GST-NR2EC
GST-NR2EF
Network Repeater

Installation and Operation Manual

Issue 1.01

ERP: 30312234

CONTENTS

Installation Precautions

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

- ✧ Do not attempt to install, service, or operate this unit until this manual is read and understood.
- ✧ This equipment must be installed in accordance with these instructions and the appropriate national, regional and local regulations specific to the country and location of the installation. Consult with the appropriate Authority Having Jurisdiction (AHJ) for confirmation of the requirements.
- ✧ It shall only be installed and serviced by trained specialist.
- ✧ Disconnect all sources of power before servicing.

1 Product Introduction

GST-NR2EC/GST-NR2EF Network Repeater is an Intelligent fire repeater for use with the GST-IFP4E. It complies to EN54-2、EN54-4 standard with features of easy installation, operation, and maintenance. The repeater integrates an ARM7-Cotex CPU with inbuilt Linux OS. Its friendly and graphical screen can be touchable in operation.

1.1 Inventory

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

- ✧ Cabinet key
- ✧ Manual

1.2 Standard Features

The repeater provides the following:

- ✧ Receive message from FACP through network.
- ✧ Send command (Reset, Silence, Ack etc.) to other FACP through network.
- ✧ Network interface: CAN for GST-NR2EC and Fiber for GST-NR2EF.
- ✧ LCD display unit of 800×480，7.0 inch color TFT LCD.
- ✧ Capacitive Touch screen.
- ✧ History file 100,000 events capacity.
- ✧ Advanced history filters allow sorting by event, time, date, address etc.
- ✧ Network operation.
- ✧ Ground fault detection.
- ✧ Password and key-protected nonvolatile memory.
- ✧ User programmable password.
- ✧ Field-programmable on repeater, or by external computer with GST-IFPx-Def Defining Tool and connected via Ethernet / USB port on SD-NR2E LCD Drive Board.

2 Technical Specifications

2.1 Electrical Specifications

- ✧ Voltage: 20VDC～28VDC
- ✧ Current is less than 200mA in standby mode and less than 400mA in fire alarm condition.
- ✧ Standby power consumption does not exceed 6W and maximum power consumption does not exceed 12W.

2.2 Communication Loop Parameters

- ✧ Interface type: CAN for GST-NR2EC and Fiber for GST-NR2EF.
- ✧ Maximum 250 nodes for Network
- ✧ GST-NR2EC CAN interface:
  - ◆ Class A.
  - ◆ Maximum distance between two neighbor nodes is 2500m with 1mm² or 3000m with 1.5mm².
- ✧ GST-NR2EF Fiber interface:
  - ◆ LC monomode fiber.
  - ◆ Maximum distance between two neighbor nodes is 20000m.

2.3 Dimensions

The dimensions of the repeater is 420mm×320mm×100mm (L x H x W) as shown in Fig. 2-1.

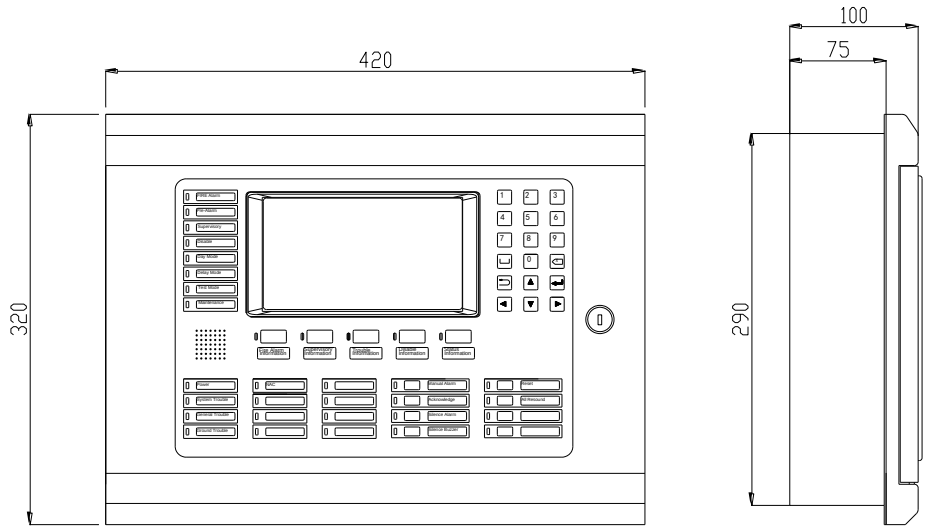


Fig. 2-1

3 Installation

The steps below are guidance for installation of the repeater.

1 Check if you have received all items ordered.

2 Install the cabinet.

3 Power up the repeater and check if it can be normally started.

4 Wiring and check the lines.

5 Setup repeater and define by using GST-IFPx-Def Defining Tool on a PC and download them to the repeater.

3.1 Component Inspection

Before installation, check the following items:

✧ **Check Engineering Requirement**

Check the packing list according to engineering requirement. The main items to be examined are: installation and operation manual, key to the repeater and etc.

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

All internal parts have been connected (including LCD drive board, main board, indicator board and main front panel) before the repeater leaves the factory. Therefore, you can mainly check the connection among parts, including the connection between LCD drive board and indicator board, indicator board and main board, etc. Please refer to Appendix A for the internal connection diagram.

3.2 Install the Cabinet

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

The repeater can be flush-mounted or wall-mounted. The dimensions for wall-mounting are shown in following Fig.3-1. The dimensions for flush-mounted are shown in following Fig.3-2.

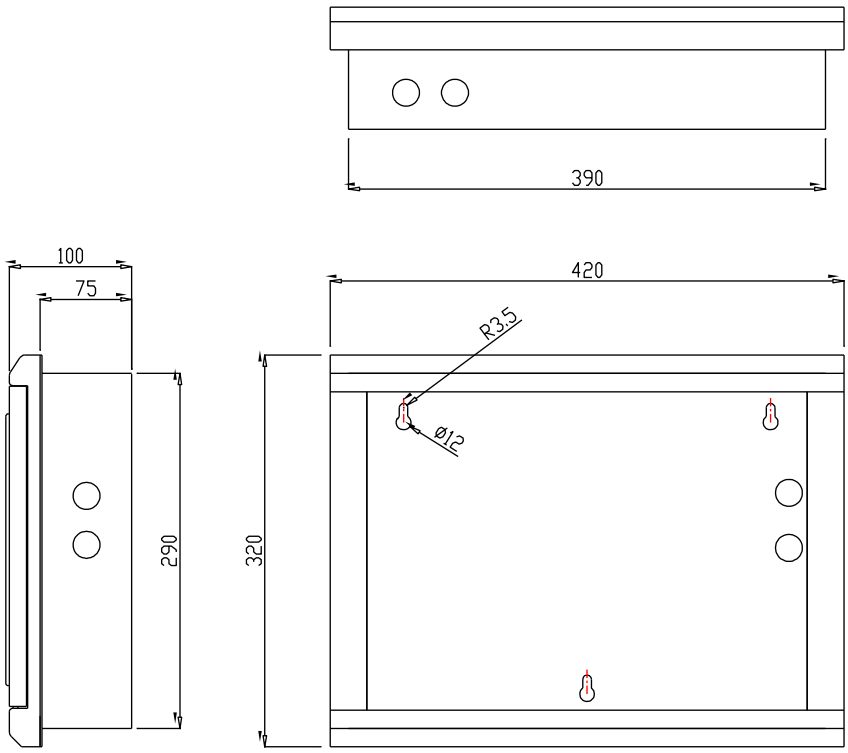


Fig. 3-1

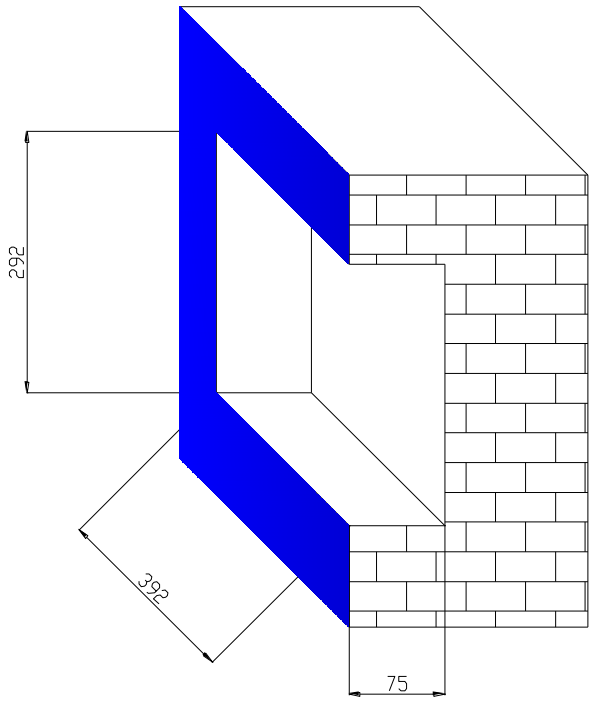


Fig. 3-2

3.3 Start-up Check

After installation, apply power to the repeater and check if the repeater can self-test. The procedures are as follows.

- ✧ Powering on the repeater, LCD doesn't light and all LEDs are illuminated for 5s.
- ✧ As All LED go out, LCD displays ***Data Loading……*** and GST logo. Initiation of the system takes about 85s~90s.
- ✧ Self-test of LEDs on the front panel.
- ✧ Self-test of internal cards.
- ✧ Reset of the system.

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

Note: After power on, the repeater will display some fault messages because the external wiring is not connected.

3.4 External Connection

3.4.1 Power Connection-Class B

Use 1.5mm² or larger wire. Power supply wires should be connected to the terminal as shown in Fig.3-3 below.

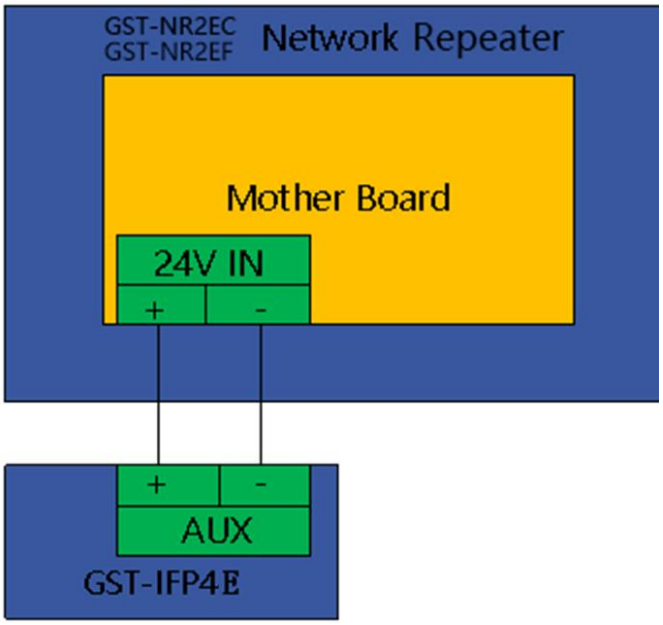


Fig. 3-3

3.4.2 Network Connection-Class A

The GST-NR2EC has a CAN type interface: Fig.3-4 is for CAN network connection .and the GST-NR2EF has a FIB type interface: Fig.3-5 is for Fiber connection.

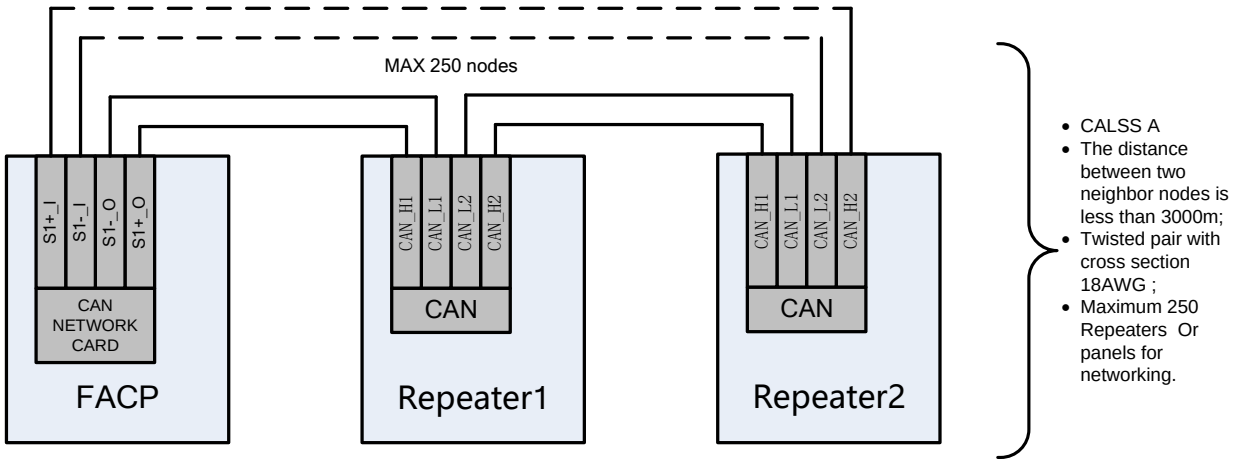


Fig. 3-4

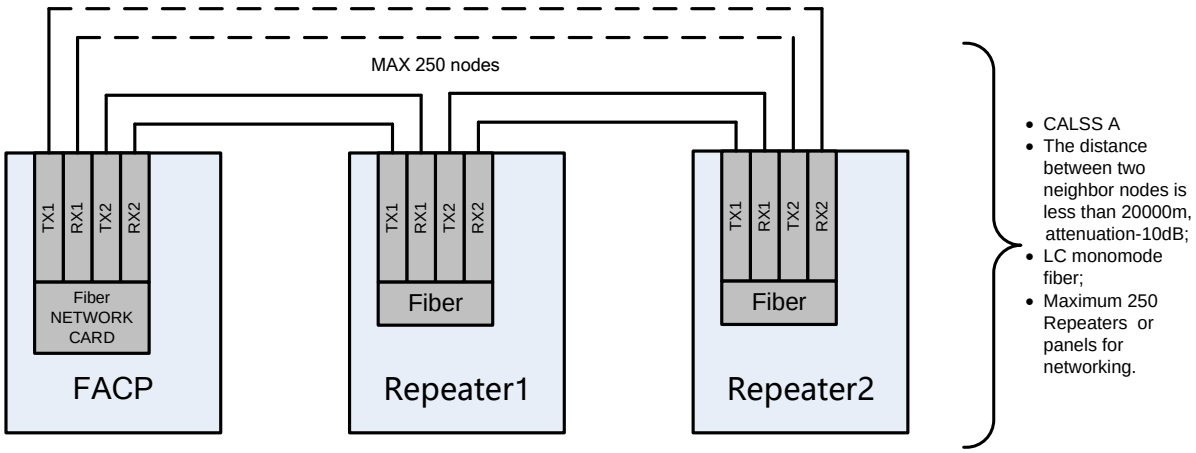


Fig. 3-5

4 Indication & Control

The keys and LED indicators of repeater are shown below Fig.4-1.

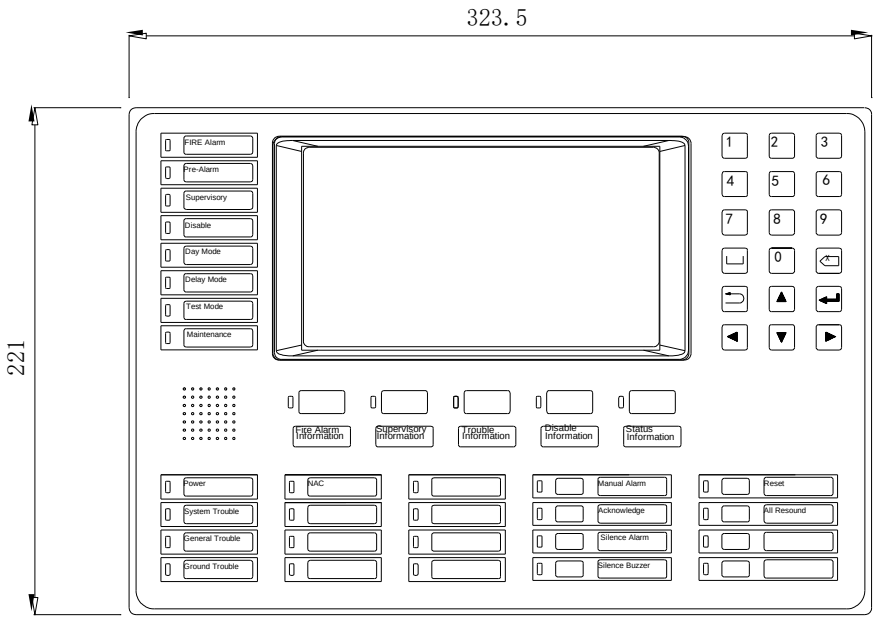


Fig. 4-1

4.1 LED Indicators

Note:

Unless otherwise specified, all LEDs are yellow.

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

✧ **FIRE Alarm**: Red. It lights when there is an alarm message.

- **Pre-Alarm**: Red. It lights when any device is in PAS delay period; it goes out as the PAS message disappears.
- **Supervisory**: It lights when any supervisory message exists.
- **Disable**: It lights when any disabled messages exists; It doesn't light without disabled messages.
- **Day Mode**: It lights when the REPEATER is in Day mode; it goes out in Night mode.
- **Delay Mode**: It lights when the REPEATER enters delay mode; it goes out as the REPEATER exits delay mode.

  Warning: The Delay Mode shall NOT be applied to required output fire signaling in UL864. It may only be used for supplementary process controls. Consult with AHJs for permissible applications.
- **Test Mode**: It lights when the REPEATER enters test mode; it goes out as the REPEATER exits test mode. REPEATER enters and exits test mode by command sent by GST-IFP4E.
- **Maintenance**: It lights when the REPEATER enters panel setup menu or system update; it goes out when the maintenance exits panel setup menu or complete system update.
- **Power**: Green. It lights steadily when the REPEATER is powered up.
- **System Trouble**: It lights when any card is fault or definition of devices/linkage equation is incorrect; it goes out as the fault is removed.
- **General Trouble**: It lights when there is fault message; it goes out as the fault is removed.
- **Ground Trouble**: It lights when there is ground trouble; it goes out as the trouble is removed.
- **Sounder Output**: The LED lights when there is any sounder is actived.
- **EVAC:** It illuminates after the ***EVAC*** button pushed by user, this operation will trigger alarm progress.
- **Acknowledge**: It lights when all real messages have been confirmed. It goes out as a new message occurs.
- **Silence Alarm**: The LED lights when any NAC is silenced. It goes out when all silenced NACs are reactivated.
- **Silence Buzzer**: It lights when the buzzer of the REPEATER is silenced. It goes out as the buzzer sounds again.
- **Resound**: It lights when ***RESOUND*** key is pressed. It goes out when any NAC is silenced again.

- **RESET**: It lights when the REPEATER is being reset; It goes out when the REPEATER completes reset.
- **Fire Alarm Information**: Red. It flashes when an alarm message is not confirmed. It goes steady when all alarm messages have been confirmed.
- **Supervisory Information**: It flashes when a supervisory message is not confirmed; it goes steady when all supervisory messages has been confirmed.
- **Trouble Information**: If flashes when a fault message is not confirmed. It goes steady when all fault messages have been confirmed; it goes out as all fault messages are cleared.
- **Disable Information**: It lights when a disabled message exists; it goes out when all disabled conditions are cleared.
- **Status Information**: It lights when any message exists; it goes out as all messages are cleared.

4.2 Functional Keys

- **Fire Alarm Information**: Fire alarm information screen is displayed when there is fire alarm information and this key is pressed.
- **Supervisory Information:** Supervisory signal may be programmed as latching or non-latching. For latching supervisory, cancellation of the signal is the indication of restoration to normal condition. For non-latching supervisory, the signal will be locked-in until manually reset. Supervisory information screen is displayed when there is supervisory information and this key is pressed.
- **Trouble Information**: Fault information screen is displayed when there is fault information as this key is pressed.
- **Disable Information**: Disable information screen is displayed when there is disable information as this key is pressed.
- **Status Information**: Status information screen is displayed when there is status information as this key is pressed.
- **EVAC**: For starting an alarm for evacuation.
- **Acknowledge**: Pressing the key will acknowledge the selected message.
- **Silence Alarm**: All activated NACs can be silenced when this key is pressed.
- **Silence Buzzer**: Buzzer can be silenced when this key is pressed.
- **Resound**: All deactivated NACs can be resound when this key is pressed.
- **RESET**: The system will be reset as this key is pressed.

4.3 Service / Program Keys:

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

4.4 User Interface

The repeater has a touch screen with graphical icons. The repeater enters System Normal screen as Fig.4-2 below after correct installation and wiring.

Fig. 4-2

ALARM: When fire alarm signal is on the screen, the repeater will pop up fire alarm (first

alarm) message with white words in red background, including alarm time, device address, device type and related description and so on. Alarm message taking the highest priority is displayed on the main screen and other messages are displayed the quantity on related tabs on the screen. Clicking each tab can check details. Refer to the figure below Fig.4-3.

Fig. 4-3

The quantity of alarm messages will be displayed if there are many such messages. Clicking ALARM tab can view details as shown the figure below Fig.4-4.

Fig. 4-4

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

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

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

DISABLED: there are disabled messages if some devices are disabled. Clicking DISABLE tab can view the details as shown in the figure below Fig3.6.

STATUS: clicking STATUS tab can view other status messages of the repeater.

5 Operations

5.1 Setup on the repeater

Clicking the button  inputs engineering password to enter **Panel Setup** menu (tree diagram) as shown below Fig. 5-1.

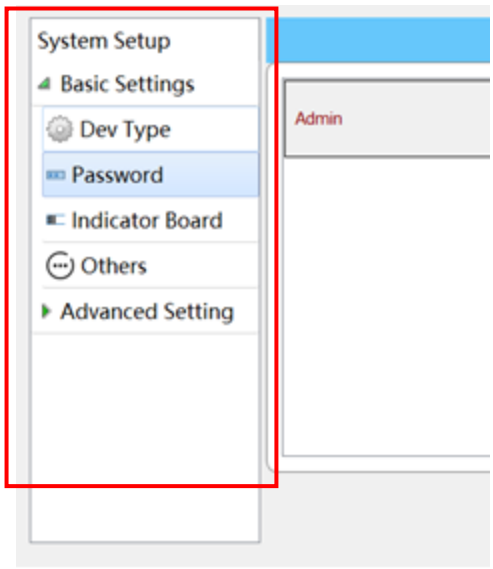


Fig. 5-1

5.1.1 Basic Setting

The Basic setting menu is on the left side of the panel setup interface and contains some common settings options as follow.

- Device Type : clicking Dev Type in Basic Setting menu, the menu shown in Fig. 5-2 pops up. Users can define the name and picture of the device type according to their needs. Only the highlighted ones can be defined, and the gray ones are devices pre-sorted in factory and cannot be defined by user.

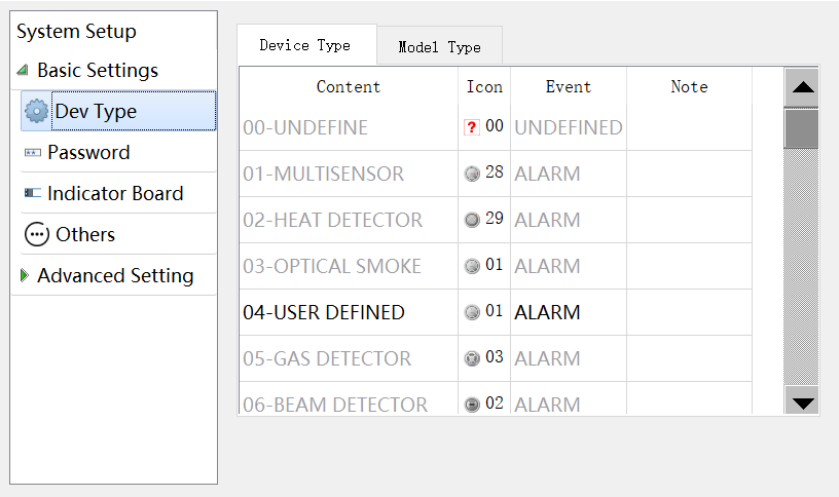


Fig. 5-2

- Password: clicking **Password** in **Basic Setting** menu enters the interface for user management as shown in the figure below Fig.5-3. Administrators can Add/Edit/Delete device user using buttons on top right corner .There are two types of passwords including **User Password** and **Engineering Password** for each user. Users using user password can only operate common function in **User Setup.** After setting, pressing **OK** can save the settings.

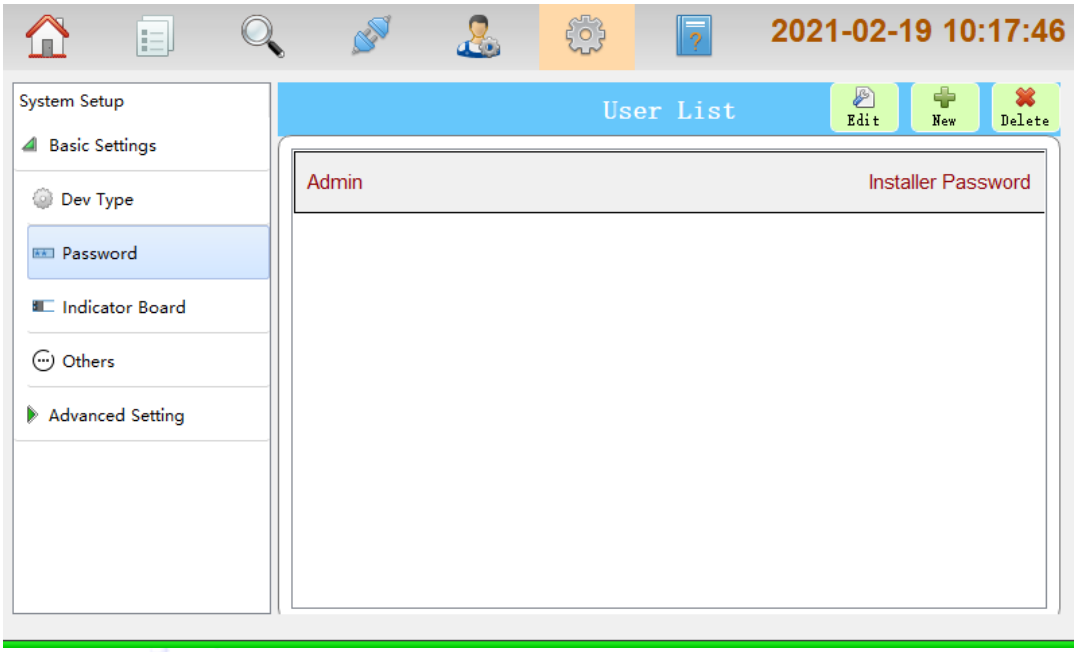


Fig. 5-3

- Indicator Board: Clicking ***Indicator Board***, Indicator Info can be displayed on the right of the screen, including Defined Led Qty. and Defined LedKey Qty. Refer to Fig.5-4 for details.

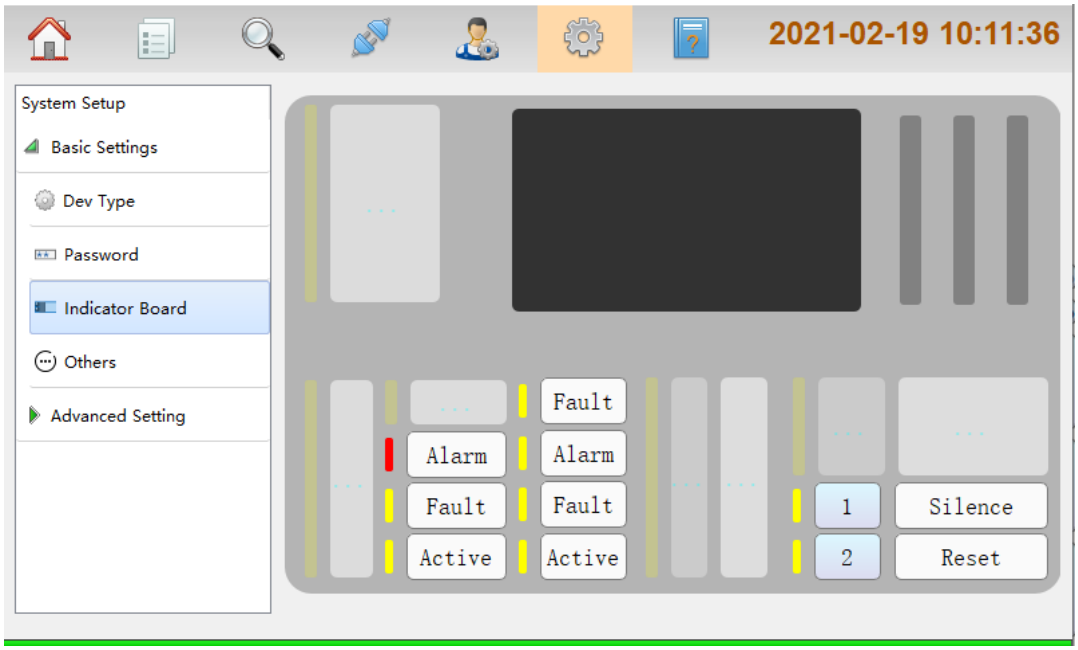


Fig. 5-4

Clicking ***Undefined*** can define LEDs and buttons as shown in Fig.5-5.

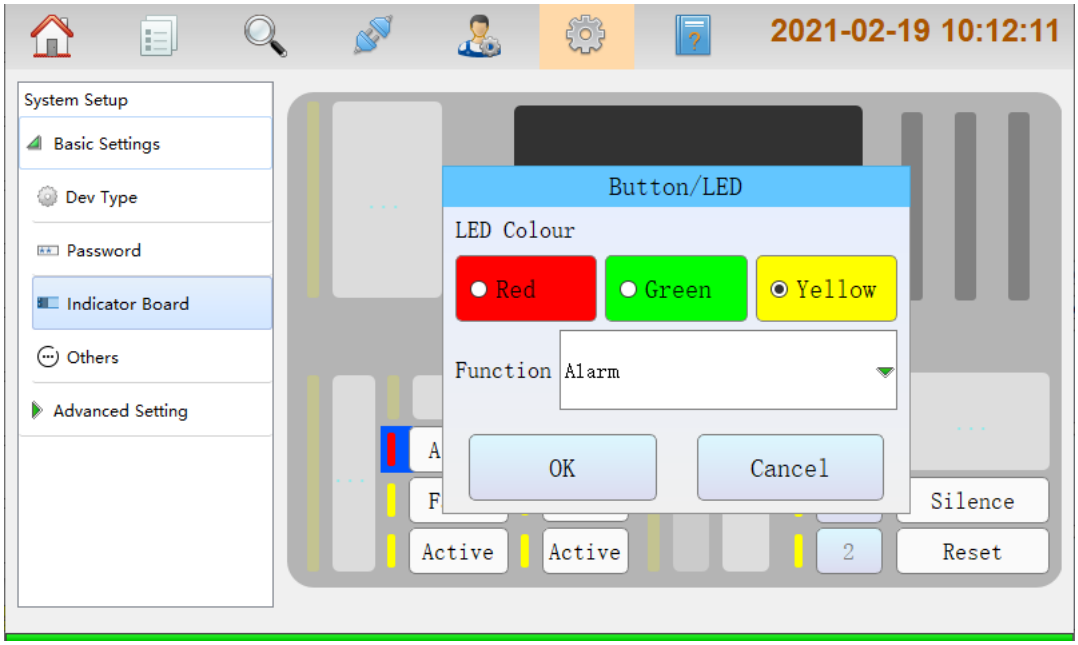


Fig. 5-5

- Others：Clicking ***Others*** enters the screen as shown in the figure below Fig.5-6. of Daylight Saving time adjust and GST-GMC function switch.

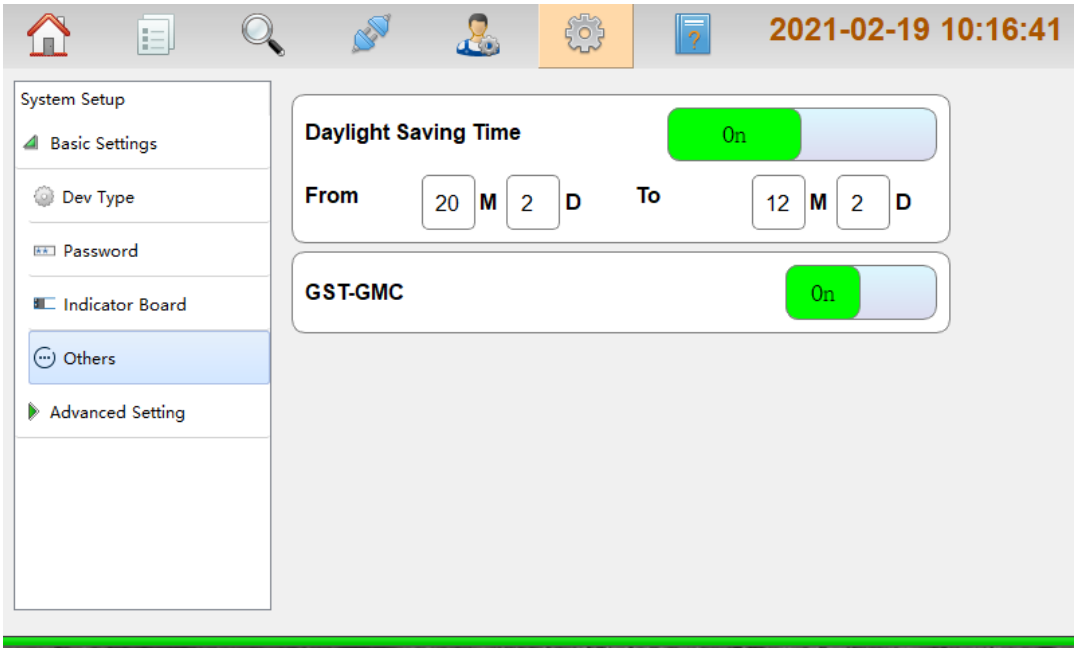


Fig. 5-6

5.1.2 Advanced Setting

Clicking **Advanced Setting** in **Panel Setup** menu enters the screen for senior setting.

- Network Setup: clicking **Network Setup** in **Advanced Setting** menu pops up the screen for setting the network on the right. Users can set up based on actual situation. Refer to the figure below Fig.5-7.

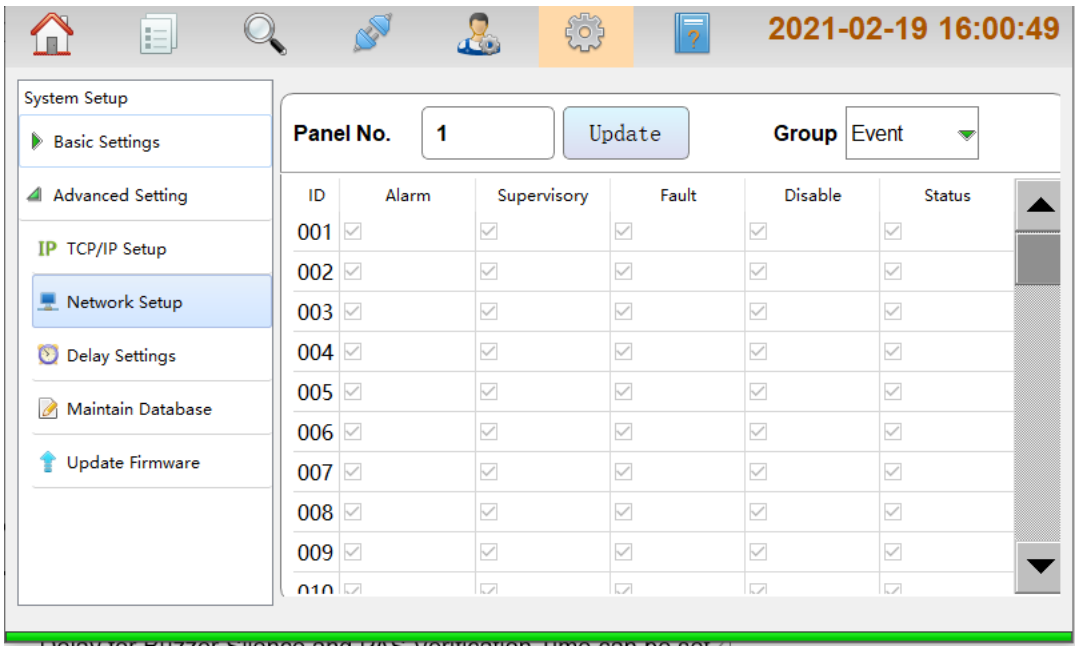


Fig. 5-7

Panel No.: input the number of the repeater here.=

Click **Update** After filling up the panel ID , users can operate chart below.Refer to the table above for Event type be filtered. Those messages with no ticks will be filtered and refused to display.

- Delay Setting: Users can set delay based on the actual situation by clicking **Delay Setting** in **Advanced Setting** menu as shown in Fig.5-8. Delay for Alarm Silence, Delay for Buzzer Silence and PAS Verification Time can be set.

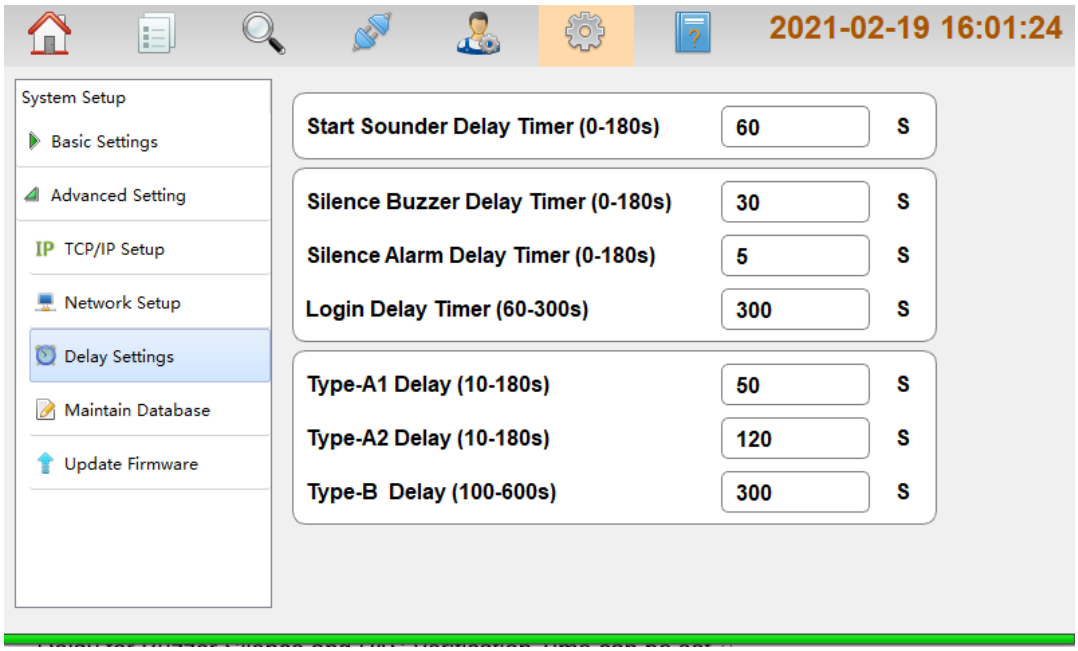


Fig. 5-8

- Update Firmware: Clicking **Update Firmware** in **Advanced Setting** menu and entering the super password (obtained from the maintenance service supplier), users can update firmware as shown in Fig.5-9, then insert U-Key into the LCD drive board and click **OK** to update firmware.

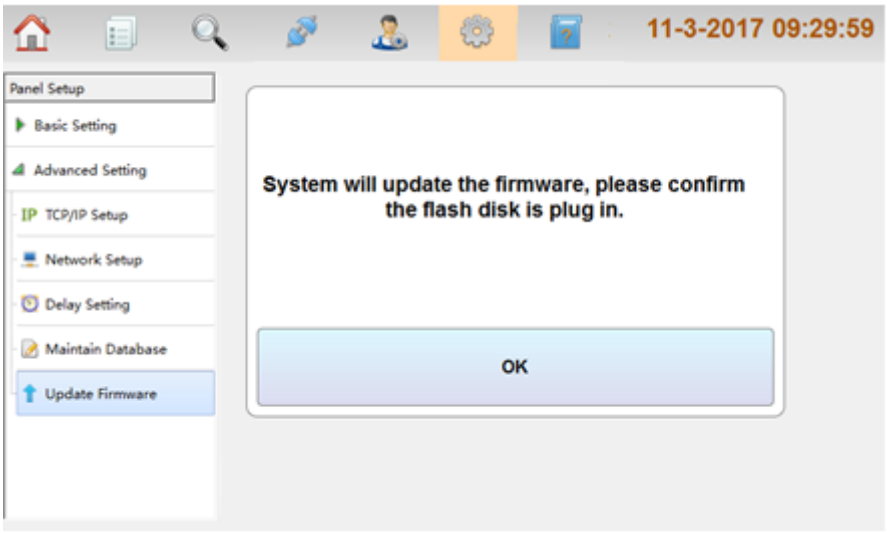


Fig. 5-9

5.2 Programming the repeater Through GST-IFPx-Def Software

Configurations and definitions can be downloaded to the repeater through USB or Ethernet interfaces after they are programmed by using GST-IFPx-Def Software Download thru USB interface

After programming the repeater using GST-IFPx-Def Software, save the configuration and definition to a USB stick, and then insert the USB stick into the USB port on the SD-400 LCD Drive Board of the repeater.

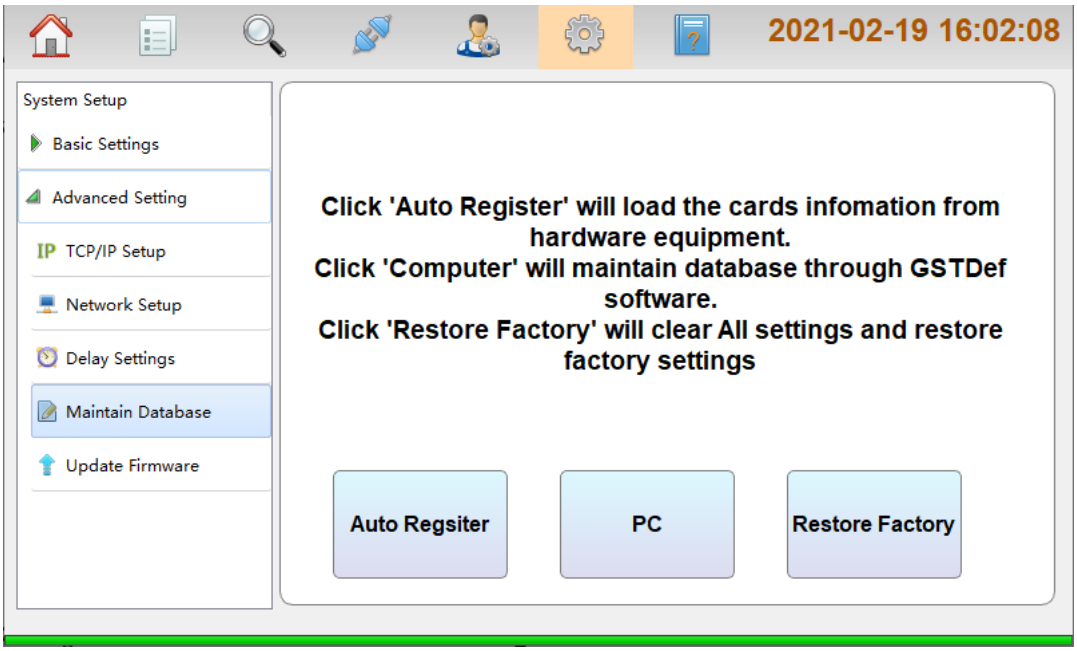


Fig. 5-10

Clicking ***Maintain Database*** in ***Advanced Setting*** menu enters the screen as shown in Fig.5-10. After clicking the ***USB,*** the repeater can automatically update according to data from U-disk.

5.2.1 Download thru Ethernet interface

After programming the repeater using GST-IFPx-Def Software, connect Ethernet port of the programming computer to the Ethernet interface on repeater's SD-400 LCD Driver Board through a switch, a router or a cross-over Ethernet cable. In ***Advanced Setting*** menu, select ***TCP/IP Setup*** as shown in the figure below Fig.5-11. On the programming window to the right, key in IP Address, Subnet Mask and Gateway address. Note that repeater's IP address shall be in the same subnet as the programming computer.

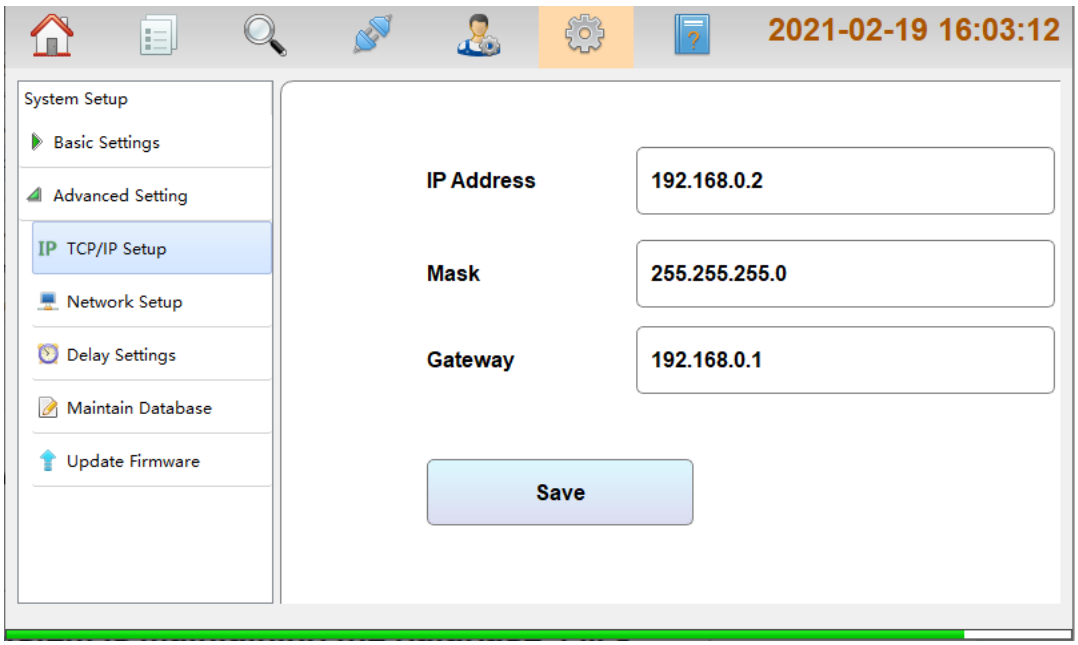


Fig. 5-11

Clicking ***Computer*** in Fig.5-9 pops up the screen as shown in Fig.5-12. At this time, the configurations and definitions can be downloaded to the repeater from GST-IFPx-Def Software.

Fig. 5-12

5.3 User Setup

Clicking  button enters ***User Setup*** menu by inputting user password. Messages about soft keyboard, display, PAS, clock, printer, day/night mode, language, project name, and so can be set in this screen. Refer to the figure below Fig.5-13.

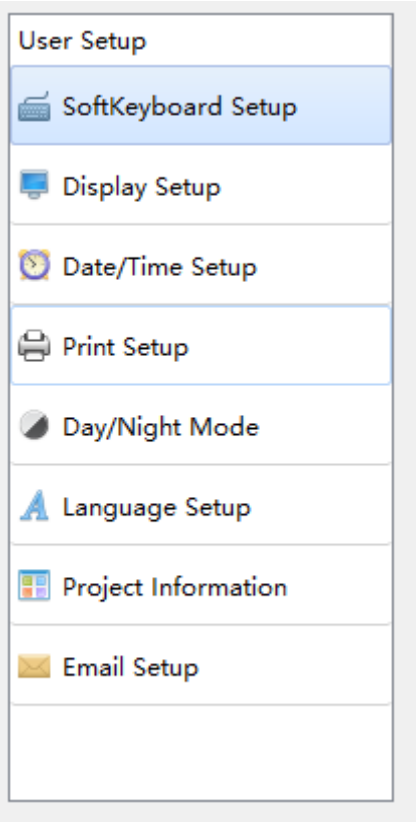


Fig. 5-13

5.3.1 Soft keyboard Setup

Clicking Soft keyboard Setup can set ***On*** or ***Off*** the soft keyboard through this option, refer to the figure Fig.5-14.

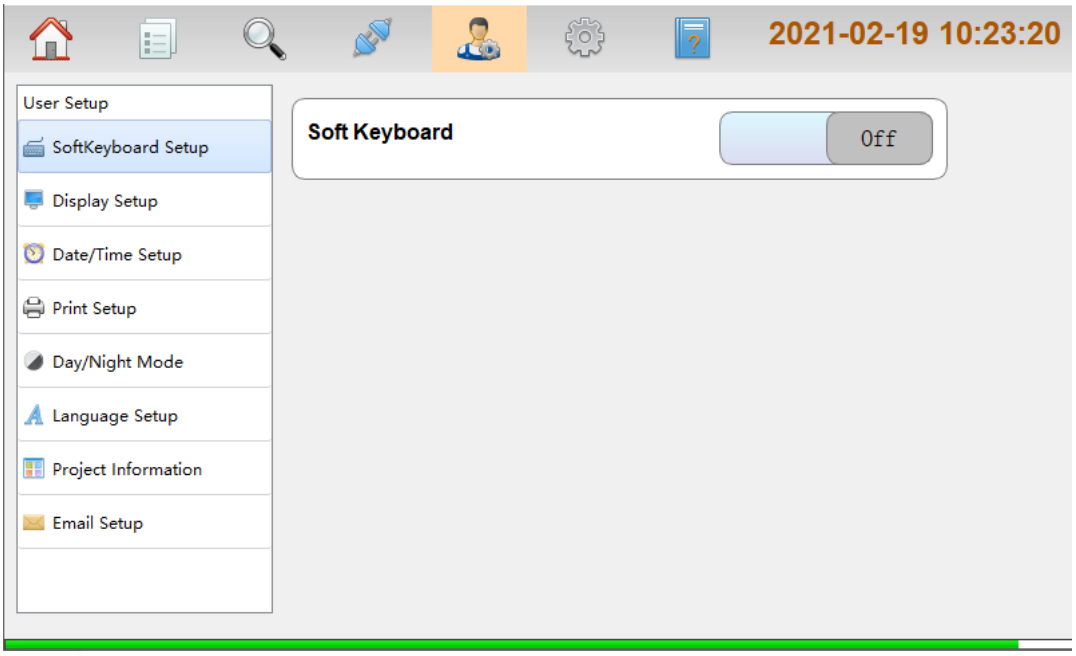


Fig. 5-14

5.3.2 Display Setup

Clicking ***Display Setup*** in ***User Setup*** menu enters the screen for setting font size, LCD backlight time and so on. Refer to the figure below Fig.5-15.

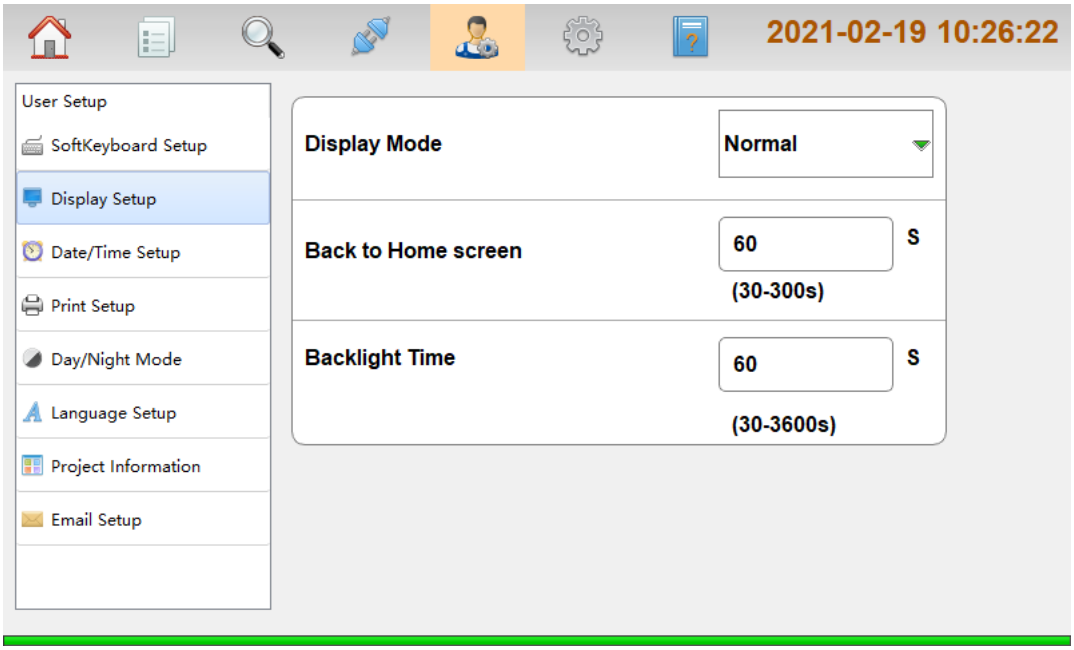


Fig. 5-15

5.3.3 Date/Time Setup

In user setup screen, users can set Data Format and Modify System Clock as required

by clicking **Date/Time *Setup*** in ***User Setup*** menu. Refer to the figure below Fig.5-16.

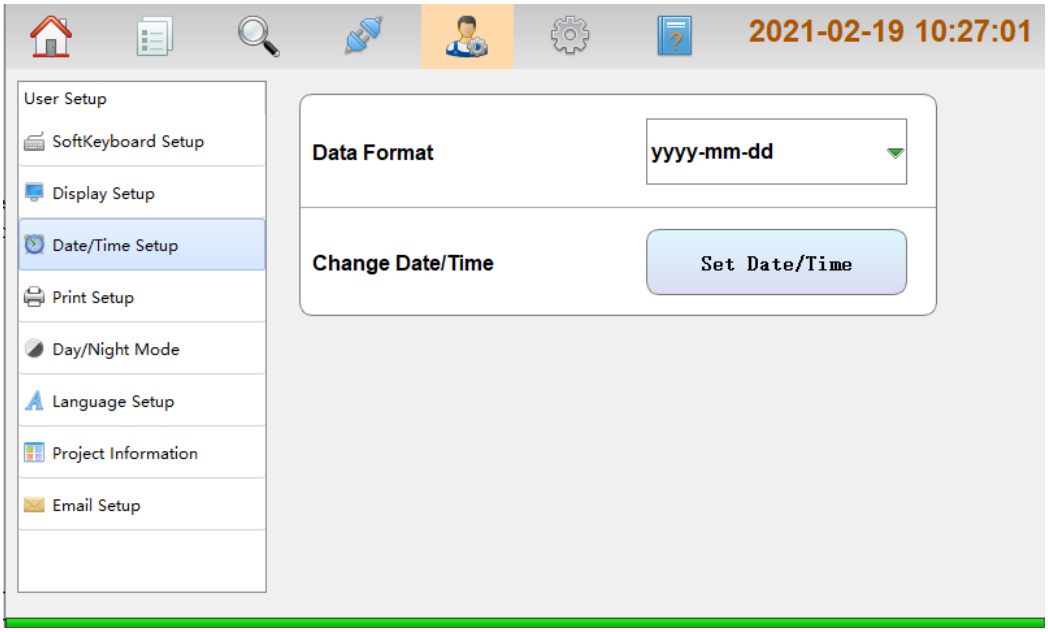


Fig. 5-16

Clicking ***Set Date/Time*** button behind ***Modify System Clock*** can modify the system time as shown in the figure below Fig.5-17.

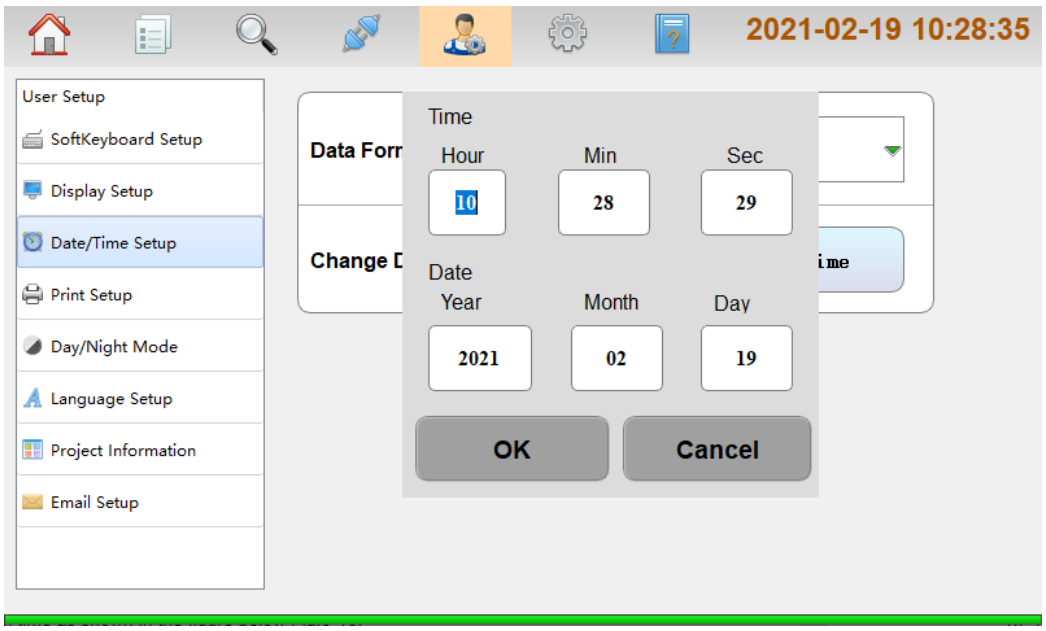


Fig. 5-17

5.3.4 Print Setup

Printing is a supplementary function. The external printer shall be UL ITE listed equipment, which connects to repeater internal USB port. The interconnecting USB

cable between repeater and printer shall not be more than 3 meters. Both the printer and repeater shall be in the same room.

Clicking ***Print Setup*** in ***User Setup*** menu enters the screen for setting the printer. Real-time print and printing types can be set. Refer to the figure below Fig.5-18.

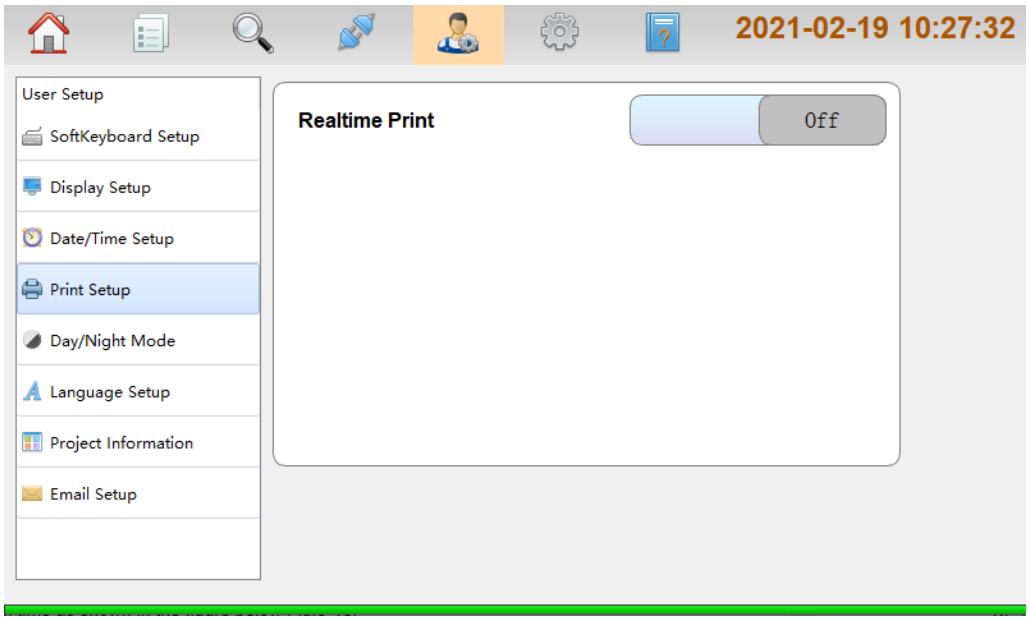


Fig. 5-18

5.3.5 Day/Night Mode

Clicking ***Day/Night Mode*** in ***User Setup*** menu, Day/Night mode can be set. Refer to the following figure Fig.5-19.

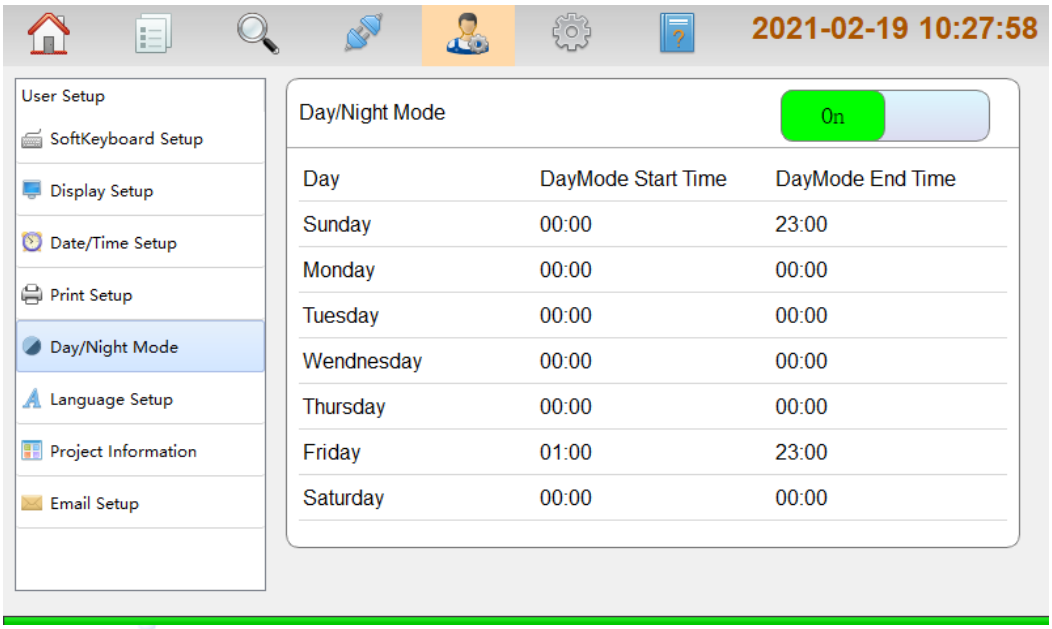


Fig. 5-19

In this mode, starting and ending time for the day can be set. Refer to the following figure Fig.5-20.

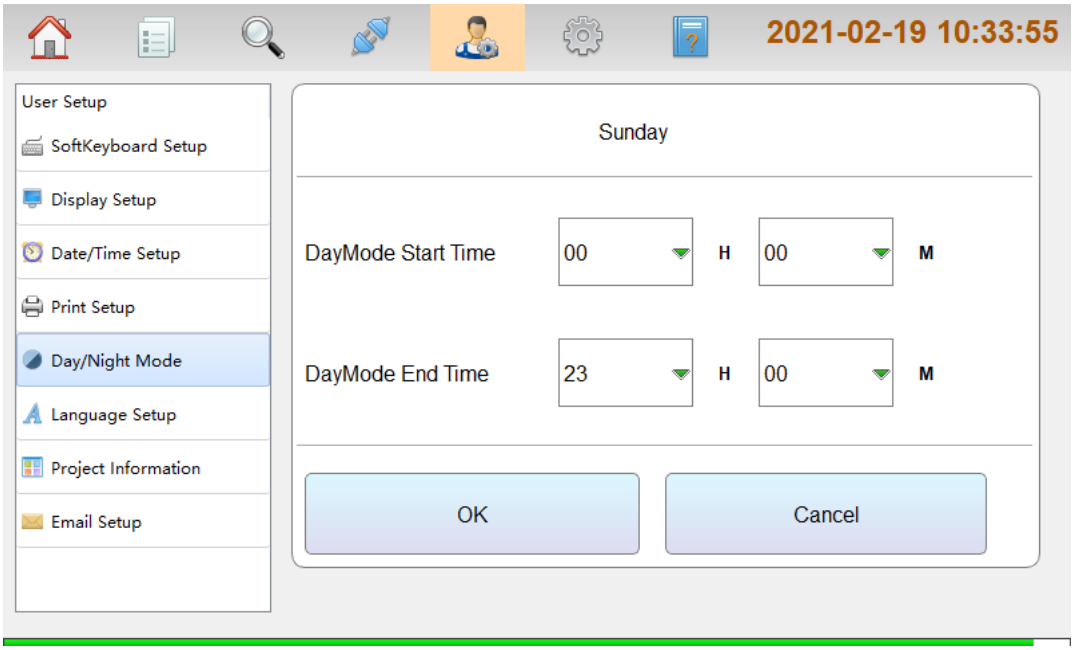


Fig. 5-20

5.3.6 Language Setup

Clicking ***Language Setup*** in ***User Setup*** menu enters the screen for setting the language. GST-NR2EC Repeater provided ten languages for users, they can chose language they need from language list Refer to the figure below Fig.5-21.

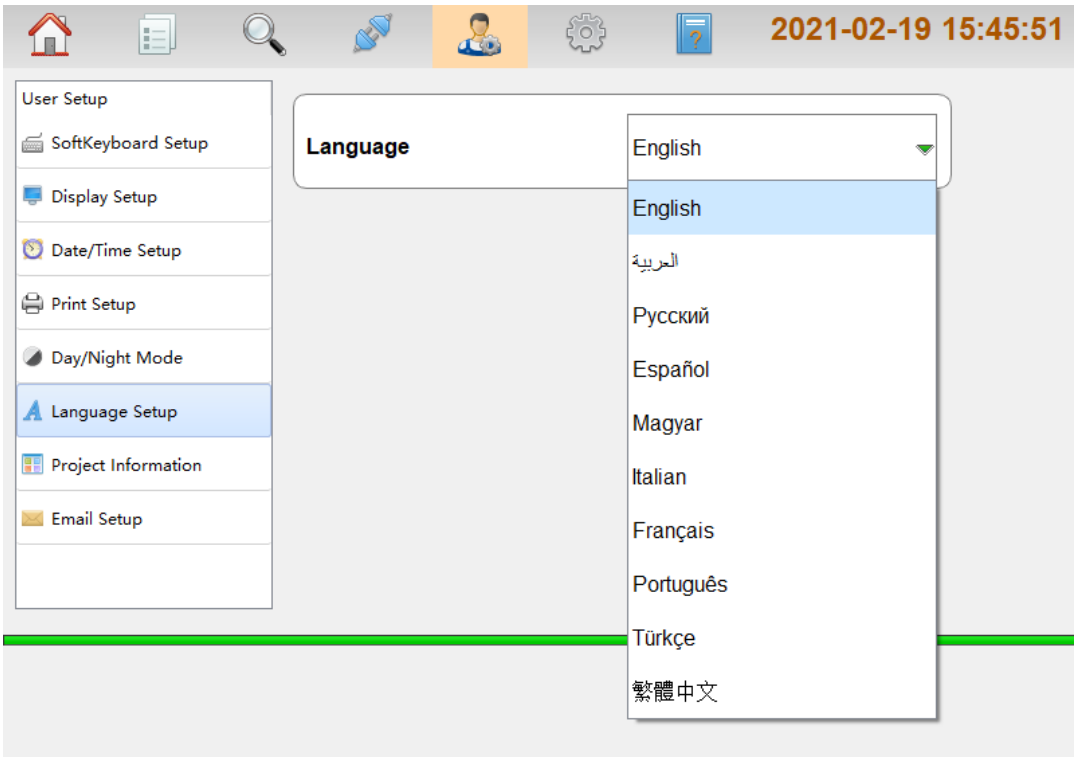


Fig. 5-21

5.3.7 Project Information

Clicking ***Project Information*** in ***User Setup*** menu enters the screen for setting the project information. Refer to the figure below Fig.5-22.

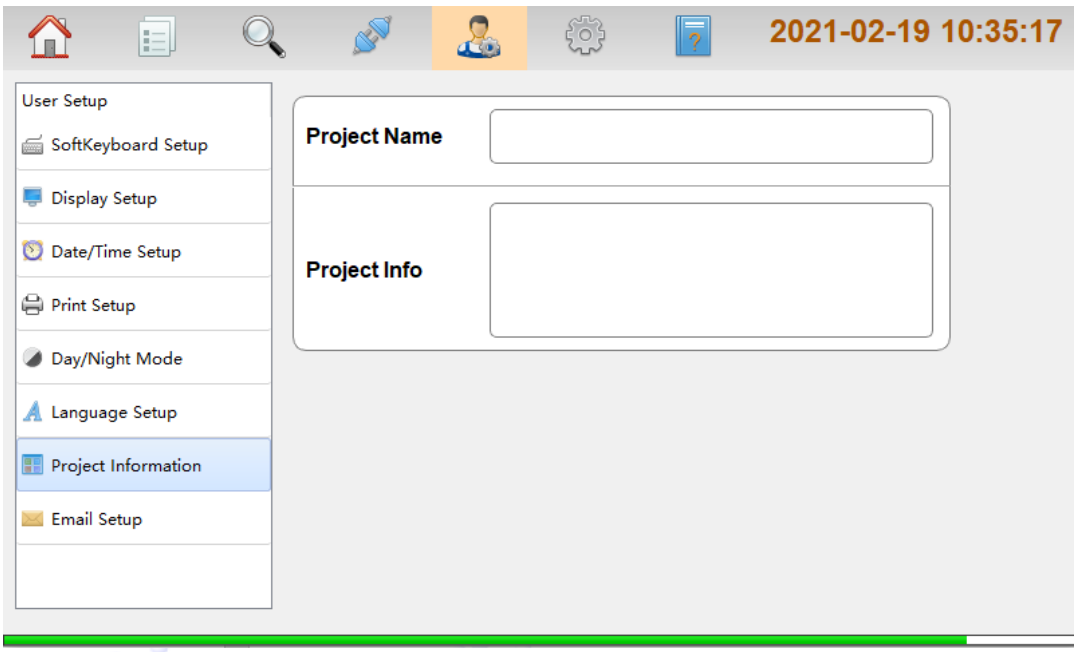


Fig. 5-22

6 Operating Instructions

6.1 Panel Control Keys

6.1.1 *EVAC* (User password)

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

- ✧ Displaying a manual alarm message in LCD.
- ✧ Lighting the ***EVAC*** LED.
- ✧ Extinguishing the ***SILENCE ALARM*** LED if it illuminates.
- ✧ Turning on the buzzer.
- ✧ Writing manual record in history file.

6.1.2 ACKNOWLEDGE (User password)

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

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

6.1.3 SILENCE *ALARM* (User password)

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

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

6.1.4 *SILENCE BUZZER* (User password)

When the ***SILENCE BUZZER*** key is pressed, the following actions will be produced:

- ✧ Silencing the buzzer of the Repeater.
- ✧ Lighting the ***SILENCE BUZZER*** LED.

- Writing silence buzzer records in history file.
- If new event occurs, the silenced buzzer will resound, and ***SILENCE BUZZER*** LED turns off.

6.1.5 *All RESOUND* (User password)

All RESOUND key is used to resound the deactivated notification appliances. When this key is pressed, the following actions will be produced:

- Resound the deactivated notification appliances.
- Lighting *the* ***All RESOUND*** LED.
- Writing resound records in history file.

6.1.6 RESET (User password)

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

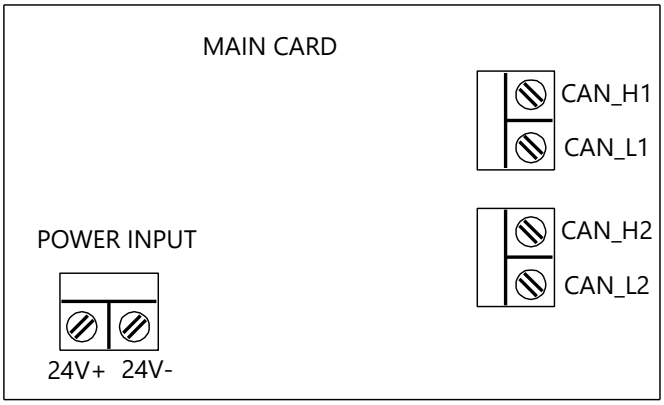
- Extinguishing all LEDs except of ***POWER*** LED and turning off the buzzer.
- Turning off all notification appliances.
- Resetting all loop devices.
- Writing system resetting record in history file.

7 Default Programming

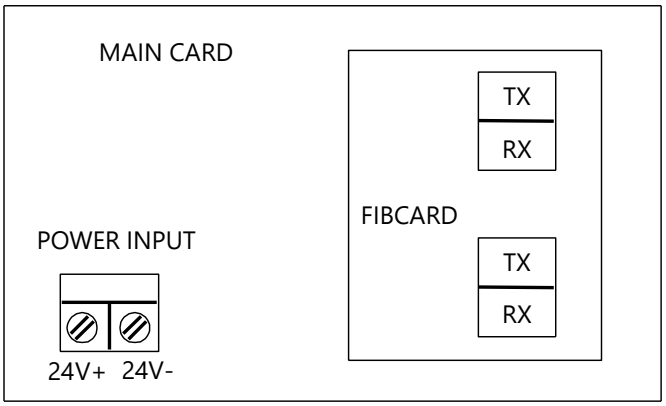
Program Option	Factory Default
BANNER	GST CO., LTD.
Maintenance Password	Empty
User Password	111111
PAS Timer	0
Userwords	Undefined
Userdefine	Userdefine01-15
E&C	Undefined
Device address（1-242）	Zone: 001 Type: 0 Undefined PAS: off Silenceable: on Autosilence: off

Appendix A Basic System Connection

GST-NR2EC



GST-NR2EF



Appendix B Electrical Specifications

B.1 Electrical Specifications

B.1.1 Input Power

- Class B.
- Rated voltage: 24VDC
- Voltage range: 20VDC~28VDC
- Standby current：200mA
- Max current：400mA
- Wire size: minimum 1.5mm², maximum 550 m per line.

B.1.2 CAN Network

- Class A.
- Maximum distance between two neighbor nodes is 2500m with 1mm² or 3000m with 1.5mm²
- Maximum 250 nodes for combination of CAN and Fiber-Optical Network.

B.1.3 Fiber-Optical Network

- Class A.
- LC monomode fiber.
- Maximum distance between two neighbor nodes is 20000m，attenuation -10dB.
- Maximum 250 nodes for combination of CAN and Fiber-Optical Network.

Appendix C Compliance information

548p/R01

2831-CPR-F4817

GST-0204-01

25

0832-UKCA-CPR-F1600

25

(Available for product models：GST-NR2EC)

548p/R02

2831-CPR-F4817

GST-0204-01

25

0832-UKCA-CPR-F1600

25

(Available for product models：GST-NR2EF)

Recycling Information

For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points.

WEEE Information

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

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

Imited Warranty

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

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