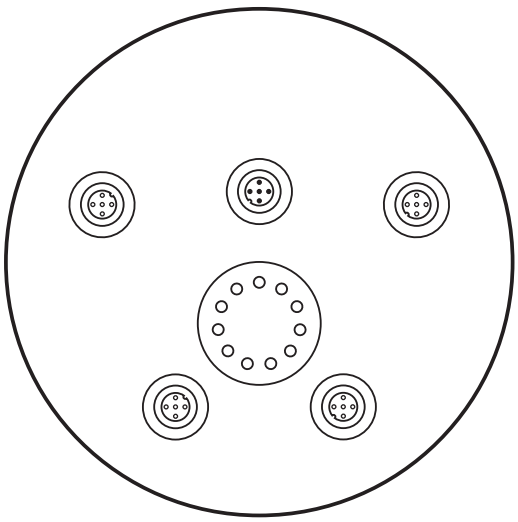
Operating instructions
ProcessLine analogue module
AC2923

GB



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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.

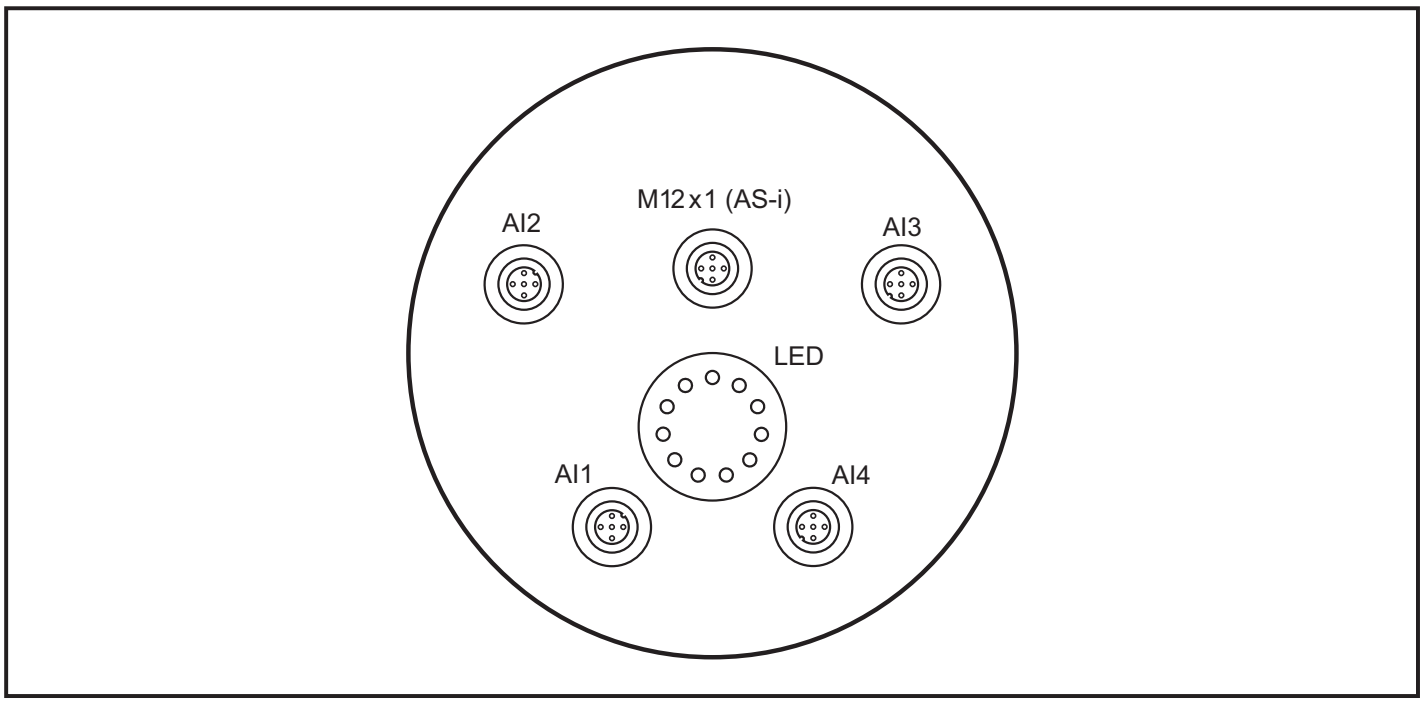
The data transfer to the host is asynchronous according to the AS-i profile S-7.3.E and the AS-i specification 3.0, downward compatible.

- 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 signal cable length for external devices (sensors, actuators) is to be limited to max. 10 m.
The signal cables must not leave the building.

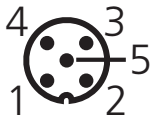
The device shall be supplied from an isolating transformer having a secondary Listed fuse rated as noted in the following table.

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

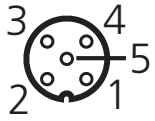
4.1.1 AS-i input

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



4.1.2 Analogue input

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

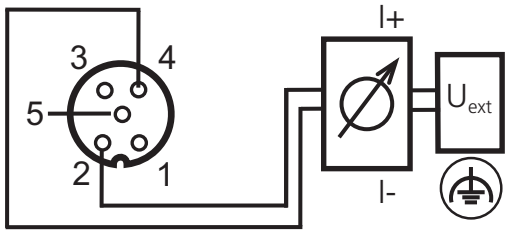


4.2 Current measurement

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

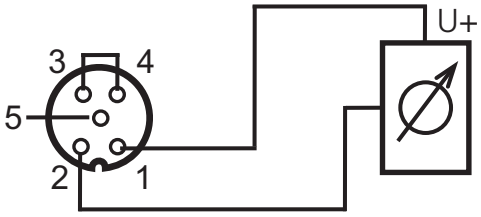
Wiring of a 2-wire sensor with own (grounded) supply

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



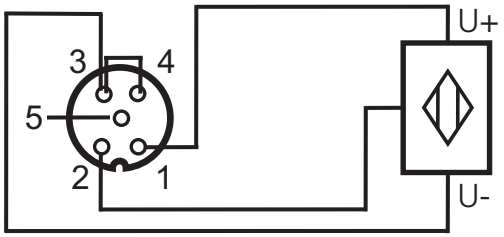
Connection of a 2-wire sensor without own supply

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

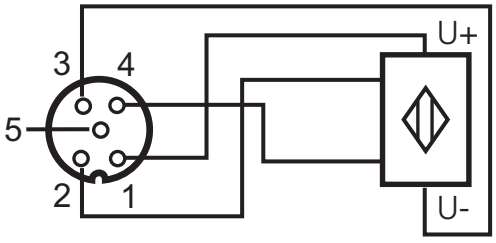
1: sensor supply 24 V
2: analogue input AI +
3: sensor supply 0 V
4: analogue input AI -
5: functional earth FE



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

<table>
<tr><th>Parameter bit</th><th colspan="2">Description</th><th colspan="2">Remarks</th></tr>
<tr><td rowspan="2">P0</td><td>1</td><td>50 Hz</td><td colspan="2" rowspan="2">50/60 Hz suppression</td></tr>
<tr><td>0</td><td>60 Hz</td></tr>
<tr><td>P1, P2</td><td colspan="4">Channel activation
<table>
<tr><th>P1</th><th>P2</th><th>Channel 1</th><th>Channel 2</th><th>Channel 3</th><th>Channel 4</th></tr>
<tr><td>0</td><td>0</td><td>on</td><td>off</td><td>off</td><td>off</td></tr>
<tr><td>0</td><td>1</td><td>on</td><td>on</td><td>off</td><td>off</td></tr>
<tr><td>1</td><td>0</td><td>on</td><td>on</td><td>on</td><td>off</td></tr>
<tr><td>1</td><td>1</td><td>on</td><td>on</td><td>on</td><td>on</td></tr>
</table></td></tr>
<tr><td rowspan="2">P3</td><td colspan="2" rowspan="2">peripheral fault if outside the measuring range</td><td>1</td><td>peripheral fault indication active</td></tr>
<tr><td>0</td><td>peripheral fault indication non active</td></tr>
</table>

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:

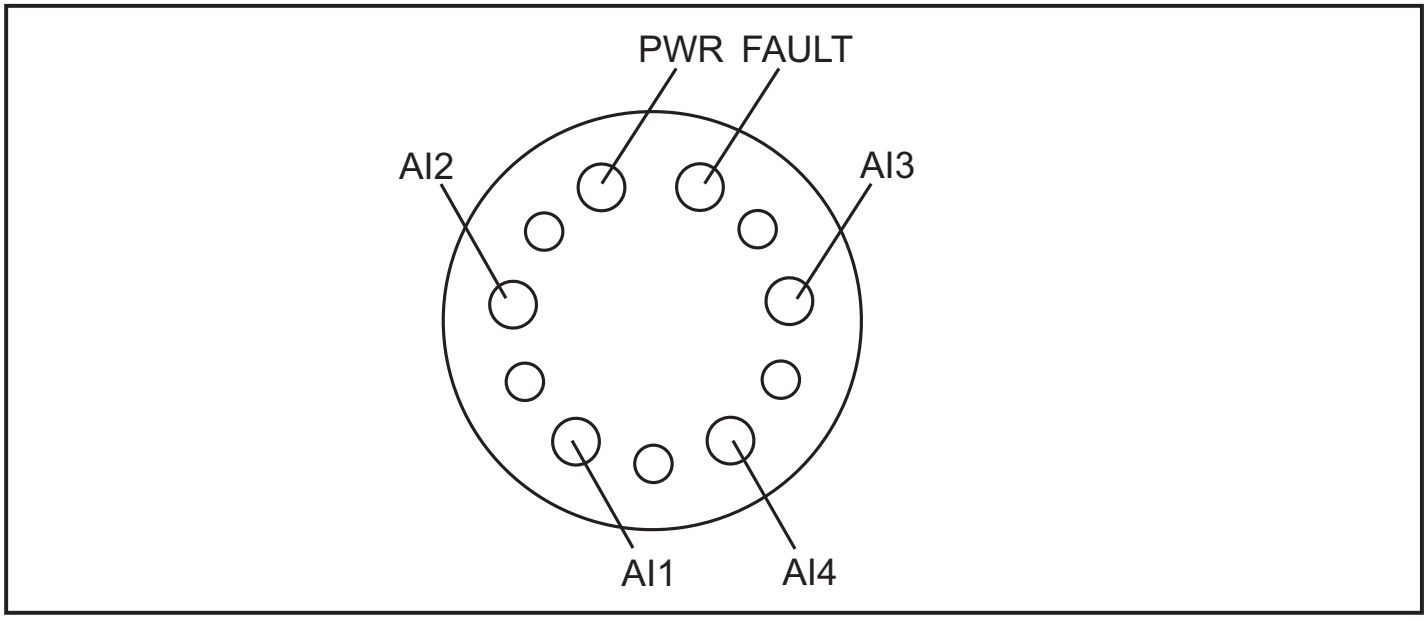
* the master replaces the value transmitted by the slave with the default value 7FFFh (32767)

** 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.



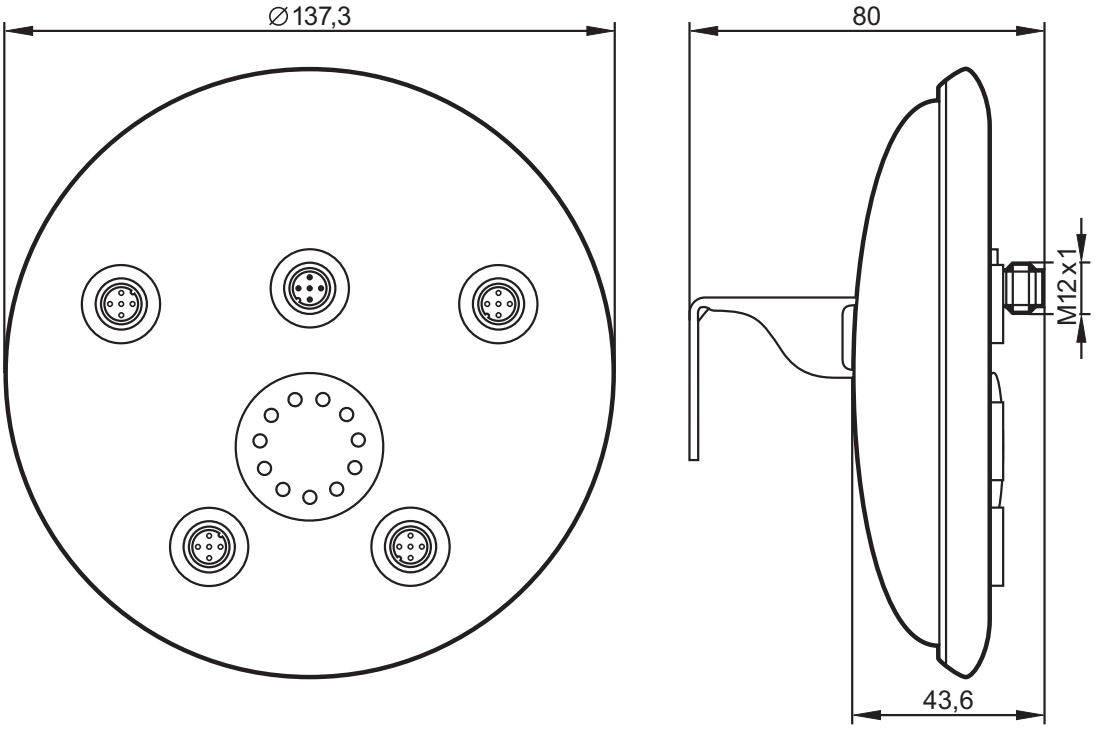
• LED AI1...AI4 yellow off	sensor input is disabled (see parameter bit P1 and P2)
• LED AI1...AI4 yellow on	analogue signal in the measuring range
• LED AI1...AI4 yellow flashes	analogue signal outside the measuring range or no sensor connected
• LED green PWR on	AS-i voltage is applied
• LED red FAULT 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 (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 → Select your country → Data sheet direct