REDBAN

CO-016

CARBON MONOXIDE DETECTION AND CONTROL PANEL

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CO-016 CARBON MONOXIDE ALARM PANEL

INSTALLATION AND USER GUIDE

Model: CO-016

Standard Number: EN50130-5 and EN62368-1

Operating Voltage: 180-240 Vac

Operating Temperature: -10°c +55°c

Relative Humidity: 95%

24V Output: Yes. 400mA max

Loop Current: 200mA maximum (27V-17V)

Loop Load: 120R

Box Quantity: 1 Piece.

Performance Declaration

No: 01 MADE IN

TURKISH

CO-016 PANEL TECHNICAL SPECIFICATIONS

OPERATING VOLTAGE	180-240v AC
POWER CONSUMPTION	100 watts
BATTERY TYPE	Sealed Lead Acid Battery
BATTERY CAPACITY	2 X12v 7A/Hour
NUMBER OF LOOPS	1-4
NUMBER OF DEVICES IN LOOP	80
HIGHEST NUMBER OF DEVICES IN THE ENTIRE PANEL	320
ETHERNET CONNECTION	None
NETWORK STUDY	There is
BATTERY SHORT CIRCUIT PROTECTION	There is
OPERATING TEMPERATURE	-10 °C ≈ +55°C
OPERATING HUMIDITY RANGE	0% ≈ 95% relative humidity
SIREN OUTPUTS	
OUTPUT TYPE	Relay Normally Open Contact
CONTACT RESISTANCE	2A @ 30V DC
INSURANCE	400 mA, Automatic Reset
OUTPUT VOLTAGE	No more than 32V
LINE END RESISTANCE	6.8K Ω 1/4 watt
GENERAL PURPOSE OUTPUTS 1, 2, 3 (AUDIO ALARM AND INDICATOR OUTPUTS)	
OUTPUT TYPE	Open Collector
OUTPUT CURRENT	400mA
OUTPUT VOLTAGE	Max 28v DC
ALARM RELAY OUTPUT	
OUTPUT TYPE	Normally Open (NO), Normally Closed (NC) 2A @ 30Vdc
CONTACT RESISTANCE	2A @ 30v DC
ERROR RELAY OUTPUT	
OUTPUT TYPE	Relay Normally Open (NO), Normally Closed (NC)
CONTACT RESISTANCE	1A @ 30v DC
24V DC PROTECTED VOLTAGE OUTPUT	Yes, up to 400mA
24V DC UNPROTECTED VOLTAGE OUTPUT	Yes, up to 2A
LOOP CURRENT	No more than 300mA
LOOP LOAD	120Ω
SERIAL OUTPUT (RS485)	
BAUDRATE	9600BPS
DATA BITS	8
PARITY BIT	None
STOP BIT	one
FLOW CONTROL	None
CASE MATERIAL	Metal Box (1.2mm Thickness)
ENVIRONMENTAL CATEGORY	IP30
DIMENSIONS	35x37.5x8.5cm
WEIGHT	1.8kg
DATA RESISTANCE	10 years

1. GENERAL FEATURES

REDBAN CO-016 Addressable Carbon Monoxide Detection and Control Panel is a microprocessor-based device designed with modern technology. By connecting your computer to RS485 connectors, you can program your device and back up its data. Other devices in the area where the panel will be installed can be controlled with control modules that can be added externally to the panel. The communication format is the internationally accepted SIA DC-09-2012A (Security Industry Association Digital Communication Standard Event Reporting) format. During the design of the device, ease of use and long life were aimed.

There are 4 loop connection slots (connectors) on the motherboard. These slots are compatible with LK204 loop cards. With the cards inserted into the slots, the panel can be connected to 4 loops and 80 devices in each loop, a maximum of 48 carbon monoxide detectors, for a total of 320 devices. The measurement range is 0-300 ppm and the resolution is 2 ppm.

The user interface is equipped with a 128 x 64-dot graphic LCD screen, function keys and warning LEDs. The device includes status indicator LEDs for 16 zones and two levels of each zone, error LEDs, audio warning module, power indicator, system ready indicator and other mandatory indicators specified in EN50130-5 and EN62368-1 standards. All status information of the device is shown on the LCD screen and/or LEDs. The panel checks for system errors and displays them on its interface in a way that the user can detect. The user can control and adjust the system functions with Reset, Evacuation, Alarm Cancel, Mute, Test and four directional keys. Visual status indicators of the system (located vertically from top to bottom, respectively, on the left side of the panel) Power, Ready, Disabled, Zone Disabled, Pre-Alarm, Fire, Cancel Alarm (listed below the LCD screen in the middle of the panel), Evacuate, Mute , (located vertically from top to bottom on the right side of the panel) General Fault, Battery Fault, Power Supply Fault, Siren Fault and Zone Status (located at the bottom of the panel) LEDs and in addition the LCD screen.

There are terminals for 24 volt output on the device. These are two different types of outputs: protected and unprotected. If the unprotected output is to be used for external devices, the connected loads must be strong enough not to draw excessive current without affecting the operation of the system. Generally, powers up to 1 ampere do not affect the operation of the system. For currents to be drawn above this, share your system configuration with the manufacturer to find out the maximum current that can be drawn. 24V protected output is limited to 400mA and no more current is allowed to be drawn. In case of exceeding currents, it does not limit the current by reducing the voltage, on the contrary, it cuts the output voltage completely. In order for it to be activated again, the load drawing current must be disabled. With these connections, other peripherals operating with 24 volts can be connected to the system without external power sources.

There are Error and Alarm Relay outputs, 3 Open Collector Sound and Indicator outputs and 2 supervised siren outputs on the main board.

REDBAN CO-016 Addressable Carbon Monoxide Detection and Control Panel is produced with SMD technology in accordance with EN50130-5 and EN62368-1 standards. The panel is designed to work with REDBAN brand peripherals. Compliance with EN 54 standards cannot be guaranteed with other brand devices to be connected. Additionally, it is possible for the panel to become damaged over time. In this case, the panel will be out of warranty.

Electronic filters on the conversion cards prevent the device from being affected by high-frequency ambient noise coming from the detector connections. Thanks to the precautions taken with the system hardware and software, all inputs and outputs are protected against electromagnetic interference, noise, short circuits and incorrect cable connections.

2. INSTALLATION

2.1. Layout and Assembly

during installation must be safe and the person installing the system must pay attention to the following issues;

- The selected place should be a place that cannot be easily accessed by unauthorized persons, the selected place should be dry and away from the risk of flooding,
- The panel should be close to the mains voltage and a healthy grounding line, the supply voltage should be selected in accordance with ventilation and heat dissipation,
- Care should be taken not to energize the system before completing the installation of the system and testing all cable connections.

WARNING: The environmental category of the panel is IP30. It is the responsibility of the installers to insulate the cables to be connected during installation in a way that does not violate IP30 rules. The manufacturer does not guarantee the healthy operation of the system and its compliance with IP - EN standards in case of errors made at this stage.

2.2. Ground

Make sure that the grounding terminals of the panel are connected to the metal panel box and the cabinet housing the panel, if any, and that they are grounded with a ground line or a co-functional metal pipe. Grounding of cable shields and panel prevents high frequency/high voltage interference. Make sure that the shields of all cables carried out of the panel are connected to the ground line and are not connected to the ground line at other points.

2.3. AC Power Connection

The panel consumes a nominal 100 watts of energy during operation. Do not use a switch-controlled connection on the supply line. The power supply of the panel operates with 220V / 50 Hz alternating current. Do not energize the system without making all connections and checking all wiring. The cable to be used in the supply line must be NYM or NYA type with a cross section of 3 x 2.5 mm2. For IEC 61000 compliance, use the supply line with 3 turns of winding on the toroid core coded K1-T-40x12.5x27.

2.4. Battery Connection

, backup power is provided by 2 12 volt / 7 Ah rechargeable lead acid batteries, as shown in Figure 1, in order to maintain the operation of the system . REDBAN CO-016 requires these batteries to be connected in series with correct polarities. Connect the batteries to the system after connecting the AC power line and starting the system. Without the primary power source connected, the batteries will not power the system.

2.5. Auxiliary Power Outlets

Auxiliary power outlets are power outlets that provide 24 volt voltage to be used to feed additional devices to be connected to the system. One of these outputs is protected by a 400 mA automatically resettable fuse, and the other is unfused. Typical auxiliary equipment/additional devices are automatic telephone dialer, communication terminals, various sensors, solenoid valves and similar devices. The 24V unprotected output is the direct output of the power supply and has a voltage of approximately 27.6Vdc. In order to meet IEC 61000 requirements when using this output, the power cable to be connected to the terminal must be used with 2 windings on the VAC W868-01 Toroid element. Power outlets should be used considering their polarity.

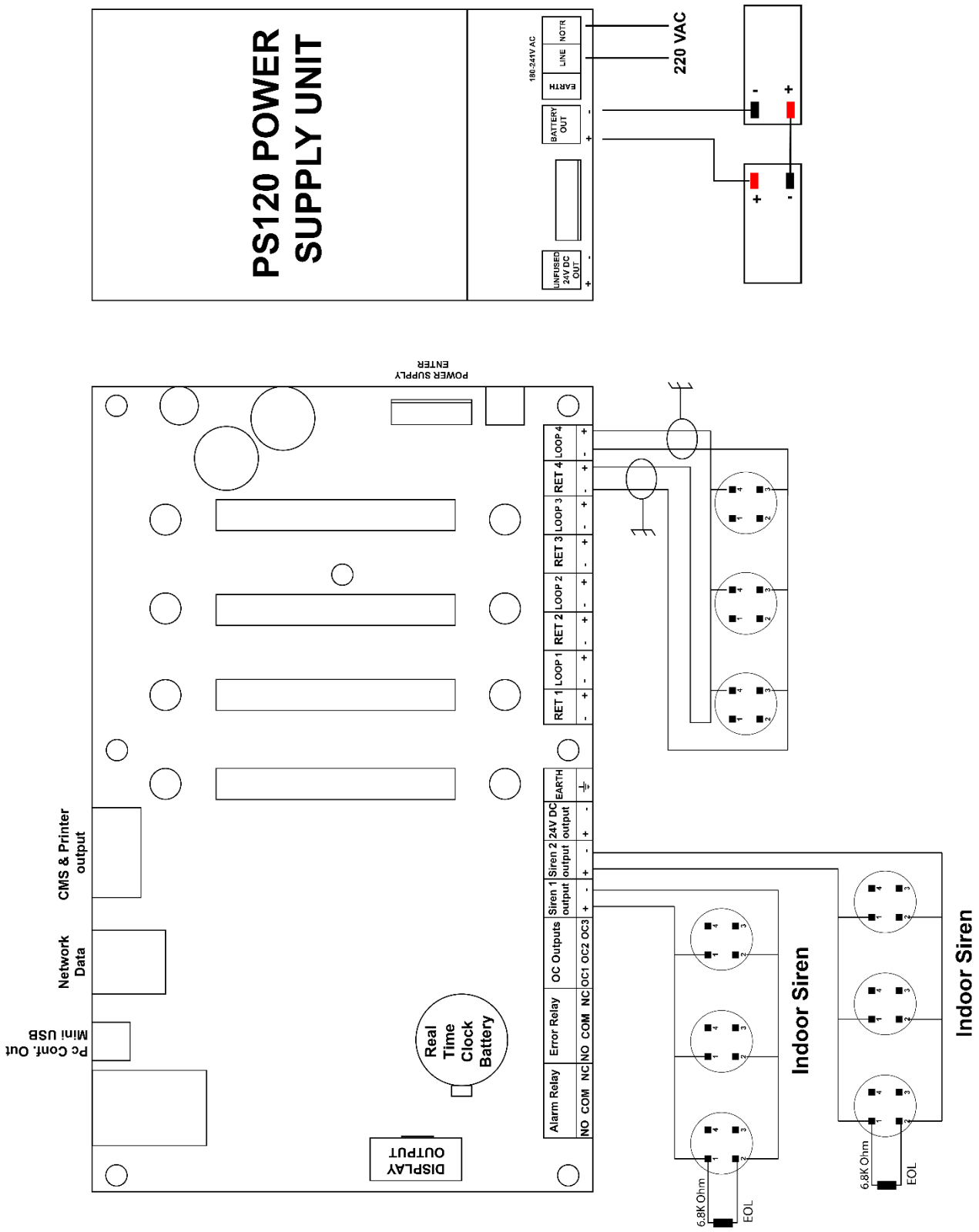

Figure 1- General Connection Diagram

2.6. Siren Outputs

2.6.1. Siren Output

There are two supervised siren outputs on the CO-016 Panel. These outputs are activated in cases of evacuation and fire. After any activation, siren outputs will remain active until the system is restarted or the alarm cancel button is pressed. Siren outputs are 24 V and protected by a 400 mA resettable fuse. When the siren outputs are not active, 12 V voltage is measured in reverse polarity. When connecting a siren, polarity should be taken into consideration and for IEC 61000 compliance, the connected siren cables should be used with 2 windings on VAC W868-01 Toroid.

REDBAN CO-016 Addressable Carbon Monoxide panel controls siren outputs. It detects a short circuit or open circuit on the line. At the end of the line, termination should be made with a 6.8 K ohm 1/4 watt resistor (figure 2). If this condition is not met, the panel will detect siren error and give Siren Error warnings on the screen and led indicators.

When connecting audio warning devices to siren outputs, it should be calculated how many devices can be connected. To be withdrawn total flow 400 mA _ _ should not pass. This limitation siren of their exit insurance with due to protection.

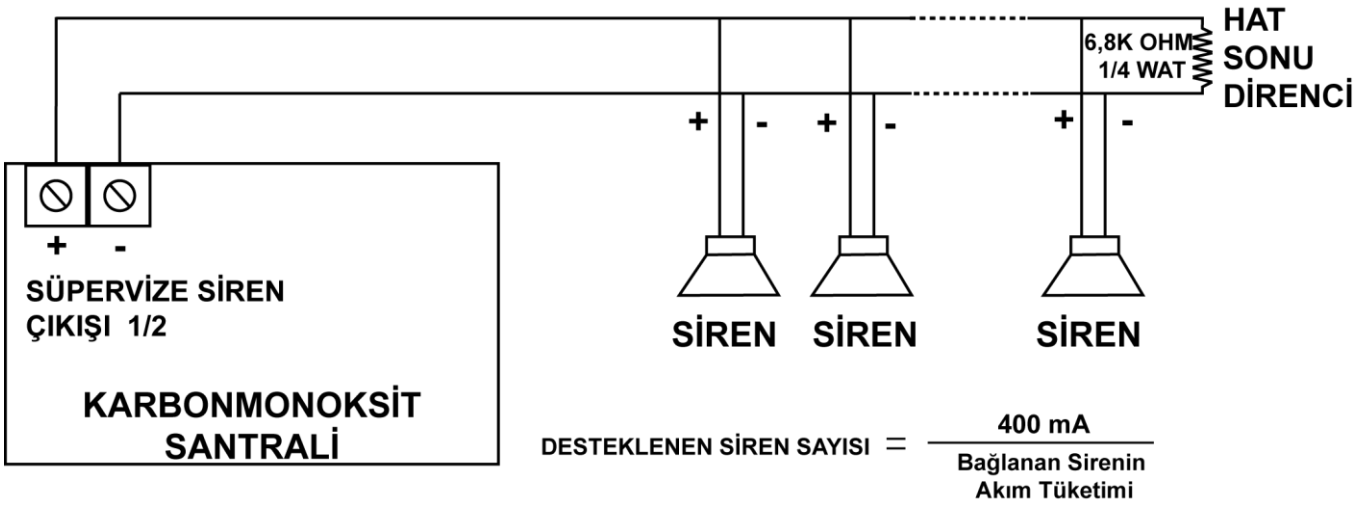

Figure 2- Supervised Siren Output Connection

2.6.2. Programmable Sound and Indicator Outputs

On main board found 3 piece REVENGE your exit each someone 400mA flow Do not Pull capacity. This Outputs are typically designed to drive a relay or internal fire sounders (programmable audible alarm outputs). Current capacity can be increased via externally connected relays (Figures 3 and 4). OC outputs numbered 1,2 and 3 in the system are connected to outputs numbered 1, 2 and 3, respectively. exit to the channels has been appointed. This your exits use of with relating to detailed information exit devices with It is explained in the relevant section. To ensure IEC 61000 compliance, the cables to be connected to the outputs must be connected with two windings via the toroid coded VAC W868-01.

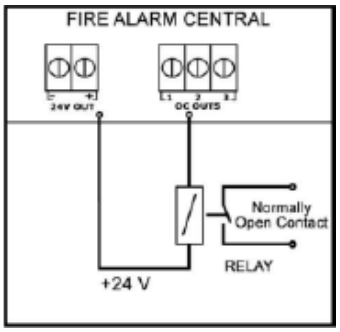

Figure 4- Open Collector Output Relay Connection

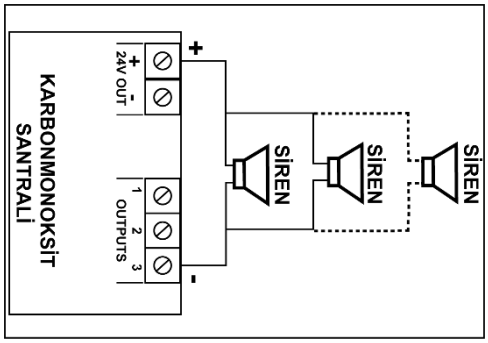

Figure 3- Open Collector Output Siren Connection

2.6.3. Alarm Relay Output

REDBAN CO-016 Panel main board on alarm relay There are. Relay normal conditions is passive, well COM-NC short circuit, COM-NO is open circuit (shape 5). Alarm And evacuation In cases, relay active halo will come. This exit, Another of systems control for available. Evacuation status By pressing the Evacuation button on the panel, the alarm is generated by the fire alarm coming from the sensors connected to the system. of the relay circuit female to stay for, alarm status formed whereas alarm of the situation from the middle must be removed and then the system must be restarted. Contact capacity is 1A @30Vdc.

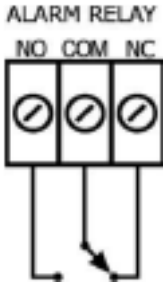

Figure 5- Alarm Relay Terminals

2.6.4. System Error Relay Output

REDBAN CO-016 Panel main board on system mistake relay There are. Relay normal active in conditions is in the situation, well COM-NO short circuit, COM-NC is open circuit (shape 5). Panel by perceived, EN 54-2 in standard mistake aspect acceptance made, normal female each situation, of the relay location will cause it to change. The relay will automatically return to normal operating position when the error condition disappears.

The system error relay is activated during normal operation. If the panel is not working, the relay will not be energized because the error relay cannot be pulled. This will enable the system to be monitored by other devices or systems in the environment.

In the system mistake relay when withdrawn each 15 per second One, ½ second during voiced warning will be heard. This warning can be canceled by pressing the mute button on the panel. However, each new line added to existing errors will activate the audio alert again. Canceling the audio warning does not affect the position of the relay. Since the System Error Relay is a contact output only, these outputs does not produce. Contact capacity is 1A@30Vdc . NO, NC and COM terminals can be accessed via terminal blocks.

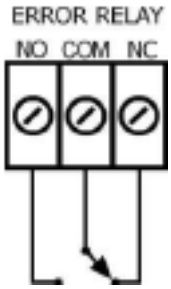

Figure 6- Error Relay Terminals

2.7. Loop Connections

Each loop has connectors marked LoopX and RetX on the main board, and these connectors have "+" and "-" terminals. This means that 4 wires are connected to the panel for each loop (figure 7). In normal operation, LoopX output connectors provide the energy of the devices connected to the loop and the signals required for two-way communication. If there is a break in the wiring, the signal coming to the RetX terminal will be lost and the line will be detected as broken. Similarly, even occurred incoming short circuit either in extreme flow shooting also system by by being perceived error signals is produced. This errors, System mistake relay And voiced warning active halo brings. Same in time It is displayed on the LCD, the system error LED lights up and it is recorded in the system event records.

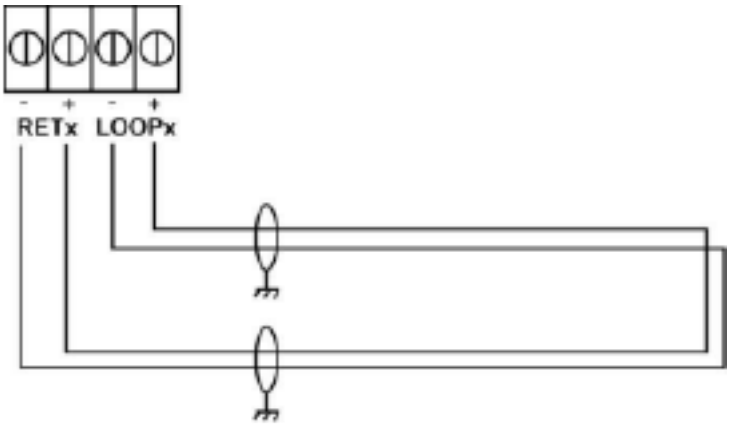

Figure 7- Loop Line Connection

In a healthy cabling for the system, the loop resistance should not exceed 35 ohms. measure this value for, of the loop end on your device "+" And "-" ends test purpose with temporary One duration for short circuit is done. The cables connected to the RETx and LOOPx connectors on the panel are removed, and the impedance of the red and black cables to be connected to the LoopX connector is measured. Next, the impedance of the red and black wires that will be connected to the RETx connector is measured. The sum of these two measurements equals the resistance (Rs) of the Loop line. To check that there is no short circuit in the cable, the short circuit in the red and black cables of the last detector in the previously short-circuited loop is opened and the measurement is repeated. In this case, the open circuit resistance (Ro) is noted.

If Rs is less than 35 ohms and Ro is open circuit, the line is healthy.

If Rs is greater than 35 ohms and Ro is open circuit, the line does not comply with standards. In this case, the panel may not work properly. The solution is provided by shortening the cable length

or using cables with better conductivity. A better conductor cable means a cable with larger conductor diameters.

If the Ro value is not open circuit, it indicates that there is a short circuit on the line. In this case, the cables should be checked again. Sometimes a damaged device (carbon monoxide detector, or modules) can cause a short circuit. If the cable check does not yield results, the devices should be disconnected from the circuit, the measurement should be repeated and the faulty device should be found.

After the test, the cables must be reconnected to the panel. During connection, make sure that the red cables are connected to the "+" terminals and the black cables are connected to the "-" terminals.

The loop lengths that can be achieved with cables made of pure copper are 1000 meters for a 2x0.8mm² cross-section cable and 2100 meters for a 2x1.5 mm² cross-section cable.

It is useful to check the problems in the cables by measuring them with a multimeter before pulling the cables.

2.7.1. Connecting Devices to Loops

Devices It must be connected as shown in Figure 8. Before connecting, devices must be addressed and there should not be more than one device with the same address on the same loop. Programming will be done with the PP1201 addressing device. This topic is explained in the PP1201 user manual. After checking, pulling and testing the cables, when connecting the devices "+" And "-" to the poles attention should be done. Red cable "+", black cable whereas "-" will be connected to the terminals. Wrong connection to devices damage if he doesn't give also, connection until it is corrected much causes them not to work.

The use of the PP1201 programmer should not be done while the devices are connected to the loop. Otherwise, all devices connected to the loop will receive the given address. This process may cause the programming device to malfunction due to its inability to operate under specified operating conditions.

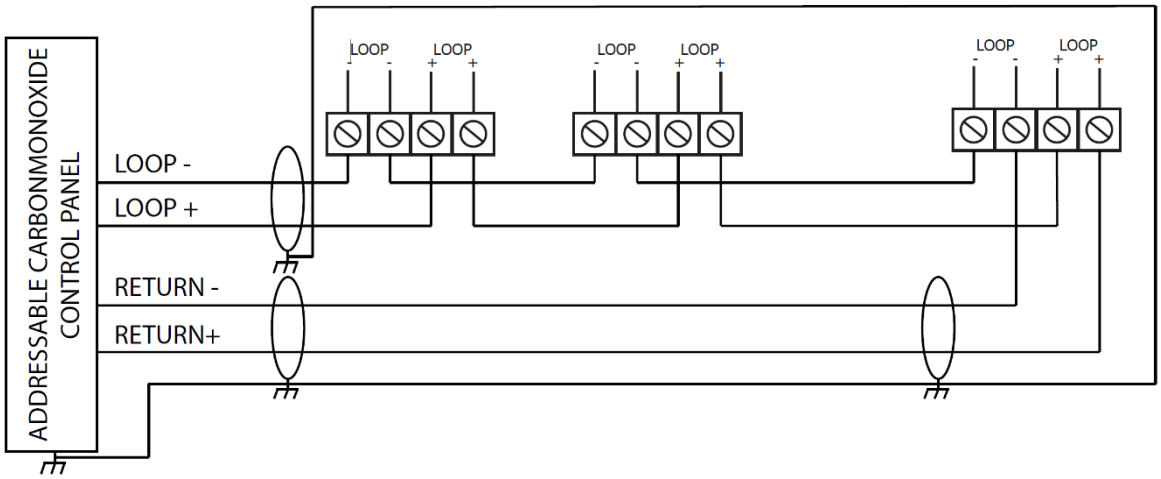

Figure 8- Connection the devices to the panel

2.8. Network Panel and Repeat Panel Connection

If you want to connect more than one CO-016 Panel in the same project or if the maximum number of loops in a panel is insufficient, CO-016 Panels can be networked to ensure that they work together.

Up to 64 panels can be connected to a network system. To create a network with CO-016 Panels, one RT121 must be connected to each panel. RT121s are mounted in their own slot within the panel case, a separate case is not added. When more than one panel is networked, the working system is as follows: each panel transmits the data in it to the RT121 network card through the RS485 port. RT121 shares the data it receives from its panel with other RT121s.

The connection of the panels to the network is made with RT121 cards. Its connection is as follows: communication between the panel and RT121 is provided by a 4-wire flat cable. Communication between network cards is connected in a loop manner using a two-wire RS485 twisted pair cable. The 2 wires coming out of the A port of the first RT121 are connected to the B port of the second RT121, paying attention to their directions, and the 2 wires coming out of the A port of the second RT121 are connected to the B port of the third RT121. The connection continues like this, and the 2 wires coming out of the A port of the last RT121 are connected to the B port of the first RT121, and thus the loop is completed by returning to the beginning.

The connection method is stated below.

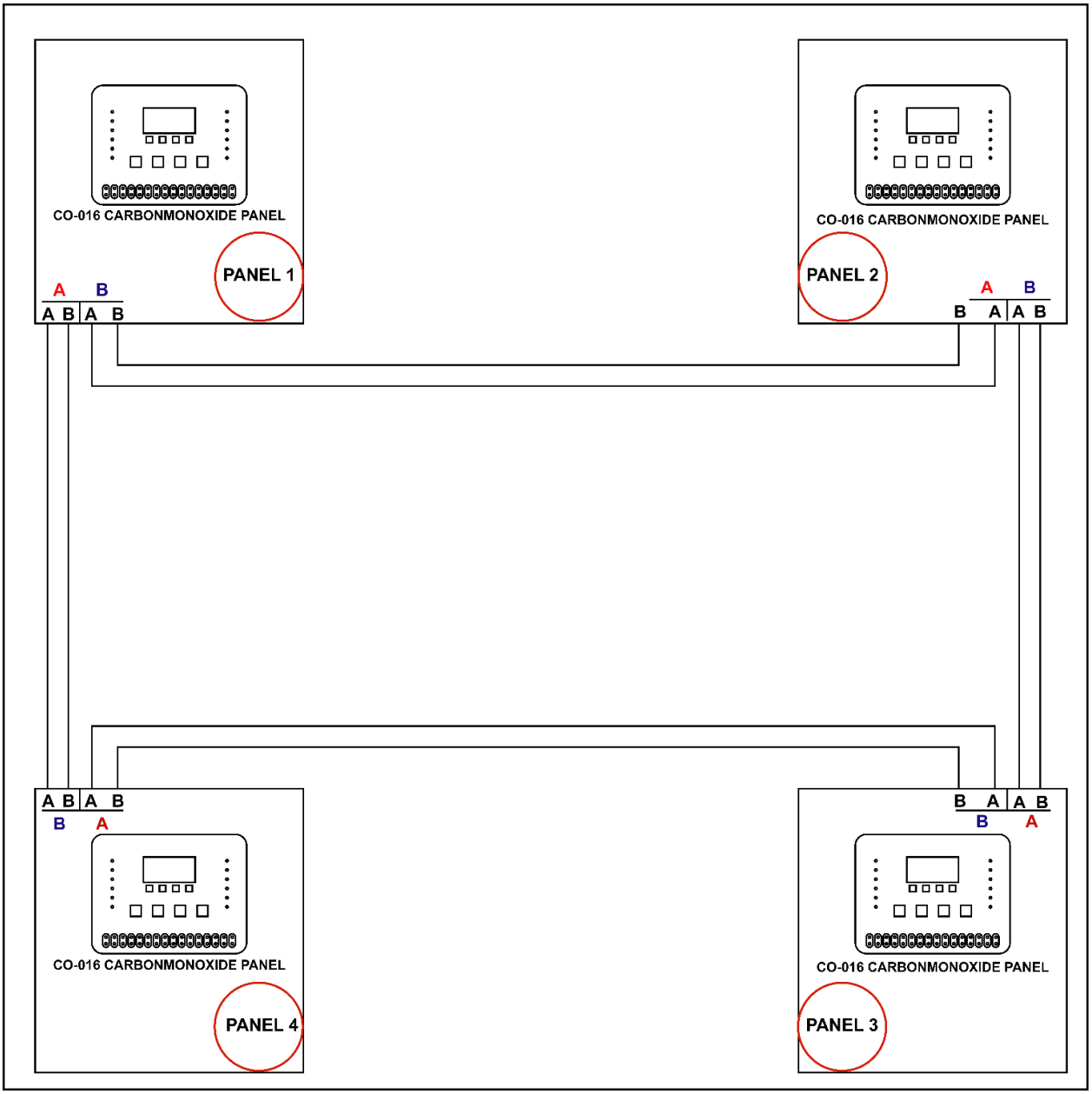

Figure 9- Network Connection of Panels

Repeater panel connection to CO-016 Panels is made over the network. If the system is already a network system to which more than one panel is connected, monitoring is included in the existing network with the RT121 network card by installing a new panel at any desired point. There is no need to install a loop card (LK401) on this panel.

If the system is a single panel, RT121 is installed on both the main panel and the repeater panel, and the system is networked and operated. Data exchange of the repeater panel on the network is regulated in the network settings.

3. OPERATING

REDBAN CO-016 Addressable Carbon Monoxide Detection and Control Panel is equipped with a 128 x 64-dot graphic LCD screen (8 lines and 20 columns in character mode), function keys and warning LEDs. There are 16 zones on the device and separate status indicator leds for two levels of each zone, error leds, audio warning module, power indicator, system ready indicator and other mandatory indicators specified in EN50130-5 and EN62368-1 Standards. All status information of the device is shown on the LCD screen and/or LEDs. The panel checks for system errors and displays them on the user interface in a way that the user can detect. The user can control and adjust the system functions with Reset, Evacuation, Alarm Cancel, Mute, Test and four directional keys. Visual status indicators of the system are (located vertically from top to bottom, respectively, on the left side of the panel) Supply, Ready, Disabled, Zone Disabled, Pre-Alarm, Alarm, Cancel Alarm (listed below the LCD screen in the middle of the panel), Evacuate, Mute , (located vertically from top to bottom on the right side of the panel) General Fault, Battery Fault, Power Supply Fault, Siren Fault and Zone Status (located at the bottom of the panel) LEDs and in addition the LCD screen.

The display shows the status of the panel, the system time and date, and the detection levels of the zones. If there is an error with the system on the panel, information about the error or errors of the system is also displayed. In case there is more than one error, the errors are displayed sequentially at 2-second intervals. If there is no error, the system status will appear as "Normal".

Alarm and evacuation have higher priority than other messages on the panel. Therefore, if there is another error, it will not be seen on the LCD screen. Alarm signals coming from the zones will cause the signal LEDs of the relevant zones to light up. If a pre-delay is defined for the zones, the Pre-Alarm LED will be on until the zones become alarmed. After the pre-alarm ends, the "Alarm" LED will turn on and the "Pre-Alarm" LED will turn off.

In order to access the system menus, the user's access level must be determined. After factory tests, the panel is set to Access Level 3 and sent to the customer. The access level is changed with the “Access Level” submenu in the “Settings” menu in the main menu. Once the access level is changed, it will remain the same until it is changed again. De-energizing or restarting the panel does not change the access level.

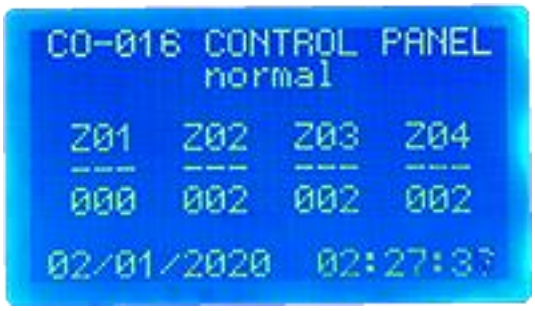

Figure 10- Normal Screen

3.1. Access Levels

In order to limit the use of the panel to unauthorized or incompetent people, access levels according to the EN54 standard have been applied. These levels are determined as ES1 = Untrained User, ES2 = Authorized User, ES3 = Service and Maintenance Engineer, ES4 = Production Engineer. The authorizations of the access levels are explained in detail below.

3.1.1. Access Level 1 (ES1)

A. mute

An error detected during operation will cause a beep to sound every 15 seconds. This warning can be canceled by pressing the "Mute" button. In case of cancellation, the mute warning LED will light. Each new error will cancel the silence command, start an audible warning again and turn off the silence LED.

B. Menu Navigation (Up / Down / Left (Exit, Cancel) / Right (Select, Accept))

At Access Level 1, Action keys can only be used to increase the access level.

3.1.2. Access Level 2 (ES2)

Access Level 2 is activated by entering the 6-digit access level password after pressing the enter key. When the password is entered incorrectly, the user is notified with a message displayed on the screen. In this case, the user can re-enter the password or give up with the esc key and return to the main menu. The cursor will automatically move to the first character of the password.

The default password assigned for ES2 is 111111.

If necessary, access level passwords can be changed during commissioning. The ES2 password must be known to stop the alarms and reset the system. One or more people responsible for the carbon monoxide detection system in the installation area must know this password.

A. Alarm Cancel

The main function of this button is to silence the sirens connected to the panel that are sounding due to alarm or evacuation. If there is an alarm condition, the sirens switch from active to passive, or active if they are inactive, every time the button is pressed. In some cases, a delay may be defined in sirens, this delay is determined by the values given in the settings of the zones or detectors. After the alarm condition is detected, only the audible warning on the panel is activated during the pre-alarm period, and the sirens are not energized until the delay ends. If the alarm cancel button is pressed for 3 seconds during this delay period, the sirens will not be activated even if the delay period ends, unless a new alarm occurs, which is indicated by a rapidly flashing LED. Control of sirens can only be done with the evacuation button. When the button is pressed during an alarm, the relevant LED lights up continuously.

B. reset

This key is used to restart the panel in irreversible modes, i.e. alarm and evacuation. Since the panel will return to normal state when the errors are corrected, there is no need to use this key in error situations. Restarting the system does not affect the access level.

C. Evacuation

This key controls the outputs activated in case of alarm. These outputs are buzzer on the panel, alarm relay output and siren output.

3.1.3. Access Level 3 (ES3)

Changing information about the area where the system is installed, which affects the operation of the panel, is possible only in ES3 and ES4. Changing these values does not change the program running on the panel, only the operating parameters. At these access levels, data related to the area where the installation is made can be read and changed. To access ES3, the "Access Level" option can be changed by entering the "Settings" submenu in the menu and entering the access level 3 password and pressing the enter (select) key.

During production, each CO-016 Panel is given an ES3 password paired with its serial number. This password can be learned from the manufacturer or distributor during installation.

If the password is entered incorrectly, the user is warned. In this case, you can return to access level 2 with the esc key or re-enter the password and press the enter key.

Figure 11- Access Level 3 Password

3.1.4. Access Level 4 (ES4)

This access level is the access level where the producer functions are located. It can only be used by authorized personnel of the manufacturer or distributors. At this level, the program of the panel can be changed, reloaded, panel data can be backed up to the computer, restored from the computer, system event records can be deleted, factory settings can be restored, ground fault detection can be disabled, and the operating language of the panel can be changed. Program memory can only be modified in ES4.

3.2. Operation of the Panel

3.2.1. Level 1 Detection Status

When the amount of carbon monoxide detected in carbon monoxide detectors exceeds the threshold value determined as the first level, the panel reaches the first detection level. The detection level is displayed by activating the first level LED on the zone status LEDs on the panel. At this level, desired outputs can be activated. When the detected amount of carbon monoxide drops below the first level threshold value, the system automatically returns to its normal position.

3.2.2. Level 2 Detection Status

When the amount of carbon monoxide detected in carbon monoxide detectors exceeds the threshold value determined as the second level after the first level threshold value, the panel reaches the second detection level. The detection level is displayed by activating the second level LED on the zone status LEDs on the panel. At this level, desired outputs can be activated. When the detected amount of carbon monoxide drops below the second level threshold value, the system automatically returns to the first level detection position.

3.2.3. Alarm Status

When the detected amount of carbon monoxide exceeds the third threshold level, the red "Alarm" LED will light as well as the zone LEDs on the panel and the system will go into alarm status. Details of the area where the alarm occurs (address and zone definition) are shown on the LCD screen.

alarm , the panel warning sound, sirens installed in the area, alarm relay on the panel and siren output will be activated. If outputs are assigned to alarm zones or detectors, these outputs will also be activated. At this level, the system will not return to its normal position unless the panel is intervened by the user. The panel warning sound can be canceled by pressing the "Mute" button. Similarly, the "Alarm cancel" button will deactivate the alarm relay and Siren outputs on the panel. The second press of the "Alarm cancel" button enables the alarm relay and siren outputs to be activated again.

The system can be restarted with the "Reset" button. If the conditions that caused the alarm have not disappeared when the system is reset, the system will enter the alarm state again.

3.2.4. Error Status

If there is one or more errors detected in the system, the yellow general fault LED will light. If the detected error is caused by the power supply, battery or siren line, the LEDs related to these errors will also light. All errors, whether visible or not, are reported in detail with messages written on the LCD screen. As long as the error continues, a ½ second warning sound will be heard on the panel every 15 seconds. The error relay contacts on the panel will switch to the error position. The audible warning on the panel can be disabled by pressing the "Silence" button. In case of multiple errors, the errors will be displayed sequentially on the screen.

3.2.5. Evacuation Status

When the evacuation button is pressed, the red "Alarm" LED will turn on and the audible warning, alarm relay and siren output on the panel will be activated. The evacuation status will be displayed on the screen. The audible warning on the panel can be disabled by pressing the "Silence" button. Similarly, the "Alarm cancel" button will deactivate the alarm relay and siren outputs on the panel.

3.2.6. System Errors

REDBAN CO-016 Carbon monoxide detection and control panel constantly checks for possible system errors. When any error is detected, the "General Fault" indicator and other relevant indicators, if any, light up. These errors are explained below.

3.2.6.1. Mains Voltage Error

The 220 V mains input to the panel and the fuses on the power supply should be checked.

3.2.6.2. Battery Error

CO-016 Carbon monoxide detection and control panel checks the battery connection inside every 10 seconds. If the backup power unit, that is, there is no battery connection, the battery supply fuse in the power supply is blown. whereas, battery voltage 20 from volt little whereas either in battery drink resistance one hundred m from Ohm high whereas battery mistake LED lights up. This your test not done condition HUNGRY of feeding sufficient is that it is. HUNGRY feed insufficient is In this case, the system will be powered from the battery and the battery will begin to discharge. The battery can supply the system up to 17 volt level. continue will. Battery 17 pacing without falling HUNGRY feed

sufficient halo If it comes battery charge It will start to happen. When the level drops to 17 volts, the system will automatically shut down to prevent deep discharge of the battery.

3.2.6.3. Siren Error

One or more sirens with a total impedance of 5 k Ohm or more should be connected to the siren output of the panel. If the impedance of the connected sirens is less than 5kOhm, a 10k Ohm resistor should be connected to the end of the line to ensure that the system detects the sirens. If the panel does not detect the specified impedance, this situation is considered as a siren error and the "Siren Error" LED turns on. Typical aspect This situation sirene outgoing of cables rupture because of occurs. Siren again normal When the status returns, this error LED turns off and the panel returns to normal operating mode.

3.2.6.4. Ground Fault

When the panel detects insufficient grounding, a ground fault condition occurs. This error can be suppressed with settings in ES4. The ground fault lights up the general fault LED and shows the "Ground fault" message on the screen.

4. MENU

While on the status screen, press the enter key to go to the main menu of the system. To go to the main menu, you need to be at least ES2. In ES2, some functions related to service, maintenance and settings in the menu are not visible, but authorized users can see all menu functions in ES3.

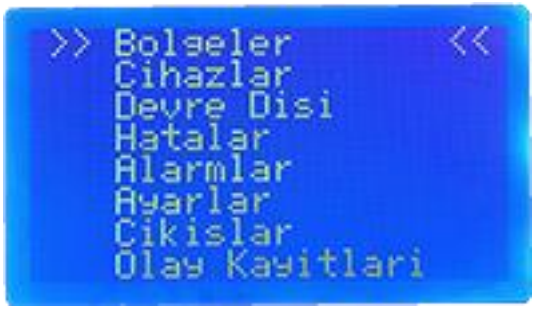

Figure 12- Panel Main Menu

Single arrows appearing in the menu indicate the navigation mode, indicating the menu to be selected. You can move to other menu options with the up and down keys. In this case, the esc key returns to the status screen, or the highlighted menu is entered with the enter key.

4.1. Zones

When the Zones menu is selected, the Zones appear in order (between 1 and 16). Navigate to the desired Zone with the up and down arrow keys and enter that Zone with the enter key.

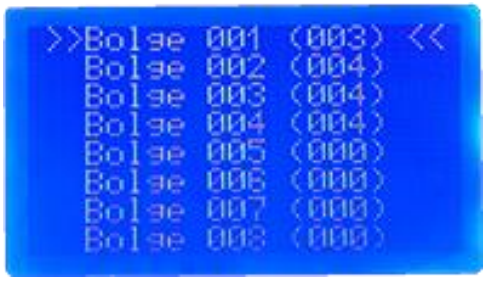

Figure 13- Zones Menu

4.1.1. Devices (Zones)

In Figure 14, the Zone number is seen on the first line within the selected Zone. The name of the Zone is written on the second line. The zone name can be changed on the panel using keys or on the computer using programming software. The first option in the menu within the Zone is "Devices". Next to this option, it is shown how many devices are defined in that Zone. When the Devices option is selected (Figure 15), a submenu is entered and the list of devices defined in that Zone and the device types are displayed. The submenu description of the devices is explained under the device heading.

Figure 14- Zone Details

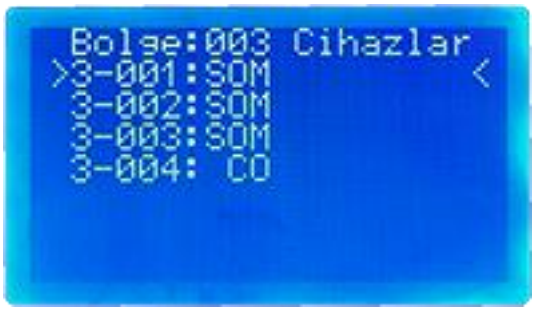

Figure 15- Devices within the Zone

4.1.2. New Zone Name

To change the Zone name on the panel, "New Zone Name" should be selected on the fourth line. Once selected, the section in figure 15 will appear. In this section, the first line contains the Zone number, the second line contains the old name of the Zone, and the third line contains the "New name" information. On the fourth line, there is a cursor starting from the first letter of the name to be entered. Letters or characters to be entered can be selected with the up and down arrow keys, the selected letter is confirmed with the enter key and the cursor moves to the next letter. In this way, a 20-character name can be determined. If the Enter key is pressed for 2 seconds, the entered name is confirmed and you go back to the upper menu. You can cancel the operation and return to the upper menu with the Esc key.

Figure 16- Entering a New Zone Name

4.1.3. Zone Enabled / Disabled

in the menu is used to enable or disable the zone. When this option is selected, the section shown in Figure 17 is entered. In this section, the zone number is written on the first line, the zone name is written on the second line, and the current status of the zone (enabled/disabled) is written below it. The new status (enabled/disabled) can be determined with the up and down arrow keys. The

selection is confirmed with the Enter key and you go back to the upper menu. You can cancel the operation and return to the upper menu with the Esc key.

Figure 17- Zone Enabled/Disabled

4.1.4. Value Average/Peak

The fourth option in the Zone menu is the "Value" option. This option determines how the detectors detect (average/peak). "Value: Average" takes the average values of the detectors in that area and checks whether they exceed the specified detection threshold level. "Value: Peak" checks whether each detector reaches the specified detection threshold level. The current detection method will be written next to the value option. When the Enter key is pressed, a submenu is accessed. On the screen shown in Figure 18, the Zone number is displayed on the first line, the Zone name is displayed on the second line, and the currently selected value is displayed in the middle of the screen. This value can be changed with the up and down arrow keys. After the selection is made, the selection is confirmed with the enter key and you go back to the upper menu. You can cancel the operation and return to the upper menu with the Esc key.

Figure 18- Detection Type of Zone

4.1.5. Level Settings

The fifth option in the zone menu is level settings. Level settings are used to determine at what ppm level the detectors will detect. Any desired value within the range of 0-300 ppm can be determined for threshold levels. When this option is selected, the submenu in figure 19 is entered.

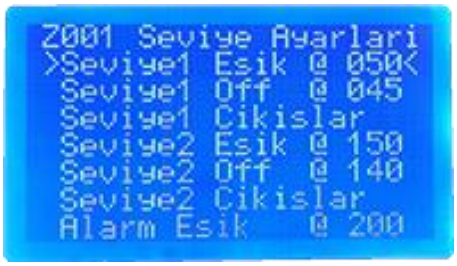

Figure 19- Detection Threshold Levels

In this submenu, from top to bottom;

- (Level1 Threshold) Detection threshold value of Level 1
- (Level1 Off) Threshold level to return to normal after exceeding this threshold
- (Level1 outputs) Output channels that can be routed for Level1
- (Level 2 Threshold) The detection threshold value of Level 2,
- (Level 2 Off) Threshold level to return to normal after exceeding the Level 2 threshold
- (Level 2 outputs) Output channels that can be routed for Level 2
- There is an alarm threshold level.

You can reach any of these threshold levels by pressing the up and down arrow keys. When the Enter key is pressed, the option becomes active and the desired threshold value can be determined with the up and down arrow keys. If the enter key is pressed again, the determined value is confirmed and navigation mode is returned. Level 1 Off and Level 2 Off values must be at least 1 unit lower than the threshold values. If the Esc key is pressed, it will return to navigation mode without confirming the selection.

4.1.6. Level 1 and Level 2 Outputs

There are level 1 outputs and level 2 outputs options in the level settings menu, and these options are used to assign output channels for level 1 and level 2.

There are 16 zones in total in the CO-016 Panel and 2-level detection is made from each zone. Level 1 and level 2 output assignments are made for each zone. Therefore, there are a total of 32 output channels for level 1 outputs and level 2 outputs.

1 channel is used for the level 1 (or Level 2) output of each zone. If there will be more than one output unit (Relay module, Fan control module, etc.) in a Zone, the same channel is assigned to all level 1 output units of that Zone. Level one channels can be any 16 of the 32 channels available. The remaining 16 channels are used for level 2.

To route the channel, enter the Level 1 (or Level 2) outputs menu. The cursor is placed on the channel to be directed with the up and down arrow keys. It is selected with Enter. It is activated as "1" (ON) with the direction keys. Exit with ESC.

Figure 20- Level 1-2 Output Channels

4.1.7. Alarm Outputs

The last option in the zone menu is the "Alarm Outputs" option. When this option is selected with enter, the submenu shown in figure 21 is entered. In this submenu, the first line shows the zone

number, the second line shows the zone name, and the third line shows the total number of outputs activated for the alarm level in this Zone. Under the total number of outputs, there are "Output 1" (with 192 output channels), "Output 2" (with 64 output channels) and "Output 3" (with 32 output channels).

Figure 21- Alarm Outputs of Zones

Figure 22- Zone Alarm Output Output-1 Menu

When entering the "Output 1" submenu, the first option is "Type". Here, the type option, which is initially Disabled, is selected as Set, Reset, Set/Reset or Toggle by pressing the enter key and then the up and down arrow keys.

- **SET:** This feature-directed output channel changes the position of the relay module's contacts and ensures that they remain in that position.
- **RESET:** This feature-directed output channel ensures that the contacts of the previously changed relay module return to their initial position.
- **SET-RESET:** The output channel directed with this feature ensures that the contacts of the relay module change position once from the initial position and return to the initial position again.
- **TOGGLE:** The output channel directed with this feature allows the relay module to change position once and return to its previous state, regardless of the position in which its contacts are located.

When entering the "Output 2" submenu, the first option is "Output 2". The enter key must be pressed to activate this option, which is initially disabled. Then, by pressing the up or down arrow keys, it can be changed from disabled to enabled, or if it is enabled, to disabled. After selecting "Output 2: Enabled", "Delay" and "See channels" options are added to the bottom line. With the Esc key, the selected exit 2 option is left and the navigation mode is returned. The delay of this output at the time of alarm is determined from the delay option. From the View channels option, you can determine which output channel of that Zone will be activated. When you enter the View channels submenu, it will be seen that the output 2 channels of that Zone are in 0 status. If you select the output channel you want to activate with the up and down arrow keys and press the enter button, Channel X: (xxx) OFF will appear on the third line of the screen. Again, it is changed from "OFF" to "ON" position with the up and down arrow keys and when the enter key is pressed again, the selection is confirmed, if the esc key is pressed, the selection is not confirmed.

Figure 23- Output 2 Enable/Disable Screen

When entering the "Output 3" submenu, the first option is "Output 3". The enter key must be pressed to activate this option, which is initially disabled. Then, by pressing the up or down arrow keys, it can be changed from disabled to enabled, or if it is enabled, to disabled. After selecting "Output 3: Enabled", "Zone Delay" and "See channels" options are added to the bottom line. With the Esc key, the selected exit 2 option is left and the navigation mode is returned. Zone delay option is also the delay of output-3. From the View channels option, you can determine which output channel of that Zone will be activated. When you enter the View Channels submenu, the output 2 channels of that Zone will be seen as 0. If you select the output channel you want to activate with the up and down arrow keys and press the enter button, Channel X: (xxx) OFF will appear on the third line of the screen. Again, it is changed from "OFF" to "ON" position with the up and down arrow keys and when the enter key is pressed again, the selection is confirmed, if the esc key is pressed, the selection is not confirmed.

Figure 24- Output 3 Enable/Disable Screen

4.2. Devices/Loops

In the Devices menu, the loop interfaces detected on the panel are listed. If an interface is not detected, it appears as "". The detected or used conversion units and the number of devices included in those conversion units are displayed in the list. The status of the conversion units will also be seen in the list. Descriptions of the situations are listed below.

Reset: The loop is restarted, in this case the devices in the loop are not energized. This process takes approximately 15 seconds.

Short Circuit : The (+) and (-) outputs of the loop are in a short circuit state, in this case the loophas entered overcurrent protection mode and is communicating with devices in the loop. Since there is no data coming or going from the loop. The problem must be examined, found and resolved by the service engineer.

Open Circuit : There is an interruption in any of the (+) or (-) outputs of the loop. In this case, some devices on the device may not be accessible. Inaccessible devices are not reported separately in the system. The problem must be examined, found and resolved by the service engineer.

No Answer: The loop card has been removed from the system or has malfunctioned. Loop tasks cannot be fulfilled. This situation should be examined by the service engineer, problems should be found and resolved.

Normal : It refers to the condition in which the loop card and the devices on the loop are working properly. After the normal text, in parentheses, in that loop The total number of devices located will be included.

New Loop: When the panel detects a new loop, it is displayed this way until the first call is made. Even if the devices on the loop are operational, the information received from the devices will not be evaluated by the panel. In this case, the user starts an automatic search and devices to the system should introduce it.

Figure 25- Loops-Devices Screen

The cursor is placed on the desired loop with the up and down arrow keys. You can enter that loop by pressing the Enter key. When you enter the submenu of the loop, "Devices", "Disabled", "Error Device", "Alarm Device", "Loop Settings" and "Automatic Search" options will appear in the menu list from top to bottom, respectively.

Figure 26- Loop Details

4.2.1. Auto Search

When adding a new loop, an automatic search must be performed first. If the automatic search option is selected with the enter key, "Data will change" appears on the screen. Should we continue? text will appear. Confirmation can be given with the Enter key or canceled with the Esc key. Once the confirmation is given, the automatic search will start and this process will only take a few seconds. After the process is completed, you will return to the loop menu again. The automatic search option will be active at access levels 3 and 4.

4.2.2. Devices

The first option in the conversion menu is the "Devices" option. The number of devices is shown in parentheses on the side. If selected with the Enter key, the devices submenu is entered. Here (Figure 27), the devices in the selected loop are shown sequentially with their addresses and device types.

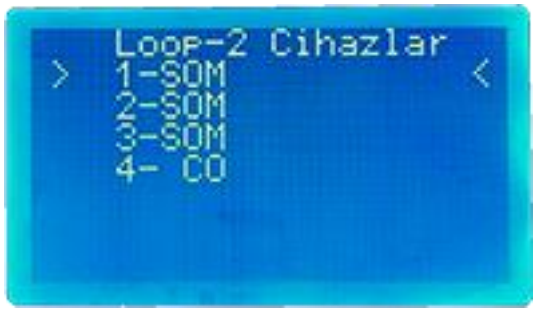

Figure 27- Device List

There are two types of addressable devices that can be connected to the CO-016 Panel. These are shown with short names in the device list.

- **SOM:** (Single Output Module) This device is a control module that provides output contact to Jetfan and other automation units of the carbon monoxide system. Provides Normally Open or Normally Closed dry contact. In order for it to work, it must be triggered by a zone. In order to trigger, output channels are assigned to Zones and SOMs.

- **CO:** (Carbonmonoxide) This device is a detection device. It detects carbon monoxide gas, represented by **CO** , which is a suffocating gas found in high amounts in the waste gases of fossil fuel vehicles, and transmits the gas density to the CO-016 panel and allows it to be processed.

When any device is selected from the list with the enter button, the detail menu of the selected device is entered. The submenu varies depending on the type of device selected. Figure 28 shows the submenu of the output module device. The first line shows the loop in which the device is located, the address of the device, the device type and in which Zone it is defined. Then, "Device Enabled", "Output Reverse / Test Mode", "Device New Name", "Drain Trigger / Zone:xxx", "Output Settings / Indicator Output" and "Diagnostics" options will appear respectively.

Figure 28- SOM Device Details

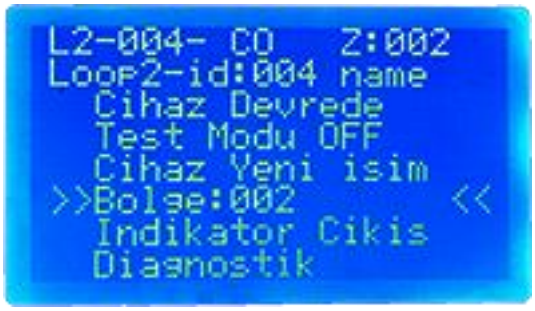

Figure 29- CO Device Details

4.2.2.1. Device Enabled / Disabled

Device enable /disable option is used to disable or enable the desired device. This option is available on all devices. If this option is selected with the Enter key, the information of the selected device will appear on the first line of the screen. "Device is enabled" or "Device is disabled" will appear in the middle of the screen. This option can be changed with the up and down arrow keys. You can return to the upper menu by confirming the selection with the Enter key. You can cancel the operation and return to the upper menu with the Esc key.

4.2.2.2. Exit Reverse

Output Reverse option is only among the options of the output module (SOM) device. It is used to optionally change the positions of the relay contact manually without any event on the panel. The mechanical operability of the device to be controlled connected to the relay module is checked. When you select this option with the up and down arrow keys and press the enter key, it will switch from the factory-set "0" position to the "1" position. When this option is in "0" position, the relay in the output module is in NO position. If it is set to "1" position, the relay in the output module will switch to NC position and the green LED on the module will be active.

4.2.2.3. Test Mode

The Test Mode option is located second in the submenu of the CO-540 detector. Alarm, error and CO level information from the device put in test mode is not reflected on the screen, but is recorded in the event records. In this way, the detector is temporarily silenced without disabling the system in cases such as device replacement, cleaning and maintenance. After the process is completed, the test mode is turned off and activated. This option is set to "OFF" by default. When the Enter key is pressed, a submenu is entered. It is moved from "OFF" to "ON" with the up and down arrow keys. If the enter key is pressed again, the selection is confirmed and you go back to the upper menu. You can cancel the operation and return to the upper menu with the Esc key.

4.2.2.4. Device New Name

The new device name option is used to change the name of the device selected in the upper menu. This option is available on all devices. When this option is selected with the Enter key, the first two lines contain the information of the selected device (which loop it is in, address information, device type and device name). The third line contains "New name:" information. The letter or character you want to enter is selected with the up and down arrow keys. This selection is confirmed with the Enter key and the cursor moves to the right. After the desired name is entered, the entered name is confirmed by holding the enter key for two seconds and the user is returned to the upper menu. You can cancel the operation and return to the upper menu with the Esc key.

4.2.2.5. Evacuation Trigger

Purge Trigger option is among the options of the output module device. This option determines whether the output module will be active or not when the evacuation button is pressed. When "Evacuation Trigger" is selected with the Enter key, a submenu is entered. In this section, the selected device information is located at the top. "Drain trigger: OFF/ON" will appear in the middle of the screen. "OFF" or "ON" position can be selected with the up and down arrow keys. The selection is confirmed with the Enter key and you go back to the upper menu. If "ON" is selected, this device will operate when the discharge button is pressed. If "OFF" is selected, it will not operate when the discharge button is pressed. You can cancel the operation and return to the upper menu with the Esc key.

4.2.2.6. Zone: xxx

The "Zone:000" option is located in the submenu of the CO-540 detector. SOM devices are not included in any Zone. This option is used to determine which Zone the device will be assigned to. One or more devices can be assigned to a zone. By routing outputs within this Zone, desired outputs can be activated at the time of detection. The issue of exit directions is explained under the heading of Zones. When this option is selected with the enter key, a submenu is entered. Here, the first two lines contain device information. The Zone number to be selected will be displayed in the middle of the screen. The desired zone number is selected with the up and down arrow keys. The selection is confirmed with the Enter key and you go back to the upper menu. You can cancel the operation and return to the upper menu with the Esc key.

4.2.2.7. Output Settings / Indicator Output

" Output settings" option is located in the output module (SOM) device submenu and assignments are made according to levels in order to provide output according to the carbon monoxide information coming from the Zones. The "Indicator output" option is located in the submenu of the CO-540 detector and is used to activate the relay output on the CO detector with the information received from the CO detector. This relay output can be used to control a device near the CO detector from which information is received. The submenus of these options are the same. It is used to

determine which output channel the selected device will be directed to at which level. When the Output settings/Indicator output option is selected, a submenu is entered.

In this menu, from top to bottom, there are "Level 1 Channel Setting", "Level 2 Channel Setting" and "Alarm Channels" options.

When level 1 or 2 channel setting options are selected, another submenu is entered. In this menu, device information is included in the upper lines. In the middle part of the screen, there are output channels (32 units) that are factory set to "0". The output channel you want to activate is selected with the up and down arrow keys. If you press the Enter key and then the up and down arrow keys again, the output channel will switch from "OFF" to "ON". The selection is confirmed with the Enter key. After the desired channels are activated, the esc key should be pressed to return to the upper menu.

When the alarm channels option on the CO detector is selected with the enter key, the submenu in figure 30 is entered. There is device information at the top here. The bottom line contains the information "Influencer Channel: 000". This information shows the number of activated output channels. Then, from top to bottom, there are "Output 1 Channel:000", "Output 2 Channel:000", "Output 3 Channel:000" and "Mute/Resound OFF" options.

Figure 30- CO Detector Alarm Channels

Output 1, output 2 and output 3 channels submenus are similar. When selection is made with the Enter key, a submenu is entered. There is device information at the top here. In the middle part of the screen, channels designated as "0" are displayed. Use the up and down arrow keys to select the channel you want to activate. If the Enter key and then the up or down arrow keys are pressed again, the channel will switch from "OFF" to "ON". When the enter key is pressed again, the selection is confirmed. After this process is applied to the channels that you want to activate/passive, you can return to the upper menu with the esc key.

The "Mute/Resound" option is used to determine whether the mute button can control the selected device. It is in the "OFF" position by default. It is turned to "ON" position with the Enter key. If this option is activated in the device menu, the device can be controlled with the silence button during alarm. If the Esc key is pressed, you will return to the upper menu.

4.2.2.8. diagnostics

The bottom option in the device menu is the "Diagnostics" option. This option is used to calibrate the detectors. When selected with the Enter key, a submenu is entered. Here the CO detector can be calibrated with the ambient conditions. If the "Should it be calibrated" question is answered "YES", the device is calibrated.

4.2.3. Out of order

The third option in the Devices/Loops menu is "Disabled". When selected with the Enter key, a submenu is entered. If there is a disabled device or devices, it will be listed as in figure 31. When one

of the listed devices is selected with the enter button, the submenu of that device is entered and the desired changes can be made from there. This entered submenu is explained under the devices heading.

If there is no disabled device, "no device" will be displayed on the screen when selected with the enter key. You can return to the upper menu by pressing the Esc key.

Figure 31- Disabled Devices

4.2.4. Error Device

The fourth option in the Devices/Loops menu is the "Error Device" option. When selected with the Enter key, a submenu is entered. If there is a device or devices with errors, they will be listed here. When one of the listed devices is selected with the enter button, the submenu of that device is entered and the desired changes can be made from there. This entered submenu is explained under the devices heading. If there is no device with error, "no device" will appear on the screen. You can return to the upper menu by pressing the Esc key.

4.2.5. Alarm Device

The fifth option in the Devices/Loops menu is the "Alarm Device" option. When selected with the Enter key, a submenu is entered. If there is a device or devices with alarm, it will be listed here. When one of the listed devices is selected with the enter button, the submenu of that device is entered and the desired changes can be made from there. This entered submenu is explained under the devices heading. If there is no device with alarm, "no device" will appear on the screen. You can return to the upper menu by pressing the Esc key.

4.2.6. Loop Settings

The sixth option in the Devices/Loops menu is the "Loop Settings" option. When this option is selected with the enter key, the submenu in figure 32 is entered. Here, the options are "Loop-X Enabled/Disabled", "All LEDs OFF/ON", "All Tests Cancelled", "Walking Test Mode", Walking Period: XXX" and "Loop Diagnostics". You can navigate between options using the up and down arrow keys.

Figure 32- Loop Settings

4.2.6.1. Loop-X Enabled / Disabled

When entering the Loop Settings menu, the first option is "Loop-X Enabled/Disabled". It is activated by factory default. The position of this option (enabled / disabled) can be changed with the enter key.

4.2.6.2. All LEDs OFF/ON

The "All LEDs OFF" option is the second option in the loop settings menu. It is in the "OFF" position by default. Its position (OFF/ON) can be changed with the Enter key. When this option is set to "ON", the lights of all devices connected to that loop will be on continuously at the same time. To turn off the device lights again, the option must be set to (OFF).

4.2.6.3. All Tests Cancelled

When the walking test is started for devices in the loop, the test continues for the entered period and time. However, if you want to complete the test and take another action, all tests must be cancelled. Third in the menu is the "All Tests Cancel" option. When selected with the Enter key, it cancels the tests currently performed.

4.2.6.4. Walking Test Mode

"Walking Test Mode" is used to test the system with one person. When selected with the Enter key, it activates the LEDs of the devices for the period specified in the "Walk Period" option, starting from the first device in the selected loop. It stops automatically after testing all devices in the loop is completed.

4.2.6.5. Walking Period: XXX

Another option in the loop settings menu is "Walking Period: XXX". In the "Walk Test Mode" option, the duration of the LEDs of the devices in loop is determined here. When selected with the Enter key, a submenu is entered. Here, "Walking Period: XXX" will appear at the bottom of the screen. "XXX" sec. with the up and down arrow keys. Numbers indicating the time in units can be increased or decreased. The selection is confirmed with the Enter key and you go back to the upper menu.

4.2.6.6. Loop Diagnostics

The "Loop Diagnostics" option is the last option in the loop settings menu. Detailed parameters and instant data about the loop can be read.

4.3. Out of order

"Disabled" indicates the zones, loops and devices that are disabled in the system. When this option is selected with the Enter key, a submenu is entered. Figure 3 3 shows the content of this menu. From top to bottom, there are "Non-D Zone", "L1 Disabled", "L2 Disabled", "L3 Disabled" and "L4 Disabled" options respectively. If any device, Zone or loop is not disabled, these options cannot be selected with the enter key. If the device, Zone or loop is disabled, their numbers are specified in parentheses and the option becomes active. When selected with the Enter key, the menu of the disabled device, zone or loop is entered. It can be activated again from here. Device, zone and loop activation/deactivation procedures are explained under their own headings.

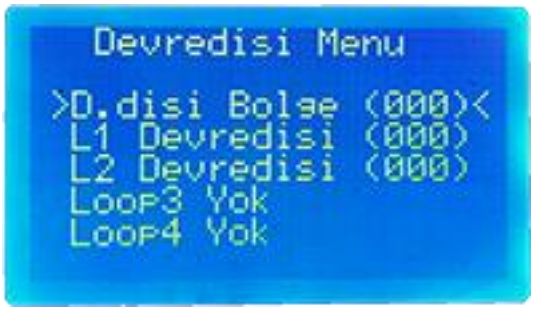

Figure 33- Disabled Menu

4.4. Errors

Errors menu is the section where errors occurring in the system are listed. Figure 3 4 shows the contents of the errors menu. From top to bottom, there are "General Error", "Loop Error", "Device Errors", "Network Error", "Network Comm" and "Error Event Record" options. There are error numbers detected in parentheses on the sides of the options. If no error is detected, these options cannot be selected with the enter key. When an error is detected, the number in parentheses changes and the option becomes active. When an error occurs, when you enter the error option with the enter key, the errors will be seen as in Figure 35. Error descriptions are listed below.

Figure 34- Errors Menu

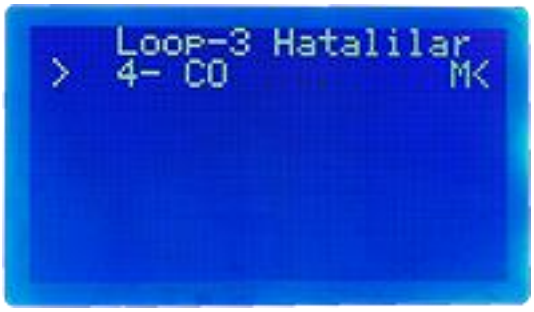

Figure 35- Incorrect Device Display

- **General Errors:** This section shows secondary power supply (battery system), primary power supply (mains voltage supply), Siren error, Ground fault, System clock errors. Siren error occurs if the siren line is not terminated with a 6.8 K ohm termination resistor, the siren output is short-circuited or the siren cable is broken. Battery group errors may be caused by the battery not being connected, the battery fuse blown, the internal resistance of the battery not being within the desired range (the battery is faulty), AC error, the mains voltage not being within the specified specifications, or the AC fuse blown. The clock error will be visible when the clock battery runs out and is replaced until the clock is set again.

- **Conversion Errors:** Possible conversion errors are the (+) and (-) outputs of the line being short-circuited, open-circuited or the conversion card not being detected.

- **Device Errors :** In case of device open circuit, device short circuit and device inaccessible errors, this option becomes active and the errors are listed.

- **Network Error: In** networked systems, RT121 Network cards provide communication between panels. These cards receive information from the panel they are connected to and share it with other network cards. The information on the network is received by other network cards and processed on the panel. The communication of the network cards with the panel is checked.

When there is a break or short circuit, it is shown on the panel. In this case, the connection between the panel and the network card is checked.

- **Network Comm:** If the communication between the network cards is broken, the panel will give this error. In this case, the communication between the network cards is controlled.

- **Error Event Recording:** While events occurring on the panel are recorded, alarms and errors are kept in separate recording locations. Error records can be accessed from this menu. Errors; Time-Date, faulty loop/device etc. shown with parameters.

4.5. Alarms

When you enter the Alarms option, the submenu in Figure 36 will appear. In this menu, from top to bottom, there are "Loop-1 Alarm", "Loop-2 Alarm", "Loop-3 Alarm", Loop-4 Alarm", "Network Alarm" and "Last Alarms" options. The number of detected alarms is shown in parentheses next to the options. When no alarm occurs, these options cannot be selected with the enter key. When an alarm occurs, the number in parentheses of the option in whichever loop or panel it occurred changes and the option becomes active. When you enter the option with the Enter key, the devices that alarm you will be listed.

Figure 36- Alarms Menu

4.6. Settings

When access level is 2 or 3, the system settings menu will be accessible. The menu will appear as follows.

Figure 37- Settings Menu

4.6.1. Panel Activation

Panel activation is the first thing to be done during installation. Without activation, the panel will operate with limited features and will not be fully commissioned. In order for the activation process to be carried out, the manufacturer must be contacted.

4.6.2. System Information

Contains information about the panel (model, serial number, version and CMS number).

4.6.3. Time/Date Setting

To set the time and date, press the enter button while "Time/Date setting" is selected. Then the following menu will appear. When first entered, the cursor will be on the line where the year digit will be set. The year can be increased or decreased with the up and down keys. When the year is finished setting, the Enter key moves the cursor to other fields.

After all fields are set, pressing the enter key again will save the new values, and pressing the esc key will exit without saving the data. Old values are loaded again.

4.6.4. Working mode

In day mode, alarm delays defined in the system are used. In night mode, delays are ignored and alarm signals and the set scenario are processed without delay.

4.6.5. Access Level

Detailed information on changing the access level is in section 3.1. It is given in .

4.6.6. Network Settings

When the CO-016 Carbon Monoxide panel is connected to the network, the network settings are disabled by default. Network is enabled in the network settings of the panel you want to activate. This process should be applied to each panel.

For this process, respectively; By following the steps ***Enter (main menu)>Settings>Network settings*** The network is activated. Then, an ID is assigned to each panel included in the network. Panels connected to the network correctly should appear as shown in the figure with the ID assigned in ***the Net map*** submenu of all other panels connected to the network.

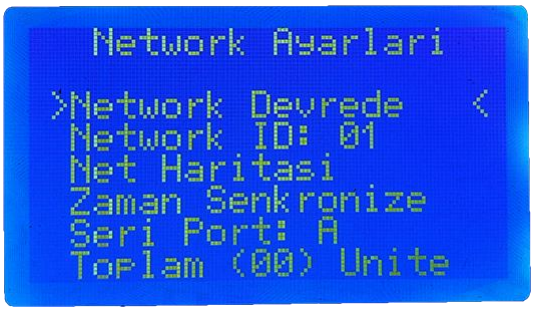

Figure 38-Network Settings

At this stage, the network is active, but all permissions are closed and data exchange is interrupted. After this step, the functions of the connected network panels must be determined and these functions must be implemented in the network map of each panel.

Receive/Do Not Receive Alarms, Receive/Receive Errors, Receive/Receive Information, allow/deny communication and allow/deny control from other panels connected to the network.
The functions in the form are shown in figure 40. It needs to be set from the menu. These settings must be made within each panel for all other network panels visible in that panel.

4.6.6.1. Network Enabled / Disabled

It is the first option in the Network Settings menu. When selected with the Enter key, a submenu is entered. Here, it will say "Network disabled" in the middle of the screen. It can be turned to "enabled" position with the up or down arrow key. The selection is confirmed by pressing the enter button again and you can return to the upper menu. You can cancel the operation and return to the upper menu with the Esc key.

4.6.6.2. Network ID

It is the identification number of the panel to which it is connected in the network operating system. Other panels recognize this panel with this ID.

4.6.6.3. Network Map

This is the section where the panels connected to the system are visible and the information to be shared can be adjusted. The screen in Picture 38- is the network map. All panels connected to this network and activated are listed here. If the panel is connected to the network but the network feature is not active, it will not appear in the list. Picture 39 shows the information that panel 02 connected to the network will send to the local (worked on) panel. The features in this menu can be adjustedaccording to the conditions of the project.

Figure 39- Network Map

Figure 40- Network communication Settings

4.6.6.4. Serial Port

This section cannot be changed.

4.6.6.5. Total (XX) Units

In this section, the total number of panels networked is shown in parentheses.

4.6.7. Advanced Settings

When the advanced settings option is selected in the settings menu with the enter key, the submenu in figure 41 is entered. Here, from top to bottom, there are "Factory Settings", "Delete Log Records", "Ground Fault", "Language", "Cms/Port Settings" and "Connect to Computer" options respectively.

Figure 41- Advanced Settings

4.6.7.1. Factory settings

The factory settings option is used to return the panel to factory settings. When selected with the Enter key, a submenu is entered and the question "Restore factory settings?" appears on the screen. text appears. The selection is confirmed with the Enter key and the system is returned to factory settings. You can cancel the operation and return to the upper menu with the Esc key.

4.6.7.2. Delete Log Records

The Delete log records option is used to delete the events recorded in the system up to that point. When the Enter key is pressed, a submenu is entered. On this screen, "Delete event records?" text will appear. The selection is confirmed with the Enter key and the event records are deleted and the next menu is returned. You can cancel the operation and return to the upper menu with the Esc key.

4.6.7.3. Ground Fault Off/On

Ground is important for the electrical safety of the panel, but in some cases it is not appropriate to connect the ground line and in this case the panel gives a ground fault. In such cases, ground fault detection on the panel can be made active or passive. When selected with the Enter key, a submenu is entered. On this screen, the text "Ground Fault Off" will be displayed as a default. It is changed from "Off" to "On" with the up and down arrow keys. The selection is confirmed with the Enter key and you return to the upper menu. You can return to the upper menu without confirming the operation with the Esc key.

4.6.7.4. Language

The language option is used to determine the language in which the texts on the main screen or the panel menu will be. Two language options are available: Turkish and English. When selected with the Enter key, a submenu is entered. On this screen, the text "Language is Turkish" will appear as a default. The language can be changed with the up and down arrow keys. The selection is confirmed with the Enter key and you go back to the upper menu. You can cancel the operation and return to the upper menu with the Esc key.

4.6.7.5. CMS/Port Settings

CMS/Port Settings are required to connect graphic monitoring software and printer to the CO-016 panel. When you enter it with the Enter key, the menu in Figure 42 will appear. The first option is "CMS Not Active". It is in "Inactive" position by default. When the Enter key is pressed, a submenu is entered. From here, it can be set to "Active" position with the up and down arrow keys. The selection is confirmed with the Enter key and you go back to the upper menu. You can cancel the operation and return to the upper menu with the Esc key. In second place is "CMS Port". This option cannot be changed. The last option is "CMS Account Number". In order to connect with monitoring software or

printer, a 5-digit account number must be entered in this section. After entering the account number, confirm it with the enter key and exit with ESC.

Figure 42- CMS Settings

4.6.7.6. Connect to Computer

The Connect to computer option is used to establish the connection between the configuration software and the panel. Some functions related to the operation of the panel can only be controlled with the configuration software installed on the personal computer. Although it is possible to control some functions via the panel, configuration software is preferred because users can do it faster and easier.

The configuration software is connected to the computer via Mini USB cable. The connection appears as a com port in the computer's device manager. In order to establish communication, the following parameters must be set on this com port: The output will be used according to 9600 baud, 1 stop bit, no parity, 8 data bit standards. The access level of the panel is changed from 3 to access level 4 and the connect to computer option is clicked on the menu in Figure 43.

Figure 43- Access Level 4 Menu

When Connect to Computer is selected from this menu, the system will be controllable with the program on the PC. To exit this menu, you must press the esc key. Before communicating with the PC, an automatic search for all loop cards must be performed and all missing devices must be corrected. The user will transfer this information to the computer and use it. After installing the program, the following interface will appear when it is runn

Figure 44- ER100 Configuration Software

By pressing the blue plus button under the "Customers" column, the name of the project where the system is installed is written and saved by pressing the green tick button.

Then, click on the blue plus button from the panel list menu in the middle line, select the model of the panel we are using, add it, and save it by pressing the green tick button.

The saved panel model is selected by single-clicking and the "Connect" option is clicked. In the window that opens, the port and transfer speed are selected and confirmed. If the cable connections are made without any problems, the connection to the panel is completed.

If desired, "Disconnected Working" can be selected and information can be entered without connecting to the panel. However, the information must be entered on the data taken from the panel.

After the connection is established, all information on the panel will start to be downloaded from the panel to ER100 by selecting "Download from panel". This process may take around 10 minutes.

Once the data is finished downloading, the ER100 will automatically disconnect from the panel. After the connection is disconnected, information can be entered.

After the information is processed, we connect to the panel by pressing the "Connect" button again and the data we process is transferred to the panel by pressing the "Send to Panel" button.

During system installation, it is recommended to back up the data and after the search, transfer the information to the computer and save it to disk so that the system can be monitored remotely. This information can then be opened and changed without connecting to the panel. Especially Zone names and device names are preferred by users because they can be changed more easily using the computer keyboard.

The operating language of the panel, ground fault notification, CMS and Printer functions, deleting system event records and restoring factory settings are also possible in the Access Level 4 menu.

4.7. Outputs

When you enter the Outputs menu, the options in Figure 45 will appear. In this menu, settings for all output devices on the panel and externally connected to the panel can be made.

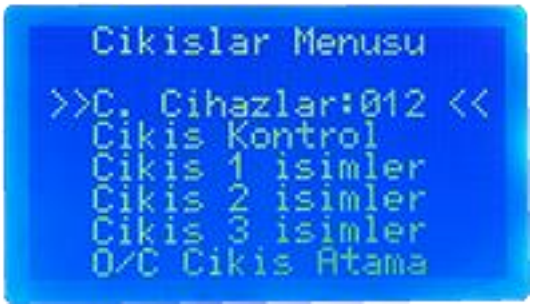

Figure 45- Output Units

4.7.1. Output Devices

Output devices are fan control modules that provide 2-level control by connecting to a loop that is not embedded on the panel . When you enter the output devices option with the enter key, the list of output devices in the loops will be displayed respectively. Select the desired output from this list with the up and down arrow keys.

The device is selected and the settings of that device can be entered with the enter key. Setting of external output devices 4. 1.5. is also explained in detail.

4.7.2. Output Control

Relay outputs, siren outputs and O/C (Open Collector) outputs on the panel can be made active or passive from the output control menu. "Alarm", "Error", "Siren1", "Siren2", respectively

"Loop Siren", "Alarm Silence" and "O/C Outputs" options are available. By hovering over these options with the up and down arrow keys and pressing the enter key, their positions will change.

4.7.3. Exit X Names

Output channels used to assign Zones can be named in this section. The list includes "Output 1" (250 channels), "Output 2" (64 channels) and "Output 3" (32 channels). When these options are entered with the enter key, each output channel can be given a separate name. By hovering over the output channel you want to name and pressing the enter key, a submenu is entered. Here, you select a letter or character with the up and down arrow keys and confirm this selection with the enter key.

When the desired name is entered, pressing and holding the enter key for 2 seconds confirms the selection and returns to the upper menu. You can cancel the operation with the Esc key and return to the top menu.

Figure 46- Naming Output 1 Channels

4.7.4. O/C Output Assignment

When this option is selected with the enter key, the submenu in figure 47 will appear. Here, when the first option "O/C Exit" is selected with the enter key, navigation mode is exited and the option can be changed with the up and down arrow keys. If the enter key is pressed again after the desired O/C output is determined, the selection is confirmed. When the "Channels" option in the second row is selected with the enter key, the cursor will move to the channels section at the bottom of the screen, which is "0" by default. From here, it is activated by hovering over the desired channel and pressing **the enter -> up arrow -> enter key combination.** You can go back to the upper menu with the Esc key. Open Collector Outputs work just like a relay module. If an alarm comes from the area affected by the directed output channel, 3 open collector outputs on the panel produce 24 v DC voltage in negative polarity. When used together with positive 24v DC from the 24v DC output on the panel, 24v DC is obtained according to a certain event. An output unit with audible or dry contact can be operated with this voltage.

Figure 47- Open Collector Output Assignments

4.8. Event Records

In the event records menu, alarm and error information recorded on the panel are shown with their dates and times. When selected with the Enter key, the menu in figure 48 will appear. If the desired event is selected again with the enter key, the event record can be viewed in detail by entering a submenu.

Figure 48- Event Logs

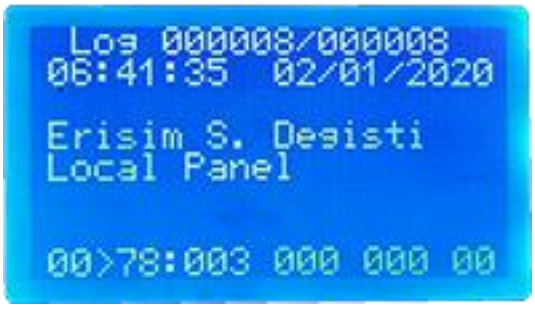

Figure 49- Event Logs Detail View

CO-016 CO Alarm Panel has a permanently stored event recording system. The total number of events that can be kept is limited to 65536. The memory area where event records are kept is circular. In other words, when the 65536th record is reached, the oldest record will be deleted and the last 65536 records will always be visible. When event records are selected in the main menu, the event records menu will open, the description of the event records and the total number of records will be displayed on the top line, as well as the number of records the selected record is. If there is no event record, the message "No event record" will be displayed on the top line.

The record to be selected is marked with "*". Previous or next records can be selected with the arrow keys. When the Enter key is pressed, details about the registration will be displayed. The keys will work in auto-repeat mode.

The last event record is numbered at the top, the previous ones continue in decreasing order. Smaller numbers are shown lower down.

When the Enter key is pressed, details of the selected event are displayed. For example, on the screen in Figure 49, we can see that there are a total of 8 records and the record shown is record number 8. Record number 8 occurred on 02.01.2020 at 06:41:35 and is an Access Level Changed warning. The error code for this event is 78.

Below, event codes are listed in numerical order.

	Short Writin	Long Spelling	Explanation
01	no loop	Boot No Loop Card	At system startup, a previously used conversion card could not be detected. (1st parameter conversion card.)
02	New Loop	Boot New Loop Card	A new, previously unused conversion card was detected at system startup. (1st parameter conversion card.)
03	com. Err.	Loop Checksum error	A checksum error was detected during communication with the conversion card. (1st parameter conversion card.)
04	Loop Err.	Loop Card inaccessible	The system cannot communicate with a loop card in use. (1st parameter conversion card.)
05	Loop OK.	Loop Card accessible	The system started communicating again with the loop card that it could not access. (1st parameter conversion card.)
06	startup	System Start	The panel started working.

	Short Writin	Long Spelling	Explanation
07	Srch Beg.	Search Started	The user started an automatic search on one of the conversion cards. (Parameter conversion card number 1.)
08	Srch End	Search End	The user-initiated automatic search function has been terminated. (1st parameter loop, 2nd parameter number of devices)
09	Access L.	Access Level Change	The access level has been changed. (1st parameter new access level)
10	AC Power	AC Power Event	Mains voltage event (Parameter 1 = 1 power cut)
11th	Battery	Battery Low Trouble	Battery thing.
12	Siren Err	Siren Fault	Termination resistor error in siren.
13	RTC Fail	RTC Battery Failed	RealTimeClock battery error or RTC setting is incorrect.
14	Alarm	fire alarm	Alarm signal detected. (Parameter 1 : loop, parameter 2 : address)
15	Dev.Short	Device Short Circuit	Entry module short circuit or smoke detector faulty. (Parameter 1: loop, Parameter 2: address)
16	Giant. open	Device Open Circuit	The input module output is not connected correctly. (Parameter 1: loop, Parameter 2: address, Parameter 3: device type)
17	Giant. Mis.	Device Missing	The device is not accessible (Parameter 1: loop, Parameter 2: address)
18	Giant. Arrow.	Device Missing OK.	The inaccessible device started responding. (Parameter 1: loop, Parameter 2: address, parameter 3: device type)
19	LP. Short	Loop Short Event	Loop (+) and (-) short circuit detected. (Parameter 1: loop number)
20	LP. Shock.	Loop Not Short Event	The short-circuited loop started to operate normally. (Parameter 1: loop number)
21	LP. open	Loop Open Event	The loop is open circuit, some devices may be inaccessible. (Parameter 1: loop number)
22	LP. O.Ok.	Loop Not Open Event	A loop that was open circuit started normal operation (Parameter 1: loop number)

	Short Writin	Long Spelling	Explanation
23	Dev.NotS	Device Not Short	A device that was previously short-circuited started working normally. (Parameter 1: loop, Parameter 2: address)
24	Dev.NotO	Device Not Open	A device that was previously Open circuit started to operate normally. (Parameter 1: loop, Parameter 2: address)
25	reset	Reset System & Loops	The user rebooted the system.
26	Alarm Cancelled	Alarm Cancel Event	The user silenced the alarm signal and sirens.
27	Sound Alarm	Siren Resound Event	Alarms and sirens were reactivated by the user.
28	Evacuate	Evacuate Event	User initiated the Evacuation process.
29	DirectOut	Direct Out Event	A device set for direct out has activated its output channels. (Parameter 1: loop, Parameter 2: address)
41	Alr.Z.Dis	Alarm At Disabled Zone	An alarm came from a detector belonging to a disabled area. (Parameter 1 : Zone)
42	Alr.S.Dis	Alarm from Dis. Sensor	An alarm signal was received from a disabled device. (Parameter 1: loop, Parameter 2: address)
43	Download	Download Ethernet	System settings are transferred from the panel to the PC with the programming software.
44	Upload	Upload via Ethernet	System settings are transferred from the PC to the panel with the programming software.
45	PC conn. W	PC SEC. Write	The system serial number has been changed.
46	PC conn. R.	PC SEC. Read	PC programming software has established the connection.
47	Set Pass.	PC New Password	The access level password has been changed. (Parameter 1: Access Level)
49	Gnd Error	Earthing Error	Ground fault detected.
50	Gnd Ok	Earthing Err Restored	Ground fault corrected.
51	Z. Disabled	Zone Disabled	User disabled a zone (Parameter 1: Zone Number)
52	Z. Enable	Zone Enabled	User re-enabled a disabled zone (Parameter 1: Zone

	Short Writin	Long Spelling	Explanation
			Number)
53	D. Disabled	Device Disabled	The user disabled a device. (Parameter 1: loop Number, Parameter 2: device address)
54	D.Enable	Device Enabled	The user has activated a disabled device. (Parameter 1: loop Number, Parameter 2: device address)
55	Alarm On	Alarm Output On	User activated the Alarm output.
56	Alarm Off	Alarm Output Off	User disabled Alarm output.
57	Error On	Error Output On	The user enabled error output.
58	Error Off	Error Output Off	User disabled error output.
59	Siren On	Siren Output On	The user activated the siren output.
60	siren off	Siren Output Off	User disabled Siren output.
61	power on	power on	The system was energized
62	AC Arrow	AC Loss Restored	AC supply error corrected.
63	Battery +	Battery Error Restored	Battery error has been corrected.
70	Cksm err1	Checksum Private	Checksum Error 1 (for service engineers)
71	Cksm err2	Checksum Private	Checksum Error 2 (for service engineers)
97	looplost	Loop Lost	Loop Lost after start (for service engineer)
99	Log Test	Log Test	Log Test (CMS)

5. PROGRAMMING

5.1. Automatic Scanning of Devices in Loop

The installer must ensure that the loop connections are made properly. Addresses must be used by only one device per loop, and all devices must be connected to the loop. Devices must be addressed before connecting to the network. Before naming the Zones, the Zones where the devices will be located must be defined. Scanning and other settings of devices 4.2.1. is explained in detail. After automatic scanning, the devices found should be checked from the menu.

5.2. Access Level 4, Running the Configuration Software and Managing the Panel

Some functions related to the operation of the panel can only be controlled with the configuration software installed on the personal computer. Although it is possible to control some functions via the panel, configuration software is preferred because users can do it faster and easier.

The configuration software is connected to the computer via Mini USB cable. The connection appears as a com port in the computer's device manager. In order to establish communication, the following parameters must be set on this com port: The output will be used according to 9600 baud, 1 stop bit, no parity, 8 data bit standards. The access level of the panel is changed from 3 to access level 4 and the connect to computer option is clicked on the menu below.

Figure 50- Access Level 4 Connect to Computer

When Connect to Computer is selected from this menu, the system will be controllable with the program on the PC. To exit this menu, you must press the esc key. Before communicating with the PC, an automatic search for all loop cards must be performed and all missing devices must be corrected. The user will transfer this information to the computer and use it.

Detailed usage is explained in the "Advanced Settings" menu. SEE. 4.6.7.6.

5.3. Manual Testing of Output Modules

Output modules can be tested via the panel. Section 4.2.2.2. This operation can be performed from the exit reverse option, as explained in detail. If the position of the desired module is changed on the panel with the output reverse option, the position of the relay in that module will also change.

5.4. Addressing and Programming of Devices

PP1201 address programmer is needed to program the address information of all devices used in the system .

Before performing the addressing process, care should be taken to ensure that the devices to be addressed are disconnected from all cable connections.

The card can be accessed by opening the 4 screws on the front cover of the CO540 carbon monoxide detectors. Before the card is connected to the loop, it is connected from the + and – terminal of the loop to the + and – terminals of PP1201. (+) and (-) terminals are indicated on the terminals to be used in the PP1201 connection of the Fan Control Modules. The red terminal on the programming device is (+) and the black terminal is (-). Connection will be made by combining the same terminals on the device and the programmer. After the connection is made, turn on the system by pressing the "ON" button on the PP1201. Then, to check that the connection of the device is correct and to find out the current address, press the "READ" button and see the address and type of the device on the screen of PP1201. If this process is not completed successfully, the message "ERROR" will appear on the PP1201 screen. In this case, at least one of the devices may be faulty. Contact your product provider to get technical support and information.

If the address and type of the device are read successfully, if you are going to change the address, type in the new address and press the "WRITE" button. After the writing process, the device will check the address it wrote without the need for an additional command. If it detects an error, the

"ERROR" message will appear on the LCD screen . In this case, the PP1201's batteries may be exhausted, or there may be a lack of contact in the cables. Check and try again.

WARNING: There is a voltage of nearly 30 volts at the programmer terminals. Although it is not dangerous to human health, it may cause an uncomfortable shock sensation. Therefore, be careful not to touch two cables at the same time.

For more detailed information, refer to the "PP1201 Programmer User Manual".

6. MAINTENANCE

The batteries inside the panel should be replaced every two years, even if they do not cause any errors. The service life of batteries depends on parameters such as discharge time, discharge rate, ambient temperature, discharge voltage. Depending on these parameters, battery replacement may be required in a shorter period of time. If operating conditions put the healthy operation of the panel at risk, the panel will detect this situation and warn the user. Every year, the general cleaning of the panel should be done and the working environment should be checked.

7. SAFE MODE

In case of any disruption in the main functions of the panel or an error detected in the dynamic and permanent memory and program areas, the panel will go into "Safe Mode". In this case, the "Ready" LED on the panel will turn off, the "System Error" LED will turn on, the "SAFE MODE" warning will appear on the LCD and an audible warning will sound. This situation requires the user to inform technical personnel without any delay.

During panel operation, it will check the program memory and the permanent memory where the data is stored to ensure that the operating parameters related to the area do not block the flow of the program. If it is detected otherwise, it will enter the "Safe Mode" state and continue its operation.

Program Memory can be modified at Access Level 4 by system engineers using special purpose hardware. There are software and hardware mechanisms that prevent program memory from changing during normal operation. These mechanisms have been developed in accordance with Access level definitions and by taking into account system malfunctions that may occur during the program flow.
The module that controls the system operates independently of the operation of the monitored system. An error that occurs in the operation of the panel will not prevent the operation of the monitoring system. The software control process is explained under the name "Memory Document" in the Design documents.

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