

Wireless Fire Detection System

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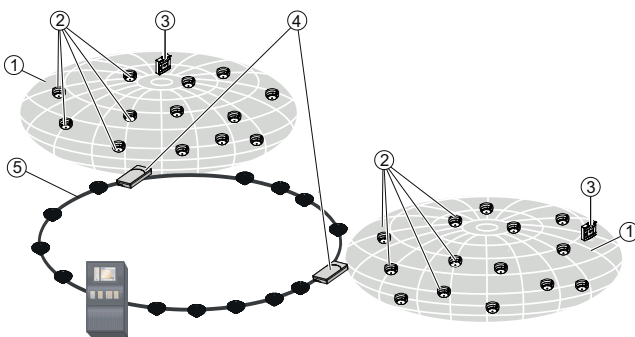
BOSCH
Invented for life



- ▶ Multihop mesh technology
- ▶ High communication reliability due to redundant transmission paths and to a dual band (433MHz, 868MHz)
- ▶ Long range thanks to an extended transmission path as every radio devices is used as a signal repeater (up to 3 hops)

System overview

Wireless fire detection system



FWI-270 on a LSN loop

- | | |
|--|-------------------------|
| 1 Radio cell | 4 Radio gateway FWI-270 |
| 2 Radio fire detector FDOOT271-0 | 5 LSN line |
| 3 Radio manual call point FDM273-O, FDM275-O | |

Functions

The Wireless Fire Detection System consists of a radio gateway FWI-270, radio fire detectors FDOOT271-O, radio manual call points FDM273-O and FDM275-O. A dual-band system with two frequency ranges (433, 868 MHz) and with numerous channels is used for the communication between the radio gateway and the radio devices to improve communication stability. Thanks to the mesh topology, all radio devices communicate with their neighbors and therefore redundant transmission paths are available to communicate to the gateway.

FWI-270 radio gateway

The radio gateway communicates with the control panel via the LSN line. Power is supplied via AUX power supply, BCM-0000-B and via a battery pack. This ensures a permanent power supply for the radio gateway. The areas that radio cells cover may overlap. The radio cell may occupy a maximum of 31 LSN addresses (30 addresses for radio devices and 1 address for the radio gateway). The radio gateway monitors its operation autonomously. If a radio gateway fails, a fault is signaled and displayed on the fire panel controller.

FDOOT271-O Radio Fire Detector

The battery-powered radio fire detector has a sophisticated opto-electronic measuring chamber with two optical transmitters, an optical receiver and two thermal sensors.

The radio fire detector can be used purely as an optical smoke detector or purely as a heat detector. The combination of optical and thermal sensor signals optimizes detection reliability and leads to:

- Early detection of all types of fire, whether they generate light or dark smoke, or no smoke at all.
- The neural fire detector can be operated at a lower sensitivity level and thus achieves a higher immunity against false alarms

FDM275-O, FDM273-O Radio Manual Call Point

The radio manual call point is used to trigger an alarm in the event of a fire or other emergency and consists of a housing and a switching unit including radio electronics and dual-band antenna.

FDM273-O has an indirect alarm activation by smashing the glass insert and pressing the alarm button.

FDM275-O has a direct alarm activation by pressing the plastic insert.

Certifications and approvals

Region	Regulatory compliance/quality marks	
Europe	CPR	0786-CPR-21670 FWI-270
	CPR	0786-CPR-21528 FDM273-O
	CPR	0786-CPR-21529 FDM275-O
	CPR	0786-CPR-21527 FDOOT271-O
Germany	VdS	G 219069 FWI-270
	VdS	G 216095 FDM273-O
	VdS	G 216096 FDM275-O
	VdS	G 216094 FDOOT271-O
Europe	CE	FWI-270
	CE	FDM273-O
	CE	FDM275-O
	CE	FDOOT271-O

Installation/configuration notes

Compatibility

Compatible with fire alarm control panels that support LSN improved. Consider that the different LSN fire panel controller may have varying performance features, e.g. maximum number of supported LSN elements.

You will find an overview in the following table:

	Fire alarm panel (LSN improved)	BZ 500 LSN UGM 2020 UEZ 2000 LSN
Automatic addressing (LSN improved), T-Tap not possible	yes	no
Compatible with manual addressing	no	no
LSN classic operation, T-Tap not possible, do not use FWI-270 as first element	yes	no

System limitations

- Max. 30 radio devices per radio gateway. Observe national guidelines and regulations
 - Sum of LSN manual call points and radio gateways max. 21 per LSN line
 - Max. 10 FWI-270 radio gateways per LSN line
- Maximum of 127 LSN elements (LSN classic), 254 LSN elements (LSN improved) is allowed per LSN processing assembly. Each radio gateway and each radio fire detector or radio manual call point is counted as an LSN element, e. g. with the maximum number of radio fire detectors:
1 FWI-270 + 30 FDOOT271-O = 31 LSN elements.

Connection and power supply

Power supply via the AUX supply voltage

In normal operation the gateway is powered via the LSN AUX supply voltage (LSN 0300 A or LSN 1500 A). Auxiliary power supply from the battery controller module (BCM-0000-B) is also possible.

Power supply from battery pack BAT3.6-10



When the battery pack is supplying power, the radio network remains active even if the auxiliary power supply is switched off.

- For commissioning the radio cell for the first time
 - If the power supply via the LSN AUX line is interrupted
 - If the LSN AUX line is temporarily switched off
- When the battery is full, the operating life is around one week if no power is supplied via the LSN AUX line.

Planning specifications

The installation must be dimensioned so that the expected fire characteristics can be detected reliably. The following planning specifications must be taken into account during planning:

- Network size
- Ranges
- Network density



The planning specifications of your system manufacturer remain unchanged. Please observe the documentation from your system manufacturer.

Network size

Up to 30 radio devices may be connected to each radio gateway.



The maximum number of devices permitted depends on your fire control panel, national guidelines and regulations.

Range

Range criteria:

- In buildings with small rooms and several walls, such as hotels and offices, a radio cell may be distributed over a maximum distance of 120 m.



Radio gateways and radio devices in a multi-story building with intermediate walls

A radio link may not exceed 20 m in length. The connection to other radio devices in the same radio cell should not penetrate more than one wall.

- A radio cell may be operated over a maximum of 5 stories, with the radio gateway positioned at the middle story.

Maximum permissible distribution for cross-story planning:

		●	●	●			Floor +2	40 m
	●	●	●	●	●		Floor +1	80 m
●	●	●	☎	●	●	●	Floor 0	120 m
	●	●	●	●	●		Floor -1	80 m
		●	●	●			Floor -2	40 m

Radio gateways and radio devices over five stories with intermediate walls

- In buildings without obstructions, such as large halls, a radio cell may be distributed over a maximum distance of 180 m.



Radio gateways and radio devices in a multi-story building without intermediate walls

Network density

Each radio device can have multiple connections to its surrounding neighbors. The distance to the surrounding neighbors must be at least 1.5 m.

Technical specifications

Radio transmission

Frequency range	433.05...434.79 MHz in band 44b and 45b ¹
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	868...870 MHz in band 48, 49, 50, 55, and 56b ¹
Channel grid	50 kHz
Number of channels	27 in 868-MHz band 20 in 433-MHz band
Transmitting power	≤10 mW ERP in band 44b, 45b, and 49 ¹ Type 10 (max. ≤25) mW ERP in band 48, 50, 55, and 56b ¹

¹ 2013/752/EU: according Official Journal of the European Union, COMMISSION IMPLEMENTING DECISION of 11 December 2013 amending Decision 2006/771/EC on harmonization of the radio spectrum for use by short-range devices and repealing Decision 2005/928/EC (notified under document C(2013) 8776) (Text with EEA relevance)

FWI-270 Radio gateway

Electrical

Operating voltage LSN (VDC)	15 to 33
Operating voltage AUX (VDC)	15 to 30
Max. LSN current consumption (mA)	3.45
Average auxiliary current consumption (mA)	10
Max. auxiliary current consumption (mA)	30
Battery service life	5 years in normal operation*

* = up to 5 years at standard climate. This value may vary, depending on the actual climate and the actual conditions. If the system is operated regularly or continuously at temperatures within the limit range (<15°C or >35°C), a maintenance interval of 3 years is recommended.

Environmental

Protection class as per EN 60529	IP40
Permissible operating temperature (°C)	-10 to +55
Permissible storage temperature (°C)	-20 to +70
Relative humidity (%)	<96 (non-condensing)

Mechanical

Housing material	Acrylonitrile-butadiene-styrene (ABS)
Color	Pure white, ~RAL 9010

Weight (without/with packaging) (g)	Approx. 155/327
Dimensions H x W x D (mm)	Approx. 167 x 89 x 28

FDOOT271-O Radio fire detector**Electrical**

Battery life cycle	> 3 years*
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*3 years corresponds to a typical battery life. The operating time of the batteries depends on the application behaviour, the application temperature and other ambient conditions. The service life may vary if the batteries are handled improperly. Information on typical handling can be obtained from the manufacturer on request.

Environmental

Protection class as per EN 60529	IP 44
Permissible operating temperature (°C)	-10 to +55
Permissible storage temperature (°C)	-30 to +75
Relative humidity (%)	≤95 (non-condensing)

Mechanical

Color	~ RAL 9010 pure white
Dimensions (mm)	Ø 117 x 64 with FDB271

FDME273-O Radio manual call point switching unit**Electrical**

Battery life cycle	> 3 years*
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*3 years corresponds to a typical battery life. The operating time of the batteries depends on the application behaviour, the application temperature and other ambient conditions. The service life may vary if the batteries are handled improperly. Information on typical handling can be obtained from the manufacturer on request.

Environmental

Protection class as per EN 60529	IP 44
Permissible operating temperature (°C)	-10 to +55
Permissible storage temperature (°C)	-30 to +75
Relative humidity (%)	≤95 (non-condensing)

Mechanical

Color	~ RAL 3000 flame red
Dimensions (mm)	135 x 135 x 58

FDM275-O Radio manual call point**Electrical**

Battery life cycle	> 3 years*
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*3 years corresponds to a typical battery life. The operating time of the batteries depends on the application behaviour, the application temperature and other ambient conditions. The service life may vary if the batteries are handled improperly. Information on typical handling can be obtained from the manufacturer on request.

Environmental

Protection class as per EN 60529	IP24D
Permissible operating temperature (°C)	-10 to +55
Permissible storage temperature (°C)	-30 to +75
Relative humidity (%)	≤95 (non-condensing)

Mechanical

Color	~ RAL 3000 flame red
Dimensions (mm)	87 x 87 x 63

Ordering information**FWI-270 Radio gateway**

Wireless gateway for up to 30 radio devices. Order separately: 1x BAT3.6-10 Li-SOCl₂ battery pack 3.6V, 10 Ah

Order number **FWI-270**

FDOOT271-O Radio fire detector

For connecting to the FWI-270 Radio gateway. Order separately: 1x FDB271 Base radio fire detector, 1x BAT3.6-10 Li-SOCl₂ battery pack 3.6V, 10 Ah

Order number **FDOOT271-O**

FDM275-O Radio manual call point

For connecting to the FWI-270 Radio gateway. Order separately: 1x BAT3.6-10 Li-SOCl₂ battery pack 3.6V, 10 Ah

Order number **FDM275-O**

FDME273-O Radio manual call point switching unit

For connecting to the FWI-270 Radio gateway. Order separately: 1x FDMH273-R Radio manual call point housing, 1x BAT3.6-10 Li-SOCl₂ battery pack 3.6V, 10 Ah

Order number **FDME273-O**

Accessories

FDUZ227 MCL-USB adapter radio

Needed for maintenance purpose together with the Wireless diagnostic tool Software FXS2061-O.
Order number **FDUZ227**

BAT3.6-10 Li-SOCI2 battery pack 3.6V, 10 Ah

Battery Pack for supplying radio devices with power.
Order number **BAT3.6-10**

FDB271 Base radio fire detector

for installation of the FDOOT271-O Radio fire detector
Order number **FDB271**

FDMG295 Spare glass FDM275-O

Spare glass for Radio manual call point
Order number **FDMG295**

FDMP295 Spare plastic FDM275-O

Spare Plastic for radio manual call point
Order number **FDMP295**

DMZ1196-AC Spare glass FDM273-O

Spare glass for Radio manual call point
Order number **DMZ1196-AC**

FDMH273-R Radio manual call point housing

Housing for Radio manual call point, mandatory for ordering the manual call point FDME273-O
Order number **FDMH273-R**

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