

# RJ Switch

## Harsh Environment Industrial Ethernet Switch

### Rugged & Waterproof Switch

Amphenol offers a small size 5 ports 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

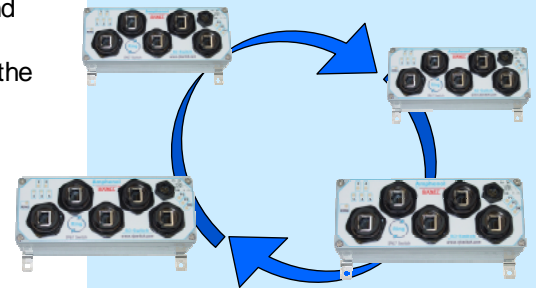
- ✓ Waterproof **IP67** Rating (NEMA 6)
- ✓ **Reduced Installation Costs** with the patented RJStop® system.
  - ✓ Use **any standard RJ45 cordset**
- ✓ Rugged **Enclosure** in Polyester reinforced with 30% glass fiber
- ✓ **Redundant power** inputs with surge/spike protection
- ✓ Ultra reliable **1,000,000 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  
IP67 sealed  
and Rugged  
Switches**

**Amphenol and Sixnet  
combination:**

- ✓ Plug and Play simplicity
- ✓ IP67 waterproof
- ✓ Ring redundancy



**Exceeds MIL-STD-1275**

### 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
Vibrations:	IEC60068-2-6 (3-13.2Hz: +/-1mm / 13.2-100Hz: 0.7g)
Hazardous Location:	UL1604, CSA C22.2/213 (Class 1, Div. 2), EN50021/Zone 2



**DNV tested**  
for marine and  
off-shore use

## 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) 5 us + frame time @ 100 Mbps
MAC addresses supported	2048
Memory bandwidth	3.2 Gbps
Ethernet isolation	1500 Vrms 1 minute
Ring features (for Ring model only)	Link loss recovery time: 30 ms plus 5 ms per hop Maximum switches in ring: 50+ Dual Ring support

## Power Supply

Input power (typical)	ES: 2,4 W ; RS: 2,7 W
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**Exceeds MIL-STD-1275**

## Status Reporting (for Ring model only)

"OK" contact output	Output current: 0.5 A max
"OK" contact State	OFF when a fail occurs ON when power and switching is OK
Modbus status registers	Modbus Ethernet over UDP

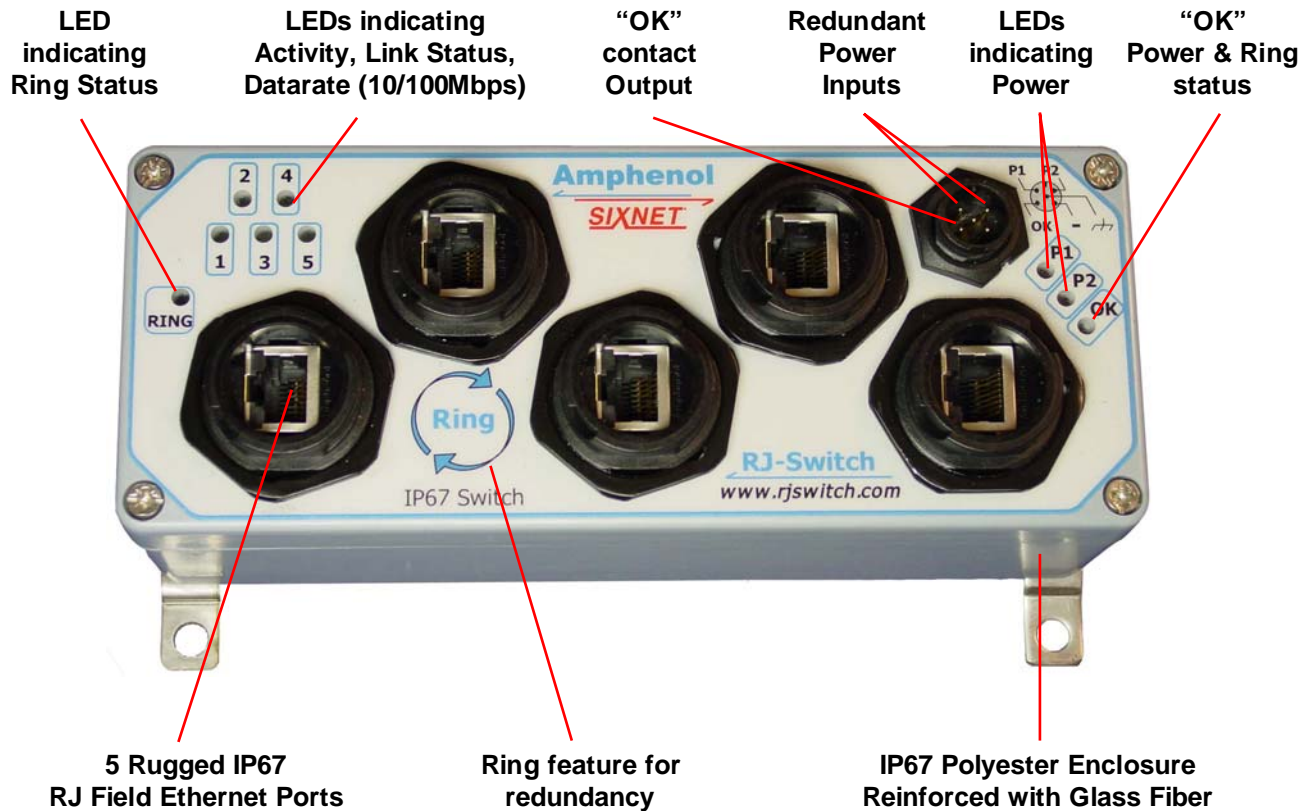
## Environmental

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

<b>Weight</b>	0.54 kg
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Power ratings	Industrial specifications (Standard models)	MIL-STD-1275 Specifications (-EP models)
Input voltage	10-30 VDC	10-50 VDC (Derate 1.8°C / V above 30V)
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) 250 V (50x for 100 µs)

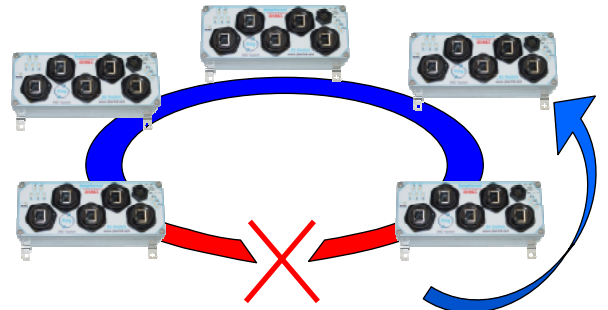
## Description (example for Ring model)



## 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

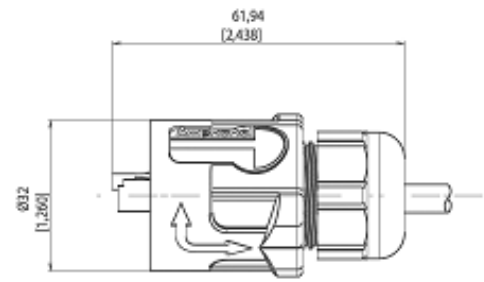
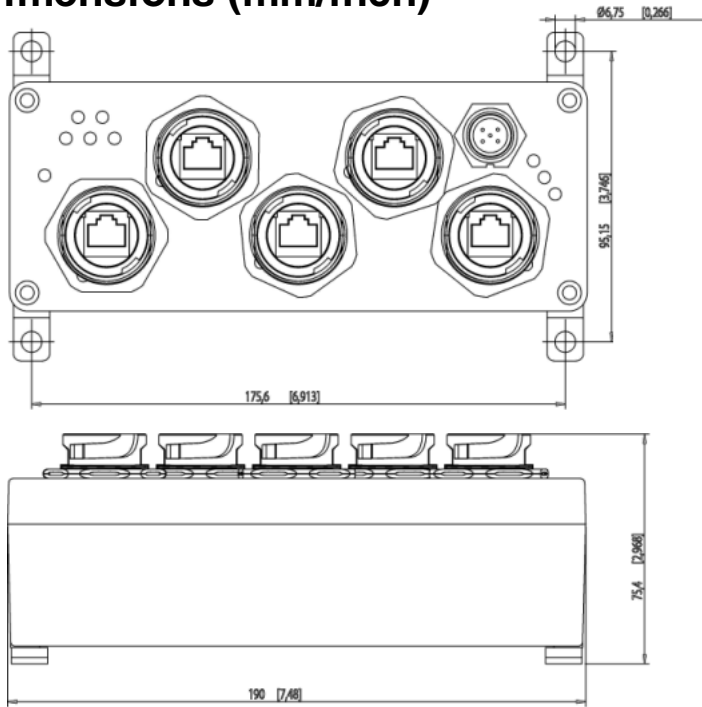


The use of such switches provides a fast network and avoids faults. When a break occurs, the switch instantly transfers data to new path. The link loss recovery is 30 ms plus 5 ms times the number of Ring switches in the ring. For example, 10 ring switches will recover in less than 80 ms. Rings can be 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 the small ring paths.

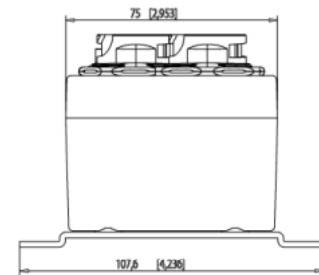
The prioritization of the messages assure delivery of real-time data. Some applications need to force no-real-time data (such as video information) to lower priority and force critical real-time data at higher priority. The network utilization is improved.

This concentrate 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!

## Dimensions (mm/inch)



Accessory: Plugs for RJ45 ports



## Part Numbers

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

However, for other pre-set configuration, please consult us.

## Accessories

**Free** Windows configuration tool

Download it at [www.rjswitch.com](http://www.rjswitch.com)



P/N: RJF PC5 PWR

Plug for power port

Sealing protection: IP67



P/N: RJF RB 6

Plugs for RJ45 ports

Sealing protection: IP67

✓ **Reduced Installation Costs** with the patented RJStop® system.

Use **any standard RJ45 cordset** in a connector to protect it from shocks, dust and fluids.

No costly, hazardous In-Field cabling or grounding !



**Easy Assembly :**

**No Tools Required**

# RJ Switch

## Harsh Environment Industrial Ethernet Switches



### Sealed, Rugged & Waterproof Switch

Today many applications require the use of rugged and sealed connection solutions for extreme environments. Amphenol offers 8 ports 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 manufacturing site, automation or control units deterministic.

### Amphenol Industrial RJ Switch

Amphenol offers a wide range of both managed and unmanaged Ethernet switches specifically designed for the harshest of environments. The switch electronics are sealed within a waterproof IP67 plastic enclosure (for highly corrosive environments) or a waterproof IP67 metallic enclosure (suitable for shocks and extreme EMI-RFI environments). The I/O interfaces are waterproof rugged RJ45 connectors from the RJ FIELD product series:

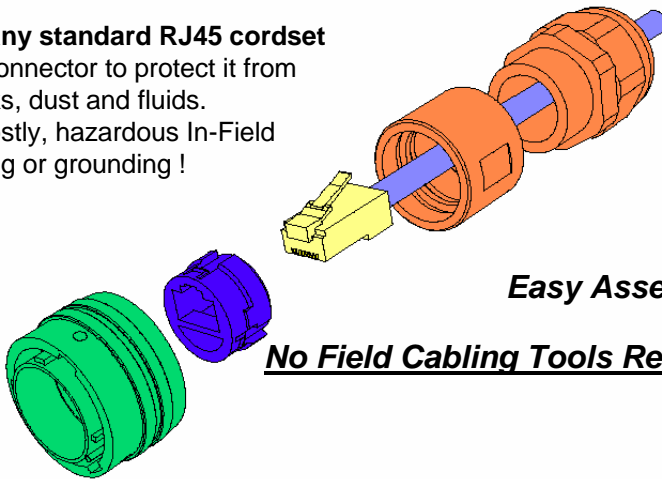
- RJF bayonet coupling, metal shell
- RJF EZ rectangular plastic, quick lever coupling.

**Sealed and Rugged Industrial Ethernet Switches**

### Key Features

✓ **Reduced Installation Costs** with the patented RJStop® system.

Use **any standard RJ45 cordset** in a connector to protect it from shocks, dust and fluids. No costly, hazardous In-Field cabling or grounding !



**Easy Assembly :**

**No Field Cabling Tools Required**

### Industrial Applications

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

- ✓ Rugged **Enclosures** in Polyester or Die-Cast Aluminum
- ✓ Proven **Electronics**
- ✓ Wide **Offering of Capabilities:** Either Unmanaged versions or Managed Systems with **Elite Features** including Vlan, QoS, ...
- ✓ Rugged RJ Field **Connectors**
- ✓ Waterproof **IP67** Rating
- ✓ High **EMI & RFI** Protection

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# Managed & Unmanaged Switch Features

## IEEE Ethernet Standards

		802.3	802.3u	802.3x	802.1D	802.1W	802.1Q	802.1p
RJS xx 308	Unmanaged	✓	✓	✓				
RJS xx 6008	Managed	✓	✓	✓	✓			
RJS xx 508	Managed Elite	✓	✓	✓	✓	✓	✓	✓

xx : Enclosure Type - See Page 4

## Regulatory Approvals

EMI:	EN55022 class A
EMS:	EN61000-4-2 to EN61000-4-5, EN61000-4-8
Shocks:	IEC60068-2-27
Vibrations:	IEC60068-2-6
Free Fall:	IEC60068-2-32
Hazardous Location:	UL/CSA 60079-15, EN50021 Class1, Div. 2 / Zone 2

## Power Supply

Redundant 24 VDC Input	12 – 48 VDC for Unmanaged (308) & Managed Elite (508) versions 9 – 32 VDC for Managed (6008) versions
Current Consumption	350 mA at 24 VDC
Reverse Polarity Protection	
Protection Against Current Overload:	
	1.1A Unmanaged Switch Version (308)
	2.5A Managed Switch Version (6008)
	1.6A Managed Elite Switch Version (508)

## Ethernet Ports

8 Ports 10/100 Base T(X)  
Full / Half Duplex  
Automatic MDI / MDIX connection

## Temperature

Operating Temperature Range:	Standard versions	0°C to +60°C
	Extreme Rugged versions	- 40°C to +70°C
Storage Temperature:	All Versions	- 40°C to +85°C

## Alarm

Relay Watchdog Output (1A at 24 VDC) in case of port disruption or power failures.  
Elite version offers 2 installed relays

## Managed Switch

### Features (6008 Version)

- Fast Redundant Ring Topology (Recovery time < 300 ms)
- Automatic Alarm via Relay Output or E-mail (Configuration defined by System Manager)
- Management via Web Interface or Telnet Interface
- Network Parameter Management
- Port Mirroring
- Ping Command controls Segment Integrity

## Elite Managed Switch

### Added Features (508 Version)

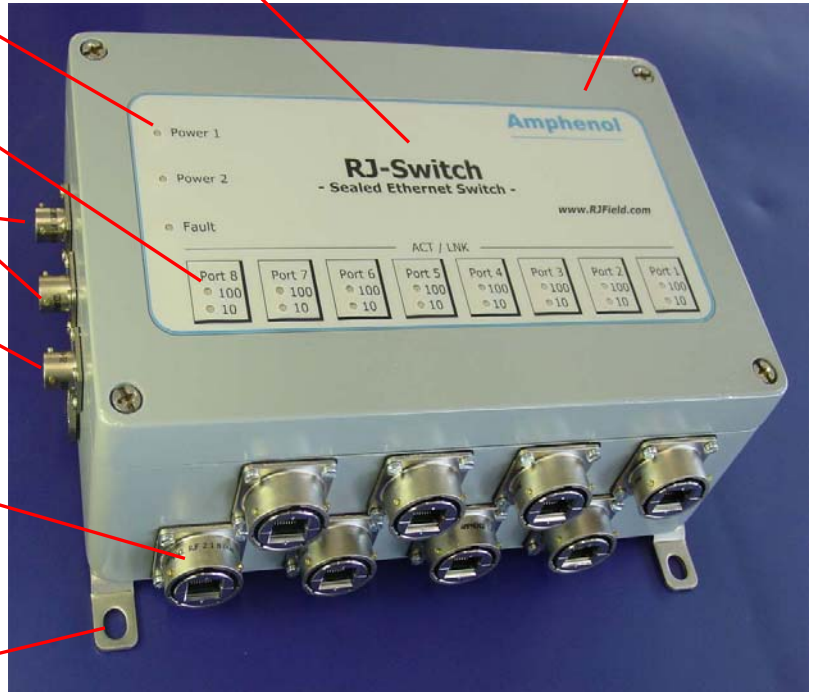
- All Basic Managed Features Included
- IGMP Snooping
- IEEE 802.1Q VLAN
- IEEE 802.1P/1Q Quality of Service
- Port Lock
- 2 Digital Inputs
  - Electrical Isolation from Electronics
  - 8 mA Maximum Current Input
  - Low state: - 30 to + 3 V
  - High state: +13 to + 30 V

# Description

- LEDs indicating Power and Fault
- LEDs indicating Activity, Link Status, Datarate (10/100Mbps)
- Redundant Power Inputs
- Alarm Output
- Optional Caps Available for unused I/O
- 8 Rugged IP67 RJ Field Ethernet Ports
- Optional Caps available for unused ports
- Vertical Mounting Fixture

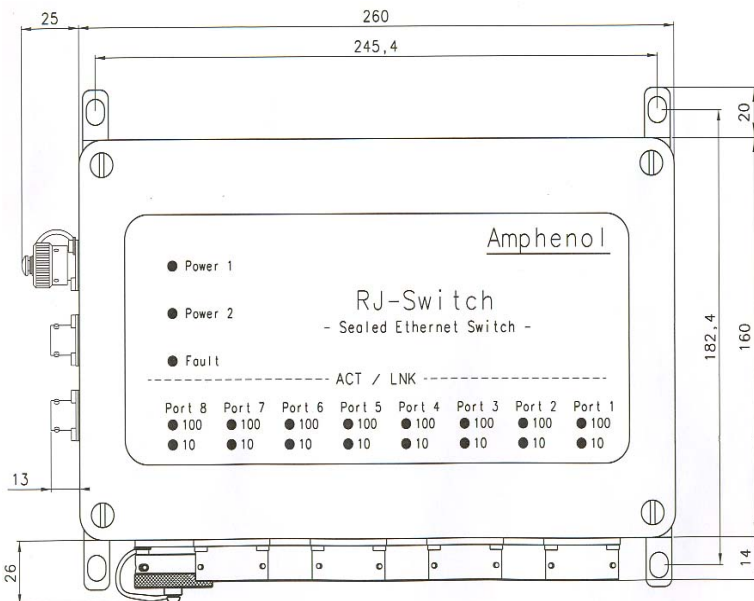
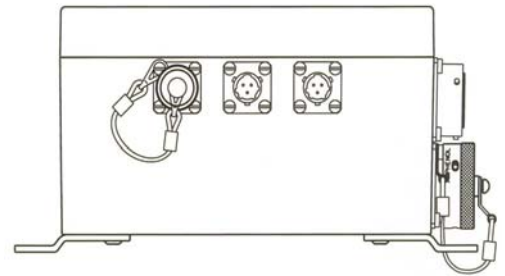
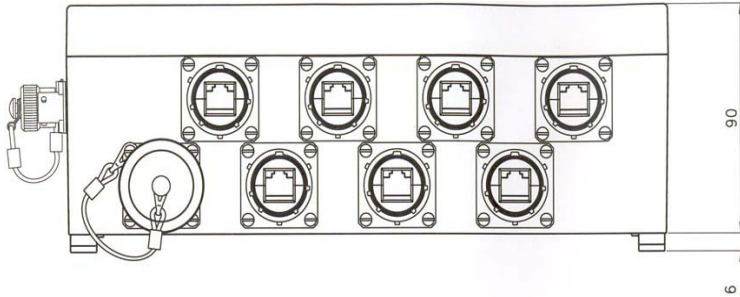
Managed or Non-managed Capability

IP67 Aluminum Enclosure Plastic or Metallic

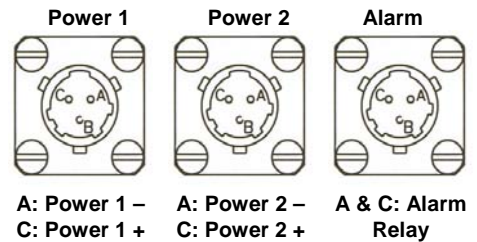


# Dimensions (mm)

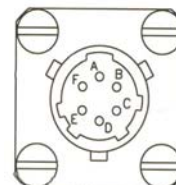
Industrial Aluminum AL Enclosure



## Pin-Out for Aluminum AL Versions



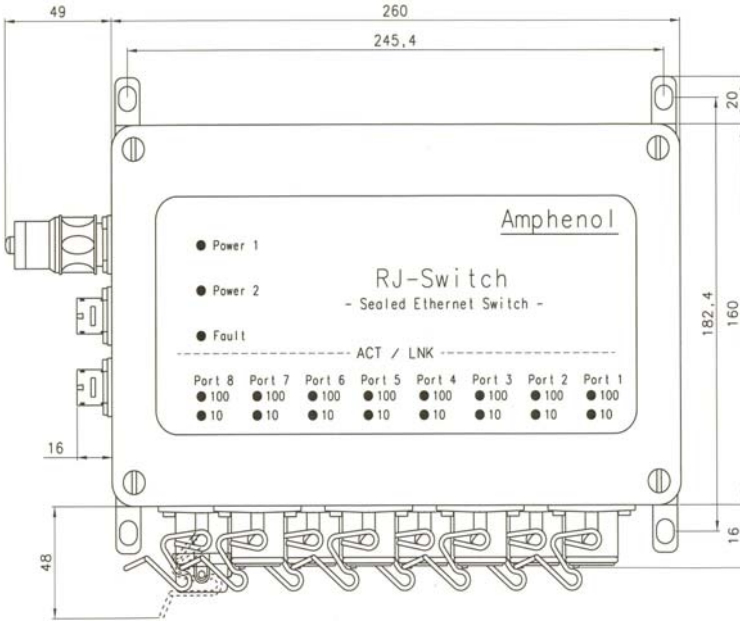
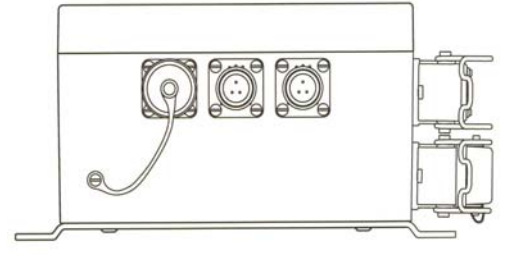
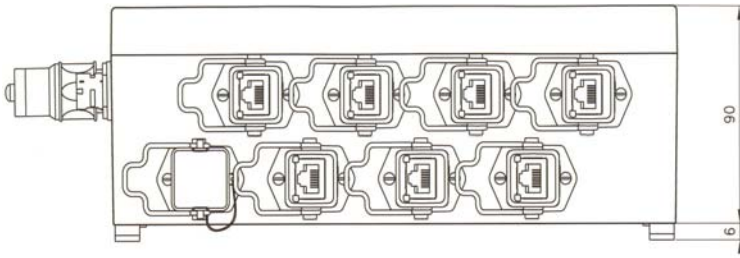
## Additional Connector for RJS AL 508 Elite version



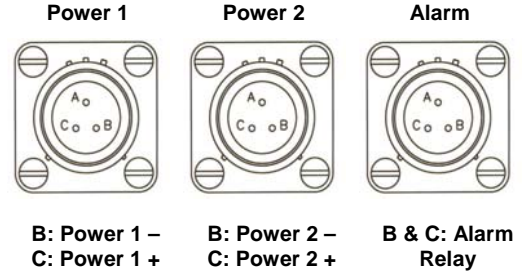
A & B: Second Alarm Relay

C to F: Digital Input  
 C: DI 1 -  
 D: DI 1 +  
 E: DI 2 -  
 F: DI 2 +

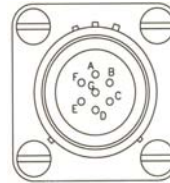
## Dimensions for Industrial PC Switch (Polyester Enclosure)



### Pin-out for Polyester PC Versions



### Additional Connector for RJS PC 508 Elite Version



- A & B: Second Alarm Relay
- C to F: Digital Input
- D: DI 1 -
- E: DI 1 +
- F: DI 2 -

## Part Numbers

Series	RJS	PC	308	-	-
RJ-Switch					
Type of Enclosure	PC : Grey plastic RAL 7000 with EZ Field Receptacles AL : Grey aluminium RAL 7001 paint with RJ Field receptacles				
Type of Electronics	308 : Unmanaged 8 ports 10/100 Base T(X) 6008 : Managed 8 ports 10/100 Base T(X) 508 : Managed 8 ports 10/100 Base T(X) with Elite Features				
Type of Operating Temperature	Blank : 0°C to 60°C T : - 40°C to 70°C				
Accessories: Caps for receptacles - fixed with string directly to the receptacle	Blank : No caps included				
Accessories: Caps for receptacles - fixed with string directly to the receptacle	Caps : Attached caps for both power and data included				

**Example:** Unmanaged, aluminum enclosure with 8 Ethernet ports (10/100BaseT(X)), RJ Field bayonet coupling receptacles, extreme operating temperature and caps added to the switch: **RJS AL 308 T CAPS**

## Accessories

### Plugs for PC plastic Enclosures

Plugs for Power 1 & 2 and Alarm ports  
**RJS PC Power Plug**

Plugs for I/O, for RJS-PC-508 only  
**RJS PC I/O Plug**

Plugs for Ethernet ports  
**RJF EZ 6**

*No tool required !!!*



### Plugs for AL Aluminum Enclosures

Plugs for Power 1 & 2 and Alarm ports  
**RJS AL Power Plug**

Plugs for I/O, for RJS-AL-508 only  
**RJS AL I/O Plug**

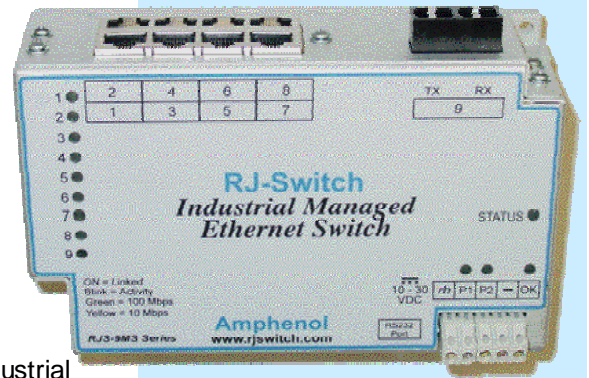
Plugs for Ethernet ports  
**RJF 6 N**

*No tool required !!!*



# RJ Switch

## Industrial Ethernet Switches



### Industrial Rugged Ethernet Switch

Amphenol offers a full range of Rugged Ethernet switches for industrial use. Those 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 to 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 (multimode or singlemode)
- ✓ 5 or 9 ports models

### 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

Exceeds MIL-STD-1275

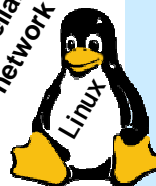
VLAN  
for traffic segregation

Industrial  
Ethernet Switches

### Industrial Applications

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

Enhance the reliability  
of your network!



# 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 Data rate 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

**Exceeds MIL-STD-1275**

## 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)

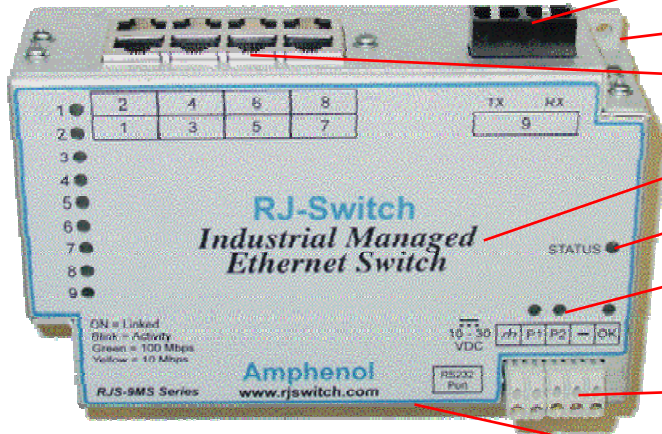
“OK” contact output	10 – 30 VDC (or 10 - 50 VDC depends on models) Maximum current 0.5 A
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## Power Supply

Input Power	4 W - typical, depends on models (all ports active at 100 Mbps)
Redundant Inputs	10 - 50 VDC (models RJS-5RS; RJS-9RS) 10 - 30 VDC (all other models)

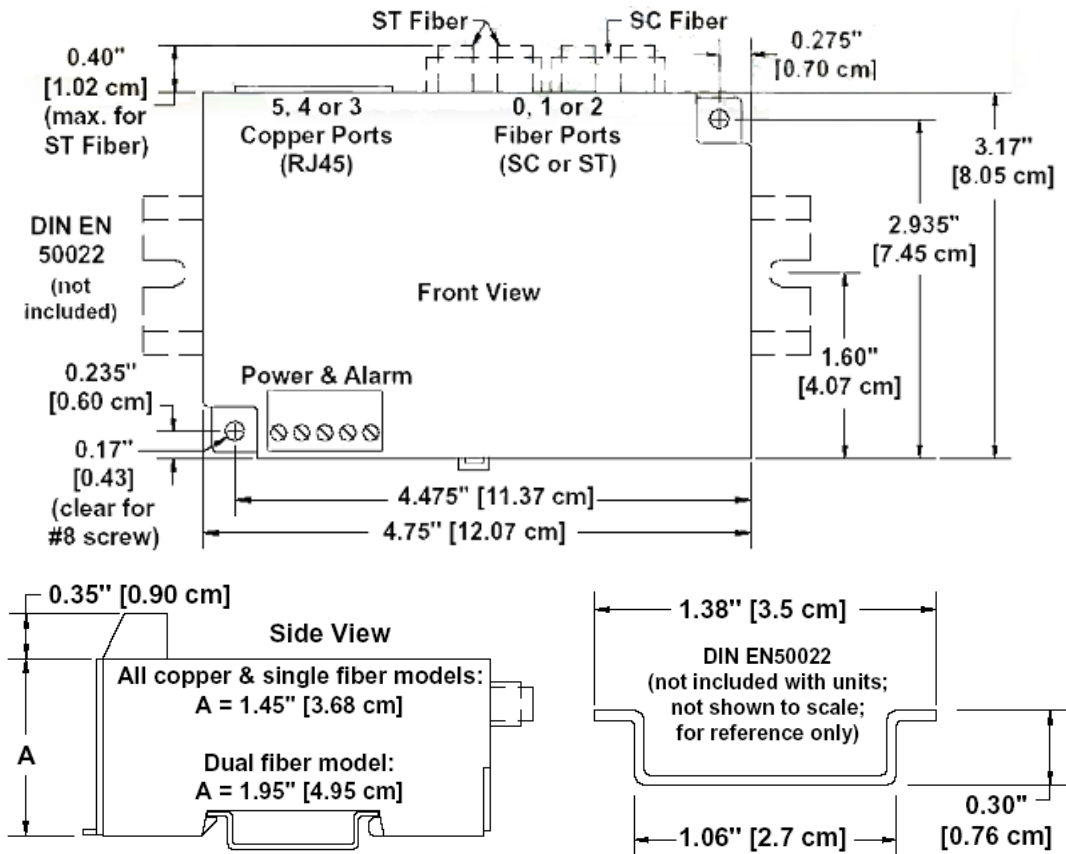
Power protection rating	Industrial	MIL-STD-1275 Available on : RJS-5RS RJS-9RS RJS-9MS -4 & -5
Surge protection		100 V for 1s
Transient protection	15 KW peaks	15 KW peaks
Spike protection	5 KW (10 times for 10 µs)	5 KW (10 times for 10 µs) 250 V (50 times for 100 µs)

# Description



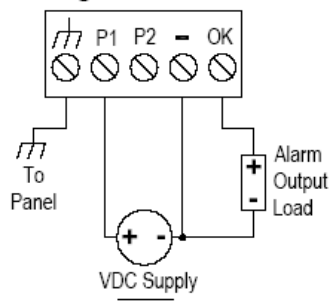
- SC or ST fiber connector (1, 2 or none)
- DIN-Rail or Panel Mounting Fixture
- 5 or 9 connectors (RJ45, SC or ST fiber)
- Unmanaged, Ring or Managed Capability
- Indicators for Power, Alarm Output Status
- Indicators for Link Status and Datarate
  - 10 Mbps
  - 100 Mbps
- Terminal bloc for Redundant Power Inputs + Alarm Output
- IP30 Iridized Aluminum Enclosure

## Dimensions (example for 5 Port Ring Models)

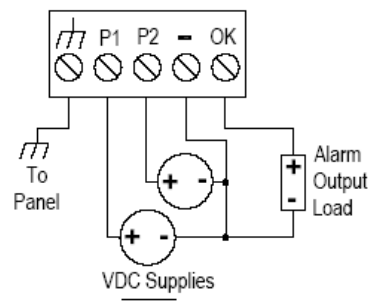


## Power and alarm wiring

Single DC Power



Redundant DC Power



# Part Numbers

Series	RJS	5ES	1	-	-
<b>RJ-Switch</b>					
<b>Type of Electronics</b>					
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					
<b>RJ45 or fiber ports</b>					
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)					
<b>Style of Fiber connectors</b>					
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					
<b>Pre-set for Ring models only</b>					
E0 : Pre-set for 0 rings (special order)					
E1 : Pre-set for 1 ring ( <b>standard order</b> ), 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 2 multimode ST fiber port, pre-set for 1 ring

**RJS-5RS-4-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](http://www.rjfield.com)).

For any other product such as RJ45/fiber optics converter, please do not hesitate to consult us.



**New !!!**

### 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

Consult our dedicated website for more information:

[www.rjswitch.com](http://www.rjswitch.com)