

# F104

## Low-power fieldbus power supply

- **Fieldbus power for FOUNDATION™ fieldbus H1 cards**
- **Low power consumption, for high efficiency in solar-powered applications**
- **Fully isolated**
- **Wide input power supply range 10-30V**
- **DIN-rail mounting**
- **Supports bussing of input power in the DIN rail**
- **13V, 250mA output**



The **F104 fieldbus power supply** is designed to provide power for a single FOUNDATION™ fieldbus H1 segment. Galvanic isolation, power conditioning and segment termination are incorporated into each F104 module.

The **F104 has low current consumption** and is ideal for use in solar-powered applications such as instrumentation nodes for remote well-heads. This is achieved by providing a lower output voltage to the fieldbus segment than with conventional fieldbus power supplies. This eliminates unnecessary power dissipation in the fieldbus instruments. The 13V nominal output is nevertheless sufficient to support up to 10 typical instruments on a 200m trunk cable.

**Termination of the fieldbus segment** is selected using a switch on the module, and is normally enabled, but it may be switched out for those few applications that do not require a terminator at the Fieldbus Power Supply.

**For extreme reliability**, the module uses passive components for power conditioning and a reliable DC/DC converter to provide galvanic isolation and power regulation. The connectors used for power input and the fieldbus are high quality pluggable types with screw retention. Spring-clamp (-PC) and screw-terminal (-PS) connector versions are supported.

**LED indicators show the status** of the module. In normal operation, the green Power LED is lit, showing that there is proper input voltage to the module and the red Fault LED is off. If the fieldbus segment is shorted, or in an over-current condition, the Fault LED blinks. An internal module error is indicated by a steady light on the red Fault LED. The status of the internal terminator switch is also indicated by an illuminated 'T' symbol.

The **F104 can be powered** from a power supply between 10 to 30V DC; a range that easily accommodates typical 12V and 24V solar-powered battery systems. The incoming power can be applied via a top-mounted connector, which supports onward looping of power wiring, or by using a proprietary plug-in connector on a DIN-rail bussing system.

The **F104 module provides galvanic isolation** between the input power and the fieldbus segments, as required by the IEC 61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for fieldbus power supplies.

*FOUNDATION™ fieldbus is a trademark of Fieldbus Foundation™, Austin, Texas.*

**SPECIFICATION**

**Location of equipment**

Safe Area, Class I Div 2 Groups ABCD T4, or Class I Zone 2 IIC T4 hazardous area  
IEC Zone 2 IIC T4 or Zone 22 hazardous area

**INPUT**

**Input voltage**

10.0 – 30.0V DC

**Reverse polarity protection**

Yes

**Current consumption**

see Input Current graph

**Power dissipation**

see Power Dissipation graph

*Note: modules are capable of operating at full load without spacing*

**OUTPUT**

**Number of Channels**

One (1)

**Voltage**

13.0 – 14.0V DC

**Design Current**

0 to 250mA

**Segment Current Limit**

> 280mA

**Minimum Load**

10mA

**Isolation**

Fieldbus to input power: Tested at 500V ACrms in accordance with FF-831

**ELECTRICAL CONNECTIONS**

**Fieldbus wiring (host and field)**

Screw-secured, 3-way pluggable connectors in screw terminal or spring clamp version, 0.14 to 2.5mm<sup>2</sup>

**Power input**

Screw-secured, 4-way pluggable connector in screw terminal or spring clamp version, 0.14 to 2.5mm<sup>2</sup> (see diagram)

**DIN-rail power bussing option**

Proprietary connection system - see Ordering Information

**Fieldbus terminator**

100 , switchable

**MECHANICAL**

**Mounting method**

Integrated fixings for vertical 'Top hat' DIN-rail, 35mm x 7.5mm to EN50022

**Housing material**

Polycarbonate

**Tagging strip**

To accept paper legend

**ENVIRONMENTAL**

**Ambient temperature**

Operating: -40°C to +70°C\*

Storage: -40°C to +85°C

\* fitted on horizontal DIN-rail mounted on a vertical plane

**Relative humidity**

<95%, non-condensing

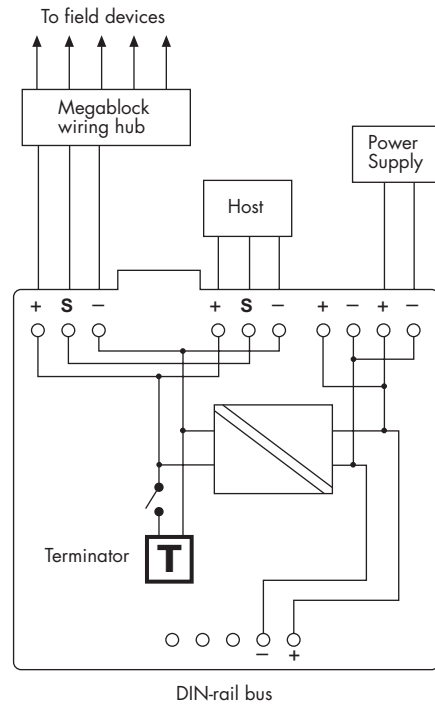
**Ingress protection**

IP20 to BS EN60529 (Additional protection by means of enclosure)

**F104 - BLOCK DIAGRAM**

(showing interconnection scheme)

The above diagram shows a basic illustration of how the F104



is wired. For detailed wiring information, see the installation instructions.

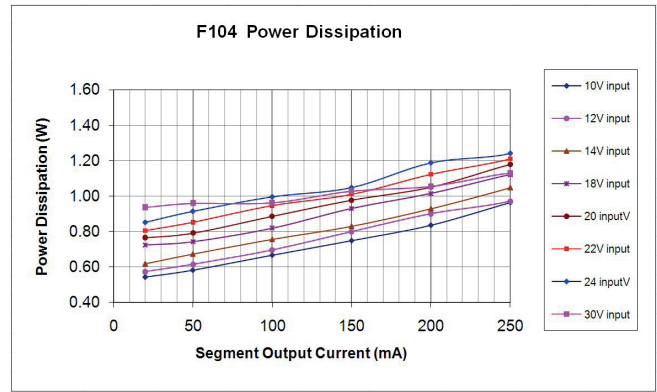
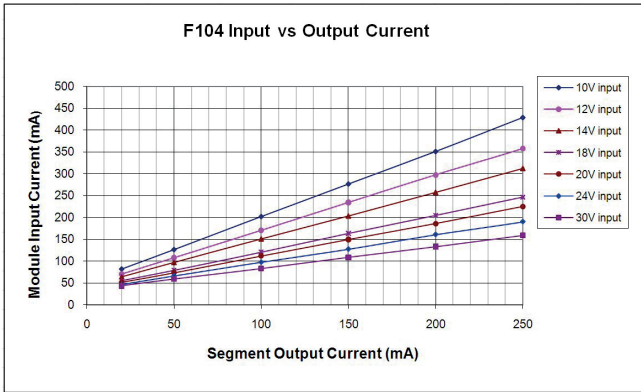
**PHYSICAL NETWORKS**

- IEC61158-2
- ISA-S50.02 Part 2-1992
- FOUNDATION™ fieldbus H1
- Profibus PA

**LED INDICATORS**

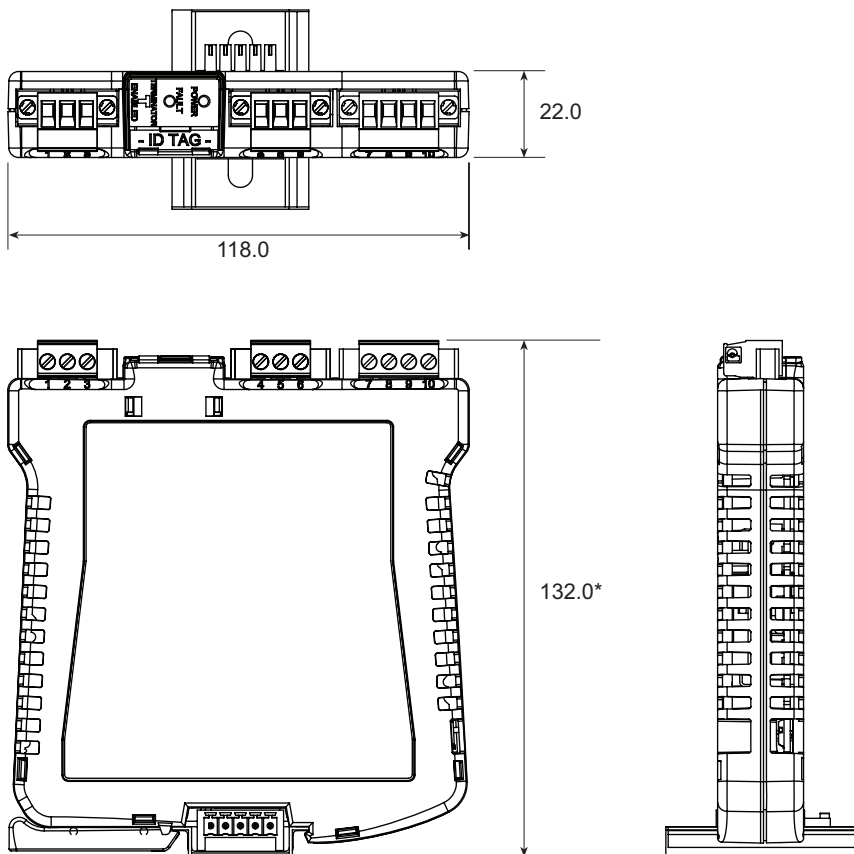
	OFF	ON	Flashing
Power (green)	Power fail or internal fault	Power OK	—
Fault (red)	Normal	Internal error, replace module	Output current limit exceeded
Terminator (white 'T')	Terminator disabled	Terminator enabled	—

**F104 PARAMETERS (typical)**



**F104 DIMENSIONS (mm)**

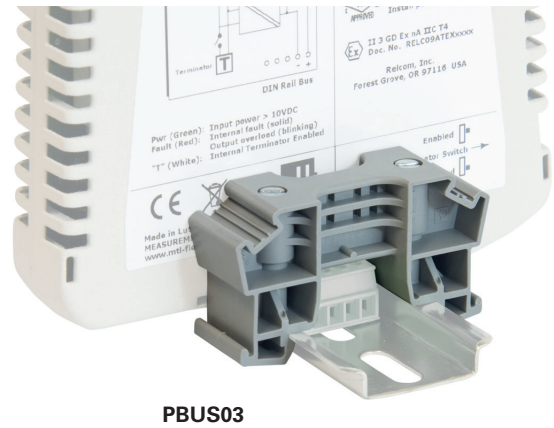
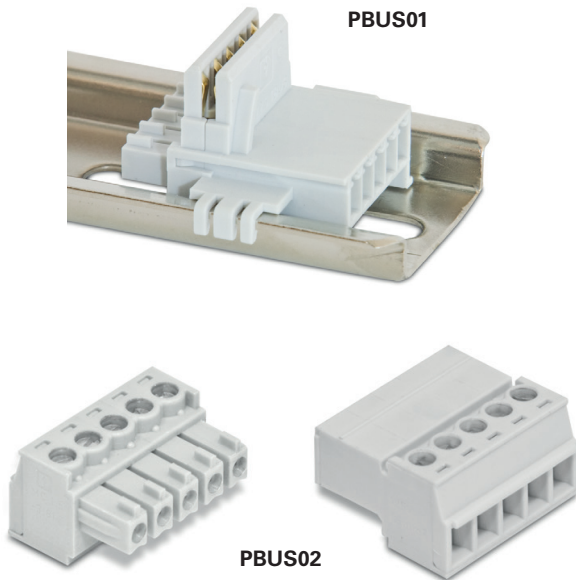
(shown with screw-clamp connectors)



\* + 5mm with spring clamp connectors

**ORDERING INFORMATION**

PART No.	Description
F104-PS	Fieldbus Power Supply (13.0V, 250mA) pluggable screw-terminal connectors
F104-PC	Fieldbus Power Supply (13.0V, 250mA) pluggable spring-clamp connectors
PBUS01	Power Bus DIN-rail connectors, pack of 5
PBUS02	Power Bus DIN-rail input plug and socket set
PBUS03	DIN-rail mounted strain relief clamps, pack of 2



**APPROVALS - for the latest certification information visit [www.mtl-inst.com/support/certificates](http://www.mtl-inst.com/support/certificates)**

Region (Authority)	Standard	Certificate	Approved for	Ratings
EU (Relcom)	EN61326-1:2013		Class A Industrial Locations	CE
(Fieldbus Foundation™)	FF-831	PS072902	-	Power Supply Type 132
US (FM)	3600: 2011 3611: 2004 3810: 2005	3035979	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	NI/1/2/ABCD/T4 Ta=70°C I/2/IIC/T4 Ta=70°C
Canada (FM)	CAN/CSA - E60079-15: 2002 C22.2 No. 213: 2004 C22.2 No. 1010.1: 2004	3035979C	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	NI/1/2/ABCD/T4 Ta=70°C Ex nA nL IIC T4 Ta=70°C
ATEX (Relcom)	EN 60079-0:2012+A11:2013 EN 60079-15:2010	RELC09ATEX1008X	Zone 2 IIC T4	Ex nA IIC T4 II 3 GD



**Measurement Technology Limited,**  
Great Marlings, Butterfield, Luton  
Beds, LU2 8DL, UK.  
Tel: + 44 (0)1582 723633 Fax: + 44 (0)1582 422283  
E-mail: [mtlenquiry@eaton.com](mailto:mtlenquiry@eaton.com)  
[www.mtl-inst.com](http://www.mtl-inst.com)

© 2016 MTL  
All Rights Reserved  
Publication No.EPS F104 rev3 280116  
January 2016

**EUROPE (EMEA):**  
+44 (0)1582 723633  
[mtlenquiry@eaton.com](mailto:mtlenquiry@eaton.com)

**THE AMERICAS:**  
+1 800 835 7075  
[mtl-us-info@eaton.com](mailto:mtl-us-info@eaton.com)

**ASIA-PACIFIC:**  
+65 6 645 9888  
[sales.mtlsing@eaton.com](mailto:sales.mtlsing@eaton.com)

The given data is only intended as a product description and should not be regarded as a legal warranty of properties or guarantee. In the interest of further technical developments, we reserve the right to make design changes.