

SYG-CEM
SYGNO-FI CONVENTIONAL EXPANDER MODULE



User instructions manual

GENERAL DESCRIPTION

The **SYG-CEM** permits to integrate a Sygno-fi wireless network to a conventional fire security installation. This solution is useful in environments where a wired installation would be difficult, inconvenient or problematic.

The **SYG-CEM** has to be connected to a conventional control panel's zone line and a sounder line; the conventional control panel will have then the capability to detect fire alarms in the area protected by the wireless system and the capability of activating or silencing the wireless sounders of the Sygno-fi system.

SYG-CEM needs an EN 54-4 certified external power supply source.



TECHNICAL SPECIFICATIONS *

Specification	Value
Power supply voltage range	from 9 Vdc to 30 Vdc
Typical power supply voltage value	12 Vdc
Maximum voltage allowed by the conventional zone line's dipole	30 V
Maximum voltage allowed by the sounder line's dipole	30 V
Typical current load (Sygno-fi system in non-alarmed standby condition)	40 mA (12 Vdc)
Maximum current load (Sygno-fi system in non-alarmed standby condition)	55 mA (12 Vdc)
Wireless frequency band	868 MHz
Radiated power value	14 dBm (25 mW)
Number of wireless channels	66
Wireless communication range **	200 m in open space
Maximum number of linked SYG-EM expander devices	15
Maximum number of linked SYG-EM expander devices in serial cascade order	8
Maximum number of linked child devices	32
Technical temperature range	from -20 °C to 70 °C
EN 54 approved temperature range	from -10 °C to 55 °C
Humidity range without condensing	from 5% RH to 90% RH
Device dimensions	235 mm x 160 mm x 70 mm
Device weight	700 g
Technical IP rating	65
EN 54 approved IP rating	30

* See TDS-TWMEC technical specification document for further technical data.

** Environmental physical obstacles can reduce this value.

WARNINGS AND LIMITATIONS

Our devices use high quality electronic components and plastic materials that are highly resistant to environmental deterioration. However, after 10 years of continuous operation, it is advisable to replace the devices in order to minimize the risk of reduced performance caused by external factors.

Ensure that this device is only used with compatible control panels. Detection systems must be checked, serviced and maintained on a regular basis to confirm correct operation. Smoke sensors may respond differently to various kinds of smoke particles, thus application advice should be sought for special risks.

Sensors cannot respond correctly if barriers exist between them and the fire location and may be affected by special environmental conditions. Refer to and follow national codes of practice and other internationally recognized fire engineering standards. Appropriate risk assessment should be carried out initially to determine correct design criteria and updated periodically.

Use only in Sygno-fi fire detection and alarm systems.

WARRANTY

All devices are supplied with the benefit of a limited 3 years warranty relating to faulty materials or manufacturing defects, effective from the production date indicated on each product.

This warranty is invalidated by mechanical or electrical damage caused in the field by incorrect handling or usage.

Product must be returned via your authorized supplier for repair or replacement together with full information on any problem identified.

Full details on our warranty and product's returns policy can be obtained upon request.



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19/20 Stratfield Park
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PO7 7XN
United Kingdom

SYG-CEM

EN 54-25:2008
EN 54-18:2005

CONTROL PANEL COMPATIBILITY

SYG-CEM is compatible with most of the conventional control panels available on the market; nevertheless:

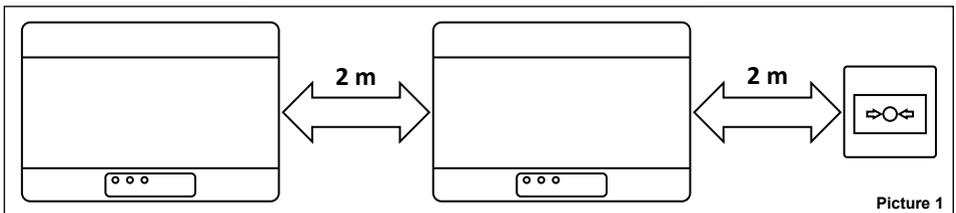
- check that the control panel's features and technical specifications ranges and values are suitable for the **SYG-CEM**;
- control of the wireless sounders require that the control panel is equipped with a sounder line for activation and silencing.

CORRECT DEVICE POSITIONING

- Apply mandatory codes of practice and standards of your country.
- Use wireless channels that are free or reasonably free from other interfering signals; possibly avoid using channels that are already used by other systems.
- Don't install wireless devices in the vicinity of equipment using large amounts of electrical current.
- Don't install wireless devices in the vicinity of large metal objects, structures or metal ceiling structures.
- Don't install wireless devices in the vicinity of fluorescent light fixings.
- Don't install wireless devices in the vicinity of computers, their cabling and their network cabling.
- Wireless devices, in their final installation location, must have a minimum distance of at least 2 meters between each other.
- Install central and expander network nodes at an height of at least 2 - 2.5 meters from the floor.
- Fix central and expander network nodes flat on the wall.
- Environmental temperature and humidity must lay in the ranges specified in the technical specifications at the beginning of this manual. Environmental compatibility applies to all devices in general.
- Environmental conditions must be with standable by the installed devices. Check the device's IP rating adequacy with the installation's environmental characteristics; IP rating value is found in the technical specifications at the beginning of this manual. Environmental compatibility applies to all devices in general.
- Make sure that all child devices (in their final installation location) are reached by good strong wireless signals from their father nodes (central and expander ones).
- Make sure that all father nodes (central and expander ones, in their final installation location) are reached by good strong wireless signals from their child devices.
- Make sure that all network nodes (central and expander ones, in their final installation location) are reached by good strong wireless signals from their linked-to network nodes.

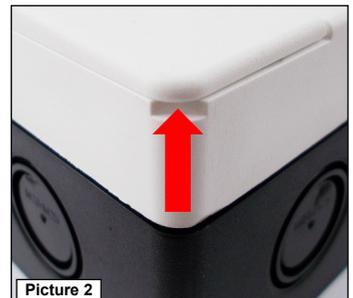


It is advisable to use the SYG-STK survey kit to locate a good wireless installation location.

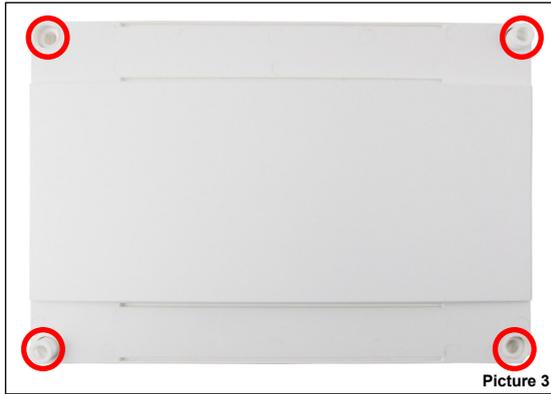


INSTALLATION

- 1) Remove the two plastic screw covers from the front side. Lifting the protective covers using the gaps at their angles makes this operation easier.



- 2) Remove the four sealing plastic screws.



- 3) Remove the front protective cover.

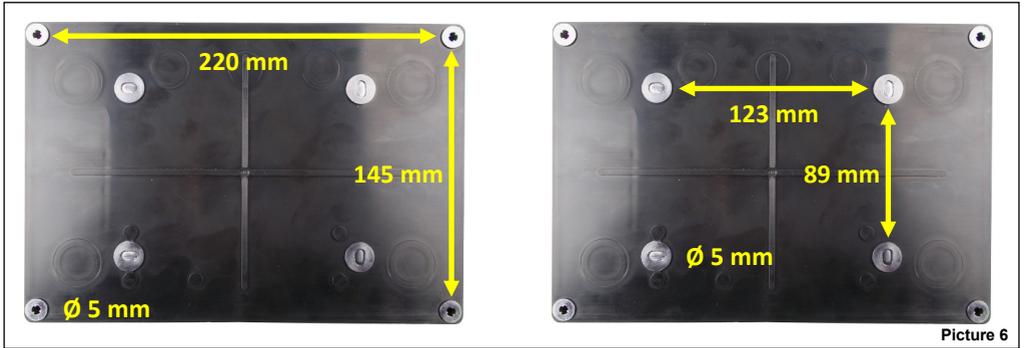
- 4) Remove the two holding screws at the base of the printed circuit board.



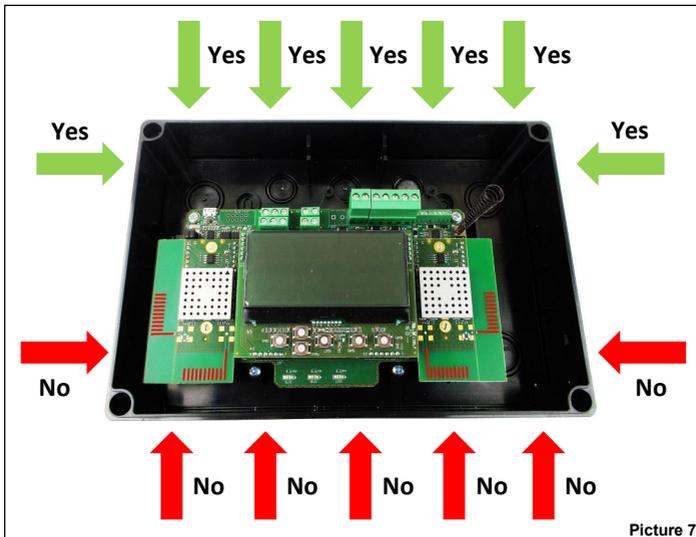
- 5) Slide upwards the board and extract it from the box.



- 6) Drill into the wall the required number of holes you need to fix the box. Refer to the following pictures for the distances between the four “IP safe” holes and the distances between the four mould-printed knock-out slots on the rear side of the box. Use the IP safe holes if you want to preserve the original IP rating of the device box, otherwise use the internal knock-out slots. If you use the internal knock-outs, the manufacturer is discharged from the liability following damage to the device that can occur from environmental factors.



- 7) The box is designed with M16/M20/M25 knock-out holes to provide IP safe compatibility with electrical cable glands. Knock out the required ones. If one or more holes have been opened but remain unused, fill them with suitable IP safe blanking plugs in order to maintain the native ingress protection degree of the box. It is suggested to select external cabling entries that are at a certain distance from the device’s antennas. Upper side entries of the box are the best choice.



- 8) Install the required cable glands.
- 9) Fix the device box to the wall; use adequate screws and avoid the countersunk type.
- 10) Slide into the box the printed circuit board.
- 11) Fix the board to the box using the two screws you removed before.
- 12) Perform the required wiring.
- 13) Program the device.
- 14) Reinstall the front cover.
- 15) Screw the front cover: fixing has to be IP safe and not loose.
- 16) Reinstall the plastic screw covers.
- 17) Check that your installation is safe, secure and fault-free; perform the functional test.

WIRING - PRELIMINARY NOTES

- Apply mandatory codes of practice and safety standards of your country.
- This device requires a EN 54-4 certified power supply source.
- Allow a maximum cable length of 3 meters between the EN 54-4 power supply source and the device.
- When performing wiring operations disconnect the power supply source.
- The printed circuit board is sensitive to electrostatic discharges: take suitable precautions when handling it in order to avoid damage.
- Connect the wire terminals to their correct blocks on the printed circuit board; keep this manual handy as a reference for good connection implementation.
- Safely screw the wire terminals to their corresponding blocks.
- Avoid mechanically loose or weak connections.
- Avoid accidental shorts between terminals.
- Allow sufficient wire length into the device box so you can comfortably screw the terminals to their corresponding blocks; this is also important to avoid mechanical stress on terminal-block couplings.

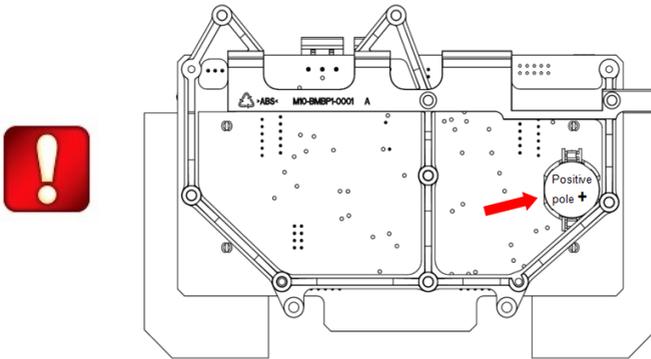


The printed circuit board is sensitive to electrostatic discharges: take suitable precautions when handling it in order to avoid damage.

CONVENTIONAL EXPANDER BACKUP BATTERY

Ensure the Conventional Expander Backup Battery is correctly installed on the Conventional Expander. The Conventional Expander Backup Battery has to be inserted to preserve the Time clock and Date when the Conventional Expander is not powered by loop or external PSU. Moreover, the Conventional Expander Backup Battery is needed also in order to use the auto-address procedure on Fire Control Panel.

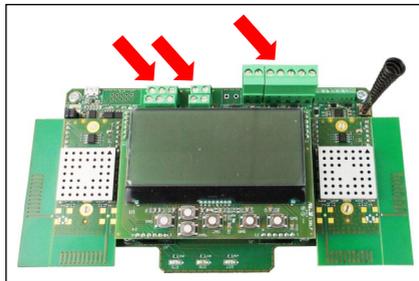
The Conventional Expander Backup Battery is located on the rear of the Conventional Expander board. Make sure to insert the battery with the correct polarity; positive pole up.



Battery Specification	Value
Battery type	CR2032 Lithium Battery

TERMINAL BLOCKS LOCATION

Terminal blocks are located on the printed circuit board in the positions highlighted in the following picture:



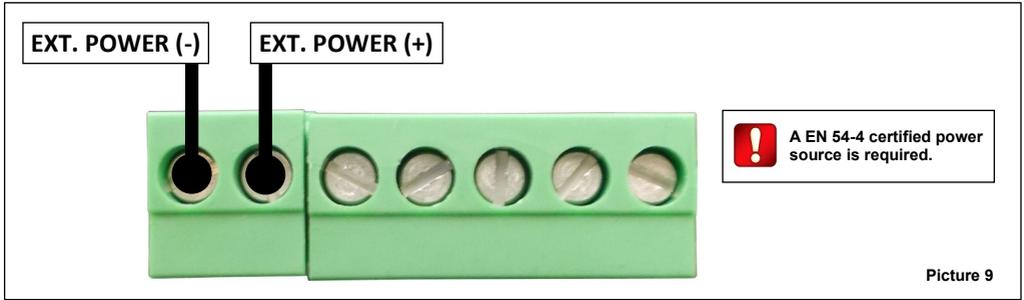
Picture 8

SYG-CEM WIRING PROCEDURE IN DETAIL

In detail, the wiring procedure for the SYG-CEM is as follows:

- 1) Connect the power supply terminals.
- 2) Connect the power supply's monitoring inputs (optional).
- 3) Connect the conventional zone line's terminals.
- 4) Connect the sounder line's terminals (optional).
- 5) ALWAYS install the Alarm end of line (EOL) resistor as specified in this manual. Resistor's value should be indicated in the control panel's datasheet / instructions manual.
- 6) Install the other EOL resistors as specified in this manual. Resistors' values should be indicated in the control panel's datasheet / instructions manual.

WIRING - POWER SUPPLY'S TERMINAL BLOCKS LAYOUT

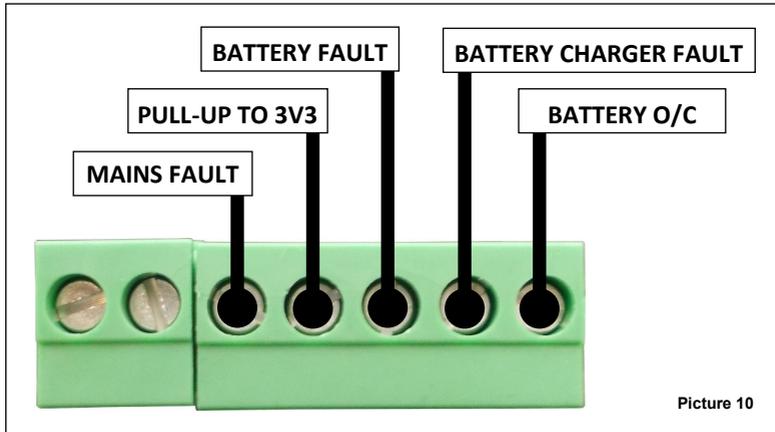


Picture 9

Block	Description	Note
EXT. POWER (-)	Power supply, negative pole	EN 54-4 certified power source is required
EXT. POWER (+)	Power supply, positive pole	EN 54-4 certified power source is required

Table 1

WIRING - POWER SUPPLY'S FAULT DETECTION INPUTS - TERMINAL BLOCKS LAYOUT



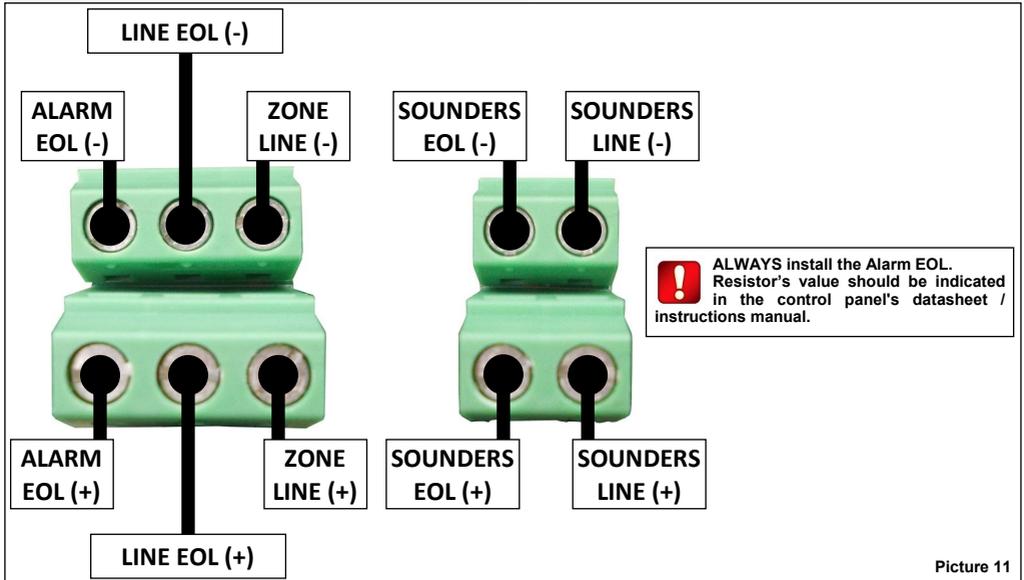
Picture 10

Block	Description	Note
MAINS FAULT	Mains' power supply fault input	Check settings. See: EN 54-4 POWER SUPPLY SUPERVISORY FEATURES MANAGEMENT
PULL-UP TO 3V3	Internal pull-up to 3.3 V	-
BATTERY FAULT	Battery fault's input	Check settings.
BATTERY CHARGER FAULT	Battery charger fault's input	See: EN 54-4 POWER SUPPLY SUPERVISORY FEATURES MANAGEMENT
BATTERY O/C	Battery open circuit fault's input	

Table 2

 Through the SygNEX configuration software always check and, eventually, activate / deactivate / set the EN 54-4 power supply supervisory features and settings.

WIRING - ZONE AND SOUNDER LINES' TERMINAL BLOCKS LAYOUT



Picture 11

Block	Description	Note
Alarm EOL (-)	Alarm EOL resistor. Negative (-)	
Alarm EOL (+)	Alarm EOL resistor. Positive (+)	
Line EOL (-)	Line EOL resistor. Negative (-)	
Line EOL (+)	Line EOL resistor. Positive (+)	
Zone line (-)	Conventional input zone line. Negative (-)	No voltage causes the reset of ALL wireless devices
Zone line (+)	Conventional input zone line. Positive (+)	No voltage causes the reset of ALL wireless devices

Table 3

Block	Description	Note
Sounders EOL (-)	Sounders EOL resistor. Negative (-)	Resistor value depends on the model of the control panel
Sounders EOL (+)	Sounders EOL resistor. Positive (+)	Resistor value depends on the model of the control panel
Sounders line (-)	Sounders line. Negative (-)	Wireless outputs are activated if voltage is applied. Voltage disconnection causes the silencing of the wireless outputs
Sounders line (+)	Sounders line. Positive (+)	Wireless outputs are activated if voltage is applied. Voltage disconnection causes the silencing of the wireless outputs

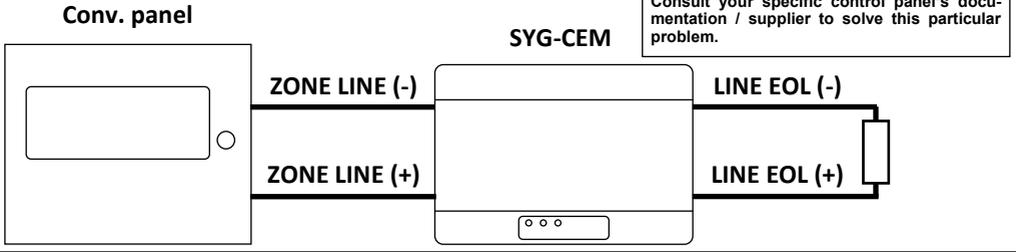
Table 4

WIRING - ZONE AND SOUNDER LINES' WIRING LAYOUTS

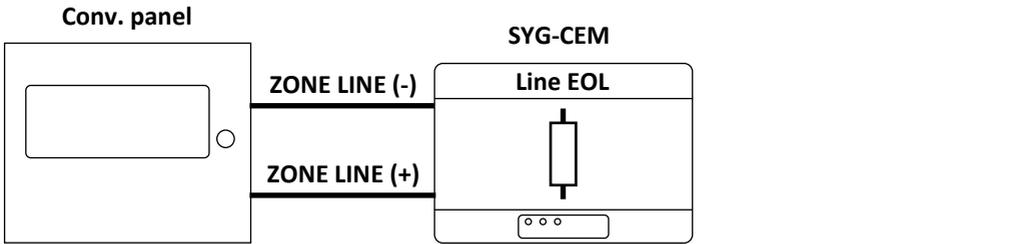
SYG-CEM is placed at the beginning or in the middle of the zone line. Line EOL is installed at the end of the zone line, outside the **SYG-CEM**. Conventional devices are installed between the panel and the **SYG-CEM** and between the **SYG-CEM** and the Line EOL.



Zone line between **SYG-CEM** and Line EOL is isolated when **SYG-CEM** signals a fault. This state persists until the fault is handled. Consult your specific control panel's documentation / supplier to solve this particular problem.



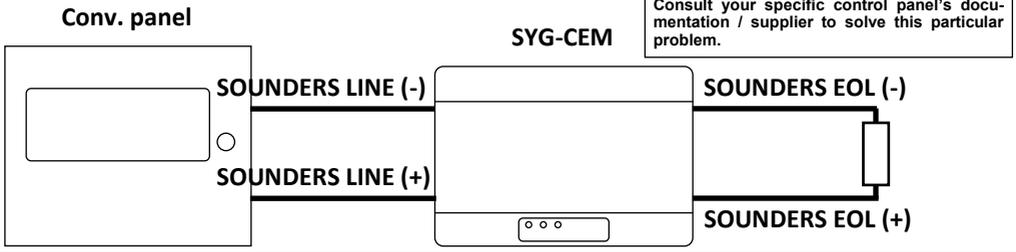
SYG-CEM is placed at the end of the zone line. Line EOL is installed inside the **SYG-CEM**. Conventional devices are installed between the panel and the **SYG-CEM**.



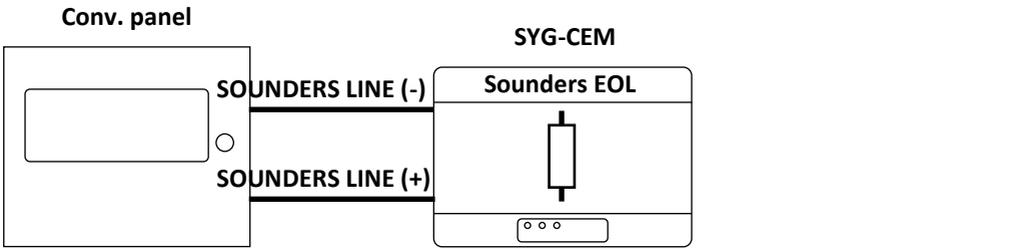
SYG-CEM is placed at the beginning or in the middle of the sounders line. Sounders EOL is installed at the end of the sounders line, outside the **SYG-CEM**. Conventional outputs are installed between the panel and the **SYG-CEM** and between the **SYG-CEM** and the sounders EOL.



Sounders line between **SYG-CEM** and Sounders EOL is isolated when **SYG-CEM** signals a fault. This state persists until the fault is handled. Consult your specific control panel's documentation / supplier to solve this particular problem.



SYG-CEM is placed at the end of the sounders line. Sounders EOL is installed inside the **SYG-CEM**. Conventional outputs are installed between the panel and the **SYG-CEM**.



Wireless outputs are activated if voltage is applied to the sounders line; voltage disconnection causes the silencing of the wireless outputs.

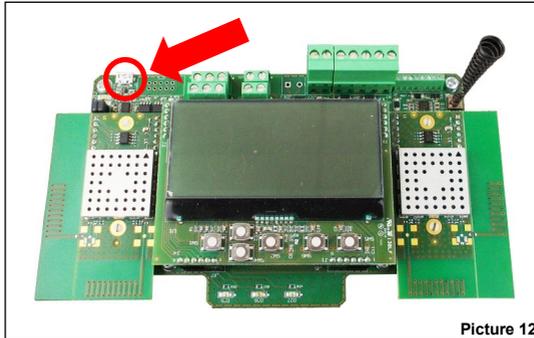
THE PURPOSES OF PROGRAMMING

Programming is done for the following purposes:

- activating or deactivating the signalling of power supply's fault events;
- activating or deactivating the signalling of tamper events;
- integrating the **SYG-CEM** into the wireless system; this means creating a wireless exclusive direct link with **SYG-EM** expanders;
- creating wireless exclusive links with local child devices (detectors, call point, sounders....).

PROGRAMMING SETUP PROCEDURE

- 1) Install on your personal computer the **SygNEX** software.
- 2) Connect your personal computer to the printed circuit board; for this operation a standard-to-micro USB cable is used; micro USB socket location is highlighted in the picture below:



Picture 12

- 3) Make sure the device is powered up.

PROGRAMMING

For more data about programming this device refer to the following documentation:

- the **SygNEX** software manual;
- the user instructions manuals of the Sygno-fi series' products.

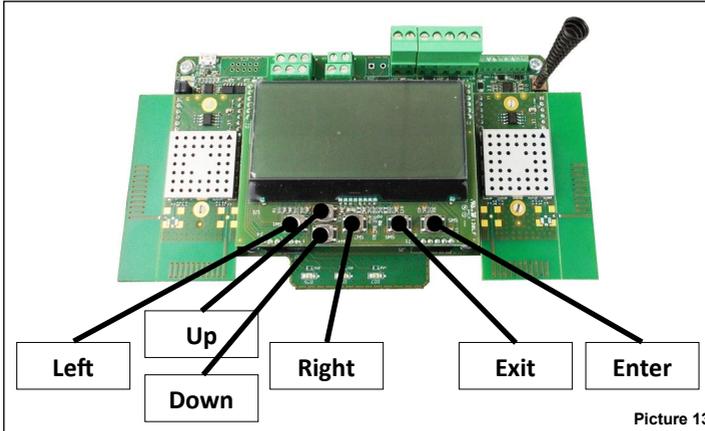
THE USER'S KEYPAD AND DISPLAY

The device keypad and display system is used for two basic purposes:

- Diagnose the **SYG-CEM** and the system: check event occurrences, faults, settings, etc.
- Program device and system's settings.

Keypad and display system is the manual alternative to the use of the **SygnEX** configuration software.

THE USER'S KEYPAD



Picture 13

Keypad buttons are:

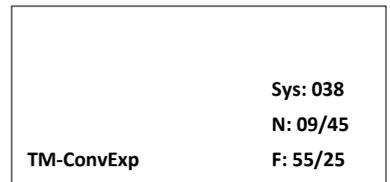
- Up** Pulls up the display's menu selection.
If applied to a value, the selected digit is increased.
- Down** Pushes down the display's menu selection.
If applied to a value, the selected digit is decreased.
- Left** Returns to the previous menu.
If editing a value, sets the cursor to the left digit.
- Right** Enters into the next submenu.
Some options require exclusively the "Enter" key to gain access to the next submenu.
If editing a value, sets the cursor to the right digit.
- Enter** Enters into the next submenu.
Confirms the selected setting.
- Exit** Returns to the previous menu.

THE USER'S DISPLAY

In a normal and eventless condition the display will have picture 14's lookalike.

Of the main window, displayed data has the following meaning:

- TM-ConvExp** Indicates that this device is a **SYG-CEM**.
- Sys: 038** Indicates the number that identifies the Sygno-fi wireless system (system code); in this case 038.
- N: 09/45** "Network" channels; system-wide wireless network numbered channels that are used by the **SYG-CEM** to exchange data with the expanders; in this case channel 9 and channel 45.
- F: 55/25** "Field" channels; local wireless network numbered channels that are used by the **SYG-CEM** to exchange data with local child devices; in this case channel 55 and channel 25.



Picture 14

EN 54-4 POWER SUPPLY SUPERVISORY FEATURES MANAGEMENT

On **SYG-CEM**'s properties window of the **SygNEX** software, you will have the following options:

EN54-4 Power Supply Unit: Mains fault	<input checked="" type="radio"/> Disabled	<input type="radio"/> Open	<input type="radio"/> Low
Battery fault	<input checked="" type="radio"/> Disabled	<input type="radio"/> Open	<input type="radio"/> Low
Battery charger fault	<input checked="" type="radio"/> Disabled	<input type="radio"/> Open	<input type="radio"/> Low
Battery O/C	<input checked="" type="radio"/> Disabled	<input type="radio"/> Open	<input type="radio"/> Low

Picture 15

Selected option	"Open" is selected	"Low" is selected
Mains fault	A fault condition is raised if there is an open circuit between MAINS FAULT terminal block and EXT. POWER (-) . Signal is in a high impedance state.	A fault condition is raised if there is a short circuit between MAINS FAULT and EXT. POWER (-) . Signal is in a low state.
Battery fault	A fault condition is raised if there is an open circuit between BATTERY FAULT terminal block and EXT. POWER (-) . Signal is in a high impedance state.	A fault condition is raised if there is a short circuit between BATTERY FAULT and EXT. POWER (-) . Signal is in a low state.
Battery charger fault	A fault condition is raised if there is an open circuit between BATTERY CHARGER FAULT terminal block and EXT. POWER (-) . Signal is in a high impedance state.	A fault condition is raised if there is a short circuit between BATTERY CHARGER FAULT and EXT. POWER (-) . Signal is in a low state.
Battery O/C	A fault condition is raised if there is an high impedance between BATTERY O/C terminal block and EXT. POWER (-) . Signal is in a high impedance state.	A fault condition is raised if there is a short circuit between BATTERY O/C and EXT. POWER (-) . Signal is in a low state.

Table 5

THE DISCOVERY OPERATION

The discovery of all possible routes for the wireless messages travelling throughout the system is called "discovery".

The discovery operation concerns only the network devices (**SYG-CEM** and **SYG-EMs**) and not the child devices.

Discovery is performed only once at the beginning, during the installation phase. It can be performed successively (e.g. following environmental changes) in order to redefine the best messaging routes for the system.

Discovery procedure:

- 1) Set all **SYG-EM** system's devices in "Discovery mode". This operation is accomplished only through the **SYG-EM**'s keypad / display system. See the **SYG-EM**'s manual for precise instructions.
- 2) Trigger and complete the discovery operation from **SygNEX**. See **SygNEX**'s manual.



SYG-EM's user interface and SygNEX will prompt you whether to use channel A, B or C for discovery. Use the less congested / relatively free channel: if channel A gives problems use B; if B gives problems use C.

Preferably, use the SYG-STK survey kit to diagnose channel A, B and C.

Make sure you specify the same channel on the SYG-EMs and SygNEX.



SYG-CEM does not require any particular keypad / display operation for the discovery operation.

EVENT SIGNALLING

Wireless system's events, like faults and alarms, are notified to the user in both of the following ways:

- through specific LEDs, visible even if the printed circuit board is hidden by the front cover;
- through written messages visualized on the LCD display; the LCD is visible only if the front cover is not installed.

LED SIGNALS - DEVICE IS POWERED ON

The blinking green LED above the "Power" icon indicates that the device is switched on.



Picture 16

LED SIGNALS - ALARM

The red LED above the "Flame" icon indicates that an alarm event has occurred.



Picture 17

LED SIGNALS - FAULT

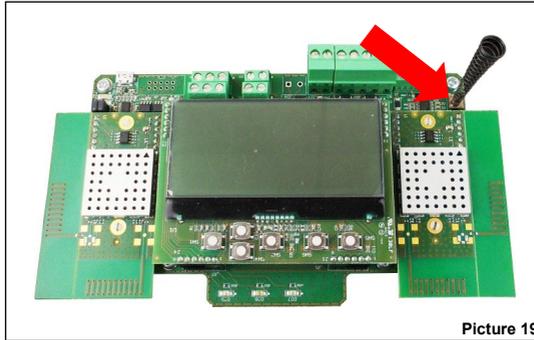
The yellow LED above the "Spanner" icon indicates that a fault event has occurred.



Picture 18

TAMPER DETECTION

SYG-CEM is equipped with a tamper detection switch; when the front cover is removed, the switch-spring system is released, causing a tamper event message to be routed to the control panel.



Picture 19

Tamper detection capability can be disabled / enabled from **SygnEX**.



EN 54 requires you to keep tamper detection enabled.

ONBOARD DISPLAY'S EVENT SIGNALLING

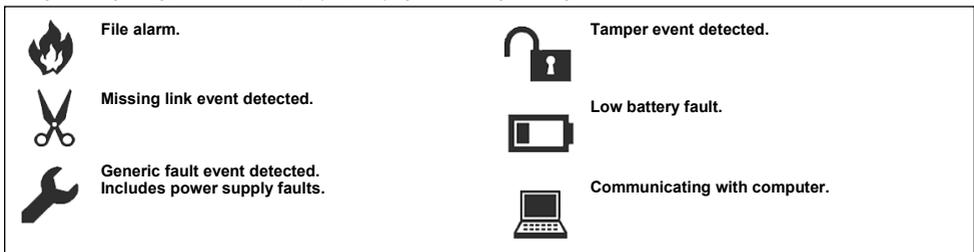
Event occurrences are notified on the **SYG-CEM**'s onboard display as in the following example:



Picture 20

- Where: **n:** The "n:" row indicates the number of the message event and the total of the messages available for viewing. To go through the message events use the left / right and up / down keys.
- RF Addr.** This row indicates the address of the device "affected" by the event. "RF Addr." is the wireless address which is a composed by the network device address (**SYG-CEM**'s, **SYG-EM**'s) and the child device address (if "0" refers to the network device itself).
- Sygno-fi Coordinator** In this example it is the generic description of the **SYG-CEM**.
- Tamper** In this example it is a "tamper" detection event type.

During event signalling, icons are also displayed, carrying the following meanings:



Picture 21

FUNCTIONAL TEST - ALARM TESTING

Test the **SYG-CEM**'s alarm signalling capability as follows:

- 1) Activate an alarm on the Sygno-fi system.
- 2) Check that the **SYG-CEM** locally displays the alarm event.
- 3) Check that the control panel displays the alarm event.
- 4) Check that Sygno-fi and conventional output devices activate (e.g. sounders...).
- 5) Reset all the system from the control panel.

FUNCTIONAL TEST - FAULT TESTING

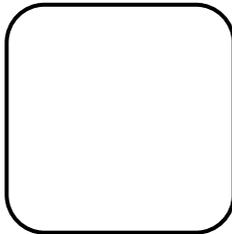
Test the **SYG-CEM**'s fault signalling capability as follows:

- 1) Activate a fault event.
- 2) Check that the **SYG-CEM** locally displays the fault event.
- 3) Check that the control panel displays and notifies the fault event.
- 4) Reset all the system from the control panel.



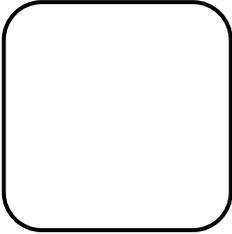
Apply mandatory testing and periodic testing policies of your country.

NETWORK DEVICE QR CODE

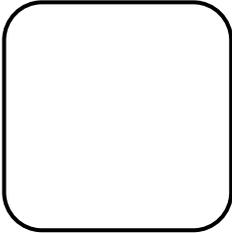


NOTE

FIELD DEVICES QR CODE

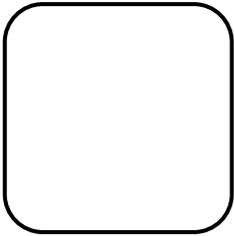


NOTE

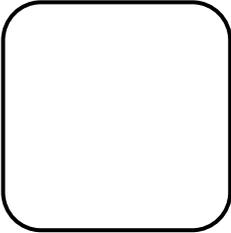


NOTE

FIELD DEVICES QR CODE

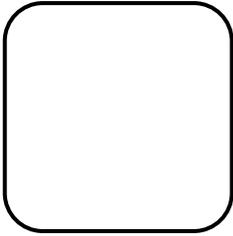


NOTE

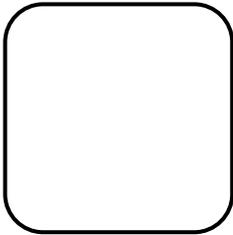


NOTE

FIELD DEVICES QR CODE

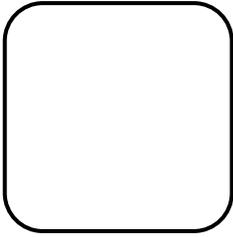


NOTE

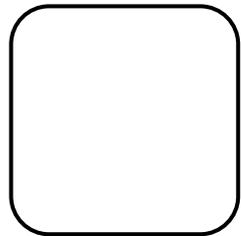


NOTE

FIELD DEVICES QR CODE

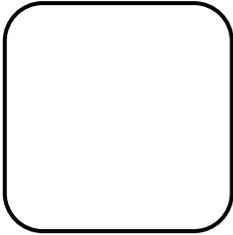


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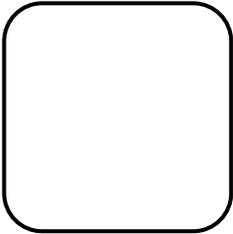


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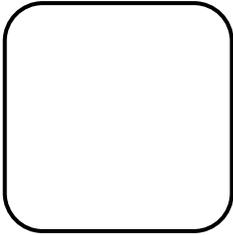


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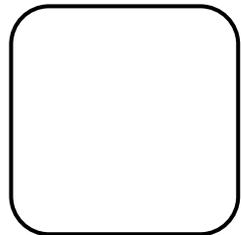


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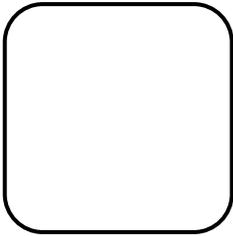


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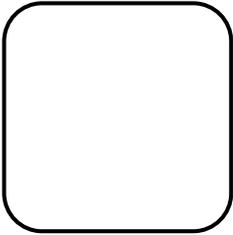


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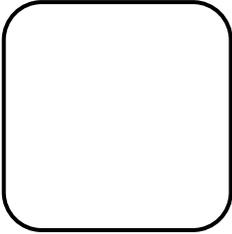


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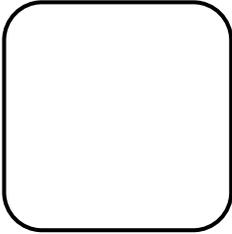


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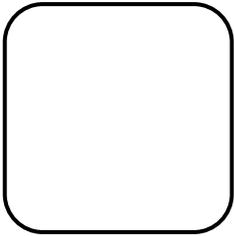


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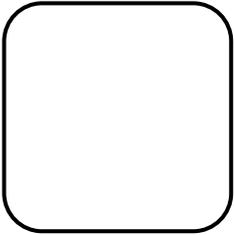


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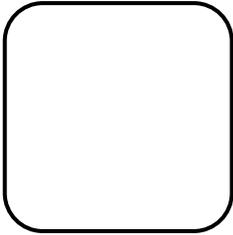


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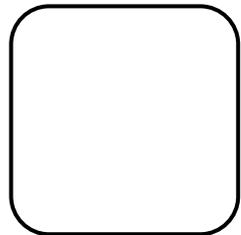


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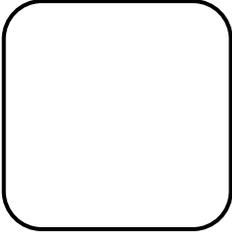


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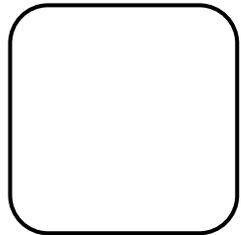


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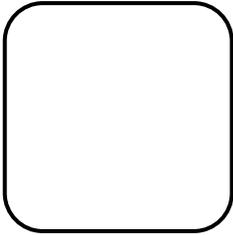


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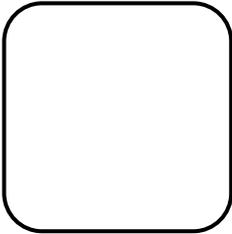


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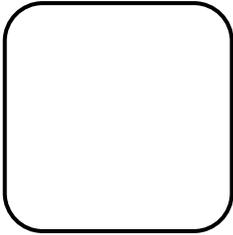


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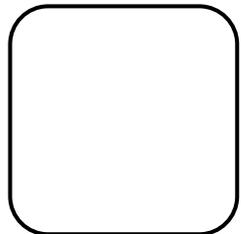


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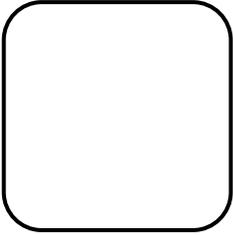


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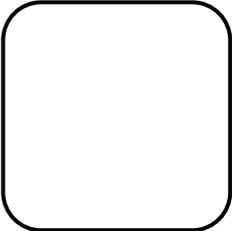


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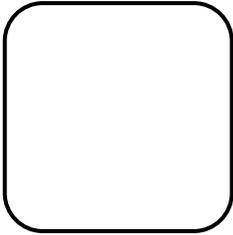


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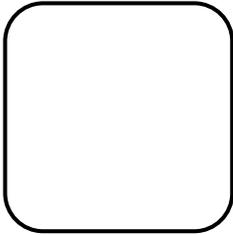


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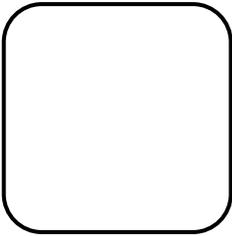


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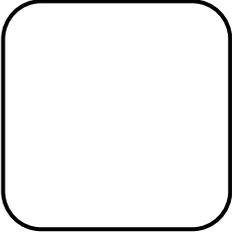


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