

ifm electronic



Operating instructions  
AS-i module

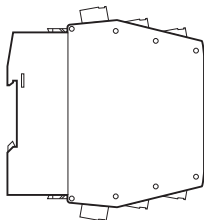
**ecomat300**

**AC2218**

**AC2219**

**UK**

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# 1 Preliminary note

- ▶ Instructions
- > Reaction, result



Important note

Non-compliance can result in malfunction or interference.



Information

Supplementary note.

## 2 Safety instructions

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- Please read the operating instructions prior to set-up of the device. 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.
- Installation, electrical connection, set-up, operation and maintenance of the unit must only be carried out by qualified personnel authorised by the machine operator.

## 3 Functions and features

The slave receives data via the AS-Interface and converts them into analogue output signals. The AS-i module operates as a slave with bidirectional data transfer in the AS-i network.

The data transfer from the host to the slave is asynchronous according to the AS-i profile S-7.3 and the AS-i specification V2.1.

- Current output 0..20mA (AC2218) or voltage output 0..10 V (AC2219)
- AS-i profile S-7.3.6
- Actuators are connected via Combicon terminals
- Maximum number of modules per AS-i system: 31
- $R_{\max}$  for current output 600  $\Omega$ ;  $R_{\min}$  for voltage output > 1 k $\Omega$
- Conversion time (digital - analogue) in the slave with four channels: < 1 ms
- Actuator supply from AS-i (max. 90 mA) or external 24 V PELV voltage source (the supply is selected automatically as soon as an external voltage is applied)

- 16 bits/1  $\mu$ A (AC2218) or 16 bits / 1 mV (AC2219)

## 4 Addressing

- ▶ Assign a free address between 1 and 31.

The address is set to 0 at the factory.

### 4.1 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.



No addressing via the addressing socket while live.

## 5 Mounting

- ▶ Fix the module onto a 35mm rail.

## 6 Electrical connection



The unit must be connected by a qualified electrician.

The national and international regulations for the installation of electrical equipment must be adhered to.

- ▶ Disconnect power.
- ▶ Connect the unit.

## 6.1 Wiring

O+	Actuator supply +24 V
C1...C4	Analogue output current (AC2218)
V1...V4	Analogue output voltage (AC2219)
O-	Actuator supply 0 V
0 V	Analogue output 0 V
A+	AS-i +
A-	AS-i -
E+	External actuator supply +24 V
E-	External actuator supply 0 V

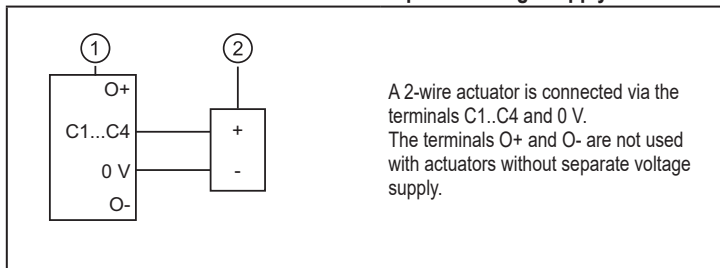
**AC2218**

**AC2219**

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## 6.2 Connection analogue module AC2218 (0...20 mA)

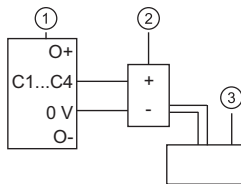
### 6.2.1 Connection of an actuator without separate voltage supply



1: Analogue module

2: Actuator without separate supply

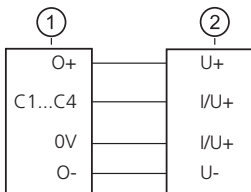
## 6.2.2 Connection of an actuator with intrinsic supply



A 2-wire actuator is connected via the terminals C1..C4 and 0 V. The terminals O+ and O- are not used with actuators without separate voltage supply.

- 1: Analogue module
- 2: Actuator with intrinsic supply
- 3: Supply PELV ungrounded

## 6.2.3 Connection of an actuator with separate 24 V supply



An actuator with separate supply is connected to the external 24 V via the terminals O+ and O-. The signal can be taken from the terminals C1..C4 and 0 V.

- 1: Analogue module
- 2: Actuator with separate supply

## 6.2.4 Electrical connection 0 V terminal

- ▶ Do not connect the 0 V terminals (analogue output 0 V) of the respective channels of the current output modules to each other.
- > This connection leads to faulty current signals.



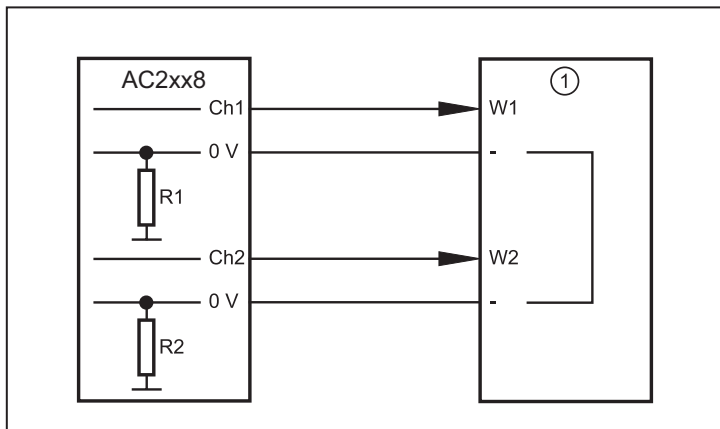
The connection of the 0 V terminals (analogue output 0 V) results in a parallel connection of the resistances R1 and R2 (see drawing). This leads to faulty current signals.

## Example

This problem can occur when a frequency converter is connected, i.e. the connection of the 0 V- terminal is established there (common-).



► Adhere to the documentation of the frequency converter.

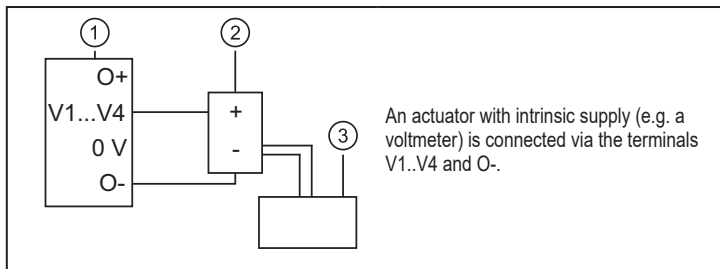


1: Frequency converter

► As a remedy, use two current output modules.

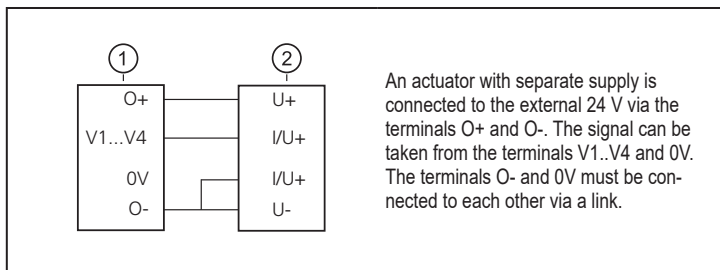
## 6.3 Connection analogue module AC2219 (0...10 V)

### 6.3.1 Connection of an actuator with intrinsic supply



- 1: Analogue module
- 2: Actuator with intrinsic supply
- 3: Supply PELV ungrounded

### 6.3.2 Connection of an actuator with separate 24 V supply



- 1: Analogue module
- 2: Actuator with separate supply



## 7 Parameter setting

Parameter bit / Designation	Description
P0 not used	1 reserved 0 reserved
P1 not used	1 reserved 0 reserved
P2 periphery fault	1 error indication active 0 error indication inactive
P3 not used	1 reserved 0 reserved

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## 8 Measuring range

- The measuring ranges, the states of the LEDs and their meaning are indicated in the following tables.

### 8.1 Analogue module AC2218

Range 0...20 mA	Units dec.	Units hex.	LEDs O1...O4 analogue	Description
0...20 mA	0000...20000	0000...4E20	on	nominal range
20.001... 23 mA	20001...23000	4E21...59D8	on	above nominal range
> 23 mA	> 23000	> 59D8	flashes	overflow

### 8.2 Analogue module AC2219

Range 0...10 V	Units dec.	Units hex.	LEDs O1...O4 analogue	Description
0 ...10 V	0000...10000	0000...2710	on	nominal range
10.001...11.5 V	10001...11500	2711...2CEC	on	above nominal range
> 11.5 V	> 11500	> 2CEC	flashes	overflow

### 8.3 Transmission time of the analogue values

The transmission time of the analogue values depends on the conversion time of the digital signals into analogue signals in the AS-i module and on the transmission time via the AS-Interface.

The conversion time of the digital signals is approx. 1 ms.

The transmission time of the 4 16-bit values via the AS-interface ideally is 7 AS-i cycles per value. For a cycle time of 5 ms per AS-i cycle this results in a transmission time of  $4 \times 7 \times 5 \text{ ms} = 140 \text{ ms}$  via the AS-Interface.

Thus the total transmission time for 4 analogue values ideally is approx. 1 ms (conversion time) + 140 ms (transmission time) = approx. 141 ms.

## 9 Operation

► Check the safe functioning of the unit.

Display by LEDs:

LED AS-i green lights	AS-i voltage supply ok
LED AUX green lights	External voltage supply 24 V ok
LEDs O1...O4 yellow light	Analogue signal within the measuring range or no actuator connected. It cannot be detected whether a 0 V signal is applied or whether no actuator is connected.
LEDs O1...O4 yellow flash	Analogue signal outside the measuring range (overflow)
LED FAULT red lights	Periphery fault. A periphery fault is indicated if at least one of the analogue signals is outside the value range.
LED yellow DIAG	Internal diagnosis
- DIAG lights	- no error
- DIAG flashes	- internal fault (replace module)
- DIAG off	- internal fault (replace module)

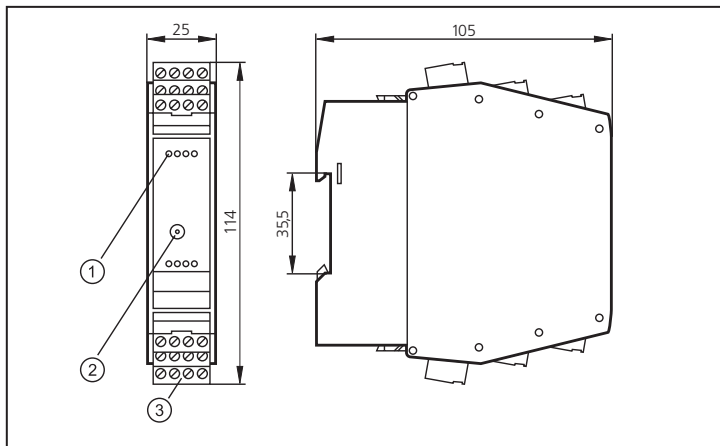
## 10 Maintenance, repair and disposal

The operation of the unit is maintenance-free. After use dispose of the unit in an environmentally friendly way in accordance with the applicable national regulations.

## 11 Technical data

Technical data and further information at [www.ifm.com](http://www.ifm.com)

## 12 Scale drawing



- 1: LEDs
- 2: Addressing socket
- 3: Combicon terminals