



MAGPRO9601

Addressable Fire Alarm Control Panel

Installation Manual



CE
1293

ESP
ScolmoreGROUP

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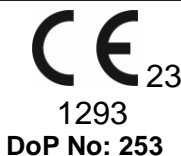
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ATTENTION!

This manual contains an information about the limitations in using and operation of the product, as and information about the limits in the responsibility of the manufacturer.
 Please read the operation manual carefully before starting the installation.
 While every effort has been made to ensure that the information in this manual is accurate and complete, no liability can be accepted for any errors or omissions.
 The manufacturer reserves the right to change the specifications of the equipment described in that manual without notice.

STANDARDS AND CONFORMITY

The addressable fire alarm control panel MAGPRO9601 is designed and certified according and with conformity to EN 54 – 2/4 standard. Conforms and approved in accordance with CPR (Construction Products Regulation).



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EN 54-2:1997; EN 54-2:1997/AC:1999; EN 54-2:1997/A1:2006
 EN 54-4:1997; EN 54-4:1997/AC:1999
 EN 54-4:1997/A1:2002; EN 54-4:1997/A2:2006

MAGPRO9601

Intended for use in fire detection and fire alarm systems in and around buildings.

Essential Characteristics	Performance
Performance under fire conditions	Pass
Performance of power supply	Pass
Response delay (response time to fire)	Pass
Operational reliability	Pass
Durability of operational reliability and response delay: temperature resistance	Pass
Durability of operational reliability: humidity resistance	Pass
Durability of operational reliability: vibration resistance	Pass
Durability of operational reliability: electrical resistance	Pass

Optional Functions with Requirements	
Output to the fire alarm device	Yes
Output to fire alarm routing equipment	Yes
Output to fire protection equipment – output type C	Yes
Fault monitoring of fire protection equipment	Yes
Delay to outputs	Yes
Dependencies on more than one alarm signal – type B dependency	Yes
Fault signals from points	Yes
Output to fault warning routing equipment	Yes
Disablement of addressable points	Yes
Test condition	Yes

1. INTRODUCTION

1.1. Basic Information

MAGPRO9601 is an addressable fire alarm control panel for detection, indication and signalization in case of fire alarm situation in the protected premises. The panel provides coverage of 96 zones and connection of 4 loop expander modules (MAGPRO96-L250 Loop expander). An arbitrary number of devices can be added to each zone, thus ensuring the easy adaptation of the system to any type of configuration. Addressable fire alarm panel MAGPRO9601 supports operation with MAGPRO communication protocol.

Attention: Every MAGPRO96-L250 Loop expander provides up to 250 devices!

MAGPRO9601 can operate as single panel or in a network with up to 64 panels, including other MAGPRO96, MAGPRO16, MAGPRO-REP Repeater fire alarm panels. The connection in the network between the panels can be realised via LAN or RS485 communication protocol. Only one type of connection can be used in a single network.

The MAGPRO9601 fire panel is equipped with a back-up supply battery in case of main power supply failure. The built-in 3V pill battery supports the uninterruptable operation of the real-time clock even in case of mains and back-up power supply failure at the same time.

A TFT touch screen and LED indication provide information about the current system status and activated zones.

To avoid or significantly diminish problems when mounting the system, it must be carefully planned prior to installation. This includes: establishing an address for every device and planning a name of maximum 40 digits (including the spaces) for each address, thereby ensuring easy access to the device.

According to the acting standards for establishing fire systems and the plan of the building, the devices must be grouped in zones.

1.2. Panel General View

MAGPRO9601 is mounted in a small metal box secured with one key-lock for limited access only from technical support engineers. The control PCB, main power supply unit and the loop expanders are organized together into the enclosure box.

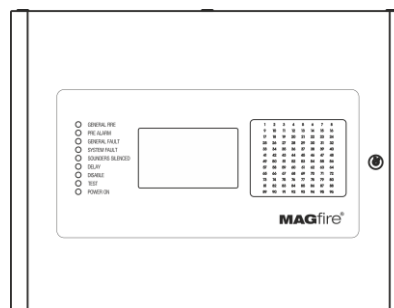


Figure 1. Front view of MAGPRO9601

The metal box of MAGPRO9601 is designed for built-in mounting in 25mm thick drywalls - see for details item [2.3](#). The box is also designed for building of common modular structures with other operational panels as MAGPRO96GBB (external power supply unit), and other MAGPRO96 series panels, as the metal boxes can be easily mounted to each other with all hardware connections hidden inside - see for details item [2.4](#).

1.3. General Specifications

The MAGPRO9601 front panel consists of graphic 5-inch TFT touch screen display (dimensions 800x480) and a light-emitting diode (LED) indication. Separate operator and engineer passwords provide access to the functions of the panel. Up to 4 loop controllers (MAGPRO96-L250 Loop expander) can be supplemented to the MAGPRO9601 outputs control module.

The system can be expanded by connecting to 64 fire panels MAGPRO series (MAGPRO9601, MAGPRO96, MAGPRO16 and MAGPRO-REP Repeater) to the Ethernet network, using TCP/IP for communication between them. MAGPRO9601 has a built-in real time clock and calendar, allowing day and night time modes of operation. Switching over between the day and night operation modes can be automatic or manual.

Events like FIRE, RESET, fault, etc., are saved in the memory in an event log-file. It contains the time and date, the address of the device, the type (module, detector, sounder or periphery device), the name of the device, the zone, the name of the zone, etc.

1.3.1. General Technical Specifications

- Loops - from 1 to 4 loops
- Up to 250 devices per one MAGPRO96-L250 Loop expander
- Max. number of devices - 1000
- Zone Number - 96 max.
- Zone Groups - 48 max.
- MAGPRO Communication protocol
- Memory log for 10000 events
- Monitored relay outputs - 4:
 - SND (for connection sounder) - 24VDC/0.5A
 - Fire R (Fire Alarm) – 24VDC / 0.1A
 - Fire P (Fire Protection) - 24VDC / 0.1A
 - Fault R (Fault) - 24VDC / 0.1A
- Non monitored relay outputs:
 - 4 programmable - 15A@24VDC
- Auxiliary output (terminals +24V and GND - see item [4.2.1](#)) – 24VA@0.3A
- Display – 5 inch 800/480 TFT
- Real time clock
- Up to 250 programmable Inputs/Outputs per panel
- Comprehensive day/night mode facility
- 2 Steps of alarm levels (T1 and T2)
- Automatic synchronization of all loop sounders for better alarm signal
- Based on Windows graphical configuration utility via Ethernet or USB
- Simple Http monitoring utility
- Loop less and Output less panel option (repeater)
- Thermal printer (optional)
- Panel for voice evacuation (optional)
- Easy software update
- Certified according EN 54-2/4

ATTENTION: The total current consumption of outputs +24V, SND, Fire R, Fire P and Fault R must not exceed 0.5A!

1.3.2. Working Environment

- IP30
- Operation temperature: -5°C up to +40°C
- Relative humidity: up to 95% (without condense)
- Storage temperature: -10°C up to +50°C
- Weight (without battery): ~6 kg
- Dimensions: 430x330x120 mm

1.3.3. Electrical Characteristics

- Cable: 4-wire
- Cross section: 0.25mm²
- Up to 1000m long distance

Earth Connection

The earth connection has to be realized in accordance with the rules for the electrical safety with the total resistance in the circuit lower than 10Ω. It is mandatory to connect the main power supply cable to the middle input of the fire panel terminal – see also item [4.1](#) Main Power Supply connection.

Main power supply

In normal operating conditions the fire panel is powered from the mains voltage line.

The characteristics of the main power supply are as follows:

- Main Power Supply:~230VAC +10% / -15%
- Frequency:50/ 60Hz
- Max. continuously output current I_{max.a}:2.7A
- Max. output current without battery charging I_{max.b}:5.0A
- Min. output current I_{min}:0.2A
- Voltage output (U):from 10.2V up to 14.3V (typical 13.65V @ 20°C)
- Electrical output:
 - To the panel5A
 - To the battery (Charging current “I”)2A

Backup Battery Power Supply

In case of mains voltage line loss, the fire panel is designed to operate with back-up power supply.

- Current output (I):5A
- Internal resistance of the accumulator battery R_i..... < 0.3 Ohm
- Battery (rechargeable, sealed lead-acid type):1 x 12V/ 18Ah or 1 x 12V/17Ah
- Battery Size (max.):167x181x76mm
- Type of the Battery connection:with a flat terminal lug - Ø5mm (M5)

Consumption

From the main power supply in standby mode:

- For 1 loop configuration:65 mA AC
- For 2 loops configuration:.....75 mA AC
- For 3 loops configuration:.....85 mA AC
- For 4 loops configuration:.....95 mA AC

From the backup power supply in FAULT mode and generated message “AC loss”:

- For 1 loop configuration:285 mA DC
- For 2 loops configuration:.....360 mA DC
- For 3 loops configuration:.....435 mA DC
- For 4 loops configuration:.....510 mA DC











List of the fuses

- General Power Supply, T Type:2A
- Outputs, PTC Type:
 - Fire Protection, Fire, Fault.....3x0.1A
 - Auxiliary.....1x0.3A
 - Sounder.....1x0.5A
- Battery, PTC Type:.....7A



ATTENTION: Do not install the fire panel near power electromagnetic fields (radio equipment, electric motors, etc.)!

List of spare parts kits:

No	Element	Description	MAGPRO9601
1		Resistor 10K \pm 5%, 0,25W	2 pcs
2		Jumper	2 pcs
3		Screw 4.2x38, cross slot, DIN7981 (wall mounting – item 2.2)	4 pcs
4		Anchor 6x30mm (wall mounting – item 2.2)	4 pcs
5		Screw M4x40, cross slot, DIN7985 (built-in mounting in 25 mm drywall – item 2.3)	4 pcs
6		Screw M4x30, cross slot, DIN 965 (built-in mounting in 25 mm drywall – item 2.3)	2 pcs
7		Washer M4 DIN 522, \varnothing 12mm (built-in mounting in 25 mm drywall – item 2.3)	4 pcs
8		Fuse 2A, glass time-delay type 5x20mm (for the main power supply terminal)	1 pc
9		Cable tie, 2.5/160mm	2 pcs
10		Keys	2 pcs

**ATTENTION!**

Qualified specialists only should install the panel.

The electronic components of the panel are vulnerable to electrostatic discharge.

Never add or turn off components which are being power supplied!

2. INSTALLATION

The panel must be installed in a clean dry place and must not be subjected to impacts or vibrations (Figure 2). It must be situated far from heating appliances. The temperature must be within -5°C and + 40°C. The fire panel is not water-proof!

Attention: The front cover of MAGPRO9601 panel is mounted to the box bottom with hinges fixed with dismountable rivets. The angle of opening of the front cover must not be greater than 110° - see Figure 3!

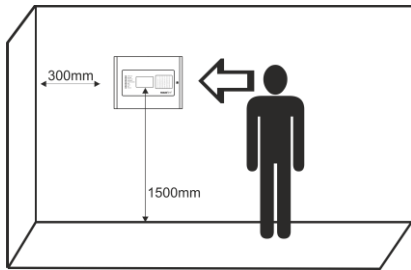


Figure 2

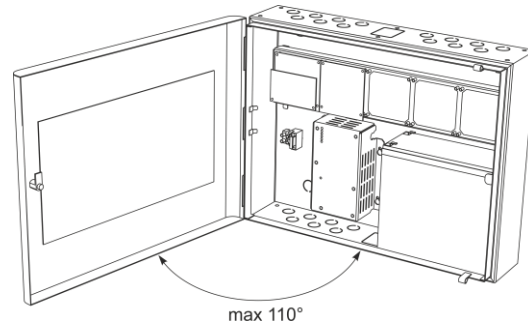


Figure 3

2.1. Installation Steps

- Remove the packing and observe the panel for any damages during the transportation. If there are visible defects, contact your local distributor immediately and cancel the installation.
- Perform wall mounting (see item 2.2), built-in mounting (see item 2.3) or wall mounting in modular structure (see item 2.4) according to the type of installation.
- Choose inlets for the cables of the main power supply, loops, sounders, control devices, etc. Remove the metal cap element just from those holes for cable running (Figure 5).
- Route the external cables onto the metal bottom, BUT DO NOT make any connections at this stage. ENTER THE MAINS CABLE THROUGH ITS OWN CABLE ENTRY POINT AND KEEP MAINS WIRING AWAY FROM SYSTEM AND OTHER LOW VOLTAGE WIRING.
- Connect the mains supply and earth wire to the power supply terminal and make sure that the connections are tight and stable (see item 4.1) BUT DO NOT apply the main electrical supply at this stage.
- Position the accumulator battery/batteries in an upright position and fix the metal clamp - Figure 14, position 5.
- When you finish with power up and testing steps, and the panel is in normal operation mode, close and lock the front cover with the securing key/keys.
- Keep the keys in a safe place for authorised access of technical personnel only.

Attention: The drawings further in this installation manual are illustrative and simplified for better presentation. The front door of the panel cannot be dismantled or removed during the installation process. Take care about all factory mounted components like PCBs, power supply unit, power terminals, grounding points, etc., to not be harmed during the installation!

2.2. Wall Mounting

- For wall mounting, use the drilling paper template to mark the mounting holes – Figure 4.
- For mounting of MAGPRO9601, drill holes $\varnothing 6 \div \varnothing 8 \text{ mm}$.

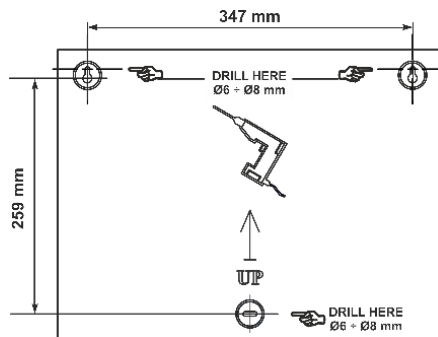


Figure 4

- Fix the box bottom with the supplied anchors and mounting screws.
- The elements of the metal box bottom are described on Figure 5.

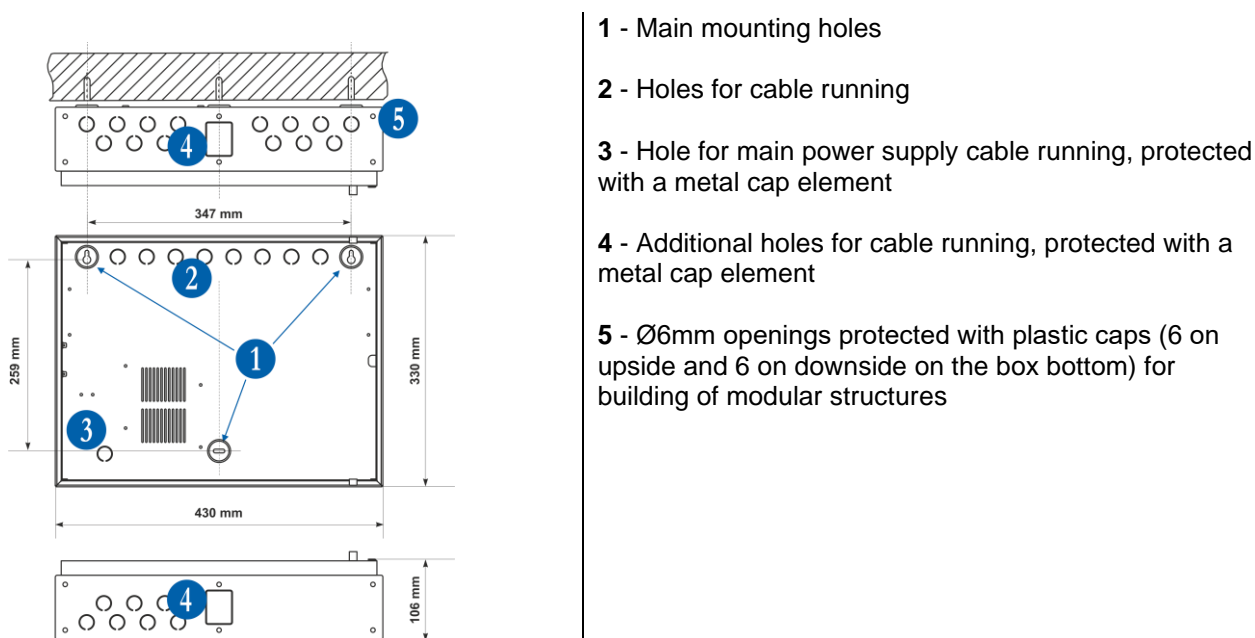
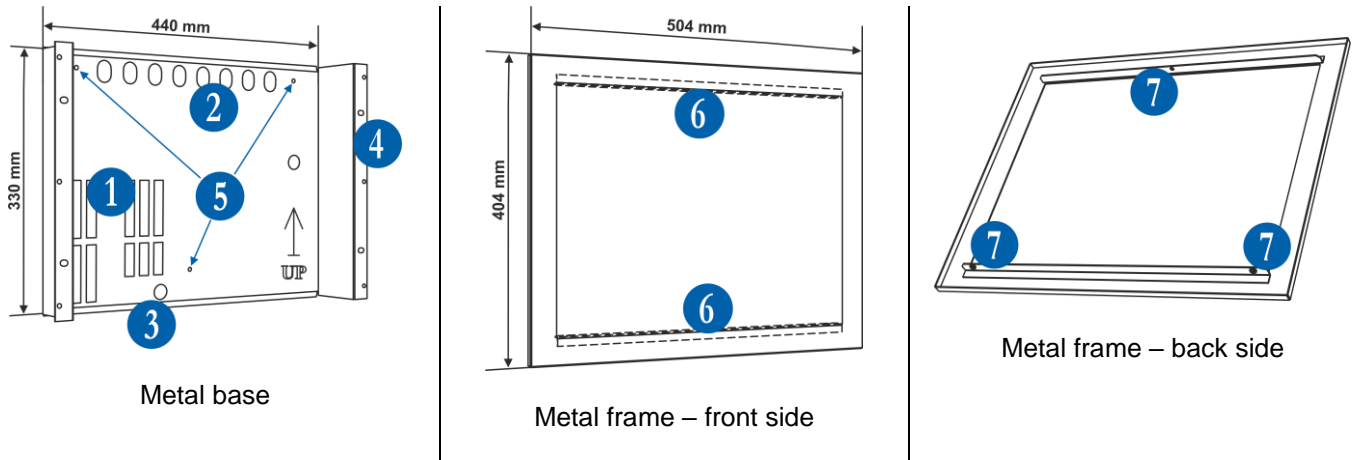


Figure 5

2.3. Built-in Mounting

The built-in mounting is designed for MAGPRO9601 panel box and it is applied in 25mm thick drywalls. The built-in mounting is performed with special kit containing: metal base, metal decorative frame and set of fixing elements – Figure 6.



Elements' description:

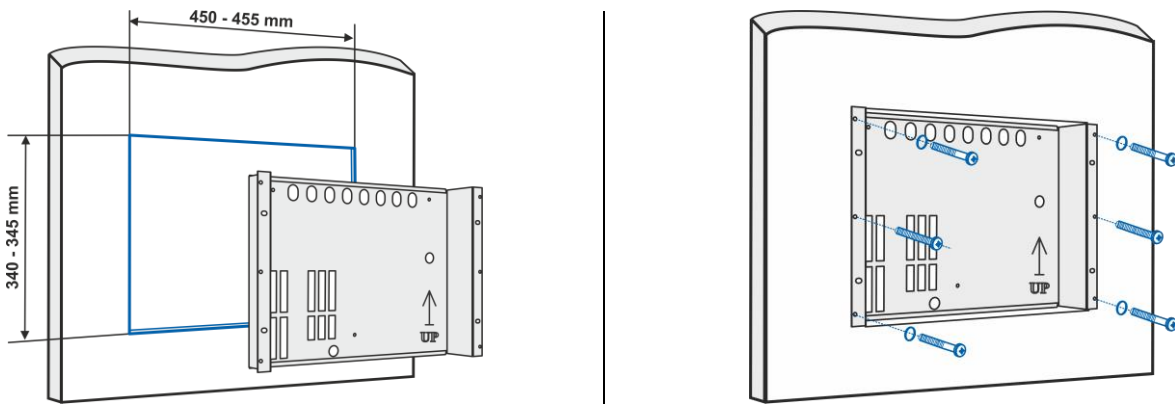
- 1 - Ventilation holes
- 2 - Holes for cable running
- 3 - Hole for main power supply cable running
- 4 - Mounting holes to the 25mm thick drywall
- 5 - Mounting holes for MAGPRO9601 metal bottom
- 6 - Metal strips for joining the frame to the box bottom of MAGPRO9601
- 7 - Holes M4 for fixing the frame to the box bottom of MAGPRO9601

Set of fixing elements:

- 4 pcs - Screw M4x40, DIN7985
- 4 pcs - Washer M4 DIN 522, \varnothing 12mm
- 2 pcs - Screw M4x30, DIN 965
- 6 pcs - Screw M4x12 DIN 966

Figure 6

- Cut a mounting hole in the drywall at the place of installation.
- Insert the metal base in the mounting hole and fix it to the drywall with the screws.

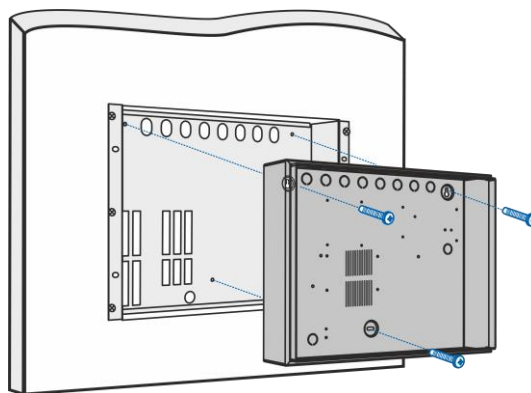
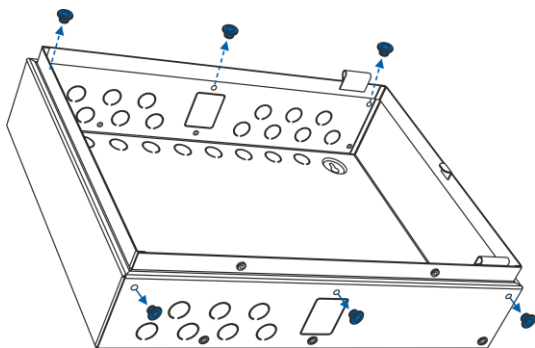


The mounting hole in the drywall must be a little greater than the dimensions of the metal base.

Use the screws M4x40 (DIN7985) and washers M4 \varnothing 12mm (DIN 522) for fixing the up and bottom corners. Use the screws M4x30 (DIN 965) for fixing the base in the middle.

Figure 7

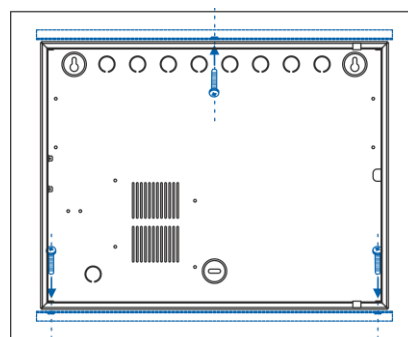
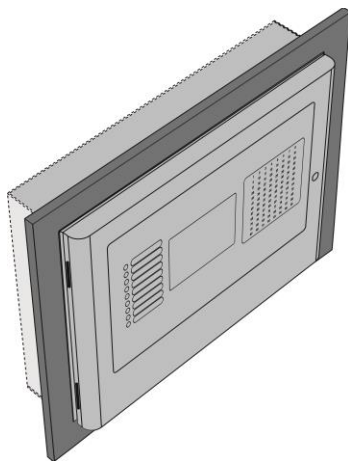
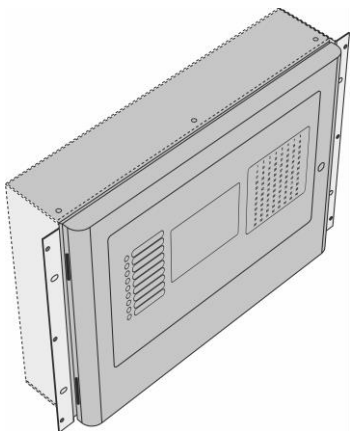
- Remove the first row plastic caps from the top and bottom side of MAGPRO9601 box.
- Insert the metal bottom of MAGPRO9601 into the metal base and fix them to each other it with the screws.



Use 3 pcs of screws M4x12 (DIN 966) for fixing the metal box of MAGPRO9601 to the metal base.

Figure 8

- Close the front door of the panel.
- Place the metal decorative frame over the front door and push forward until it is located around the MAGPRO9601 box bottom. The fixing holes on the back strips of the frame must align with the holes (on the top and bottom side) of the MAGPRO9601 box. **The hinges of the front door must be visible after installing the frame. The front door of the panel must be opened freely.**
- Open the front door of MAGPRO9601 and fix the frame to the box bottom with the screws.



Use 3 pcs of screws M4x12 (DIN 966) for fixing the metal frame to the MAGPRO9601 box bottom.

Figure 9

2.4. Module Structures

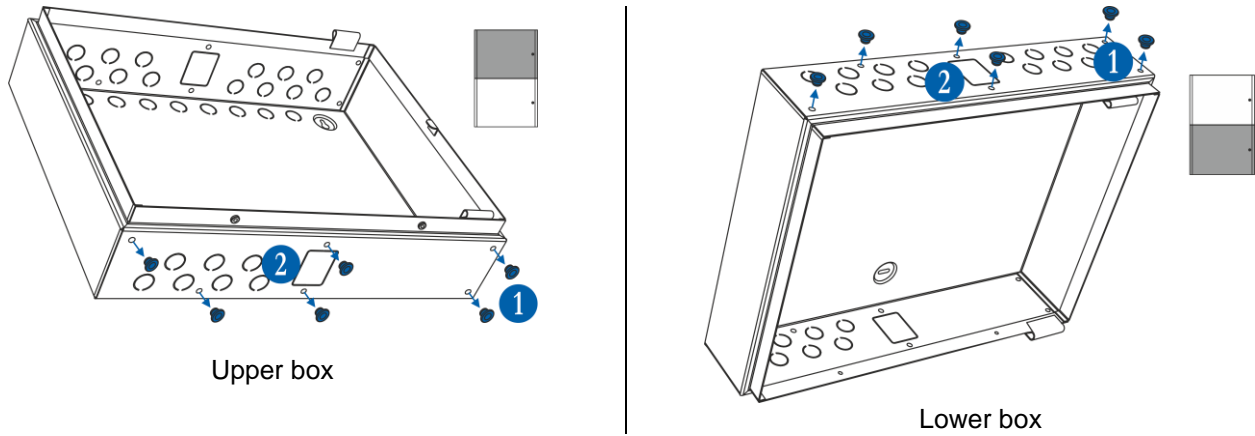
The building of module structures with the standard metal boxes of MAGPRO9601 panels is flexible solution for any installation. The boxes are easily mounted to each other as all the hardware connections between the panels remain hidden inside.

It is possible to add different peripheral panels to MAGPRO9601 main box. The peripheral panels MAGPRO series, available in standard small metal box suitable for building of modular structures and MAGPRO96GBB (external power supply unit).

The joining of the panels to each other is all and the same for all metal boxes. One module structure can be built with two, three or four boxes according the type and requirements of the fire installation. The modular structures allow expanding the capability of already existing installations at low cost and with minimum additional expenses.

The necessary fixing elements for modular structures building, are included in the spare parts kit of the peripheral panels.

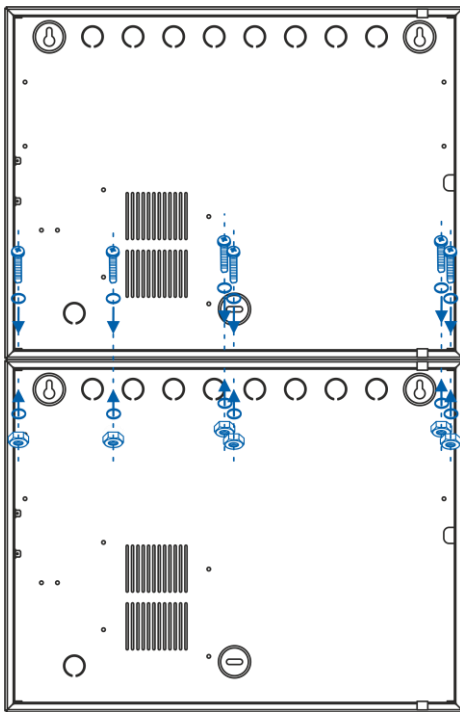
- Prepare the metal boxes for mounting to each other as remove the plastic caps from the top or bottom side of the box bottom according its position in the module structure. For module structures with three or four panels you have to remove all plastic caps from the boxes mounted into the middle.
- Remove the metal caps from those holes used for running cables.



- 1 – Remove the plastic caps from the box bottom
- 2 – Remove the metal caps for running cables between the boxes.

Figure 10

- Follow the steps in item [2.2](#) and perform wall mounting of the boxes as locate them in module structure.
- Join the boxes to each other.



Set of fixing elements:

- 6 pcs - Screw M5x10 DIN 7985 A2
- 6 pcs - Nut M5 DIN934
- 12 pcs - Washer $\varnothing 5,3$ DIN 125

In case of module structure with three or four panels, fix the boxes in the middle from both sides – up and down – to the upper and lower box.

Figure 11

3. SYSTEM COMPONENTS

3.1. Front Panel

The front panel of MAGPRO9601 presents detailed information of the current system status (1) and activated zones (3) via LED indication. The operation, control and programming of the panel is via the 5 inch TFT screen (2) – Figure 12.

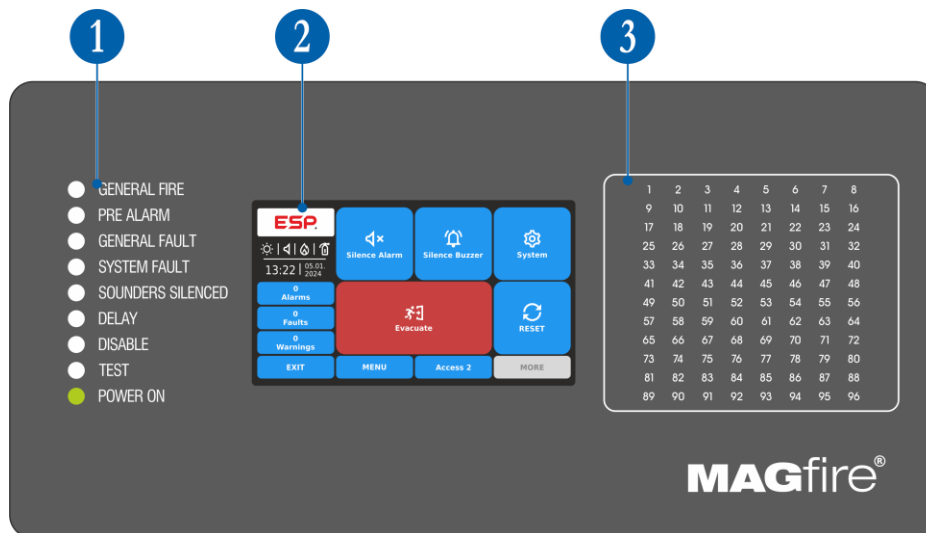


Figure 12

3.2. LED Indication for the System Status

The LED indication supports Users in operation with MAGPRO9601 and presents a quick review of the system status without reviewing the programming menus.

The system status descriptions are printed on the front panel. The system status is displayed also with color LEDs. In case of fire alarm, common or system faults, settings for delays disablements or tests, the LED is lighting on permanently. On Figure 13 is presented an example for fire alarm indication in zones 1, 2 and 3.

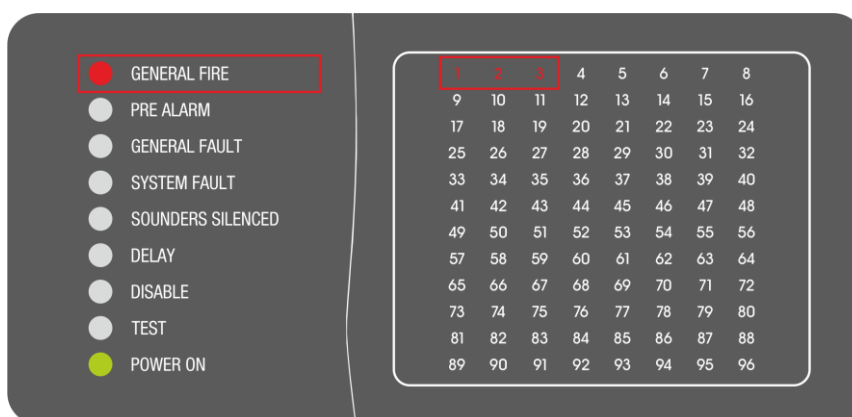
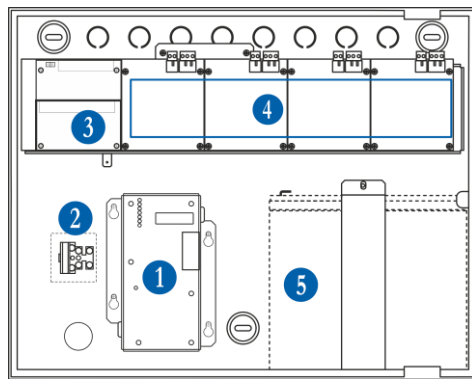


Figure 13

LED Indication	Description
● GENERAL FIRE (red)	Lights on permanently in case of fire alarm event – fire alarm signal from an automatic detector or manual call point, or another auxiliary device connected to a panel input.
● PRE ALARM (red)	Lights on permanently for indication of zones in Pre-Alarm Condition.
● GENERAL FAULT (yellow)	Lights on permanently in case of fault event in the system or back-up power supply is missing.
● SYSTEM FAULT (yellow)	CPU FAULT. Lights on permanently in case of main microprocessor fault.
● SOUNDERS SILENCED (yellow)	General Indication for Silenced Sounders.
● DELAY (yellow)	Lights on permanently in case of set time delay for one or several panel's outputs.
● DISABLE (yellow)	Lights on permanently in active disablement in the system.
● TEST (yellow)	Lights on permanently in system test mode.
● POWER (green)	Presence of power supply – main or back-up, or both.

3.3. Configuration of the Basic Modules

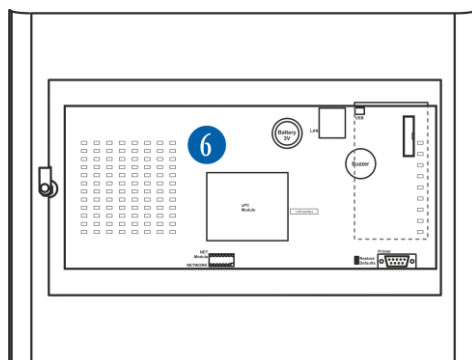
The MAGPRO9601 panel is designed with a range of basic modules organized in factory configuration – Figure 14.



Main box view

Elements' description:

- 1 - Main power supply unit - see item [4.1](#).
- 2 - Terminal for connection between the main power supply and a power source. A slow type fuse 2A is situated into the terminal - see item [4.1](#).
- 3 - Monitored Outputs Control Module with supplementary, factory mounted, Relay Module - see item [4.2](#).
- 4 - Place for mounting of Loop expanders 1-4 - see item [4.3.4](#).
- 5 - Place for accumulator battery 12V/18Ah or 12V/17Ah with vertical supporting tightening clamp - see item [4.1.2](#).



Back side of the front door

- 6 - Main (Indication LCD and LED) control module PCB - see item [4.4](#).

Figure 14

4. BASIC MODULES DESCRIPTION

The MAGPRO9601 is delivered with plug connectors (2- and 3-position) mounted to the PCB of the Loop expander(s). The plug connectors are used for quick wire installation. To unplug a connector, just pull it up from the terminal. To plug it back, press down until a click is heard.



Attention:

The basic modules are factory wired with interface and grounding cables, depending on panel configuration. **DO NOT unplug, modify or change the factory connection cables to avoid malfunctioning of the panel!** Follow the instructions for electrical safety and operation during the installation! Adding of any addition modules **MUST** be done only with main and back-up supplies off!

4.1. Main Power Supply and Back-up Battery Connection

4.1.1. Main Power Supply Elements Description

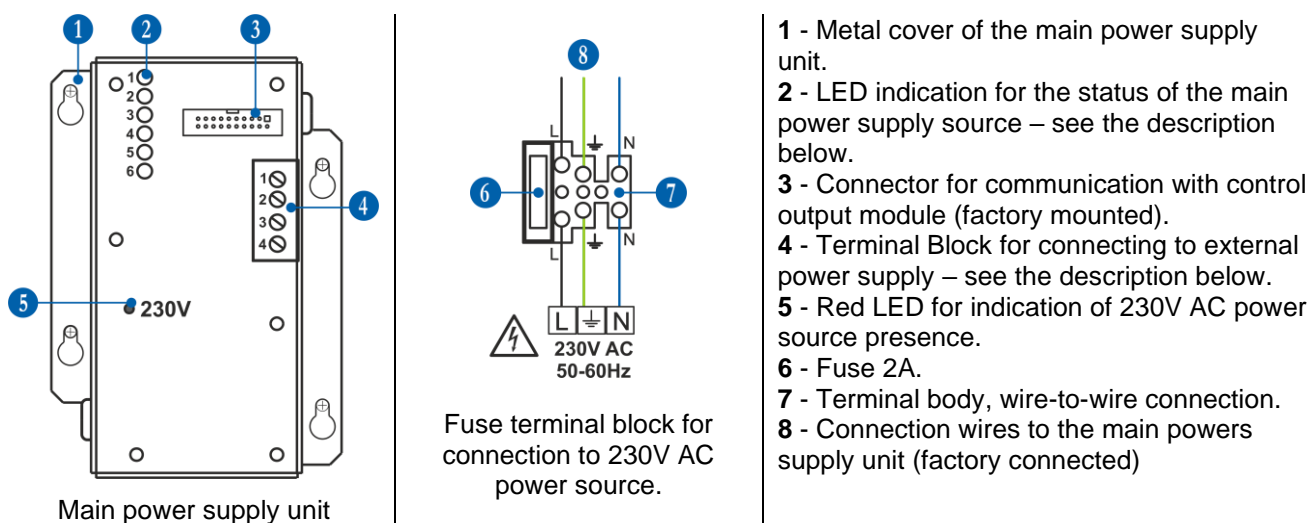


Figure 15

LED indication of the Main Powers Supply Unit:

LED	Function	Description
1	AC LOSS	Main power supply loss 230V.
2	Charger Fault	Problem with the battery charging.
3	BATT LOSS	Battery loss.
4	BATT Low/ Ri	Discharged battery/ High internal resistance Ri of the accumulator battery.
5	EARTH FAULT	Resistance to GND $\leq 10k\Omega$.
6	Rx / Tx	Shows the communication with the panel.

Terminal Block for connecting to external power supply:

Terminal	Terminal	Description
1	+13.8V	External power supply input.
2	IN	Input for connecting the Fault output of the external power supply.
3	OUT	Fault output, turns on when a problem with the main power supply occurred. Connect it to the input (Fault In) of the external power supply.
4	GND	Input for connecting of external power supply EARTH.

4.1.2. Connection Diagram of Main Power Supply Unit and Back-up Battery

The connection between the accumulator battery and the main power unit has some special features. It is strongly recommended to use only battery with electrical characteristics and dimensions pointed from the manufacturer. Before connecting to the main power unit check the polarity of the battery. The battery cannot power up the panel before the mains supply has been switched on. Connect the battery after the mains supply is turned on. If the battery is new, it will take a few hours before its complete charging!

The charging of the accumulator battery is done at maximum current $I=2A$ and charging voltage $U < 13.8V$.

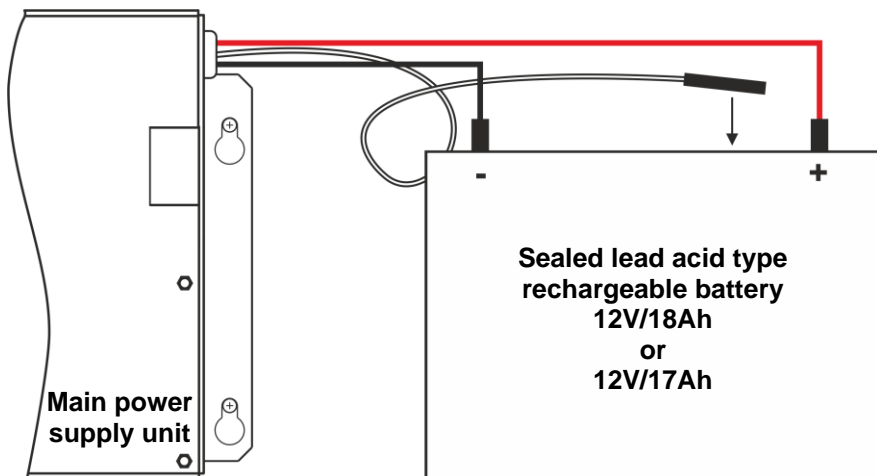


Figure 16

Attention: Check the earth connection cable before switching on the mains power supply – the connection must be tight and stable to ensure the correct operation of the panel and accurate LED indication on main power source for possible problems with earth connection of the panel. Before the mains supply is switched on, check the correct connection of each loop, sounder or any other input or output, and the earth connection cable.

- Connect 230V AC power source to fuse terminal block as strictly observe the polarity.
- Connect the red cable to the positive pole of the battery, and the black cable - to the negative battery pole. Both of the cables are connected to the battery by means of a flat terminal lug Ø5mm or cable shoes.
- Place the temperature sensor behind or under the accumulator battery to provide correct measurement the battery temperature and calculation of the internal resistance value R_i .

4.2. Outputs Control Module

The Outputs Control module in MAGPRO9601 addressable fire alarm panel is a structure of two PCBs mounted to each other via interface slot: Monitored outputs PCB and Programmable Relays PCB.

ATTENTION: The Outputs Control Module could not work independently!

4.2.1. Elements Description

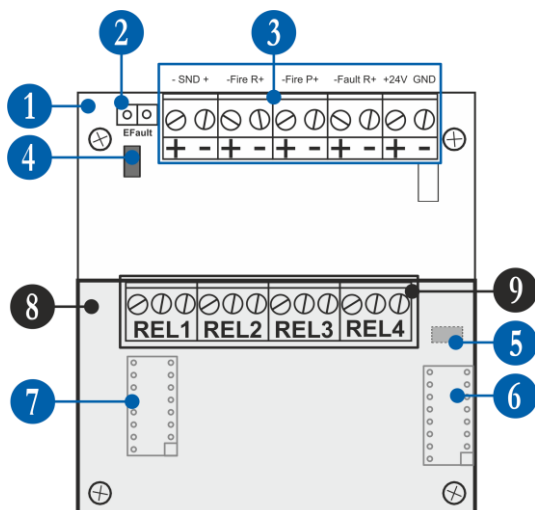


Figure 17

- 1 - Monitored Outputs PCB. The PCB is under the Relays PCB. The elements are indicated with blue numbers.
- 2 - Jumper for enable/disable indication for earth fault (EFault). For example, if you want to enable the earth fault indication set a jumper.
- 3 - Monitored Outputs - see the detailed description below.
- 4 - LED (green) – Indication for data transfer between the main microprocessor of the panel and the Output Module. In normal operation mode it is constantly blinking.
- 5 - LED (red) - Indication for power supply at the terminal for connection of the first Loop expander. In normal operation mode it is constantly lighting on.
- 6 - Interface connector for connecting the first Loop Expander Module (on the back side of the Outputs Module).
- 7 - Ribbon cable interface connector from the main power supply unit and to the front panel (on the back side of the Outputs Module).
- 8 - Relays PCB. The elements are indicated with black numbers.
- 9 - Programmable volt free switching over relay contacts - see the detailed description below.

Monitored outputs terminals:

Terminal	Description
+24V	DC Auxiliary output, 24VA@0.3A
GND	Common earth
SND	Monitored output for connecting of a sounder, 24V DC/0.5A
Fault R	Monitored output for connecting of auxiliary devices, 24V DC/0.1A. This output is deactivated in case of system trouble or fault.
Fire R	Monitored outputs for connecting of auxiliary devices (e.g., signaling devices), 24V DC/0.1A.
Fire P	These outputs are activated in case of a fire alarm condition.

ATTENTION: The total current consumption of outputs +24V, SND, FIRE R, FIRE P and FAULT R must not exceed 0.5A!

The output SND at activation, provides 24VDC@0.5A to the load, and outputs FAULT R, FIRE R and FIRE P, at activation, provide 24VDC@0.1A to the load. It is necessary to connect in parallel to the last device in the loop a 10k terminate resistor, so to ensure that the panel is able to detect any break or short circuit in the loop - see item 4.2.2 and item 4.2.3.

Programmable relay terminals:

Terminal	Description							
Rel 1-4	Programmable volt free switching over relay contacts each, 15A@24VDC. Each relay has one NO (normal open) and one NC (normal closed) contact with common lead on a terminal. When a relay output is activated the NO contact is closed and the NC contact is opened.	<table border="1"> <tr> <td>NC</td> <td>COM</td> <td>NO</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	NC	COM	NO			
NC	COM	NO						

4.2.2. Connection of Sounders

To the monitored output SND, could be connected several sounders - Figure 18. The maximum number of sounders that could be connected in the circuit, depends on their total current consumption, which must not exceed 0.5A. Before connecting the last sounder in the circuit, parallel to it must be added resistor 10k.

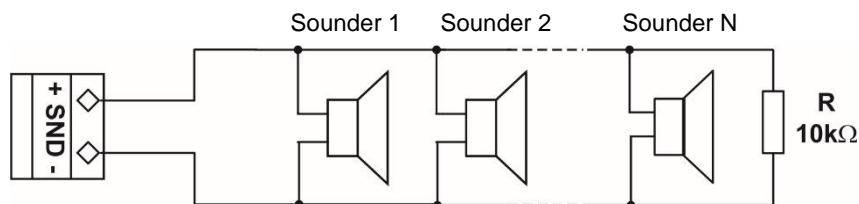


Figure 18

4.2.3. Connection of Signalling Devices

To every monitored output FAULT R, FIRE R and FIRE P could be connected signalling and other control devices – Figure 19. The maximal consumption of the devices should not exceed 0.1A. Before connecting the last device in the circuit, parallel to it must be added resistor 10k.

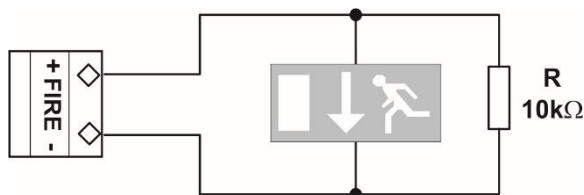


Figure 19

4.3. MAGPRO96-L250 Loop Expander

The MAGPRO9601 addressable fire alarm panel operates with MAGPRO96-L250 Loop Expanders. The communication with connected to the loop addressable devices is via MAGPRO communication protocol.

The MAGPRO96-L250 Loop Expander (see item 4.3.2, Figure 20) realizes the connection between the Output Module and devices connected to the communication line.

The MAGPRO96-L250 Loop Expander has two basic functions: 1. Gathers data from the devices in the communication line and transfers it to the Output Module; 2. Receives commands from the Output Module and transfers them to the devices connected in the communication line.

Every MAGPRO96-L250 Loop Expander support operation with up to 250 addressable devices.

The maximum current consumption (I_{max}) of the devices in the communication line in alarm state must be up to 500mA. If the consumption exceeds this value an overload protection would be turned on.

In the configuration of MAGPRO9601 addressable fire alarm panel could be mounted up to 4 loop expanders.

4.3.1. Permissible Cable Length

The maximum length of the loop in the system could vary according to the cross-section and the ohmic resistance of the used cable.

ATTENTION: MAGPRO96-L250 loop controller supports up to 250 devices!

To ensure the correct operation of the system is necessary to make some calculations in advance:

<p>1. To ensure the ability of the fire panel to receive the signals from the devices in the loop, calculate:</p> $L_{C1max} \leq 123 / R_c$	<p>2. To ensure the ability of the fire panel to recognize the double addresses in the system, calculate:</p> $L_{C2max} \leq 62 / R_c$	<p>3. To ensure the ability of the devices in the loop to receive command signals from the panel, calculate:</p> $L_{C3max} \leq (12 / I_{max} - R_i) / R_c$
--	---	--

Where:

L_{C1MAX} , L_{C2MAX} and L_{C3MAX} - are maximum permissible length of the used cable, [km];

R_c - is total ohmic resistance of the two wires of the used cable; its value shows the magnitude of the cable resistance at length 1km [Ω /km];

R_i - is the total resistance of the isolator modules in the loop;

I_{max} - is the maximum current consumption in the loop in alarm condition - total amount of the current consumption of all devices in alarm state** in the loop.

Note: In case of using more than 15 devices MAGPRO series from type HD1, SD1, HSD1, MC and CZM, in calculation of I_{max} value is used the maximum current consumption in alarm state** only for those 15 devices with the highest consumption, and for the rest devices is used the consumption in stand-by mode**.

** For the max. current consumption in alarm state and the consumption in quiescent state with communication (stand-by mode) of a device refer to its installation manual.

L_c - is the necessary length of the cable for the loop.

After calculating, the maximal length of the cable is determined according:

- If $L_c \leq L_{C2max}$ and $L_c \leq L_{C3max}$ - the fire panel will be able to communicate with the devices in the loop and also will be able to identify the presence of double address.
- If $L_{C2max} < L_c \leq L_{C1max}$ and $L_c \leq L_{C3max}$ - the fire panel will be able to communicate with the devices in the loop but will not be able to identify the presence of double addresses.

ATTENTION: Always calculate the maximal cable length according the mentioned above formulas!

IF $L_c > L_{C1max}$ or $L_c > L_{C3max}$ - the fire panel would not be able to communicate with the devices.

4.3.2. Loop Expander Elements Description

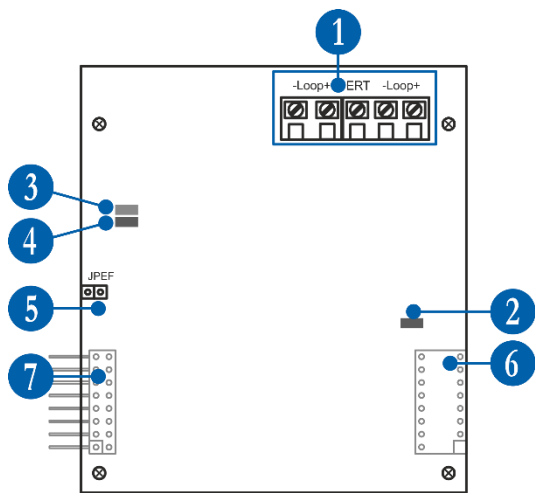


Figure 20

- 1 - Interface for connection of the loop line – see item 4.3.3.
- 2 - LED (red) – Indication for power supply of the Loop expander. In normal operation mode it is constantly lighting on.
- 3 - LED (green) – Indication for data transfer between the main microprocessor of the panel and the Loop expander. In normal operation mode it is constantly blinking.
- 4 - LED (red) – Indication for scanning the devices connected to the Loop expander. In normal operation mode the LED lights on continuously in 10 seconds intervals.
- 5 - Jumper for enable/disable indication for earth fault (JPEF). For example, if you want to enable the earth fault indication set a jumper.
- 6 - Interface connector for connecting the next Loop expander (on the back side of the Loop expander).
- 7 - Interface connector for connecting the Loop expander to the Output Module or to other (previous in order) loop expander (on the back side of the Loop expander).

4.3.3. Loop Line Connection

Connect the loop line to the MAGPRO96-L250 Loop expander as strictly observe the polarity. The “Channel A” is the starting point for addressing the connected devices, and “Channel B” is the end point. The addressing methods are described in item 5.2. To avoid faults and malfunctioning of the system, **the loop line must be connected to the Loop expander only when the main and back-up supplies of the panel are off!**

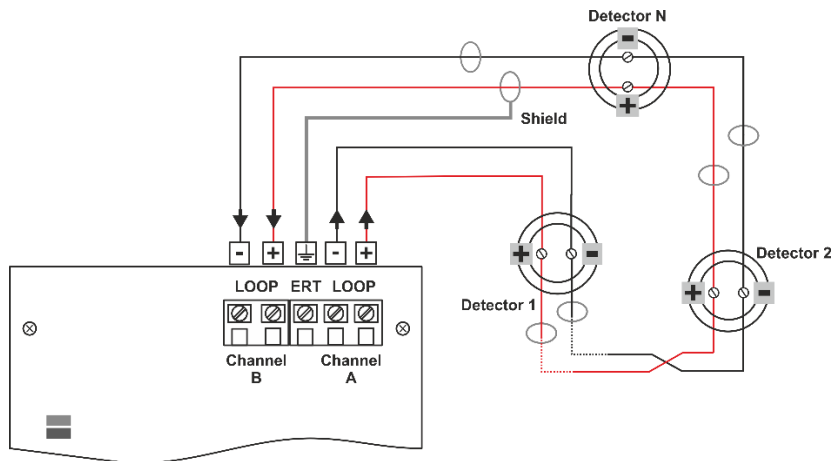


Figure 21

4.3.4. Adding Loop Expanders

The loop expanders are periphery devices in MAGPRO9601 system configuration. According the physical place of mounting, every loop expander takes a system factory address of periphery device that cannot be changed – see item 5.1 for general information about the factory addressing of periphery devices.

The connection between the loop expanders is via interface connectors for coupling the modules to each other.

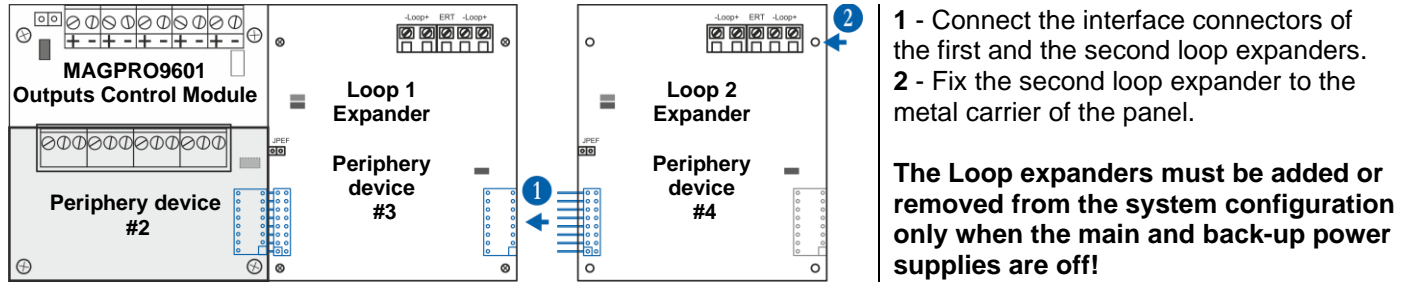


Figure 22

4.3.5. Finding Short-Circuit in the Loop Line

The connection diagram shown on Figure 23, gives the possibility to provide operation of the loop in case of short-circuit fault, using devices with built-in isolator modules. For example, short-circuit in section 2 will not influence the operation of sections 1 and 3. The isolator modules at the both ends of section 2 will isolate it, and section 1 and 3 will continue working properly, as section 1 will operate by supply from the channel “A” and section 3 - by supply from channel “B”. Since the fire panel will not be able to communicate with the devices from section 2, it will generate an alarm signal for lost devices and open circuit.

The maximum recommended number of devices between two isolator modules (module isolator device or using the built-in module isolator in a device) is 30!

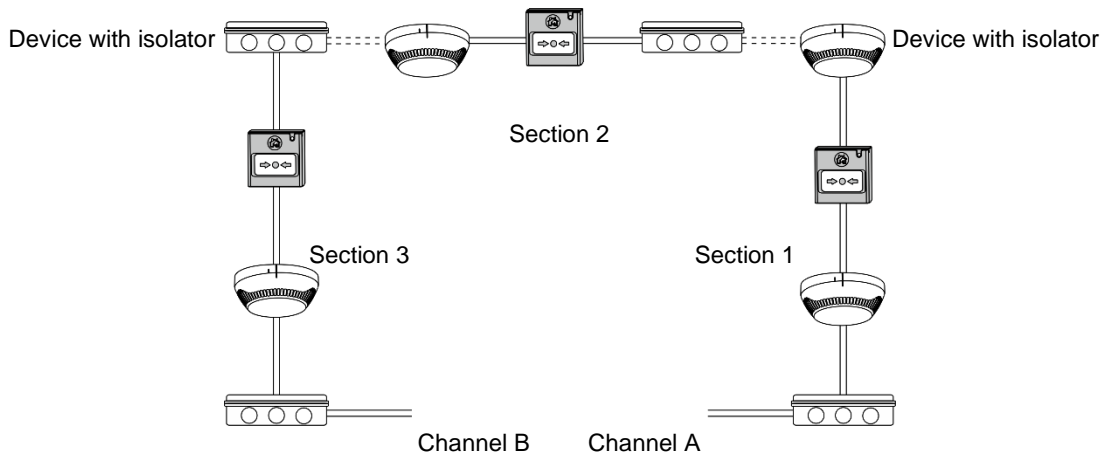
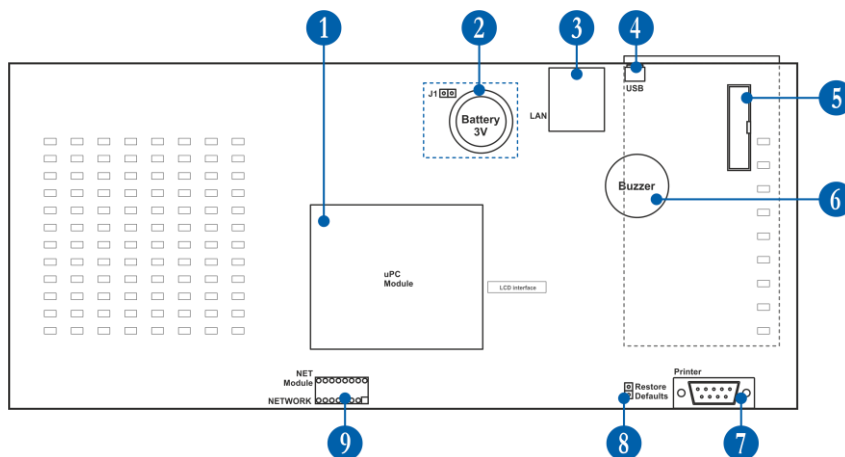


Figure 23

4.4. Main control module PCB

The Main control module is situated on the back side of the front cover – Figure 14. On the Main control module is factory integrated a control module - uPC Module, for control of the panel functions and operations. **The Main control module PCB is not a periphery device.**



- 1 - CPU Control module integrated to the Main PCB.
- 2 - Built-in 3V backup battery for the real-time clock. To activate the battery set jumper on J1 terminals.
- 3 - LAN interface connector.
- 4 - Micro USB port for software and firmware update.
- 5 - Connector to the Outputs Control module (factory connected).
- 6 - Buzzer for sound signalization.
- 7 - RS232 interface connector for connecting to a thermal-printer or other control equipment.
- 8 - Restore Defaults Jumper for resetting the panel with default parameters.
- 9 - Interface connector for a Redundant network module and Voice evacuation module to the system configuration.

4.4.1. Thermal Printer Connection

The addressable fire alarm panel MAGPRO9601 is equipped with RS232 interface connector, situated in the right bottom of the main PCB, for connecting a thermal printer. The thermal printer allows the technician to print the log file for the alarm and fault events, warnings and changes during programming. The capacity of log file is 10 240 events, which are saved with date and time of occurring.

MAGPRO9601 panels support operation with Canon 9 type external printers, models Kafka and Datecs (EP1000), stand-alone devices.

You can use only one printer connected to the MAGPRO9601 panel. The type of printer is selected from the installer programming menus at level 3: *System-Programming-Panel-Printer*.

For connecting the MAGPRO9601 panel to Canon type thermal printer, you must prepare a special cable for the purpose – connect two male DB9-DB9 (for model Datecs printer) or DB9-DIN5 (for model Kafka printer) type connectors as shown on Figure 24.

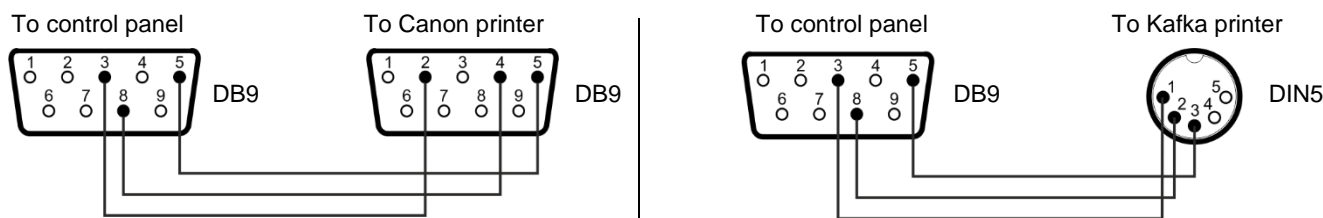


Figure 24

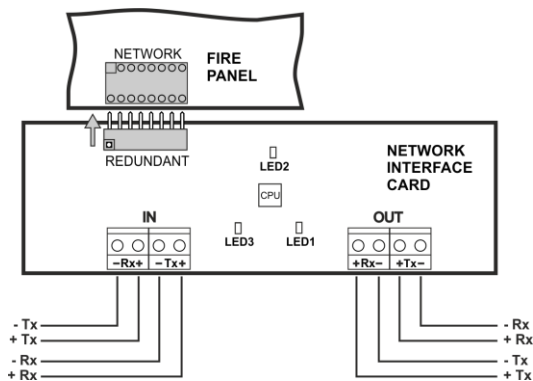
Before printing (access level 2 or 3), make sure that the thermal printer is connected to the Printer terminal and the printer is powered on.

To start printing enter menu: *System-Maintenance-View Log* and press *Print* button. If the thermal printer is unavailable or off, the button will be not operable.

4.4.2. Network Interface Card

The MAGPRO9601 addressable fire alarm panel is designed with option for connection in a redundant network with other MAGPRO9601, MAGPRO96, MAGPRO16 or MAGPRO-REP Repeater panels (up to 64). The redundant network is based on RS485 interface using network interface card MAGPRO-NIC.

MAGPRO-NIC is an additional network interface card, sold separately. The interface card is mounted to Network connector of MAGPRO9601 main control module PCB. The additionally mounted PCB should be fixed with screws to the metal cover. The maximum cable length between two interface cards and/or repeater panel should not exceed 1000m.



Network Interface Card Basic Information

Technical Characteristics:

- Communication - RS485
- Twisted pair cable:
 - Length - max. 1000m (between two modules)
 - Cross Section - 0.5 - 2.5mm²

LED Indication:

- LED1 - Output communication
- LED2 - Panel-Module communication
- LED3 - Input communication

Operation Modes:

- Normal - Blinking LEDs
- Trouble - Lighting on LEDs

Figure 25

To use the redundant module, the installer must set the Network type for all connected panels as “RS485” in installers menus (access level 3): *System-Programming-Panel-Network-Network Settings-Network Type*.

4.5. Connection of a Repeater Panel

The Repeater panel is a control panel for remote indication of fire alarm, fault, trouble, warning, and other type of events, reported from MAGPRO9601 and other MAGPRO addressable panels connected into one common network. The MAGPRO-REP Repeater can operate only as a part of a network. It repeats the status of the connected fire panels and informs for events.

Up to 64 panels can operate in a single network, including MAGPRO-REP Repeater, MAGPRO96, MAGPRO9601 and MAGPRO16 fire alarm panels. According the used Repeater model, the connection in the network between the panels can be realised via RS485 interface or LAN:

- Model MAGPRO-REP TFT Repeater – RS485 interface or LAN
- Model MAGPRO-REP Repeater – RS485

Only one type of connection can be used in a single network.

RS485 Interface

The RS485 interface is built-in the repeater panel and the connection with MAGPRO9601 is realized via Network Interface card (Figure 26) connected to “NETWORK” connector on the main control module PCB.

The following table represents the correspondence of Tx/Rx terminal connections for IN and OUT communication lines.

Observe the polarity of the RS485 interface connection!			MAGPRO-REP Repeater								
			IN				OUT				
			Tx		Rx		Tx		Rx		
			+	-	+	-	+	-	+	-	
Network Interface Card	IN	Rx	-								
		Tx									
	OUT	Rx									
		Tx									
		Rx									
		Tx									

The repeater panel is powered up from an undependable external power supply 24 VDC - Figure 28.

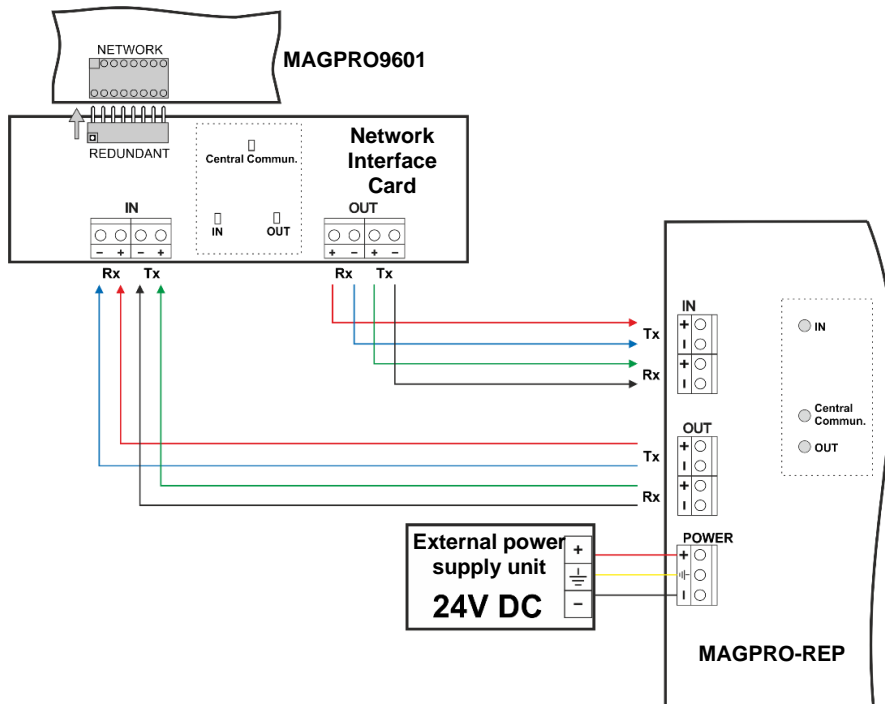


Figure 26

The maximum cable length between two network modules and/ or repeater panel is 1000m.

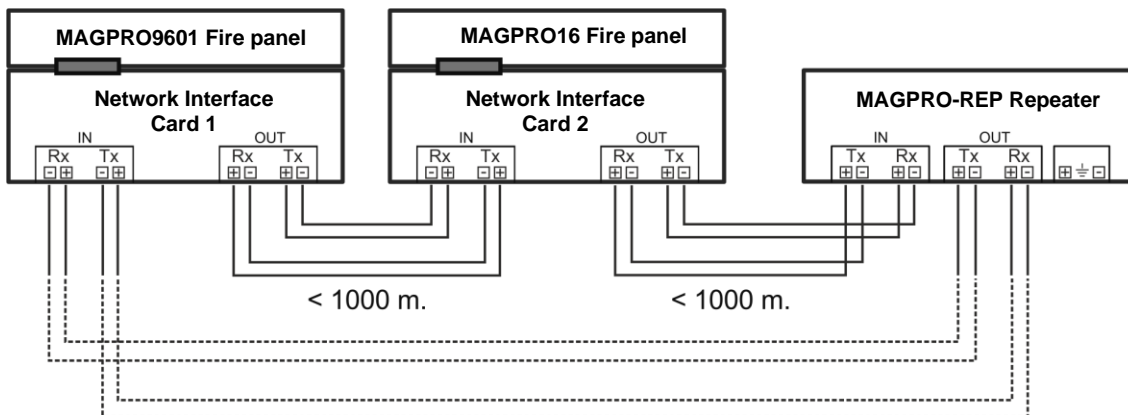


Figure 27

Up to 64 panels can be connected in a common redundant network.

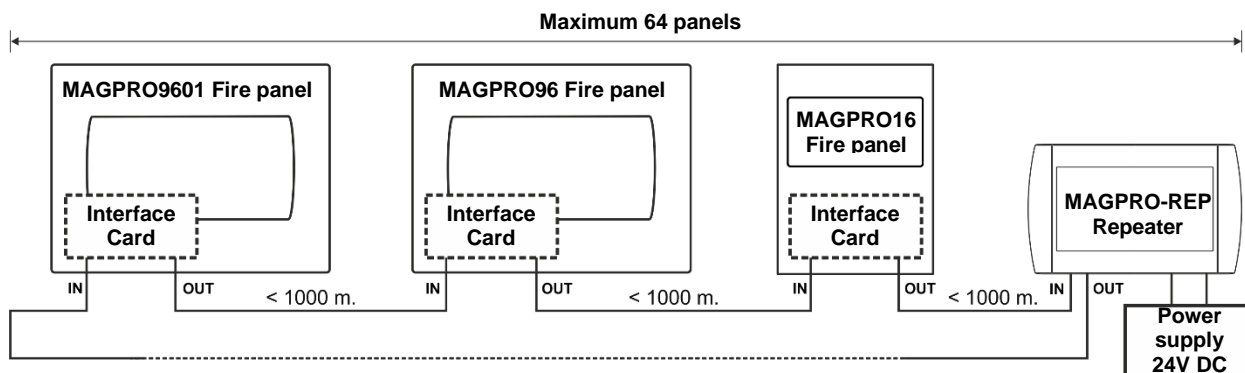


Figure 28

LAN Interface

Model MAGPRO-REP TFT Repeater supports operation also via LAN network. Note: The LAN connector is accessible after removing the left and right side covers and the front panel of the enclosure box. The general connection diagram for LAN network is presented in item 4.6.

4.6. LAN connection

The realization of LAN network is possible only for Repeaters TFT model and MAGPRO9601 and MAGPRO96 series addressable fire alarm panels (up to 64). The LAN connection can be direct panel-to-panel or by means of a HUB via TCP/IP protocol.

To operate in LAN network with other MAGPRO9601, MAGPRO96 and TFT Repeater panels, the installer must set for all panels "LAN" type of the communication protocol.

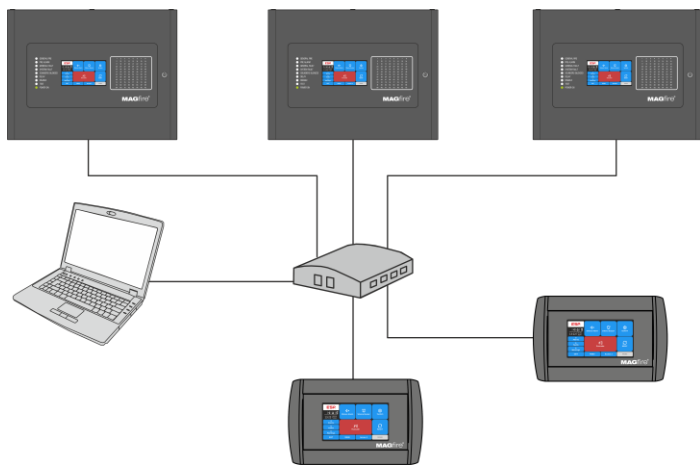


Figure 29

5. SUPPLEMENTARY INFORMATION

5.1. Periphery Devices

All “functional modules” connected to the control panel configuration are defined as Periphery Devices, and have special programming and settings.

Attention: The Main control module PCB is not a periphery device!

Up to 6 periphery devices can be added to the system configuration of MAGPRO9601 panel.

Periphery Device	MAGPRO9601
PSU – Main power supply	1
OUT – Outputs module	1
LOOP – Loop controller (expander)	4

The periphery devices have factory set address numbers that cannot be changed. The loop controllers always take periphery device addresses from 3 to 6 (fixed), but their current number is possible to be changed according the system configuration.

The following drawing of the hardware configuration of MAGPRO9601 panel and the table next to it represent the fixed factory addresses of the periphery devices, which must be assumed during the initial power up and programming of the whole system.

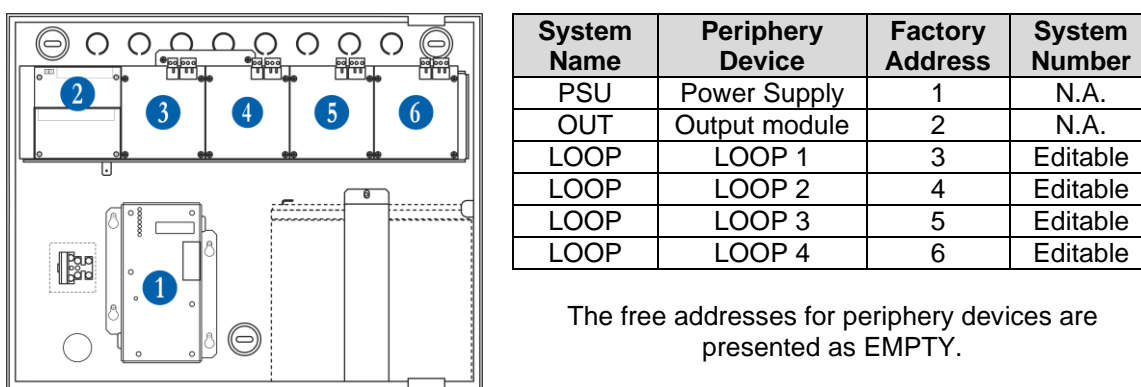


Figure 30

5.2. Methods for Addressing Loop Devices from the Panel

After connection the loop line(s) to the loop expander(s) and powering up the fire panel, MAGPRO9601 automatically recognizes the type of connected devices and shows them in the order of finding them along the loop line. The Installer can choose if to Save the devices with automatically set numbers, or to address them according the requirement of the installation specific for every protected site. The installer can use three approaches for adding and addressing devices to the system configuration.

- **The devices are directly connected to the panel via MAGPRO96-L250 Loop expander.** The panel will recognize them and gives automatically addresses according the order of the devices in the line. The panel will start with the first free address in the system configuration. The installer can SAVE the new devices one-by-one or all at the same time with SAVE button from the Programming main screen.
- **SELF ADDRESSING.** The new devices are prepared for connection to the system configuration - the loop line is ready but the devices are not installed (the detectors and sounders are not mounted to the bases, the call points and modules are not connected to the loop). The installer enters (access level 3): System-Programming-Devices-Addressing-Start Self Addressing menu. The panel shows the first free address for every of the available MAGPRO96-L250 loops. Now the installer can start mounting detectors and modules one-by-one. The panel will set the displayed address number to the mounted device and automatically proceeds with next free address in the system.
- **AUTO ADDRESSING.** The auto addressing feature of MAGPRO9601 panel has the purpose to make the installation of the addressable systems easier. By using it the installer could mount all devices without setting address and then do it automatically by a single click in the panel. There are two main ways for auto addressing: by ID number of the devices, and by isolators.

The direction of auto-addressing procedure by isolator module, according to the positive and negative lines of the MAGPRO96-L250 Loop expander, is shown on Figure 31:

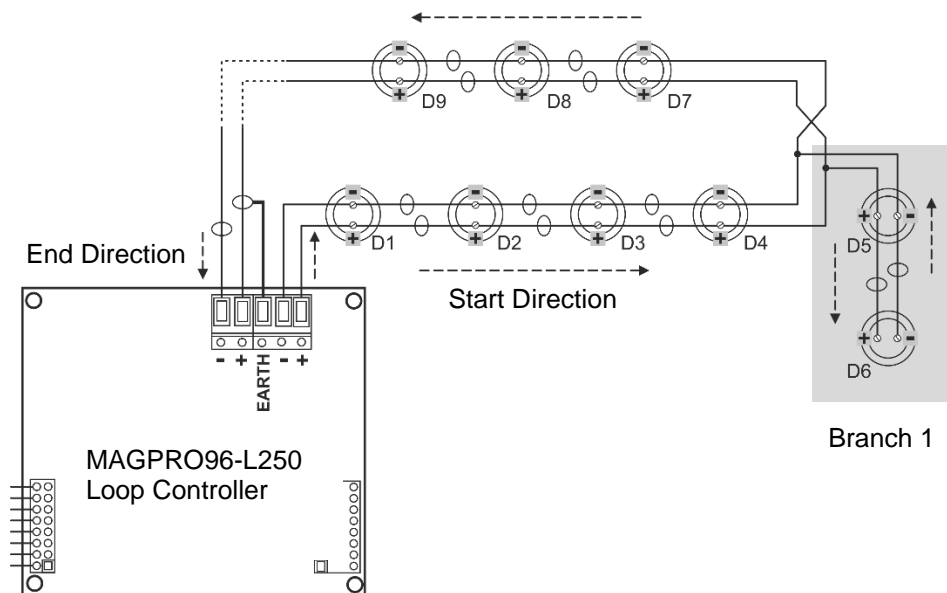


Figure 31

Routine Maintenance

MAGPRO9601 control panel does not require any specific maintenance. To clean the panel's surface, use a dry cloth. Detergents or solvents should not be used to clean the panel and care must be taken that water does not enter the enclosure.

The control panels contain sealed lead acid batteries (12V/18Ah or 12V/17Ah) to provide standby power in the event of mains failure. This battery has a life expectancy of around 4 years. It is recommended that this battery be annually tested in accordance with the battery manufacturer's recommendations to determine its suitability for continued standby applications.

Routine testing of the fire alarm system in accordance with EN54-14 will identify any malfunction of the control panel and any malfunction should be reported to the fire alarm maintenance company immediately.

Detection devices are automatically calibrated on a daily basis and any devices that fail the detector manufacturer requirements will be notified as a maintenance fault. The contamination status menu is also useful in determining detection devices that are approaching their working range limits.

Care of the TFT Screen

MAGPRO9601 is equipped with TFT control screen, presenting clear view and user-friendly interface for operation. It is recommended to use touch pen to avoid damage and contamination of the sensitive TFT screen during operation. Do not use sharp instruments for pressing the screen, like screwdrivers, tweezers or pliers, because they can scratch or break the plastic surface of the screen and the panel to become not operational!

Attention: The enclosure box is not waterproofed! Clean the metal surface with a dry cloth only, and the TFT screen with cleaning sprays or foams containing no solvents (alcohol, acetone, ammonia, etc.).



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