Input/Output Module BX-O2I4

Technical Documentation

Version 1.0

FIRE ALARM

SCHRACK SECONET

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1 General & Validity

1.1 Validity

The following documentation applies for the BX-O2I4 input/output module with the following issue state 20-2100014-01-01.

1.2 General

The BX-O2I4 (E**X**TENDED **O**utput **2** / **I**nput **4**) can be connected to the Integral X-LINE of and consists of two relay outputs and four primary inputs for querying potential-free contacts.

The individual I/O functions can be configured and combined, so that the module for example is also suitable for connecting fire dampers with feedback.

A maximum of 32 BX-O2I4 units can be installed per loop circuit.

1.3 Notes about compatibility

The BX-O2I4 input/output module from issue state 20-2100014-01-01 is supported by version 7.2 and above of the Integral Software.

When connecting the module to existing systems, the Integral Software must be upgraded to version 7.2 or higher. When operated using a version of the software prior to version 7.2, the module won't be detected.

The BX-O2I4 does not support backward compatible mode, and can therefore not be used with Integral Software V6.x.

Pursuant to EN 54 the type plate supplied with the module is to be fitted at access level 1 (i.e. on the outside of the cover of the installation case).

2 Functions & Structure

Both the addressing of the module and the setting of parameters for connected peripheral devices (e.g. how they behave when there is an alarm) is carried out via the fire alarm control panel using PC software.

Input 1 can be programmed as feedback input for the output 1 (via isolated contact).

Input 2 can be programmed as feedback input for the output 2 (via isolated contact).

The relay outputs can be switched to a fail-safe position in the event of the X-LINE losing power. This behaviour can be configured and is determined using PC software. The relay outputs are suitable for emitting pulses.

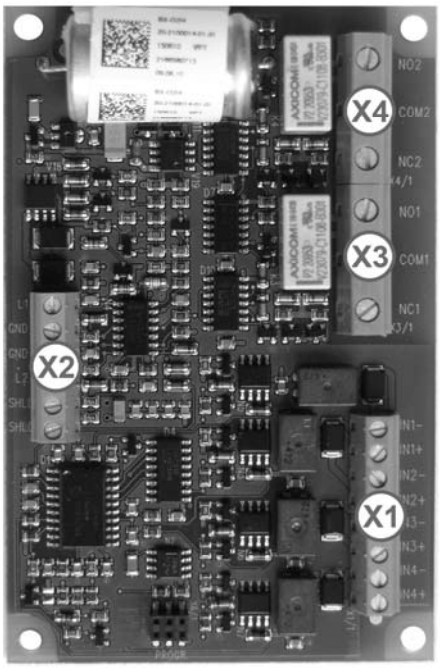
The module contains a short circuit isolator. In the event of a wire break or a short circuit, this function ensures that the fault is localised and that the fully-functioning operation of the loop circuit is simultaneously maintained.

2.1 Overview

The BX-O2I4 module is screwed into a plastic case. The cable inlet for the X-LINE and peripheral cables use PG cable glands. The connection to the X-LINE is made using a 6 pole screw-type terminal, with peripheral wiring being connected to two 3 pole and one 8 pole screw-type terminal.

The following interfaces can be found on the BX-O2I4 module:

X1	**Peripheral Interface**
X2	**X-LINE Interface**
X3	**Relay output 1**
X4	**Relay output 2**



2.2 X-LINE Interface X2

Pin	Label	Description
1	L1	Input/Output X-LINE +30V
2	GND	X-LINE Ground
3	GND	X-LINE Ground
4	L2	Input/Output X-LINE +30V
5	SHLD	Pin insulator
6	SHLD	Pin insulator

Electrical:	in accordance with the requirements of the Integral X-LINE
Transmission type:	Start-Stop-Operation, 8 data bits Manchester format
Baud rate:	9600 Baud or 4800b/s
Direction:	bidirectional
Power supply:	VLoop = 12 to 30 V
Protection:	EMC and ESD via transzorp diodes.
Connection:	6 pole screw-type terminal at 7.62 mm intervals, for wire thicknesses from 0.14 to 1.5 mm²
Cable:	J-Y(St)Y 1x2X0.8 red, 1 core, shielded, twisted, capacitance: max. 120 nF / km

2.3 Peripheral Interface X1

Pin	Label	Description
1	IN4+	Input 4+
2	IN4-	Input 4-
3	IN3+	Input 3+
4	IN3-	Input 3-
5	IN2+	Input 2+
6	IN2-	Input 2-
7	IN1+	Input 1+
8	IN1-	Input 1-

Quantity:	4
Connection:	potential-free contacts
Query current :	10 mA
Query voltage :	3-6 V
Terminal resistance:	180 Ω
Alarm resistor:	180 Ω
Line resistance:	max. 30 Ω
Query impulse:	165 µs
Query cycle :	100 ms
Input filter:	10 µs
Duration of period :	> 8 s (switching states with a duration of longer than 500 ms and with a repeat time of greater than 8s are detected.)
Wiring length :	max. 30 m, monitored for occurring wire breaks and short circuits
Connection:	8 pole screw-type terminal at 3.81 mm intervals, for wire thicknesses from 0.14 - 1.5 mm²

2.4 Relay output X3 and X4

Pin	Label	Description
1	NC	Normally Closed
2	COM	Common
3	NO	Normally Open

Quantity:	2
Relay:	bistable, 1 coil
Contact type:	Change-over contact
Switching voltage:	100µV – 230V ***)**
Switching current:	100µA – 2A
Switching power:	60W (230V, 250mA)
Switching frequency:	3.125Hz max. (every 160ms one relay per loop can change its state, as long as no other command needs to be executed)
Pulse emission:	200ms – 25s in 100ms intervals (resolution +100ms)
Wiring length:	max. 100m
Connection:	3 pole screw-type terminal at 7.62 mm intervals, for wire thicknesses from 0.14 to 2.5 mm²

***)** When switch mains supply voltage (~230V) it must be ensured that this relay output is suitable for up to overvoltage category III pursuant to DIN VDE110:

Overvoltage Category III

Equipment of overvoltage category III is intended for use in systems, or parts thereof, in which spike surges do not need to be considered. They are intended as a component of a permanent installation, but not however for fitting in or near the mains supply for buildings between it and the main distributor. In this sense, this includes equipment for permanent installations e.g. protective systems, locks, switches, switchboxes etc.

3 Planning guidelines

The programming and configuration of the module can be found in the current Integral software documentation.

3.1 Power Consumption

Where there is a mixed operation of detectors and modules on the loop circuit, it must be ensured that the BX-O2I4 has the power consumption higher than that of a single detector. The number of detectors that can be controlled is reduced and for safety reasons a maximum of 32 BX-O2I4 modules per loop circuit are permissible.

In the event of a power failure, the fire alarm control panel is supplied with power by rechargeable cells. According to the configuration and peripherals that are attached (modules, detectors, sirens etc.) it must be ensured, that the capacity of the rechargeable cells is sufficient to permit the operation of the fire alarm control panel for a period of time which exceeds the prescribed amount of time specified (in a standard or directive).

3.1.1 Typical power consumption values for the BX-O2I4

The loop circuit module's own current consumption should also be taken into account when carrying out the power consumption calculation.

Type	Label	Idle State	In the event of an alarm
BX-O2I4	Input/Output module	630 µA	630 µA

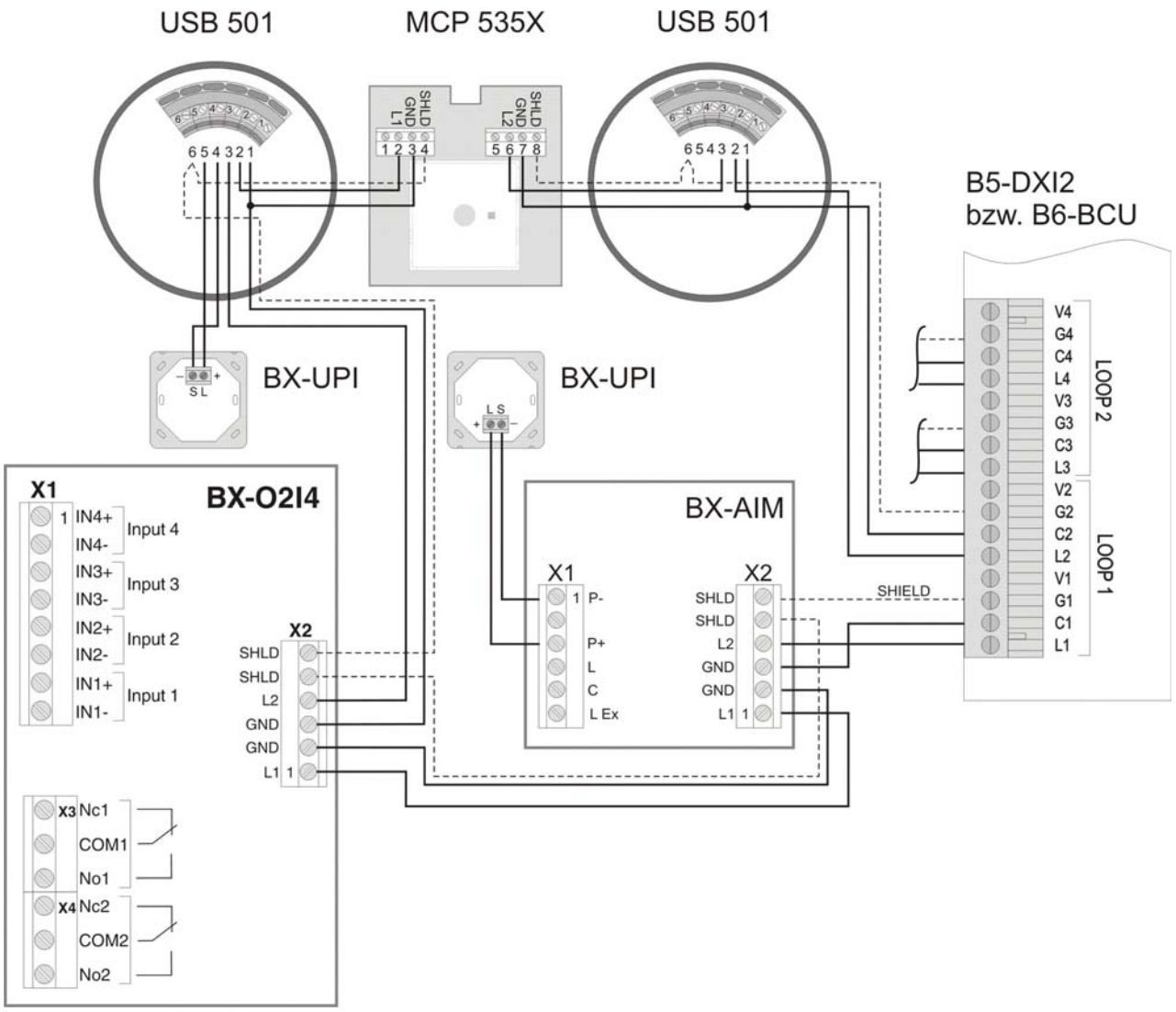
3.1.2 Power Consumption Calculation

A calculation program is available for the power consumption calculation. There it is possible to enter the types of rechargeable batteries and the required supply interruption period (conforming to local standards and guidelines).

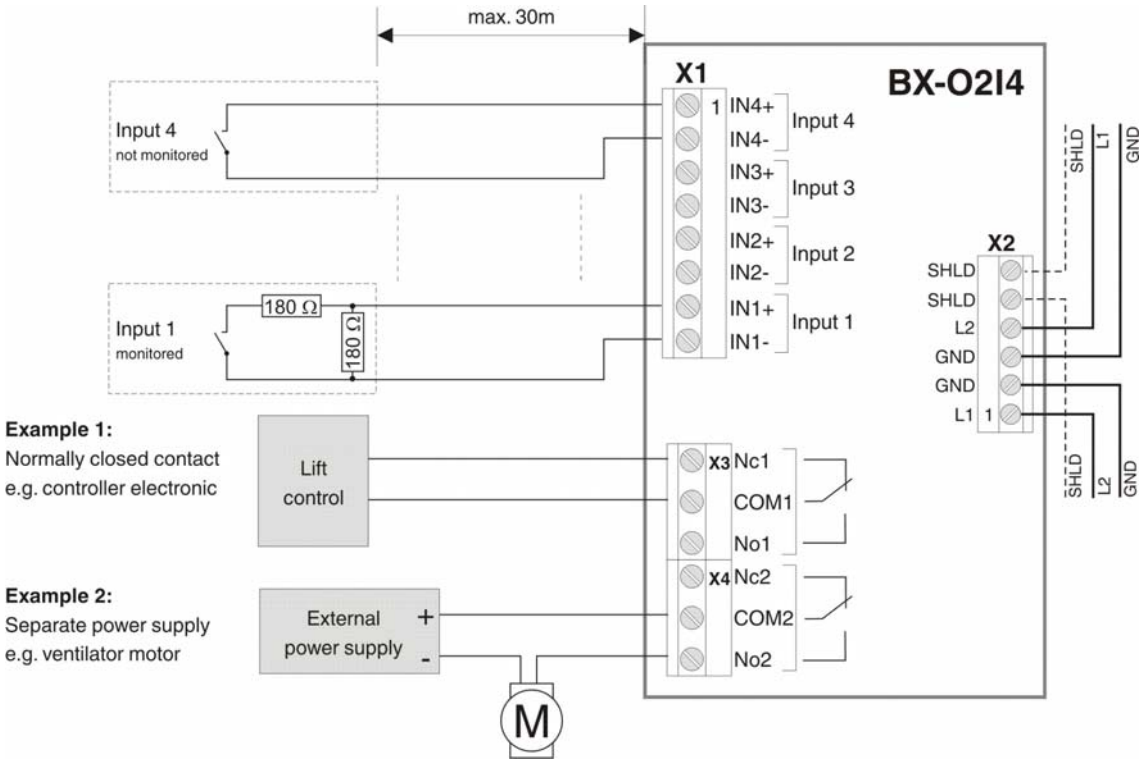
4 Connection diagrams

When laying a 230 V connection cable, it must be ensured that the cable is not laid directly above the module's electronic circuitry.

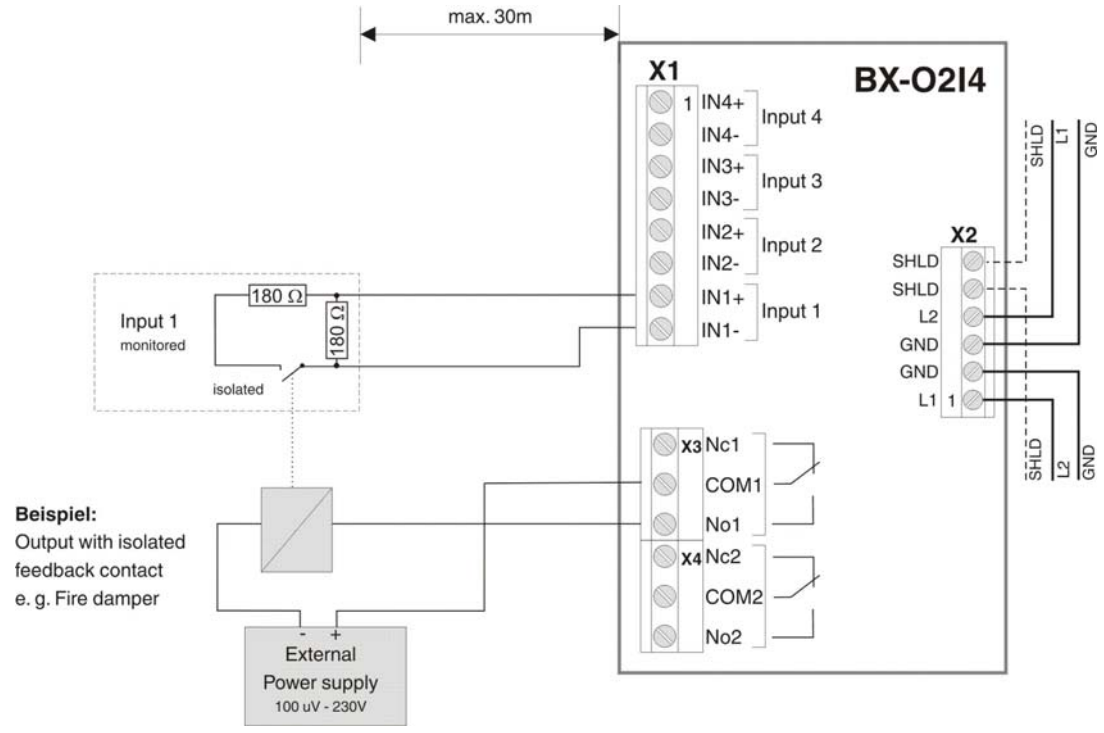
4.1 Integral X-LINE



4.2 Use as an I/O-Modul

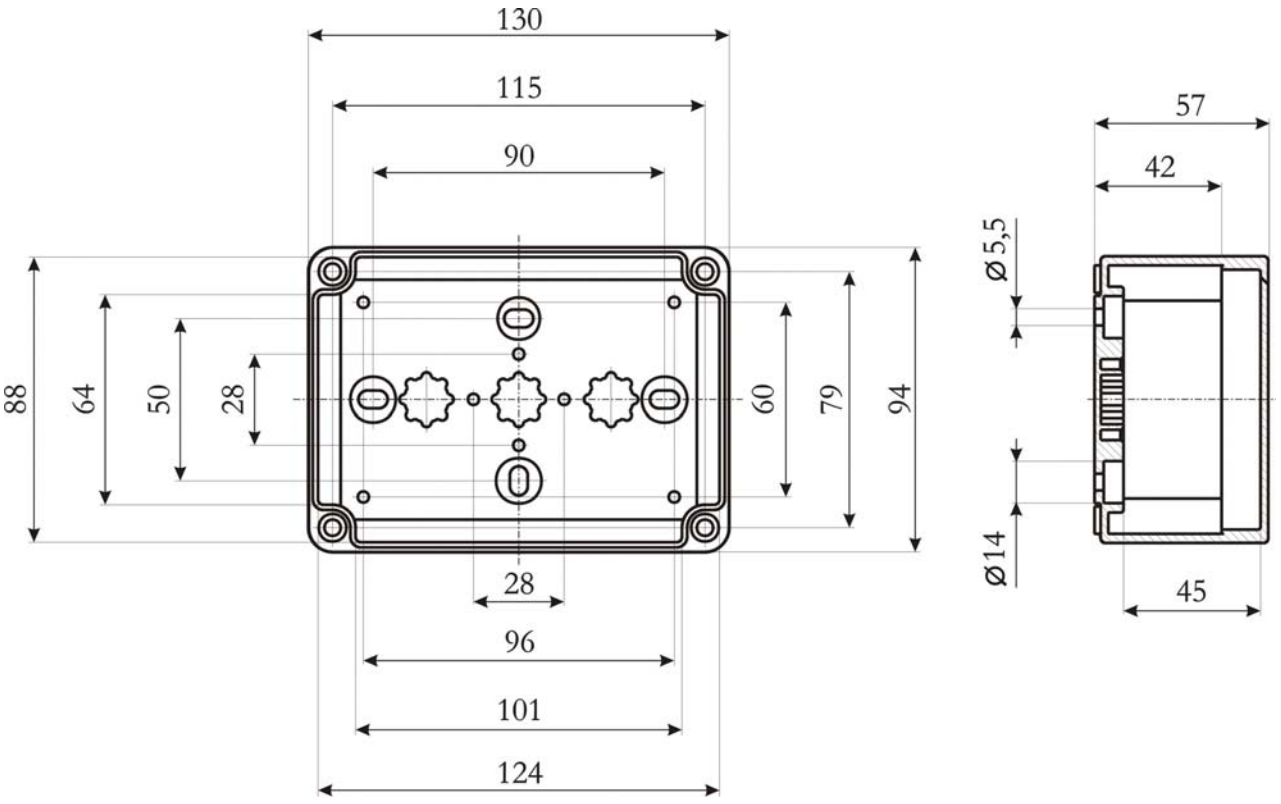


4.3 Use as output with feedback



5 Technical Specifications

Controller:	Microchip 16F689, 8 Bit Microcontroller
Memory:	Data: 256 bytes on chip Programming: 4k *14 bits on chip
Address memory:	EEProm 256 bytes on chip
System connection:	6 pole screw-type terminal Loop over two-wire circuit Integral X-LINE Protocol max. 32 pcs. BX-O2I4/loop
Short circuit isolator:	max. line voltage: V_{max} =30V min. line voltage: V_{min} =12V max. nominal direct current: I_{Cmax} = 100 mA max. nominal switching current: I_{Smax} = 180 mA. max. leakage current: I_{Lmax} = 10 uA max. series impedance: Z_{Cmax} = 0,60 Ω Switching from „closed“ to „open“ only by nominal switching power or shutdown command Switching from „open“ to „closed“ only by power up command min. cutout or operating voltage: V_{SOmin} = 10V max. cutout or operating voltage: V_{SOmax}= 30V
Peripheral connection:	2 x 3 pole screw-type terminal for relay contacts 8 pole screw-type terminal for querying contacts
Protection:	EMC using tranzorp diodes and broadband decoupling of the power supply circuit
Dimensions:	Circuit board: 100 x 67 x 20 (LxWxH) Case: 130 x 94 x 57 (LxWxH)



6 Document History

Version	Date	Most important changes compared to the previous version
First edition	15.03.2011	