Amphenol
RJ-Switch

IP67/68 rugged Ethernet Portable Switch
RES-SCE-AC-4US
& RES-SCE-AC-8US
- User Manual -

Contents

This manual applies to the following products:

- **RES SCE AC 4US**
  Rugged IP67/68 Unmanaged Miniature Ethernet Switch, 4x 10/100 Mbps
- **RES SCE AC 8US**
  Rugged IP67/68 Unmanaged Miniature Ethernet Switch, 8x 10/100 Mbps

Revision	Date	Modifications
1.0	January 11, 2013	Initial document
1.1	April, 10, 2013	Updates drawings and pictures
1.2	January, 6, 2015	Added 4 ports model

Amphenol Statement of Limited Warranty:

Products shall benefit from a legal guarantee of one year following the date of delivery in accordance with the terms and conditions indicated hereunder.

In all instances, Seller's guarantee shall be limited to free replacement, in identical quantities, of the Product acknowledged as defective by Seller with the exclusion of any compensation or damages and interests other than agreed in a specific contract. The guarantee is subject that Client notifies Seller of defect immediately following discovery thereof by any written means during the legal guarantee period. Defective Products shall be returned to Seller in accordance with the same procedure as that applicable to Products which do not comply with orders as indicated under article 9 hereinabove.

The following shall be excluded from the guarantees provided by Seller:
- Product defects resulting from inadequate maintenance, or supervision and, more widely, any use which does not comply with written instructions of Seller and indicated in technical notices and/or product specifications, or default in respecting applicable standards or professional customs and uses;
- Product defects resulting from an external cause or any modification or intervention by Client or third party without the prior written consent of Seller;
- The guarantee shall not cover normal wear and tear of Products;
- Product defects resulting generally in whole or in part from damage or accidents attributable to Client or a third party;
- More specifically whether the cover of the switch enclosure have been opened.
- Whether the components have been damaged in transit or have not been stored by the Customer in conditions in accordance with the specification.
- The guarantee shall not cover any defects resulting from instructions given by Client to Seller ;
- Whether the components have been subjected to abuse (mechanical, electrical or thermal) on installation or on use and, in the case of slices/dice, have been subjected to handing or such operations as the welding of connecting wires mounting by soldering or sticking.
- Whether the unfitness or defectiveness of the components has resulted from exceeding the maximum values for usage (temperature limit, maximum voltage, etc.) as defined by the Vendor, or from incorrect choice of application.
- Damages resulting from force majeure, such as this is defined under article 11 of Amphenol Socapex Sales Conditions hereunder, or resulting from any unpredictable event or natural disaster.
- Furthermore, the guarantee shall not cover consequential liability, direct or indirect which may result from the failure of a component supplied by the Vendor.

Client shall retain sole and exclusive liability for the use of Products provided by Seller and the suitability thereof for use. Client should ensure that its premises and storage conditions are adequate for the due and proper storage of Products and ensure all safety guarantees as stipulated by regulations in force. No guarantee shall be provided by Seller in this regard.

CE Declaration of conformity:

This equipment complies with the requirements relating to electromagnetic compatibility and security.
EN55022 (Emissions);
EN55024 (EN50082-1 ou -2) et/ou EN61326-1 (Immunity);
EN61010-1 ou EN60950 (Electrical safety);

This meets the essential protection requirements of the European Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Note: All information in this document is subject to change without notice.

Section 1 | General Information

Overview

This manual will help you install and maintain the Amphenol Rugged Ethernet Portable switches. These products are extremely easy to install and operate.

Military applications can now take full advantage of 100Mbps Fast Ethernet performance. The installation guide describes how to install and use the hardened compact Ethernet RES-SCE-AC-4US & RES-SCE-AC-8US Military Rugged Switch. Capable of operating at extreme temperature of -35°C to +75°C and meet the toughest industrial and military environments such as MIL-STD-810F, MIL-STD-461E up to the highest levels. The mentioned ability turns the RES-SCE-AC-4US & RES-SCE-AC-8US to the optimal solutions switch of choice for harsh environments constrained by space.

Developed for military and harsh mobile applications, the switch features mechanical packaging enhancements designed for MIL-STD-810F airborne and ground environmental compliance and high reliability. The unit has been especially hardened to improve ingress, impact, and shock/vibration protection, as well as eliminate all moving parts through passive cooling, and interface through sealed SCE2 connectors.

Leveraging best-in-class switching technology, the switch serves as a robust solution for providing local area network (LAN) connectivity to IP-enabled computing and net-centric devices. Compact in size, the RES-SCE-AC-4US & RES-SCE-AC-8US are particularly useful for expanding port density to tactical IP routers in space-constrained airborne and ground vehicle environments.

RES-SCE-AC-4US & RES-SCE-AC-8US are specifically designed for Data Acquisition & Transmission, Battlefield Communication C4ISR, Rugged Networks, Mobile Communications, Combat vehicles and Avionic & Shipboard Systems.

Performance Specifications

These general specifications apply to these switches. Refer to Section 6 for complete technical specifications.

Ports	RES-SCE-AC-4US : 4x 10/100BaseT(x) RES-SCE-AC-8US : 8x 10/100BaseT(x)
Voltage	5Vdc Nominal Power Consumption: 2W Typical
MIL standards	MILSTD-461E, MILSTD-810F
Electromagnetic	MIL-STD-461E Electromagnetic compatibility RE-02, RS-03
Operating Temp.	-35ºC to +75ºC (-31ºF to +167ºF) – Cold Start-Up
Waterproof	IP67

Section 2 | Hardware

Overview

The switches can be mounted directly to a flat surface or to a wall. Refer to the mechanical drawing below. Its high protected enclosure makes it able to withstand immersion (IP67/68 rating).

The Ethernet connections come out from rugged SCE2 connectors.

Front Panel Display

The following describes the front panel, and LED indicators of the RES-SCE-AC-4US & RES-SCE-AC-8US.

LED Indicators

Note: Due to Tactical requirements, LED's will ONLY operate while pressing and holding the marked "Push-Button"!

The Single LED indicator on the front panel positioned above the "Push-Button" shows the operative status of the switch.

Once the LED is turned on, the switch is powered and ready-for-use.
This LED will be on solid yellow/green when proper power (5VDC) has been applied to the unit.
Above the single "power" LED you will find 8 additional LEDS.
  • Each port has a single LEDs indicator that indicates Link / Activity (Off – there is no link, Steady Green – There is a device connected, Flashing Green – data is being transmitted)

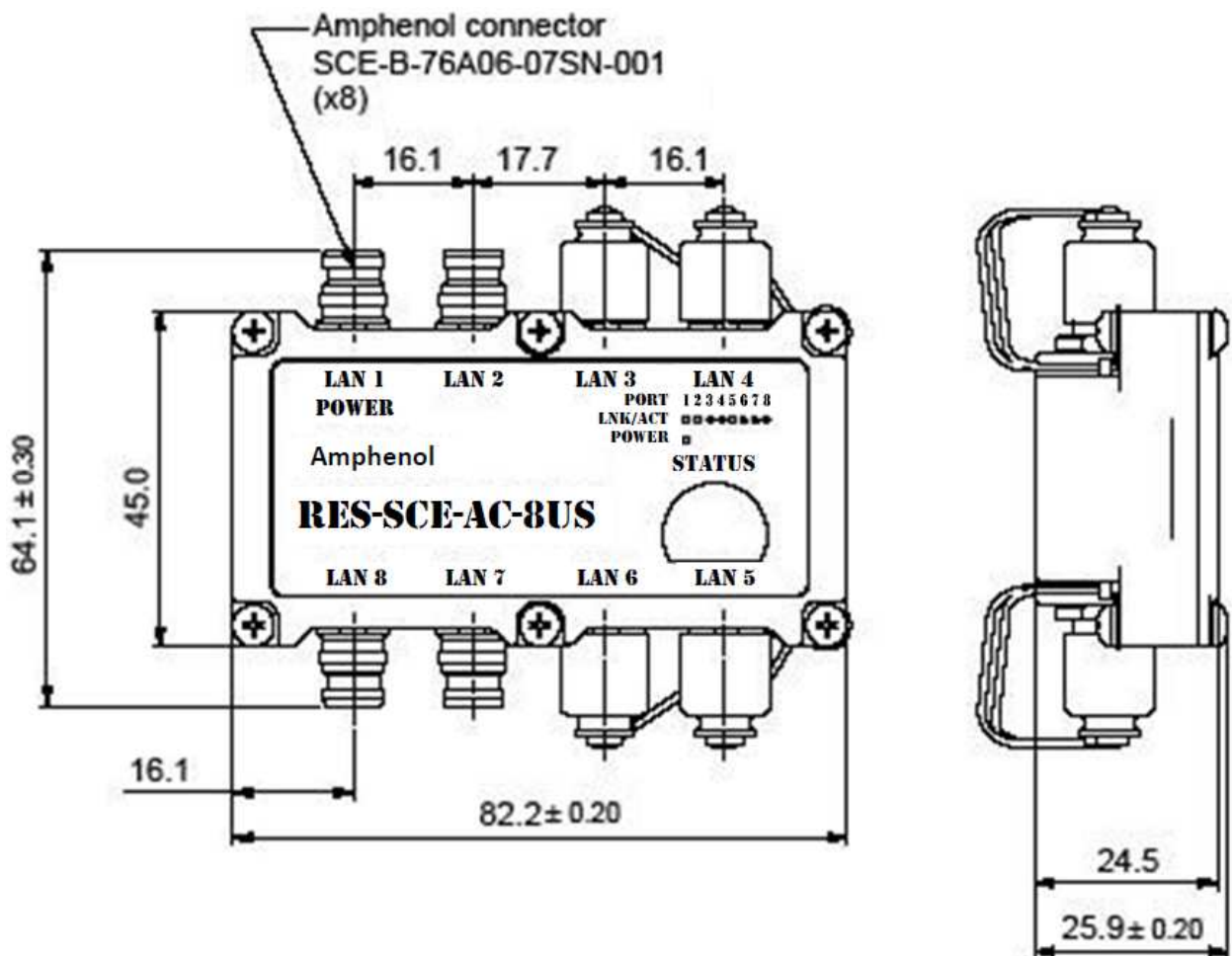# Section 3 | Installation

Selecting a Site

As with any electronic device, you should place the switch where it will not be subject to extreme temperatures, humidity, or electromagnetic interference that exceeds the profile of RES-SCE-AC-4US & RES-SCE-AC-8US. Specifically, the site you select should meet the following requirements:
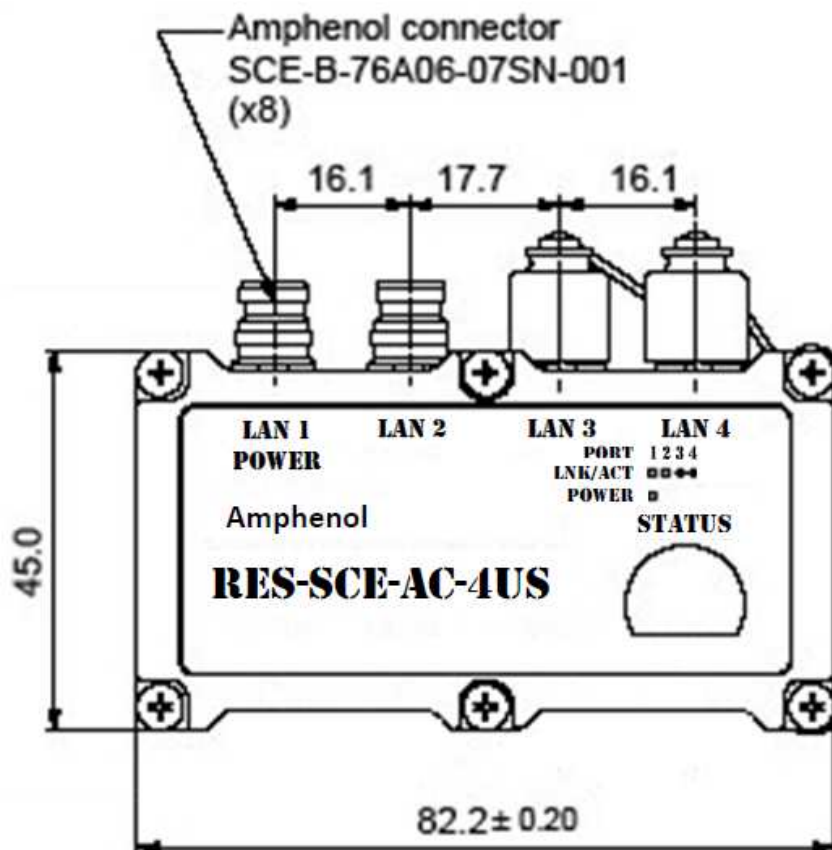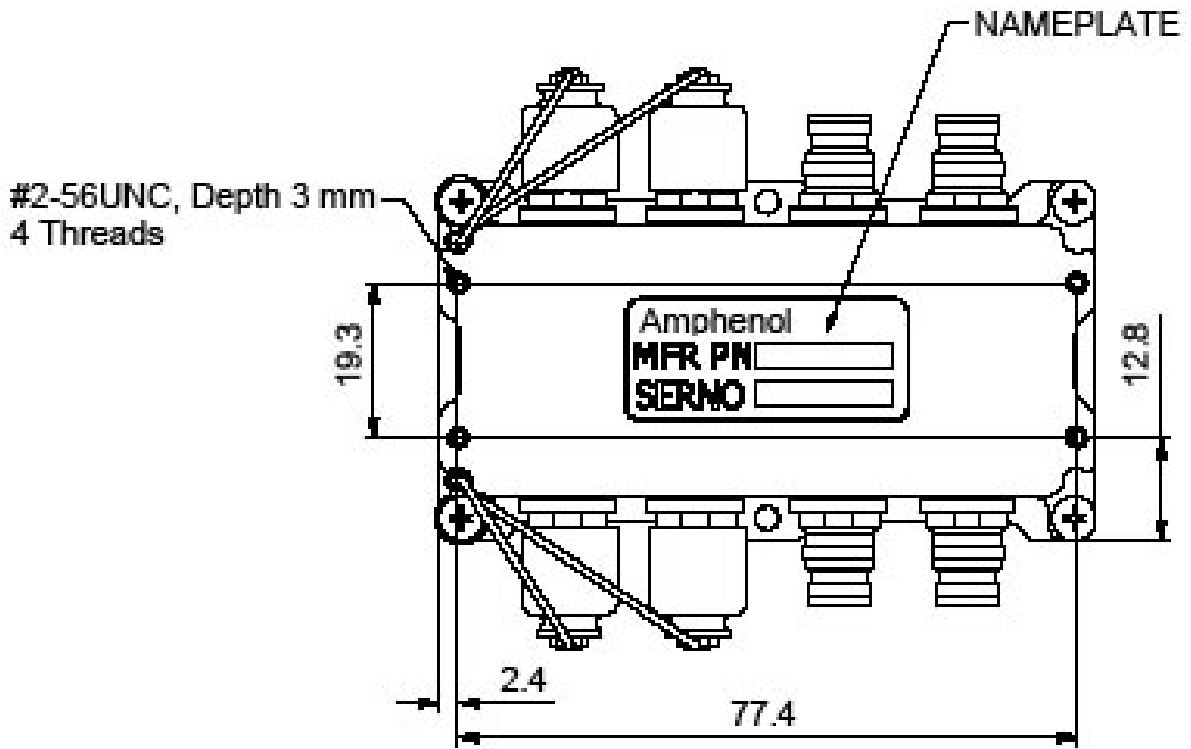
- The ambient temperature should be between -35 to 75 degrees Celsius.
- The relative humidity is recommended to be less than 95% percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards for MIL-STD-461E.

CAPS for unused connectors

The switches are pre-equipped with caps on all ports, including power and Ethernet.

➔ *Make sure all connectors are protected with cap or sealed plug to ensure sealing and prevent from deterioration of the contacts.*

NAMEPLATE

#2-56UNC, Depth 3 mm
4 Threads

Amphenol
MFR PN
SERNO

19.3

12.8

2.4

77.4

Amphenol connector
SCE-B-76A06-07SN-001
(x8)

16.1   17.7   16.1

LAN 1   LAN 2   LAN 3   LAN 4
POWER   PORT   1 2 3 4
                               LNK/ACT □□◆◆
                               POWER   □
Amphenol

RES-SCE-AC-4US   STATUS

45.0

82.2± 0.20

| **Section 4** | # Wiring |

Wiring

Overview

These switches provide connections to Ethernet devices in harsh environment. Typically a port is used to connect to another Ethernet switch that is connected to the main Ethernet backbone. The other Ethernet ports are then connected to Ethernet devices such as communication systems, Ethernet I/O, or industrial computers. Electrical isolation is provided on the Ethernet ports for increased reliability.
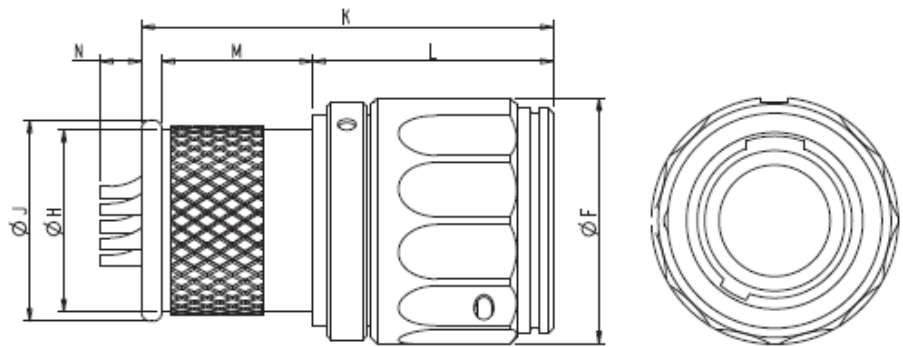
Power wiring

Power plug

This switch is powered by using port number 1.
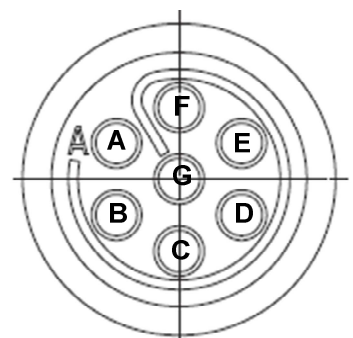
We suggest using SCE2-B-L1K06-07PN.

Note : pay attention to use the cable's shield for the ground continuity during the wiring process.

Shell Size	ØF	ØH	ØJ	K	L	M	N
Size 06	.540 (13.75)	.399 (10.14)	.440 (11.18)	.902 (22.91)	.527 (13.39)	.330 (8.38)	.090 (2.29)

Power plug wiring

Pin	Signal	Description
A	LAN_RX+	10/100 Base T Receive Data Positive
B	LAN_RX-	10/100 Base T Receive Data Negative
C	LAN_TX+	10/100 Base T Transmit Data Positive
D	VCC	5V+10% 0.5Amp. max
E	GND	Digital Ground
F	LAN_TX-	10/100 Base T Transmit Data Negative
G	Reserved	

rear view of the plug

Ethernet wiring

Ethernet plug part number

Use data-quality (not voice-quality) twisted pair cable rated category 5 (or better) with SCE2 connector.

We suggest using SCE2-B-L1K06-07PN.

Note : pay attention to use the cable's shield for the ground continuity during the wiring process.

Ethernet plug wiring

Pin	Signal	Description
A	LAN_RX+	10/100 Base T Receive Data Positive
B	LAN_RX-	10/100 Base T Receive Data Negative
C	LAN_TX+	10/100 Base T Transmit Data Positive
D	Reserved	
E	Reserved	
F	LAN_TX-	10/100 Base T Transmit Data Negative
G	Reserved	
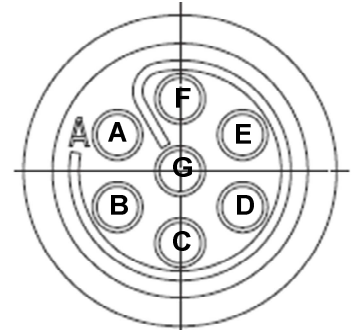
rear view of the plug


RJ45 Wiring Guidelines

Use data-quality (not voice-quality) twisted pair cable rated category 5e (or better) with standard RJ45 connectors.

Please note that these cables are available as straight-thru or cross-over configurations. Either type can be used because these switches support auto-mdi/mdix-crossover. For reference, the pin-outs of the two cable types are listed below.

Ethernet Cable Pin-outs

Straight-thru Cable Wiring		Cross-over Cable Wiring	
Pin 1	Pin 1	Pin 1	Pin 3
Pin 2	Pin 2	Pin 2	Pin 6
Pin 3	Pin 3	Pin 3	Pin 1
Pin 6	Pin 6	Pin 6	Pin 2

Ethernet Connector Pin Positions
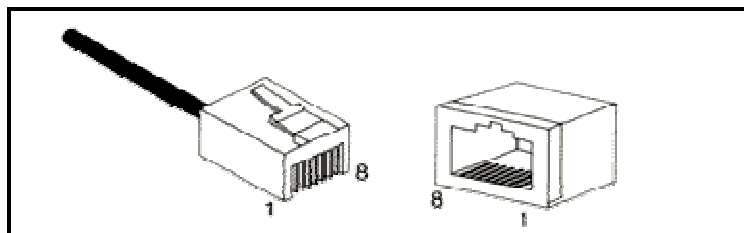
Ethernet Connector Pin-outs

Pin #	MDI-X Port	MDI Port (typical for uplink)	Auto-MDI/MDI-X	Ethernet Device Port
1	TX+	RX+	TX/RX+	RX+
2	TX-	RX-	TX/RX-	RX-
3	RX+	TX+	RX/TX+	TX+
6	RX-	TX-	RX/TX-	TX-

Cable Distance

The maximum cable length for 10/100BaseT(x) is typically 100 meters (328 ft.).

Note: Hubs and switches are different devices. Hubs simply broadcast all messages out all ports. Switches intelligently route messages only out the appropriate port.

Section 5 | Features Overview

Here's a brief explanation of some of the features found in these switches documented by this manual.

ETHERNET PORTS:

- RES-SCE-AC-4US : 4 x switched 10/100 (Fast Ethernet) ports
- RES-SCE-AC-8US : 8 x switched 10/100 (Fast Ethernet) ports

NETWORKING:

- Full wire-speed forwarding rate
- Store-and-forward mechanism
- Auto MDI-II, MDI-X
- Auto-Negotiation Protocol
- Address Look-Up
- Migration
- Learning

CONNECTORS:

- LAN & Power Connector Type: SCE2-B-76A06-07SN-001

CHASSIS:

- Low profile rugged aluminum extrusion
- Conductively cooled w/custom internal heat-sinks
- Ingress protection against sand, dust and moisture
- Anodize Coating, MIL-A-8625, Type II, Class 2

STANDARDS:

- MILSTD-461E, MILSTD-810F GM, IP67

VOLTAGE OPERATION:

- Standard USB - 5VDC @ 0.5A

PERFORMANCE:

- 128K Byte of SRAM for Frame Buffering
- 2.0Gbps High-Performance Memory Bandwidth
- Wire-Speed Reception and Transmission
- Integrated Address Look-Up Engine
- Automatic Address Learning

STANDARDS COMPLIANCE:

- IEEE 802.3 10 Mbps 10BASE-T (Ethernet)
- IEEE 802.3u 100BASE-TX 100 Mbps (Fast Ethernet)
- IEEE 802.3x Flow Control

POWER:

- Voltage Input: 5Vdc, 0.5A, Can be powered by USB
- Power Consumption: 2.0W Typical
- Ground: Grounding screw provided for connection to system chassis ground - Optional

ELECTROMAGNETIC:

- MIL-STD-461E Electromagnetic compatibility
- CE-102, CS-114, CS-115, CS-116, RE-102, RS-103

SHOCK/VIBRATION/HUMIDITY:

- MIL-STD-810F, Random vibration (514.5I), Bench Handling (516.6VI), High Temp.(501.5I,II), Low Temp.(502.5I), Humidity (507.5II), Air Pressure (500.5I,II), Blowing Rain (506.5I), Immersion (512.5I), Salt Atmosphere (509.5I), Blowing Dust (510.5I), Loose Cargo Vibration (514.6II), Wind Analysis
- IP67

PHYSICAL:

- Dimensions: 82.2mm (L) x64.1(W) x 26.0(H), including connectors & hardware (Not Including Caps)
- Weight: 140g including dust caps

INSTALLATION:

- Set of Four mounting screws on bottom for mounting to any flat surface.

COOLING:

- No Moving Parts. Passive Cooling

OPERATING TEMP:

- -35ºC to +75ºC (-31ºF to +167ºF) – Cold Start-Up

STORAGE TEMP:

- -45ºC to +85ºC (-49ºF to +185ºF)

Service Information

We sincerely hope that you never experience a problem with any **Amphenol** product. If you do need service, call **Amphenol** at +33(0) 450 89 28 00 and ask for Applications Engineering. A trained specialist will help you to quickly determine the source of the problem. Many problems are easily resolved with a single phone call. If it is necessary to return a unit to us, an RMA (Return Material Authorization) number will be given to you.

Amphenol tracks the flow of returned material with our RMA system to ensure speedy service. You must include this RMA number on the outside of the box so that your return can be processed immediately.

The applications engineer you are speaking with will fill out an RMA request for you. If the unit has a serial number, we will not need detailed financial information. Otherwise, be sure to have your original purchase order number and date purchased available.

We suggest that you give us a repair purchase order number in case the repair is not covered under our warranty. You will not be billed if the repair is covered under warranty.

Please supply us with as many details about the problem as you can. The information you supply will be written on the RMA form and supplied to the repair department before your unit arrives. This helps us to provide you with the best service, in the fastest manner. Normally, repairs are completed in two days. Sometimes difficult problems take a little longer to solve.

We apologize for any inconvenience that the need for repair may cause you. We hope that our rapid service meets your needs. If you have any suggestions to help us improve our service, please give us a call. We appreciate your ideas and will respond to them.

For Your Convenience:
Please fill in the following and keep this manual with your **Amphenol** system for future reference:

P.O. #:_____   Date Purchased: _____

Purchased From:_____

**Product
Support**

To obtain support for Amphenol products:

Visit our website. http://www.rjswitch.com

Phone: +33(0) 450 89 28 00

Fax: +33(0) 450 96 29 75

E-mail: mailto:contact@rjswitch.com

Mailing Address: Amphenol, Promenade de l'Arve, B.P.29, 74311 Thyez Cedex, France

**For more
information**

You will find all useful information on the RJ-Switch series on the dedicated website:

http://www.rjswitch.com