



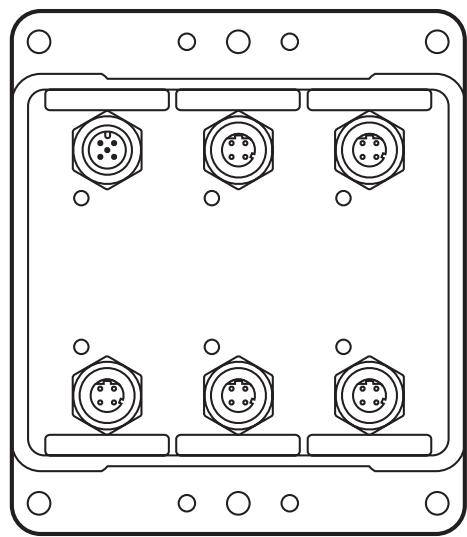
CE

Installation instructions Ethernet switch

ecomat100[®]

UK

EC2095



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1 Preliminary note

This document applies to devices of the type "Ethernet switch" (art. no.: EC2095). It is part of the unit.

This document is intended for specialists. These specialists are people who are qualified by their appropriate training and their experience to see risks and to avoid possible hazards that may be caused during operation or maintenance of the device. The document contains information about the correct handling 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.

Adhere to the safety instructions.

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1.1 Symbols used

- ▶ Instructions
- > Reaction, result
- [...] Designation of pushbuttons, buttons or indications
- Cross-reference
-  Important note
Non-compliance can result in malfunction or interference.
-  Information
Supplementary note

1.2 Warning signs used

WARNING

Warning of serious personal injury.
Death or serious irreversible injuries may result.

CAUTION

Warning of personal injury.
Slight reversible injuries may result.

NOTE

Warning of damage to property.

2 Safety instructions

2.1 General

These instructions contain texts and figures concerning the correct handling of the device and must be read before installation or use.

Observe 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 seriously affect the safety of operators and machinery.

2.2 Target group

These instructions are intended for authorised persons according to the EMC and low-voltage directives. The device must only be installed, connected and put into operation by a qualified electrician.

2.3 Electrical connection

Disconnect the unit externally before handling it. If necessary, also disconnect any independently supplied output load circuits.

If the device is not supplied by the mobile on-board system (12/24 V battery operation), it must be ensured that the external voltage is generated and supplied according to the criteria for safety extra-low voltage (SELV) as this voltage is supplied without further measures to the connected controller, the sensors and the actuators.

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 supplied SELV voltage is externally grounded (SELV becomes PELV), the responsibility lies with the user and the respective national installation regulations must be complied with. All statements in this document refer to the device the SELV voltage of which is not grounded.

The connection terminals may only be supplied with the signals indicated in the technical data and/or on the device label and only the approved accessories of ifm electronic may be connected.

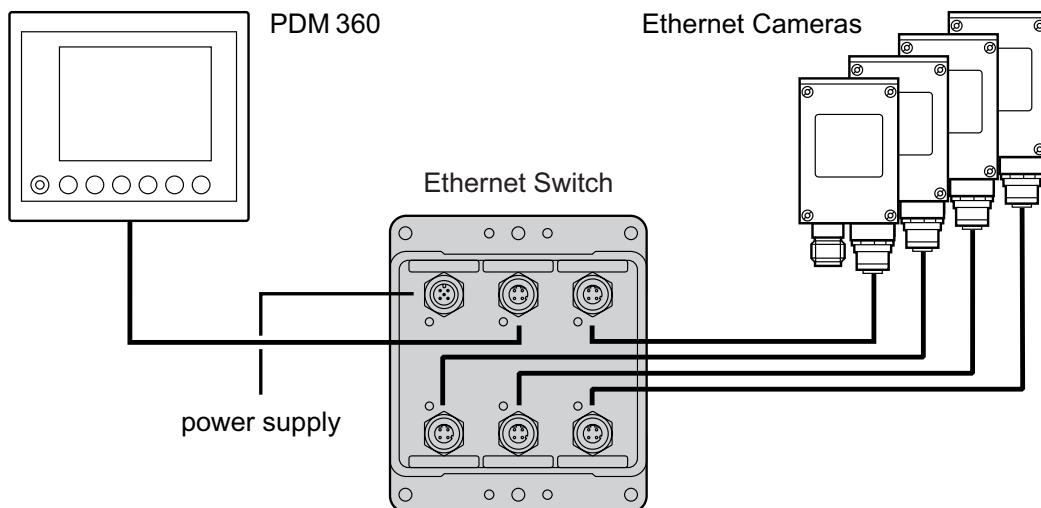
2.4 Tampering with the device

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

3 Functions and features

The device is used for networking up to 5 Ethernet devices.

It enables, for example, connection of a process and dialogue monitor PDM 360 with up to 4 Ethernet cameras.



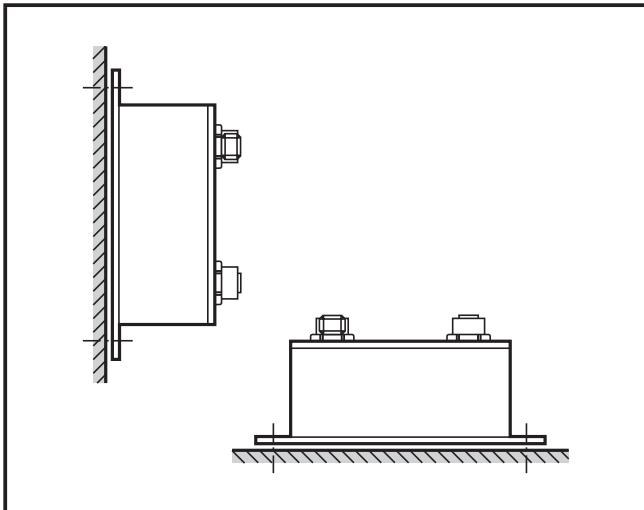
Application example

3.1 Features at a glance

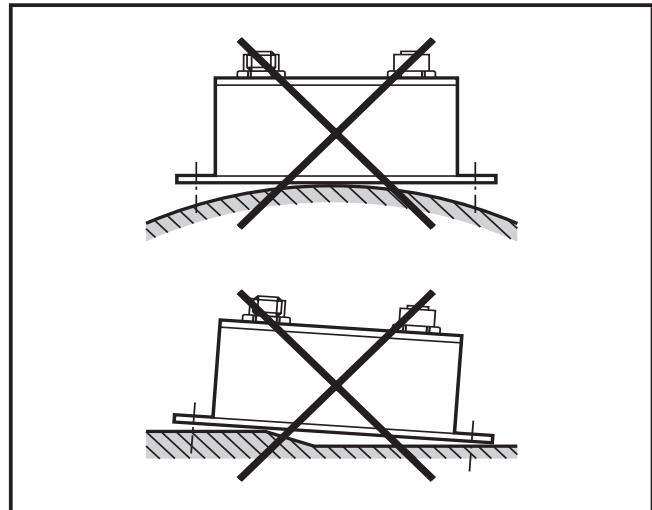
- 5 ports with 10/100 Mbits/s
- Auto-negotiation
Transmission speed and mode (half/full duplex) of the connected devices are recognised and set automatically.
- Auto-crossing
The port output and input are automatically switched to the corresponding pairs of wire. Crosslink or patch cables (1:1) can be used.
- Switching method: Store and forward technologies
- The device learns up to 2000 MAC addresses.
Thanks to independent subnets more than one final unit can be connected to one or several ports.
- Plug and play
Software installation or parameter setting is not necessary.
- Protection IP 67
(All ports used and/or unused ports protected by caps.)

4 Installation

4.1 Installation position and mounting surface



Installation position as required



No uneven mounting surface

NOTE

The housing must not be exposed to any torsional forces or mechanical stress.
Damage possible.

- Fix the device only on plane surfaces.
- Ensure that the contact area of the device lies completely flat on the mounting surface.

4.2 Fixing

- The device is fixed with 6 M5 screws. Tighten the screws alternately crosswise.

Mounting dimensions → 7 Technical data

Screw material: steel

Tightening torque: $8^{\pm 2}$ Nm

5 Electrical connection

5.1 Wiring

Wiring → 7 Technical data

NOTE

Wrong connection may cause damage to the device.

- Observe the safety instructions.
- First establish the Ethernet connections, then the supply voltage.

- Basically all supply and Ethernet cables must be laid separately.

- ▶ Lay supply and Ethernet cables away from the device using the shortest possible route.
- ▶ All connected cables must be provided with a strain relief.

5.2 Operating voltage

- !** The supply voltage can be connected to V1 or V2 as option. 2 different sources have to be connected for redundant operation, however.

Core cross-section: 0.3...1.3 mm.

Cable length for optimum performance: ≤ 10 m

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- ▶ To protect the device use fuses for the operating voltages.

Description	Potential	M12 connector (5 poles)	Fuse
Operating voltage V1	10...30 V DC (V1)	Pin 1	max. 2 A T
Operating voltage V2	10...30 V DC (V2)	Pin 4	max. 2 A T

The operating voltage is electrically separated from the functional earth.

5.3 Ground connection

- ▶ To ensure the protection of the device against electrical interference, the housing must be connected to GND (e.g. to the ground of the vehicle).
- ▶ For permanent installation in a vehicle connect the ground via an M5 fixing screw.
Core cross-section: ≥ 0.5 mm²
- ▶ Ensure a well-conductive connection.

5.4 Ethernet

- ▶ Use a shielded CAT5 cable.
STP, Shielded Twisted Pair, according to EIA/TIA-568.
Max. length 100 m
- ▶ Use screened connector housings and connect the screen of the Ethernet cable to the connector housing.
- ▶ Do not lay the Ethernet cable in parallel to live cables.

5.5 Assignment of the ports

Ports 1 ... 5 can be used by the devices as required.
(→ 3 Intended use, application examples)

- !** Connection from one port to another port on the same Ethernet switch is prohibited. It will cause a failure of the network (broadcast storm).

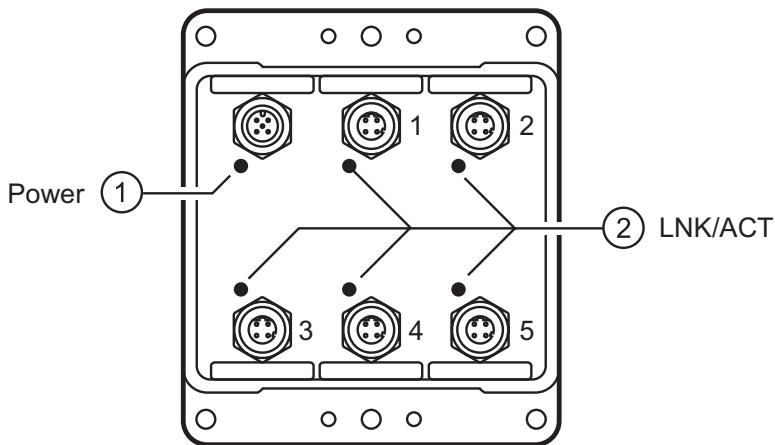
5.5.1 Cover all unused ports

NOTE

Moisture penetrating through unused or unprotected ports may destroy the device.

- Cover unused ports with protective caps.

6 Indicators



1: LED Power (green)

2: LED LNK/ACT (green)

Operating states (LED) → 7 Technical data

7 Set-up/Operation

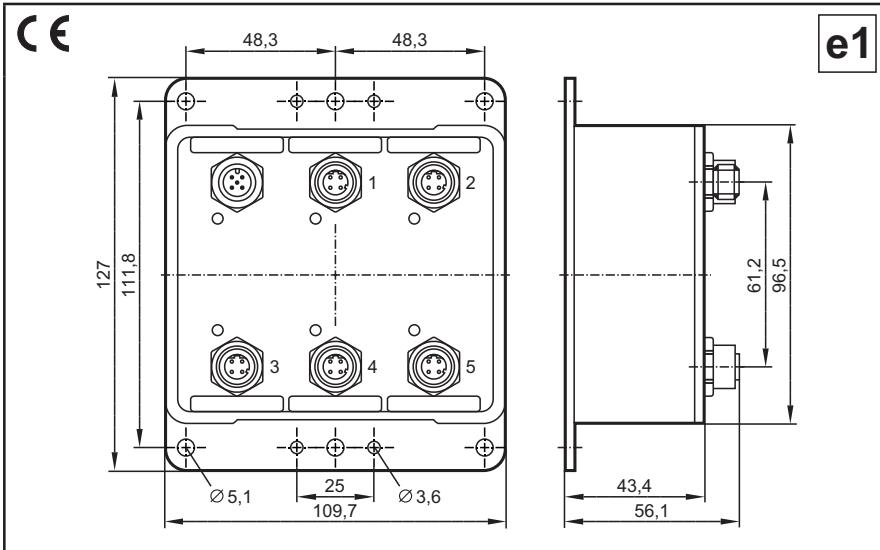
After installation and electrical connection the device is ready for operation.

- !** A restart (operating voltage ON/OFF) or if the operating voltage drops below the set value will delete the taught address entries.
The device is reset and newly initialised.
- !** Interference due to external influences
Faulty or insufficient radio interference suppressors in other electrical equipment, such as inverters or generators, as well as voltage fluctuations when switching on/off electric loads may lead to problems with the data transmission.

8 Technical data

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Ethernet switch
 5 ports
 10/100Base-TX
 Autosensing speed
 Auto-negotiation
 Auto-crossover
 IP 67
 Redundant
 voltage supply
 10...30 V DC



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Technical data

e.g. for the connection of up to 4 O2M Ethernet cameras to a PMD360 process and dialogue monitor

Material	housing: aluminium fixing plate: stainless steel
Dimensions (H x W x D)	109.7 x 127 x 56.1 mm
Installation	mounting holes for 6 x M5
Weight	0.85 kg
Operating temperature	-40...80 °C
Storage temperature	-40...85 °C
Relative air humidity	5...100 % (non condensing)
Operating altitude	≤ 3000 m (above sea level)
Protection rating	IP 67
Operating voltage	10...30 V DC (redundant)
Current consumption	≤ 215 mA (24 V DC)
Inrush current	≤ 7.8 A / 0.7 ms (24 V DC)
MTBF	> 2 x 10 ⁶ h
Ports	5
Transmission rate	10/100 Mbit/s (10/100Base-TX to IEEE 802.3)
Cables to be used	Cat. 5 UTP/STP, max. 100 m (shielded twisted pair STP recommended)
Auto-negotiation	yes (transmission speed and mode (half and full duplex) are automatically recognised and set)
Auto-crossing	yes (no crossover cable required)
MAC addresses to be administered	2000
Max. buffer size	512 Kbytes
Max. frame size	1522 bytes
Display	one LED for each connection
Operating voltage	1 LED green (power)
Ethernet	5 LEDs green (LNK/ACT)

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Technical data

Operating states (LED)

LED	Status	Description
Power	off	no operating voltage
	on	operating voltage OK
LNK/ACT (for each port)	off	no connection
	on	connection exists
	flashing	ongoing data transmission

Test standards and regulations

Interference emission	<ul style="list-style-type: none"> EN61000-6-4, EN55011 - class A FCC title 47, part 15, subpart B - class A ICES-003 – class A
Noise immunity to conducted HF and interfering fields	<ul style="list-style-type: none"> EN61000-6-2 EN61000-4-2 (ESD) EN61000-4-3 (RS) EN61000-4-4 (EFT) EN61000-4-5 (Surge) EN61000-4-6 (Conducted Disturbances)
Safety	<ul style="list-style-type: none"> UL listed per ANSI/ISA-12.12.01-2000 (US and Canada) and is listed for use in class I, div 2, groups A, B, C, and D, T4A
e1 type approval	<ul style="list-style-type: none"> to directive 2009/19/EC

Wiring

Operating voltage M12 connector, A-coded, 5 poles	Pin	Potential
	1	10...30 V DC (V1)
	2	GND (V1)
	3	GND (V2)
	4	10...30 V DC (V2)
	5	functional earth

Ethernet M12 socket, D-coded, 4-poles	Pin	Potential
	1	TxD
	2	RxD
	3	TxD
	4	RxD
	housing	screen

9 Maintenance, repair and disposal

The device is maintenance-free.

- Do not open the housing as the device does not contain any components which must be maintained by the user. The device must only be repaired by the manufacturer.
- Dispose of the device in accordance with the national environmental regulations.

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10 Approvals/standards

Test standards and regulations → 7 Technical data.

The EC declaration of conformity and approvals can be found at:

www.ifm.com → Data sheet direct: → EC2095 → Approvals