



IP65/68 Ethernet Managed Switch RJSML-8ELMG - Hardware User Manual -

Contents

Section 1	General Information	Page 3
Section 2	Installation	Page 4
Section 3	Power Wiring	Page 5
Section 4	Ethernet Wiring	Page 8
Section 5	Technical Specifications	Page 10
Section 6	Service Information	Page 11

This manual applies to the following products:

- **RJSXX-8ELMG-(704)-(PSM)-(CAPS)**
Managed IP68 Ethernet switch with 8 gigabit ports

Note: **XX = ML:** Olive drab cadmium plating on both receptacles and enclosure
XX = BKN: Black painted enclosure with nickel plated receptacles
XX = ML1019: Sand painted enclosure with nickel plated receptacles
XX = BKN9010: White painted enclosure with nickel plated receptacles
704 = option: filter for power supply allowing better lightening protection
PSM = option: 230VAC power supply
CAPS = option: the switch comes with caps fixed onto each receptacle

Revision	Date	Modifications
1	October 2023	Initial document
2	August 2026	• Added OK power control feature • Updated general conditions of sales

AMPHENOL SOCAPEX GENRAL CONDITIONS OF SALE

(Effective as at 18th/03/2025)

(EXTRACT from the Conditions of Sale available on our website :
<https://www.amphenol-socapex.com/sites/default/files/media/document/2025-03/CGV%20Amphenol%20Socapex.pdf>)

ARTICLE 11: GUARANTEE - LIABILITY

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

11.2. 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 and 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 10 hereinabove.

11.3 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;
- the guarantee shall not cover any defects resulting from instructions given by Client to Seller ;
- damages resulting from force majeure, such as this is defined under article 12 hereunder, or resulting from any unpredictable event or natural disaster.

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.

In all instances and under no circumstances whatsoever shall Seller be liable for any damage, whether direct or indirect, or predictable or not, caused by any defect of the Product sold. In this regard, no compensation may be claimed.

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 Managed switches**. These products are easy to install and operate.

Military applications can take advantage of 1000Mbps Ethernet performance.

The installation guide describes how to install and use the hardened Ethernet switch RJSML-8ELMG.

For managing the Ethernet switch, use the extract of User Manual from Advantech EKI-5000 series.

Operation

The 8ELMG switches support up to 1000 Mbps (1000BaseTx) on their RJ45 ports.

Each of these ports will independently auto-sense the speed, allowing you to interface to regular or fast Ethernet devices.

Performance Specifications

These general specifications apply to these switches. Refer to Section 5 for complete technical specifications.

Ports	10/100/1000BaseT(x) (Shielded RJ45)
Required Voltage	Models 8ELMG: 12 - 48 VDC Models 8ELMG-704: 12 – 33 VDC Models 8ELMG-PSM: single power input AC AC voltage: 85-264 VAC / 47-63 Hz
Ethernet Standards	IEEE 802.3 (10BaseT), 802.3u (100BaseTX), 802.3x (Full Duplex)
Ethernet Protocols	All standard IEEE 802.3 protocols supported
Speed Per Port	RJ45: 10/100/1000 Mbps
Ethernet Isolation	1500 Volts RMS (for 1 minute)
Operating Temp.	-40 to 75 °C
Waterproof	IP68 (2 m water for 24 hours)
Shocks	MIL-STD-810F (40g)

Standards and Safety



The Amphenol Military Ethernet Switch meets the following standards:

EMI Emissions - CE, FCC Class A

EMC Immunity- EN61000-4-2/4-3/4-4/4-5/4-6/4-8

Install the Amphenol Military Ethernet Switch in accordance with local and national electrical codes.

Lightning Danger: Do not work on equipment during periods of lightning activity.

Do not connect a telephone line into one of the Ethernet RJ45 connectors.

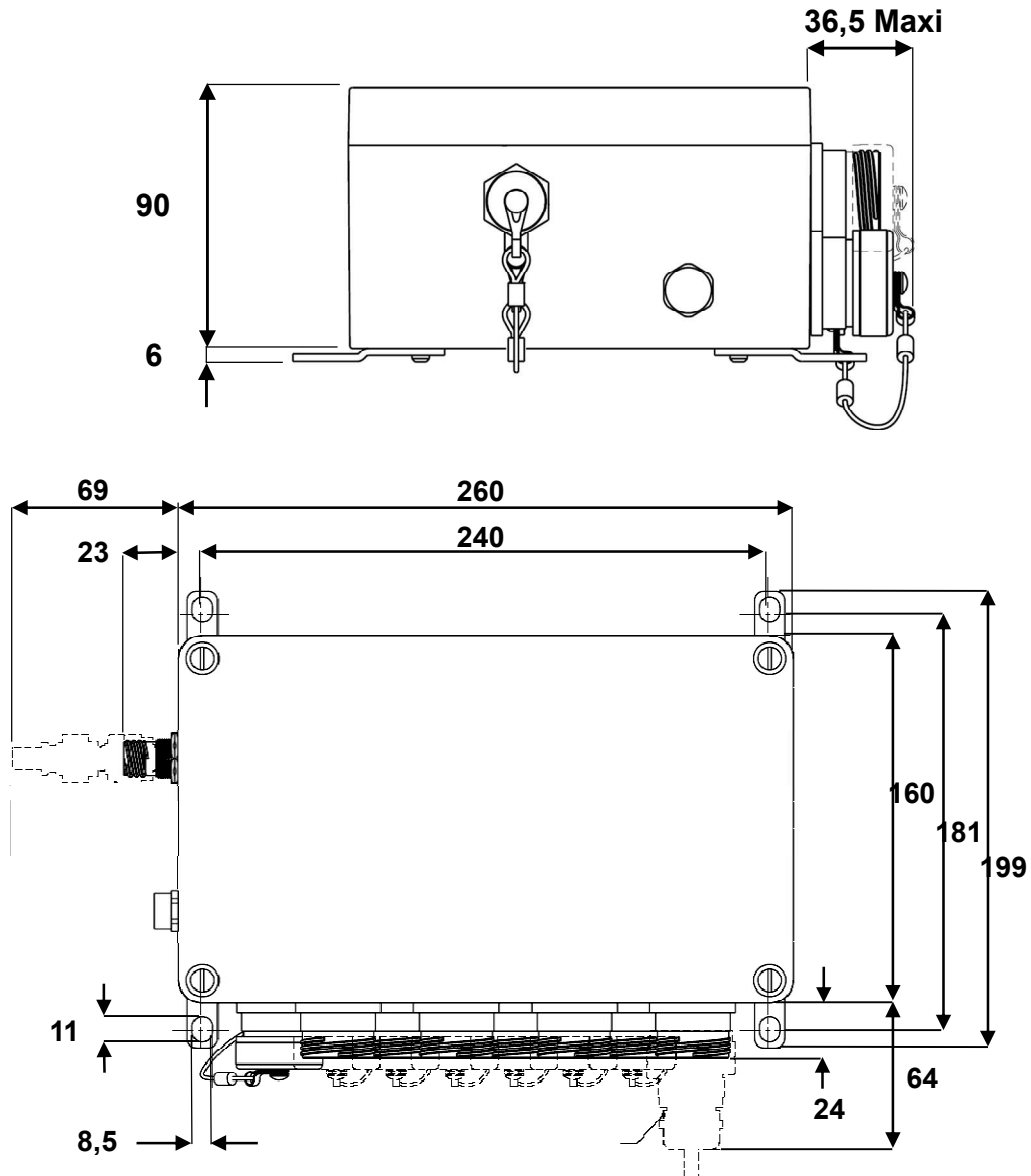
Section 2

Installation

Overview

All switches share the same footprint and 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 water jets (IP65 rating) but also immersion until 2m depth (IP68 rating).

The Ethernet connections for all models come out from rugged MIL-DTL-38999 III connectors from RJField range (see www.amphenol-socapex.com). Make sure to allow enough room to route your Ethernet cables.



Section 3

Power Wiring

Overview

These switches can be powered from the same DC or AC source that is used to power your I/O devices. Refer to the wiring diagram hereafter for correct voltage powering.

GND screw should be tied to panel or chassis ground.

Plugs and backshells

The switches should be powered using mating plugs and backshells compliant with MIL-DTL-38999 series III. We suggest using hereunder accessories. Another backshell can be used but it must ensure a correct sealing protection.

Accessories part numbers

	RJS-ML-8ELMG-(704)-(PSM)-(CAPS)	RJS-BKN-8ELMG-(704)-(PSM)-(CAPS)
Plug	TV 06 RW 0935 S (Size 9; using 6 contacts #22D)	TVS 06 RF 0935 S (Size 9; using 6 contacts #22D)
Backshell	TV35 09 10 08 014	TV35 09 10 08 023
Heat shrink	804221	804221

The plugs are using crimp contacts.

We suggest using hereunder tooling.

Crimping tools for all models

	Amphenol No	Military No
 Crimping tool	For #22D: 809 801	For #22D: M22520/2-01
 Positioner	For #22D: 809 835	For #22D: M22520/2-07

Plastic insertion and removal tools

Switch model	Contact size	Amphenol No	Military no	
8ELMG	22D	809 856	M81969/14-01	

Note: metallic tools are also available. Consult dedicated Tri-Start TV-CTV catalog (E113) for details.

Wiring power inputs

The diagrams below show the rear face of mating plugs.

The plugs to be used with the switches are from our TV series. They are compliant with MIL-DTL-38999 series III.

Part number of the power plug: See the previous page.

Models 8ELMG (not valid with options 704 or PSM) support redundant power supplies. Voltage input can be supplied into P1 or P2 or both.

OK contacts: Wiring a relay output for power control

OK relay output can be used to control power input voltages at P1 and P2.

When both P1 and P2 are supplied, a relay is closed between contacts 3 and 6. The relay supports up to 1A at 24V.



Pinout for standard models 8ELMG



Redundant Power Inputs for models 8ELMG
P1 and/or P2: 12-48 VDC



Single Power Input for models 8ELMG-704
P1: 12-33 VDC
3,4,5,6 : Not connected



Single Power Input for models 8ELMG-PSM
L/N: 85-264 VAC
3,4,5,6: Not connected

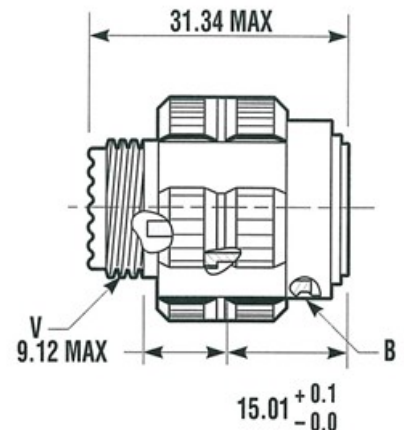
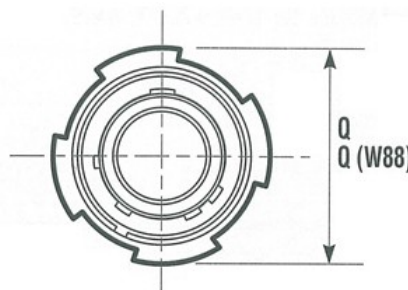
Dimensions of acceptable wires

Switch model	Contact size	Gauge AWG / Section mm ²		Outside diameter (mm)		
		min	max	Min	Average	Max
8ELMG	22D	28 0.095	22 0.38	0.76	1.20	1.37

Plugs dimensions

For all models:

Plug size: 9 (A)
B Thread Class 2A: 0.6250 mm
Q Max: 21.82 mm
V thread metric: M12x1-6g



Backshells

We suggest using TV35 backshells with corresponding heat shrinks.



These band backshells provide a full 360° shield termination. They are available with different cabling chamber lengths and exit diameters. The use of replaceable bands facilitates future maintenance or reparability.

Sealing is ensured by straight or right-angled heat shrink moulded piece at the rear of backshell.

TV35 is suitable for TV-CTV (MIL-DTL-38999 Series III). These straight band backshells provide a full 360° shield termination with a quick, easy, and cost-effective cabling process.

Suggested backshell designation:

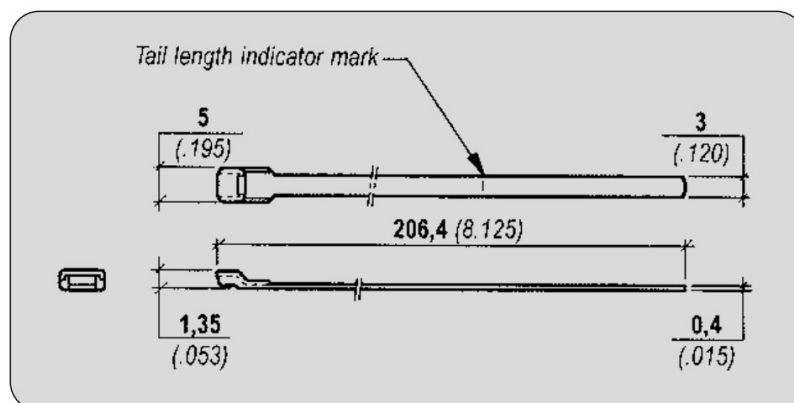
TV35-09-10-08-014 (with Olive Drab Cadmium plating)

TV35-09-10-08-023 (with Nickel plating)

Heat-shrinks are molded pieces for harsh environment, fluid resistant (with preinstalled adhesive).

Suggested heat shrink designation: 804221

Micro band (precoiled): 895693



Use the following tools for the assembly of TV35 backshells:

Coupling Tool

Coupling wrench for TV35 Backshells: 116.5 (Facom p/n)

Hand banding Tool

Banding tool for Micro band: 809985

Section 4

Ethernet Wiring

Overview

These switches provide connections to Ethernet devices on the battlefield. Typically, a port is used to connect to another Ethernet switch or hub 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.

Please follow normal Ethernet wiring practices when installing these switches.

Ethernet IP68 plugs

The IP68 rated RJ45 plug is field installable and does not require any special tools. It can be installed over any standard Ethernet patch cable (though you may have to remove the latch cover if it has an over-molded boot). Refer to the diagrams for mechanical and assembly details.



Part number of the plug to be used:

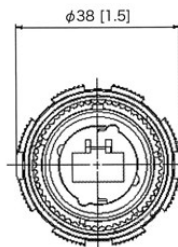
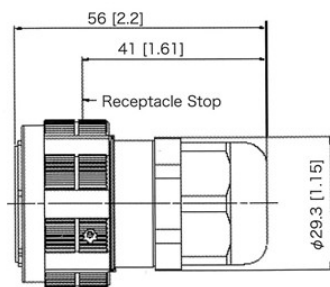
RJFTV6MG (OD Cadmium Plating)

RJFTV6MN (Nickel plating).

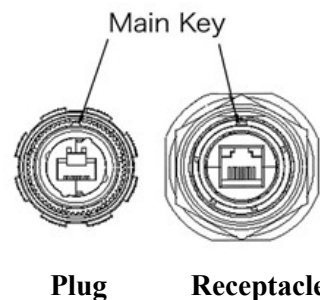
This plug may be assembled with 4 different coding. Use the coding A to make your assembly. For more details, please consult:

www.amphenol-socapex.com

RJFTV6Mx plug dimensions

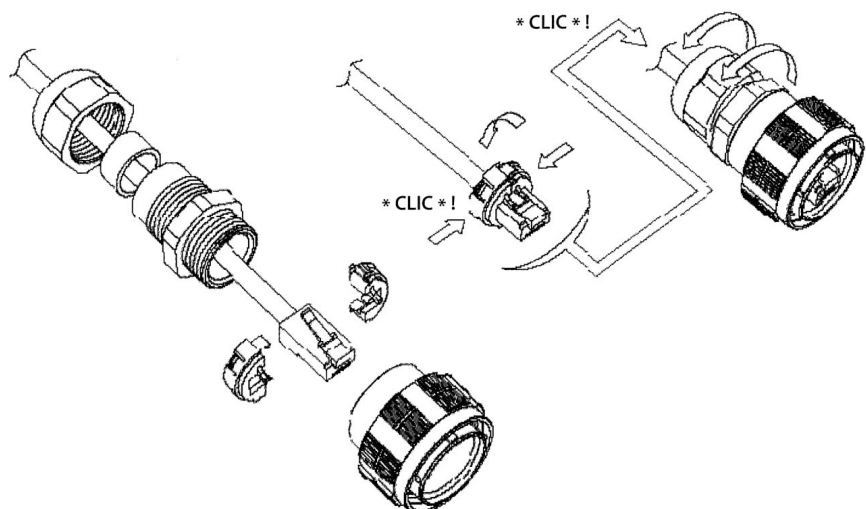


A coding



RJFTV6Mx plug 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. The RJ45 cordset latch should be at the same position than the main key of the shell to meet the A coding.



The models of switches with –CAPS (example: RJS-ML-8ELMG-CAPS) termination are pre-equipped with caps on all ports, including power and Ethernet.

The models without –CAPS termination (example: RJS-ML-8ELMG) do not have caps on ports. The required number of caps may be ordered separately as accessories.

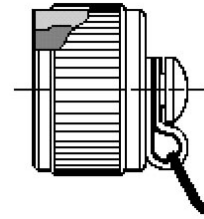
Part number of the caps as accessories:

RJSML C 7 G (with Olive drab Cadmium plating)

RJSML C 7 N (with Nickel plating)

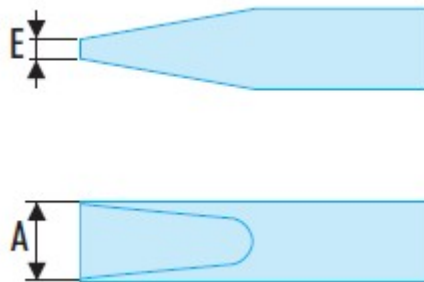
The cap can be screwed directly on the receptacle.

Note: The screw is supplied with the cap.



Assembly of the cap

Tool: Use a flat screw-driver to assemble the cap onto the switch.



Suggested dimensions for the screwdriver:

- Thickness: $E = 0.8 \text{ mm}$
- Width: $A = 5 \text{ mm} \pm 1 \text{ mm}$

Suggested coupling torque: 1.2 N.m.

Section 5

Technical Specifications

Technical Specifications

Here are the technical specifications for these switches covered by this manual.

Copper Ports		
Shielded RJ45	10/100/1000BaseT(x) ports	
Coupling mechanism	Star Thread (MIL-DTL-38999 series III type) with anti-decoupling device	
RJ45 cordset retention	100 N in the axis of the plug	
Mating cycles	500 min	
Protocols supported	All standard IEEE 802.3	
Ethernet compliancy	IEEE 802.3, 802.3u, 802.3x	
Auto-crossover	Yes , Auto-mdi/mdix-crossover	
Auto-negotiating	10BaseT, 100BaseTX or 1000BaseTX	
Auto-polarity	Yes	
Flow control	Half or full duplex	
Ethernet isolation	1500 VRMS 1 minute	
Plug and play	Yes	
Cable requirements	Twisted pair (Cat. 5 or better) (shielded recommended)	
Max. cable distance	100 meters	
General		
Operation	Managed, Store and forward	
MAC address	8K entries	
Switching Capacity	16 Gbps	
Compliance	IEEE 802.3 (10BaseT), 802.3u (100BaseTX), 802.3x (Flow Control)	
Latency (typical)	5 μsec (time to route a message from one port to another internal to switch)	
Flow control	Yes, for half and full duplex	
Jumbo frames	Supports Jumbo frame transmission up to 9kbytes	
Environmental		
Required supply voltage	Depends on models: see section 1	
Power consumption	5.2 Watts	
Operating temp. range	-40°C to +75°C	
Storage temp. range	-40 to 85 °C	
Waterproof	IP68, 2m / 24h	
Electrical safety	UL 60950-1, CAN/CSA-C22.2 No.60950	
EMI	EN55022 Class A, EN61000-6-4, FCC part 15 Subpart B Class A	
EMS	EN 55024/ EN 61000-6-2 EN 61000-4-2 / 4-3 / 4-4 / 4-5 / 4-6 / 4-8	
Vibration	IEC 60068-2-6 RTCA/DO-160C Sinusoidal vibrations 5-55 Hz: 0.01 inch ; 55-500 Hz: 1.5g	
Altitude	MIL-STD-810F Altitude 50,000 ft – 15,000 m	
Shocks	IEC 60068-2-27 MIL-STD-810F (40g, 11ms, 18 saw tooth shocks)	
Salt Spray	500 h (Olive Drab Cadmium)	
Dimensions	See mechanical diagrams	
Power filtering (option -704 only)	MIL-STD-461E DEF-STAN-59-41 DEF-STAN-61-5 MIL-STD-704A MIL-STD-1275A	CE102 Conducted Emission DCE01/ DCE02 Pt 6 600V Input transient, applied for 10μs Spikes: +/- 250 V for 100μs Surges: 100 V for 50 ms at 0.5 mohm Ripple: 14VAC pk - pk

Section 6

Service Information

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. <https://support.amphenol-socapex.com/hc/en-gb>

Phone: +33(0) 450 89 28 00

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:

<https://www.amphenol-socapex.com/products/ethernet-switch-media-converter>