

# JUNCTION BOX SELECTION GUIDE FOR FIELDBUS INFRASTRUCTURE



## Delivering Solutions

For the last 50 years, Pepperl+Fuchs has been a world leader in hazardous area protection, always striving to provide our customers with the latest technologies in the most cost-effective manner. Committed to providing our customer with a competitive edge, we now offer our expertise in designing and building enclosure solutions. Our FieldConnex segment protector and FieldBarrier wiring interfaces are now available in ready-to-install field junction boxes. Our fieldbus junction box solutions are tailored to meet the demanding needs of harsh operating environments. This value-added solution results in reduced engineering and installation costs. Junction boxes are available in a variety of housing materials and enclosure designs. Our off-the-shelf solutions offer a quick turn around for your next project.



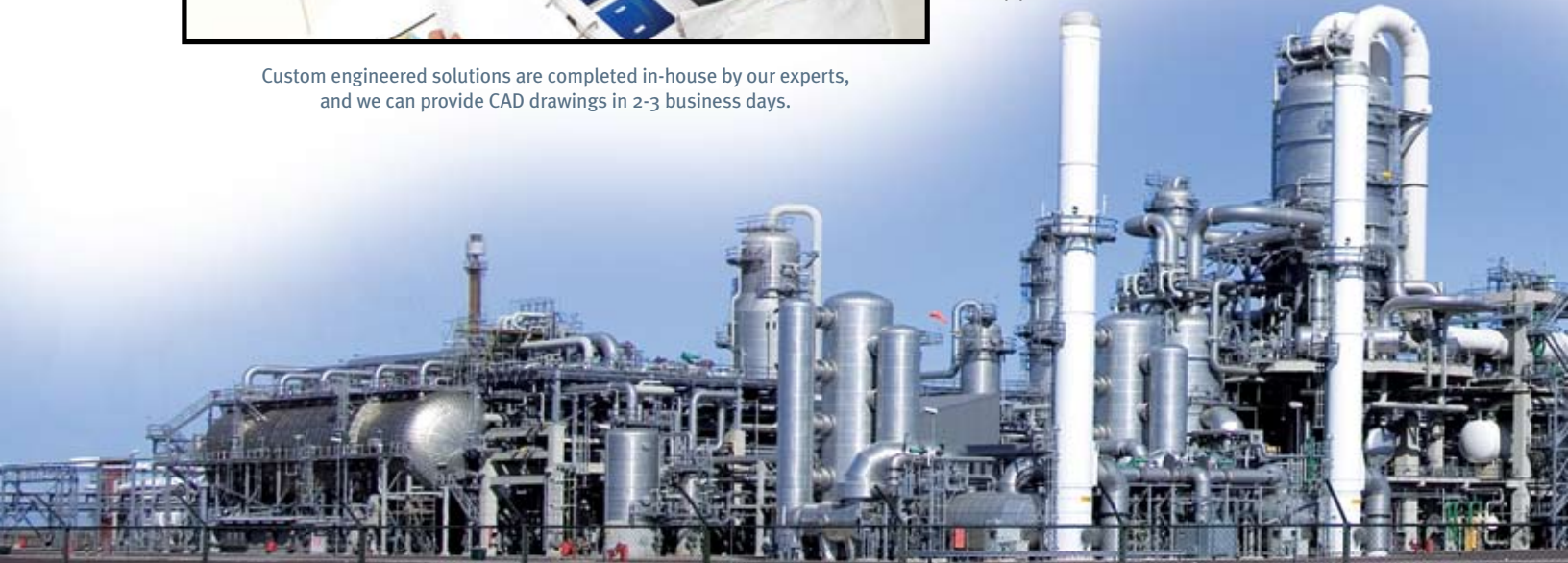
Typical field junction box

We not only offer a complete range of solutions for fieldbus installations, we can also develop custom solutions tailored to specific requirements. If your enclosure needs are on a much larger scale, allow



Custom engineered solutions are completed in-house by our experts, and we can provide CAD drawings in 2-3 business days.

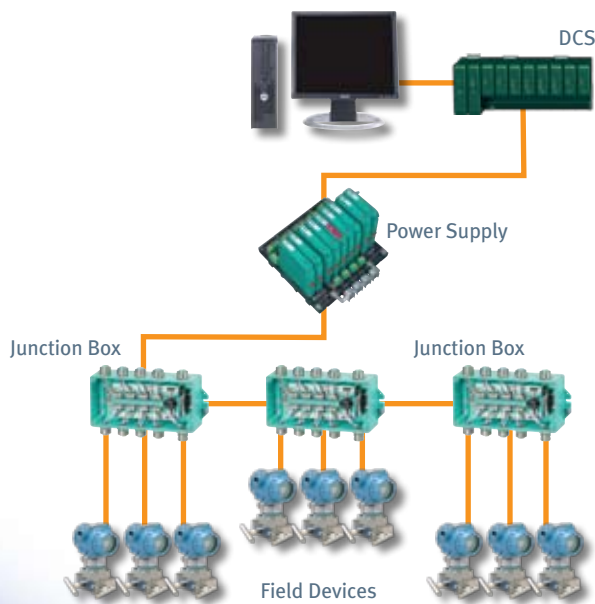
our application engineers to develop your unique solution. This reduces in-house engineering efforts and costs. From concept and design to startup and commissioning, Pepperl+Fuchs will provide custom-engineered field boxes manufactured in our UL508A, UL698A, and CSA approved panel shop. This guarantees the consistent superior quality you have come to expect from Pepperl+Fuchs.



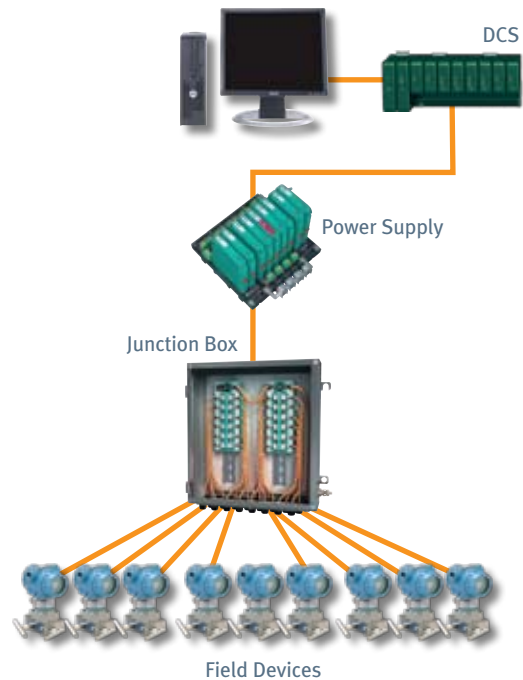
## Distributed Architecture

In process plants throughout the world, segment protectors and FieldBarriers are used as key components in the distribution of fieldbus networks from the control room to the field instruments. A trunk and spur topology is commonly used. In a typical fieldbus installation, 10-12 fieldbus devices are connected via one cable run that can span between 1500-1900 meters. This one cable supports power and communication to all the devices; therefore, it is recommended to use short circuit protection and energy limitation to isolate a fault condition from negatively affecting device communications on that segment. One device is connected to the output spur of a segment protector or FieldBarrier. Fieldbus junction boxes are installed close to the instruments in the field in one of two ways depending on the location of the instrumentation:

**Highly Distributed Architecture** Multiple segment protectors and FieldBarriers may be packaged together or combined with other components for a custom distribution panel



**Distributed Architecture** One segment protector/FieldBarrier per enclosure



# BUILDING A STANDARD JUNCTION BOX



Painted Steel



Polycarbonate



## Choose Your Material

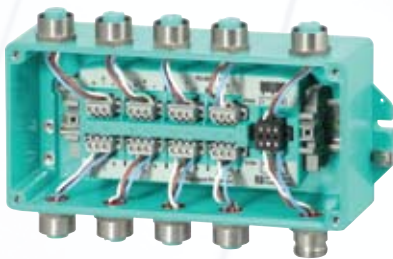
The enclosure material is an important consideration in planning the fieldbus network distribution, and it is critical to the overall success of the installation and long-term stability of fieldbus communications. Materials differ tremendously in their physical strength; however, the strength of a material does not determine its resistance to corrosion, water, or other outdoor elements.



Stainless Steel



Fiberglass

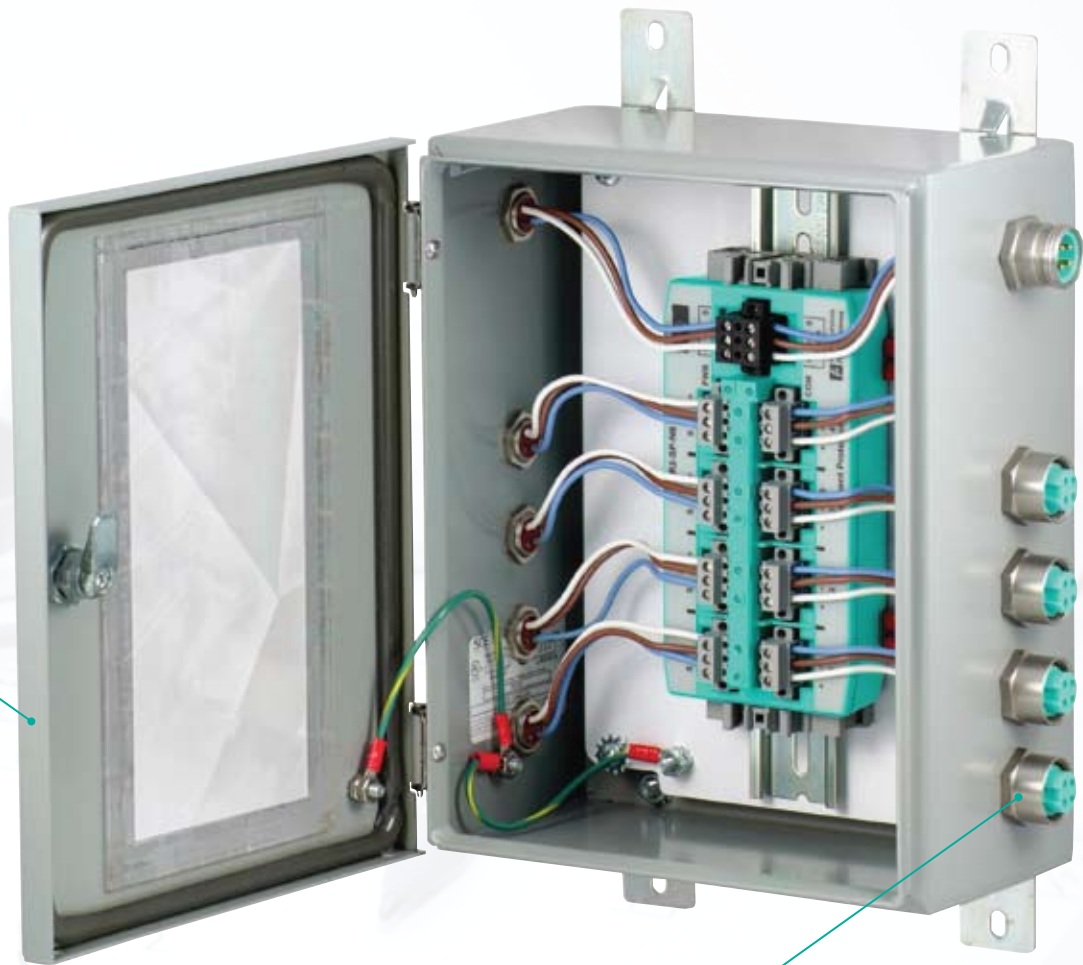


Aluminum (Segment Protector)



Aluminum (FieldBarrier)

	Polycarbonate	Fiberglass	Painted Steel	Aluminum	Stainless Steel
Options (cord grips & connectors)	available	available	available	available	available
Dimensions (inches)	9.2 x 6 x 3.3	9.6 x 7.5 x 4.7	10 x 8 x 4	10.1 x 4.5 x 3	10 x 8 x 4
Temperature Range (°C)	-35 to +70	-35 to +70	-40 to +70	-40 to +70	-40 to +70
IP/NEMA Ratings	IP 67 / NEMA 4, 4X, 6, 12, 13	NEMA 4X, 6P, 12	IP 66 / NEMA 4, 12, 13	NEMA 4X	IP 66 / NEMA 4, 4X, 12, 13



## Choose Your Cable Connection

Whether the installation specifies conduit, or armored or PLTC/ITC cable from the control room to the junction box, we have a wide range of solutions to make installation quick and easy. It is not uncommon to have different trunk and spur connections, i.e., conduit adapter on the trunk in/out and quick disconnect receptacles on the spurs. If you have a specific gland requirement, contact us for a solution.



*Mini Receptacle*

*NPT Conduit*

*Stainless Steel*

*Plastic*

*Nickel-Plated Brass*

## Choose Your Distribution Module

Segment protectors and FieldBarriers are key components in the distribution of the FOUNDATION fieldbus and PROFIBUS PA networks from the control room to the field instruments. FieldConnex distribution modules offer best-in-class segment reliability and simplified installation. Select the distribution interface that matches the application.

### Segment Protectors: General-Purpose, Div. 2/Zone 2

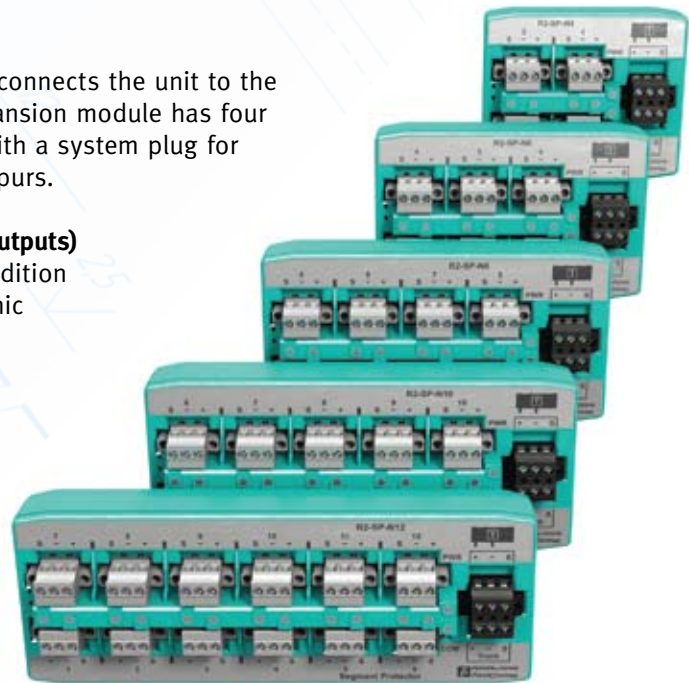
Segment protectors (current limiting devices) provide additional dependability to the fieldbus network; they isolate a single short from affecting the entire network. FieldConnex segment protectors simplify installation and reduce the likelihood of miswiring or over-termination. When the fault is repaired, the segment protector automatically resumes operation of the spur.

**R2 Segment Protector:** The innovative design provides simple installation of field instruments. A key feature is the trunk T-connector. It provides a single location for the terminator, and the segment protector can be replaced without disturbing the trunk. R2 segment protectors support 4-12 spurs.

**RM Modular Segment Protector:** The trunk module connects the unit to the segment and also has two output spurs. Each expansion module has four spurs and simply snap side-by-side on a DIN rail with a system plug for connection. RM segment protectors support 2-26 spurs.

### FieldBarrier: Zone 1/Class I Div. 1 Spurs (Entity/FISCO Outputs)

The FieldBarrier can be installed in Zone 1/Div. 2. In addition to short-circuit protection the FieldBarrier offers galvanic isolation. Each intrinsically safe output can be up to 120 m long. This permits installation of field instruments in Zone 0/Div. 1 and allows live maintenance on the instruments.



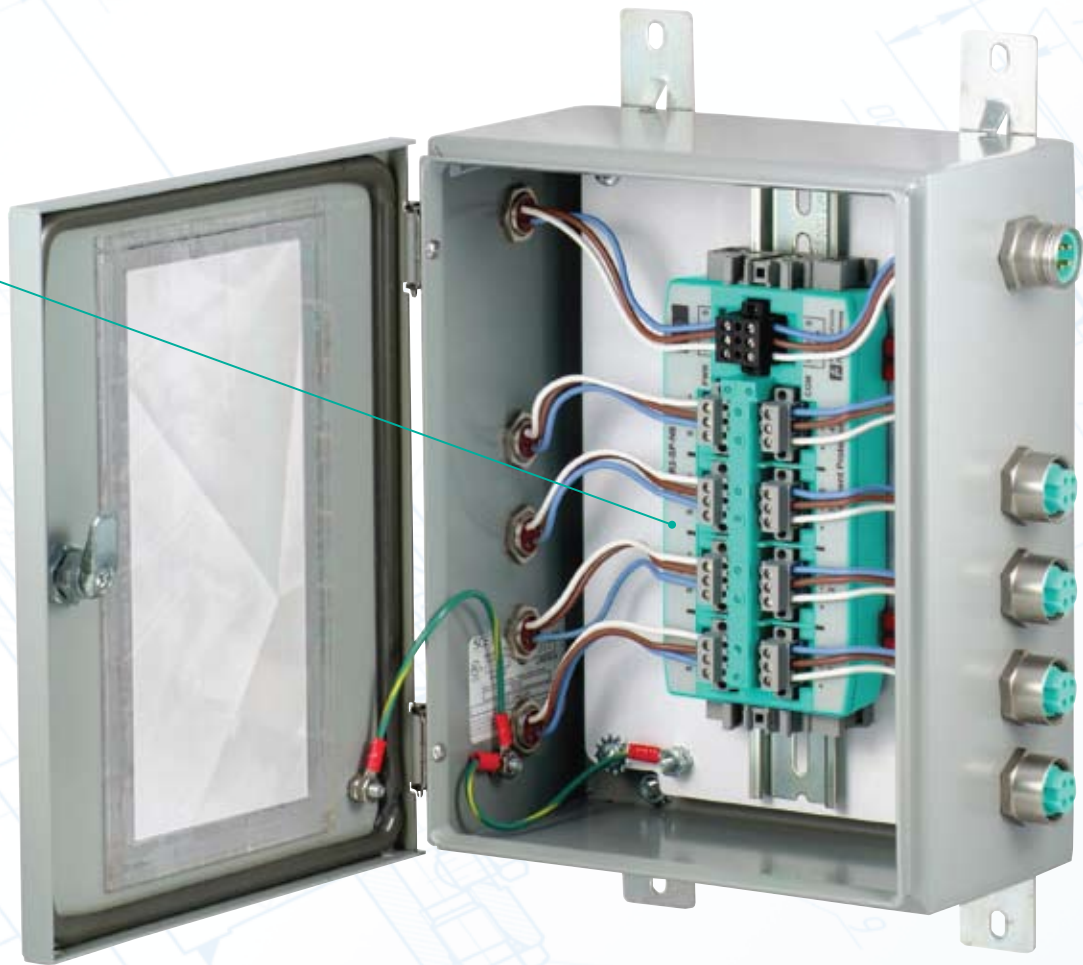
R2 Segment Protectors



RM Segment Protector  
Available as a custom junction box solution



FieldBarrier  
F2D0-FB-EX4 or available as a  
custom junction box solution



**SPJB - 10 - SS . CGS**

**Segment Protector  
Junction Box**

**Number of Spurs**  
4,6,8,10,12

**Enclosure Material**

**SS** Stainless Steel  
**SSW** Stainless Steel with Window  
**CS** Carbon Steel  
**CSW** Carbon Steel with Window  
**PCW** Polycarbonate with Window  
**FB** Fiberglass  
**FBW** Fiberglass with Window  
**AL** Aluminum

**Connection Type**

**NF** No Fitting  
**1/2 CB** 1/2" NPT Conduit  
**7/8S** 7/8" Mini Receptacle  
**CGP** Plastic Cable Gland  
**CGB** Nickel-Plated Brass Gland  
**CGS** Stainless Steel Gland

## Build an R2 Segment Protector Junction Box Model Number

Select the distribution module, number of spurs, connection type, and enclosure material to build your model number.

## Customize Your Junction Box

Pepperl+Fuchs is more than just a hazardous location supplier, we put things together.

Allow our trained engineering staff to assist in the design and documentation of your next custom junction box. Our experienced design engineers use AutoCAD® to provide quick turnaround on panel layout drawings and will explore all design options to ensure the most cost-effective solution. A custom enclosure, built to your specification, saves time and provides reduced startup and installation costs. Consider the versatility of incorporating multiple segment protectors, FieldBarriers, as well as lightning surge protection or Pepperl+Fuchs Bebcu EPS® purge solutions into a single enclosure. Our standards for quality and craftsmanship combined with our competitive prices make Pepperl+Fuchs an excellent choice for your next project.

- Reduced in-house engineering
- Installation savings
- Enclosures designed and built in our facility
- UL508A, UL698A, and CSA approved panel shop



Multiple FieldBarriers can be packaged with other components, such as surge protection, for a custom solution.

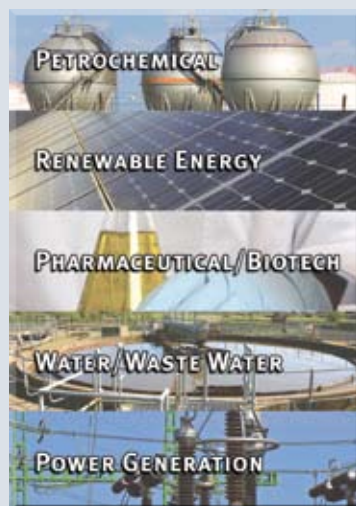


# TREMENDOUS VERSATILITY AND COST SAVINGS

Pepperl+Fuchs Bebcos EPS Purge Pressurization products offer a safe and economical approach to installing electrical equipment in hazardous locations. By creating a safe area inside the enclosure, general-purpose equipment can be used in hazardous (classified) areas.



## Applications & Markets Where We Specialize



Installing signal conditioners and intrinsic safety isolator termination boards in the field replaces manual point-to-point wiring and long cable runs back to the control system cabinet. This shift saves a tremendous amount of time and money.



Distributed fieldbus junction boxes are a money-saving option when there is a large grouping of field instruments.

## Quick Disconnect Cables and Bulk Fieldbus Cable

Our Type A/ER molded cordset and extension cables are manufactured with PLTC/ITC ER-rated cable. Exposed Run (ER) cable is more robust and has a crush-resistant construction. ER cable can run up to 15 meters outside an open cable tray or conduit reducing the overall installation time and cost. Quick disconnect connectors make installation and disconnection quick and easy. Male-female molded extension cables eliminate common hard wiring errors. In the North American fieldbus market we typically see female cordsets (female molded connector with flying leads). The fieldbus cable is hard wired at the field junction box and has a molded connector at the instrument.

Armored FOUNDATION Fieldbus Extension Cables & Cordsets	
See online part no. configurator at <a href="http://www.am.pepperl-fuchs.com/fieldconnex/configurator.jsp">http://www.am.pepperl-fuchs.com/fieldconnex/configurator.jsp</a>	
C-V9F-G-BK-*M-ACL-V9M-G-FF-S	AL armored extension cable * = lengths 1-300 m
C-V9F-G-BK-*M-ACL-0-0-FF-S	AL armored female cordset * = lengths 1-300 m

FOUNDATION Fieldbus Type A/Exposed Run Extension Cables & Cordsets (4-pole S.S. coupling nut)	
C-V9F-G-OR-*M-ER-V9M-G-FF-S	(7/8) extension cable * = lengths 1-250 m (stocked lengths 1,2,5,10,15,20, 25,30, and 50 meters)
C-V1F-G-OR-*M-ER-V9M-G-FF-S	(M12) extension cable * = lengths 1-250 m (stocked lengths 1,2,5,10,15,20, 25,30, and 50 meters)
C-V9F-G-OR-*M-ER-0-0-FF-S	(7/8) female cordset * = lengths 1-250 m (stocked lengths 1,2,5,10,15,20, 25,30, and 50 meters)
C-V1F-G-OR-*M-ER-0-0-FF-S	(M12) female cordset * = lengths 1-250 m (stocked lengths 1,2,5,10,15,20, 25,30, and 50 meters)

Bulk Fieldbus Type A Exposed Run Cable * = OR (Orange) * = BL (Blue)	
C-*- 300	Fieldbus Type A: shield TP, 18 AWG - PVC type PLTC, ITC cable, 300 m (1000 ft)
C-*- 750	Fieldbus Type A: shield TP, 18 AWG - PVC type PLTC, ITC cable, 750 m (2500 ft)
C-*- 1500	Fieldbus Type A: shield TP, 18 AWG - PVC type PLTC, ITC cable, 1500 m (5000 ft)
Bulk FOUNDATION fieldbus multicore - orange	
C-OR-* MC-300	Fieldbus Type A: * 2, 5 or 8 shield TP Pair, 18 AWG multicore PVC type A PLTC, ITC cable, 300 m (1000 ft)
Bulk FOUNDATION fieldbus armored Type A - black	
C-A-300	Type A fieldbus cable with aluminum armor, 18 AWG, PLTC/CM/ITC 300 m (1000 ft)

## Fieldbus Physical Layer Diagnostics

Increase commissioning efficiency and reduce operating cost with online diagnostics that continuously evaluate the fieldbus physical layer. The Advanced Diagnostic Module (ADM) is a tool for comprehensive commissioning diagnostics for the fieldbus physical layer for both FOUNDATION fieldbus H1 and PROFIBUS PA. The ADM simplifies device installation and loop checks through the node commission wizard and sets notification levels for signal degradation and easy troubleshooting from the control room.

Advanced Physical Layer Diagnostics	
COMM-KT	Fieldbus commissioning kit, 120 V 500 mA PS, 24 V fieldbus PS (No DM-AM/DTM license)
ADM-COMM-KT	Fieldbus commissioning kit, 120 V 500 mA PS, 24 V fieldbus PS, DM-AM/DTM license
ADM-COMM-NI-KT	Fieldbus commissioning kit, 120 V 500 mA PS, 24 V fieldbus PS, DM-AM/DTM license & National Instruments FF H1 interface
DM-AM-KIT	Mobile ADM Kit, includes ADM, carrying case, mounting bracket, cables & screw driver
DTM-FC.ADM	Professional DTM license for Mobile ADM

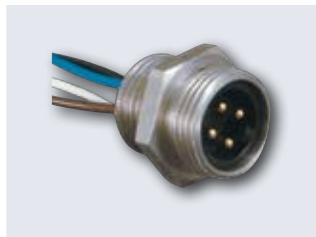
## Accessories

Fieldbus accessories make installation easier. We have a variety of mini and micro instrument receptacles, receptacle covers, and cable gland plugs in plastic, stainless steel, and nickel-plated brass. Mini and micro field attachable connectors are available to make quick disconnect cable connections in the field.



### Field Attachable Connectors

V1-FA-M-B	M12, male, NPB, shielded (right angle available)
V1-FA-F-B	M12, female, NPB, shielded (right angle available)
V9-FA-M-B	7/8", male, NPB, shielded (right angle available)
V9-FA-F-B	7/8", female, NPB, shielded, straight (right angle available)
V9-FA-M-S	7/8", male, plastic W/ SS, straight (right angle available)
V9-FA-F-S	7/8", female, plastic W/ SS, straight (right angle available)



### Instrument Receptacles

V9-R-M-S	7/8" (mini) male 1/2" NPT, 18 AWG, SS
V9-R-M-A	7/8" (mini) male 1/2" NPT, 18 AWG, aluminum
V9-R-M2-S	7/8" (mini) male 1/2" NPT, 18 AWG, SS, 2-wire
V1-R-M-S	7/8" (mini) male 1/2" NPT, 18 AWG, SS, 4-wire
V1-R-M2-S	7/8" (mini) male 1/2" NPT, 18 AWG, SS, 2-wire



### Other Accessories

M20-CG-PLUG	M20 cable gland plug enclosure
V9-CL	Mini connector lock, 10 pieces/bag
VAZ-VR-1	M12 male receptacle cover
V9-R-F-COV	7/8" female receptacle cover nylon
JB-BR-TB	Insertion bridge - 2 position, 10 pieces
M16-NPT-CON	Adapter - M16 to 1/2" NPT-brass
C-V9-TEE-A	4-pole mini tee, aluminum
C-V9-TEE-S	4-pole mini tee, S.S.



### Fieldbus Surge Protection

DB-LB-I	DIN rail base module, I.S.
DP-LBF-I1.34	I.S. protection module
DB-LB	DIN rail base module, general-purpose
DP-LBF-1.34	General-purpose protection module
FN-LBF-D1.32	1/2"NPT screw in surge protection, general-purpose
FN-LBF-I1.32	1/2"NPT screw in surge protection, I.S. fieldbus



### Terminators

KMD0-FT-EX	DIN rail fieldbus terminator, I.S. or safe area
FN-FT-EX1.D.IEC	Screw mount terminator, I.S. or safe area

# PROCESS AUTOMATION – PROTECTING YOUR PROCESS



For over a half century, Pepperl+Fuchs has provided new concepts for the world of process automation. Our company sets standards in quality and innovative technology. We develop, produce and distribute electronic interface modules, Human-Machine Interfaces and hazardous location protection equipment on a global scale, meeting the most demanding needs of industry. Resulting from our world-wide presence and our high flexibility in production and customer service, we are able to offer complete individual solutions – wherever and whenever you need us. We are the recognized experts in our technologies – Pepperl+Fuchs has earned a strong reputation by supplying the world's largest process industry companies with the broadest line of proven components for a diverse range of applications.

**1 Worldwide/German Headquarters**  
Pepperl+Fuchs GmbH  
Mannheim · Germany  
Tel. +49 621 776 2222  
E-Mail: [pa-info@de.pepperl-fuchs.com](mailto:pa-info@de.pepperl-fuchs.com)

**2 Asia Pacific Headquarters**  
Pepperl+Fuchs PTE Ltd.  
Singapore  
Company Registration No. 199003130E  
Tel. +65 6779 9091  
E-Mail: [pa-info@sg.pepperl-fuchs.com](mailto:pa-info@sg.pepperl-fuchs.com)

**3 Central/Western Europe & Africa Headquarters**  
Pepperl+Fuchs N.V.  
Schoten/Antwerp · Belgium  
Tel. +32 3 6442500  
E-Mail: [pa-info@be.pepperl-fuchs.com](mailto:pa-info@be.pepperl-fuchs.com)

**4 Middle East Headquarters**  
Pepperl+Fuchs M.E (FZE)  
Dubai · UAE  
Tel. +971 4 883 8378  
E-Mail: [pa-info@ae.pepperl-fuchs.com](mailto:pa-info@ae.pepperl-fuchs.com)

**5 North/Central America Headquarters**  
Pepperl+Fuchs Inc.  
Twinsburg · Ohio · USA  
Tel. +1 330 486 0002  
E-Mail: [pa-info@us.pepperl-fuchs.com](mailto:pa-info@us.pepperl-fuchs.com)

**6 Northern Europe Headquarters**  
Pepperl+Fuchs GB Ltd.  
Oldham · England  
Tel. +44 161 6336431  
E-Mail: [pa-info@gb.pepperl-fuchs.com](mailto:pa-info@gb.pepperl-fuchs.com)

**7 Southern/Eastern Europe Headquarters**  
Pepperl+Fuchs Elcon srl  
Sulbiate · Italy  
Tel. +39 039 62921  
E-Mail: [pa-info@it.pepperl-fuchs.com](mailto:pa-info@it.pepperl-fuchs.com)

**8 Southern America Headquarters**  
Pepperl+Fuchs Ltda.  
São Bernado do Campo · SP · Brazil  
Tel. +55 11 4341 8448  
E-Mail: [pa-info@br.pepperl-fuchs.com](mailto:pa-info@br.pepperl-fuchs.com)

[www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

 **PEPPERL+FUCHS**  
PROTECTING YOUR PROCESS