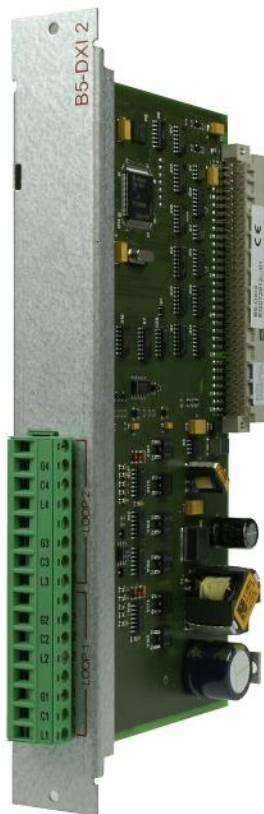# SecuriFire
SecuriLine eXtended board
B5-DXI2

Technical description

Imprint

Notice

This document, T 811 113, is valid only for the product described in Section 1.

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This document, T 811 113[1], is available in the following languages:

German	T 811 113 de
English	T 811 113 en
French	T 811 113 fr

Current edition: Index c   14.05.2013   Rd

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[1] Reference document: B5-DXI2, V 1.0

Safety information

Provided the product is deployed by trained and qualified persons in accordance with technical documentation T 811 113 and the danger, safety and general information in this technical documentation is observed, there is no danger to persons or property under normal conditions and when used properly.

National and state-specific laws, regulations and guidelines must be observed and adhered to in all cases.

Below are the designations, descriptions and symbols of general, danger, and safety information as found in this document.

Danger

If the danger information is not properly observed, persons and property may be endangered by the product and any other installation elements, or the product or installation elements may be damaged to the extent that malfunctions could represent a danger to persons and property.

- Description of which dangers can occur
- Measures and preventative actions
- How dangers can be averted
- Other safety-relevant information

Warning

The product may be damaged if the safety information is not heeded.

- Description of which damage can occur
- Measures and preventative actions
- How dangers can be averted
- Other safety-relevant information

Notice

The product may malfunction if this notice is not observed.

- Description of the notice and which malfunctions can be expected
- Measures and preventative actions
- Other safety-relevant information

Environmental protection / recycling

Neither the product nor product components present a hazard to the environment provided they are handled properly.

- Description of parts for which there are environmental issues
- Description of how devices and their parts have to be disposed of in an environmentally-friendly way
- Description of the recycling possibilities

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Document history

First edition **Date 27.08.2010**

Index „a" **Date 13.02.2012**

Most important changes compared with first edition:

Section		New (n) / changed (c) / deleted (d)	What / Reason
Title page	c	Picture changed	Update
• 2.3.1	c	Notice "Physical limitations"	Change
	c	Connection	MTD 537 replaced by MCD 573
	c	Footnote	Change
• Fig. 3	c	Connnecting SecuriLine eXtended	Product name changed
• Fig. 4	c	Stub line connection	Change

Index „b" **Date 24.10.2012**

Most important changes compared with previous edition:

Section		New (n) / changed (c) / deleted (d)	What / Reason
• 4.2	c	Notice	Adaptation to the applicable EN 54 standard

Index „c" **Date 14.05.2013**

Most important changes compared with previous edition:

Section		New (n) / changed (c) / deleted (d)	What / Reason
• all	c	Document number previously T131449, new T811113	Administrative
	d	Programming	Section removed and not replaced
• 3	c	Fault displays	Text adjusted

Table of contents

1   General information

1.1   Validity

The following documentation is valid for the SecuriFire B5-DXI2 SecuriLine eXtended board with edition EG072912--.

1.2   General information

The B5-DXI2 (dialog eXtended line interface) can be fitted in the unit rack of each SecuriFire 3000 at slots 2 to 9 of the unit rack. When relay boards (B3-REL10, B3-REL16, B3-REL16E) are used, the board must NOT be fitted at slot 9.

1.3   Abbreviations, symbols and terms

Abbreviation	Meaning
X-LINE	SecuriLine eXtended

1.4   Compatibility notice

👉	**Notice** The B5-DXI2 is supported beginning with SecuriFire Studio V 1.0.

2 Design and function

The B5-DXI2 SecuriLine eXtended board is used for power supply and evaluation of two ring circuits with the associated detectors and modules of the SecuriLine eXtended. Alternatively, a ring circuit and two X-LINE stub lines or four stub lines can also be connected. The digitised states of the detectors and modules are further processed by the B5-DXI2 and forwarded via the B5-BUS to the B5-MCB15 Main Control Board.

2.1 Overview

The B5-DXI2 has a front panel made of galvanised sheet steel. The system connection to the B5-BUS is on the rear side using a 96-pin male connector. The detection zones are connected on the front side with a 16-pin plug-in screw terminal.
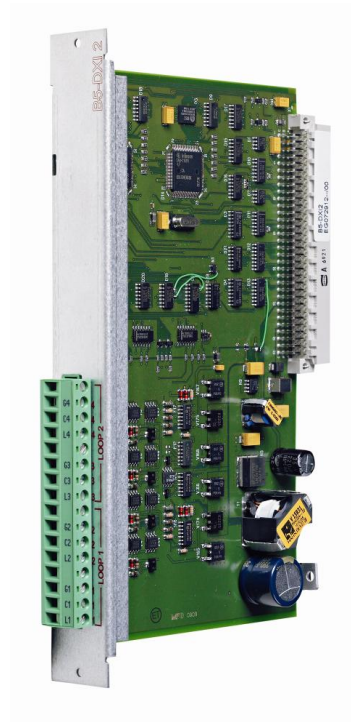

Fig. 1 B5-DXI2

2.2 Redundancy

The B5-DXI2 is built to be redundant to ensure system availability. This means that all logical functional blocks with the exception of the peripheral electrical circuits are doubled. Both system halves have a program and data memory which are loaded with the same program when the SCP starts up. A Watchdog continuously monitors both controllers. If there is a fault, a switch is made automatically to the second system, and the operability remains fully in tact in this case.

2.3 Interfaces

X1 B5-BUS connector

X2 Connection plug for 2 ring circuits or 4 stub lines
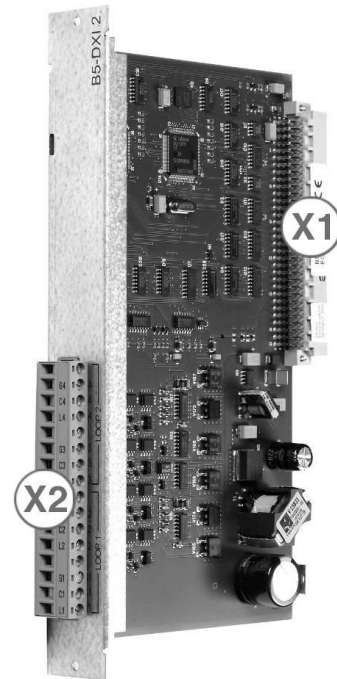

Fig. 2 B5-DXI2 interfaces

2.3.1 Ring circuit interface (X2)

The B5-DXI2 is designed for connecting 2 ring circuits. Each ring circuit interface has its own current-limited output driver which supplies the connected ring with power. There is only one transmission and reception part per ring. When it is operated as a stub, communication alternates between the two stubs.

Logical limitations:

The number of elements per ring depends on the type of used/connected elements and is logically limited. Up to 250 participants (addresses) can be connected. However, because more than one element can be implemented on one participant (e.g. BX-IM4 = 1 participant with 4 possible elements), the limitations have to be taken into account when planning. A total of 750 elements can be connected to both rings. They can be dynamically distributed on both loops (e.g. Ring1 = 500 elements, Ring2 = 250 elements). Not all elements on a participant have to be used.

> **Notice**
> - Participants are devices which communicate directly via SecuriLine eXtended: detectors, manual call point, modules.
> - Elements are logical objects (detectors, inputs, outputs).
> - 1 participant = 1 element, with the following exception: BX-IM4 = 1 to 4 elements, depending on configuration.

> **Notice**
>
> **Physical limitations:**
>
> The actual loop length depends on the number and type (power consumption, inner resistance) of participants, on additional power load (number of switched on alarm LEDs, telegram current), and on the cable cross-section. This means that for the optimal configuration the number of participants and the coverage range of the loop must be matched to each other.
> A tool is available for calculating the maximum possible loop length and the maximum number of participants.

Design and function

Connection

	SecuriLine eXtended	SecuriLine
Ring circuits per board:	max. 2	
Stubs per board:	max. 4	
Main processing unit:	B5-MCB	
Participants per ring:	max. 250	max. 128
Participants per stub:	max. 125	max. 64
Logical elements:	max. 750 / B5-DXI2	
Modules:[1]	BX-AIM, BX-IM4, BX-IOM, BX-OI3, BX-REL4, BX-RGW, BX-ESL	BA-AIM, BA-IM4, BA-IOM, BA-OI3, BA-REL4, BA-RGW
Detectors:	MCD 573X, MCP 535X, MCP 545X	MCD 573, STD 531, SSD 531, UTD 531, MCP 535, MCP 545
Alarm units:	BX-SOL, BX-FOL,BX-SBL 501,BX-SBL 502	BA-SOL, BA-FOL, SBL 501, SBL 502
Ring length:	max. 3,500 m	max. 2,000 m
Max. line resistance:	255 Ω	75 Ω

[1] The maximum number of connectable modules is found in this documentation: SF-AI-04 or SecuriFire Release Notes

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Notice

The properties of the SecuriLine eXtended (e.g. 250 participants per ring) apply only when SecuriLine eXtended elements are used. Since the SecuriLine eXtended elements are backwards compatible, mixed operation with elements of SecuriLine is also possible; in this case, however, the performance features of the conventional SecuriLine apply to the ring.

Ring connector (X2)

Ring no.	Designation	Function
2	G4	Screen
	C4	GND ring end
	L4	+24 V ring end
	G3	Screen
	C3	GND ring beginning
	L3	+24 V ring beginning
1		
	G2	Screen
	C2	GND ring end
	L2	+24 V ring end
	G1	Screen
	C1	GND ring beginning
	L1	+24 V ring beginning

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3 Fault displays

A "Module faults" document is planned for a detailed description of all module faults.

4 Connection examples

4.1 Connecting SecuriLine eXtended

> **Notice**
> - All modules and detectors of the X-LINE are fully symmetrical with respect to the input circuit and short-circuit isolators. When wiring, it is therefore unimportant from which side of the ring "INCOMING" and "OUTGOING" are connected. For purposes of clarity, however, we recommend retaining and continuing with a wiring system once begun.
> - Mixing SecuriLine and X-LINE participants is possible, but X-LINE functions such as fast startup, self-sufficient short-circuit detection and high numbers of participants cannot be used.
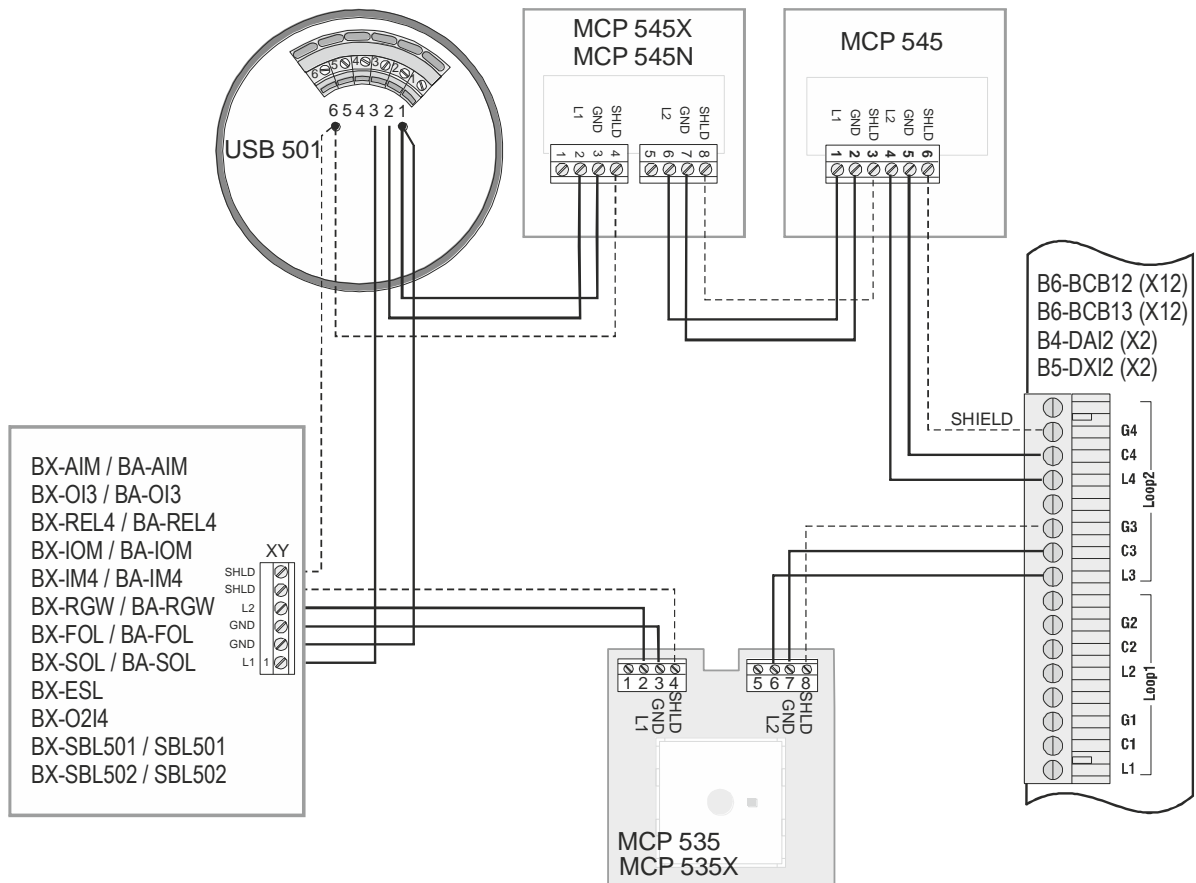

Fig. 3 Connecting SecuriLine eXtended

Connection examples

4.2 Stub line connection

> **Notice**
>
> According to EN 54, a maximum of 32 detectors (total of automatic + manual detectors) are permitted to be installed on one stub line.
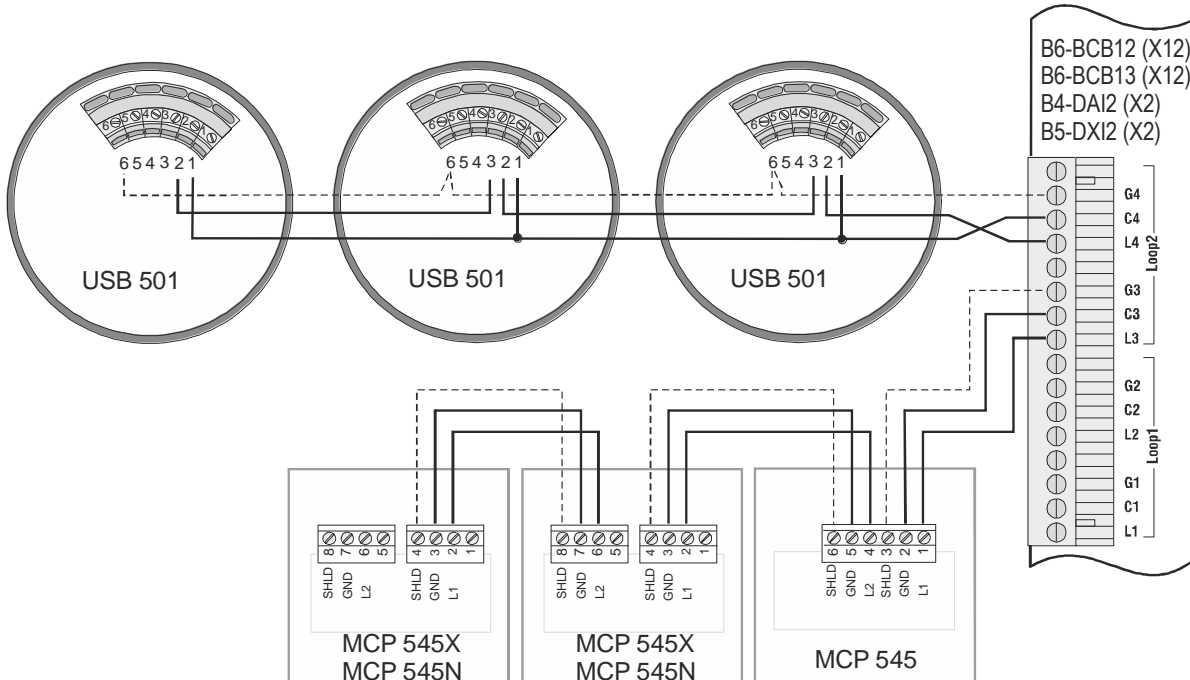

Fig. 4 Stub line connection

4.3 Connecting X-Line modules

- The advanced input module **BX-AIM** functions as a DC-line branch on the ring circuit and can be planned either as a surveyed input for polling potential-free contacts or as a detection zone for connecting collective detectors. Among other things, it serves to connect intrinsically safe threshold detectors (Ex-i) with intermediate (in-line) switching of a Zener barrier; the module also has an output for a parallel indicator.

- The output/input module **BX-OI3** can be planned either as an output/input module (1x relay output, 2x surveyed inputs, 1x opto-isolator) or as a detector or detection zone for connecting special detectors.

- The relay module **BX-REL4** has 4 potential-free relay outputs for switching loads. All relays are bistable changeover contacts and each one has a screw terminal for the normally closed contact normally open contact. For each output an "Active in Fail-Safe-Position" can be programmed in the event of ring voltage failure.

- The input/output module **BX-IOM** has a surveyed output and a galvanically separated input. It is for actuating monitored consumers (e.g. sirens) which are supplied with power from external voltage sources. The input can be used to poll potential-connected voltage sources.

- The input module **BX-IM4** has 4 inputs for monitored and unmonitored polling of potential-free contacts.

- The radio module **BX-RGW** serves to link radio detectors to the fire alarm control panel.

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- The addressable Loop flashlight **BX-FOL** serves to signal a fire alarm visually in interior rooms and is suitable for connecting directly to the X-LINE.

- The addressable Loop siren **BX-SOL** serves to signal a fire alarm audibly in interior rooms.

- The Loop design base siren **BX-SBL 501** and Loop ceiling siren **BX-SBL 502** serve to signal a fire alarm audibly in interior rooms.
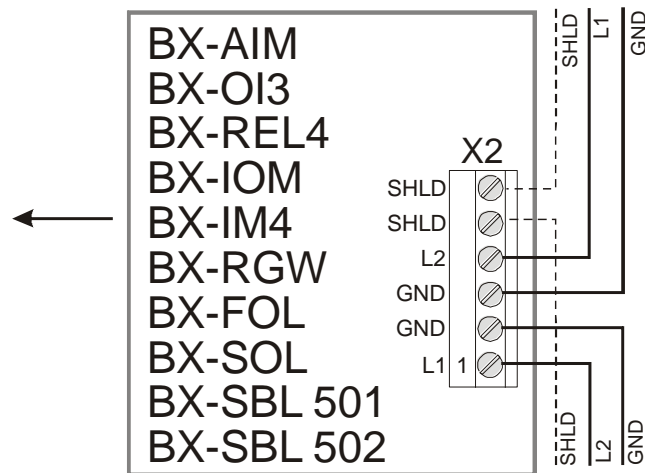

Fig. 5 Connecting X-Line modules

Notice
Further information and detailed descriptions of how to connect the X-LINE modules are found in the relevant technical description.

5   Technical data

Power supply

The power supply of the B5-DXI2 SecuriLine eXtended board is internal via the B5-BUS.

Supply voltage:	VP	+22 V to +30 V
	VCC	+3.4 V ±2%
	VCC	+5.1 V ±2%
	Loop voltage	30 V ±3%
Power consumption:	IP	approx. 35 mA
	ICC	approx. 80 mA
Short-circuit isolator:	Short circuit current	typical 232 mA
	Rated current	typical 150 mA
Transmission type:	Start-stop operation, 8 data bits	
	Manchester format	
Baud rate:	9,600 Baud / 4,800 b/s	
Direction:	Bidirectional	
Cable:	J-Y(St)Y 1x2X0.8 rt; 1 pair, screened, twisted	
	Capacity: max. 120 nF / km	
Line capacity:	Max. 350 nF	
Protection:	EMC, ESD by means of Transzorp diodes and high-voltage capacitators	
Mechanical:	16-pin plug-in screw terminal	
	MSTB 2.5 / 16-ST-5.08	
	MSTBA 2.5 / 16-G-5.08	

Power requirement

> ☞ **Notice**
>
> In the event of a power failure, the fire alarm control panel is powered by batteries. Depending on the configuration and connected peripheral devices (boards, detectors, sirens, etc.), it is important to ensure that the batteries have sufficient capacity to operate the fire alarm control panel for the specified time (e.g. according to a standard or directive).

The power requirement calculation is performed by entering the battery types in use and the necessary bridging time (according to the local standards and directives) in a power requirement tool.

Environmental conditions

Ambient temperature:	-5°C to +50°C, measured at natural convection under the board.
Relative humidity:	5% to 95%, without condensation
Air pressure:	≥ 80 kPa, up to 2,000 m above sea level
Contact protection:	IP00, no protection against contact, foreign matter or water

EMC:	EN 50130-4	Electromagnetic compatibility
	EN 61000-6-3	Emission standard for residential environments
	EN 61000-6-2	Immunity for industrial environments
	VdS 2110	Schutz gegen Umwelteinflüsse (Protection against environmental influences)
Security:	VDE 0800	Telecommunications – Security
	VDE 0804	Telecommunications – Additional definitions

Dimensions

Printed circuit board (H x D x W):	195 x 115 x 20 mm
Front panel (H x D x W):	215 x 27.5 x 1.0 mm

6   Article numbers / spare parts

Short designation		Art. number CH	Art. number
B5-DXI2		115.242 357	EG072912
ST-DXI	Connecting plug for DXI boards	239.239 640	YY970138

7   List of figures