MMD 130 Ex-i

Ex-i collective smoke and heat detector

The MMD 130 Ex-i is an intrinsically safe, automatic fire detector for use in Ex zones 1 or 2. It can be configured as an optical smoke detector or as a rate-of-rise (differential) heat detector.

It is operated via the USB 501-7 Ex-i detector base and Z787F safety barrier or GTW01/02 direct current isolating transformer on the fire detector line of the SecuriFire or SecuriPro fire alarm system.

Fig. 1 MMD 130 Ex-i with USB 501-7 Ex-i

Function and use

The fire detector line consists of the GTW direct current isolating transformer or EXBAR02 safety barrier as an interface between the explosion hazardous area and the safe area, the fire detector bases, and the actual fire detectors.

Depending on the configuration, the MMD 130 Ex-i fire detector can be used as a smoke- or heat detector in classes A1, A1S, A2, A2S as well as B and BS.

The detector is backwards compatible to detector types ORM 130 Ex-i, WDM 215 Ex-i, WMM 216 Ex-i and the Hochiki detectors DCD-1E-IS and SLR-E-IS. It can replace any of these detector types and also functions in mixed operation.

The Application overview section shows the variants for connecting the MMD 130 Ex-i to different FAS types.

Configuration

Setting the mode of operation is by means of DIP switches. The DIP switches are freely accessible when the detector is not in the base.

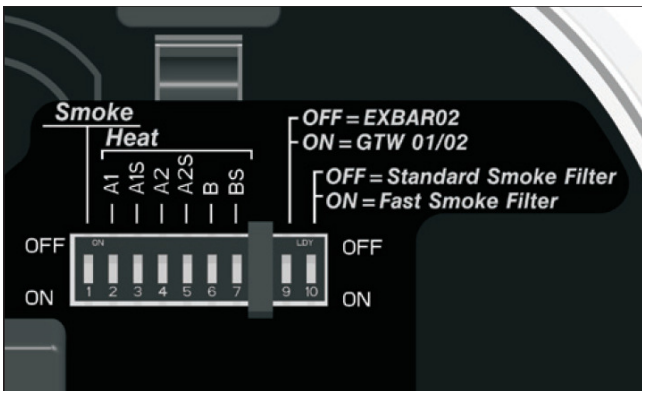

Fig. 2 MMD 130 Ex-i configuration

DIP switch (ON)	Operation
1	Smoke detector active
2	Heat detector class A1 active
3	Heat detector class A1S active
4	Heat detector class A2 active
5	Heat detector class A2S active
6	Heat detector class B1 active
7	Heat detector class BS active
8	No function (covered by bridge)
9	Operation with GTW 01/02 (OFF = Z787F)
10	Fast smoke filter active (special application, see “Planning”)

Operation with EXBAR02:
Switch 9 must be set to OFF.

Operation with GTW:
Switch 9 must be set to ON.

Fast smoke filter
For special applications “Fast Smoke Filter” can be activated. This increases the fault sensitivity of the detector considerably. This is why the detector is delivered with the factory setting “OFF”. In this position the standard smoke filter is active. The “ON” or “OFF” setting has no effect on the response sensitivity of the detector.

Only one of the DIP switches from 1 to 7 may be set to ON. Otherwise, a fault message is signalled.

After each change to the DIP switch, you have to wait at least 10 seconds before re-inserting the detector into the base.
This guarantees that the detector is properly reset.

Planning

The country-specific guidelines for planning and installing automatic fire detector systems in areas subject to explosion hazards apply when planning. The following project specifications are subject to country-specific specifications.

- The Ex-i installation from EXBAR02 or GTW 01/02 in the Ex zone must be done with the blue sheathed cable.
  The cable must meet the following prerequisites:
  – oil and flame resistant
  – electrical strength at least 500 VAC
  – sheath colour blue RAL 5015
  – 2-wire, at least 0.5 mm^2, without screening

  (e.g. Lapp, Ölflex EB or Helukabel type OZ - BL)

- It is not permitted to mix the Ex-i installation with normal installations (non Ex-i). A separate cable conduit is necessary.
- A maximum of 10 detectors may be connected per Ex-i fire detector line.
- Only Ex-i detectors may be connected to an Ex-i fire detector line.
- The MMD 130 Ex-i can be operated with the WDM 215 Ex-i and WMM 216 Ex-i or ORM 130 Ex-i on the same fire detector line. In mixed operation with the ORM 130 Ex-i, DIP switch 10 must be set to ON.
- No room indication lamps can be connected to the Ex-i detectors.
- Two-detector dependency cannot be programmed on Ex-i fire detection zones.
- Two-zone dependencies (e.g. for actuating fire-extinguishing systems) can be implemented.

Terminal assignment

Terminal	Signal
1	GND (in)
2	Voltage supply (in)
3	Voltage supply (out)
4	GND (out)
5	Support point (potential-free)
6	Support point (potential-free)

Mounting / installation

The MMD 130 Ex-i is permitted to be operated only with the USB 501-7 Ex-i and via an Z787F or GTW 01/02.

The safety barrier and the GTW must be installed in the safe zone.

In the last base of a fire detection zone, terminals 3 and 4 are terminated with termination resistance. The supply line must be on terminals 1 and 2.

Dimensioned drawing

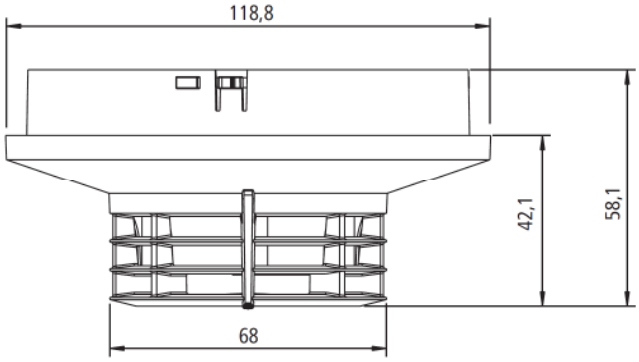

Fig. 3 Dimensioned drawing MMD 130 Ex-i

Connection of Z787F safety barrier

There are connection possibilities by means of self-opening device terminals with a maximum wire cross-section of 2.5 mm^2.
To avoid equipotential carry-overs, an equipotential bonding conductor must be used between the safe barrier and the FACP. If there are several safety barriers on one FACP, the earth potentials must be connected in a star shape. The equipotential bonding of the safety barrier must be established with a separate protective conductor terminal (4-10 mm^2) in the map case.
Each Ex area must have an earthing system. For objects with more than one Ex area, equipotential bonding must be present covering all Ex areas. The equipotential bonding conductor for the Ex barriers (mounting rail) must be at least 10 mm^2 copper and yellow/green isolated. For equipotential bonding lines of single Ex barriers, 1.5 mm^2 copper is sufficient.

Application overview

The MMD 130 Ex-i can be connected to various control panels. Which barriers and termination resistance to be used depends on the card built into the control panel and the connected module. The following table shows the system configurations.

Control panel	Interface	Barrier	Terminal resistor	Qty. [1)]	Remarks
SCP 3000	B3-IM8	Z787F	2k7	10	For new installations
	B3-IM8	GTW 01/02	4k7		For modernisation
	B3-DAI2 / BA-AIM	Z787F	19k1		
	B5-DXI2 / BX-AIM	Z787F	19k1	4	For new installations
	B3-DCI6	Z787F	11k8		
	B3-MTI8	Z787F	2k7		
	B3-LEE23 / RKM150	GTW 01/02	4k7		For modernisation
	B3-LEE24 / RKM150	GTW 01/02	4k7		For modernisation
	B5-BAF	---	---		Not possible
SCP 2000	B4-EIO	Z787F	11k8	10	For new installations
	B6-EIO	Z787F	2k7	10	For new installations
	B6-DXI2 / BX-AIM	Z787F	19k1	4	For new installations
	B6-LXI2 / BX-AIM	Z787F	19k1	4	For new installations
	B6-BAF	---	---		Not possible
SCP 1000	B6-DXI2 / BX-AIM	Z787F	19k1	4	For new installations
	B6-BAF	---	---		Not possible
SCP 500	B7-DXI2 / BX-AIM	Z787F	19k1	4	For new installations
	B7-BAF	---	---		Not possible
SecuriPro	MDI82	GTW 01/02	4k7	10	
BMZ345 BMZ340 BMZ3400	LEE21 / LEK21 / RKM150	GTW 01/02	4k7		
	LEE21 / LRK21 / RKM150	GTW 01/02	4k7		
	LEE23 / LEK22 / RKM150	GTW 01/02	4k7		
	LEE24 / LEK24 / RKM150	GTW 01/02	4k7		
BMZ346	LEK61	GTW 01/02	4k7		
	LEK63 / RKM150	GTW 01/02	4k7		
BMZ350		GTW 01/02	4k7		
BMZ349		GTW 01/02	4k7		
ELZ350		GTW 01/02	4k7		
BMZ360	RKM150	GTW 01/02	4k7		

[1)] max. number of intrinsically safe detector MMD130Ex-i per alarm line.

Connection examples

Connection to SecuriFire board B3-IM8 or B4-EIO/B6-EIO unit

An Ex-i detection zone is evaluated via the B3−IM8 (SecuriFire 3000) unit or B4-EIO/B6-EIO (SecuriFire 2000) unit with intermediate switching of a safety barrier and a maximum of 10 connected MMD 130 Ex-i detectors. The detector line is terminated with 2.7 kΩ / 1 W / 1% terminal resistance (art. no. 4301189, not included in the scope of delivery).

The jumper must be shunted to the 130 Ex-i series mode of operation. At the same time the corresponding operating mode has to be planned with SecuriFire Studio.

The equipotential bonding of the safety barrier must be established with a separate protective conductor terminal (4-10 mm²) in the map case.

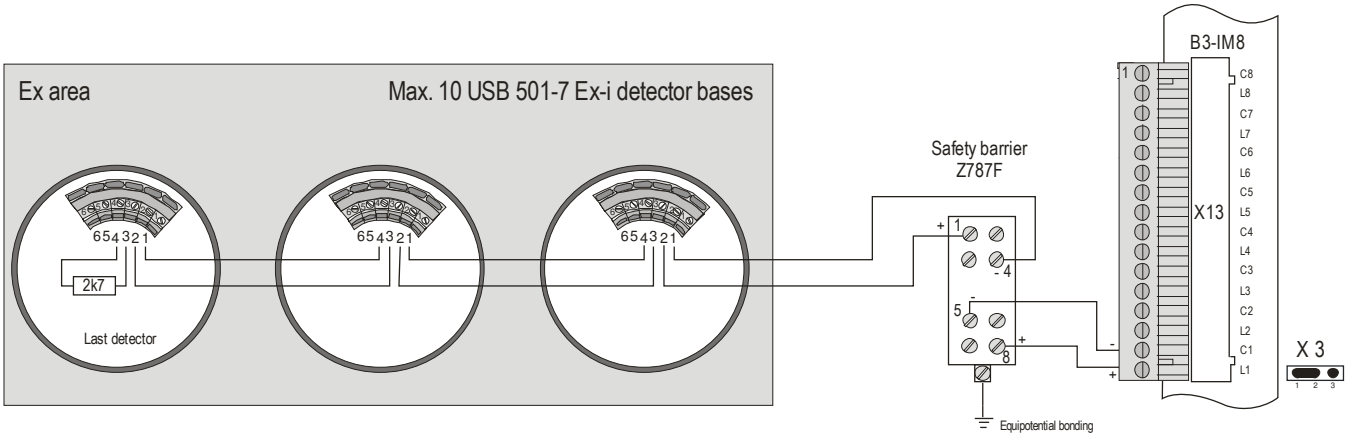

Fig. 4 MMD 130 Ex-i connection to B3-IM8

Connection to SecuriFire loop module BX-AIM

An Ex-i detection zone is evaluated via the BX-AIM addressable loop module with intermediate switching of a safety barrier on all SecuriFire control panel types with a maximum of 4 connected MMD 130 Ex-is per BX-AIM.
The detector line is terminated with a 19.1 kΩ / 0.6 W / 1% terminal resistor (art. no. 43001190, not included in the scope of delivery).
The equipotential bonding of the safety barrier must be established with a separate protective conductor terminal (4-10 mm²) in the map case.

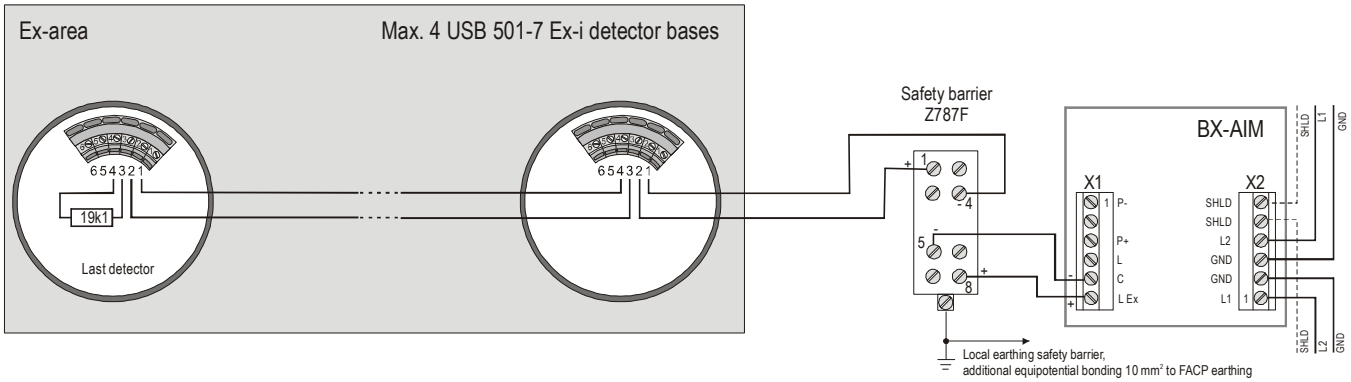

Fig. 5 MMD 130 Ex-i connection to BX-AIM

Connection to SecuriPro SecuriLine module MDI82

Up to two Ex-i detection zones are evaluated via the MDI 82 module with intermediate switching of a direct current isolating transformer with a maximum of 10 connected MMD 130 Ex-i units per GTW output. The detector line is terminated with 4.7 kΩ / 0.6 W / 1% terminal resistance (art. no. 4300396, included in the scope of delivery of the GTW).

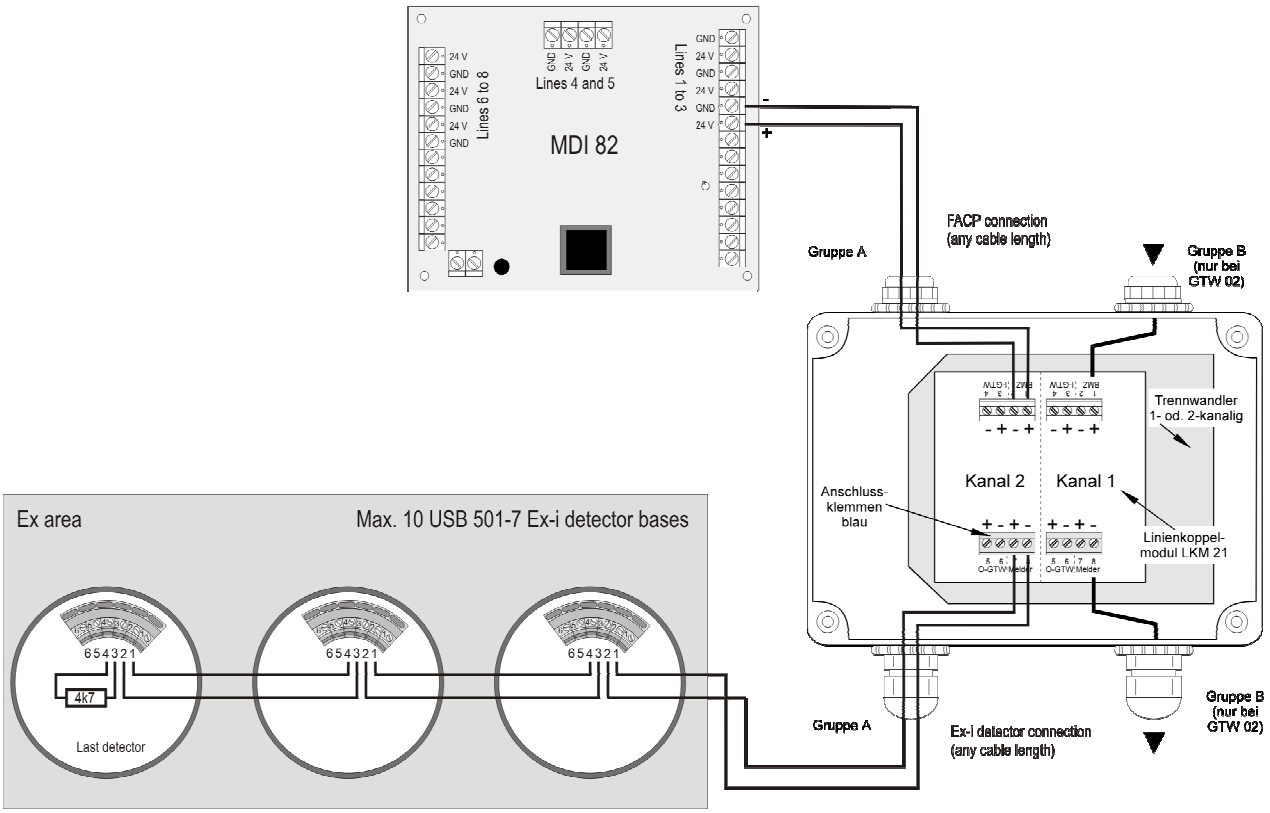

Fig. 6 MMD 130 Ex-i connection to MDI82

Revision (maintenance)

The MMD 130 Ex-i has an alarm filter for preventing false alarms. The functions are tested via the signature alarm transmission. A maintenance alarm is not possible!
The detector tester is used for checking the detectors functioning as smoke- and heat detectors. How to handle the detector tester is described in data sheet FDT 533 (T800928).

Danger

- The applicable EN 60079-14 regulations for repairs, maintenance and testing must be strictly observed!
- For commissioning- and servicing work in explosion hazardous zones a “Clearance approval” is required from the system operator. It must be ensured that no explosion hazardous atmosphere is present in the work area.
- The FDT 533 detector tester is not approved for explosion hazardous zones!
- The warning and safety instructions printed on the testing aerosol must be strictly observed!

Important for GTW 01/02!

After a short-circuit on the detector line has occurred and been rectified, the operating voltage on the fire alarm control panel of the concerned detector line must be switched off and then on again or a reset (reset fault) must be initiated. This is necessary because in the event of a short-circuit the operating voltage to the detectors has to be switched off. However, it is not automatically switched on again after the short-circuit has been rectified!

Servicing

Maintenance and inspection work on alarm systems is subject to the provisions of the country in which the system is operated. For example:

- EN 13306 Maintenance — Maintenance terminology
- In GERMANY the DIN VDE 0833 Parts 1 + 2 and DIN 14675
- In SWITZERLAND the VKF (Cantonal Fire Insurance Union) guideline and the Technical Guideline of the SES (TR SES)

These national provisions refer in part to the equipment manufacturer’s specifications with regard to inspection intervals.

Securiton fire detectors have a detector self-test with which the detectors are automatically subjected to an extensive, electronic functional check. They are also equipped with automatic soiling compensation. It is nevertheless necessary that the detectors are subject to a physical functional check on site at regular intervals. Securiton recommends the following:

- Maintenance and inspection should be carried out at regular intervals and by trained and qualified personnel only (qualified electrician).
- At least once a year a functional and visual check in accordance with Securiton servicing instructions should be carried out.

Check	
Visual check of the detector fastening (base)	X
Visual check of the detector (damage)	X
Visual check of the detector labelling	X
Check of the monitoring area (space around the detector not obstructed)	X
Triggering with test gas (aerosol) smoke and heat sensors	X
Check the alarm LED	X
Check fault LED (flashing yellow)	X
Check that the alarm transmission path from the detector to the control panel is functioning properly	X

Detectors which are extremely soiled or mechanically damaged must be replaced. Depending on the ambient conditions (level of soiling), optical fire detectors should always be replaced every 5 - 8 years. Early replacement may be required when the conditions are particularly dusty!

The MMD 130 Ex-i fire detector must not be opened!

This product meets the requirements of the 2002/95/EC RoHS directive.

Although the product is not included in the area of applicability of 2002/95/EC directives (RoHS), we have voluntarily fulfilled this guideline; likewise, the product is not included in 2002/96/EC (WEEE), category 9 (according to WEEE, RoHS and other fact sheets, of 21.07.05 ZVEI installation equipment and systems).

Article numbers / spare parts

Short designation	Art. number CH	Art. number
MMD 130 Ex-i fire detector	022.246794	30-5000005-01-01
USB 501-7 Ex-i detector base	123.246786	5000547.0007
Safety barrier Z787F	115.246352	FG020121
Map case for Ex barrier	115.246344	FG020432
GEH EXBW mounting bracket	115.246360	FG020433
Protective conductor terminal	---	6900439
Terminal resistor 2.7 kΩ / 1 W / 1% with shrink tubing (IM8/EIO)	275.246948	4301189
Terminal resistor 19.1 kΩ / 0.6 W / 1% with shrink tubing (AIM)	275.246956	4301190
Direct current separating converter GTW 01	115.205141 / 605336	5700080
Direct current separating converter GTW 02	115.205133 / 605328	5700081
Terminal resistor 4.7 kΩ / 0.6 W / 1% with shrink tubing (MDI 82)	254.204 919	4300396

Technical data

Operating principle	Smoke- or heat detectors	
Monitoring area[1)]	max. 150	m^2
Installation height[1)]	max. 16	m
Permissible air velocity	20	m/s
Smoke detector sensitivity	EN 54-7, CEA 4021	
Heat detector sensitivity	Class A1, A2, B; Index S as per EN 54-5	
Operating voltage	10 to 28	VDC
Power consumption with 28 VDC		
quiescent	≤ 150	µA
in alarm status	max. 27	mA
Signal transmission	2-conductor stub line, current increase	
Single display		
Alarm	Static, red LED,	
Fault	Flashing 0.5 Hz, yellow LED,	
Protection type with USB 501-7 Ex-i universal base	IP 54	
Ambient temperature (continuous)		
Smoke element	-20 to +60	°C
Heat element	-20 to +70	°C
Humidity ambient conditions (continuous, without condensation) at ≤ 34°C	10 to 95	% rel. hum.
Humidity ambient conditions (continuous, without condensation) at ≥ 34°C	max. 35 10 to 95	g/m³ % rel. hum.
Dimensions without base (D x H)	ø118.8 x 58.1	mm
Housing colour (similar to RAL 9003)	Electrical white	
Housing material	ABS/PC	
Weight	123	g
Ex zones	1 and 2	
Ignition protection type	II 2 G Ex ib IIC T4	
Ex approval	EPS 11 ATEX 1 346 X	
Explosion protection type designation	CE 0820 Ex II 2 G	
VdS approval	G 211094	
EU certificate of conformity (EN 54-7)	0786 – CPD – 21104	

[1)] Depending on active detection principle (smoke/heat detector). Values dependent on the ceiling construction (height, inclination), according to country-specific project guidelines.

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