GST5000
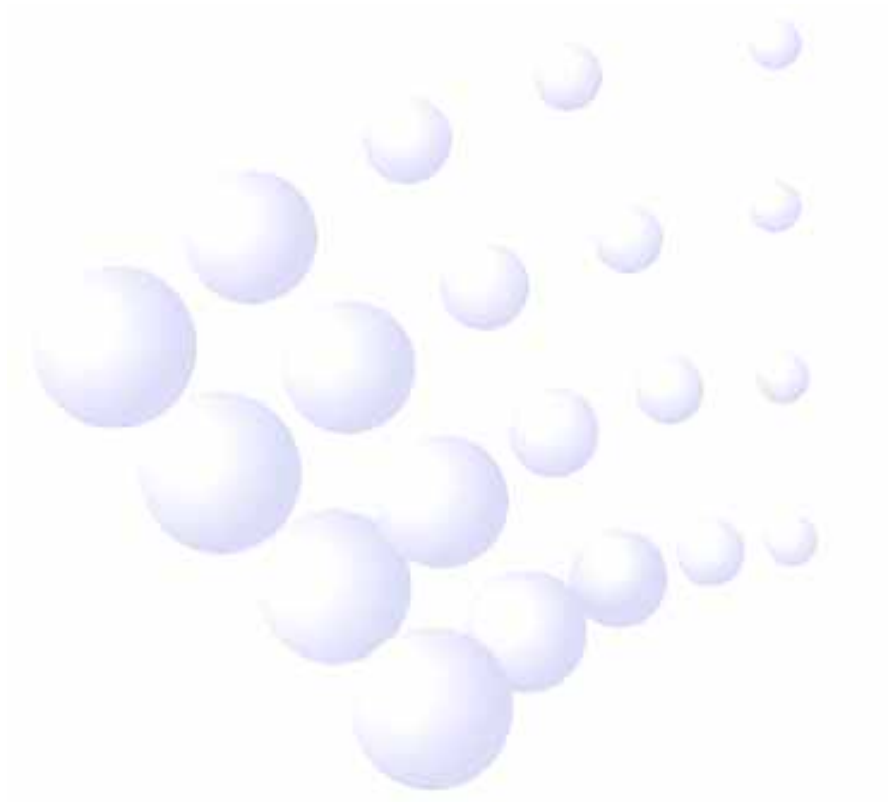
Intelligent Fire Alarm Control Panel

Installation and Operation Manual

(Issue 4.01, September 2005)

CONTENTS

Preface

GST5000 Intelligent Fire Alarm Control Panel Installation and Operation Manual includes two parties: generic part and Fireman's Control Panel part. This is generic part. Please refer to relative part for description on Fireman's Control Panel.

Please assign a specific person to keep this manual for occasional use during operation of the GST5000 Intelligent Fire Alarm Control Panel.

Chapter 1 Product Introduction

GST5000 Intelligent Fire Alarm Control Panel has been designed by EN 54-2 standard with simple installation, operation, and easy maintenance qualities. It can be used in the fire alarm system with the following features:

(1) It supports 60 fire zones. Each zone has Alarm and FLT/Disable LEDs and a zone label separately. It's expandable to supporting a maximum of 256 zones.

(2) It can provide 4 ring detection loops that can be expanded up to 28. Being compatible with a series of GST addressable products, each loop can connect to 235 addressable devices. It can connect with I-9403 addressable sounder strobe designed by EN54-3, I-9103 heat detector by EN 54-5, I-9102 smoke detector by EN 54-7, I-9202 manual call point by EN 54-11, I-9105R infrared beam detector by EN 54-12, I-9300 and I-9301 module by GEI1-052 and C-9503 Loop Isolator by GEI1-084.

(3) Graphic display can show 320×240 dot matrix, assisting the 15 LEDs to conduct independent indications of important information.

(4) Non-lost electricity memory when saving system data. The data won't lose if electricity goes off.

(5) It has manual keys for each zone, which can activate/mute the sounder strobe separately.

(6) Automatically prompting operation steps for every alarm device and for smoke exhaust and fire extinguisher by field programming.

(7) With sounder strobe interface providing 0.5A/24V output. It can connect with C-9403 conventional sounder strobe by EN 54-3.

(8) RS232 interface enables communication with PC.

(9) RS485 interface enables the control panel to be included into fire supervisory network.

Chapter 2 Technical Parameters

2.1 Operating Voltage

✧ Input Voltage: 230VAC± 10

✧ Frequency: 50Hz

✧ Input Current: 0.75A

✧ Fuse: 2A delay

✧ Wiring: The shield wire with diameter not less than 1.5mm should be adopted. It has to comply with local code when installing.

2.2 Standby Batteries

✧ Maximum Charge Current: Float charging 27.2V@0.8A

✧ Type: Sealed lead acid batteries

✧ Maximum Charge Capacity: 38 Ah

✧ Fuse: 8A

✧ Wiring: GST FireCable®2E/1.5   2core and Earth 1.5mm CSA

2.3 Communication Loop Parameters

2.3.1 RS485 Communication Loop

✧ **NETWORK (A, B):** Communication bus, for connecting with up to 32 network control panels of different model.

✧ **REPEATER (A, B):** Communication bus for connecting with 64 repeater panels at most.

Wiring: GST FireCable ® 2E/1.0   2core and Earth 1mm CSA

2.3.2 RS232 Communication Loop

RS232 communication loop is connected with CRT system installed in PC through RJ45 plug connector.

Wiring: Cable length should be less than 15m.

2.4 Detection Loop Parameters

✧ LOOP OUT (+, -): Polarized signal bus from GST5000, connecting with 235 addressable devices at most.

✧ LOOP IN (+, -): Polarized signal bus returning to GST5000.

✧ Output Voltage: 24V pulse

✧ Output Current: 0.3A

Wiring: GST FireCable ® 2E/1.0   2core and Earth 1mm CSA

2.5 Output Loop Parameters

Wiring: GST FireCable ® 2E/1.0   2core and Earth 1mm CSA

(1) FIRE ALARM OUTPUT (+, -)

Output Voltage: 21VDC   27VDC

Output Current: 0.5A

Terminal Resistor: 4.7KΩ

(2) F.P.E OUTPUT (+, -)

Output Voltage: 21VDC   27VDC

Output Current: 0.5A

Terminal Resistor: 4.7KΩ

(3) SOUNDER CIRCUIT OUTPUT (+, -)

Output Voltage: 21VDC   27VDC

Output Current: 0.5A

Terminal Resistor: 4.7KΩ

(4) FAULT OUTPUT (NC, COM, NO)

Contact Capacity: 24VDC @1.0A

In fault state, NC and COM open, NO and COM close.

2.6 Dimension

2.6.1 Wall-mounted GST5000 FACP

Dimension (Length × Width × Height): 500mm×170mm×700mm
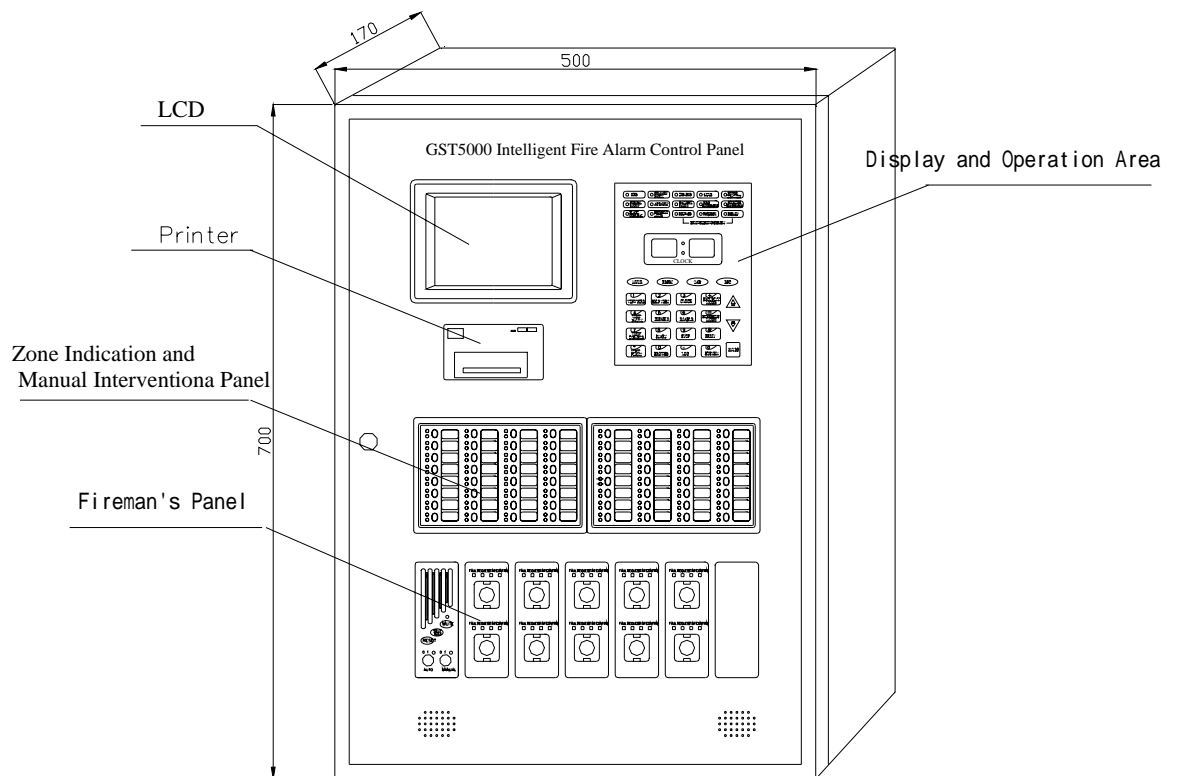
Fig. 2.1

2.6.2 Rack type GST5000 FACP

Dimension (Length × Width × Height): 580mm×520mm×1715mm
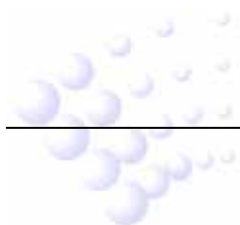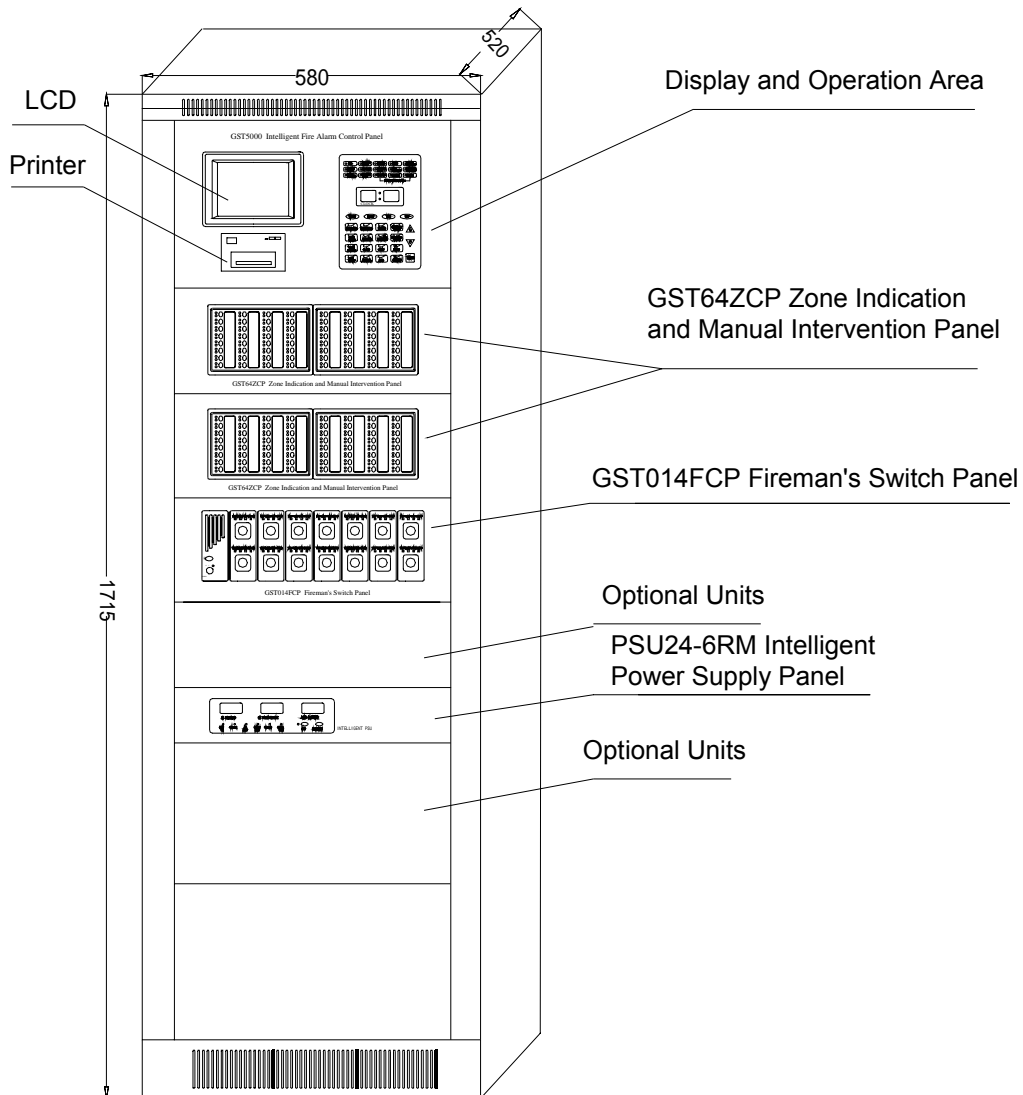
Fig. 2.2

2.6.3 Console type GST5000 control panel

Dimension (Length × Width × Height, single unit): 555mm×933mm with table ×1350mm

Dimension (length × width × height, double unit): 1045mm×933mm (with table)×1350mm
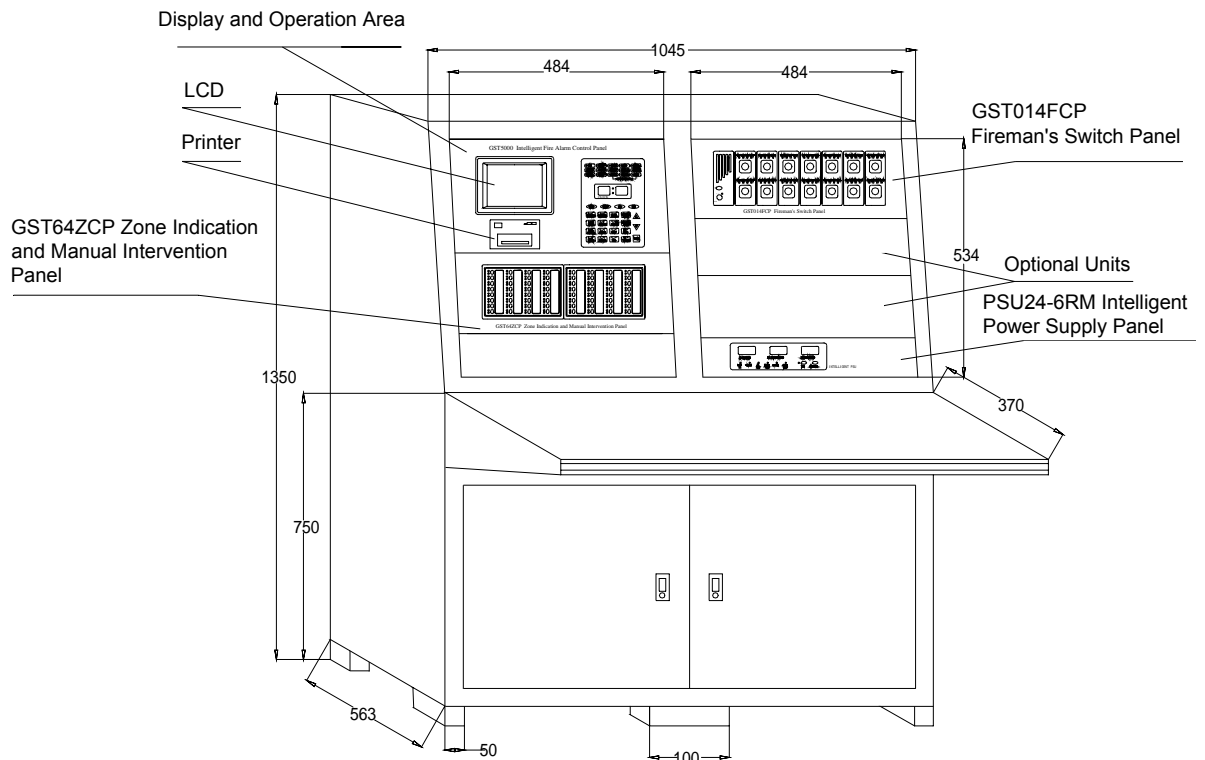
Fig. 2.3

Note: There are three types of GST5000 FACP: wall-mounted type, rack type and console type. These three types will not be described differently in this manual. Differences will be elaborated separately and the similarities described together.

Chapter 3 Structure and Configuration

3.1 Display and Operation Area

The display and operation area is shown in Fig. 3.1, which consists of LCD display, indicators, clock display, keyboard and printer.

Intelligent Fire Alarm Control Panel
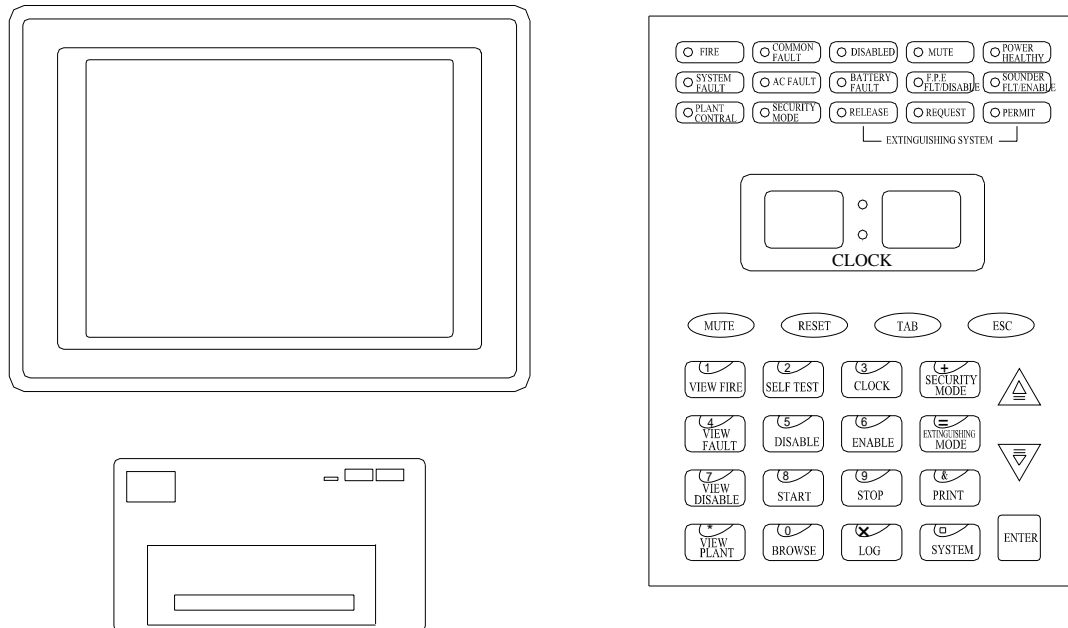
Fig. 3.1

3.1.1 Indicators

◇ **FIRE:** Red. This light on means the control panel has checked fire alarm state of connected detectors. Detailed messages are shown in LCD. When fire alarms are cleared, press "RESET" key to turn it off.

◇ **COMMON FAULT:** Yellow. Lit when any fault occurs.

◇ **DISABLED:** Yellow. Lit when connected devices, F.P.E. output or SOUNDER output are in isolation state.

◇ **MUTE:** Green. When the control panel sounds alarm, press "MUTE" key, this LED lights, and the speaker stops alarming. If "MUTE" key is pressed again or there are new alarms, it goes out and the control panel sounds again.

◇ **POWER HEALTHY:** Green. Remains lit when main power or standby power of the system is normal.

◇ **SYSTEM FAULT:** Yellow. Lit when the program fails or the system cannot operate normally.

◇ **AC FAULT:** Yellow. Lit when the 220VAC is cut off or defected. And it goes out when the power becomes normal.

◇ **BATTERY FAULT:** Yellow. Lit when standby power is in fault and gone when the fault is cleared.

✧ **F.P.E. FLT/DISABLE:** Yellow. Lit when F.P.E. output is in fault or isolated.

✧ **SOUNDER FLT/DISABLE:** Yellow. Lit when SOUNDER output is in fault or isolated.

✧ **PLANT CONTROL:** Green. Action message indication. Lit when there are feedback signal inputs of fire-protective plant.

✧ **SECURITY MODE:** Green. Lit when security detector is in valid state.

✧ **EXTINGUISHING SYSTEM RELEASE:** Green. Lit when the extinguishing system has been activated.

✧ **EXTINGUISHING SYSTEM REQUEST:** Green. Lit when the extinguishing system is ready to be activated or in delay state.

✧ **EXTINGUISHING SYSTEM PERMIT:** Green. Lit when the extinguishing system gets permission to be activated.

3.1.2 Key Functions

✧ **MUTE:** To make sound quiet.

✧ **RESET:** To reset the system.

✧ **TAB:** To shift time display.

✧ **ESC:** To turn back to previous menu or system normal menu.

✧ **VIEW FIRE:** Viewing fire messages.

✧ **VIEW FAULT:** Viewing fault messages.

✧ **VIEW DISABLE:** Viewing isolation messages.

✧ **VIEW PLANT:** Viewing action messages.

✧ **SELFTEST:** The control panel tests itself.

✧ **DISABLE:** To isolate the devices.

✧ **ENABLE:** To de-isolate the devices.

✧ **CLOCK:** To modify system time.

✧ **START:** To start the device.

✧ **STOP:** To stop the device.

✧ **PRINT:** Printer equipment.

✧ **SECURITY MODE:** To set security mode.

✧ **EXTNGUISHING MODE:** To set gas releasing mode.

✧ **BROWSE:** To look through system configuration.

✧ **LOG:** To look through history events.

✧ **SYSTEM:** System setting menu.

✧ **ENTER:** For confirmation.

✧   and   : To look through more than one message.

3.2 Zone Indication and Manual Intervention Panel (ZCP)

Three types of GST5000 FACP, whose zone indication and manual intervention panels have the same structure and function. The cabinet of wall-mounted GST5000 FACP can connect with only one GST64ZCP zone indication and manual intervention panel. Rack type and console type can connected with more according to requests.

3.2.1 Structure

The ZCP includes two LED boards and one control board. Control board connects with the two LED boards through pins. Structure of the control board is shown in Fig. 3.2.
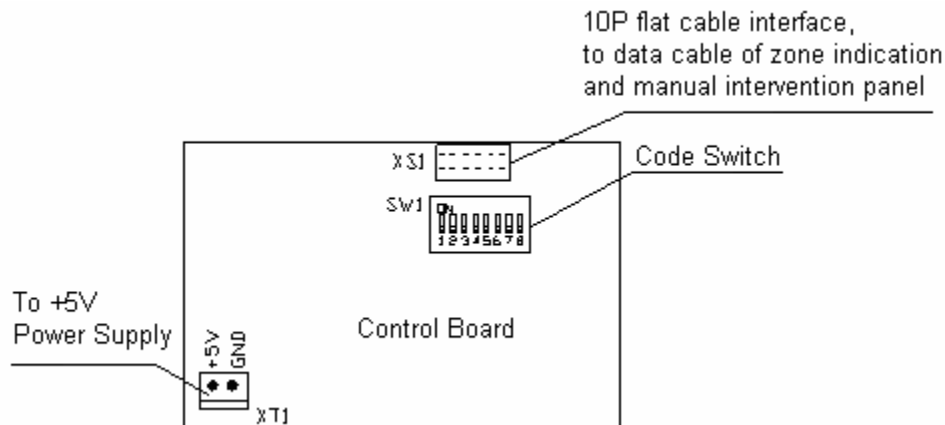
Fig. 3.2

Every loop card can drive 4 ZCPs. All of them are connected together with a 10p ribbon cable through XS1 of the control board.

We can use the switch to set a code for each ZCP.

- No. 1: 1, 6, 8 at ON, others at OFF.
- No. 2: 2, 6, 7 at ON, others at OFF.
- No. 3: 3, 5, 8 at ON, others at OFF.
- No. 4: 4, 5, 7 at ON, others at OFF.
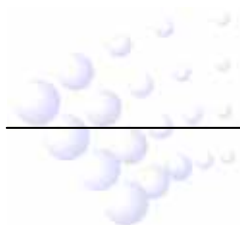
3.2.2 Functions
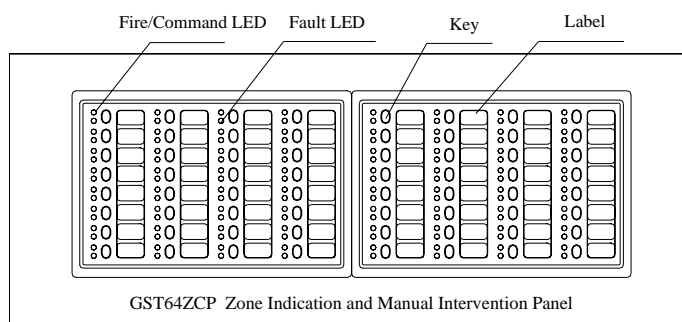
Fig. 3.3

Each switch includes a red LED, a yellow LED, a key (which can directly initiate connected devices) and a label (brief description of the start key).

The ZCP can be defined as three operation modes:

a) Zone direction mode [ZoneDir]

When fire occurs in a zone, corresponding red LED is lit and the sounder strobe is automatically initiated; when fault occurs, corresponding yellow LED flashes; when disabling all devices in the zone, corresponding yellow LED is constantly lit.

When pressing the key of the zone, the sounder strobe is initiated; press again, it is stopped.

b) Silence mode [Silence]

Press this key, all connected sounder strobes are silenced and red LED lit; press it again, the silenced sounder strobes sound again, and red LED goes out. In silence mode, when new alarm occurs, all silenced sounder strobes activate again.

c) Point device mode

Single startable devices can also be defined on the ZCP. Press the key, corresponding device is initiated and red LED is lit. Press the key again, corresponding device stops, red LED goes out.

3.3 Configuration

3.3.1 Typical Configuration

(1) Wall-mounted GST5000 FACP

A typical FACP system consists of a control cabinet, a loop interface board, a P.S.U system, display and operation area and a ZCP.

Control cabinet

Cabinet is the core part of the FACP, mainly consisting of 3 parts: motherboard, main board, and loop card. RS232 and RS485 communication cards can be inserted like in Fig. 3.4.

A: Motherboard Illustration
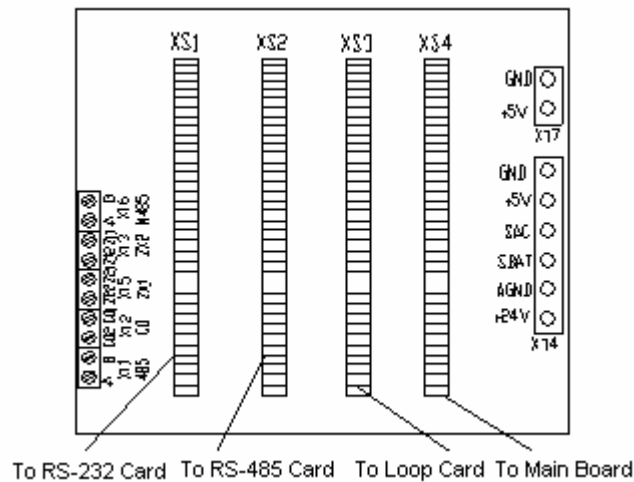
Fig. 3.4

Fig. 3.4 shows the structure of the motherboard installed on the bottom of the control part. It connects with the AC-DC100W power supply through terminals. There are 4 channel slots for plugging main board, loop card and 232 and 485 communication cards.

XT4: Connecting with AC-DC100W power supply.

XT7: Connecting with switchboard.

B: Illustrations of main board, loop card and communication card

Appearances of main board, loop card and communication card are shown in Fig. 3.5.
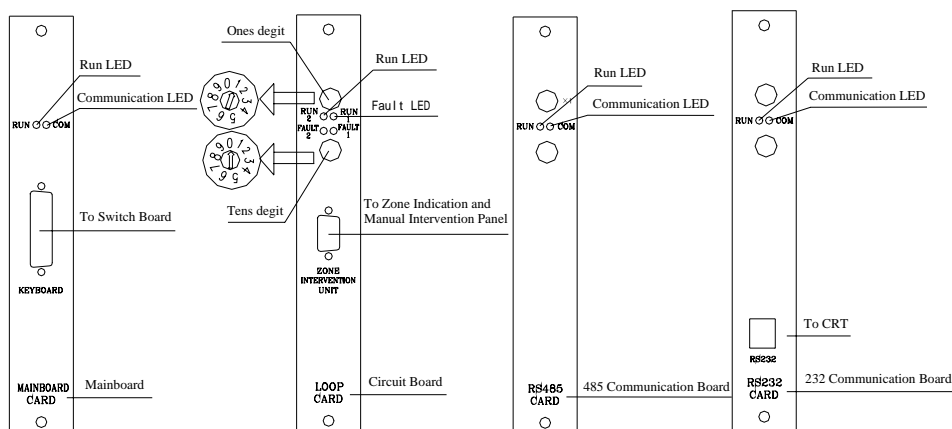
Fig. 3.5

There are two decimal code switches on each loop card and communication card respectively, representing tens digit and ones digit. They are used to set the channel

number of loop card and communication card. The loop card is double. The code switch sets the channel number of the first channel, and automatically adding 1 for the second channel. The numbers of communication card and loop card can be mixed randomly.

Example: In code switch of loop card, tens digit is 0, ones digit is 1. The channel number of the first loop is 1, and that of the second loop is 2.

Loop interface board

It is signal interface board of the FACP, which has communication port, detecting port, fire alarm output port, fault output port and etc. The loop interface board makes field devices and the FACP compose a whole fire alarm system.

Power supply

It provides the control cabinet, loop interface board and printer with voltage. Non-lost electricity ensures that all the registered devices being monitored after commission.

Display and operation area

It can indicate and show all kinds of status information resulting from operations from keyboard (such as browsing, setting, and printing).

Zone indication and manual intervention panel (ZCP)

Indicating fire, and fault/Isolation of corresponding devices, and starting or stopping them.

(2) Typical configurations of GST5000 rack type and console type:

Comparing with wall mounted type, GST5000 console type's control cabinet can be connected with intelligent PSU panel and more loop cards.

Control Cabinet

Main control unit is the core part of the control panel, including motherboard, main board, 232 communication card, 485 communication card and loop card.

A: Motherboard

Fig. 3.6 shows the structure of the motherboard of the control panel installed on the bottom of the control part. It connects with the DC-DC convertor through terminals. There are 10 channel slots for plugging main board, loop card and communication cards. The control panel is expandable to at most two motherboard boxes.
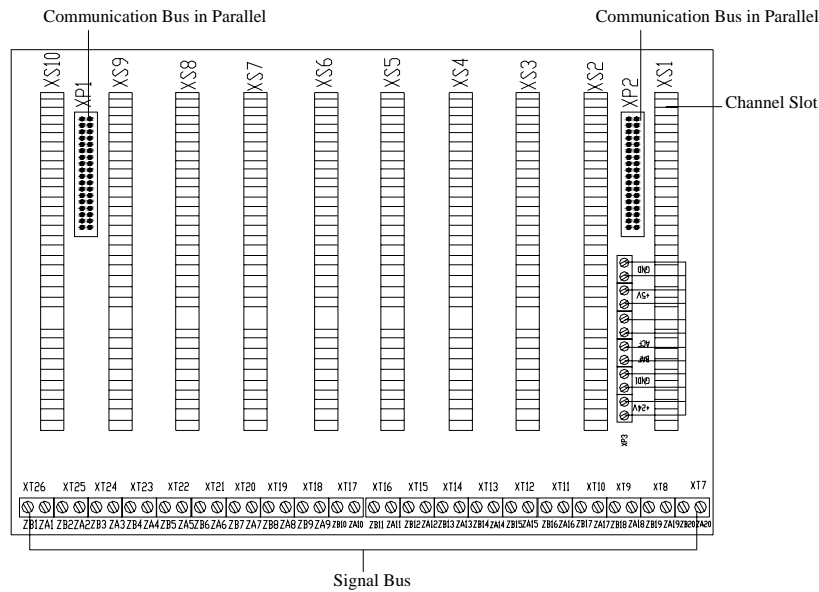
Fig. 3.6

✧ Communication bus in parallel: Used for system extension

✧ Channel Slot: Used to plug main board, loop card and communication card on.

✧ XP3: Connecting with DC-DC convertor

✧ ZAn, ZBn   n=1   20   : 1   10 channel signal bus terminals

Note: When DC-DC convertor is switched off, loop 24V is not cut off. If you want to plug or pull the circuit board in the main unit, please disconnect main and standby power.

B: Main board, loop card, communication card

Appearances of main board, loop card and communication card are the same as GST5000 wall mounted control panel.

C: Illustration of DC-DC Convertor

DC-DC converting module is shown in Fig. 3.7.
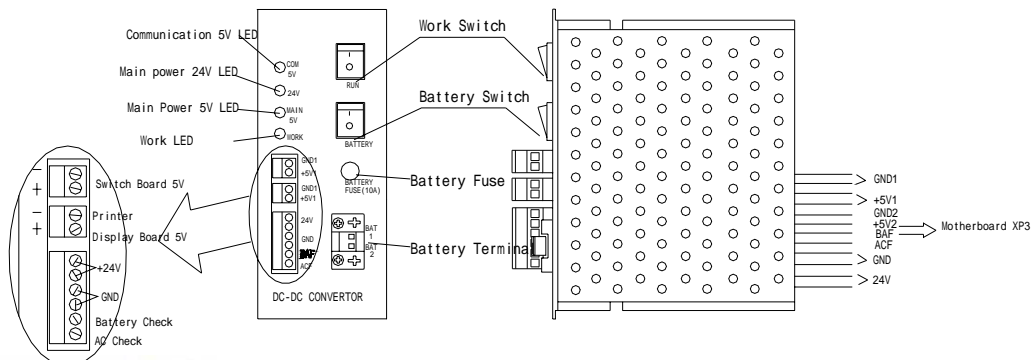
Fig. 3.7

PSU24-6RM Intelligent PSU

PSU24-6RM intelligent PSU is used to supply power to modules and corresponding controlled devices.

PSU24-6RM is shown in Fig. 3.8.
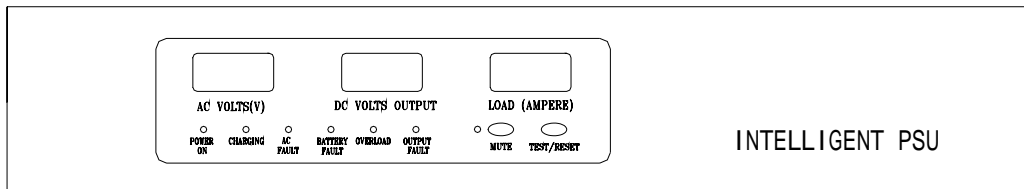
Fig. 3.8

A   Indicators and switches:

✧ **MUTE Key:** Press "**MUTE**" to silence the PSU panel when fault occurs. The sound will resume when new fault occurs.

✧ **TEST/RESET Key:** Under monitoring state, this is "**TEST**" key, testing all display components as pressing it, which should be normally lit; after self-test, press "**TEST**" key again, it will self-test again. Under fault state, this is "**RESET**" key to clear the fault. "**RESET**" key can clear the fault display and fault alarm sound.

✧ **POWER ON LED:** Green. For AC power indication.

✧ **CHARGING LED:** Green. Indicating the charging mode.

✧ **AC FAULT LED:** Yellow. Lit when AC power voltage is higher than 260VAC or lower than 160VAC. The buzzer will alarm at the same time.

✧ **BATTERY FAULT LED:** Yellow. Lit when battery voltage is lower than 15VDC or higher than 28VDC. The buzzer will alarm at the same time.

✧ **OVERLOAD LED:** Red. Lit when battery voltage is higher than 28VDC. The buzzer will alarm at the same time.

✧ **OUTPUT FAULT LED:** Yellow. Lit when a break or short circuit occurs or output current is higher than 8A. The buzzer will alarm at the same time.

✧ **MUTE LED:** Red. Lit when in mute state.

✧ Display windows indicate the input AC voltage, output voltage and output current.

B   Terminals

Back of the PSU and terminals are shown in Fig. 3.9.
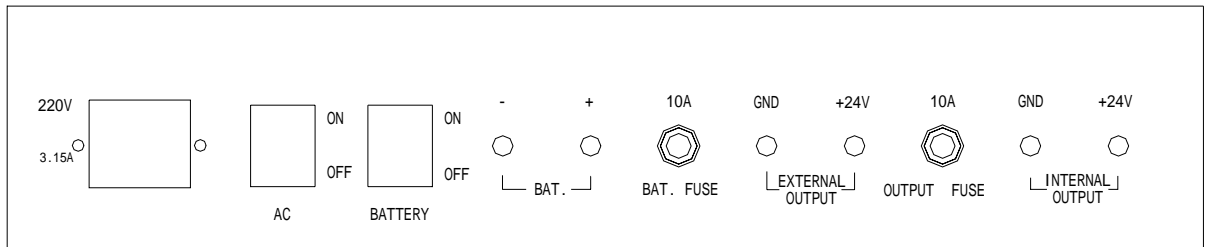
Fig. 3.9

- ✧ **AC ON/OFF:** AC ON applies AC power, and AC OFF disconnects AC power.

- ✧ **BATTERY ON/OFF:** BATTERY ON applies battery, and BATTERY OFF disconnects battery.

- ✧ **+, - (BAT.):** Battery input.

- ✧ **+24V, GND (EXTERNAL OUTPUT):** 24VDC main output.

- ✧ **+24V, GND (INTERNAL OUTPUT):** 24VDC multi-wire power output.

- ✧ **AC socket:** 220VAC power input (including chassis earth).

3.3.2 Optional Configuration

(1) Fireman's Control Panel

Fireman's Controller is an important device in the system. These devices include fire pump, smoke exhauster and blower. Fireman's Controller of GST5000 intelligent fire alarm control panel can control at most 12 equipments by option. For equipments needing both start and stop, it can control at most 6. The panel can check short circuit and broken circuit with corresponding audio and visual instruction, which can ensure the reliability of connection between the control panel and important devices as much as possible.

(2) SP-M4004PC Printer

SP-M4004PC Printer adopts special structure to be installed on a small mounting hole (103mm× 57mm) on the front panel of the control panel. The printer is made up of front cover, rack, head, circuit, spindle and scroll. There are "SEL" and "LF" keys and indicators on the right-upper side of the front panel on the control panel, and paper-out slot with cutting saws on lower part. The printer head is installed in the rack, and at the bottom of the head is paper-in slot. Fix the printer on the panel with flexible bars. Place the scroll spindle on the rack. The rack and printer can be simply pulled out or plugged into the control panel for changing paper.

(3) Communication Card

GST5000 Intelligent Fire Alarm Control Panel provides a multi-functional communication port, connecting with network cards to realize networking among GST series fire alarm control panels, to form urban fire alarm supervisory network through public telephone network and to fulfill graphic supervision by connecting with CRT

system in the control center of buildings. The control panel watches network cards running in real time, that is, the cards can take effect as inserted.

Note: You need to purchase a CRT card for your first order of GST5000. Only with this CRT card, device definition and C&E formula can be downloaded from PC.

3.4 Field Devices

3.4.1 A Series of Intelligent Fire Detectors

GST 5000 can connect with a series of fire detectors, such as I-9102, I-9103, and I-9105R. The detectors mounted in the protected area transmit monitoring message to the control panel through ring detection loop. Every detector has its own address with which the control panel can supervise the information of alarm, fault, and normal status of the detectors.

3.4.2 Modules

GST5000 can connect with I-9300 addressable input module and I-9301 addressable single I/O module. I-9300 module receives the signal of normally open switching signal, and transmits the information to the control panel (This type of FACP is able to activate the connected devices). I-9301 single I/O module connects with the devices controlled by the control panel, such as smoke exhauster, fan blower and fire valve. It can also receive the self-answering signal.

3.4.3 Loop Isolator

Loop Isolator can isolate the shorted part of loop from the whole system to ensure normal operation of other devices and to ascertain the location of the part in fault. When the fault is repaired, the loop isolator can automatically reset the isolated part and include it into the system.

3.4.4 Manual Call Point

A series of manual call point (such as I-9202) can be connected with the bus of GST5000. When fire is confirmed manually, press the glass on the MCP, alarm signal can be sent to the control panel. After receiving the alarm signal, the control panel will show the number and location of the MCP, and sound alarm.

3.4.5 Addressable Sounder Strobe

Addressable Sounder Strobe is a kind of audible/ visual alarm device installed in field, which can be activated by fire alarm control panel in fire control center or by manual call point installed in field. A series of GST addressable sounder strobes (such as I-9403) can be connected to the bus of GST5000. Having been activated, it will generate strong audible/ visual alarm signal to warn people in field.

3.4.6 GST852RP Repeater Panel

GST852RP Repeater Panel is designed with a microprocessor. When one or more detectors alarm fire, the repeater panel can display the location numbers and information of the detectors and send out audible and optical signals. Through

communication loops, it can be connected with fire alarm control panels, disposing and displaying the data transmitted from the control panels. When monitoring several floors or several zones with one fire alarm control panel, a repeater panel on each floor or in each zone can replace zonal fire alarm control panel.

3.5 Configuration　C&E formula and devices　Software

The software owns the functions of editing and downloading definition of device and C&E formula. Before the system starts operation, you need to define the device and C&E through configuration software via computer. Then download it to the control panel.

Chapter 4 Mounting

Follow the steps before mounting the GST5000:

(1) Check whether you have received all items ordered.

(2) Mount the Cabinet.

(3) Power up the control panel and carry out start-up inspection.

(4) Connect field devices.

(5) Inspect circuits and register devices.

(6) Define the devices and download them to the control panel through the configuration software by PC according to engineering configuration.

(7) Define C&E formula and download it to the control panel through the configuration software by PC according to engineering configuration.

(8) Commission and inspect field devices.

4.1 Configuration Inspection

4.1.1 Check Engineering Configuration

Check the configuration according to packing list. The main items to be examined are: Installation and Operation Manual, keys to the control panel, etc.

4.1.2 Check Internal Configurations and Interconnection of the Control Panel

All internal parts have been connected completely (including optional units) before the control panel leaves the factory. Therefore, mainly check the internal parts and connection according to Appendix 1.

4.2 Installation of the Cabinet

4.2.1 Installation condition and method of wall-mounted FACP

The dimension of wall-mounted FACP is shown in Fig. 4.1.
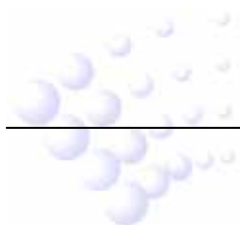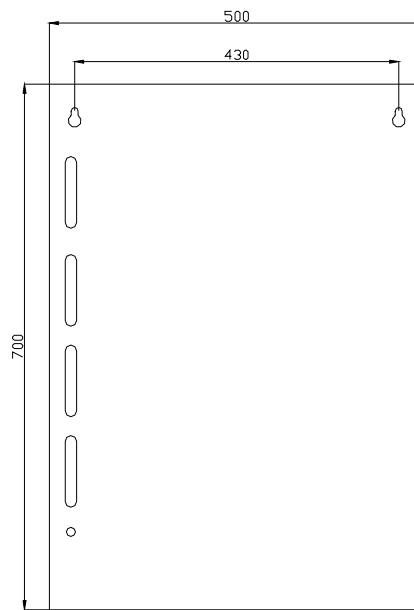
Fig. 4.1

4.2.2 Installation condition and method of rack type and console-typed control panel.

Rack (Length× Width× Height): 580mm× 520mm× 1540mm (or 1715)mm

Console(Length× Width× Height, single unit): 555mm× 933mm(with table)× 1350mm

Console(Length × Width × Height, double unit):1045mm × 933mm (with table) × 1350mm

Ambient Temperature: 0   +40

Relative Humidity   95%, non condensing

Installation Space: Width of maintenance of the control panel should be more than 1000mm.

4.3 Start-up Check

After mounting GST5000, apply power to it as shown in Fig. 4.2. Turn on the main and standby power supply in the cabinet and check if the control panel can self-test. The procedures are as follows.

1   Check LCD, digitron and indicators.

2   Check self-test on the stored running records, isolation information and C&E formula.

3   Observe whether the indicators, and digitron on the control panel and ZCP can all be lit and whether the speaker gives three continuous alarm sounds and "beep" tone.

Power		
L	N	G
1	3	2

AC Power
AC230V± 10%

Switch

L

N

earth
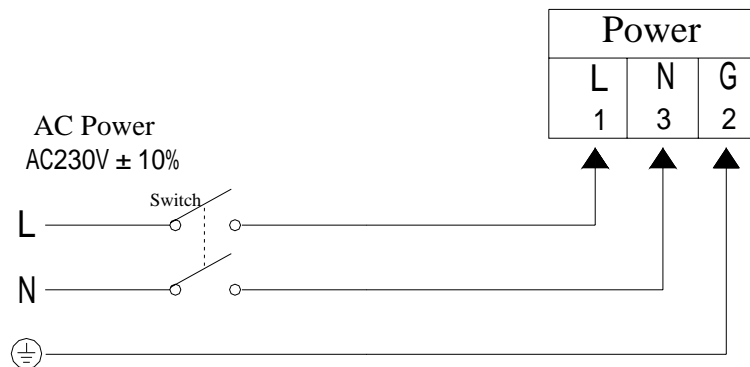
Fig. 4.2

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

4.4 Connections of Field Devices

Loop interface board combines GST5000 control panel and field devices.

Terminals of loop interface board are shown in Fig. 4.3.
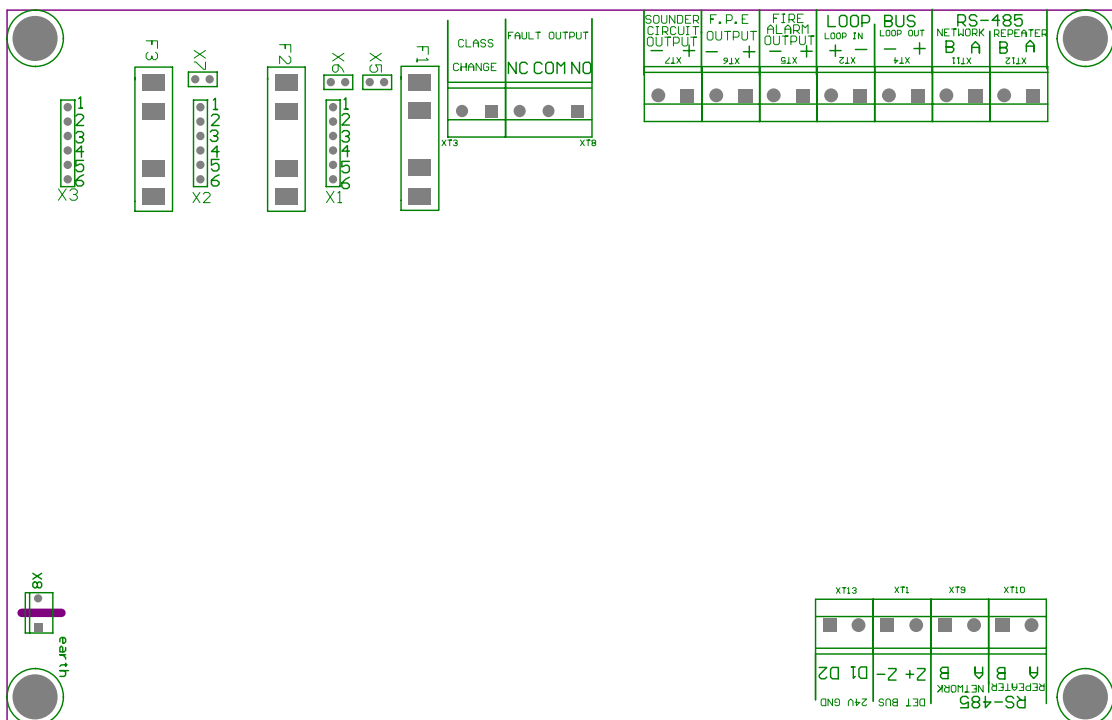
Fig. 4.3

Description:

✧ **CLASS CHANGE (XT3):** Short it to make sounder output.

✧ **FAULT OUTPUT (XT8):** Normally open contact is closed when fault signal occurs, and normally open contact is disconnected when the control panel

repairs fault automatically.

◇ **SOUNDER CIRCUIT OUTPUT (XT7):** It outputs when there is fire alarm. It can be stopped by pressing "**SILENCE**" key on ZCP. Output can be isolated, and there is no output in isolation state. The control panel will report fault when connected cable in short or open circuit.

◇ **F.P.E. OUTPUT (XT6):** It outputs when there is fire alarm. It can be isolated, and does not output when fire alarm occurs in isolation state. The control panel alarms fault when connected cable in short or open circuit.

◇ **FIRE ALARM OUTPUT (XT5):** It outputs when there is fire alarm and should give fault signals when connected circuit is shorted or opened.

◇ **LOOP BUS (XT2, XT4):** It can be connected with 235 coded points. With loop isolator in the ring detection loop, the detector protected by loop isolator is not missing when there is short or open circuit. In this case, the control panel reports fault.

◇ **RS-485 (XT11, XT12):** To be connected with repeater panel and control panel.

◇ **earthX8:** This terminal is for checking earth fault when there is short circuit.

F.P.E. OUTPUT, **SOUNDER CIRCUIT OUTPUT, FIRE ALARM OUTPUT can provide three output modes:** 24VDC active output, normally open output and normally closed output. You can set up the three modes through Pin X1　X7. See more details in Table 4.1.

Table 4.1

Output	24VDC	Normally Closed	Normally Open
F.P.E. Output	Short 1to 2 & 4 to 5 of X3 Short X7	Short 3 to 4 & 5 to of X3 Disconnect X7	Short 2 to 3 & 5 to 6 of X3 Disconnect X7
Sounder Circuit Output	Short 1 to 2 & 4 to 5 of X2 Short X6	Short 3 to 4 & 5 to 6 of X2 Disconnect X6	Short 2 to 3 & 5 to 6 of X2. Disconnect X6
Fire Alarm Output	Short 1 to 2 & 4 to 5 of X1. Short X5	Short 3 to 4 & 5 to 6 of X1. Disconnect X5	Short 2 to 3 & 5 to 6 of X1 Disconnect X5

4.4.1 Connection of Sounder Circuit Output

Connection of Sounder Circuit Output is shown in Fig. 4.4.
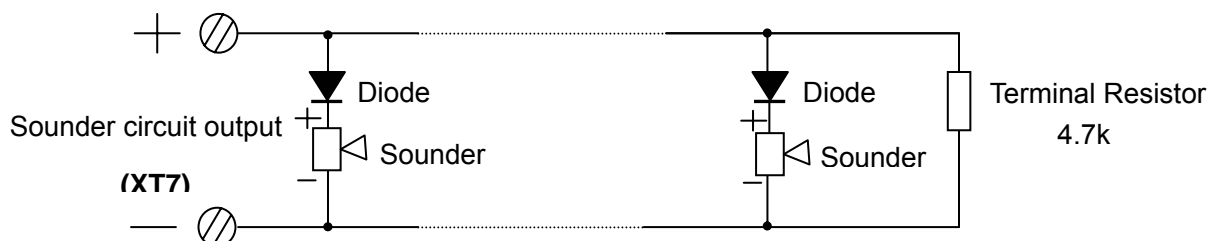
Fig. 4.4

Description:

Remove the terminal resistor and keep it well. Connect the cable in correct polarization. Add a 4.7KΩ resistor to the end of each circuit.

NOTE: The sounder strobes are polarized. Note polarization in connection. The maximum current of the circuit depends on the number of sounder strobe. Do not overload.

4.4.2 Connection of F.P.E. Output

F.P.E. output is shown in Fig. 4.5.
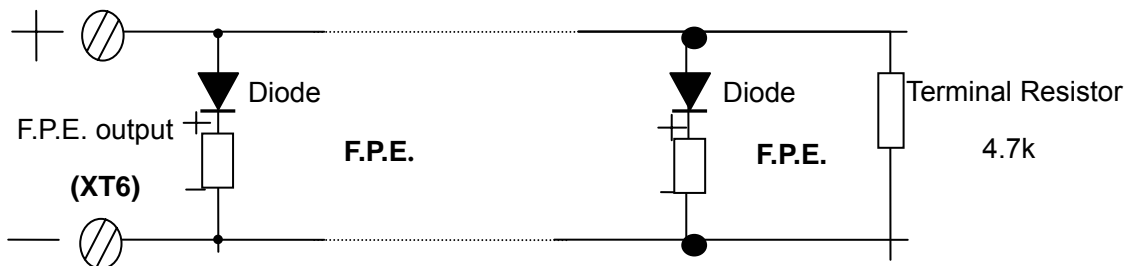
Fig. 4.5

Description:

Remove the terminal resistor and keep it well. Connect the cable in correct polarization. Add a 4.7KΩ resistor to the end of each F.P.E output loop.

NOTE: F.P.Es are polarized. Note polarization in connection. The maximum current of the circuit depends on the number of F.P.E.Do not overload.

4.4.3 Connection of Fire Alarm Output

Fire alarm output is shown in Fig. 4.6.
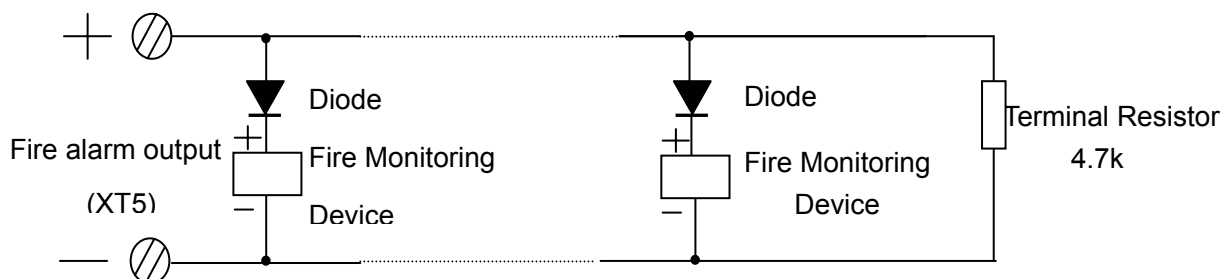
Fig. 4.6

Description:

Remove the terminal resistor and keep it well. Connect the cable in correct polarization. Add a 4.7KΩ resistor to the end of fire alarm output loop.

NOTE: Fire supervisory devices are polarized. Note polarization in connection. The maximum current of the circuit depends on the number of fire supervisory

device. Do not overload.

4.4.4 Connection of Ring Detection Loop

Ring detection loop is shown in Fig. 4.7.
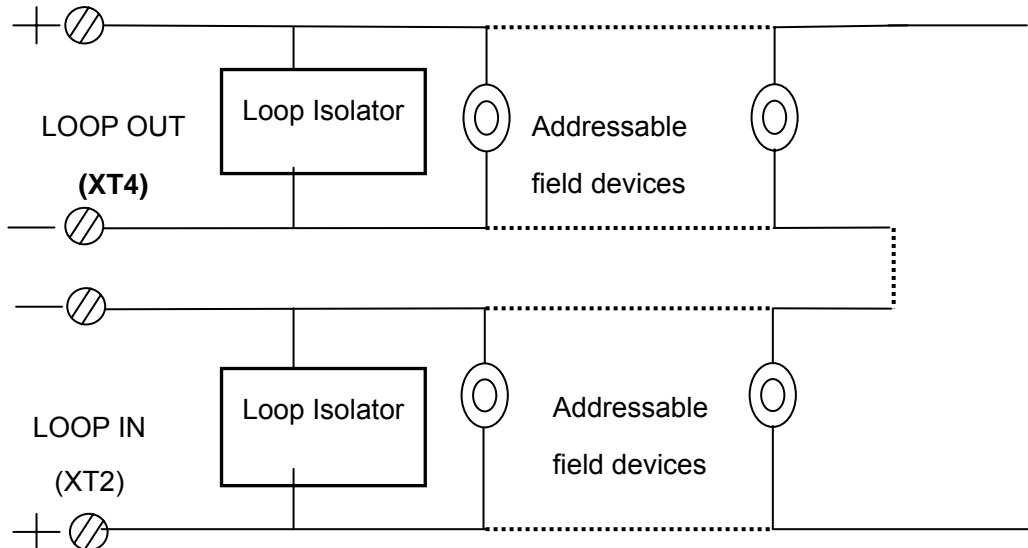
Fig. 4.7

Note: Every loop isolator can control up to 32 detectors.

4.4.5 Connection of Communication Loop
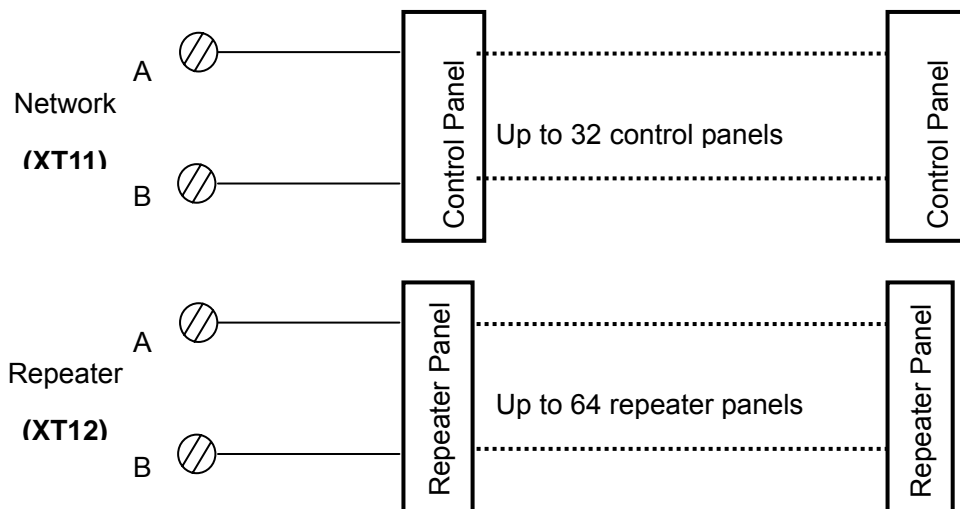
Fig. 4.8

4.4.6 Connection of Ring Module
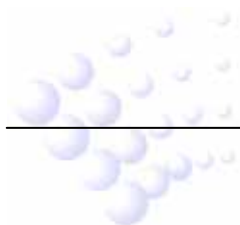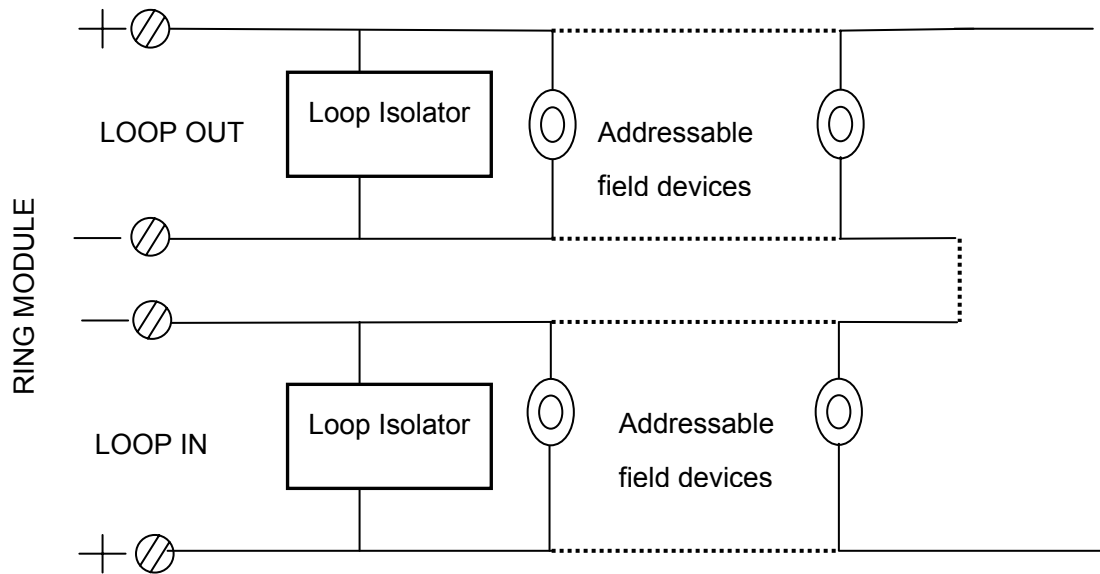
Fig. 4.9

4.5 Connection Inspection and Device Registration

4.5.1 Connection Inspection

Check the circuit connected with the control panel. Insulation resistance measured at different circuits and ground should be more than 20MΩ, the resistance in the detection loop should be more than 1KΩ. The resistance among fire alarm output, sounder circuit output, F.P.E. output should be equal to terminal resistor.

4.5.2 Registration of Devices

Step One: Set the control panel at commissioning state.

Press "**SYSTEM**" to enter system setting menu and choose "**3.Working state setup** "(see Fig. 4.10):

Ver V4.05f

☞**Working state setup**
   1   Monitoring State
   2   Commissioning State
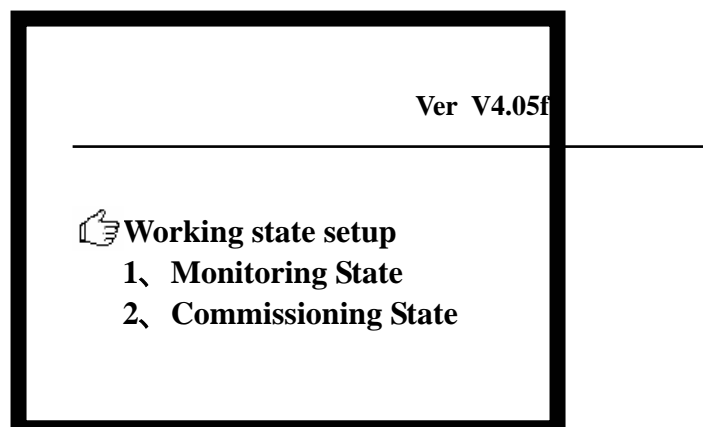
Fig. 4.10

Press " " or " " to make the cursor point to "**2.Commissioning State**", and press

"ENTER" to enter commission state. The screen like Fig. 4.11 will be shown on the LCD.

```
                        Installer V1.5
         System running

```
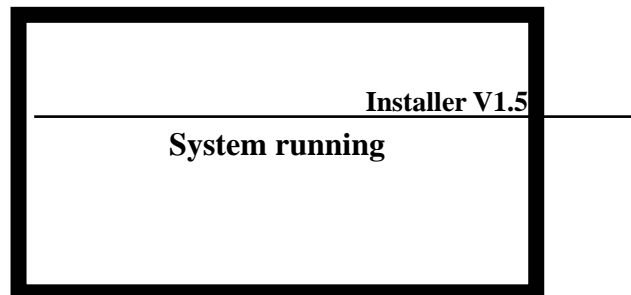
Fig. 4.11

Step Two: In commission state, re-start the control panel.

GST5000 control panel will automatically register devices. Please check the number of devices registered, programming, and operation state comply to design request, and remove any problem.

4.6 Definition of Devices

Please define devices and C&E formula by configuration software (GST-DEF) via a PC, and download the definitions to the control panel.

4.6.1 Mounting

1. Configuration Requirement

Minimum Configuration: Pentium II 233 CPU, 32M memory, 800M hard disk available space.

Recommended Configuration: Pentium III 500 CPU or above, 64M memory or above, 800M hard disk available space.

Operating System: Windows 95, Windows 98, Windows 2000.

2. Software Installation

Please visit our website to download the installation software (GST-DEF) at http://www.gst.com.cn/english/webmap.htm. After downloading, you can start installation following the installation wizard. The serial number is GSTSOFTWARE and default directory is C:\GST-Gui. We recommend you to install to this directory. After installation, the program may request re-start your computer, please restart following the instructions.

3. Connection of PC with Fire Alarm Control Panel (FACP)

Connect the PC with the FACP including CRT communication board through a 4-core communication cable which one end connects with DB9F port and the other with an RJ45 plug connector (the cable will be supplied as accessory parts). Maximum length of the cable is 15m. Hardware connection is shown in Fig. 4.12.

DB9

Upload/download device definition and C&E formula definition
Pin 2 Sending data
Pin 3 Receiving data
Pin 5 GND

Fig. 4.12

4.6.2 Adding Fire Alarm Control Panel

Run configuration definition software, and input access password. The window is as in Fig. 4.13.
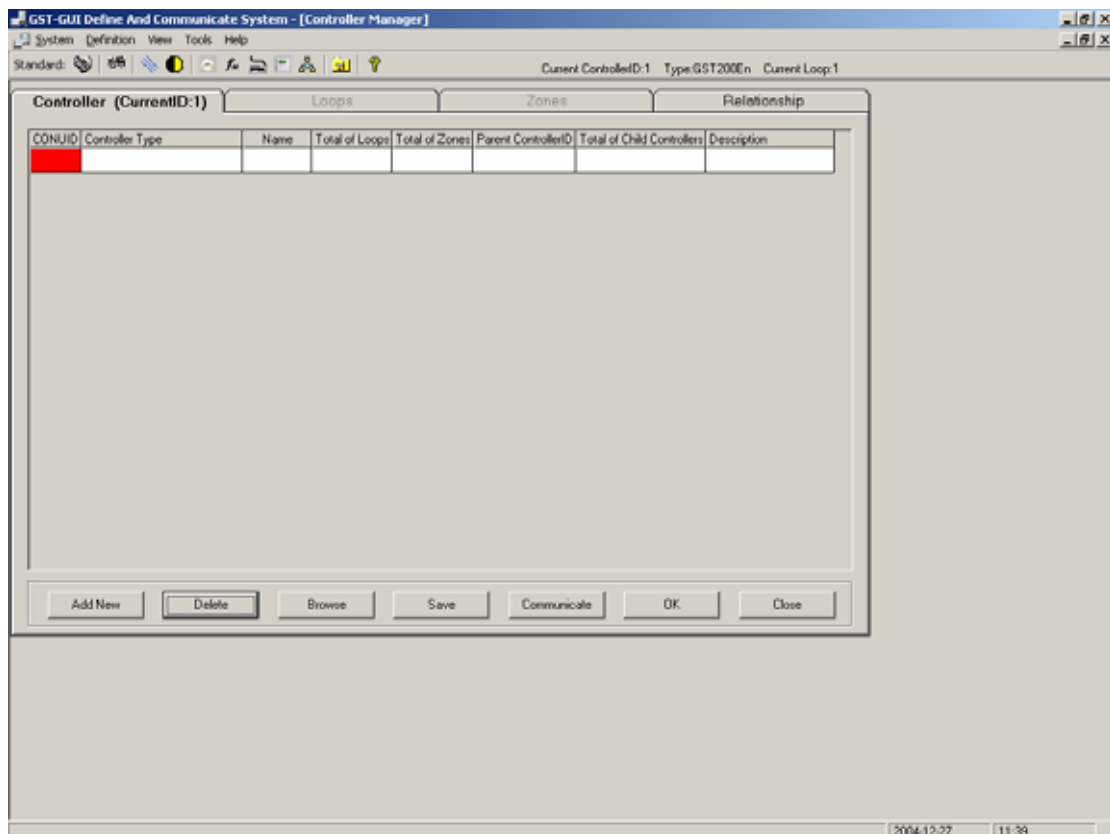
Fig. 4.13

Before device definition, add fire alarm control panel used for defining device:

Step 1: Click "**AddNew**" under "**Controller**". Select the model of control panel "1-GST5000EnV4.0" under the pull box "**Controller Type**".

Step 2: Input name of control panel under "**Name**", and input descriptions about this

control panel under "**Description**".

Step 3: Click "**SAVE**" to save the settings.

Buttons at the bottom of Fig. 4.13 are for editing, whose meanings are as follows:

Table 4-2

Name	Function
Add New	Add new control panel to the system. Default is GST5000EnV4.0.
Delete	Delete selected control panel.
Browse	View information of selected control panel.
Save	Save edition to current control panel.
Communicate	Enter communication window of selected control panel. Communication windows of different control panels are different.
OK	Save edit result to control panel and exit network administration window.
Close	Exit network administration window without saving edit result.

4.6.3 Zone Definition

1. Use of Zone Definition

By zone definition, you can define devices of a certain area (such as a large room) as one zone through zonal management, and describe the features of the zone clearly through "**Description**". When the devices in the area are in fire alarm state, fault state, action state and isolation state, the control panel shows not only the abnormal messages, but also zonal messages and address of the device, so that the operators can find out the specific location and take effective measures. You will have to define zones before defining devices because the device must be in a zone.

2. Steps for Zone Definition

First: Choose the control panel to be defined.

In network window, click "**CONUID**" to choose the control panel.

Second: Enter the window of zone definition.

Choose menu "**Define Zone**" under "**Definition**", or choose "**Zones**" under communication window and click "**Define**" button, or using the zone icon in tool bar as shown in Fig. 4.14 to enter the window of zone definition shown in Fig. 4.15.
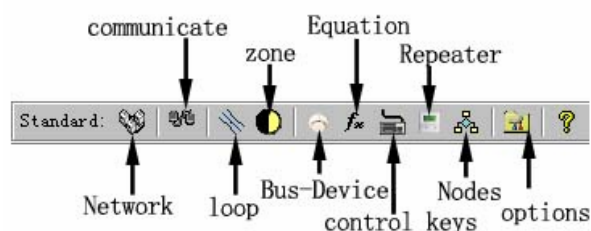
Fig. 4.14
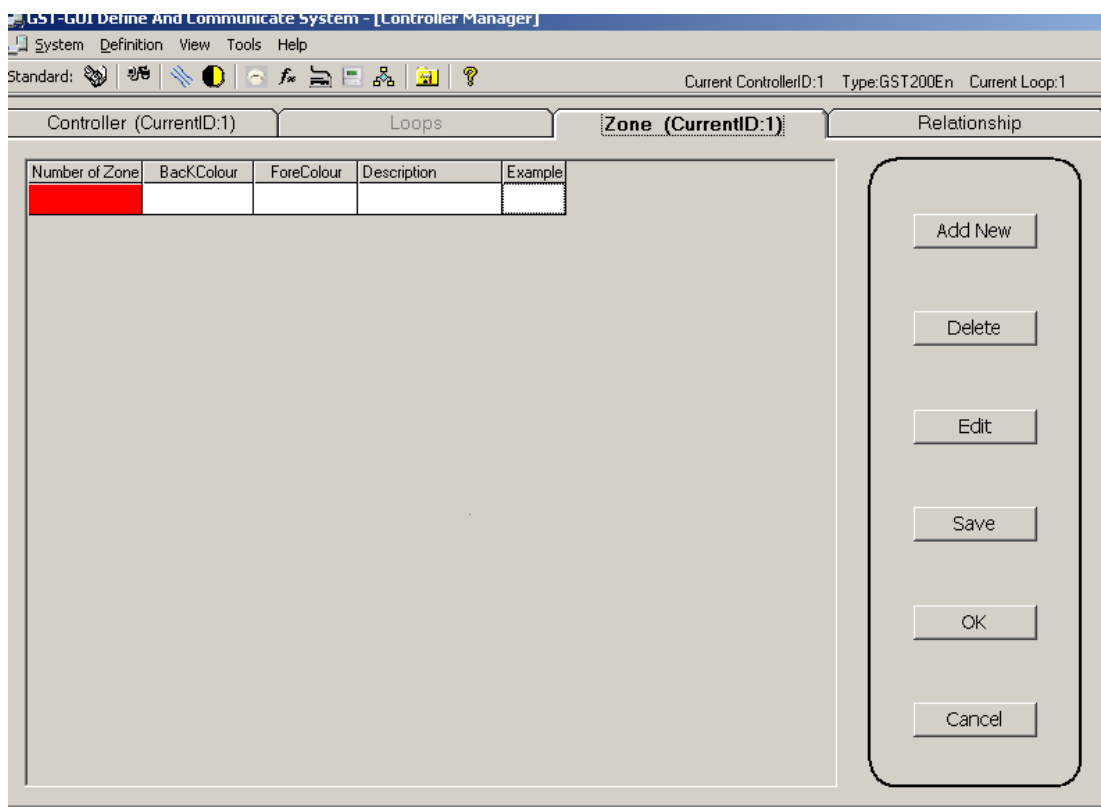
Fig. 4.15

Third: Add zones

Click "**AddNew**" to add zones. The control panel can define 60 zones at most. It is allowed that the zone numbers are not continuous, but it should not be more than 200. Clicking "**BackColour**" and "**ForeColour**", you can edit background colour and font colour. Fill out features of relative zone under "**Description**". See Fig. 4.16. After editing, click "Save" to save the setting.

Note: The defaulted background colour of zone is white, and font colour is black. Different zones can have different colours through editing. During the definition of device below, background colour of device in different zones are the same as setting here, which make different zones distinct.
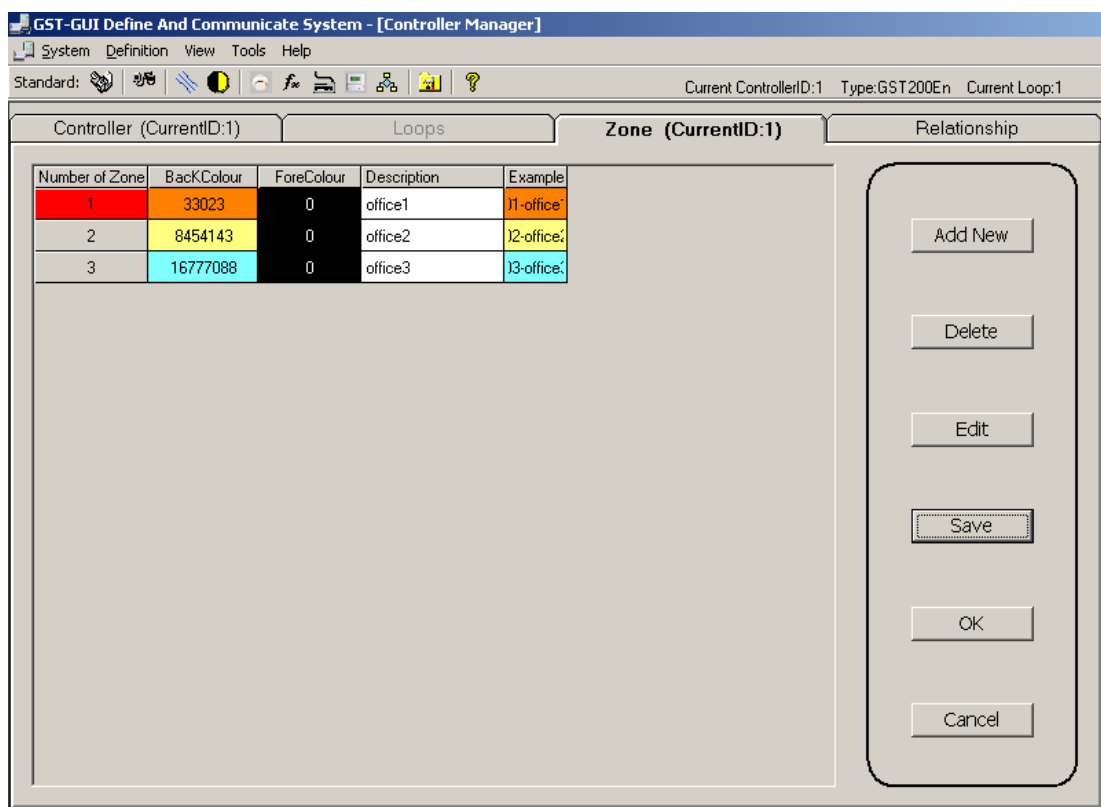
Fig. 4.16

3. Downloading Zone Definition to the Control Panel

First: Clicking communicate icon to enter communication window. See Fig. 4.17.

Second: Choose "**Zones**" option.

Choose communication type under "Communication Type".

- Choosing "**Download**", the system will transmit the definition information to the corresponding control panel.

- Choosing "**Upload**", the system will read the information of corresponding control panel.

- Choosing "**Compare**", the system will read the information of control panel, and then compare it with information on the PC. If different, a dialog box for the definition will be bounced, displaying definition information of the control panel.

Choose the range of download data under "Content".

- It will download all the devices or zones when choosing "**All the Definitions**".

- It will download some of the devices and zones when choosing "**Some Definitions**". Add some number of addresses to "**Fractional Address**" as the download range.

- You can select the number of a zone in "**Address**" when choosing "**One Definition**" to download one device or zone.
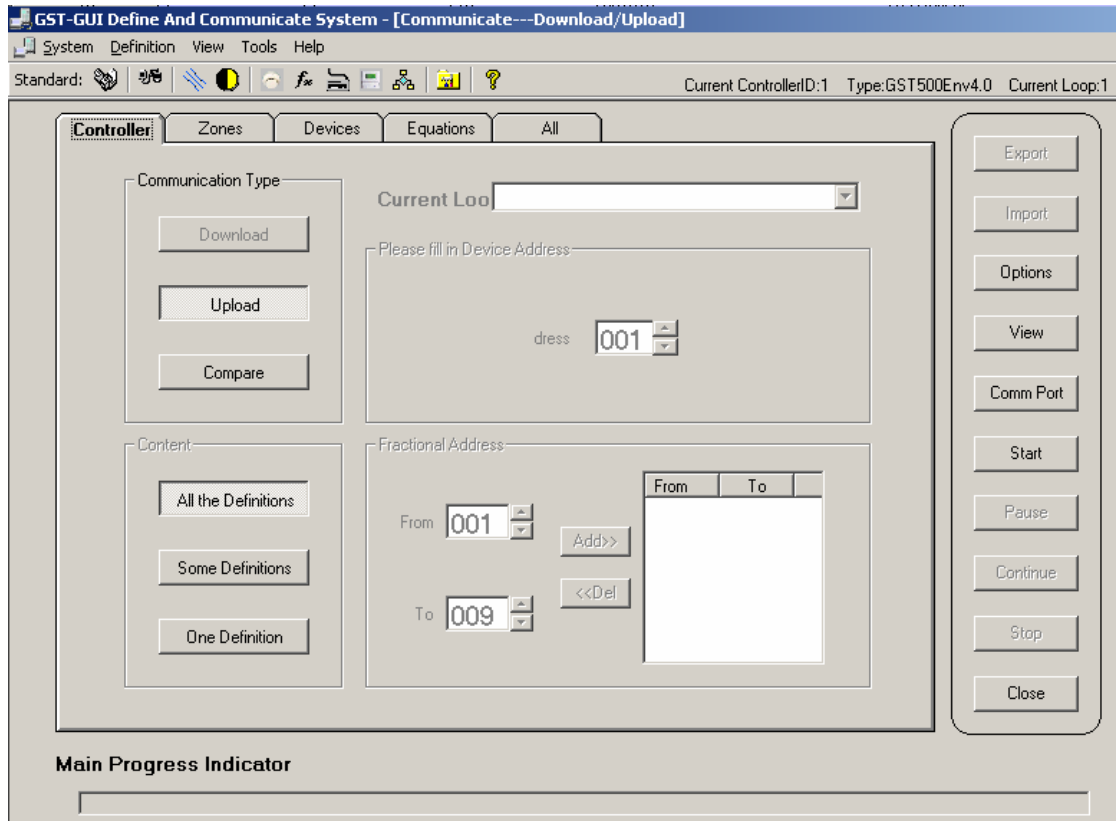
Fig. 4.17

Third: Creating and disposing communicating report.

After ascertaining content and type of communication, click "**Start**" to start communication. You can select disposal options through "**Communicating Report**" under "**Options**" if a piece of information fails.
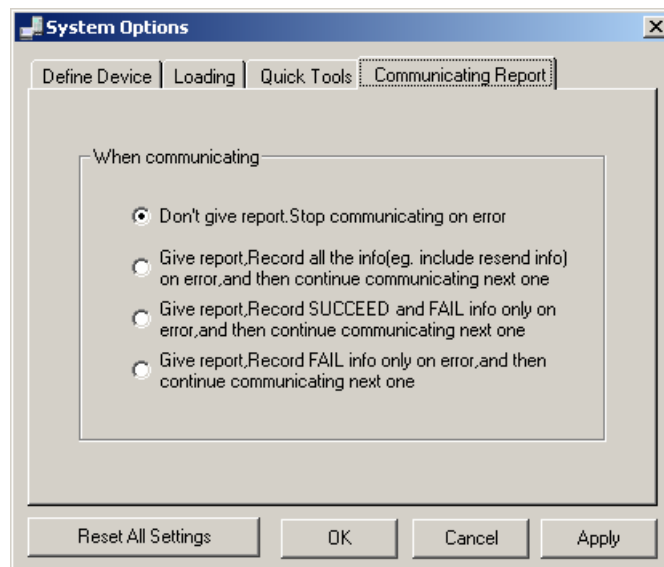
Fig. 4.18

● If you choose "**Don't give report Stop communicating on error**", the system

will stop communicating and prompt the error when a piece of information fails.

● If you choose "**Give report Record**…", the system will continue to communicate when a piece of information fails. The system will bounce a communication report after communication stops, which includes basic information of this communication and contents of the failure. Controller's number, type and loop, communicating items, flow direction, object and time belong to the basic information. The contents of failure will be displayed according to the setting under "**Options**".
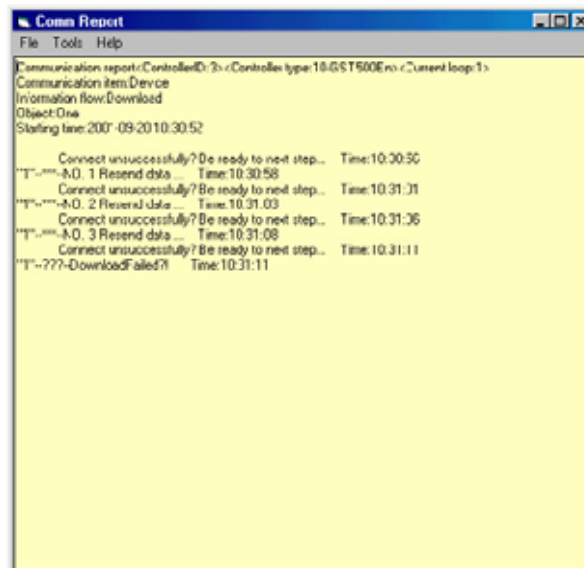
Fig. 4.19

● When communication is unsuccessful, check connection between the control panel and PC. If correct, download again.

4. Browsing Definition of Zone on the Control Panel

Step One: Press "**SYSTEM**" to enter system menu like Fig. 4. 20.
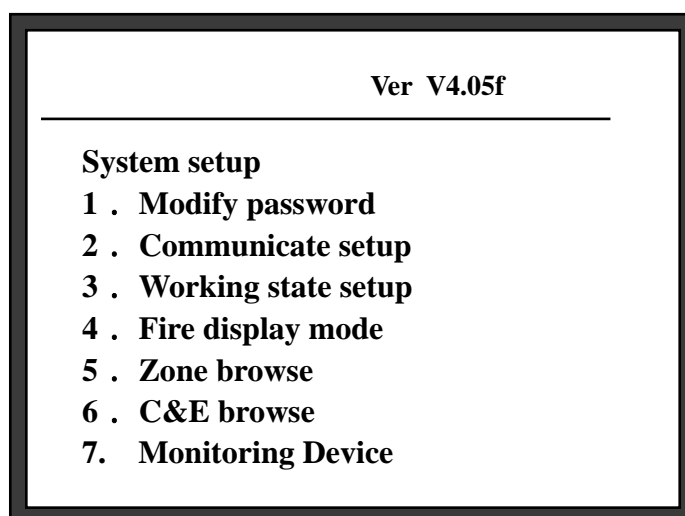
Fig. 4.20

Step Two: Choose "5 Zone browse", you can browse zone definition shown in Fig. 4.21.

```
                    Ver  V4.05f
    ─────────────────────────────────────

        Display the Zone Name
        Zone 0001 1floor
        Zone 0002 2floor
        Zone 0003 3floor
        Zone 0004 4floor
        Zone 0005 5floor
        Zone 0006 6floor
        Zone 0007 7floor
```
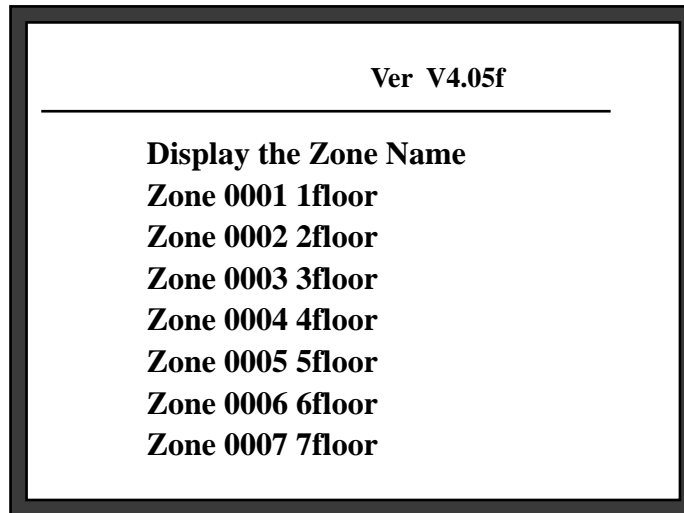
Fig. 4.21

Description of zone screen:

Zone 0001 1floor// zone number, zone description

View the zone information through   and   .

4.6.4 Loop Definition

1.   Use of Loop Definition

GST5000 can have at most 4 loops. Devices from one zone or from neighboring zones can be defined into one loop and their features described in "**Description"**. When there is fire alarm, fault, action, and isolation information from any device, the control panel will display not only the information, but also the zone/loop information and address of the device, so that the operator can find out the specific location quickly, and take effective measures in time. **Note: You will have to define zones and loops before defining devices because the device must be in a zone and loop.**

2.   Basic steps for loop definition

Step One: Choose the control panel requiring definition of devices. In network window, select the control panel by clicking "**CONUID**".

Step Two: Enter device definition window.

In the window of communication, choose "**Loops"** option, and then click "**Define**". Or click "**Loop**" icon in tool bar as shown in Fig. 4.13 to enter loop definition window shown in Fig.4.22.
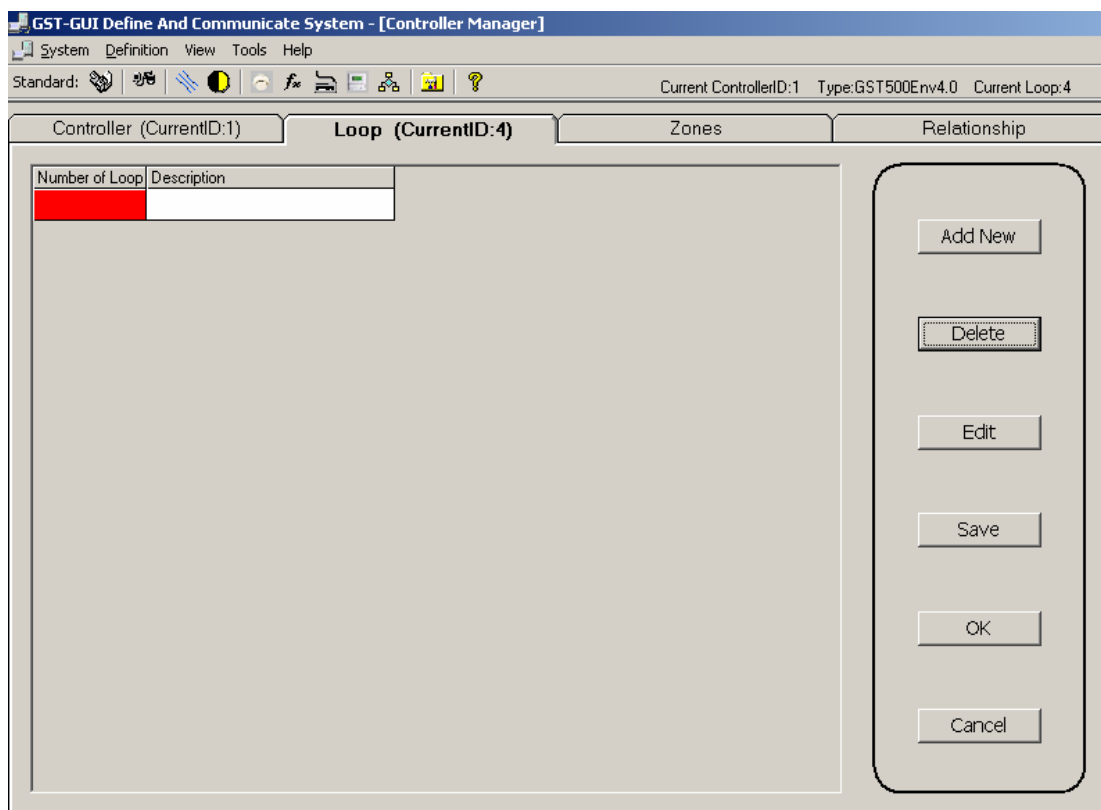
Fig. 4.22

Step Three: Add loops.

Click "**AddNew**" to add a loop. The control panel can have 4 loops at most. Fill relative description information in "**Description**". **Note:** The loop number defined here must be the same as the actual project design. Otherwise the definition will be senseless.

Step Four: Save and exit.

4.6.5 Definition of Loop Devices and ZCP

1. Use of Device Definition

The software can define device address, type, location description, zone and loop with which operator can find out alarm area quickly when fire alarm and fault condition occur.

2. Steps for Device Definition

You can define devices with two methods: by group and one by one. In commission, firstly define the devices using group definition, then modify individual device through single definition. It is an effective way to define devices combining the two methods.

Step One: Choose the control panel requiring definition of devices.

In network window, select the control panel by clicking "**CONUID**"

Step Two: Using group definition, quickly define the devices.

Enter the window of group definition. Click "Definition\Define Devices\Bus-Devices\Text Mode-By Group" menu, enter the window like Fig. 4.23. Its

upper part belongs to definition area, and lower part list area.

Define one group in definition area.

● Choose a loop to which the devices belong from the pull-down menu of "**Loop**".

● Choose a zone to which the devices belong from the pull-down menu of "**Zone**".

● Choose type of device under "**Device Type**" (the specific meanings of device type is shown in **Appendix 2**).

● Set starting and ending addresses in "**Address From**".

● Define user code for the group in "**Device Number Settings (from left No.1 6 bit)**".

● Input notes in "**Description Settings**" (for instance, if this zone is an office, just input the note "**Office**" here).

● Set up properties in "**Properties**".

● You can define keys for ZCP in "**Key Settings**" for this group.

After editing, add the definition of the group into the list by clicking "**Add**". The system will automatically number it in sequence.

Complete group definition of the devices by clicking "**Update**".

Fig. 4.23

Description of command buttons:

Add: Fill the contents in definition area in the list. You can copy using the button. The method is: Choose one group definition in the list, click "**Add**", and copy this definition to the list. Modification of this definition can be made.

Del: Delete the present selected definition.

Save/Open: Clicking "**Save**", save the definition in the list as one file. Clicking "**Open**" when needed, you can find and open this document by saved path. Convert it into devices definition by clicking "**Update**". Some modification can be made according to actual situations before "Update".

Update: Renew the device definition according to present group description information to finish group definition.

Close: Close the window of group definition.
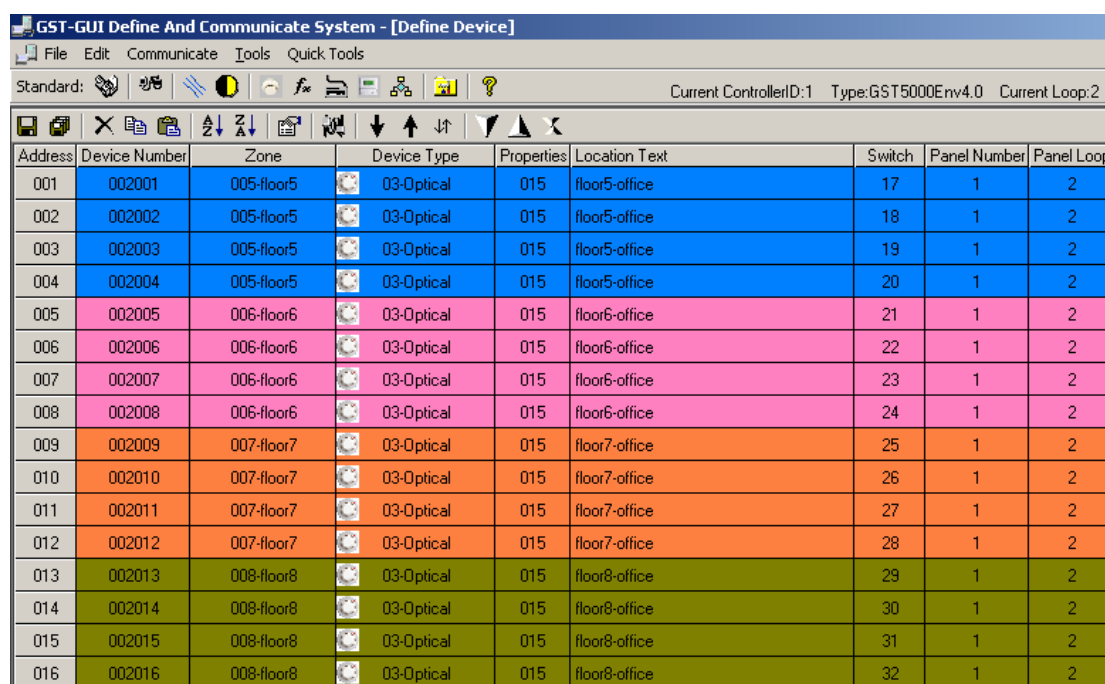
Step Three: Modify individual device using Text Mode one by one.

After group definition, enter the window of single definition. Make modifications to specific device.

Select the loop of the device.

Select the loop in which there is device definition is to be modified in "**Loops**" options.

Enter the window of Text Mode-One by One. Choose "**Device**", then click "**Define**" under "**Definition/Define Device/Bus-Devices/Text Mode-One by One**" menu, or choose "**Device**", then click "**Define**" in communication window or click "**Bus-device**" icon in the tool bar to enter the window of "**Text Mode-One by One**". See Fig. 4. 24.

Address	Device Number	Zone		Device Type	Properties	Location Text	Switch	Panel Number	Panel Loop
001	002001	005-floor5		03-Optical	015	floor5-office	17	1	2
002	002002	005-floor5		03-Optical	015	floor5-office	18	1	2
003	002003	005-floor5		03-Optical	015	floor5-office	19	1	2
004	002004	005-floor5		03-Optical	015	floor5-office	20	1	2
005	002005	006-floor6		03-Optical	015	floor6-office	21	1	2
006	002006	006-floor6		03-Optical	015	floor6-office	22	1	2
007	002007	006-floor6		03-Optical	015	floor6-office	23	1	2
008	002008	006-floor6		03-Optical	015	floor6-office	24	1	2
009	002009	007-floor7		03-Optical	015	floor7-office	25	1	2
010	002010	007-floor7		03-Optical	015	floor7-office	26	1	2
011	002011	007-floor7		03-Optical	015	floor7-office	27	1	2
012	002012	007-floor7		03-Optical	015	floor7-office	28	1	2
013	002013	008-floor8		03-Optical	015	floor8-office	29	1	2
014	002014	008-floor8		03-Optical	015	floor8-office	30	1	2
015	002015	008-floor8		03-Optical	015	floor8-office	31	1	2
016	002016	008-floor8		03-Optical	015	floor8-office	32	1	2

Fig. 4.24

Modification of individual device definition. Click the first line or double click a certain piece of definition, the window for definition one by one will bounce. See Fig. 4.25. Meanings of the keys are shown in Table 4.3. In this window, the device information (loop, device user code, zone, device type, description, sensitivity and keys on ZCP) can be modified. **Note: Click "Save" after modifying a device, then go on with the next one.**

Fig. 4.25

Table 4.3

Previous	Display previous definition.
Next	Display next definition.
Restore	Restore the content modified (before they are saved)
Save	Save the modification to the list and database.
Clear	Clear the present defined contents and make it undefined.
Apply	Save the modification into the list without closing the dialogue box.
Cancel	Close the dialogue box without saving the modification.
OK	Save the modification to the list and close dialogue box.
Compare	Save the modification to the list and database, then upload device information and compare it with PC. If different, upload device will be displayed in another dialogue box.
Download	Save the modification to the list and database, then download the piece of device definition.
Upload	Save the modification to the list and database, and then upload the device. Uploaded device information will be displayed in another dialogue box.

Note: The modification of device definition can be done in the window shown as Fig. 4.24. Or you can click a certain item in the screen shown in Fig. 4.24. Please not the following:

(a) GST5000 control panel lists the entire 242 devices by their code, with which the user can define users code (six digits). Clicking "**Device Number",** device code will display

as "XXX-XXX" to be modified. Two user codes can be the same as long as they are of different device type, but this has to be set accordingly through "**Tools/Options…**" menu (See Fig. 4.26). When saving device definition, the software will check the legality of the device definition according to this option. The invalid device definition will not be saved.
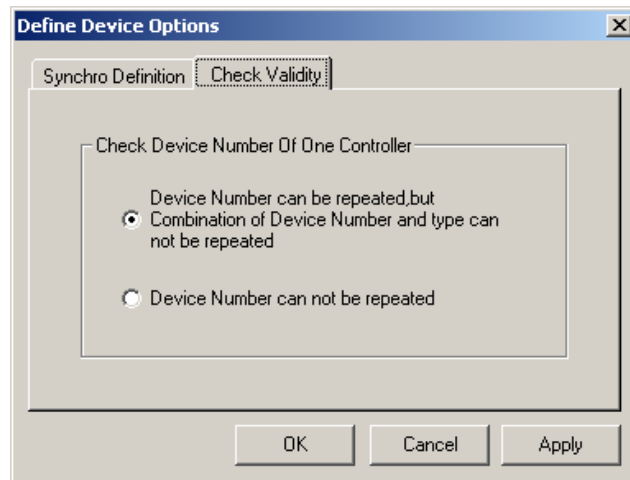
Fig. 4.26

(b) GST5000 control panel defines ZCP keys for devices to be started while defining the devices. Because GST5000 control panel can have more than one ZCPs, you need to give the ZCP loop number and ZCP number while defining the ZCP keys. A ZCP loop can have 4 ZCPs and a ZCP 64 keys.
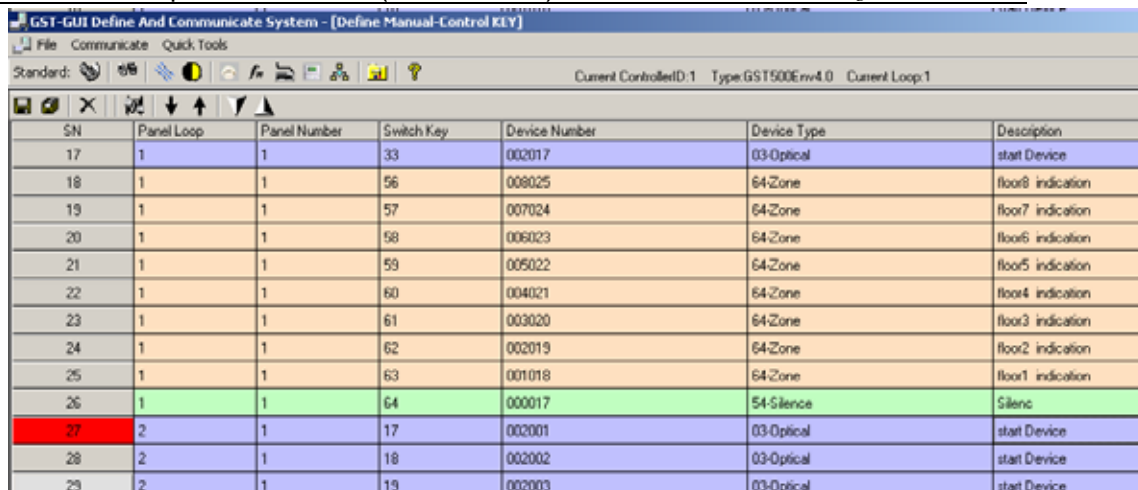
(c) According to En 54-2 standard, a general silence direction must be defined for a fire alarm system, and a zone direction must be defined for a zone. Device type for general direction is 54-Silence, and 64-Zone for zone direction in this system. While defining these directions, corresponding keys on the ZCP should also be defined. After those defined, if there are still keys without definitions, they can be defined to initiate field devices.

(d) You can make use of background colour provided by the software to distinguish different functions on the ZCPs.

Step Four: View and modify the definition information on ZCPs.

Click the "**zone**" icon in the tool bar, you can view definitions to ZCP keys. Add corresponding description for the keys in "**Description**". See Fig. 4.27.
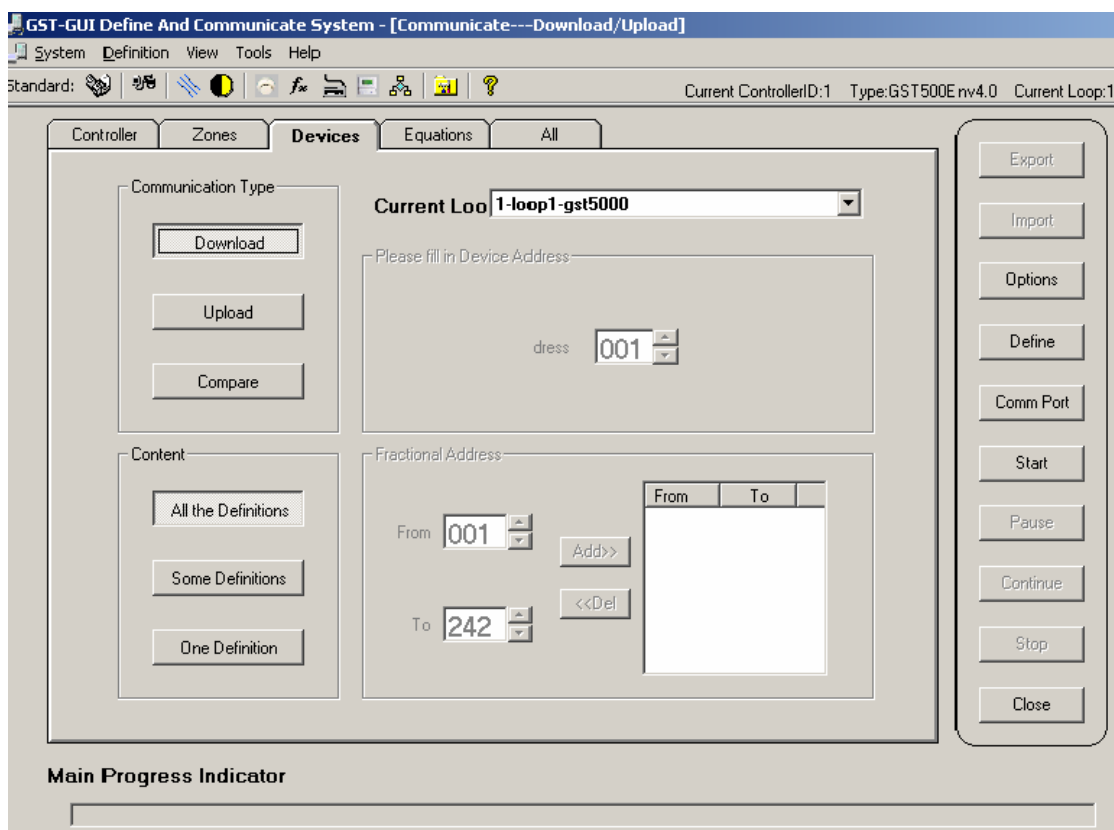
Fig. 4.27

Step Five: After definition, save and exit.

3. Downloading the Device Definition to the Control Panel

Step One: Click "**Communicate**" icon on the tool bar to enter communication window.
See Fig. 4.17.

Step Two: Choose "**Devices**" option. See Fig. 4.28.

Fig. 4.28

Choose loop number of the device in pull-down menu of "**Current loop**".

Choose communication type in "**Communication Type**".

● Choosing "**Download**", the system will transmit definition information to the corresponding control panel.

● Choosing "**Upload**", the system will read the information of corresponding control panel.

● Choosing "**Compare**", the system will read the information of control panel, then compare it with information on the PC. If distinctive, dialog box of the definition will be given, displaying definition information of the control panel.

Choose the range of download data in "**Content**".

● Download all the devices and zones when choosing "**All the Definitions**".

● Download partial devices and zones when choosing "**Some Definitions**". Add some number of addresses to "**Fractional Address**" as the download range.

● Choose "**One Definition**" to download one device and zone by selecting its number in "**Address**".

Step Three: Create and dispose communication report　the same as zone definition in section 4.6.3　.

4. Browsing the device information on the control panel.

Step One: Pressing "**Browse**", the system configuration will be displayed in Fig. 4.29.

```
┌─────────────────────────────────────┐
│                                     │
│    Browse register info             │
│    ───────────────────────────────  │
│          System Configuration       │
│    Total Loops    004               │
│    Devices        013               │
│    Repeaters      0000              │
│    Access         000               │
│    Color CRT      Installed         │
│                                     │
│                                     │
│                                     │
└─────────────────────────────────────┘
```

Fig. 4.29

Step Two: Check information of loop configuration.

Press any key in Fig. 4.30 to enter loop selecting state, displaying configuration of each loop. The top line is highlighted; after pressing "TAB", the highlighted position becomes normal, the control panel is in loop checking state. Press "　" or "　", the highlighted position will move up and down to choose different loop (See Fig. 4.30).

Browse register info

Loop00 000 Repeater
Loop01 000 points 0
Loop02 013 points 0
Loop03 001 CRT

Browse register info

Loop00 000 Repeaters
Loop01 000 points 000 Access
Loop02 013 points 000 Access
Loop03 001 CRT
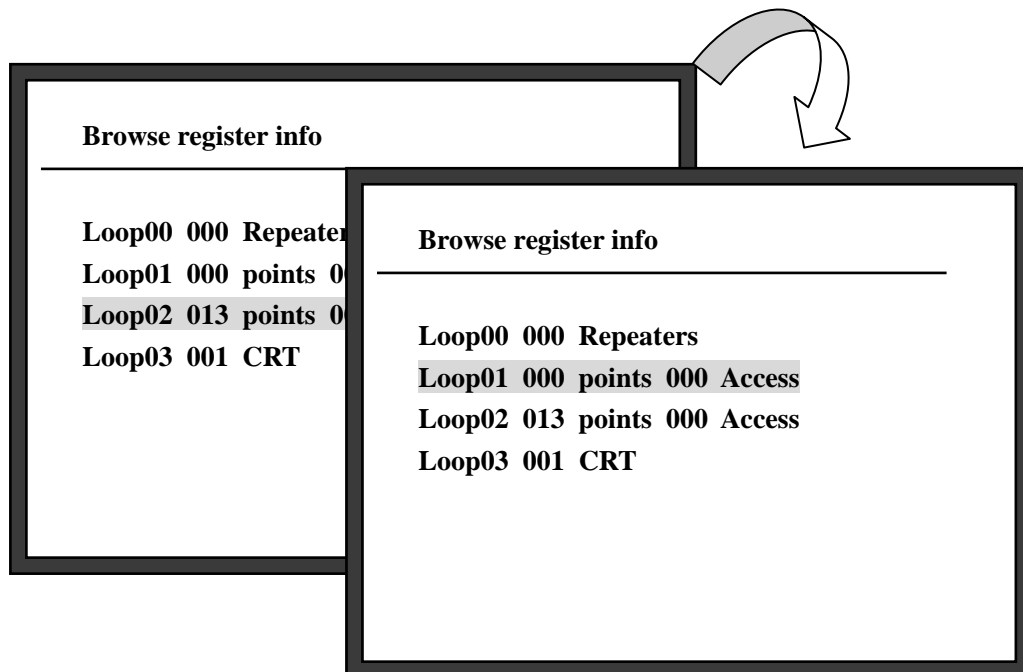
Fig. 4.30

Step Three: Check device information.

Pressing "ENTER" then will display every device definition registered of this loop. The top line is highlighted; pressing "TAB", the highlighted position becomes normal, and the control panel is in device checking state (See Fig. 4.31).

Browse register info Loop 02 013 Points

 016 Zone 001-016 Gas Det
1floor   cookroom
 017 Zone 002-017 Fix Temp
1 floor bathroom
 032 Zone 003-032 Optical
1floor corridor
 214 Zone 003-214 Fresh Air
1 floor toilet
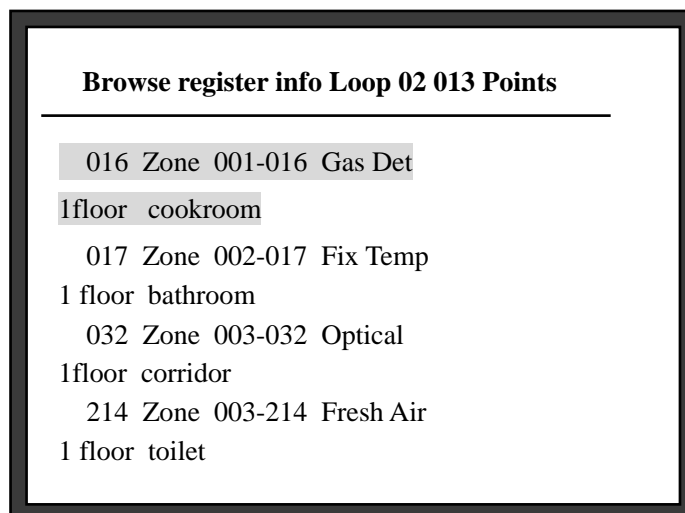
Fig. 4.31

Description of device information:

 016 Zone 001-016 Gas Det // Information number, user code zone number   device number , device type

1floor   cookroom// Zone description   device description

 017 Zone 002-017 Fix Temp// Information number, user number (zone number

device number), device type

1 floor bathroom// Zone description   device description

   032 Zone 003-032 Optical// Information number, user number   zone number device number   , device type

1floor corridor // Zone description   device description

   214 Zone 003-214 Fresh Air// Information number, user number   zone number device number   , device type

1 floor toilet// Zone description   device description

In device check state, pressing "   " and "   " to view devices. In device selected state,

pressing "   "and "   " to change the selected device one by one.

4.7 Definition of C&E Linkage Formula

4.7.1 Use of C&E Formula

The control panel can define under what conditions extinguishing equipment or alarm devices have to be started. So please define C&E formula after defining devices and before operation of the control panel.

Note: Please define C&E formula after finishing the definition of devices.

4.7.2 Arrangement of C&E

Define the devices and arrange C&E in the system before defining C&E formula.

    Structure and meaning of C&E formula

To arrange C&E formulas, you need to know its structure and meaning. A control panel can have many C&E formulas. The total number of bytes of the formulas should not exceed 8K, and total number of formula in a fire alarm control panel should not be over 255. Each C&E formula should not be over 128 bytes (17 devices).

The structure of a C&E is shown in Fig. 4.32.
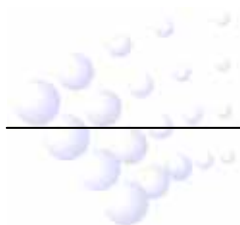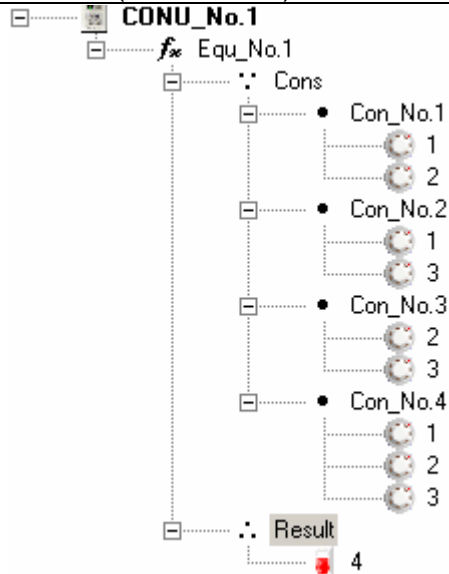
Fig. 4.32

"**Cons**" stands for conditions of C&E, which comprises of many conditions (Con_No.1; Con_No.2; Con_No.3; Con_No.4). Relationship among these conditions is "or". Each condition (such as Con_No.1) is made up of lots of devices (Detector 1 and Detector 2). The condition is valid when all the devices alarm.

"**Result**" is the result of C&E formula.

The meaning of C&E in Fig. 4.31: Only when at least two of detector1, detector 2, detector 3 alarm fire, sounder 4 will be activated and give alarm sounds.

Arranging C&E in the system

Suppose device list in the GST5000Env4.0 control panel system is as in Table 4.4.

Table 4.4

Location	Devices
Office 1	3 photoelectric detectors and1sounder
Office 2	3 photoelectric detectors and1sounder
Office 3	3 photoelectric detectors and1sounder

We require the sounder to be activated if two or three detectors alarm in the office at the same time. Then three C&E formula have to be defined, see details in Table 4.5.

Then three C&E formula have to be defined, see details in Table 4.5.

Table 4.5

Contents	Conditions		Results	Standby
Formula 1	Con_No.1	Detector 1 and 2 alarm simultaneously.	Sounder 4 alarms	Office 1
	Con_No.2	Detector 1 and 3 alarm simultaneously.		
	Con_No.3	Detector 2 and 3 alarm simultaneously.		
	Con_No.4	Detector 1, 2 and 3 alarm simultaneously.		
Formula 2	Con_No.1	Detector 5 and 6 alarm simultaneously.	Sounder 8 alarms	Office 2
	Con_No.2	Detector 5 and 7 alarm simultaneously.		
	Con_No.3	Detector 6 and 7 alarm simultaneously.		
	Con_No.4	Detector 5, 6 and 7 alarm simultaneously.		
Formula 3	Con_No.1	Detector 9 and 10 alarm simultaneously	Sounder 12 Alarms	Office 3
	Con_No.2	Detector 9 and 11 alarm simultaneously		
	Con_No.3	Detector 10 and 11 alarm simultaneously		
	Con_No.4	Detector 9, 10 and 11 alarm simultaneously		

4.7.3 Basic steps for defining C&E formulas

GST5000 serial control panels are defined and downloaded by formula types (Normal or Gas) separately. These two types have the same definition windows. When defining ordinary C& E formulas, you can select device lists without gas equipment; when defining C&E formula for gas extinguishing equipment, if gas equipment doesn't exist in the result, an indication will be given when saving.

Step One: Choose the C&E requiring definition.

In network window, click "**CONUID**" to choose the control panel requiring definition of C&E.

Step Two: Enter the screen of C&E.

Click "**Equation**" icon on the tool bar or choose "**Definition\Define Equations**" menu to enter the screen of editing C&E. See Fig. 4.33. The blank area at the left is for displaying the structure of C&E. Upper part of the right displays specific information of C&E, and lower part displays the list of defined optional devices which are usually in disabled state. They can only be activated when adding devices to "**Conditions**" or "**Result**" of the

formulas. The original form of the selected formula is shown at the bottom of the screen.
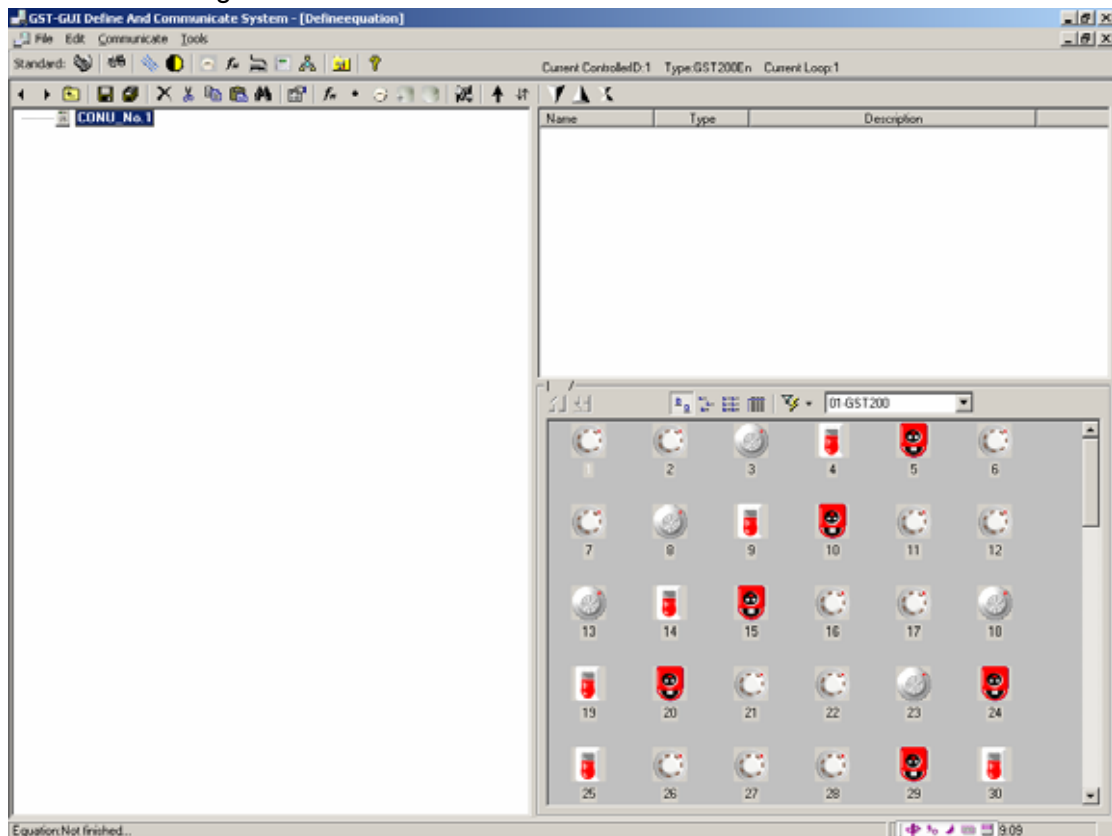
Fig. 4.33

Step Three: Add formula to the control panel

According to the above arrangement, add 3 formulas to the control panel, and each formula four conditions.

Adding formula (one condition and one result are defaulted by the system). Right-click the right side of the screen in Fig. 4.34, the dialogue box shown in Fig 4.33 will be given, and choose "**Add New Equation**" to add a formula.
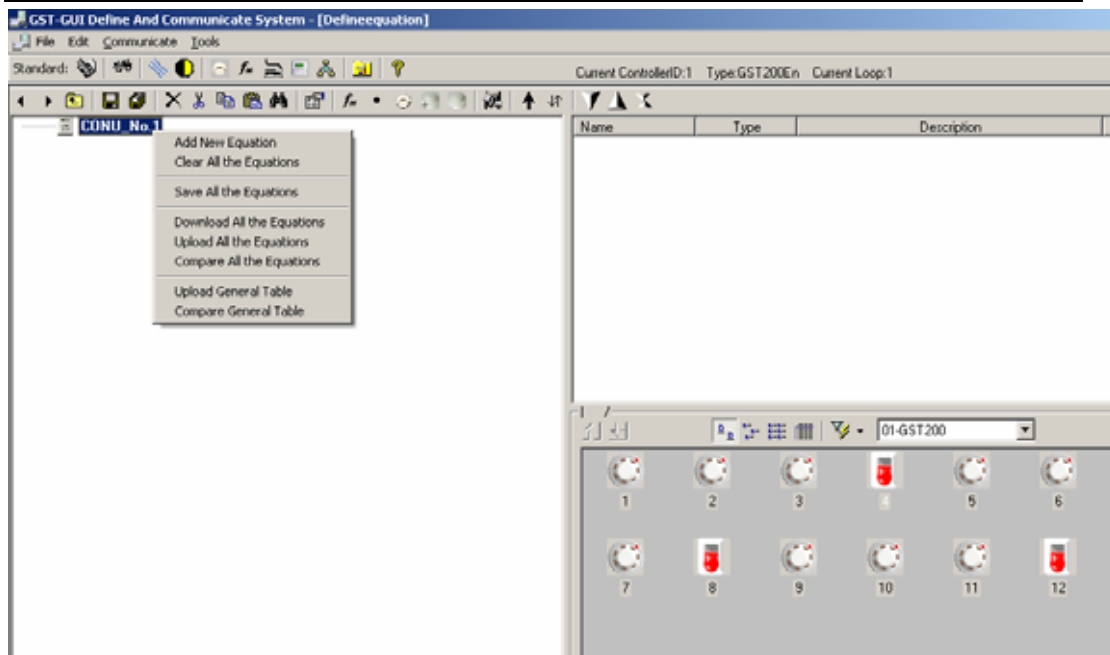
Fig. 4.34

Adding conditions to a formula. Right-click the formula condition, a dialogue box as in Fig. 4.35 will be given, then choose "**Add New Condition**".
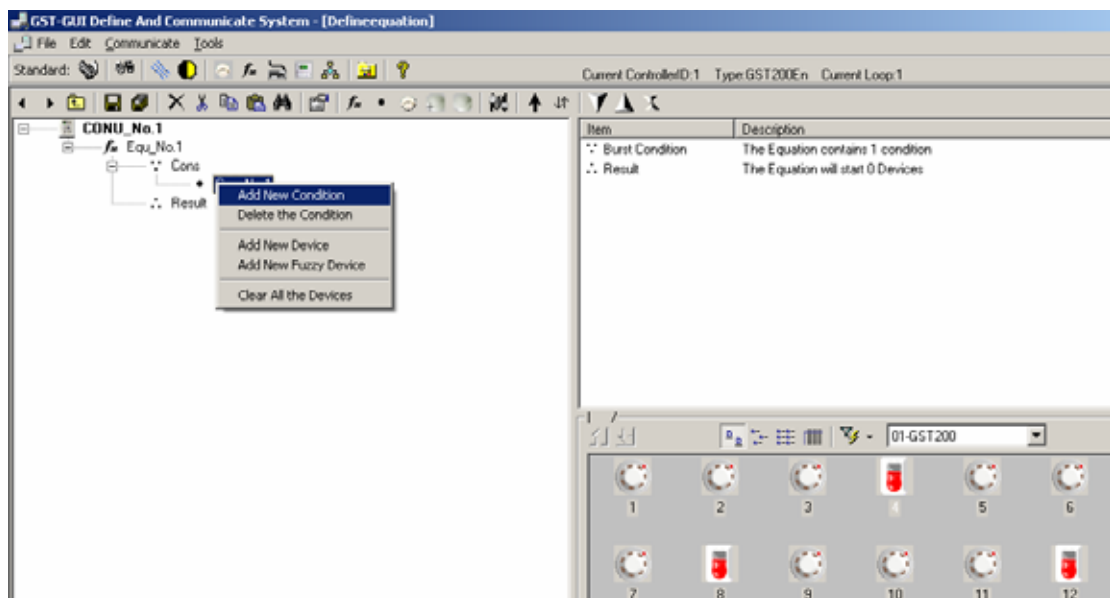
Fig. 4.35

Adding devices to the formula.

The simple way is: First click the condition, then directly draw the device there. Click the condition, draw the corresponding device to the upper part which shown in Fig. 4.36.
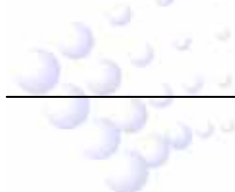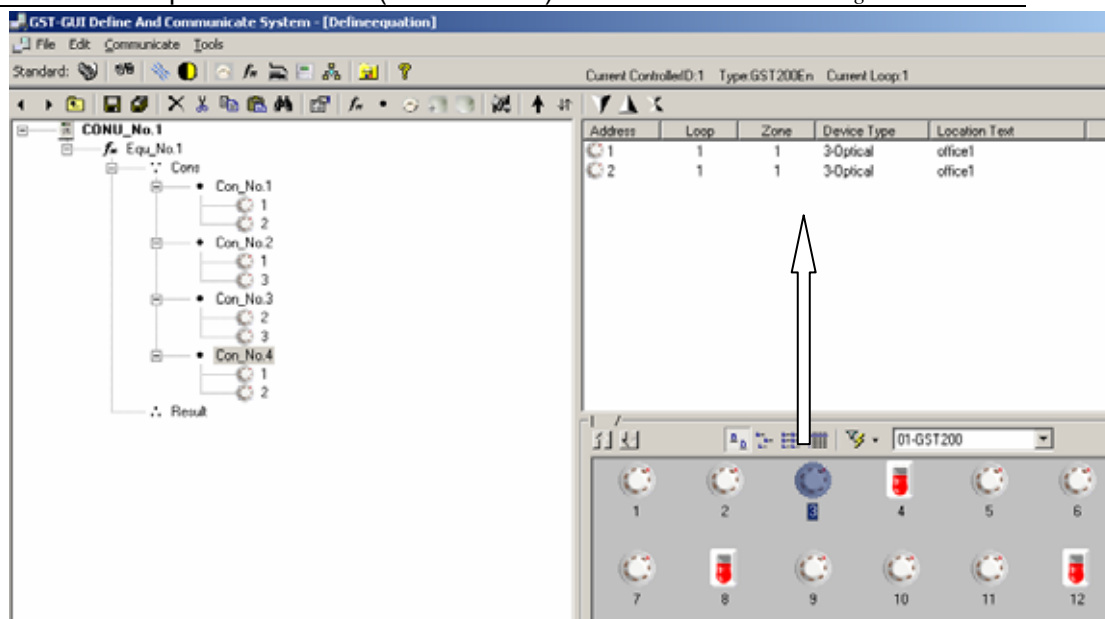
Fig. 4.36

Step Four: Add fuzzy device and making the device selected become a fuzzy device.

Disposal of fuzzy device code

The system will deal with the triggered device you input according to Table 4.6.

Table 4.6

Input	Results	Example
6-digit number	Search device from database by code, and add the type to the end of code, to form a 8-digit code; if there is no such code, it is considered as an unlawful code.	00100203
6-digit character, including non-figure	Non-figure type is defaulted as "*" and device type is defaulted as 01	0*1*02 ⇨ 0*1*0201
6-digit figure	Add 0 to get 6 figures, and then search the device from database. If there hasn't device, it is considered as an unlawful code.	46 ⇨ 000046

When you input a startable device code, the first 8 can be handled by Table 4.6. The next three can be handled by Table 4.7.

Table 4.7

9th-11th digits	Results	Example
Non	Delay time is zero.	00100203
0~255	Delay time is ten times of the actual.	0010020309⇨ delay time is 90 seconds
More than 255	Delay time is 255	00100203460 ⇨ delay time is 255 seconds

Adding Fuzzy Device and Making the Selected Device Fuzzy.

Right-click a selected device in C&E formula, then click "**Fog the Device**" menu, the device becomes editable, just like device 00000102 shown in Fig. 4.37. In this state, modify the device code directly. The system will deal with it according to former description.
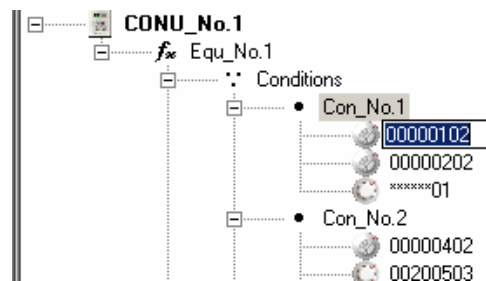
Fig. 4.37

If clicking "**Add New Fuzzy Device**" on tool bar, the state is the same as Fig. 4.36. The default device code is "******01" this code can be modified directly.

Step Five: Modify delay time for devices by C&E linkage.

Delay time of the devices can be modified from the device property window or modified manually by clicking "**Result**" and then "**TimeDelay**" of a device, which will make the become green (see Fig. 4.38). You can then input delay time through keyboard.
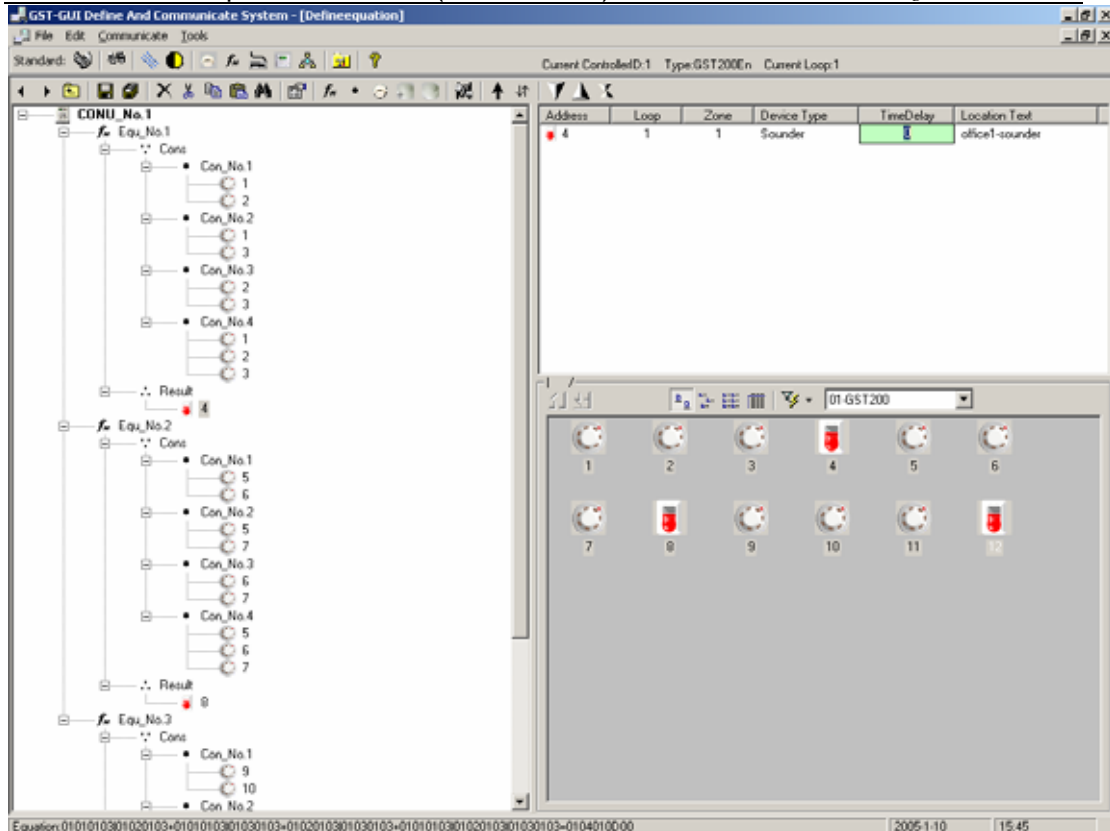
Fig. 4.38

Step Six: Define action mode for C&E formula

Action mode of a certain formula can be defined from the menu. First, right-click a selected device, the menu like in Fig. 4.39 will be given. Or you can choose "**Edit/Equations**" menu (see Fig. 4.40).
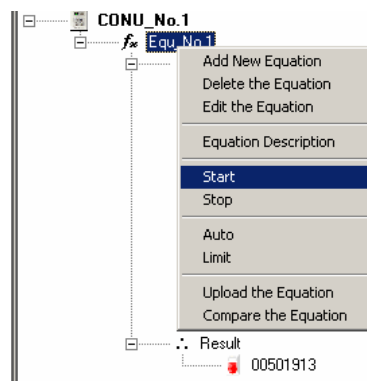
Fig. 4.39
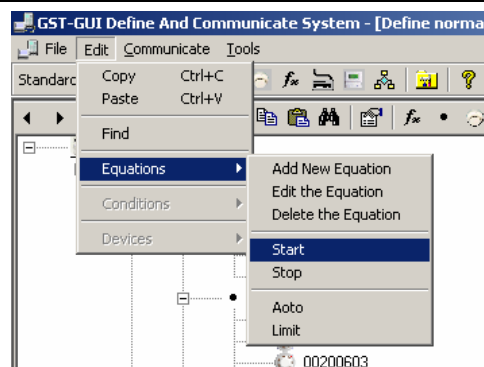
Fig. 4.40

Then, you can define the action mode on the menu. Two combinations will result from the definition, and start\stop can be distinguished by the colour of words. Please refer to Table 4.7.

Table 4.7

Type	Auto or constraint	Background color	Start or stop	Word color	Meaning
Auto-start	Auto	White	Start	Black	Initiate the device by C&E if trigger conditions were met.
Auto-stop	Auto		Stop	Red	Initiate the device by C&E if trigger conditions were met.

In GST5000Env4.0, "=", "=x" are used to separate triggering devices and result of the linkage. Triggering devices are in from of the marks, and the devices to be started by C&E are after them. Their meanings are shown in Table 4.8.

Table 4.8

Type of Formula	Mark
Auto-start	=
Auto-stop	=x

Step Six: Check the C&E formula, save and exit.

Click "**Tools\Equations**" to check legality of C&E formula. Save and exit if the result is lawful.

Note: The checks here just involve in the structure of the formulas other than incorrect activation caused by wrong programming of the formula. Therefore, it is important to arrange the formulas correctly.

4.7.4 Downloading the formulas to the control panel

Step One: Click "**Communicate**" icon on the tool bar to enter the window of communication like Fig. 4.17.

Step Two: Choose "Equations" option shown as Fig. 4.41.

Select the type of C&E to download from "**Equations Type**".

Choose communication type in "**Communication Type**".

- Choosing "**Download**", the system will transmit the definition information to the corresponding control panel.

- Choosing "**Upload**", the system will read the information from corresponding control panel.

- Choosing "**Compare**", the system will first read the information of control panel, then compare it with information on the PC. If distinctive, a dialog box of the definition will be given, displaying definition information from the control panel.

    Choose the range of download data in "Content".

- It will download all the devices or zones when choosing "**All the Definitions**".

- It will download some of the devices and zones when choosing "**Some Definitions**". Add some number of addresses to "**Fractional Address**" as the download range.

- You can select the number of a zone in "**Address**" when choosing "**One Definition**" to download one device or zone.
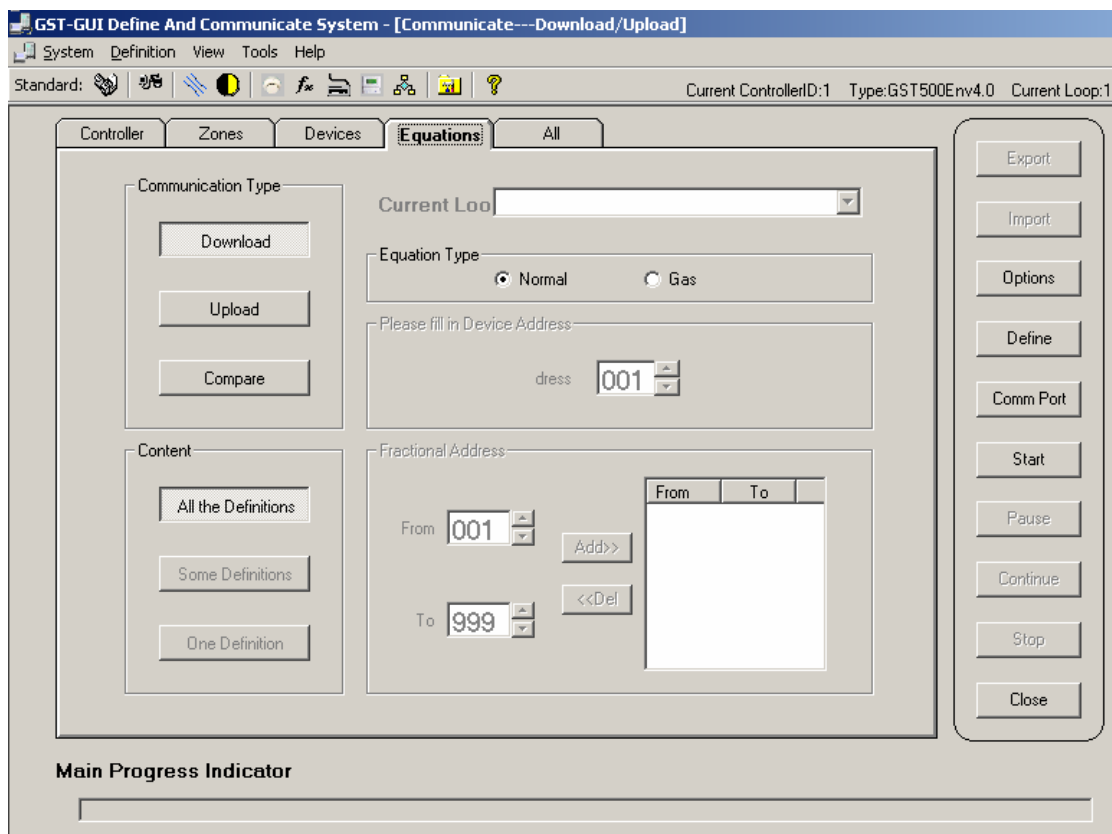
Fig. 4.41

Step Three: Create and dispose communication report.   See zone definition in section 4.6.3
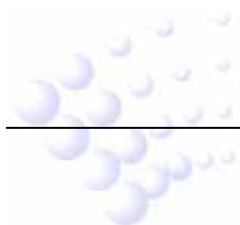
4.7.5 Browsing C&E formula on the control panel

Step One: Press "**SYSTEM**" to enter the system setting menu shown in Fig. 4.20.

Step Two: Choose Item 6 "**C&E browser**", the screen will show browsing window of C&E formula. Pressing 1, the screen displays C&E formulas for gas extinguishing devices, and pressing 2 it displays ordinary C&E formulas (see Fig. 4.42). Pressing "**ENTER**", the system will indicate "**Please Input the number**". Input the number of C&E formula, the screen will display the formula.

Ver V4.05f

C&E Formula Browser

    1. General C&E

    2.   Extinguishing C&E

    3.   The Space of Formulas

No000100100103× 00100203+00100203× 00100303   00100103× 0100303
00100203× 00100303   00100413 00
No000200200103× 00200203+00200203× 00200303   00200103× 0100303
00200203× 00200303   00200513 00
No0003004***03+004***02+004***11=004***1300
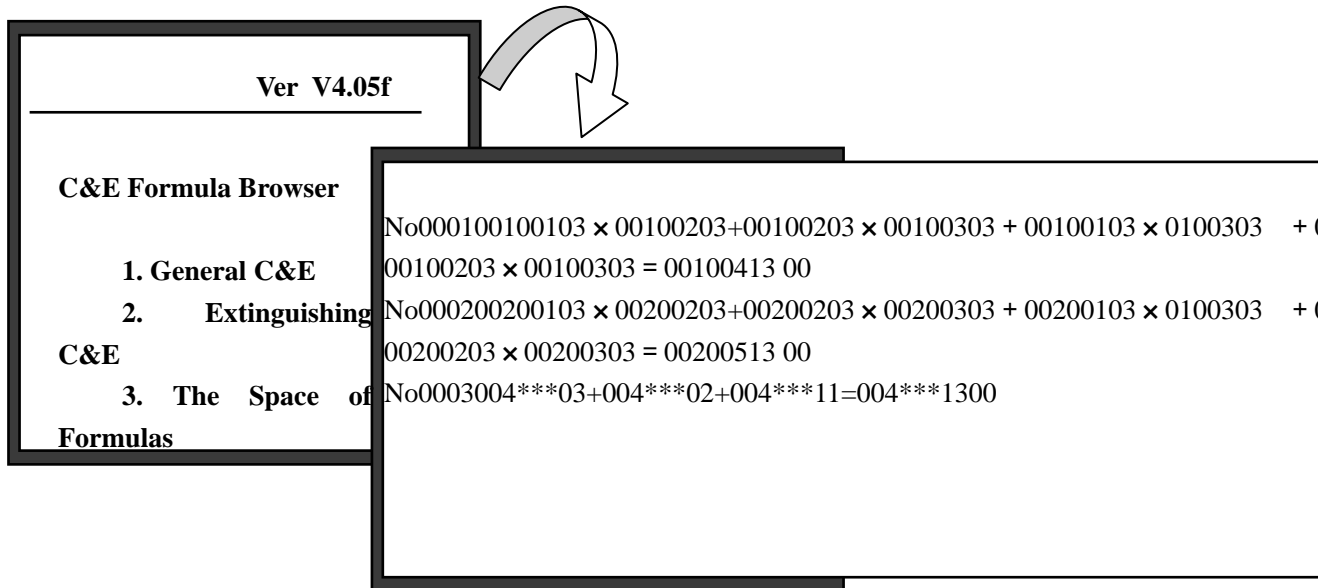
Fig. 4.42

● The part before "　" is the condition and that after it is the result.

● "×" means "and", and "+" means "or".

● No. 0001 represents the first C&E formula.

● A condition is composed of the following items:

001 001 03

           → Device type

       → Device address

   → Zone number of the device
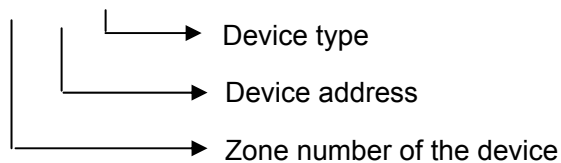
● A result is composed of the following items.

001 004 13 00

              → Delay time

          → Device type

      → Device address

   → Zone number of the device
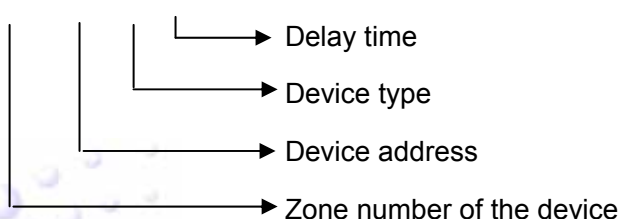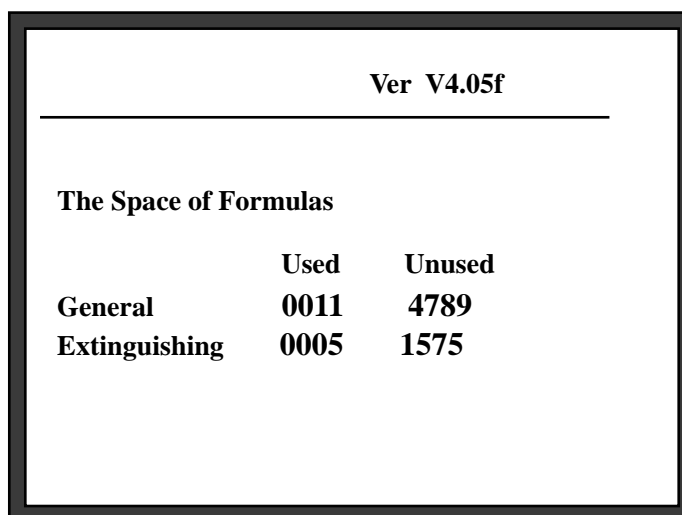
● Description of the third formula

No0003004***03+004***02+004***11=004***1300

This formula includes fuzzy devices. Asterisk wildcard "*" represents any figure from 0
9. In this formula, any optical detector, or any rate of rise heat detector or any MCP in
zone 4 alarms fire, the sounder strobe of the zone will be initiated at once.

Step Three: Browsing space allocation of C&E formula.

Press 3 to search space allocation of C&E formula. See Fig. 4.43.

Ver V4.05f

The Space of Formulas

	Used	Unused
General	**0011**	**4789**
Extinguishing	**0005**	**1575**

Fig. 4.43

4.8 Field Devices Commission

After connection of cables, definition and download of device and C&E formulas, you
can power up the control panel and start commission. The following steps are for
reference.

1. Enter commission state according to Section 4.5

2. Check whether the loop devices registered are the same as real connection. If
   most of devices are found missing, check the power supply and loop isolators
   first, then come to individual device. Press "SELF TEST" key to check field
   device registration.

3. Check whether registration of repeater panels is the same as the actual. If
   there is any problem, check the communication wires of A / B and 24V power
   supply.

4. Label the ZCP and fireman's control panel (FCP) at the right places.

5. Carry out detector alarming test and repeater panel transmitting test.

6. Check device definition and execute C and E automatic linkage test.

7. Connect important devices (such as gas extinguishing control panel) and train
   the operators.

Chapter 5 Display and Disposal of System Information

GST5000 can be started after mounting according to Section IV.

5.1 Normal Information

Turn on the external power switch, and main and standby power switch on the control panel, the control panel executes self-test and enters monitoring state. The system displays properly if it is in normal state, or the system displays improperly.

The normal display is shown in Fig. 5.1, which means the system is in working state. Then only "**POWER HEALTHY**" LED is lit.

<div style="border:2px solid black; padding:1em;">

Ver V4.05f

System running

</div>
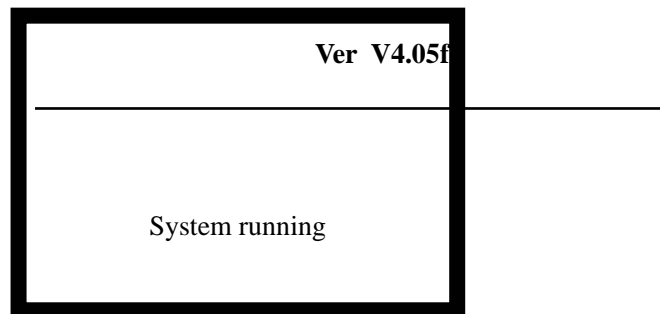
Fig. 5.1

5.2 Information of Fire Alarm

5.2.1 Fire Alarm Screen

"FIRE" LED is lit when there is fire alarm signal. Speaker of the control panel sounds (fire truck sound), and corresponding "FIRE" LED on the ZCP is also lit. There are two options for "**FIRE**" display, by zone and by device. In zone mode, only the 1st alarm in the same zone is displayed. All alarms will be displayed in device mode. Device mode is usually used for commission.

The zone mode "**FIRE**" information shows in Fig. 5.2.

```
        Last Fire    16:34 Zone001
   6 FLOOR GREEN HOUSE
   !Fire! total 008
   002 16:34 zone 001
   1 FLOOR COOKROOM
   003 16:34 zone 002
   2 FLOOR DINING ROOM
   004 16:34 zone 006
   3 FLOOR LIBINGROOM
   005 16:34 zone 005
   4 FLOOR BATHRROOM

   Press Enter toSelect an Item
```
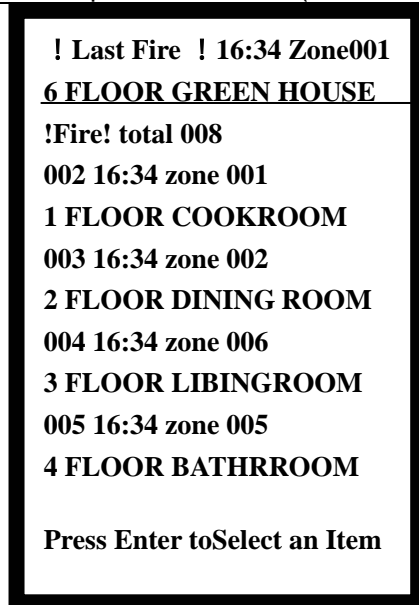
Fig. 5.2

Description:

Last Fire 16:34 Zone001

6 FLOOR GREEN HOUSE //This is the last alarm. It happens in Zone001, at 16:34, the location is the GREEN HOUSE on the 6th floor.

Each fire alarm message occupies two lines. You can view different fire message by pressing " " and " ".

!Fire! total 008 //Total alarms.

002 16:34 zone 001 //Time and zone of the second fire alarm

1 FLOOR COOKROOM //Zone definition (first 8 digits) and device definition (last 32 digits)

003 16:34 zone 002// Time and zone of the third fire alarm

2 FLOOR DINING ROOM// Zone definition (first 8 digits) and device definition (last 32 digits)

004 16:34 zone 006// Time and zone of the forth fire alarm

3 FLOOR LIBINGROOM// Zone definition (first 8 digits) and device definition (last 32 digits)

005 16:34 zone 005// Time and zone of the fifth fire alarm

4 FLOOR BATHRROOM // Zone definition (first 8 digits) and device definition (last 32 digits)

Press "Enter" to Select an Item // Press **"ENTER"** to view a fire alarm message.

The device mode "**FIRE**" information shows in Fig. 5.3.

```
   Last Fire     16:34 Zone001
6 FLOOR GREEN HOUSE
!Fire! total 100
002 16:34 zone 001    103 OPTICAL
1 FLOOR COOKROOM
003 16:34 zone 001-101 OPTICAL
1 FLOOR DINING ROOM
004 16:34 zone 002-111 OPTICAL
2 FLOOR LIBINGROOM
005 16:34 zone 003-121 OPTICAL
3 FLOOR LIBINGROOM


Press Enter to Select an Item
```
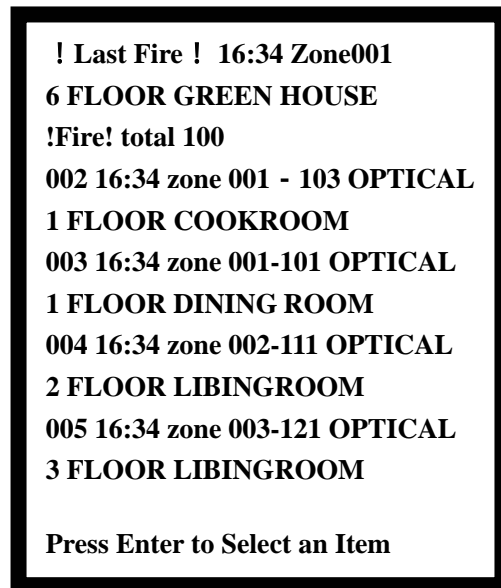
Fig. 5.3

Description of fire alarm screen:

Last Fire 16:34 Zone001

◇ **6 FLOOR GREEN HOUSE //** This is the last alarm. It happens in Zone001, at 16:34, the location is the GREEN HOUSE on the 6th floor.

◇ **!Fire! total 100**// Total alarms.

◇ **002 16:34 zone 001   103 OPTICAL//**Time, zone device address and type of the second fire alarm.

◇ **1 FLOOR COOKROOM//** Zone definition (first 8 digits) and device definition (last 32 digits)

◇ **003 16:34 zone 001-101 OPTICAL//** Time, zone device address and type of the third fire alarm.

◇ **2 FLOOR DINING ROOM//** Zone definition (first 8 digits) and device definition (last 32 digits)

◇ **004 16:34 zone 002-111 OPTICAL/** Time, zone device address and type of the forth fire alarm.

◇ **3 FLOOR LIBINGROOM //** Zone definition (first 8 digits) and device definition (last 32 digits)

◇ **005 16:34 zone 003-121 OPTICAL//** Time, zone device address and type of the

fifth fire alarm.

✧ **4 FLOOR LIBINGROOM //** Zone definition (first 8 digits) and device definition (last 32 digits)

Press Enter to Select an Item //Press **"ENTER"** to view a fire alarm message.

5.2.2 Disposal of Fire Alarm Signal

When fire alarm occurs, first find out the location according to the information shown on the control panel to verify whether the fire really happened.

If it's a real fire, please take corresponding measures.

Step One: Evacuate the people in field.

Step Two: Call the fire department.

Step Three: Initiate extinguishers.

If it is a false alarm, please take the following measures.

Step One: Press "SILENCE" to stop the sound.

Step Two: Remove the factors that caused the false alarm.

Step Three: Press "RESET" to make the control panel back to the normal state. If the device still gives false alarm, isolate it and inform the installer or manufacturer for repair.

5.3 Fault Information

5.3.1 Screen of Fault Information

When there are fault signals, different LEDs can be lit according to fault type. If it is mains fault, "**AC FAULT**" LED will be lit; if it is standby power fault, "**BATTERY FAULT**" LED will be lit; if it is system fault, "**SYSTEM FAULT**" LED will be lit; if it is field device fault, relative LED on the ZCP is lit. Speaker of the control panel gives alarm sound (ambulance sound).

Fault information can only be displayed by device, the screen is shown in Fig. 5.4.

```
                                        Ver V4.05f
 _____

 !FAULT!  Total 100

 001 16:34 zone 002   03 OPTICAL

 1 FLOOR COOKROOM

 002 16:34 zone 002-101 OPTICAL

 1 FLOOR DINING ROOM

 003 16:34 zone 002-111 OPTICAL

 2 FLOOR LIBINGROOM

 Press Enter to Select an Item
```
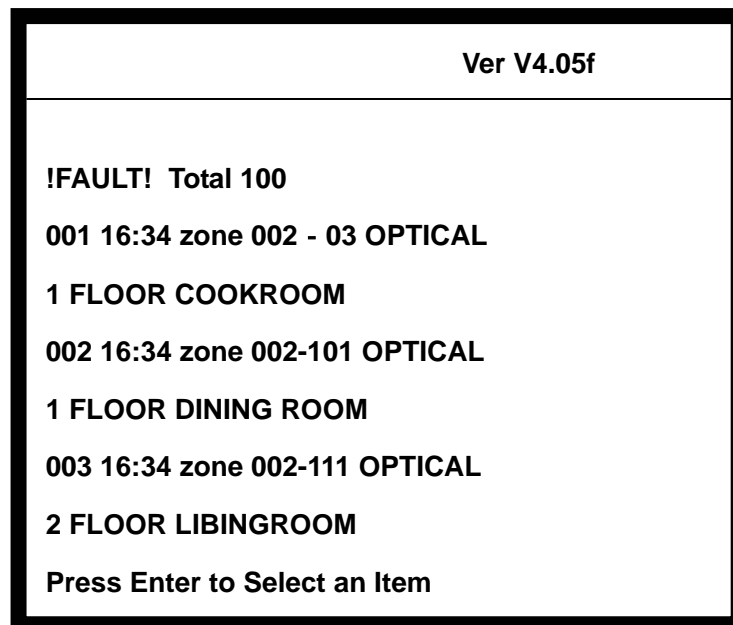
Fig. 5.4

Description of the fault screen:

Each fault message occupies two lines. You can view different fault message by pressing "　" and "　".

◇ **!FAULT! total 100**//Total fault events.

◇ **001 16:34 zone 002　03 OPTICAL//** Time, zone　device address and type of the fault event.

◇ **1 FLOOR COOKROOM//** Zone definition (first 8 digits) and device definition (last 32 digits)

◇ **002 16:34 zone 002-101 OPTICAL//** Time, zone　device address and type of the fault event.

◇ **1 FLOOR DINING ROOM//** Zone definition (first 8 digits) and device definition (last 32 digits)

◇ **003 16:34 zone 002-111 OPTICAL//** Time, zone device address and type of the fault event.

◇ **2 FLOOR LIBINGROOM //** Zone definition (first 8 digits) and device definition (last 32 digits)

5.3.2 Disposal of Fault Information

There are two kinds of fault. One is system fault, for instance, AC power and battery

fault, loop fault. The other is field device fault, like detector fault, module fault etc.

● If it is battery fault, charge storage battery in time to avoid damage. If the battery has powered the system overtime, the control panel will power down for protection.

● If it is system fault, check and repair in time. If power-down is needed, make detailed notes.

● If it is field device fault, prepare it immediately. You can isolate it if the fault can't be cleared for some reason. Then enable it when the device fault is repaired.

5.4 Disable and Enable

5.4.1 Use of Disable/Enable

When some problems happen to the field device, it may be necessary to isolate the device for maintenance, and then de-isolate it after repairing or replacing.

5.4.2 Disable/Enable of Devices

1) Disabling a device

"**Disable**" LED will be lit if the device is isolated.

Pressing "**Disabled**" key, the screen will show as in Fig. 5.5.

```
┌─────────────────────────────────────┐
│                                     │
│             Ver  V4.05f             │
│      ─────────────────────────      │
│                                     │
│                                     │
│                                     │
│            system running           │
│                                     │
│                                     │
│                                     │
│                                     │
│  Disable>  001 Zone 016 Num 03-Optical │
│                                     │
│                                     │
└─────────────────────────────────────┘
```
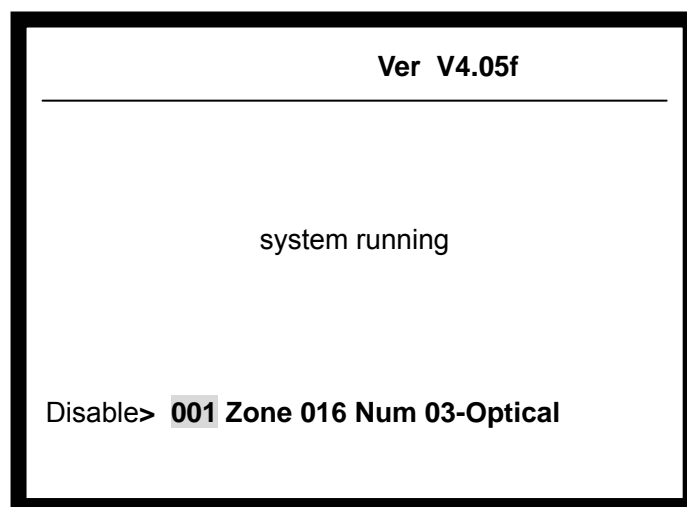
Fig. 5.5

Suppose user code of the optical smoke detector to be isolated is 001016. The operation of isolation should be as follows:

Step One: Input zone number "001" of the device.

Step Two: Press "**TAB**", the highlight position moves to next input zone.

Step Three: Input device code number "016".

Step Four: Referring to "Appendix 2 Device Type List", input the device type "03".

Press "ENTER" to save. If the device has been isolated, the screen will show "Input Err", if not, the screen will add the device to the isolation information.

2) Enabling the device

Pressing "**Enable**", the screen will show like Fig. 5.6.

```
                              Ver  V4.05f
   _____




                        System running

   Enable >  001 Zone 016 Num 03-Optical
```
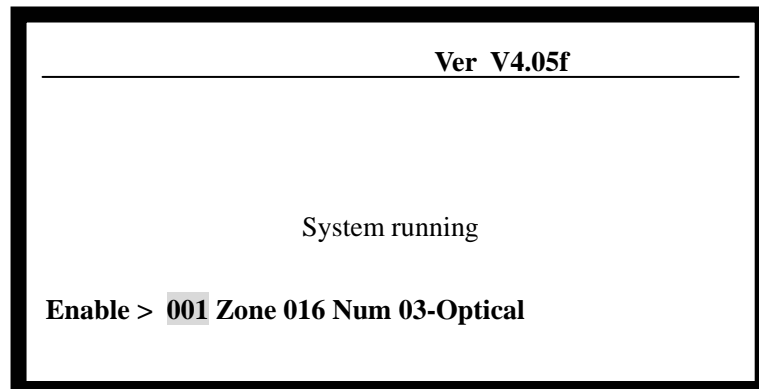
Fig. 5.6

Suppose user code of the optical smoke detector to be enabled is 001016. The operation of isolation should be as follows:

Step One: Input zone number "001" of the device.

Step Two: Press "**TAB**", the highlight position moves to next input zone.

Step Three: Input device code "016".

Step Four: Referring to "Appendix 2 Device Type List", input the device type "03".

Press "ENTER" to save. If the device has been enabled, the isolation information on the screen will disappear. Otherwise "Input Err" will be shown.

5.4.3 Browsing Isolation Information

Pressing "**VIEW ISOLATE**", you can browse isolation information of the device. Pages

are changed by pressing " " and " ". Isolation information can only be displayed by

device mode. The window is shown in Fig. 5.7.

```
   ! DISABLED! total 100

   001 16:34 zone 001-106OPTICAL

   002 16:34 zone 001-103 OPTICAL

   003 16:34 zone 002-101 OPTICAL

   004 16:34 zone 003-121 OPTICAL

   005 16:34 zone 004-141 OPTICAL

   006 16:34 zone 005-155 OPTICAL

   007 16:34 zone 006-166 OPTICAL
```
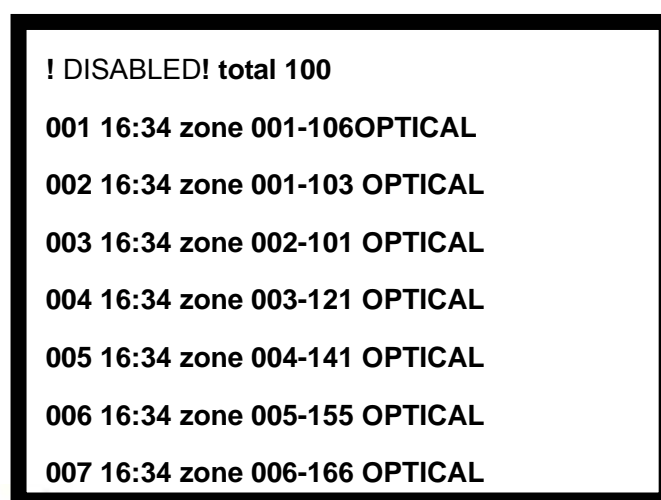
Fig. 5.7

Description of disabled screen:

◇ **!DISABLED! total 100//** Total number of the isolation information

◇ **001 16:34 zone 001   106OPTICAL//** Zone, device address and type of disabled device

◇ **002 16:34 zone 001   103 OPTICAL//** Zone, device address and type of disabled device

◇ **003 16:34 zone 002-101 OPTICAL//** Zone, device address and type of disabled device

◇ **004 16:34 zone 003-121 OPTICAL//** Zone, device address and type of isolated device

5.5 Manual Start and Stop of Loop Devices

When fire alarm is confirmed, you can manually start extinguishing equipment in short time.

5.5.1 "START/STOP" operation through Keyboard on Main Unit

1.   Starting the device

Pressing "START" can start the loop device, and the screen is shown in Fig. 5.8.

Ver V4.05f

start> 001zone 016Num 03 -Undefine
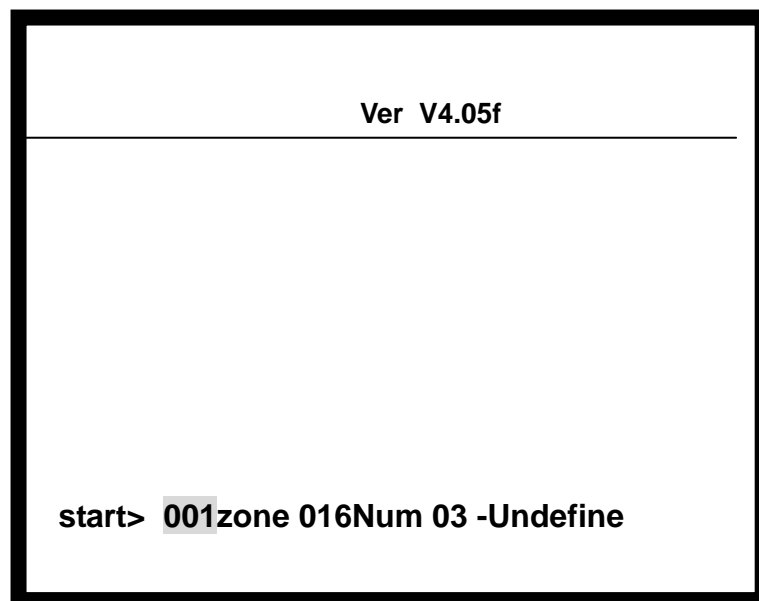
Fig. 5.8

The basic steps are as follows:

Step One: Input the user code of the device to start.

Step Two: Pressing "TAB", device type is highlighted.

Step Three: Input the device type referring to "Appendix 2 Device Type List".

Step Four: Pressing "ENTER", the control panel gives start command.

After the device is started,"**PLANT CONTROL**" LED and Action indicator on the ZCP will be lit.

2. Stopping loop device

Pressing "STOP" can stop loop device. The screen is shown in Fig. 5.9.

```
                         Ver  V4.05f
     _____




















     stop>  001zone 016Num 03 -Undefine
```
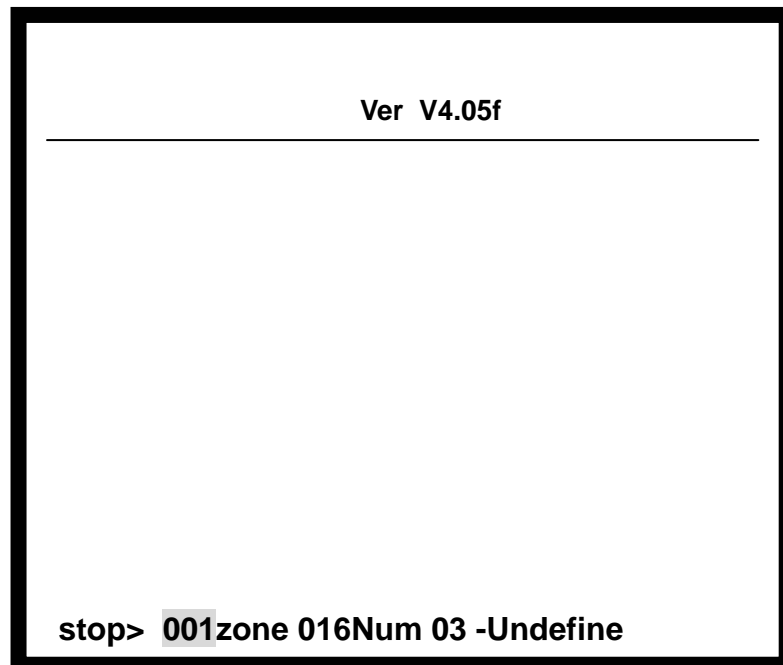
Fig. 5.9

Basic steps are as follows:

Step One: Input the user code of the device to stop.

Step Two: Pressing "TAB", device type is highlighted.

Step Three: Input the device type referring to "Appendix 2 Device Type List".

Step Four: Pressing "ENTER", the control panel gives stop command.

After the device is stopped,"**PLANT CONTROL**" LED and Action indicator on the ZCP will be off.

5.5.2 Operation of the Devices by ZCP

According to definition of the ZCP, press the key corresponding to the device, and input the password by system indication, you can start the device. Corresponding command LED of the key is lit. Press the key and input password again, you can stop the device, and the command LED turns off.

5.5.3 Browsing Start Information

Pressing "VIEW PLANT", you can browse the start information and change pages

through " " and " . Start information is only shown by device mode, and its screen is

like in Fig. 5.10.

```
!ACTION! total 100

001 16:34 zone 002-03 OPTICAL

1 FLOOR COOKROOM

002 16:34 zone 002-101 OPTICAL

1 FLOOR DINING ROOM

003 16:34 zone 002-111 OPTICAL

2 FLOOR LIBINGROOM




Press Enter toSelect an Item
```
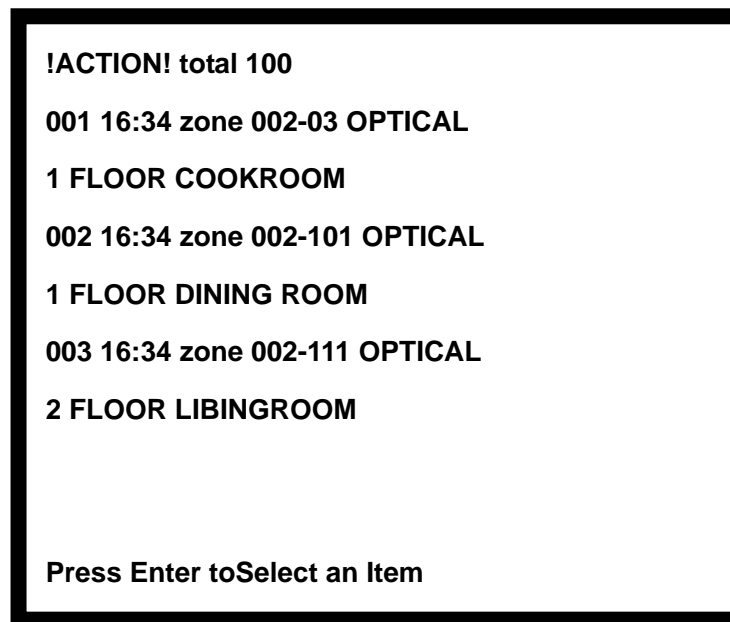
Fig. 5.10

Description of action information:

 ✧ **! ACTION! total 100**// Total number of action information

 ✧ **001 16:34 zone 002   03 OPTICAL//** Time, zone, device address and type of the
   action

 ✧ **1 FLOOR COOKROOM//** Zone definition (first 8 digits) and device, definition (last
   32 digits)

 ✧ **002 16:34 zone 002-101 OPTICAL//** Time, zone, device address and type of the
   action

 ✧ **1 FLOOR DINING ROOM//** Zone definition (first 8 digits) and device definition (last
   32 digits)

 ✧ **003 16:34 zone 002-111 OPTICAL//** Time, zone, device address and type of the
   action

 ✧ **2 FLOOR LIBINGROOM//** Zone definition (first 8 digits) and device definition (last
   32 digits)

5.6 Resetting and Silencing of the System

First silencing the sound, then pressing "**RESET**" can turn off all the control modules,
local outputs and all the detectors without changing the device isolation state. LCD
displays information of "**RESET IN SYSTEM**". LEDs will be turned off   Except for
"**POWER HEALTHY**", "**SECURITY MODE**", "**EXTINGUISHING SYSTEM PERMIT**"
LEDs   . "**RESET**" information will be written into running log. If there are still some fire
alarm fault and action information not acknowledged after pressing the "**RESET**" key,
the control panel will remain relative sound indications. If all information has been

acknowledged before pressing "**RESET**" key, the system returns to normal display state.

If the control panel alarms, press "MUTE", you can mute the sound of the speaker. Pressing "**MUTE**" again or if there are new alarms, the speaker will sound again.

5.7 Rules for Information Display

If there are more than one piece of information, they will be displayed in the following order: fire alarm, action, fault, start, isolation.

The earliest fire alarm is displayed in priority. The latest action, fault, isolation information is displayed in priority.

There are zone and loop display modes for fire alarm, fault, and isolation information. And start and action only has loop display mode.

In any display mode, the system will return to displaying of the highest priority if there is no operations within 20s (15s 30s).

5.8 Rules for Sound Indication

When there is fire alarm or fault, the speaker of the control panel will give the corresponding sound to indicate.

✧ The FACP gives fire truck sound when fire alarm occurs.

✧ The FACP gives action sound when any device is activated.

Module action: ——slow "tick" sound.

Gas extinguishing device action —— police car sound

Delay activation of devices by automatic C&E linkage—— quick "tick" sound.

✧ The FACP gives ambulance sound when fault occurs.

The control panel will give sound of higher priority if two types of information occur simultaneously. Pressing "**MUTE**" can stop the sound; pressing "**MUTE**" again, the control panel is still in mute state. It will sound by priority when new event appears.

Chapter 6 Description of System Operating

6.1 Keyboard

6.1.1 Functions

Most of the keys have double functions. Upper mark is a character and lower mark is command function that is only activated in monitoring state. Most function keys are controlled by password. The characters are only active after entering the menu.

6.1.2 Common Method of Data Input

There is a highlighted area indicating the current position and range of data input. Press

a character key, the highlight and original characters disappear and input from that character. Move the highlight tab to any position for modification by pressing " " or " ".

Press "**TAB**", the edited text is stored and the highlight moves to the next position and returns to the first after the last position. Wherever the cursor is, Press "**ENTER**" key, all the input data will be saved; press "**ESC**" to exit present editing state without saving.

6.1.3 Method of Browsing Information

Entering browsing state, press " " and " "to scroll for information.

Press "**ENTER**", the top piece of information becomes highlighted and the system enters information selection state. Press " **TAB**" and exit highlight state.

In selecting state, press " " and " " to select highlight tab.

Press "**ENTER**" to print the information or display details of the information. Press "**ESC**" to exit to former menu or normal operation screen.

6.1.4 Keyboard Unlock and Lock

The control panel is defaulted as key-locked in initiation. A password needs to be input if you operate any of the function keys (except for "**SELF TEST**", "**MUTE**"**,** "**LOG**"**,** "**VIEW FIRE**"**,** "**VIEW FAULT**"**,** "**VIEW ISOLATE**" and "**VIEW PLANT**") (see Fig.6-1). Input correct password and press "**Enter**" to continue operation. After one minute without operation, the keys are automatically locked.

Ver V4.05f

Password 1-8 digits

Enter password****
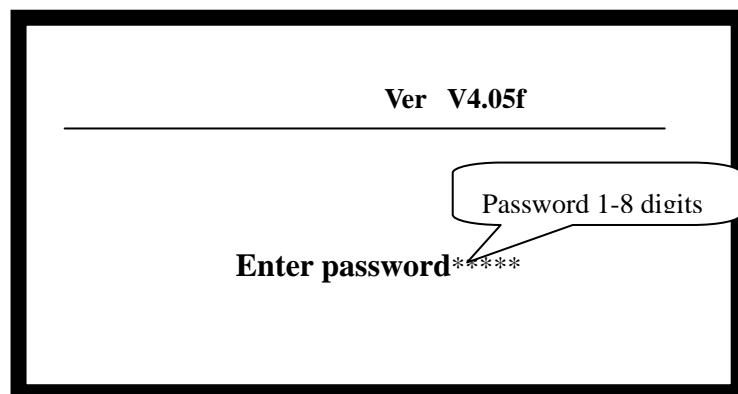
Fig. 6.1

6.2 User Operation Instruction

6.2.1 Changing time display

The clock is usually displayed in hour and minute (time mode) by the digitron on the panel. In normal monitoring state, press "**TAB**", month and day (date mode) are displayed. Press "**TAB**" again or after a minute, time mode is displayed again.

6.2.2 Browsing history records

Press "**LOG**", the system enters history information screen. Each piece of information

includes the event time, 6-digit user number, event type and abstract of the event.

6-digit user number   If the event refers to an addressable device, the first 3 digits show zone number, the following 3 digits show the user code in this zone. If the information is about loop or bus, this number will be the loop or bus number.

Device type   It shows the device type for device information or the operation type for system operation.

Abstract: Provides a brief instruction for the events, such as fire, initiation, action, fault, stop, isolation, de-isolation, action reset, set and operation etc.

Press **ENTER** key to highlight an information, press " " and " " to scroll up and down. Press "**ENTER**" again to print the highlighted information. See Fig. 6.2.

History

12//06//10:45	000000	CRTFault
12//06//10:40	000000	Reset
12//06//10:37	000000	AC Fault
12//06//10:28	000000	AC Fault
12//06//10:20	010032	CableDet
12//06//10:11	010056	HR Pump
12//06//10:05	020011	Sounder
12//06//10:01	030124	Heat Det

Press Enter to select an it

History

12//06//10:45	000000	CRTFault	Fault
12//06//10:40	000000	Reset	
12//06//10:37	000000	AC RCL	Back
12//06//10:28	000000	AC Fault	Fault
12//06//10:20	010032	CableDet	Fire
12//06//10:11	010056	HR Pump	Start
12//06//10:05	020011	Sounder	Act
12//06//10:01	030124	Heat Det	Fire

Press ENTER to print Highlight item

Fig. 6.2

6.3 Instructions for System Operator

6.3.1 Self Test

In normal monitoring state, pressing "**SELF TEST**", you can check all the audio and visual components.

6.3.2 Printer Setting

The printer can be set to 3 modes. Press "**PRINT**" (needing password when the control panel in key-locked state) in monitor state, the system is in the screen shown in Fig.6.3.

```
                        Ver V4.05f
    ─────────────────────────────────────────



    Print mode setup
         ☞ 1.  Disable

              2.  History

              3.  Only fire
```
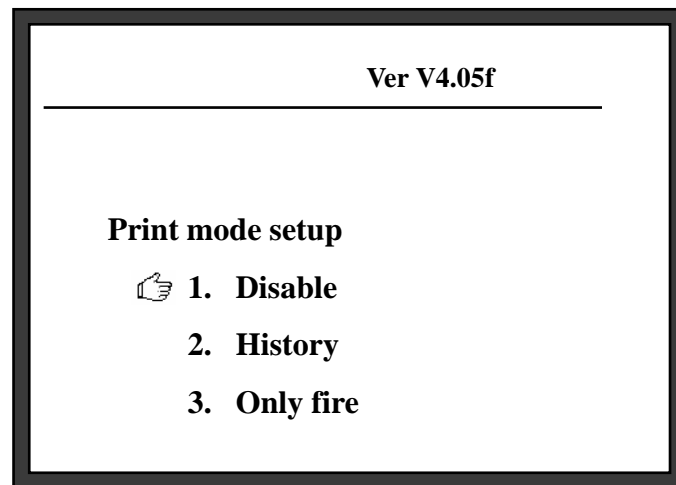
Fig. 6.3

Press " " and " " to select 1, 2 or 3 and press "**ENTER**" to choose different system printing mode:

1. Disable printing

2. Print history events

3. Only print fire records

6.3.3 Security Mode

Press "**SECURITY MODE**" (needing password when the control panel in key-locked state), the system will get into security mode setting. See Fig. 6.4.

```
                      Ver  V4.05f
    ─────────────────────────────────────



    Security Mode
              1.   Disable
         ☞    2.   Enable
```
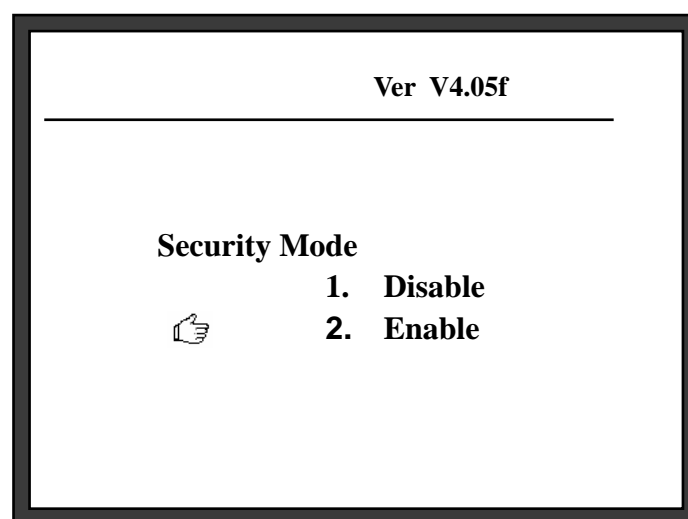
Fig. 6.4

The system can be set as security enable and disable mode under this screen. In

enable mode, the security alarm function is enabled to monitor the protected area by security detectors, and "**SECURITY MODE**" indicator is lit.

6.3.4 Extinguishing Mode

Press "**EXTINGUISHING MODE**", the system enters gas extinguishing mode. See Fig. 6.5.

```
                        Ver  V4.05f
        _____


                Extinguishing System Mode
                    ☞   1.    Disable
                        2.    Enable




```
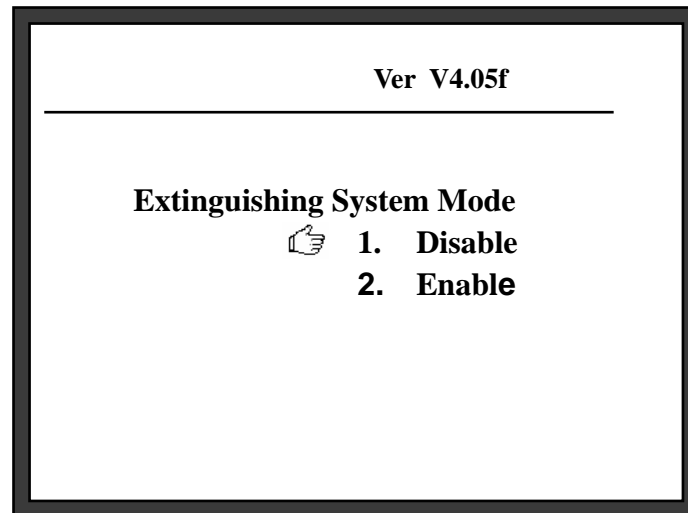
Fig. 6.5

Select one from the options of "**Enable**" and "**Disable**" gas release function. If it is in "**Enable**" mode, the "**EXTINGUISHING SYSTEM PERMIT**" indicator will be lit, the gas release device can be started manually or automatically.

6.3.5 Modification of time

In monitoring state, press "**CLOCK**" (needing password when the control panel in key-locked state), the screen will display as in Fig. 6.6. Input the time in the highlight area and then press "**TAB**" to move the highlight to next position. Press "**ENTER**" to confirm.

```
                        Ver  V4.05f
        _____




                    System running


        Modify system time
        Enter time:2001//12//06    16:19
```
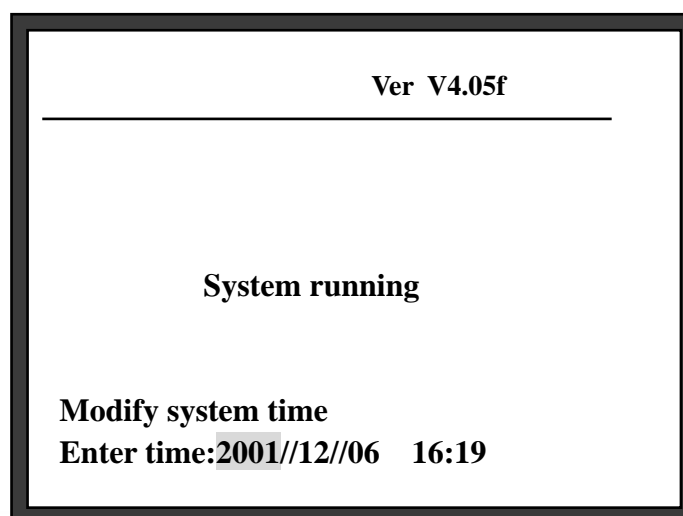
Fig. 6.6

6.4 Instructions for System Administrator

Press "**SYSTEM**" to enter system setup menu. This menu contains password setting and other functions for commissioning, including "Modify password", "Communicate setup", "Working state setup", "Fire display mode", "Zone browser", "C&E browser" and "Monitoring device". See Fig. 6.7.

```
                         Ver  V4.05f
    ───────────────────────────────────────────
    System setup
    1.  Modify password
    2.  Communicate setup
    3.  Working state setup
    4.  Fire display mode
    5.  Zone browse
    6.  C&E browse
    7.  Monitoring Device
```
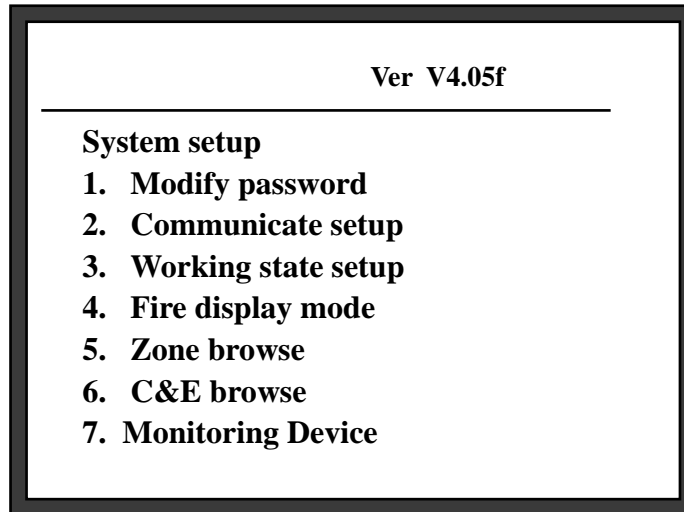
Fig. 6.7

6.4.1 Password Modification

1.   Access level

After the function keys (except for "**SELF TEST**", "**MUTE**", "**LOG**", "**VIEW FIRE**", "**VIEW FAULT**", "**VIEW ISOLATE**" and "**VIEW PLANT**") are pressed, the system will display a screen requiring a password. Only after the correct password is input can a further operation be done.

User password: for print setting, clock setting, security mode setting, start/stop, isolate, de-isolate and the operation on ZCP and control panel reset.

Gas extinguishing control password: for gas release enable control.

System password: Entering "**SYSTEM**" menu for setting of system state and data.

Higher-level password can substitute for lower-level password. System password must be entered for system operation. It becomes invalid on exit after certain operations are finished. Input password for other operations.

2.   Password Modification

In system setup menu like Fig. 6.7, Select the first item "**Modify password**", the screen will display the three levels of password. See Fig. 6.8.

```
                            Ver  V4.05f
        ────────────────────────────────────────────


        Modify password


                1.  User Password
                2.  Extinguishing Password
                3.  System Password
```
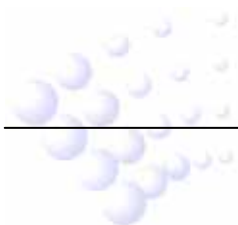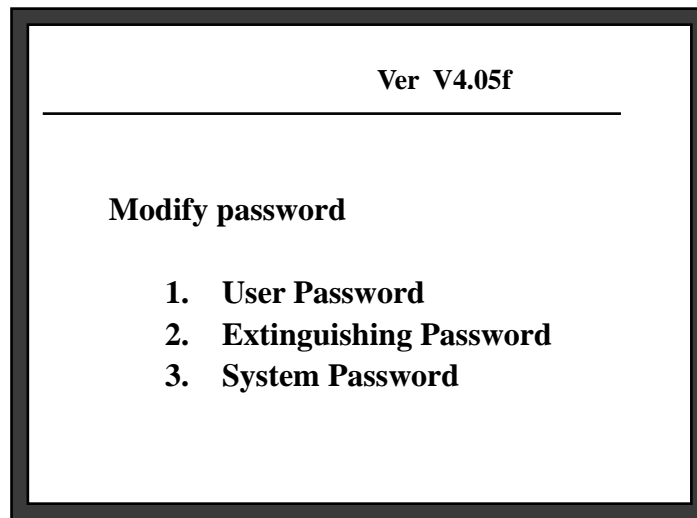
Fig. 6.8

Select the password to be modified, the screen will prompt to enter the old password. Input the password and press "**ENTER**". If the password is correct, the screen will prompt to input the new password (Fig.6.9). If the password is wrong, the system will exit current operation.

```
                            Ver  V4.05f
        ────────────────────────────────────────────

                                        ┌──────────────┐
                                        │  1-8 digits  │
                                        └──────────────┘

        Enter new password        *****
```
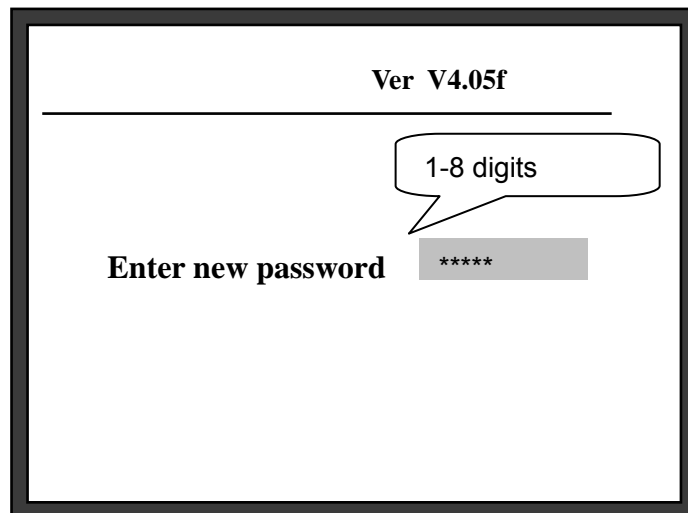
Fig. 6.9

Enter new password and press "**ENTER**".

To prevent mistake, the control panel requires entering the new password again (Fig. 6.10).

If you typed the same password twice, the screen shows a brief password display with a long 'beep' sound and the system exits current operation, showing the new password has been input successfully. If there are any mistakes, the system will exit current operation without any other prompt and the password will not be changed.

```
                              Ver  V4.05f
    _____

                                          ┌──────────┐
                                          │ Repeat   │
                                          │ new      │
                                          └────┐ ┌───┘
        Enter new password                    ▼▼
        Confirm password            ┌──────────────────┐
                                    │ *****            │
                                    └──────────────────┘
```
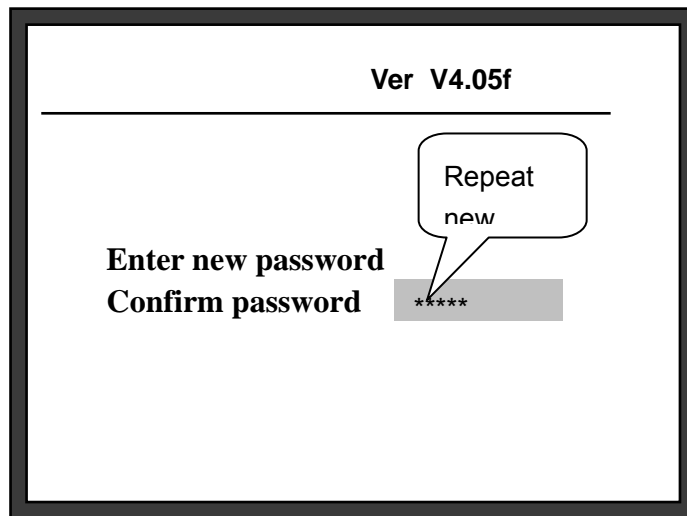
Fig. 6.10

6.4.2 Communication Setting

In system setup menu shown in Fig. 6.7, select the second item "**Communicate setup**", you can enter communication setting menu. See Fig. 6.11.

```
                              Ver  V4.05f
    _____



        Communicate setup

            1.   Color CRT
            2.   Remote Telephone Network
            3.   Network Setup


```
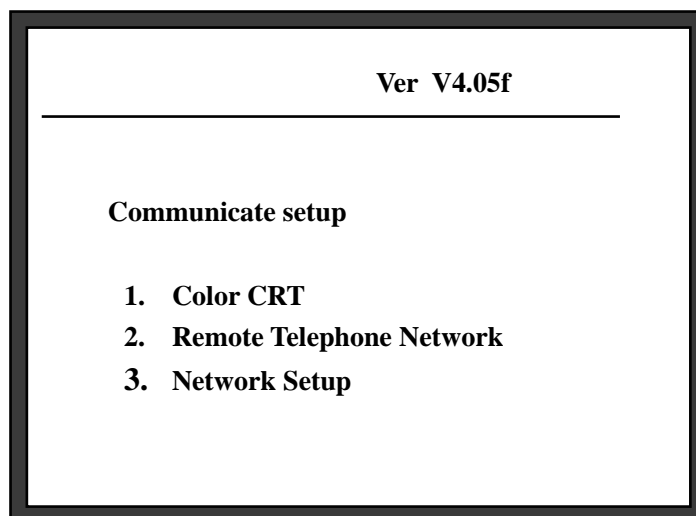
Fig. 6.11

Inputting 1 is to set CRT system.

Inputting 2 is to set remote telephone network system.

Inputting 3 is to set network system.

6.4.3 Working State Setting

In system setup menu in Fig. 6.7, select 3 "**Working state setup**". (Fig.6.12):

.

```
                              Ver  V4.05f
    _____


        Working state setup
    👉  1.  Monitoring State
            2.  Commissioning State
```
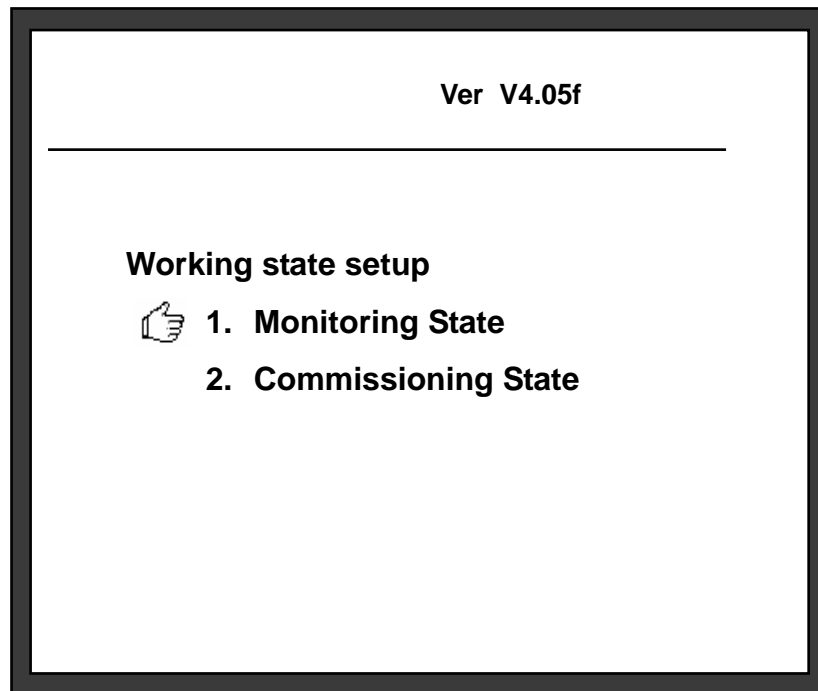
Fig. 6.12

Inputting 1, the system enters monitoring state.

Inputting 2, the system enters commissioning state.

6.4.4 Fire Display Mode

Select 4 "**Fire display mode**" under system setup menu, the screen shows as in Fig. 6.13.

```
                          Ver  V4.05f
    _____

    Display Mode

    👉 1.By Point
       2.By Zone
```

Fig. 6.13

Inputting 1, fire information will be displayed by device.

Inputting 2, fire information will be displayed by zone.

6.4.5 Zone Browser

Refer to section 4.6.3

6.4.6 Formula Browser

Refer to section 4.7

6.4.7 Browsing supervisory data of addressable devices

In the system setup menu Fig. 6.7, choose item 7 "**Monitoring Device**", enter setting mode of fire display. See Fig. 6.14.

```
┌──────────────────────────────────────────┐
│                                          │
│               Ver  V4.05f                │
│   ────────────────────────────────────   │
│                                          │
│                                          │
│             Monitoring Device            │
│                                          │
│ Channel NO:                              │
│                                          │
│ Code:                                    │
│                                          │
│ Command:                                 │
│                                          │
│ Alternation:                             │
│                                          │
│                                          │
└──────────────────────────────────────────┘
```
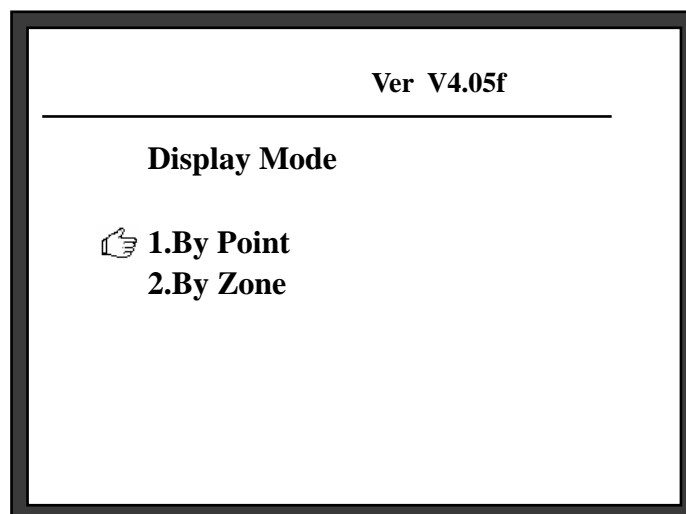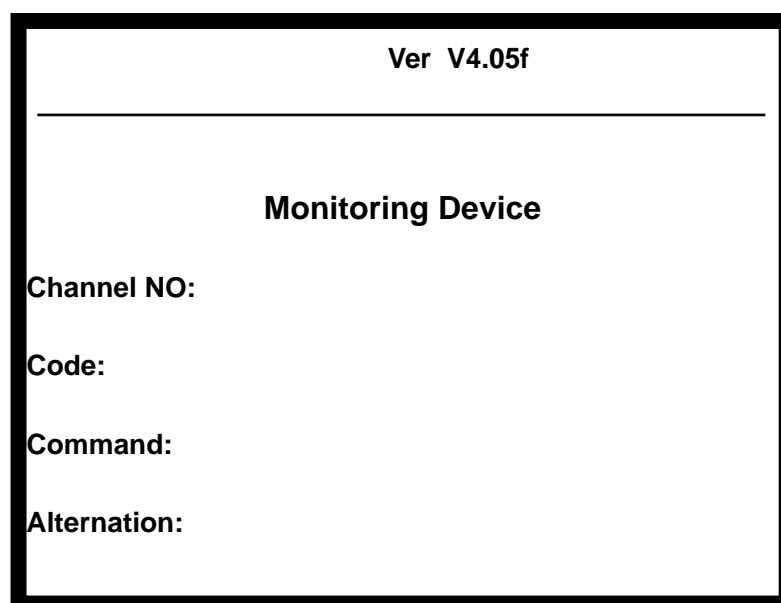
Fig. 6.14

Input loop number (Channel NO), code, command, intervals between two commands (Alternation).

In the Item of "Command" of the above screen, inputting different number represents different command. Details are as follows:

◇ "0 " represents "polling": Display value in "450 650" is normal; display value in "900 1200" is fire alarm; display value in "0 120" is fault.

◇ "1" presents "register": If display value is 720, it is normal.

◇ "2" represents "viewing dynamic data": It can read data of detectors in real time. It monitors commissioning state of I-9105 Intelligent Beam Detector, if the return value is between "680 750", it means the commission is successful.

◇ "3" represents "viewing static data".

◇ "4" represents "immediate start of gas extinguishing devices". If the command of "Turn on gas release 24V", gas-extinguishing devices will be started at once. Please be cautious with this operation.

✧ "5" represents "delay start of gas extinguishing devices". If the command of "Turn on gas release 24V", gas-extinguishing devices will be started after a delay of 30s. Please be cautious with this operation.

✧ "6" represents the command of "Turn on gas release 24V". Please be cautious with this operation.

✧ "7" represents "start ordinary module", which will cause output of corresponding modules. Please be cautious with this operation.

Chapter 7 Commissioning Functions

The commission mode is set for system commissioning, including registering devices, loop card isolation and detector searching functions.

NOTE: Under commission mode, all the registering information will not be saved. When the control panel is restarted, the missed or damaged devices will not be reported. These functions are only for commissioning.

7.1 Getting into Commission Mode

Enter system setup menu (Fig. 6.7), select "3.Working state setup" (Fig. 7.1):

```
                      Ver  V4.05f
            _____


        Working state setup
                 1.   Monitoring State
          ☞ 2.   Commissioning State



```
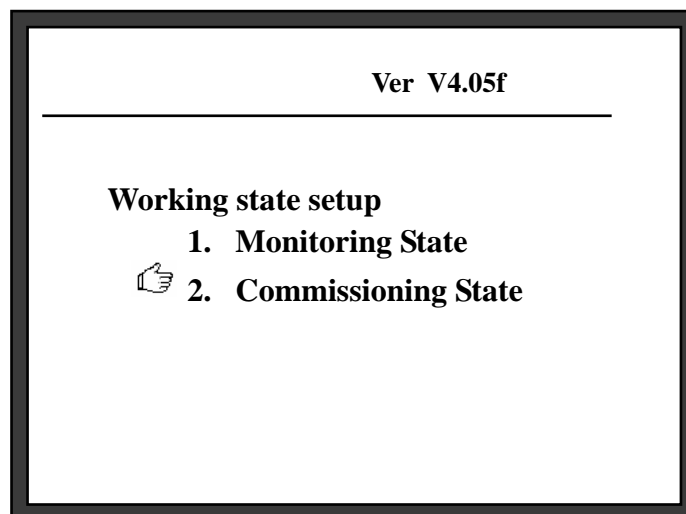
Fig. 7.1

Press " " and " ", select 2 "**Commissioning State**", confirm to enter commissioning state, an "**Installer**" will appear on top of the screen. The screen shows as in Fig. 7.2.

```
                                    Installer Ver 1.5
    ─────────────────────────────────────────────




                          System running



```
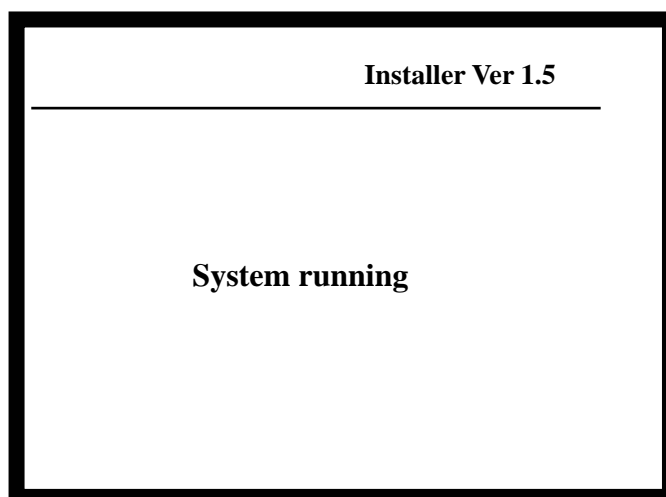
Fig. 7.2

Restart the control panel in this mode, it will register all devices again.

7.2 Exiting Commission Mode

Get into the screen in Fig. 7.1 and select 1 "**Monitoring State**", it will exit commission mode.

7.3 Registration at Any Time

In commission state, pressing "**SELF TEST**", the control panel will automatically register all the devices again and display the information on the screen without affecting other information.

7.4 Loop Card Isolation

In commission mode, the loop cards can be isolated with the same method as detectors. The device type is 59. The user number is the loop number.

The isolated loop will stop bus output and stop the communication with the main board.

Enable to clear isolation to the loop card.

7.5 Detector Searching

Under Commission Mode, the detectors can be forced into alarming state by keyboard operation. It will be easy to find the location of a specified detector and test the transmission function of communication part.

The operation is the same as starting a module.

7.6 Protection of C&E Formulas

There is a three-foot setting pin on the control panel main board, put its jumper at LEWR end when setting up, modifying or deleting a cause and effect formula. After system commission, you must put it at LDWRProtect end to protect the C&E formulas.

Chapter 8 Troubleshooting and Regular Checks

8.1 General Fault Treatment

Table 1

No.	Fault	Reason	Solution
1	No display or abnormal display	a. Abnormal power supply. a. The connection with the display board is loose.	1. Check +24 power supply. 2. Check the display connection cable
2	"AC Fault" is displayed when powered up	1. No AC power supply. 2. AC fuse blown	1. Check mains supply 2. Change the fuse (refer to the label for specification)
3	"Battery Fault" is displayed when powered up	1. The fuse is blown. 2. Loose connection. 3. The batteries are deficient in voltage or damaged.	1. Change the fuse (refer to the label for specification) 2. Open the cover of the power box and check relative connection parts. 3. Power up with AC power supply of over 8 hours, if the fault still exists, replace the batteries.
4	The loop cards can't be registered correctly.	1. The loop cards are not inserted correctly. 2. The addresses of loop cards are wrongly set.	1. Check and insert correctly. 2. Check addresses of the loop cards.
5	The display panel can't be registered	The communication cable is not connected correctly	Check the cables for the display panel
6	Not printing	1. Print mode isn't set. 2. Printer cable is not connected well. 3. Printer is broken.	1. Set the print mode. 2. Check and connect it well. 3. Replace the printer.
7	When pressing a key on zone indication panel, it doesn't respond.	1. Manual disable mode 2. The cable of the zone indication panel is not connected well.	1. Set manual enable mode. 2. Check the cable and connect it well.
8	Device fault	1. The cable is broken. 2. The device is damaged.	1. Check cable. 2. Replace the device.
9	Loop fault	Loop is shorted or broken	Check the cable
10	Clock fault, memory fault, loop fault etc.	1. Environment Interference 2. Corresponding parts are ageing.	1. Check whether ground is properly connected. 2. Inform GST.

8.2 Regular Checks and Replacement

The device should be checked regularly:

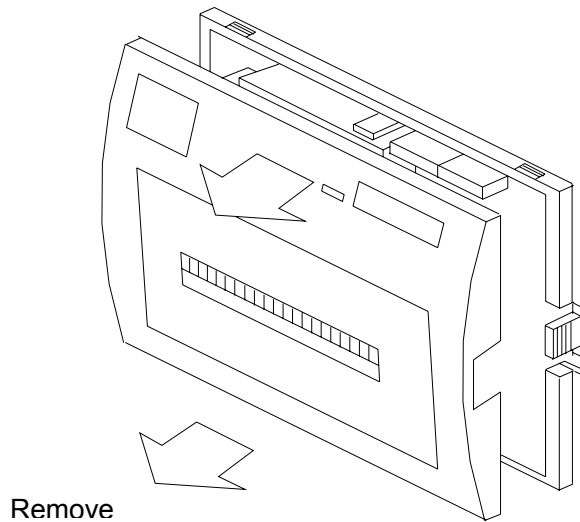1. The print paper should be replaced as required prior to running out.

Remove

Fig. 8.1

1) Remove the printer front cover as shown in Fig.8.1.

2) Remove the whole printer from the panel. Please nip the movable tongues on the two sides with fingers according to Fig.8.2, remove the whole printer from the panel gently. **Note: Before removing the printer, make sure to turn off the power to the printer.**
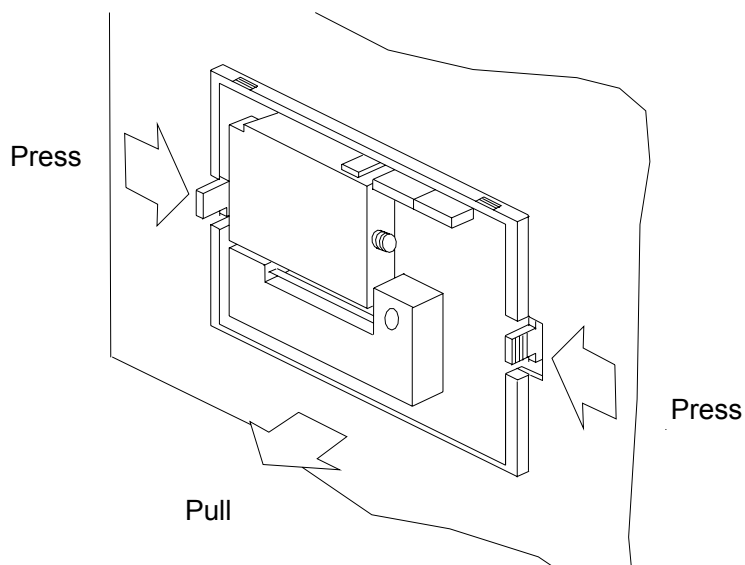
Press

Press

Pull
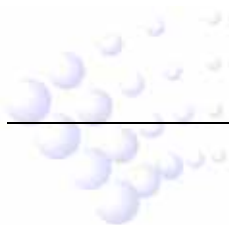
Fig.8.2

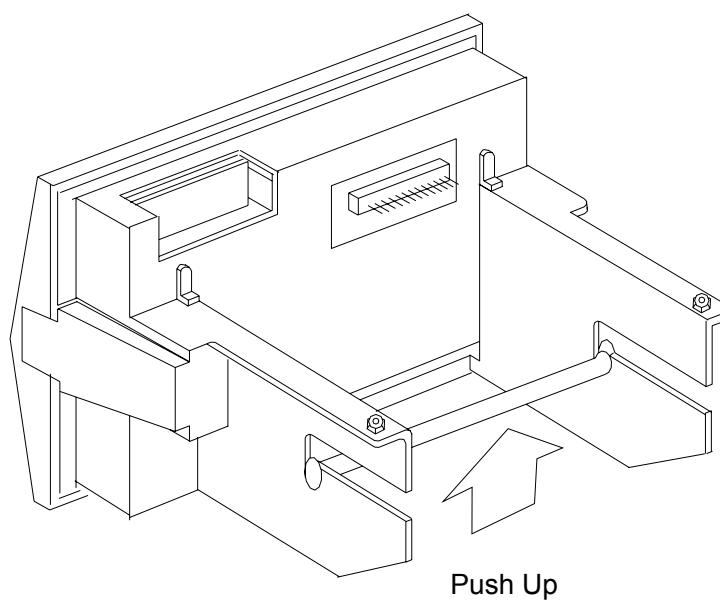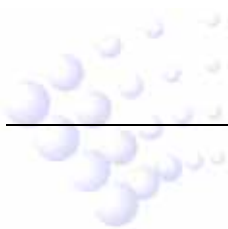3) Remove the scroll spindle (Fig. 8.3).

Push Up

Fig. 8.3

4) Put the new scroll on the spindle. And press the scroll spindle into the groove of the printer as in Fig. 8.4. Make sure the scroll spindle is installed firmly.

Push down

Fig. 8.4

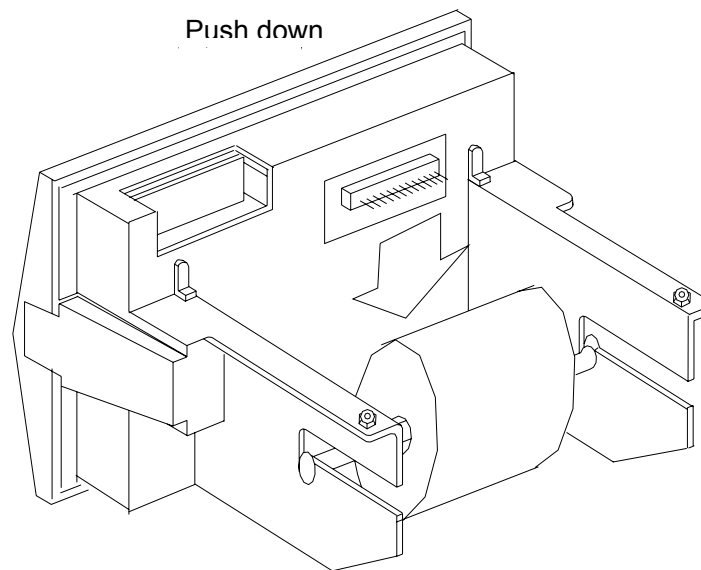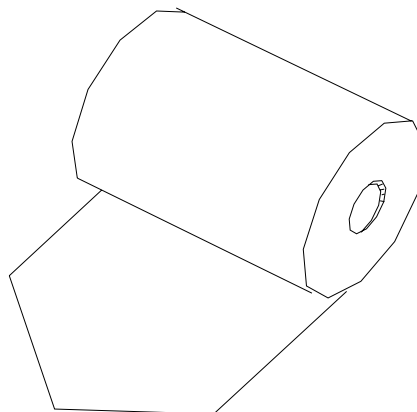5) Cut the end of the paper according to Fig.8.5.

Fig. 8.5

6) Turn on the power of the printer. Press "SEL" key to turn off the "SEL" light. Then press LF to move the head. Feed the paper through by hand, the paper will enter slowly until it appears in front of the head. Feed through a suitable length of paper. Press LF or SEL again, or turn off the power. Replace the front cover of the printer. Feed the

paper through the paper slot.

7) Press the printer into the control panel gently.

8) If, according to engineering configuration, the back of the control panel display part is not covered by other structures, it is easier to take the paper from the back. Replacement of paper can be carried out according to steps 3), 4), 5) and 6).
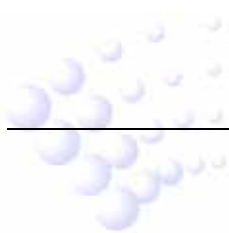
2. The background light of the LCD has a life range. When any problem is found in its brightness, please inform GST.

Chapter 9 Calculation of Battery Capacity

The formula for calculating battery capacity of GST5000 is as follows:

Battery Capacity   AH   =0.84× T   0.03× N+3.5

In which N is the number of detectors, and T is the time of operation in supervisory state.

Appendix 1   Internal Wirings

1. GST5000 Wall Mounted
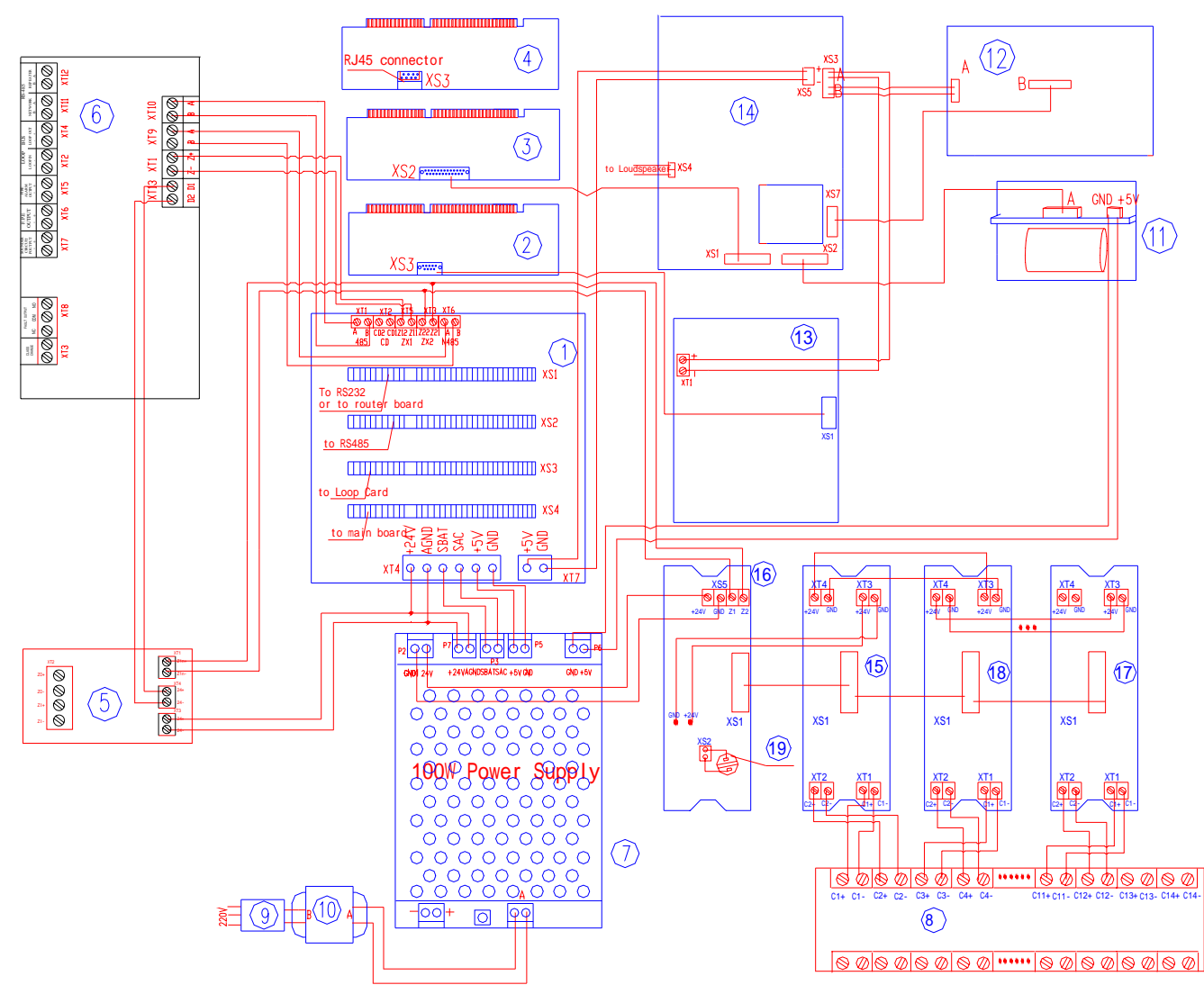
Number	Name	Number	Name	Number	Name	Number	Name
1	Motherboard	6	Loop interface board	11	Printer	16	Main board of fireman's control panel
2	Loop card	7	100W power	12	LCD	17	Slave board of the last fireman's control panel
3	Main board	8	Filter board	13	Zone indication and manual intervention panel	18	Slave board of fireman's control panel
4	232 communication card	9	Power filter	14	Switch board	19	Manual lock
5	Loop module	10	Transformer	15	Slave board of the first fireman's control panel	20	

2 Rack type and console type FACP
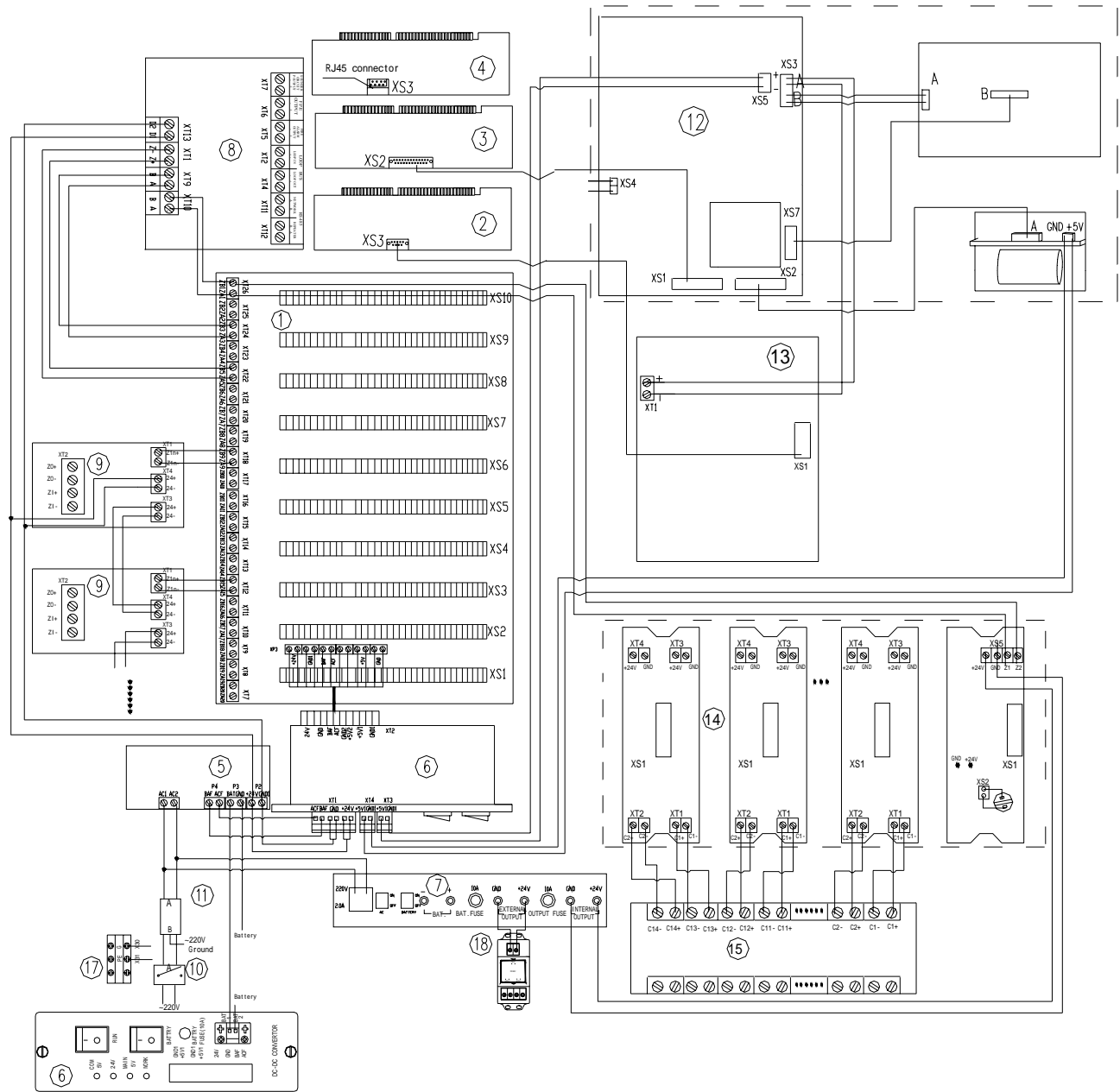
Number	Name	Number	Name	Number	Name	Number	Name
1	Motherboard	6	DC-DC converting module	11	Power filter	16	Power filter
2	Loop card	7	Intelligent PSU	12	Front Panel	17	Wiring board
3	Main board	8	Loop interface board	13	Zone indication and manual intervention panel	18	
4	232 communication board	9	Ring module	14	Fireman's Control Panel	19	
5	AC Power	10	Air switch	15	Filter board of fireman's control panel	20	

Appendix 1: Internal Connection Diagram
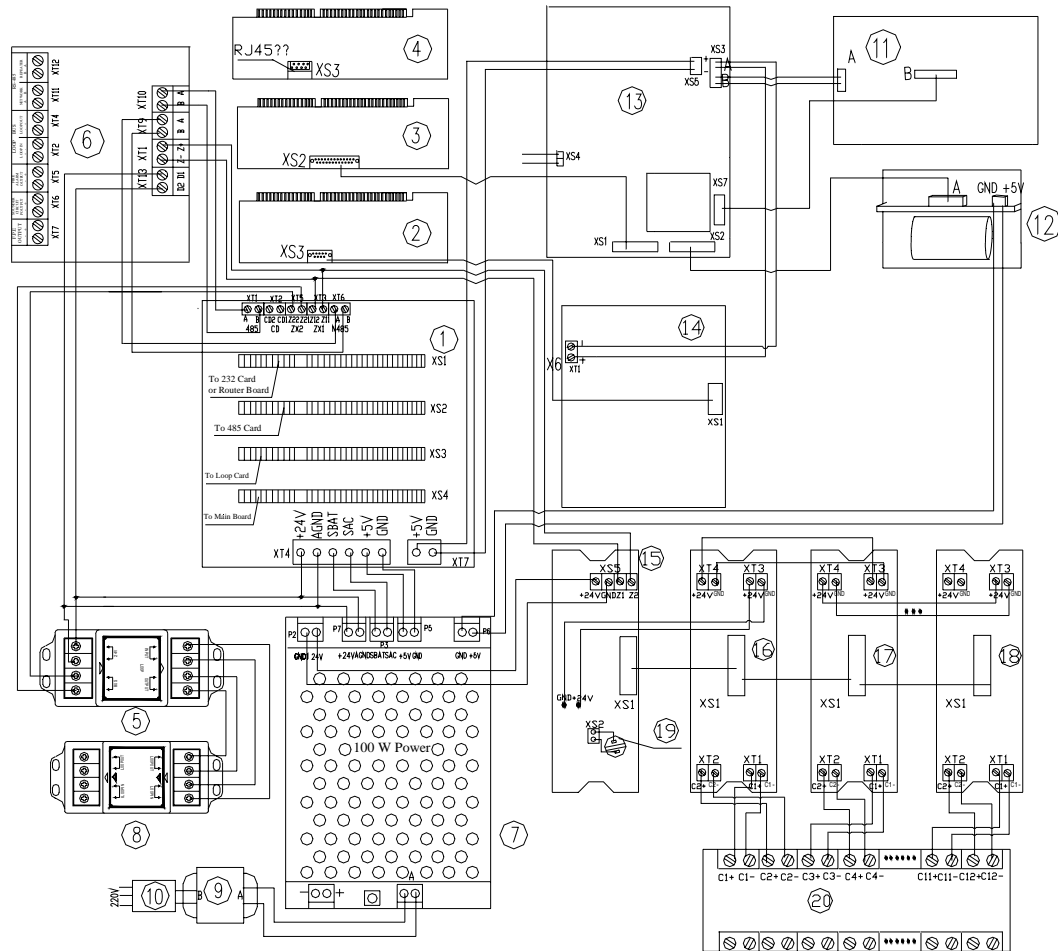
1. Motherboard	13. Switch board
2. Loop card	14. Control board of the manual panel
3. Main board	15. Main board of fireman's control panel
4. 232 communication card	
5. Loop module	16. Slave board of the first fireman's control panel
6. Bus Interface board	
7. 100W power	17. Slave board of fireman's control panel
8. Double-loop bus filter	
9. Transformer	18. Slave board of the last fireman's control panel
10. Power filter	
11. LCD	19. Manual lock
12. Printer	20. Filter board

Appendix 2 Device Type List

Abbreviation	No.	Device type
Undefine	00	Undefined
ION	01	Ionization detector
R+F.Heat'	02	Rate-of-rise and fixed temperature detector
Optical	03	Photoelectrical smoke detector
Fix Temp	04	Fixed temperature detector
Gas Det	05	Gas detector
Beam Det	06	Infrared beam detector
FlameDet	07	Ultraviolet flame detector
CableDet	08	Cable heat detector
Heat Det	09	Analogue heat detector
Complex	10	Combination detector
MCP	11	Manual call point
VAModule	12	Voice alarm module
Sounder	13	Sounder strobe
FTModule	14	Fire telephone module
HR MCP	15	Hydrant manual call point
HR Pump	16	Hydrant pump
SPKR Pmp	17	Sprinkler pump
PS.SW	18	Stabilized pressure pump
Extract	19	Smoke exhauster
Presuriz	20	Blower
FreshAir	21	Fresh air
Damper	22	Fire damper
SM Vent	23	Smoke vent
Air Inlet	24	Air inlet
SolValve	25	Solenoid valve
SM CURT	26	Roller shutter door middle point
RSD Clse	27	Shutter screen door close point
FireDoor	28	Fire door
PS.DIFF	29	Pressure switch
Flow SW	30	Water flow indicator
Elevator	31	Elevator
AHU	32	Air handling unit

GENI	33	Diesel generator
Light.DB	34	Power for lightning
Power.DB	35	Power distribution
WTR.CURT	36	Solenoid valve for water curtain
Gas Dump	37	Gas start-up
GasAbort	38	Gas stop
Net unit	39	Net unit
Repeater	40	Repeater panel
Module	41	Flash-locks valve
DryPower	42	Dry powder fire extinguisher
FoamPump	43	Foam pump
FieldPSU	44	Power supply unit
EM Light	45	Emergency light
EscapeLT	46	Escape light
GasActiv	47	Gas activation
Security	48	Security module
ZoneValv	49	Zone valve
Cylinder	50	Cylinder
DelugePM	51	Deluge pump
Undefine	52	Undefined
Stop Mod	53	Device stop
Silence	54	Mute key
SounderA	55	Fire alarm sounder
SounderF	56	Fault sounder
Loop SW	57	Loop switch
CRT Fault	58	CRT Fault
Loop	59	Loop
PSU.Bat	60	Battery
PSU.AC	61	AC power
Lock	62	Multi-wire lock
PART	63	Part of devices
ZoneDir	64	Zone direction
F.P.E	65	Fire protection equipment
All evac	66	Evacuation
Ground.f	67	Ground fault

Appendix 3 Operation Menu

Menu

MUTE To mute the speaker

RESET To reset the system [password required]

TAB To change time display mode

ESC To the previous menu

and   For changing pages

ENTER: For confirmation

VIEW FIRE: Viewing fire information

VIEW FAULT: Viewing fault information

VIEW ISOLATE Viewing isolation information

VIEW PLANT Viewing action information

SELF TEST For self-test [password required]

ISOLATE Isolating a device [password required]

START To start a device [password required]

BROWSE Viewing registration information [password required]

CLOCK Modifying the system time [password required]

DE-ISOLATE To de-isolate the isolated device [password required]

STOP To stop a started device [password required]

LOG Browsing history record

SECURITY MODE To set security mode [password required]

EXTINGUISHING MODE To set gas-release mode [password required]

PRINT To set the printer [password required]

SYSTEM System menu [password required]

Modify password Modifying password

Communicate setup Setting communication mode

Working state setup Setting working mode

Fire Display Mode Setting fire display mode

Zone Browse Viewing zone information

C&E Browse Viewing C&E formula

Monitoring Device Viewing supervisory data of intelligent
devices
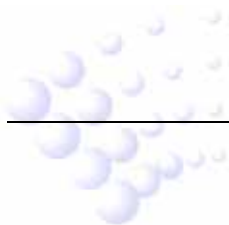
GST China

Gulf Security Technology Co., Ltd.

No. 80, Changjiang East Road, QETDZ, Qinhuangdao, Hebei,

P. R. China 066004

Tel: +86 (0) 335 8502528

Fax: +86 (0) 335 8508942

Email: sales@gst.com.cn

www.gst.com.cn

GST UK

Global System Technology PLC

Staunton Harold Hall, Staunton Harold Ashby-de-la Zouch, Leicestershire,
England LE65 1RT
Tel : +44 (0)1530 564764
Fax : +44(0)1530 564769

Rigional Office

PO Box 17998 Unit ZA04 JEBEL ALI Free Zone,

Dubai, UAE

Tel: +971 (0) 4 8833050

Fax: +971 (0) 4 8833053

Email: tech.support@gst.uk.com

www.gst.uk.com