Installation and Operation Manual of

Intelligent Conventional Fire Alarm Control Panel

MC5

M5-CCP-2XX

Fire Alarm Systems

Tabel of content

Introduction

Thank you for choosing the MC5 Fire Alarm Control Panel. This manual has been prepared to provide comprehensive information and step-by-step instructions for the installation, commissioning, configuration, testing, troubleshooting, and proper maintenance of the MC5 Fire Alarm System.

Fire alarm systems play a vital role in ensuring safety and protecting life and property. The MC5 panel, designed and manufactured using advanced technologies and in compliance with the highest safety and performance standards, offers a reliable and efficient solution for accurate fire detection and timely alarm notification.

Warning

- Read this manual carefully before doing installation and using the device.
- The performance of the device should be tested after installation on-site.
- The placement of all fire alarm equipment must be done by experts and those who are familiar with the valid standards of fire alarm systems.
- For the proper functioning of the fire alarm control center and its related parts, it is necessary to carry out the 6-month periodic services and maintenance process. If this process is not implemented by competent individuals, no responsibility will be borne by the manufacturer.
- The fire alarm system is only for warning and notification of fire or gas leakage. For complete information on the placement and installation of fire alarm systems please refer to BS5839 or NFPA 72 standards

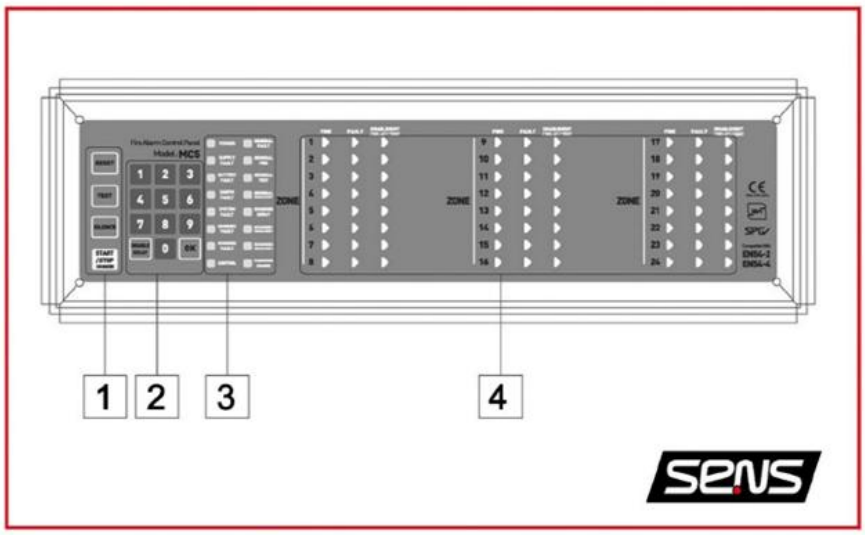
Technical Specifications of the Device

Model	**MC5**
Class	Conventional
Compatible with	EN54-2, EN54-4
Input Voltage	220VAC±10% @ 50-60Hz
Max. Current Consumption AC	500mA
Operating Voltage	24VDC
Power Supply	

• Type	Integrated switching power supply with battery charging and monitoring circuits.
• Description	100 W single-output enclosed type switching power supply. High efficiency up to 89% with metallic mesh case for enhanced heat dissipation. Operates under natural air convection without fan.
• Input Voltage	100–240 VAC, 50/60 Hz
• Output Voltage	30 VDC (nominal), 27–31 VDC (min/max)
• Output Current	3A max.
• Max Internal Resistance	60mΩ @ 25°C
• Cable	1mm2, 20mΩ @ 1m
• $\mathbf{I_{min}}$ (the quiescent current drawn by the power supply equipment (PSE) with the minimum output loading.)	300mA
• $\mathbf{I_{max\,a}}$ (the current taken from the main power source, when supplying the quiescent load, charging the battery and supplying the maximum load from all auxiliary outputs.)	1.3A
• $\mathbf{I_{max\,b}}$ (the current taken from the main power source, when supplying the system in the fire alarm condition, with all mandatory outputs activated, and with no battery charging.)	2.8A
Battery	
• Number	2
• Voltage	12V
• Capacity	4.5Ah - 7.2Ah
• Type	Lead Acid
• Max. Battery Current	3A
• Battery Cable	1mm2, 20mΩ @ 1m
Fuse Ratings	
• Input Fuse	5A
• Battery Fuse	3A
• AUX Fuse	0.8A
Zones	

• Number	24 Zones
• Max. Detectors Per Zone	20
• Max. Call Point Per Zone	Unlimited
• Voltage	24VDC ± 2V
• Max. Cable Resistance	22.5 Ω
• Cable size	1–1.5 mm²
• End of Line Resistor	6.8 kΩ ± 5% Tolerance, 0.25 Watt
Sounders Output	
• Number of Channels	2 Channels
• Max. Sounders Per Channel	10
• Voltage	24VDC ± 1V
• Current	Max. 500 mA each channel
• Max. Cable Resistance	22.5 Ω
• Cable size	1–1.5 mm²
Auxiliary Output	
• Voltage	24VDC ± 1V
• Current	Max. 500 mA
Dialer Output	
• Voltage	12VDC ± 0.5V
• Current	Max. 100 mA
Relays	
• Fire Relay Output Max. Current	7A @220VAC 7A @ 30VDC
• Fault Relay Output Max. Current	7A @220VAC 7A @ 30VDC
Material	Metal
Dimensions	W315 × D85 × H405 mm
Operating Temperature	-10°C to +40°C
Relative Humidity	93% @ 40°C 95% @ 25°C (Non-condensing)
Weight (Without Battery)	3.6 kg

Introduction of MC5 Fire Alarm Control Panel



The above figure shows the different parts of the MC5 fire alarm control panel. In the table below, each part is briefly described:

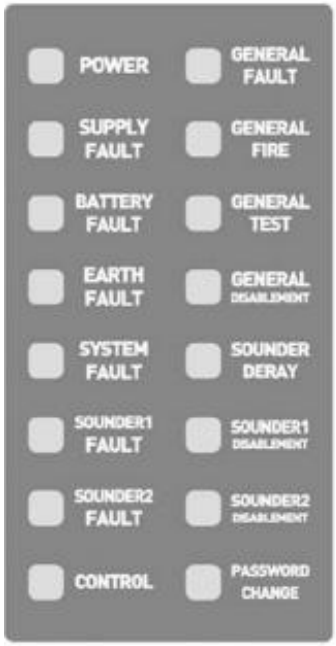
Item	Name of Part	Description
1	Control Keys (four push buttons for controlling the device)	These buttons work only if the device is in access levels 2 or 3
2	Password Settings	Access level passwords and device settings can be entered using these keys
3	System Status Indicator	This part includes indicators such as device power supply, main power input, battery, sounders, etc.
4	Zone Status Indicator	This part includes indicators such as fire, error, and zone de- activation

Control Keys

Name of Control Key	Description
Reset	This key is used to restart Zones
Test	-By pressing this key at level 1, all the indicators and the buzzer will turn on for 4 seconds, and then they will turn off - Pressing the test key at level 2 takes the panel to the engineering test mode
Silence	By pressing this key in access levels
Start\Stop Sounder	-This key is used to activate or deactivate the alarm sounders in access levels 2 and 3 -This key overrides the delay setting for sounders at level 1

System Status Indicators

- **Power:** Device power indicator.
- **Supply fault:** Main power failure indicator.
- **Battery fault:** Battery error indicator
- **Earth fault:** Earth connection error indicator
- **System fault:** Any system fault indicator
- **Sounder1 fault:** Sounder channel 1 error indicator
- **Sounder2 fault:** Sounder channel 2 error indicator
- **Control:** Access level indicator
- **General Fault:** General error indicator
- **General Fire:** General fire mode indicator
- **General Test:** Test mode indicator
- **General Disablement:** Deactivation mode indicator
- **Sounder Delay:** Indicates if any delay is set



- **Sounder 1 Disablement:** Sounder channel 1 deactivation indicator
- **Sounder 2 Disablement:** Sounder channel 2 deactivation indicator
- **Password Change:** Password change mode

indicator	Introduction
Power	If the device is powered, this green indicator lights up constantly
Supply fault	It will light up constantly when there is no power and will flash in case of a fault
Battery fault	It will flash if there is no battery or when the fuse is broken and will light constantly in case of a battery problem
Earth fault	It will flash in case of a short circuit in the zones or sounders wires to the body and any current leakage
System fault	Flashes in case of any problem in the system processor, and will light up constantly if the processor burns out
Sounder1 and Sounder2 fault	flashes in case of a short circuit fault in sounder channels and will light up constantly in case of an open circuit
Control	It lights up continuously at level 2 and flashes at level 3
General Fault	Flashes when there is a system error and stays in this state until the error is fixed and the device is reset
General Fire	Flashes if there is a fire detected in any zone circuit
General Test	Flashes if test mode is on
General Disablement	Flashes if the deactivation mode is on and lights up after a zone or sounder is selected

Sounder Delay	Flashes if the delay mode is on and will light up constantly after a delay is set
Sounder 1 and sounder 2 Disablement	Flashes when a sounder channel is selected for deactivation, and it will light up constantly if deactivation is applied
Password Change	Flashes if the password change mode is on

Login Password and Settings

These keys are used to enter the password and change the access level

Access Level	Type of Operator	Description
1	General	Testing of the indicators of the panel, and the buzzer and fixing the delay (if the delay mode is activated)
2	System Manager	Sounders Activation/deactivation, Muting the buzzer, Panel reset, activation/deactivation of the zones, sounder, and test mode.
3	Engineers and Installers	Delay setting, sounder activation/deactivation, muting the buzzer, panel reset

- Access level 1

Access level 1 is activated by default when the panel is turned on. In this level, all of the pushbuttons are deactivated and the "Control" indicator is off.

- Access level 2

To enter access level 2:

- Press the OK button
- Enter the level 2 password. The pre-defined factory password is 2222.
- Press the OK button again. Level 2 will be activated and the "Control" indicator will light up constantly.

Press the OK button three times to exit this level.

- Access level 3

To enter access level 3:

- Press the OK button
- Enter the level 3 password. The pre-defined factory password is 3333.
- Press the OK button again. Level 3 will be activated and the "Control" indicator will start flashing.

Press the OK button three times to exit this level.

Channels and Zones Activation/Deactivation

All zone and alarm lines are set to active mode in the factory. If you want to disable any line or vice versa, follow these steps:

1. Enter access level 2
2. Press the “Disable/Delay” button. The "General Disablement" indicator will flash
3. Enter the zone number from 1 to 24 or the alarm line number 25 or 26
4. Click OK to confirm. The corresponding LED in the “Disablement/Delay/Test” column should be flashing. Repeat step 3 and 4 to add other zones or alarm lines
5. To apply the settings and exit, press the “Disable/Delay” button.

- You can reactivate the lines by following the same steps.
- Note: Turning on and off the device will not activate disabled channels

Testing (Engineering Test)

The purpose of this mode is to speed up the testing and maintenance of the entire system. Follow these steps to activate the Test mode

1. Enter access level 2.
2. Press the test key. The "General Test" indicator will flash.

3. Enter the desired zone number from 1 to 24.

4. Press the OK to confirm. The corresponding LED from the "Disablement/Delay/Test" column will flash.

5. If fire is detected on the zone line, the sounders will operate for 5 seconds on and 2 seconds off and this will continue as long as the zone is in fire mode.

- To exit this mode, press the Test button.
- Note: The Test mode does not affect zone lines other than the selected ones.

Alarm Activation Delay

In this mode, the system operator can set a delay of 1 to 8 minutes before the alarms are activated after a fire is detected.

Note: This feature is not available for zones; 1, 5, 9, 13, 17, and 21.

To set a delay, follow these steps:

1. Enter access level 3.

2. Press the "Disable/Delay" button. The "Sounder Delay" indicator will flash.

3. Enter a number between 1 and 8 using the keyboard.

4. Press the OK to confirm. The corresponding LED will flash.

5. Press the "Disable/Delay" button to apply the delay and exit the delay setting menu.

- Repeat the above steps, except step3, to remove the delay.
- Note: When you enter a delay between 1 and 8 minutes and exit the delay mode, the “Sounder Delay” indicator will remain on.

Changing Password

First, enter the desired access level (the level you want to change the password). Reenter the old password and press the OK button. The “Password Change” indicator should be flashing now.

Enter the new password as a four digit number and press the OK button. The “Password Change” indicator will be on constantly. To exit the password change mode, press OK three times.

Zone Status Indicators

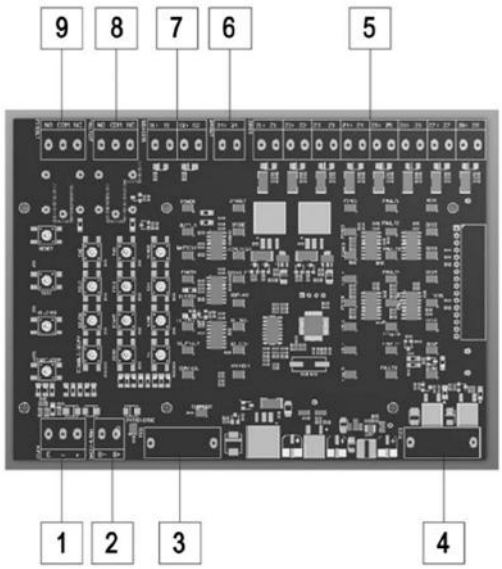
indication	Description
Flashing Yellow Light	A flashing yellow light in the fault column means a short circuit fault in the zone circuit.
Constant Yellow Light	Yellow light in the fault column means an open circuit or broken connection in the zone circuit
Flashing Red Light	The flashing red light in the fire column indicates that the fire alarm mode is active and sounders are activated
Constant Red Light	A constant red light in the fire column indicates that the fire alarm mode is on and sounders have been turned off
Disablement/Delay/Test column	Indicators in this column show the status of the zones in test, deactivation, and alarm delay modes that are explained in the relevant sections

Internal Boards

The MC5 fire alarm control panel includes two internal boards called the motherboard and expansion board:

- Motherboard

An overview of the motherboard and its different parts are shown in the figure below.



1. Main power input terminal (power switching output)

2. Battery terminal

3. Battery fuse (3A)

4. 24V AUX output fuse (0.8A)

5. Terminal zones

6. 24 AUX terminal

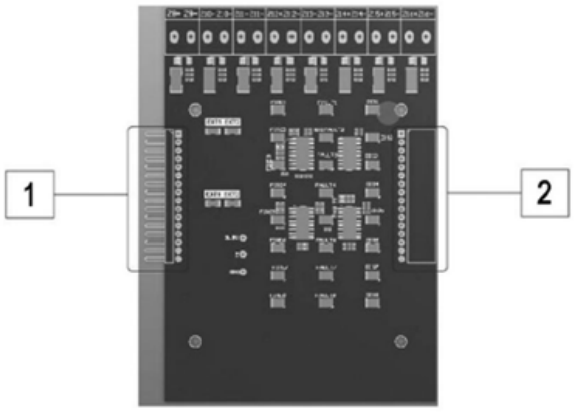
7. Sounder terminal

8. Fault relay terminal

9. Fire relay terminal

- Expansion board

An overview of the development board is shown in the below figure



1. Connection to the mother board or previous expansion board

2. Connection to the next expansion board

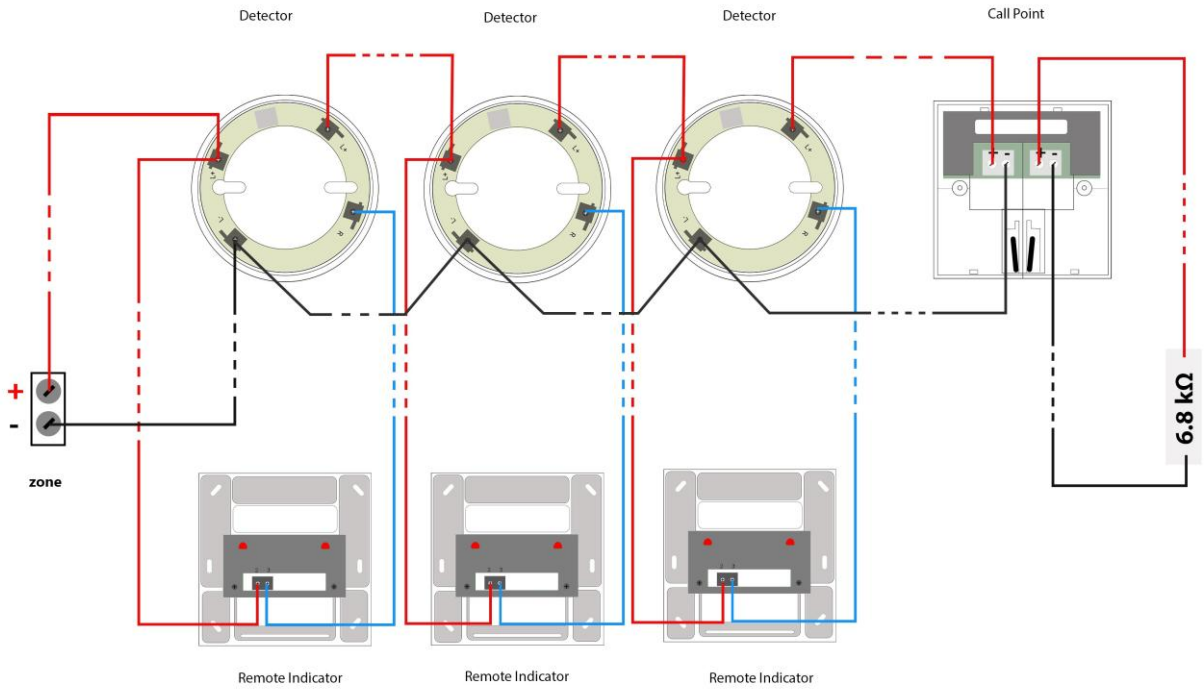
Installation

Fire alarm control panels must be installed according to national standards, NFPA-72 or BS-5839, by certified experts.

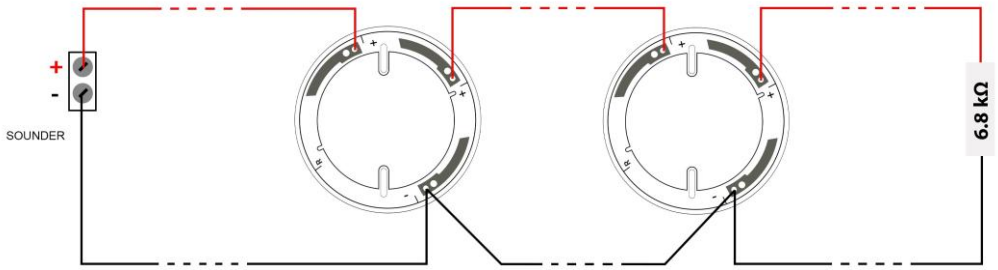
Circuit Diagram

A connection diagram between the components of the fire alarm system and the fire alarm control panel is shown below.

- Conventional Fire Alarm System Zone Diagram:



- Conventional Fire Alarm Sounder Diagram:



Battery Wiring

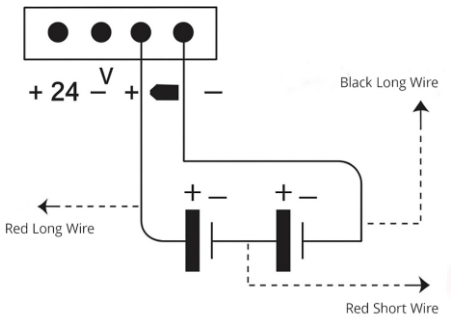
Please follow these steps carefully for wiring:

1. Connect the small red wire connector between the plus (red) connection of one battery and the minus (black) connection of the other battery.

2. The longer red wire connector connects the other red end of the battery to the positive battery input on the power supply.

3. The black wire is for connecting the other black end of the battery to the negative battery input on the power supply board.

Below is a diagram of the battery wiring:



Tips for Battery Installation

- For 2 to 12-zone uses, use two 12V dry batteries with a minimum capacity of 4.5 Ah and for 12 to 24-zone uses, use a minimum capacity of 7 Ah batteries.
- The battery fault LED will flash if the battery circuit is open. It will be on if the batteries are defective.
- Test the device with fully charged batteries during the initial installation and testing.

Initial Testing

The panel should be tested before connecting to other devices.

1. Ensure that the zone connectors are connected to the end-of-line resistors (6.8K Ohm) with blue, gray, red, and gold/silver color codes.

2. The power connector should be connected to the 220V power line.

3. Connect the batteries as described.

4. Now all indicators except the green power indicator, should be off.

5. All the indicators and internal buzzer should be on for 5 seconds after pressing the Test button.

- Power fault and battery fault test

1. Cut off the 220V power supply when the panel is connected to a live power line and battery.

2. You should see the "Supply fault" indicator flashing and hear the buzzer after a few seconds.

3. To mute the buzzer, enter to access level 2 or 3 and press the "Silence" button. "Supply fault" indicator should continue flashing.

4. Reconnect the 220V power line to the panel, the panel should return to its normal, and the power indicator continuously green.

5. This time, disconnect the battery. You should see the "Battery fault" LED flashing and hear the buzzer.

6. Reconnect the battery. The panel should return to normal and only the green power light should stay on.

- Zone circuits test

Ensure that the zone connectors are connected to the end-of-line resistors (6.8K Ohm) with blue, gray, red, and gold/silver color codes.

Zone circuits may have four states as follows:

state	Description
Normal	All fault LEDs and the internal buzzer are off
Open Circuit Fault	The zone circuit is disconnected at some point. The zone's yellow fault light and buzzer are constantly on
Short Circuit Fault	There is a short circuit in the zone circuit. The yellow fault light is flashing and the buzzer is on
Fire Alarm	When a detector or call point on the zone circuit is activated, the panel goes into alarm mode. The zone's red LED will be flashing and the sounders will be activated

- Alarm lines test

Ensure that the alarm connectors are connected to the end-of-line resistors (6.8K Ohm) with blue, gray, red, and gold/silver color codes.

Alarm circuits may have three states as follows:

state	Description
Normal	All fault LEDs and the internal buzzer are off
Open Circuit	The alarm circuit is disconnected at some point. The yellow fault light and buzzer are constantly on.
Short Circuit	There is a short circuit in the alarm circuit. The yellow fault light is flashing and the buzzer is on.

Note: When one of the zones is in alarm mode and alarms have been muted manually, the fire LED will remain on and the buzzer will not sound.

Note: The sounders can be activated directly by pressing the "Start/Stop sounder" button.

Troubleshooting

This section will help you identify common problems with the MC5 fire alarm control panel and find possible solutions. Before taking any action, please ensure that the panel's main power supply and battery are disconnected to prevent probable hazards.

Notice: Any complex troubleshooting, repairs, or replacement of the panel's internal components must only be carried out by trained and authorized technicians.

- Common Issues and Recommended Solutions
  - "Supply fault" indicator lights up continuously:
    1- Check that the 220 V AC power cable is properly connected to the terminal and has not been disconnected from the switching power supply.
    2- Verify that the input terminal fuse is intact
    3- Check the building's power supply status.
  - Flashing "Supply Fault" indicator:

    This fault occurs due to a defect in the switching power supply unit, which must be inspected by a qualified technician
  - "Battery fault" indicator lights up continuously:
    1- Ensure that the battery cables are properly connected to the terminals.

2- Check and correct the battery connection polarity (positive to positive and negative to negative).

- Flashing “Battery Fault” indicator:

  In this case, the battery is either fully discharged or defective.

- Flashing “Earth Fault” indicator:

  1- Inspect all zone wiring, sounder wiring, and terminal outputs for any unintended connection to ground or metal chassis.

  2- Ensure that the wire insulation is in good condition.

  3- Use separate wiring routes for fire alarm system cables and high-voltage cables.

  4- If the fault persists, contact technical support.

- Flashing “System Fault” indicator:

  1- Reset the panel once or turn it off and then back on.

  2- If the fault persists, contact technical support. This fault usually requires professional inspection.

- “Fault” indicator of any zone light up continuously:

  1- Ensure that the EOL (End-of-Line) resistor is correctly installed at the end of the zone.

  2- Check the zone wiring for any breaks or disconnections.

  3- Inspect the detectors and manual call points in the zone for proper connection.

- Flashing “Fault” indicator of any zone:

  1- Check the zone wiring for any short circuits.

  2- Test the detectors/manual call points individually to identify the faulty device.

  3- Ensure that the wires are not touching each other at the terminals

- “Sounder1 Fault” or “Sounder2 Fault” indicators light up continuously:

  1- Ensure that the EOL (End-of-Line) resistor is correctly installed at the end of the sounder circuit.

  2- Check the sounder circuit wiring for any breaks or disconnections.

  3- Inspect the sounders for proper connection and functionality.

- Flashing “Sounder1 Fault” or “Sounder2 Fault” indicators:

1- Check the sounder circuit wiring for any short circuits.

2- Test the sounders individually to identify the faulty device.

3- Ensure that the wires are not touching each other at the terminals.

- Flashing “Fire” indicator of any zone:

1- Check the source of the fire and take appropriate action if necessary.

2- Eliminate any sources of false alarms (such as steam or heavy dust).

3- After removing the cause of the alarm, restart the system at Access Level 2 using the **Reset** button.

4- If the issue recurs, inspect or replace the corresponding detector/manual call point

Maintenance and Inspection

Fire alarm systems should be inspected periodically with the following routines:

- **Daily inspection**

Fire alarm systems should be inspected and checked daily for any faults or fires

- **Weekly inspection**
  - To ensure the functionality of the entire system, a weekly "Engineering Test" must be conducted. Refer to the "Engineering Test" section in this manual.
  - Once a week, fire alarm sounders should be checked for one minute during working hours. All residents should be able to hear the alarm sound.
- **Monthly inspection**
  - First, a weekly inspection routine must be conducted.
  - To ensure the functionality of the batteries, turn off the main power for at least one hour. During the test inspect any false fire or fault on the panel.
- **Quarterly inspection**
  - First, a monthly inspection routine must be conducted.
  - Furthermore, recorded fires and faults should be carefully reviewed to ensure they have been corrected.
  - In case of a false alarm, address it and take necessary action(s).
  - One or more detectors on the circuit should be triggered to test the system and panel's functionality.

- All panel auxiliary outputs should be checked.
- Power, Battery, Alarm Line, and Zone circuit faults should be tested according to this manual

- Annual inspection

- All detectors and devices on the system should be checked for visible damage and performance.
- Activate all output devices and check their performance
- To ensure the performance of the detectors, alarm devices and panel, all detectors should be triggered and tested with fire simulation.
- Visual fire alarms and detectors should be checked for the visibility and cleanliness element surface.
- Ensure that audio fire alarms are audible and sound good.
- Any visible damage to cables and wiring should be checked.
- Check the capacity of backup batteries according to this manual, and their expiration date, and replace them if necessary.

Caution: Keeping fire alarm systems in good working order requires regular inspections and servicing. Technicians who have been trained and authorized by SENS should perform this work.