

ifm electronic



Operating instructions

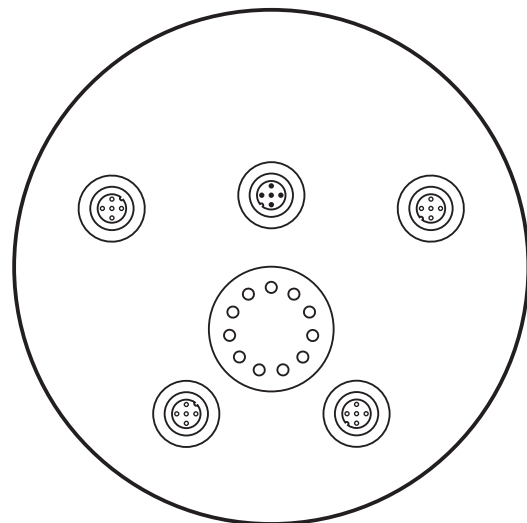
**AS interface**

ProcessLine analogue module

**AC2923**

**UK**

7390860/01 06 / 2012



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# 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.

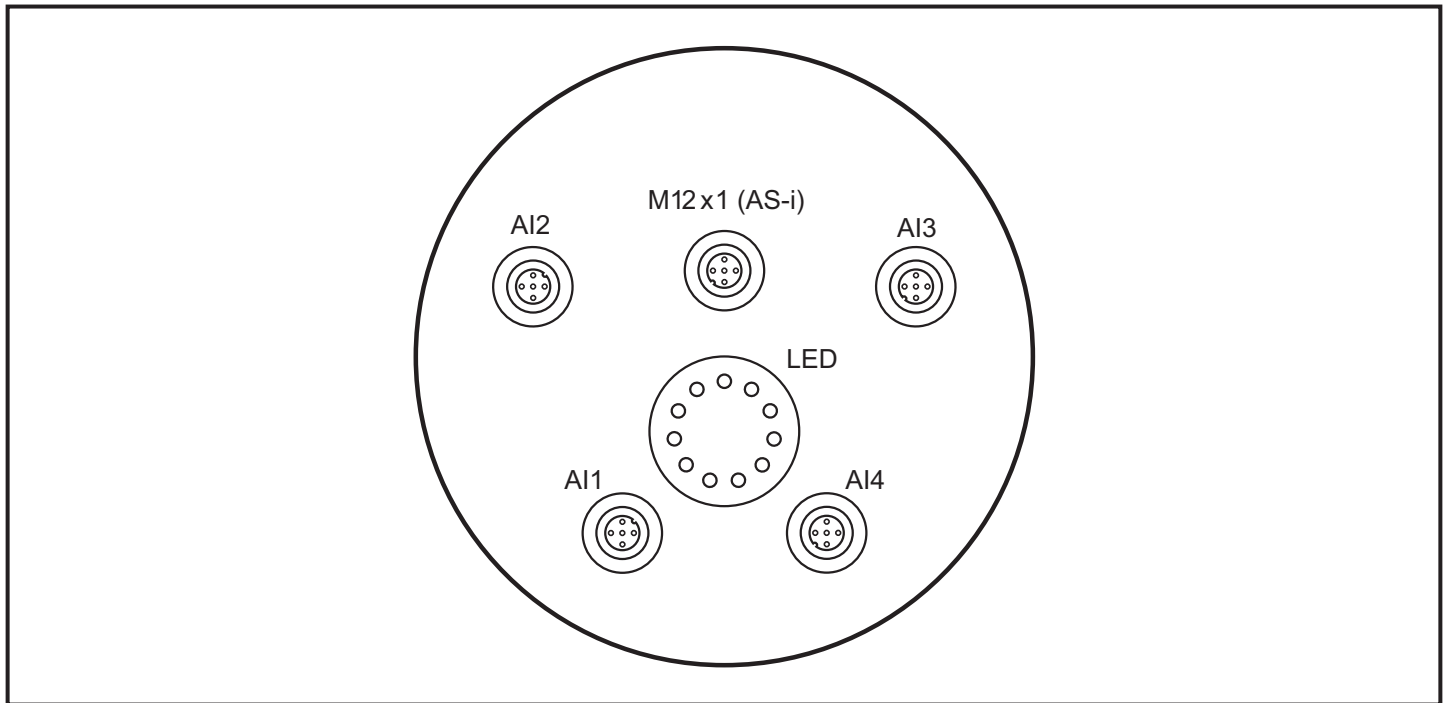
The data transfer to the host is asynchronous according to the AS-i profile S-7.3.E and the AS-i specification 3.0, downward compatible.

- 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

The analogue inputs and AS-i are electrically separated. This separation is only effective in case of external supply. When an actuator is supplied via AS-i, the electrical separation for this input is bridged.

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.

### 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 <sup>2</sup> )	
26	(0.13)	1
24	(0.20)	2
22	(0.32)	3
20	(0.52)	5
18	(0.82)	7
16	(1.3)	10

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## 4.1 Wiring

### 4.1.1 AS-i input

<p>1: AS-i +                  2: n.c.                  3: AS-i -                  4: n.c.                  5: functional earth FE</p>	
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### 4.1.2 Analogue input

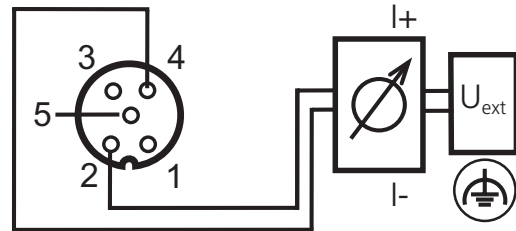
<p>1: sensor supply 24 V                  2: analogue input AI +                  3: sensor supply 0 V                  4: analogue input AI -                  5: functional earth FE</p>	
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## 4.2 Current measurement

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

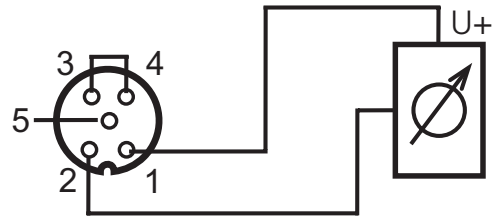
Wiring of a 2-wire sensor with own (grounded) supply

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



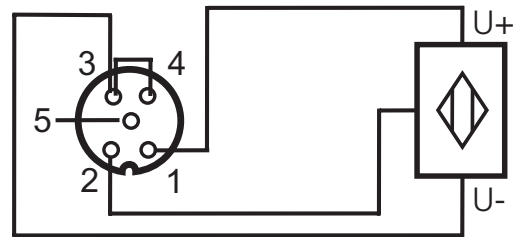
Connection of a 2-wire sensor without own supply

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



Connection of a 3-wire sensor without own supply

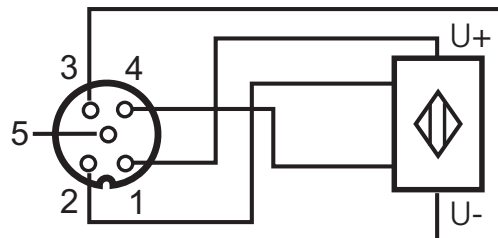
- 1: sensor supply 24 V
- 2: analogue input AI +
- 3: sensor supply 0 V
- 4: analogue input AI -
- 5: functional earth FE



When connecting a 2-wire or 3-wire sensor without own supply there has to be an external link between pin 3 and pin 4.

Connection of a 4-wire sensor without own supply

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



# 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.



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

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Parameter bit	Description		Remarks			
P0	1	50 Hz	50/60 Hz suppression			
	0	60 Hz				
P1, P2	Channel activation					
	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	
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:

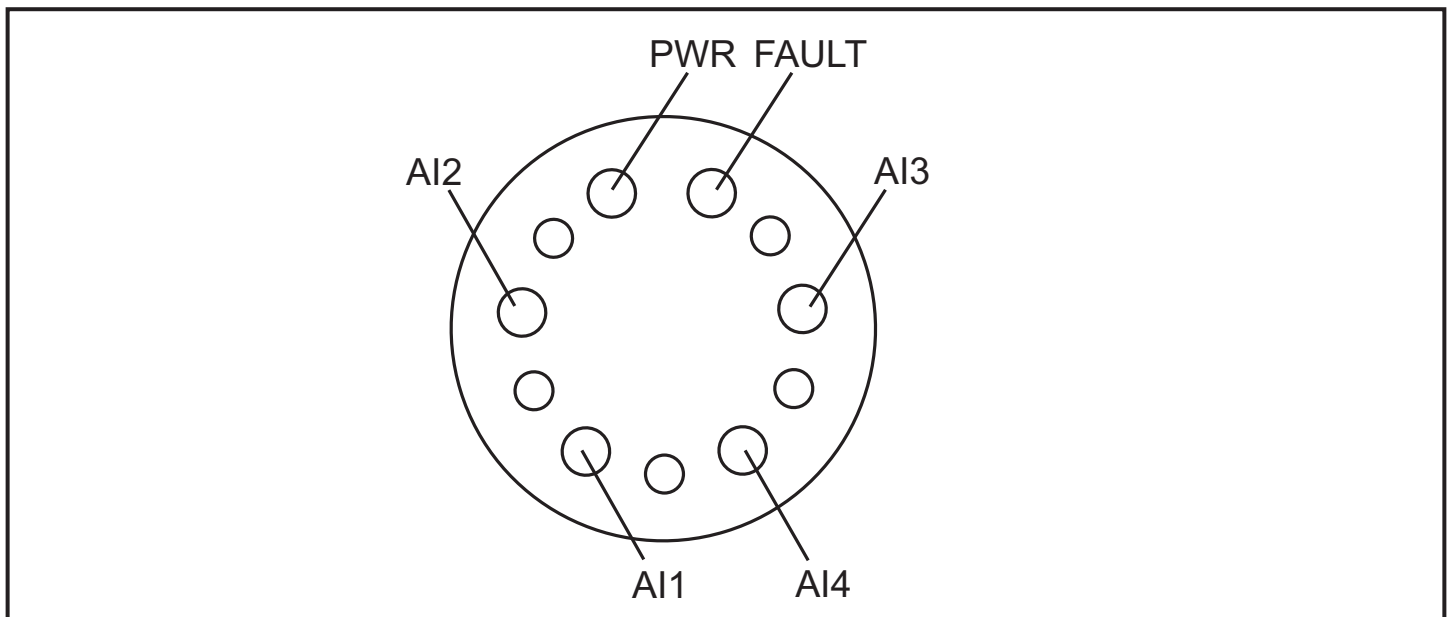
\* the master replaces the value transmitted by the slave with the default value 7FFFh (32767)

\*\* the accuracy is only guaranteed 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*

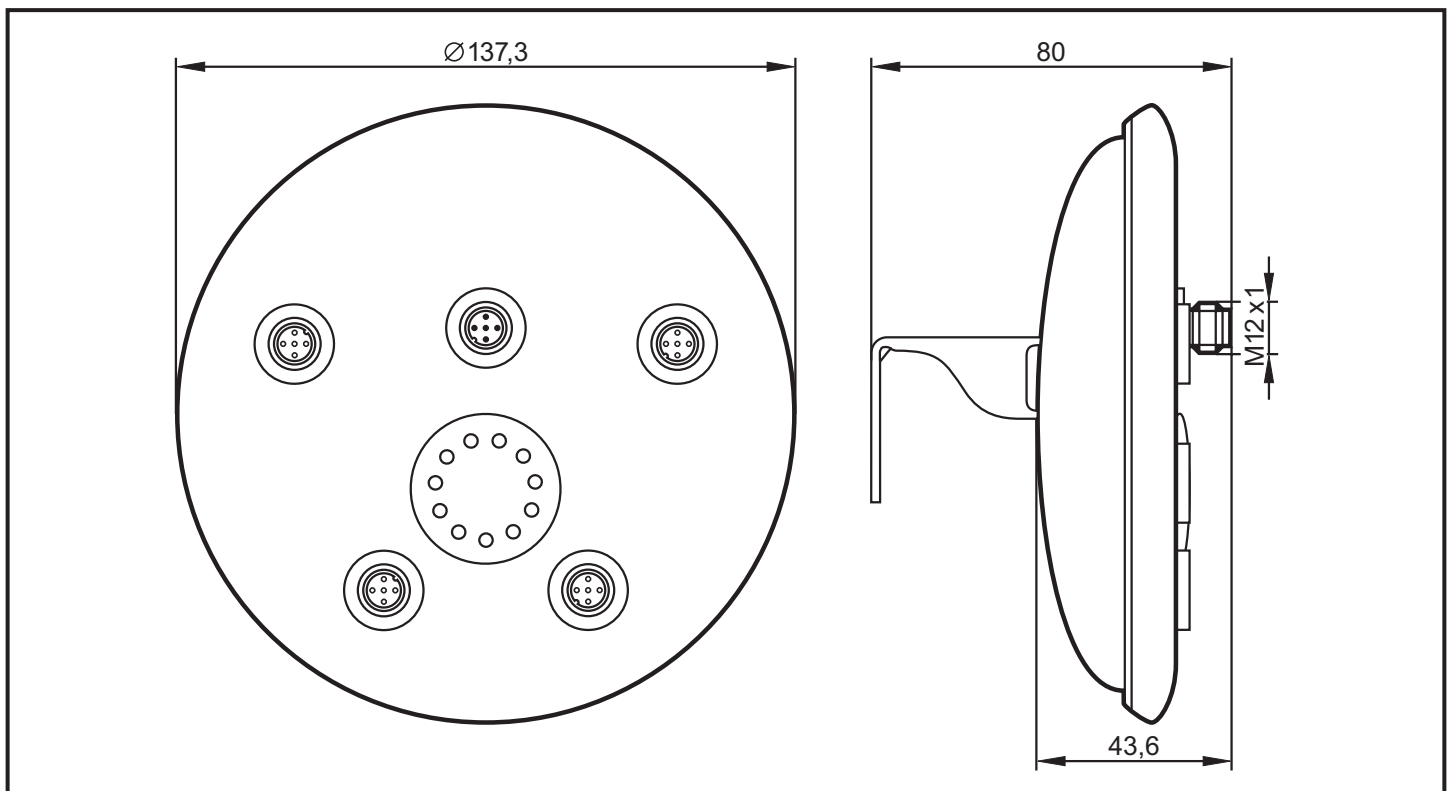
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\* peripheral fault

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 (P1, P2) is active
- in case of overload or short circuit of the sensor supply

## 7 Scale drawing



Technical data and further information at  
[www.ifm.com](http://www.ifm.com) → Select your country → Data sheet direct