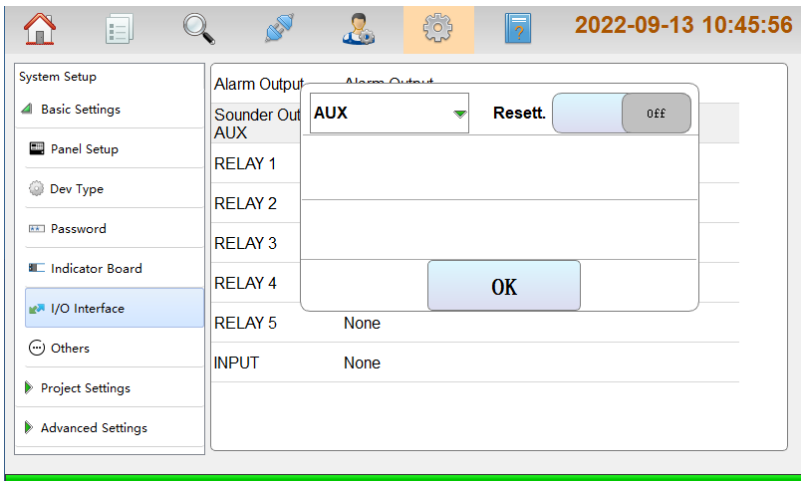


Fig. 4.7

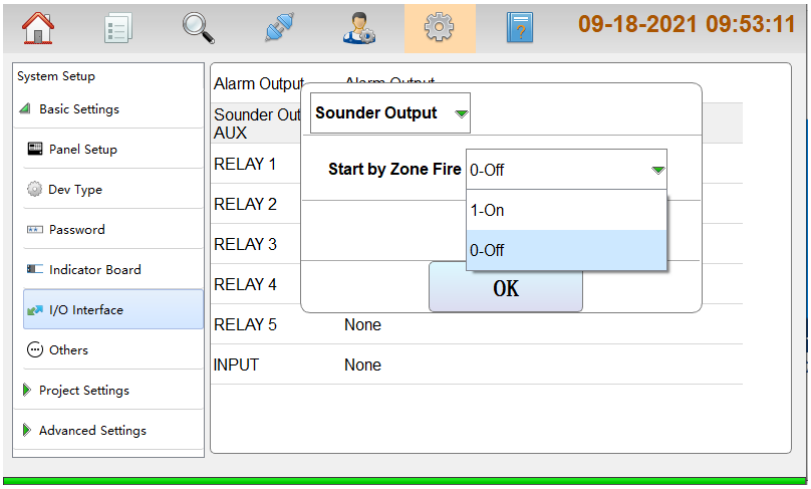


Fig. 4.8

Sounder Output or AUX：Clicking Sounder Output or AUX enters setup screen for Sounder Output/AUX. This interface has Sounder Output and AUX modes. When AUX mode is used, it is used as Class B supervised auxiliary 24V power output. In AUX mode, Resettable option is available as shown the figure above Fig.4.7 When Sounder Output mode is used sounder mode can be selected as 0-sound by zone fire or 1-on C&E see Fig. 4.8.

RELAY: The FACP has 5 relays. Relay1 is fire alarm output, Relay2 is supervisory output, Relay3 is fault output. Relay4 and Relay5 are user-defined, and they can be set as ***Alarm***, ***Supervisory***, ***Fault***, ***Mains Fault***, ***isolate and Reset*** by requirement.

INPUT: The ***INPUT*** is input interface can be set as ***Active***, ***Reset***, ***Day Mode, Night mode, MCP Alarm, External fault, External Supervise*** by requirement

- Others: Users can set dirty level and daylight saving time based on the actual situation and the switch of GMC, Disable Battery Resistance Fault, Check Device Type, after the change the switch of Disable Battery Resistance Fault, Check Device Type, the function require a reboot to take effect. ***Others*** menu as shown in Fig. 4.9.

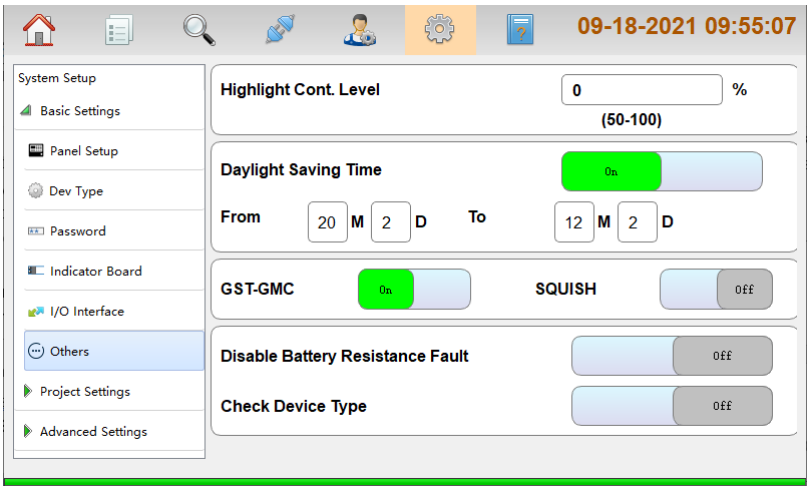


Fig. 4.9

Sometimes users do not want smoke detector becomes too dusty to alarm. User can enter

the screen for setting loop devices by following the path: Panel Setup->Project Settings->Loops. Clicking a certain loop, a list for the loop will be shown. Clicking Cont. button will check and show the smoke detector dirty level. The devices which dirty level reach the value been set at Highlight Dirty Level will be highlighted as yellow. For example, Highlight Dirty Level is set 50%. there is a device which dirty level is 70%, the device is highlighted as yellow. Shown in Fig. 4.10-4.12.

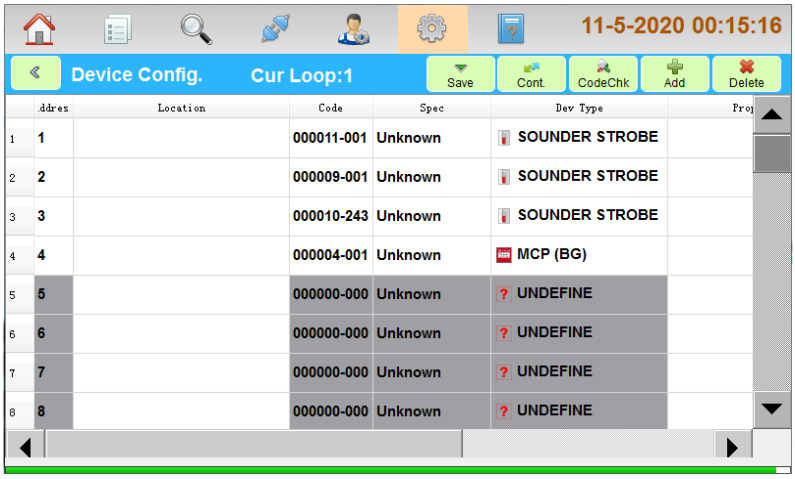


Fig. 4.10

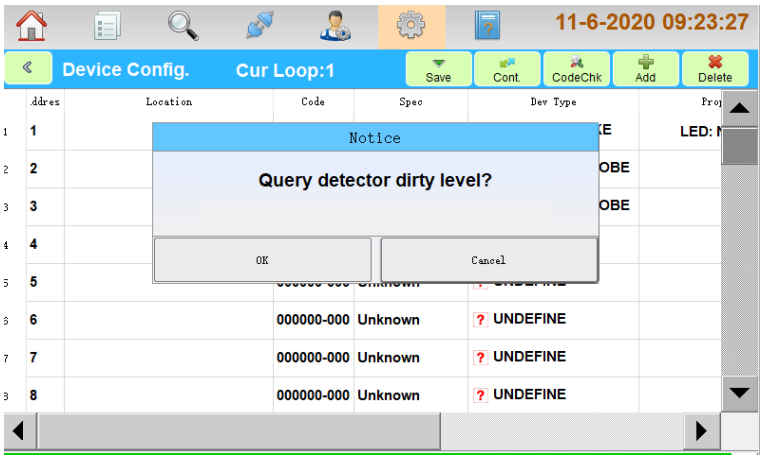


Fig. 4.11

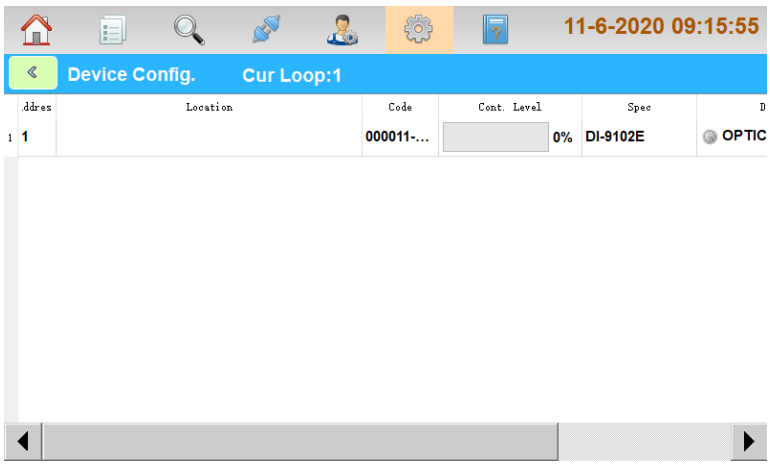


Fig. 4.12

4.1.2 Program

In ***Panel Setup*** screen, clicking ***Project Settings*** option enters the screen for setting program as shown in the figure below Fig. 4.13.

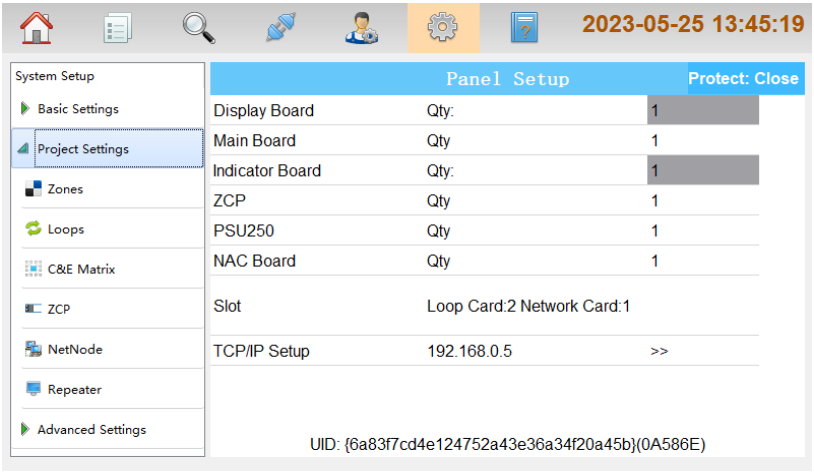


Fig. 4.13

- Zones: the zones screen shows all current defined zones. First column is zone number and the second is descriptions. Maximum 40 characters.

Quick Locate: The related zone can be located by inputting a number.

Click the plus sign (**+**) to add a new zone or double-click the existed zone to edit the selected zone.

Walk Test: Only display fire alarm information without any further actions

Zone Resound Mode: After the sounder in local zone is activated, perform silence, and the local sounder will be activated again by alarm in the neighbor zone

Pre Mode: Type A, panel turns into a fire alarm after both A1 and A2 time periods have alarm; Type B, panel turns into a fire alarm after two different alarms during the same time period.

Sound by zone Fire: The fire alarm will automatically start the sounders in the same zone

Delay Mode: Sounder delay start mode

click ***OK*** button to save setup. Refer to the figure below Fig. 4.14.

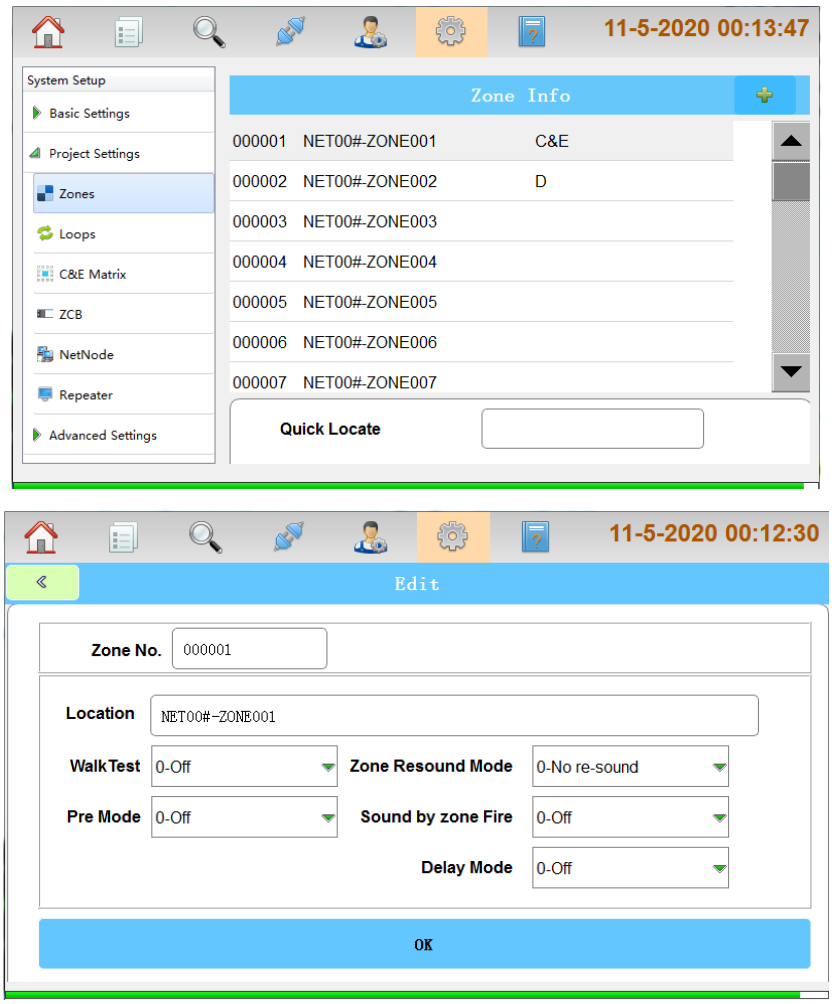


Fig. 4.14

If the zone is configured to Walk Test on, the test mode can be viewed by clicking Browse following Zones, as shown in Fig. 4.15.

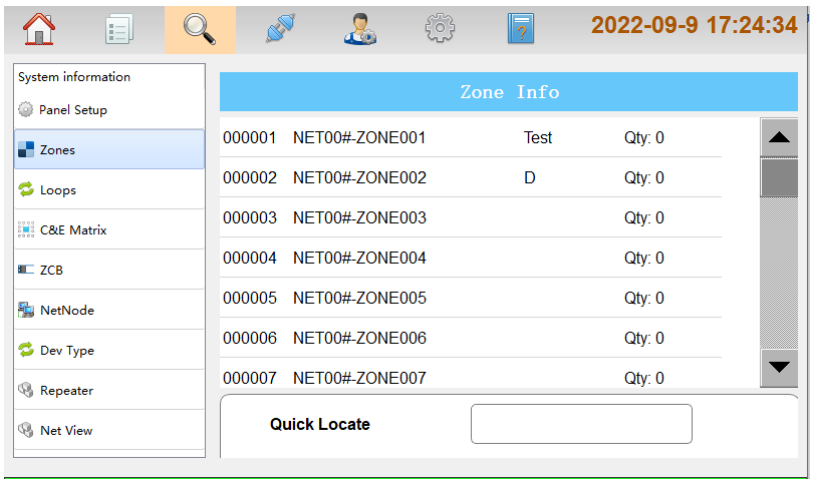


Fig. 4.15

- Loops: clicking ***Loops*** enters the screen for setting loop devices. The right screen shows all the loops of the FACP, quantity of devices of each loop, as shown in the figure below Fig. 4.16.

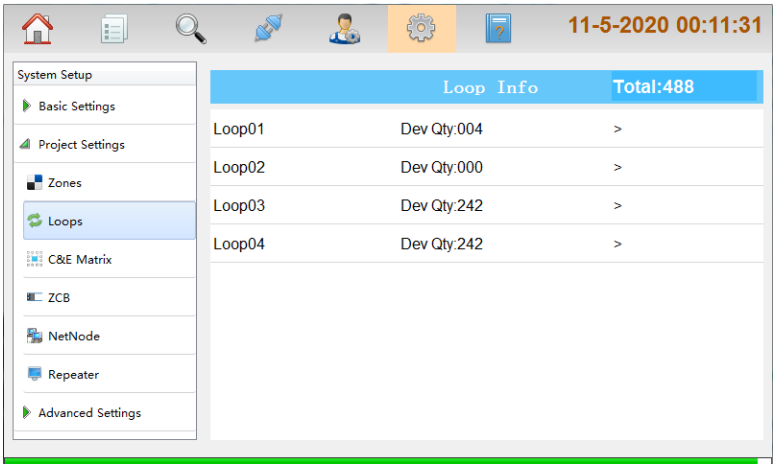


Fig. 4.16

Clicking a certain loop, a list for the loop will be shown. In this screen, loop devices can be added, deleted and saved. Refer to the figure below Fig. 4.17.

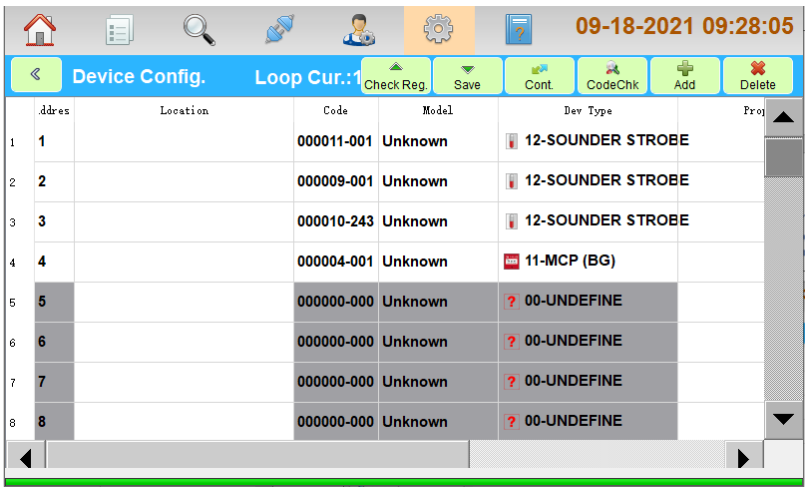
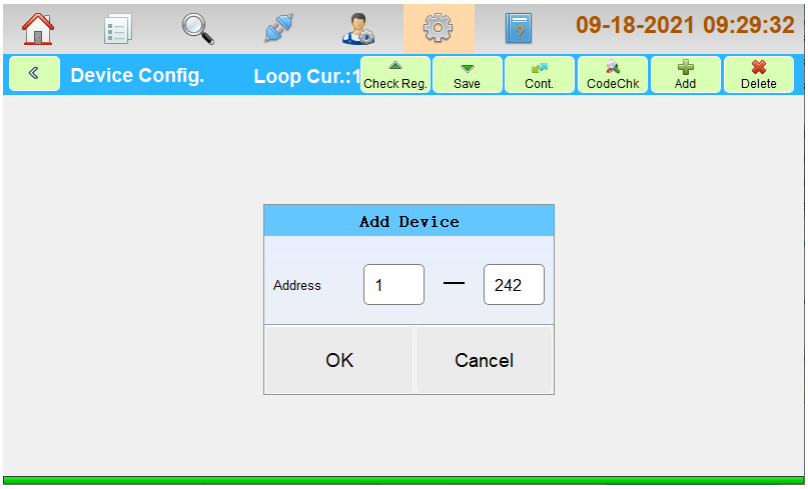


Fig. 4.17

Add/Delete a Device: clicking ***Add*** or ***Del*** button on the right corner, devices can be added or deleted. After each ***Add*** or ***Del*** operation, need to click ***Save***. Refer to the following figure Fig. 4.18.



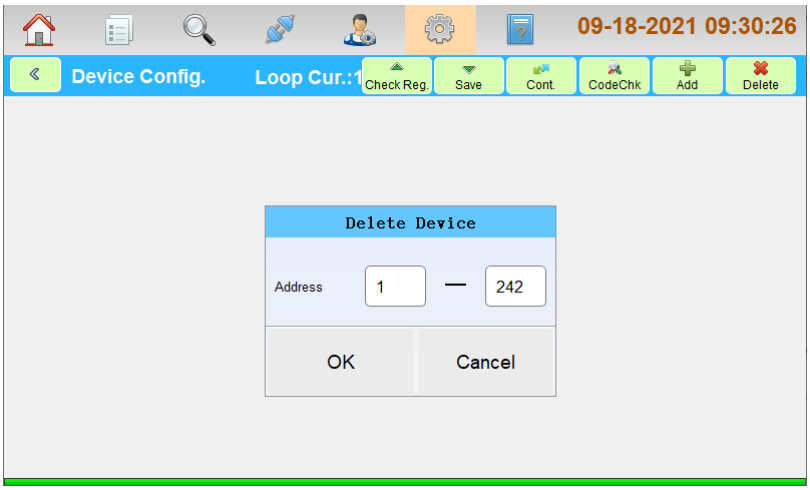


Fig. 4.18

Clicking a device in device define screen pops up the screen for setting the details of the device. Clicking **=>** or **<=** can skip to another device or the previous device respectively. Refer to the figure below Fig. 4.19.

- **Panel**: address of the FACP
- **Loop ID**: loop number of the device
- **Address.**: address code of the device
- **Status**: status of the device
- **Zone**: zone number of the device
- **Dev No**: device number of the device in the zone
- **Model**: device model
- **Dev Type**: device type
- **Location**: device descriptions
- **Sensitivity**: sensitivity information of the detector
- **LED Mode**: indicates polling state of the device
- **Day/Night**: enable or disable of Day or Night mode

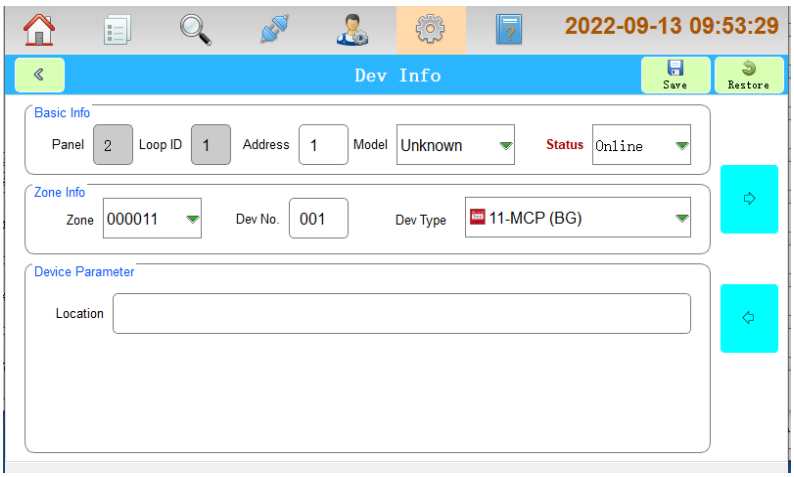


Fig. 4.19

Clicking ***Save*** button on the right corner, device definitions for the current loop can be downloaded to the loop board.

- C & E Matrix: clicking ***C&E Matrix*** in ***Project Settings*** menu enters the screen below Fig. 4.20 including ***Alarm Rules***, ***Fault Rules***, ***Action Rules*** and ***Mix Rules***.

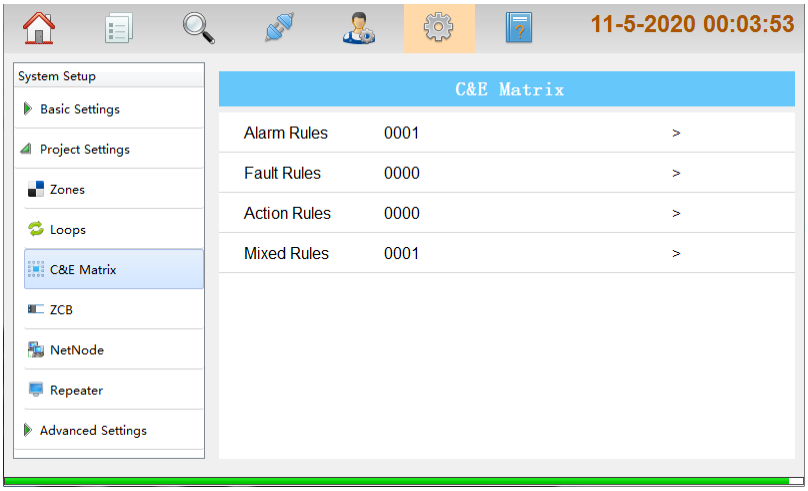


Fig. 4.20

Clicking a cause and effect matrix of any kind, details of that kind of matrix can be shown as in Fig. 4.21.

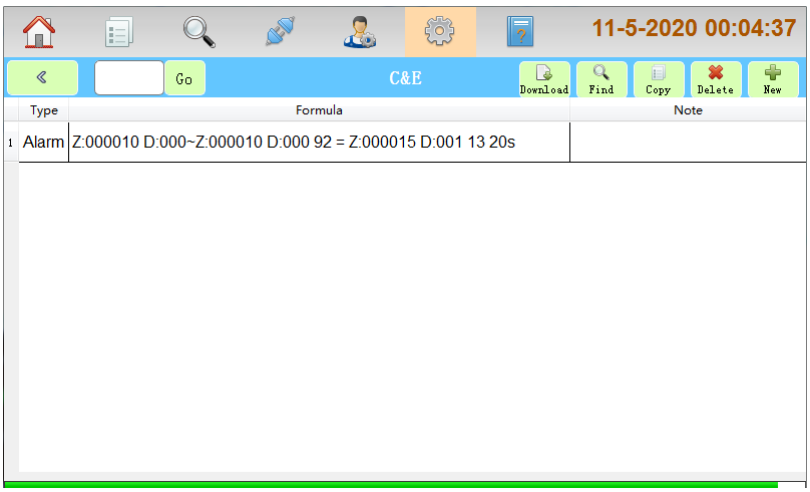


Fig. 4.21

Clicking ***Find*** in Fig. 4.21 can pop up a dialogue box as shown in Fig. 4.22. As the conditions are changed as required, clicking ***OK*** can view those cause and effect matrixes meeting those conditions.

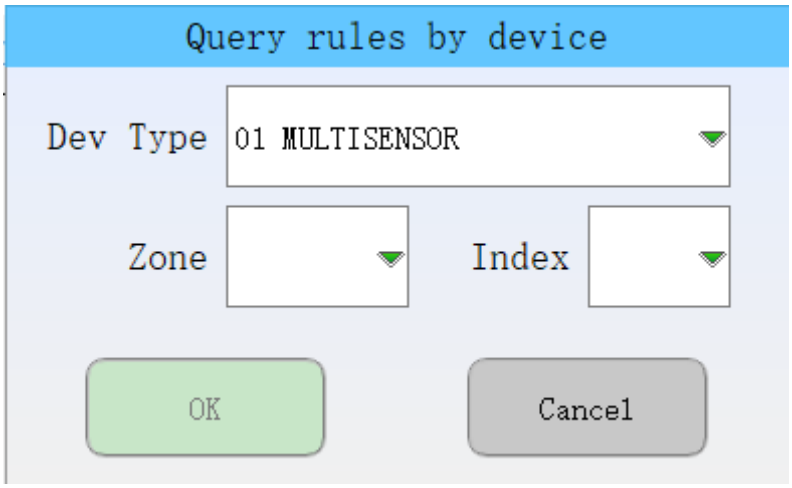


Fig. 4.22

Clicking ***Copy*** in Fig. 4.21 can pop up a dialogue box. As the parameters are changed, clicking ***OK*** can copy that selected cause and effect equation or that with the same format.

Clicking ***Delete*** in Fig. 4.21 can pop up a dialogue box for delete. Clicking ***OK*** can delete the selected equation.

Clicking ***New*** in Fig. 4.21 can enter the screen for creating a new cause and effect equation as shown in Fig. 4.23. Input device list is on the left and output device list on the right.

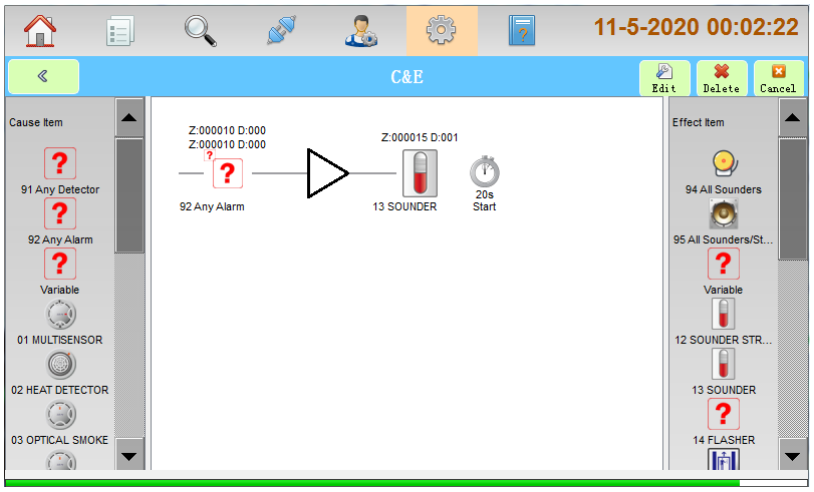


Fig. 4.23

Clicking a device in the list, drag and release it in the editing area. A new equation will be added by editing the parameters.

Selecting a device in editing area, its message can be changed by clicking ***Edit*** or double clicking on the device.

Selecting a device in editing area, it can be deleted by clicking ***Delete***.

Clicking ***Cancel*** can stop creating a new matrix and return to the previous screen.

- ZCP: clicking ***ZCP*** in ***Project Settings*** menu enters the screen for setting the zone panels. Refer to the figure below Fig. 4.24.

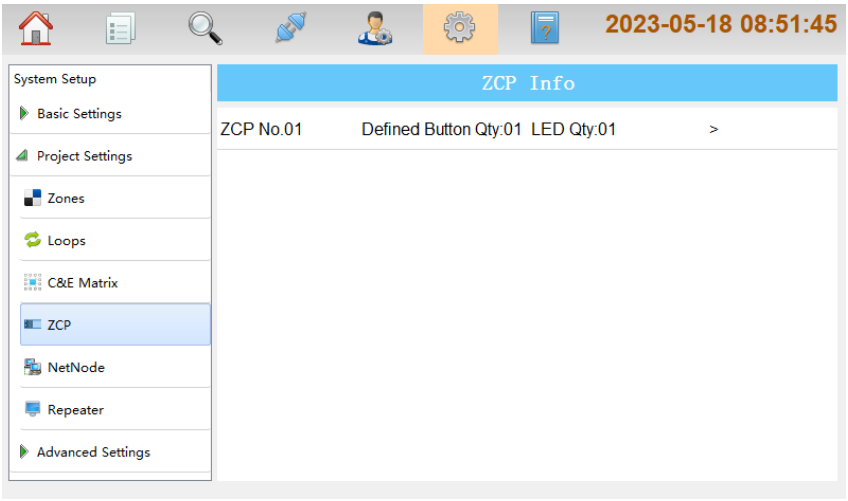


Fig. 4.24

Clicking a zone panel enters the setting screen as shown in the figure below Fig. 4.25. Every zone panel has 40 LEDs and 20 keys. Each LED had red, green and yellow colors for users to set.

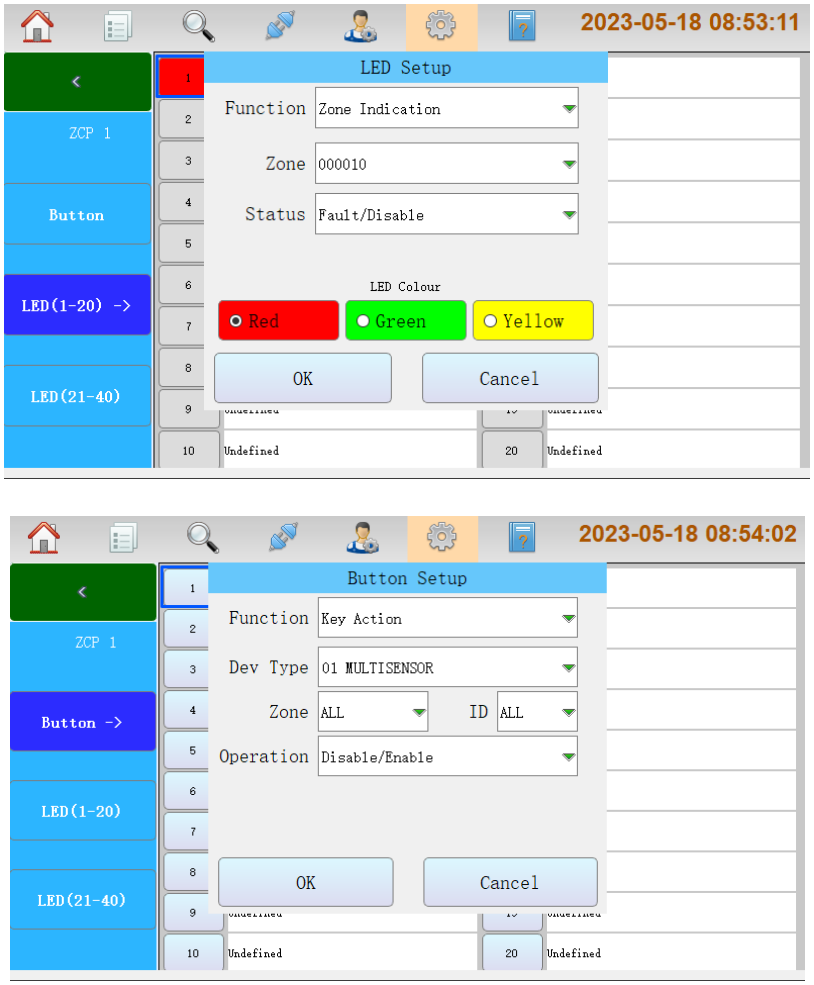


Fig. 4.25

4.1.3 Advanced Settings

Entering the Engineering password, clicking "Network Setup" in "Advanced Settings", Groups can be set as shown in Fig. 4.26.

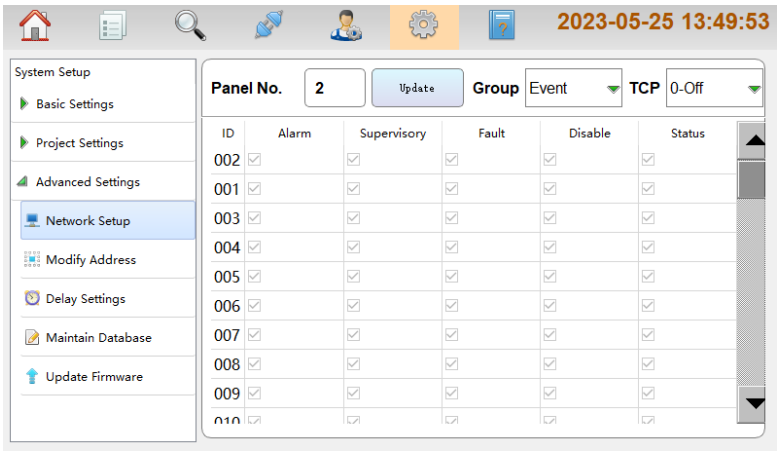


Fig. 4.26

Panel No: click "Update" after filling up the Panel ID.

Group: "Event" and "Command" can be filtered.

Refer to the table above for Event type be filtered. Those messages with no ticks are filtered.

TCP: It is network mode which can be set to on or off. As it is set to On, TCP/IP is used to connect other panels. As it is set to Off, CAN is used to connect other panels.

- Modify Address: Users can modify device code based on the actual situation by clicking ***Modify Address*** in ***Advanced Settings*** menu as shown in Fig. 4.27.

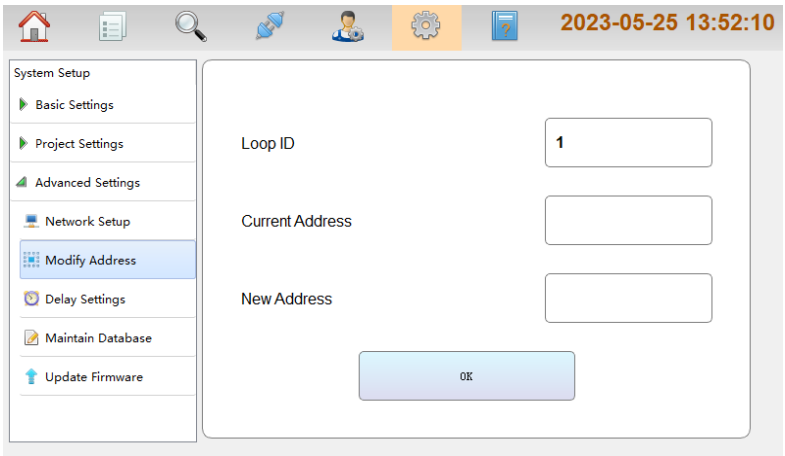


Fig. 4.27

Loop ID: loop No.
Current Address: an existing device code.
New Address: a new device code.

- Delay Setting: Users can set delay based on the actual situation by clicking ***Delay Settings*** in ***Advanced Settings*** menu as shown in Fig. 4.28. Delay for Silence, Mute and Pre-Alarm delay timer can be set.

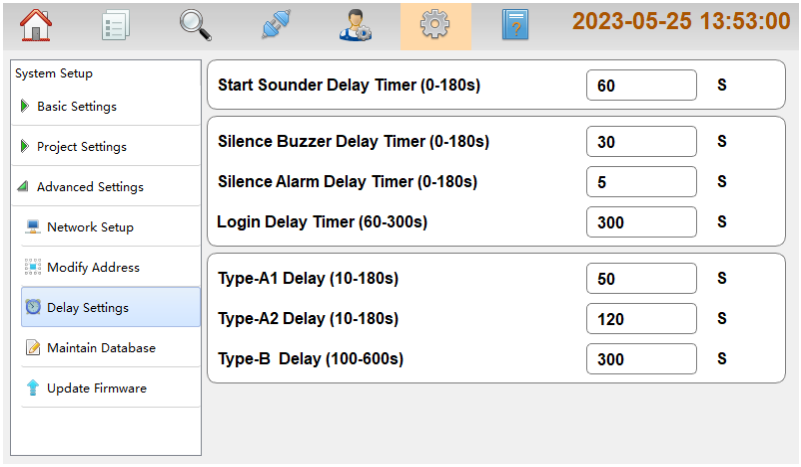


Fig. 4.28

Silence Alarm Delay Timer: When fire alarm condition occurs user can silence alarm by press the Silence Alarm key after the Silence alarm Delay time.

Silence Buzzer Delay Timer: When fire alarm condition occurs user can silence buzzer by press the Silence Buzzer key after the Silence Buzzer Delay time.

Type_A1 Delay: Type A phase 1 of pre-alarm delay setting.

Type_A2 Delay: Type A phase 2 of pre-alarm delay setting.

Type B Delay: Type B pre-alarm delay setting.

- Update Firmware: Clicking ***Update Firmware*** in ***Advanced Settings*** menu and entering the upgrade password (obtained from the maintenance service supplier), users can update firmware as shown in Fig. 4.29 then insert USB flash into the LCD drive board and click ***OK*** to update firmware.

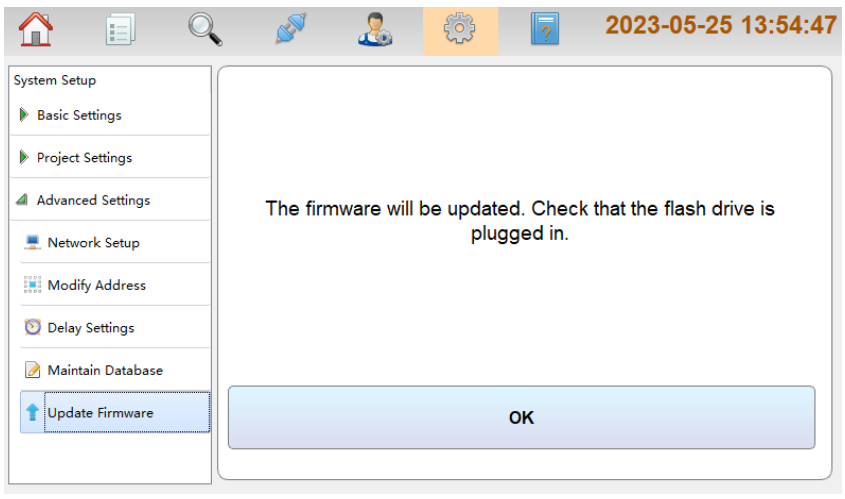


Fig. 4.29

4.2 Programming FACP Through GST-IFPx-Def Defining Tool

Configurations and definitions can be downloaded to the FACP through USB or Ethernet interfaces after they are programmed by using GST-IFPx-Def (version 1.0 or above) Defining Tool.

4.2.1 Auto Registration to Generate Configuration

Entering System Setup/Advanced Settings/Maintain Database，click Auto Register button.

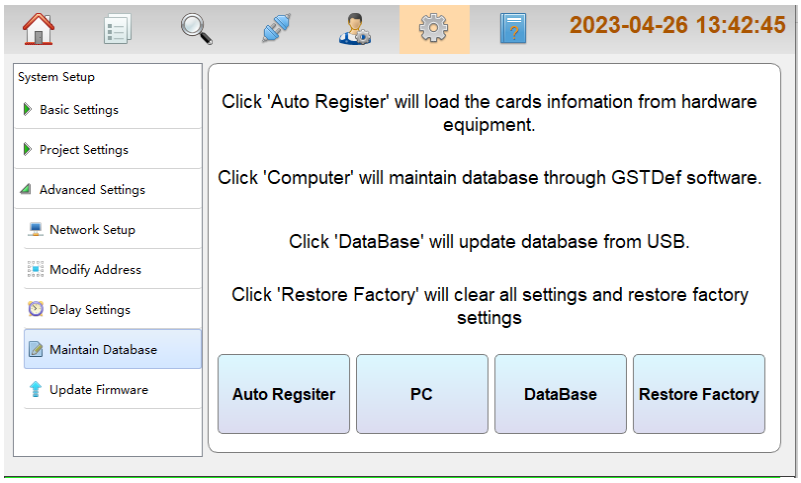


Fig. 4.30

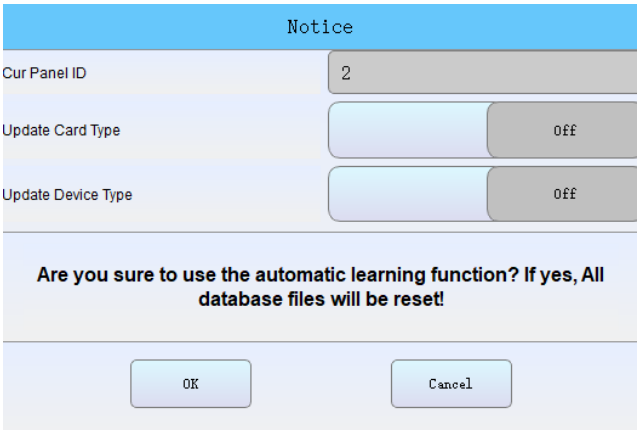


Fig. 4.31

- Cur Panel ID: Devices can be zoned by the current panel ID. For example: Those devices connected to panel 1 will be distributed to zone 1-8. Those devices connected to panel 2 will be distributed to zone 9-16. Address within a zone are physical addresses of devices.
- Update Device Type: If auto registration is set to On, the current device type can be updated based on its MAC. If auto registration is set to Off, on-line state and related zone are updated, but the current device type is not be verified.

Clicking OK, the system reboots and enters auto registration. Please wait.

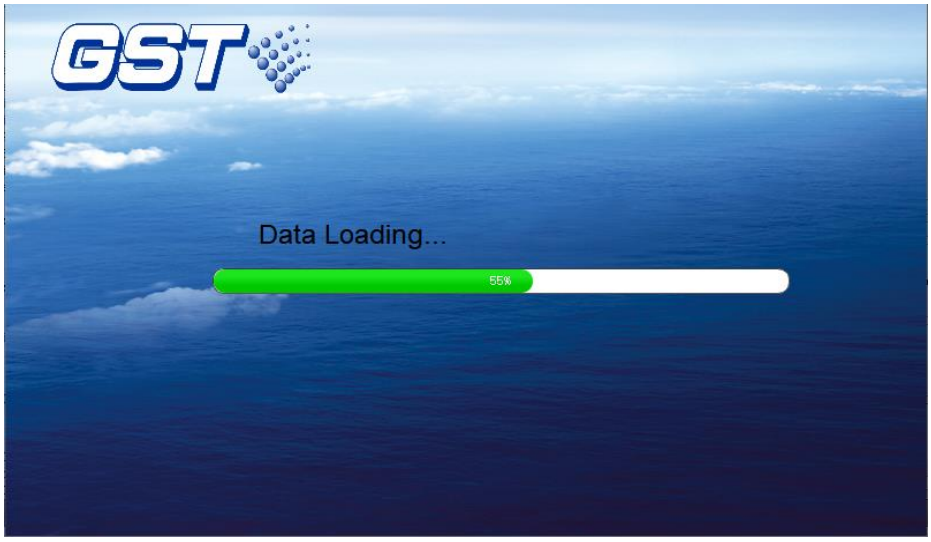


Fig. 4.35

4.2.2 Download thru Ethernet interface

After programming the FACP using GST-IFPx-Def Defining Tool, connect Ethernet port of the programming computer to the Ethernet interface on FACP's SD-400E LCD Driver Board through a switch, a router or a cross-over Ethernet cable. In ***Basic Settings*** menu, select ***TCP/IP Setup*** in ***Panel setup*** as shown in the figure below Fig. 4.36 On the programming window to the right, key in IP Address, Subnet Mask and Gateway address. Note that FACP's IP address shall be in the same subnet as the programming computer.

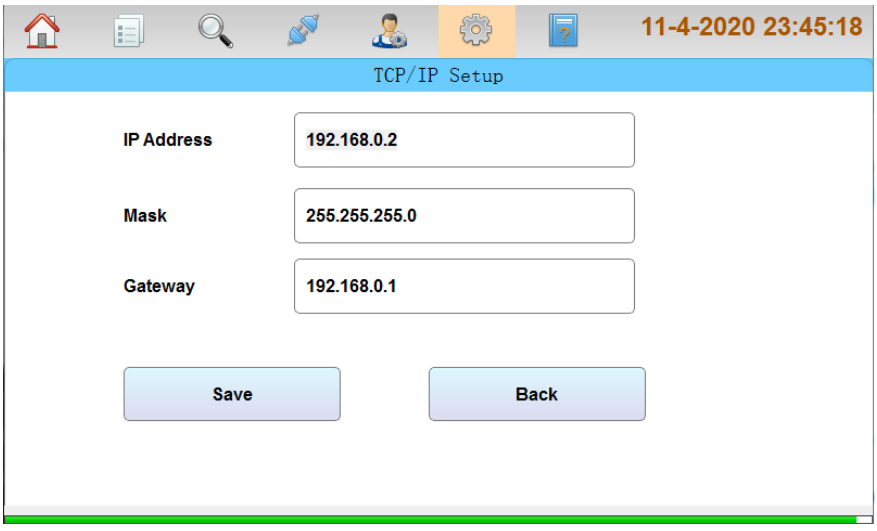


Fig. 4.36

Clicking ***Computer*** in Fig. 4.33 pops up the screen as shown in Fig. 4.37. At this time, the configurations and definitions can be downloaded to the FACP from GST-IFPx-Def Defining Tool.

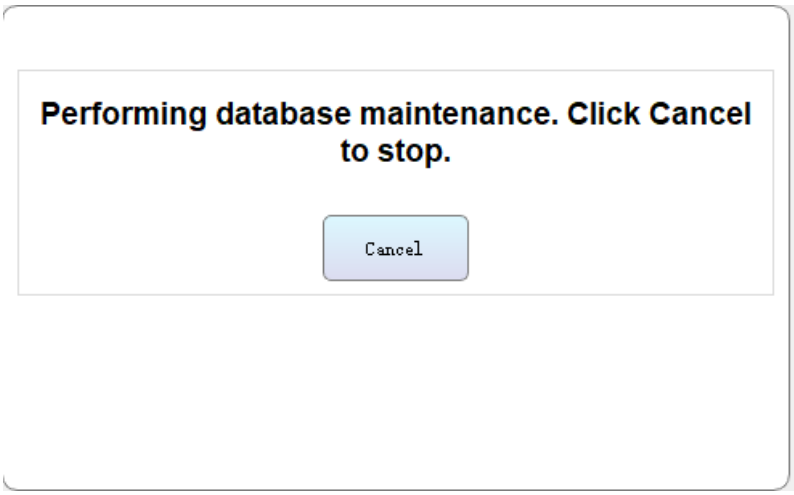


Fig. 4.37

4.3 User Setup

Clicking  button enters ***User Setup*** menu by inputting user password. Messages about soft keyboard, display, test, date/time, printer, day/night mode, language, project information, and so can be set in this screen. Refer to the figure below Fig. 4.38.

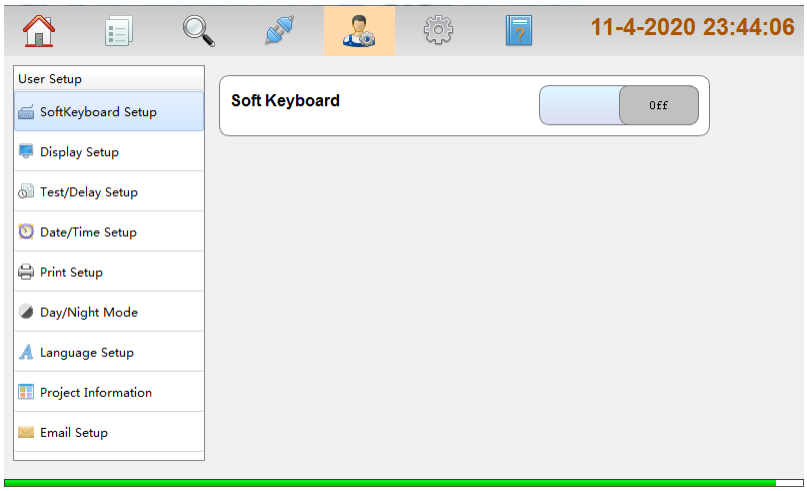


Fig. 4.38

4.3.1 Soft keyboard Setting

Clicking Soft keyboard Setup can set ***On*** or ***Off*** the soft keyboard through this option, refer to the figure above Fig. 4.38.

4.3.2 Display Setup

Clicking ***Display Setup*** in ***User Setup*** menu enters the screen for setting font size, LCD backlight time and so on. Refer to the figure below Fig. 4.39.

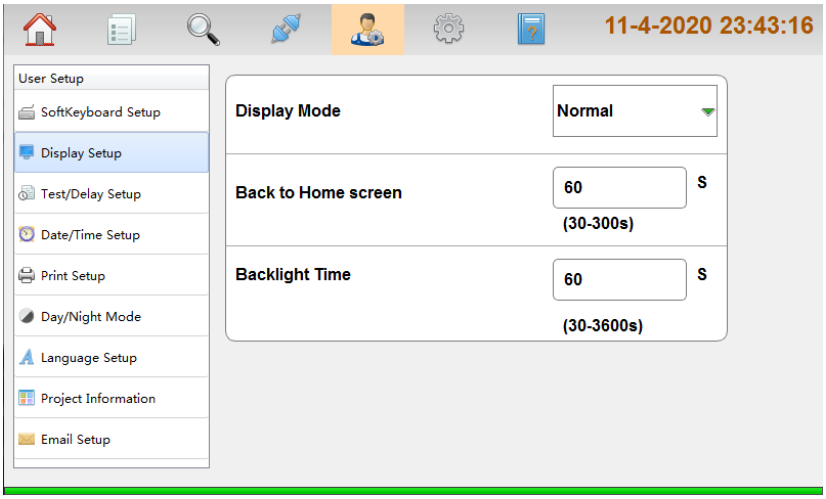


Fig. 4.39

4.3.3 Test/Delay Setup

In Test Setup Menu, there are two items as shown in Fig. 4.40.

Delay Mode: Delay Mode setting, 1 is on, 0 is off.

Activate ALARM/SOUNDER OUTPUT in Test Mode: EN listed notification appliances are connected to the OUTPUTs.

User can set the activate time of notification appliances in test mode by the option.

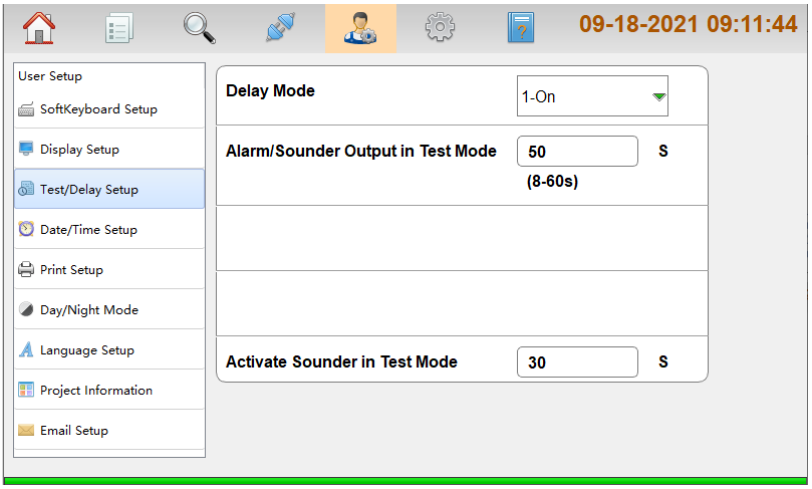


Fig. 4.40

4.3.4 Date/Time Setup

In user setup screen, users can set Data Format and Modify System Clock as required by clicking ***Date/Time Setup*** in ***User Setup*** menu. Refer to the figure below Fig. 4.41.

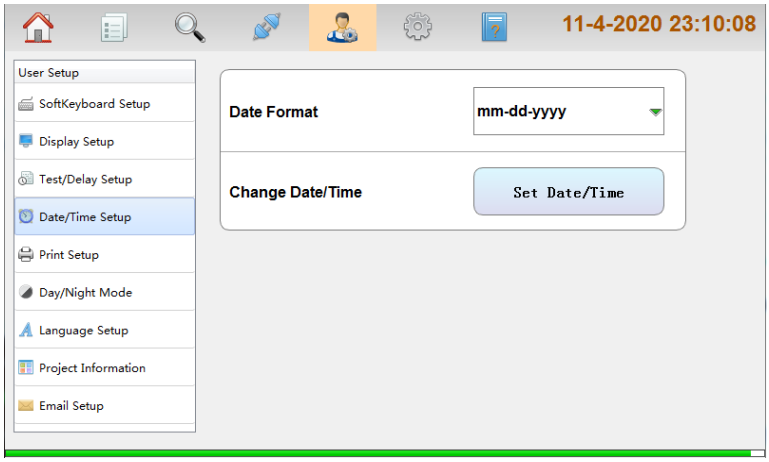


Fig. 4.41

Clicking ***Set Date/Time*** button behind ***Change Date/Time*** can modify the system time as shown in the figure below Fig. 4.42.

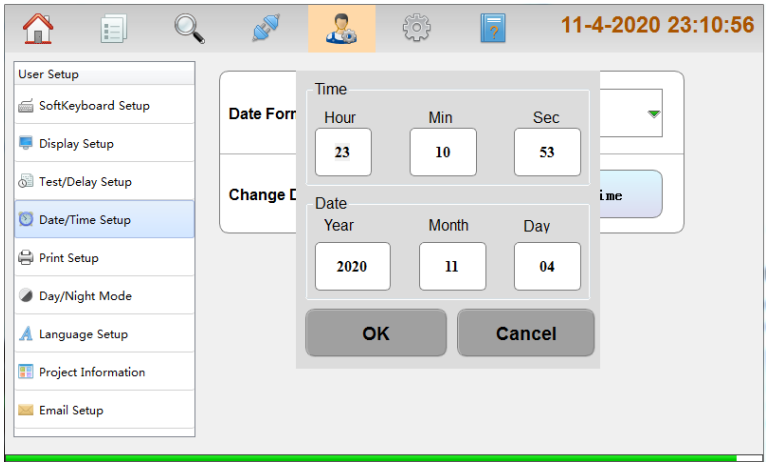


Fig. 4.42

4.3.5 Print Setup

Clicking ***Print Setup*** in ***User Setup*** menu enters the screen for setting the printer. Real-time print and printing types can be set. Refer to the figure below Fig. 4.43.

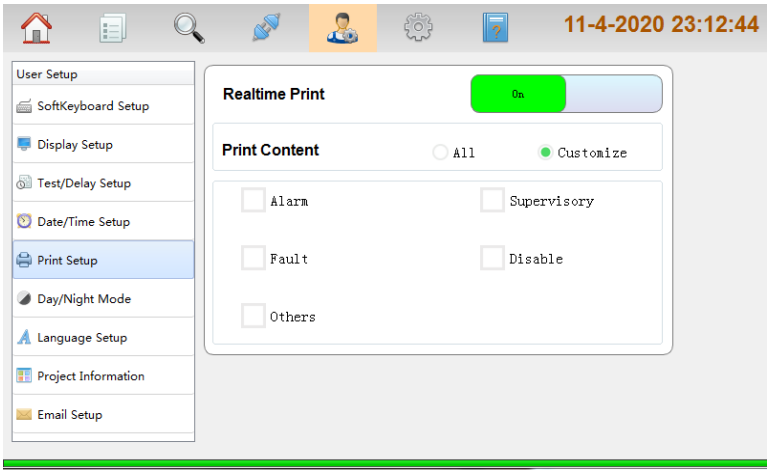


Fig. 4.43

4.3.6 Day/Night Mode

Clicking ***Day/Night Mode*** in ***User Setup*** menu, Day/Night mode can be set. Refer to the following figure Fig. 4.44.

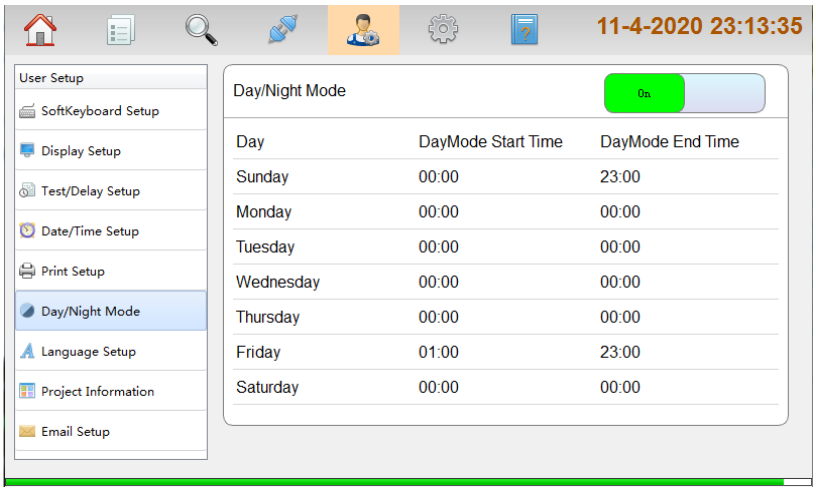


Fig. 4.44

In this mode, starting and ending time for the day can be set. Refer to the following figure Fig. 4.45.

In the ***Day mode***, the sensitivity of the detector decreases,

In the ***night mode***, the sensitivity of the detector increases.

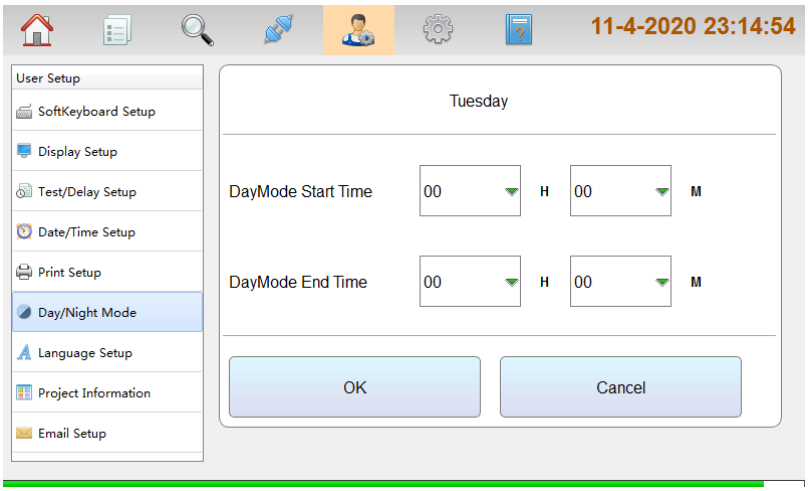


Fig. 4.45

4.3.7 Language Setup

Clicking ***Language Setup*** in ***User Setup*** menu enters the screen for setting the language. In this screen, the display language can be selected. Available languages are English, Arabic, Russian, Spanish, Hungarian, Italian, French, Portuguese, Turkish, Traditional Chinese. Refer to the figure below Fig. 4.46.

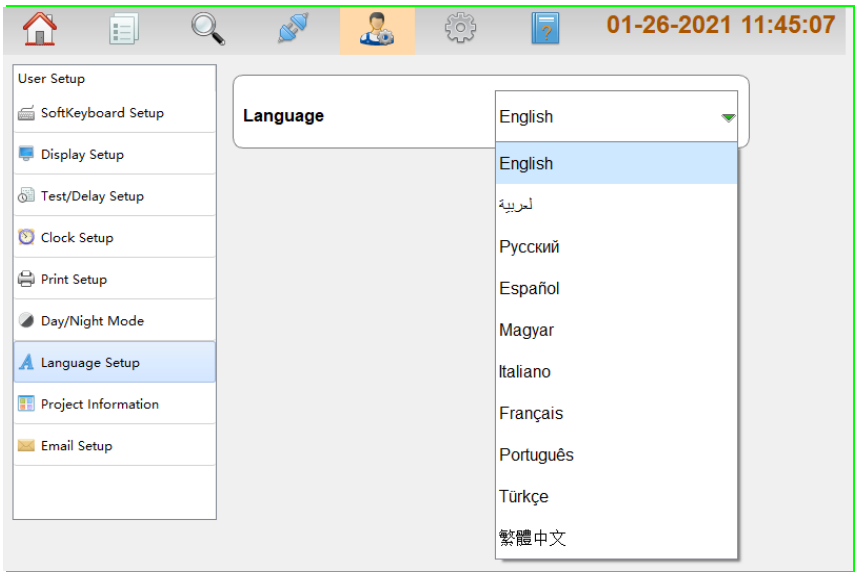


Fig. 4.46

4.3.8 Project Information

Clicking ***Project Information*** in ***User Setup*** menu enters the screen for setting the project information. Refer to the figure below Fig. 4.47

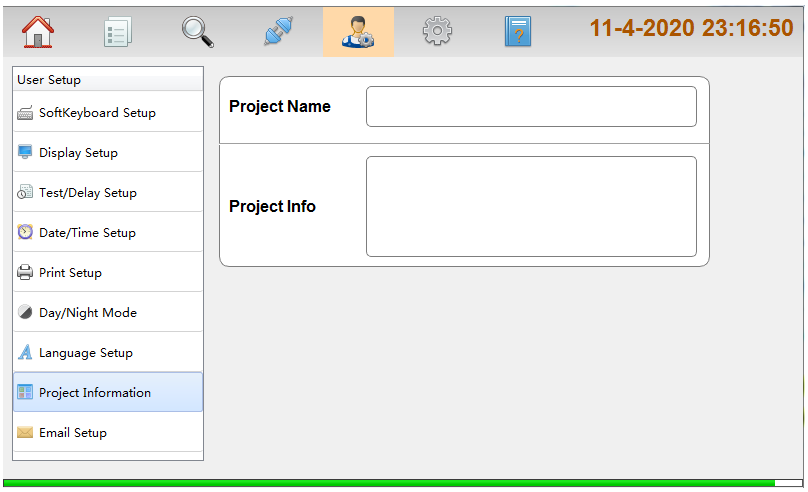


Fig. 4.47

4.3.9 Email Setup

Clicking ***Email Setup*** in ***User Setup*** menu enters the screen for setting the email that receive all events from panel. Refer to the figure below Fig. 4.48.

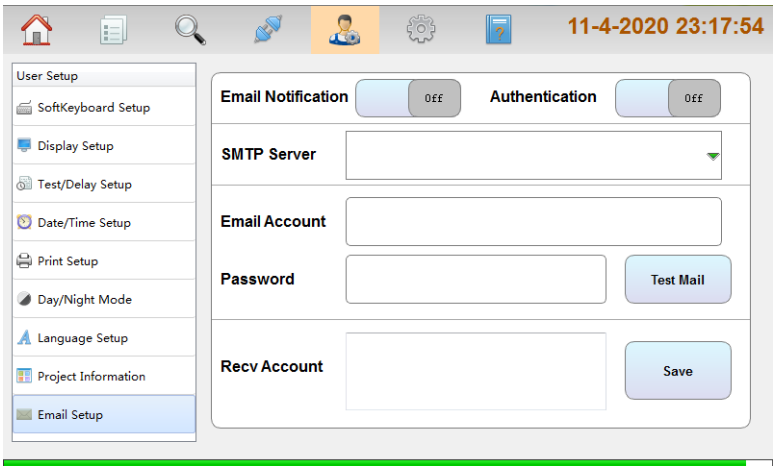


Fig. 4.48.

4.4 Forget Password

Clicking any enters a screen for you to enter the password. Refer to Fig. 4.49.

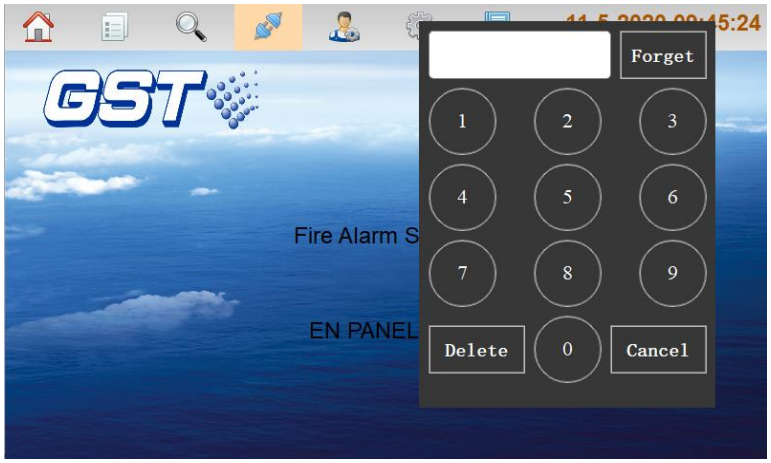


Fig. 4.49

Clicking “Forget” enters the screen as shown in Fig. 4.50.

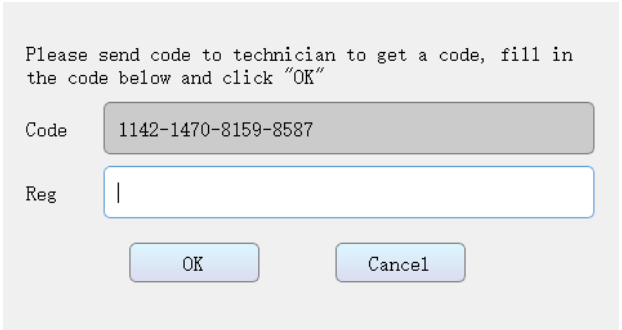


Fig. 4.50

Send “authentication code” to a technician and get back a “Code”. Fill up the code on that day you send “authentication code”. Click “OK” to finish.

4.5 GMC Connection

Switch on the GST-GMC switch as Fig. 4.9，connect the computer with GST GMC software and RJ45 of the panel. After that, Panel sends an alarm message to GMC and GMC displays it in real time.

The panel can check connection with GMC software in real time.

5 Equipment operation and information browsing

5.1 Equipment operation

Clicking  button on the left corner enters the menu for operating device including ***Reset***, ***Silence Buzzer, Silence Alarm***, ***Self Check***, ***Start***, ***Stop***, ***Disable*** and ***Enable***. Refer to the following figure Fig.5.1.

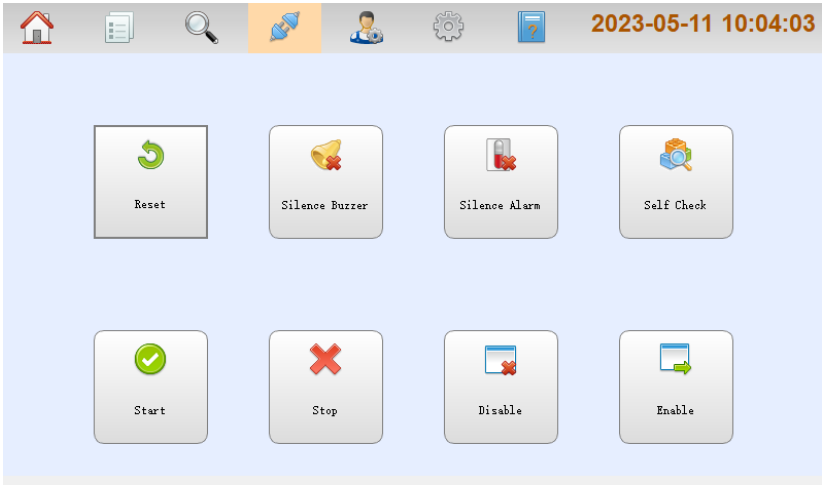


Fig. 5.1

- **Reset**: clicking this button resets the FACP.
- **Silence Buzzer**: clicking this button silences the buzzer sound of the FACP.
- **Silence Alarm**: clicking this button silences the sounds from notification appliances.
- **Self Check**: clicking this button checks LCD、LEDs and buzzer automatically.
- **Start**: clicking this button enters the screen for starting devices as shown below Fig. 5.2.

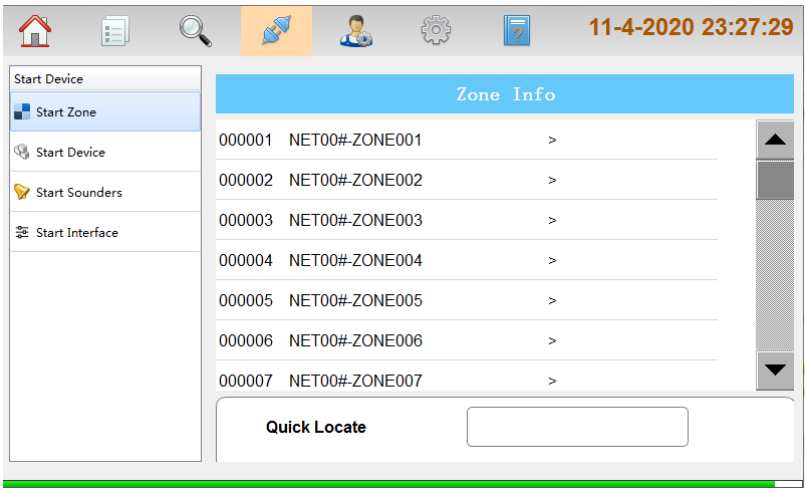


Fig. 5.2

Start Zone: starting devices by zone. Clicking a designated zone enters the screen shown in Fig. 5.3. Choosing device type and then clicking ***OK*** can confirm to start these devices

in this zone.

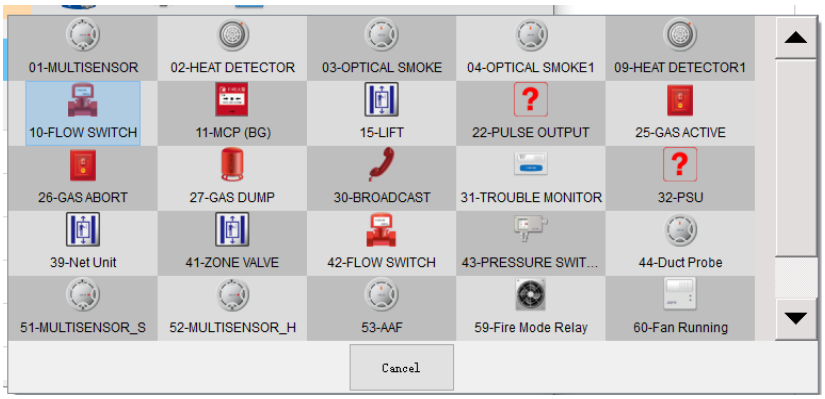


Fig. 5.3

To start all devices in a zone, you can choose 96-Whole Zone then click ***OK*** as shown in Fig.5.4. To start all alarm devices like detectors and manual call points, you can choose 92-Any Alarm. To start all sounders, you can choose 94-allSND.

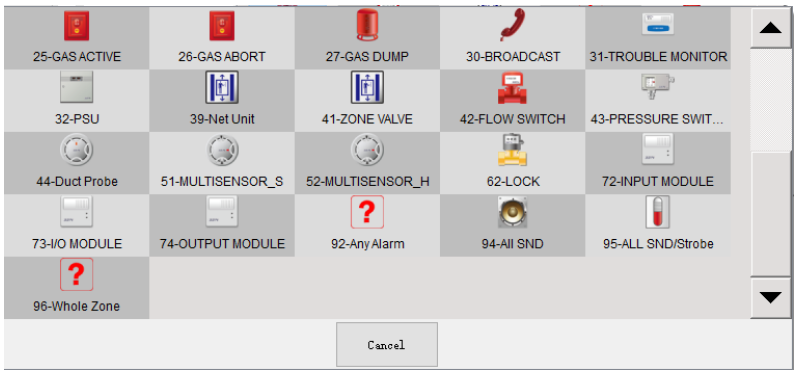


Fig. 5.4

Clicking ***Start Device*** enters the screen shown below Fig. 5.5 to start a designated device.

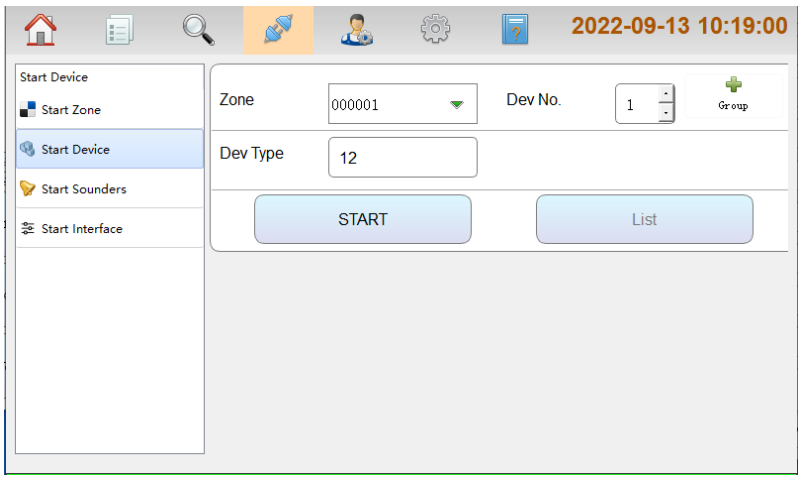


Fig. 5.5

Clicking Group button, choosing start zone, zone code and stop zone, zone code and device type, then clicking ***START*** can start a range of the devices. Refer to the following

figure Fig. 5.6.

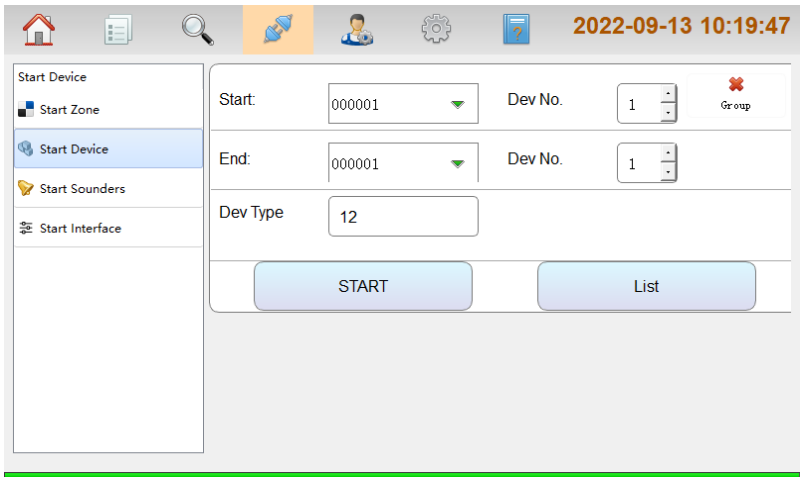


Fig. 5.6

Start Sounder: Clicking ***Start Sounder*** enters the screen for starting sounders. Choosing a designated zone and then clicking ***OK*** can confirm to start all sounders in the zone. Refer to the figure below Fig. 5.7.

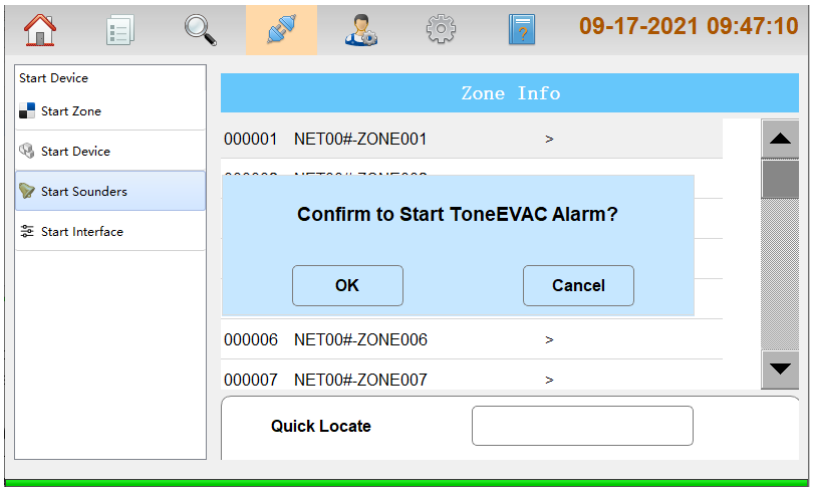


Fig. 5.7

- **Stop**: clicking ***Stop*** button enters the screen for stopping the device screen. Stopping operations also include options such as ***Stop Zone***, ***Stop Device*** and ***Stop Sounder***. The operation is the same as starting devices.
- **Disable**: clicking ***Disable*** button enters the screen for disabling the device screen. Disabling operations include options such as ***Disable Zone***, ***Disable Device*** and ***Disable ALARM OUTPUT or SOUNDER OUTPUT***. Users can disable devices of a whole zone by choosing 96-Whole Zone in Fig. 5.4 and disable all alarm devices by choosing 92-Any Alarm., The operation is the same as the starting devices.
- **Enable**: clicking ***Enable*** button enters the screen for enabling the device screen. Enabling operations include options such as ***Enable Zone***, ***Enable Device*** and ***Enable ALARM OUTPUT or SOUNDER OUTPUT*** Its operation is the same as starting devices.

Start Interface: Clicking ***Start Interface*** enters the startup interface selection screen, select the interface to start, and click OK to confirm. Refer to the figure below Fig. 5.8.

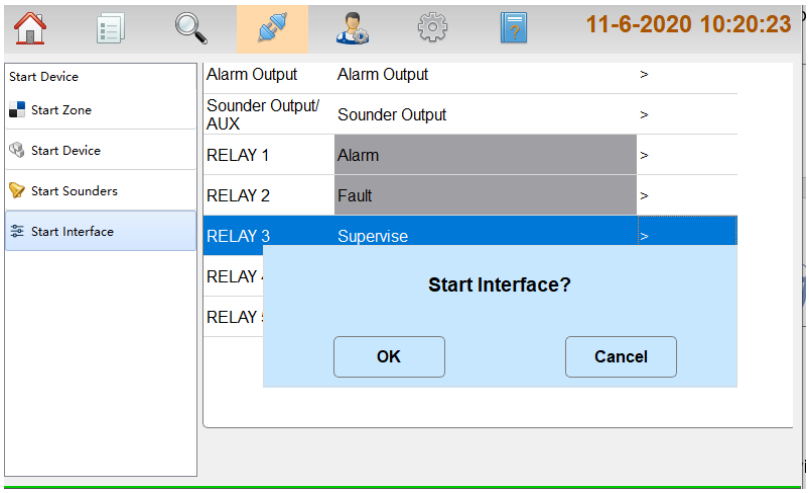


Fig. 5.8

5.2 Devices information Browsing

Clicking  button on the left corner enters the menu for browsing devices as shown in the figure below Fig. 5.9.

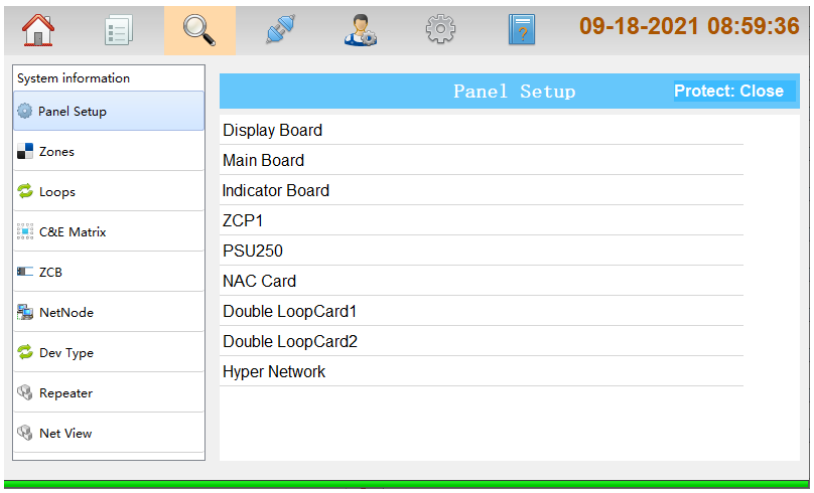


Fig. 5.9

- **Panel Setup**: clicking ***Panel Setup*** can browse the hardware versions and firmware versions of all boards.
- **Zones**: clicking ***Zones*** can browse all loop devices by zone. Device browsing screen is the same as the editing screen, but the function is different. Device browsing screen is only for viewing devices without editing them.
- **Loops**: clicking ***Loops*** can browse all loop devices by loop. Clicking any loop can browse device list of this loop.
- **C&E Matrix**: clicking ***C&E Matrix*** can browse all cause & effect matrixes. Clicking any type can browse the detailed matrix.

- **ZCP**: clicking ***ZCP*** can browse all zone panels. Clicking one zone panel can browse specific description for keys and LEDs.
- **Dev Type**: clicking ***Dev Type*** can browse all loop devices by type. Clicking any device type can browse device list of this type.

5.3 Record Browsing

Clicking  button on the left corner enters the screen for browsing history record. There are six kinds of history records including ***Fire***, ***Supervisory***, ***Fault***, ***Disable*** and ***All Events***. Refer to the figure below Fig. 5.10.

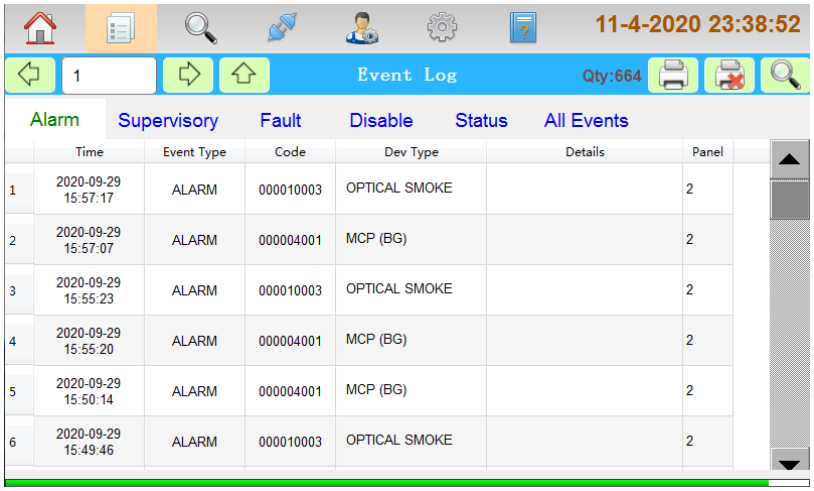


Fig. 5.10

Each message includes ***Time***, ***Event Type***, ***Code***, ***Device Type***, ***Details*** and ***Panel***.

6 Operating Instructions

6.1 Panel Control Keys

6.1.1 *ACKNOWLEDGE* (User password)

Pressing *ACKNOWLEDGE* key will acknowledge a new fire, fault, or supervisory event. Pressing *ACKNOWLEDGE* key will result in the following actions:

- ✧ Lighting the *ACKNOWLEDGE* LED.
- ✧ Marking an acknowledgement to the event displayed.
- ✧ Writing acknowledgement record in history file.
- ✧ Information of higher level will be displayed if there is more information. Pressing *ACKNOWLEDGE* repeatedly can toggle between different types of information and pressing up and down key can view them.

6.1.2 *SILENCE ALARM* (User password)

SILENCE ALARM key is used to silence the notification appliances. When this key is pressed, the following actions will be produced:

- ✧ Silencing the notification appliances.
- ✧ Lighting *the SILENCE ALARM* LED.
- ✧ Writing silence alarm records in history file.
- ✧ If new alarm occurs, the silenced notification appliances will resound, and *SILENCE ALARM* LED turns off.

6.1.3 *MANUAL ALARM* (User password)

When the ***MANUAL ALARM*** key is pressed, the following actions will be produced:

- ✧ Displaying a manual alarm message in LCD.
- ✧ Lighting the ***FIRE ALARM*** LED and ***MANUAL ALARM*** LED.
- ✧ Extinguishing the *SILENCE ALARM* LED if it illuminates.
- ✧ Turning on the buzzer.
- ✧ Turning on all notification appliances and Alarm Relay.
- ✧ Writing manual alarm record in ***FIRE ALARM INFORMATION*** and history file.

6.1.4 *RESET* (User password)

Pressing the *Reset* key, the following actions will be produced:

- ✧ Displaying *System resetting…* in LCD.
- ✧ Extinguishing all LEDs except of *POWER* LED and turning off the buzzer.
- ✧ Turning off all notification appliances.
- ✧ Resetting all loop devices.
- ✧ Writing system resetting record in history file.
- ✧ System self-check after resetting.

6.2 Pre-alarm

6.2.1 *Type-A Warning*

1) When Type A zone device alarms, the control panel will immediately enter Phase 1 of Type A. User can setup the Phase I delay time(10~180s).

2) During the phase I of Type A, pre-alarm is maintaining without fire conditions.

✧ As a new alarm (as many times as they can) from the same zone is received, the control panel stays on the pre-alarm state.

✧ As a new alarm from other zones is received, the control panel responds according to how the zone where the new alarm comes from is set. The previous Type A still remains.

✧ After Phase 1 delay, the control panel enters Phase 2 of Type A delay, user also can setup the phase 2 delay time(10~180s).

3) During the phase 2 of Type A:

✧ As a new alarm from the same zone is received, the control panel changes to fire alarm state.

✧ As a new alarm from the other zones is received, the control panel responds according to how the zone where the new alarm comes from is set.

✧ As no alarm is received, the control panel will clear pre-alarm state and turn to standby state after the delay time runs out.

4) Inputting pre-alarm signal of Type A, the Pre-alarm LED lights, but other LEDs, buzzers, output and loop devices cannot be activated.

6.2.2 *Type-B Warning*

1) As Type B device alarms, it will immediately enter Type B delay that can be setup to 100~600s.

2) During Type B:

✧ As a new alarm either from the same zone or the other zone is received, the control panel changes to fire alarm state.

✧ As a new alarm from different zones is received, the control panel responds according to how the zone where the new alarm comes from is set.

✧ As no alarm is received, the control panel will clear pre-alarm state and turn to standby state after the delay time runs out.

3) Inputting pre-alarm signal of Type B, the local Pre-alarm LED and zone LED light with buzzer sounding alarm sounds. However, other LEDs, output and loop devices cannot be activated.

7 Default Programming

Program Option	Factory Default
BANNER	GST CO., LTD.
Engineering Password	999999
User Password	123456
Userwords	Undefined
Userdefine	Userdefine01-15
C&E Matrix	Undefined
Device address（1-242）	Zone Max Index 255 Type: 0 Undefined

8 Maintenance

The FACP shall only be repaired by specially trained GST technical service personnel. Please disconnect the power before repair!

Warning: The key to the FACP shall be kept by specially assigned maintenance personnel!

8.1 Replacing the Battery

Type of battery: Sealed lead-acid battery

Recommended period for replacing the battery: 5 years (25℃)

Recommended manufacturer and model: Yuasa/NP38-12I Yuasa/NP65-12I

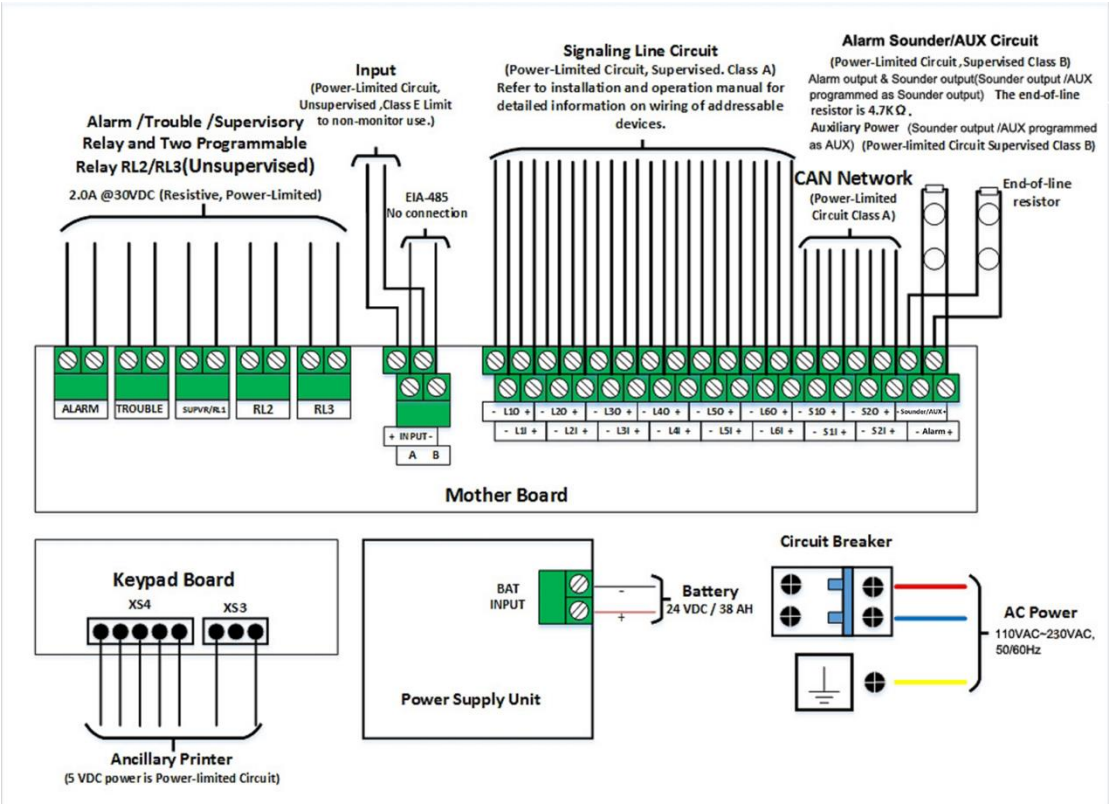
Disposal of used batteries: Please properly dispose the used batteries according to your local rules and regulations.

NOTE: RISK OF EXPLOSION IF BATTRY IS REPLACED BY AN INCORRECT TYPE.

8.2 Replace of Fuse

Position	Mark	Rating
PF-200 Power Filter	F1	2A delay

Appendix A Basic System Connection



Appendix B Electrical Specifications

B.1 Electrical Specifications

B.1.1 AC Power

- 110VAC~230VAC, 50/60Hz,3.0A~1.4A(Maximum Alarm)
- Wire size: Minimum 14AWG (2.0mm^2) with 600V insulation. The FACP shall be connected to max branch circuit of 15A.

Note:

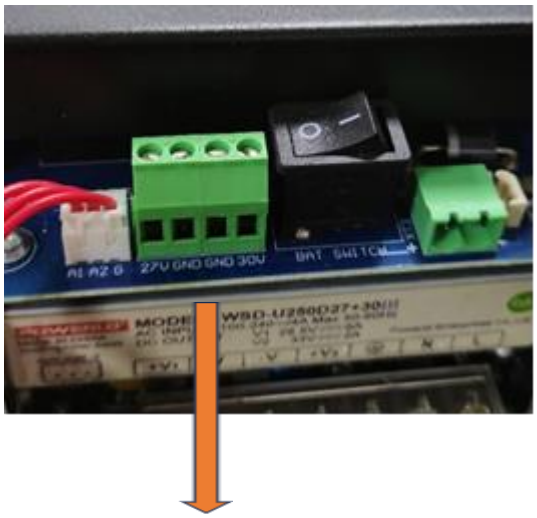
Please note the AC power input (with ground bonding wire) must be in compliance with ratings on the FACP's label.

B.1.2 Battery

The FACP uses only sealed lead-acid batteries for secondary standby power.

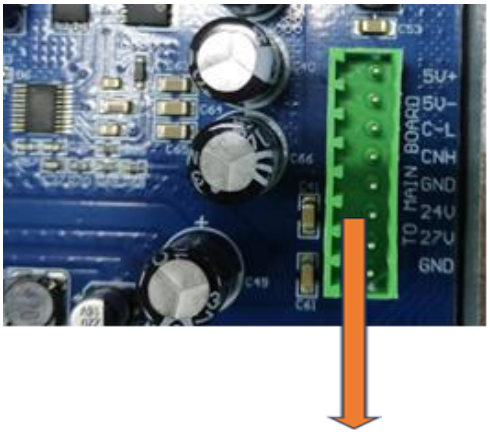
- Rated voltage: 24VDC
- Float charging voltage: 27.5VDC
- Maximum charging current: 3.0A
- Maximum Internal Resistance: 0.55Ω
- The maximum output current in standby condition (Imax a): 1.55A
- The maximum output current in alarm condition (Imax b): 5.1A
- The minimum quiescent current when the FACP is without load (Imin): 0.2A
- The maximum output current drawn from the battery when the main power is disconnected: 5.2A (at a float voltage of 27.5V)
- Maximum battery capacity: 65Ah
- Minimum battery capacity: 38Ah
- Battery capacity: two 12V / 38Ah batteries in series
  two 12V / 65Ah batteries in series with external battery box

B.1.3 Power Input - PB-400E Power supply board inputs



Parameter	XT1 (27V) - Input	XT2 (30V)- Input
Min voltage supply	21.0Vdc	27.0Vdc
Max voltage supply	28.9Vdc	33.6Vdc

B 1.4 Power Input - PB-400E Power supply board at XT4 outputs



Parameter	XT4-24V - Input	XT4-27V - Input	XT4-5V- Input
Min voltage supply	21.0Vdc	27.0Vdc	5.0Vdc
Max voltage supply	28.9Vdc	33.6Vdc	5.2Vdc

B.1.5 Signaling Line Circuit (SLC)

- Class A, power-limited and supervised.
- Nominal operating voltage: 24VDC
- Maximum voltage: 28VDC

- Average current: 130mA
- Maximum alarm current:300mA
- Maximum wiring resistance: 18ohms (each line).
- Maximum length is 1300m with 16AWG (1.32mm²) or 2000m with 14AWG (2.08mm²).
- Recommended Wiring (subject to local installation codes):

  Vencroft Gold and Platignum

  Nexans NX 200 and 200 Plus (LPCB tested)

  Prysmian FP 200 and 200 Gold

  Draka Firetuf and Firetuf Plus

  And all LPCB approved Fire cables

B.1.6 Alarm/Sounder Circuit (OUTPUTs)

- Class B, power-limited, supervised, and regulated circuit
- Nominal operating voltage: 24VDC
- Maximum signaling current: 2.5A (Shared by both ALARM OUTPUT and SOUNDER OUTPUT/AUX)
- End-of-line resistor: 4.7kΩ (Part No. 30107866)
- Maximum wiring voltage drop: 2.0VDC
- Recommended Wiring (subject to local installation codes):

  Vencroft Gold and Platignum

  Nexans NX 200 and 200 Plus (LPCB tested)

  Prysmian FP 200 and 200 Gold

  Draka Firetuf and Firetuf Plus

  And all LPCB approved Fire cables

B.1.7 Auxiliary Power (SOUNDER OUTPUT/AUX programmed as AUX)

- Class B, power-limited, supervised, special application. Compatible with I-9300 module.
- Programmable as resettable or non-resettable
- Nominal operating voltage: 27VDC
- Maximum standby current: 0.1A
- Maximum signaling current: 2.5A (Shared by both ALARM OUTPUT and SOUNDER OUTPUT/AUX)
- Recommended Wiring (subject to local installation codes):

  Vencroft Gold and Platignum

  Nexans NX 200 and 200 Plus (LPCB tested)

  Prysmian FP 200 and 200 Gold

  Draka Firetuf and Firetuf Plus

And all LPCB approved Fire cables

B.1.8 Relays

- Three fixed relays: Alarm, Supervisory and Fault.
- Two programmable relays: RL2, RL3. These two relays can be programmed as Alarm, Supervisory, Fault or Disable.
- Contact rating: 2.0A @ 30VDC (resistive), power limited.
- Recommended Wiring (subject to local installation codes):

  Vencroft Gold and Platignum

  Nexans NX 200 and 200 Plus (LPCB tested)

  Prysmian FP 200 and 200 Gold

  Draka Firetuf and Firetuf Plus

  And all LPCB approved Fire cables

B.1.9 Input

- Maximum current: 1.7mA (short circuit)
- Recommended Wiring (subject to local installation codes):

  Vencroft Gold and Platignum

  Nexans NX 200 and 200 Plus (LPCB tested)

  Prysmian FP 200 and 200 Gold

  Draka Firetuf and Firetuf Plus

  And all LPCB approved Fire cables

B.1.10 CAN Network

- Class A.
- Maximum distance between two neighbor nodes is 2500m with 1mm² or 3000m with 1.5mm².
- Maximum 250 model IFP4E FACPs for networking.
- Recommended Wiring (subject to local installation codes):

  Vencroft Gold and Platignum

  Nexans NX 200 and 200 Plus (LPCB tested)

  Prysmian FP 200 and 200 Gold

  Draka Firetuf and Firetuf Plus

  And all LPCB approved Fire cables

B.1.11 Fiber-Optical Network

- LC mode fiber.
- Maximum distance between two neighbor nodes is 20000m.
- Maximum 250 model IFP4E FACPs for networking.

B.1.12 Modbus Communication – for supplementary use only

- RS485
- Maximum distance is 3m from IFP4E FACP to the third party equipment.
- Recommended Wiring (subject to local installation codes):

  Vencroft Gold and Platignum

  Nexans NX 200 and 200 Plus (LPCB tested)

  Prysmian FP 200 and 200 Gold

  Draka Firetuf and Firetuf Plus

  And all LPCB approved Fire cables

B.1.13 EIA-485: RPTR

This port is used to connect with repeater panels. The parameters are shown below.

- Class B
- Maximum length: 1200m with 1mm²;
- Maximum quantity: 64 GST852RP Repeater Panels for network display. GST852RP Repeater Panel can only set its own address, silence and self-test itself.
- Recommended Wiring (subject to local installation codes):

  Vencroft Gold and Platignum

  Nexans NX 200 and 200 Plus (LPCB tested)

  Prysmian FP 200 and 200 Gold

  Draka Firetuf and Firetuf Plus

  And all LPCB approved Fire cables

B.2 Typical Configuration of SLCs

The typical configurations of SLCs include Intelligent Photoelectric Smoke Detector, Intelligent Rate of Rise and Fixed Temperature Heat Detector, Digital Manual Call Point, Addressable Input Module, Addressable Output Module and Loop Isolators. Refer to table B.1 for maximum length of wires in different configurations.

Table B.1

	Configuration 1	Configuration 2	Configuration 3	Configuration 4
No. of smoke detectors	60	80	100	120
No. of heat detectors	8	10	10	15
No. of MCPs	8	10	10	15
No. of input modules	4	4	4	10

No. of output modules	4	4	4	10
No. of loop isolators	4	5	5	7
Max. length with 1.5mm^2	3000m	2300m	1900m	1400m
Max. length with 1.0mm^2	2000m	1500m	1200m	900m

Appendix C Compatible Devices

C.1 Series Addressable Detectors

Intelligent, addressable detectors provide information to the FACP on an SLC (Signaling Line Circuit). This allows the FACP to continually monitor the status (alarm, fault, maintenance or normal) of each detector.

C.1.1 Smoke Detectors (Photoelectric)

DI-9102E or I-9102 Intelligent Photoelectric Smoke Detector is developed on the principle of infrared scattering. With integrated microprocessor and amplifier, the detector has the following features:

- Addressable code written by a programmer makes the detector easy and reliable to commission.
- The microprocessor disposes data by sampling and can save 14 history records. The curve displayed on the FACP shows the field conditions.
- Compensating excursion of temperature and humidity, detecting dust accumulation fault.

C.1.2 Heat Detectors

DI-9103E or I-9103 Intelligent Rate of Rise and Fixed Temperature Heat Detector uses a thermistor as its sensor. The built-in microprocessor processes the signal from the sensor by intelligent algorithm. The detector has the following features:

- Addressable code is written by programmer.
- The microprocessor disposes data by real-time sampling and can store 14 history records. The curve displayed on the FACP shows the field condition.
- The detector can be set by programmer to be rate-of-rise detector or fixed temperature detector.

C.1.3 Intelligent Combination Heat Photoelectric Smoke Detector

DI-9101E and I-9101 Intelligent Combination Heat Photoelectric Smoke Detector integrates photoelectric detection and fixed temperature detection technology by

combining smoke sensor and semi-conductor heat sensor in mechanism and circuitry structure. The detector has the following features:

- Address can be set in field.
- Fault self-diagnostic.
- Built-in MCU can store 14 history messages.
- Polling LED can be set to close.

C.1.4 Intelligent Reflective Beam Detector

DI-9105E Intelligent Reflective Beam Detector (hereinafter referred to as the detector) is an addressable smoke detector with infrared optical beam. Combining a transmitter and a receiver, the detector connects reflector on the opposite wirelessly. In this way, it is simple for on-site wiring. One reflector or four reflectors are used based on different mounting distance from a detector to a reflector. The detector has the following features:

- Combining a transmitter and a receiver, one end connects wires simply.
- Judging fire alarms and faults intelligent with a built-in MCU.
- Commissioning in field becomes easier than before with the help of the visible indicator and 2 bits digital tube.
- Monitoring faults inside the detector due to self-diagnosis ability.
- Providing compensation for such sensor signal changes caused by the build-up of dirt, position offset or a component aging.
- Four sensitivities are available in field.

C.2 Manual Pull Stations

DI-9204Exd and DI-9204E Digital Manual Call Point can be connected to the panel directly to complete a fire alarm system.

C.3 Loop Isolators

In loop type fire alarm system, short circuit of part of the loop often affects normal operation of the whole system. C-9503E / DC-9504E/DC-9503E Loop Isolator can disable the shorted part of loop from the whole system to ensure normal operation of other parts and can easily find the location of the disabled part.

C.4 Control Modules

- I-9300/DI-9300E Addressable Input Module is used to receive normally open switch signals from connected fire protection devices, and transmit the messages back to the FACP.
- I-9301/DI-9301E/DI-9302E Addressable Output Module can be connected on an SLC to receive the start command from the FACP. When receiving the command, it will close the output relay to output normally-open / normally closed contact signal and illuminate the active indicator.

- DI-9305E Digital Single Riser Output Module, the module is designed to connect controlled devices with 70V/100V input audio signal cables or 24VDC input cable, When the module receives a command from the FACP, it will open or close their connection.
- DI-9319E Digital Zone Monitor Unit is designed to connect with conventional detectors, occupying one address. When any device in the loop reports alarm signal, the Unit will transmit the signal to the FACP which generates fire alarm and displays the address of the Unit

C.5 Horns / Strobes Module

- Horns: EN listed DI-9405 manufactured by GST
- Strobes: EN listed I-9314 manufactured by GST.
- Horns / Strobes: EN listed I-9403/I-9404/ DI-9406 manufactured by GST.

Appendix D Battery Calculations

Power Requirements (All currents are in amperes)							
Model Type	**Description**	**Qty.**		**Standby**	**Total Standby**	**Alarm**	**Total Alarm**
GST-IFP4E	FACP	1	X	0.30	=	0.50	=
GST-IFP4E	AUX Load	1	X	(max.0.1)	=	(max.0.1)	=
PR-400B	Ancillary Printer	1	X	0.01	=	0.30	=
LC-401E	Single Loop Card		X	0.040	=	0.060	=
LC-402E	Dual Loop Card		X	0.070	=	0.080	=
P-9981E	Zone Display Panel		X	0.008	=	0.016	=
P-9981EF	Zone Display Panel		X	0.008	=	0.016	=
P-9982E	Zone Display and Control Panel		X	0.008	=	0.016	=
P-9982EF	Zone Display and Control Panel		X	0.008	=	0.016	=
P-9966EA	CAN Class A Network Card		X	0.050	=	0.050	=
DI-9102E, I-9102	Intelligent Photoelectric Smoke Detector		X	0.0008	=	0.002	=
DI-9101E I-9101	Intelligent Combination Heat Photoelectric Smoke Detector		X	0.0008	=	0.0018	=
DI-9102E I-9102, I-9105R	Intelligent Photoelectric Smoke Detector		X	0.0008	=	0.0018	=
DI-9103E, I-9103	Intelligent Rate of Rise and Fixed Temperature Heat Detector		X	0.0006	=	0.0015	=
DI-9204Exd, DI-9204E	Digital Manual Call Point		X	0.0006	=	0.0018	=
C-9503E	Loop Isolator		X	0.00015	=	0.00015	=

DC-9504E	Base Mount Isolator		X	0.00015	=	0.00015	=
I-9300，I-9303	Addressable Input Module		X	0.001	=	0.005	=
DI-9300E	Addressable Input Module		X	0.00026	=	0.0005	=
DI-9301E	Addressable Input/Output Module		X	0.00026	=	0.0007	=
DI-9302E	Addressable Input/Output Module		X	0.00028	=	0.0007	=
I-9301	Addressable Input/Output Module		X	0.002	=	0.003	=
DI-9305E	Digital Single Riser Output Module		X	0.00026	=	0.0005	=
DI-9319E	Digital Zone Monitor Unit		X	0.00038	=	0.00038	=
I-9314	Strobes Module		X	0	=	0.103	=
DI-9405	Horn Module		X	0.001	=	0.006	=
I-9403，I-9404	Horn / Strobes Module		X	0	=	0.075	=
DI-9406	Horn / Strobes Module		X	0.001	=	0.006	=
Total currents (Add above currents)					(A)		(B)

Battery Capacity Requirement

Battery (AH) = (Standby Current Total x Discharge Time) + (Alarm Current Total x Alarm Time)

([STANDBY (A) _____] X [(24 Hours) _____]) + ([ALARM (B) _____] X [Alarm in Hr.] _____) = (C) _____ (AH)

SOUNDER OUTPUT and AUX interfaces should not exceed 2.5A, and the standby current of AUX interface should not exceed 0.1A.

Battery Selection

Battery Size = Multiply (**C**) by 1.20 to derate battery.

YUASA NP65-12I(65AH) and YUASA NP38-12I(38AH) are the recommended Power-Sonic batteries for use with this panel.

Use of alternative batteries may result in failure of the FACP to meet agency and regulatory requirements, and may result in shortened battery life. Batteries should be tested regularly, and replaced at least every three years. If the Battery Fault indicator activates, obtain required service.

Appendix E Operating Instructions

Normal Standby

With no alarm or fault in the system, the display message is *System Normal*.

Alarm

If fire alarm condition occurs, the Fire Alarm Control Panel (FACP) will indicate the following:

- *FIRE ALARM* LED illuminates.
- The buzzer sounds fire alarm.
- The LCD displays the alarm message.

Fault

If a fault condition occurs, the FACP will indicate the following:

- *FAULT* LED illuminates. If it is system fault, AC fault, battery fault, charger fault, ALARM OUTPUT fault, SOUNDER OUTPUT fault or ground fault, corresponding LEDs will simultaneously illuminate.
- The buzzer sounds fault.

The LCD displays the fault message.

ACKNOWLEDGE

Pressing *ACKNOWLEDGE* key shall acknowledge new alarm, fault and supervisory events.

SILENCE ALARM

If an alarm exists, pressing this key shall silence all silenceable OUTPUTs. A subsequent new alarm will re-sound the system OUTPUTs.

MANUAL ALARM

When this key is pressed, the *FIRE ALARM* LED and *MANUAL ALARM* LED shall be lighted, the buzzer shall be turned on, all OUTPUTs and the Alarm Relay shall be activated and a manual alarm message shall be displayed in *FIRE ALARM INFORMATION*.

RESET

Pressing this key can turn off all OUTPUTs and control modules, and reset all loop devices. If any alarm or fault still exists, alarm will be activated again. If all alarms and faults are cleared, the LCD displays *System Normal*.

Regular Maintenance

We recommend maintenance of the FACP and connected devices every 6 months.

Battery Maintenance & Replacement

Type of battery: Sealed lead-acid battery

Recommended period for replacing the battery: 5 years (25℃)

Recommended manufacturer and model number: YUASA NP65-12I(65Ah and YUASA NP38-12I(38Ah).

Disposal of used batteries: Please properly dispose the used batteries according to your local rules and regulations.

Note: Risk of explosion if battery is replaced by an incorrect type

Appendix F Devices type list

Device Type Group	No.	Device Type
Undefined	00	UNDEFINED
ALARM	01	MULTISENSOR
	02	HEAT DETECTOR
	03	OPTICAL SMOKE
	04	USER DEFINED
	05	GAS DETECTOR
	06	BEAM DETECTOR
	07	FLAME DETECTOR
	08	CONVENTIONAL P
	09	HEAT DETECTOR1
	10	FLOW SWITCH
	11	MCP (BG)
ACTIVITY	12	SOUNDER STOBE
	13	SOUNDER
	14	FLASHER
	15	LIFT
	16	FIRE DAMPER
	17	FIRE DOOR
	18	AHU
	19	EXTRACT FAN
	20	BMS
	21	USER DEFINED
	22	PULSE OUTPUT
	23	USER DEFINED
	24	USER DEFINED
	25	GAS ACTIVE
	26	GAS ABORT
	27	GAS DUMP

	28	USER DEFINED
	29	USER DEFINED
	30	BROADCAST
FAULT	31	TROUBLE MONITOR
	32	PSU
	33	USER DEFINED
	34	USER DEFINED
	35	USER DEFINED
	36	USER DEFINED
	37	USER DEFINED
	38	USER DEFINED
	39	Net Unit
	40	Repeater
SUPERVISORY	41	ZONE VALVE
	42	FLOW SWITCH
	43	PRESSURE SWITCH
	44	DUCT PROBE
	45	USER DEFINED
	46	USER DEFINED
	47	USER DEFINED
	48	USER DEFINED
	49	USER DEFINED
	50	USER DEFINED
ALARM	51	MULTISENSOR_S
	52	MULTISENSOR_H
	53	USER DEFINED
	54	USER DEFINED
	55	USER DEFINED
	56	USER DEFINED
	57	USER DEFINED
	58	USER DEFINED

ACTIVITY	59	USER DEFINED
	60	USER DEFINED
	61	USER DEFINED
	62	LOCK
	63	USER DEFINED
	64	USER DEFINED
	65	USER DEFINED
	66	USER DEFINED
	67	USER DEFINED
	68	USER DEFINED
	69	USER DEFINED
	70	USER DEFINED
	71	USER DEFINED
	72	INPUT MODULE
	73	I/O MODULE
	74	OUTPUT MODULE
	75	USER DEFINED
	76	USER DEFINED
	77	USER DEFINED
	78	USER DEFINED
	79	USER DEFINED
	80	USER DEFINED

Appendix G Compliance information

548p/13

2831-CPR-F4817

GST-0204-01

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0832-UKCA-CPR-F1600

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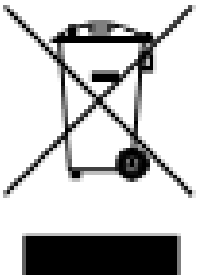
(Available for product models：GST-IFP4E)

WEEE Information



2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points.

For Article33 information, please refer to the following website：
https://www.gst.com.cn/en/reacharticle33.asp

Limited Warranty

GST will repair or replace the product to the original purchaser free of charge, if defective in materials or workmanship during the warranty period, subject to the terms below. GST and KDSS are not responsible for defects or problems as a result of conditions or applications including normal wear and tear; catastrophe; fault or negligence of any user or any party other than GST and KDSS; improper installation, application, storage, maintenance, or use of products; other causes external to products; or failure to conform to any applicable recommendations of GST and KDSS. In no event shall GST and KDSS be liable for incidental, indirect, special or any other consequential damages. To the fullest extent permissible by law, the foregoing limited warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. Subject to applicable law, in no event shall the liability of GST and KDSS exceed the purchase price of the products. NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. Anybody, including the agents, distributors or employees, is not in the position to amend the contents of this warranty.

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