technical datasheet

MTL5995

isolated power supply for fieldbus systems

- Straightforward 'clip-on' DIN-rail mounting
- Low cost per fieldbus segment
- High packing densities
- Simplified installation and maintenance using plug-in connectors

FOUNDATION

The MTL5995 is a general purpose power supply unit designed for use in 31.25kbit/s (H1) fieldbus systems. It complies with the requirements of Fieldbus Foundation™ power supply Type 131† (non-IS supply intended for feeding an IS barrier).

To comply with fieldbus standards, each bus must be terminated at both ends. MTL's FBT1-IS, F100 or FCS-MBT fieldbus terminators can be supplied for this purpose; or its switch-enabled, internal terminator can be used for installations in which an MTL5995 is located at one end of the fieldbus trunk.

When designing a fieldbus segment the total current consumption of the fieldbus devices should be calculated for normal operation. This should be within the range of the published design current for the power supply.

For the MTL5995 power supply, the current limit is at least 20mA higher than the maximum design current. This provides a margin for inrush current when a new device is added to the network. Therefore, with a fieldbus loaded with its maximum design current, a fieldbus device can be disconnected and reconnected without the risk that other devices on the bus will reset.

The MTL5995 clips quickly onto DIN rail, so it is compatible with the industry-standard mounting system. Wiring is simplified by a single, secured, plug-in fieldbus connector (MTL5995-PS), or a pair of plug-in fieldbus connectors (MTL5995) and a power plug which accepts a power bus; all leading to quicker insertion, fewer wiring errors and trouble-free, tidier installations.

† *The applicable fieldbus specifications and standards are: FOUNDATION™ fieldbus 31.25kbit/s Physical Layer Profile Specification, document FF-816, IEC 61158-2: 1993 and ISA-S50.02-1992 for 31.25kbit/s fieldbus systems.*

COOPER Crouse-Hinds

MTL5995
FIELDBUS POWER SUPPLY
31.25kbit/s fieldbus

The MTL5995 provides a pair of plug-in fieldbus connections. The MTL5995-PS is recommended for new fieldbus installations.

SPECIFICATION

OUTPUT

Voltage
19V±2%
<2Ω dc impedance

Design current
0 to 350mA,

Current limit
>370mA

Output ripple
Complies with clause 22.6.2 of the fieldbus standards† for output current >10mA.

Internal termination
Selected by a switch in the base of the unit.

INPUT

Supply voltage
20 to 30V dc –20°C to +60°C

Power requirement, with 350mA output load
420mA typical at 24V
370mA typical at 30V
520mA typical at 20V

Power dissipation within unit, with 350mA output load
3.4W typical at 24V
4.5W maximum at 30V

Note: *To allow adequate heat dissipation under all likely thermal conditions, it is recommended that the MTL5995-PS is installed on DIN-rail with 10mm clearance from any adjacent unit. 10mm DIN-rail module spacers (part no. MS010) are available from MTL for this purpose.*

LED indicator
Green: one provided for power indication

Isolation
250V rms between fieldbus and power supply terminals

Location of units
Safe area

Terminals
Accommodate conductors with cross-section of 0.14 to 2.5mm^2, stranded or single-core

Mounting
On 35mm (top hat) rail to EN 50022–35 x 7.5; BS 5584;
35 x 27 x 7.3 DIN 46277

Ambient temperature limits
–20 to +60°C (–6°F to +140°F) operating
–40 to +80°C (–40°F to +176°F) storage

Humidity
5 to 95% relative humidity

Weight
110g approx

SAFETY

Location of module
Safe area, Zone 2, IIC T4 hazardous area or Class 1, Div 2, Groups A, B, C, D T4 hazardous location.

Fieldbus Foundation™ is a trademark of Fieldbus Foundation, Austin, Texas, USA.
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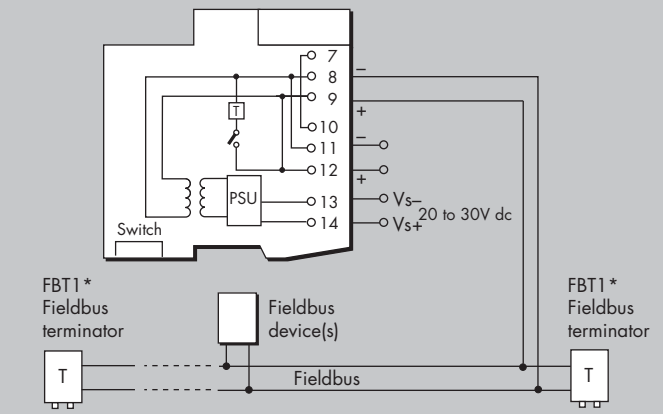
Safe or Division 2/Zone 2 hazardous area



Terminal	Function
7	Internally linked to 10
8 & 11	Fieldbus device(s) connection –ve
9 & 12	Fieldbus device(s) connection +ve
10	Internally linked to 7
13	Supply –ve
14	Supply +ve

Note: *Terminals 7 and 10 are linked internally to assist in the process of terminating cable screens.*

Location of field wiring
Safe area, Zone 2, IIC T4 hazardous area or Class 1, Div 2, Groups A, B, C, D T4 hazardous area.

Field wiring protection
Normally non-arcing/Ex nA

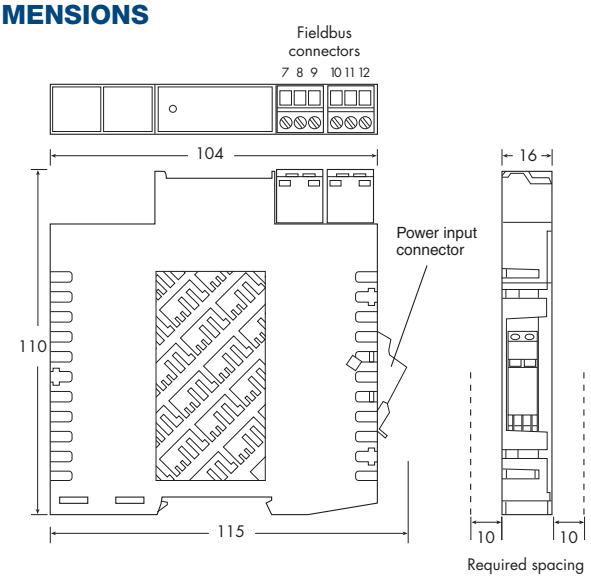
CERTIFICATION

EUROPE (ATEX)
EN 50021 ⟨Ex⟩ II 3 G Ex nA IIC T4

USA (FM)
Class No.3611 Class1, Div 2 Grps A-D

CANADA (CSA)
C22.2 No.213 Class1, Div 2 Grps A-D; Ex nA IIC T4

DIMENSIONS



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MTL5995-PS
FIELDBUS POWER SUPPLY
31.25kbit/s fieldbus

The MTL5995-PS provides a single, secured, plug-in fieldbus connection and is recommended for new fieldbus installations.

SPECIFICATION

OUTPUT

Voltage
19V±2%
<2Ω dc impedance

Design current
0 to 350mA,

Current limit
>370mA

Output ripple
Complies with clause 22.6.2 of the fieldbus standards† for output current >10mA.

Internal termination
Selected by a switch in the base of the unit.

INPUT

Supply voltage
20 to 30V dc –20°C to +60°C

Power requirement, with 350mA output load
420mA typical at 24V
370mA typical at 30V
520mA typical at 20V

Power dissipation within unit, with 350mA output load
3.4W typical at 24V
4.5W maximum at 30V

Note: *To allow adequate heat dissipation under all likely thermal conditions, it is recommended that the MTL5995-PS is installed on DIN-rail with 10mm clearance from any adjacent unit. 10mm DIN-rail module spacers (part no. MS010) are available from MTL for this purpose.*

LED indicator
Green: one provided for power indication

Isolation
250V rms between fieldbus and power supply terminals

Location of units
Safe area

Terminals
Accommodate conductors with cross-section of 0.14 to 1.5mm^2, stranded or single-core

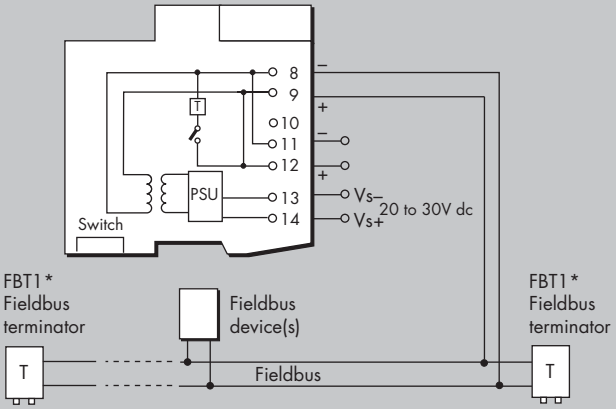
Mounting
On 35mm (top hat) rail to EN 50022–35 x 7.5; BS 5584;
35 x 27 x 7.3 DIN 46277

Ambient temperature limits
–20 to +60°C (–6°F to +140°F) operating
–40 to +80°C (–40°F to +176°F) storage

Humidity
5 to 95% relative humidity

Weight
110g approx

Safe or Division 2/Zone 2 hazardous area



Terminal	Function
8 & 11	Fieldbus device(s) connection –ve
9 & 12	Fieldbus device(s) connection +ve
10	Terminal for inteconnecting cable screens
13	Supply –ve
14	Supply +ve

SAFETY

Location of module
Safe area, Zone 2, IIC T4 hazardous area

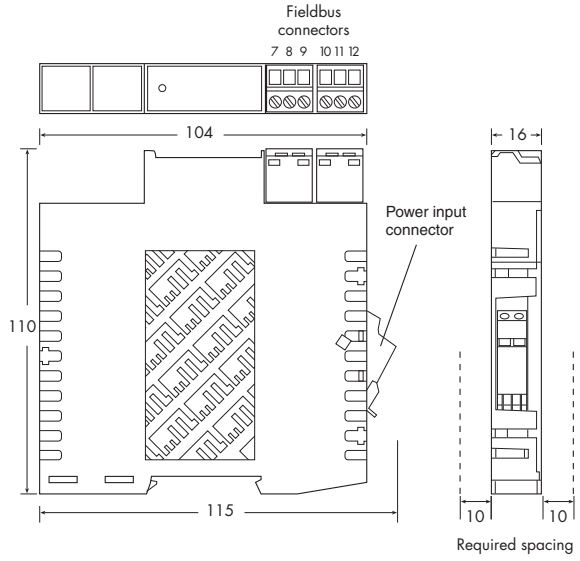
Location of field wiring
Safe area, Zone 2, IIC T4 hazardous area

Field wiring protection
Normally non-arcing/Ex nA

CERTIFICATION

EUROPE (ATEX)
IEC 60079-15 ⟨Ex⟩ II 3 G Ex nA IIC T4

DIMENSIONS



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technical datasheet

F101/102

Fieldbus power supply

- Fieldbus power for FOUNDATION™ fieldbus H1 cards
- Compact design
- Fully isolated
- Low power dissipation
- DIN-rail mounting
- Supports bussing of input power in the DIN rail
- F101 (21.5V min. at 500mA)
- F102 (27.9V min. at 500mA)

The F101 and F102 fieldbus power supplies are designed to provide power for a single FOUNDATION™ fieldbus H1 segment. Galvanic isolation, power conditioning and segment termination are incorporated into each F101 or F102 module. Termination of the fieldbus segments is normally enabled with a switch on the module, but may be switched off for those few applications that do not require a Terminator at the Fieldbus Power Supply.

For extreme reliability, the modules use 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.

The modules can be powered from a supply between 19.2 – 30.0 DC. 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.

LED indicators show the status of the modules. 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.

F101 and F102 modules provide galvanic isolation between the input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for fieldbus power supplies.

The F101 is specifically intended for use in applications that require live-workable, energy-limited spurs in Zone 2 or Division 2 hazardous areas where the field devices are certified Ex nL or Ex i with Ui ≤ 24V.

The F102 has a high output voltage and should be specified for applications requiring heavily loaded segments and/or long cable lengths.

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
19.2 – 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
F101: 21.5 – 24.0V DC
F102: 27.9 – 30.0V DC

Design Current
0 to 500mA per segment

Segment Current Limit
> 550mA

Minimum Load
0mA

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^2

Power input
Screw-secured, 4-way pluggable connector in screw terminal or spring clamp version, 0.14 to 2.5mm^2 (see diagram)

DIN-rail power bussing option
Proprietary connection system - see Ordering Information

Fieldbus terminator
100Ω, 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

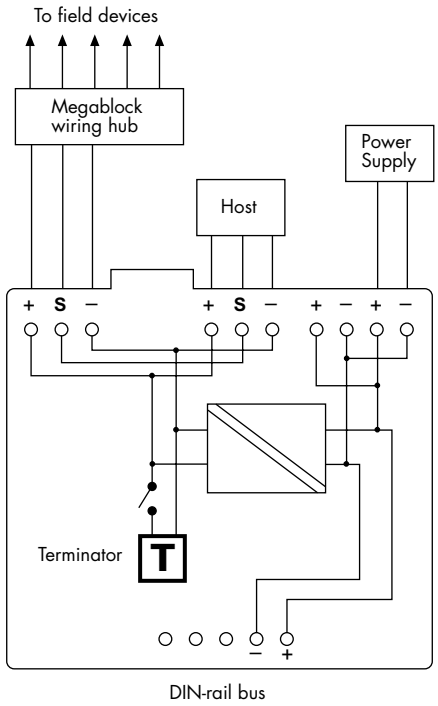
Ambient temperature
Operating: –40°C to +65°C* (at maximum rated output)
–40°C to +70°C* (at 400mA output)
Storage: –40°C to +85°C
* fitted on horizontal DIN-rail mounted on a vertical plane

Relative humidity
<95%, non-condensing

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

F101/102 - BLOCK DIAGRAM

(showing interconnection scheme)



The above diagram shows a basic illustration of how the F101 or F102 is wired. For detailed wiring information, see the installation instructions.

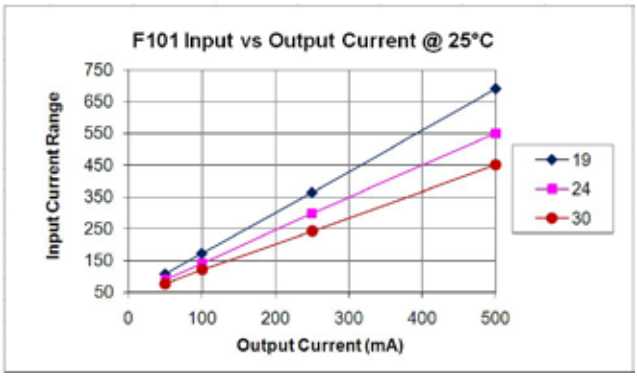
PHYSICAL NETWORKS

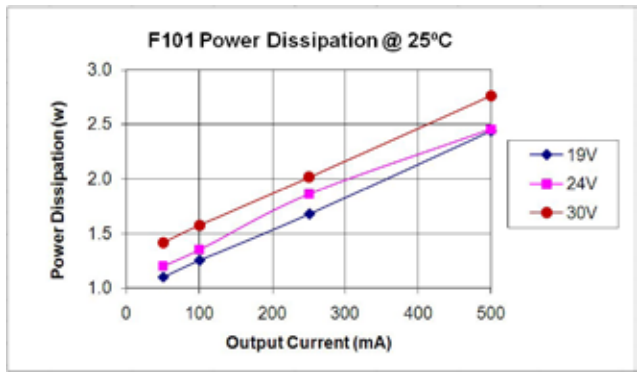
IEC61158-2
ISA-S50.02 Part 2-1992
FOUNDATION™ fieldbus H1
Profibus PA

LED INDICATORS

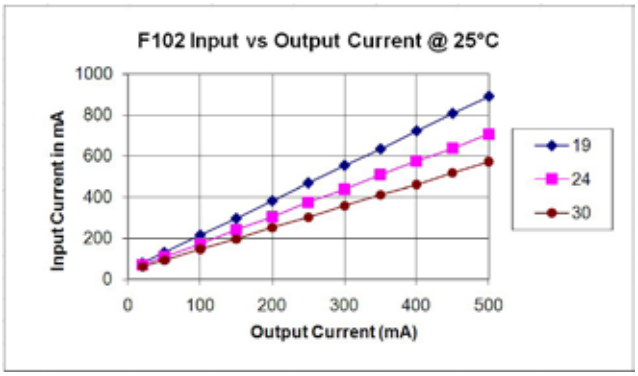
	OFF	ON	Flashing
Power (green)	Power fail or internal fault	Power OK	–
Fault (red)	Normal	Internal error, replace module	Output current limit exceeded
Terminator (white 'T')	Terminator disabled	Terminator enabled	–

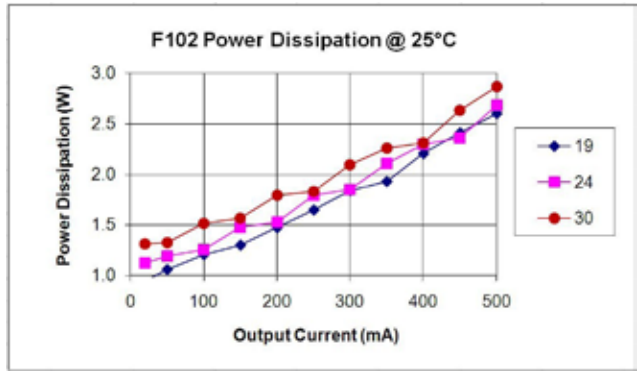
F101 PARAMETERS (typical)



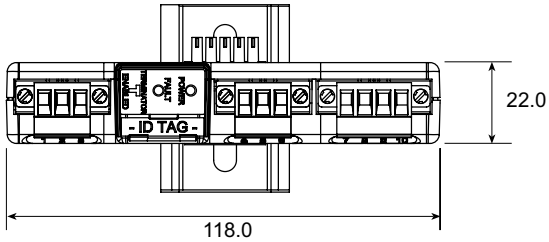


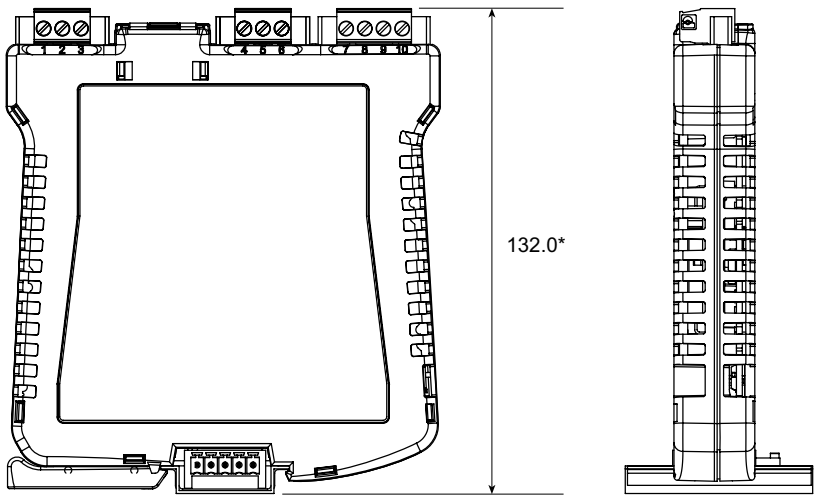
F102 PARAMETERS (typical)





F101/102 DIMENSIONS (mm) (shown with screw-clamp connectors)





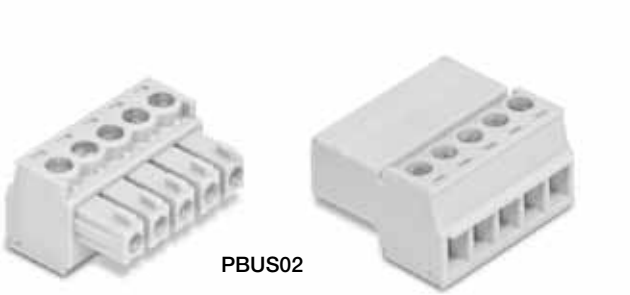
* + 5mm with spring clamp connectors

ORDERING INFORMATION

PART No.	Description
F101-PS	Fieldbus Power Supply (21.5V min., 500mA) pluggable screw-terminal connectors
F101-PC	Fieldbus Power Supply (21.5V min., 500mA) pluggable spring-clamp connectors
F102-PS	Fieldbus Power Supply (27.9V min., 500mA) pluggable screw-terminal connectors
F102-PC	Fieldbus Power Supply (27.9V min., 500mA) pluggable spring-clamp connectors

PART No.	Description
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

PBUS01



PBUS02

PBUS03

APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates*

Region (Authority)	Standard	Certificate	Approved for	Ratings
EU (Relcom)	EN61326		Class A Industrial Locations	CE
(Fieldbus Foundation™)	FF-831	PS072900 (F101) PS072901 (F102)	–	Power Supply Type 132
US (FM)	3600: 1998 3611: 2004 3810: 2005	3035979	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	NI/I/2/ABCD/T4 Ta=65°C I/2/IIC/T4 Ta=65°C
Canada (FM)	CAN/CSA - E60079-15 C22.2 No. 213 C22.2 No. 1010.1	3035979C	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	NI/I/2/ABCD/T4 Ta=65°C Ex nA nL IIC T4 Ta=65°C
ATEX (Relcom)	EN 60079-0 EN 60079-15	RELC09ATEX1008X	Zone 2 IIC T4	Ex nA IIC T4 Ⓔx II 3 GD

technical datasheet

F11 Fieldbus Power Hub

power conditioner with terminators for fieldbus networks

- built-in fieldbus power conditioning
- 5 fieldbus device ports
- 30mA current per device
- up to 315mA total current
- auxiliary port for expansion
- complete with AC power supply
- battery-pack option

The Relcom Power Hub (F11) is the next generation of the popular Power Hub. Ideal for bench-tops, labs, demonstrations and test setups, the Power Hub is a mini fieldbus segment in a box—just add devices.

The Power Hub is a combined bulk power supply, fieldbus power conditioner, two built-in terminators, five ports for attaching devices (Device Ports), and an Auxiliary Port for expansion and connection of additional devices. It functions as a zero length homerun with spurs (star topology).

The Power Hub is powered by a plug-in wall transformer with an input voltage range of 100-240VAC (50-60Hz). Adapters are supplied with the transformer for four different country power outlets (North America, Europe, UK, and Australia).

Fieldbus devices can be connected to the Power Hub with shielded or unshielded twisted pair fieldbus cable. The controller (host), if present, is considered to be a device.

The Power Hub provides a minimum of 30mA of power-conditioned current for each Device Port. If the current needs of a fieldbus segment exceed the capability of a Device Port, the Auxiliary Port can also be used to provide additional power-conditioned current.

The Power Hub can supply up to 315mA of power-conditioned current for all Device Ports and the Auxiliary Port. The Power Hub can be mounted on a 35mm DIN rail. For applications where AC power is not available, the Power Hub can also be mounted on a battery pack (accessory FCS-A11) for fieldbus power in the field.

Current limiting SpurGuard™ protection for each Power Hub Device Port limits the current draw of an attached cable and device and protects against short circuits. A short circuit in a spur cable or device will not take down the entire segment. The remaining devices on the segment continue to operate normally.

Wire Connections to the Power Hub are made using pluggable screw terminal connectors. Pluggable connectors allow easy connecting, disconnecting, and moving of devices for reconfiguration, maintenance, and troubleshooting. Two securing screws on each connector ensure it stays in place.

To connect a device, cut and strip the +, –, and shield (S) wires, insert them into the terminals, and tighten the screw terminals. Plug the connector into a Device Port or the Auxiliary Port and tighten the securing screws.

A typical use for the Power Hub is to configure, precommission, test, or calibrate Fieldbus devices. In this case, the Fieldbus device and host device (Emerson 375 or 475, National Instruments Fieldbus interface, etc.) are connected to the Power Hub. No other components are required to have a functioning Fieldbus segment.

SPECIFICATIONS

ELECTRICAL

Device Port Rated Current
30mA

Total Current for all Device Ports and Auxiliary Port
315mA max. (for specified operation)

Device Port Short Circuit Protection
Continuous protection against damage

Maximum Fieldbus Cable Length
120 metres

Auxiliary Port Short Circuit Protection
Continuous protection against damage

Wall-mounted Bulk Power Supply
Input voltage: 100 - 240V ac, 50/60Hz
Output voltage: 24V dc (nominal)

MECHANICAL

Fieldbus Connectors
Six sets, pluggable screw-terminal, with two securing screws

Mounting requirements
35mm DIN rail

Wire capacity
0.14 to 2.5mm^2

Case material
Lexan polycarbonate

Temperature range
0° to +50°C

Weight
146g (nominal)

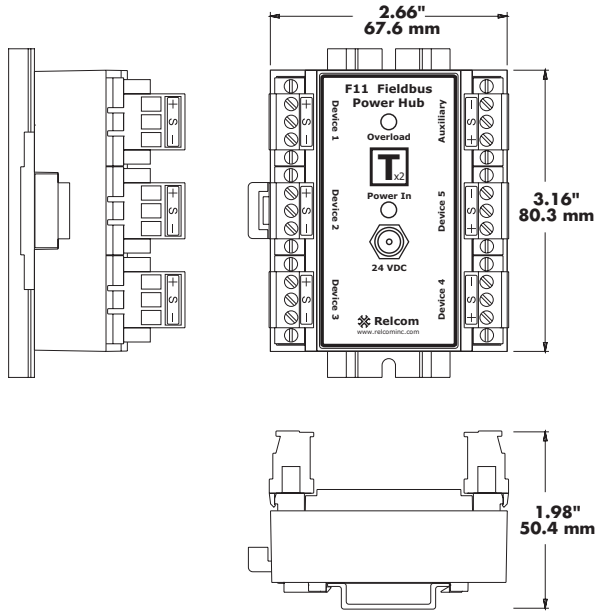
PHYSICAL NETWORK

IEC 61158-2
Foundation™ fieldbus H1
Profibus PA

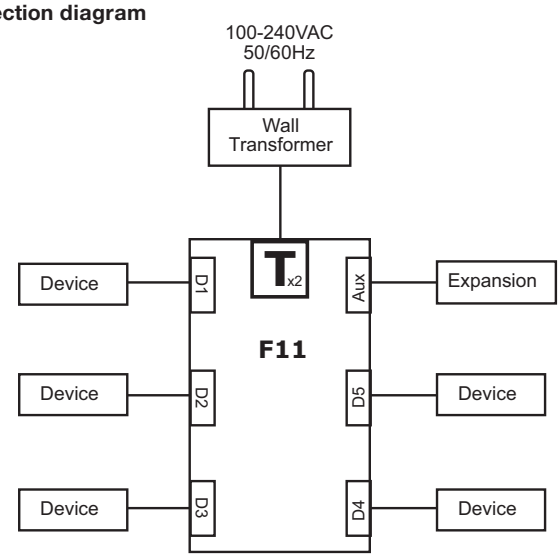
ORDERING INFORMATION

Fieldbus Power Hub	**F11**
Battery Pack (Power Hub power in the field)	**FCS-A11**
Heavy-duty DIN rail end stop	**FCS-A06**
35mm DIN rail, aluminum,1 meter	**FCS-A01**

CASE DIMENSIONS

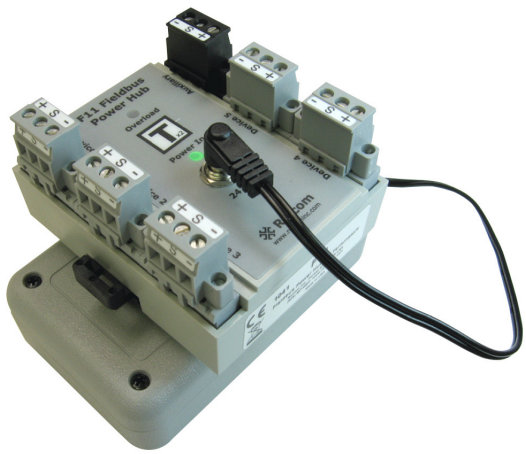


Connection diagram



Wall Power Supply and Interchangeable Power Outlet Adapters (included with F11)

F11 with Optional Battery Pack



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technical datasheet

F810

redundant fieldbus power for Foxboro I/A Series™ Control System

- Integrated redundant fieldbus power for FBM228 Foundation™ fieldbus modules
- 8-segment redundancy
- High-density, compact design
- Fully isolated
- Low power dissipation
- No components on carrier
- Built-in "smart" termination
- Continuous physical layer diagnostic option

The F810 fieldbus power system is designed to provide redundant Foundation™ fieldbus power for Foxboro I/A Series control systems using FBM228 modules. Eight fieldbus segments are supported. The system comprises a baseplate which accommodates two redundant pairs of Foxboro FBM228 modules and two MTL-Relcom F801 or F802 power modules operating in redundant configuration. Failure alarms, galvanic isolation, power conditioning and segment termination are incorporated into each F80x module. In applications requiring simplex power, a single F80x module may be used.

For extreme reliability, the module baseplate has no components and only provides interconnections between FBM228 modules, the power modules and external connections.

Each F80x module has indicator LEDs to show both its status and that of the eight segments under power. In normal operation, each green 'Segment' LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the red 'Alarm' LED is lit. In the alarm condition, a normally closed, galvanically-isolated relay contact goes to an open condition. Connections to the alarm relay are made via screw terminals on the F810 baseplate. If multiple F810 units are used, a common alarm circuit can be achieved by 'daisy-chaining' the alarm circuits.

The F80x module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power conditioners. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures from ground faults on more than one segment. Each segment has its own fieldbus power conditioner and current limitation. Termination of the fieldbus segment is automatically maintained when single or redundant F80x modules are fitted.

An F809F diagnostic module may optionally be installed on the carrier, to automatically collect and distribute diagnostic information on each of the eight fieldbus segments. Measured parameters may be viewed in the Foxboro control system by either assigning the F809F as a fieldbus device to segment 1 or 8 of the powered segments, or by means of a separate fieldbus segment. Connections for the separate segment are provided on the baseplate. For more information see the F809F product specification.

Redundant 24V DC (nom.) input power can be connected to the F810 baseplate using Foxboro I/A standard AMP connectors. F80x power modules and the F809F fieldbus diagnostic module can either be powered from the same source or, alternatively, for installations in which standard Foxboro power supplies are unable to provide sufficient current capacity, an external 24V DC supply may be connected.

Field wiring connections are available with either pluggable screw terminals (F810-PS) or pluggable spring clamp terminals (F810-PC).

SPECIFICATION

Location of equipment
Safe area

INPUT	F801	F802
Input voltage (DC)	19.2 - 30.0V	19.2 - 30.0V
Current consumption (24V input, all outputs fully loaded)	4.4A*	6.9A*
Total Power dissipation (24V input, all outputs fully loaded)	42W*	46W*

** Redundant operation*

(Figures based upon fully populated F810 baseplate, including all F80x, FBM228 and F809F modules - see also next page)

OUTPUT	F801	F802
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	21.5V - 24.0V	28.0V - 30.0V
Design current (per segment)	0 to 350mA	0 to 500mA
Current limit	> 370mA	> 520mA
Minimum load	0mA	0mA
Isolation		
Fieldbus to input power:	250V AC rms withstand	
Segment to segment:	200V DC withstand	

ALARMS

Alarm contact rating
1A maximum @ 30V DC maximum

Alarm contact status
Normally closed

Alarm threshold	F801	F802
Segment output	<19V DC	<24V DC

MECHANICAL

Mounting method
Integrated fixings for 'Top hat' DIN rail, 35mm x 7.5mm to EN50022

SYSTEM CONNECTIONS

Foxboro 'Fieldbus' LAN
9-way subminiature D, female

Address switches

Fieldbus wiring

Baseplate I.D.		
	Sw.1	Sw.2
0	ON	ON
1	ON	OFF
2	OFF	ON
3	OFF	OFF

Posn.	Sw.3
1 - 4	ON
5 - 8	OFF

Segment 1–8 and diagnostic segment – each has 3-way pluggable connector in screw terminal or spring clamp version, 0.14 to 2.5mm^2 (See ordering information)

Foxboro primary and secondary power inputs
2 x 3-way socket headers type AMP Universal MATE-N-LOK

Alternative power inputs
2 x 3-way pluggable connector in screw terminal or spring clamp version, 0.14 to 2.5mm^2 (See ordering information)

Chassis and ground
2-way fixed screw terminal connector, 0.14 to 2.5mm^2

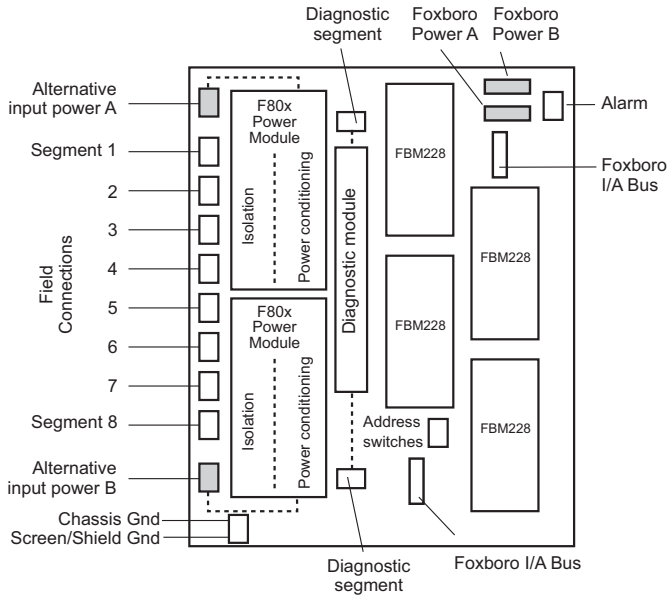
Alarm contacts
2-way fixed screw terminal connector, 0.14 to 2.5mm^2

ENVIRONMENTAL

Ambient temperature	F801	F802
Operating (full load)	−40°C to +65°C	−40°C to +50°C
Operating (60% load)	−40°C to +65°C	−40°C to +65°C
Storage	−40°C to +85°C	−40°C to +85°C

***Note**: Temperature range applies only when mounted on a horizontal DIN rail attached to a vertical surface.*

F810 - BLOCK DIAGRAM



Ingress protection
IP20 to BS EN60529
(For additional protection mount the equipment in an enclosure)

ELECTRICAL

EMC Compliance
To EN61326:1998 Electrical equipment for measurement, control and laboratory use - EMC requirements

PHYSICAL NETWORKS

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

ORDERING INFORMATION

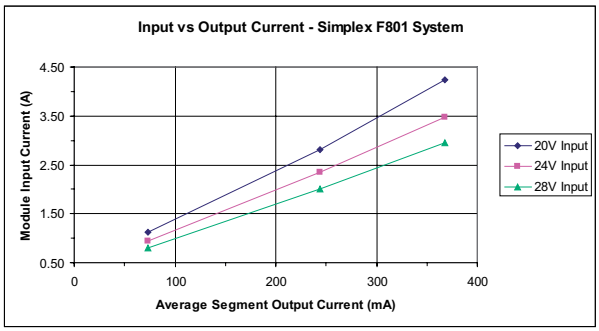
DESCRIPTION	PART NO.
Carrier, unpopulated	**F810-CA**
8-segment power module: 21.5V, 350mA	**F801**
8-segment power module: 28V, 500mA	**F802**
F810 system with pluggable screw terminal connectors and two F801 modules	**F810-PS**
F810 system with pluggable screw terminal connectors and two F802 modules	**F810-2-PS**
F810 system with pluggable spring clamp connectors and two F801 modules	**F810-PC**
F810 system with pluggable spring clamp connectors and two F802 modules	**F810-2-PC**
Blanking module *	**F800-BLK**
Fieldbus diagnostic module	**F809F**

* Used in place of an F80x power module for non-redundant operation in order to defeat the failure alarm caused by the absence of the F80x.

***Note**: Foxboro FBM228 modules are not included and must be obtained separately.*

F801 PARAMETERS

a)



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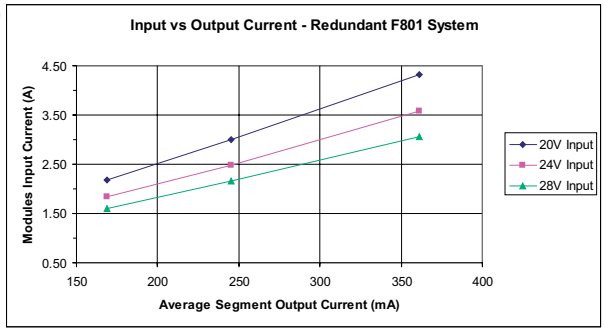

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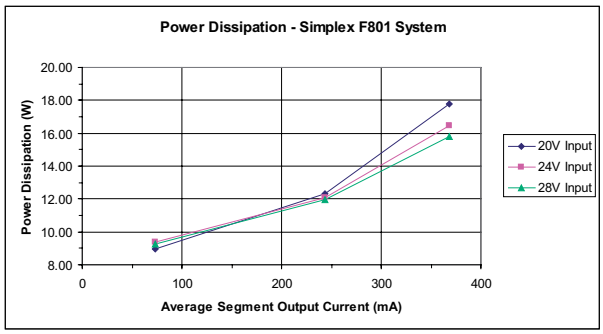

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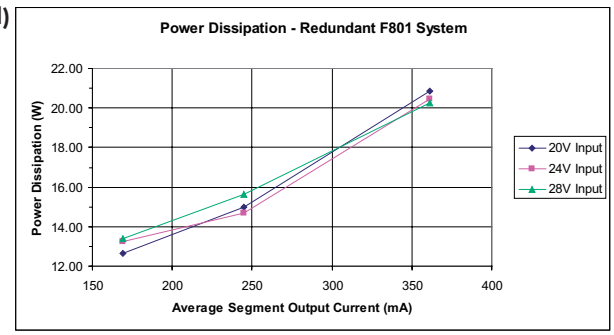
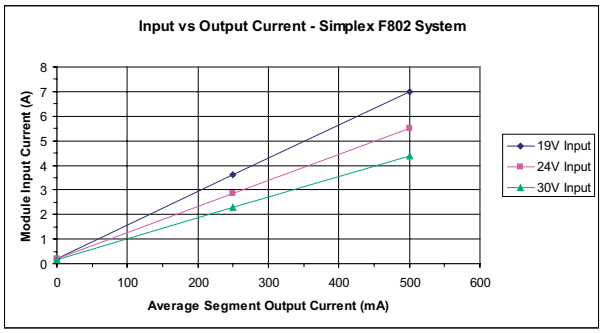
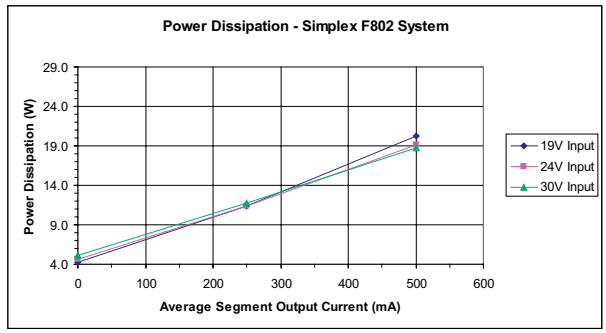


F802 PARAMETERS

a)



b)



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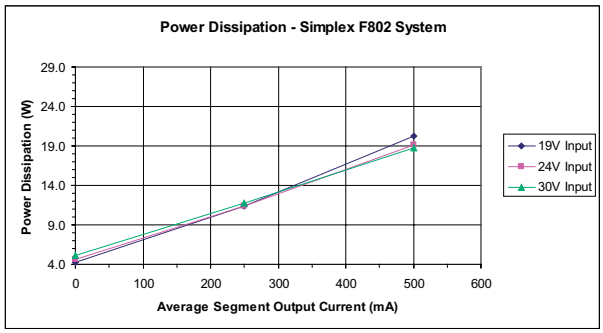

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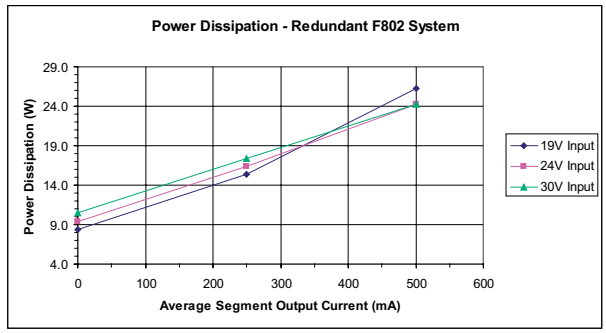


Calculating current requirements

There are two separate methods of powering the F80x power modules on the baseplate - **Option 1** - from the Foxboro Power system or - **Option 2** - from External Power supplies. Both methods can provide redundant power to the F810.

Note: *Power for the FBM228 modules is always taken from the Foxboro power supplies.*

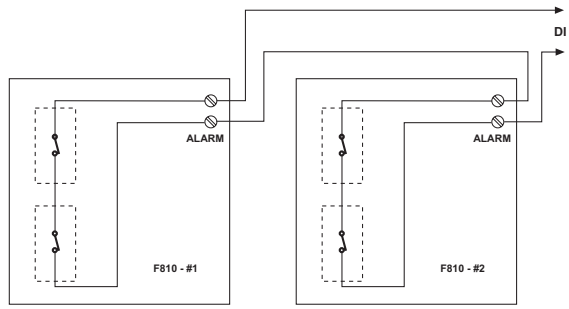
Option 2 current requirement from either external supply:

1. Use the 801/802 a) graph for simplex operation or the b) graph for redundancy.
2. Add 0.08A for the F809F - if fitted.

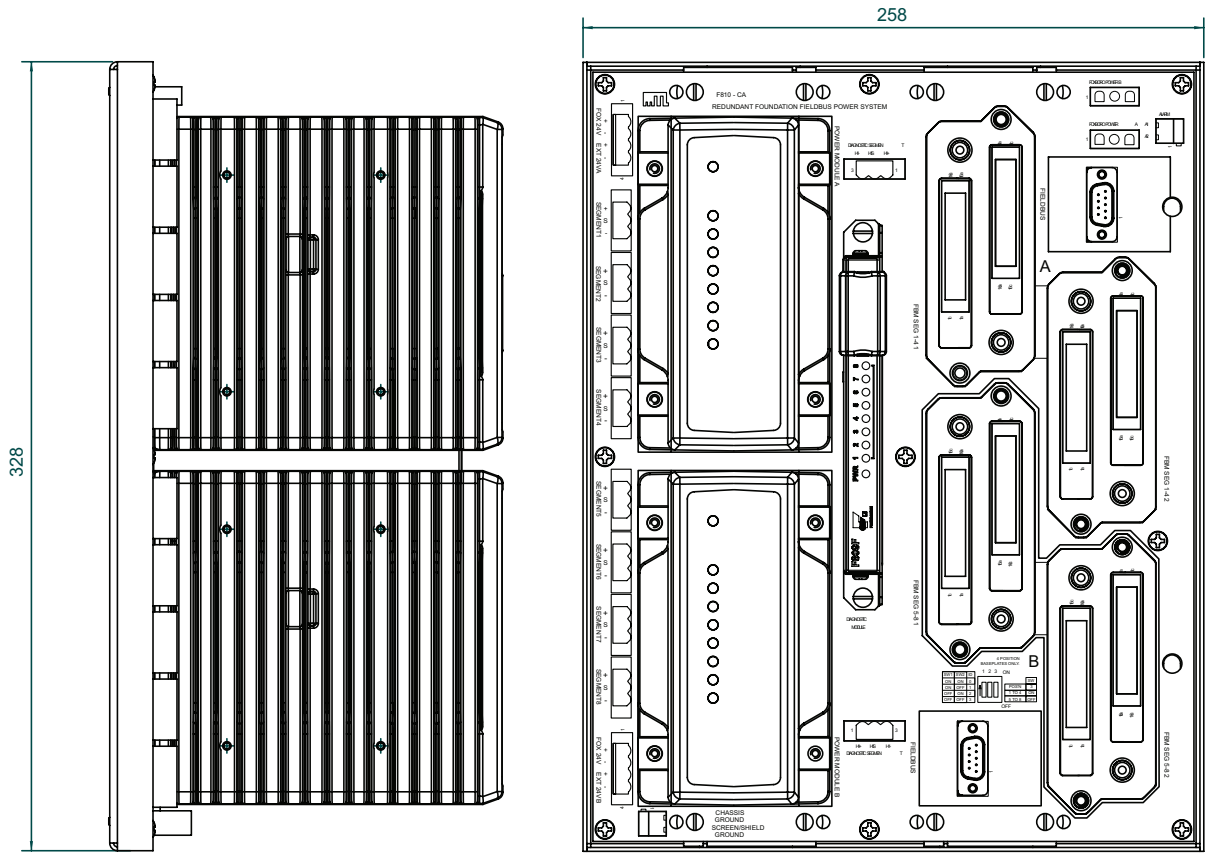
Option 1 current requirement from Foxboro supply:

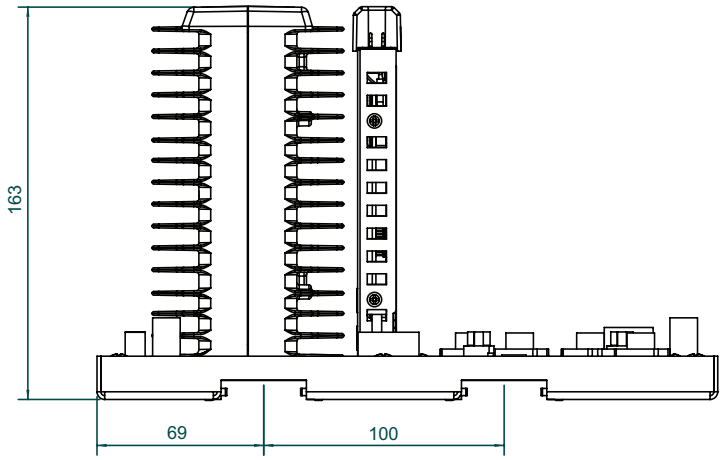
Add a total of 0.8A for four FBM228 module to Option 2 current.

Linking alarm circuits



DIMENSIONS





Shown using F802 power modules. Overall dimensions are the same when F801 modules are fitted.

F80x module top panels showing indicators

APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Country	Authority	Standard	Certificate	Approved for	Ratings
–	Fieldbus Foundation™	FF-831	PS001700 (F801) PS001900 (F802)	H1 Profile - 132	–

technical datasheet

F811

redundant fieldbus power for Foxboro I/A Series™ Control System

- Redundant fieldbus power for FBM228 FOUNDATION™ fieldbus modules
- 8-segment redundancy
- High-density, compact design
- Fully isolated
- Low power dissipation
- No components on carrier
- Built-in "smart" termination
- Physical layer diagnostic option
- Vertical DIN-rail mounting
- F801 output 21.5V, 350mA
- F802 output 28V, 500mA

The F811 fieldbus power system is designed to provide redundant FOUNDATION™ fieldbus power for Foxboro I/A Series control systems using FBM228 modules. The F811 module carrier has system connectors for direct connection to two redundant pairs of FBM228 modules mounted on standard Foxboro baseplates using the standard cables. Eight fieldbus segments are supported. The system comprises a carrier which accommodates two F801 or F802 power modules operating in redundant configuration. Failure alarms, galvanic isolation, power conditioning and segment termination are incorporated into each F80x module. In applications requiring simplex power, a single F80x module may be used.

For extreme reliability, the module carrier has no components and provides only interconnections between the power modules and the external connections.

Each F80x module has indicator LEDs to show both its status and that of the eight segments under power. In normal operation, each green 'Segment' LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the red 'Alarm' LED is lit. In the alarm condition, a normally closed, galvanically-isolated relay contact goes to an open condition. Connections to the alarm relay are made via screw terminals on the F811 carrier. If multiple F811 units are used, a common alarm circuit can be achieved by 'daisy-chaining' the alarm circuits.

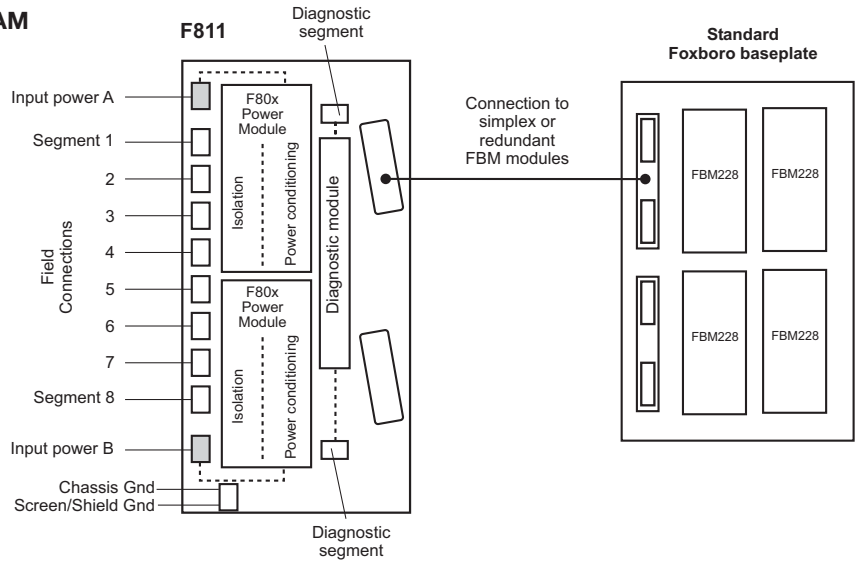
The F80x module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power conditioners. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures from ground faults on more than one segment. Each segment has its own fieldbus power conditioner and current limitation. Termination of the fieldbus segment is automatically maintained when single or redundant F80x modules are fitted.

An F809F diagnostic module may optionally be installed on the carrier, to automatically collect and distribute diagnostic information on each of the eight fieldbus segments. Measured parameters may be viewed in the Foxboro control system by either assigning the F809F as a fieldbus device to segment 1 or 8 of the powered segments, or by means of a separate fieldbus segment. Connections for the separate segment are provided on the carrier. For more information see the F809F product specification.

Redundant 24V DC (nom.) input power is connected to the F811 carrier using two-part pluggable connectors.

Field wiring connections are available with either pluggable screw terminals (F811-PS) or pluggable spring clamp terminals (F811-PC).

F811 - BLOCK DIAGRAM



SPECIFICATION

Location of equipment
Safe area

INPUT	F801	F802
Input voltage (DC)	19.2 - 30.0V	19.2 - 30.0V
Current consumption (24V input, all outputs fully loaded)	3.5A*	6.0A*
Total Power dissipation (24V input, all outputs fully loaded)	20W*	24W*

** Redundant operation*

OUTPUT	F801	F802
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	21.5V - 24.0V	28.0V - 30.0V
Design current (per segment)	0 to 350mA	0 to 500mA
Current limit	> 370mA	> 520mA
Minimum load	0mA	0mA
Isolation		
Fieldbus to input power:	250V AC rms withstand	
Segment to segment:	200V DC withstand	

ALARMS

Alarm contact rating
1A maximum @ 30V DC maximum

Alarm contact status
Normally closed

Alarm threshold	F801	F802
Segment output	<19V DC	<24V DC

MECHANICAL

Mounting method
Integrated fixings for 'Top hat' DIN rail, 35mm x 7.5mm to EN50022

ENVIRONMENTAL

Ambient temperature	F801	F802
Operating (full load)	−40°C to +65°C	−40°C to +50°C
Operating (60% load)	−40°C to +65°C	−40°C to +65°C
Storage	−40°C to +85°C	−40°C to +85°C

***Note**: Temperature range applies only when mounted on a horizontal DIN rail attached to a vertical surface.*

Ingress protection
IP20 to BS EN60529
(For additional protection mount the equipment in an enclosure)

ELECTRICAL

System connectors
Host 1, Host 2, via standard cables to FBM228 modules mounted on standard Foxboro template

Field, Power & Alarm terminals
Pluggable rising cage-clamp screw terminals (-PS)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp screw terminals (-PC)
Conductor size: 0.2 to 2.5 mm^2
Chassis ground
2-way fixed screw terminal connector 0.14 to 2.5 mm2

Terminators
A single termination is provided automatically when using either 1 or 2 power modules

EMC Compliance
To EN61326:1998 Electrical equipment for measurement, control and laboratory use - EMC requirements

PHYSICAL NETWORKS

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

ORDERING INFORMATION

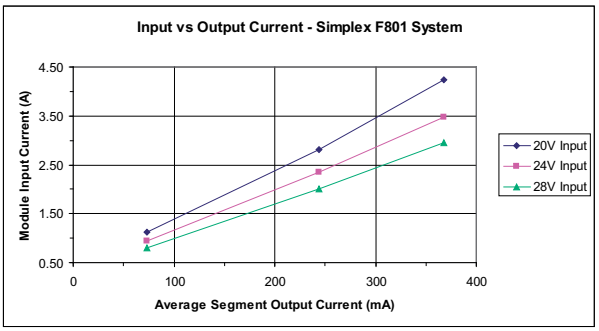
DESCRIPTION	PART NO.
Left-hand carrier, unpopulated	**F811-CL-P***
Right-hand carrier, unpopulated	**F811-CR-P***
8-segment power module: 21.5V, 350mA	**F801**
8-segment power module: 28V, 500mA	**F802**
Blanking module *(Used in place of an F80x power module for non-redundant operation in order to defeat the failure alarm caused by the absence of the F80x.)*	**F800-BLK**
Fieldbus diagnostic module	**F809F**

	with F801	with F802
F811-CL-P*and two F80x modules	**F811-L***	**F811-2-L***
F811-CR-P*and two F80x modules	**F811-R***	**F811-2-R***
F811-CL-P*and one F80x module	**F811-L*-NR**	**F811-2-L*-NR**
F811-CR-P*and one F80x module	**F811-R*-NR**	**F811-2-R*-NR**

* = S or C S = Pluggable Screw Terminal Connectors
C = Pluggable Spring Clamp Connectors

F801 PARAMETERS

a)



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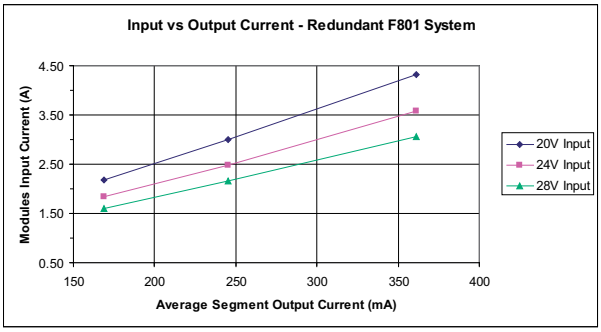

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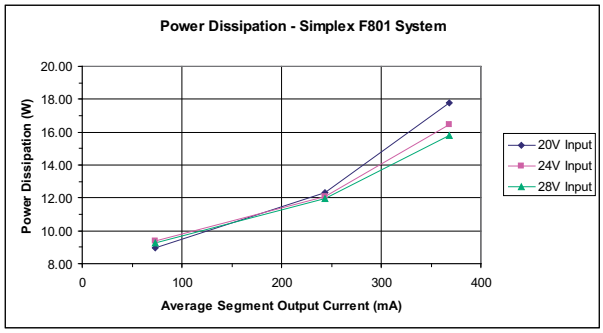

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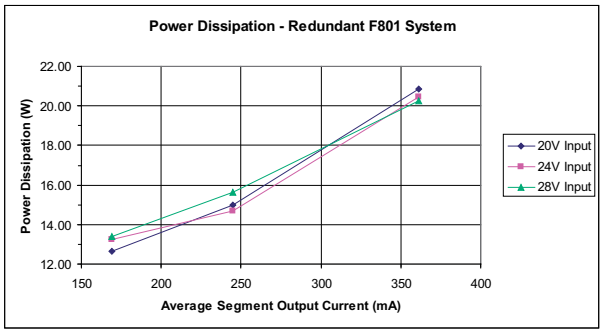
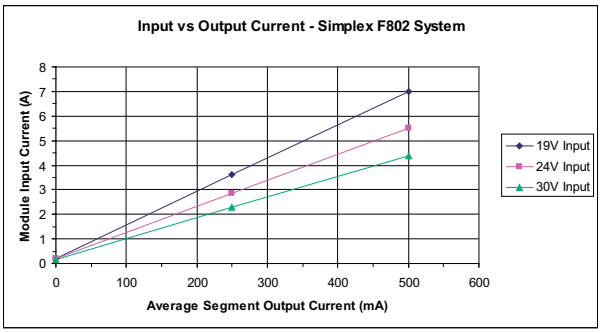
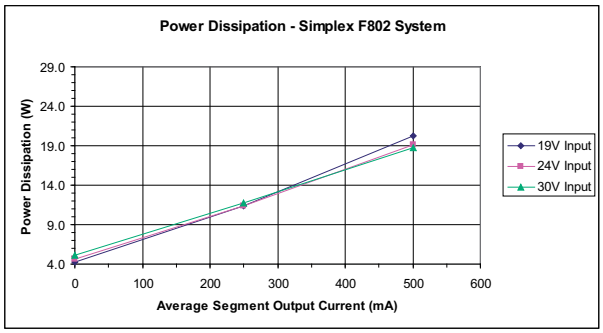


F802 PARAMETERS

a)



b)



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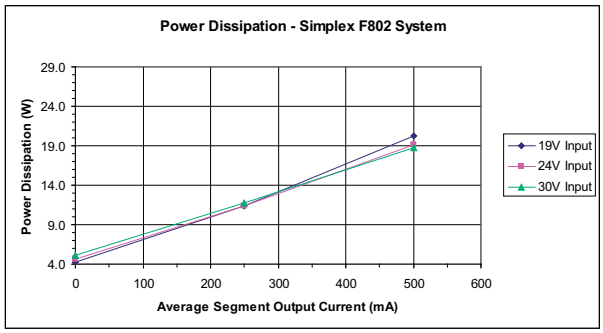

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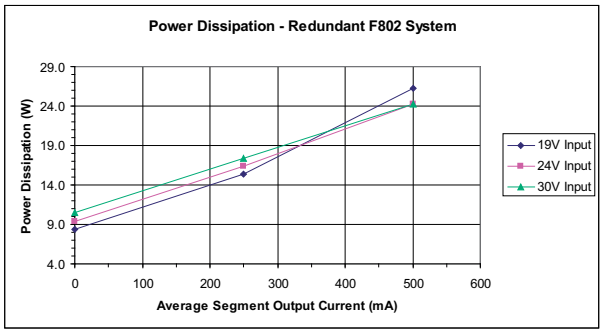
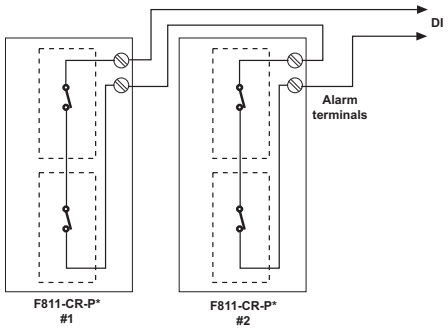
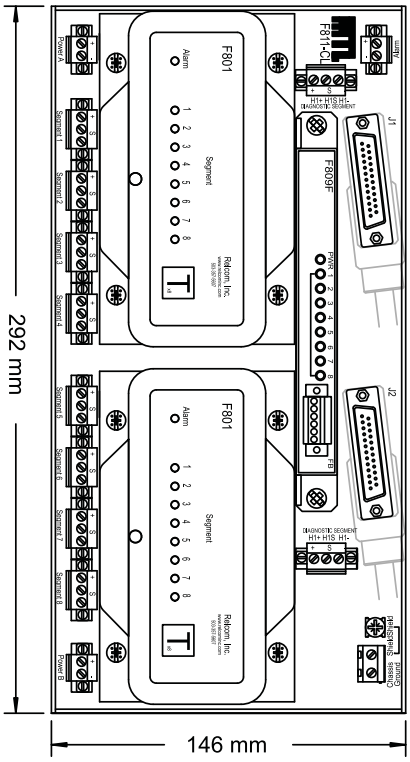


Linking alarm circuits

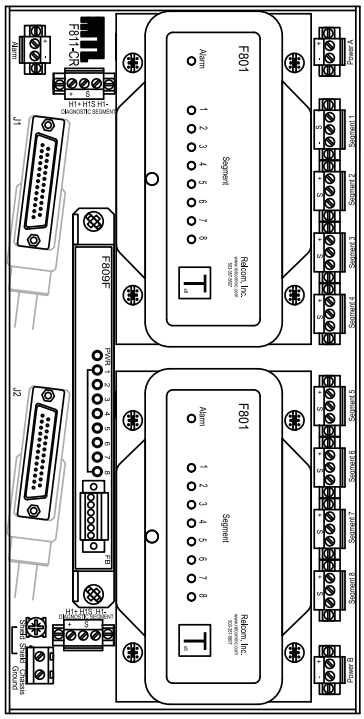


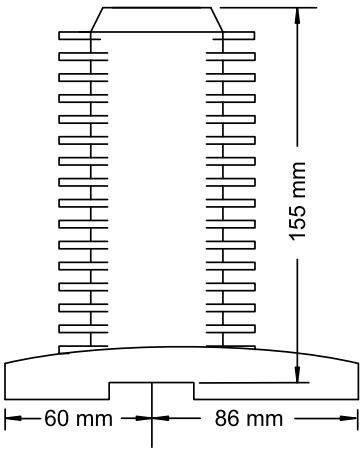
DIMENSIONS (mm)

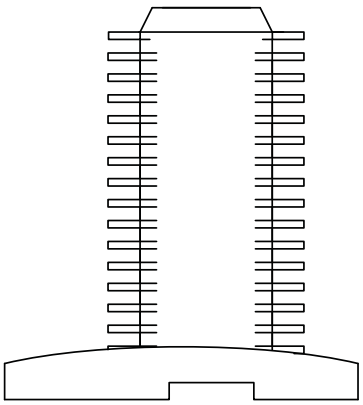
F811-CL



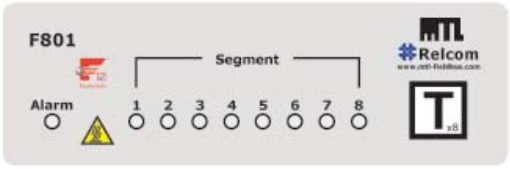
F811-CR

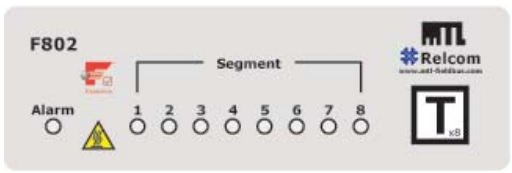






F80x module top panels showing indicators





APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Country	Authority	Standard	Certificate	Approved for	Ratings
–	Fieldbus Foundation™	FF-831	PS001700 (F801) PS001900 (F802)	H1 Profile - 132	–

technical datasheet

F860

redundant fieldbus power for Honeywell Experion "Series C" 4-link FIM

- redundant power for 8 fieldbus segments
- 8-segment redundancy
- “Series C” I/O compatible
- high-density, compact design
- 11.6 inch IOTA format
- highest levels of availability
- fully isolated
- low power dissipation
- remote-alarm facility
- on-line diagnostics option
- F801 output 21.5V, 350mA
- F802 output 28V, 500mA

The F860 is designed to provide redundant power for eight Foundation fieldbus™ H1 segments when used with Honeywell Experion "Series C" Fieldbus Interface Modules (FIMs). The module carrier complies with the mechanical and electrical requirements of 11.6 inch I/O Termination Assemblies (IOTAs), for direct fitting into Honeywell mounting channel. Power for the fieldbus segments is provided by two power modules - F801s or F802s - operating in a redundant configuration. Failure alarms, galvanic isolation, power conditioning and segment termination are incorporated into each F80x module. In simplex applications, a single F80x module may be used. Termination of the fieldbus segments is automatically maintained when single or redundant F80x modules are fitted.

For extreme reliability, the F860 IOTA is passive and only provides interconnections between the power modules and the external connections.

The IOTA has two multi-pin connectors, each of which is connected to a FIM IOTA by mean of a standard system cable. Different lengths are available, to accommodate mounting of the F860 and its respective FIM IOTAs in various locations within a Series C I/O cabinet. Field wiring is connected at the FIM IOTA.

Each F80x module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as recommended by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power conditioners. There is galvanic isolation between the fieldbus segments, thereby preventing segment failure in the event of ground faults in the field wiring.

Each F80x module has indicator LEDs to show both its status and that of the eight segments under power. In normal operation, each green 'Segment' LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the red 'Alarm' LED is lit. An alarm is also triggered by faults inside the F80x modules, or by the loss of 24V DC power to either module. In the alarm condition, fault inputs for segments 1–8 are alerted automatically via dedicated signal lines in the interconnecting cable to the FIM IOTAs. Separate digital input modules are not needed to detect alarms.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the F809F product specification.

Power for the IOTA is taken via mounting screws from 24V DC busbars that are embedded in the Series C mounting channel. Alternatively, for installations in which the internal Series C power supplies are unable to provide sufficient current capacity, two independent (for redundancy) external 24V DC supplies may be connected to the IOTA via two-part pluggable connectors. Each F80x power module is protected by its own replaceable anti-surge fuse, to provide reliable bulk power.

SPECIFICATION

Location of equipment
Safe area

INPUT	F801	F802
Input voltage (DC)	19.2 - 30.0V	19.2 - 30.0V
Current conumption (24V input, all outputs fully loaded)	3.5A*	6A*
Total Power dissipation (24V input, all outputs fully loaded)	20W*	24W*

** Redundant operation*

OUTPUT	F801	F802
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	21.5V - 24.0V	28.0V - 30.0V
Design current (per segment)	0 to 350mA	0 to 500mA
Current limit	> 370mA	> 520mA
Minimum load	0mA	0mA

Isolation

Fieldbus to input power:	250V AC rms withstand
Segment to segment:	200V DC withstand

ALARMS

Alarm contact rating
1A maximum @ 30V DC maximum

Alarm contact status
Normally closed

Alarm threshold	F801	F802
Segment output	<19V DC	<24V DC

POWER INPUT CONNECTIONS

Channel Busbars
Via mounting screws onto busbar

OR

External power supply
Pluggable rising cage-clamp screw terminals
Conductor size: 0.14 to 2.5 mm^2

FIM IOTAS

16-way multipin connectors using FCAB-0x cable
(2 off required)

TERMINATORS

A single termination per segment is provided automatically when using either 1 or 2 power modules.

ENVIRONMENTAL

Ambient temperature	F801	F802
Operating (full load)	−40°C to +65°C	−40°C to +50°C
Operating (60% load)	−40°C to +65°C	−40°C to +65°C
Storage	−40°C to +85°C	−40°C to +85°C

***Note**: Temperature range applies only when mounted on a vertical IOTA channel.*

Ingress protection
IP20 to BS EN60529 (Additional protection by use of enclosure)

MECHANICAL

Mounting method
Standard Honeywell 'Series C' I/O mounting channel

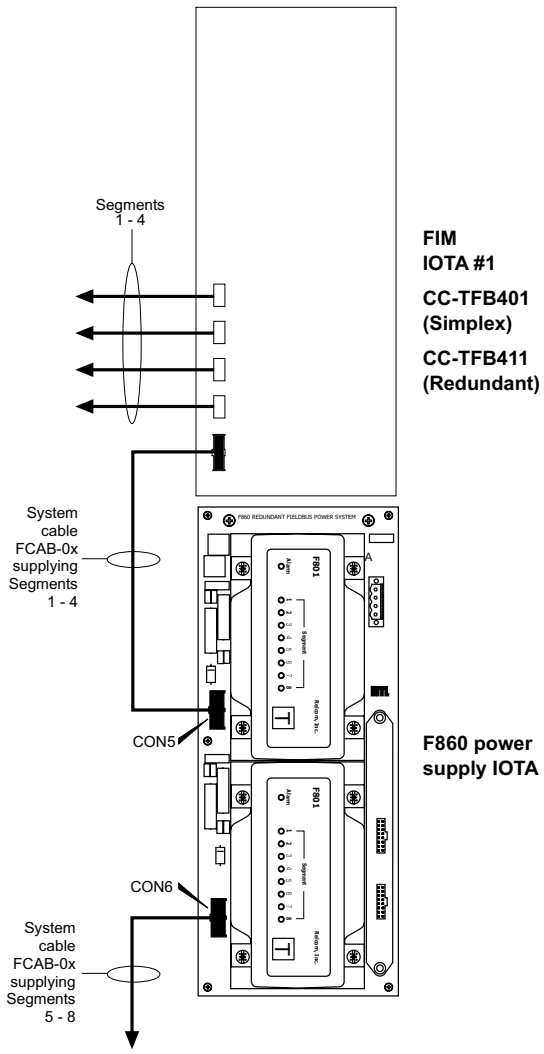
Weights

F801:	1.45kg
F802:	1.50kg
F860-CA:	0.92kg

ELECTRICAL

EMC Compliance
To EN61326:1998 Electrical equiment for measurement, control and laboratory use - EMC requirements

Diagram showing interconnection scheme



PHYSICAL NETWORKS

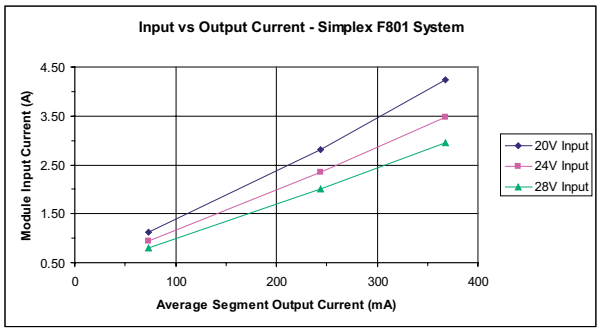
IEC61158-2
ISA-S50.02 Part 2-1992
FOUNDATION™ fieldbus H1
Profibus PA

ORDERING INFORMATION

DESCRIPTION	PART NO
IOTA, unpopulated	F860-CA
8-segment power module: 21.5V, 350mA	F801
8-segment power module: 28V, 500mA	F802
IOTA power cable, 30cm	FCAB-05
IOTA power cable, 1m	FCAB-06
IOTA power cable, 2m	FCAB-07
IOTA power cable, 4m	FCAB-08
F860 system comprising two F801 modules and an F860-CA IOTA	F860
F860 system comprising two F802 modules and an F860-CA IOTA	F860-2

F801 PARAMETERS

a)



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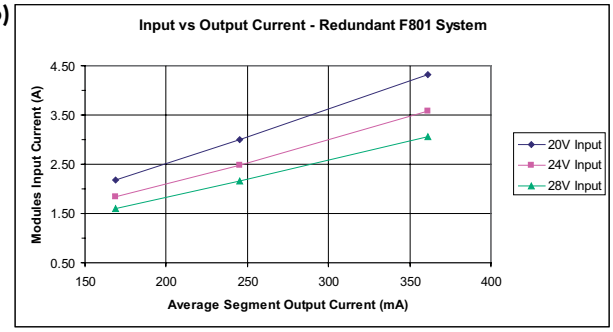

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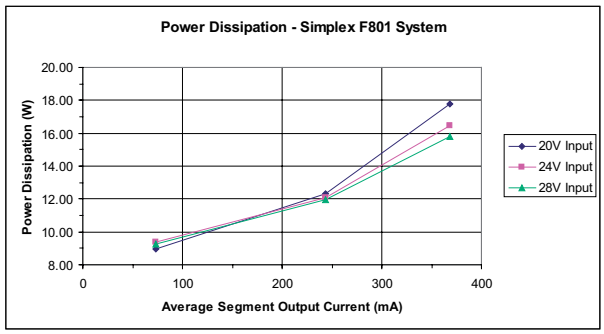
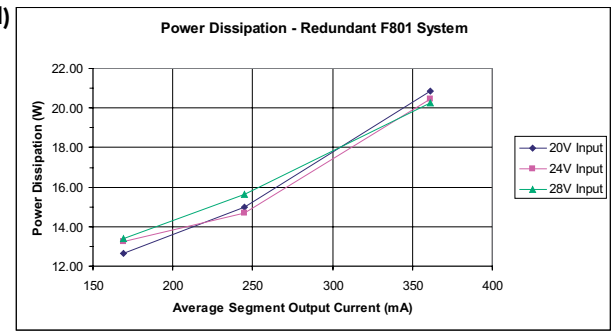
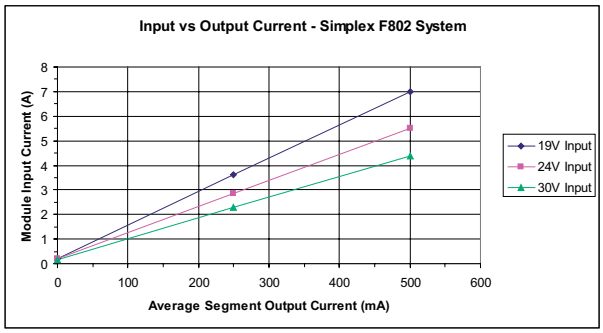


d)



F802 PARAMETERS

a)



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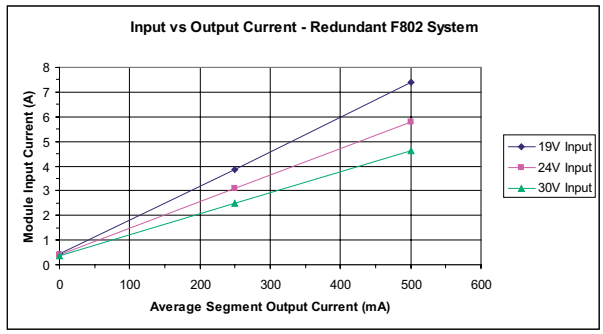

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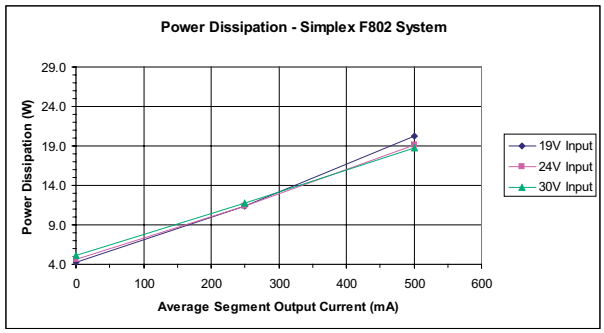

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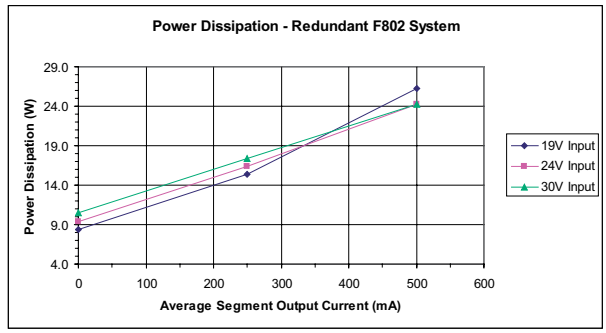

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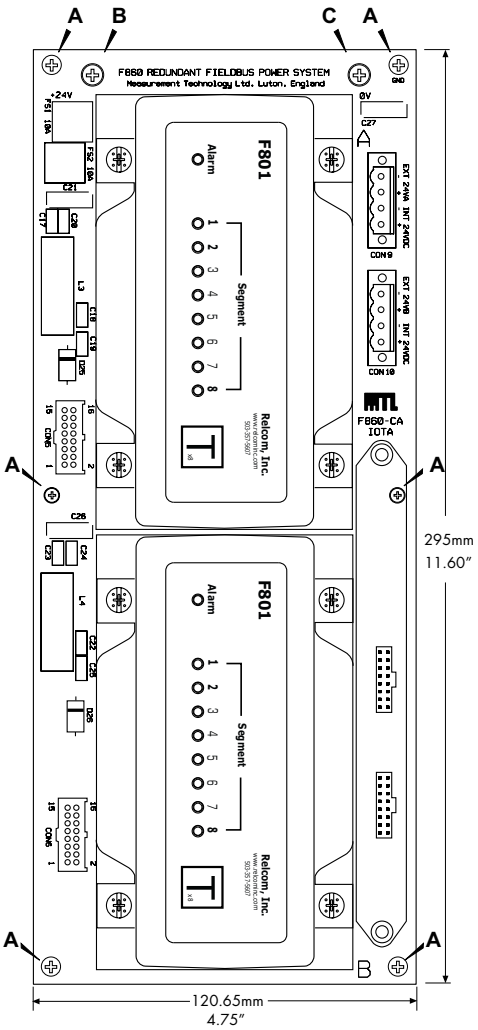
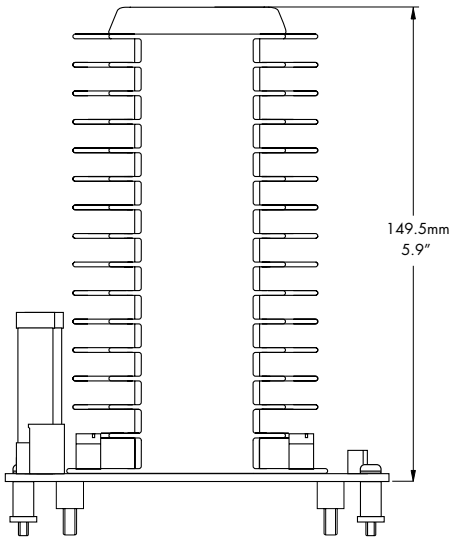
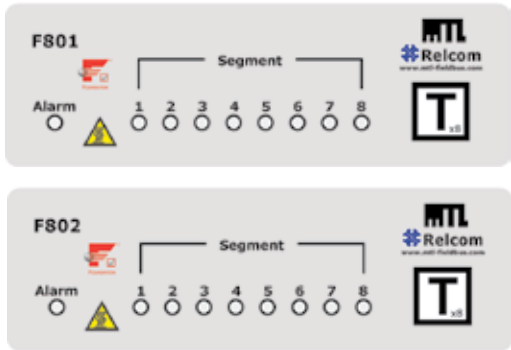
F860 DIMENSIONS





CAD drawings are available on-line at www.mtl-fieldbus.com

F80x module top panels showing indicators



APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Country	Authority	Standard	Certificate	Approved for	Ratings
–	Fieldbus Foundation™	FF-831	PS001700 (F801) PS001900 (F802)	H1 Profile - 132	–

technical datasheet

F880

redundant fieldbus power for Yokogawa CENTUM 3000 R3 Control System

- Integrated redundant fieldbus power for ALF111 FOUNDATION™ fieldbus cards
- 8-segment redundancy
- High-density, compact design
- Fully isolated
- Hot swappable power modules*
- Low power dissipation
- Zero component carrier
- On-line diagnostics option
- Redundant power & conditioning
- Vertical DIN-rail mounting
- F801 output 21.5V, 350mA
- F802 output 28V, 500mA

The F880 fieldbus power system is designed to provide redundant power for eight FOUNDATION™ fieldbus H1 segments when used with Yokogawa ALF111 fieldbus cards. The F880 module carrier has system connectors for direct connection to two redundant pairs of fieldbus cards using Yokogawa AKB336 cables.

Power for the fieldbus segments is provided by two power modules - F801s or F802s - operating in a redundant configuration (load sharing). Failure alarms, galvanic isolation, power conditioning and segment termination are incorporated into each F80x module. In simplex applications, a single F80x module may be used. Termination of the fieldbus segments is automatically maintained when single or redundant F80x modules are fitted.

For extreme reliability, the module carrier has no components and only provides interconnections between the power modules and external connections. It is supported in a rigid metal frame that protects the circuit board from mechanical damage. Secure DIN-rail mounting is provided by integrated fixings.

Each F80x module monitors the output of the eight fieldbus segments and indicates an alarm, by means of a built-in, normally closed relay, if any of the segments is shorted or below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also annunciated. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the F880-Cx carrier. A separate alarm module is not required for this function. LED indicators also show the status of each F80x module and the eight individual segments. In normal operation, each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the F809F product specification.

The F80x module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for fieldbus power supplies. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment. Each segment has its own fieldbus power conditioner and current limitation.

Redundant 24V DC (nom.) input power is connected to the F880 carrier using two-part pluggable connectors. Field wiring connections are available with either pluggable screw terminals (F880-xS) or pluggable spring clamp terminals (F880-xC).

Three variants of carriers are available in the F880 family. The F880-CA-Px carrier provides terminal numbering and consistent connector polarity. Where two columns of F880-CA-Px are installed in a cabinet the carrier is rotated by 180 degrees for installation in the second column. Alternatively, if there is a requirement for cabinet wiring to be symmetrical, there are lefthand (F880-CL-Px) and righthand (F880-CR-Px) versions.

* *Gas clearance certificate needed in Zone 2 hazardous areas*

SPECIFICATION

Location of equipment

Safe area,
Class I Div 2 Groups ABCD T4 or
Class I Zone 2 IIC T4

INPUT	F801	F802
Input voltage (DC)	19.2 - 30.0V	19.2 - 30.0V
Current consumption (24V input, all outputs fully loaded)	3.5A*	6A*
Total Power dissipation (24V input, all outputs fully loaded)	20W*	24W*

** Redundant operation*

OUTPUT	F801	F802
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	21.5V - 24.0V	28.0V - 30.0V
Design current (per segment)	0 to 350mA	0 to 500mA
Current limit	> 370mA	> 520mA
Minimum load	0mA	0mA

Isolation

Fieldbus to input power: 250V AC rms withstand
Segment to segment: 200V DC withstand

ALARMS

Alarm contact rating

1A maximum @ 30V DC maximum

Alarm contact status

Normally closed

Alarm threshold	F801	F802
Segment output	<19V DC	<24V DC

ELECTRICAL CONNECTIONS

System connectors

Host 1A, Host 1B, Host 2A, Host 2B via AKB336 cables to ALF111 modules

Field, Power & Alarm terminals

Pluggable rising cage-clamp screw terminals (-PS)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp screw terminals (-PC)
Conductor size: 0.2 to 2.5 mm^2

Diagnostics and ground terminals

Fixed screw terminal connector 0.14 to 2.5 mm^2

Cable screen ground connections *(version D.0 or higher)*

User-selectable jumper for segment shields: isolated (default) or interconnected and ground connection

Terminators

A single termination is provided automatically when using either 1 or 2 power modules

ENVIRONMENTAL

Ambient temperature	F801	F802
Operating (full load)	−40°C to +65°C	−40°C to +50°C
Operating (60% load)	−40°C to +65°C	−40°C to +65°C
Storage	−40°C to +85°C	−40°C to +85°C

***Note**: Temperature range applies only when mounted on a vertical DIN rail.*

Ingress protection

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

MECHANICAL

Mounting method

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

Weights

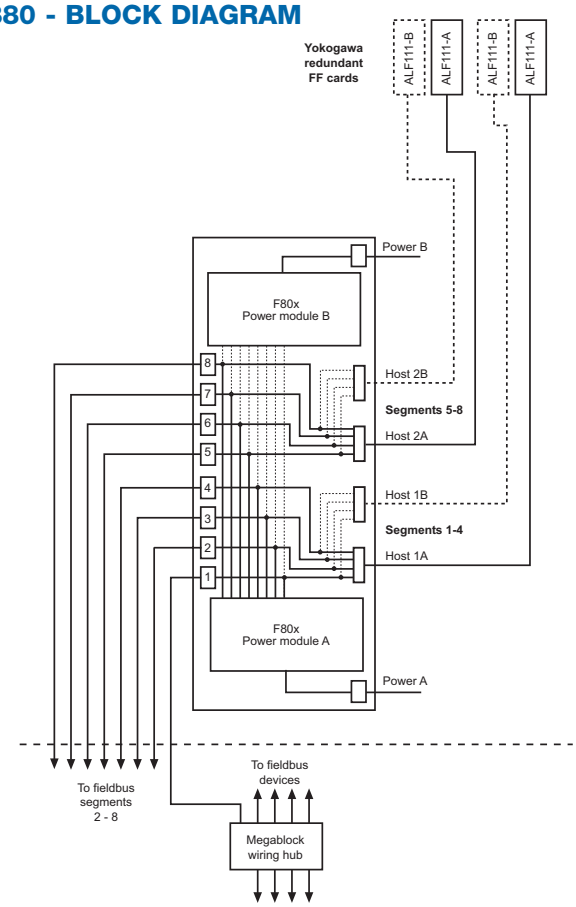
F801: 1.45kg
F802: 1.50kg
F880-C*-P*: 0.92kg

ELECTRICAL

EMC Compliance

To EN61326:1998 Electrical equiment for measurement, control and laboratory use - EMC requirements.

F880 - BLOCK DIAGRAM



The above diagram shows a block diagram of how the F880 is wired. Note that the Chassis Ground and Alarm connection are not shown. The Diagnostic module is also not shown (see the F809F product specification). For detailed wiring information see the Installation Instructions for the F880 (Document number 502-089).

PHYSICAL NETWORKS

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

ORDERING INFORMATION

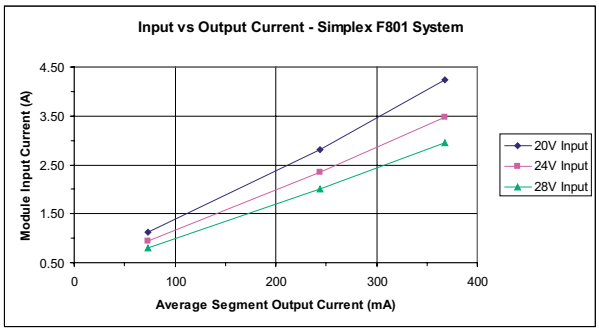
DESCRIPTION	PART NO.
Carrier, unpopulated	F880-CA-P*
Left hand carrier, unpopulated	F880-CL-P*
Right hand carrier, unpopulated	F880-CR-P*
8-segment power module: 21.5V, 350mA	F801
8-segment power module: 28V, 500mA	F802
Blanking modules included with -NR systems	F800-BLK
Fieldbus diagnostic module	F809F

	with F801	with F802
F880-CA-P*and two F80x modules	F880-P*	F880-2-P*
F880-CL-P*and two F80x modules	F880-L*	F880-2-L*
F880-CR-P*and two F80x modules	F880-R*	F880-2-R*
F880-CA-P*and one F80x module	F880-P*-NR	F880-2-P*-NR
F880-CL-P*and one F80x module	F880-L*-NR	F880-2-L*-NR
F880-CR-P*and one F80x module	F880-R*-NR	F880-2-R*-NR

* = S or C S = Pluggable Screw Terminal Connectors
C = Pluggable Spring Clamp Connectors

F801 PARAMETERS

a)



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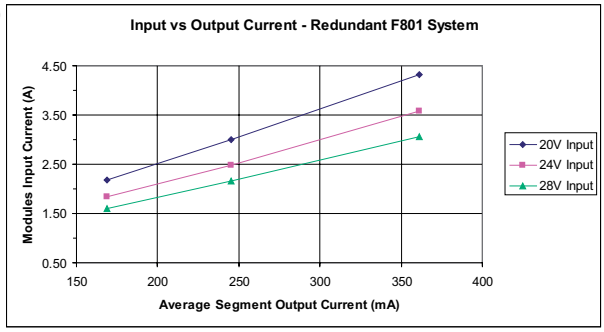

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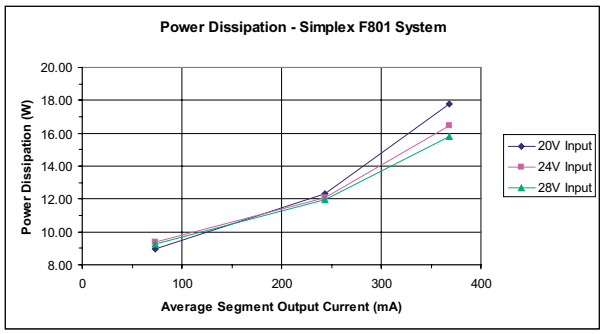
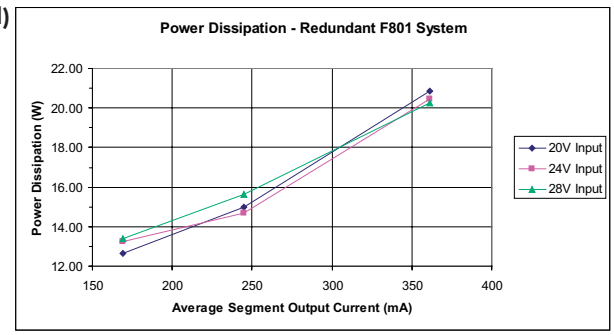
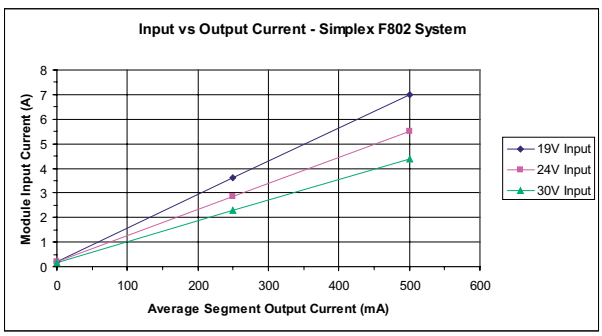


d)

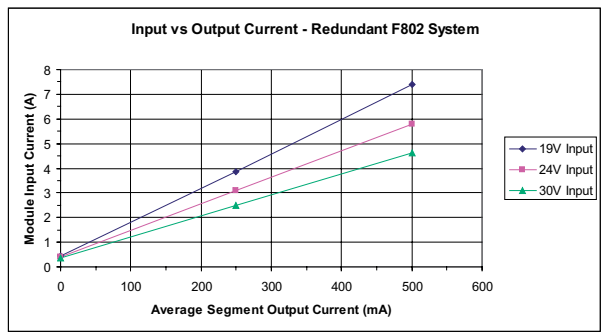


F802 PARAMETERS

a)



b)



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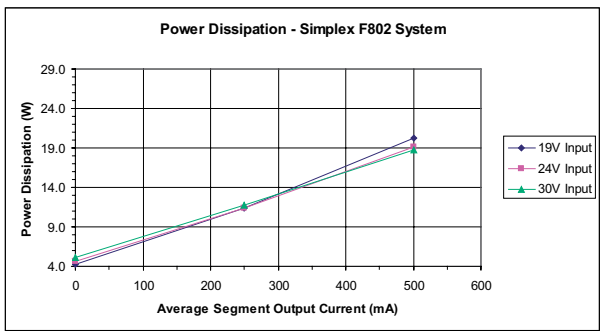

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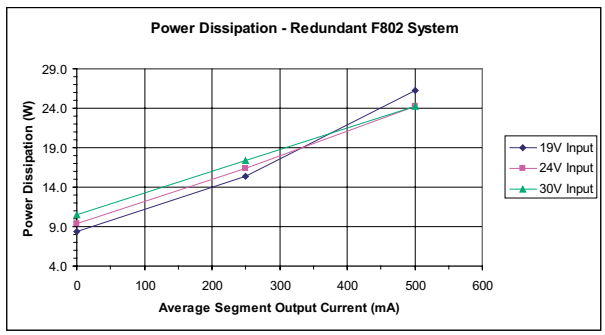
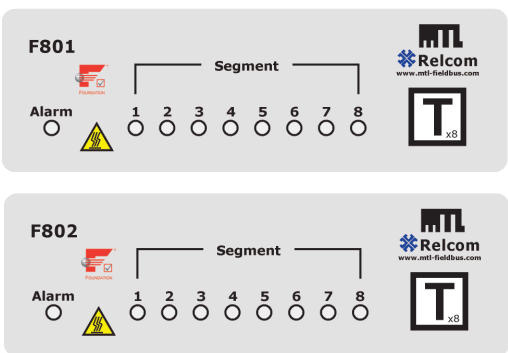
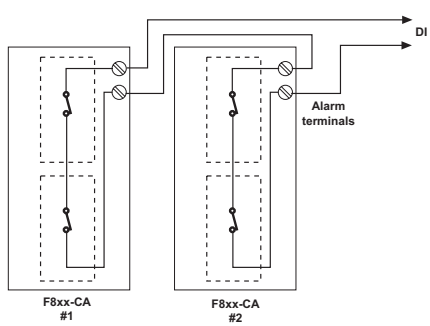


F80x module top panels showing indicators

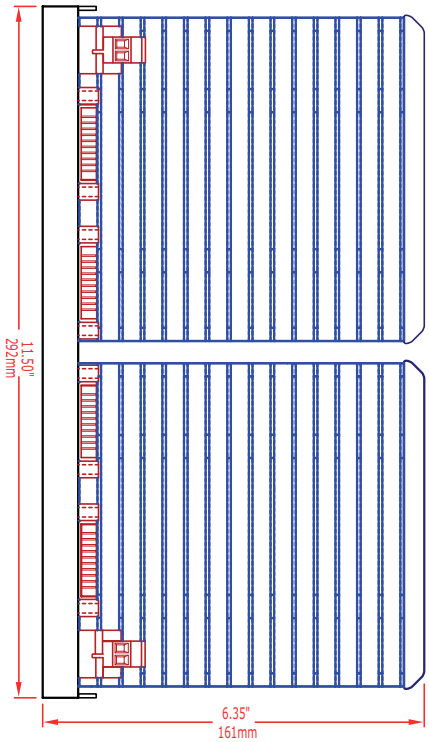


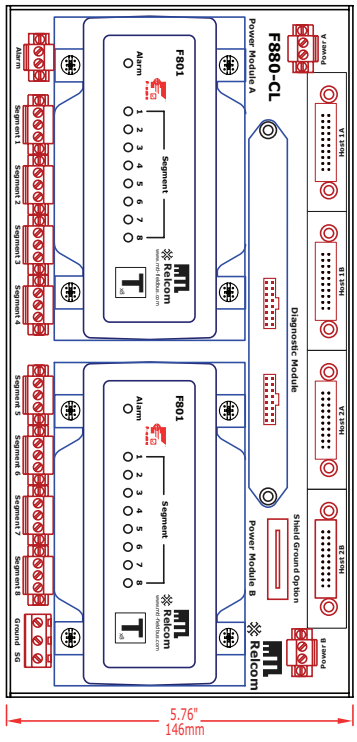
Linking alarm circuits

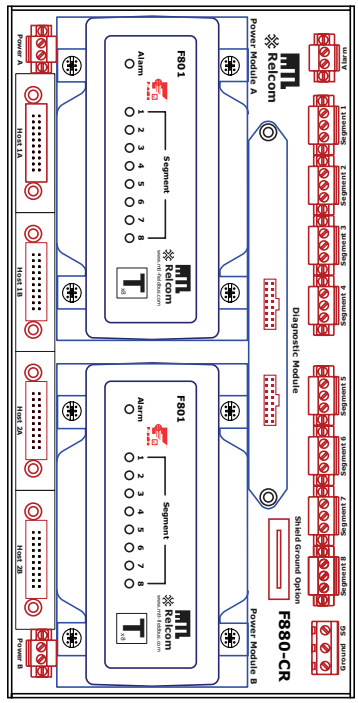


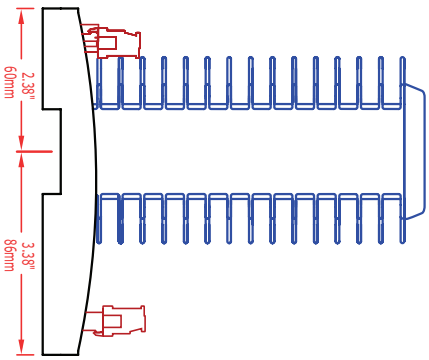
The given data is only intended as a product description and should not be regarded as a legal warranty of properties or guarantee. In the interest of further technical developments, we reserve the right to make design changes.

F880-L* & F880-R* DIMENSIONS









The Shield Ground Option is available on revision D.0 and later units.

CAD drawings are available on-line at www.mtl-fieldbus.com

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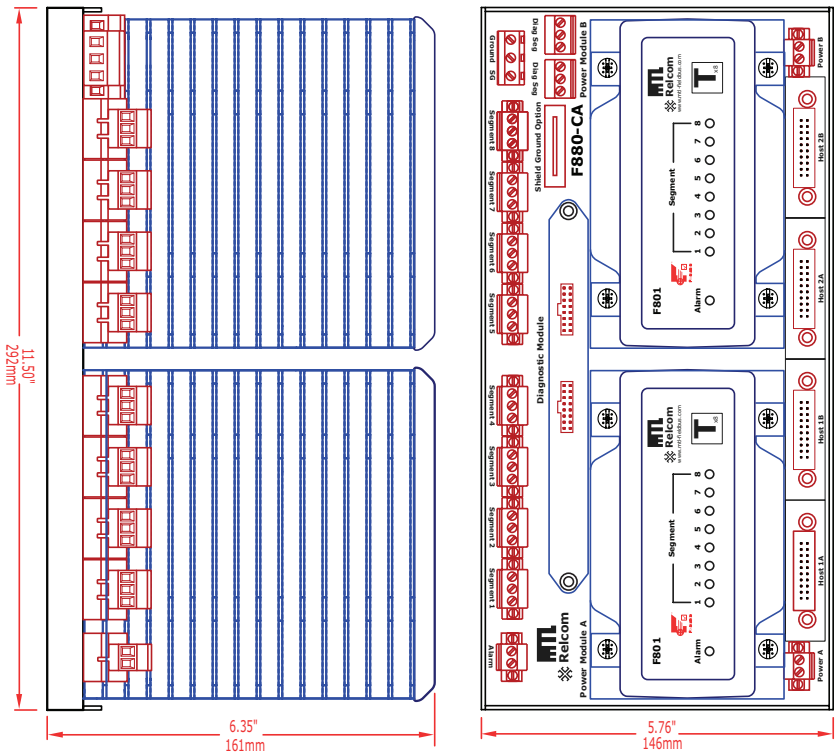
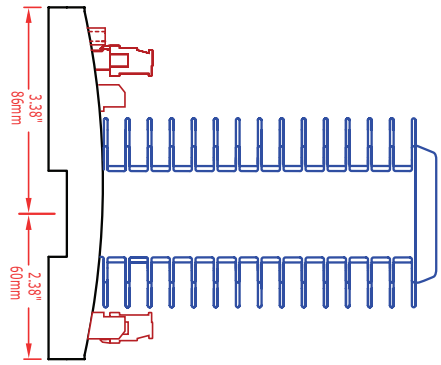
F880-P* DIMENSIONS





Only units produced after date code 1012 include the Diagnostic Segment connectors.

The Shield Ground Option is available on revision D.0 and later units.

CAD drawings are available on-line at www.mtl-fieldbus.com

APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Region (Authority)	Standard	Certificate	Approved for	Ratings
EU (Relcom)	EN61326		Class A Industrial Locations	CE
(Fieldbus Foundation™)	FF-831	PS001700 - (F801) PS001900 - (F802)		Power Supply Type 132
US (FM)	3600, 3611, 3610	3025124 - (F801) 3033657 - (F802)	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	Vmax = 24V (F801) = 30V (F802)
Canada (FM)	C22.2 No. 213 C22.2 No. 142	3025124C - (F801) 3033657C - (F802)	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	Vmax = 24V (F801) = 30V (F802)
EU (Relcom)	IEC 60079-0:2004 IEC 60079-15:2005	RELC07ATEX1002X (F801 + F802)	Ex nA IIC T4	Uo = 24V (F801) = 30V (F802)

technical datasheet

F880-RT

redundant fieldbus power for Yokogawa CENTRUM 3000 R3 Control System

- Integrated redundant fieldbus power for ALF111 FOUNDATION™ fieldbus cards
- 8-segment redundancy
- High-density, compact design
- Fully isolated
- Hot swappable power modules*
- Low power dissipation
- Zero component carrier
- On-line diagnostics option
- Redundant power & conditioning
- Vertical DIN-rail mounting
- F801 output 21.5V, 350mA
- F802 output 28V, 500mA

FOUNDATION

The F880-RT fieldbus power system is designed to provide redundant power for eight FOUNDATION™ fieldbus H1 segments when used with Yokogawa ALF111 fieldbus cards. The F880-CA-RT module carrier has system connectors for direct connection to two redundant pairs of fieldbus cards using Yokogawa AKB336 cables.

Power for the fieldbus segments is provided by two power modules - F801s or F802s - operating in a redundant configuration (load sharing). Failure alarms, galvanic isolation, power conditioning and segment termination are incorporated into each F80x module. In simplex applications, a single F80x module may be used. Termination of the fieldbus segments is automatically maintained when single or redundant F80x modules are fitted.

For extreme reliability, the module carrier has no components and only provides interconnections between the power modules and external connections. It is supported in a rigid metal frame that protects the circuit board from mechanical damage. Secure DIN-rail mounting is provided by integrated fixings.

Each F80x module monitors the output of the eight fieldbus segments and indicates an alarm, by means of a built-in, normally closed relay, if any of the segments is shorted or below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also annunciated. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the F880-CA-RT carrier. A separate alarm module is not required for this function. LED indicators also show the status of each F80x module and the eight individual segments. In normal operation, each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the F809F product specification.

The F80x module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for fieldbus power supplies. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment. Each segment has its own fieldbus power conditioner and current limitation.

Redundant 24V DC (nom.) input power is connected to the F880-CA-RT carrier using ring terminals that are attached to the barrier strip on the carrier. Field wiring connections are made in the same manner.

SPECIFICATION

Location of equipment
Safe area,
Class I Zone 2 IIC T4

INPUT	F801	F802
Input voltage (DC)	19.2 - 30.0V	19.2 - 30.0V
Current consumption (24V input, all outputs fully loaded)	3.5A*	6A*
Total Power dissipation (24V input, all outputs fully loaded)	20W*	24W*

** Redundant operation*

OUTPUT	F801	F802
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	21.5V - 24.0V	28.0V - 30.0V
Design current (per segment)	0 to 350mA	0 to 500mA
Current limit	> 370mA	> 520mA
Minimum load	0mA	0mA
Isolation		
Fieldbus to input power:	250V AC rms withstand	
Segment to segment:	200V DC withstand	

ALARMS

Alarm contact rating
1A maximum @ 30V DC maximum

Alarm contact status
Normally closed

Alarm threshold	F801	F802
Segment output	<19V DC	<24V DC

ELECTRICAL CONNECTIONS

System connectors
Host 1A, Host 1B, Host 2A, Host 2B via AKB336 cables to ALF111 modules

Fieldbus Wiring
Segments 1–8, 2-way barrier strip for use with ring terminals.

Fieldbus Power Input
Power A, Power B, 2-way barrier strip for use with ring terminals

Chassis ground and Alarm contacts
2-way barrier strip for use with ring terminals

Note*: Barrier strip supports up to 8mm ring terminals with hole sizes from 3.5mm to 5.0mm*

ENVIRONMENTAL

Ambient temperature	F801	F802
Operating (full load)	−40°C to +65°C	−40°C to +50°C
Operating (60% load)	−40°C to +65°C	−40°C to +65°C
Storage	−40°C to +85°C	−40°C to +85°C

Note: Temperature range applies only when mounted on a vertical DIN rail.

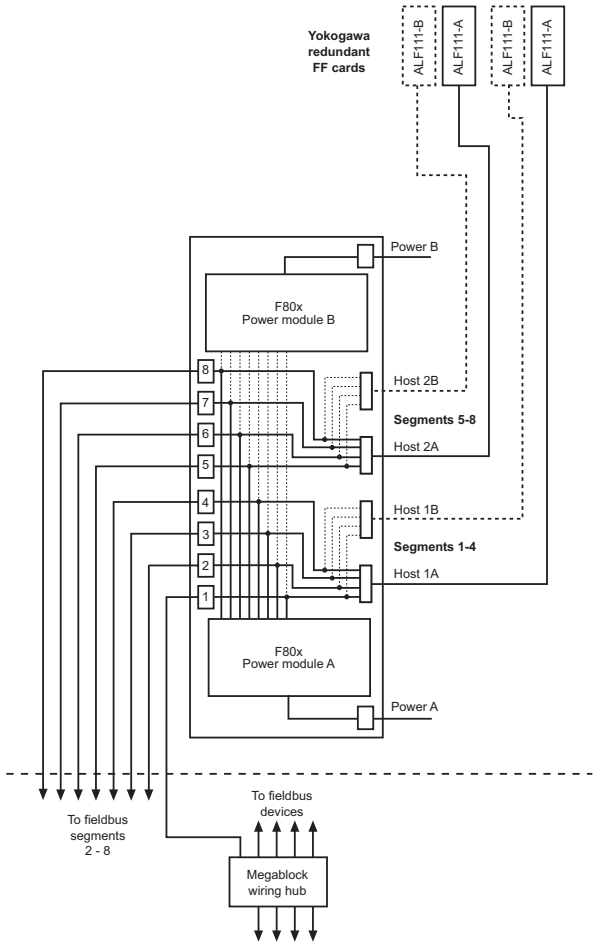
Ingress protection
IP20 to BS EN60529 (Additional protection by use of enclosure)

MECHANICAL

Mounting method
Integrated fixings for 'Top hat' DIN rail, 35mm x 7.5mm to EN50022

ELECTRICAL

EMC Compliance
To EN61326:1998 Electrical equiment for measurement, control and laboratory use - EMC requirements



The above diagram shows a block diagram of how the F880-CA-RT is wired. Note that the Chassis Ground and Alarm connection are not shown. The Diagnostic module is also not shown (see the F809F product specification).

For detailed wiring information see the Installation Instructions for the F880-RT (Document number 502-139).

PHYSICAL NETWORKS

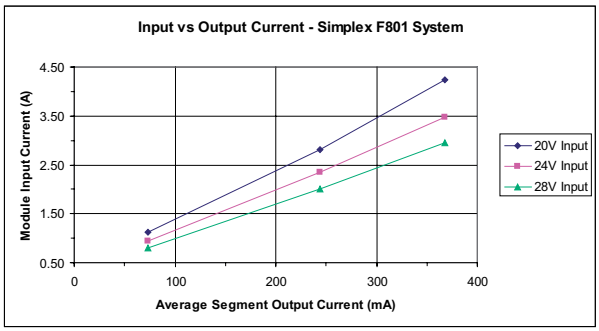
IEC61158-2
ISA-S50.02 Part 2-1992
FOUNDATION™ fieldbus H1
Profibus PA

ORDERING INFORMATION

DESCRIPTION	PART NO.
Carrier, unpopulated	**F880-CA-RT**
8-segment power module: 21.5V, 350mA	**F801**
8-segment power module: 28V, 500mA	**F802**
F880-CA-RT and two F801 modules	**F880-RT**
F880-CA-RT and one F801 module	**F880-RT-NR**
F880-CA-RT and two F802 modules	**F880-2-RT**
F880-CA-RT and one F802 module	**F880-2-RT-NR**
Blanking modules included with -NR systems	**F800-BLK**
Fieldbus diagnostic module	**F809F**

F801 PARAMETERS

a)



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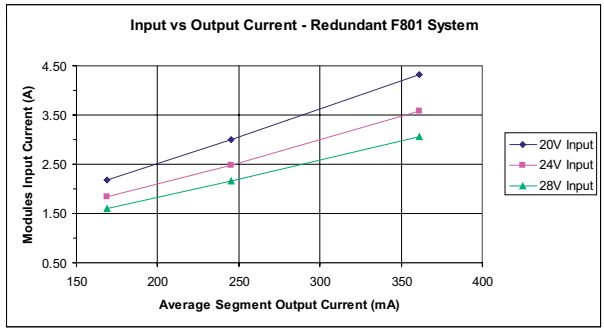

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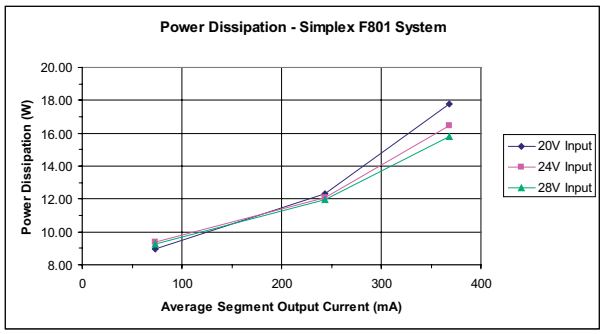

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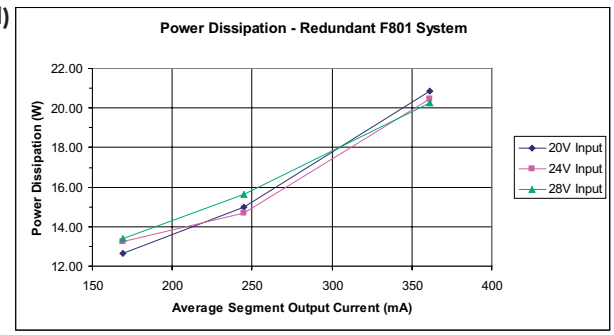
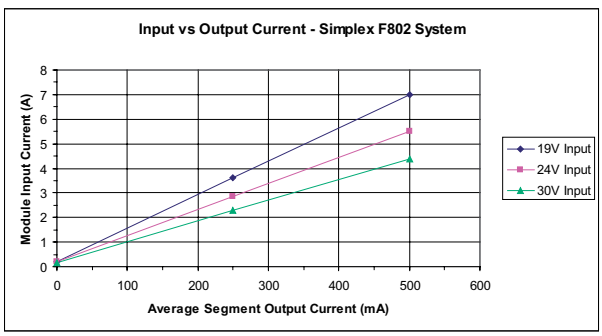


F802 PARAMETERS

a)



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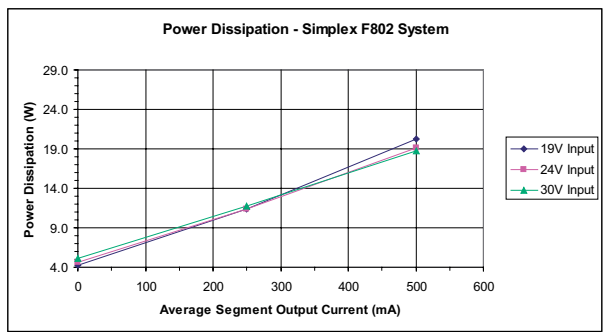

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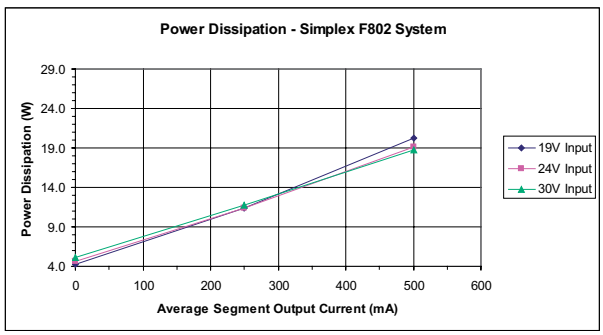

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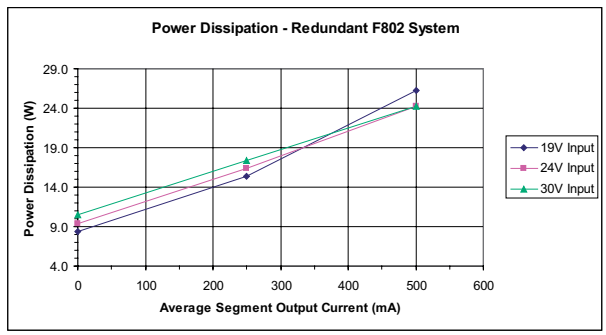
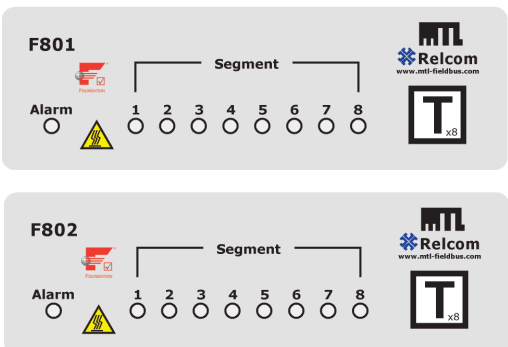
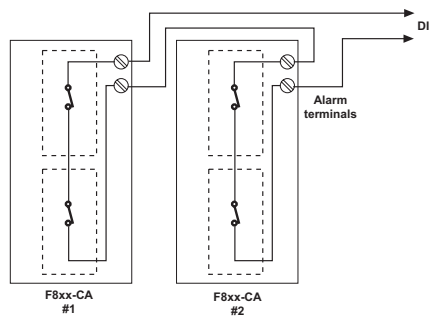


F80x module top panels showing indicators

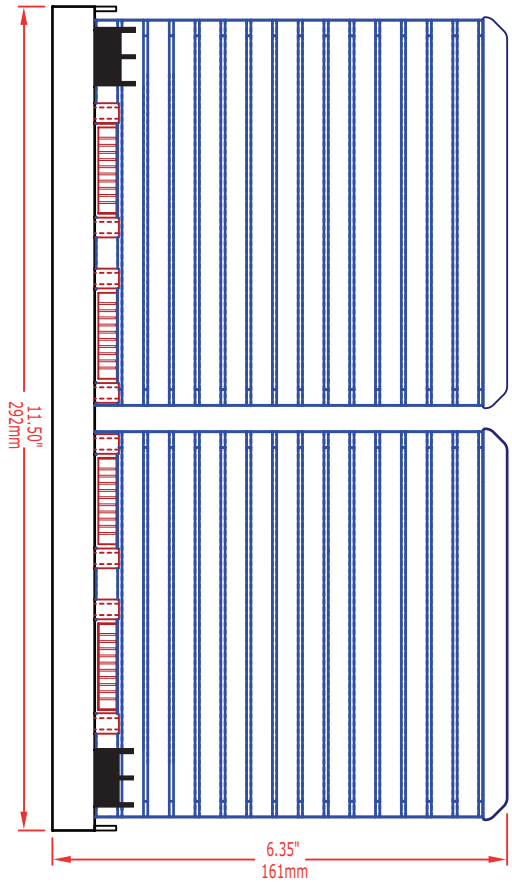


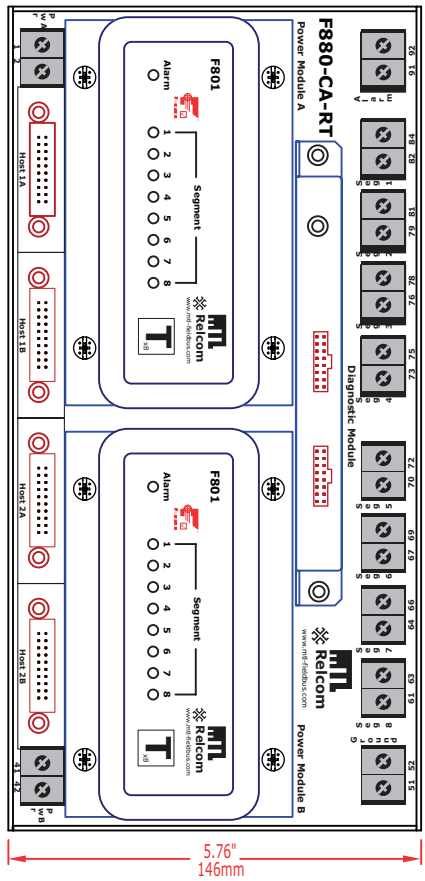
Linking alarm circuits

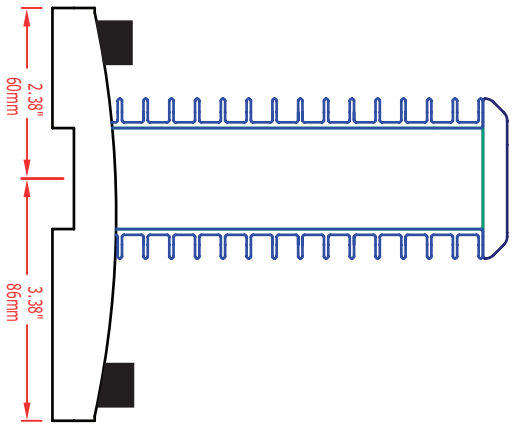


The given data is only intended as a product description and should not be regarded as a legal warranty of properties or guarantee. In the interest of further technical developments, we reserve the right to make design changes.

F880-RT DIMENSIONS







Shown using F801 power modules. Overall dimensions are the same when F802 modules are fitted.

CAD drawings are available on-line at www.mtl-fieldbus.com

APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

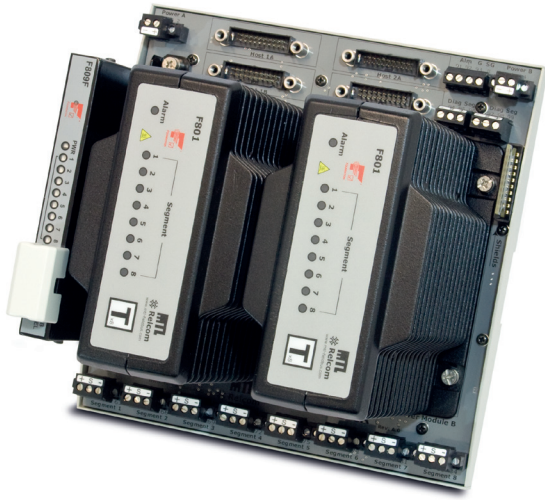
Region (Authority)	Standard	Certificate	Approved for	Ratings
EU (Relcom)	EN61326		Class A Industrial Locations	CE
(Fieldbus Foundation™)	FF-831	PS001700 - (F801) PS001900 - (F802)		Power Supply Type 132
EU (Relcom)	IEC 60079-0:2004 IEC 60079-15:2005	RELC07ATEX1002X (F801 + F802)	Ex nA IIC T4	Uo = 24V (F801) = 30V (F802)

technical datasheet

F882

redundant fieldbus power for Yokogawa CENTUM 3000 R3 Control System

- Integrated redundant fieldbus power for ALF111 FOUNDATION™ fieldbus cards
- 8-segment redundancy
- High-density, compact design
- Fully isolated
- Hot swappable power modules*
- Low power dissipation
- Zero component carrier
- On-line diagnostics option
- Redundant power & conditioning
- Horizontal DIN-rail mounting
- F801 output 21.5V, 350mA
- F802 output 28V, 500mA



FOUNDATION

The F882 fieldbus power system is designed to provide redundant power for eight FOUNDATION™ fieldbus H1 segments when used with Yokogawa ALF111 fieldbus cards. The F882 module carrier has system connectors for direct connection to two redundant pairs of fieldbus cards using Yokogawa AKB336 cables.

Power for the fieldbus segments is provided by two power modules - F801s or F802s - operating in a redundant configuration (load sharing). Failure alarms, galvanic isolation, power conditioning and segment termination are incorporated into each F80x module. In simplex applications, a single F80x module may be used. Termination of the fieldbus segments is automatically maintained when single or redundant F80x modules are fitted.

For extreme reliability, the module carrier has no components and only provides interconnections between the power modules and external connections. It is supported in a rigid metal frame that protects the circuit board from mechanical damage. Secure DIN-rail mounting is provided by integrated fixings.

Each F80x module monitors the output of the eight fieldbus segments and indicates an alarm, by means of a built-in, normally closed relay, if any of the segments is shorted or below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also annunciated. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the F882-CA-P* carrier. A separate alarm module is not required for this function. LED indicators also show the status of each F80x module and the eight individual segments. In normal operation, each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the F809F product specification.

The F80x module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for fieldbus power supplies. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment. Each segment has its own fieldbus power conditioner and current limitation.

Redundant 24V DC (nom.) input power is connected to the F882 carrier using two-part pluggable connectors. Field wiring connections are available with either pluggable screw terminals (F882-PS) or pluggable spring clamp terminals (F882-PC).

* *Gas clearance certificate needed in Zone 2 hazardous areas*

SPECIFICATION

Location of equipment

Safe area,
Class I Div 2 Groups ABCD T4 or
Class I Zone 2 IIC T4

INPUT	F801	F802
Input voltage (DC)	19.2 - 30.0V	19.2 - 30.0V
Current consumption (24V input, all outputs fully loaded)	3.5A*	6A*
Total Power dissipation (24V input, all outputs fully loaded)	20W*	24W*

** Redundant operation*

OUTPUT	F801	F802
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	21.5V - 24.0V	28.0V - 30.0V
Design current (per segment)	0 to 350mA	0 to 500mA
Current limit	> 370mA	> 520mA
Minimum load	0mA	0mA

Isolation

Fieldbus to input power: 250V AC rms withstand
Segment to segment: 200V DC withstand

ALARMS

Alarm contact rating

1A maximum @ 30V DC maximum

Alarm contact status

Normally closed

Alarm threshold	F801	F802
Segment output	<19V DC	<24V DC

ELECTRICAL CONNECTIONS

System connectors

Host 1A, Host 1B, Host 2A, Host 2B via AKB336 cables to ALF111 modules

Field & Power terminals

Pluggable rising cage-clamp screw terminals (-PS)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp screw terminals (-PC)
Conductor size: 0.2 to 2.5 mm^2

Alarm, Diagnostics and Ground terminals

Fixed screw terminal connector 0.14 to 2.5 mm^2

Cable screen ground connections

User-selectable jumper for segment shields: isolated (default) or interconnected and ground connection

Terminators

A single termination is provided automatically when using either 1 or 2 power modules

ENVIRONMENTAL

Ambient temperature	F801	F802
Operating (full load)	−40°C to +65°C	−40°C to +50°C
Operating (60% load)	−40°C to +65°C	−40°C to +65°C
Storage	−40°C to +85°C	−40°C to +85°C

***Note**: Temperature range applies only when mounted on a vertical DIN rail.*

Ingress protection

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

MECHANICAL

Mounting method

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

Weights

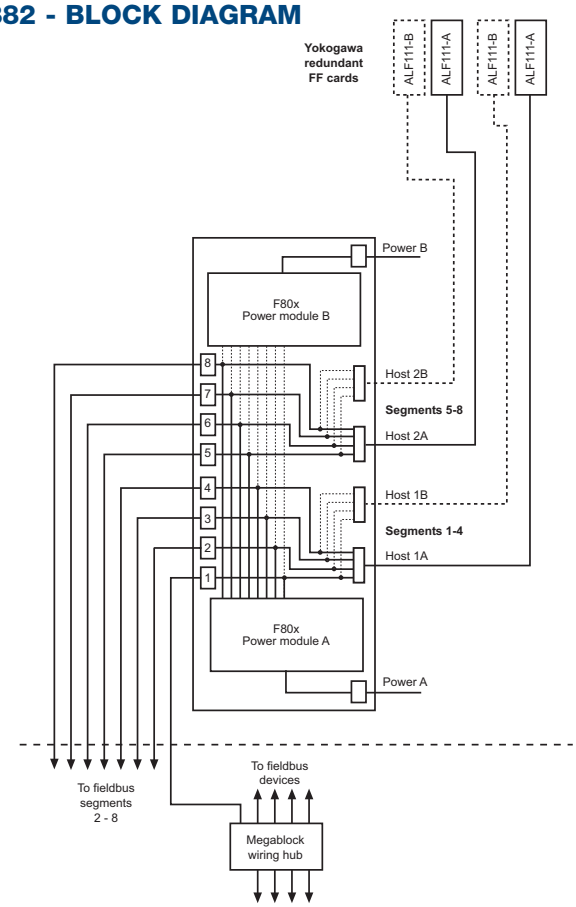
F801: 1.45kg
F802: 1.50kg
F882-CA-P*: 1.10kg

ELECTRICAL

EMC Compliance

To EN61326:1998 Electrical equiment for measurement, control and laboratory use - EMC requirements.

F882 - BLOCK DIAGRAM



The above diagram shows a block diagram of how the F882 is wired. Note that the Chassis Ground and Alarm connection are not shown. The Diagnostic module is also not shown (see the F809F product specification). For detailed wiring information see the Installation Instructions for the F882 (Document number 502-570).

PHYSICAL NETWORKS

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

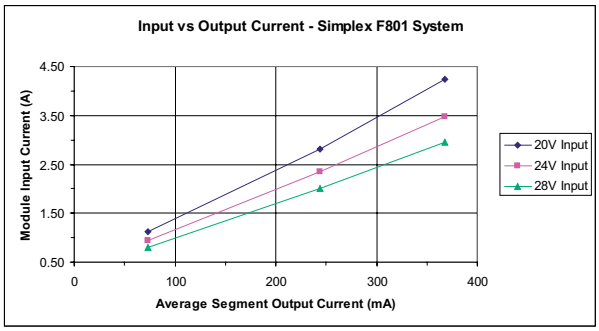
ORDERING INFORMATION

DESCRIPTION	PART NO
Carrier, unpopulated	F882-CA-P*
8-segment power module: 21.5V, 350mA	F801
8-segment power module: 28V, 500mA	F802
F882-CA-P*and two F801 modules	F882-P*
F882-CA-P*and one F801 module	F882-P*-NR
F882-CA-P*and two F802 modules	F882-2-P*
F882-CA-P*and one F802 module	F882-2-P*-NR
Blanking modules included with -NR systems	F800-BLK
Fieldbus diagnostic module	F809F

* = S or C S = Pluggable Screw Terminal Connectors
C = Pluggable Spring Clamp Connectors

F801 PARAMETERS

a)



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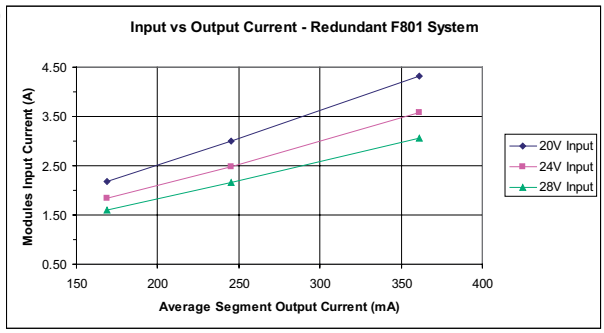

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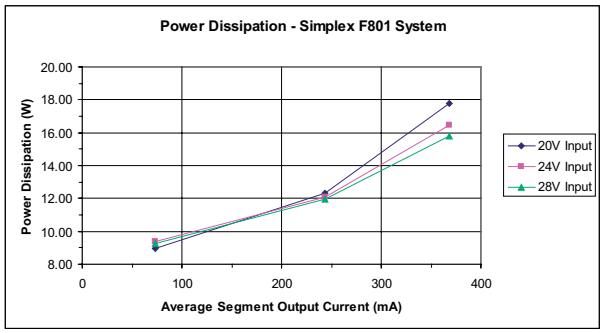

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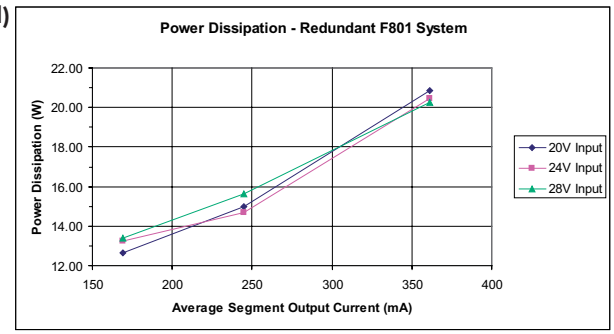
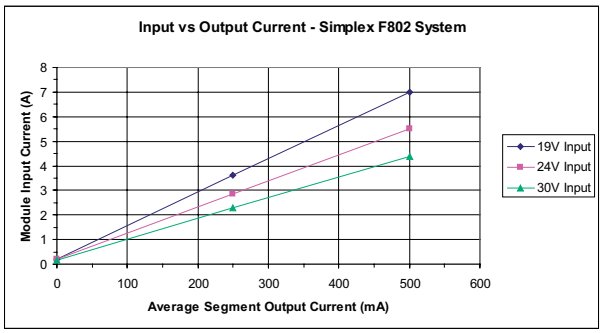


F802 PARAMETERS

a)



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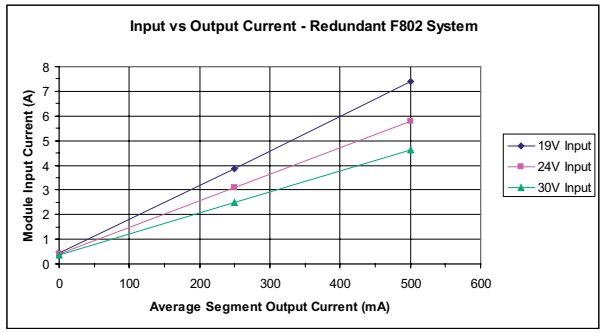

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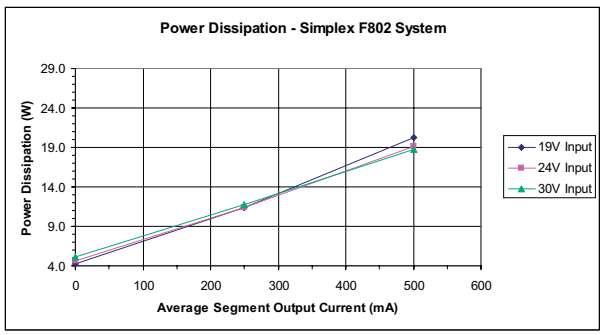

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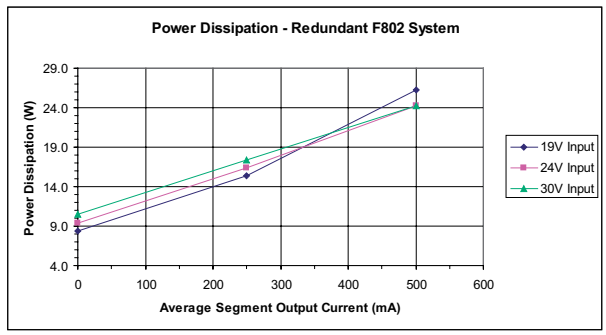
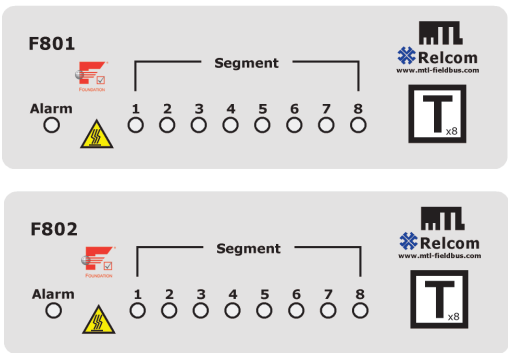
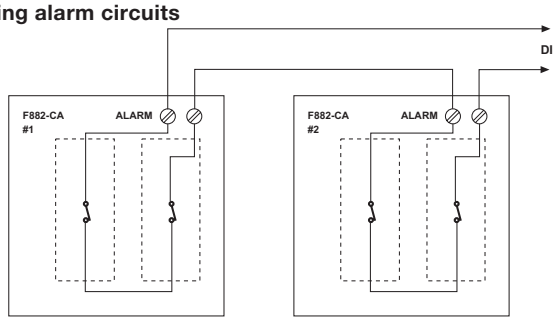


F80x module top panels showing indicators



Linking alarm circuits



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.

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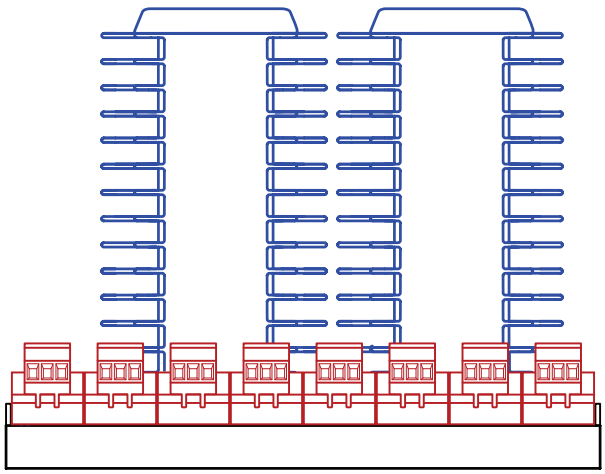
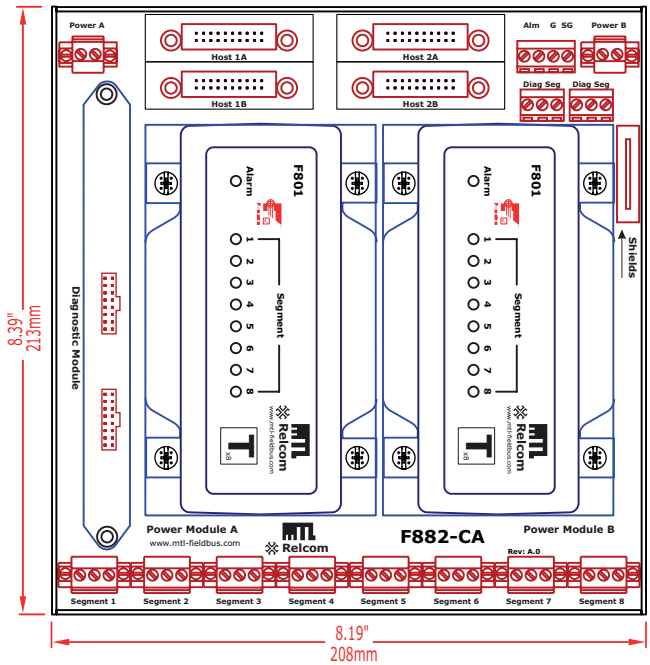
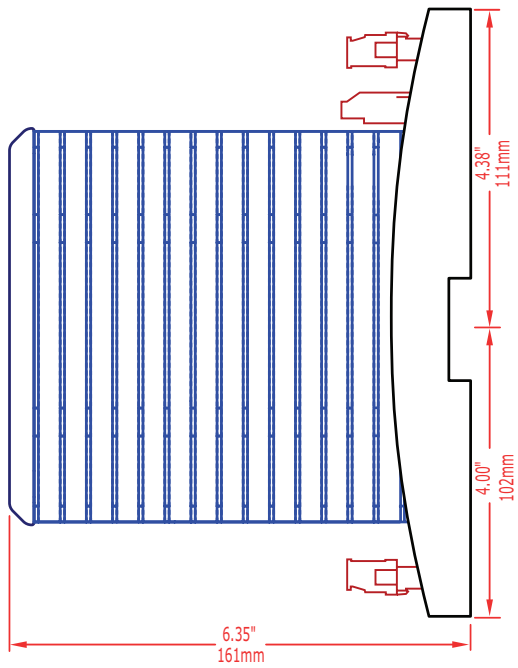
F882-P* DIMENSIONS



CAD drawings are available on-line at www.mtl-fieldbus.com





APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Region (Authority)	Standard	Certificate	Approved for	Ratings
EU (Relcom)	EN61326		Class A Industrial Locations	CE
(Fieldbus Foundation™)	FF-831	PS001700 - (F801) PS001900 - (F802)		Power Supply Type 132
US (FM)	3600, 3611, 3610	3025124 - (F801) 3033657 - (F802)	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	Vmax = 24V (F801) = 30V (F802)
Canada (FM)	C22.2 No. 213 C22.2 No. 142	3025124C - (F801) 3033657C - (F802)	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	Vmax = 24V (F801) = 30V (F802)
EU (Relcom)	IEC 60079-0:2004 IEC 60079-15:2005	RELC07ATEX1002X (F801 + F802)	Ex nA IIC T4	Uo = 24V (F801) = 30V (F802)

8-segment redundant fieldbus power supply

F890

- **Redundant fieldbus power for FOUNDATION fieldbus™ cards**
- **High-density, compact design**
- **Fully isolated**
- **Hot swappable power modules***
- **Low power dissipation**
- **Zero component carrier**
- **On-line diagnostics option**
- **Redundant power & conditioning**
- **Vertical DIN-rail mounting**
- **F801 output 21.5V, 350mA**
- **F802 output 28V, 500mA**

The F890 fieldbus power system is designed to provide redundant power for eight FOUNDATION fieldbus™ H1 segments when used with the Emerson DeltaV or another non-proprietary cabled fieldbus system. Power for the fieldbus segments is provided by two power modules - F801s or F802s - operating in redundant configuration (load sharing). Failure alarms, galvanic isolation, power conditioning and segment termination are incorporated into each F80x module. In simplex applications, a single F80x module may be used. Termination of the fieldbus segments is automatically maintained when single or redundant F80x modules are fitted.

For extreme reliability, the module carrier has *no components* and only provides interconnections between the power modules and external connections. It is supported in a rigid metal frame that protects the circuit board from mechanical damage. Secure DIN-rail mounting is provided by integrated fixings.

Each F80x module monitors the output of the eight fieldbus segments and indicates an alarm by means of a built-in, normally closed relay if any of the segments is shorted, or below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also annunciated. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the F890-CA carrier. A separate alarm module is not required for this function. LED indicators also show the status of each F801 module and the eight individual segments. In normal operation, each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the F809F product specification.

The F80x module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power supplies. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment. Each segment has its own fieldbus power conditioner and current limitation.

Redundant 24V DC (nom.) input power is connected to the F890 carrier using two-part pluggable connectors. Field wiring connections are available with either pluggable screw terminals (F890-PS), or pluggable spring clamp terminals (F890-PC).

** Gas clearance certificate needed in Zone 2 hazardous areas*

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

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ASIA PACIFIC Tel: +65 6 487 7887 Fax: +65 6 487 7997
E-mail: enquiry@mtl-inst.com **MTL web site: www.mtl-fieldbus.com** **Relcom web site: www.relcominc.com**

Jan 2009

SPECIFICATION

Location of equipment

Safe area,
Class I Div 2 Groups ABCD T4* or
Class I Zone 2 IIC T4*
**F802 power module certification is pending*

INPUT	**F801**	**F802**
Input voltage (DC)	19.2 - 30.0V	19.2 - 30.0V
Current consumption (24V input, all outputs fully loaded)	3.5A*	6A*
Total Power dissipation (24V input, all outputs fully loaded)	20W*	24W*
	* Redundant operation	

OUTPUT	**F801**	**F802**
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	21.5V - 24.0V	28.0V - 30.0V
Design current (per segment)	0 to 350mA	0 to 500mA
Current limit	> 370mA	> 520mA
Minimum load	0mA	0mA

Isolation

Fieldbus to input power: 250V AC rms withstand
Segment to segment: 200V DC withstand

ALARMS

Alarm contact rating

1A maximum @ 30V DC maximum

Alarm contact status

Normally closed

Alarm threshold	**F801**	**F802**
Segment output	<19V DC	<24V DC

ELECTRICAL CONNECTIONS

System, Field, Power & Alarm terminals

Pluggable rising cage-clamp screw terminals (-P**S**)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp screw terminals (-P**C**)
Conductor size: 0.2 to 2.5 mm^2

Chassis ground

2-way fixed screw terminal connector 0.14 to 2.5 mm^2

Terminators

A single termination is provided automatically when using either 1 or 2 power modules

ENVIRONMENTAL

Ambient temperature	**F801**	**F802**
Operating (full load)	–40°C to +65°C	–40°C to +50°C
Operating (60% load)	–40°C to +65°C	–40°C to +65°C
Storage	–40°C to +85°C	–40°C to +85°C

Note: Temperature range applies only when fitted to a vertical DIN rail mounted on a vertical plane.

Ingress protection

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

MECHANICAL

Mounting method

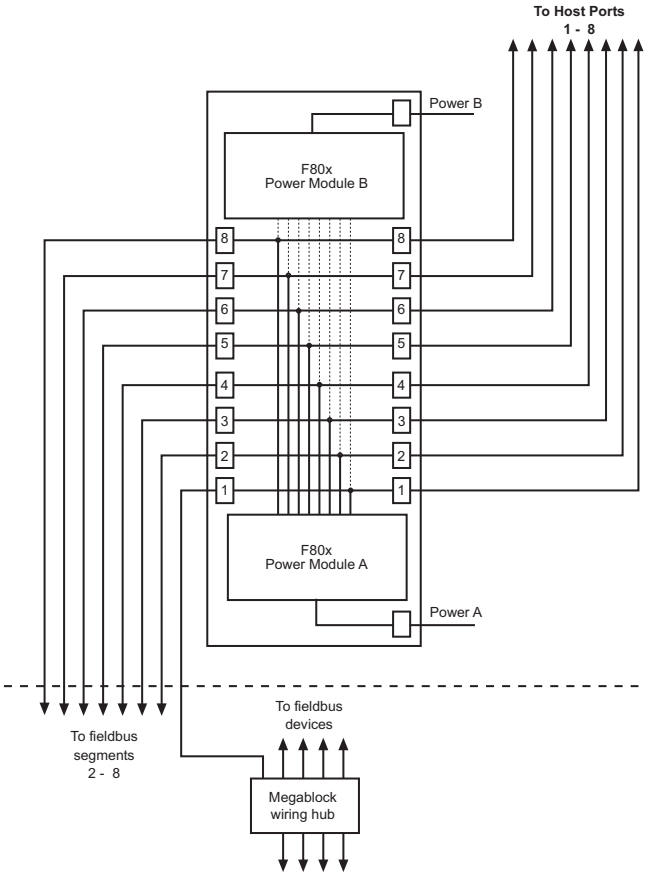
Integrated fixings for 'Top hat' DIN rail, 35mm x 7.5mm to EN50022

ELECTRICAL

EMC Compliance

To EN61326:1998 Electrical equiment for measurement, control and laboratory use - EMC requirements

F890 - BLOCK DIAGRAM



The above diagram shows a block diagram of how the F890 is wired. Note that the Chassis Ground and Alarm connection are not shown. The Diagnostic module is also not shown (see the F809F product specification). For detailed wiring information see the Installation Instructions for the F890 (Document number 502-090).

PHYSICAL NETWORKS

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

ORDERING INFORMATION

DESCRIPTION	**PART NO**
Carrier, unpopulated	F890-CA-P*
8-segment power module: 21.5V, 350mA	F801
8-segment power module: 28V, 500mA	F802
F890-CA-P*and two F801 modules	F890-P*
F890-CA-P*and one F801 module	F890-P*-NR
F890-CA-P*and two F802 modules	F890-2-P*
F890-CA-P*and one F802 module	F890-2-P*-NR
Blanking modules included with -NR systems	F800-BLK
Fieldbus diagnostic module	F809F

* = S or C S = Pluggable Screw Terminal Connectors
C = Pluggable Spring Clamp Connectors

Product specifications are subject to change without notice

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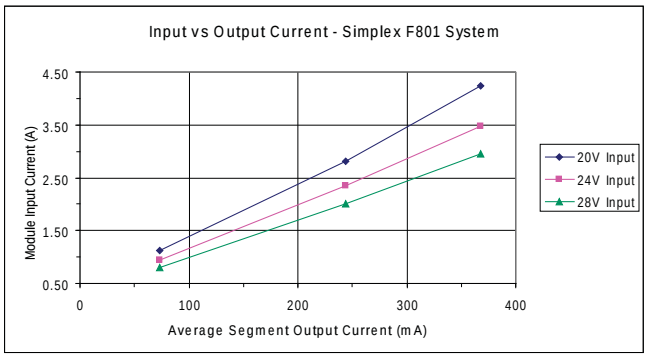
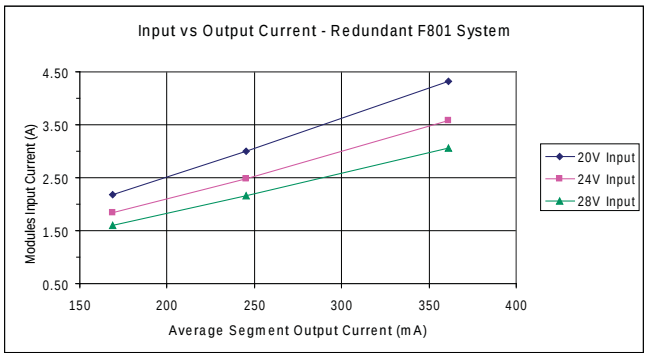
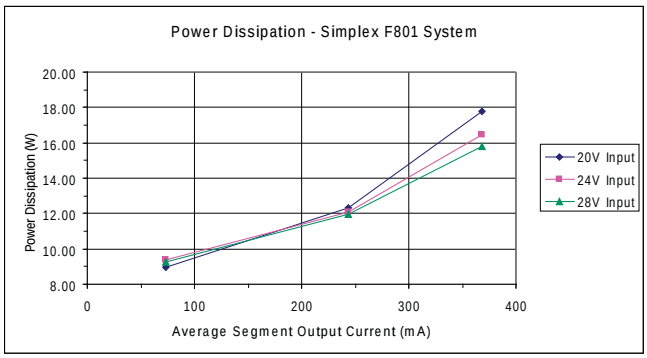
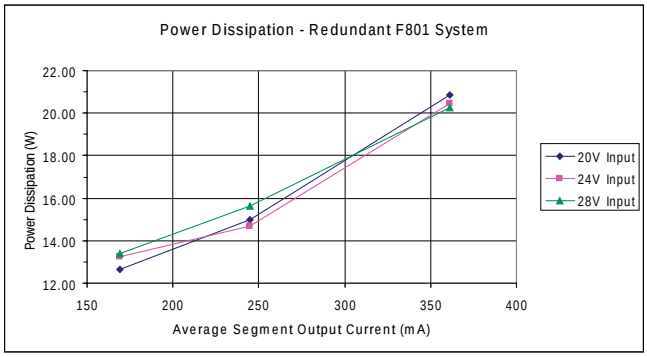
F801 PARAMETERS

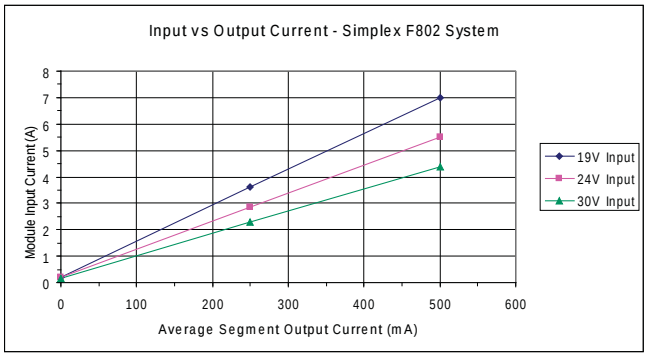


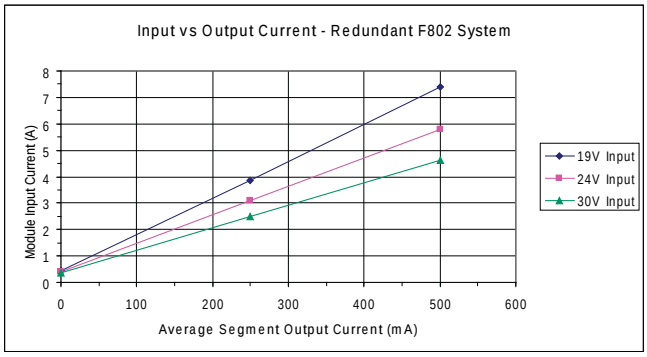


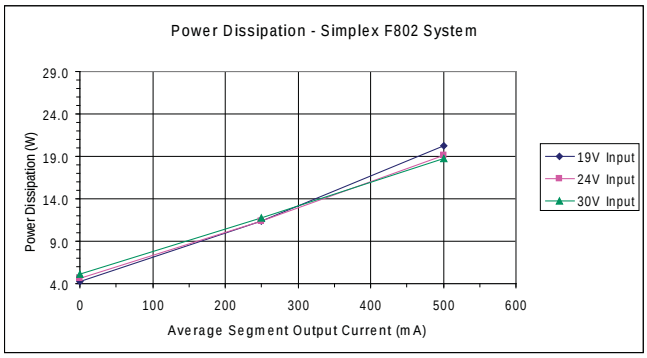


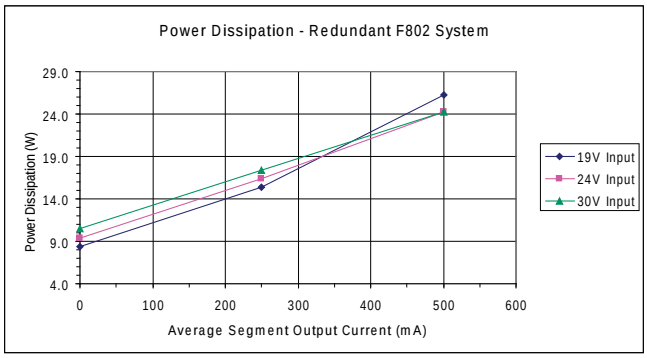


F802 PARAMETERS

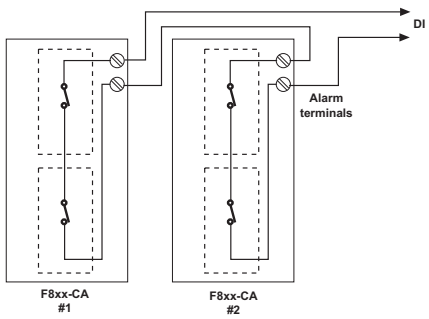




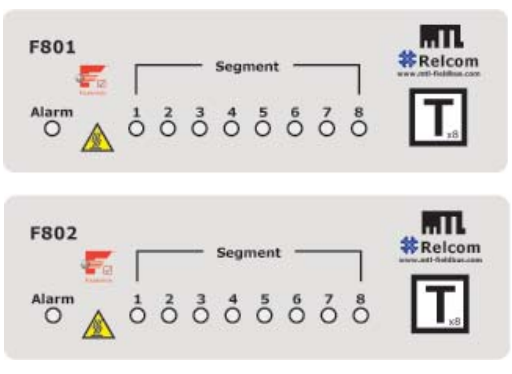




Linking alarm circuits



F80x module top panels showing indicators



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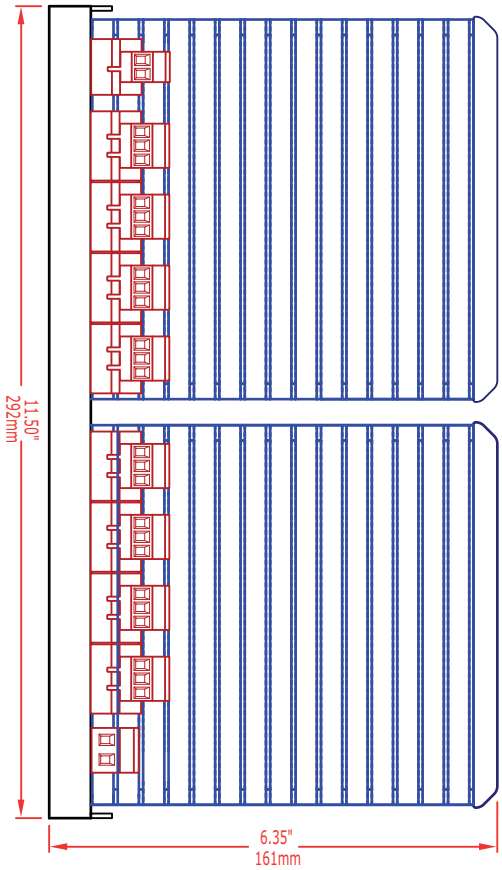
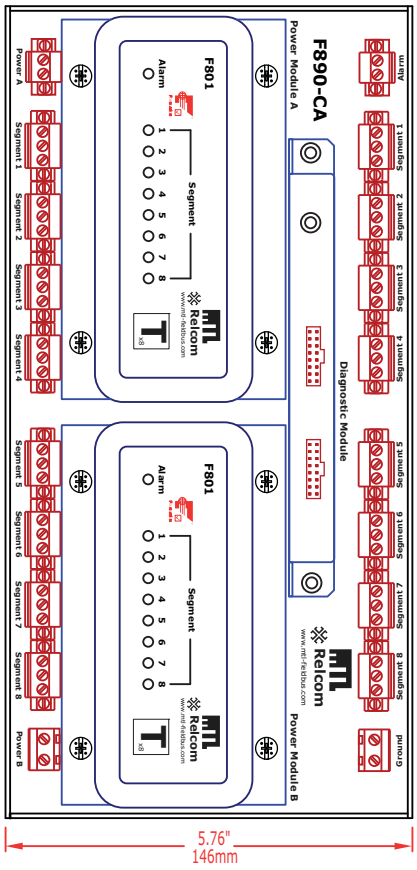
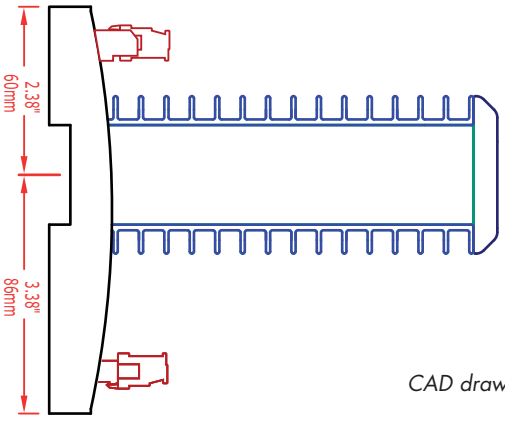
F890-P* DIMENSIONS







Shown using F801 power modules. Overall dimensions are the same when F802 modules are fitted.

CAD drawings are available on-line at www.mtl-fieldbus.com

APPROVALS - *for the latest certification information visit www.mtl-inst.com/certs_1.nsf*

Region (Authority)	Standard	Certificate	Approved for	Ratings
EU (Relcom)	EN61326		Class A Industrial Locations	CE
(FIELDBUS foundation™)	FF-831	PS001700 - (F801) PS001900 - (F802)		Power Supply Type 132
US (FM)	3600 3611 3610	3025124 - (F801) 3033657 - (F802)	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = 24V (F801) = 30V (F802)
Canada (FM)	C22.2 No. 213 C22.2 No. 142	3025124C - (F801) 3033657C - (F802)	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = 24V (F801) = 30V (F802)
EU (Relcom)	IEC 60079-0:2004 IEC 60079-15:2005	RELC07ATEX1002X (F801 + F802)	Ex nA IIC T4	U_o = 24V (F801) = 30V (F802)

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8-segment redundant fieldbus power supply for horizontal DIN-rail mounting

F892

- **Redundant fieldbus power for FOUNDATION fieldbus™ cards**
- **High-density, compact design**
- **Fully isolated**
- **Hot swappable power modules***
- **Low power dissipation**
- **Zero component carrier**
- **On-line diagnostics option**
- **Redundant power & conditioning**
- **Horizontal DIN-rail mounting**
- **F801 output 21.5V, 350mA**
- **F802 output 28V, 500mA**

The F892 fieldbus power system is designed to provide redundant power for eight FOUNDATION fieldbus™ H1 segments when used with the Emerson DeltaV or another non-proprietary cabled fieldbus system. Power for the fieldbus segments is provided by two power modules - F801s or F802s - operating in redundant configuration (load sharing). Failure alarms, galvanic isolation, power conditioning and segment termination are incorporated into each F80x module. In simplex applications, a single F80x module may be used. Termination of the fieldbus segments is automatically maintained when single or redundant F80x modules are fitted.

For extreme reliability, the module carrier has no components and only provides interconnections between the power modules and external connections. It is supported in a rigid metal frame that protects the circuit board from mechanical damage. Secure DIN-rail mounting is provided by integrated fixings.

Each F80x module monitors the output of the eight fieldbus segments and indicates an alarm by means of a built-in, normally closed relay if any of the segments is shorted or below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also annunciated. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the F892-CA carrier. A separate alarm module is not required for this function. LED indicators also show the status of each F80x module and the eight individual segments. In normal operation, each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the F809F product specification.

The F80x module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power conditioners. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment. Each segment has its own fieldbus power conditioner and current limitation.

Redundant 24V DC (nom.) input power is connected to the F892 carrier using two-part pluggable connectors. Field wiring connections are available with either pluggable screw terminals (F892-PS) or pluggable spring clamp terminals (F892-PC).

** Gas clearance certificate needed in Zone 2 hazardous areas*

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

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SPECIFICATION

Location of equipment

Safe area,
Class I Div 2 Groups ABCD T4 or
Class I Zone 2 IIC T4

INPUT	**F801**	**F802**
Input voltage (DC)	19.2 - 30.0V	19.2 - 30.0V
Current consumption (24V input, all outputs fully loaded)	3.5A*	6A*
Total Power dissipation (24V input, all outputs fully loaded)	20W*	24W*
	* Redundant operation	

OUTPUT	**F801**	**F802**
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	21.5V - 24.0V	28.0V - 30.0V
Design current (per segment)	0 to 350mA	0 to 500mA
Current limit	> 370mA	> 520mA
Minimum load	0mA	0mA

Isolation

Fieldbus to input power: 250V AC rms withstand
Segment to segment: 200V DC withstand

ALARMS

Alarm contact rating

1A maximum @ 30V DC maximum

Alarm contact status

Normally closed

Alarm threshold	**F801**	**F802**
Segment output	<19V DC	<24V DC

ELECTRICAL CONNECTIONS

System, Field, Power & Alarm terminals

Pluggable rising cage-clamp screw terminals (-P**S**)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp screw terminals (-P**C**)
Conductor size: 0.2 to 2.5 mm^2

Chassis ground

2-way fixed screw terminal connector 0.14 to 2.5 mm^2

Terminators

A single termination is provided automatically when using either 1 or 2 power modules

ENVIRONMENTAL

Ambient temperature	**F801**	**F802**
Operating (full load)	–40°C to +65°C	–40°C to +50°C
Operating (60% load)	–40°C to +65°C	–40°C to +65°C
Storage	–40°C to +85°C	–40°C to +85°C

Note: Temperature range applies only when mounted on a horizontal DIN rail attached to a vertical surface.

Ingress protection

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

MECHANICAL

Mounting method

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

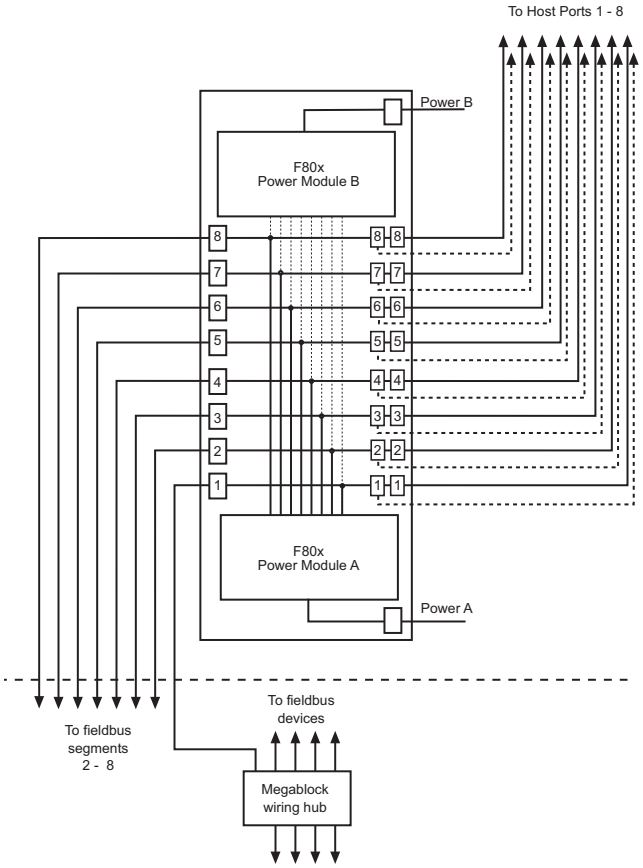
ELECTRICAL

EMC Compliance

To EN61326:1998 Electrical equiment for measurement, control and laboratory use - EMC requirements

Product specifications are subject to change without notice

F892 - BLOCK DIAGRAM



The above diagram shows a block diagram of how the F892 is wired. Note that the Chassis Ground and Alarm connection are not shown. The Diagnostic module is also not shown (see the F809F product specification). For detailed wiring information see the Installation Instructions for the F892 (Document number 502-091).
The above diagram also shows two sets of 8 connectors for connection to the Host. Early versions of the F892 included only one set of connectors (unit date code 0711, and earlier) and so did not support redundant Host connection. Some Host systems such as the Emerson DeltaV provide their own method of connecting the Redundant Host port, in which case a Simplex connection to the F892 is all that is required, or desired.

PHYSICAL NETWORKS

IEC61158-2
ISA-S50.02 Part 2-1992
Foundation fieldbusTM H1
Profibus PA

ORDERING INFORMATION

DESCRIPTION	**PART NO**
Carrier, unpopulated	F892-CA-P*
8-segment power module: 21.5V, 350mA	F801
8-segment power module: 28V, 500mA	F802
F892-CA-P*and two F801 modules	F892-P*
F892-CA-P*and one F801 module	F892-P*-NR
F892-CA-P*and two F802 modules	F892-2-P*
F892-CA-P*and one F802 module	F892-2-P*-NR
Blanking modules included with -NR systems	F800-BLK
Fieldbus diagnostic module	F809F

* = S or C S = Pluggable Screw Terminal Connectors
C = Pluggable Spring Clamp Connectors

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E-mail: enquiry@mtl-inst.com **MTL web site: www.mtl-fieldbus.com** **Relcom web site: www.relcominc.com**

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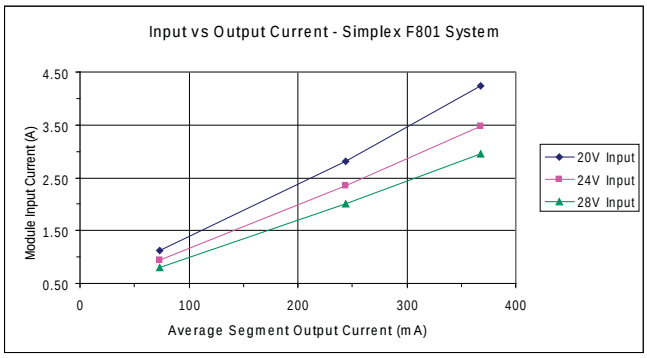
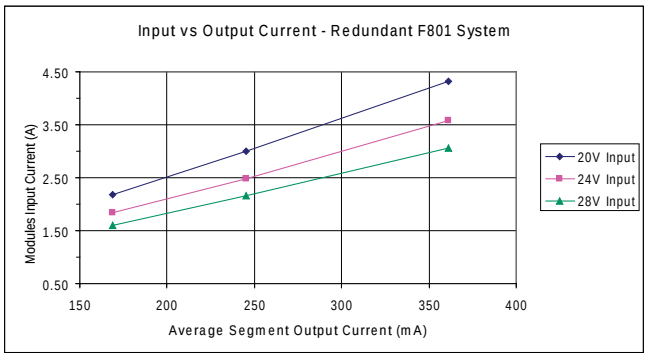
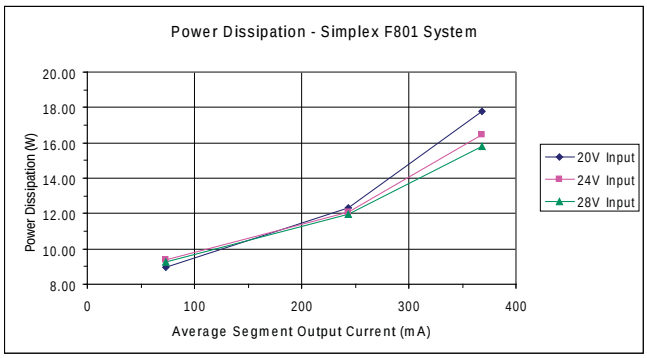
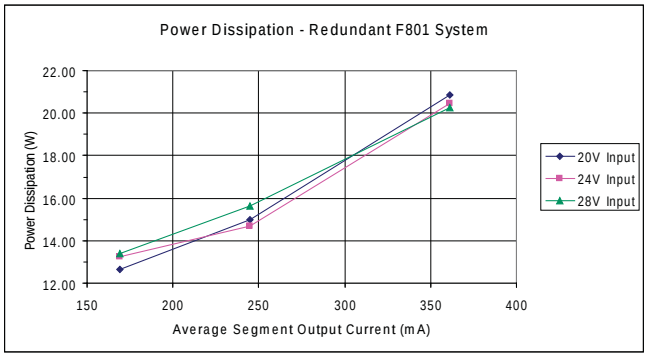
F801 PARAMETERS

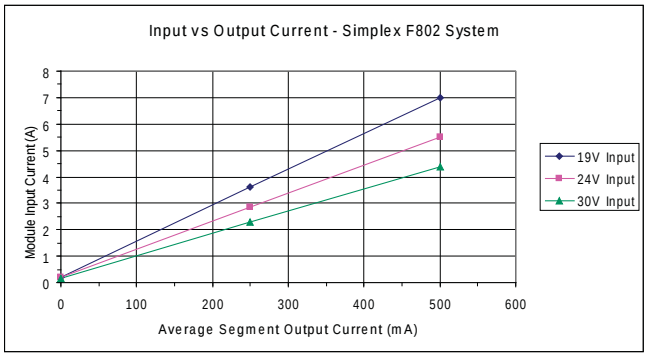


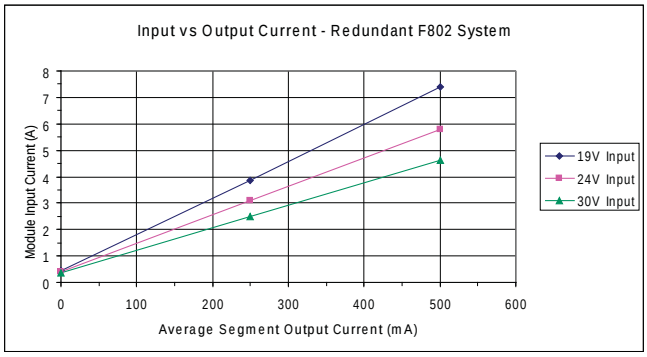


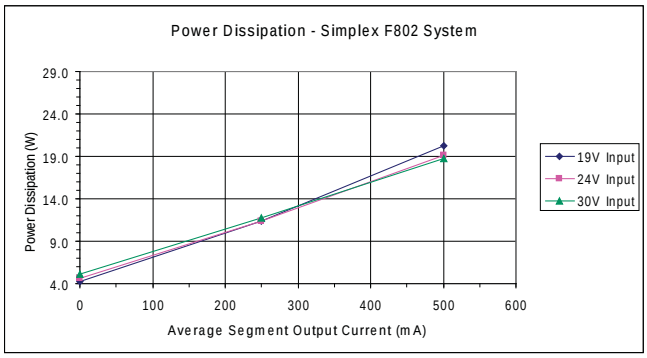


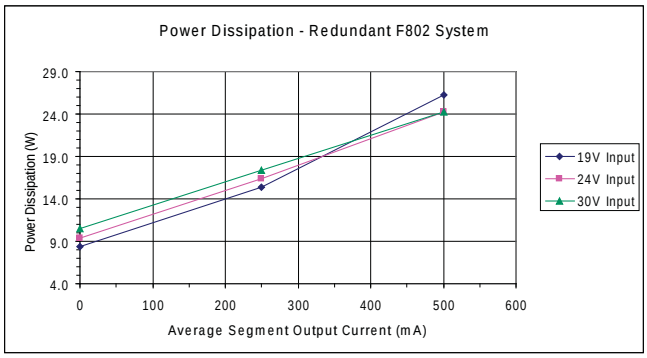


F802 PARAMETERS

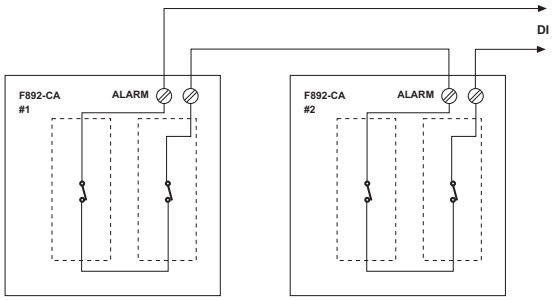




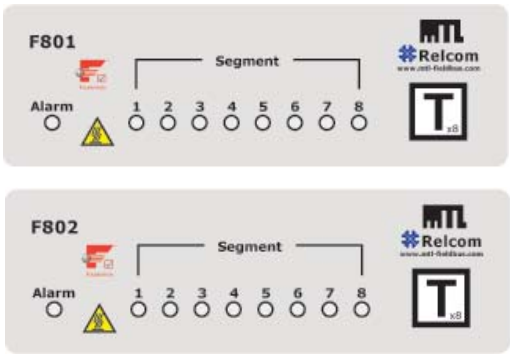




Linking alarm circuits



F80x module top panels showing indicators



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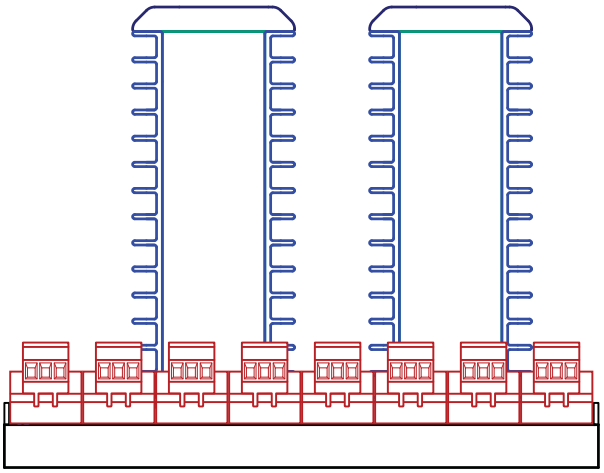
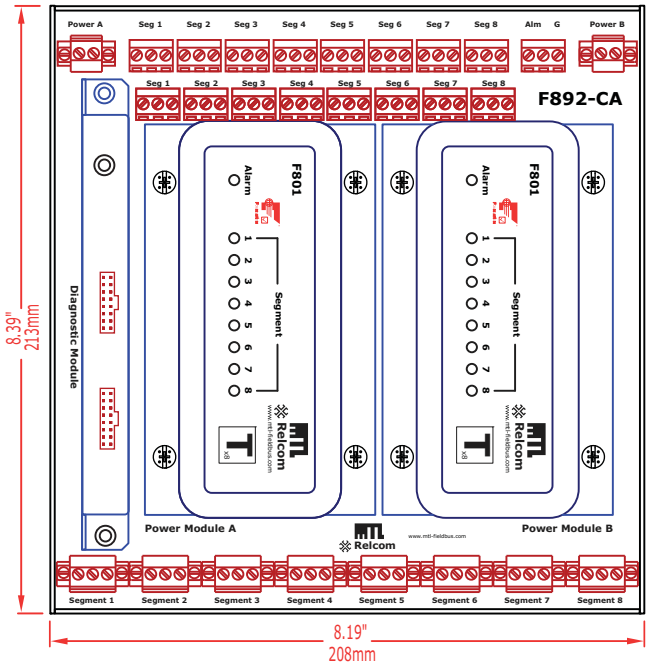
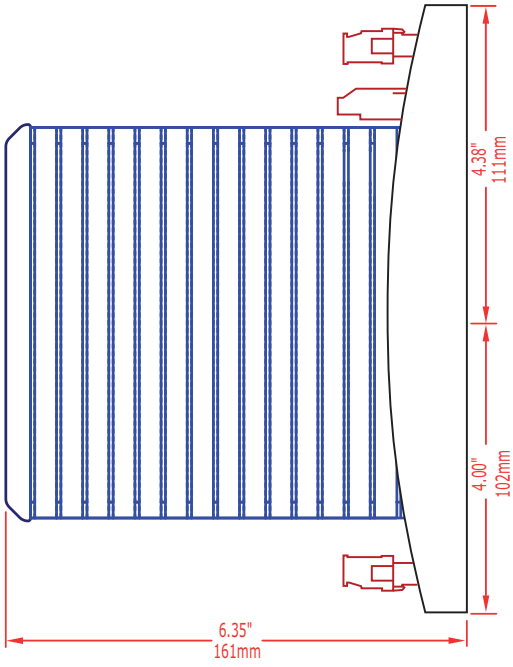
F892-P* DIMENSIONS



Shown using F801 power modules. Overall dimensions are the same when F802 modules are fitted.





CAD drawings are available on-line at www.mtl-fieldbus.com

APPROVALS - *for the latest certification information visit www.mtl-fieldbus.com*

Region (Authority)	Standard	Certificate	Approved for	Ratings
EU (Relcom)	EN61326		Class A Industrial Locations	CE
(FIELDBUS foundation™)	FF-831	PS001700 - (F801) PS001900 - (F802)		Power Supply Type 132
US (FM)	3600 3611 3610	3025124 - (F801) 3033657 - (F802)	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = 24V (F801) = 30V (F802)
Canada (FM)	C22.2 No. 213 C22.2 No. 142	3025124C - (F801) 3033657C - (F802)	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = 24V (F801) = 30V (F802)
EU (Relcom)	IEC 60079-0:2004 IEC 60079-15:2005	RELC07ATEX1002X (F801 + F802)	Ex nA IIC T4	U_o = 24V (F801) = 30V (F802)

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technical datasheet

9181-x1

8 segment redundant fieldbus power for Invensys Foxboro I/A® series control systems

- Redundant fieldbus power for Foundation™ fieldbus cards
- Integrated connections to Foxboro I/A baseplate
- Flexible N+1 redundancy
- Low capital cost whilst supporting future expansion
- Fully isolated
- Hot swappable power modules
- Low power dissipation
- On-line diagnostics option
- Pluggable trunk surge protection option

The 9181 fieldbus power system is designed to provide redundant power for up to eight FOUNDATION™ fieldbus segments. It has host-side connections that allow direct integration into Invensys Foxboro I/A® series control systems using standard pre-assembled cables. It is optimised for use in general purpose and hazardous area High Energy Trunk architectures which, with the appropriate FieldPlus wiring components, supports fieldbus devices using all hazardous area protection techniques. The power supply has been designed to optimise cabinet layouts, maximising the number of fieldbus segments powered per cabinet while providing space for installing and maintaining cable connections.

Power for the fieldbus segments is provided by two groups of up to three 919x-FP 4-segment power modules, operating in N+1 redundant configuration (load sharing). For redundant applications requiring 250 to 500mA current per segment, three 9191-FP power modules are fitted on the carrier for each 4 segment group. For redundant applications, initially requiring up to 250mA current per segment, two 9191-FP modules are fitted on the carrier, with the option of adding a third power module to allow for future segment expansion. Failure alarms and galvanic isolation are incorporated into each 919x-FP module. Passive inductors and terminators on each fieldbus segment deliver the highest level of availability.

Each 919x-FP module monitors the output of the four fieldbus segments and indicates an alarm (by means of a built-in, normally-closed relay) if any of the segments is shorted, or its output is below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also announced. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the 9181-CA-Px carrier; a separate alarm module is not required for this function. LED indicators show the status of each 919x-FP module and that of the four individual segments. In normal operation each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

The 919x-FP module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power supplies. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the **F809F** product specification.

Pluggable surge-protection components for each fieldbus trunk are available as an option reducing the installed cost of providing surge protection on fieldbus networks. Consult MTL for availability.

Redundant 24V DC (nom.) input power is connected to the 9181-CA-Px carrier using two-part pluggable connectors. System connections are compatible with Foxboro I/A® Series baseplates, using P0916Dx cables, and field wiring connections are available with either pluggable screw terminals (9181-CA-PS) or pluggable spring clamp terminals (9181-CA-PC). The pluggable connections are screw-retained providing a reliable connection in an industrial environment.

SPECIFICATION

Location of equipment
Safe area,
(Hazardous area certification pending)

9191-FP MODULE

Number of channels	Four (4)
Output Voltage (DC)	28.0 - 32.0V
Design current (per segment)	0 to 250mA
Current limit	>320mA
Minimum load	0mA

9181-x1 SYSTEM

Input voltage (DC)	19.2 - 30.0V
Isolation	
Fieldbus to input power	500V AC rms withstand ‡
Segment to segment	850V DC withstand
	‡ *in accordance with FF-831*

	9181-61-P*	**9181-91-P***
Current consumption (24V input, all outputs fully loaded)	2.9A	5.7A
Power dissipation/segment (24V input, all outputs fully loaded)	1.3W	2.5W
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	As module	As module
Design current (per segment)	0 to 250mA	0 to 500mA

	9181-21-P*	**9181-41-P***
Current consumption (24V input, all outputs fully loaded)	1.5A	2.9A
Power dissipation/segment (24V input, all outputs fully loaded)	1.3W	2.5W
Number of channels	Four (4)	Four (4)
Voltage (DC)	As module	As module
Design current (per segment)	0 to 250mA	0 to 500mA

ALARMS

Alarm contact rating
1A maximum @ 30V DC maximum

Alarm contact status
Normally closed

Alarm threshold	**9191-FP**
Segment output voltage	<16V

CONNECTIONS

ELECTRICAL CONNECTIONS

System connectors
25-pin subminature D-type connector - compatible with Foxboro system cables from the P0916Dx series. (Select a cable of the appropriate length.)

Diagnostics segment terminals
3-way fixed screw terminal connector 0.14 to 2.5 mm^2

Field & Power terminals
Pluggable rising cage-clamp screw terminals (-PS)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp terminals (-PC)
Conductor size: 0.2 to 2.5 mm^2

Alarm & ground terminals
2-way fixed screw terminal connector 0.14 to 2.5 mm^2

Cable screen ground connections
Common connection for segment shields and ground

Terminators
A single termination is provided on each segment

ENVIRONMENTAL

Ambient temperature - operating
–20°C to +60°C (optimum orientation)
–20°C to +50°C (non-optimum orientation)

Ambient temperature - storage
–40°C to +85°C

Relative Humidity
< 95%, non-condensing

Ingress protection
IP20 to BS EN 60529 (Additional protection by means of enclosure)

MECHANICAL

Dimensions
See following page

Mounting options
- Integrated fixings for 'Top hat' DIN rail, 35mm x 7.5mm to EN50022
- Four-hole surface mount - M4

Weights

9191-FP	0.2kg
9181-CA-P*	1.1kg

ELECTRICAL

EMC Compliance
To EN61326:2006 Electrical equipment for measurement, control and laboratory use - EMC requirements

PHYSICAL NETWORKS

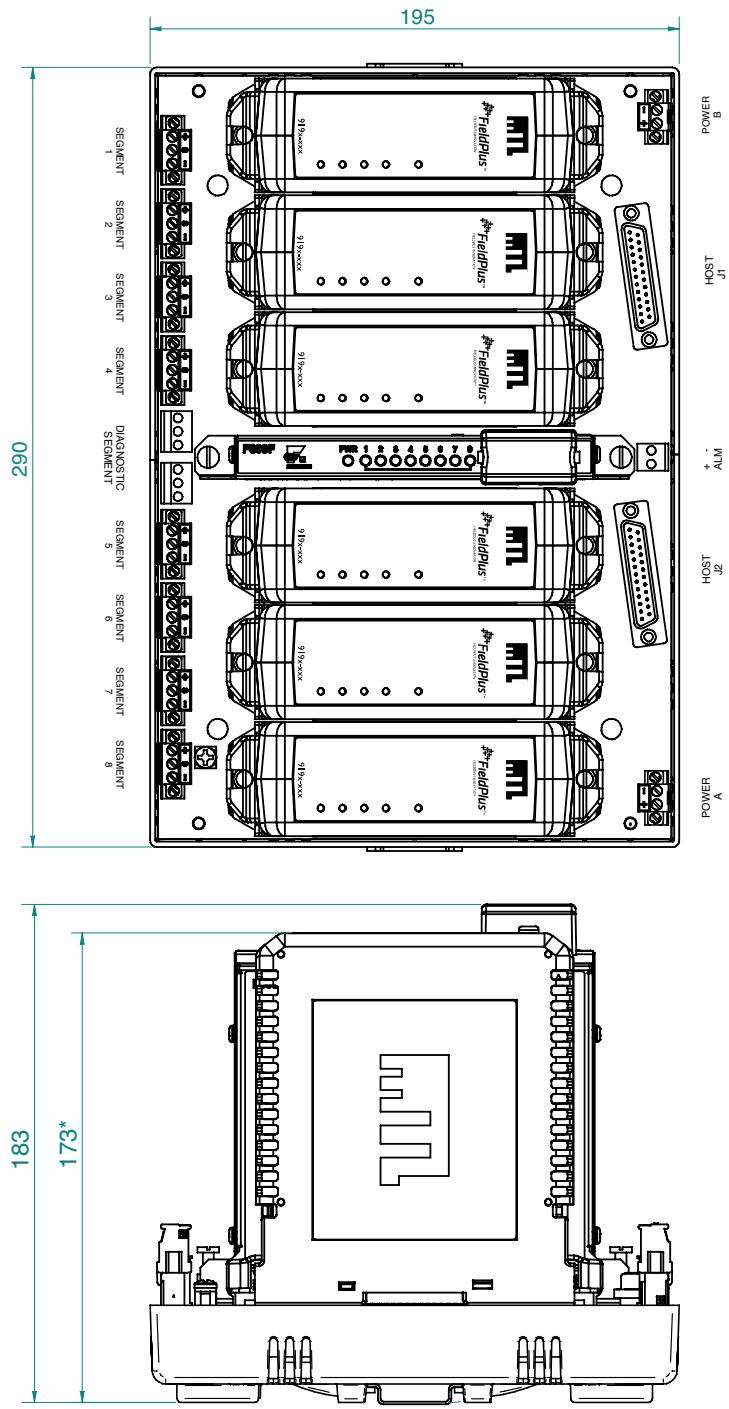
IEC61158-2
ISA-S50.02 Part 2-1992
Foundation™ fieldbus H1
Profibus PA

ORDERING INFORMATION

PART NO	DESCRIPTION
9181-CA-P*	Carrier, unpopulated
9191-FP	4-segment power module: 28V, 250mA
9197-BLK	Alarm blanking module *(used in any empty power module position to defeat the carrier alarm)*
9181-21-P*	4 segment system with 9181-CA-P* carrier, 2 x 9191-FP and 4 x 9197-BLK
9181-41-P*	4 segment system with 9181-CA-P* carrier, 3 x 9191-FP and 3 x 9197-BLK
9181-61-P*	8 segment system with 9181-CA-P* carrier, 4 x 9191-FP and 2 x 9197-BLK
9181-91-P*	8 segment system with 9181-CA-P* carrier and 6 x 9191-FP
F809F	Fieldbus diagnostic module

* = S or C
S = Pluggable Screw Terminal Connectors
C = Pluggable Spring Clamp Connectors

DIMENSION DRAWING (9181-91-PS shown)



*This dimension applies if the F809F diagnostic module is not used.

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APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Region (Authority)	Standard	Certificate	Approved for	Ratings
(Fieldbus Foundation™)	FF-831	PS079000	–	Power Supply Type 132
US (FM)	3600, 3611, 3610	Pending	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = TBA
Canada (FM)	C22.2 No. 213 C22.2 No. 142	Pending	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = TBA
IECEx (Baseefa)	IEC 60079-0:2004 IEC 60079-15:2005	Pending	Ex nA IIC T4	U_o = TBA
Europe (MTL)	EN 60079-0:2011 EN 60079-15:2010	Pending	Ex nA IIC T4	U_o = TBA

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technical datasheet

9188

8 segment redundant fieldbus power for Yokogawa CENTUM CS3000

- Redundant fieldbus power for Foundation™ fieldbus cards
- Integrated connections to redundant ALF111 Foundation fieldbus™ communication modules
- Flexible N+1 redundancy
- Low lifetime costs
- Low capital cost whilst supporting future expansion
- Fully isolated
- Hot swappable power modules*
- Low power dissipation
- On-line diagnostics option
- Pluggable trunk surge protection option

The 9188 fieldbus power system is designed to provide redundant power for eight, or four, Foundation™ fieldbus H1 segments on the Yokogawa CENTUM CS3000. It is optimised for use in general purpose and hazardous area High Energy Trunk architectures which, with the appropriate FieldPlus wiring components, supports fieldbus devices using all hazardous area protection techniques. The power supply has been designed to optimise cabinet layouts, maximising the number of fieldbus segments powered per cabinet while providing space for installing and maintaining cable connections and minimising the operating temperature.

Power for the fieldbus segments is provided by two groups of up to three 919x-FP 4-segment power modules, operating in N+1 redundant configuration (load sharing). For redundant applications requiring 250 to 500mA current per segment, three 9191-FP power modules are fitted on the carrier for each 4 segment group. For redundant applications, initially requiring up to 250mA current per segment, two 9191-FP modules are fitted on the carrier, with the option of adding a third power module to allow for future segment expansion.

Failure alarms and galvanic isolation are incorporated into each 919x-FP module. Passive inductors and terminators on each fieldbus segment deliver the highest level of availability.

Each 919x-FP module monitors the output of the four fieldbus segments and indicates an alarm (by means of a built-in, normally-closed relay) if any of the segments is shorted, or its output is below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also announced. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the 9188-CA-Px carrier; a separate alarm module is not required for this function. LED indicators show the status of each 919x-FP module and that of the four individual segments. In normal operation each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

The 919x-FP module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power supplies. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the **F809F** product specification.

Pluggable surge-protection components for each fieldbus trunk are available as an option reducing the installed cost of providing surge protection on fieldbus networks.

Redundant 24V DC (nom.) input power is connected to the 9188-CA-Px carrier using two-part pluggable connectors. System connections are compatible with ALF111 fieldbus communication modules, via AKB336 cables, and field wiring connections are available with either pluggable screw terminals (9188-CA-PS) or pluggable spring clamp terminals (9188-CA-PC). The pluggable connections are screw-retained providing a reliable connection in an industrial environment.

* *Gas clearance certificate required in Zone 2/Division 2 hazardous areas*

SPECIFICATION

Location of equipment
Safe area,
Class I Div 2 Groups ABCD T4 or
Class I Zone 2 IIC T4 †

OUTPUT

	9191-FP
Number of channels	Four (4)
Voltage (DC)	28.0 - 32.0V
Design current (per segment)	0 to 250mA
Current limit	>320mA
Minimum load	0mA

9189 SYSTEM

Input voltage (DC)	19.2 - 30.0V
Isolation	
Fieldbus to input power	500V AC rms withstand ‡
Segment to segment	850V DC withstand

‡ *in accordance with FF-831*

	9188-61-P*	9188-91-P*
Current consumption (24V input, all outputs fully loaded)	2.9A	5.7A
Power dissipation/segment (24V input, all outputs fully loaded)	1.3W	2.5W
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	As module	As module
Design current (per segment)	0 to 250mA	0 to 500mA

	9188-21-P*	9188-41-P*
Current consumption (24V input, all outputs fully loaded)	1.5A	2.9A
Power dissipation/segment (24V input, all outputs fully loaded)	1.3W	2.5W
Number of channels	Four (4)	Four (4)
Voltage (DC)	As module	As module
Design current (per segment)	0 to 250mA	0 to 500mA

ALARMS

Alarm contact rating
1A maximum @ 30V DC maximum

Alarm contact status
Normally closed

Alarm threshold	**9191-FP**
Segment output voltage	<16V

CONNECTIONS

ELECTRICAL CONNECTIONS

System connectors
Host 1A, Host 1B, Host 2A, Host 2B via AKB336 cables to ALF111 modules

Optional Diagnostics segment terminals
3-way fixed screw terminal connector 0.14 to 2.5 mm^2

Field & Power terminals
Pluggable rising cage-clamp screw terminals (-PS)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp screw terminals (-PC)
Conductor size: 0.2 to 2.5 mm^2

Alarm & ground terminals
2-way fixed screw terminal connector 0.14 to 2.5 mm^2

Cable screen ground connections
Common connection for segment shields and ground

Terminators
A single termination is provided on each segment

ENVIRONMENTAL

Ambient temperature - operating
–20°C to +60°C (optimum orientation)
–20°C to +50°C (non-optimum orientation)

Ambient temperature - storage
–40°C to +85°C

Relative Humidity
< 95%, non-condensing

Ingress protection
IP20 to BS EN 60529 (Additional protection by means of enclosure)

MECHANICAL

Dimensions
See following page

Mounting options
- Integrated fixings for 'Top hat' DIN rail, 35mm x 7.5mm to EN50022
- Four-hole surface mount - M4

Weights

9191-FP	0.2kg
9188-CA-P*	1.1kg

ELECTRICAL

EMC Compliance
To EN61326:2006 Electrical equipment for measurement, control and laboratory use - EMC requirements

PHYSICAL NETWORKS

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

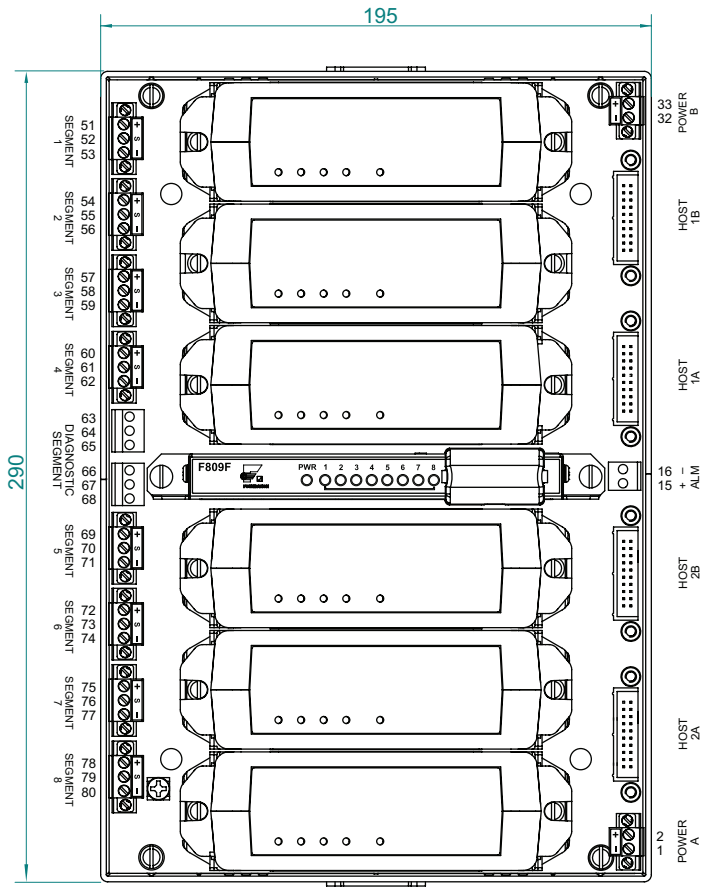
ORDERING INFORMATION

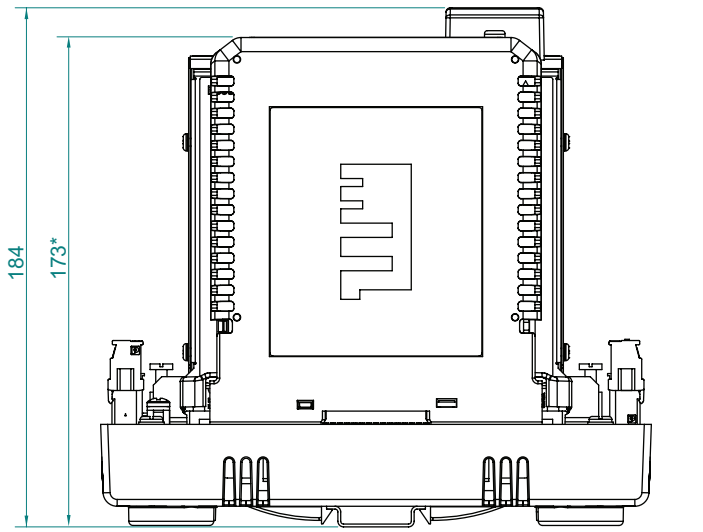
PART NO	DESCRIPTION
9188-CA-P*	Carrier, unpopulated
9191-FP	4-segment power module: 28V, 250mA
9197-BLK	Alarm blanking module *(used in any empty power module position to defeat the carrier alarm)*
9188-21-P*	4 segment system with 9188-CA-P* carrier, 2 x 9191-FP and 4 x 9197-BLK
9188-41-P*	4 segment system with 9188-CA-P* carrier, 3 x 9191-FP and 3 x 9197-BLK
9188-61-P*	8 segment system with 9188-CA-P* carrier, 4 x 9191-FP and 2 x 9197-BLK
9188-91-P*	8 segment system with 9188-CA-P* carrier and 6 x 9191-FP
F809F	Fieldbus diagnostic module

* = S or C
S = Pluggable Screw Terminal Connectors
C = Pluggable Spring Clamp Connectors

† *certificate pending*

DIMENSION DRAWING





* This dimension applies if the F809F diagnostic module is not used.

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APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Region (Authority)	Standard	Certificate	Approved for	Ratings
(Fieldbus Foundation™)	FF-831	PS079000	–	Power Supply Type 132
US (FM)	3600, 3611, 3610	Pending	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = TBA
Canada (FM)	C22.2 No. 213 C22.2 No. 142	Pending	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	V_{max} = TBA
IECEx (Baseefa)	IEC 60079-0:2004 IEC 60079-15:2005	Pending	Ex nA IIC T4	U_o = TBA
Europe (MTL)	EN 60079-0:2011 EN 60079-15:2010	Pending	Ex nA IIC T4	U_o = TBA

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technical datasheet

9189

8 segment redundant fieldbus power supply

- Redundant fieldbus power for Foundation™ fieldbus cards
- Flexible N+1 redundancy
- Low lifetime costs
- Low capital cost whilst supporting future expansion
- Fully isolated
- Hot swappable power modules*
- Low power dissipation
- On-line diagnostics option
- Pluggable trunk surge protection option

The 9189 fieldbus power system is designed to provide redundant power for eight, or four, Foundation™ fieldbus H1 segments for use with all fieldbus systems. It is optimised for use in general purpose and hazardous area High Energy Trunk architectures which, with the appropriate FieldPlus wiring components, supports fieldbus devices using all hazardous area protection techniques. The power supply has been designed to optimise cabinet layouts, maximising the number of fieldbus segments powered per cabinet while providing space for installing and maintaining cable connections and minimising the operating temperature.

Power for the fieldbus segments is provided by two groups of up to three 919x-FP 4-segment power modules, operating in N+1 redundant configuration (load sharing). For redundant applications requiring 250 to 500mA current per segment, three 9191-FP power modules are fitted on the carrier for each 4 segment group. For redundant applications, initially requiring up to 250mA current per segment, two 9191-FP modules are fitted on the carrier, with the option of adding a third power module to allow for future segment expansion. Failure alarms and galvanic isolation are incorporated into each 919x-FP module. Passive inductors and terminators on each fieldbus segment deliver the highest level of availability.

Each 919x-FP module monitors the output of the four fieldbus segments and indicates an alarm (by means of a built-in, normally-closed relay) if any of the segments is shorted, or its output is below the minimum output voltage threshold. Failure of either of the bulk power input supplies is also announced. The alarm contacts are volt-free and galvanically isolated from other circuitry. Connections to the alarm relays are made via terminals on the 9189-CA-Px carrier; a separate alarm module is not required for this function. LED indicators show the status of each 919x-FP module and that of the four individual segments. In normal operation each segment LED is lit, showing that the segment is powered. If a segment is shorted, this LED is extinguished, and the module Alarm LED is lit.

The 919x-FP module provides galvanic isolation between the 24V DC input power and the fieldbus segments, as required by the IEC61158-2 fieldbus standard and the Fieldbus Foundation™ FF-831 validation test for power supplies. There is also galvanic isolation between the fieldbus segments, thereby preventing multiple segment failures due to ground faults on more than one segment.

A separate physical layer diagnostics module may be installed on the carrier to automatically collect and distribute additional diagnostic information for each of the eight fieldbus segments. For more information see the **F809F** product specification.

Pluggable surge-protection components for each fieldbus trunk are available as an option reducing the installed cost of providing surge protection on fieldbus networks.

Redundant 24V DC (nom.) input power is connected to the 9189-CA-Px carrier using two-part pluggable connectors. Field wiring connections are available with either pluggable screw terminals (9189-CA-PS) or pluggable spring clamp terminals (9189-CA-PC). The pluggable connections are screw-retained providing a reliable connection in an industrial environment.

* *Gas clearance certificate required in Zone 2/Division 2 hazardous areas*

SPECIFICATION

Location of equipment
Safe area,
Class I Div 2 Groups ABCD T4 or
Class I Zone 2 IIC T4 †

OUTPUT

	9191-FP
Number of channels	Four (4)
Voltage (DC)	28.0 - 32.0V
Design current (per segment)	0 to 250mA
Current limit	>320mA
Minimum load	0mA

9189 SYSTEM

Input voltage (DC)	19.2 - 30.0V
Isolation	
Fieldbus to input power	500V AC rms withstand ‡
Segment to segment	850V DC withstand

‡ *in accordance with FF-831*

	9189-61-P*	9189-91-P*
Current consumption (24V input, all outputs fully loaded)	2.9A	5.7A
Power dissipation/segment (24V input, all outputs fully loaded)	1.3W	2.5W
Number of channels	Eight (8)	Eight (8)
Voltage (DC)	As module	As module
Design current (per segment)	0 to 250mA	0 to 500mA

	9189-21-P*	9189-41-P*
Current consumption (24V input, all outputs fully loaded)	1.5A	2.9A
Power dissipation/segment (24V input, all outputs fully loaded)	1.3W	2.5W
Number of channels	Four (4)	Four (4)
Voltage (DC)	As module	As module
Design current (per segment)	0 to 250mA	0 to 500mA

ALARMS

Alarm contact rating
1A maximum @ 30V DC maximum

Alarm contact status
Normally closed

Alarm threshold	9191-FP
Segment output	<16V

CONNECTIONS

ELECTRICAL CONNECTIONS

System & optional Diagnostics segment terminals
3-way fixed screw terminal connector 0.14 to 2.5 mm^2

Field & Power terminals
Pluggable rising cage-clamp screw terminals (-PS)
Conductor size: 0.14 to 2.5 mm^2
Pluggable spring-clamp screw terminals (-PC)
Conductor size: 0.2 to 2.5 mm^2

Alarm & ground terminals
2-way fixed screw terminal connector 0.14 to 2.5 mm^2

Cable screen ground connections
User-selectable jumper for segment shields: isolated (default) or interconnected and ground connection

Terminators
A single termination is provided on each segment

† *certificate pending*

ENVIRONMENTAL

Ambient temperature - operating
–20°C to +60°C (optimum orientation)
–20°C to +50°C (non-optimum orientation)

Ambient temperature - storage
–40°C to +85°C

Relative Humidity
< 95%, non-condensing

Ingress protection
IP20 to BS EN 60529 (Additional protection by means of enclosure)

MECHANICAL

Dimensions
See following page

Mounting method
- Integrated fixings for 'Top hat' DIN rail, 35mm x 7.5mm to EN50022
- Four-hole surface mount - M4

Weights

9191-FP	0.2kg
9189-CA-P*	1.1kg

ELECTRICAL

EMC Compliance
To EN61326:2006 Electrical equipment for measurement, control and laboratory use - EMC requirements

PHYSICAL NETWORKS

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

ORDERING INFORMATION

PART NO	DESCRIPTION
9189-CA-P*	Carrier, unpopulated
9191-FP	4-segment power module: 28V, 250mA
9197-BLK	Alarm blanking module *(used in any empty power module position to defeat the carrier alarm)*
9189-21-P*	4 segment system with 9189-CA-P* carrier, 2 x 9191-FP and 4 x 9197-BLK
9189-41-P*	4 segment system with 9189-CA-P* carrier, 3 x 9191-FP and 3 x 9197-BLK
9189-61-P*	8 segment system with 9189-CA-P* carrier, 4 x 9191-FP and 2 x 9197-BLK
9189-91-P*	8 segment system with 9189-CA-P* carrier and 6 x 9191-FP
F809F	Fieldbus diagnostic module

* = S or C
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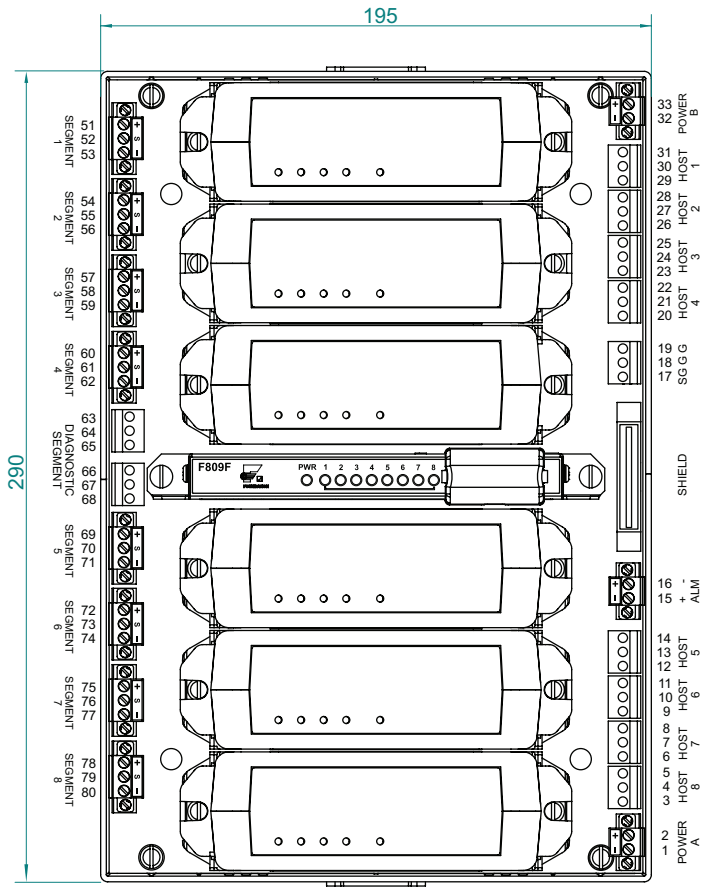
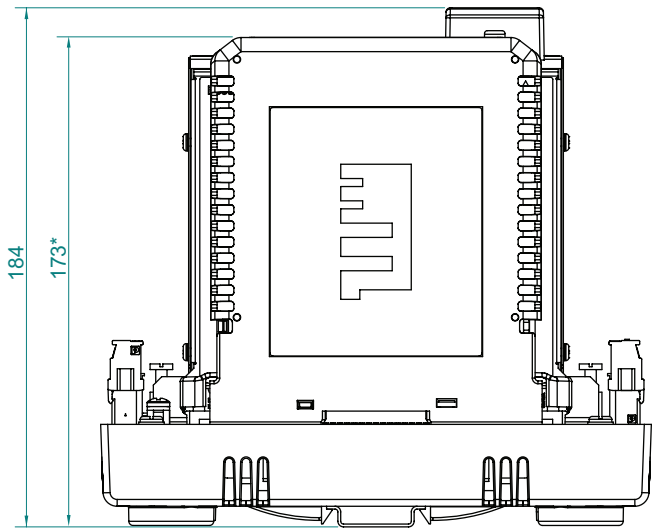
DIMENSION DRAWING





* This dimension applies if the F809F diagnostic module is not used.

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APPROVALS - *for the latest certification information visit www.mtl-inst.com/support/certificates/*

Region (Authority)	Standard	Certificate	Approved for	Ratings
(Fieldbus Foundation™)	FF-831	PS079000		Power Supply Type 132
US (FM)	3600, 3611, 3610	Pending	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	Vmax = TBA
Canada (FM)	C22.2 No. 213 C22.2 No. 142	Pending	Class I, Div 2, ABCD, T4 Class I, Zone 2, IIC, T4	Vmax = TBA
IECEx (Baseefa)	IEC 60079-0:2004 IEC 60079-15:2005	Pending	Ex nA IIC T4	Uo = TBA
Europe (MTL)	EN 60079-0:2011 EN 60079-15:2010	Pending	Ex nA IIC T4	U_o = TBA

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