

**A WIRELESS SOLUTION FOR BUILDING AND  
EXPANDING OF FIRE ALARM AND SECURITY SYSTEMS**



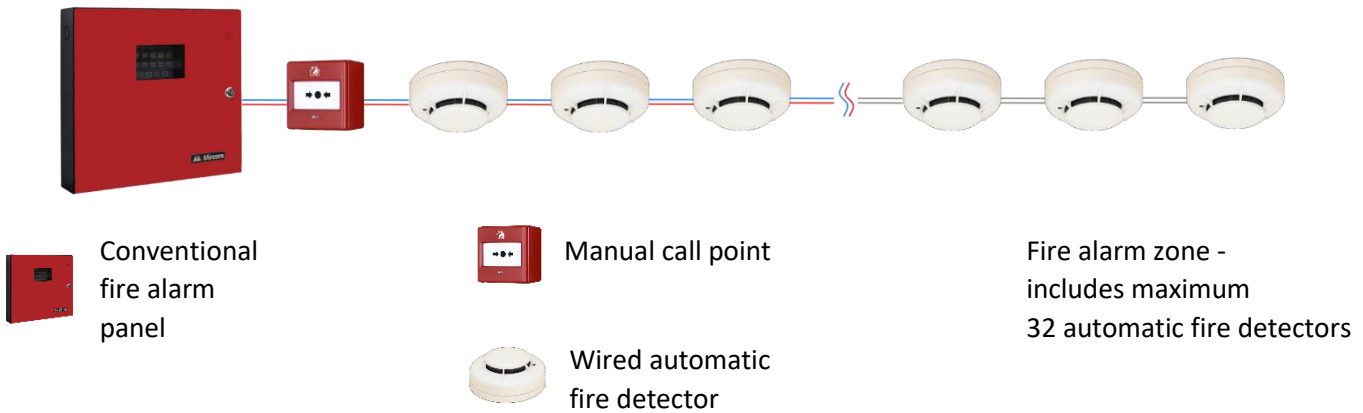
**BY**



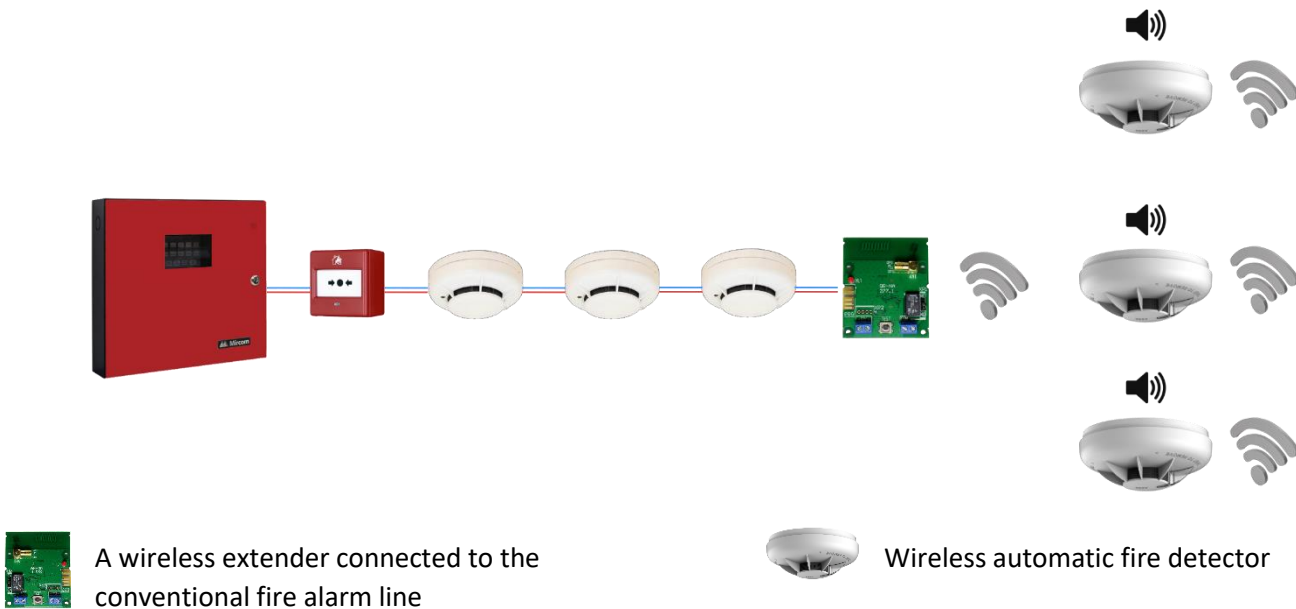
# 1. A typical use of the Alertifire system

## 1.1 Restoration of an existing fire alarm system

The figure below shows a conventional fire alarm line with a hard-to-detect discontinuity.



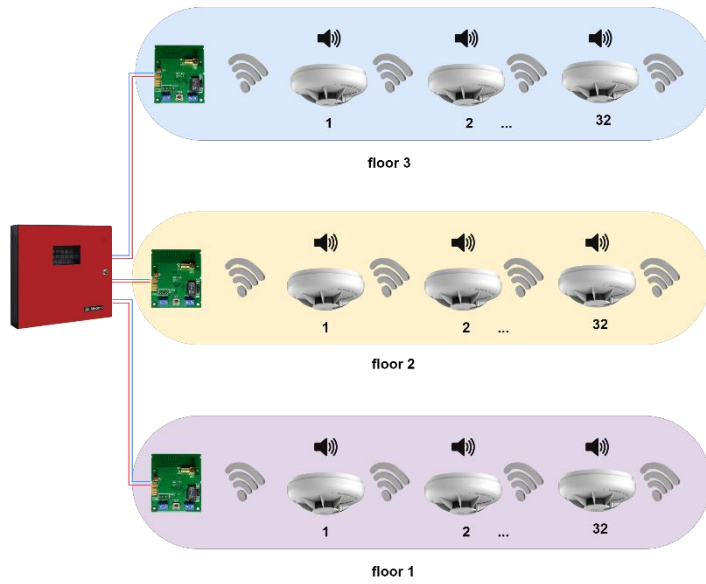
The figure below shows the installation of a wireless extender and fire detectors at the point of the disconnected part of the fire alarm line



When registering a fire from a wireless fire detector:

- activates the built-in siren
- transmits the signal to all wireless fire detectors connected in a wireless network with it and they turn on the sirens built into their housings
- transmits the signal to the wireless extender connected in the same wireless network, and the wireless extender transmits the signal over the wired fire alarm line to the conventional fire alarm panel

### 1.2 Design of a fire alarm system with wireless fire alarms



### 1.3 Including a wireless extender and fire detectors to an alarm system



## 2. Product overview

Alertifire is a wireless fire alarm system consisting of an extender and fire detectors communicating by means of a radio signal at a frequency of 868 MHz. The extender connects directly to a conventional fire alarm line, from which it receives supply voltage and to which it sends a fire signal when any fire alarm from its radio network is triggered. The extender can be connected to the conventional fire alarm line alone or together with other wired automatic fire alarms of any type and manual buttons. A resistor can be connected to the expander, balancing the current in the duty mode of the line, as well as a second resistor, determining the fire current when a wireless fire detector is triggered by its radio network. By selecting the value of these resistors, the wireless extender can work with conventional control panels of any type and manufacturer, as well as connect to addressable fire alarm systems using the adapter provided with the relevant address system for the inclusion of conventional fire alarms.

When the wireless fire detector registers a fire condition in the protected object, it lights up a red indicator, turns on the built-in siren, and transmits the signal via radio channel to all elements connected in its radio network (extender and fire detectors). The wireless extender immediately transmits the signal to the fire alarm center via the conventional fire alarm line, and the wireless fire detectors that receive the signal include the sirens with a delay of 0 to 30 seconds after the start of the signal broadcast by the fire detector that registered it. This state of the radio network is preserved until manual or automatic reset of the fire detector that emitted the fire signal.

### 2.1 Basic functions

- Compatibility with all types of fire alarm and security systems.
- Creates a wireless network with up to 32 fire detectors. Technically, more than 32 fire detectors can be connected to the wireless extender if the relevant regulatory framework allows this.
- Availability of one button, through which the organization of the network and the testing of the fire detector are carried out.
- Availability of a self-healing function
- Presence of an LED indication visualizing the operating modes of the fire detectors and the extender

### 2.2. Technical specifications

**Power supply voltage of the wireless extender:** 8V to 30V DC with the possibility of direct connection to a fire alarm line

**Powering the wireless fire detector:** Built-in lithium-ion battery with a voltage of 3V and a capacity of 1500 mAh, sealed, with a period of continuous operation of 10 years

**RF frequency:** 868.100 (<1% duty cycle)

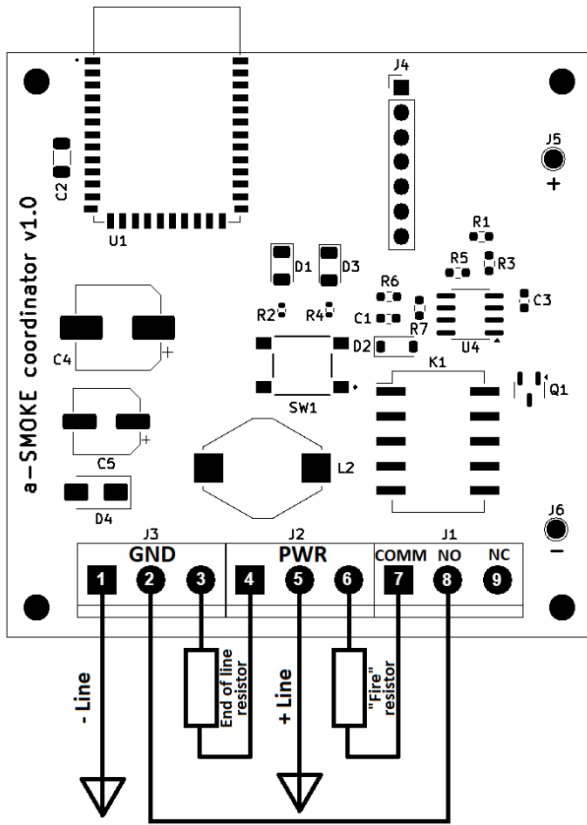
**RF emission power:** 14 dB

**RF range:** 280 m open space

**Type of wireless fire detector:** Optical-smoke with a built-in siren with a volume of 85 dB at a distance of 3 meters

**Operating temperature:** 0 °C to + 55 °C

### 2.3 Connecting the wireless extender to a conventional fire alarm line. Operation in "Duty Mode" and "Fire" Mode



The extender is connected to a conventional fire alarm line as shown in the figure.

#### Connecting the extender to the conventional fire alarm line:

- Positions 1 to 3 of the terminal block are short-circuited and supplied with "-" on the supply voltage or "-" on the fire alarm line
- Positions 4 to 6 of the terminal block are short-circuited and supplied with "+" of the supply voltage or "+" of the fire alarm line
- Positions 7 to 9 of the terminal block allow connection to the dry switching contacts of the relay, which turns on when a fire message is received from any of the fire detectors in the extender radio network.
- An "End of Line" resistor is used to balance the current of the conventional fire alarm line in Standby mode when the Extender is at the end of the line. It is selected depending on the parameters of the Fire Alarm Center.
- A "Fire" resistor is used to switch the conventional fire alarm line into "Fire" mode when the extender receives a fire message from any of the fire alarms in its radio network. It is selected

depending on the parameters of the Fire Alarm Center.

- The figure shows an example circuit for connecting the extender to a conventional fire alarm line. Other variants of inclusion are admissible, consistent with the purpose of the designation described above.
- When connecting the expander to a security system, the minus of the expander's power supply is supplied to terminals 1 to 3, and the plus to terminals 4 to 6, respectively. The fire signal is received through the dry switching contacts of the relay (terminals 7 to 9)

#### Operation of the Expander in "Duty Mode" and "Fire" Mode

- After applying power to the fire alarm line, the Extender illuminates the green LED indicator.
- When receiving a fire signal from a fire detector connected to the radio network, the Extender turns on its relay and it changes the position of its contacts.
- The Extender's transition from "Fire" mode to Standby mode (deactivation of the relay) is carried out in case of receiving a signal to disable the alarm from the same fire detector that initiated the alarm.
- When the conventional fire alarm line is reset (the voltage becomes 0V for a time determined by the type of fire alarm control panel), the Extender remains de-energized and the green LED goes out. When re-powering, the green LED lights up and the network parameters remain unchanged. In doing so, the Extender goes into Standby mode and monitors the radio network for the presence of a "Fire" signal.

### 3. Procedures for organizing a network

It is recommended that before performing the "Network Creation Procedure", the settings of all devices (detectors and extender) are deleted by following the steps of the "Network disconnection Procedure".

### 3.1 Network Creation Procedure

#### Actions with the Expander

- **step 1** (*entering expander in "Service Mode"*)

The expander button is pressed 5 times. An indication of this condition is the flashing of the red indicator light at 1 second intervals.

- **step 2** (*opening "Join Window" on devices*)

The expander button is held for about 1-2 seconds. An indication of this condition is the blinking of the light indicator in red color at intervals of 0.5 seconds. (fast blink).

**Performing steps 1 and 2 ensures an open window for the detectors to join the network for a period of 80 seconds. After that, for each of the detectors, the following steps are performed:**

#### Actions with Fire detectors

- **step 3** (*entering a fire detector in "Service Mode"*)

The detector button is pressed 5 times. An indication of this condition is the red color of the detector indicator flashing at 1 second intervals.

- **step 4** (*connecting a fire detector to the network*)

The detector button is pressed 1 time. This condition is indicated by the red indicator lighting up for a second and then going out.

### ATTENTION

- *The red LED on the fire detector lights up for 80 seconds with one short and one long flash - this means that the detector has been entered into join mode (step 4 has been completed), without the presence of a 'Join Window'.*

- *The detector's red LED lights up briefly, then goes out, but the detector does not join the network - this means that there are settings of another network in the detector's memory, which were not deleted before entering the network join mode.*

### 3.2 Network Expansion Procedure

*Steps 1 and 2 of the "Network Creation Procedure" are executed (without performing the pre-deletion of the existing network settings)*

*Steps 3 and 4 of the "Network Creation Procedure" are performed for the new detectors we want to join the existing network.*

### 3.3 Network Testing Procedure

With a correctly organized network, press and hold the TEST button on the fire detector being tested. The extender will enter the "Fire" state immediately, and the detectors on the same radio network will sound their sirens with a delay of 0 to 30 seconds.

### 3.4 Procedure for disconnecting a device from the network

- **step 1** (*entering device into "Service Mode"*)

The device button (expander or detector) is pressed 5 times. This condition is indicated by flashing of the indicator light at 1 second intervals (red for expander and red for detector).

- **step 2** (*delete network settings from device memory*)

The button of the device (extender or detector) is pressed 3 times. After performing this action, the indicator lights steadily for 1 second (in red for expander and red for detector), then goes out and the device goes into standby mode with the regular light indication for this condition.

Note 1: Performing this procedure deletes the existing network settings for the particular device.

Note 2: The procedure can also be performed when the fire detector / extender is not in network range.

### 4. Precautions for handling the devices



Caution!  
ESD-sensitive

### RoHS Compliant

This product has the following features:

- Without halogens (chlorine, bromine)
- Antimony free
- Without TBBP-A (C15H12Br4O2)
- PFOS free
- No SVHC

### 5. Contact information

For the latest specifications, additional product information, sales and distribution locations:

Parameter	Rating	Standard
ESD—Human Body Model (HBM)	Class 1A	ESDA / JEDEC JS-001-2012
ESD—Charged Device Model (CDM)	Class C1	JEDEC JESD22-C101F
MSL—Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020

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Fire detection