

MAVIGARD®
..... harezmic



MaviGard Harezmic 'Very Intelligent' Analogue Addressable Fire Alarm Control System

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1. INTRODUCTION

1.1. System structure

MaviGard Harezmic analogue addressable fire alarm control system consists of the following equipment:

- MG-7100 – 1 loop panel
- MG-7200 – 2 loop panel
- MG-7400 – 4 loop panel
- MG-7000 – Repeater panel
- MG-9100 – Photo-electric smoke detector
- MG-9200 – Ionisation smoke detector
- MG-9300 – Heat detector
- MG-9400 – Multisensor (smoke + heat)
- MG-8100 – Manual call point with break glass
- MG-8110 – Resettable manual call point
- MG-8101 – Two terminal red back box for manual call points
- MG-6100 – Relay controller*
- MG-6108 – Relay controller, 8-way output*
- MG-6200 – Switch monitor*
- MG-6208 – Switch monitor, 8-way input*
- MG-6300 – Sounder controller*
- MG-6308 – Sounder controller, 8-way output*
- MG-6400 – Zone monitor *
- MG-6408 – Zone monitor, 8-way input *
- MG-6500 – Short circuit isolator module
- MG-6600 – Addressable loop-powered sounder*
- MG-8200 – Address programmer

*** from this point further in the manual MG-6100, MG-6108, MG-6300, MG6308 and MG-6600 will be mentioned as 'output devices'; and MG-6200, MG-6208, MG-6400, MG-6408 will be mentioned as 'input devices'**

Also, the following equipment can be used with the addressable system:

- MG-7050 – Switched mode power supply 2.5A (power supply for the modules)
- MG-7080 – Switched mode power supply 4A (power supply for the modules)
- MG-2000 series – Conventional fire detectors for connecting to zone monitors
- MG-5100 – Conventional manual call point for connecting to zone monitors
- MG-5000 – Electronic sounder
- MG-5200 – Electronic sounder strobe

1.2. Protocol features

The system is operating on unique Very Intelligent Communication Protocol (VIP). Loop polling is performed in 7.5 seconds regardless of the number of devices connected to loop. The protocol has a feature of loop polling interrupt in case of fire event, which provides fast fire detection and prompt signalling. Detector alarm threshold reading and fault detection is made on complex panel software algorithm thus strengthening the system reliability. Data during the loop polling is protected with parity control.

1.3. Main capabilities

The panel is capable of covering up to 48 PC-configured zones with 127 addressable devices per loop. The panel is equipped with 4 programmable and fault monitored sounder outputs; an auxiliary power supply output; programmable alarm, fault and fire alarm relays.

Switched mode power supply provides continuous and reliable power supply with monitoring of earth, mains power supply, battery and 24 V DC faults.

The system supports integration of 32 fire alarm control panels and/or repeater panels into a network via RS-485 interface. Loop maximum cable length is 1200 meters. Zone monitor module (MG-6400-6408) enables expanding the protection area with a conventional zone, which can carry up to 20 conventional detectors and unlimited number of manual call points. All addressable devices are 'soft'-addressed (without DIP switches) by use of the Address programmer, which also displays analogue values of detectors.

An external printer, connected to the fire alarm control panel, enables printing out current events as well as the Event Log from the panel's memory. The Event Log carries up to 999 events, which include these data: type of event; panel name; type, address and location text of device, date and time.

1.4. Building security automation

The relay controller module enables controlling security systems such as ventilation, lifts etc. The switch monitor module supervises external systems and devices such as sprinkler extinguishant system, gas detector etc. In this way, external information is collected and necessary commands to building security automation systems are formed. The sounder controller module provides adding auxiliary programmable and monitored sounders and sounder strobes to the loop. Settings of monitoring and controlling functions are made by use of a PC program, Loop Manager.

1.5. Programming by use of Loop Manager

The program enables

- allocating an arbitrary number of devices into zones
- setting activation algorithms to interface modules
- setting activation delays to all outputs
- allocating a 40-character location text to each addressable device
- and many more.

2. WARNING

The equipment contains static-sensitive high quality electronic control equipment. Do not use the panel before reading this manual. In case of any fault, only the technicians of the manufacturer or technicians authorized by the manufacturer should repair or maintain the panel. Use the recommended cable types defined in this manual for cabling of power supply, detection and sounder circuits. Do not remove any connections and do not make any connections while mains power supply is connected. Panel's earth connection must be made. The cabinet must be connected to a suitable earth point.

Under no circumstances should voltage or current outside of the limits described in this manual be used with the devices and the panel. Otherwise, damage on panel may occur, which is not subject to maintenance under warranty.

'Automatic learning' causes erasing of existing configuration data at panel. Therefore, it is recommended to download the configuration data to PC prior to making 'Automatic learning'.

3. MOUNTING

The chosen site for the mounting of the panel must be clean, dry and not subject to shock or vibration. The panel must not be mounted near to sources of excessive heat or cold (see the specifications).

Mark the position of the fixing holes according to the respective Annex, ensuring that the wall is flat at the chosen location. Screws or bolts of a minimum of 4mm diameter must be used to mount the cabinet in all four mounting positions. Panel cable entries from back and top of the panel are available for easy mounting. Drill and plug the wall then fix the cabinet using all fixing points.

Open the panel front cover using the key provided.

4. PANEL INPUTS

4.1. Mains power supply

The system is designed to operate with 220V AC 50Hz. Earth connections must be made to earth terminal and earth resistor must be less than 10Ω. The mains supply of the panel must be via an independent self-resetting fuse rated 6A 220V AC. This fuse must be separate from the other fuses and a caution note should be written such as "ATTENTION! FIRE ALARM CONTROL PANEL'S FUSE. DO NOT REMOVE" to ensure safe operation of the panel.

Recommended cable types are 3x2,5 NYM or 3x2,5 NYA.

Do not connect or disconnect loops, mains supply input and PCB connections while the panel is energized to avoid an electric shock.

4.2. Batteries

Batteries provide continuity of operation during a failure of the mains power supply. The switched mode power supply has an automatic battery charger circuit, so there is no need for an external charging unit.

The panel uses 2 units of 12V DC 7Ah dry type batteries.

4.3. Loops

A loop provides power supply to the devices on site and conveying the polling data as well as other information necessary for maintaining fire alarm control system. A loop is capable of hosting up to 127 addressable devices. The diameter of the cable is dependant on the length of the loop: for a loop of 0-500 meter long, use 1x2x0,8+0,8J-Y(st)Y cable, for a loop of 500-1500 meter long - 1x2x1,5+0,8J-Y(st)Y. A 0Ω resistor must be connected to unused loops. Loops operate on 24V DC.

Earth cable of the loop must be connected to the PCB-bearing base of the panel.

Loops are monitored for short and open circuits. In case of a fault on loop cable, the panel displays fault message. After removing of the cause of the fault, press the 'Reset' button on silk screen label, otherwise, the panel will continue to display fault message.

4.4. PC port

When uploading data to panel from computer or downloading data from panel to computer, COM1 socket on MCU (Main Control Unit) is used for communication.

4.5. Write enable switch

When uploading or downloading panel data turn the write enable switch to 'On' (2) position. After the uploading and downloading, turn the switch to 'Off' position, otherwise, the panel will display fault message and buzzer will activate.

The switch is also used to enable 'Automatic learning'.

5. PANEL OUTPUTS

5.1. Sounder outputs

The panel has 4 programmable and monitored sounder outputs rated 0.5A 24V DC. Each output is capable of hosting up to 16 MG-5000 sounders. Overloading the outputs will cause a sounder output fault and self-resetting fuse activation. Outputs can be disabled from panel and delayed by use of Loop Manager.

A 2x1,5 mm² cable must be used as a sounder line. 10kΩ resistors, located on sounder outputs from factory default are used as end-of-line resistors. Sounder output faults such as open and short circuits are displayed on panel LCD accompanied with buzzer sounding.

5.2. Auxiliary power supply output

The panel is equipped with an auxiliary 0.5A 24V DC power supply output. The output is used for energizing external devices such as telephone dialler or gas detector. Connecting an external device with improper voltage requirement or overloading the output will cause device malfunction or output fault. The output provides continuous power supply. In case of mains power supply failure, the batteries provide power supply to the output.

5.3. Relay outputs

The panel has 3 programmable relay outputs with volt free changeover contacts rated 1A 30V DC, NC and NO. If a relay output would be used in an application requiring continuous high current - even below the rated values - an appropriate terminal should be used between the device and the relay output.

Fire alarm relay and alarm relay are normally not energized, fault relay is normally energized; this enables conveying a fault signal to a remote control unit when the panel goes out of power supply.

Outputs can be disabled from panel and delayed by use of Loop Manager.

Relay outputs, which are not programmed with Loop Manager, activate by default as follows.

5.3.1. Fire relay

The output activates on any fire event. The output is returned to its initial position only by pressing 'Reset' button on silk screen label.

5.3.2. Alarm relay

The output activates on any fire event. The output is returned to its initial position by pressing 'Silence alarm' button on silk screen label. On reception of a new fire event, the output will activate again.

5.3.3. Fault relay

The output activates on any fault event. The output is returned to its initial position only by pressing 'Reset' button on silk screen label. As described above, the output also activates when panel goes out of power (both mains and battery).

6. INTERFACE MODULES

6.1. Relay controllers

6.1.1. MG-6100 Relay controller

The module is used for controlling a ventilation system, air conditioners, lifts, telephone diallers, door holders etc. The module is equipped with one 'dry' contact relay output rated 1A 30V DC, NC and NO.

By use of the Loop Manager, the module can be set to activate on fire or fault event with a delay up to 300sec. The module is set to activate on any fault event with a delay of 0sec by default. Please refer to the "Loop Manager" chapter of the manual for detailed information on programming the module.

The module is loop-powered and does not need an external power supply.

The module has 2 LED indicators: LED1 blinks at polling, LED2 illuminates continuously with LED1 on activation.

6.1.2. MG-6108 Relay controller, 8-way output

The module is used for controlling a ventilation system, air conditioners, lifts, telephone diallers, door holders etc. The module is equipped with 8 'dry' contact relay outputs rated 1A 30V DC, NC and NO.

When addressing the module by use of the MG-8200 Address Programmer, the address is assigned to the first output, and the other 7 outputs are automatically assigned consecutive numbers. For example, if the module is given address 1, the first output gets address 1, and the other 7 outputs get 2, 3, 4, 5, 6, 7, and 8 respectively.

By use of the Loop Manager, each relay output of the module can be set to activate on fire or fault event with a delay up to 300sec. All outputs of the module are set to activate on any fault event with a delay of 0sec by default. Please refer to the MaviGard Harezmic panel manual for detailed information on programming the module.

The module is loop-powered and does not need an external power supply.

The module has one LED indicator, which blinks at polling and illuminates continuously on activation.

6.2. Switch monitors

6.2.1. MG-6200 Switch monitor

The module is used for monitoring an external volt free changeover contact. This would typically be a gas detector, extinguishant panel, flow switch, etc. The module has J2 jumper, which is used for determining the contact's monitoring position. Mounted jumper sets the contact's normal position as NC, unmounted jumper sets the contact's normal position as NO. The setting must be made prior to putting the module into operation.

By use of the Loop Manager, the module can be set to signal a fire or fault event. The module is set to signal a fault event by default. Please refer to the "Loop Manager" chapter of the manual for detailed information on programming the module. The module is loop-powered and does not need an external power supply.

The module has one LED indicator, which blinks at polling and illuminates continuously on activation.

6.2.2. MG-6208 Switch monitor, 8-way input

The module is used for monitoring an external volt free changeover contact. This would typically be a gas detector, extinguishant panel, flow switch, etc.

When addressing the module by use of the MG-8200 Address Programmer, the address is assigned to the first input, and the other 7 inputs are automatically assigned consecutive numbers. For example, if the module is given address 1, the first input gets address 1, and the other 7 inputs get 2, 3, 4, 5, 6, 7, and 8 respectively.

Activated input's address, location text (if available) etc. are displayed on the panel LCD.

The module has 8 switches for determining each contact's monitoring position. Switch numbers correspond to the switch monitor numbers on the module. If the switch is ON, the switch monitor supervises NC contact; if the switch is OFF, the switch monitor supervises NO contact. The setting must be made prior to putting the module into operation.

By use of the Loop Manager, each input of the module can be set to signal a fire or fault event. All inputs of the module are set to signal a fault event by default. Please refer to the MaviGard Harezmic panel manual for detailed information on programming the module.

The module is loop-powered and does not need an external power supply.

The module has one LED indicator, which blinks at polling and illuminates continuously on activation of one of the inputs.

6.3. Sounder controllers

6.3.1. MG-6300 Sounder controller

The module has one monitored sounder output rated 0.5A 24V DC used for activating sounders and sounder strobes. The output enables connecting max. 16 MG-5000 sounders. A 10kΩ end-of-line resistor provided with the module must be connected to the end of sounder line.

By use of the Loop Manager, the module can be set to activate on fire or fault event with a delay up to 300sec. The module is set to activate on any fault event with a delay of 0sec by default. Please refer to the "Loop Manager" chapter of the manual for detailed information on programming the module.

The module needs an external 24V DC power supply. Using MG-7080 and MG-7050 power supply units is recommended.

The module has 3 LED indicators: LED1 blinks at polling, LED2 illuminates continuously with LED1 on 24V fault, LED6 illuminates continuously on activation.

The panel monitors the following module-specific faults:

Fault type	LCD message
Sounder line O.C.	'Sounder Line O.C.'
Sounder line S.C.	'Sounder Line S.C.'
Mains power supply failure	'Power fault'
Power supply fault monitoring line O.C.	'Power Line O.C.'
Power supply fault monitoring line S.C.	'Power Line S.C.'
24V DC supply failure	'24V Fault'

6.3.2. MG-6308 Sounder controller, 8-way output

The module has 8 monitored sounder outputs each rated 0.5A 24V DC used for activating sounders and sounder strobes. Each output enables connecting max. 16 MG-5000 sounders. 10kΩ end-of-line resistors provided with the module must be connected to the ends of sounder lines.

When addressing the module by use of the MG-8200 Address Programmer, the address is assigned to the first output, and the other 7 outputs are automatically assigned consecutive numbers. For example, if the module is given address 1, the first output gets address 1, and the other 7 outputs get 2, 3, 4, 5, 6, 7, and 8 respectively.

By use of the Loop Manager, each output of the module can be set to activate on fire or fault event with a delay up to 300sec. All outputs of the module are set to activate on any fault event with a delay of 0sec by default. Please refer to the MaviGard Harezmic panel manual for detailed information on programming the module.

The module needs an external 24V DC power supply. Using MG-7080 power supply unit is recommended.

The module has 10 LED indicators: LED1 blinks at polling, LED2 illuminates intermittently with LED1 on 24V fault, the other 8 LEDs (LED3-LED10) illuminate on activation of the respective sounder outputs.

The panel monitors the following module-specific faults:

Fault type	LCD message
Sounder line O.C.	'Sounder Line O.C.'
Sounder line S.C.	'Sounder Line S.C.'
Mains power supply failure	'Power fault'
Power supply fault monitoring line O.C.	'Power Line O.C.'
Power supply fault monitoring line S.C.	'Power Line S.C.'
24V DC supply failure*	'24V Fault'

*The LCD message displays the address assigned to the first output.

6.4. Zone monitors

6.4.1. MG-6400 Zone monitor

The module is used for connecting a conventional zone to the loop. A conventional zone can host up to 20 MG-2000 (24V) series detectors and unlimited number of MG-5100 manual call points. A 6.8kΩ end-of-line resistor provided with the module must be connected to the end of zone.

By use of the Loop Manager, the module can be set to signal a fire or fault event. The module is set to signal a fault event by default. Please refer to the "Loop Manager" chapter of the manual for detailed information on programming the module.

The module needs an external 24V DC power supply. Using MG-7080 and MG-7050 power supply units is recommended.

The module has 2 LED indicators: LED1 blinks at polling and illuminates continuously on activation, LED2 illuminates continuously with LED1 on 24V fault.

The panel monitors the following module-specific faults:

Fault type	LCD message
Zone open circuit	'Zone O.C.'
Zone short circuit	'Zone S.C.'
Mains power supply failure	'Power fault'
Power supply fault monitoring line O.C.	'Power Line O.C.'
Power supply fault monitoring line S.C.	'Power Line S.C.'
24V DC supply failure	'24V Fault'

6.4.2. MG-6408 Zone monitor, 8-way input

The module is used for connecting 8 conventional zones to the loop. A conventional zone can host up to 20 MG-2000 (24V) series detectors and unlimited number of MG-5100 manual call points. 6.8kΩ end-of-line resistors provided with the module must be connected to the ends of the zones.

When addressing the module by use of the MG-8200 Address Programmer, the address is assigned to the first input, and the other 7 inputs are automatically assigned consecutive numbers. For example, if the module is given address 1, the first input gets address 1, and the other 7 inputs get 2, 3, 4, 5, 6, 7, and 8 respectively.

Activated input's address, location text (if available) etc. are displayed on the panel LCD.

By use of the Loop Manager, each input of the module can be set to signal a fire or fault event. All inputs of the module are set to signal a fault event by default. Please refer to the MaviGard Harezmic panel manual for detailed information on programming the module.

The module needs an external 24V DC power supply. Using MG-7080 power supply unit is recommended.

The module has 2 LED indicators: LED1 blinks at polling and illuminates continuously on activation, LED2 illuminates intermittently together with LED1 on 24V fault.

The panel monitors the following module-specific faults:

Fault type	LCD message
Zone open circuit	'Zone O.C.'

Zone short circuit	'Zone S.C.'
Mains power supply failure	'Power fault'
Power supply fault monitoring line O.C.	'Power Line O.C.'
Power supply fault monitoring line S.C.	'Power Line S.C.'
24V DC supply failure*	'24V Fault'

*The LCD message displays the address assigned to the first output.

6.5. MG-6500 Short circuit isolator module

The module is used for isolating a short-circuited section on a loop, thus maintaining the healthy operating of the rest of the loop. Connecting one module per 20 addressable devices is recommended. The panel has built-in short circuit isolators on loop input and outputs as well. The module is not addressable.

7. ADDRESSING DEVICES

Detectors, manual call points, interface modules and addressable sounders are addressed by use of the Address Programmer (MG-8200, see the figure below). Short circuit isolator modules are not addressable. To avoid double address fault, it is recommended to re-address all devices, which have factory default addresses, prior to mounting on site. The MG-8200 requires 9V DC battery.

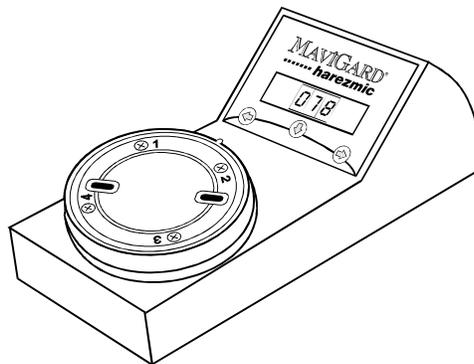


Fig. 1. Address Programmer.

To address a device follow the steps below:

1. Mount detector on the base of the Address Programmer. When addressing manual call points and modules, connect the "+" terminal of the loop to terminal №1 on the base and "-" terminal of the loop to terminal №3 on the base. If, while addressing, manual call point or module is already connected to the loop, disconnect the loop wires.

2. Press the 'left' button to turn on the Address programmer. 'On' message will be displayed. After 5 seconds the Address Programmer will display the device's address and dots will start to blink.

Note: In case of incorrect connection of an addressable device, the Address Programmer will turn off automatically in 5 seconds.

3. Tens and unit digits are set by the 'left', and the 'right' buttons respectively.

4. Press the 'down' button to save the address. Upon saving the address, the device's LED indicators blink once and the blinking dots on the Address Programmer's display stop blinking. Blinking of the dots after saving mean the new address has not been saved in the device's memory.

5. After saving, press the 'down' button to display the current analogue value of the detector.

6. Press the 'left' button to turn off the Address Programmer.

8. PANEL BUTTONS AND INDICATORS

8.1. Buttons

On Access Level 1 only the 'More Events', 'Enter' and 'Reset' buttons are usable in functionally limited mode (see below). To enable using the other buttons passing to Access Level 2 by pressing 'Enter' is necessary.



Fig. 3. Silk screen label control buttons.

After passing to Access Level 2, a 20-second countdown is started, at the end of which, if no button is pressed, the panel returns to Access Level 1.

'MORE EVENTS'. On Access Levels 1 and 2 the button is used for viewing messages on panel LCD, if there are more than one message to display. The button is also used in passing to Access Level 3. This feature is described below.

'SILENCE ALARM'. The button is used for silencing an alarm. On Access Level 2 pressing the button in fault event will silence the buzzer to activate intermittently every 10sec. In fire event pressing the button will

- silence the buzzer to activate intermittently every 10sec.
- deactivate alarm relay
- silence the sounders

On reception of a new fire or fault event the panel will return to alarm mode again. This button is also used in navigating the menu.

'RESET'. On Access Level 2 pressing the button resets all fire and fault events as well as fire alarm relay. On Access Level 1 pressing the button for 3sec. and releasing it tests all LED indicators on silk screen label.

'ALARM'. On Access Level 2 pressing the button activates the following:

- buzzer
- panel sounder outputs
- fire and alarm relay outputs
- fire LED indicators

'ENTER'. On Access Level 1 the button is used for scrolling the LCD message. On Access Level 2 the button is used for navigating the menu and changing settings.

8.2. Front panel LED indicators

Illumination of the LEDs indicates the following:

'FIRE'. Fire event or the 'Alarm' button is pressed on Access Level 2.

'System On'. Panel is energized.

'Pre-Alarm'. Detector has reached a pre-alarm threshold level (not available in panel versions V2.04 or earlier).

'System Fault'. Main microprocessor fault.

'General Fault'. Any fault.

'Sounder Fault'. Faults of panel sounder outputs.

'Silence Alarm'. The 'Silence alarm' button is pressed.

'Disabled'. An output or device is disabled.

'Delay Active'. An output's or device's activation is delayed.

'On Test'. Test mode active (not available in panel versions V2.04 or earlier).

'More Events'. More than one active events are available.

8.3. Internal indicators

Loop 1 Output active LED. Blinks continuously in healthy operation of the loop.

Loop 1 Communication LED. Blinks on polling a device on the loop.

Loop 2 Output active LED (if available). Blinks continuously in healthy operation of the loop.

Loop 2 Communication LED (if available). Blinks on polling a device on the loop.

Loop 3 Output active LED (if available). Blinks continuously in healthy operation of the loop.

Loop 3 Communication LED (if available). Blinks on polling a device on the loop.

Loop 4 Output active LED (if available). Blinks continuously in healthy operation of the loop.

Loop 4 Communication LED (if available). Blinks on polling a device on the loop.

'Earth fault'. Current leakage from '+' or '-' contacts to earth.

'Battery fault'. A battery fault. This would typically be:

- Disconnection of batteries
- Incorrect connection of batteries
- Fall of battery voltage under 21.6V DC
- Inability of being charged

'System fuse'. Short circuit or overloading of the 24V DC output of the switched mode power supply (provided batteries are connected). The self-resetting fuse FS1 (see below) of the output activates.

'Power fault'. Mains power supply failure (provided batteries are connected) or F1 fuse activation.

9. PANEL FUSES

Sounder outputs fuses (F501, F502, F503, F504 respectively) are self-resetting and activate on 0.5A current overload. In case of fuse activation, the panel displays 'open circuit' fault message for respective sounder output.

Battery fuse (FS01) is self-resetting and activates on 0.5A current overload or a short circuit on battery inputs. Illuminating of the LED indicator means the batteries are disconnected.

System fuse (FS1) is self-resetting and activates on 4A current overload or a short circuit on panel PCBs. On activation of the fuse the 'System fuse' LED indicator illuminates.

Mains fuse (F1) is of glass type and activates on 5A current overload, a short circuit or exceeding 220V AC on mains supply input. On the fuse activation, the 'Power fault' LED indicator on switched mode power supply illuminates and power to the panel is supplied from the batteries.

Loop fuses (one fuse per loop) are self-resetting and activate on 0.5A current overload. The fuses protect the loops from current overload. On the fuse activation the panel displays loop open circuit fault message. If no short circuit isolator modules are available on the loop, in case of a short circuit the fuse activates.

10. POWERING THE PANEL

According to the position of the Write enable, powering of the panel is done in two modes:

- Automatic loading of the configuration from panel memory ('Off' position).
- Making either 'Automatic learning' or downloading/uploading of the panel data ('On' position).

To re-power the system press the 'Microprocessor reset' button.

10.1. 'Off' ('1') position of the Write enable switch.

On connection of mains power supply, the panel detects PCBs, switched mode power supply and network board. The panel displays the following message:

Checking the system...
Harezmic Panel Version V2.02

Afterwards:

Loop1+	Loop2+	Loop3+	Loop4+
Power supply+	Network+		System ready

Next to each unit a '-' or a '+' signs are put, according to unavailability or availability of the units. This checking is performed on every loading of the panel regardless of the powering mode. In case a fault is detected on LCU (Loop Control Unit) or the switched mode power supply, 'System fault' LED indicator illuminates. A network board is an optional accessory, unavailability of which does not cause a fault message.

After the checking, the panel loads existing configuration from the panel memory. The loading is accompanied by LCD messages, informing of the configuration detail being loaded ('loading network', 'loading location texts', etc. if available).

10.2. 'On' ('2') position of the Write enable switch.

After the checking (see above) the panel displays a menu consisting of three options:

- 'Computer communication'
- 'Use previous panel configuration'
- 'Automatic learning'

xxxx Select configuration type xxxx
Computer configuration

The panel displays the 1st option by default, to navigate the menu use the 'left' and 'right' buttons. Confirm the selection by pressing the 'Enter' button.

10.2.1. 'Computer configuration'

This option enables uploading and downloading of configuration. To upload/download configuration follow these steps:

- a) Connect the respective sockets of the communication cable to the serial port on computer and COM1 port on MCU (Main Control Unit) on the panel.
- b) Press the 'Enter' button while on 'Computer communication' menu option.
- c) In Loop Manager, click either 'Upload to panel' or 'Download from panel' in accordance with the desired operation.

Provided no communication problems available, the panel displays the following message:

Communicating with computer...

On successful completion of the communication, the panel automatically loads either the uploaded configuration or the existing configuration from the panel memory if a downloading was made. Write enable switch must be put into 'Off' position, otherwise the panel will display a fault message and the buzzer will activate.

In case of a communication fault the following message is displayed

Communication error

and the panel returns to initial menu.

In case of communication errors caused by cable or COM1 port connection, Loop Manager displays the 'Communication error' message.

10.2.2. 'Use previous panel configuration'

Activating this option will load the configuration from the panel memory as described in Chapter 10.1.

10.2.3. 'Automatic learning'

Activating this option will erase the panel memory and re-configure the system by scanning the field devices. By the 'Automatic learning' the panel detects each addressable device's type and address, at the same time allocating to each device a randomly defined zone number. As a result of scanning, all previously configured data are erased.

ATTENTION! Prior to performing the 'Automatic learning' it is highly recommended to download the configuration and saving it in a file.

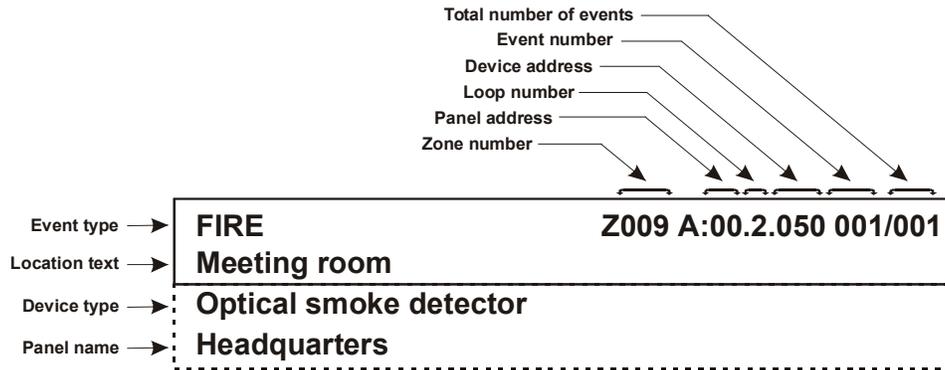
On completion of 'Automatic learning', the number of detected devices is displayed:

*** Devices found 127 ***

Then, the panel loads the new configuration based on the 'Automatic learning' data. If no setting by use of Loop Manager is made, the system operates in Common mode. See the respective chapter for guidance on recommended steps for setting the system.

11. FIRE EVENT MESSAGE FORMAT ON PANEL LCD

On fire event the panel displays a message in 4 lines as shown below.



Since the LCD has two displayable lines, the panel displays 2 upper lines of the message. Pressing the 'Enter' button scrolls the message upwards, so that 2nd and 3rd, 3rd and 4th, 4th and 1st, etc. lines are displayed.

12. PANEL MENU

To access the panel menu, firstly press the 'Enter' button once to pass to Access Level 2, then, press the 'Enter' button again, and, keeping the button pressed, press the 'Silence Alarm' button. On successful entrance, 'Devices' panel menu point will be displayed.

The panel menu includes the following options:

- 'Devices' - viewing devices' information
- 'Disabling' - disabling of loops, devices, zones and panel outputs
- 'Events' - viewing of information on current events
- 'Set system time'
- 'Access Level 3' - passing to Access Level 3
- 'Event Log' - viewing the recorded events
- 'Select panel language please' - selecting the panel menu language.
- 'Print events' - printing the event log.

Navigating the menu is done using the arrow buttons.

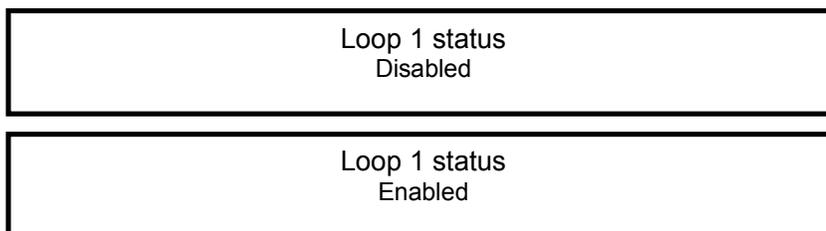
12.1. 'Devices'

After selecting the desired loop, the panel firstly displays the number of devices on the loop and, then, displays each device's information (type, address, zone number and location text, if available). Press the 'Enter' button to scroll the lines and 'up' and 'down' to navigate between the devices.

12.2. 'Disabling'

The option enables disabling the loops, zones, devices and panel outputs. This option would typically be necessary during maintenance of the system or painting, construction workings, etc. on the site, where the fire alarm system is installed, to avoid faulty alarms.

To disable or enable press the 'Enter' button.



If the system has a disabled loop, device, etc. 'Disabled' LED indicator on silk screen label illuminates.

12.3. 'Events'

The option is used for viewing current events categorized as 'Fire events' and 'Fault events'.

12.4. 'Set system time'

The correct system time is vital in proper registration of events.



To start changing the system time press the 'right' button. On consequent pressing of the 'right' button the panel displays 'Year', 'Month', 'Day', 'Hour' and 'Minute'. To change setting, use 'up' and 'down' buttons, to save the changes - the 'Enter' button.

12.5. 'Access level 3'

For viewing and clearing of the Event Log, changing the panel language as well as printing the Event Log passing to Access Level 3 is necessary. The password is 1342 (see the above-mentioned picture for button-number relation).

12.6. 'Event log'

Press the 'right' button to enter the option. Firstly, the number of registered events will be displayed. Then, the panel will automatically display the first registered event. The events are put in sequence according to the date and time of registration.

To navigate in events the 'up' button is used. To view the registration date and time, press the 'Enter' button.

12.6. 'Clear Event Log'

Pressing the 'Enter' button on this option will erase all registered events in the Event Log.

12.7. 'Select panel language please'

This option enables changing the language used in panel menu: 'Turkce' (Turkish), 'English' and 'Русский' (Russian). The 'Russian' option is unusable on panels designed for English-speaking countries because of LCD type used, which does not support Cyrillic characters .

Navigating between the options is done by pressing the 'left' and 'right' buttons. Press the 'Enter' button to save the selection. After changing the panel menu language, the panel returns to 'Clear Event Log' option.

12.8. 'Print events'

The option enables printing out the Event Log. Press the 'Enter' button to start printing.

The printer must have a serial port. EPSON LX-300+ is recommended. Cable printer is an accessory provided separately from the panel. The cable configuration scheme is shown in the respective Annex. The printer cable must be connected to HD3 port on MCU. Besides using 'Print events' option, the panel prints the events simultaneously with their occurrence provided the printer is connected.

13. SYSTEM OPERATION MODES

The system has two operation modes, Common and Cause-effect, each having its own level of complexity and enabling flexible fire alarm control setting according to the site needs. The latter mode enables devices to operate either in Zonal or address-based cause-effect principle. The principles define the algorithm of cause-effects, i.e. activation of outputs from inputs according to certain condition (see table below). The system operation mode can be set by use of Loop Manager.

System operation mode	'Common'		'Cause-effect'	
	Automatic learning	Loop manager	Loop manager, no inclusion in 'Cause-effect'	Loop manager, inclusion in 'Cause-effect'
MG-6100-6108 Relay controller output	Any fault event, no zonal affiliation	Either any fire event or any fault event, no zonal affiliation	Either any fire event or any fault event, zonal affiliation	Address-based condition, no event type affiliation, no zonal affiliation
MG-6300-6308 Sounder controller output	Any fault event, no zonal affiliation	Either any fire event or any fault event, no zonal affiliation	Either any fire event or any fault event, zonal affiliation	Address -based condition, no event type affiliation, no zonal affiliation
MG-6600 Addressable Loop-Powered Sounder	Any fault event, no zonal affiliation	Either any fire event or any fault event, no zonal affiliation	Either any fire event or any fault event, zonal affiliation	Address -based condition, no event type affiliation, no zonal affiliation
Panel sounder output	Any fire event			Address -based condition, no event type affiliation
Fire relay	Any fire event			Address -based condition, no event type affiliation
Alarm relay	Any fire event			Address -based condition, no event type affiliation
Fault relay	Any fault event			Address -based condition, no event type affiliation

Table 1. Output activation according to system operation modes and Loop Manager configuration.

13.1. Common mode

This mode provides the minimum and most simplest cause-effect with no zonal or address-based configuration. The Common mode can be modified by Loop Manager as explained below.

13.1.1. Common mode after automatic learning

This mode is set by default after 'Automatic learning'. All controller modules, addressable sounders, and fault relay activate on any fault event. Panel sounder outputs, fire relay and alarm relay activate on any fire event. The addresses have randomly defined zone numbers, which have no effect in controller module and addressable sounder's activation, the zone number affects only the LED indicator, which will illuminate on reception of a fire event from the address with respective zone number.

Addresses have no location texts, the panel gets a name of 'Harezmic panel' and 'Supplier name' of 'Mavili Elektronik A.S. (0216) 466 45 05' by default. All delays are set to 0.

13.1.2. Common mode adjusted by Loop Manager

Loop Manager, described thoroughly below, is a PC program used for making adjustments to the system. The following properties of the panel in Common operation mode can be modified by use of Loop Manager:

- Supplier name
- Panel name
- Panel output delays

The following device and address settings can be modified:

- Device type
- Location text
- Zone number
- Input and output event type (if available)
- Output delay (if available)
- Output delay bypass (if available)

13.2. Cause-effect

To set the system to Cause-effect mode, check 'Cause-effect' option in 'Panel settings' window of Loop Manager. Different from Common mode, Cause-effect mode enables zonal or address-based affiliation of cause-effect, i.e. activation of outputs according to event type and the zone number, to which they are allocated or, in address-based principle, according to defined input devices only.

13.2.1. Zonal principle

Zonal principle limits controller module's and addressable sounder's activation algorithm with the zone number and event type. For example, a controller module's output, which 'Output' is set to 'Fire' and 'Zone' is set to '27', will activate from a fire event received from any address from zone number 27 only.

13.3. Address-based principle

Address-based principle enables most complex cause-effect programming.

An address included in a cause-effect is freed from zonal affiliations.

Panel outputs can be included in a cause-effect.

Controller module outputs' and addressable sounder's activation are not affiliated with the event type to which they are set.

Different from Common operation mode and zonal cause-effect principle, a fault event in address-based cause-effect principle is limited with monitor module's input event type only and does not include such fault events as 'disconnect fault' or any similar.

ATTENTION! An address *not included* in a cause-effect will operate according to the zonal cause-effect principle. A panel output *not included* in a cause-effect will operate according to Common operation mode. A controller module's output, addressable sounder or panel output, *included* in a cause-effect, are not activated from addresses *not included* in a cause-effect even if they have the same zone number.

14. LOOP MANAGER

14.1. Running the program

It is recommended to run the program on Windows® XP Service Pack 2. Copy the 'Loop Manager' folder from the CD, provided with the panel, to your computer and double click on 'Loop Manager' icon.

14.2. Main window

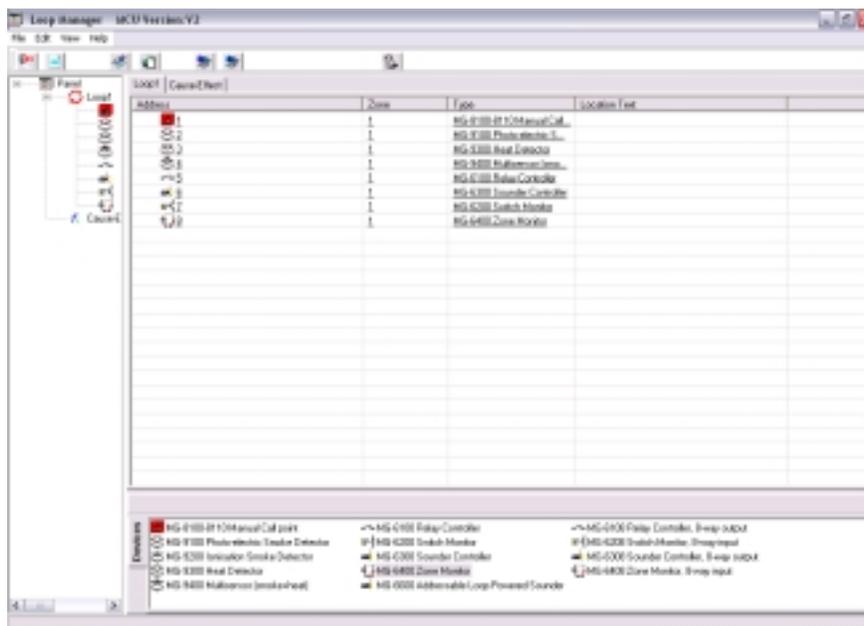


Click once on any place of the picture.

'Select MCU version' window will occur, where the version written on back of the panel door should be selected:



Click on 'Save'. The main window will occur:



14.2.1. 'File' menu

Under 'File' menu, the following items are available:

'New' ('Ctrl+N', the 2nd button from the left on the toolbar) – creating new configuration file.

'Open File' ('Ctrl+O') – opening existing configuration file.

'Save As...' ('Ctrl+S') – saving configuration file.

'Download From Panel' (the 5th button from the left on the toolbar)– downloading configuration from panel. (See also 'Powering the panel' chapter)

'Upload To Panel' (the 6th button from the left on the toolbar) – uploading configuration to panel. (See also 'Powering the panel' chapter)

'Program Options' ('Ctrl+P') – checking 'Code Saved Data' will enhance data security, checking 'Ask Version On StartUp' will enable asking MCU Version on every program running, the pulldown menu enables selecting available languages:



'MCU Version' – selecting the MCU Version of the panel.

'Print' – printing the configuration. On selecting the option, a 'Save As' window will occur. Enter a file name and click the 'Save' button, then 'Print'. The configuration will be printed via default printer.

An example of a printed configuration looks as follows:

File Header:"Mavili Elektronik Ticaret ve Sanayi A.S. Tel: (0216) 466 45 10. www.mavigard.com"

Supplier Name:"Fire Security Co."

Panel Name:"Headquarters"

Number of Loops:1

Loop	Address	Zone	Type	Location Text
1	1	1	MG-8100-8110 Manual Call point	Crridor
1	2	1	MG-9100 Photo-electric Smoke Detector	Main
1	3	1	MG-9300 Heat Detector	
1	4	1	MG-9400 Multisensor (smoke+heat)	
1	5	1	MG-6100 Relay Controller	
1	6	1	MG-6300 Sounder Controller	
1	7	1	MG-6200 Switch Monitor	
1	8	1	MG-6400 Zone Monitor	Depot

Total Number Of Devices: 8

10,0,0,0,250,0,0

System Operation Mode: Common

Total Number of Cause-Effects: 1

Cause-Effect Name: "CE1"

Cause-Effect Inputs:

"1,1,1,2,1,7.."

Cause-Effect Outputs:

"1,5,5,1,5,5,5,7.."

2

Where,

The '10,0,0,0,250,0,0' represents the delay values of sounder and relay outputs.

'1,1' = 'Loop 1, address 1'

'5,1' = Sounder output 1

'5,2' = Sounder output 2

'5,3' = Sounder output 3

'5,4' = Sounder output 4

'5,5' = Fire relay

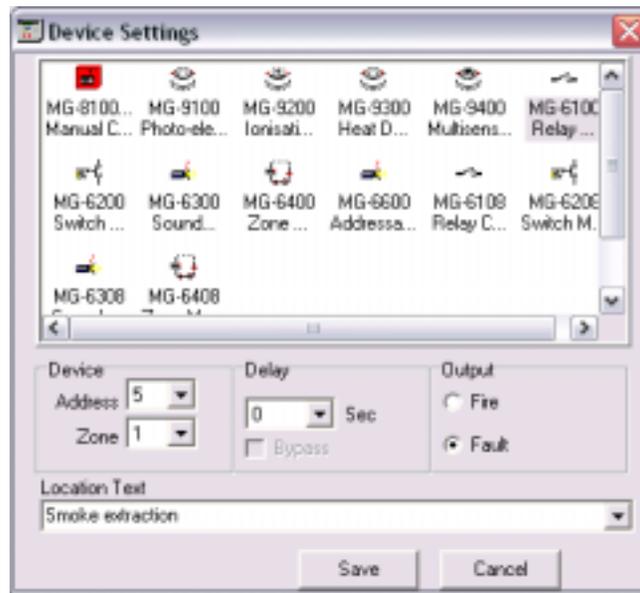
'5,6' = Alarm relay

'5,7' = Fault relay

'Exit' ('Alt+X', the 1st button from the left of the toolbar) – exiting the program.

14.2.2. 'Edit' menu

'Device settings' ('Ctrl+E', the 3rd button from the left on the toolbar, double click on a device) – settings of the selected addressable device. **A device can be added to the configuration by double clicking on a device in the right lower window of the main program window. The edited device type can be changed by selecting a device in the upper window of 'Device settings'.**



The device settings include the following:

- '**Address**' – a number assigned to the device, from 1 to 127. Note that for 8-way input/output modules this address is assigned to the first input/output, the other input/outputs are assigned addresses with consecutive numbers.

- '**Zone**' – a zone number, to which the device is included. The zone number affects zonal and address-based cause-effects. When 'System Operation Mode' is set to 'Common', the zone number affects only the silk screen label LED, which illuminates on fire event received from a device from the respective zone. Please read 'System operation modes' and 'Add Cause-Effect' chapters for more information on this option.

- '**Delay**' – an activation delay of up to 300sec. set to controller modules and addressable sounders.

- '**Bypass**' – if the box is checked, a delay set to the controller modules and addressable sounders, which activate from the edited device, is cancelled.

- '**Output/Input**' - the event type on which the edited output device's output will activate or the event type which will be signalled by the monitor module upon activation.

For output devices (MG-6100-6108-6300-6308-6600) in 'Common' mode of system operation the selected event type determines on which event type the output will activate. For example, if MG-6100 Relay controller is set to 'Fire', it will activate on any fire event.

In 'Cause-effect' system operation mode, if the output *is included* in a cause-effect the 'Output' field does not need any modification, because the output activates from the selected inputs on certain condition and *regardless* of the event type to which it is set. Note that the output will not activate on detector faults, even if they are included in the same cause-effect as inputs, because in cause-effects, fault events are limited with fault events of monitor modules' inputs as they are set in 'Input' field. In 'Cause-effect' system operation mode, if the output *is not included* in a cause-effect, it operates according to zonal cause-effect principle.

For input devices (MG-6200-6208-6400-6408) in 'Common' mode of system operation the selected event type will affect all panel and output devices' outputs set to the same event type. For example, if MG-6200 Switch monitor is set to 'Fault', it will activate the *fault* relay output of the panel as well as all outputs set to *fault* output event type.

In 'Cause-effect' system operation mode, if the input *is included* in a cause-effect, selected event type defines only the message displayed on LCD, and activates or participates in activation of all outputs included in the cause-effect, *regardless* of the event type to which they are set. In 'Cause-effect' system operation mode, if the input *is not included* in a cause-effect, it operates according to zonal cause-effect principle.

Please read 'System operation modes' and 'Setting a cause-effect' chapters for more information on this option.

- **'Location text'** – text of max. 40 characters displayed on the 2nd line of the event message. The text would normally be a description of the room or the purpose of the device (as in controller modules).

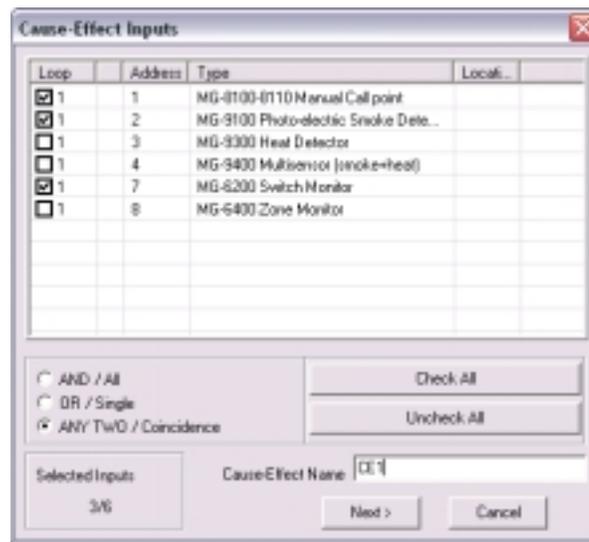
'Delete' ('Del' button, the first button from the right on the toolbar) – deleting the selected device.

'Add Cause-Effect' (right click on the right button of mouse and select 'Add Cause-Effect' option on upper right window of the main window) – adding a cause-effect to the configuration (available only if the system is on 'Cause-Effect Mode').

Before configuring cause-effects it is recommended to configure the devices first.

'System operation mode' should be selected as 'Cause-effect'. (on the 'Panel settings' window)

When configuring the system using cause-effects, care should be taken to ensure that the system operation conforms to the local fire regulation requirements.



The above window is used for entering the name of cause-effect, selecting inputs and the condition of cause-effect, upon which outputs' activation will be made. Settings in this window are done in the following sequence: Input(s) selection -> condition selection -> name of cause-effect -> «Next», as follows:

1. Select inputs (max. 254). 'Check All' and 'Uncheck all' buttons may be used to facilitate the selection.

2. Select the condition:

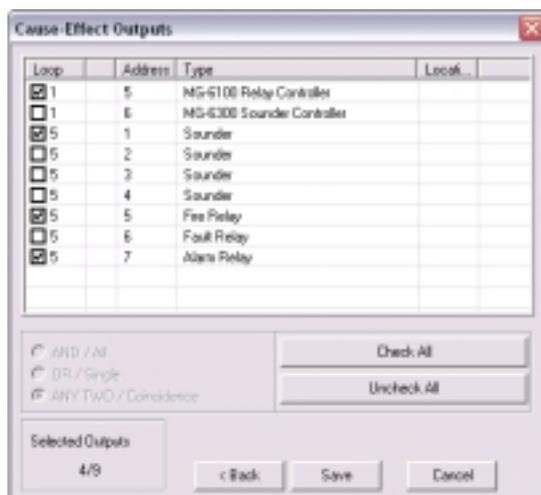
'AND' - outputs activation from all of the selected inputs.

'OR' - outputs activation from any of the selected inputs.

'ANY TWO' - outputs activation from any two of the selected inputs.

3. Enter the name of cause-effect (max. 40 characters).

4. Click "Next".



In the above window, outputs are selected, which are activated from inputs according to the selected condition.

The last 7 lines in the list are the outputs of the panel: 4 sounder outputs and 3 relay outputs.

The maximum number of outputs is 254 (except panel outputs).

'Check All' and 'Uncheck all' buttons may be used to facilitate the selection.

Cause-effect setting is completed by pressing the 'Save' button.

Editing and deleting of the configured cause effect are made by double clicking on the cause-effect; or pressing the right button of mouse on cause-effect window and selecting 'Show Cause-Effect' option.



To delete the cause-effect check 'Delete Cause-Effect' and press 'Delete'.

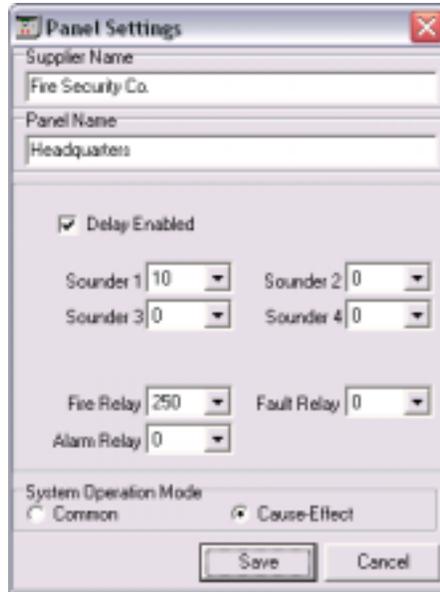
To remove certain inputs/outputs from the cause-effect, check the inputs/outputs and click 'Delete'.

To edit the cause-effect, click 'Edit'. Note that cause-effect name cannot be edited.

ATTENTION!

Disabled outputs do not activate even if they are included in a cause-effect.

'Panel settings' (the 4th button from the left on the toolbar):



- '**Supplier Name**' – a text of max. 40 characters, which is displayed on the 2nd line of the LCD in 'Normal status' of the panel. The text would normally be the name and telephone number of the company responsible for the maintenance of the system.

- '**Panel name**' – text of max. 40 characters displayed on the 4th line of the event message. In networking the panel name is necessary to identify the panel. The text would normally be a description or name of site.

Just under the 'Panel Name' an activation delay of the panel outputs are set. The max. delay value is 250sec. To enable the delays 'Delay enabled' box must be checked.

- '**System operation mode**' – the 'Common' and 'Cause-effect' options define the operation of inputs and outputs. Please see the 'System Operation Modes' and 'Add a Cause-Effect' chapters for more information.

'**Select number of loops**' – selecting the number of loops in the system.

14.2.3. 'View' menu

'**Show Tool Bar**' – viewing/hiding the tool bar.

'**Show Status Bar**' – viewing/hiding the status bar.

'**View/hide details**' – viewing/hiding details in the devices/cause-effects windows.

14.2.4. 'Help' menu

'**Help index**' (F1) – accessing help.

'**About**' – information on the company and the version of the program.

15. PANEL NETWORKING

Up to 32 control panels and/or repeater panels can be connected together using an RS-485 cable type. An additional network board (MG-7090) is necessary to connect a control panel to network. Pressing 'Evacuate', 'Silence alarm' or 'Reset' buttons on any panel operating in a network will initiate respective functions of the system. Any panel in a network shows events from other panels in the same format adding the address and name of the panel.

Repeater panel (MG-7000) is used to monitor and control the system by buttons on silk screen label.

A panel to work in a network must be addressed (See respective Annex).

Networking does not need to be configured from a PC, all necessary data are loaded automatically, when connecting panel to a network. Removing or adding a panel to a network is recognised by the system automatically as well.

Maximum distance between two adjacent cable segments is 1200m.

Network faults do not affect panels' operation. In case of a network fault, 'General fault' LED illuminates on silk screen label and the respective fault message is displayed on panel LCD.

Panel address DIP switches are located on network board (MG-7090), repeater panels (MG-7000) have DIP switches on RCU board.

16. RECOMMENDED STEPS OF SETTING THE SYSTEM

1. Energise the panel without loops connected and make 'Automatic learning'.
2. Clear the Event Log.
3. Set system time.
4. Address the panel (in network operation).
4. Address the devices and make necessary adjustments to jumpers on interface modules (if any).
5. Connect the devices to the loops and connect power supply to the modules.
6. Connect the loops to the panel.
7. Establish a network (if there is).
8. Connect the mains power supply to the panel and make 'Automatic learning'.
9. After the panel reaches 'Normal' operation mode, wait till all fault events (if any) are displayed on LCD. Connecting a printer to the panel will facilitate further fault solving.
10. Solve the faults so that no fault messages are displayed on LCD in Normal status. Solving the faults may require multiple resetting of the panel by pressing 'Microprocessor reset' button.
11. Download the configuration to PC and save in a file.
13. Make necessary adjustments to the configuration.
14. Save the changed configuration in a file.
15. Print the configuration and check if all adjustments are correct.
15. Upload the configuration.
16. Check the system operation thoroughly by initiating fire and fault events and cause-effects.
17. Print the Event Log.
18. Clear the Event Log prior to starting the system operation on site.

17. PANEL SPECIFICATIONS

17.1. Mechanical specifications

Size	500x400x128mm
Construction	1.2mm mild steel epoxy powder coated
Operating ambient temperature	(-10°C)-(+55°C)
Operating ambient humidity (non-condensing)	0 – 95%
Mounting	Surface
Cable entries	Top and back
Weight (excluding batteries)	12-13kg, depending on the model

17.2. Electrical specifications

Number of loops	1, 2 or 4
Mains power supply	220V AC 50Hz
Operating voltage	24V DC
Sounder outputs	4x(500mA 24V DC)
Relay outputs	3x(1A 30V DC, NC and NO)
Number of zones	48
Power consumption	81W

17.3. Specifications of MaviGard Switched Mode Power Supply (MG-7080)

17.3.1. Mechanical specifications

Size	215x85x70mm
Construction	1mm mild steel epoxy powder coated
Mounting	Surface
Cable entries	Side

Weight (excluding batteries)	0.945kg
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17.3.2. Electrical specifications

Maximum output power	112W
Continuous output power	81W
Mains power supply	220±10%V AC, 50Hz
Output voltage	27V (21.6V min., 28.2V max)
Operating ambient temperature	(-5°C)-(+ 50°C)
Operating ambient humidity (non-condensing)	0 – 95%
Mains fuse	5A
Battery type	Sealed lead acid
Battery capacity	7Ah, 13.5V DC max, 11V DC min.
Supply current	8mA

18. PANEL MODELS

Stock ID	Prod. ID	Product name
m2052	MG-7100	1 Loop, 128 Addresses; with 4A SMPS
m2053	MG-7200	2 Loop, 254 Addresses; with 4A SMPS
m2054	MG-7400	4 Loop, 508 Addresses; with 4A SMPS
m2105	MG-7100/M	1 Loop, 128 Addresses; marine type, with 4A SMPS
m2106	MG-7200/M	2 Loop, 254 Addresses; marine type, with 4A SMPS
m2107	MG-7400/M	4 Loop, 508 Addresses; marine type, with 4A SMPS

19. INTERFACE DEVICES SPECIFICATIONS

Stock ID	Prod. ID	Power supply	Quiescent current	Alarm current	Contact rate (dry)	Zone input	Sounder output	Operating temperature	Operating humidity	Size	Weight
m2061	MG-6100	Loop-powered	377µA	380µA	1A 30V DC	-	-	(-10°C) – (+55°C)	0-95%	160x120x75mm	300g
m2143	MG-6108	Loop-powered	650µA	1.8mA	8 x (1A 30V DC)	-	-	(-10°C) – (+55°C)	0-95%	115x110x65mm	315g
m2062	MG-6200	Loop-powered	345µA (NO)	530µA (NO)	-	-	-	(-10°C) – (+55°C)	0-95%	160x120x75mm	290g
m2144	MG-6208	Loop-powered	650µA (NO) 3mA (NC)	4.2mA (NO) 4.2mA (NC)	-	-	-	(-10°C) – (+55°C)	0-95%	115x110x65mm	275g
m2063	MG-6300	External 24V DC	24.4mA (power supply)*	43mA (power supply)*	-	-	500mA 24V DC	(-10°C) – (+55°C)	0-95%	160x120x75mm	300g
m2145	MG-6308	External 24V DC	490µA (loop) 25.5mA (power supply)*	490µA (loop) 150mA* (power supply)*	-	-	8 x (500mA 24V DC)	(-10°C) – (+55°C)	0-95%	300x110x65mm	540g
m2065	MG-6400	External 24V DC	17.2mA (power supply)*	33.1mA (power supply)*	-	max 20 detectors (MG-2000 series)	-	(-10°C) – (+55°C)	0-95%	160x120x75mm	290g
m2146	MG-6408	External 24V DC	480µA (loop) 34.8mA (power supply)*	1.53mA (loop) 47.2mA (power supply)*	-	max 20 detectors per input (MG-2000 series)	-	(-10°C) – (+55°C)	0-95%	155x110x65mm	315g
m2065	MG-6500	Loop-powered	4µA	30mA	-	-	-	(-10°C) – (+55°C)	0-95%	90x90x40mm	110g

m2147	MG-6600	Loop-powered, max. 10 pcs per loop	220 μ A	10mA	-	-	-	(-10 ^o C) – (+55 ^o C)	0-95%	108x108x94mm	270g
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*no devices connected

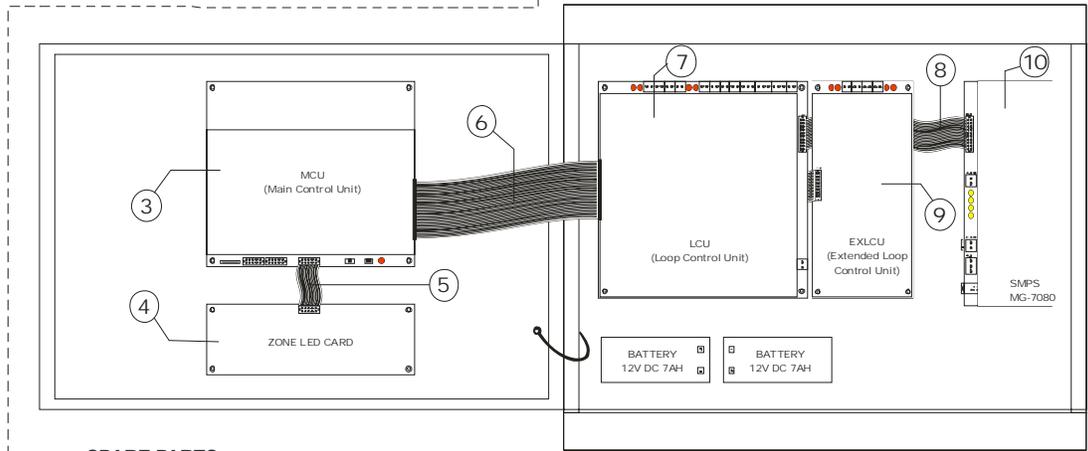
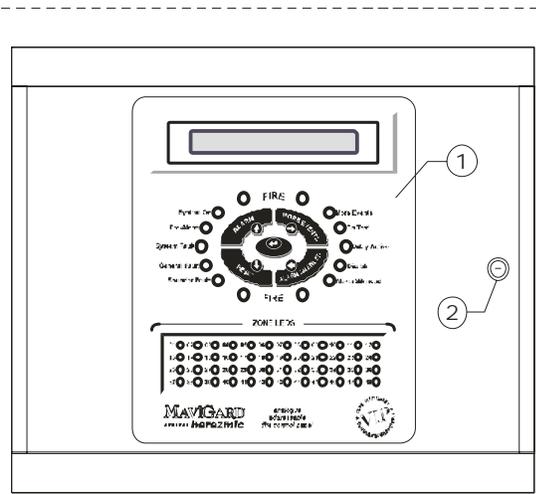
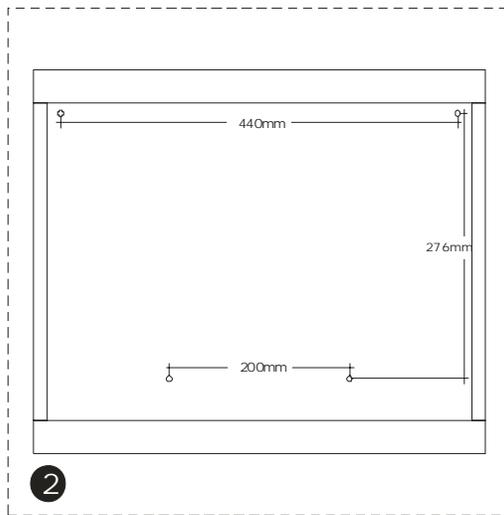
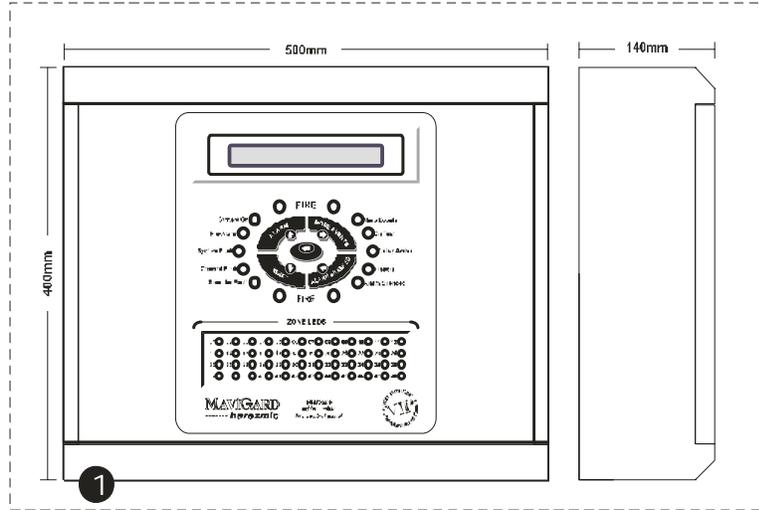
20. SPARE PARTS LIST

(see also Annexes)

Stock ID	Prod. ID	Product name
m7026	0S0027	Silk screen label, English
m7033	0S0034	Silk screen label, Russian
m7040	0S0041	Silk screen label, special
m6631	0MA002	Panel door lock, c/w key
m4169	00YS70	MCU (Main Control Unit)
m4170	00YS71	LCU (Line Control Unit)
m4186	00YS87	EXLCU (Extended Line Control Unit) for 4 loop model, with flat cable
m4171	00YS72	Zone LED board
m4173	00YS74	Flat cable for MCU
m4178	00YS79	Flat cable for LCU
m4174	00YS75	Flat cable for Zone LED board
m4172	00YS73	4 A SMPS (used in all Harezmic panels and also 32 and 64 zone models of SD64+ panels and TP64+ panel repeaters)

Annex A – Panel size, mounting points and spare parts

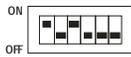
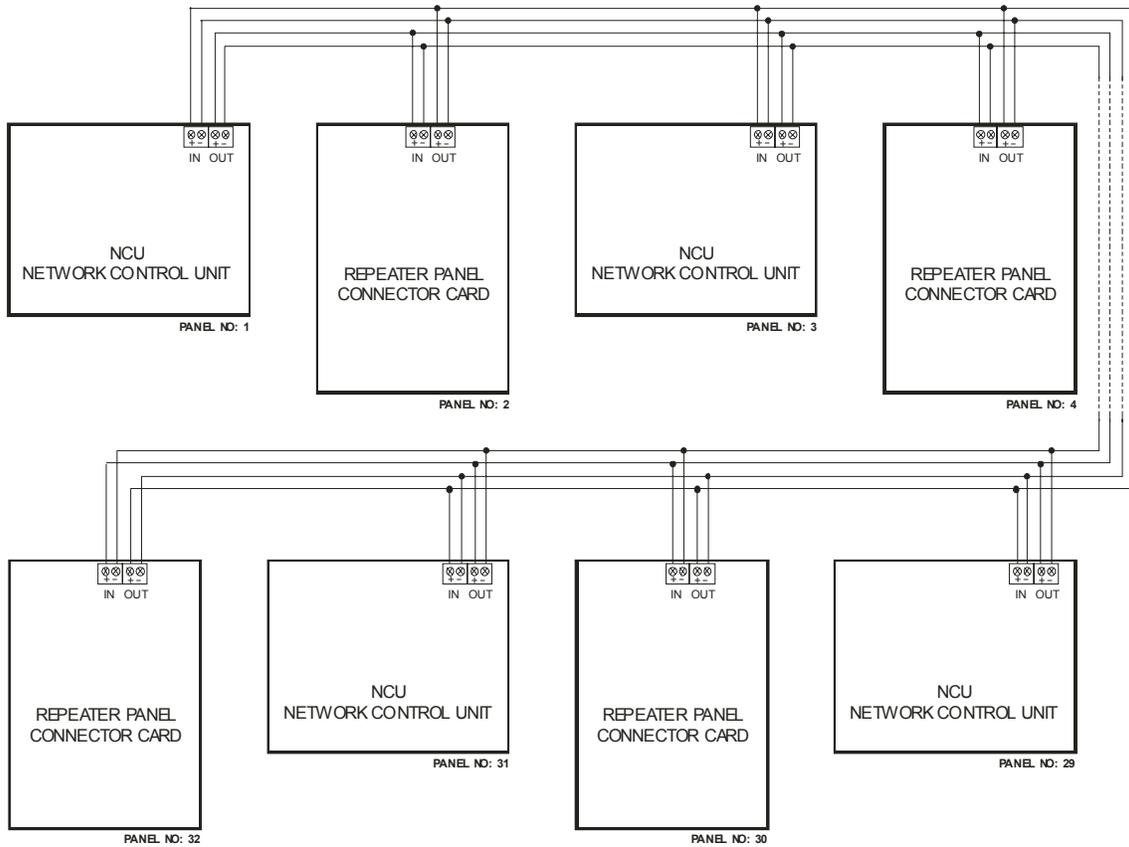
- 1 - Panel size
- 2 - Mounting points
- 3 - Spare parts



SPARE PARTS

- 1 - Silk screen label, English
- 2 - Panel door lock, c/w key
- 3 - MCU Main control unit
- 4 - Flat cable for MCU
- 5 - LCU Line control unit
- 6 - Flat cable for LCU
- 7 - Zone LED card
- 8 - Flat cable for Zone LED card
- 9 - EXLCU Extended line control unit, with flat cable
- 10 - 4A SMPS: for all Harezmic panels and also 32 and 64 zone models of SD64+ panels and TP64+ repeaters

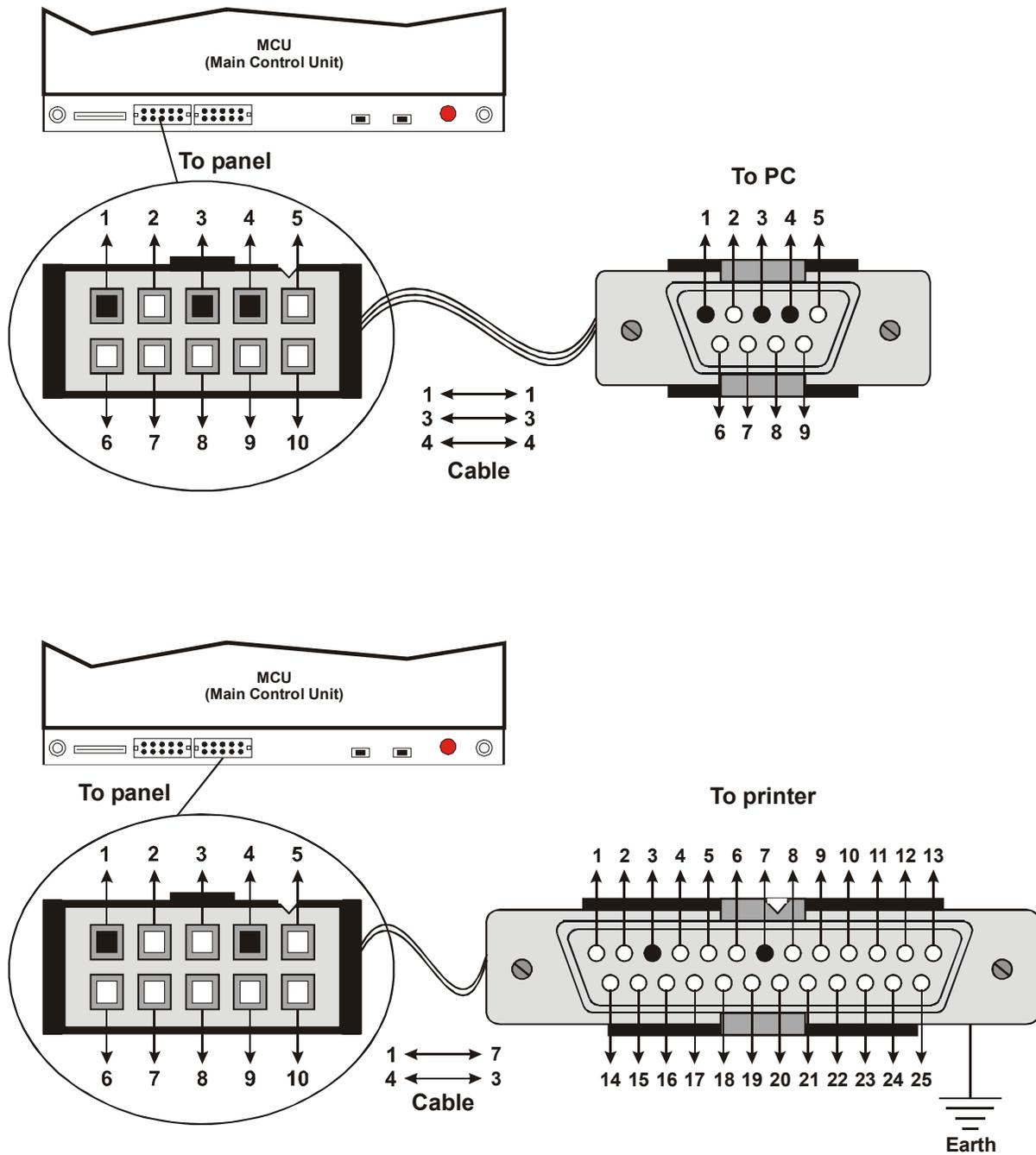
Annex B – Networking and panel addressing diagram



1	2	3	4	5	6	Address No	1	2	3	4	5	6	Address No
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<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18
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<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20
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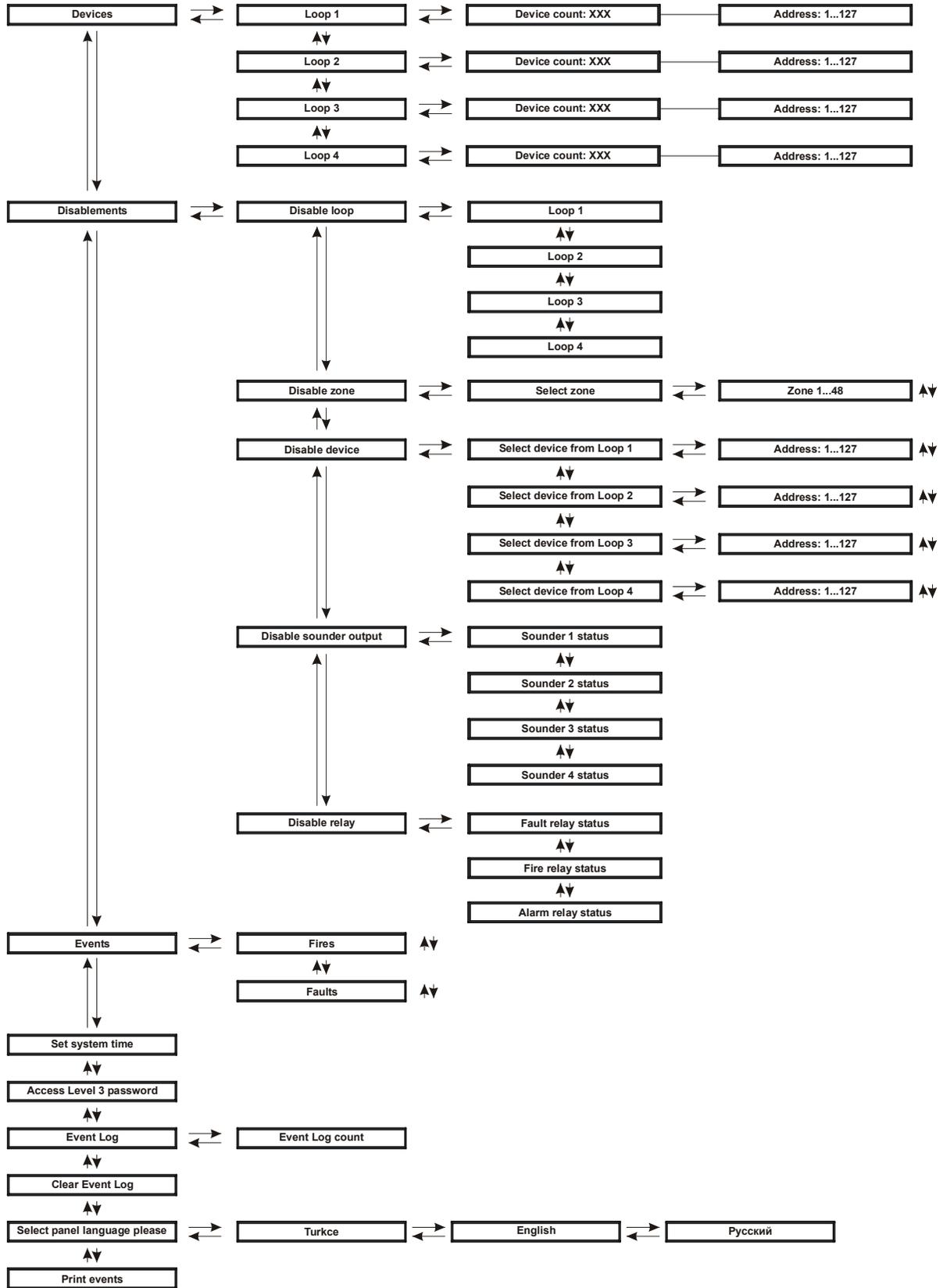
ON
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Annex C - Printer cable and serial communication cable diagrams



c

Appendix D– Panel menu diagram



Annex E – Panel and interface devices connections diagram

