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TECHNICAL DATA SHEET
EP4NET, F4NET, EP4RS, F4RS ELECTRONIC DISPLAYS WITH WITH FIELDBUS
(Profinet, EthernetIP, EtherCAT, IO-Link, Modbus)

Manual purpose

This manual has been designed by the Manufacturer to provide the necessary information regarding the EP4/F4 display to those who are authorized to carry out safely its installation, maintenance, removal and disposal. All the necessary information for the buyers and planners can be found in the Sales documentation. In addition to adopting good technical construction practices, the information should be read carefully and strictly applied. Failure to observe this information could cause risks for the health and safety of people and economical damage. This information, provided by the Manufacturer in the original language (Italian) is also available in other languages to satisfy legislative and/or commercial needs. This manual must be kept in good conditions by a responsible person in an ideal place so that it is always available for consultation. In case this manual is lost or deteriorates, a replacement should be requested directly from the manufacturer indicating the manual's code. This manual reflects the state of the instrument at the time of input on the market: however the manufacturer reserves the right to make changes, add or improve the manual without further notice.

Identification of the equipment

The identification label is applied on the instrument.
To determine the identification code of the instrument, consult the sales documentation.

Environmental conditions

Temperature range: min. 0°C, max. + 50°C.
It is forbidden to use the instrument other than for its specific use and in potentially explosive conditions or where anti-explosive elements are required.

Storage

Here below are some references to be followed for the storage of the instrument:
Avoid environments with excessive humidity and those exposed to bad weather (avoid open areas).
Avoid putting the instrument directly on the ground.
Store the instrument in its original packaging.

Conformity declaration and EC marking

The instrument respects the following Communitarian Directives:
2014/30/EU Electromagnetic compatibility, 2011/65/EU RoHS.

Maintenance

The instrument does not need particular maintenance except cleaning, only with a soft cloth dampened with ethyl alcohol or water. Do not use hydrocarbon solvents (petrol, thinners, etc.): the use of these products could affect the proper function of the instrument.
Repairs should be done only and exclusively at the FIAMA technical assistance centre.
Calibrations and tests
It is advisable to calibrate the instrument periodically, once every working year.
To conduct calibration, follow the calibration procedure described in the present manual.

Technical Support

For any kind of technical assistance, contact the sales department of the Manufacturer directly indicating the information given on the identification label, the number of hours used and the type of defect.

Manufacturer's responsibility

The manufacturer declines any responsibility in case of:

- Using the instrument contrary to applicable national safety and accident-prevention laws.
- Incorrect installation, inobservance of, or incorrect procedures in contrast with the instructions provided in the present manual.
- Defective electrical power supply.
- Modifications or tampering.
- Operations carried out by untrained or unqualified staff.

The safety of the instrument also depends on the strict observance of the procedures indicated in the manual: always operate the instrument in its functioning capacity and carry out a careful routine maintenance.

- All phases of inspection and maintenance should be carried out by qualified staff.
- The configurations indicated in the manual are the only ones permitted.
- Do not attempt to use the instrument in anyway which is contrary to the indications provided.

The instructions in this manual do not substitute but are a complement to the obligations of the current legislation regarding safety laws.

Installation

Before installing the instrument, heed the following warnings:

a) Connect the instrument strictly following the instructions of the manual.
b) It is the responsibility of the user to check, before using, the correct setting of all parameters of the instrument to avoid damage to persons or things.
c) The instrument CANNOT function in a hazardous environment (inflammable or explosive).
The unit contains parts sensitive to electrostatic charge, therefore handling of the internal electronic cards has to be carried out with appropriate care to avoid permanent damage.

Description
The instruments of the F4 and EP4 series are position display units with an integrated position sensor that create a complete system for measuring linear or rotary displacements.

The fieldbus output (available versions: Profinet, EthernetIP, Ethercat, IO-Link, Modbus) allows connection to a PLC or remote monitoring system to constitute a compact measuring device, easy to install, applicable to various types of industrial machines (packaging, woodworking, aluminum, sheet metal, etc.) for implementing manual format changes using handwheels operated by the operator.

The following versions are available:

- F4 with a position transducer for linear magnetic tape type P50,
- F4 AM with a rotary position transducer with magnetic ring mounting with pass-through hollow shaft with diameters 25mm (AM25), 20mm (AM20), 14mm (AM14),
- F4 EM43 with a rotary transducer with a pass-through shaft diameter of 14mm,
- F4 EM46 with a rotary transducer with a pass-through shaft diameter of 20mm or 25mm,
- EP43 with the position transducer with pass-through hollow shaft mounting of diameter 14mm integrated into the container,
- EP46 with the position transducer with pass-through hollow shaft mounting of diameter 20mm integrated into the container.

The backlit LCD display has 2 lines, the first indicating the current machine position to the operator while the second displays the position to reach to obtain the new machine configuration. This position is communicated to the EP4 (or F4) via the fieldbus through the PLC, allowing manual format change through handwheel operation. Two green and red LED indicators indicate whether the new positioning position has been reached or not.
With three buttons on the front panel, it is possible to program the value to be displayed on the display for each turn of the hollow shaft and activate the reset/preset functions of the position, absolute/relative position, mm/inch conversion (all these functionalities are also accessible from the remote supervisor).
All activated functions are displayed with symbols on the display.
The instrument must be externally powered with a voltage of 10-30VDC and has an internal backup battery that ensures the maintenance and updating of the position, even in the absence of external power, for a period of 6-8 years. In the absence of external power, the display is turned off, and communication on the bus is not managed.
The robust housing of EP4 and F4 is made of solid machined and anodized aluminum alloy, while the command hollow shaft is made of stainless steel and rotates on ball bearings.

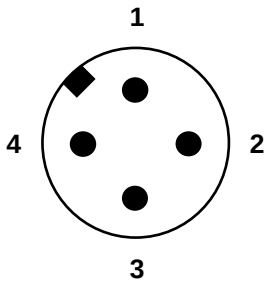
Connection diagram

The following chapters contain the connection diagram for the various versions of EP4 and F4. Please refer ONLY to the version in use.

IO-Link version

- **POWER SUPPLY CONNECTOR**

M12x1 Male 4 pins A code, IO-Link code

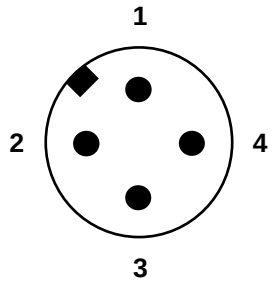


PIN	DESCRIPTION
1	+24VCC
2	NC
3	GND
4	IO-Link Data

Modbus (RS) version

- **POWER SUPPLY CONNECTOR 24VDC**

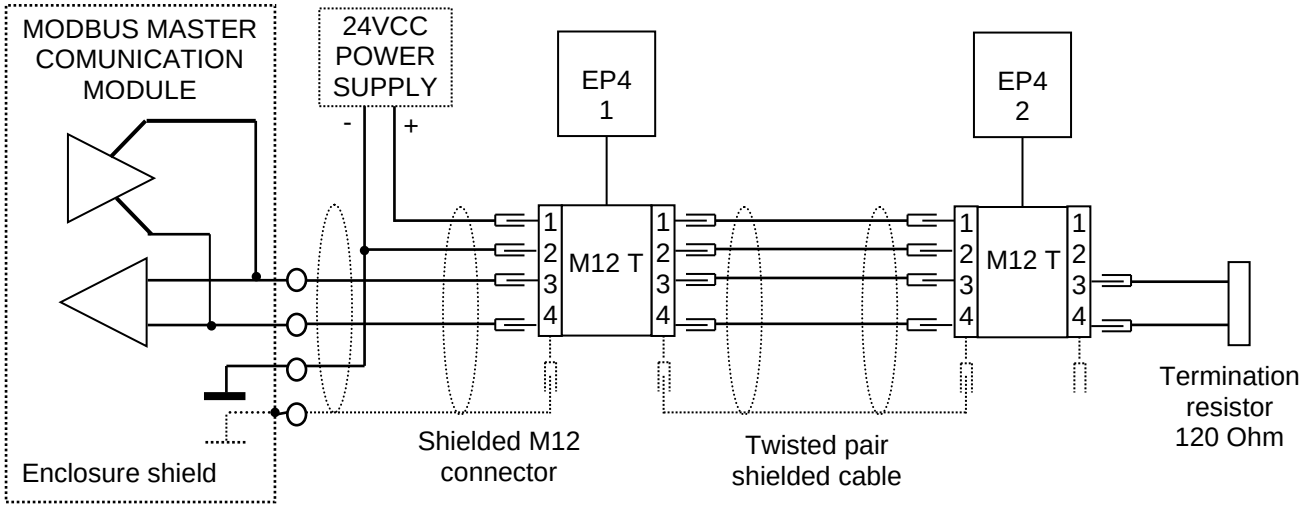
M12x1 Male 4 pins A code, IO-Link code



	CONNETTORE M12	CAVO
+10÷30VDC	**1**	BROWN
GND	**2**	WHITE
RS+ positive RS485 serial port	**3**	YELLOW
RS– negative RS485 serial port	**4**	GREEN
Not connected	**-**	GREY

View of the male 4-pole M12x1 connector.
The pin layout in both connectors is identical.
The termination resistor for the RS485 line (120 Ohms 1/4W) should be placed at the last node of the network by connecting it to pins 3-4 of the connector.

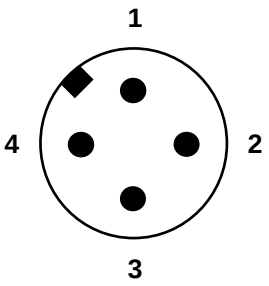
Extreme caution is advised when making electrical connections: applying power to the pins of the serial port can damage the device.



Profinet/ EthernetIP/Ethercat versions

- **POWER SUPPLY CONNECTOR 24VDC**

M12x1 Male 4 pins A code

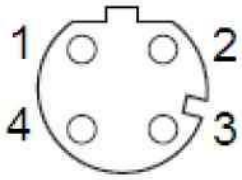


PIN	DESCRIPTION
1-4 (*)	GND
2-3 (*)	+24VDC

(*) The two pins are internally connected together, and it is sufficient to wire only one of the two.

- **PROFINET/ETHERNET CONNECTOR**

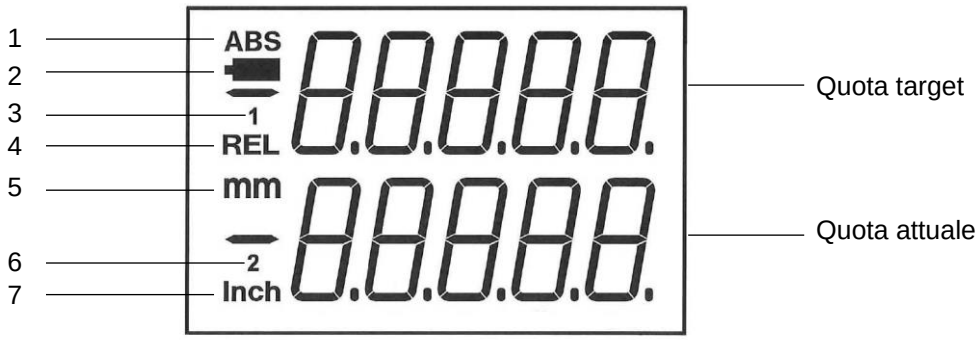
M12x1 Female 4 pins D code (2 ports)



PIN	DESCRIPTION
1	TX DATA +
2	RX DATA +
3	TX DATA -
4	RX DATA -
CASE	CASE

Looking at the device with the battery cover door and the four LED indicators positioned at the top;
Ethercat input: left connector
Ethercat output: right connector

Display



1. Absolute mode indicator
2. Low battery indicator: begins to blink when the level of charge is lower than a certain value and when it stays on is is necessary to change the batteries within 15 days.
3. origin 1 indicator (not used)
4. Relative mode indicator
5. mm unit indicator
6. origin 2 indicator (not used)
7. inch unit indicator

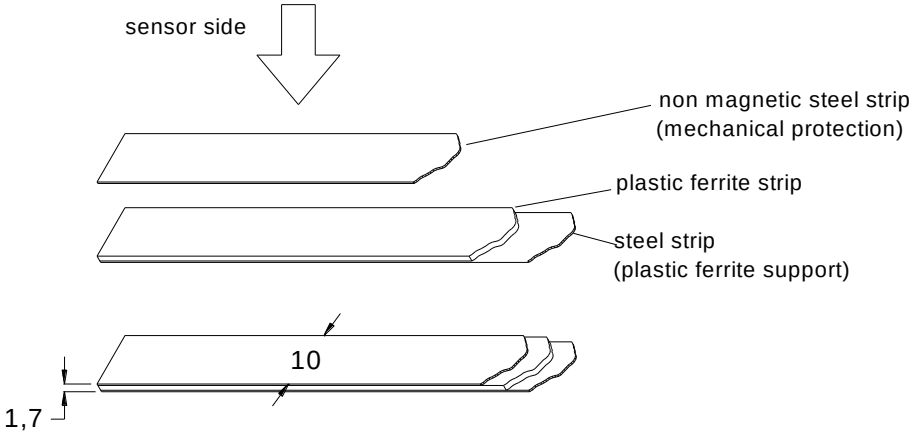
Error messages:

ouEr the current value exceeds the maximum value that can be visualized (from –99999 to 999999).

F4 sensors

Magnetic strip

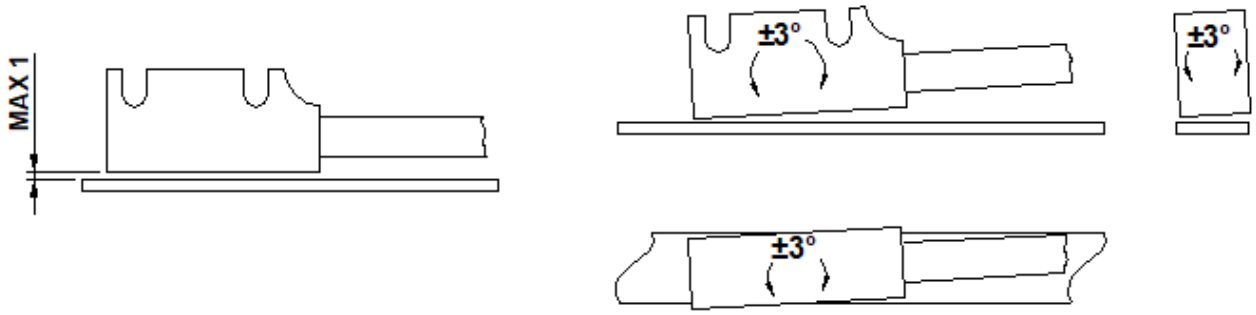
The magnetic strip P50 consists of a magnetized plastic ferrite strip with alternate magnetic poles of 5 mm pitch, carried by a ferromagnetic steel strip. Mechanical protection of the plastic ferrite strip is supplied by a non magnetic steel strip with thickness 0,2mm.

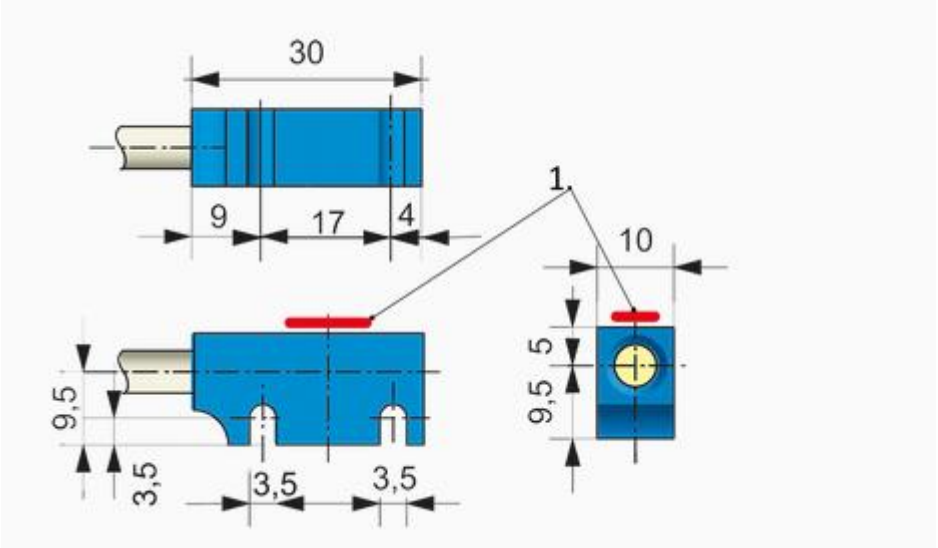


The magnetic strip is assembled by sticking it with a bi-adhesive tape. The surface has to be smooth, clean and dry: is advisable to clean it with a degreasing product (isopropyl alcohol, ethyl alcohol, solvents, etc). The magnetic strip has to be stuck holding the plastic ferrite side in the direction of the sensor, which means the steel side leaned on the stand surface. Fixed the magnetic strip, to keep off damages due to abrasions or grazes of the plastic ferrite strip, is advisable the appliance (always bi-adhesive) of the non magnetic protection strip. The optimal ambient temperature for stick the bi-adhesive tape is over 10°C. The maximum adherence of the tape works out after 48 hours (about) of the application and is kept between –10 and 80°C.

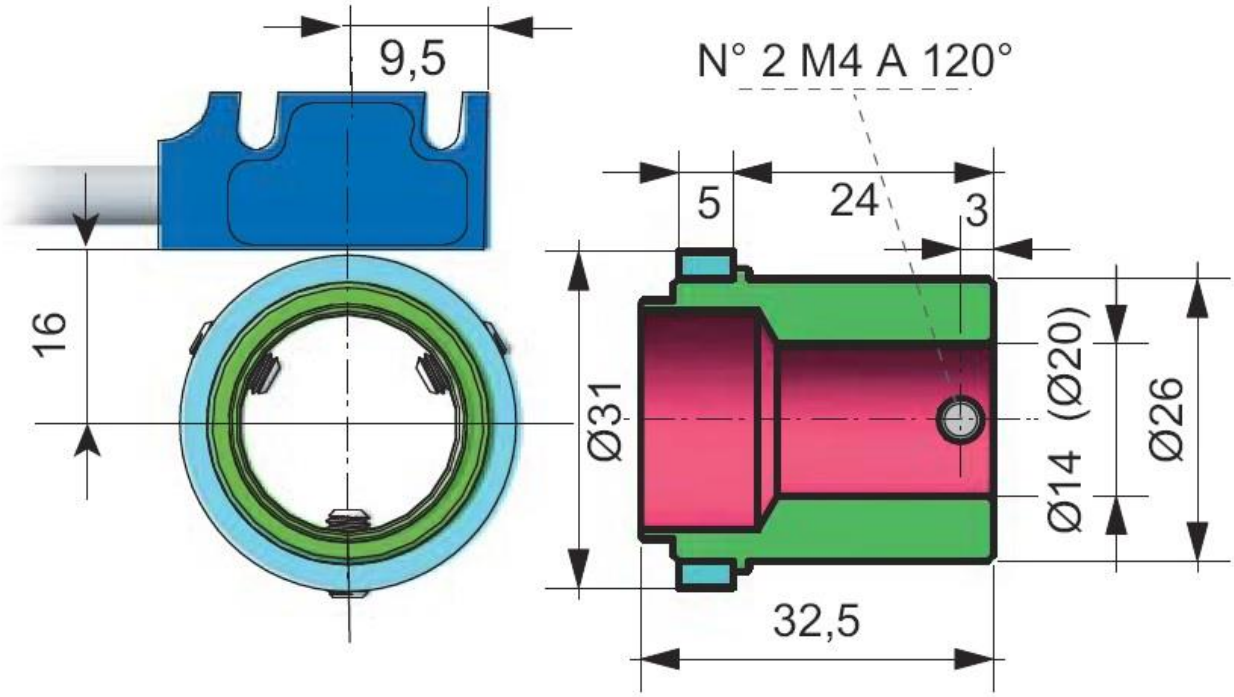
Linear sensor mounting

The sensor has be mounted according to the following draw, and keeping the indicated tolerances.
For the optimal system functioning its is necessary that the distance between the sensor and the magnetic band is not over 1mm of the useful stroke.

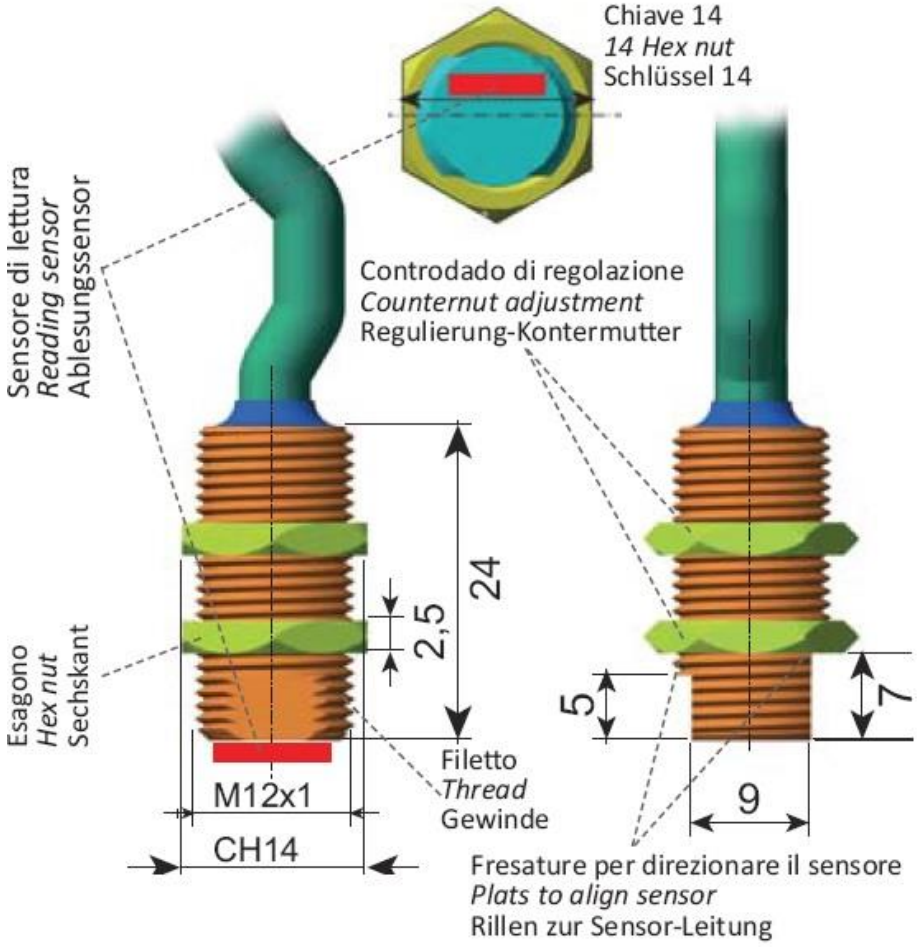




Magnetic ring mounting
(only F4 RS-AM and F4 NET AM)



SM12 sensor mounting
(only F4 RS M12 and F4 NET M12)



NB: the magnetic strip must be aligned parallel to the two lateral grooves of the sensor.

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Technical specification

Power supply	10 - 30 Vdc max 100mA
Battery	battery ½ AA, voltage 3,6V (lithium thionyl chloride)
Battery life	Typical 6/8 years
Hollow shaft diameter	EP43NET: Ø14, Ø1/2” EP46NET: Ø20, Ø3/4”, Ø25
Max rotation speed	1000 RPM
Resolution	EP43: 3200 impulsi/giro EP46: 4000 impulsi/giro
Range	-99999; 99999
Display	LCD retroilluminato ad alta visibilità con altezza cifre 7,5mm
Keyboard	3 tasti per programmazione ed attivazione funzioni
Bus output	Profinet, EthernetIP, EtherCAT, IOLink, Modbus
Profinet, EthernetIP, EtherCAT, port connection	2 connectors M12x1, D coding
Power supply connection	1 connector M12x1, A coding
Available functions	reset/preset, absolute/incremental value, mm/inches conversion
Protection degree	IP65
Working temperature	0-50°C
Relative humidity	35-85%
Electromagnetic compatibility	2014/30/UE
RoHS	2011/65/UE

Manufacturer
All communications to the manufacturer should be addressed to:
FIAMA s.r.l., Via G. Di Vittorio, 5/A – 43016 San Pancrazio (Parma) - Italy
Tel. (+39) 0521.672.341 – Fax. (+39) 0521.672.537 – e-mail: info@fiama.it – www.fiama.it

FIAMA srl is not responsible for any damage to persons or things caused by tampering and improper use and in any cases that are not compatible with the features of the instrument.