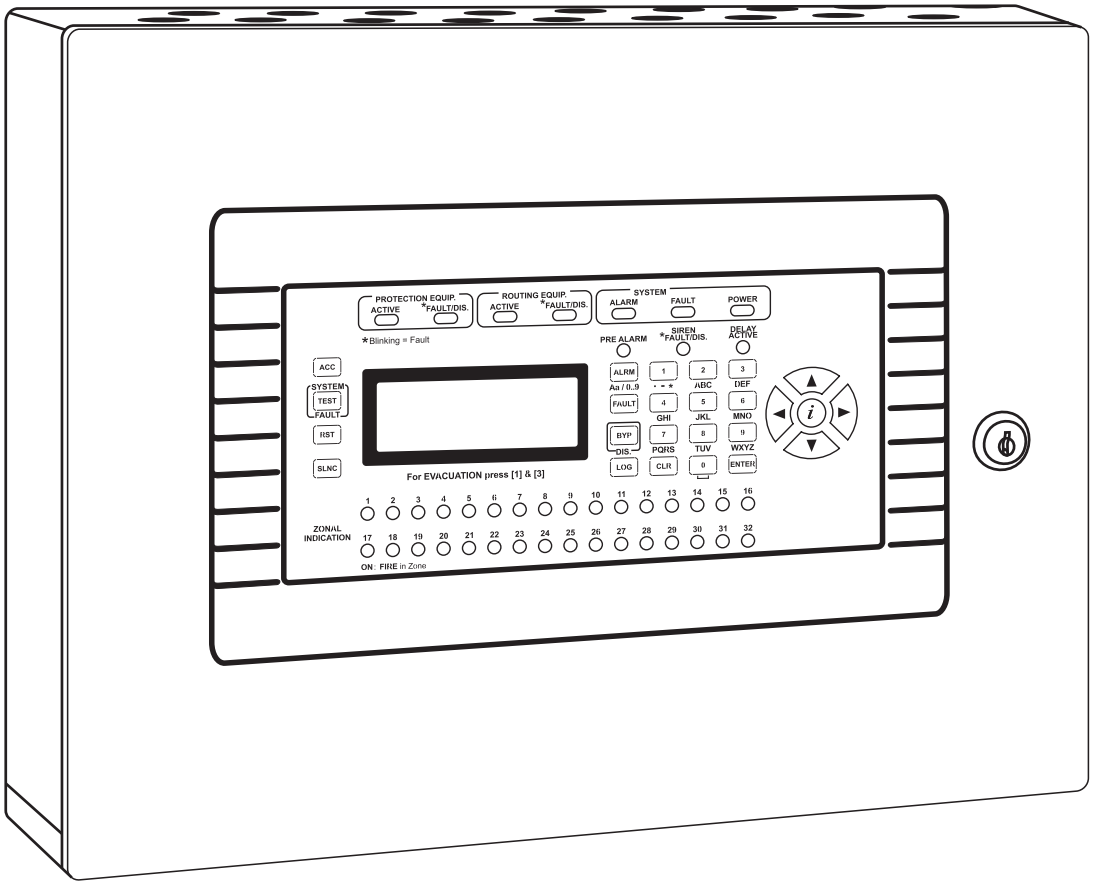
MIKRÓ



Installation and Operation Manual

Single loop analogue addressable control panel

Version: **1.0**
Revision: **0**

Cert No. 1369a/01
0832-CPR-F2832

IMPORTANT INFORMATION

Limitation of liability
It is mandatory, Mikro advanced analogue conventional fire alarm panel to be installed in accordance with this manual, applicable codes, and the instructions of the Authority Having Jurisdiction. The manufacturer shall not under any circumstances be liable for any incidental or consequential damages arising from loss of property or other damages or losses owing to the failure of products beyond the cost of repair or replacement of any defective products. The manufacturer reserves the right to make product improvements and change product specifications at any time.

The manufacturer assumes no responsibility for errors or omissions, while every precaution has been taken during the preparation of this manual to ensure the accuracy of its contents.

Warranty
Shield Fire, Safety & Security Ltd warrants its products to be free from defects in materials and workmanship under normal use for a period of one (1) year (the “Warranty Period”) from the production-delivery date, identified by date code(s) indicated on the products. Because Shield Fire, Safety & Security Ltd does not install or connect the products and because the products may be used in conjunction with products not manufactured by Shield Fire, Safety & Security Ltd, Shield Fire, Safety & Security Ltd cannot guarantee the performance of the fire alarm system and shall not be responsible in any way whatsoever for faulty installation or connection.

Manufacturer's Declaration

The design of the Mikro fire panel has been carried out under strict compliance with our ISO9001 quality management system. It covers software and hardware development and production procedures. All electrical components have been selected for proper operation of the panel and operate within their ratings when the environmental conditions outside the cabinet comply with class 3k5 of EN 60721-3-3.

RoHS directive compliance

The EC RoHS guideline has been released in order to reduce the heavy metal load in electrical and electronic products caused by e.g. lead and mercury. All manufacturers are obligated to provide only RoHS-compliant products to the European market, effective from July 1st, 2006.

Shield Fire, Safety & Security Ltd hereby states that Mikro panel is fully compliant with RoHS 2002/95/EC directive.

Disposal of your old appliance

1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.

2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.

3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.

4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.

TABLE OF CONTENTS

1. Introduction

Mikro is a one loop Analogue Addressable Fire panel based on Shield's devices. It is the result of many years of experience in the field of fire panels and hard work from motivated people that are proud of their products. It's main design goals was an inexpensive, reliable and easy to use and program panel. Of major importance was the networking and communications aspect, making it easily a part of a bigger installation and offering centralized monitoring and control. We hope to find this manual and our product pleasant to read, program and use. Thank you for choosing Shield Fire, Safety & Security Ltd!

2. Typing conventions and abbreviations

Throughout this manual specific symbols and character types have special meaning. The following list summarizes the typing conventions:

- **[Button/Indicator], [Button]:** A Keypad button that can be pressed. The button also works as an indicator that can be lit or not. e.g. [ACC], [5].
- ***Indicator*:** A visual indicator that may be lit or not. e.g. *ALARM*.
- **|TEXT ON LCD DISPLAY|**: Text that appears on the LCD display by the system.
- **”TEXT ENTERED BY THE USER”**: Text that appears on the LCD display as a result of user input.

The following terminology is used:

- **PSU:** Power supply unit
- **A.L.:** Access Level
- **ALM:** Access Level Menu
- **ALM.x.y.z:** Access Level Menu x, subitem y, subitem z.
- **EOL:** End Of Line (device).

3. System overview

3.1 System capabilities list

The Mikro fire panel has the following characteristics:

- **One Loop Analogue addressable panel.**
- Support for **Shield's** devices.
- High current (500mA) loop driver.
- **Two conventional zone inputs** (on board).
- 16 or 32 logic zones.
- 2 Powered and monitored Siren Outputs (on board).
- 2 generic dry contact outputs, N/O or N/C selectable by jumpers (on board).
- 2 generic, active when grounded inputs.
- 4 generic open collector outputs.
- Auxiliary power connector (24V nominal, 700mA max).
- 1 dry contact fault relay output.
- **User friendly interface:** List based presentation with cursor keys navigation, filters and formatting of viewable information.
- On screen, context intelligent short help.
- **PSTN communicator** for remote reporting of events.
- **User defined descriptions** for all inputs, outputs and zones.
- **LOG event registry**, up to 2000 events.
- **Bypasses (disablements)** for inputs and outputs.
- **Delayed outputs**, Alarm verification for all inputs.
- **Day/Night operation**, separate profile for each week day. Alarm verification.
- **Siren pattern** selection for on board outputs (switched).
- **Global evacuation** triggered by any input, selectable at Access Level 3.
- **Periodic test reminder.**
- **Walk test:** An easy way to test the system by triggering one input at the time.
- **Advanced Access level control:** The system is not limited to (the required by European and American) standard
- **3 access levels:** It provides 8 Access Level 2 users plus one Master user that manages the rest. There is also the Access Level 3 user (installer) and an access codes reset mechanism.
- **TCP/IP expansion port** provides remote monitoring and control with optional TCP/IP module.
- **PC connectivity:** The expansion port along with the required communication module permits PC connectivity for system supervision and operations.
- **Main screen branding, Installer's contact info:** The installer has one line (20 characters) on the main screen that can program to display any message he wishes (e.g. company name). Contact information (e.g. telephone number) may also be programmed into the panel for user reference.
- **Direct activation of outputs** from inputs regardless of alarm/evacuation state programmed at A.L.3.
- **Group operations** change specific attributes in groups of objects, making programming much more efficient.
- **Autolearn** function for loop devices.
- **Manual add/remove** of loop devices (easy search with Shield's part number).
- **Backup/Restore configuration;** Save current system configuration to on-board memory and restore it if needed.
- **Real time clock/calendar** with battery backup.
- **Visual overview** of installed loop devices.
- **Easy device identification** through their LED indicators**.**
- **Convenient loop devices overview** with alarms, faults and installed types indications.
- **Up to 15 groups of outputs** for simultaneous activation.
- **Delayed group activation** for cascaded evacuation schemes.
- Implements **EN54-2 "Outputs to protection equipment"**
- Implements **EN54-2 "Outputs to routing equipment"**
- **Easy configurable inverse operation** of outputs for high safety applications (e.g. fire doors).
- **Programmable activation** of outputs on faults/bypasses (required for fire doors in some locales).
- **Easy identification of sensors** with simultaneous LED activation on all troubled devices.

3.2 System components

The Mikro fire panel may be factory assembled with the following options:

- 16 or 32 logical zones represented by visual indicators on the main panel
- Relay module with 8 monitored 24 V output relays and independent power supply (also supervised).

3.2.1 System description and Wiring diagram

Figure 1 and Figure 2 show an overview of the system components, connections and various notes on their connectivity.

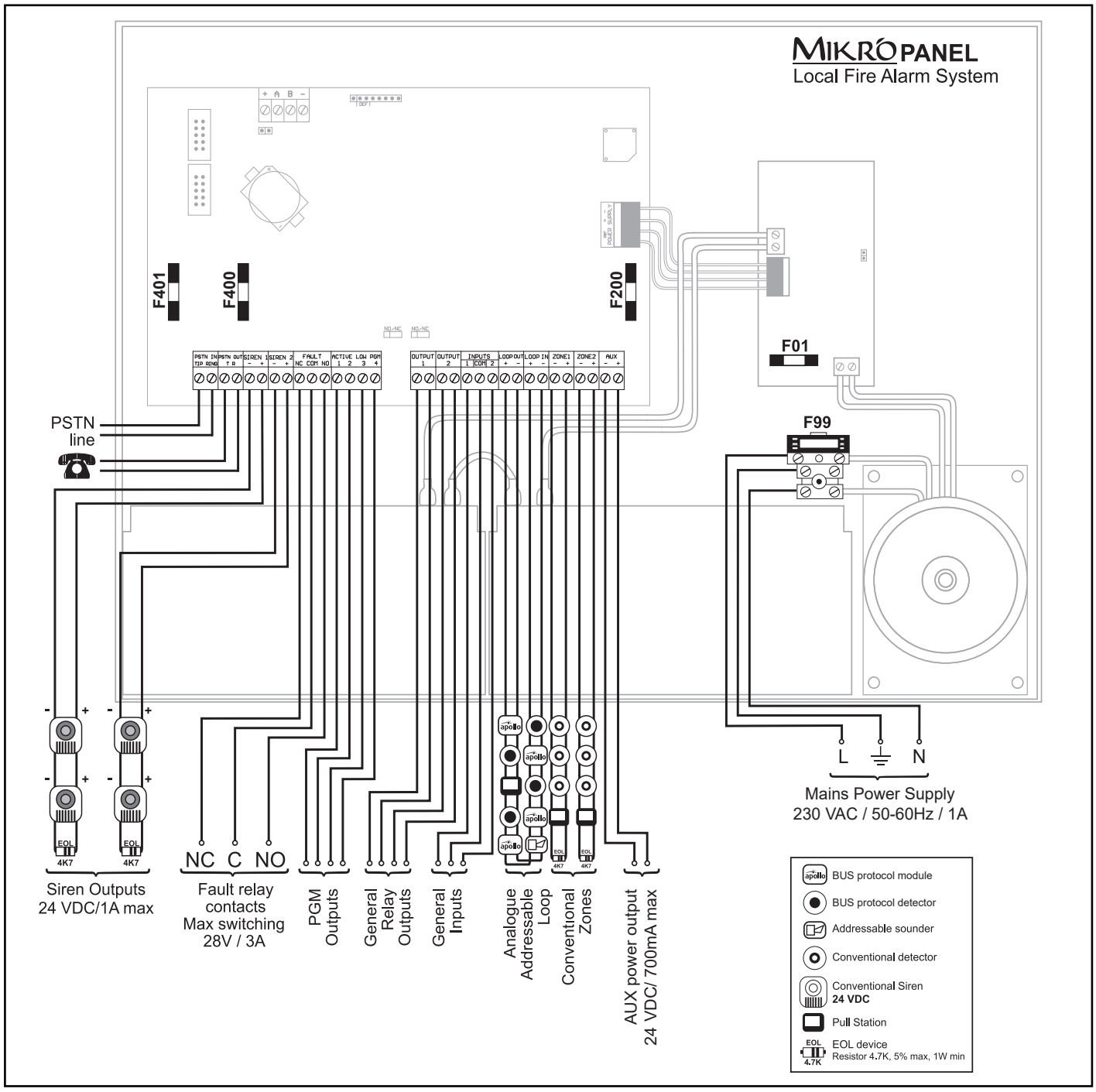
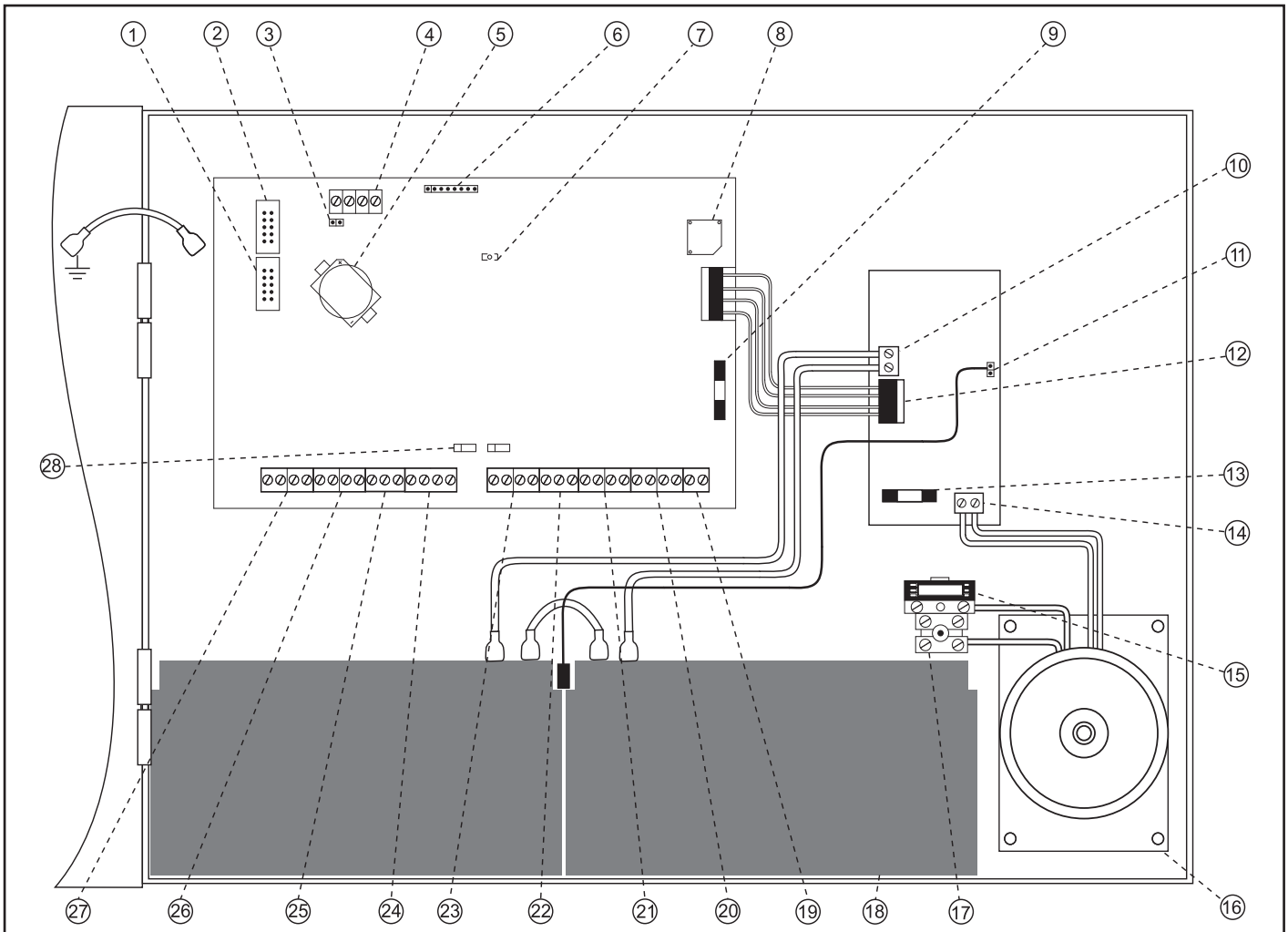


Figure 1. Wiring diagram and information

Fuse ratings		
Fuse	**Location**	**Value**
F01	Power Supply Unit	5A, 250V, Slow Blow
F200	Main board (Input)	5A, 250V, Slow Blow
F400	Main board	1.6A, 250V, Fast Blow
F401	Main board	1.6A, 250V, Fast Blow
F99	Mains connector	800mA, 250V, Slow Blow



1. **Connector to TCP/IP module board**.
2. **Connector to display board.**
3. **485 Line Termination.**
4. **Vbus connector (RS485).**
5. **Real Time clock battery:** 3,3V CR2032.
6. **Flash programer.**
7. **Power LED.**
8. **On board buzzer.**
9. **Main board fuse.**
10. **Battery connector:** Connects with two 12V 7AH batteries.
11. **PTC:** Jumper for the temperature sensor connection.
12. **Power connector:** Connection to main Power Supply.
13. **Power supply unit fuse:** The power supply is protected by a 5 A slow blow fuse.
14. **28 VAC:** 28 VAC input from main transformer**.**
15. **Main fuse:** Main power supply fuse (800mA, slow blow).
16. **Main transformer:** Transforms 230 VAC supply voltage to 28 VAC. Fully isolated.
17. **Main connector terminals:** Main input for 230 VAC (primary power) and earth connection.
18. **Batteries:** Secondary/standby power source to the panel electronics in the absence of primary power.
19. **AUX power output:** 24 VDC / 700mA max output for devices that need extra power. This output is fused.
20. **2 conventional zone inputs.**
21. **Loop connection.**
22. **General Inputs:** Internal pulled up active low inputs. 1.5mA sinc current. **ATTENTION!** ***Use dry contacts or open collector to activate. Do not exceed 12V at any time.***
23. **2 general relay outputs:** N/O or N/C (jumper selectable, see item 27) dry contacts 28V/3A max**.**
24. **4 PGM outputs:** Open collector 200mA sink max current, 30V max handling voltage.
    ATTENTION! ***Use protected wiring. Very short length (Internal).***
25. **Fault output relay:** No power, NO/NC contacts.
26. **2 Alarm outputs (signaling devices):** Switched 24 VDC for audio and visual signaling devices operation.
27. **PSTN connector.**
28. **JP505 & JP506:** Jumper for the General Relay Outputs selection.

Figure 2. Panel's Components identification - Cabinet inside view

4. System installation

4.1 Installation checklist

- Prepare the site: Make sure the installation location is free from construction dust, debris and without extreme temperature ranges and humidity.
- Unpack the equipment.
- Install the cabinet: See 'Installing the cabinet' for cabinet dimensions.
- Install optional components
- Review wire routing: See page 6.
- Connect the field wiring: See Figure 4.
- Perform a visual check for opens, grounds, and shorts before connecting the wires to the panel.
- Connect ground then AC power.

Ensure that the AC circuit breaker is OFF before connecting high voltage wires (230 VAC) to the main connector.

- Connect batteries.
- Test for proper operation.

4.2 Installing the cabinet

Cabinets can be surface or flush mounted. See Figure 3 and Table 1 for framing and mounting dimensions.

To wall mount the cabinet:

1. Position the cabinet on the finished wall surface.
2. Fasten the cabinet to the wall surface where indicated.

Cabinet dimensions

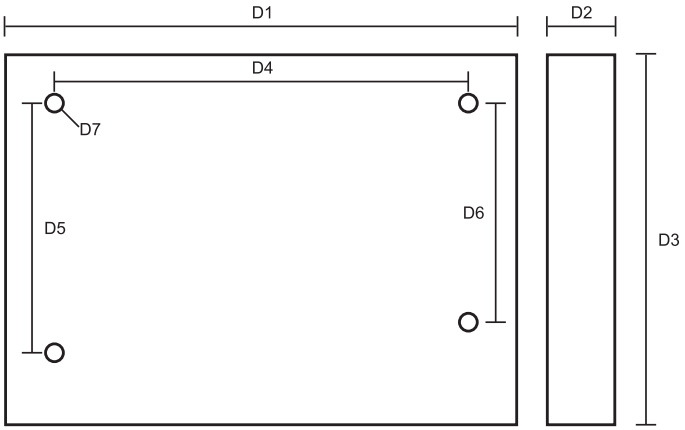


Figure 3. Mikro cabinet dimensions

	Models [cm / inch]
D1	42.5 / 17.73
D2	10 / 3.9
D3	31 / 12.4
D4	36 / 14.2
D5	16.5 / 6.5
D6	11.5 / 4.3
D7 [Ø]	0.6 / 0.236

Table 1. Framing and mounting dimensions

4.3 Mains connection

Use the 3 terminal fused block to connect the AC power cable to the panel. Ensure that the power cable is safe to handle (has no power). First connect the ground wire to the middle connector of the terminal then the phase and neutral wires.

The diameter of the wires must be between 0.823 and 3.31 mm^2 (12-18 AWG). See section 12.

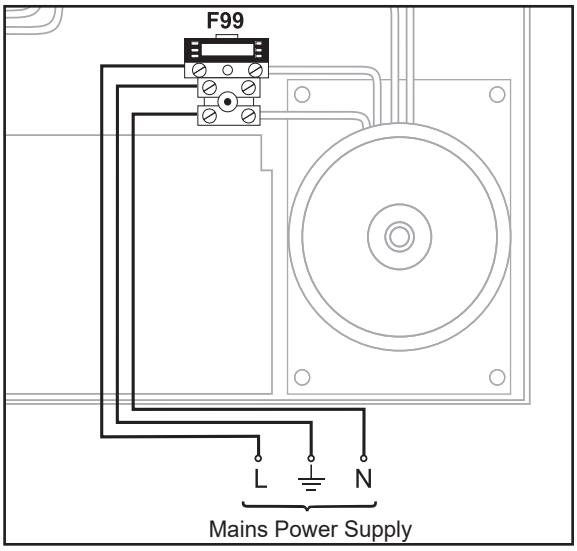


Figure 4. Mains connection

4.4 Battery installation

The panel uses two lead acid gel 12 V/7Ah batteries connected in series. Connect the batteries with the supplied free lead and the Batteries to the power supply unit with the red (positive) and black (negative) wires.

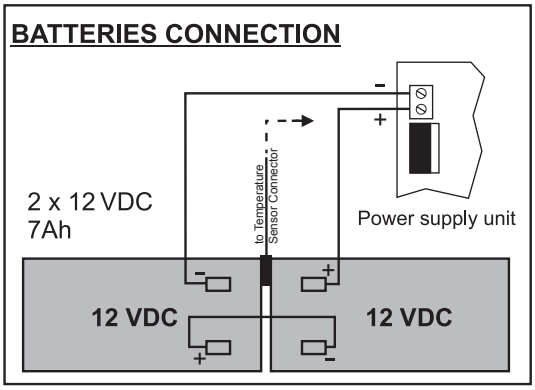


Figure 5. Battery installation

Please note that for the proper charging of the batteries, the temperature sensor must be placed between the batteries.

4.5 Power up

The panel will take a few seconds to boot as it reads all configuration data from it's eeprom and sets the hardware. When the initialization completes the loop reset/scan phase starts. This may take from a few seconds for an empty/non configured panel up to 3 minutes for a full loop. An indicative percentage of the progress is displayed on the bottom line of the LCD screen. After the operation completes the main screen will be shown. At this state the system is ready for operation.

5. System Architecture

5.1 System description

The Mikro panel tries to provide a simple solution to a complicated problem: *Create a system easy for users and installers, without compromising flexibility*. Trying to achieve this, it uses the following principles that should be understood in order to make the most of the panel's capabilities.

The panel's "representation" of the real world that interfaces to, is composed of four types of "logic items":

- Inputs
- Outputs
- Zones
- Peripherals

The above items belong to two major categories:

- On Board (Siren 1 & 2, PGM1-4, Generic outputs 1 & 2, Analogue zones 1 & 2, Gen Inputs 1 & 2).
- BUS (loop) devices.

All objects have a unique identifier that consists of 3 to 8 characters. For all the loop devices this identifier is their address (e.g. **|L1.25|:** Loop 1, address 25)

Refer to Table 2 below for a list of all identifiers.

Object Identifiers	
ZN01 - ZN32	Virtual Zones 1 - 32
ANZ1, ANZ2	Analogue zone inputs 1 - 32
INP1, INP2	Analogue inputs 1 & 2
SIR1, SIR2	On board siren outputs 1 & 2
PGM1 - PGM4	On board PGM outputs 1 - 4
OUT1, OUT2	Generic Outputs 1 & 2
Lx.aa	Loop <x> address <aa>
Lx.aa.s	Loop <x>, address <aa> sub-address <s>
XRLx	Expansion Relay address <x>

Table 2. List of object identifiers

5.1.1 Operating logic

The baseline logic of the panel's operation is:

Each **input** produces some events/states. Every **output** is "sensitive" to (or gets affected by) these events/states. When an output detects a state that it is sensitive to, will be activated.

Inputs

The events that may be produced by inputs are:

- Pre alarm.
- Alarm.
- Evacuation.
- Direct output activation.

Also,

- each input may belong to one logical zone.
- each input may directly affect any number of built-in outputs.
- each input may directly affect up to two loop outputs.
- the default behavior of an input is to lock ("latch") to the activated condition once it has been activated. This may be canceled if the "LATCHED" setting is disabled (0). Alarm and Evacuation inputs must always be latching types. Non latched inputs always reflect their electrical condition, They are mainly used for auxiliary operations. An output affected by a non latched input, reflects the state of the input.

Outputs

Each output may be affected by the following:

- A prealarm event
- An alarm event.
- An evacuation event.
- Any number of the "built in" inputs (analogue zones 1 & 2, generic inputs 1 & 2).
- Any number of loop input devices.

Outputs have the following extra properties:

- Bypassable: If set to 0 the output cannot be bypassed (disabled)
- Silenceable: If set to 0 the output will not be affected by silence operations
- Delay: A period of time in seconds that the output will delay activation when commanded. EN54 does not allow this type of operation. Used mainly for auxiliary operations.

Zones

There are 16 or 32 virtual zones depending on the panel model.

A zone is a group of inputs. It appears as another input that gets activated when any of it's member inputs is activated.

Apart from that, it is identical to the Input object as described above.

5.1.2 User interface

The panel is equipped with 4 lines by 20 character LCD display. Even with it's limited characters and space it provides a surprisingly user friendly experience. The philosophy behind it is this:

- The **[i]** key is the starting point for the majority of operations being Access level 1, 2 or 3.
- As a general rule: if you see it you can learn more about it then you can modify it (with proper access level).
- The starting point is lists of "items". Each member of a list is selected with the cursor keys that also perform the scrolling function (horizontal and vertical).
- The **[ENTER]** key on the selected item brings the next level of detail. At this level the item's properties are displayed followed (as the user scrolls further down) by one or more lists related to the object. This is called "**Item details screen**" through out the rest of this manual.

For example, the **[i] [2]** key presses will produce the **|All Inputs|** list. Selecting any input and pressing **[ENTER]** will bring on the screen the details of the selected object e.g. Identification, description, causes alarms etc. Selecting **|[AFFECTED OUTPUTS]|** and pressing enter shows a list of the Outputs that are affected by this input. Pressing **[ENTER]** again activates the "modify" mode. The access level 3 code is requested by the panel and then the attributes previously displayed may be changed.

Important Keys

During display of lists, numeric keys modify the appearance and content of the list as below (**[i]** may be used as a quick reminder).

Key **[0]**: It changes the behavior of the horizontal scrolling in a way that the first column of the list (mostly the item's unique identifier) is either anchored or not during the scrolling action.

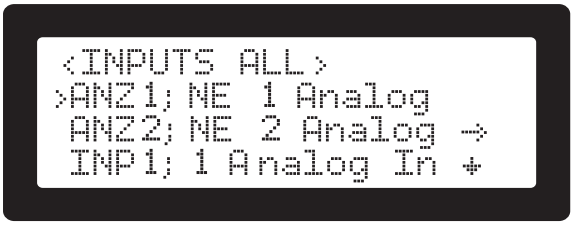


Figure 6. Key [0] function example

Keys **[1]**, **[2]**, **[3]** (top row) are used to select different ways of showing the list. In general, keys 1 and 2 select if the User defined description or the system's fixed description of an item will be shown first (more convenient for end-

users or installers respectively).

Figure 7. Key [2] function example

Key **[5]** resets any filtering and returns the list to show "ALL" items.

Keys **[7]**, **[8]**, **[9]** when used, filter the content of the list. For example the input's list (**[i]-[2]**, ALM1.2) may show only inputs that cause Alarm by activating the "Alarm" filter (key **[8]**, see Figure 8). The filter keys have a toggle action. The current filter is shown in the tittle (e.g. <INPUTS: ALL> for unfiltered input list or <INPUTS: EA_> for inputs with alarm AND evacuation active (keys **[7]** & **[8]**).

Figure 8. Key [8] function example

5.1.3 On screen buttons selectors and titles

The user interface is kept as consistent as possible with the use of the following:

|< >|: The top left of most screens contain information that identify the entity that the rest of the screen is referring to. This is enclosed in "less than" / "greater than" signs. For example The ID of an object: **|<ANZ1>|** or the type of a list: **|<INPUTS>|** or some filtering applied to a list of inputs: **|<INPUTS: ALL>|**.

|[ ]|: Square brackets in lists enclose an action that is executed by pressing enter on the line. For example |[SAVE]| will perform the action of saving to memory any information that has been modified.

|> <|: The "greater than" / "lesser than" signs as shown signify a toggle field, e.g. selected item: |**>S<|**, not selected item: |**> <|**. The toggling of the selection is performed by pressing the **[ENTER]** key.

5.1.4 Descriptions

Most "objects" have and may be presented/described in one or more of the following strings of text:

- Unique ID: A short 3 to 8 characters string that uniquely identifies on board and loop devices (e.g. ANZ1, L1.123).
- A Short system description (e.g. "Analogue Zone 1").
- The user's description: Up to 19 characters that may be programmed by the installer.
- "Affected" and "Affected by" special characters.

A configured system will have a set of rules logically connecting inputs with outputs. This model may be examined in two ways:

- One **input** activating many **outputs** ("Affected outputs").
- One **output** been activated by many inputs ("Affected by").

This is implemented by the lists:

- **|[Affected Outputs]|** for each **input**
- **|[Affected by]|** for each **output**.

5.1.5 Inputs / Outputs relations and their indication

Inputs and outputs may have some form of relation. For example One input may be programmed to **directly** affect the output. Another input may be causing **alarm** condition that another output is programmed to respond to. This is the **alarm** relation between the two.

These relations of cause and effect are displayed in the two mentioned lists. They display 5 characters that represent the relation between an input and an output. On screen these five characters form a field that may look like this: **|SPAEZ|** (here all relations are active).

The following list shows the input/output relations and their corresponding character due to the active configuration:

|S|: Selected: The input directly affects the output.

|A|: Alarm: The input causes an alarm and the output responds to alarms.

|E|: Evacuation: The input causes evacuation and the output responds to it.

|Z|: Zone: One input belongs to a zone and the **zone** directly or indirectly affects the output.

|P|: Prealarm: The input causes a prealarm (for the alarm verification system) and the output responds to it.

5.1.6 Inputs / Outputs lists and their flag indicators

The three lists of ALM1.2 **|Zones|**, ALM1.3 **|Inputs|** and ALM1.4 **|Outputs|** (key sequences **[i]-[2]**, **[i]-[3]** and **[i]-[4]**) have a field of 3 characters with the following letters and their meaning as below:

|A|: Causes Alarm (for inputs/zones) or **Responds to Alarms** (for outputs): The item either causes or responds to the alarm condition.

|E|: Causes Evacuation or **Responds to Evacuation:** The item either causes or responds to the evacuation condition.

|V|: Belongs to Alarm Verification group (inputs) or **Activates during Pre-alarm Condition** (outputs). See section 8.1.2 "Alarm Verification".

In addition, the input lists have a fourth flag with the following meaning:

|_|: No base sounder installed.

|B|: Base sounder installed and working normal.

|b|: Base sounder configured but not present.

5.2 Keyboard description

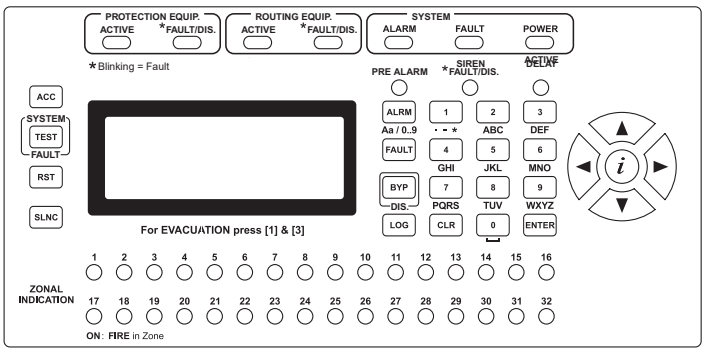


Figure 9. Mikro keypad

Each keypad (Figure 9) has several buttons with some having different functions depending on the system's state.

The following table summarizes each key's functionality:

[ACC]	"Access Level". **Indicator:** • OFF: Keypad in access level 1. • ON: Keypad in access level 2. • Flashing: Keypad in access level 3. **Button:** Press to enter elevated access level. Factory default access codes are "2222" and "3333" for access levels 2 and 3 respectively.
[SLNC]	**Button:** Activate a silence operation. **Indicator:** There are active silenced notifications either from buzzers or alarm output devices.
[BYP] / DIS.	"Bypasses". Also known as Disablements. **Button:** Display active disablements list. Press **[ENTER]** to modify. **Indicator:** There are active disablements of either inputs or outputs.
[RST]	**Button** Resets the panel's state including alarm zones, faults etc. (needs access level 2 or 3).
[ALRM] (Aa / 0..9)	**Button:** Displays a list of zones in Alarm. **Alternative function:** During text input field editing (access level 2 and 3 programming), changes character entry mode from numeric to T9 (text entry mode as used on mobile and telephone devices).
[FAULT]	**Button:** Displays a list of zones in fault. **Alternative function:** During text input field editing (access level 2 and 3 programming), deletes the character that the cursor is over.
[LOG]	**Button:** Shows the log events from the main board. While in the LOG screen the user can navigate through the log using the arrow keys (UP=RIGHT=get next log and DOWN=LEFT=get previous log).
[NUM PAD] (keys 0-9)	**Button:** Keys used for: • Data entry in numeric or text fields (T9 mode). • Special operations in lists and overviews. In general: **[1]**, **[2]**, **[3]**: Select how the information is displayed (format) **[7]**, **[8]**, **[9]**: Select what information is displayed (filters) **[5]**: Reset filters to default **[0]**: Lock/unlock first displayed field (usually ID) for horizontal scrolling. See section 5.1.2 for detailed description
[CLR]	**Button:** Returns to the previous menu or to main menu depending the current menu.
[ENTER]	**Button:** Selects an option/menu or submits a change during editing.
[i] (info key)	**Button:** Displays help information about a menu or action. In the main screen it displays the Menu of Access Level 1 (informational).
[ARROW KEYS]	**Button:** Navigate through menus, lists and log.
PROTECTION EQUIP.	***ACTIVE* Indicator:** Protection equipment is active ***FAULT/DIS.* Indicator:** This indicator when blinking is used to indicate faults to any inputs or outputs that are programmed for the "Routing equipment" and "Protection equipment" systems, when lit it indicates that they are Disabled.
ROUTING EQUIP.	***ACTIVE* Indicator:** Routing equipment is active ***FAULT/DIS.* Indicator:** Routing equipment when blinking is in Fault, else is Disabled
ALARM	**Indicator:** The General Alarm indicator. Lit when there is an alarm (including evacuation) condition.
FAULT	**Indicator:** There is an identified fault condition.
POWER	**Indicator:** • ON: The panel is powered up with no power related faults • Blinking: Powered up with power fault
PRE ALARM	**Indicator:** The system has received the "first alarm" and is in prealarm condition. While lit, any more alarms from alarm verification inputs will cause an immediate alarm.
SIREN FAULT/ DIS.	**Indicator:** The siren when blinking is in Fault, else is Disabled.
DELAY ACTIVE	**Indicator:** Alarm verification is active for some alarm events. This causes a possible alarm condition to be delayed before the generic alarm state is activated.
SYSTEM FAULT	**Indicator:** System Fault.

Table 3. Keyboard's keys functionality

5.2.1 Data entry operation

The LCD and Keypad are used in various operations for data entry such as zone descriptions, dates, numeric settings etc. During data entry mode a designated area on the LCD is used for the input. The LCD characters allocated for the data field are enclosed in square brackets Figure 10. If the length of the data is greater than the available LCD character space, horizontal scrolling takes place. In this case the Left or Right (or both) square brackets enclosing the data are changed to "less than" or "greater than" signs indicating the direction of existing but not visible characters.

The data entry takes place in two different modes:

- Numeric data entry: The keypad is in numeric mode, and every time a key is pressed the corresponding number is produced on the screen.

- T9 entry mode: Each key has a set of characters (4 or 5) that are selected by promptly pressing the same key as many times needed. The characters allocated to each key are printed below them on the keypad mask (Figure 9). This mode is very popular with cellular phones and used for SMS text messaging.

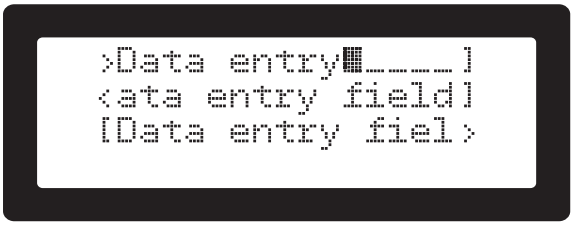


Figure 10. Data entry examples

The operation of the keys during data entry is as follows:

[0] to **[9]:** Characters 0-9, A-Z and symbols.

[ALRM]: Switch keypad mode between Numeric and T9.

[FAULT]: Delete the character that the cursor is over.

[CLR]: Cancel editing and exit data entry mode.

[ENTER]: Accept editing saving data field and exit data entry mode.

[Left Arrow], [Right Arrow]: Move cursor in the corresponding direction.

[Up Arrow], [Down Arrow]: Increase or decrease the character or numeric value highlighted by the cursor.

5.3 Access Levels

The fire panel during it's operation is said to be in a specific access level; from 1 to 3. Each access level defines what operations are allowed and what are protected. Each Access Level may be activated or "entered" by entering the requested code (or PIN) for the corresponding access level. Factory default access codes are "2222" and "3333" for access levels 2 and 3 respectively. Many operations and menus require an elevated access level (other than 1, see Table 4 for operations summary). If the user initiates an operation that requires increased access level the system will prompt for the PIN, and once successfully entered, it will execute the operation and return to access level 1. Alternatively the user may request the menus of access level 2 or 3 (by pressing **[ACC]** key). In this case he/she will be prompted for the PIN and once successful, the access level menu will be displayed for further operations. While the access is granted, any operation under the specific access level is possible and the user will not be asked for the PIN every time. Elevated Access levels are canceled if the user willingly exits (by pressing **[CLR]**) or the menu times out due to user inactivity.

The Table 4 summarizes the basic functions and their required access level.

Basic Function	Access Level Required
Access level 2 menu	2 / 3
Access level 3 menu	3
Reset	2 / 3
Silence	2 / 3
Bypass	2 / 3
Test Indicators	1
Log	1
Display alarms	1
Display Faults	1
Display bypasses	1
Evacuation	1 / 2 / 3
System Programming	3
Date/Time set	2 / 3
Walk Test	2 / 3
Periodic Test Confirmation	2 / 3

Table 4. System operations and required access levels

5.3.1 Users (master / normal, installer)

The fire panel apart from having two elevated access levels, also provides 9 users for access level 2; one Master and 8 Normal users. All users are limited to access level 2 operations (including the Master user). The Master user may change the PIN codes for himself as well as all 8 Normal Users. Each Normal user can change only his/her own PIN. This system ensures that the Master user has control over who is authorized to operate the system without disclosing his/her own PIN. This guarantees control in the case of access revocation for a specific user.

The Access level 3 (A.L.3) user has full control over the entire system, including the Master and Normal user codes, programming and operation of the system. In other words Access level 3 (A.L.3) may perform operations that belong to the Access level 2 (A.L.2) group.

A PIN code of "0000" makes the user inactive.

5.3.2 Access level 3 PIN reset

The system provides a backup security code for the case were the AL3 PIN is lost/forgotten. The reset PIN is defined in the last entry of ALM3.1 **|1.Installer code|** and labeled as "Installer PIN reset". This PIN, if entered in the PIN request screen (by pressing **[ACC]** key), will reset the access level 3 pin to the factory default of "3333". A verification screen is presented before the actual resetting takes place.

5.4 Loop Overview (ALM1.1)

This screen presents the loop devices in a concise manner with one character per Loop Address. The arrow keys are used for positioning the cursor to any of the 127 addresses. The top line apart from the title, presents for a short period (3 seconds) the type of the device that the cursor has stopped over. The top right area of the screen indicates the address that corresponds to the cursor position. Addresses are represented in groups of 15, one group per line. The beginning of the address lines show the first address of the group (1, 16, 31 etc.).

TIP! Pressing on *SYSTEM FAULT* indicator on an occupied address will light up the device's indicator LED for easy identification (not all devices support this feature).

Keys **[1]**, **[2]** and **[3]** apply the following filters, altering the meaning of the displayed characters and the corresponding titles.

Loop Devices

|<LOOP1: DEVICES>|: Key **[1]**. This is the default screen of ALM1.1. It's main purpose is to indicate used addresses and if there is a slave device (+127 off the main address).

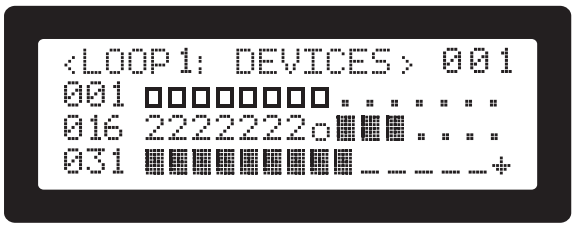


Figure 11. Loop Devices Overview screen

The indication of each address may be one of the following:

|_| (underscore): This address is not used by any installed device.

|□| (empty square): The address is used. No slave device at address offset +127.

|▪| (solid square): The address is used and the device has a slave device at sub-address with an offset of +127, e.g. a smoke detector at address 1 with a base sounder at address 128.

|o| (lower case O): The address is used and it's LED is switched ON. Please note that not all loop devices support this operation.

| . |: The address is in use but the device is not in the system configuration. See Not configured devices, Section 5.10, "Loop Devices".

|2|: There are two devices with the same address. This is a serious error as non of the two may be operated. This indication has priority over the rest.

|B|: The device is bypassed (disabled).

|T|: The device is triggered (active).

|P|: The device is in pre-alarm state.

|A|: The device is in alarm state.

|E|: The device is in evacuation state.

|F|: The device reports a fault.

|s|: There is a base sounder (address above 127) with no device over it.

Loop Devices Type
|<LOOP1: TYPES>|: Key **[2]**. The purpose of this screen is to provide a quick overview of the used addresses as well as the generic type of the device in each address (Optical, heat, call point etc).

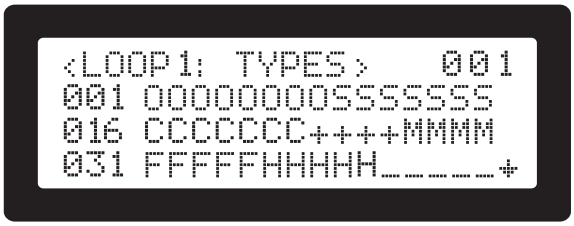


Figure 12. Loop Devices Types Overview screen

The characters for each reported type is as follows:

|_| (underscore): This address is not used by any installed device.

|M|: Module device such as inputs, outputs, conventional zones etc. See Appendix E for devices in this category.

|H|: Heat sensor.

|O|: Optical sensor.

|C|: Manual Call point.

|F|: Flash unit.

|S|: Sounder unit.

|+|: Other unit.

Loop Devices Configuration
|<LOOP1: CONFIG>|: Key **[3]**. Provides indications related to the configuration of the displayed addresses.

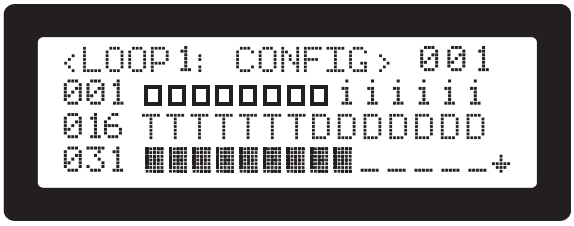


Figure 13. Loop Devices Configuration Overview screen

The character indications is as below:

|_| (underscore): This address is not used by any installed device.

|I|: Alarm verification input plus Day Night automatic switching.

|i|: Alarm verification input.

|D|: Day Night automatic switching.

|□| (empty square): The address is used. No slave extended address.

|▩| (solid square): The address is used and the device has a slave subaddress at an offset of +127.

Address details
Pressing the **[ENTER]** key on an occupied address, causes the system to display more information about the device. There are two cases in this action:

- Device provides a single input or single output. In this case the detailed info screen is displayed and the operation is identical to either "detailed info" for inputs (see section 5.7.2) or "detailed info" for outputs (see section 5.9.1).
- Device has multiple inputs and/or outputs. Some modules provide multiple inputs/outputs (for example two inputs, one output). In this case a list with the device's contribution to the system in the form of inputs and outputs is shown. Selecting one of the items and pressing **[ENTER]** activates the corresponding "detailed info" screen as above.

The **[CLR]** key steps back to the previous menu items.

5.5 Definition of terms and references

The following items may appear in multiple screens. They are presented here for a quick and clear reference.

5.5.1 Status indications

Applies to: Zones, Inputs, Outputs

The detailed item screens include a **|STAT|** field that present various status information. The possible indications (where applicable) are as follows:

|OK|: No error
|PSUF|: Power Fault
|PSUL|: PSU Low
|ISOo|: SCI Open
|ISOf|: SCI Fault
|FLT|: Device general fault
|LST|: Lost
|FLTi|: Internal faults
|FLTos|: Open or Short fault
|REM|: Detector removed
|REMo|: Detector removed or open
|FLRo|: Optical fault
|FLTh|: Heat fault
|FLToh|: Optical and heat fault
|FLTz|: Short on zone
|LBAT|: Low battery on devices
|TAMP|: Tampered devices
|CONT|: Contamination warning
|FLTc|: Contamination fault
|DBL|: Double address
|FLTO|: Open fault
|FLTS|: Short fault
|ACT|: Active
|SLNC|: Silenced
|BYP|: Bypassed

5.5.2 Latching operation

Applies to: Inputs, Zones.

A latch operation is one that keeps the active state regardless of the running state that caused the initial activation. Think of a door that is pushed closed (initial activation); once closed it will not open (stay in latched condition) until the opening mechanism is operated (reset event).

IMPORTANT! It it recommended that all inputs that are used for alarm and/or evacuation, are configured as latched.

Loop device outputs that are affected by alarms, do not deactivate if an alarm is raised and stopped by a non latching input (they always latch on alarm).

5.6 Zones (ALM1.2) Zones Configuration (ALM3.2.1)

5.6.1 General Info

A zone is a group of inputs. It appears as another input that gets activated when any of it's member inputs is activated. A zone like any other input, may activate any number of onboard outputs, up to two individual loop output devices, as well as cause pre-alarm, alarm or evacuation. A zone can-

not belong to another zone. An input may belong to only one zone.

Latch operation
Zones, being special kind of inputs, also have the "latch" attribute (See also "Latching operation" above).

Since a zone is a virtual input that is based on other inputs who may be latching, it's behavior is a combination of conditions:

- A "Not latching" zone with no latching inputs, will follow the status of any activated input. It will deactivate if all inputs return to not active state.
- A "Latching" zone will keep it's state activated regardless of the state of the input that initially triggered it.
- A "Not latching" zone with latched inputs will also latch, as the input that activated it will stay latched (activated until reset).

The items of the ALM1.2 menu is as follows:

Figure 14. Zones list screen

Zone list
The initial screen shows all the available zones along with their short description, user defined description and Alarm, Evacuation and Alarm verification status flags (see section 5.1.3 "On screen buttons selectors and titles").

Keys **[1]** and **[2]** select the alternative format for short and user description. Key **[0]** locks the ID of the zone during horizontal scrolling.

Keys **[7]**, **[8]** and **[9]** toggle the filtering for Evacuation, Alarm and Alarm Verification. The active filter is shown in the title e.g. **|<ZONES: __A_>|** means that only zones that cause alarm are included in the list. Key **[5]** resets the active filters and the title e.g. **|<ZONES: ALL>|**.

Selecting a zone (with the up/down arrows) and pressing **[ENTER]** will enter the zone's detailed info screen. See section 5.2.1 for help on data entry.

5.6.2 Zones - Detailed info screen

When entering the detailed information screen either for viewing or editing, a list with attributes, one per line, are displayed. The installer may modify the programmable entries by pressing the **[ENTER]** key.

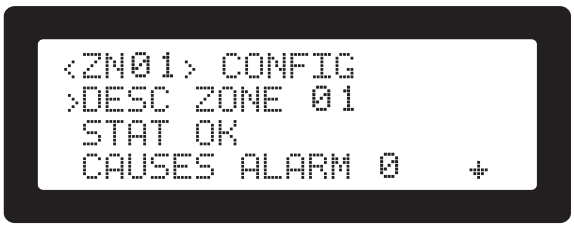


Figure 15. Zone configuration screen

The fields shown on the screen are listed below:

|DESC|: 20 characters of user defined description.

|STAT|: The status of the zone. See "Status Indications" section 5.5.1.

|CAUSES ALARM|: When set to **1**, activation of the input will cause an alarm condition.

|LATCHED|: When set to **1**, the input will latch after an activation event, until reset. See also "Latching operation" above.

|CAUSES EVAC|: When set to **1**, the activation of the input will activate the evacuation state.

|ALARM VERIF|: When set to **1**, the item is declared as an alarm verification input. See section 8.1.2 "Alarm Verification".

|[AFFECTED OUTPUTS]|: Pressing **[ENTER]** shows a list of outputs that are affected (activated) when the input becomes active. Modifiable at Access level 3. See section 5.8 "Affected outputs".

|[ZONE'S INPUTS]|: Pressing **[ENTER]** displays a list of inputs that belong to this zone. Modifiable with Access level 3.

|[SAVE]|: Pressing **[ENTER]** will save any modifications made to the above fields. Only used at Access level 3.

5.6.3 Zone's Inputs

The list shows or modifies the inputs that belong to a zone.

Viewing mode

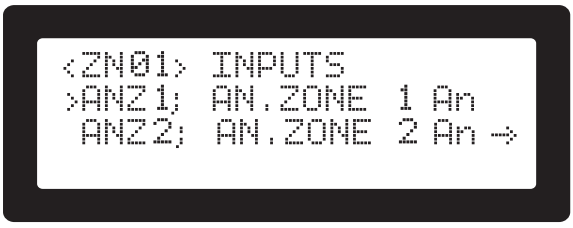


Figure 16. Analog Zone Inputs viewing mode screen

In viewing mode keys **[1]** and **[2]** put either the user description or the input's short description first for the preferred viewing mode. Key **[0]** locks on screen the input's ID while the user scrolls horizontally with the **[Left Arrow]**/ **[Right Arrow]** keys.

Modifying mode

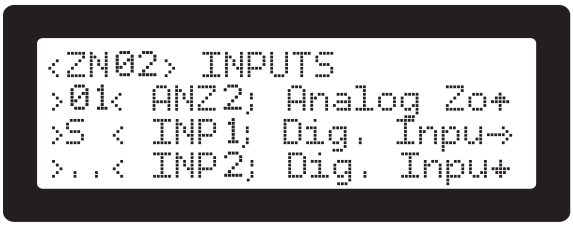


Figure 17. Analog Zone Inputs modifying mode screen

From viewing mode, pressing **[ENTER]** will activate the editing mode. Access level 3 is required. If not already in Access Level 3, the system will ask for the required PIN. In editing mode, a list with all available inputs is displayed. The cursor may be positioned to the desired input with the up/down arrow keys. Not all inputs may be selected as some may already belong to another zone. These inputs are distinguished by the number shown in the selection area (2 characters), which shows the zone that they currently belong to. Pressing **[ENTER]** on an already allocated input has no effect. Pressing enter on an available input will toggle the letter **"S"** in the selection area either selecting or de-selecting the input. To move an input from one zone to another, it must first be deselected from the first. Any changes made to this selector screen are saved automatically.

5.7 Inputs (ALM1.3)
Input Configuration (ALM3.2.2)

5.7.1 Inputs list

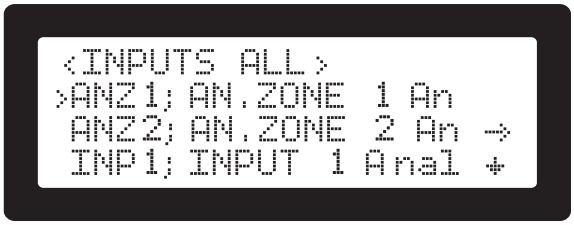


Figure 18. Inputs list screen

The screen shows all the available inputs along with their short description, user defined description and Alarm, Evacuation and Alarm verification status flags (see section 5.1.3 "On screen buttons selectors and titles").

Keys **[1]** and **[2]** select the alternative format for short or user description. Key **[0]** locks the ID of the input during horizontal scrolling.

Keys **[7]**, **[8]** and **[9]** toggle the filtering for Evacuation, Alarm and Alarm Verification. The active filter is shown in the title e.g. **|<INPUTS: _E__>|** means that only inputs that cause evacuation are included in the list. Key **[5]** resets the active filters and the title e.g. **|<INPUTS: ALL>|**.

BUS loop devices that have a base sounder device at slave address with offset +127, are indicated by the letter **|B|** in the flags field e.g. **|L1.115; B_A_|** which means that the device at address 115 has a base sounder with address 242 (115 + 127). A lower case **|b|** indicates that a base sounder has been saved in the system configuration but has not been found by the system (fault condition).

The inputs that Mikro panel presents correspond to a variety of actual devices:

- On board analogue zones with IDs ANZ1 and ANZ2.
- On board digital inputs with IDs INP1 and INP2.
- All automatic sensors on the loop (optical, heat, ionization).
- All manual call points on the loop.
- Various digital relay outputs from BUS modules.

5.7.2 Inputs - Detailed info screen

When the user presses the **[ENTER]** key on any listed input, the detailed information screen is shown:

Figure 19. Zone Inputs configuration screen

The panel has some settings (and information) for each input regardless of the actual device that provides the input and some specifics that apply to each individual device. They are listed below:

|DESC|: The user configurable, 20 character description of the input.

|STAT|: The status of the input. See section 5.5.1 for indications.

|ITEM|: The Shield's part number

|TYPE|: A short description of the input e.g. "Analogue Zone" or "Optical smoke sensor".

|ZONE|: The zone that the input belongs to. Can be set to **0** which means no zone.

|CAUSES ALARM|: When set to **1**, activation of the input will cause an alarm condition.

|LATCHED|: When set to **1**, the input will latch after an activation event, until reset. See also "Latching operation", section 5.5.2.

|CAUSES EVAC|: When set to **1**, the activation of the input will activate the system evacuation.

|ALARM VERIF|: When set to 1, the item is declared as an alarm verification input. See section 8.1.2 "Alarm Verification".

|PROT FAULT INP|: Protection fault input (EN54-2 §7.10.4).If this flag is set to **1** the input is set to create a fault when activated. This is used with outputs from fire protection equipment that signify that the protection equipment has a fault. The fault is displayed on the LCD. The ***EQUIP FLT*** indicator is also activated.

Various Shield sensors implement a remote LED output. This output can be controlled, independently of the state of the addressable device, from the panel's controller. The Mikro line of panels may be configured in A.L.3 to activate this output in three scenarios. The menu items may be found under each input's configuration menu in **ALM3.2 |2.Input Config| -> [ADDRESS OF INPUT]**. Four menu entries are provided as listed below:

|R.LED ON ALARM|: Values 0 or 1. (Remote LED output is activated on General Alarm). If set to 1 the remote output of the selected addressable device will be activated when the panel enters the general alarm state.

|R.LED ON EVAC|: Values 0 or 1. (Remote LED output is activated on Evacuation). If set to 1 the remote output of the selected addressable device will be activated when the panel enters the general alarm state.

|R.LED ON LOCAL|: Values 0 or 1.(Remote LED output is activated on device activation). If set to 1 the remote output of the selected addressable device will be activated when the device itself is activated.

Note that sensor devices that belong to the Alarm Verification group, will activate the remote LED output as soon as the sensor is activated; this includes pre-alarm and alarm states.

|R.LED AUDIO DEV|: Values 0 or 1. (The remote LED output controls an audio notification device). The value of this setting controls the way the remote LED output reacts to the "Silence" and "Bypass Alarm devices" operations (access level 2). Setting this value to 1, configures the selected Remote LED output as an audio notification appliance. This makes it silent when the "Silence" operation is commanded and disables/enables it's operation when the "Bypass Alarm devices" are deactivated/reactivated (**ALM2.2 |4.Byp.Alarm Devices|**).

The Remote LED output may be disabled (bypassed) if the corresponding input device/address is disabled.

The default value (eg. after a loop autolearn operation) for the Remote LED settings are activated (1). See also Group operations in section 11.2.1 Group Configuration (ALM3.2.4).

|[AFFECTED OUTPUTS]|: Pressing **[ENTER]** shows a list of outputs that are affected (activated) when the input becomes active. Modifiable at Access level 3. See Affected outputs, below.

|[SAVE]|: Pressing **[ENTER]** will save any modifications made to the above fields. Only used at Access Level 3.

5.8 Affected outputs

The Affected Outputs list screen (Figure 20) is common to both ALM1.2 **|2.Zones|** and ALM1.3 **|3.Inputs|**.

The list contains the outputs that are affected by the zone or input that is initially selected. It is activated by pressing the **[ENTER]** key while the **|[AFFECTED OUTPUTS]|** screen line is selected.

As explained earlier (see section 5.1.5 "Inputs / Outputs relations and their indication") an input may affect a number of outputs. These are called "affected outputs". Outputs may be triggered from an input either directly or indirectly (through Alarm, Alarm Verification or Evacuation conditions). The affected outputs list plays a double role:

- To inform (Access level 1): It provides a complete list of all outputs that will be activated either directly or indirectly when the input is triggered. This mode also provides the **|SPAEZ|** flags that explain why the output will be activated from this input (as explained in section 5.1.5).

Figure 20. Affected Outputs list screen

- To modify (Access level 3): Pressing **[ENTER]** while the affected outputs list is displayed shows all available system outputs. The list has the typical selection field through which the user may select a number of outputs. Once saved, these outputs will be the "directly affected" outputs of the input.

Figure 21. Edit Affected Outputs screen

While any number of on-board inputs may be selected, only 2 loop device outputs are allowed. If the user keeps selecting more than two loop devices, the third selection cancels the second, enforcing the "only two selected" rule.

If the user presses [ENTER] to modify the affected outputs list while not in access level 3, the pin request screen is shown. Upon successful AL3 pin entry, he has to press [ENTER] again to activate edit mode. This is not necessary if the navigation to the affected outputs list was through Access level 3 menu (meaning he/she is already in Access Level 3).

To exit the screen the **[CLR]** key has to be pressed. Any modification must be saved with either the **|[SAVE]|** screen button or during the prompt of the system (Figure 22).

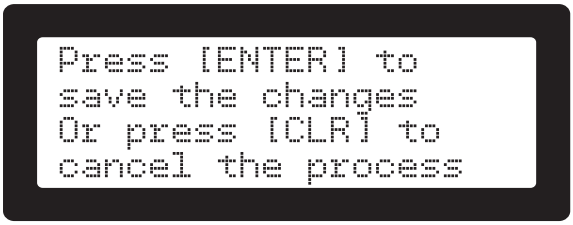


Figure 22. Save modifications in Affected Outputs screen

5.9 Outputs (ALM1.4) Output Configuration (ALM3.2.3)

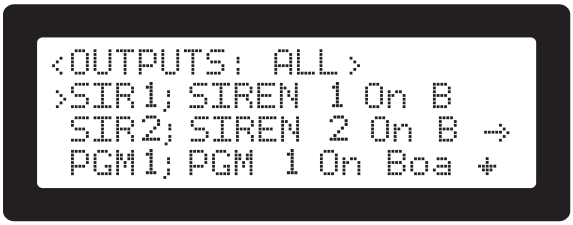


Figure 23. Outputs list screen

The "outputs" screen (Figure 23) shows all available on board and loop outputs. Each line contains the ID, the short and user descriptions as well as a 3 character flags field.

Keys **[1]** and **[2]** change the preferred format of each line placing either the user description or the flags and device type first. Key **[0]** locks the ID during horizontal scrolling.

Keys **[5]**, **[7]**, **[8]** and **[9]** toggle the active filters changing the listed devices and the title to indicate the filter. The operational keys and their corresponding filters are shown below:

- **[7]**: **|<OUTPUTS: E__>|**: Show only devices that are affected by evacuation.
- **[8]**: **|<OUTPUTS: _A_>|**: Show only devices that are affected by alarm.
- **[9]**: **|<OUTPUTS: __V>|**: Show only devices that are affected by the prealarm state during alarm verification (see "Alarm Verification" section 8.1.2).
- **[5]**: **|<OUTPUTS: ALL>|**: Resets any active filtering to none (all outputs are shown).

Note that the active filters have and 'AND" logic eg having Evacuation AND Alarm as filters ('EV_' on title line) will only show outputs that are affected by both alarms and evacuation.

The user may scroll horizontally with the left/right arrow keys or vertically with the up/down arrow keys.

The **[BYP]** key brings up the bypass (disablements) screen for the outputs.

The **[ENTER]** key activates the detailed information screen for the output under the cursor.

5.9.1 Outputs - Detailed info screen

Figure 24. Output detailed info screen

The panel has some settings (and information) common to all outputs regardless of the actual device that provides the

output; also some specifics that apply to each individual device. They are listed below:

|DESC|: The user configurable, 20 character description of the output.

|STATUS|: The status of the output. See section 5.5.1 for indications.

|ITEM|: The Shield part number.

|TYPE|: A short description of the output e.g. **|On Board Siren|** or **|Loop powered siren|**.

|OUTPUT PATTERN|: (ON BOARD outputs only) The desired output on/off pattern when activated. These outputs support 8 activation patterns (values 0 to 7). The pattern controls their on/off sequence when active. The patterns are listed in Appendix E.

BUS module outputs have no pattern selection and are either on or off.

BUS module outputs have no pattern selection and are either on or off.
The above patterns are used for activations coming directly from inputs. Alarm and evacuation sound patterns are defined in ALM3.3 |Sounders config|.

|INVERSE|: When set the active electrical state of the output is inversed. This may be useful with high reliability setups where an output may be required to activate on complete lack of power. It may also be combined with the **|FAULT|** flag that activates the output when a fault is detected.

|BYPASSABLE|: If the output may be bypassed (disabled).

|SILENCABLE|: If the output is affected by the silence operation.

|PRE ALARM|: If the output is activated when a pre-alarm condition is active.

|ALARM|: If the output is activated when an alarm condition is active.

|EVACUATION|: If the output is activated when a evacuation condition is active.

|WALK TEST|: If the device activates during the walk test procedure (see "Walk Test" section 8.3).

|BYPASS|: When set, the output will be activated when the user activates a bypass (disablement) of any input or output.

|FAULT|: (as per EN54-2 $8.9): When set, the output will activate when any fault is detected. Useful for high reliability setups where a fault may trigger or remove power from protection equipment. Activating the **|INVERSE|** option will make the output compliant to the EN54-2 $8.9 option, where a the signal will be transmitted even on a total power failure.

|DELAY|: Time in seconds that the actual output will be delayed, after the activation of a condition that affects it. **0** means no delay.

It is not recommended to use delays in alarm or evacuation outputs when implementing EN54-2 installations. The delay is meant primarily for automation systems. Extra caution is needed when using this feature.

|ROUT EQUIP|: (as per EN54-2 $7.9) : When set, the output is declared as driving routing equipment. When an output driving routing equipment is active, the LCD display will show the non maskable message **|ROUT EQP: ACT|** Note that this message may be alternating with the Protection equipment status (see below).

To comply with EN54-2 $7.9 option with requirements, this type of outputs must have their |SILENCABLE| flags set to 0 (silence operation must not affect it).
The same output may not be used for both Routing and Protection equipment.

|PROT EQUIP|: (as per EN54-2 $7.10): When set, the output is declared as driving protection equipment. When an output driving protection equipment is active, the LCD display will show the non maskable message **|PROT EQP: ACT|**. Note that this message may be alternating with the routing equipment status (as above).

To comply with EN54-2 $7.10 option with requirements, this type of outputs must have their "SILENCABLE" flags set to 0 (silence operation must not affect it).
The same output may not be used for both Routing and Protection equipment.

|VERIF INP|: (as per EN54-2 $7.9.2 and $7.10.3): If the output is used for driving routing or protection equipment, the driven equipment may provide feedback on successful reception of the output's signal. In this case the installer may connect this verification signal to an available input and select this input in this field. This makes the selected input the "verification" for the output's operation. When this 'signaling with verification' setup is used the display will indicate the status of the activation operation as follows:

- **|ROUT EQP: ACT|** or **|PROT EQP: ACT|**: Output activated, no verification is set.
- **|ROUT EQP: ACT+ver|** or **|PROT EQP: ACT+ver|**: Output activated, verification required but not received yet
- **|ROUT EQP: ACT+VER|** or **|PROT EQP: ACT+VER|**: Output activated, verification required and received.

To comply with EN54-2 $7.9.2 and $7.10.3 this message is not suppressed during the fire alarm condition.

|[AFFECTED BY]|: This is a "screen button". When the user presses **[ENTER]** on this line, a list with the all the inputs that affect the output is displayed. See section 5.9.3 "Affected by" list.

|[SAVE]|: "Screen button" that saves any modified parameters. Only applicable to access level 3.

Fault monitoring on Equipment driving outputs (as per EN54-2 $7.10.4)

Any faults involving the outputs or inputs allocated to routing and/or protection equipment is indicated in the normal faults screen and also by the shared separate LED indicator ***EQUIP FAULT***.

5.9.2 Access Level 3 operations - Detailed info

Pressing **[ENTER]** in the detailed information screen activates the programming mode for the selected output. Access Level 3 pin is required. Once the user enters access level 3 (**[ACC]** button/indicator flashing) he/she may select the required parameter and (if modifiable) change it's current value.

If the user presses [ENTER] to modify the "Affected by "list while not in access level 3, the pin request screen is shown. Upon successful AL3 pin entry, he has to press [ENTER] again to activate edit mode. This is not necessary if the navigation to the "Affected by" list was through Access level 3 menu (meaning he/she is already in access level 3).

To exit the screen the **[CLR]** key has to be pressed. Any modification must be saved with the **|[SAVE]|** screen button. If unsaved data exist while the user tries to exit, the system will display the message **|There are unsaved**

data, press [ENTER] to save them|, preventing the user from loosing possible modifications.

5.9.3 "Affected by" list

"Affected by" list - Viewing

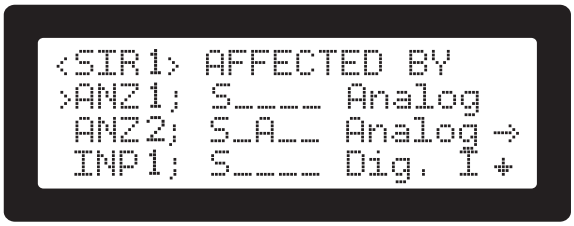


Figure 25. "Affected by" list screen

Each output may be activated in a pre-alarm, alarm, evacuation or after direct command from an input. All four conditions are initiated by inputs. The inputs that are capable of activating the selected output are included in the "Affected by" list. The reason for a possible activation (alarm, evacuation or direct) is also shown as flags:

|S|: the output is directly selected for activation by the listed input.

|P|: the output is programmed to get activated during a pre-alarm and the input belongs to alarm evacuation group.

|A|: the output is programmed to get activated during alarms and the listed input causes alarms.

|E|: the output is programmed to get activated during evacuation and the listed input causes evacuation.

|Z|: the output gets triggered by a zone that the input belongs to.

"Affected by" list - Modifying (Access level 3)

Figure 26. "Affected by" list modifying screen

The **[ENTER]** key on this list activates the modification mode. All available inputs are presented in a scrollable list with the usual selector field **|>S<|** displayed at the start of each line. Already selected inputs are indicated with the letter **|S|**, the rest (available) have a **|.|** (period) character. If the input has already allocated two outputs, a **|-|** character is displayed which makes the input not available for selection. This is because all inputs have a limitation of 2 outputs that they may directly affect. The **|-|** (minus) indicates that the input has both affected outputs already used and thus is not available for selection.

In editing mode (selection mode) the **[1]** and **[2]** keys, change the format of the displayed information. The **[ENTER]** key toggles the selection of the active line and the **[CLR]** key terminates the modification/selection process. The changes made by the input selector, have to be saved with the **|[SAVE]|** screen button along with any other modifications performed.

5.10 Loop devices (ALM1.5)

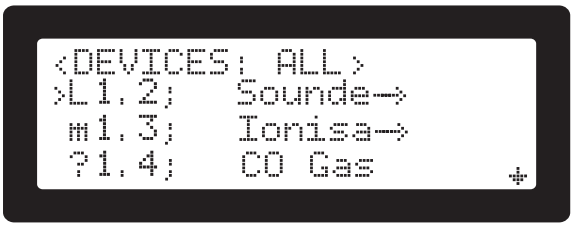


Figure 27. Loop devices screen

This screen is a list with all the loop devices that have been detected and/or configured in the system. Listed devices are characterized according to the following conditions:

- **A healthy device** will have it's ID as **|L1.xxx|** where xxx is the address, e.g. **|L1.115|**. A healthy system should consist only of installed, found and configured devices.
- **Not configured devices**. These are devices that have been found on the loop at unique addresses but are not declared as valid in the configuration and as such are not used. These devices are identified by a question mark character in their ID; for example, **|?1.115|** indicates a device that has address 115 and is not meant to be there.

  The type of "not configured" devices is known (e.g. "Ionisation Det.") if the system was powered on with the device present. These devices may use the "Device Identification" system to light on their LEDs and be easily located (select them and press on ***SYSTEM FAULT*** indicator on keypad). This feature is extremely useful for initial system verification, right after installation. Please note that on these devices there is no way to switch an activated indicator LED off.
- **Missing devices**. Devices that are saved in the configuration of the panel as a specific device type at a specific address but this address is found empty. These devices are declared as missing and have their ID set to **|m1.xxx|** where xxx is the address, e.g. **|m1.115|**.

The initial default screen of "Loop devices" show all devices. Furthermore there are two filtered screens activated by keys **[8]** and **[9]** that show:

- Key **[8]**: only "not configured" devices. The title changes to **|<DEVICES: NOT CONF>|**.
- Key **[9]**: only "missing" devices. The title changes to **|<DEVICES: MISSING>|**.
- Key **[7]** restores the initial "all devices" list with the title **|<DEVICES: ALL>|**.

The filtered lists provide an easier way to identify possible problems. This screen supports the easy "Device Identification" operation see section 8.2.

Selecting and pressing **[ENTER]** on a listed device will show the logical items (inputs/outputs) that this device contributes to the system. In a typical installation most devices will have just one. The user may select with the cursor keys and the **[ENTER]** key the item of interest. This will display the detailed info screen for the selected item. From this point on the operation is identical to the "detailed info" screens for inputs or outputs as described in sections 5.7.2 and 5.9.1.

The **[CLR]** key steps back to the previous screens.

While in the "loop devices" list, the ***SYSTEM FAULT*** indicator doubles as identification button, pressing on it will on the LED indicator of the selected device (for the devices that support this function).

5.11 Power levels (ALM1.7)

Figure 28. Power levels screen

The Mikro line of panels have one main Power supply unit (PSU) in the main cabinet. Models that include the auxiliary relays expansion have a second PSU in the relays cabinet. Both PSUs are fully monitored for Main power, battery voltage and battery health (internal resistance).

The condition of the PSUs is displayed under this menu.

If the relay's PSU is present, the up/down arrow keys selects the main or the secondary PSU.

The PSU's output voltage as well as the batteries voltage is displayed in Volts DC. The presence (or not) of the main power supply is indicated with **|AC :OK|** and the batteries internal resistance within allowed limits (less than about 1.5 ohms) is indicated with **|BATT: OK|**. Faults are indicated with the label **|FAULT|**.

TIP: This screen may also be accessed from the main screen with the [Left Arrow] key.

5.12 System info (ALM1.8)

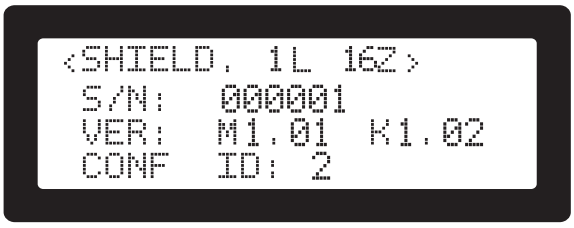


Figure 29. System info screen

This screen shows:

- The serial number of the unit. This is stored in the main PCB during production.
- The firmware version of the system (Mx.xx).
- The firmware version of the Keypad (Kx.xx).
- Configuration ID [i]->**|8.System info|**-> "CONF ID:" Every time the panel configuration (also referred as "site specific data") is modified, the new configuration is given a unique, always increasing numeric ID. This ID cannot be directly modified by the user or installer. It can be used as a reference (something similar to software versions) for tracking changes in installed systems.

The versions have two parts separated by a dot ("."). The part before the dot is the main version. This is the version that the product is certified to. The part after the dot, is the revision. Different revisions may be released during the filecycle of the product. They signify minor, mainly cosmetic modification to the firmware.

Some products may have a third part after the revision. This will be a user interface language designator and is either one or two english letters e.g. "el" for the Greek version of the user interface.

5.13 Contact info (ALM1.9)

Figure 30. Contact info screen

Displays the installer pre-programmed contact information. Useful for keeping technical support telephone number and/or other means of communication in case the installer must be contacted. The contents of this screen are programmed at ALM3.7 **|7.Additional Info|** item.

5.14 Test Indicators (ALM1.0)

Performs a visual "all on" test of the indicators and LCD character blocks.

6. System operation

6.1 Alarm - Evacuation

The main purpose of a fire alarm panel is to visually and audibly notify persons in the protected area when a fire is detected.

The evacuation is also a notification operation with possibly different sound and output devices. The whole system is designed in such a way as to give the most reliable way for an Alarm/Evacuation signal. As explained earlier, each input may be allocated to the task of activating the alarm or the evacuation state. In these states the output devices that are configured to respond are also activated. Every output may be configured to respond to one or both conditions; the difference being the way that they will sound.

There are two global settings that define the sound that will be produced during alarm and evacuation. This setting may be found in the "item details" configuration screens. For outputs that are set to respond to both conditions, the evacuation takes priority over the alarm signal. For on-board devices patterns see Appendix E.

The configured patterns are different for BUS and on-board devices:

The BUS loop devices have a predefined set of sounds defined by the manufacturer. For loop devices set of sounds, see Appendix E.

The on-board devices have only on-off capability. As a consequence only an on-off pattern may be generated by the on-board electronics (by switching the connected devices on or off). For on-board devices set of sounds, see Appendix E.

The **alarm condition** may be entered under the following conditions ("alarm input" is any input that has it's "Causes Alarm" flag set):

- An alarm input is activated by an automatic detector (smoke, thermodifferential, rate of temperature rise etc).
- An alarm input is activated by a Manual Call Point with user action.
- One or more programmed alarm verification inputs are activated in a certain pattern (see Alarm Verification section 8.1.2).
- **Evacuation** is activated with one of the following ways:

- An input that has the "Causes Evacuation" flag set is activated. The mechanism is the same as above (alarms).
- With a key combination on a key display unit. The operation is initiated by keeping buttons **[1]** and **[3]** pressed for about 3 seconds. Access level 2 may be required if the installer has selected so from ALM3.2.6 **|6.Evacuation from keypad|** (see section 11.2.2).
- From Access level 2 menu ALM2.1 **|1.Evacuation start|** (see section 10.1).

During an alarm/evacuation condition the following take place:

- The general alarm indication on the display is activated.
- The onboard buzzer is activated.
- All outputs programmed to respond to alarms (and/or evacuation) are activated to their corresponding output pattern. See section 11.3 and Appendix E for information selecting the desired sound pattern.
- The alarm screen is shown on the LCD screen.

6.1.1 The alarm screen

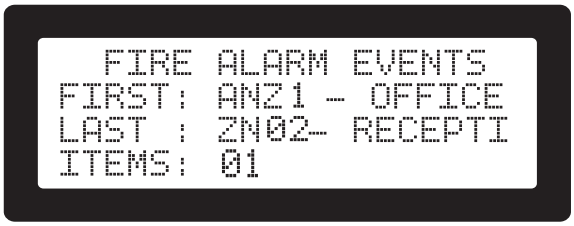


Figure 31. Default alarm indication screen

The above screen is the default indication when there are alarms under way. The screen shows the following information:

|FIRST|: The first zone/input during idle state that produced an alarm.

|LAST|: The latest zone/input that produced an alarm.

|ITEMS|: The total number of zones/inputs in alarm.

In case of an evacuation The word **|EVACUATION|** is also displayed on the bottom right of the screen.

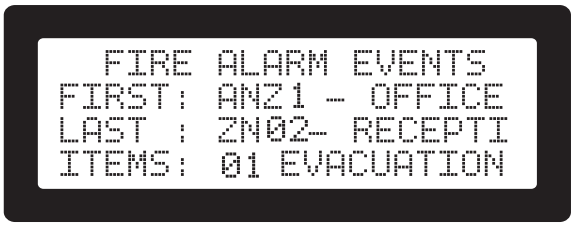


Figure 32. Default alarm indication with evacuation screen

This screen is mandatory by the EN54 directive. If the user navigates away from it during an alarm, it will be automatically re-displayed after user inactivity of 20 seconds.

6.1.2 To get information about active alarms

By pressing **[ALRM]** the Alarms list screen appears. This is a scrollable list with the input's ID and description:

Figure 33. All alarms list screen

6.1.3 Bypasses of inputs during alarm/evacuation

- Bypassing an input already in alarm will cause the corresponding indication (and possible affected output) to be deactivated.
- Bypassing **all inputs in alarm** will cause all Alarm Outputs to be deactivated.
- Evacuation activated outputs, are not affected by any disablements after the evacuation state has been activated.

6.1.4 Faults during alarm

- An input in alarm will not be affected if a fault develops on it.
- A fault on any other input will not affect an input in alarm.
- Any other system fault will not alter or interfere with the alarm condition.
- Indications of alarms take precedence of fault indications on the LCD.
- The user is informed for the existence of detected faults from the activation of the General Fault indicator and the fault relay output.

6.1.5 Other operations during alarm

The only way to completely cancel an alarm/evacuation condition is by the Reset operation (see Reset, section 6.2).

Silence operations will alter the way the user is audibly notified during alarm condition. The sound notification devices may be separately silenced from the panel's buzzer.

6.2 Reset

The system can be set to the Normal/Idle condition by using the reset operation. The operation requires A.L.2 / A.L.3 authorization.

An alarm condition from an alarm input is a latching operation; The conventional sensors will present an alarm as long as they are kept under power. The loop devices present the same behavior through the panel's logic. To reset the detectors to idle state, either the power must be interrupted for a short period for analogue conventional sensors (3 seconds is typical), or a logic reset plus some loop operations are needed for BUS devices. This operation is called "Resetting the system". The following list shows all actions during a reset:

- The power to the conventional on board zone inputs is switched off for 3 seconds forcing any activated detectors to reset.
- Any active outputs are deactivated.
- The fault relay if active is deactivated.
- All silences are cancelled.
- All active indicators except Power are turned off.
- Any Bypasses are NOT affected (including their indicators and sound notification which are reactivated).
- The loop driving circuit is reset to it's normal state (Loop powered only from "Loop Out" block terminals).
- Any loop devices that had "power up initialization errors" are marked for re-initialization (once loop driver is ready and in healthy state.

Immediately after the reset operation, the system returns to it's normal state. This of course includes detection of alarms, faults etc. Any condition that was canceled by the reset, will be reactivated as long as the cause continues to exist.

Any manual call point that is found activated after a reset will have the same effect as before the reset (eg cause an alarm condition if programmed to do so). Call points, being mechanical latching switches, cannot be reset by an electrical/communications procedure such as the "Reset". The user must ensure that the call points are manually deactivated.

If for practical reasons this is not possible, the bypass mechanism may be used to temporarily disable the active call point.

6.3 Bypasses (disablements)

Bypasses are distinguished into three categories:

- Zones Bypasses.
- Inputs Bypasses.
- Outputs Bypasses.

Please note that the term "bypass" and "disablement" are synonymous in this document.

Active bypasses are not affected by the Reset operation. To cancel an active bypass the user must use the provided configuration menus as described below.

6.3.1 Zones Bypasses

A special case of bypasses are the Zone disablements. A zone, being a collection of inputs, when disabled passes this condition to all member inputs. Also, a zone is marked as disabled when ALL member inputs are set to disabled condition. With the same logic, even if one of it's members is not disabled, the zone is automatically set as active (as per EN54-2 9.5 Disablements of addressable points).

6.3.2 Input Bypasses (Zone disablements)

An input bypass operation is performed at access level 2. It marks the input as not operational and as such any signals coming from the specific input are not detected. With an active input bypass the following apply:

- The **[BYP]** key indicator is lit.
- The buzzers on the keypads and main unit are activated once every minute.
- An alarm condition coming from a bypassed input will not be indicated on the LCD or any other Indicator.
- An active condition coming from a bypassed input will not activate any affected output.
- Any fault on a bypasses input will not be indicated and no sounders will be activated.
- The disabled output appears in the **|BYPASSES|** list (shown when the **[BYP]** key is pressed).

6.3.3 Output Bypasses

A bypass operation on an output is an access level 2 operation. It prevents the bypassed output from reaching the activated status.

With active bypasses on outputs the following apply:

- The **[BYP]** key indicator is lit.
- If the output responds to alarm or evacuation, the ***SIREN FAULT/DIS.*** indicator turns on (lit). This is to draw attention to the fact that an alarm or evacuation condition will not be announced as intended in the panels configuration.
- Any activation of inputs affecting this output will not be affected and will be fully indicated.
- The disabled output appears in the **|BYPASSES|** list (shown when the **[BYP]** key is pressed).
- Bypassing an output while active, forces it's state to inactive.
- Un-Bypassing an output with a reason to be active (affected by active inputs) will immediately activate it.

6.3.4 User Operations

To see the active bypasses, press the **[BYP]** key. This produces a list with all active disablements of Zones, Inputs or Outputs.

Figure 34. All bypasses screen

Pressing the **[BYP]** key repeatedly, cycles through alternative lists of only Zones, Inputs or Outputs. The current list is indicated on the title e.g. **|<BYPASSES: ALL>|** or **|<BYPASSES: ZONES>|**.

Pressing **[ENTER]** on an empty list shows the selector list of the corresponding items (Zones, inputs or outputs) that may be bypassed. Access level 2 or 3 pin is required.

Pressing **[ENTER]** on an item that is already bypassed and shown in any bypass list, shows the selector list but with the cursor positioned on the specific item; The **[ENTER]** key toggles the disablement state.

When the "details screen" of any item is active (see Figure 35 sample of this screen) placing the line selector on the |STATUS| line and pressing the [BYP] key. Access level 2 or 3 pin is required. Pressing the [BYP] key again toggles the bypass state of the item on and off.

The bypass selectors may also be accessed from ALM2.2 |2.Bypasses|.

Figure 35. Bypass through STATUS screen

ATTENTION: Bypasses are not considered "healthy" system states and are only used for tests or other exceptional conditions.

6.4 Silence

The silence operation is used to stop the various sounders either connected or built in to the fire alarm panel. It requires A.L.2 authorization.

The sounders belong to two distinct categories; The buzzers that are built into the system and the external devices that the installer connects to the system's outputs. The external devices may be connected to the two General Alarm Outputs, the Fault output relay, the 8 expansion relays (if installed) and on the BUS loop.

The silence menu prompts the user with the following menu (Figure 36) to select which of the above groups to silence.

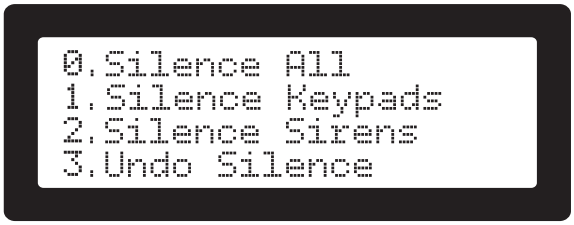


Figure 36. Silence menu screen

|0.Silence All| will stop any sound coming either from internal (buzzers) or external devices. Same result as both 1 and 2 below.

|1.Silence Keypads| will stop any sounding onboard devices (buzzers) on keypads and main board.

|2.Silence Sirens| will stop only externally connected devices on Alarm and Fault relays.

|3.Undo Silence| will cancel any silence already active.

To perform a silence operation:

- Press **[SLNC]**: The access level code request appears.
- Enter A.L.2 code: The Silence Menu appears.
- Press buttons **[0]**, **[1]**, **[2]** or **[3]** according to what action is required.

During an active silence condition the following apply:

- The **[SLNC]** button/indicator is lit.
- If the operation effects any active output that responds to alarms or evacuation the ***SIREN FAULT/DIS.*** indicator is lit on the panel
- The Fault relay is deactivated (if silence Sirens is in effect).
- Any silencable, active outputs (including The General alarm outputs) are deactivated (if silence Sirens is in effect).
- The on board buzzers are deactivated (if silence keypads is in effect).
- Any new event that would trigger a sound notification will cancel the silence condition.
- Alarms and faults are indicated without modification.
- The silence will produce a reminder sound of about 3 seconds every 1 minute.

6.5 LOG (events)

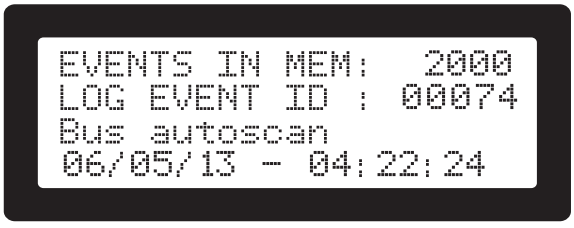


Figure 37. LOG (events) screen

The above screen shows the log events from the main board. To see the log events press the **[LOG]** button. The screen shows the following information:

|EVENTS IN MEM|: Number of stored events. The maximum capacity for stored events is 2.000.

|LOG EVENT ID|: Every event has a unique incremental serial ID number. The number on display is the ID of the selected event as shown in the last two LCD lines.

7. Faults & Monitoring

Most of the system functions, inputs and outputs are fully supervised. When a subsystem is found to be out of accepted working parameters or not working, a fault condition is raised and the appropriate indications are displayed.

7.1 Loop health monitoring

Shield's bus loop architecture provides an advanced very reliable and highly flexible system for interconnecting the loop devices. Part of this system is the ability to recover from faults on the installed wires with the minimum or no loss of detectors. The key characteristics to this system are:

- Ability to monitor the continuity of the loop cable.
- Ability to power the loop cable from both ends if needed.
- Ability to sense a short on the cable and isolate the shorted section.

The panel needs to support these features by implementing the following structure and logic:

There are two - two pole connectors, the "Primary Loop Output" (marked "Loop Out" on the PCB) and the "Loop Return/Secondary output" (marked "Loop In" on the PCB) (see Figure 1).

The healthy state of the loop uses the Primary output to feed power to the loop and send/receive commands and data to the installed devices. The "Loop return" is used only to monitor the health of the cable (both positive and negative conductors).

If an open circuit is detected then the loop driver enters the "Open State". Both connectors are used as Outputs(/Inputs) for power and communications. The system goes into fault and a reset is required to bring the system back to normal state. During this state any short on the primary or secondary connectors will trigger a full isolation of the bus and a "hunt" for a healthy section that may have the power restored. If no such path is found the loop is powered down, the fault is indicated and a reset (of course after a repair of the wiring) is needed.

The same protection for shorts is active during the normal operation of the loop. If any short is detected, the loop is powered down and the same "hunt" begins for a healthy section. This is possible with the uses of BUS isolator devices. One isolator device on the loop, splits it in half. The half with the shorted wires is isolated from the other half. This way the panel may power the healthy side and recover the devices that are connected there. A "Loop shorted" fault condition is raised. If more than one isolators are installed in one loop, they form loop sectors with one isolator on each side. Each sector may sustain a short and the system will only loose the devices on the shorted sector. These lost devices will raise at least a "lost device" fault as they will be unable to communicate with the panel during the periodic polling sequence.

TIP: From the above description is should be clear that the best practice is to install as many isolators as possible. They help form small section of the loop minimizing device loss during a short.

7.2 System Fault, Watchdog, Configuration integrity

The Mikro panel implements a self checking and data integrity mechanism for detection of system faults. This sys-

tem consists of the following:

Firmware execution

Monitor of the integrity of the main microprocessor and firmware execution (watchdog). When an error is detected, the system resets and activates the System fault indication. The fault relay, local buzzer and General fault as well as the system fault indicators are activated. If the panel manages to restore proper operation, the system fault is latched and remains active until reset by the user at access level 2 or 3.

Site specific data (configuration)

The integrity of the site specific data (configuration) is checked once per hour. The system's configuration is protected with a combination of control data, CRC verification and strong signature of the configuration block, making it almost impossible to have undetected configuration corruption. Upon detection of this fault the system activates the fault relay, local buzzer, General fault and the System fault indicators. All controllable outputs are disabled and no new activations are performed. This condition applies until the user performs a reset operation. After the reset operation a valid configuration is expected to be found in memory. If the configuration error persists, the panel will need reprogramming (access level 3).

ATTENTION The occurrence of this fault in a configured and working panel is a strong indication of a hardware fault. A recurring fault of this kind is a signal that the main PCB is probably faulty and needs replacement.

IMPORTANT Every new panel that the configuration data have not been updated at least once from access level 3, will always produce a system fault. The state is similar to the Performing a reset operation (access level 2 or 3) will perform a system restart. This is normal with the intention of limiting the operation of a panel that has not been properly commissioned.

The architecture of the Mikro uses two microprocessor units. This permits the cross check of each microprocessor's health. Including the built in watchdogs, the Mikro panel implements a total of four supervising systems.

7.3 BUS loop devices faults

All devices on the loop are endlessly and in turn "spoken to" by the panel. This never ending cycle is called "polling". Every polled device is expected to provide an answer with specific data regarding it's state. Any device that does not respond is addressed in a predefined special way to discover if it is present and if so what the fault/problem is. The results from this procedure, either being "device lost" or some other fault will trigger the fault indicators. There are some faults that are automatically restored (eg device presence) and some that need a system reset to be restored (after they have been fixed).

7.4 On board Zone and Relay Faults

The two on-board zone inputs, two Siren relay outputs, 8 expansion board relays and all BUS loop devices are supervised for proper operation. An End Of Line (EOL) resistor must be used with all monitored inputs/outputs. See Figure 38 for proper input and output termination, as well as Shield's manuals for each installed device.

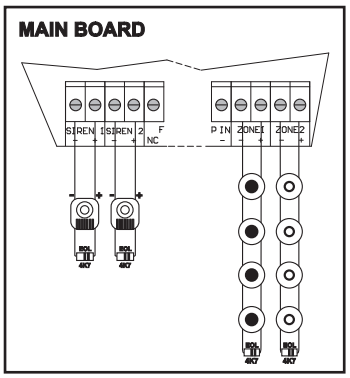


Figure 38. Analog input and output zones termination

The following table (Table 5) summarizes the resistance ranges and their effect on the system. Please note that all values given are for un-terminated inputs/outputs (No EOL device connected).

Zone Inputs Resistance Ranges	
0 up to 15 Ohm	Short / Fault
25 up to 600 Ohm	Alarm or Active
1000 up to 7 KOhm	Normal
10K and up	Open / Fault

Relay Outputs Resistance Ranges	
0 up to 400 Ohm	Short / Fault
1600 up to 7 KOhm	Normal
10K and up	Open / Fault

Table 5. System's resistance ranges

A zone input or relay output that is outside the normal operating conditions will raise a fault which:

- Will activate the General Faults LED indicator.
- Will activate the General Faults relay.
- Will be automatically indicated on the faults list screen (if no alarm condition is active).
- Will be indicated in a variety of auxiliary screens upon user operation.

The fault's list is shown in Figure 39.

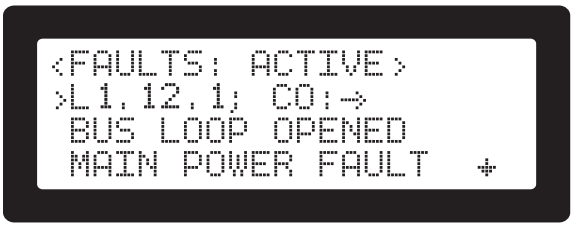


Figure 39. Fault's list screen

7.5 Earth Fault

An earth fault is generated when any part of the Loop, Zones, Relays or Auxiliary Power circuitry comes in contact with the protective earth of the installation. The fault will:

- activate the General Faults LED indicator.
- activate the General Faults relay.
- be automatically indicated on the faults list screen (if no alarm condition is active).

The Earth fault detectable resistance is below 500 Ohm.

It is very important to connect a proper protective earth to the mains terminal block connector as shown in Figure 4. If this connection is not made the Earth fault circuit is unable to operate as designed.

7.6 Power Fault, Battery fault

Power conditions are monitored on the main power supply as well as on the optional auxiliary relay board's PSU.

There are 4 types of power related faults:

- Total PSU failure: No power is coming into the system by the affected PSU.
- Mains Power Failure: Mains power is not present. The PSU is providing power from the backup batteries.
- Battery failure: The PSU has disconnected or totally destroyed batteries. Power is provided by the Mains power path.
- Batteries need replacing: The connected batteries have increased internal resistance. This is a state of the batteries in which limited power can be stored and provided if needed. Mikro PSUs have electronics that will detect this condition and raise a fault. This fault is usually caused by aged or abused batteries.

The internal battery resistance that will trigger the fault is about 3 Ohms.

Power faults will:

- activate the General Faults LED indicator.
- activate the General Faults relay.
- be automatically indicated on the faults list screen (if no alarm condition is active).

8. Features

8.1 Alarm Verification, Day/Night Operation & Sensor Sensitivity

In order to minimize false alarms the fire panel implements three mechanisms that effectively change it's sensitivity to enter the fire alarm condition:

- Varying sensitivity of the BUS sensor devices
- Alarm verification
- Day Night operation

8.1.1 BUS sensitivity change

Each BUS sensor device has the means to measure the content of smoke (or heat) in the air. An alarm is generated when a threshold is exceeded. Since this threshold may be programmable, by increasing it the system becomes less sensitive. Each sensor may be configured with two sensitivities, one for day and one for night time. The switch between the two sets happens automatically at pre-programmed times (see section 8.1.3 "Day/Night Operation").

Programming
Every BUS sensor has at least two sensitivity thresholds, one for day and one for night. The multi-sensors have more than one set to accommodate for the different sensing elements (e.g. smoke + heat).

The settings are labeled:

|DAY HT SENS| for Heat sensors (temperature)
|NIGHT HT SENS| for Heat sensors (temperature)

|DAY OPT SENS| for Optical sensors (smoke density)
|NIGHT OPT SENS| for Optical sensors (smoke density)

|DAY ROR SENS| for Heat sensors (rate of rise)
|NIGHT ROR SENS| for Heat sensors (rate of rise)

|DAY SENS| for Single Optical sensors (smoke density)
|NIGHT SENS| for Single Optical sensors (smoke density)

and may be found in the item's property page. For inputs this may be accessed through ALM.3.2 (list of input devices) or **[i] [3]** buttons (from main screen).

8.1.2 Alarm verification (Intellizone)

The concept of the first one, Alarm Verification, is: To enter the Alarm condition, after the reception of an alarm signal ("first alarm") a Second Alarm signal must be received. This signal may be from the same or a another zone/sensor. It must be received in a predefined time after the First Alarm signal (5 min). The First Alarm signal can only originate from any input that has the "Alarm Verification" configuration active. The second Alarm Signal may originate from the same sensor/zone that created the first alarm signal only after an initial inhibition time has passed (up to 30 sec).

Please note that the terms "Alarm Verification" and "Intellizone" are treated as synonymous in the following sections.
The Mikro alarm verification system complies with the EN54-2 7.12 type b.

System Operation - Alarm verification (Intellizone)
Each zone or input may be programmed to be an "Alarm Verification" input (from ALM3.2). The sum of these inputs form the alarm verification group.

The operation of this system is as follows:

When an alarm condition is detected on an Alarm Verification input (First Alarm):

The "same input inhibit" Delay is activated (can be set from ALM3.2.5, up to 30 seconds).

- The "automatic pre-Alarm Cancel" Delay (5 minutes) is activated.
- The alarm is indicated on the LCD and Pre-Alarm Indicator.
- The keypad and system buzzers produce a notification sound.
- The Alarm Outputs (e.g. Main Siren Relays) are NOT activated (General Alarm condition is not entered).
- Any outputs that are configured to respond to pre-Alarm condition are activated
- After the "same input inhibit" Delay time, any conventional automatic detectors are reset.
- During the above delay ("same input inhibit") any other input except the initial may cause the Second Alarm signal (see below).
- The Alarm verification will remain active for the remaining of the 5 minutes before the first alarm is completely canceled.
- During the above delay (automatic pre-Alarm Cancel Delay) any input including the initially triggered may provide the Second Alarm. Also the ***PRE ALARM*** indicator will remain on (lit).

The Second Alarm will:

- Activate the General Alarm Condition.
- Activate any outputs that respond to the Alarm condition (including the main siren relays if programmed so).

The Alarm Verification feature may be disabled/re-enabled in Access Level 2 menu, ALM2.8 item **|8.Alarm Ver Cancel|**. If the system has been disabled the main screen will indicate so by displaying **|ALARM VERIFICATION DISABLED|**.

Figure 40. Alarm Verification Disabled screen

Zone operation with Alarm verification
There is a minor variation to the way the system responds if a zone is set to operate with alarm verification:

- Any input that belongs to a zone with active Alarm Verification, inherits the Alarm verification.
- The "same input inhibit" delay affects all inputs of the same zone. For example: Sensor1 (names are only for this example) and Sensor 2 belong to the same zone, namely Zone 3. Alarm verification is configured for Zone 3. The system enforces this to Sensor 1 and Sensor 2. If an alarm signal is generated by Sensor 1 (consequently from Zone 3 also) and before the "same input inhibit" timer expires another alarm is generated by Sensor 2, no alarm will be produced. The explanation is that alarm events appear as originating from the Zone, which produced the second alarm while it was inhibited.

8.1.3 Day/Night operation

The idea behind Day/Night operation is that in some installations the monitored environment changes during the 24hr period for each weekday. For example a sensor in an office smoking room must be a lot more tolerant to smoke during work hours. Mikro fire panel, allows the definition of one period for each day that is declared as "Day". During this period the system is using the less sensitive thresholds for the sensors and (if configured) the alarm verification system.

The alarm verification, may either be controlled by the Day/Night operation, or be left permanently on or off. On top of that, it may be disabled by the user with an access level 2 operation (ALM2.8 **|8.Intellizone Cancel|**).

System Programming
The alarm verification, day/night and sensor sensitivity may be programmed and combined in a number of ways to meet the requirements of each installation. The menu items below control this system:

- The **|ALARM VERIF|** option in each input's property screen.
- The Day and Night sensitivities in each sensor's property screen.
- The Alarm verification and Day/Night settings in ALM.3.2.5 **|5.Day/Night, Al.Verif.|**.

The rules that the system follows are:

- For Day/Night to be active at least one day must have the ON/OFF flag set to ON (**1**) (ALM3.2.5).
- The time period defined by start time and end time corresponds to the DAY. During this time reduced sensitivity is desired.
- The Alarm Verification is considered ON if one or both of the **|Analog Time|** and **|Addr Time|** is anything but 0 (these are the "initial inhibition times" mentioned above).
- If the ALM3.2.5 **|DAY->AL.VERIF|** setting is ON (**1**) then the Alarm Verification follows the day/night schedule (activated during DAY time). If set to **0** (OFF) then the alarm verification works independently and is always on or off according to the settings of **|Analog Time|** or **|Addr Time|**.
- If all the Day/Night ON/OFF flags are set to **0** (which means Day/Night is OFF) the **|DAY->AL.VERIF|** setting is ignored, as there is no day/night schedule for the Alarm Verification to follow.

To program the system:

- Enter ALM.3 by pressing **[ACC]** key: Pin request screen appears.
- Enter A.L.3 pin: ALM.3 appears. Factory default pin for AL3 is **"3333"**.
- Press key **[2]** to select menu item ALM3.2 **|Loop/Device Conf|**, and then press key **[5]** to enter submenu item ALM3.2.5 **|5.Day/Night,Al.Verif|**.
- Use the arrow keys to navigate through the 4 available screens. Press **[ENTER]** to modify any required parameters. Press **[ENTER]** on the last one to save any changes made or **[CLR]** to cancel.

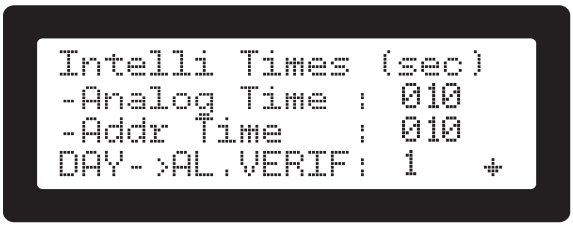


Figure 41. Day/Night, Alarm Verification first screen

On the first screen use **[ENTER]** to advance through the three available settings.

The available parameters are:

|Intelli times (sec)|: Values: 0 to 30. **0** signifies system is OFF. This is the time that a second alarm will be ignored from the same sensor that created the first alarm. There are two settings one for on board inputs and one for BUS loop input devices

|Analog time|: Seconds as described above that applies to all inputs from the on board inputs (ANZ1, ANZ2, INP1, INP2 and all logical zones)

|Addr time|: seconds as described above for all inputs on the BUS loop.

|DAY->AL.VERIF|: Values **0** (OFF), **1** (ON). If the alarm verification follows the Day/Night schedule. See description above.

The second and third screens have identical lines, with every line corresponding to a day of the week:

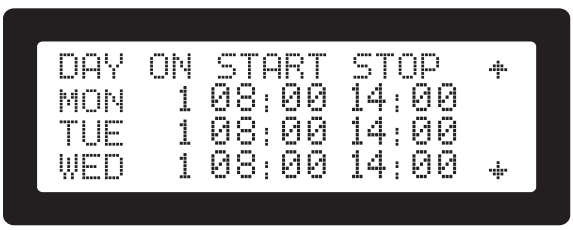


Figure 42. Day/Night, Alarm Verification second screen

- Use the arrow keys to select the required field. Press **[ENTER]** to modify it.
- Make sure the Start Time is before the End time or the system will reject it.
- Acceptable time ranges are 00:00 to 23:59.
- Set the ON/OFF flag to **1** to activate the Day/Night operation for the specific day.

TIPS:

- Long Pressing **[0]** or **[1]** will deactivate/activate all days at once.
- Pointing at the on/off flag of a line and pressing **[4]** will copy the settings of the previous day to it.
- Pointing at the on/off flag of a line and pressing **[7]** will copy the settings of the next day to it.

This way you can program for example the first day (MON) and then keep pressing **[Down Arrow]** and **[4]** to easily set the same times to the six remaining days.

8.1.4 Indications and user overwrite

Any time the Alarm verification is active the indication ***DELAY ACTIVE*** on the panel will be lit (yellow color).

The user may disable the alarm verification from AML2.8 **|8.Alarm Ver Cancel|**. In this case the indicator produces one short flash every second and the display shows the message **|ALARM VERIFICATION DISABLED|**.

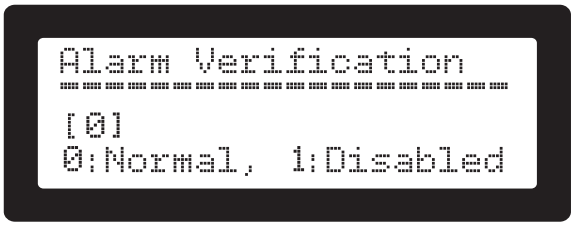


Figure 43. Alarm Verification Disabled

The Day/Night operation is indicated on the display's main screen. The bottom right corner will either have:

- **|DAY|** for Day/Night active and in day mode
- **|NIGHT|** for Day/Night active and in night mode
- None of the two when this feature not used.

8.2 Device Identification

This operation is supported in the following screens: ALM1.1 **|1.Loop Overview|**, ALM1.5 **|5.Loop Devices|**, ALM1.6 **|6.Contamination LVL|**.

The system provides an easy device identification method. If the device under the cursor features a LED controlled from the panel, then pressing on ***SYSTEM FAULT*** indicator will turn on it's LED. This is of great value as it minimizes the margin for errors and thus waisted time and user/installer frustration in systems with multiple and visually identical devices. It is also invaluable for verifying the address against the actual placement of installed devices (e.g. is the smoke detector with address 120 at the building's entrance as required?). The alternative would be to remove the device from it's base and use the field address programmer, a time consuming and sometimes difficult job that interrupts normal system operation. The selected device continues to operate normally during the LED activation. The system will turn off the selected device's LED if one of the following conditions apply:

- After 180 seconds (3 minutes) of it's activation.
- If the user presses on ***SYSTEM FAULT*** indicator again on an activated address/device.
- If the user presses on ***SYSTEM FAULT*** indicator on a new address/device.
- If the user presses on ***SYSTEM FAULT*** indicator on an empty address/device (Only in Loop Overview screen).
- The user performs a system reset using the **[RST]** button.
- Devices with activated addresses are indicated by the **|o|** character on the LCD.

If the system is left without user activity, the screen will time out from the one that activated the LEDs and the main screen (or any other with higher priority) will be automatically shown. This operation will not switch off the selected LED.

If the user re-enters one of the three supported screens (as shown at the beginning of this section) after an automatic screen timeout any previous LED activation will be cancelled.

8.3 Walk Test (ALM2.7)

This function is not compliant to EN 54-2 clause 10 "Test Condition".

A walk test operation permits a single person to test multiple installed devices. The test is performed while the system operator (with Access level 2 privileges) walks to each sensor or input device and activates it. As result a short activation of pre-selected outputs confirms the successful activation of the input (confirmation signal).

During the walk test the whole of the system is in **"No operational state"** (A fire or evacuation will not be produced). It is thus important to exit the test condition as soon as the test finishes. There is also a timer function that protects the system from been left forgotten in this state ("Walk test timeout", see Figure 44).

The pre-selected outputs are a subset of the available outputs and are assigned to the "Walk test" output group. For this purpose all outputs have a "walk test" option at their programming screen in Access level 3.

During the walk test activation and to minimize possible disturbance, the user may choose to perform a silent test by excluding sounders ("Sounders mode" set to 0). In this case only the main unit's buzzer as well as any installed beacons (flashers) are used for the confirmation signal.

The confirmation signal for sound devices, is the same pattern as the global alarm pattern (set in ALM3.3).

To perform a walk test:

- Enter ALM.2 by pressing **[ACC]** key: Pin request screen appears.
- Enter A.L.2 pin: ALM.2 appears.
- Select menu item ALM2.7 **|7.Walk test|**: Press key **[7]**.
- Enter "Walk test timeout" using keypad and press **[ENTER].**

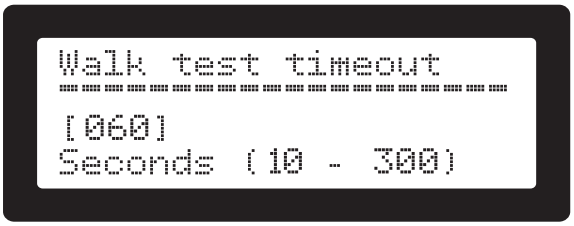


Figure 44. Set Walk Test timeout screen

- Enter "Sounders mode": **1** for active sounders, **0** for inactive and press **[ENTER]**.

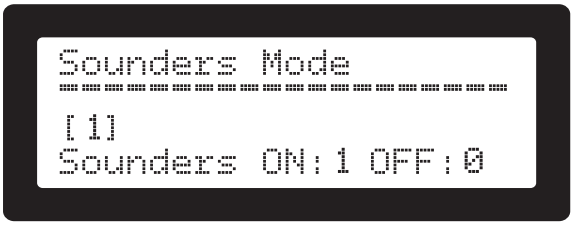


Figure 45. Sounders Modes selection screen

The system is now in test mode and the ***SYSTEM FAULT*** indicator is lit yellow. The screen shows the remaining time is seconds before automatic termination of the walk test. Every time a new input activation event is detected, this timer is automatically reset to the initial value as set above. The user may press **[CLR]** anytime to terminate the test and return to normal operation.

Figure 46. Walk Test in progress screen

8.4 Periodic Test Configuration (ALM2.5)

The installer may program the Mikro fire panel to create a reminder at a preset time interval that the system must be checked. The user performs a system check and at Access Level 2 (A.L.2) confirms the good operation of the system. This action is kept in the system log along with the date of the event.

The reminder screen is shown in Figure 47.

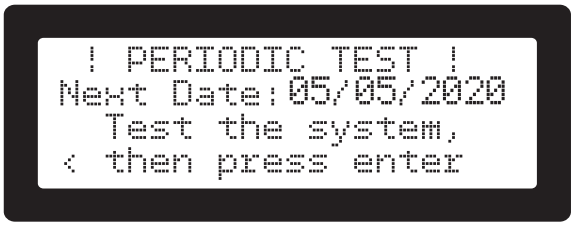


Figure 47. Access Level 2 Periodic Test screen

The system is described below:

The installer activates in ALM3.6 **|6.Periodic test|** the time of the day and every how many days that reminder will get automatically activated (see Figure 48 below).

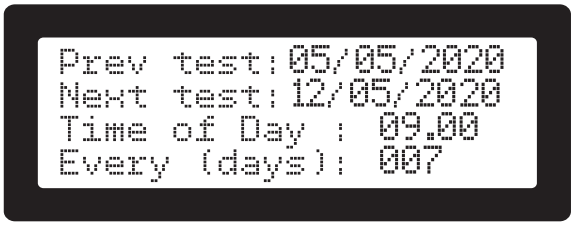


Figure 48. Set Periodic Test screen

Once the pre-programmed period expires the system displays the reminder screen and sounds the notification buzzers (see Figure 49 below).

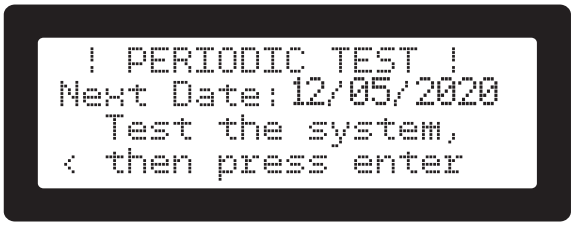


Figure 49. Periodic Test screen

The user must perform a system test (possibly a walk test and/or any other test dictated by the installation components).

Once the test is satisfactory, the user must either press **[ENTER]** in the reminder screen, or use menu item ALM2.5 **|5.Periodic Test|** to confirm the good operation of the system. Upon confirmation a message screen as shown in Figure 50 confirms and renews the automatic reminder timer.

Figure 50. Periodic Test confirmation screen

The user may perform a system test anytime before the test period expires. He/she then uses ALM2.5 **|Periodic Test|** menu to review the automatic notification for the number of days programmed in ALM3.5 **|5.Periodic test|**.

In ALM3.6 **|6.Periodic test|** screen, the user may press the **[Left arrow]** and **[Right arrow]** keys to switch between the Previous test date and the Next programmed test date.

8.5 Configuration Backup/Restore

The Mikro fire panel includes a system that allows an installer to experiment or test a setup without loosing the previous active configuration. This is implemented through a backup/restore system to on-board memory. Someone can freely reset to defaults, autolearn, modify anything he wishes and then restore the previously saved configuration; as long as she does not overwrite the saved one.

A user may:

- Backup the active configuration in on-board memory through ALM3.9, **|9.Backup Config|**.
- Restore a previously saved configuration from ALM3.0, **|0.Restore Config.|**.

9. Access Level 1 Menu

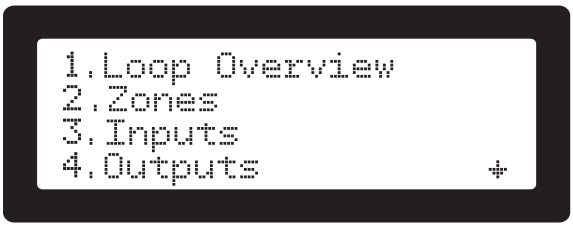


Figure 51. Access Level 1 menu screen

In Access level 1 (A.L.1) the user may request through the level's menu a number of information screens. The A.L.1 menu is shown by pressing the **[i]** button while on the main screen (Figure 51). The items of the A.L.1 menu is as follows:

1. Loop Overview (see section 5.4)
2. Zones (see section 5.6 & section 5.8)
3. Inputs (see section 5.7 & section 5.8)
4. Outputs (see section 5.9)
5. Loop Devices (see section 5.10)
6. Contamination Levels (see section 5.11)
7. Power levels (see section 5.11)
8. System info (see section 5.12)
9. Contact info (see section 5.13)
10. Test Indicators (see section 5.14)

Pressing [i] on some screens will display a help screen with useful related information.

10. Access Level 2 Menu

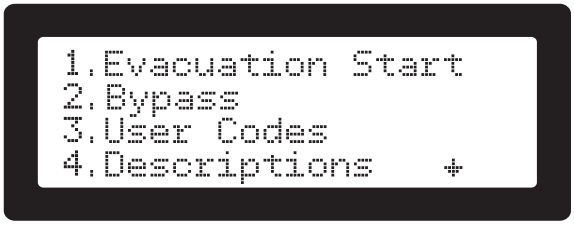


Figure 52. Access Level 2 menu screen

The items of the A.L.2 menu is as follows:

1. Evacuation Start (see section 10.1)
2. Bypasses (see section 6.3)
3. User codes (see section 10.2)
4. Descriptions (see section 10.3)
5. Periodic Test (see section 8.4)
6. Time/Date Adj. (see section 10.4)
7. Walk Test (see section 8.3)
8. Alarm Verification Cancel (see section 8.1.4)

10.1 Evacuation (ALM2.1)

This menu provides a direct control to initiate a system evacuation. As described in system operation. the evacuation will activate all outputs that are configured to respond to evacuation.

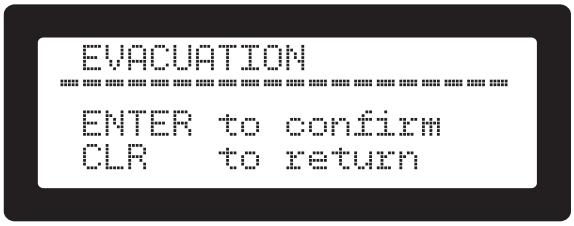


Figure 53. Set global evacuation from keypad screen

Pressing **[ENTER]** confirms the action and the evacuation is started. The display units show the screen shown below.

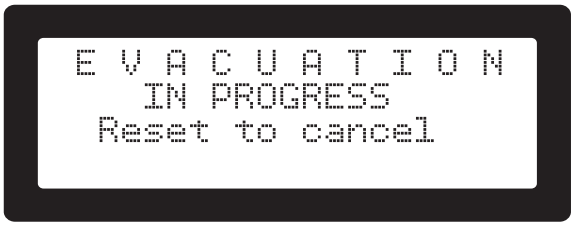


Figure 54. Set global evacuation from keypad screen

To cancel an evacuation the system must be reset with the [RST] button. This is an Access level 2 or 3 operation.

10.2 User Codes (ALM2.3)

Figure 55. Set Master Code screen

Shows or Changes the users' codes. The factory Default Master code is 2222. You need A.L.2 access to be able to change the pin. With the **[Bottom Arrow]** and **[Up Arrow]** you can navigate though the users.

To change the existing PIN code press **[ENTER]** at the above screen. Enter the new pin and press **[ENTER]**. The description of the user may also be changed from the default "SHIELD FIRE".

10.3 Descriptions (ALM2.4)

Descriptions are distinguished into three categories:

1. Zone Descriptions
2. Input Descriptions
3. Output Descriptions

Selecting one of the categories (e.g. ALM2.4.2 |Input Descriptions|), the screen shows a scrollable list of all installed devices along with their description. Selecting an input (with the up/down arrows) and pressing **[ENTER]** the input's description editor will appear. See section 5.2.1 for help on data entry.

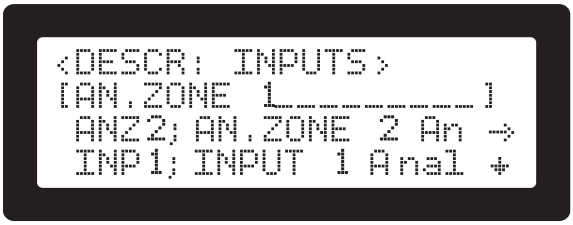


Figure 56. Edit input description example screen

10.4 Time/Date Adj. (ALM2.6)

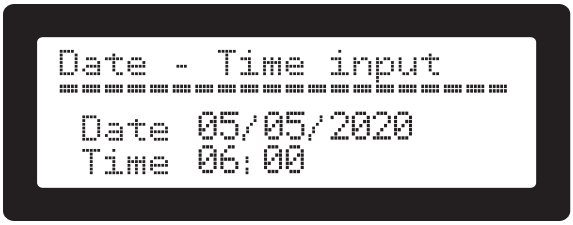


Figure 57. Time/Date adjust screen

Entering the screen will show the current date and time. To perform changes press **[ENTER]**. Enter Date, Month, Year, Hours and Minutes pressing **[ENTER]** after each entry. After all 5 data fields have entered, press **[ENTER]** to finalize and accept changes, or **[CLEAR]** to cancel.

On initial system power up, the real time clock is not set. In this case all display units present a scrolling reminder of this condition on the main system screen.

11. Access Level 3 Menu

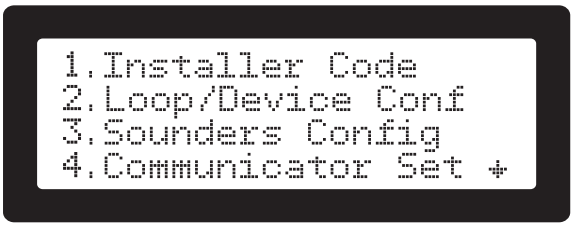


Figure 58. Access Level 3 menu screen

The items of the A.L.3 menu is as follows:

1. Installer Code (see section 11.1)
2. Loop-Device Configuration (see section 11.2)
3. Sounders Configuration (see section 11.3)
4. Communicator Settings (see section 11.4)
5. TCP/IP Options (see section 11.5)
6. Periodic Tst Conf (see section 8.4)

7. Additional Info (see section 11.6)
8. Restore to Default (see section 11.7)
9. Backup Configuration (see section 11.8 & section 8.5)
10. Restore Configuration (see section 11.9 & section 8.5)

11.1 Installer's code (ALM3.1)

Shows or Changes the installer's code. The factory Default code is 3333. You need A.L.3 access to be able to change the pin.

Figure 59. Installer's code screen

To change the existing PIN code press **[ENTER]** at the above screen. Enter the new pin and press **[ENTER]**.

11.2 Loop Device Configuration (ALM3.2)

The items of the ALM3.2 menu is as follows:

1. Zone Configuration (see section 5.6)
2. Input Configuration (see section 5.7)
3. Output Configuration (see section 5.9)
4. Group Configuration (see section 11.2.1)
5. Day/Night & Al.Ver (see section 8.1)
6. Evacuation from keypad (see section 11.2.2)
7. Expansion Relay (see section 9)
8. Loop Autolearn (see section 11.2.3)
9. Add Loop Device (see section 11.2.4)
10. Remove Loop Device (see section 11.2.5)

11.2.1 Group Configuration (ALM3.2.4)

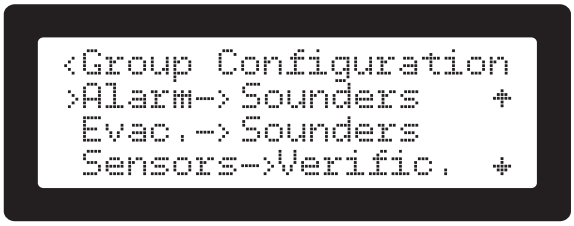


Figure 60. Group configuration screen

The purpose of the Group Configuration operations is to make easier for the installer the initial configuration of the system. A number of operations that affect more than one item create a starting point for further tuning of the system. As an example, one may define all of the smoke sensors to generate alarms without having to perform this operation on each individual input. Group operations override any existing configuration of the targeted items; further fine tuning is possible by individual item configuration.

The desired operation is selected with the up/down arrow keys and executed by the **[ENTER]** key. A short explanation is provided by pressing the **[i]** key. Each group operation may be used for activation or deactivation of the corresponding option. For example the installer may configure all sounders and beacons to be active or inactive during the general alarm condition. This is performed by either selecting **[1]** for activation or **[0]** for deactivation (see Figure 61). Upon successful completion of the operation a short verification message is shown.

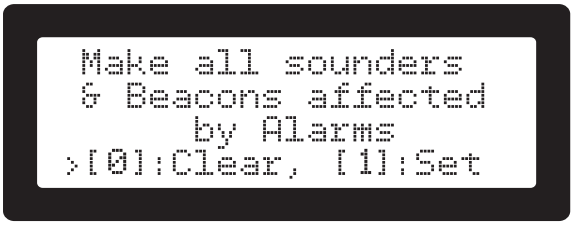


Figure 61. Sounders alarm group configuration screen

The available group operations are listed below:

|Alarm → Sounders|: Program all sounder and beacon (flashers) loop devices to activate or not when an alarm condition is active.

|Evac. → Sounders|: Program all sounder and beacon (flashers) loop devices to activate or not when an evacuation condition is detected.

|Sensors → Verific.|: Set all smoke sensors to belong to the alarm verification group of inputs. See "Alarm Verification" section 8.1.2.

|Sensors → Alarm|: Set all smoke sensors to cause (or not) the alarm condition.

|Sensors → Evac|: Set all smoke sensors to cause (or not) the evacuation condition.

|Call P. → Alarm|: Set all manual call points to cause (or not) the alarm condition

|Call P. → Evac|: Set all manual call points to cause (or not) the evacuation condition.

|Zones → Verification|: Set all logical zones to belong to the alarm verification group of inputs. See "Alarm Verification" section 8.1.2 for the behavior of logical zones in the alarm verification system.

|Zones → Alarm|: Set all logical zones to cause (or not) the alarm condition.

|Zones → Evacuation|: Set all logical zones to cause (or not) the evacuation condition.

There are also 4 Group Operations that may configure all installed devices with remote LEDs in one operation. Individual item may be further configured after this operation to best fit the intaller's requirements.

|ALARM → REM LED|:

[0]: Configures all Remote LEDs so they are not activated when the panel enters the General Alarm state.

[1]: Configures all Remote LEDs so they are activated when the panel enters the General Alarm state.

|EVAC → REM LED|:

[0]: Configures all Remote LEDs so they are not activated when the panel enters the Evacuation state.

[1]: Configures all Remote LEDs so they are activated when the panel enters the Evacuation state.

|LOCAL → REM LED|: .

[0]: Configures all Remote LED outputs so each one is not affected by the activation state of the sensor that it belongs to.

[1]: Configures all Remote LED outputs so each one is activated when the sensor that it belongs to is activated.

|AUDIO DEV → REM LED|:

[0]: Configure all Remote LED outputs as Visual/Other outputs.

[1]: Configure all Remote LED outputs to belong to the audio notification group. This makes them follow silence and "alarm devices Bypasses" related operations.

11.2.2 Evacuation from keypad (ALM3.2.6)

This option controls the evacuation from the keypad. If enabled, pressing keys **[1]** and **[3]** for 3 seconds, will initiate an evacuation. If disabled, the same key press will request an access level 2 pin for the same operation.

Figure 62. Evacuation from Keypad activation screen

11.2.3 Loop Autolearn (ALM3.2.8)

The auto-learn procedure scans the loop for all installed devices and saves them in the system configuration. The procedure does a full reset to defaults before the scan. Any found devices are registered and configured with default settings. These settings are presented in Appendix E. As a quick guideline:

- All automatic sensors are set to trigger an alarm.
- All manual call points will cause evacuation.
- All visual and audible outputs will respond to alarms and evacuation.

The autolearn operation is convenient for new installations; it is not recommended for an already configured system as it will reset all programming of inputs/outputs. The **|Add loop device|** and **|Remove loop device|** options are more convenient for an already set-up loop. Also the configuration backup and restore feature may be used if an installer wants to experiment with the autolearn (or any other aspect of programming). See also ALM3.2.0, ALM3.2.9, ALM3.9 and ALM3.0.

To activate autolearn, select the ALM3.2.8 **|8.Loop Autolearn|** and press **[ENTER]**. A warning / verification screen is displayed; pressing **[ENTER]** on this screen confirms the current configuration deletion and the start of an autolearn cycle. During this cycle the bottom line of the LCD displays the progress of the procedure. Although the keypad remains available for a variety of operations, it is advised to let the autolearn complete before any user operation.

11.2.4 Add loop device (ALM3.2.9)

Through this menu the installer may add a known type of an BUS loop device to a particular address. All supported BUS device types are presented in a scrollable list. The installer must select with the up/down keys the desired type and press **[ENTER]**.

TIP! An easy way of selecting the desired device type is with the aid of filtering; pressing [1] will cause the system to request from the used a string of characters. These characters will be searched in all known types and a new filtered list will be created based on the user search string. The search characters may be at any place in the device's type.

After the desired device type has been selected with **[ENTER]**, the system requests the target address. The first available address is already filled in the entry field. The user may choose to manually enter any valid address she wishes. If the address is in use an error message will be displayed and a new address will be requested. Pressing **[CLR]** repeatedly will cancel the whole operation.

Adding and removing devices by hand may create some lists where the addresses are out of order. This is normal and may be avoided by always adding new devices at the end of the installed address range when this is feasible).

11.2.5 Remove loop device (ALM3.2.0)

This operation will remove an installed device from the system configuration. A list with all devices is created and the user selects with the up/down arrow and **[ENTER]** keys the device to be removed. A verification screen is presented where **[ENTER]** confirms the removal while **[CLR]** cancels it.

11.3 Sounders Configuration (ALM3.3)

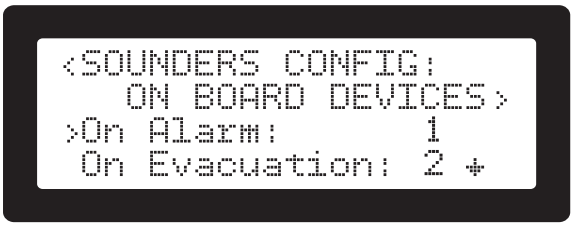


Figure 63. On-board devices configuration screen

See Appendix E for the on-board devices desired sound configuration.

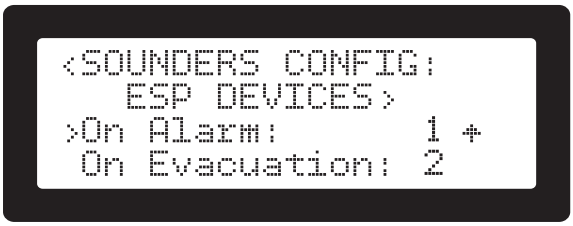


Figure 64. BUS devices configuration screen

See Appendix E for the Shield devices desired sound configuration.

11.3.1 Sounders and beacons

There are two ways to activate sounder and beacon devices on the loop: cascaded activation and simultaneous activation.

Cascaded activation

This mode of activation addresses one device at a time. The Mikro panel gives priority to output devices when an activation is needed. Since multiple addresses need to be activated, the total time required depends on the number of output devices with the rate being about 35 devices per second. In some cases this cascaded effect may not be desired. The simultaneous activation, although a bit more complicated to implement, addresses this issue.

Simultaneous activation (group activation)

The Mikro makes possible the simultaneous activation of multiple sounder and beacon devices on the loop.

The devices may belong to only one group, set by dip switches on the devices. In order to keep the programming as simple as possible the installer must follow the rules and plan the addressing scheme as described below:

- Each output, may belong to one primary group (from 1 to 15).
- Every primary group must have a "header" device in the address range 112 to 126.
- The group is activated when the group header device is activated.
- By convention group address 112 corresponds to group ID 1, address 113 to group ID 2 and so on. "Group IDs"

are "group addresses" - 111.

- Device groups are activated with the fixed sound pattern and level of the installed devices.

To create a group (with group ID 15 as an example):

- Use the devices dip switches to set their address and group.
- Install the first sounder device on address 126 and set it's group address to 0. This is the "Head device" of the group.
- Install the rest of the group devices to addresses below 112 and set their group address to 126. These form the "group member devices".

Now, every time that address 126 is activated all the devices belonging to this group will simultaneously activate.

Notes

- There are 15 groups in total, with group addresses ranging from 112 to 126. In the above example any one of these groups may had been used. Just remember that the "head device" must always have an address from 112 to 126 (and a group address of 0). The "member devices" must have any address below 112 and a group address that matches the address of the "head device".
- During "Rapid activation" of outputs/groups the Mikro panel will start from group 126 and work it's way down to 112 one group at a time. Thus it is advised to put alarms and/or evacuation groups at the higher group addresses.
- An activation delay on the "head device" (set from menu ALM3.xxxx) will delay the activation of the whole group. This is a convenient way to implement multi stage evacuation/alarm sequences by programming the desired delay on each of the head devices.
- The addresses above 112 may also be used for input devices (eg optical, heat sensors etc). In this case the corresponding group address may not be used for outputs.
- The panel will search automatically during auto-learn for head and group-member devices and save it in the configuration. The group that each device belongs to (as set by the group dip switches) may be seen in the ALM3.xxx screen. This discovery process also happens every time the panel is switched on. The extra delay it creates depends on the number of output devices installed.
- As mentioned above, the group ID in the properties of the devices is automatically found during the autolearn sequence of the bus devices. After that, it is used for configuration verification. If the installer changes the dip switches on an installed device to make the device member of another group, this entry must also be manually modified.

11.4 Communicator (ALM3.4)

The Mikro fire panel includes a PSTN communicator. Using a PSTN telephone line all the events that are created during the operation of the system may be sent to a remote receiving station. The protocol used is the well established Contact I.D. (CID).

11.4.1 PSTN System connection

Figure 65 shows the required phone line connections. Under normal conditions (no data transmission) the phone line enters the Main PCB from the TIP-RING block connector pins and is routed to the T-R pins. The T-R pins are used to provide PSTN service to the rest of the installation.

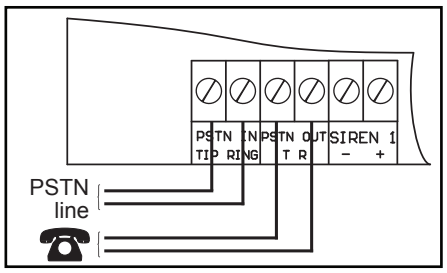


Figure 65. System required phone line connection

When a signal must be transmitted to the receiving station the PSTN line is isolated from the rest of the installation and is routed to the internal PSTN interface. This gives priority to the fire panel over any other communication on the same PSTN line.

It is important to install the fire panel as the first device on the incoming PSTN line as this will ensure it has priority over other uses.

11.4.2 Communicator settings (ALM.3.4)

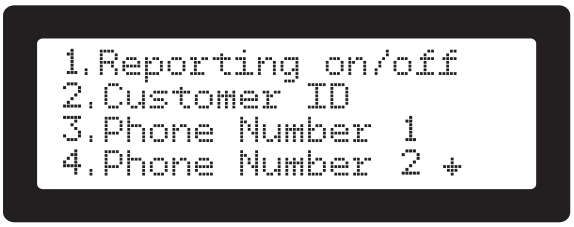


Figure 66. Communicator options screen

There is a set of options that affect the communicator feature (Figure 66). They are grouped in A.L.3 menu, item ALM.3.4 **|4.Comm Settings|** and are explained below:

|1.Reporting on/off|: Enables (1) or disables (0) the feature. If the communicator is disabled no events will be ever transmitted

|2.Customer ID|: This is a unique customer identifier that is transmitted with every communication message. It identifies the client to the receiving station. Valid values for each of the 4 digits is 0-9, A-F (hexadecimal number).

Tip: ***To avoid switching between numeric and alphanumeric keys, you can use the Up/Down arrows to change the number under the cursor.***

|3.Phone Number 1|: The first central station's telephone number that the communication will use. (Default: empty)

|4.Phone Number 2|: The second central station's telephone number that the communication will use. (Default: empty).

The telephone numbers that the reporting will take place. The two numbers are used as a backup of the second to the first; If the event is successfully transmitted to Phone Number 1, it will not be sent to Phone Number 2

A pause can be inserted anywhere in the phone number by using the dot character ".". The pause will cause 2 seconds delay.

|5.Test Reporting|: This number sets every how many hours a test signal will be sent to the receiving station. 0 disables the feature.

|6.TLM delay|: Telephone Line monitoring delay. This is the minimum required time in seconds that a telephone line must be found in error before a fault conditions is raised.

|7.Alarm TX delay|: This is the delay in seconds before

an event is sent to the receiving station. If more than one events have been cued up while this delay was active, they will be sent all at once and not delayed any further. This setting is used to minimize communication costs by grouping events together for transmission.

|8. Max Dial Attempts|: This is the number of successive failed attempts to send an event to a receiving station that will create a fault and will stop the retransmission process. Every new event will restart the retransmission mechanism. Any lost events are kept in the internal memory and will be transmitted with he first successful communication.

|9. Attempts Delay|: This is the delay in seconds that the system will wait before re-dialling after an unsuccessful transmit ion attempt.

11.5 TCP/IP Options (ALM3.5)

Figure 67. TCP/IP Options menu screen

|1.Local TCP IP|: This is the IP address of the communications module. The IP must be unique for the local network.

|2.Local TCP port|: This is the TCP port that will be used for incoming connections to the panel (The "SmartView" software package uses this port to connect to the panel). Valid port range is 1 to 65535.

|3.Subnet Mask|: The TCP/IP subnet mask that the TCP/IP module will use.

|4.Gateway|: The IP of the gateway router that the TCP/IP module will use.

|5.TCP encryption key|: Encryption key that will be used between the TCP clients and the panel. It consists of 8 hexadecimal digits (0-9, A-F). If set to zeros no encryption of data will take place.

|6.UDP remote IP|: IP address of the remote server that gets event notifications and presence notifications (observer).

|7.UDP remote port|: The UDP port that the server is set for receiving events.

|8.UDP remote freq.|: How often the panel will report it's presence and status to the monitoring (observing) server. The unit is seconds. A value of 0 disables this feature.

|9.UDP Encryption key|: Encryption key that will be used for transmissions between the panel and the monitoring station. It consists of 8 hexadecimal digits (0-9, A-F). If set to zeros no encryption of data will take place.

11.6 Additional Info (ALM3.7)

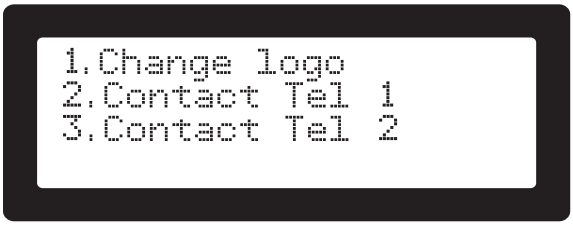


Figure 68. Additional Info menu screen

|1.Change logo|: Changes the main's screen display logo therefore any company can use it's own.

|2.Contact Tel 1|: This is the primary emergency telephone number that the user can view in the display. This number can be the fire department's number, the police, the installation company etc.

|3.Contact Tel 2|: This is the secondary emergency telephone number that the user can view in the display. This number can be the fire department's number, the police, the installation company etc.

11.7 Restore to default (ALM3.8)

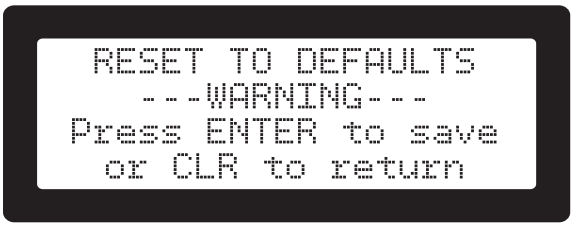


Figure 69. Restore to default screen

Resets the panel to it's default parameters.

11.8 Backup Configuration (ALM3.9)

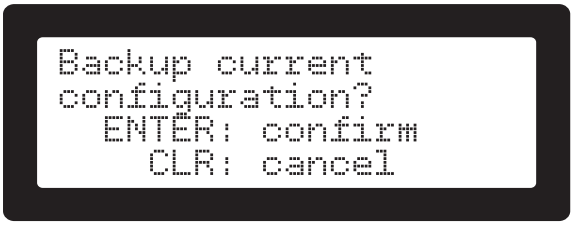


Figure 70. Backup Configuration screen

Backup system's current configuration settings.

11.9 Restore Configuration (ALM3.0)

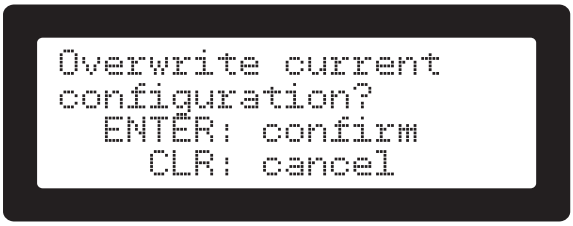


Figure 71. Restore Configuration screen

Restores the panel to it's last saved configuration settings.

12. Recommended Cables for Zone Inputs

Recommended cables for installations and maximum lengths are shown on Table 6. The cables must be in compliance with EN standards, with resistance to flame / temperatures up to 830°C for 15 minutes (EN50200 standard, PH30 category minimum).

Maximum wire length				
Current required [A]	**18 AWG (0.823 mm²) [ft / m]**	**16 AWG (1.31 mm²) [ft / m]**	**14 AWG (2.08 mm²) [ft / m]**	**12 AWG (3.31 mm²) [ft / m]**
0.25	584 / 178	950 / 290	1460 / 445	2170 / 660
0.50	292 / 89	474 / 144	730 / 222	1084 / 330
0.75	194 / 58	316 / 96	486 / 148	722 / 220
1.00	146 / 44	236 / 72	364 / 111	542 / 165
1.25	116 / 35	190 / 58	292 / 89	434 / 132
1.50	92 / 28	158 / 48	242 / 74	362 / 110
Resistance / 1000 ft	13 Ohm	8 Ohm	5.2 Ohm	3.5 Ohm

Table 6. Maximum wire lengths

IMPORTANT: ***The cables used during EMC tests is deemed the "Approved cable". The cable identification is "FP200 GOLD" from Prysmian cables & systems.***

IMPORTANT: ***The batteries used during LPCB tests were the NP7-12 from YUASA. This battery is considered the "Approved" type for the Mikro 1 loop fire alarm panels.***

Appendix A: Panel Technical Specifications

	Mikro 16	Mikro 32
Number of loops	1	
Loop current	400mA	
Fire Zones	16	32
Zonal indicators	16	32
Max. number of devices	126	
Mains Power	230 VAC 50Hz	
Conventional zones	2 (Maximum 20 detectors per zone)	
Conventional zones termination resistors	4,7KOhms / 1W	
Mains supply fuse	800mA 250V, Slow blow	
Internal Power Supply Output (Imax.a, Imax.b)	24 VDC / 2,2A, 2.5A	
AUX output	24 VDC ±10% , 700mA max, current limited, monitored	
Battery Backup Power	2x 12V / 7Ah sealed lead acid gel batteries	
Battery health monitoring (periodic load test)	Every 90 seconds	
Max. Battery internal resistance	1.5Ohm	
Supervised siren outputs	2 outputs, 24VDC ±10%, 1A max, fused and monitored	
Generic trouble output (on main unit) non monitored	Dry relay contacts NO - C - NC	
Analogue Inputs	2 intern AUX pulled up inputs 1.5mA sinc current	
Relay Outputs	2 general relay outputs N/O or N/C (jumper selectable) dry contacts 28V/3A max	
PGM Outputs	4 PGM outputs Open collector, 200mA sink max current, 30V max handling	
Earth faults detection and indication	Front panel LCD indication & buzzer	
Display	4 lines of 20 characters LCD	
Enclosure	Epoxy powder coated metal box	
IP rating	IP30	
Construction	1.2mm steel sheet powder coated in grey color	
Environmental	Class A temperature range: -5 to 40 °C (23 to 104 °F) Humidity: 5 to 95% RH, non condensing	
Terminal blocks rating	All terminals rated for 12 to18 AWG (0.75 to 2.5 sq mm)	
Dimension (HxWxL [cm])	31,5 x 42,5 x 10	

Appendix B: EN54-2 Optional Functions Implemented

The Mikro panels optional functions as referenced in EN54-2 standard, sections:

- **7.8:** Output to fire alarm devices
- **7.9.1:** Control to fire alarm routing equipment
- **7.9.2:** Alarm confirmation input from fire alarm routing equipment
- **7.10:** Outputs to fire protection equipment
- **7.10.1:** Output Type A
- **7.10.2:** Output Type B
- **7.10.3:** Output Type C
- **7.10.4:** Fault monitoring of fire protection equipment
- **7.12:** Dependencies on more than one alarm signal
- **7.12.2:** Type B dependency
- **9.5:** Disablement of addressable points

Appendix C: Shield' s Compatible Devices

Sensors

Type	Description
SEN-A4013	Heat Detector
TEN-A8012	Heat Detector with Isolator
SEN-A4015	Multisensor Smoke Detector
SEN-A4011	Optical Smoke Detector
TEN-A8011	Photo-Electric Smoke Detector with Isolator
TEN-A8013	Multisensor Detector with Isolator
SEN-A4025	Deep Isolating Base
TEN-A8030	Standard Mounting Base for Detector
SEN-C2001	Standard Base
SEN-A4001	Mounting Base
SEN-A4004	Isolator Base
SEN-A4002	Isolating Base

Audio/Visual

Type	Description
SEN-A4021	Intelligent Open-Area Sounder Red
SEN-A4022	Intelligent Open-Area Sounder Beacon Red
SEN-A4047	Sounder Control Unit with Isolator
SEN-A4005	Integrated Base Sounder with Isolator
SEN-A4006	Integrated Base Sounder
SEN-A4010	Beacon Base
S-A4027	Ancillary Base Sounder

Call Points

Type	Description
SEN-A4061	Intelligent Manual Call Point

Modules

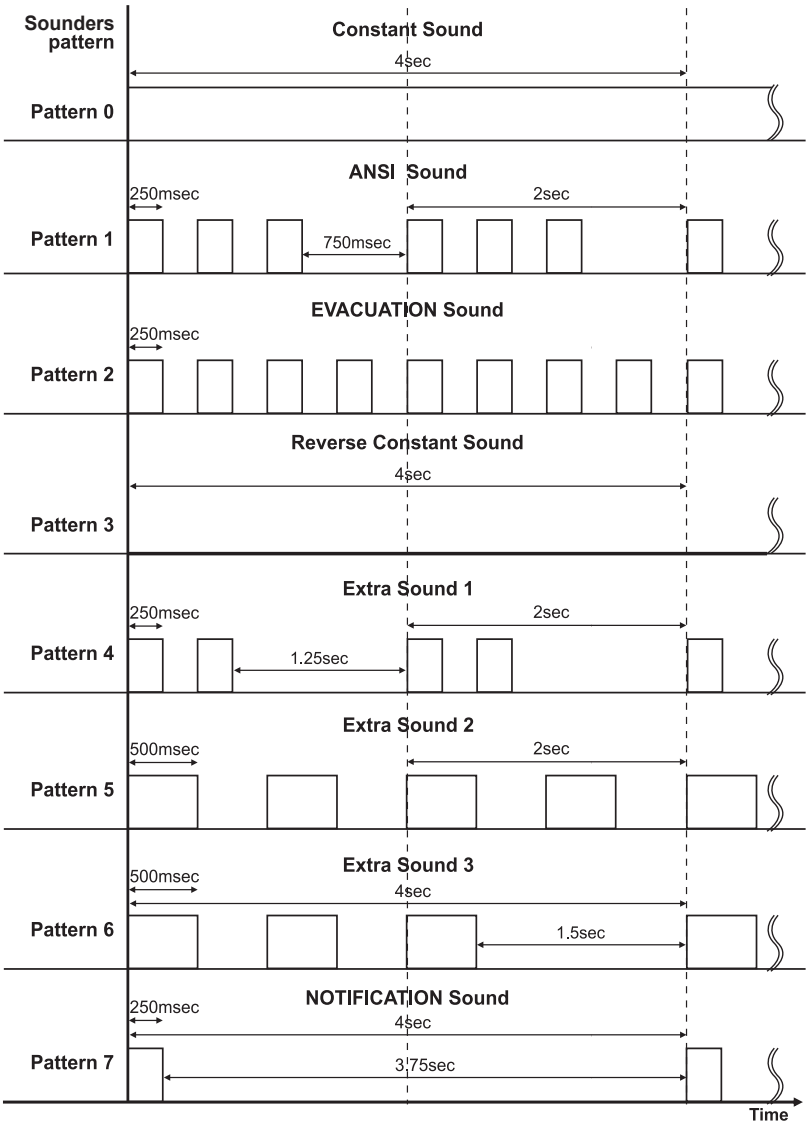
Type	Description
SEN-A4003	Isolator
TEN-A6061	Intelligent Switch Monitor
TEN-A6062	Intelligent Input / Output Unit
TEN-A6063	Intelligent Mains Switching Input / Output Unit
TEN-A6064	Intelligent Twin Input / Output Unit
TEN-A6065	Intelligent DIN-Rail Switch Monitor
TEN-A6066	Intelligent DIN-Rail Input / Output Unit
SEN-A4042	Mini Switch Monitor
SEN-A4044	Zone Monitor with Isolator
TEN-A6067	Intelligent Twin Input / Output Unit
S-A4052	Mains Switching Input/Output Unit

Appendix E: Sounders Settings

On-board devices set of sounds

Tone Number	Tone
0	Constant Sound
1	ANSI Pattern
2	Evacuation Pattern
3	Constant Reverse Pattern
4	Extra Pattern 1
5	Extra Pattern 2
6	Extra Pattern 3
7	Notification Pattern

On-board devices patterns



Appendix E: Initial System Configuration

Inputs

	Causes Alarm			Causes Evacuation			Alarm Verification			Latched		
Type	**L**	**M**	**R**	**L**	**M**	**R**	**L**	**M**	**R**	**L**	**M**	**R**
Sensors	Y		Y							Y		Y
Call Points	Y		Y	Y		Y				Y		Y
Analogue Zones			Y									Y
Other Inputs												

Outputs

	Pre-Alarm			Alarm			Evacuation		
Type	**L**	**M**	**R**	**L**	**M**	**R**	**L**	**M**	**R**
Sounders				Y		Y	Y		Y
Beacons				Y		Y			
SIR 1, 2 relays						Y			Y
EXP Relays (8)									
OUT 1, 2						Y			Y
PGMs 1-4									

L: Autolearn
M: Manual Add
R: Reset to defaults

Installed by

Name:_____

Company:_____

Address:_____

Phone:_____

For service contact

Company:_____

Address:_____

Phone:_____

Acceptance Inspection by

Date:_____

Shield Fire Safety & Security Ltd
Endeavour Drive
Basildon
SS14 3WF
United Kingdom

Appendix F: Contact ID Event Codes

EVENT	CODE	DATA*
ADDRESS AT FAULT	333	ADDR
DEVICE ADDED	531	
CONTAMINATION FAULT	924	
DOUBLE ADDRESS FAULT	925	
ALARM	110	INPUT ID
ON BOARD ZONES FAULT	373	
DEDICATED FAULT INPUT	391	
INPUT BYPASS (DISABLE)	571	
EVACUATION	910	
ALARM VERIFICATION PREALARM	915	
LOOP RESTORED	918	LOOP No
LOOP OPEN	919	
LOOP OVERCURRENT	920	
MEMORY CORRUPTED	303	-
MAIN POWER LOST	301	
LOOP RESET	305	
REPLACE BATTERIES	309	
EARTH FAULT	310	
BATTERY LOW VOLTAGE	311	
TELEPHONE LINE FAULT	351	
PERIODIC TEST	602	
LOOP INVALID CONFIGURATION	917	
DISPLAY UNIT FAULT	921	
DISPLAY UNIT RESTORE	922	
SYSTEM LOW POWER	926	
AUX POWER FAULT	934	
REMOTE USER CONNECTED	940	
REMOTE USER DISCONNECTED	941	
REMOTE USER TIMEOUT	942	
OUTPUT FAULT	320	OUTPUT ID
OUTPUT BYPASS (DISABLE)	572	
COMMUNICATION TROUBLE	350	PHONE LINE
ON BOARD SIREN FAULT	323	SIREN
USER RESET	313	USER ID
USER SILENCE	520	
USER WALK TEST	607	
USER TIME ADJUST	625	
USER LOGIN	627	
USER LOGOUT	628	
MANUAL EVACUATION	911	
ALARM VERIFICATION DISABLED	916	
USER SYSTEM VERIFICATION	604	

DATA: This column defines the data that are sent in the "data" section of the C.I.D. communication message. A short explanation follows:

ADDR : The address of the loop device that caused the event

INPUT ID : A 3 characters device identification as shown below :

- ***B01, B02 : On board analogue zone 1 and 2***
- ***B03, B04 : On board generic input 1 and 2***
- ***C01 - C32 : Zones 1 to 32 (as indicated on the keypad's zone indicators)***
- ***001 - 256 : Loop address device***

OUTPUT ID : A 3 characters device identification as shown below :

- ***B01, B02 : On board sirens 1 and 2***
- ***B03 - B06 : On board open collector outputs 1 to 3 (PGMs)***
- ***B07, B08 : On board dry contacts outputs 1 and 2***
- ***001 - 256 : Loop address device***

LOOP No : The loop of the corresponding event. As this is a one loop panel this number is always 0 (for loop 1).

PHONE LINE : Numbers 1 or 2 depending on the phone number with communication trouble.

SIREN : Numbers 1 or 2 corresponding to the onboard siren outputs.

USER ID : "0" : Access level 3 user, 1: Main Access level 2 user, 2 - 9 : Access level 2 users 1 to 8.

NOTES

Document Part Number: Mikro-Ap-IM
version 1.00, revision 0 - 05/2020