Amphenol

RJ Field

RJF TV

Self Closing Cap
(RJ 45/USB/IEEE 1394)


RJF RB (RJ Fast)

RJF 544


RJF EZ

USB-A Field


Rugged USB memory key

FW Field (IEEE 1394)

RJ11 Field


MTRJ Field - LC Field


RJ Switch

# FIELD Series - *catalog*

Reinforced Infocom Connectors for Harsh Environment

RJ45 Field - RJ11 Field - RJ Switch - USB Field - FireWire Field - LC Field - MTRJ field

**Electronica 2004**

**Amphenol**

*RJF Series Awarded*

***"Component product of the year"***

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## APPLICATIONS

Commercial
Avionics and Rail
Mass Transit

Factory
Automation

Video
and CCTV

Wireless
Systems

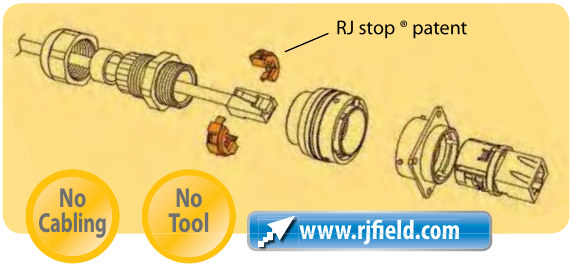
C4ISR
Military
Communications

## RJFIELD CONCEPT

The Amphenol Field Series allows you to transform a standard infocom cordset into a rugged waterproof connector for harsh environments.

RJ field allows you to use Ethernet Class D / Cat. 5e connections for 10 Base T, v 100 Base TX or 1000 Base T networks in extreme environments.

EXAMPLE FOR RJ 45 CORDSET




- A full range of versions depending upon the application
- No cabling operation nor measurement required after installation
- Sealing: IP67 (1 meter immersion for up to 30 minutes)
- Shock, vibration and traction resistant
- Inline extension
- Mechanical coding/polarization
- EMI protection

## RJFIELD SELECTION GUIDE

| CONNECTORS | Series | Industrial Ethernet Specification | Coupling Mechanism | Shape | Material | Specification | Prime Market | Page |
|---|---|---|---|---|---|---|---|---|
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|  | RJF EZ | IEC 60603-7 variant 13 | Lever | Rectangular | Plastic | N/A | Industrial & Telecom | 8 |
|  | RJF | IEC 60603-7 variant 11 | Bayonet | Circular | Metal | MIL-C-26482 | MIL/Aero & Industrial | 10 |
|  | RJF TV | | Thread | Circular | Metal | MIL-DTL-38999 (Series III) | MIL/Aero & Rail Mass Transit | 15 |
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## RJFIELD SELECTION GUIDE

| ETHERNET SWITCHES | Series | Sealing | Material | Number of ports | Unmanaged | Ring | Managed | Prime Market | Page |
|---|---|---|---|---|---|---|---|---|---|
|  | RJS | IP30 | Metal & Plastic | 5 or 9 | x | x | x | Factory Automation / Video | 44 |
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| NEW  | RJSML | IP67 | Metal | 9 | x | x | x | MIL/Aero | 51 |

## RJFIELD SELECTION GUIDE

| CABLE & CORDSET | Reels | Cordsets | Prime Market | Page |
|---|---|---|---|---|
|  | *(without RJ45)*<br>100 m (around 238 ft)<br>300 m (around 984 ft) | *(with RJ45 overmolded at each end)*<br>Available lengths see page 25 | Mil/Aero & Rail Mass Transit | 25 |
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# RJF RB

**Ethernet Connection System for Harsh Environment – Industrial Ethernet**

RJFRB allows you to use an Ethernet Class D / Cat. 5e and Class E/Cat 6 connection for 10 BaseT,100 BaseTX or 1000 BaseT networks in harsh environments.
With the patented RJStop® system you can use a standard RJ45 cordset in a protective composite plug which will protect it from shocks, dust and fluids.
**No hazardous on-field cabling and grounding!**

IDC Receptacle

NEW CAT6

PCB Receptacle

NEW PCB

## MAIN CHARACTERISTICS

- Sealed against fluids and dust (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field, no tools required
- **Reverse bayonet coupling**
- RJ45 cordset retention in the plug: 70 N in the axis
- Mating cycles: 500 min

ROHS COMPLIANT

## Applications

- Telecom Equipments
- Video Control
- Robotics
- Industrial Process Control
- CNC Machines
- Special Machines
- Motion Control

## Environmental Protection

- Sealing: IP67
- Salt Spray > 1000 h
- Fire Retardant / Low Smoke: UL94 V0 and NFF 16102, DIN 5510-2
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Operating Temperature: - 40°C / +85°C

## Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801
Cat6 per TIA/EIA 568B and ClassE per ISO/IEC 11801

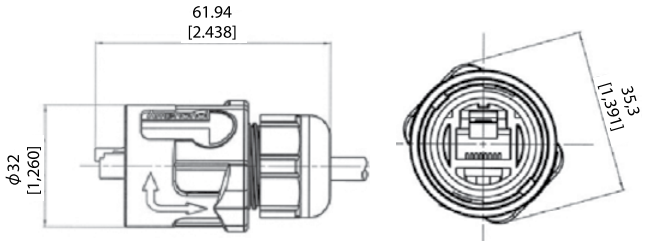
## Part Number Code

| | | | | |
|---|---|---|---|---|
| **Series**<br>**RJF RB** | | **RJF RB** | **7** | **1RA** |
| **Shell Type** | | | | |
| **6:** | Composite reverse bayonet Plug, Plastic Gland | | | |
| **7:** | Composite jam nut Receptacle | | | |
| **Back Terminations** *(For Receptacles only)* | | | | |
| **1:** | Female RJ45 | | | |
| **1RA:** | Right angle female RJ45 | | | |
| **2:** | RJ45 Cordset | | | |
| **3U:** | IDC cat6 - unshielded | | | |
| **3F:** | IDC cat6 - partial shielding | | | |
| **3S:** | IDC cat6 - 100% shielded | | | |
| **Cordset Length** *(For Receptacles with "2" back termination only)* | | | | |
| **03:** | 0.3m [11.81 inches] | | | |
| **05:** | 0.5m [19.68 inches] | | | |
| **10:** | 1m [39.37 inches] | | | |
| **15:** | 1.5m [59.05 inches] | | | |
| **Cabling Configuration** *(For "7" Receptacles and with type "2" back termination only)* | | | | |
| **100BTX:**<br>**568A** | (=568B) | | | |

Examples:
- Plug: RJF RB 6
- Receptacle, female RJ45 Back termination: RJF RB 71
- Receptacle, right angle female RJ45 Back termination: RJF RB 71RA
- Receptacle, 1,5m [59.05"] RJ45 cordset termination: RJF RB 72 15 100BTX

## Plug

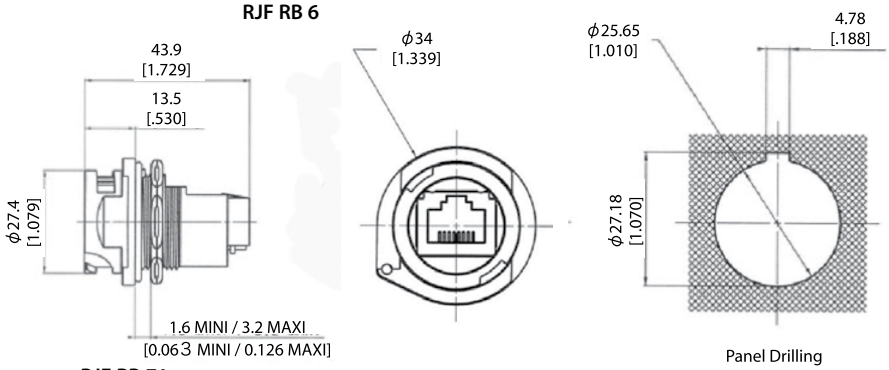
■ Type 6 Shell with Plastic Gland




**RJF RB 6**

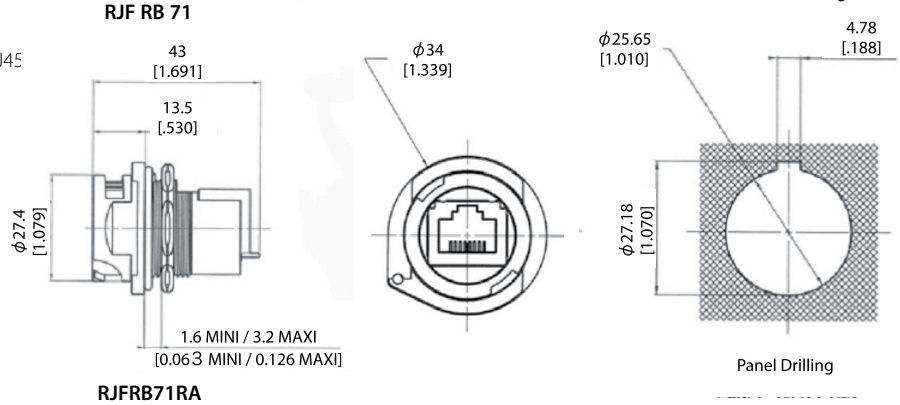
## Receptacle

■ Type 1: Female RJ45
*(front mounting)*



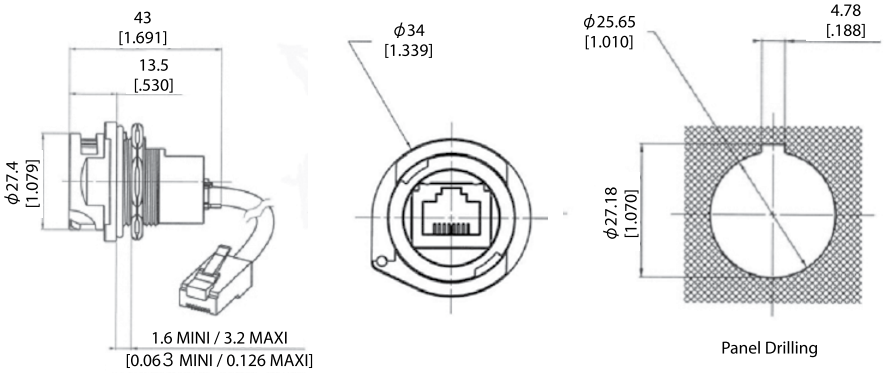

**RJF RB 71**

■ Type 1RA: Right Angle Female RJ45
*(front mounting)*




**RJFRB71RA**

■ Type 2: RJ45 Cordset
*(front mounting)*

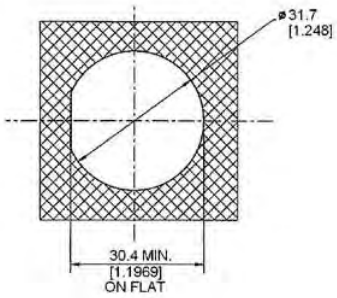



**RJFRB72XX 100BTX (XX=03, 05, 10 or 15 - see part number code page 3)**

■ Type 3: IDC Cat6 termination
*(rear mounting)*

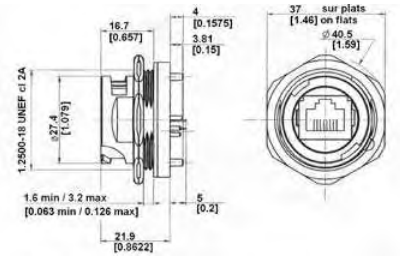
Unshielded: **RJFRB73U**
Partial shielding **RJFRB73F**

**Panel Drilling**

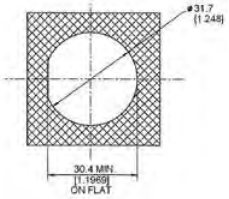



Shielded: **RJFRB73S**

■ Straight PCB termination receptacle:
*(rear mounting)*



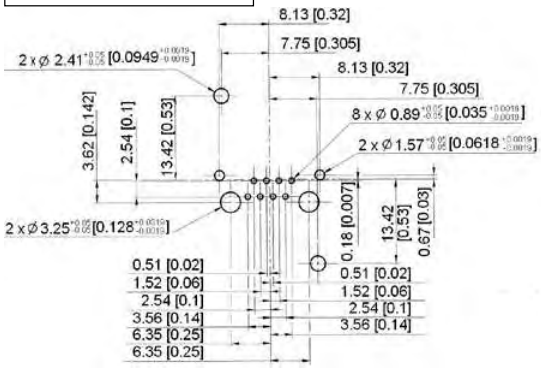

**Panel Drilling**




**Part number:** RJF RB 75

**IMPORTANT NOTE**
The customer's PCB design will determine the receptacle category.

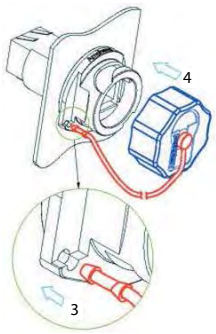
## PCB Drilling RJFRB



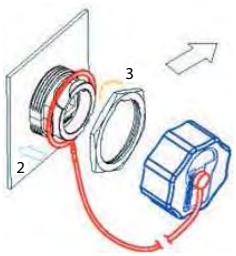

## Assembly Instructions


## Accessories

■ **IP67 Dust Caps**




**RJF RB C7**
Cap for receptacles RJFRB71 / 71RA / 72xxx




**RJF RB C75**
Cap for receptacles RJFRB75 and RJFRB73x

# RJF 544

## Ethernet Connection System for Harsh Environment – Industrial Ethernet

RJF544 allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT,100 BaseTX or 1000 BaseT networks in harsh environments:
With the patented RJStop® system you can use a standard RJ45 cordset in a protective composite plug which will protect it from shocks, dust and fluids.
**No hazardous on-field cabling and grounding!**

ROHS COMPLIANT

## MAIN CHARACTERISTICS

- **Compliant with IEC 60603-7 variant 12**
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- Sealed against fluids and dust (IP67)
- **Quick Push Pull coupling**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Improved EMI Protection

### Applications

- Telecom Equipment
- Video Control
- Robotics
- Industrial Process Control
- CNC Machines
- Special Machines
- Motion Control
- Tele-maintenance

### Environmental Protection

- Sealing: IP67
- Salt Spray > 1000 h
- Fire Retardant / Low Smoke: UL94 V0 and NFF 16102, DIN 5510-2
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 10 nano s.
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Operating Temperature: - 40°C / +85°C

### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

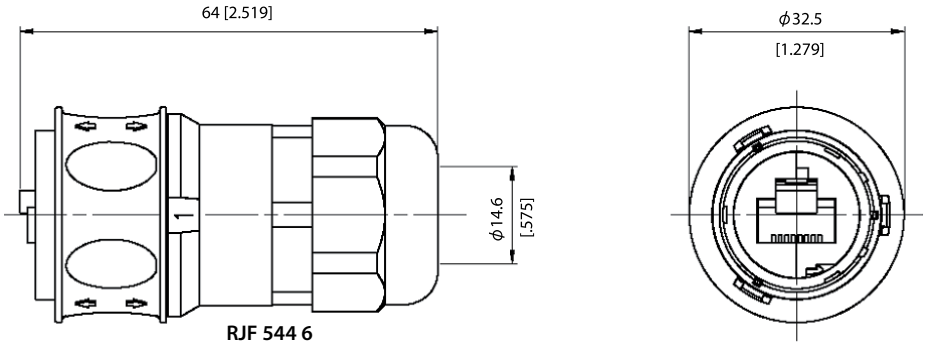
## Part Number Code

| | | | | | |
|---|---|---|---|---|---|
| **Series**<br>**RJField 544 - Push Pull** | **RJF 544** | **2** | **2** | **03** | **100 BTX** |
| **Shell Type**<br>**6:** Composite Push Pull Plug, Plastic Gland<br>**2:** Composite Square Flange Receptacle<br>**2M:** Metallized (Ni) Composite Square Flange Receptacle | | | | | |
| **Back Terminations** *(For Receptacles only)*<br>**1:** Female RJ45<br>**2:** RJ45 Cordset | | | | | |
| **Cordset Length** *(For Receptacles with "2" Back Termination only)*<br>**03:** 0.3 meters [11.81 inches]<br>**05:** 0.5 meters [19.68 inches]<br>**10:** 1 meter [39.37 inches]<br>**15:** 1.5 meters [59.05 inches]<br>**00:** 8 tinned holes at the rear of the PCB to solder the cable | | | | | |
| **Cabling Configuration** *(For "2" Receptacles only)*<br>**100BTX:** (=568B)<br>**568A** | | | | | |

Examples:
- Plug: RJF 544 6
- Square flange receptacle, Female RJ45 Back termination: RJF 544 21
- Metallized Square flange receptacle, Female RJ45 Back termination: RJF 544 2M 1
- Square flange receptacle, 1,5m [59.05"] 100 BTX cordset termination: RJF 544 22 15 100BTX
- Square flange receptacle, solder termination: RJF 544 22 00

## Plug

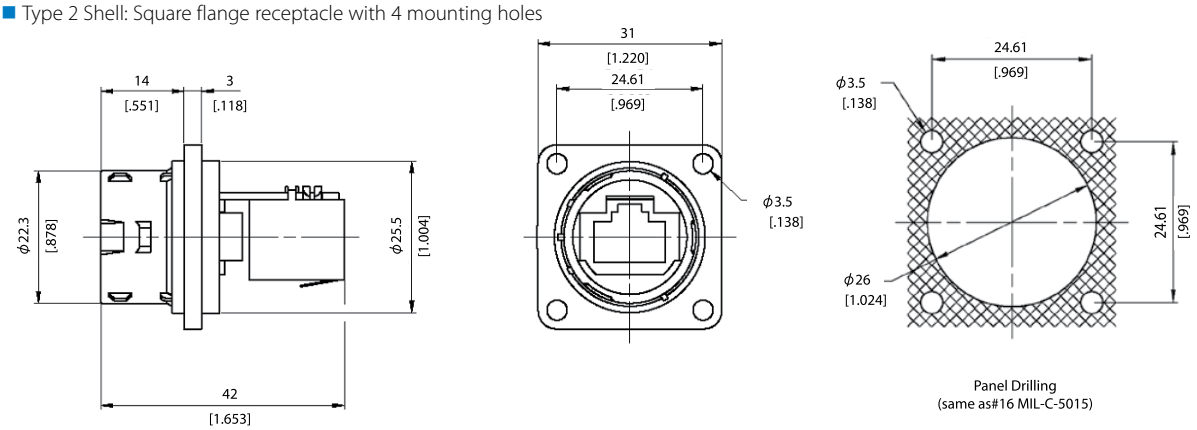
- Type 6 Shell with Plastic Gland




**RJF 544 6**

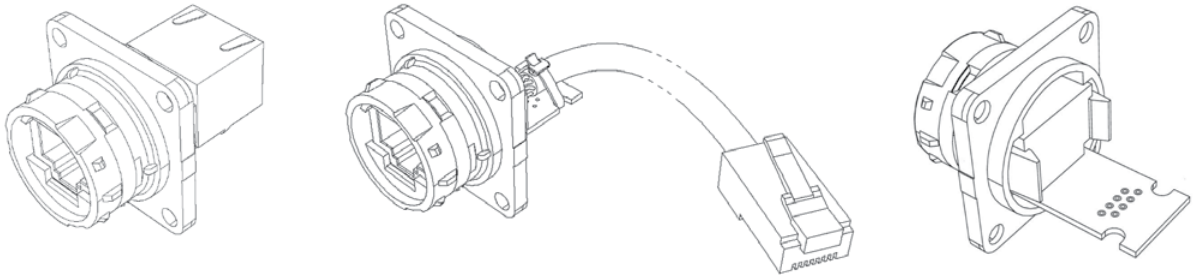
## Receptacle

- Type 2 Shell: Square flange receptacle with 4 mounting holes




**RJF 544 2**

## Back Terminations



Type 1: Female RJ45

Type 2: RJ45 Cordset

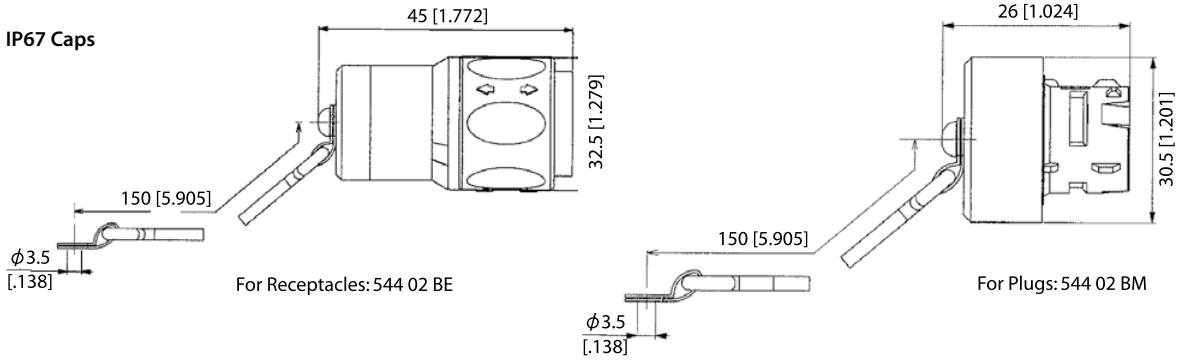
Type 2 - 00: Solder – 8 tinned holes

**Notes:** - Type 2 without RJ45 plug at the end of the cable are also available: consult factory

- Type 1 also availble with 90° female RJ45

## Accessories

- **IP67 Caps**




For Receptacles: 544 02 BE

For Plugs: 544 02 BM

- Panel Gasket (Thickness: 1 mm [.039]): Part No. 544 02 JE
- Plug Insert removal tool: Part No. 5440 OT 02

# RJF EZ

## Ethernet Connection System for Harsh Environment – Industrial Ethernet

RJFEZ allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT,100 BaseTX or 1000 BaseT networks in harsh environments.
With the patented RJStop® system you can use a standard RJ45 cordset in a protective composite plug which will protect it from shocks, dust and fluids.
**No hazardous on-field cabling and grounding!**

### MAIN CHARACTERISTICS

- **Compliant with IEC 60603-7 variant 13**
- Sealed against fluids and dust (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- **Quick lever coupling**
- RJ45 cordset retention in the plug: 70 N in the axis
- Mating cycles: 500 min

### Applications

- Telecom Equipment
- Video Control
- Robotics
- Industrial Process Control
- CNC Machines
- Special Machines
- Motion Control
- Tele-maintenance

### Environmental Protection

- Sealing: IP67
- Salt Spray > 1000 h
- Fire Retardant / Low Smoke: UL94 V0 and NFF 16102, DIN 5510-2
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Operating Temperature: - 40°C / +85°C

### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

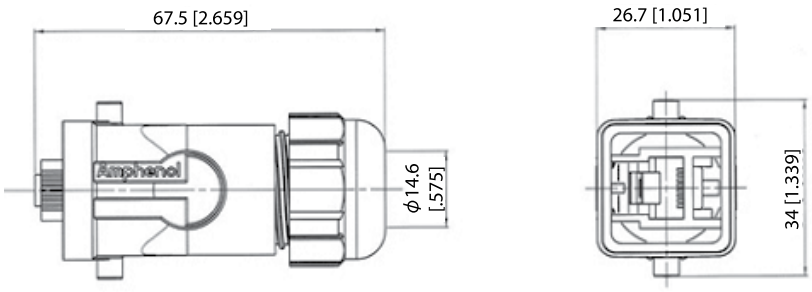
ROHS COMPLIANT

### Part Number Code

| | | | | | |
|---|---|---|---|---|---|
| **Series**<br>**RJField EZ - Lever** | **RJF EZ** | **2** | **2** | **03** | **100 BTX** |
| **Shell Type**<br>**6:** Composite Lever Plug, Plastic Gland<br>**2:** Composite Square Flange Receptacle | | | | | |
| **Back Terminations** *(For Receptacles only)*<br>**1:** Female RJ45<br>**2:** RJ45 Cordset | | | | | |
| **Cordset Length** *(For Receptacles with "2" Back Termination only)*<br>**03:** 0.3m [11.81 inches]<br>**05:** 0.5m [19.68 inches]<br>**10:** 1m [39.37 inches]<br>**15:** 1.5m [59.05 inches] | | | | | |
| **Cabling Configuration** *(For "2" Receptacles only)*<br>**100BTX:** (=568B)<br>**568A** | | | | | |

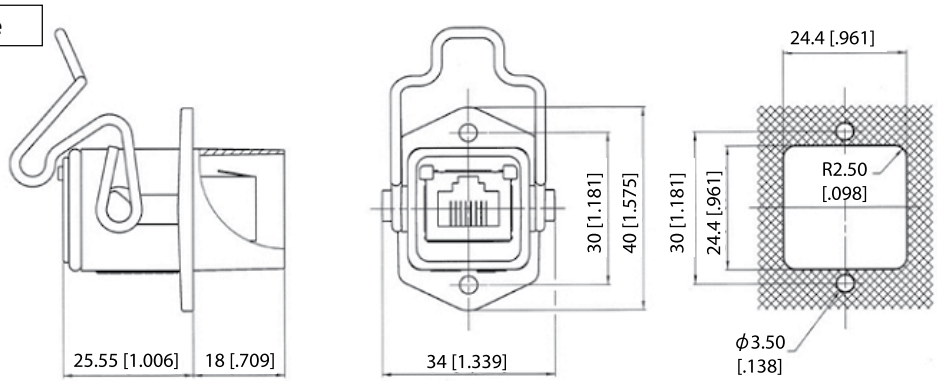
Examples:
- Plug: RJF EZ 6
- Receptacle, Female RJ45 Back termination: RJF EZ 21
- Receptacle, 1,5m [59.05"] 100 BTX cordset termination: RJF EZ 22 15 100BTX

## Plug




**RJF EZ 6**

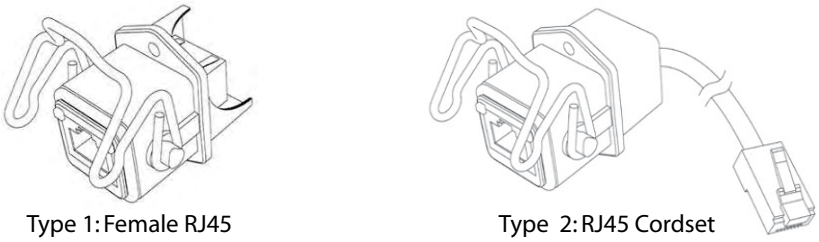
## Receptacle




Panel Drilling

**RJF EZ 2**

## Back Terminations

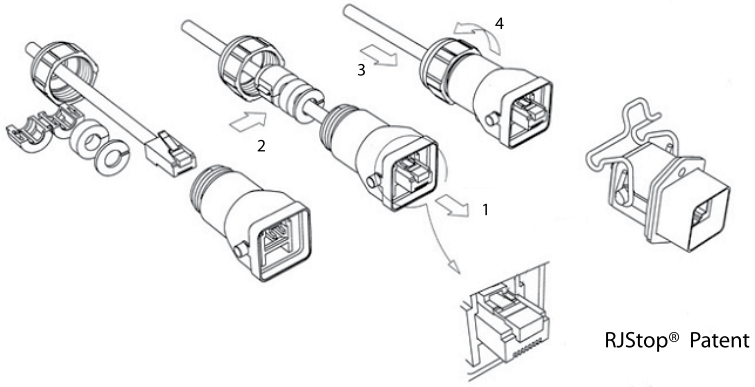


Type 1: Female RJ45

Type 2: RJ45 Cordset

**Notes:** Type 2 without RJ45 plug at the end of the cable are also available: consult factory

## Assembly Instructions




RJStop® Patent

## Accessories

- **IP67 Dust Caps**
  For Plugs: **Not available**
  For Receptacles: **RJF EZ BE**

- **Panel Gasket**
  Thickness: 1 mm [.039]
  Part No. RJF EZ JE

# RJF

**Ethernet Connection System for Harsh Environment – Industrial Ethernet**


RJF allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT,100 BaseTX or 1000 BaseT networks in harsh environments:
With the patented RJStop®system you can use a standard RJ45 cordset in a metallic plug which will protect it from shocks, dust and fluids.
**No hazardous on-field cabling and grounding!**

**ROHS COMPLIANT**
"N": nickel plating
"B": black coating

## MAIN CHARACTERISTICS

- **Compliant with IEC 60603-7 variant 11**
- **Bayonet coupling** ("Audible & Visual" coupling signal )
- **Robust metallic shells based on MIL-C-26482**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min
- Sealed against fluids and dust (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- Mechanical Coding / Polarization (4 positions)

### Applications

- Robotics
- Industrial Process Control
- CNC Machines
- Special Machines
- Oil & Gas
- Motion Control
- Data Acquisition and Transmission in Harsh Environment
- Tele-maintenance

### Environmental Protection

| | |
|---|---|
| Sealing: | IP67 |
| Salt Spray: | 48 h with Nickel plating<br>> 96 h with black coating<br>> 500 h with Oliv Drab Cadmium |
| Fire Retardant / Low Smoke: | UL94 V0 and NF F 16 101 & 16 102 |
| Vibrations: | 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 10 nano s. |
| Shocks: | IK06: weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair) |
| Humidity: | 21 days, 43°C, 98% humidity |
| Thermal Shock: | 5 cycles at - 40°C / +100°C |
| Temperature Range: | - 40°C / +85°C |

### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

## Part Number Code

| Series<br>RJField | RJF | 2 | 2 | B | 03 | 100 BTX |
|---|---|---|---|---|---|---|

**Shell Type**

| | |
|---|---|
| **6:** | Plug, Plastic Gland |
| **6M:** | Plug, Metal Gland |
| **2:** | Square Flange Receptacle |
| **2PE:** | IP67 In line square flange Receptacle |
| **2PEM:** | IP67 In line square flange Receptacle, Metal Gland |
| **7:** | Jam Nut Receptacle |
| **7PE:** | IP67 In line Jam Nut Receptacle |
| **7PEM:** | IP67 In line Jam Nut Receptacle, Metal Gland |

**Back Terminations** *(For Receptacles only)*

| | |
|---|---|
| **1:** | Female RJ45 |
| **2:** | RJ45 Cordset |

**Shell Finishes**

| | |
|---|---|
| **B:** | Black Coating - ROHS compliant |
| **N:** | Nickel *(Note: with this version, the inserts are metallized)* - ROHS compliant |
| **G:** | Olive Drab Cadmium *(Note: with this version, the inserts are metallized)* |

**Cordset Length** *(For Receptacles with "2" Back Termination only)*

| | |
|---|---|
| **03:** | 0.3m *[11.81 inches]* |
| **05:** | 0.5m *[19.68 inches]* |
| **10:** | 1m *[39.37 inches]* |
| **15:** | 1.5m *[59.05 inches]* |
| **00:** | 8 tinned holes at the rear of the PCB to solder the cable |

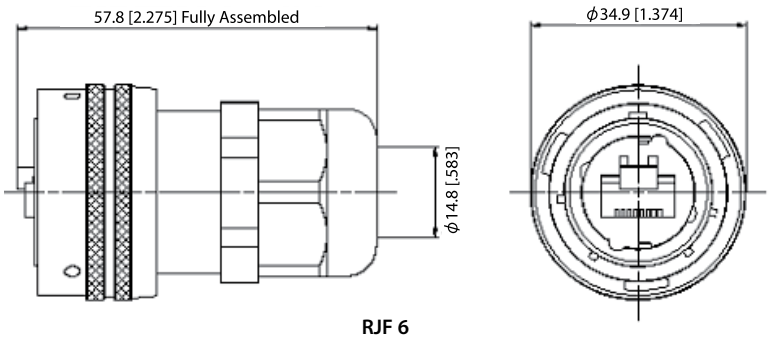
**Cabling Configuration** *(For "2" Receptacles only)*

| | |
|---|---|
| **100BTX:** | (=568B) |
| **568A** | |

Examples:
- Nickel plug: RJF 6 N
- Black square flange receptacle, female RJ45 back termination: RJF 2 1 B
- Olive drab cadmium jam nut receptacle, 1.5m [59.05"] 100 BTX cordset termination: RJF 7 2 G 15 100BTX
- Black in line square flange receptacle, 30cm [11.81"] 100BTX cordset termination: RJF 2PE 2 B 03 100BTX
- Nickel jam nut receptacle, solder termination: RJF 72 N 00

## Plug:

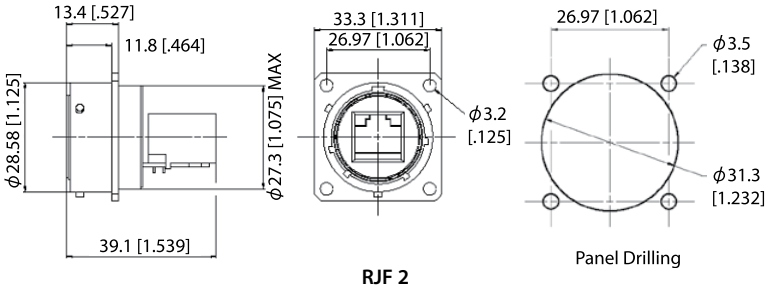
■ Shell type 6 With Plastic or Metal Gland




**RJF 6**

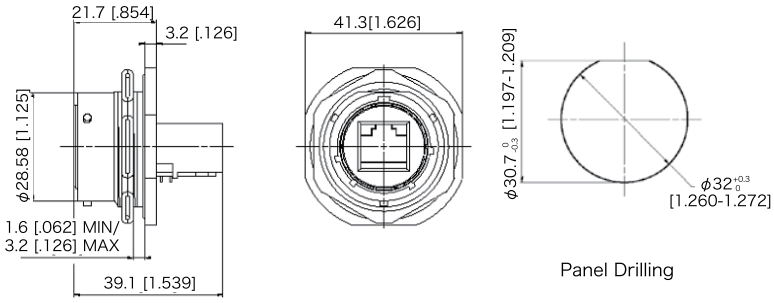
## Receptacles:

■ Square flange receptacle
4 mounting holes: Shell type 2



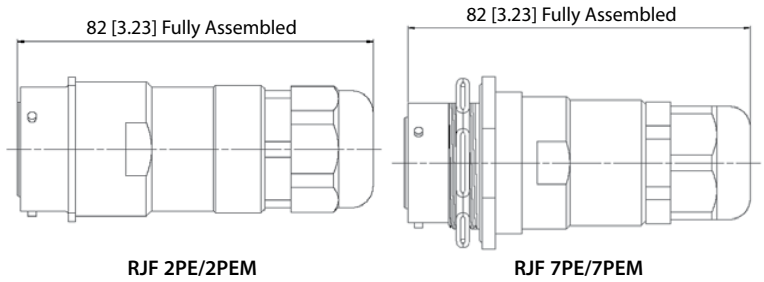

**RJF 2**

■ Jam nut receptacle
Hexagonal Nut mounting:
Shell type 7



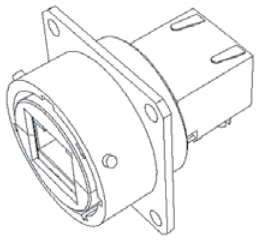

**RJF 7**

■ IP67 In line receptacles:
Shell type 2PE and 7PE with Plastic or Metal Gland

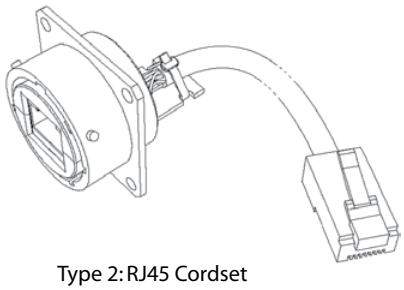



**RJF 2PE/2PEM** **RJF 7PE/7PEM**

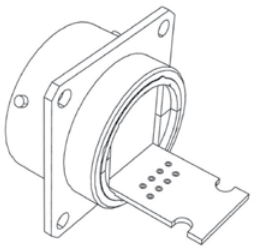
## Back Terminations:



Type 1: Female RJ45



Type 2: RJ45 Cordset



Type 2 - 00: Solder - 8 tinned holes

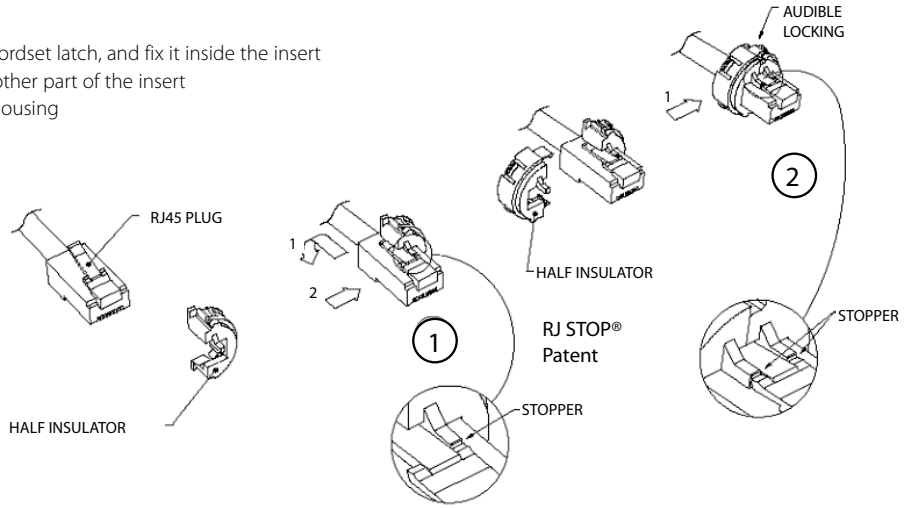
**Notes:** • Type 2 without RJ45 plug at the end of the cable are also available: consult factory

• Type 1 also available with 90° female RJ45

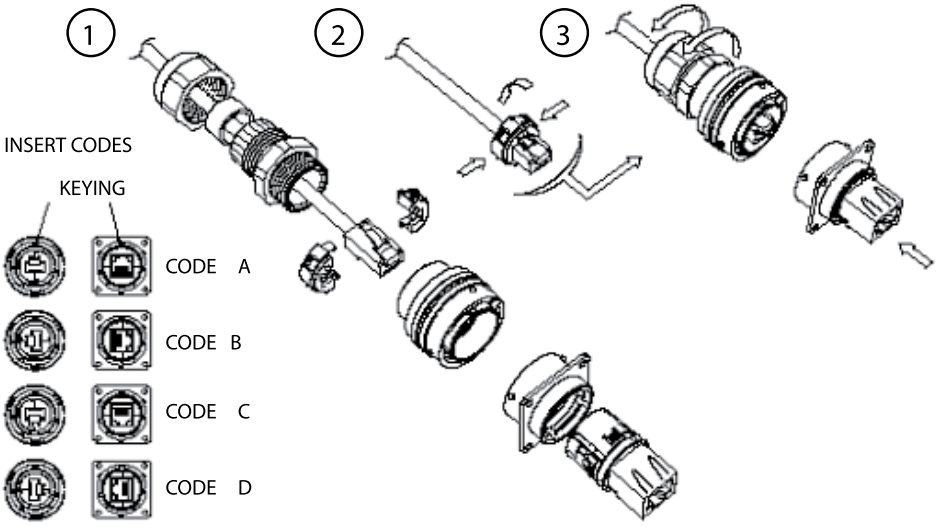
## Universal: Can be used with all standard * RJ45 Cat.5e cordset brands

**Assembly instructions**

1. Push down the RJ45 cordset latch, and fix it inside the insert
2. Press in and click the other part of the insert
3. Insert in the metallic housing



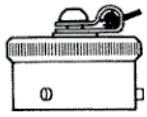

## Easy and Safe: No field cabling tools required



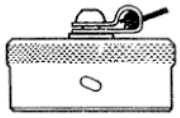

## Accessories:

■ **Metallic cap**

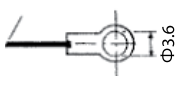
| RJFC | 2 | B |
|---|---|---|
| **Connector Type**<br>**6:** Plug<br>**2:** Square Flange Receptacle<br>**7:** Jam Nut Receptacle | | |
| **Finishes**<br>**B:** Black Coating - ROHS compliant<br>**N:** Nickel - ROHS compliant<br>**G:** Olive Drab Cadmium | | |



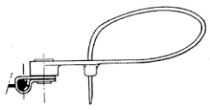
Plug Cap



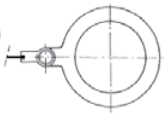
Receptacle Cap




Square Flange
type "2"

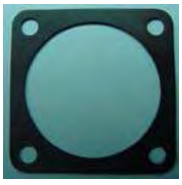


Plug Cap end
type "6"



Jam nut receptacle
type "7"

■ **Panel gasket for square flange « 2 »thickness: 0,6 mm – P/N: JE 18**



■ **Insert removal tool for receptacle and plug P/N = RJF ODE**

# RJF

**Special receptacles: Right angle, cable mount inline & PC tails**

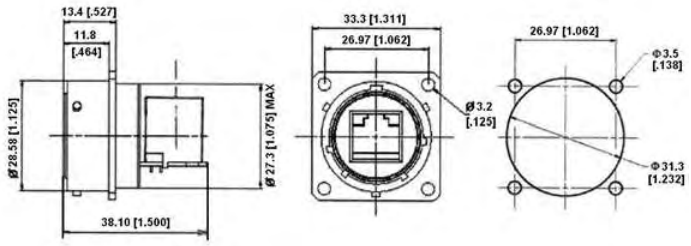


## Right Angle Receptacles


**ROHS COMPLIANT**
"N": nickel plating
"B": black coating

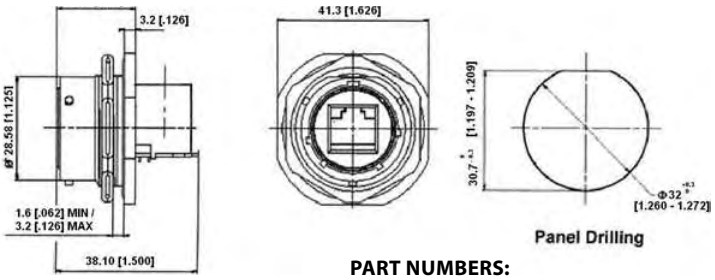
Some applications have minimal space inside the system. The right angle receptacles meet this need while keeping the advantage of connecting a standard RJ45 cordset at the back.

**Square Flange Receptacle - 4 mounting holes - Right Angle – 4 clocking positions:**




**PART NUMBERS:**
Black coating: **RJF21RAB**
Nickel plating: **RJF21RAN**
Olive Drab Cadmium plating: **RJF21RAG**

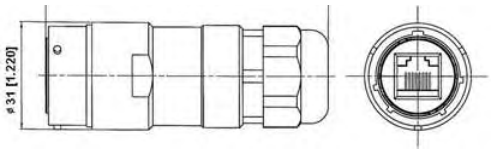
**Jam Nut Receptacle – Hexagonal nut mounting - Right Angle – 4 clocking positions:**




**PART NUMBERS:**
Black coating: **RJF71RAB**
Nickel plating: **RJF71RAN**
Olive Drab Cadmium plating: **RJF71RAG**

## Inline Cable Mount Receptacles

Inline receptacles allow you to make cable extensions in the field by using them with rugged RJFied series plugs.

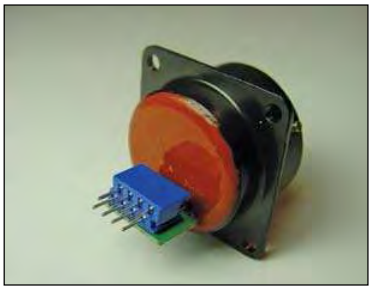



**PART NUMBERS:**

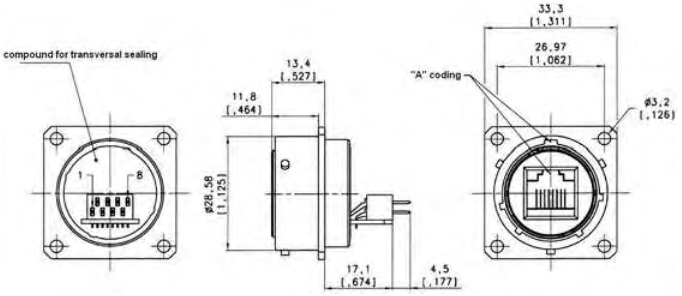
**Plastic Gland**
Black coating: **RJF2PEWF1B**
Nickel plating: **RJF2PEWF1N**
Olive Drab Cadmium plating: **RJF2PEWF1G**

**Metallic Gland**
Black coating: **RJF2PEWFM1B**
Nickel plating: **RJF21PEWFM1N**
Olive Drab Cadmium plating: **RJF2PEWFM1G**

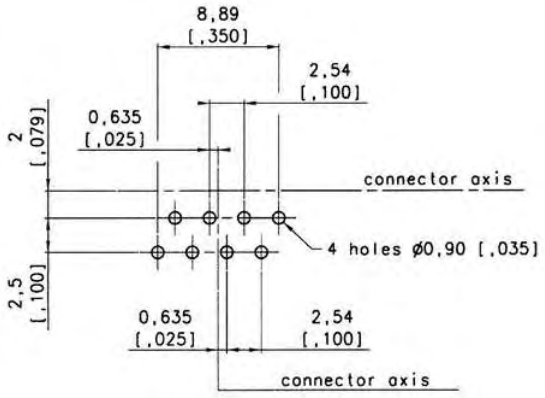
## PCB Tails Receptacles

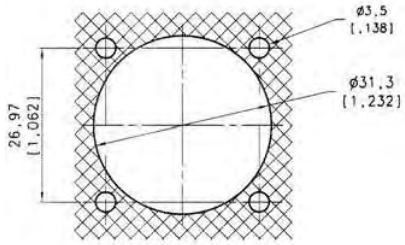


These receptacles can be soldered directly on your PCB. A compound insures a transversal sealing and good performance in high vibration environments. They can be connected with rugged RJField series plugs.




**PCB LAYOUT – SOLDER FACE VIEW** **PANEL DRILLING**




**PART NUMBERS:**

Note:

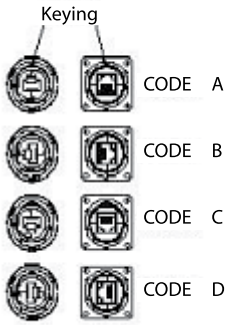
1. Platings available:
"B": black coating
"N": nickel plating
"B": olive drab cadmium plating

2. As these receptacles are compounded, coding position has to be chosen before ordering

**Examples:**

Square flange receptacle – black coating – coding A: **RJF2SA5B**
Square flange receptacle – nickel plating – coding C: **RJF2SC5N**
Square flange receptacle – olive drab cadmium plating – coding D: **RJF2SD5G**

Insert Codes




## Environmentally Sealed Receptacles

In some applications, a **transversal sealing** for the receptacle is a « must ». This will prevent fluids and dust from going through the receptacle when plug or cap are not mated to the receptacle. The sealed solution (version "S") has a compound at the rear of the receptacle as shown on the picture. For more information, please consult datasheet RJF-RJFTV Environmentally Sealed Receptacles, page 23.

**ROHS COMPLIANT**
"N": nickel plating
"B": black coating

# RJF TV

**Ethernet Connection System for Harsh Environment**

**ROHS COMPLIANT**
"N": nickel plating
"BZ": marine bronze

RJFTV allows you to use an Ethernet Class D / Cat. 5e connection for 10 BaseT, 100 BaseTx or 1000 BaseT networks in harsh environments.
With the patented RJStop system you can use a standard RJ45 cordset in a metallic plug which will protect it from shocks, dust and fluids.
**No hazardous on-field cabling and grounding!**

## MAIN CHARACTERISTICS

- Sealed against fluids and dusts (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- Mechanical Coding / Polarization (4 positions)
- Improved EMI protection
- **Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device**
- **Robust metallic shells**
- RJ45 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min

### Applications

- Data Acquisition and Transmission in harsh environment
- Railways
- Radars
- Shelters
- Battlefield Communication
- Systems
- Navy

### Data Transmission

10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD per ISO/IEC 11801

### Environmental Protection

- Sealing: IP67
- Salt Spray: 48 h with Aluminium shell - Nickel plating
  > 500 h with Aluminium shell - Olive Dran Cadmium plating
  1000h with Marine bronze shell
- Fire Retardant / Low Smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 10 nano s.
- Compounded versions tested per NAS 1599 (5-3000 Hz, 20g, 12h)
- Shocks: IK06: weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Temperature Range: - 40°C / +85°C

### Part Number Code

| Series<br>RJ Field TV | RJF TV | 2 | 2 | G | 03 | 100 BTX |
|---|---|---|---|---|---|---|

**Shell Type**

| | |
|---|---|
| **6:** | Plug with Plastic gland |
| **6M:** | Plug with Metal gland |
| **2:** | Square Flange Receptacle |
| **2PE:** | Square Flange Rec. with IP67 backshell |
| **2PEM:** | Square Flange Rec, IP67 back, metal gland |
| **7:** | Jam Nut Receptacle |
| **7PE:** | Jam Nut Rec. With IP67 backshell |
| **7PEM:** | Jam Nut Rec., IP67 back., metal gland |
| **2SA, 7SA:** | Compounded versions: *see page 23* |

**Back Terminations** *(Receptacles only)*

| | |
|---|---|
| **1:** | Female RJ45 |
| **2:** | RJ45 Cordset |

**Shells material & Finish**

| | |
|---|---|
| **N:** | Aluminium shell - nickel plating (receptacle inserts are metallized) - ROHS compliant |
| **G:** | Aluminium shell - olive drab cadmium plating (receptacle inserts are metallized) |
| **BZ:** | Marine bronze shell (receptacle inserts are metallized) - ROHS compliant |

**Cordset Length** *(type 2 back termination only)*

| | |
|---|---|
| **03:** | 0.3m [11.81 inches] |
| **05:** | 0.5m 19.68 inches] |
| **10:** | 1m [39.37 inches] |
| **15:** | 1.5m [59.05 inches] |
| **00:** | 8 tinned holes at the rear of the PCB to solder the cable |

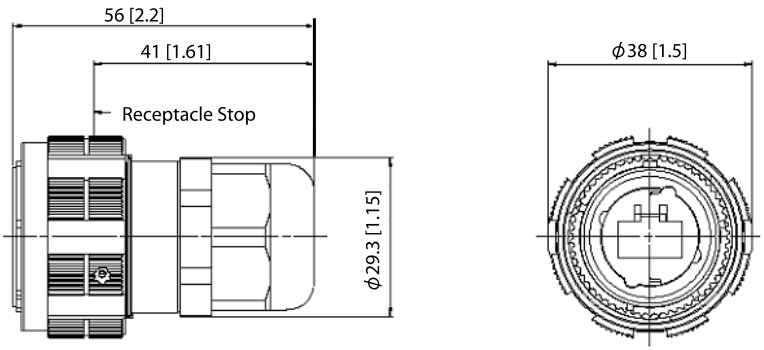
**Cabling Configuration** *(for Type ""2"" receptacles only)*

| | |
|---|---|
| **100BTX:** | (=568B) |
| **568A** | |

Examples:
- Olive Drab Cadmium plug with plastic gland: RJF TV 6G
- Olive Drab Cadmium Jam Nut Receptacle, female RJ45 back termination: RJF TV 71G
- Nickel Jam Nut Receptacle, 1,5 m 100 BTX cordset back termination: RJF TV 72N 15 100BTX
- Olive Drab Cadmium in line Square Flange Recept., 0,3 m 100 BTX cordset back termination: RJF TV 2PE 2 G 03 100BTX
- Nickel Jam Nut Receptacle Solder termination 8 tinned holes: RJF TV 22 N 00

## Plug

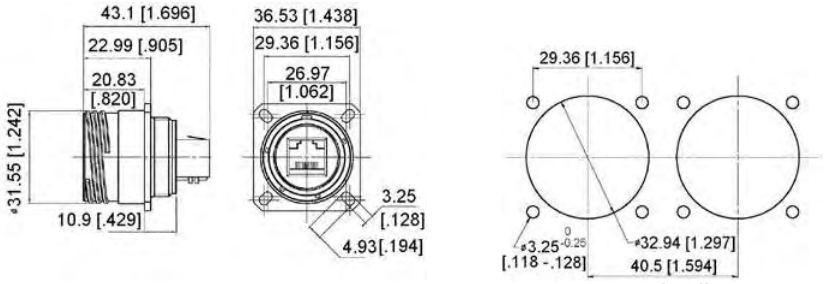
■ « 6 » Shell With plastic or metal gland




**RJF TV 6**

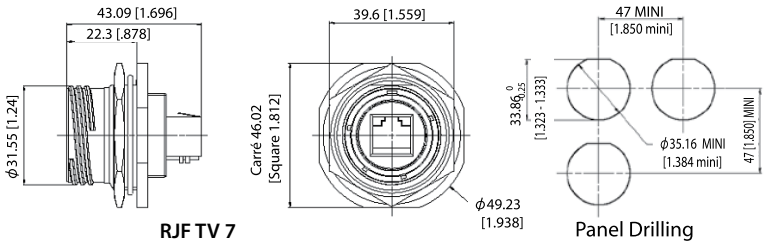
## Receptacles

■ « 2 » Shell Square Flange



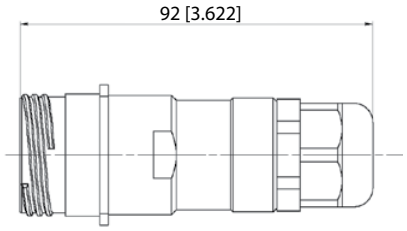

**RJF TV 2** **Panel Drilling**

■ « 7 » Shell Jam Nut



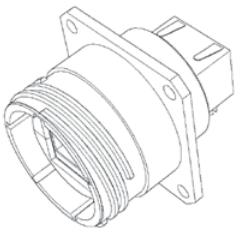

**RJF TV 7** Panel Drilling

■ « 2PE » and « 7PE » Shells
IP67 In-line receptacle
With plastic or Metal gland

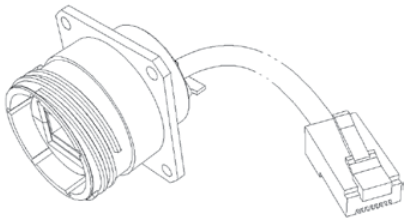



**RJF TV 2PE/2PEM/7PE/7PEM**

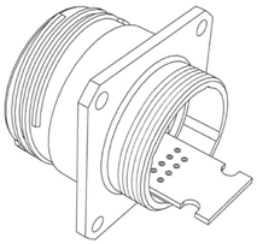
## Back Terminations



Type 1: Female RJ45



Type 2: RJ45 Cordset



Type 2 - 00: Solder – 8 tinned holes

**Notes** Type 2 without RJ45 plug at the end of the cable are also available: consult factory

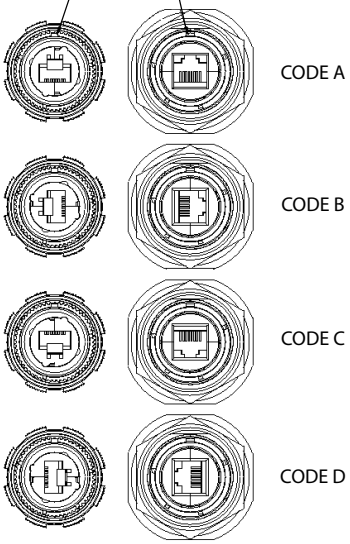
## Assembly instructions

### Insert Codings

*CONNECTION SIDE VIEW*

Plug Receptacle

Main Key

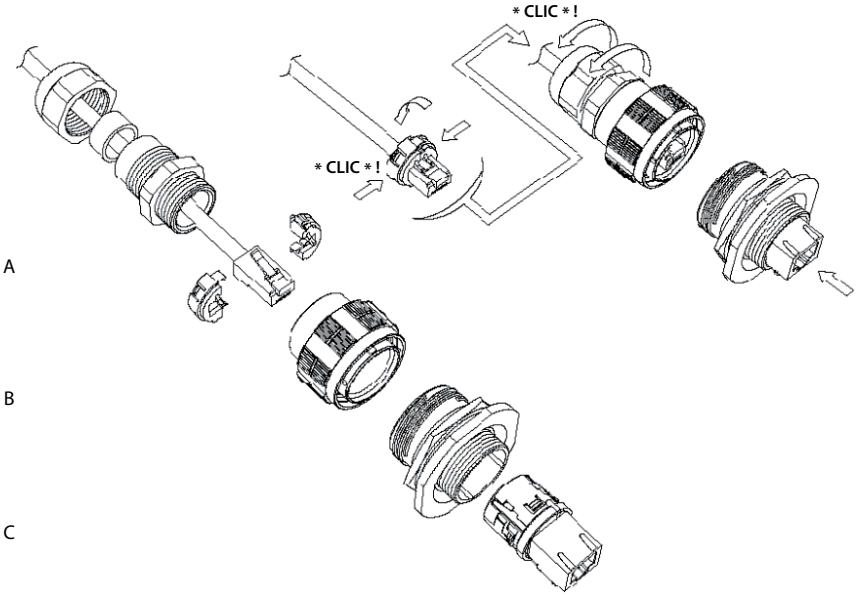


CODE A

CODE B

CODE C

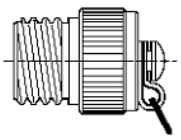
CODE D



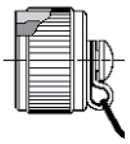

### Accessories

■ **Metallic Caps**

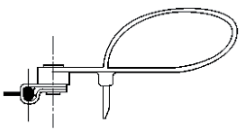
| | RJFTVC | 2 | G |
|---|---|---|---|
| **Connector Type** | | | |
| **6:** Plug | | | |
| **2:** Square Flange Receptacle | | | |
| **7:** Jam Nut Receptacle | | | |
| **Shell Material & finish** | | | |
| **N:** Aluminium shell - nickel plating - ROHS compliant | | | |
| **G:** Aluminium shell - olive drab cadmium plating | | | |
| **BZ:** Marine bronze shell - ROHS compliant | | | |



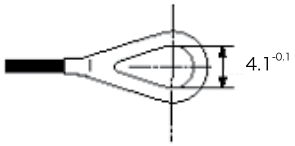
Plug Cap



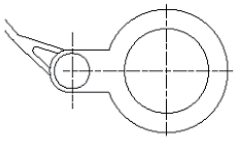
Receptacle Cap



Plug Cap end




Square flange receptacle cap end



Jam Nut receptacle cap end

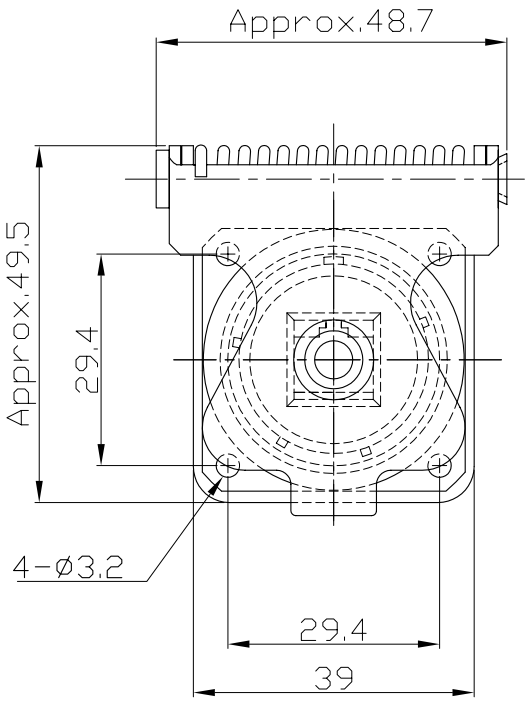
■ **Panel Gasket for square flange receptacle (Thickness: 0,8 mm [.031]): JE19**

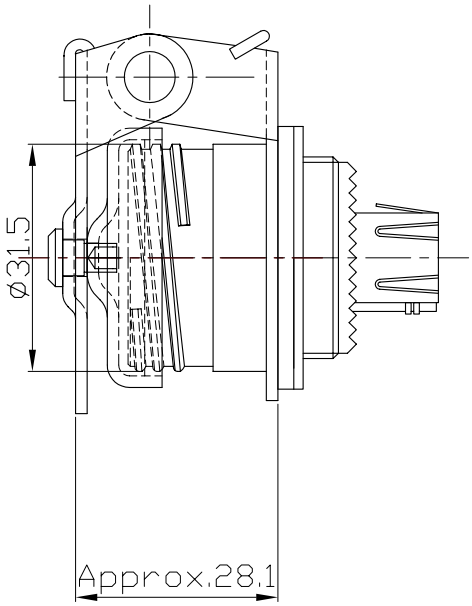
■ **Insert removal tool: RJF ODE**

# RJF TV

**SELF CLOSING CAP (SCC SERIES)**

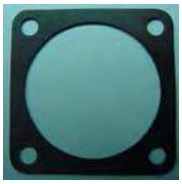
This Self Closing cap automatically protects the RJF TV square flange receptacle (MIL-DTL-3899 type), protecting your system from dust and water projection. A spring automatically closes the upper part of the cap when the RJF TV plug is removed from the receptacle.




- **Panel Gasket for square flange receptacle (Thickness: 0,8 mm [.031]):**

PART NUMBER: **JE19**



**PART NUMBER:**

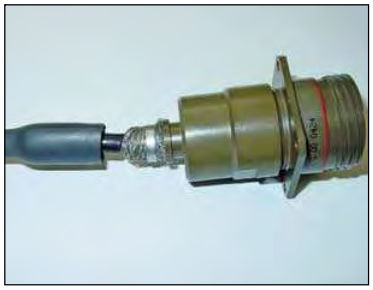
Self closing cap only: **RJFTVSCC**

**Remark:** Compatible only with RJFTV square flange receptacle type: RJFTV**2**XXX (see page 15)

# RJFTV

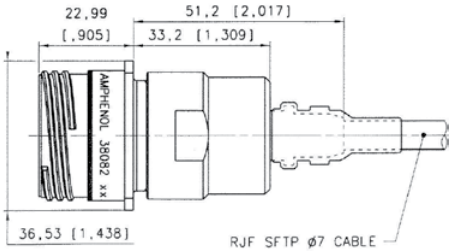
**Receptacles - Plugs with 360° EMI backshells**

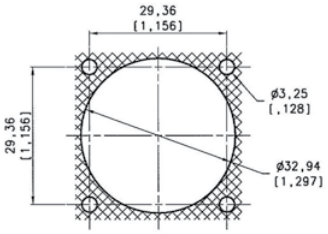




RJFTV series receptacles and plugs with EMI backshells provide a solution with 360° shielding: same protection than the one proposed per standard MIL-DTL-38999 serie III connectors. With those solutions we recommend using our reinforced and double shielded cat5E cable, see page 24.

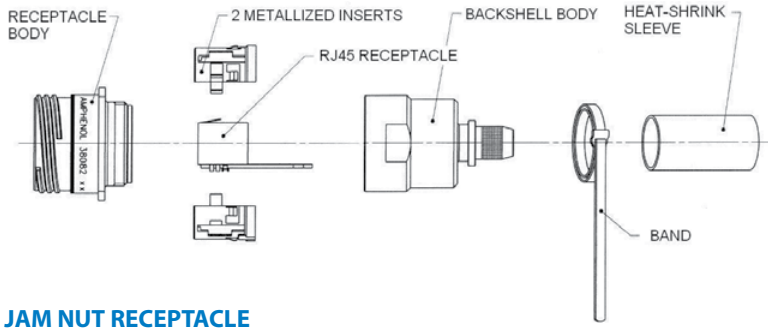
## SQUARE FLANGE RECEPTACLE

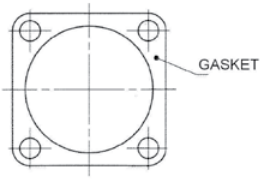


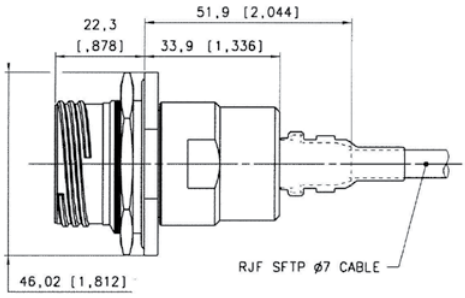

**PART NUMBERS:**
Olive Drab Cadmium Plating: **Kit38082**
Nickel Plating: **Kit38082NI**

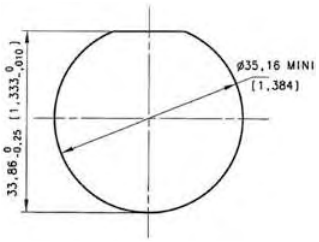
Kit38082 and Kit38082NI include:



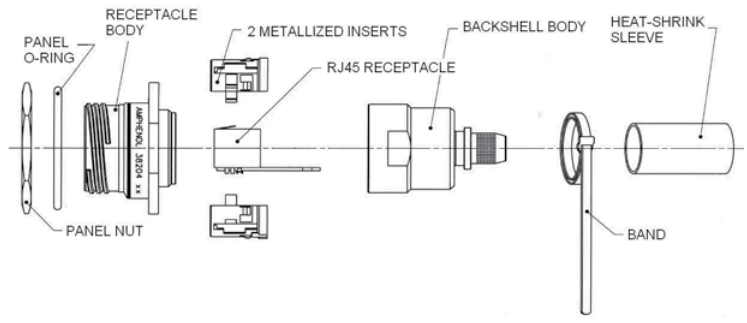

## JAM NUT RECEPTACLE



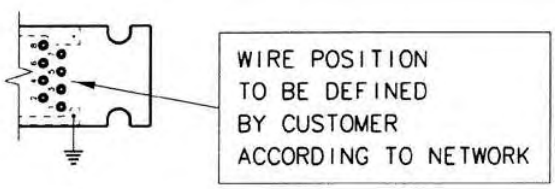




**PART NUMBERS:**
Olive Drab Cadmium Plating: **Kit38204**
Nickel Plating: **Kit38204NI**

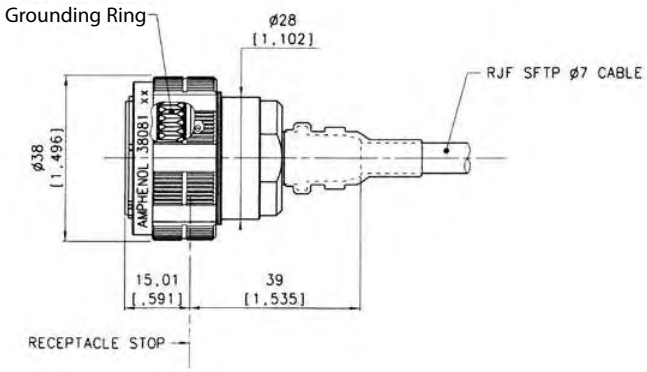
Kit38204 and Kit38204NI include:



**IMPORTANT NOTE**
With these receptacles, customer will have to solder his cable on the PCB. So the wire positions have to be defined per the customer according to his network.

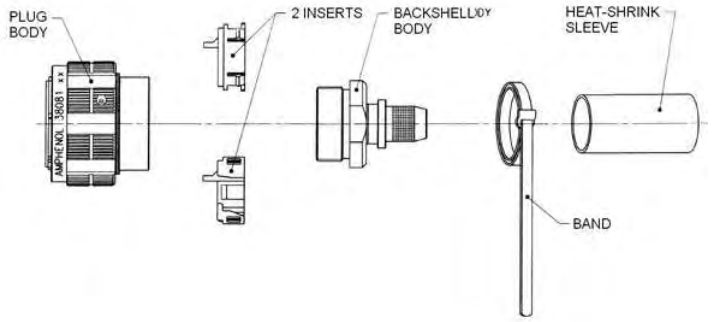



## PLUGS



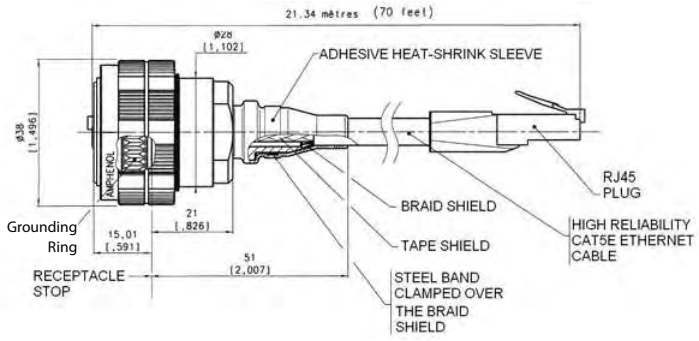

**PART NUMBERS:**
Olive Drab Cadmium Plating: **Kit38081**
Nickel Plating: **Kit38081NI**

Kit38081 and Kit38081NI include:




**IMPORTANT NOTE**
With these plugs, the standard RJ45 plug is not provided. Customer will have to crimp a standard RJ45 on the cable by himself.

We advise using our double Shielded, reinforced Cat5E cable (see page 24) with these RJFTV series EMI connectors.If customer wants to use his own cable, please check with us regarding compatibility with our backshells: **contact@rjfield.com**.
We also provide assembled cordsets, (see examples below). For this type of solution please provide the configuration needed: length, description of second end…



# RJFTV

**Right angle – Through Bulkhead – PC Tails Receptacles**



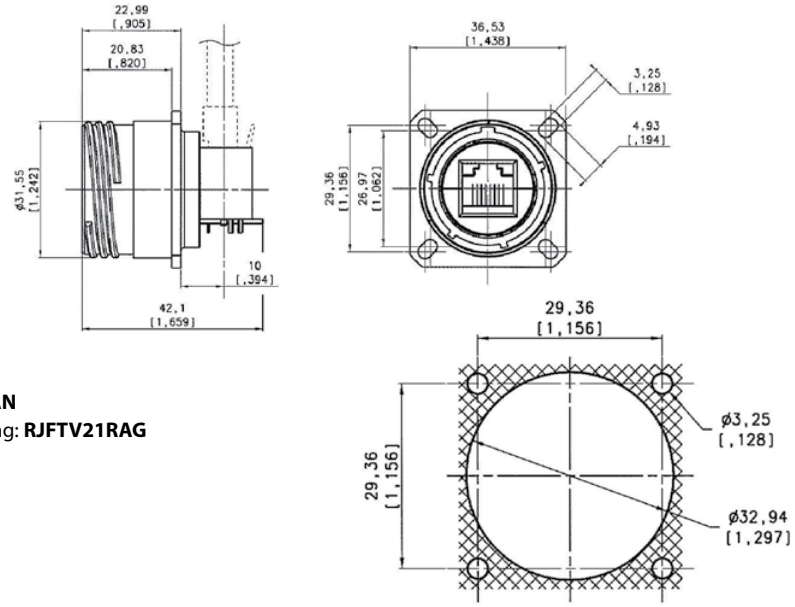
## Right Angle Receptacles

Some applications have minimal space inside the system. The right angle receptacles meet this need while keeping the advantage of connecting a standard RJ45 cordset at the back.

**ROHS COMPLIANT**

"N": nickel plating

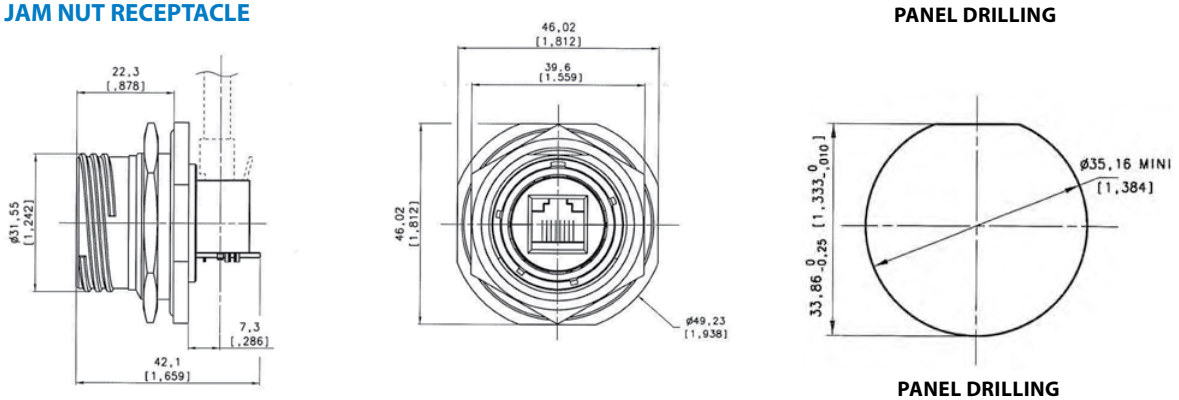
### SQUARE FLANGE RECEPTACLE




**PANEL DRILLING**

**PART NUMBERS:**
Nickel plating: **RJFTV21RAN**
Olive Drab Cadmium plating: **RJFTV21RAG**

### JAM NUT RECEPTACLE



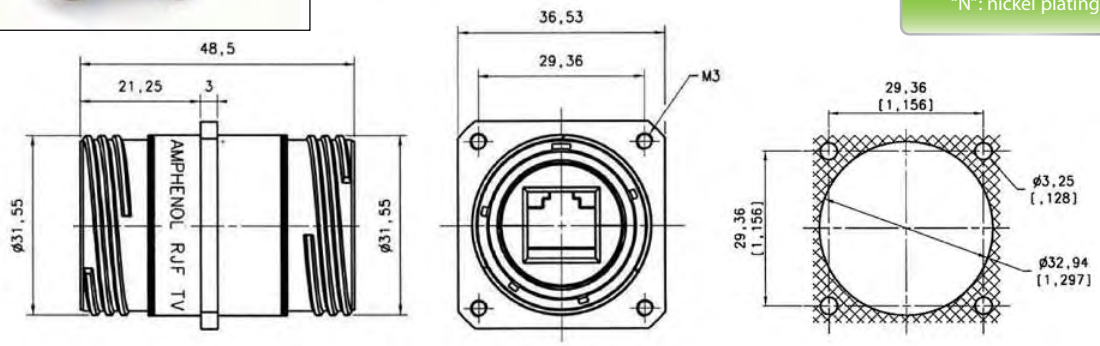

**PANEL DRILLING**

**PART NUMBERS:**
Nickel plating: **RJFTV71RAN**
Olive Drab Cadmium plating: **RJFTV71RAG**

## Through Bulkhead Receptacles

Our RJFTV through bulkhead receptacles can be connected on each side with rugged RJFTV plugs. This system allows mechanical protection and a sealing (IP67) inside and outside the equipement, and keeps the flexibility offered by panel mount and plug connectors.

**ROHS COMPLIANT**
"N": nickel plating




**PART NUMBERS:**

Nickel plating – Non metallized inserts: **RJFTVB2N ISO BRUT**
Nickel plating – Metallized inserts: **RJFTVB2N ISO NI**
Olive Drab Cadmium plating – Non metallized inserts: **RJFTVB2G ISO BRUT**
Olive Drab Cadmium plating – Metallized inserts: **RJFTVB2G ISO NI**

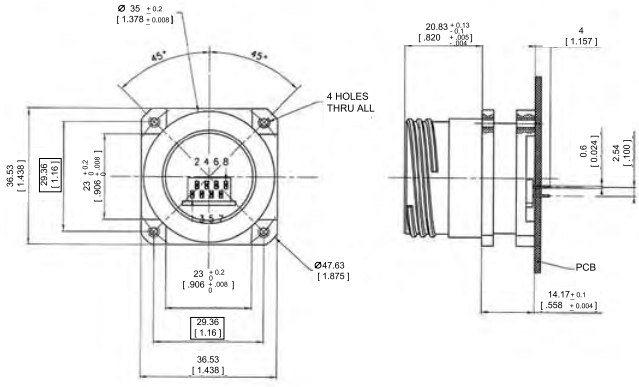
## Environmentally Sealed Receptacles


In some applications, a transversal sealing for the receptacle is a « must ». This will prevent fluids and dust from going through the receptacle when plug or cap are not mated to the receptacle. The sealed solution (version "S") has a compound at the rear of the receptacle as shown on the example. In addition, the Sealed RJF TV have been successfully tested in very high vibration corresponding to airplanes applications. For more information, please consult datasheet RJF-RJFTV Environmentally Sealed Receptacles *(see page 23)*.

## PCB Tails receptacles

These receptacles can be soldered directly to your PCB. A compound insures a transversal sealing and good performance in high-vibration environments. The shell of those receptacles are in the « Stand Off » style. They can be connected with RJFTV series plugs.

### SQUARE FLANGE RECEPTACLE

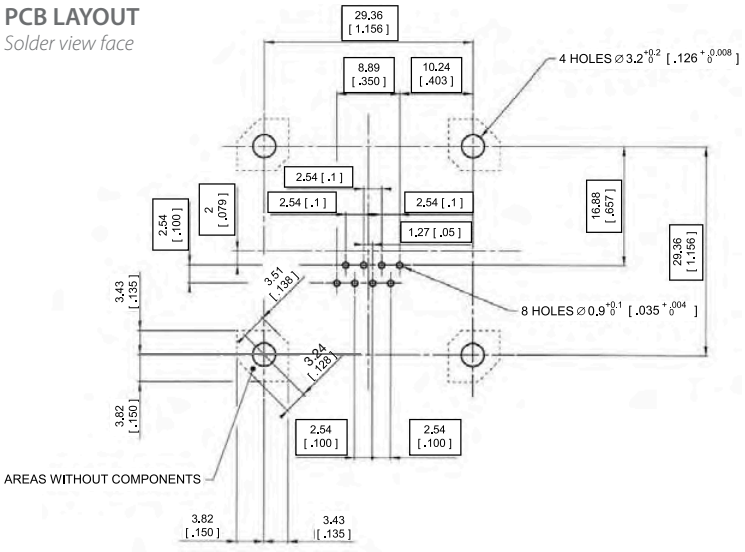


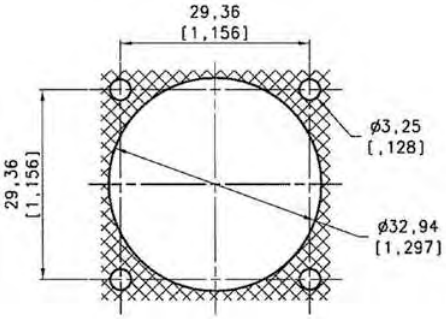

**PART NUMBERS:**

Olive Drab Cadmium Plating: **RJFTV25GF459**
Nickel Plating: **RJFTV25NF459**

## PCB LAYOUT

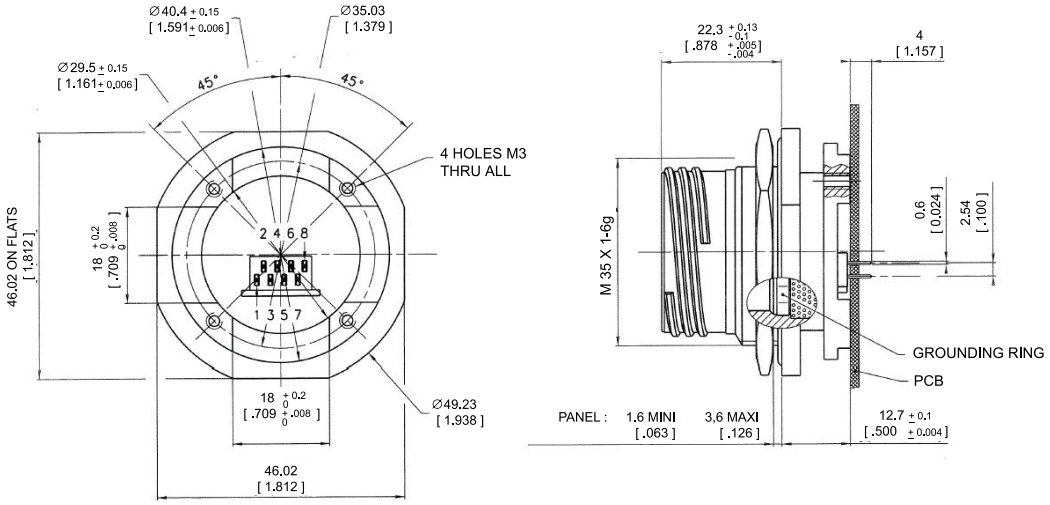
*Solder view face*




**PANEL DRILLING**

## JAM NUT RECEPTACLE



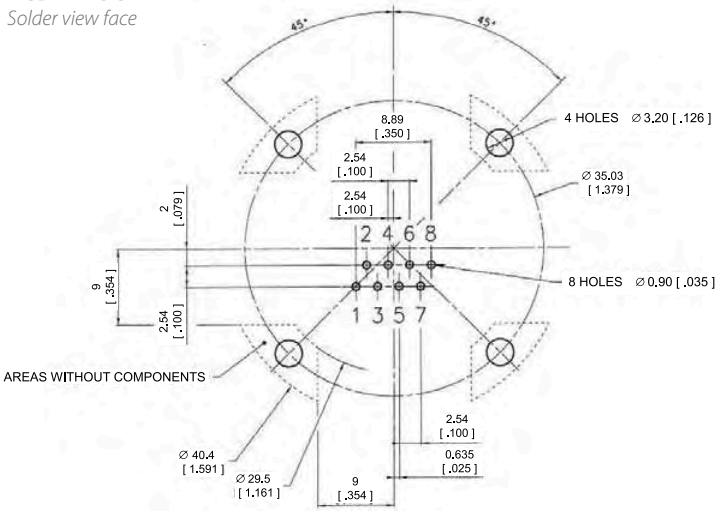

**PART NUMBERS:**

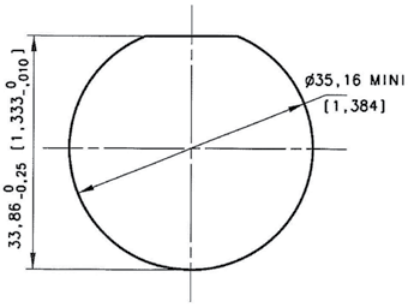
Olive Drab Cadmium Plating: **RJFTV75RGF459**

Nickel Plating: **RJFTV75RNF459**

## PCB LAYOUT

*Solder view face*




**PANEL DRILLING**

# RJF/RJF TV

## Environmentaly Sealed Receptacles

**SEALED RECEPTACLE** In some applications, a transversal sealing for the receptacle is a « must ». This will prevent fluids and dust from going through the receptacle when plug or cap are not mated to the receptacle. The sealed solution (version "S") has a compound at the rear of the receptacle as shown on the examples below. This feature is available both in RJF and RJF TV shells (please consult the relevant data sheet for product details and accessories). In addition, the Sealed RJF TV have been successfully tested in very high vibration corresponding to airplane applications.

### Applications

- Outdoor Equipment
- Airplanes Equipment
- Tactical Radios
- Shelters
- Rugged computers
- Data Acquisition and Transmission in Harsh Environments

### Data Transmission

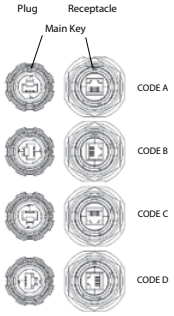
10 BaseT, 100 BaseTX and 1000 BaseT networks
Cat 5e per TIA/EIA 568B and ClassD
per ISO/IEC 11801

**ROHS COMPLIANT**
"N": nickel plating
"B": black coating
"BZ": marine bronze (only for RJFTV)

### MAIN CHARACTERISTICS

- Same as the RJF and RJF TV series … a complete IP67 sealing of the receptacle (even with no plug or no protective cap mated) is added. IP 67 means immersion during 30 minutes under 1 meter of water (watertight).
- Outside dimensions are the same as the standard RJF and RJF TV series.
- Vibrations: The compounded versions of the RJF TV have been tested in vibration following the NAS 1599 Aeronautic specification (Ambient temperature): 5 - 3000 Hz, 20g, 2,5 mm [.1 inch] double amplitude, 3 axes, 12 hours Note: This specification exceeds MIL-C-26500 requirements.

**IMPORTANT NOTE**
Due to the compound, the coding of the connector must be done in the factory: use the codes A, B, C or D in the Part Number.




RJFTV 7S A 2G 15 100BTX

### Part Number Code

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Series** | | **RJF TV** | **7S** | **A** | **2** | **G** | **03** | **100 BTX** |
| **RJF:** | MIL-C-26482 bayonet | | | | | | | |
| **RJFTV:** | MIL-C-38999 series III | | | | | | | |
| **Shell Type** | | | | | | | | |
| **2S:** | Sealed Square Flange Receptacle | | | | | | | |
| **7S:** | Sealed Jam Nut Receptacle | | | | | | | |
| **Coding** | | | | | | | | |
| **A,B,C,D** | | | | | | | | |
| **Back Terminations** *(For Receptacles only)* | | | | | | | | |
| **1:** | Female RJ45 | | | | | | | |
| **2:** | RJ45 Cordset | | | | | | | |
| **Shell material & Finish** | | | | | | | | |
| **B:** | Aluminium shell - black coating - ROHS compliant (available for RJF Series Only) | | | | | | | |
| **N:** | Aluminium shell - nickel plating - ROHS compliant (note: receptacle inserts are metallized) | | | | | | | |
| **G:** | Aluminium shell - olive drab cadmium plating (note: receptacle inserts are metallized) | | | | | | | |
| **BZ:** | Marine bronze shell (receptacle inserts are metallized) - ROHS compliant (only available for RJFTV) | | | | | | | |
| **Cordset Length** *(For Receptacles with "2" Back Termination only)* | | | | | | | | |
| **03:** | 0.3m [11.81 inches] | | | | | | | |
| **05:** | 0.5m [19.68 inches] | | | | | | | |
| **10:** | 1m [39.37 inches] | | | | | | | |
| **15:** | 1.5m [59.05 inches] | | | | | | | |
| **Cabling Configuration** *(For "2" Receptacles only)* | | | | | | | | |
| **100BTX:** | (=568B) | | | | | | | |
| **568A** | | | | | | | | |

Examples:
- Bayonet, A coding, Olive Drab Cadmium Jam Nut sealed receptacle with female RJ45 Back termination: RJF 7SA 1 G
- Bayonet, A coding, Black square flange sealed receptacle, Female RJ45 Back termination: RJF 2SA 1 B
- Series III, A coding, Olive Drab Cadmium Jam Nut sealed receptacle, 1.5m [59.05"] 100 BTX cordset: RJF TV 7SA 2 G15 100BTX

# CABLE CAT 5E

**High Reliability Cat 5e Ethernet Cable & Cordsets**

General Construction:A 4 pair, 24 AWG, 100 Ohm SFTP round patch cable, designed to the ISO / IEC 11801 Category 5e requirements (cat 5e on 76m). The cable contains 4 twisted pairs, cabled, double shielded with kevlar reinforcement strands, jacketed in black UV resistant Polyurethane HFFR. Designed for fixed or portable applications in harsh environments.

**HFFR: Halogen Free Flame Retardant**

ROHS COMPLIANT

Jacket Compound Specification:
Halogen Free Flame Retardant Polyether-based Polyurethane. Glossy finish. Excellent hydrolysis resistance. High microbial resistance. UV resistant. High flexibility.

Applications
- Robotics
- Motion Control
- Railways
- CNC Machines
- Battelfield communication
- Industrial Process Control

## PHYSICAL CHARACTERISTICS

| | |
|---|---|
| **CONDUCTORS** | 24 AWG (0,25 mm²) tinned copper, 7x0.20 mm |
| **INSULATION** | Color coded 568-B, Linear Low Density Polyethylene, Nom. Dia. 0,039" (1mm) |
| **ASSEMBLY** | Pairs cabled with Kevlar strength members and separation tape wrapped |
| **SHIELDS** | Inner: Aluminium mylar 100% coverage<br>Outer: Tinned copper braid 80% coverage |
| **JACKET** | Black, special PUR compound |
| **WEIGHT** | 40 Lbs / mft (59 KG/Km) |
| **OUTSIDE DIAM.** | 0.28" (7.1 mm) nom. |
| **MIN BEND RADIUS** *(During installation)* | 67.5mm (9x O. D.) |
| **MIN BEND RADIUS** *(During operation)* | 37.5mm (5 x O.D.) |
| **MIN FLEXES TO FAILURE** | Passes IEC 61156-6 requirtements |
| **TEMPERATURE** | Plus 70°C, minus 25°C |

| **Cordsets with a RJ45 plug overmolded on each end** | |
|---|---|
| **Length (m/ft)** | **Part Number** |
| 0,76 m / 2,5 ft | RJF SFTP 5E 0076 |
| 1,52 m / 5 ft | RJF SFTP 5E 0152 |
| 3,05 m / 10 ft | RJF SFTP 5E 0305 |
| 4,57 m / 15 ft | RJF SFTP 5E 0457 |
| 6,24 m / 20,46 ft | RJF SFTP 5E 0624 |
| 7,62 m / 25 ft | RJF SFTP 5E 0762 |
| 9,37 m / 30,72 ft | RJF SFTP 5E 0937 |
| 10,00 m / 32,78 ft | RJF SFTP 5E 1000 |
| 15,25 m / 50 ft | RJF SFTP 5E 1525 |
| 22,87 m / 75 ft | RJF SFTP 5E 2287 |
| 30,5 m / 100 ft | RJF SFTP 5E 3050 |
| 45,75 m / 150 ft | RJF SFTP 5E 4575 |

## ELECTRICAL CHARACTERISTICS

| | |
|---|---|
| **DC Resistance** | 96 Ohms/Km @ 20° C |
| **Impedance** | 100 +/- 15 Ohms 1-100 MHz |
| | |
| **Attenuation** | |
| 772 KHz | 2.70 db/100m nom. |
| 1 MHz | 3.15 db/100m nom. |
| 4 MHz | 6.45 db/100m nom. |
| 10 MHz | 9.90 db/100m nom. |
| 16 MHz | 12.3 db/100m nom. |
| 20 MHz | 13.8 db/100m nom. |
| 31.25 MHz | 17.7 db/100m nom. |
| 62.5 MHz | 25.6 db/100m nom. |
| 100 MHz | 33 db/100m nom. |
| | |
| **N.E.X.T.** *(Near-End Crosstalk Loss)* | |
| 772 KHz | 64 db min. |
| 1 MHz | 62 db min. |
| 4 MHz | 53 db min. |
| 10 MHz | 47 db min. |
| 16 MHz | 44 db min. |
| 20 MHz | 42 db min. |
| 31.25 MHz | 40 db min. |
| 62.5 MHz | 35 db min. |
| 100 MHz | 32 db min. |
| | |
| **Capacitance** | 46pF / m nom. @ 1KHz |
| **LCL** | 43 dB min. @ 64 KHz |
| **Capacitance Unbalance** | 3.4 pF / m max. @ 1KHz (wire to ground) |
| **Insulation Resistance** | 150 M Ohm min. |
| **Voltage Rating** | 230 VMS |
| **Dielectric Strength** | VAC/1 min - 700 V/Min |
| **Propagation Delay (100 MHz)** | 5.2 ns/m max. @ 100 MHz |
| **Delay Skew** | 20 ns/100m max. @ 1-100 MHz |
| **Resistance Unbalance** | 3% max. @ 20° C |
| **Structural Return Loss (100 MHz)** | 23db/100m min. @ 1-20 MHz |
| **Spark test (tested during production)** | 3 KV |
| **Velocity of propagation** | 67% nom. |

| **Reel of cable (without RJ45 plug on ends)** | |
|---|---|
| **Length (m / ft)** | **Part Number** |
| 100 m / ~328 ft | 190-038045-00 |
| 300 m / ~984 ft | 190-038045-01 |

# USBF TV

**USB Connection System for Harsh Environment**

With USB Field, you can insert a standard USB 2.0 cordset into a metallic plug which will protect it from shocks, dust and fluids.
**No hazardous on-field cabling and grounding!**
This metallic plug is connected into a receptacle, using a Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device for high vibrations.

### Applications

- Embedded Computers
- Data Acquisition and transmission in harsh environment
- Railways
- Battelfield Communication Systems
- Navy Systems

**ROHS COMPLIANT**
"N": nickel plating
"BZ": marine bronze

### Data Transmission

USB Specification 2.0
Data Rate: Up to 480 Mb/s for High Speed USB

### MAIN CHARACTERISTICS

- Sealed against fluids and dusts (IP67)
- Shock, Vibration and Traction resistant
- No cabling operation in field and no tools required
- Mechanical Coding / Polarization (2 positions)
- Improved EMI protection
- Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device
- 2 mechanical Coding / Polarization possibilities by the user (receptacle insert rotation)
- USBF TV plug retention in the receptacle: 100 N in the axis
- Mating cycles: 500 to 1500

### Environmental Protection

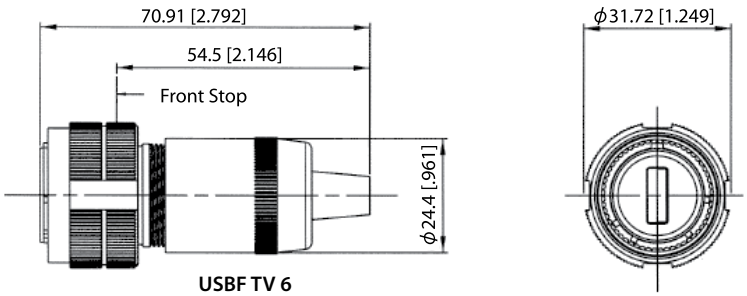
- Sealing (when mated): IP67 (Temporary immersion)
- Salt Spray: 48 h with Nickel plating
  > 500 h with Olive Drab Cadmium
  1000 h with marine bronze shell
- Fire Retardant / Low Smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 1micro s
- Shocks: IK06: weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Temperature Range: - 55°C / +85°C

## Part Number Code

| | | | | |
|---|---|---|---|---|
| **Series**<br>**USB Field TV** | **USBF TV** | **2** | **1** | **G** |
| **Shell Type**<br>**6:** Plug<br>**2:** Square Flange Receptacle<br>**2PE:** Square Flange Receptacle with backshell<br>**7:** Jam Nut Receptacle<br>**7PE:** Jam Nut Receptacle with backshell | | | | |
| **Back Terminations** *(Receptacles only)*<br>**1:** USB-A receptacle<br>**2:** Solder (4 tinned holes) | | | | |
| **Shells Material & Finish**<br>**N:** Aluminium shell - Nickel plating - ROHS compliant<br>**G:** Aluminium shell - Olive Drab Cadmium plating<br>**BZ:** Marine bronze shell - ROHS compliant | | | | |

Examples:
- Olive Drab Cadmium Plug: USBF TV 6G
- Olive Drab Cadmium Square Flange Receptacle, USB-A back terminat°: USBF TV 21G
- Olive Drab Cadmium Jam Nut Receptacle, USB-A receptacle back terminat°: USBF TV 71G
- Nickel Jam Nut Receptacle, solder termination: USBF TV 72N

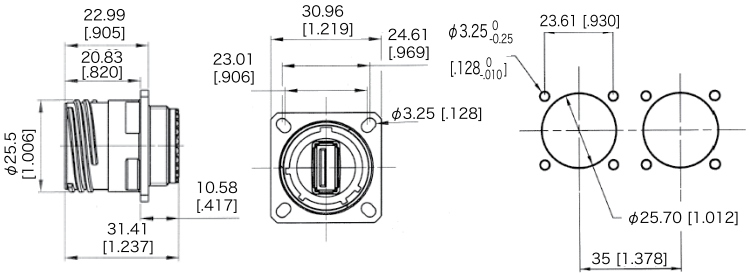
## Plug




**USBF TV 6**

## Receptacles

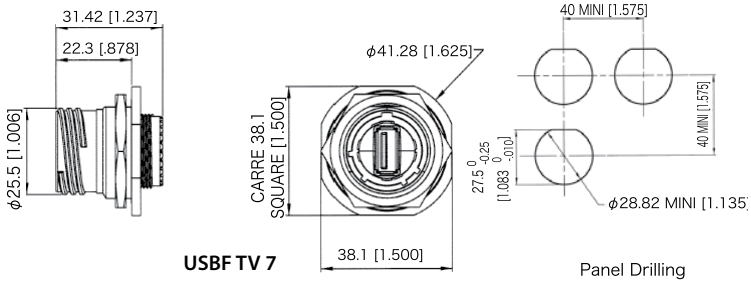
■ « 2 » Shell Square Flange




**USBF TV 2**

Panel Drilling

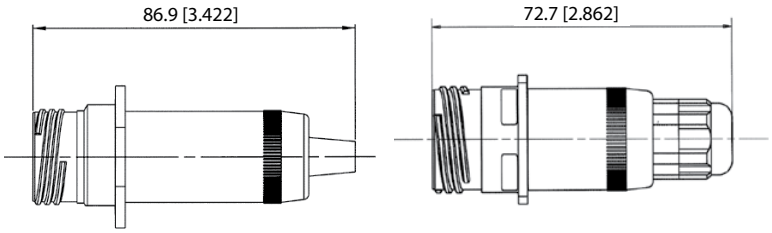
■ « 7 » Shell Jam Nut




**USBF TV 7**

Panel Drilling

■ « 2PE » and « 7PE » Shells

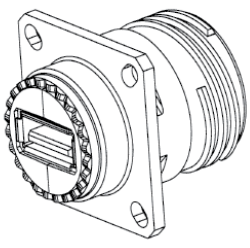



Backshell used with back termination type 1:
USB A receptacle (Not sealed)

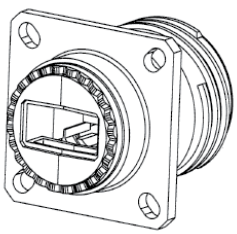
**USBF TV 2PE/7PE-1**

Backshell used with
back termination type 2:
Solder (Sealed – IP67)
**USBF TV 2PE/7PE-2**

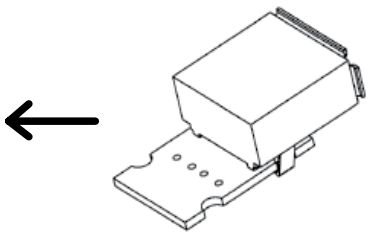
## Back Terminations



Type 1: USB-A Receptacle



Type 2: Solder
4 Tined holes to solder your cable



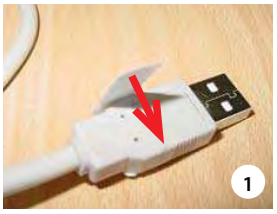
View of the PCB of the
Type 2 version with 4 tined
holes for solder termination

## Assembly Instructions

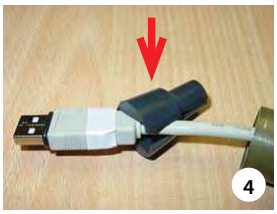
*Can be used with most the USB cordset brands: No tools required!*

**Plug Assembly**

1. Only if you need a full sealing (IP67): Install the white sticker around the plug, covering the 4 little holes of the overmolding
2. Insert the black O Ring around the front face of the USB A plug. This O Ring will ensure connection sealing
3. Insert the USB cordset into the metallic backshell
4. Insert the retention spacer laterally to the cable (this spacer is soft, in order to adapt to different shapes of overmolding) and slide the overmolding of the USB-A plug into this retention spacer
5. Insert the friction ring laterally to the cable
6. Choose the right coding (2 positions) and insert the USB-A plug into the protective plug. Note at this step, the main key is used for polarization.
7. Screw the backshell on the plug body. A wrench can be necessary to fully tighten it, and the connection to the receptacle can help

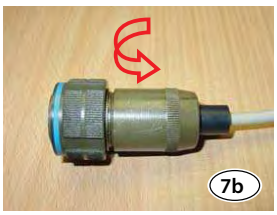







**IMPORTANT NOTE**
The connection sealing is not done by the black retention spacer (which is sloted), but by the front face ORing (see 2)


**Receptacle Assembly**

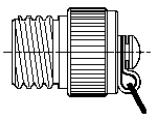
Insert the USB module from the rear. Reference is main key.
Beware to have a coding compatible with the coding you used for the plug: on front view, the white shapes in the USBs must be on the same side.

To remove the USB module, insert the removal tool USBF ODE from the Front, and push back the module.

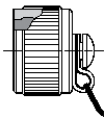
## Accessories

- **Metallic Caps**

| | USBF TVC | 2 | G |
|---|---|---|---|
| **Connector Type**<br>**6:** Plug<br>**2:** Square Flange Receptacle<br>**7:** Jam Nut Receptacle | | | |
| **Shells Material & Finish**<br>**N:** Aluminium shell - Nickel - ROHS compliant<br>**G:** Aluminium shell - Olive Drab Cadmium<br>**BZ:** Marine bronze shell - ROHS compliant | | | |

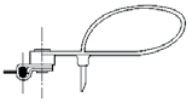


Plug Cap

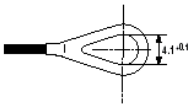


Receptacle Cap

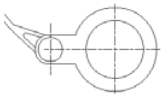
- Panel Gasket for square flange receptacle (Thickness: 0,8 mm [.031]): JE15



Plug Cap end



Square flange receptacle cap end



Jam Nut receptacle cap end

- Receptacle Insert removal tool: USBF ODE

# USBFTV

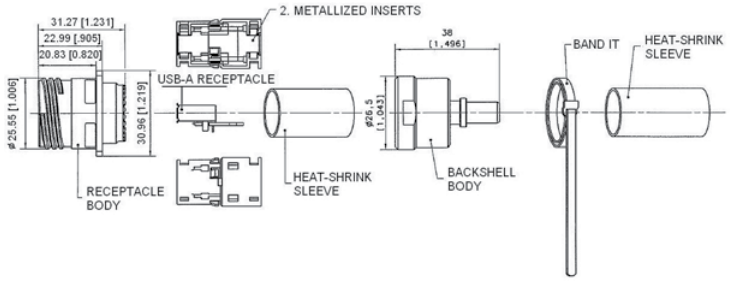
**Receptacles with 360° EMI backshells & PC Tails receptacles**

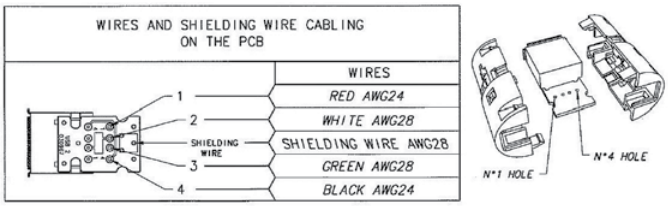
## RECEPTACLES WITH 360° EMI BACKSHELLS

USBFTV Receptacles series with EMI backshells provide 360° shielding: same protection than the one proposed per Standard MIL-DTL-38999 serie III Connectors. We offer these EMI backshells with square flange and jam nut receptacles. The available platings are nickel or olive drab cadmium.
With those solutions we suggest using our reinforced USB cable (shielded – zero halogen jacket). See page 31
We can provide those receptacles:
- with cordset already soldered
- without cordset

For 360° shielded USBFTV series receptacles, please consult us:
**www.usbfield.com**

### EXAMPLE WITH A SQUARE FLANGE RECEPTACLE *(PROVIDED WITHOUT CABLE)*





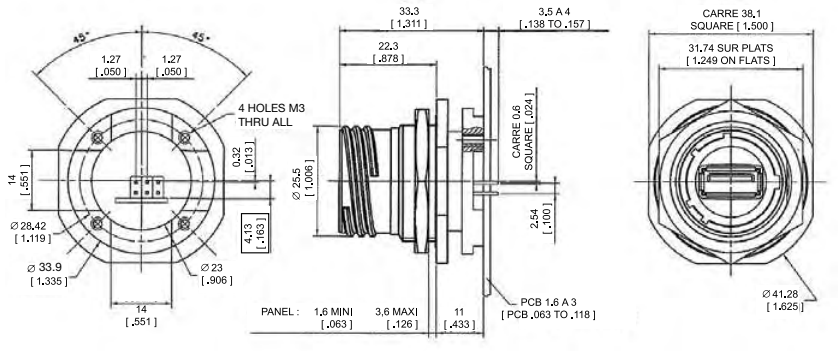


**IMPORTANT NOTE**
With receptacles provided without cable, customer will have to solder his cable on the PCB, please find below the cabling specification.
If customer prefers to use his cable, please check with us compatibility with our EMI backshells:
**www.usbfield.com**

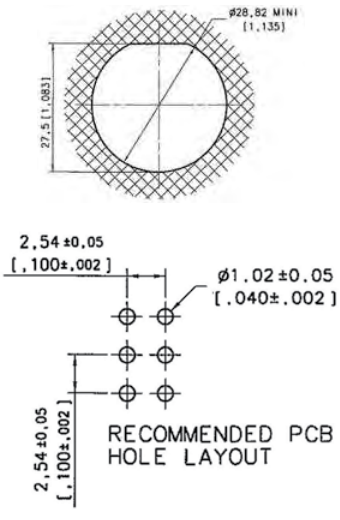
**ROHS COMPLIANT**
"N": nickel plating

### PC TAILS RECEPTACLE WITH « STAND OFF » SHELL

Those receptacles can be soldered directly on your PCB. A compound insures a transversal sealing and good performance in high-vibration environments. The shell of these receptacles are in the « Stand Off » style. They can be connected with rugged USBFTV series plugs.

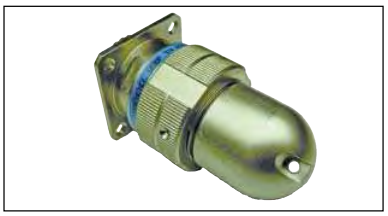



**Panel Drilling**



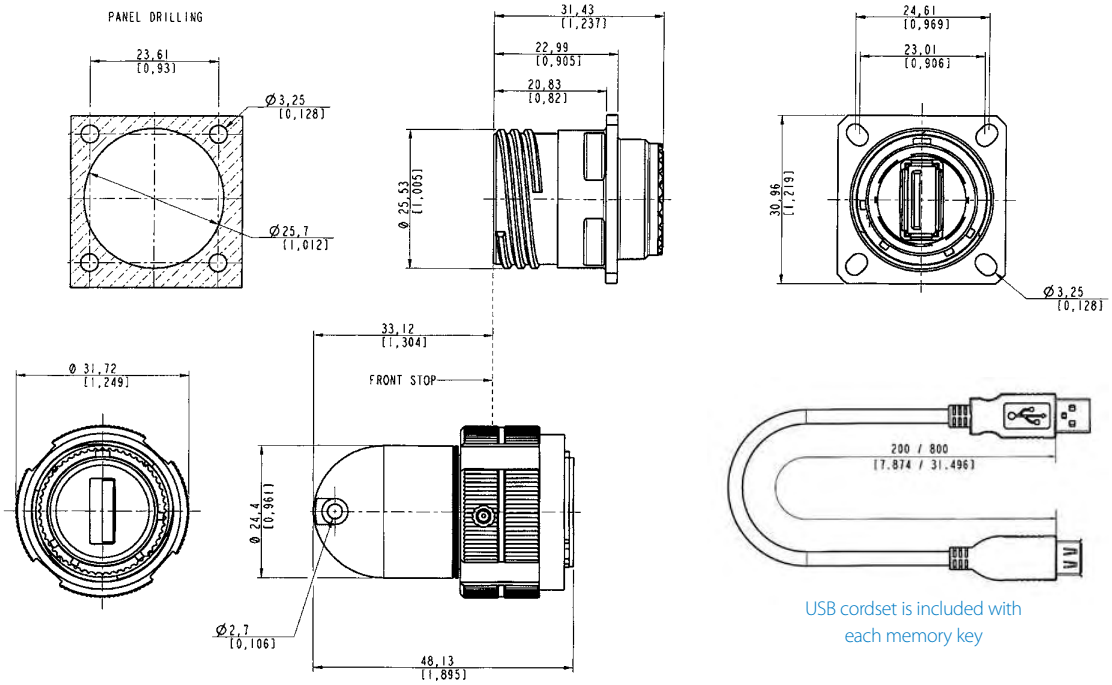

**PART NUMBERS:**
Jam nut receptacle – Nickel: **USBFTV75NF459**
Square flange receptacle – Olive Drab Cadmium: **USBFTV75GF459**

# REINFORCED USBFTV MEMORY KEYS



We provide reinforced USB memory keys available in different capacities. They can be used ONLY with our USBFTV series receptacles. When mated on the receptacle, the system is IP67.

Dimensions of rugged USBFTV Key shown with receptacle USBFTV21x




USB cordset is included with each memory key

**ROHS COMPLIANT**
"N": nickel plating
"B": black coating

## DEFINITION OF PART NUMBER

**USBFTV KEY 6 A 0256 N CAP**

| | | | | |
|---|---|---|---|---|
| Beginning of every USBFTV Key part number. Remains unchanged. | **Coding position:**<br>**A:** coding A<br>**B:** coding B<br>**NB:** please check the coding of your USBFTV receptacle* | **Capacity of your USBFTV Key:**<br>0256<br>0512<br>1024<br>Other capacity, please consult us at **contact@rjfield.com** | **Plating:**<br>**"N":** nickel plating<br>**"G":** olive drab cadmium<br>**NB:** please check the plating of your USBFTV receptacle | **Cap:** With cap<br>**Blank:** Without cap |

* The coding can be changed on the receptacle using our tool USBFODE

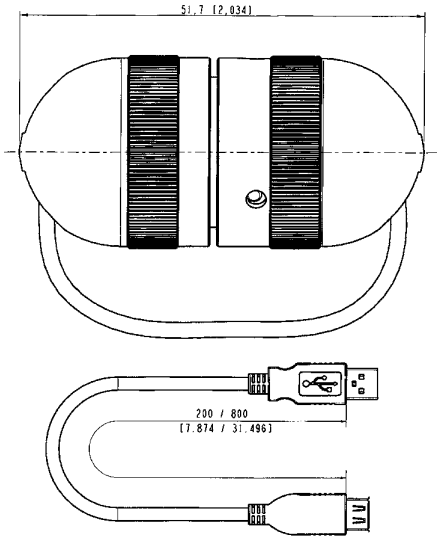
EXAMPLE: **USBFTVKEY6A0256N:** USBFTV KEY – CODING A – CAPACITY OF 256MO – NICKEL PLATING
EXAMPLE: **USBFTVKEY6A1024GCAP:** USBFTV KEY – CODING A – CAPACITY OF 1024MO – OLIVE DRAB CADMIUM PLATING - PROTECTIVE CAP

# REINFORCED USB MEMORY KEYS

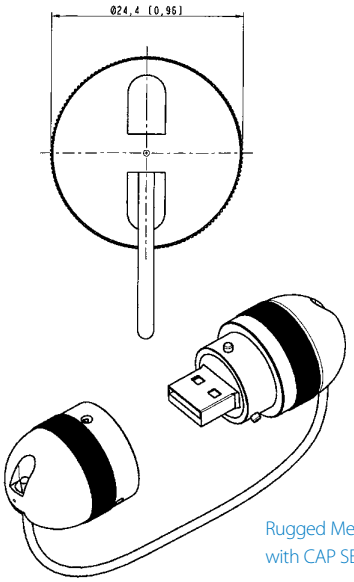
We provide reinforced USB memory keys available in different capacities. When mated, the system is IP67. Shells are metallic with 1/4 turn bayonet coupling.

Dimensions of rugged USBF Key:

ROHS COMPLIANT




USB cordset is included with each memory key




Rugged Metallic USB KEY with CAP SEALING : IP 67

## DEFINITION OF PART NUMBER

**USBF KEY** **0256** **N**

Beginning of every USB Key part number. Remains unchanged.

**Capacity of your USBF Key:**
0256
0512
1024
Other capacity, please consult us at **contact@rjfield.com**

**Shell finish:**
**N:** Natural
**G:** Green
**B:** Black

EXAMPLE: **USBFKEY0256N:** USB MEMORY KEY - CAPACITY OF 256MO - SHELL FINISH : NATURAL
EXAMPLE: **USBFKEY1024G:** USB MEMORY KEY - CAPACITY OF 1024MO - SHELL FINISH : GREEN

# High Reliability USB 2.0 Cordsets

Applications
- Robotics
- Motion Control
- Railways
- CNC Machines
- Battelfield communication
- Industrial Process

General Construction :this is a USB-2.0 cable containing one 28 AWG 90Ω characteristic impedance data pair, two 24 AWG power conductors, overall SFTP shields (SFTP = double shielding, Braid and foild), jacketed in black UV resistant Polyurethane HFFR*. Designed for fixed or portable applications in industrial and harsh environments.*HFFR : Halogen Free Flame Retardant.

**Jacket Compound Specification:**
Halogen Free Flame Retardant Polyether-based Polyurethane. Glossy finish. Excellent hydrolysis resistance. High microbial resistance. UV resistant. High flexibility.

ROHS COMPLIANT

## PHYSICAL CHARACTERISTICS

| | |
|---|---|
| **DATA CONDUCTORS** | bare copper, 7/0.12 mm nom (28 AWG) |
| **DATA INSULATION** | 0.9 mm nom |
| **COLOR DATA PAIR** | Green & white |
| **POWER CONDUCTORS** | Tinned copper, 7/0.2 mm (24 AWG) |
| **POWER INSULATION** | 1.1 mm nom |
| **COLOR POWER WIRE** | Red & Black |
| **SHIELDS** | Foil: poviding 100% coverage, in contact with tinned copper drain wire and an overall braid providing 65% nom. coverage made of 16x5/0.1 mm tinned copper strands |
| **JACKET** | PU compound |
| **COLOR JACKET** | Black |
| **WEIGHT** | 38 KG/Km |
| **OUTSIDE DIAM.** | 0.20 inch (5.1 mm nom. +/- 0.15) |
| **MIN BEND RADIUS** *(During installation)* | 45.9 mm ( 9x O. D.) |
| **MIN BEND RADIUS** *(During operation)* | 25.5mm ( 5 x O.D.) |
| **TEMPERATURE installation** | Plus 60°C, minus 5°C |
| **TEMPERATURE operational** | Plus 70°C, minus 30°C |

## ELECTRICAL CHARACTERISTICS

| | |
|---|---|
| **DC RESISTANCE** | 94 Ohms/Km @ 20° C |
| **IMPEDANCE** | 90 +/- 13 Ohms 1-400 MHz |
| **ATTENUATION** | |
| **1 KHZ** | 8 db/100m max. |
| **4 MHZ** | 15,6 db/100m max. |
| **24 MHZ** | 38 db/100m max. |
| **96 MHZ** | 76 db/100m max. |
| **200 MHZ** | 128 db/100m max. |
| **400 MHZ** | 232 db/100m max. |
| **CAPACITANCE 2X28 AWG** | 54pF / m nom. @ 1KHz |
| **CAPACITANCE UNBALANCE** | 2.0 pF / m max. @ 1KHz (wire to ground) |
| **DIELECTRIC STRENGTH** | VAC/1 min - 500 V/Min |
| **RESISTANCE UNBALANCE** | 2% max. @ 20° C |
| **VELOCITY OF PROPAGATION** | 65% min. 68% max. |

**CORDSETS WITH A USB A PLUG OVERMOLDED ON EACH END (OUT OF USB SPECIFICATION > 5 M)**

| Length (m/ft) | Part Number |
|---|---|
| 6 m / 19,68 ft | USB2 AA 600 PU HFFR |
| 7 m / 22.96 ft | USB2 AA 700 PU HFFR |
| 8 m / 26.24 ft | USB2 AA 800 PU HFFR |
| 9 m / 29.52 ft | USB2 AA 900 PU HFFR |
| 10 m / 32.80 ft | USB2 AA 1000 PU HFFR |

**CORDSETS WITH A USB A PLUG OVERMOLDED ON EACH END (UNDER USB SPECIFATION ≤ 5M)**

| Length (m/ft) | Part Number |
|---|---|
| 0.5 m / 1,64 ft | USB2 AA 050 PU HFFR |
| 1 m / 3.28 ft | USB2 AA 100 PU HFFR |
| 1.50 m / 4.92 ft | USB2 AA 150 PU HFFR |
| 2 m / 6.56 ft | USB2 AA 200 PU HFFR |
| 2.50 m / 8.2 ft | USB2 AA 250 PU HFFR |
| 3 m / 9.84 ft | USB2 AA 300 PU HFFR |
| 3.50 m / 11.48 ft | USB2 AA 350 PU HFFR |
| 4 m / 13.12 ft | USB2 AA 400 PU HFFR |
| 4.5 m / 14.76 ft | USB2 AA 450 PU HFFR |
| 5 m / 16.40 ft | USB2 AA 500 PU HFFR |

# USB B Field

ROHS COMPLIANT

**SEALED (IP67) USB-B CONNECTION SYSTEM**
- USB-B male plug overmolded on USB2.0 cable
- USB-A plug can be used with USBFTV
- USB-B female receptacle with 50 mm wires & 5 way connectors
- Plastic shells
- Thread coupling
- Rear mount Jam Nut receptacle with panel gasket included

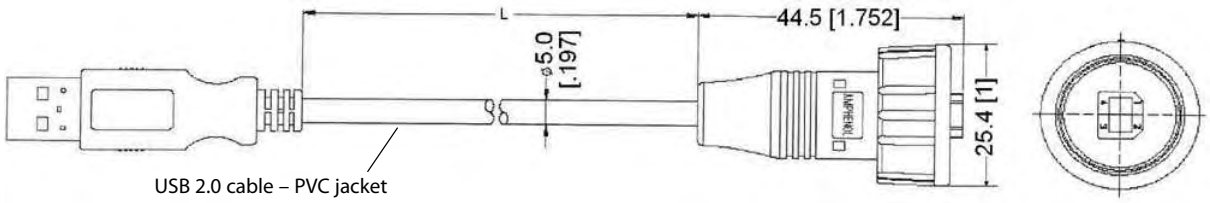
Applications

■ Embedded Computers ■ Data Transfer ■ Numerical Control Machine

## MALE SEALED PLUG USB-B / USB-A CORDSET

## FEMALE RECEPTACLE AND CAP

## PLUG CORDSET – MALE SEALED USB-B / MALE USB-A *(*)*

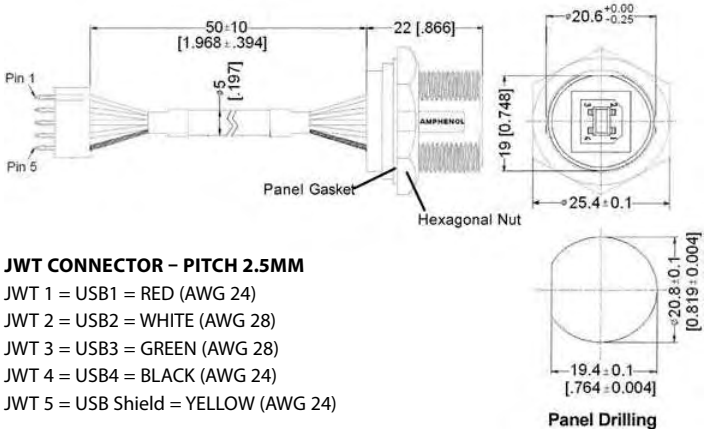



**PART NUMBERS:**
L = 1000±50mm [39.37±1.97] - P/N: **USBBF6100**
L = 2000±50mm [78.74±1.97] - P/N: **USBBF6200**

*(*) To get a sealed USB-A plug, you can use our USB FTV series.*

**PIN ASSIGNMENTS** *(FRONT VIEW)*
1 = RED (AWG 24)
2 = WHITE (AWG 28)
3 = GREEN (AWG 28)
4 = BLACK (AWG 24)
Shield = Drain

## RECEPTACLE – FEMALE USB-B




**JWT CONNECTOR – PITCH 2.5MM**
JWT 1 = USB1 = RED (AWG 24)
JWT 2 = USB2 = WHITE (AWG 28)
JWT 3 = USB3 = GREEN (AWG 28)
JWT 4 = USB4 = BLACK (AWG 24)
JWT 5 = USB Shield = YELLOW (AWG 24)

## RECEPTACLE CAP

**RECEPTACLE PN:** *USBBF7*

**CAP PN:** *USBBFC7*

# FWF TV

**IEEE 1394 Connection System for Harsh Environments**

ROHS COMPLIANT
"N": nickel plating

With FW Field, you can insert a standard IEEE1394 cordset into a metallic plug which will protect it from shocks, dust and fluids.
**No hazardous on-field cabling and grounding!**
This metallic plug is connected into a receptacle, using a Tri Start Thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device for high vibrations.

## MAIN CHARACTERISTICS

- No assembly tools required
- Sealed against fluids and dusts (IP67)
- No time-consuming in-field cabling operation necessary
- **Tri-start thread coupling mechanism (MIL-DTL-38999 series III type) with anti-decoupling device**
- FW plug retention in the receptacle: 100 N in the axis
- Mating cycles: 500 to 1500 times
- Improved EMI protection

### Applications

- Embedded Computers
- Video
- Railways
- Battelfield Communication Systems
- Naval & Shipboard Systems
- Robotics & Automation
- Process Control
- Rugged Communications

### Environmental Protection

- Sealing (mated): IP67 (Temporary immersion - 1 meter up to 30 minutes)
- Salt Spray: 48 hr with Nickel plating
  500 hr with Olive Drab Cadmium
- Fire Retardant / Low Smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 1micro s
- Shocks: IK06: weight of 250 g drop from 40 cm [15.75 in] onto connectors (mated pair)
- Humidity: 21 days, 43°C, 98% humidity
- Temperature Range: - 55°C / +85°C

### Data Transmission

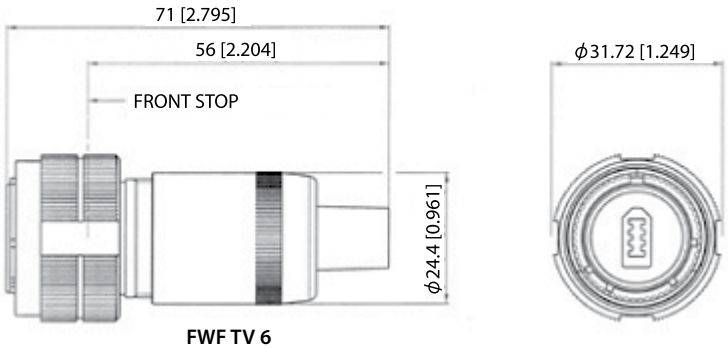
IEEE 1394a-2000
400 Mbits/second over 4.5 meters

## Part Number Code

| | | | | |
|---|---|---|---|---|
| **Series**<br>**IEEE1394 Field TV** | **FW F TV** | **2** | **1** | **G** |
| **Shell Type**<br>**6:** Plug<br>**2:** Square Flange Receptacle<br>**2PE:** Square Flange Receptacle with backshell<br>**7:** Jam Nut Receptacle<br>**7PE:** Jam Nut Receptacle with backshell | | | | |
| **Back Terminations** *(Receptacles only)*<br>**1:** IEEE 1394 receptacle<br>**2:** Solder Board (6 tinned holes) | | | | |
| **Shell Plating**<br>**N:** Nickel - ROHS Compliant<br>**G:** Olive Drab Cadmium | | | | |

Examples:
- Olive Drab Cadmium Plug: FWF TV 6G
- Olive Drab Cadmium Square Flange Receptacle, IEEE 1394 front & back: FWF TV 21G
- Olive Drab Cadmium Jam Nut Receptacle, IEEE 1394 front and back: FWF TV 71G
- Nickel Jam Nut Receptacle, solder board termination: FWF TV 72N

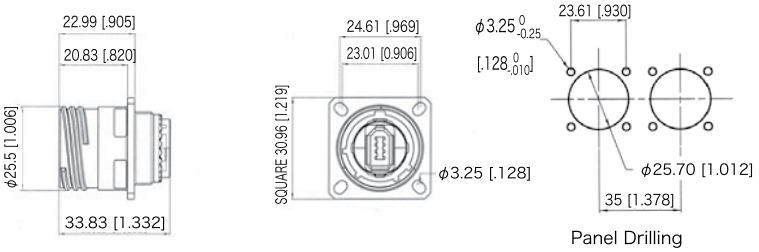
## Plug




**FWF TV 6**

## Receptacles

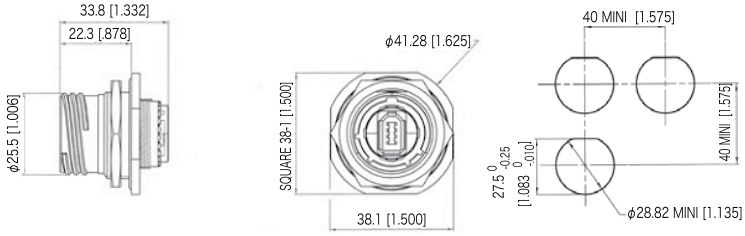
■ « 2 » Shell Square Flange




Panel Drilling

**FWF TV 2**

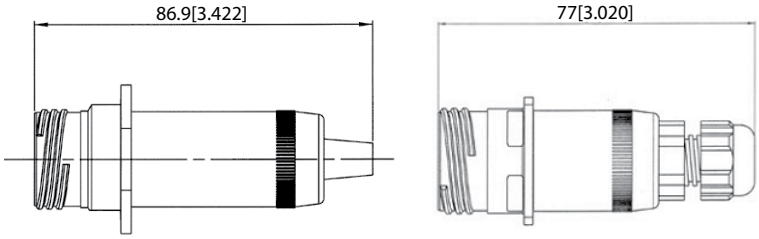
■ « 7 » Shell Jam Nut




**FWF TV 7**

Panel Drilling

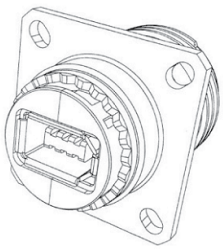
■ « 2PE » and « 7PE » Shells



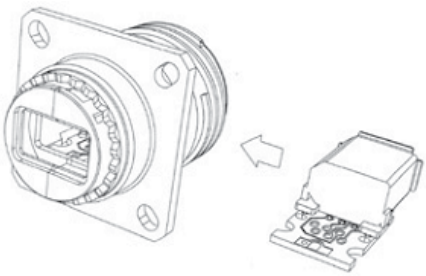

Backshell used with IEEE 1394
Receptacle with back-termination - (Type 1)
Non sealed version

Backshell used with PCB
Receptacle back- termination - (Type 2)
Sealed version – IP67

## Back Terminations



Type 1 : IEEE 1394 Receptacle



Type 2 : Solder 6 Tined holes for soldering

View of the PCB Type 2 version - with 6 tinned holes for solder termination

## Assembly Instructions

*Can be used with most IEEE 1394 cordset brands: No tools required!*

**Plug Assembly**

1. If a fully sealed (IP67) assembly is required: Install the white tape around the plug to cover the 4 holes of the overmolding. If there are no holes omit this step.

2. Insert the black O Ring around the front face of the IEEE 1394 plug. This O Ring will ensure the seal.

3. Insert the IEEE 1394 cordset into the metallic backshell.

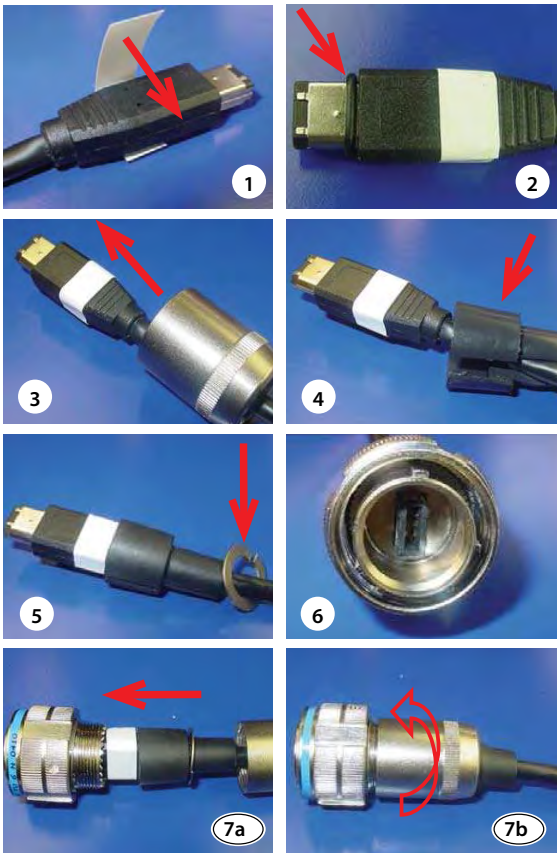
4. Insert the retention spacer laterally onto the cable (this spacer is soft so as to adapt to various overmolding styles) and slide the IEEE 1394 plug into this retention spacer.

5. Insert the friction ring laterally onto the cable cordset.

6. Insert the IEEE 1394 plug into the metallic circular shell. Note at this step that the main key is used for polarization.

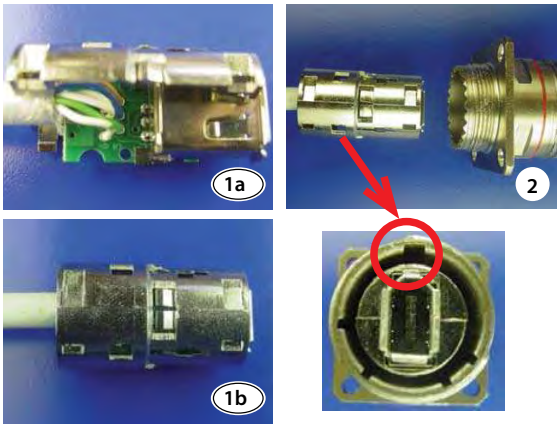
7. Screw the backshell on the plug body. A spanner may be required to fully close the backshell to the circular shell.

**Important Note:** The sealing of the connector is not done by the black retention spacers which are slotted, but rather by the front face O-Ring (Fig 2).



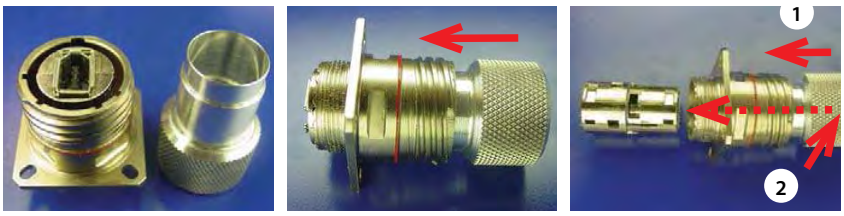

**Receptacle Assembly**

To Solder your cable onto the PCB:
1. Attach the 2 metallized plastic inserts around the PCB (Fig 1a & 1b).
2. Insert the IEEE 1394 module from the rear of the connector.




**Removing Modules**

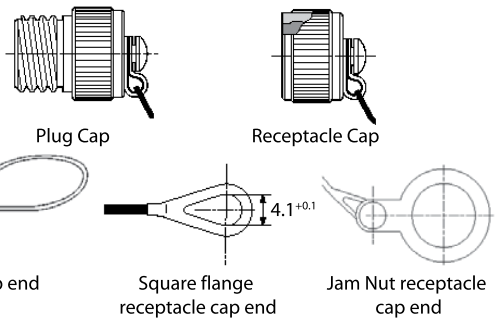
1. Insert the removal tool FWF ODE from the front
2. Push the module back with thumb.



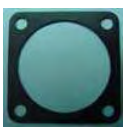

## Accessories

- **Metallic Caps**

| | FWF TVC | 2 | G |
|---|---|---|---|
| **Connector Type** | | | |
| **6:** | Plug | | |
| **2:** | Square Flange Receptacle | | |
| **7:** | Jam Nut Receptacle | | |
| **Shell plating** | | | |
| **N:** | Nickel - ROHS Compliant | | |
| **G:** | Olive Drab Cadmium | | |




- Panel Gasket for square flange receptacle (Thickness: 0,8 mm [.031]): JE15
- Receptacle Insert removal tool: FWF ODE



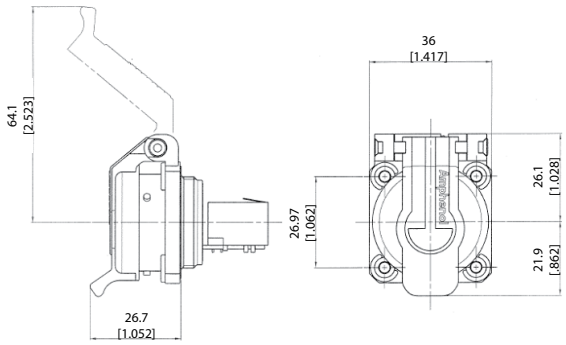
# SELF CLOSING CAP

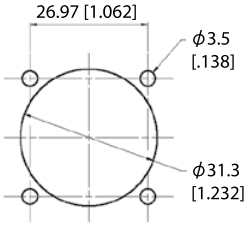
For RJ Field, USB and IEEE1394 receptacles


This Self Closing Cap automatically protects the RJ Field square flange receptacles (MIL-C-26482 type), protecting your system from dust and water projections. The same cap can be used to protect USB and IEEE1394 receptacles. A spring automatically closes the upper part of the cap when either the RJ Field plug, RJ45 cordset, USB or IEEE1394 cordset, or USB key are removed from the receptacle.

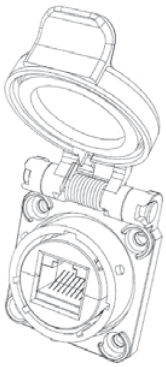
**ROHS COMPLIANT**

"N": nickel plating
"B": black coating



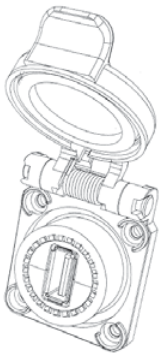




Panel Drilling



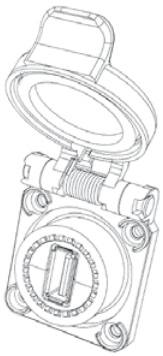
**Version: RJ45**
**RJF 21N SCC**
Nickel and metallized inserts (EMI)

**RJF 21B SCC**
Black and blank insert



**Version: USB**
**USBF 21N SCC**
Nickel and metallized inserts (EMI)

**USBF 21B SCC**
Black and blank insert



**Version: IEEE1394**
**FWF 21N SCC**
Nickel and metallized inserts (EMI)

**FWF 21B SCC**
Black and blank insert

- Note: Panel gasket for square flange receptacles: JE18

# RJ11F

Rugged RJ11/RJ12 Connection System for Harsh Environment


RJ11Field allows you to use a standard phone RJ11 / RJ12 connection in harsh environments. With the patented RJStop® system you can use a standard RJ11 / RJ12 cordset in a metallic plug which will protect it from shocks, dust and fluids. **No hazardous on-field cabling!**

## MAIN CHARACTERISTICS

- **Bayonet coupling** ("Audible & Visual" coupling signal )
- **Robust metallic shells based on MIL-C-26482**
- 4 mechanical user-defined coding / Polarization settings (insert rotation)
- RJ11 cordset retention in the plug: 100 N in the axis
- Mating cycles: 500 min

### Applications

- Industrial applications
- Battlefield communication

**ROHS COMPLIANT**
"N": nickel plating
"B": black coating

### Environmental Protection

- Sealing: IP67
- Salt Spray: 48 h with Nickel plating
  > 96 h with black coating
  > 500 h with Oliv Drab Cadmium
- Fire Retardant / Low Smoke: UL94 V0 and NF F 16 101 & 16 102
- Vibrations: 10 – 500 Hz, 10 g, 3 axes: no discontinuity > 10 nano s.
- Shocks: IK06: weight of 250 g drop from 40 cm [15.75 in] onto connectors *(mated pair)*
- Humidity: 21 days, 43°C, 98% humidity
- Thermal Shock: 5 cycles at - 40°C / +100°C
- Temperature Range: - 40°C / +85°C

## Part Number Code

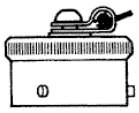
| Series RJ11Field | RJ11F | 2 | 2 | B |
|---|---|---|---|---|
| **Shell Type**<br>6: Plug, Plastic Gland<br>2: Square Flange Receptacle<br>7: Jam Nut Receptacle | | | | |
| **Back Terminations (For Receptacles only)**<br>1: Female RJ11<br>2: Solder (6 tinned holes) | | | | |
| **Shell Finishes**<br>B: Black Coating - ROHS Compliant<br>N: Nickel - ROHS Compliant<br>G: Olive Drab Cadmium | | | | |

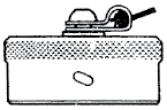
Examples:
- Black Plug: RJ11F 6 B
- Black square flange receptacle, Female RJ11 Back termination: RJ11F 2 1 B
- Nickel Jam Nut Receptacle, solder termination: RJ11F 72 N

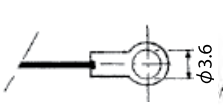
## Accessories

- Metallic cap

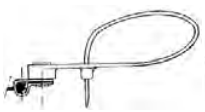
| | RJ11FC | 2 | B |
|---|---|---|---|
| **Connector Type**<br>6: Plug<br>2: Square Flange Receptacle<br>7: Jam Nut Receptacle | | | |
| **Finishes**<br>B: Black Coating - ROHS Compliant<br>N: Nickel - ROHS Compliant<br>G: Olive Drab Cadmium | | | |

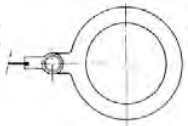

Plug cap


Recaptacle cap

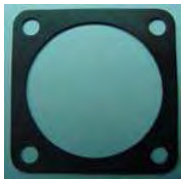


Square Flange type « 2 »


Plug Cap end type « 6 »


Jam nut receptacle type « 7 »

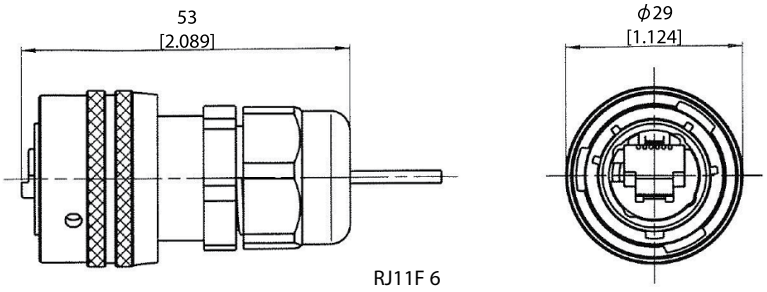
- Panel gasket for square flange « 2 »
  thickness: 0,6 mm P/N: JE 14



- Insert removal tool for receptacle and plug
  P/N = RJ11F ODE

## Plug

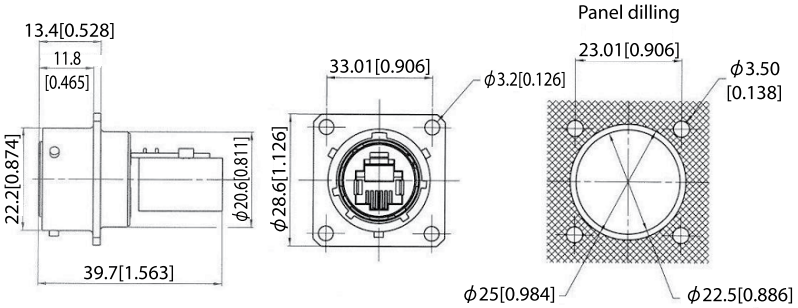
- Shell type 6 with Plastic Gland




RJ11F 6

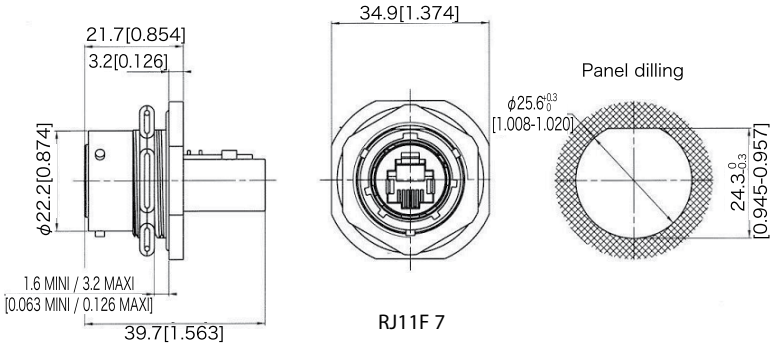
## Receptacles

- Square flange receptacle
  4 mounting holes Shell type 2



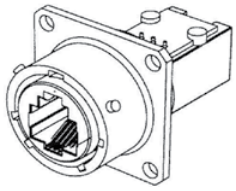

RJ11F 2

- Jam nut receptacleHexagonal Nut mounting-
  Shell type 7

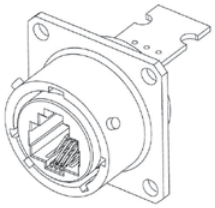



RJ11F 7

## Back Terminations



Type 1: Female RJ11 / RJ12

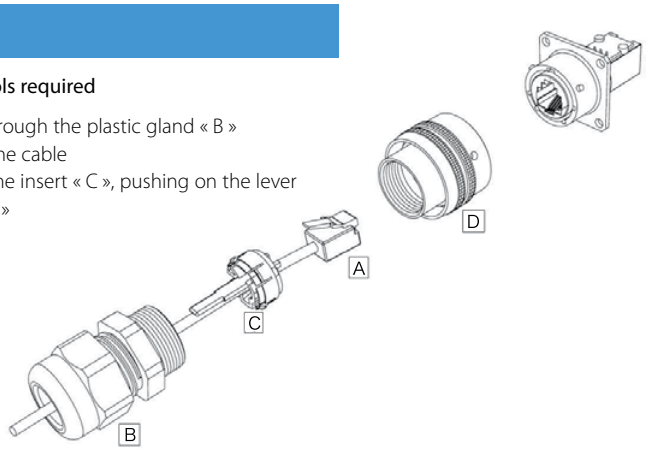


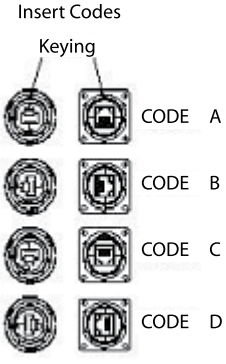
Type 2: Solder
6 tined through holes to solder your cable

## Assembly instructions

**Easy and Safe: No field cabling tools required**

1. Pass the RJ11 / RJ12 plug « A » through the plastic gland « B »
2. Lateraly slide the insert « C » on the cable
3. Fix the RJ11 / RJ12 plug « A » in the insert « C », pushing on the lever
4. Insert in the metallic housing « D »
5. Tighten the plastic gland « B »




4 coding positions

# MTRJF TV

Transform your MTRJ patchcord into an Environmental Connector

With MTRJFTV you can use a standard MTRJ patchcord in a metallic plug which will protect it from shocks, dust and fluids.

**No hazardous on-field cabling!**

The MTRJ Field offers an easy system to upgrade from a standard to an environmental MTRJ.

- Sealed against fluids and dust (IP67)
- Shock, Vibration proof,
- No cabling operation in field and no tools required for installation

## Applications

- Railways
- Base Station
- Military communication
- Navy

## MECHANICAL CHARACTERISTICS

- Number of Channels: 1/2/4
- Typical Insertion Loss: 0,5db in MM
- Durability: 500 mating/unmating cycles (changes for<0,2 db)

ROHS COMPLIANT

"N": nickel plating

## Part Number Code

| Serie<br>MTRJ Field TV | MTRJF TV | 6M | C | G | N |
|---|---|---|---|---|---|

**Shell Type**

| | |
|---|---|
| 6: | Plug with metal backshell, plastic PG clamp |
| 6M: | Plug with metal backshell and metal PG clamp |
| 2: | Square flange receptacle |
| 2PE: | Square flange, metal backshell and plastic PG clamp |
| 2PEM: | Square flange, metal backshell and metal PG clamp |
| 7: | Jam nut receptacle |
| 7PE: | Jam nut, metal backshell and plastic PG clamp |
| 7PEM: | Jam nut, metal backshell and metal PG clamp |

**Cable Type**

| | |
|---|---|
| C: | Mini round cable 2,8 mm |
| D: | Flat duplex cable 1,6 mm |
| S: | Duplex zipcord 1,6 mm |
| 0: | Receptacle without backshell |
| T: | Flat duplex cable + Duplex zipcord for 1,6 mm - 2mm - 2,8mm |

**Shell Finish**

| | |
|---|---|
| N: | Nickel plated |
| G: | Olive drab cadmium plated |
| B: | Bronze |
| D: | Black zinc cobalt |
| Z: | Olive drab zinc cobalt |

**Polarization**

N: Normal

A / B / C / D / E

| Cap Series | B | EC | N | TV | W | 13 |
|---|---|---|---|---|---|---|

**Protective cap type**

| | |
|---|---|
| EC: | For square flange receptacle |
| ER: | For jam nut receptacle |
| F: | For plug |

**Wire type**

| | |
|---|---|
| N: | Nylon cord |
| Blank: | Metallic chain |

TV: Series

**Shell finish**

| | |
|---|---|
| B: | Bronze |
| F: | Electroless nickel plated, aluminium version |
| W: | Olive drab cadmium plated, aluminium version |
| D: | Black zinc cobalt |
| Z: | Olive drab zinc cobalt |

- **Requested information to order MTRJ Field Patchcord**

| | |
|---|---|
| Plug MTRJ: | Male /Female |
| Type of fiber: | 50/125, 62,5/125, 9/125 |
| Patchcord length: | ex 10.5m |
| Drawing: | description of the product |

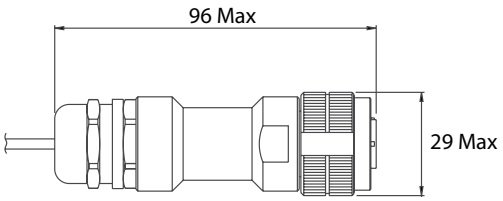
Contact us for other configuration

**Dismounting Tool Ordering Information**

MTRJFTV DM TOOL

## Line drawings *(Dimensions in mm)*

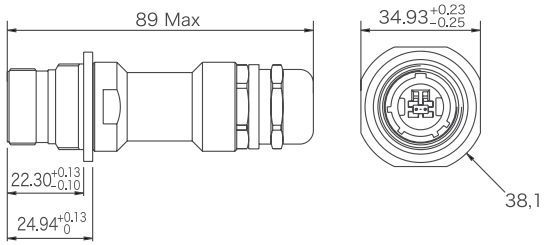
■ Plug (MIL DTL 38 999 series III Size 13)




MTRJ FTV 6

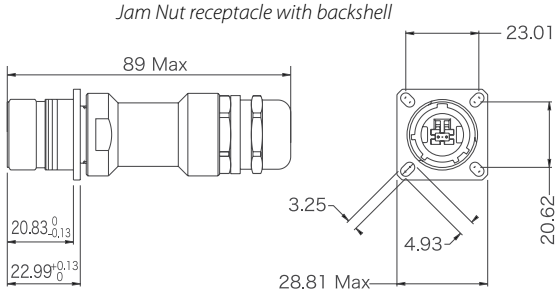
■ Receptacle (MIL DTL 38 999 series III Size 13) with backshell

*Square flange receptacle with backshell*



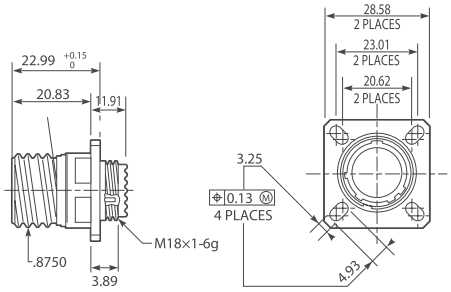

MTRJ FTV 2PE/2PEM

*Jam Nut receptacle with backshell*




MTRJ FTV 7PE/7PEM

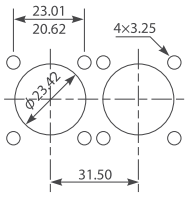
■ Square Flange Receptacle (MIL DTL 38 999 series III Size 13)



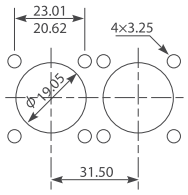

MTRJ FTV 2

**PANEL DRILLING**

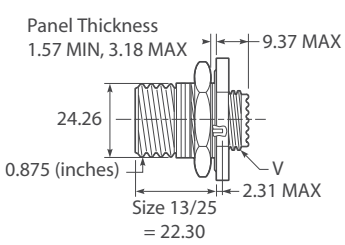
Square flange receptacle rear panel mounting




Square flange receptacle front panel mounting



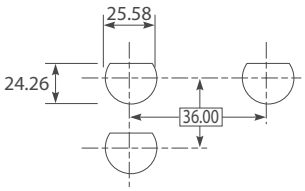

■ Jam Nut Receptacle (MIL DTL 38 999 series III Size 13)





**PANEL DRILLING**

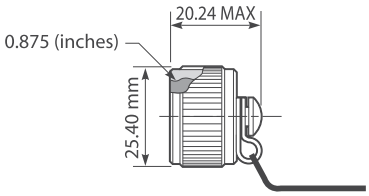
Jam nut receptacle rear panel mounting



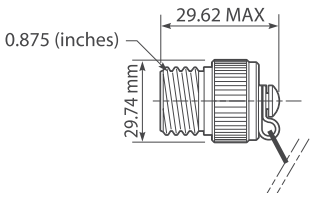

MTRJ FTV 7

## Protective caps

Protective cap for plug (nylon cord)




Protective cap for receptacles (nylon cord)



# LC/LX5F

Transform your LC/LX5 patchcord into an Environmental Connector



The LC Field and LX5 Field offers an easy system to upgrade from a standard to an environmental LC or LX5.
- Sealed against fluids and dust (IP67)
- Shock, Vibration proof
- No cabling operation in field and no tools required for installation (except 1,6mm and 2mm zipcord cable)

With the patented RJStop ® system you can use a standard LC or LX5 patchcord in a metallic plug which will protect it from shocks, dust and fluids. **No hazardous on-field cabling!**

## MECHANICAL CHARACTERISTICS

- Number of Channels: 2
- Typical Insertion Loss: 0,5db in MM and SM
- Durability 500 mating/unmating cycles (changes for<0,2 db)

## Applications

- Railways
- Base Station
- Military communication
- Navy

**ROHS COMPLIANT**
"N": nickel plating

## Part Number Code

| Serie | XXXX TV | XX | X | X | X |
|---|---|---|---|---|---|
| **Optical connector type**<br>**LCF:** LC Field TV<br>**LX5F:** LX5 Field TV | | | | | |
| **Shell Type**<br>**6M:** Plug with metal backshell and metal PG clamp<br>**2:** Square flange receptacle without backshell<br>**7:** Jam nut receptacle without backshell | | | | | |
| **Cable Type**<br>**D:** Flat duplex cable 1,6 mm<br>**E:** Duplex zipcord 1,6 mm<br>**F:** Flat duplex cable 2 mm<br>**G:** Duplex zipcord 2 mm<br>**H:** Flat duplex cable 2,8 mm<br>**I:** Duplex zipcord 2,8 mm<br>**0:** Receptacle without backshell<br>**T:** Flat duplex cable + Duplex zipcord for 1,6 mm - 2mm - 2,8mm | | | | | |
| **Shell Finish**<br>**N:** Nickel plated<br>**G:** Olive drab cadmium plated<br>**B:** Bronze<br>**D:** Black zinc cobalt<br>**Z:** Olive drab zinc cobalt | | | | | |
| **Polarization**<br>**N:** Normal<br>A / B / C / D / E | | | | | |

| Cap Series | B | EC | N | TV | W | 19 |
|---|---|---|---|---|---|---|
| **Protective cap type**<br>**EC:** For square flange receptacle<br>**ER:** For jam nut receptacle<br>**F:** For plug | | | | | | |
| **Wire type**<br>**N:** Nylon cord<br>**Blank:** Metallic chain | | | | | | |
| **TV:** Series | | | | | | |
| **Shell finish**<br>**B:** Bronze<br>**F:** Electroless nickel plated, aluminium version<br>**W:** Olive drab cadmium plated, aluminium version<br>**D:** Black zinc cobalt<br>**Z:** Olive drab zinc cobalt | | | | | | |
| **Corresponding connector shell size: 19** | | | | | | |

**Requested information to order LC/LX5 Field Patchcord**

| | |
|---|---|
| Type of connector: | Male /Female |
| Type of fiber: | 50/125, 62,5/125, 9/125 |
| Patchcord length: | ex 10.5m |
| Drawing: | description of the product |

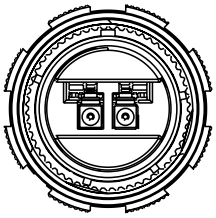
Contact us for other configutration

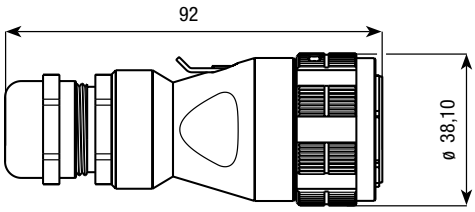
**Tools informations:**
**Mounting Tools:**
LCFTV MO TOOL: LC FIELD Mounting tools
LX5TV MO TOOL: LC FIELD Mounting tools

**Dismounting Tools *:**
LCFTV DM TOOL: LC FIELD Dismounting tools
LX5TV DM TOOL: LC FIELD Dismounting tools
(To dismount the LC or LX5 you need to use both of dismounting and mounting tools)

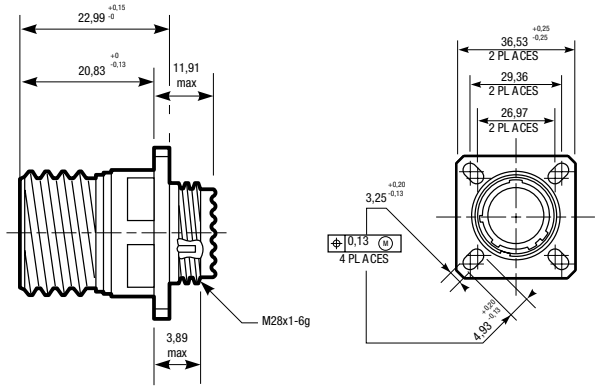
## Line drawings *(Dimensions in mm)*

■ Plug (MIL DTL 38 999 series III Size 19)



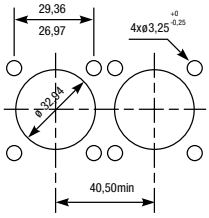



■ Square Flange Receptacle (MIL DTL 38 999 series III Size 19)

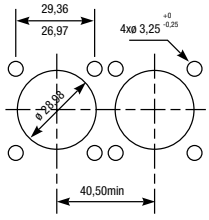



**PANEL DRILLING**

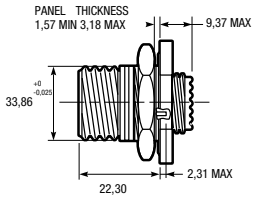
Square flange receptacle rear panel mounting

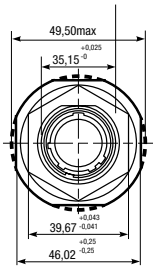


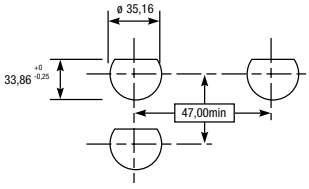

Square flange receptacle front panel mounting




■ Jam Nut Receptacle (MIL DTL 38 999 series III Size 19)

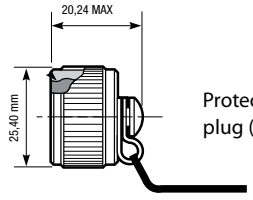


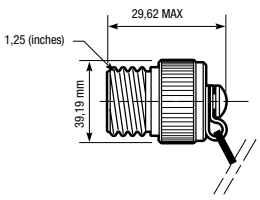




**PANEL DRILLING**
Jam nut receptacle
rear panel mounting

## Protective caps




Protective cap for plug (nylon cord)




Protective cap for receptacles (nylon cord)

# RJ Switch

ROHS COMPLIANT

**Industrial Ethernet Switch**
**IP30**


**INDUSTRIAL RUGGED ETHERNET SWITCH**

Amphenol offers a full range of Rugged Ethernet switches for industrial use. These switches are specifically designed for industrial applications where Real-Time is a key requirement. The wide range, from unmanaged Plug & Play switches to those managed with fiber optics ports, will fulfill all your needs. This family of switches, IP30 rated, is suitable for both Din-Rail or flat panel mounting. This is an easy way to make the Ethernet networks of your manufacturing site, automation or control units deterministic.

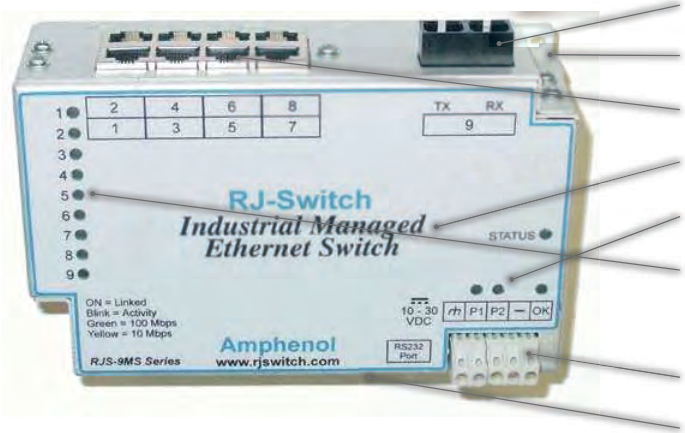
This wide range of Ethernet switches is available with following features:
- Unmanaged, Real-Time Ring and Managed models
- RJ45 ports and up to two fiber optics ports (mutlimode or singlemode)
- 5 or 9 port models

Applications
- Factory Automation
- Robotics
- Process Control
- Transportation Systems
- Data Acquisition & Transmission

## KEY FEATURES

- Redundant power inputs with surge/spike protection
- Ultra reliable 1,000,000 hours MTBF
- Hazardous location: operation in Zone 2
- Wide operating temperature range of –40°C to 70/85°C
- Rugged metal packaging with DIN rail or direct panel mounting
- Auto-detecting, auto-crossover and auto-polarity
- Full-Duplex operation with flow control (no collisions!)
- Ring Switch Networking Features
  - Real-Time Ring for ultra-fast fault-tolerant loops
  - Recovery time of 30 ms + 5 ms per hop!
  - Ideal for deterministic systems and PLCs
  - Real-time traffic prioritization
  - Port mirroring for traffic diagnostic
- Managed Switch Networking Features
  - Rapid Spanning Tree (RSTP) for fast redundant rings
  - Priority queuing for real-time performance (QoS and CoS)
  - SNMP v1 and v2 for network management
  - SNMPv3 for authentication and encryption
  - IGMP for multicast filtering
  - VLAN for traffic segregation
  - User friendly configuration (web, Telnet, RS232)
  - Encryption using HTTPS, SSL, SSH, SNMPv3
  - Message filtering to stop broadcast storms
  - RMON and port mirroring for diagnostics
  - The Power of Linux Inside

## DESCRIPTION




*SC or ST fiber connector (1, 2 or none)*

*DIN-Rail or Panel Mounting Fixture*

*5 or 9 connectors (RJ45, SC or ST fiber)*

*Unmanaged, Ring or Managed Capability*

*Indicators for Power, Alarm Output Status*

*Indicators for Link Status and Datarate*
- *10 Mbps*
- *100 Mbps*

*Terminal block for Redundant Power Inputs + Alarm Output*

*IP30 Iridized Aluminum Enclosure*

## MANAGED, RING & UNMANAGED SWITCH FEATURES

### IEEE Ethernet Standards

| | |
|---|---|
| IEEE 802.3 /u | 10 Mbps Ethernet and 100 Mbps Fast Ethernet |
| IEEE 802.3x | Full-Duplex with Flow Control |
| IEEE 802.1p | Priority Queuing – QoS, CoS, ToS/DS *(Ring and managed models)* |
| IEEE 802.1D/w | Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability *(managed models)* |
| IEEE 802.1Q | VLAN for traffic segregation *(managed models)* |

### Regulatory Approvals

| | |
|---|---|
| EMI emissions | EN55022, FCC part 15, ICES-003 |
| EMC immunity | IEC61326-1, IEEE C37.90 |
| Shocks | IEC60068-2-27 |
| Vibrations | IEC60068-2-6 |
| Free Fall | IEC60068-2-32 |
| Hazardous Location | UL1604, CSA C22.2/213 *(Class 1, Div. 2)*, EN50021/Zone 2 |

### Ethernet features

| | |
|---|---|
| RJ45 ports | 5 or 9 Shielded RJ45 ports 10/100BaseTX |
| Fiber optic ports | SC or ST connectors |
| | Datarate 100BaseFX *(100Mbps)* |
| | Wavelength 1300 nm center |
| | Fiber multimode (mm) optimal: 62.5/125 um |
| | Fiber singlemode (sm) optimal: 9/125 um |
| | Fiber max distance *(Full duplex)*: 2km *(mm)*, 15 or 40 km *(sm)* |
| Ethernet switch type | Intelligent store & forward |
| Full / Half Duplex | Configurable |
| RJ45 speed | 10 or 100 Mbps auto-negotiation |
| RJ45 MDI/MDIX | Auto-crossover connection |
| RJ45 TD and RD polarity | Auto-polarity |
| Typical latency | 16 us + frame time @ 10 Mbps *(varies on load and settings)* |
| | 5 us + frame time @ 100 Mbps |
| MAC addresses supported | 2048 |
| Memory bandwidth | 3.2 Gbps |

### Environmental

| | |
|---|---|
| Operating Temperature | - 40°C to +85°C |
| *(- 40°C to +70°C for RJS-9MS models)* | |
| Storage Temperature | - 40°C to +85°C |
| Humidity (non-condensing) | 5 to 95 % RH |

### Status *RS and MS models only*

| | |
|---|---|
| "OK" contact output | 10 – 30 VDC |
| *(or 10 - 50 VDC depends on models)* | |
| | Maximum current 0.5 A |

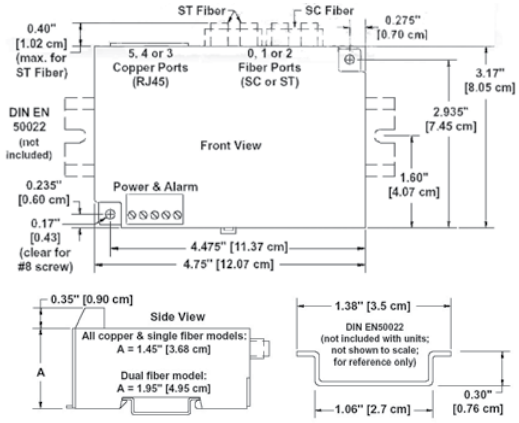
**EXCEEDS MIL-STD-1275**

| Power protection rating | Industrial | MIL-STD-1275 Available on: RJS-5RS / RJS-9RS RJS-9MS -4 & -5 |
|---|---|---|
| Surge protection | | 100 V for 1s |
| Transient protection | 15 KW peaks | 15 KW peaks |
| Spike protection | 5 KW *(10 times for 10 µs)* | 5 KW *(10 times for 10 µs)* 250 V *(50 times for 100 µs)* |

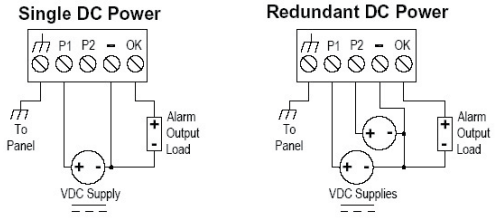
### Power Supply

| | |
|---|---|
| Input Power *(depends on models)* | 4 W - typical, |
| *ALL PORTS ACTIVE AT 100 MBPS* | |
| Redundant Inputs | 10 - 50 VDC *(models RJS-5RS; RJS-9RS)* |
| | 10 - 30 VDC *(all other models)* |

## DIMENSIONS *(EXAMPLE FOR 5 PORT RING MODELS)*




## POWER AND ALARM WIRING




## Part Number Code

| | | | | | |
|---|---|---|---|---|---|
| **Series** **RJ-Switch** | **RJS** | **5ES** | **1** | **-** | **-** |

**Type of Electronics**
- **5ES:** 5 ports total, Ethernet unmanaged switch
- **9ES:** 9 ports total, Ethernet unmanaged switch
- **5RS:** 5 ports total, Ethernet Ring switch
- **9RS:** 9 ports total, Ethernet Ring switch
- **5MS:** 5 ports total, Ethernet Managed switch
- **9MS:** 9 ports total, Ethernet Managed switch

**RJ45 or fiber ports**
- **1:** RJ45 ports only, no fiber
- **2:** 1 multimode fiber ports
- **3:** 1 singlemode fiber ports
- **4:** 2 multimode fiber ports (except for 9ES- models)
- **5:** 2 singlemode fiber ports (except for 9ES- models)

**Style of Fiber connectors**
- **Blank:** No fiber
- **SC:** SC style fiber connector(s)
- **ST:** ST style fiber connector(s)
- **SCL:** SC style fiber connector(s), long haul fiber (40km), on singlemode models
- **STL:** ST style fiber connector(s), long haul fiber (40km), on singlemode models

**Pre-set for Ring models only**
- **E0:** Pre-set for 0 rings (special order)
- **E1:** Pre-set for 1 ring (standard order), configured on last 2 ports
- **E2:** Pre-set for 2 rings (special order), Ring 1 = last 2 ports, Ring 2 = ports 1 & 2.

Example: RJ-Switch, 5 ports Ethernet Ring switch, with 1 multimode ST fiber port, pre-set for 1 ring: **RJS-5RS-2-ST-E1**

## A COMPLETE RANGE OF IP67 SEALED INDUSTRIAL ETHERNET SWITCHES

Amphenol offers the widest range of IP67 sealed Industrial Ethernet switches for very harsh environments. The Ethernet interfaces are waterproof & rugged RJ45 connectors from the RJ FIELD series ***(www.rjfield.com)***. For any other product such as RJ45/fiber optics converter, please do not hesitate to consult us.

*CONSULT OUR DEDICATED* ***WEBSITE*** *FOR MORE INFORMATION:*

www.rjswitch.com

**RJS-PC5 SERIES**
- 5 ports IP67 RJ45 connectors
- Polyester enclosure
- Ring or unmanaged models

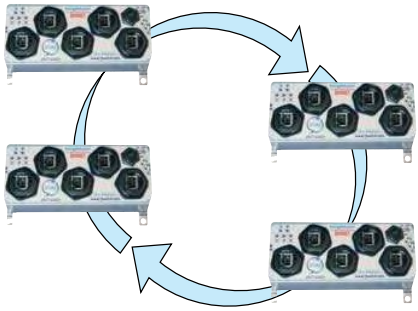
**RJS-AL SERIES**
- 8 ports IP67 RJ45 connectors
- Aluminum enclosure
- Managed or unmanaged models

**RJS-PC SERIES**
- 8 ports IP67 RJ45 connectors
- Polyester enclosure
- Managed or unmanaged models

# RJ Switch

ROHS COMPLIANT

Harsh Environment Industrial Ethernet Switch
**Plastic Enclosure - IP67**





Rugged & Waterproof Switch

Amphenol offers a small size 5 port waterproof Ethernet Switch that can withstand a variety of extreme conditions - low & high temperatures, shocks & vibrations, dust particles or even liquid immersion. This is an easy way to make the Ethernet networks of your manufacturing site, automation or control units deterministic.

## Amphenol IP67 Industrial Ring Switch

Amphenol IP67 Ring Ethernet switch is a combination of very fast, fault-tolerant network redundancy Sixnet technology and IP67 sealed & rugged packaging, specifically designed for the harshest environments.
Rings self-configure and just run, without any complex configuration.
The switch board is sealed within a waterproof IP67 polyester enclosure suitable for highly corrosive environments. The polyester material is glass fiber reinforced. This makes it very rugged against shocks and vibration.
The I/O interfaces are waterproof & rugged RJ45 connectors from the RJ FIELD plastic circular series.

## Key Features

- Waterproof IP67 Rating (NEMA 6)
- Reduced Installation Costs with the patented RJStop® system
- Use any standard RJ45 cordset
- Rugged Enclosure in Polyester reinforced with 30% glass fiber
- Redundant power inputs with surge/spike protection
- Ultra reliable 1,000,000 hours Mean Time Between Failure (MTBF)
- Zone 2 hazardous location
- Ring Switch Networking Features (managed features available !)
  - Real-Time Ring for ultra-fast fault-tolerant loops
    - Recovery time of 30 ms + 5 ms per hop!
  - Modbus monitoring over Ethernet
    - Ideal for deterministic systems and PLCs
  - Real-time traffic prioritization (QoS and CoS)
    - Assure delivery of real-time data
    - Improve network utilization
    - User settable priority assignments
  - Advanced switch features
    - User configurable port settings
    - Port mirroring for traffic diagnostics
    - Pre-configurable for Plug-And-Play simplicity

## Industrial Applications

- Factory Automation
- Robotics
- Process Control
- Transportation Systems
- Data Acquisition & Transmission

IP67 Unmanaged and Ring Switch Features

## IEEE Ethernet Standards

| | |
|---|---|
| IEEE 802.3 | 10Mbps Ethernet |
| IEEE 802.3u | 100Mbps Fast Ethernet |
| IEEE 802.3x | Full-Duplex with Flow Control |
| IEEE 802.1p standard | QoS/CoS - Quality/Class of Service for Ring model only |

## Regulatory Approvals

| | |
|---|---|
| EMI emissions | EN55022, FCC part 15, ICES-003 |
| EMC immunity: | IEC61326-1, IEEE C37.90 |
| Shocks: | IEC60068-2-27 |
| Vibrations: | IEC60068-2-6 |
| Free Fall: | IEC60068-2-32 |
| Hazardous Location: | UL1604, CSA C22.2/213 (Class 1, Div. 2), EN50021/Zone 2 |

## Ethernet features

| | |
|---|---|
| Ports | 5 Shielded RJ45 ports 10/100BaseTX |
| Ethernet switch type | Intelligent store & forward |
| Full / Half Duplex | Configurable |
| RJ45 speed | 10 or 100 Mbps auto-negotiation |
| RJ45 MDI/MDIX | Auto-crossover connection |
| RJ45 TD and RD polarity | Auto-polarity |
| Typical latency | 16 us + frame time @ 10 Mbps (varies on load and settings)<br>5 us + frame time @ 100 Mbps |
| MAC addresses supported | 2048 |
| Memory bandwidth | 3.2 Gbps |
| Ethernet isolation | 1500 Vrms 1 minute |
| Ring features<br>(for Ring model only) | Link loss recovery time: 30 ms plus 5 ms per hop<br>Maximum switches in ring: 50+<br>Dual Ring support |

## Power Supply

| | |
|---|---|
| Input power (typical) | ES: 2,4 W ; RS: 2,7 W |

## Status Reporting (for Ring model only)

| | |
|---|---|
| "OK" contact output | Output current: 0.5 A max |
| "OK" contact State | OFF when a fail occurs<br>ON when power<br>and switching is OK |

## Environmental

| | |
|---|---|
| Operating Temperature | - 40°C to +75°C |
| Storage Temperature | - 40°C to +85°C |

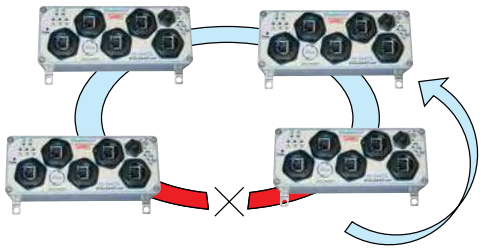
## Weight

0.54 kg

Real-Time Ring Switches

Amphenol Real-Time Ring switches combines the Plug&Play simplicity of an unmanaged switch with high performances of Sixnet Ring managed switches.

- **Real-Time fault-tolerant Ring**
  Recovery time of 30 ms + 5 ms per hop!
- **Real-Time traffic prioritization (QoS & CoS)**
  Assure delivery of real-time data
- **Available Managed features**
  User configurable port settings
  Port mirroring for traffic diagnostics
  Pre-configurable for Plug & Play simplicity

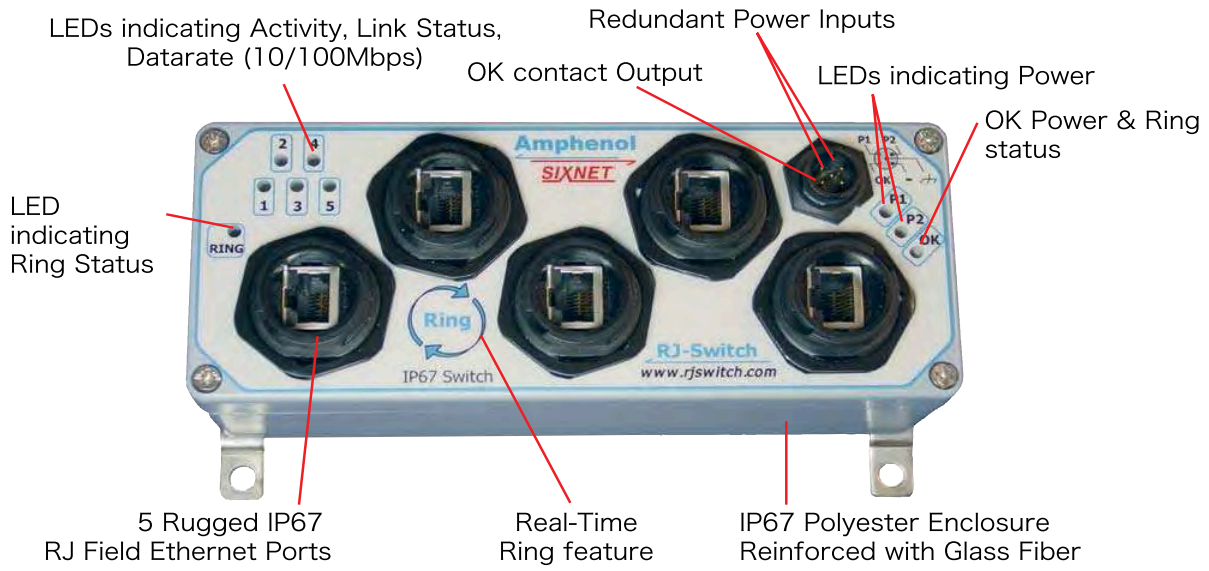


The use of such switches provides a fast network and avoids faults. When a break occurs, the switch instantly transfers data to new path. The link loss recovery is 30 ms plus 5 ms times the number of Ring switches in the ring. For example, 10 ring switches will recover in less than 80 ms. Rings can be pre-configured to "just run". They don't need an assigned IP address. But if you like, you can fine tune the performance of the ring by using a simple Windows wizard (which is free).
Ring networks can be divided into multiple "sub-rings" which enhance reliability and recovery speed through small ring paths.

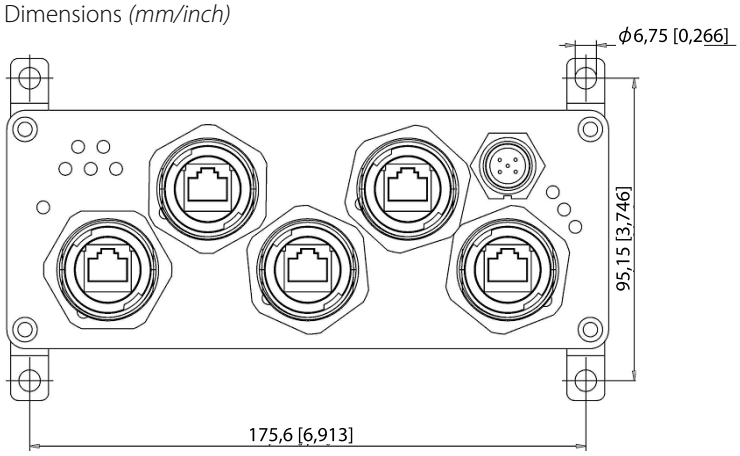
The prioritization of messages assures delivery of real-time data. Some applications need to force no-real-time data (such as video information) to lower priority and force critical real-time data at higher priority. Network utilization is improved.

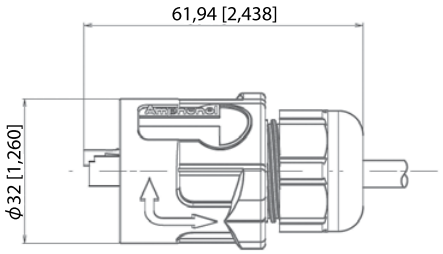
This combination of Ethernet technology associated with rugged and sealed protective enclosure is the ideal solution to deliver deterministic performance to your industrial systems even in the harshest environment!

**Description** *(example for Ring model)*

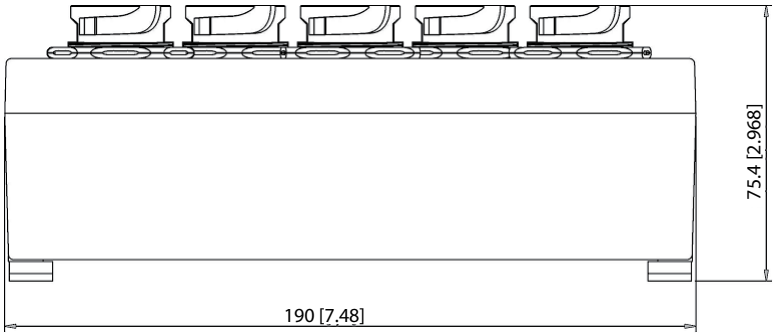


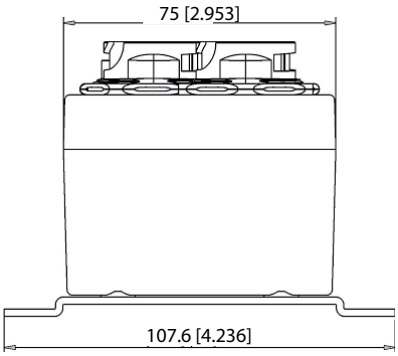
Dimensions *(mm/inch)*




Accessory: Plugs for RJ45 ports




## Part Numbers

| | | | |
|---|---|---|---|
| Series<br>IP67 RJ-Switch, with polyester body | RJS-PC | 5ES | 1 |
| Type of Electronics<br>5RS: 5 ports 10/100 Mbps, Ring switch (standard order)<br>5ES: 5 ports 10/100 Mbps, Unmanaged switch (special order) | | | |
| Connectors<br>1: RJ45 ports, 10/100BaseT(X)<br>1CAPS: Caps are attached on both power and data receptacles | | | |
| Military Rated Protection<br>Blank: Industrial protection (standard order)<br>EP: Extended power protection exceeds MIL-STD-1275 (special order) | | | |

Example IP67 Ethernet Ring switch, 5 ports 10/ 100 Mbps, with caps attached on the receptacles: RJS-PC-5RS-1CAPS

Note The Ring model is pre-set for 1 ring enabled on the ports 4 and 5.
You may change the configuration by using the free windows configuration tool.
Simply choose the desired pair of ports for your new enabled ring.

## Accessories

- P/N: RJF PC5 PWR
  Plug for power port
  Sealing protection: IP67


- P/N: RJF RB 6
  Plugs for RJ45 ports
  Sealing protection: IP67

**FREE WINDOWS**
Configuration tool
Download it at
**www.rjswitch.com**

# RJ Switch

Harsh Environment Military Ethernet Switch
**Metallic enclosure – IP67 – Gigabit**




## Sealed, Rugged & Waterproof Switch

Amphenol offers 9 ports managed, RING and unmanaged Ethernet Switches that can withstand a variety of extreme conditions. Whatever the situation - high temperatures, extreme shocks & vibrations, dust particles or even liquid immersion there is a solution available.

This is an easy way to make the Ethernet networks of your systems deterministic. Up to 3 gigabit ports are offered! The switch electronics are sealed within a waterproof IP67 metallic enclosure. The conductive cadmium plating is suitable for most demanding EMI-RFI environments. The I/O interface includes redundant power inputs as well as waterproof rugged RJ45 connectors from the RJF TV FIELD threaded product series based on MIL-DTL-38999 (Series III) metallic shell size 19. This series enables the transformation without tooling any standard RJ45 cordset into a robust and waterproof connection system.

## Key Features

**Rugged environmental features**

- Rugged metal packaging with cadmium olive drab protection
- MIL-DTL-38999 III connectors for both power and Ethernet ports
- IP65/IP67 rated
- MIL-STD-1275 Surge and Spike protection
- MIL-STD-810F shocks
- Zone 2 hazardous location
- Wide operating temperature range of –40°C to 70°C
- Altitude 3000m height; transportation 10000m height

**Ethernet features**

- 3 ports 10/100/1000-BaseT(X) + 6 ports 10/100-BaseT(X)
- Unmanaged, RING unmanaged and Managed models
- Full-Duplex operation with flow control (no collisions!)
- Auto-detecting, auto-crossover and auto-polarity

## Applications

**Military Applications**

- Data Acquisition & Transmission
- Battlefield Communication C4ISR
- Rugged Networks
- Mobile Communications
- Test Equipment
- Avionic & Shipboard Systems

**RING switch**

- Ring for fast fault-tolerant loops
- Recovery time of 30 ms + 5 ms per hop!
- QoS and CoS priority queuing

**MANAGED switch**

- RSTP for redundant rings
- QoS and CoS priority queuing
- SNMPv3 authentication and encryption
- IGMP for multicast filtering
- VLAN for trafic segregation
- And much more !

Managed & Unmanaged Switch Features

## IEEE Ethernet Standards

| Models | Features | 802.3/u | 802.3x | 802.3z | 802.1p | 802.1D | 802.1w | 802.1Q |
|---|---|---|---|---|---|---|---|---|
| RJS ML 9ES | Unmanaged | ✓ | ✓ | | | | | |
| RJS ML 9RS | RING | ✓ | ✓ | | ✓ | | | |
| RJS ML 9RG | RING - Gigabit | ✓ | ✓ | ✓ | ✓ | | | |
| RJS ML 9MS | Managed | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| RJS ML 9MG | Managed - Gigabit | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

| | |
|---|---|
| IEEE 802.3 /u | 10 Mbps Ethernet and 100 Mbps Fast Ethernet |
| IEEE 802.3x | Full-Duplex with Flow Control |
| IEEE 802.3z | Gigabit 1000 Mbps Ethernet |
| IEEE 802.1p | Priority queuing – QoS, CoS, ToS/DS |
| IEEE 802.1D/w | Rapid Spanning Tree for redundant rings and Spanning Tree (interoperability) |
| IEEE 802.1Q | VLAN for traffic segregation |

### Regulatory Approvals

| | |
|---|---|
| EMI emissions | EN55022 class A, FCC part 15, ICES-003 |
| EMC immunity | IEC61326-1, IEEE C37.90 |
| Shocks: | MIL-STD-810F : 40g, 11ms, 18 saw tooth shocks |
| Hazardous Location: | UL1604, CSA C22.2/213, EN50021 Class1, Div. 2 / Zone 2 |

### Power Supply

| | |
|---|---|
| Redundant 24 VDC Input | 10 – 50 VDC for Ring -9RS models<br>10 - 30 VDC for all other models |
| Input power | 4 to 9 W typical (all ports active), depends on models |
| Connectors for power | TV 07 RW 0935 P: MIL-DTL-38999 III Jam nut receptacle<br>olive drab cadmium plated<br>6 contacts size 22D |

### Ethernet features

| | |
|---|---|
| RJ45 ports | 9 shielded RJ45 ports 10/100 Base T(X) or 1000 Base T(X) |
| Connectors for RJ45 ports | RJFTV 7 G: Jam nut receptacle based on MIL-DTL-38999 III<br>Olive drab cadmium plated |
| Full / Half Duplex | Automatic or configurable |
| MDI / MDIX | Auto-crossover connection |
| RJ45 speed | 10, 100 or 1000 Mbps auto-negotiation |
| Typical latency | 16 us + frame time @ 10 Mbps (varies on load and settings)<br>5 us + frame time @ 100 Mbps |
| MAC addresses supported | 2048<br>8192 (gigabit models) |
| Memory bandwidth | 3.2 Gbps<br>32 Gbps (gigabit) |

### Temperature

| | |
|---|---|
| Operating Temperature | - 40°C to +70°C |
| Storage Temperature | - 40°C to +85°C |

### Status (Ring models)

| | |
|---|---|
| "OK" contact output | Sourcing power |
| Maximum current | 0.5 A |

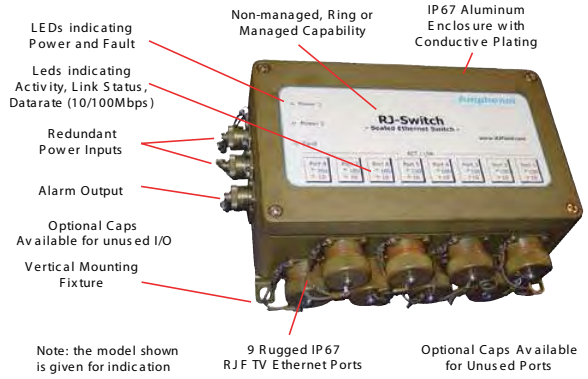
### Weight

approx 2.2Kg

**EXCEEDS MIL-STD-1275**

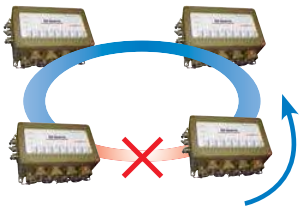
| Power ratings | Industrial specifications 9ES1; 9MS1; 9RG1; 9MG1 | MIL-STD-1275 Specifications RJS-ML-9RS1 |
|---|---|---|
| Surge protection | | 100 V for 1s |
| Transient protection | 15 KW peaks | 15 KW peaks |
| Spike protection | 5 KW (10x for 10 µs) | 5 KW (10x for 10 µs)<br>250 V (50x for 100 µs) |

## RJ-Switch enclosure description




## Real-Time Ring Switches

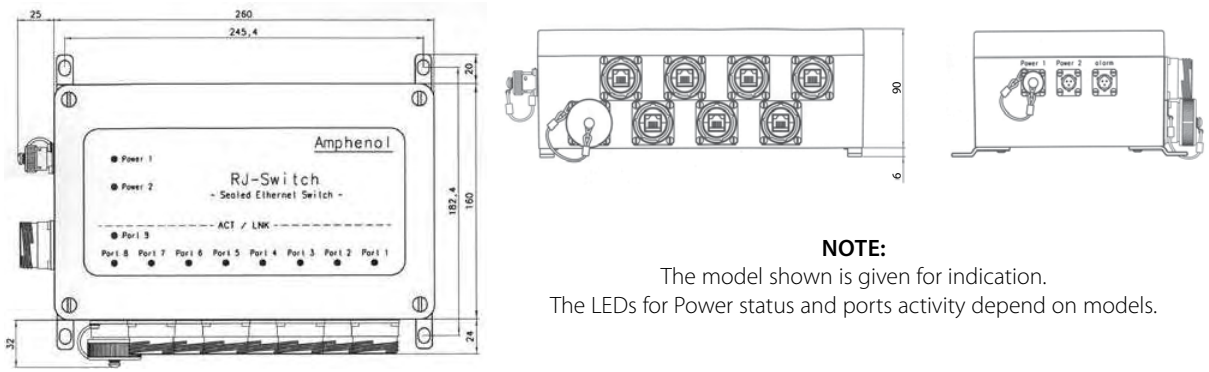
Amphenol Real-Time Ring switches combines the Plug&Play **simplicity** of an unmanaged switch with **high performances** of managed switches.



**Real-Time fault-tolerant Ring**
Recovery time of 30 ms + 5 ms per hop!
**Real-Time traffic prioritization (QoS & CoS)**
Assure delivery of real-time data
**Available Managed features**
User configurable port settings
Port mirroring for traffic diagnostics
Pre-configurable for Plug & Play simplicity

The use of such switches provides a fast network and avoids faults. When a break occurs, the switch instantly transfers data to new path. The link loss recovery is 30 ms plus 5 ms times the number of Ring switches in the ring. For example, 10 ring switches will recover in less than 80 ms. Rings can be pre-configured to "just run". They don't need an assigned IP address. But if you like, you can fine tune the performance of the ring by using a simple Windows wizard (which is free).
Ring networks can be divided into multiple "sub-rings" which enhance reliability and recovery speed through the small ring paths.

## Dimensions (mm) *Military Aluminum ML Enclosure*




**NOTE:**
The model shown is given for indication.
The LEDs for Power status and ports activity depend on models.

## Part Numbers

| Series RJ-Switch | RJS | ML | 9ES1 |
|---|---|---|---|
| Type of Enclosure<br>**ML:** Aluminum, OD Green Cadmium Plating & MIL-DTL-38999 (Series III) Receptacles | | | |
| Type of Electronics<br>**9ES1:** Unmanaged 9 ports 10/100 Base T(X)<br>**9RS1:** Unmanaged RING 9 ports 10/100 Base T(X)<br>**9RG1:** Unmanaged RING 6 ports 10/100 Base T(X) + 3 ports 10/100/1000 Base T(X)<br>**9MS1:** Managed 9 ports 10/100 Base T(X)<br>**9MG1:** Managed 6 ports 10/100 Base T(X) + 3 ports 10/100/1000 Base T(X) | | | |
| Accessories:<br>**Blank:** No caps included<br>**Caps:** Attached caps for both power and data included | | | |

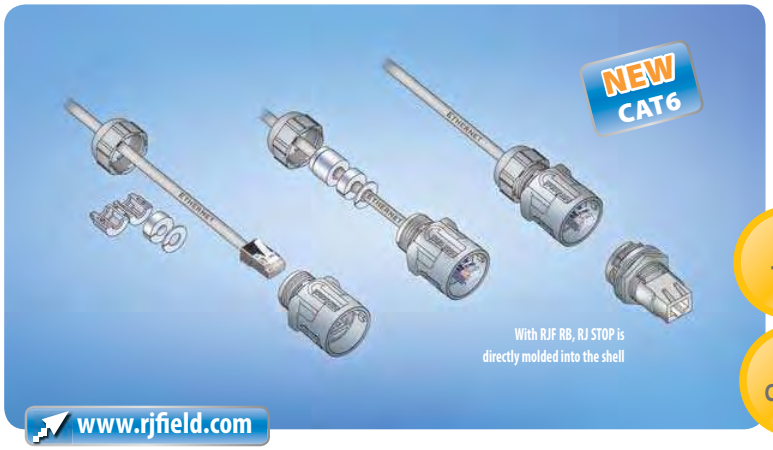
**Example:** Unmanaged RING switch in an aluminum enclosure with olive drab green conductive cadmium plating, 9 ports 10/100 Base T(X) & RJF TV threaded coupling receptacles & caps added to the switch: **RJS ML 9RS1 CAPS**

## Accessories

- Plugs for Ethernet ports
Based on MIL-DTL-38999
No tool required!
RJF TV 6 M G

- Plugs for Power 1 and Power 2
MIL-DTL-38999
Olive drab cadmium plated
Crimp contacts
6 contacts size 22D
TV 06 RW 0935 S

## RJF RB (RJ FAST) CONCEPT




RJFast is the only system on the market capable of converting a standard RJ-45 cable into a category 6 Ethernet connector compatible with industrial environments (including IP67) in a few seconds, without tedious, long and costly crimping.


## NOTES

## NOTES

# RJ FIELD GLOSSARY

**10BASE-T**
10 Mbps Ethernet on twisted-pair (Category 3) cable.

**100BASE-T**
The twisted pair version of 100 Mbps Ethernet. Requires Category 5 cabling.

**1000BASE-T**
A recent LAN standard for implementing 1000 Mbps Ethernet on Category 5 cable. Also called Gigabit Ethernet.

**Auto-MDIX**
A protocol which allows two Ethernet devices to negotiate their use of the Ethernet Transmit (Tx) and Receive (Rx) cable pairs. This allows two Ethernet devices with MDI or MDI-X connectors to connect without using a cross-over cable.

**Baud**
A unit of measurement that denotes the number of bits that can be transmitted per second. For example, if a modem is rated at 9600 baud it is capable of transmitting data at a rate of 9600 bits per second.

**Bandwidth**
The maximum capacity of a network channel. Usually expressed in bits per second (bps). Ethernet channels have bandwidths of 10, 100, and 1000 Mbps (Gigabit).

**bps**
Bits Per Second is the unit used for measuring line speed, the number of information units transmitted per second.

**Broadcast**
A transmission initiated by one station and sent to all stations on the network.

**Byte**
The amount of memory needed to store one character such as a letter or a number. Equal to 8 bits of digital information. The standard measurement unit of a file size.

**Category 5**
A performance classification for twisted pair cables, connectors and systems. Specified to 100 MHz. Suitable for voice and data applications up to 155 Mbps.

**Category 5 e**
Also called Enhanced Category 5. A performance classification for twisted pair cables, connectors and systems. Specified to 100 MHz. Suitable for voice and data applications up to 1000 Mbps.

**Category 6**
A performance classification for twisted pair cables, connectors and systems.Specified up to 250 MHz.

**CSMA/CD**
Carrier Sense Multiple Access/Collision Detect. The Medium Access Control (MAC) protocol used in Ethernet.

**Data rate**
The speed of the data transmission, measured in bps (bits per second) or Mbps.

**Duplex (Full, Half)**
Full duplex is a communications method that allows for the simultaneous transmission and reception of data. In Half Duplex communication, transmissions and receptions can occur in either direction but not at the same time.

**Ethernet**
The most common network protocol in use. A protocol is a set of rules enabling data communications. Ethernet can operate over several different media including fiber optic, coaxial cable and twisted-pair cable.

**IEEE 802.3**
IEEE Working Group for CSMA/CD, the protocol used in Ethernet transmissions.

**IGMP snooping**
The ability of a switch to observe Internet Group Multicast Protocol (IGMP) traffic in order to learn IP Multicast group membership. The purpose is to restrict multicast transmissions to only those ports which have requested them.

**LAN**
Local Area Network. A network of directly-connected machines (located in close proximity), providing high speed communication over physical media such as fiber optics, coaxial cable, or twisted pair wiring.

**MAC Address**
A unique address assigned to a station interface, identifying that station on the network. With Ethernet, this is the unique 48-bit station address. Same as the physical address.

**Megabit (Mb)**
Megabit. One million bits of information, usually used to express a data transfer rate; 1 Megabit/second = 1Mbps.

**Megabyte (MB)**
MegaByte. A unit of data storage size which represents one million characters of information.

**Multicast**
A transmission initiated by one station to many stations of the network.

**Port Mirroring**
Port mirroring allows a switch port to monitor packets from any or all of its ports so that traffic can be analysed.

**Quality of Service (QoS)**
Some switches support QoS (per 802.1p and 802.1Q standards) whereby messages can be assigned levels of priority. QoS is important where time-critical applications can be impaired by data delays.

**RJ45**
8-position modular jacks used on twisted pair links for Ethernet cabling.

**RJ-Field**
A wide range of connectors which allow to reinforce and seal standard RJ45 cable. See www.rjfield.com

**SNMP**
Simple Network Management Protocol. This is THE standard used for switch management programs.

**Spanning Tree Protocol (STP)**
A link management protocol providing path redundancy and preventing network loops by defining a tree to span all switches in a network. It forces redundant data paths into a standby (blocked) state. If a path malfunction occurs, the topology is reconfigured and the link reestablished by activating the standby path.

**TCP/IP**
Transmission Control Protocol/Internet Protocol. A set of protocols, resulting from ARPA efforts, used by the Internet to support services such as remote login (TELNET), file transfer (FTP) and mail (SMTP).

**TELNET**
The Internet standard protocol for remote login (terminal connection) service. TELNET allows a user at one site to interact with a remote timesharing system at another site as if the user's terminal were connected directly to the remote computer.

**VLAN**
Virtual Local Area Network. A LAN that maps stations on a basis other than location such as by department, user type or application. Managing traffic, workstations, and bandwidth can be easier with a VLAN and improve network efficiency.

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