ifm electronic

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Operating instructions

AS interface

ProcessLine analogue module

AC2916

UK

Contents

Preliminary note

- Operating elements are indicated as follows:
  Example: [Out off] = button "Out off"

- An instruction is indicated by "▶":
  Example: ▶ Disconnect power.
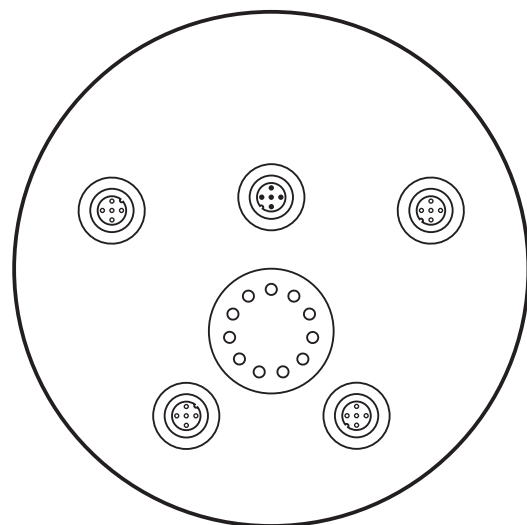
- A reaction to the action is indicated by ">":
  Example: > yellow LED lights.

1 Safety instructions

- Please read the product description prior to set-up of the unit. Ensure that the product is suitable for your application without any restrictions.

- The unit conforms to the relevant regulations and EC directives.

- Improper or non-intended use may lead to malfunctions of the unit or to unwanted effects in your application.

That is why installation, electrical connection, set-up, operation and maintenance of the unit must only be carried out by qualified personnel authorised by the machine operator.

2 Functions and features

The slave converts analogue input signals and transfers them to the AS-i master via the AS-Interface. The AS-i module operates as a slave with bidirectional data transfer in the AS-i network.

The data transfer to the host is asynchronous according to the AS-i profile S-7.3.E and the AS-i specification 3.0, downward compatible.

* maximum number of modules per master: 31

* current measurement 4...20 mA

* time for converting the measured values in the slave

  - for one channel: 60 ms

  - for two channels: 120 ms

  - for three channels:

      channel 1: 120 ms

      channels 2 and 3: 240 ms

  - for four channels: 240 ms

When the sensors are supplied from AS-i the load must not exceed 380 mA, the load for an individual sensor connection must not exceed 200 mA. There is an electrical connection between the sensor and AS-i.

3 Operating and display elements
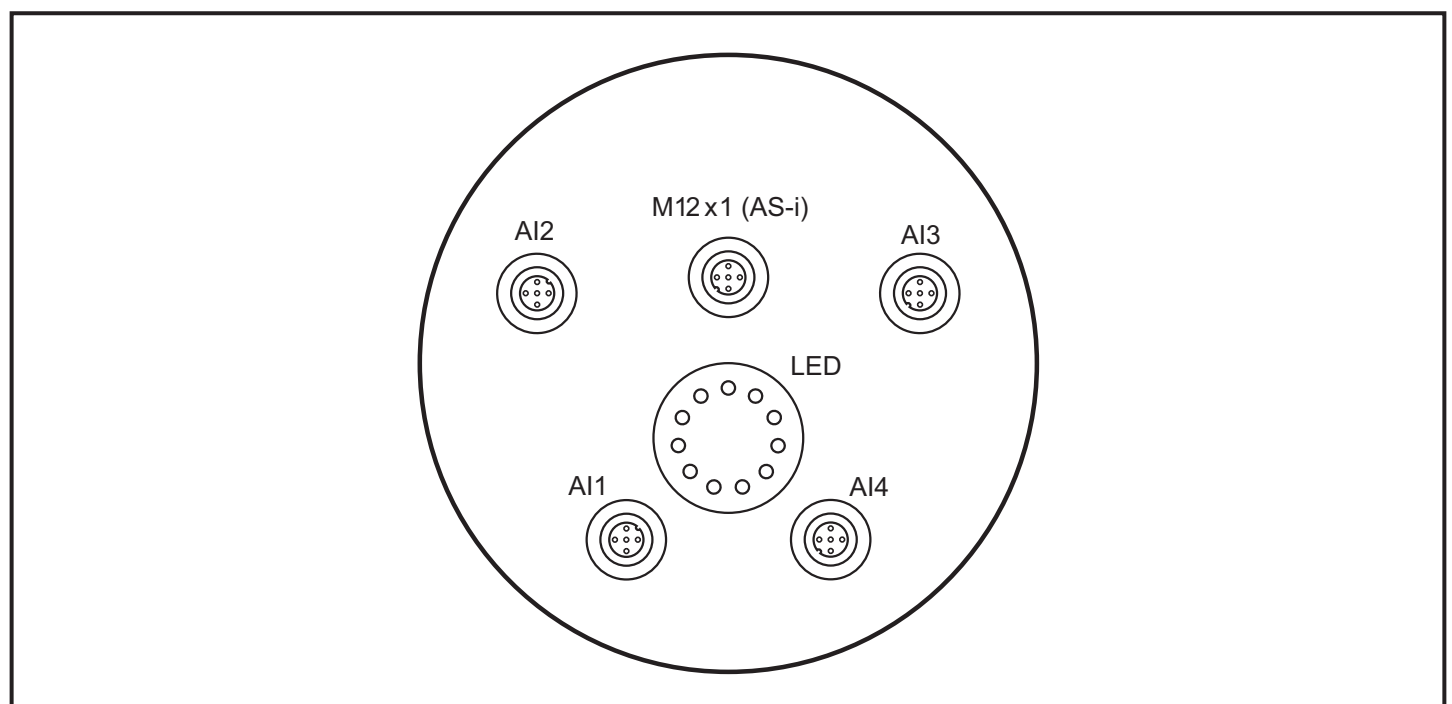
4 Electrical connection

▶ Do not remove the mounted protective caps (E70297) before the sensor plugs are connected to the M12 sockets.

To guarantee the protection rating IP 69K

- unused sockets must be covered with these protective caps (tightening torque 0.6...0.8 Nm).

- the M12 connectors must be tightened with a tightening torque of 0.6...0.8 Nm.

[!] The round cable connected to AS-i should not be longer than 2 m.

The device shall be supplied from an isolating transformer having a secondary Listed fuse rated as noted in the following table.

Overcurrent protection		
Control-circuit wire size		Maximum protective device rating Ampere
AWG	(mm^2)	
26	(0.13)	1
24	(0.20)	2
22	(0.32)	3
20	(0.52)	5
18	(0.82)	7
16	(1.3)	10

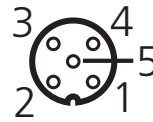## 4.1 Wiring

4.1.1 AS-i input

1: AS-i +
2: n.c.
3: AS-i -
4: n.c.
5: FE (functional earth)

4.1.2 Analogue input

1: 24 V (sensor supply)
2: AI + (input current loop)
3: 0 V / AI -(sensor supply /
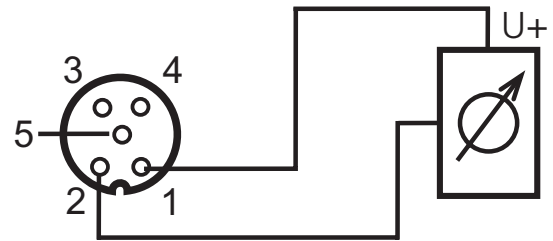output current loop)
4: n.c.
5: FE (functional earth)

4.2 Current measurement

In all the following wiring diagrams the indicated pin connection refers to the unit.

Connection of a 2-wire sensor without own supply

1: sensor supply +24 V
2: AI+ analogue input
3: sensor supply 0 V /
analogue input AI-
5: functional earth
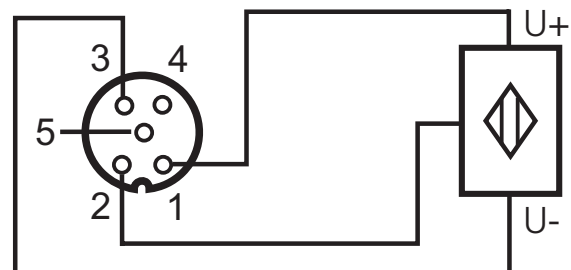
Wiring of a 2-wire sensor with electrically isolated and earth-free supply

1: sensor supply +24 V
2: analogue input AI+
3: sensor supply +0 V /
analogue input AI-
5: functional earth
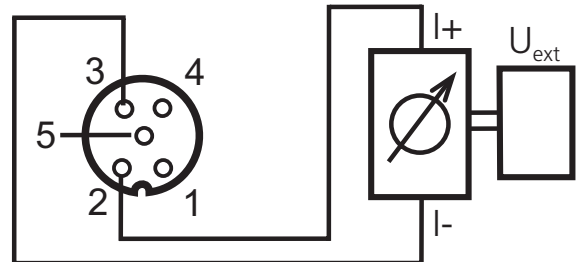
Connection of a 3-wire sensor without own supply

1: sensor supply +24 V
2: analogue input AI+
3: sensor supply +0 V /
analogue input AI-
5: functional earth

5 Addressing

The address is set to 0 at the factory.

5.1 Addressing with the addressing unit AC1154

▶ Addressing the unit via the AS-i connection.

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! Connected sensors might exceed the ability of the addressing unit to supply power.

▶ Remove the sensors from the unit and address them.

5.2 Parameter setting of the analogue module

Parameter bit	Description		Remarks	
P0	1	50 Hz	50/60 Hz suppression	
	0	60 Hz		

Parameter bit	Channel activation					
P1, P2	P1	P2	Channel 1	Channel 2	Channel 3	Channel 4
	0	0	on	off	off	off
	0	1	on	on	off	off
	1	0	on	on	on	off
	1	1	on	on	on	on

Parameter bit	Description	Remarks	
P3	peripheral fault if outside the measuring range	1	peripheral fault indication active
		0	peripheral fault indication non active

5.3 Measuring range of the unit

▶ For the measuring ranges and their significance please refer to the following tables:

| Range [mA]	Units dec.	Units hex.	LED	Peripheral fault	Description
< 3.4	32768 → 32767 *	8000 → 7FFF *	flashes	on***	wire break
3.4...3.59	3400...3599 → 32767 *	0D48...0E0F → 7FFF *	flashes	off	below nominal range
3.6...22	3600...22000	0E10...55F0	on	off	extended and nominal range**
22.01...23	22001...23000 → 32767 *	55F1...59D8 → 7FFF *	flashes	off	above nominal range
> 23	32767	7FFF	flashes	on***	outside range

Note:

* the master replaces the value transmitted by the slave with the default value 7FFFh (32767)

** the accuracy is only guarantueed in the nominal range (4...20 mA) but not in the extended nominal range.

*** only for the parameter bit 3 = 1

6 Operation

Check whether the unit operates correctly. Display by LEDs.
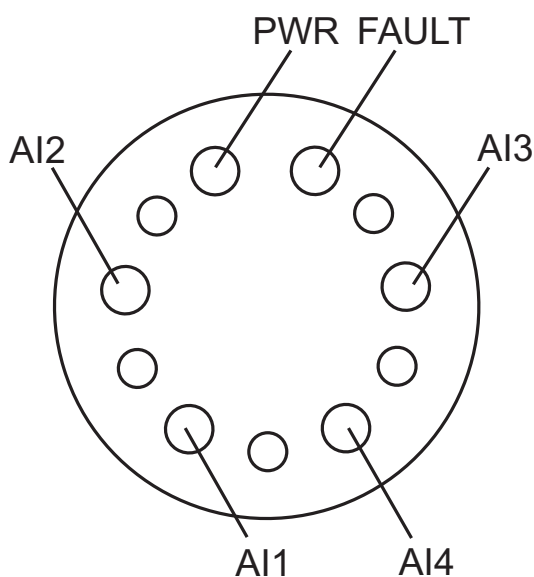
• LED AI1...AI4 yellow off	sensor input is disabled (see parameter bit P1 and P2)
• LED AI1...AI4 yellow on	analogue signal in the measuring range
• LED AI1...AI4 yellow flashes	analogue signal outside the measuring range or no sensor connected
• LED green PWR on	AS-i voltage is applied
• LED red FAULT on	AS-i communication error
• LED red FAULT flashes	peripheral fault*

* peripheral fault

A peripheral fault is displayed:

- if at least one of the analogue signals is outside the value range (P3)
- if nothing is connected to at least one analogue channel although the respective channel (P3) is activated
- in case of overload or short circuit of the sensor supply

7 Scale drawing
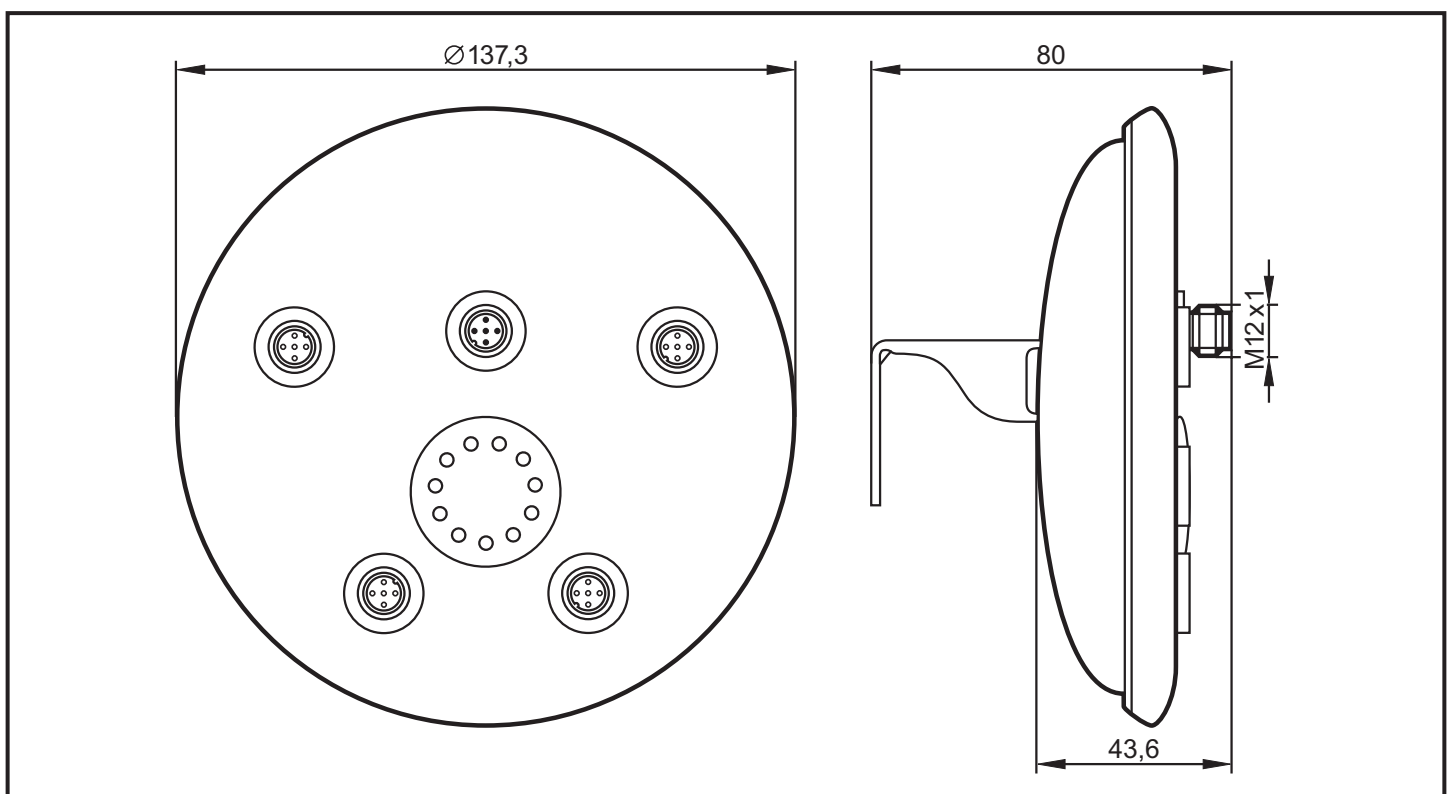
Technical data and further information at
www.ifm.com