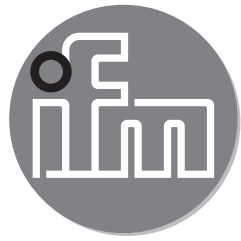


ifm electronic



Operating instructions
AS-i SmartLine module

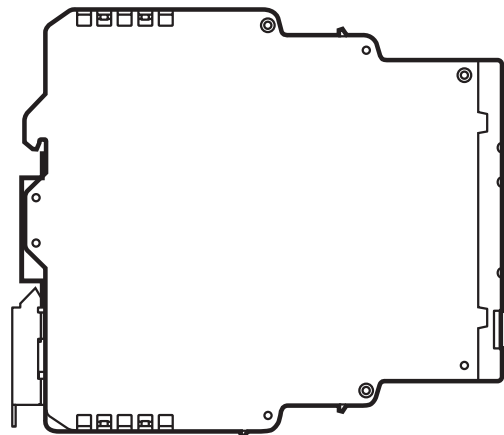
AS interface

AC3220

AC3221

UK

80237516/00 06/2016



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1 Preliminary note

This document is intended for specialists. These specialists are people who are qualified by their training and their experience to see risks and to avoid possible hazards that may be caused during operation, installation or maintenance of the device.

Read this document before use to familiarise yourself with operating conditions, installation and operation. Keep this document during the entire duration of use of the device.

WARNING

Adhere to the warning notes and safety instructions (→ 2 Safety instructions).

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1.1 Symbols used

▶ Instructions

→ Cross-reference



Important note

Non-compliance may result in malfunction or interference.



Information

Supplementary note



General warning

Non-compliance may result in personal injury.

1.2 Warnings used

WARNING

Warning of serious personal injury.

Death or serious irreversible injuries may result.

2 Safety instructions

2.1 General

Follow the operating instructions. Non-observance of the instructions, operation which is not in accordance with use as prescribed below, wrong installation or incorrect handling can affect the safety of operators and machinery.

The installation and connection must comply with the applicable national and international standards. Responsibility lies with the person installing the device.

The system installer is responsible for the safety of the system into which the device is integrated.

2.2 Target group

The device must only be installed, connected and put into operation by a qualified electrician.

2.3 Electrical connection

Disconnect the device externally before handling it. Also disconnect any independently supplied relay load circuits.

Make sure that the external voltage is generated and supplied according to the requirements for safety extra-low voltage (SELV) since this voltage is supplied without further measures near the operating elements and at the terminals for the supply of connected sensors.

The wiring of all signals in connection with the SELV circuit of the device must also comply with the SELV criteria (safety extra-low voltage, safe electrical isolation from other electric circuits).

If the externally supplied or internally generated SELV voltage is externally grounded, the responsibility lies with the user in accordance with the applicable national installation regulations. All statements in these operating instructions refer to the unit the SELV voltage of which is not grounded.

The consumption of current which exceeds the value given in the technical data is not allowed.

An external main switch must be installed for the unit which can switch off the unit and all related circuits. This main switch must be clearly assigned to the unit.

2.4 Handling

Be careful when handling the unit once power is applied. This is only allowed by qualified personnel due to the protection rating IP 20.

2.5 Location

For the correct operation the device must be mounted in a housing which can only be opened using a tool or in a locked control cabinet (both protection rating IP 54 or higher) as an enclosure in accordance with EN61010-1.

2.6 Housing temperature

As described in the technical specifications below the device can be operated in a wide ambient temperature range. Because of the additional internal heating the operating elements and the housing walls can have high perceptible temperatures when touched in hot environments.

2.7 Tampering with the device

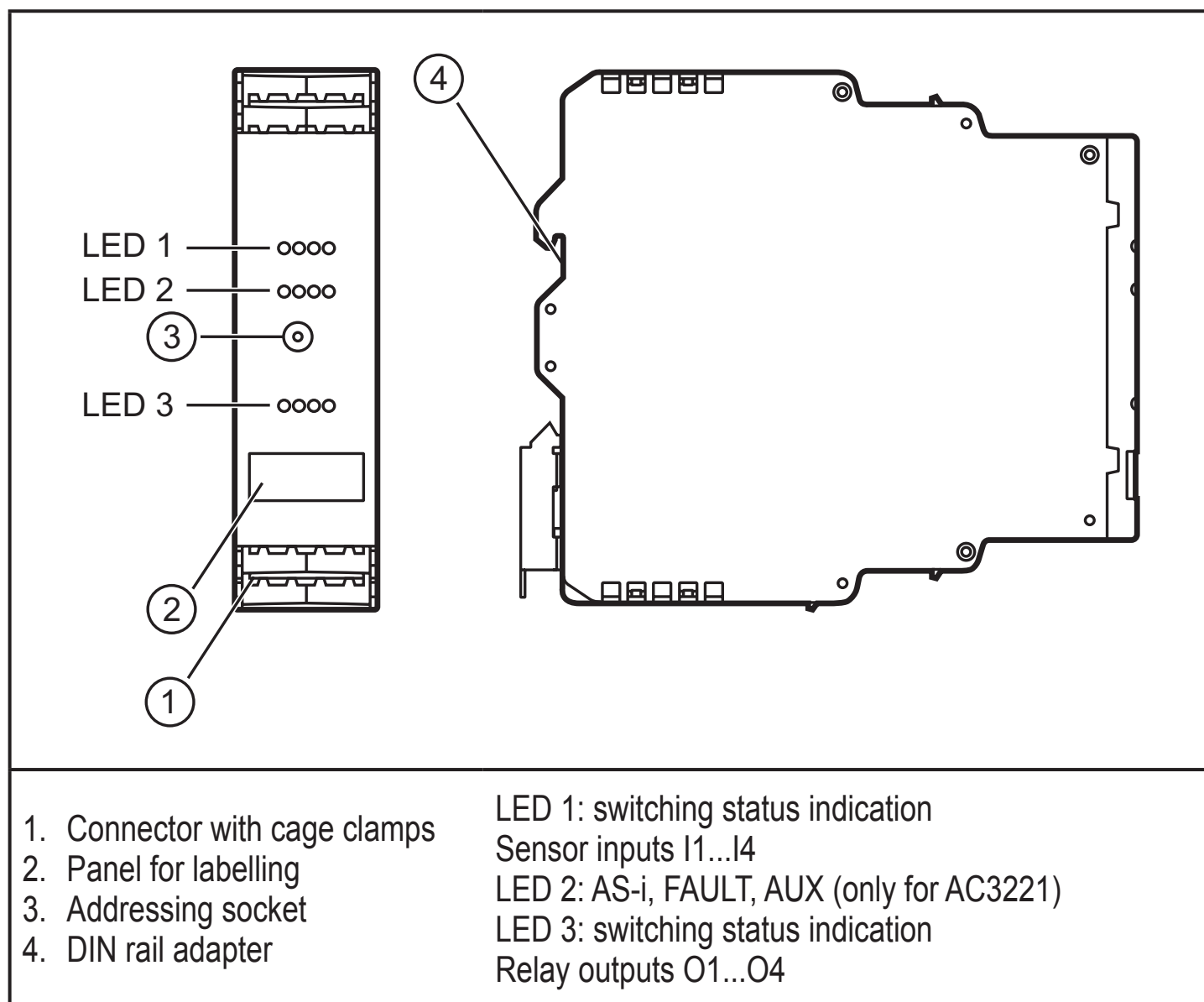
In case of malfunction of the device or queries please contact the manufacturer. Any tampering with the device can seriously affect the safety of operators and machinery. This is not permitted and leads to the exclusion of any liability and warranty claims.

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3 Functions and features

- The devices act as digital input and output modules in the AS-i network with 4 digital inputs and outputs each.
- Inputs for the connection of up to max. 4 sensors (2-wire or 3-wire sensors).
- Outputs (relay) for the direct control of contactors, small drives, valves, etc. Voltage range up to max. 240 V AC or 24 V DC, current intensities up to max. 6 A per output or per module (total current).
- AC3220: sensor supply via AS-i 200 mA
- AC3221: sensor supply via AUX 1 A
- Maximum number of modules per master: 62 (A/B slave)
- AS-i profile S-7.A.7
- The devices can only be operated in conjunction with a version 3.0 master (master profile M4).

4 Operating and display elements



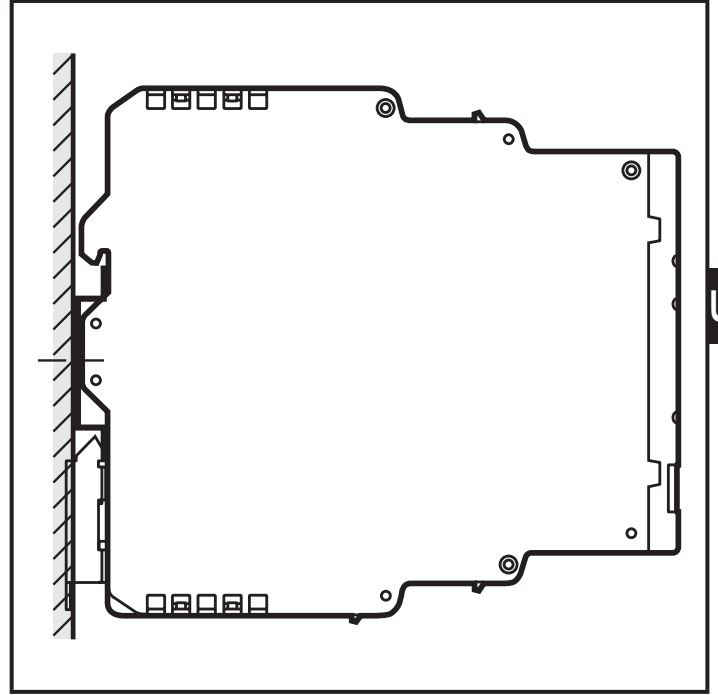
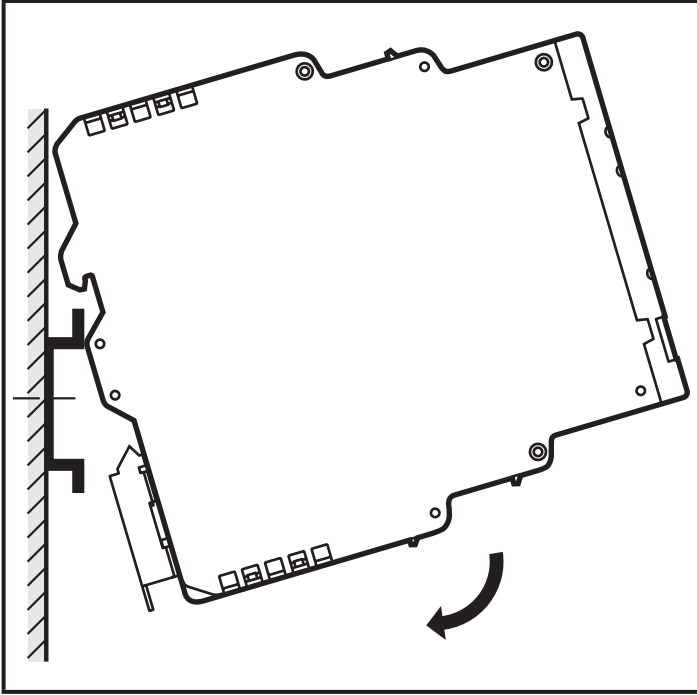
5 Operation / LEDs

- LED 1 yellow lights: inputs (I1...I4) switched
- LED 2 AS-i green lights: AS-i voltage supply OK
- LED 2 FAULT red lights: AS-i communication error, slave does not participate in the "normal" exchange of data, e.g. slave address 0
- LED 2 FAULT red flashes: peripheral fault, e.g. sensor supply overloaded or shorted
- LED 2 AUX green lights (only AC3221): external voltage supply OK
- LED 3 yellow lights: relay outputs O1...O4 switched

6 Installation

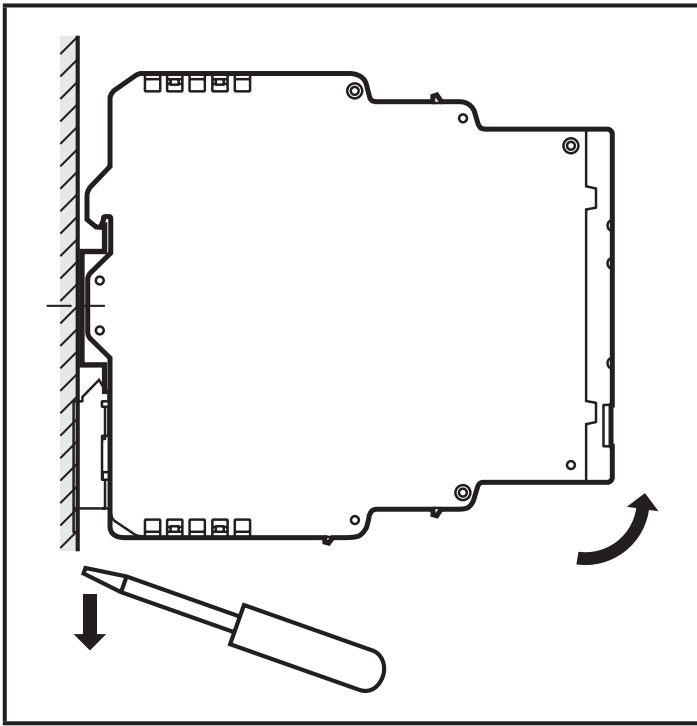
6.1 Installation of the device

- ▶ Install the device on a 35 mm DIN rail.



- ▶ Leave enough space between the unit and the top and bottom of the control cabinet to enable air circulation and to avoid excessive heating.
- ▶ Take into account the internal heating of all devices when mounting several devices side by side and observe the environmental conditions for every device.

6.2 Remove the device



6.3 Mounting of the sensors

- ▶ Follow the manufacturer's installation instructions.

7 Electrical connection

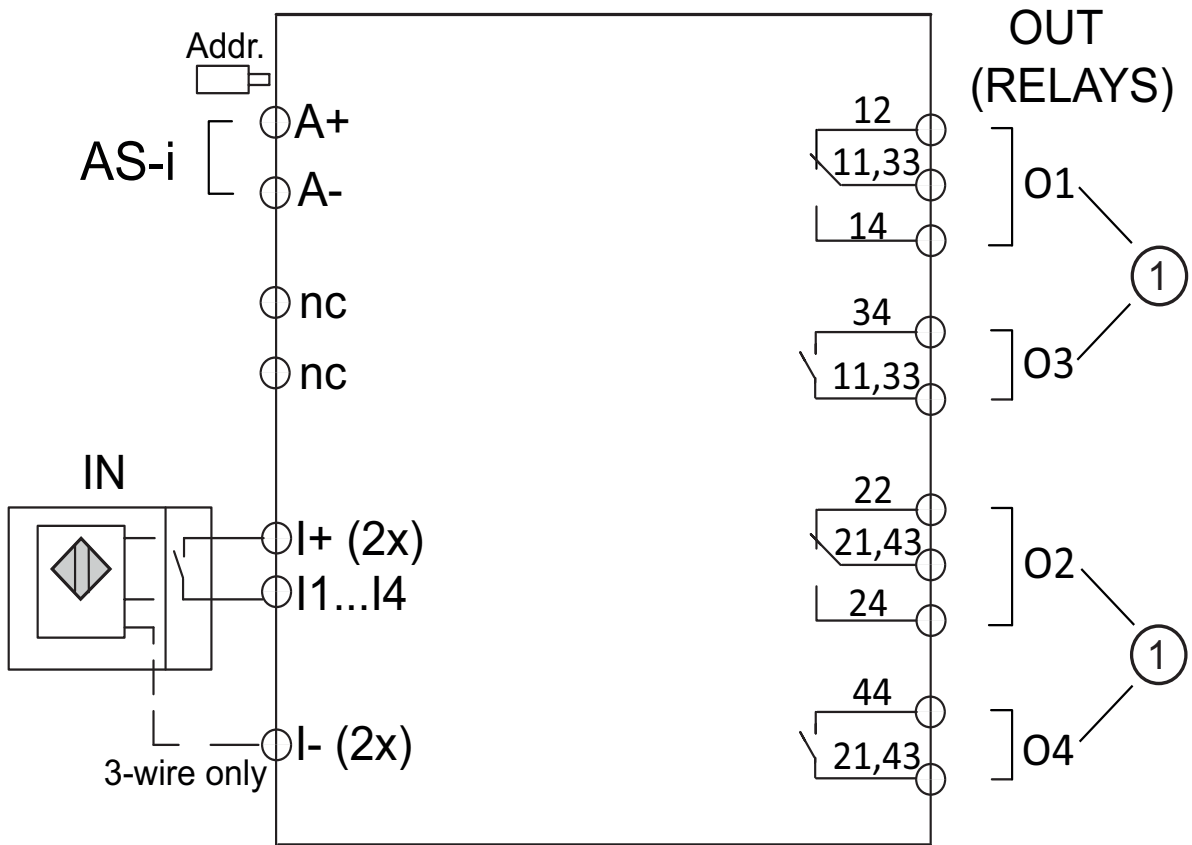
7.1 Connection accessories

The unit is supplied including the connectors.

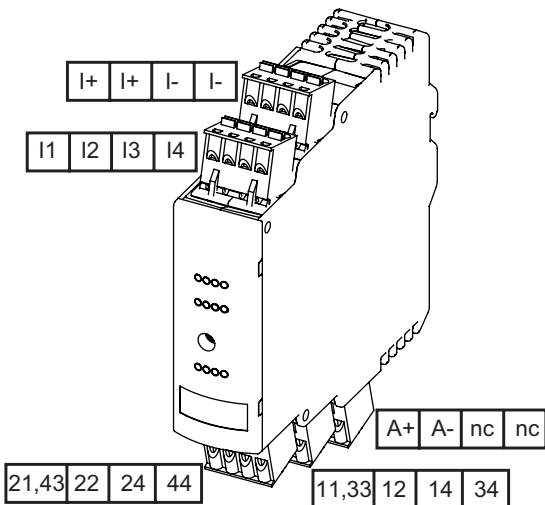
You can find more information about the available accessories at www.ifm.com.

7.2 Terminal connection

AC3220



1: The outputs (relays) O1 + O3 and O2 + O4 must be supplied in pairs with the same voltage.



A+: AS-i +

A-: AS-i -

I+: sensor supply +24 V

I-: sensor supply 0 V

I1...I4: switching input sensors 1...4

11: relay O1 changeover contact, common

12: relay O1 changeover contact, normally closed

14: relay O1 changeover contact, normally open

21: relay O2 changeover contact, common

22: relay O2 changeover contact, normally closed

24: relay O2 changeover contact, normally open

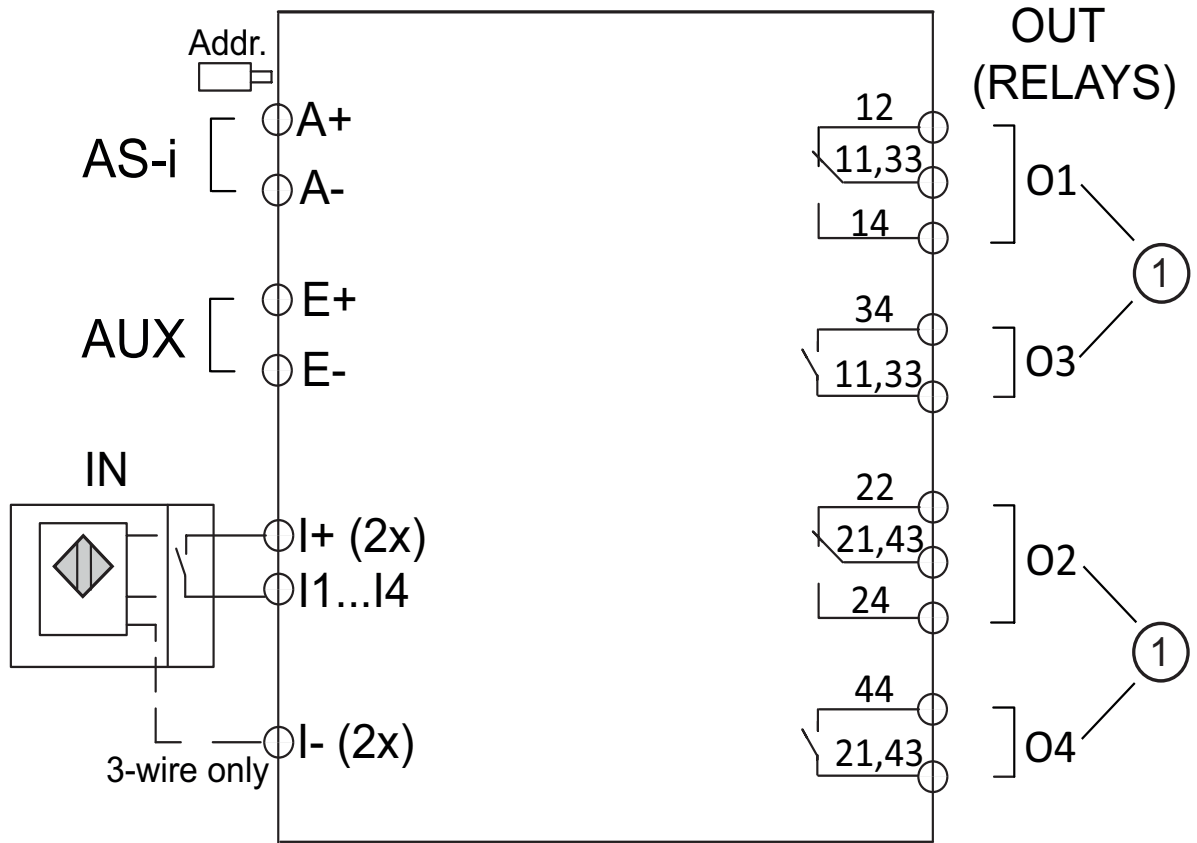
33, 34: relay O3 normally open

43, 44: relay O4 normally open

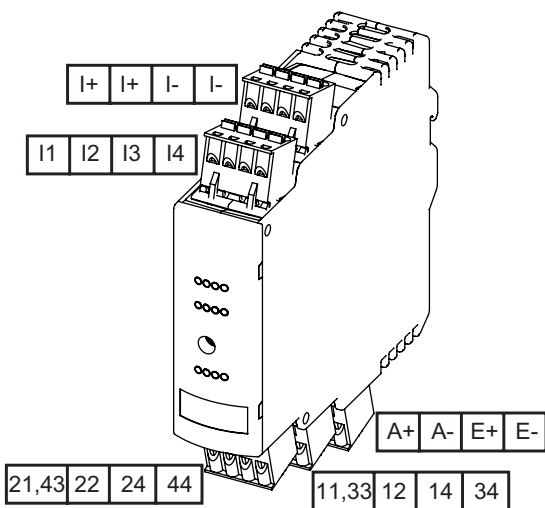
nc: not connected

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AC3221



1: The outputs (relays) O1 + O3 and O2 + O4 must be supplied in pairs with the same voltage.



A+: AS-i +

A-: AS-i -

E+: external voltage supply +24 V

E-: external voltage supply 0 V

I+: sensor supply +24 V

I-: sensor supply 0 V

I1...I4: switching input sensors 1 ... 4

11: relay O1 changeover contact, common

12: relay O1 changeover contact, normally closed

14: relay O1 changeover contact, normally open

21: relay O2 changeover contact, common

22: relay O2 changeover contact, normally closed

24: relay O2 changeover contact, normally open

33, 34: relay O3 normally open

43, 44: relay O4 normally open

WARNING

Only the supplied or technically identical connectors may be used on the terminal blocks for the relay outputs (O1...O4) → 9 Technical data.

To ensure protection rating IP20 for the housing and the terminals, connect terminals to all the unused connector contacts.

WARNING

Do not use unconnected terminals which are not shown in the diagram (n.c. for AC3220) as support point terminal.

WARNING

AC3221

Only for connection with an isolating transformer with a UL approved 10 A upstream fuse at AUX (E+).

Alternatively, a class 2 power supply can be used to supply AUX.

Please note the technical data concerning the AUX supply.



AC3220

Do not connect the terminals I1...I4 und I+, I- to external potential.



For both devices the cable length must not exceed 30 m.

8 Addressing

The address is set to 0 at the factory.

8.1 Addressing with the AC1154 addressing unit

When mounted and wired the module can be addressed with the addressing cable (E70213) via the integrated addressing interface.

If a slave is used in combination with a master of the new generation (version 2.1), it is possible to select an address between 1A and 31B with the AC1154 addressing unit.

If a slave with the ID code "A" (extended address mode possible) is used in combination with a master of the 1st generation (version 1),

- the parameter P3 must be 1 and the output bit D3 must be 0.*
The output bit D3 must not be used.
- an address between 1A and 31A must be assigned to this slave.

* Default setting

9 Technical data

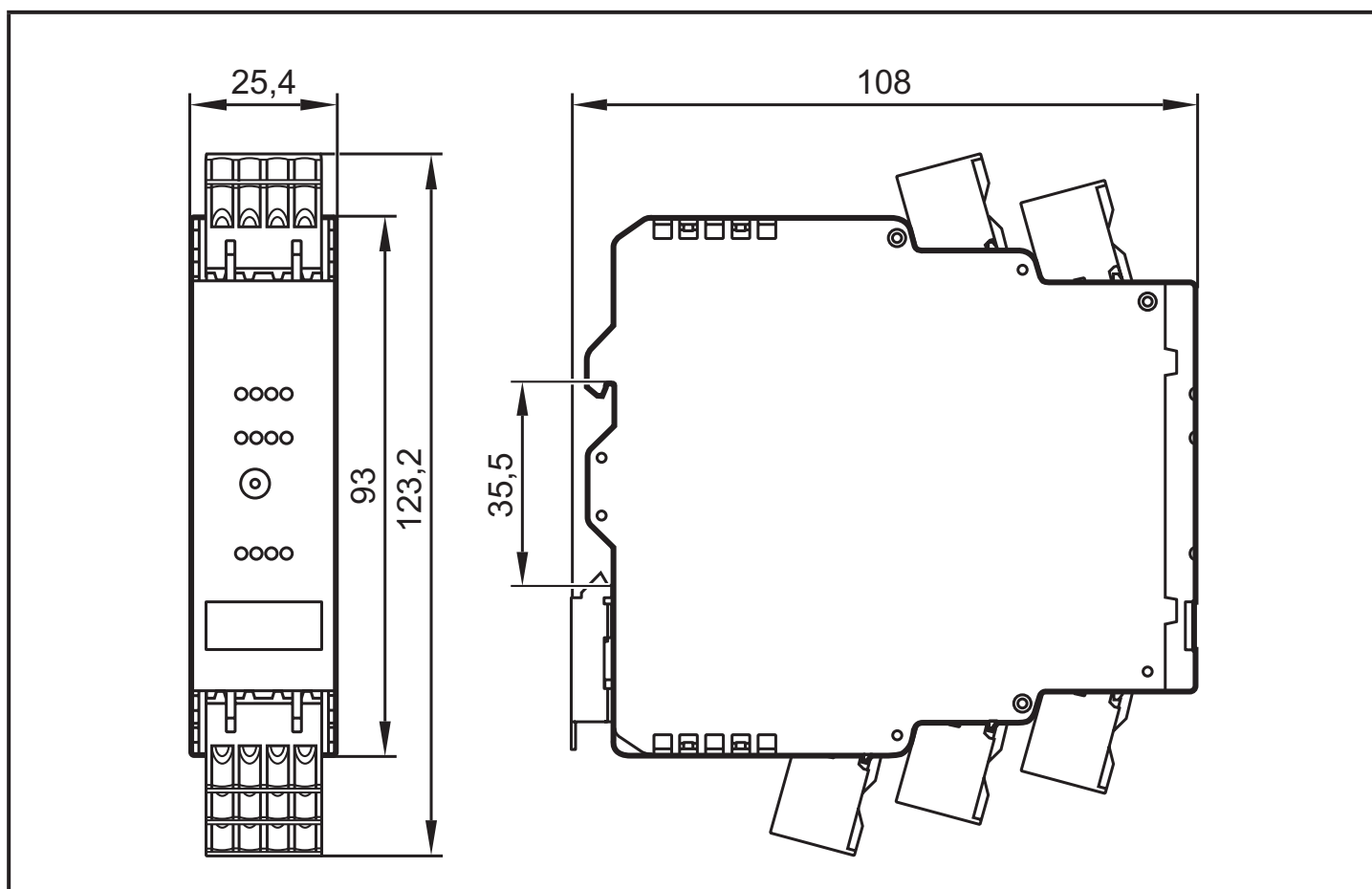
SmartLine module		AC3220 / AC3221
Electrical design		4 digital inputs / 4 digital outputs
Operating voltage	[V]	AC3220: 26.5...31.6 DC (AS-i) AC3221: 18...31.6 DC (AS-i), 20...30 DC (AUX)
Total current consumption from AS-i	[mA]	AC3220: < 300 AC3221: < 30
Current rating per module	[A]	6
Inputs		PNP (type 2 to IEC 61131-2)
Sensor supply		AC3220: AS-i AC3221: external to SELV
Voltage range inputs	[V]	16...30 DC
Max. current load for all inputs total	[mA]	AC3220: 200 AC3221: 1000
Outputs		Relays
Relay contact rating	[A]	6 Resistive load (240 V AC or 24 V DC) The outputs (relays) O1 + O3 and O2 + O4 must be supplied in pairs with the same voltage (e.g. 2 x 240 V AC or 2 x 24 V DC) Electrically isolated Reinforced insulation to EN61010 Overvoltage category II Degree of soiling 2 to 240 V AC nominal voltage
Protection housing / terminals		IP 20 / IP 20
Ambient temperature	[°C]	-25...60
Max. permissible relative humidity	[%]	90 (not condensing)
Maximum operating altitude	[m]	2000 above sea level
AS-i profile		S-7.A.7

SmartLine module		AC3220 / AC3221
AS-i version		3.0 (extended address mode)
Connection		To supply AUX, an isolating transistor with a UL approved 10 A upstream fuse at AUX (E+) must be used. Alternatively, AUX can be supplied via a class 2 power supply.
Maximum cable length on inputs and outputs	[m]	30
Device		4-pole terminal blocks with 5.0 mm pitch
Connectors (all connectors are supplied with the device)		1x4-pole twin connector with cage clamp connection from Phoenix contact, type TVFKC 1,5/4-ST BK 0.2...1.5 mm ² (AWG 24...16) 4x4-pole connector with cage clamp connection from Phoenix Contact, type FKCT 2,5/4-ST BK 0.2..2.5 mm ² (AWG 24...14)

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Data sheets are available at www.ifm.com.

10 Scale drawing



10.1 Approvals/standards

EC declarations of conformity, approvals etc. are available at www.ifm.com.

11 Maintenance, repair, disposal

11.1 Maintenance

The unit is maintenance-free.

11.2 Cleaning the housing surface

- ▶ Disconnect the device.
- ▶ Clean the device from dirt using a soft, chemically untreated and dry cloth.



Micro-fibre cloths without chemical additives are recommended.

11.3 Repair

- ▶ The device must only be repaired by the manufacturer.
Observe the safety instructions (→ 2.7 Tampering with the device).

11.4 Disposal

- ▶ Dispose of the device in accordance with the national environmental regulations.