5910 Ethernet Gateway Module

Hardware Manual

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Schneider Electric

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Technical Support

Questions and requests related to any part of this documentation can be directed to one of the following support centers:

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Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety message indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result** in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **can result** in death or serious injury.

⚠CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Before You Begin

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

⚠ WARNING

EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.

- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.

- Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in death or serious injury.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future reference.

Test all software in both simulated and real environments.

Verify that the completed system is free from all short circuits and grounds, except those grounds installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to help prevent accidental equipment damage.

Operation and Adjustments

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.

- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have

access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.

- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to help prevent unauthorized changes in operating characteristics.

Acceptable Use

SCADAPack controllers and expansion modules are intended for use in monitoring and controlling non-critical equipment only. They are not intended for safety-critical applications.

⚠WARNING
UNACCEPTABLE USE
Do not use SCADAPack controllers and expansion modules as an integral part of a safety system. These devices are not safety products. **Failure to follow these instructions can result in death or serious injury.**

⚠CAUTION
EQUIPMENT OPERATION HAZARD
When devices are used for applications with technical safety requirements, the relevant instructions must be followed. Use only Schneider Electric software or approved software with Schneider Electric hardware products. **Failure to follow these instructions can result in minor or moderate injury.**

About the Book

At a Glance

Document Scope

This manual describes the operation and maintenance of the 5910 Ethernet Gateway module.

Validity Notes

This document is valid for all versions of the 5910 Ethernet Gateway module.

Product Related Information

⚠ WARNING
UNINTENDED EQUIPMENT OPERATION
The application of this product requires expertise in the design and programming of control systems. Only persons with such expertise should be allowed to program, install, alter and apply this product.
Follow all local and national safety codes and standards.
Failure to follow these instructions can result in death or serious injury.

User Comments

We welcome your comments about this document. You can reach us by e-mail at supportTRSS@schneider-electric.com.

Overview

The Model 5910 Ethernet Switch is a five port unmanaged switch used to route Ethernet messages. It is easy to install and operate as no configuration is necessary. Once the Ethernet connections are made and the unit is powered up, the 5910 will begin to operate.

The 5910 mounts on a DIN rail and is powered from the 5V available in SCADAPack controllers and other 5000 systems. The 5910 can also be powered from 11-30Vdc sources such as 12Vdc batteries, 24Vdc power supplies or AC adapters. The 5910 is available with a desktop mounting option.

Applications include in-plant I/O and connectivity between SCADAPack controllers and operator workstations, other PLC devices and SCADA systems communications that uses 10BaseT (10 Mbps) or 100BaseT (100 Mbps) in an industrial environment.

Figure 1: 5910 Ethernet Gateway Module

Installation

The 5910 Ethernet Switch is available in two standard versions, the model 5910 and the model 5910SA. The model 5910 is a standard 5000 module that connects to the system I/O Bus as an integrated part of a Schneider Electric system. The model 5910SA is a stand-alone version of the 5910 and is used with other devices such as personal computers. Both versions of the modem are identical in every respect except that the 5910SA has rubber feet for desktop mounting.
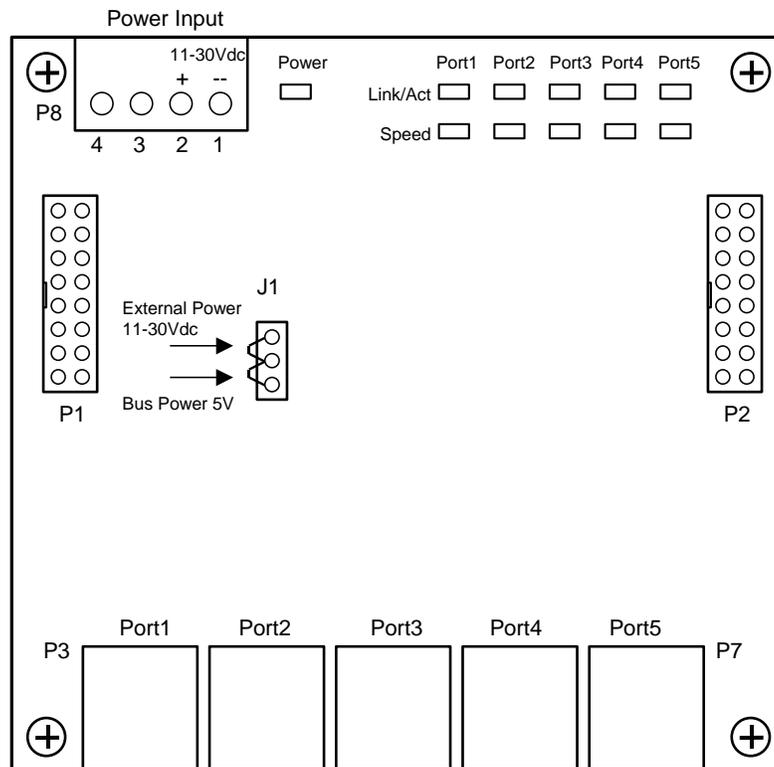
Figure 2: 5910 Module Layout

Field Wiring

WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR USE IN HAZARDOUS LOCATIONS.

AVERTISSEMENT - LA SUBSTITUTION DE COMPOSANTS PEUT AFFECTER LA CONVENANCE POUR UNE UTILISATION DANS DES EMPLACEMENTS DANGEREUX.

WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES.

AVERTISSEMENT – RISQUE D'EXPLOSION – DANS DES EMPLACEMENTS DANGEREUX, COUPEZ L'ALIMENTATION AVANT DE REMPLACER OU DE CÂBLER DES MODULES.

WARNING - do not connect/disconnect circuits unless area is known to be non-hazardous.

AVERTISSEMENT - Ne connectez/déconnectez pas les circuits à moins que la zone soit considérée non dangereuse.

Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods Article 501-4 (b) of the National Electrical Code, NFPA 70 for installations in the U.S. or as specified in Section 18-1J2 of the Canadian Electrical Code for installations within Canada and in accordance with the authority having jurisdiction.

The 5910 module has six connectors for field wiring. Refer to *Figure 2: 5910 Module* Layout for the location of these connectors.

- The five Ethernet connections are terminated at the RJ-45 modular jacks labeled Ports1 through 5. The RJ-45 modular jack pin-out is compatible with straight-through Ethernet cables and cross-over Ethernet cables. See the

- *Ethernet* Connection section for more information.

- External power in the range of 11 to 30Vdc in maybe connected to pins 1 and 2 of P8. External power may come from any DC power source such as a 12V battery, 12Vdc AC adapter or 24Vdc power supply. See the *Configuration Jumpers* section for setting J1 and the *Specifications* for the current requirements.

An AC adapter cannot be used in Hazardous Locations.

Ethernet Connection

The Ethernet network connects to the RJ-45 modular jacks labeled Port1 through Port5. The RJ-45 jack mates with 8-pin connector and cable assemblies common to Ethernet 100Base-T applications. Use data quality, shielded, twisted pair cable.

Pins 1,2,3 and 6 are used. Pins 4,5,7, and 8 are not used. See *Figure 3: 5910 Ethernet RJ-45 Connection* for pin connections. The Ethernet RJ-45 ports are MDI/MDIX Auto crossover compatible. The allows the use of straight-through or cross-over cables.

RJ-45
1: TD/RD+
2: TD/RD-
3: RD/TD+
4: nc
5: nc
6: RD/TD-
7: nc
8: nc
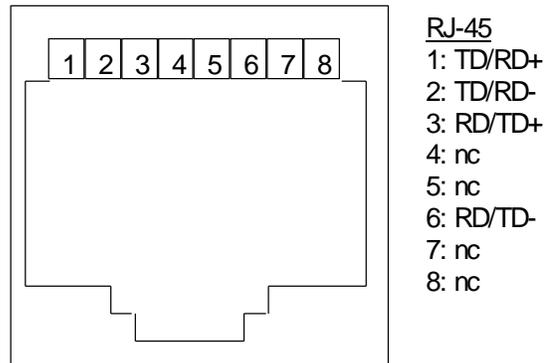
Figure 3: 5910 Ethernet RJ-45 Connection

Power Connections

The 5910 module may be powered in any one of the following ways:

- 5Vdc applied to the 5910 from the I/O Bus.

- 11-30Vdc applied to the 5910 on P8.

The 5910 module is for use with Class 2 output power supplies only.

I/O Bus Connection

The 5910 module is normally powered through the connection to the system I/O Bus. The 5910 module is connected to the system I/O Bus using a cable connected to P1 or P2. Refer to the **System Configuration Guide** for complete information on the system I/O Bus cabling. A jumper link is installed in the bottom or "Bus power 5V" position on J1.

External Power Connection using an AC adapter

The 5910 Ethernet Switch can be powered using a 12Vdc AC adapter (Schneider Electric part number: TBUM297240). The AC adapter plugs into a 120Vac supply and provides 12Vdc to the 5910. A jumper link must be installed in the upper or "External Power 11-30V" position on J1.

- Check that the AC adapter is not connected to the 120Vac supply.

- Locate connector P8 on the 5910 module. Refer to *Figure 2: 5910 Module* Layout for the location of P8.

- The output cable end should be factory installed on a four position removable terminal block. The negative output connects to pin 1 and the positive output connects to pin 2. Pins 3 and 4 are not used.

- Insert the terminal block into onto connector P8.

- Plug the AC adapter into a 120Vac supply.

The 12Vdc adapter connection cannot be used in Hazardous Locations.

External Power Connection using an external power source

The 5910 Ethernet Switch can be powered using 11-30Vdc power source such as a 24Vdc power supply. A jumper link is installed in the upper or "External Power 11-30V" position on J1.

A Class 2 power source must be connected to the External Power 11-30Vdc input on P8.

- Check that the power source is off.

- Locate connector P8 on the 5910 module. Refer to *Figure 2: 5910 Module* Layout for the location of P8.

- Connect the power source outputs to the terminal block. The negative output connects to pin 1 and the positive output connects to pin 2. Pins 3 and 4 are not used.

- Insert the terminal block into onto connector P8.

- Turn the power source on.

Configuration Jumpers

The 5910 Ethernet Switch uses a single configuration jumper link for selecting the input power source.

Jumper	Description	Position
J1	Input power source is from an AC adapter or external power source.	Upper or "External Power 11-30V"
J1	Input is 5V from the Bus on P1 or P2.	Bottom or "Bus power 5V"

LED Indicators

The 5910 module has 11 LEDs to indicate module operation and status. The SCADAPack controllers cannot disable the power to these LEDs.

LED	Function
Power	On when power is applied to the module. Power source can be Bus or External.
Link/Activity	One LED for each port. On when a link (proper Ethernet connection) has been established. Flickers when data is being transmitted or received.
Speed	Off for 10 Mbps operation. On for 100 Mbps operation.

Operation

The 5910 is a layer 2, five port unmanaged switch. No programming or configuration is required to use the 5910. Once the Ethernet connections are made and the 5910 is powered it will begin to operate. Unlike an Ethernet hub that broadcasts incoming messages to every port, the 5910 Ethernet Switch will route messages only out of the appropriate port. Both 10BaseT (10 Mbps) and 100BaseTx (100 Mbps) can be used on any of the ports. These ports will auto0sense the speed and accommodate cross-over or straight-through cables.

`Maintenance`

This module requires no routine maintenance. If the module is not functioning correctly, contact Schneider Electric Technical Support for more information and instructions for returning the module for repair.

Troubleshooting

Condition	Solutions
Power LED is not on.	Check power source. If the input is 5V from the Bus on P1 or P2 then the J1 jumper should be in the bottom or "Bus power 5V" position. If the input is 11-30Vdc from P8 then the J1 jumper should be in the upper or "External Power 11-30V" position.

Specifications

Disclaimer: Schneider Electric reserves the right to change product specifications. For more information, visit http://www.schneider-electric.com.

Ethernet switch type	5 ports, unmanaged, store & forward, 10/100BaseT
Ethernet Terminations	RJ45 ports (shielded)
Protocols	IEEE 802.3, IEEE 802.3u (TBC), IEEE802.3x
Speed and connection	Auto-detecting 10/100 Mbps operation MDI/MDIX Auto crossover (no need for cross-wired cables)
Broadcast storm protection	Yes. 1% of bandwidth.
Memory bandwidth	1.4 Gbps
Full or half duplex operation	Full duplex IEEE802.3x and half duplex back pressure flow control
MAC addresses supported	Dedicated lookup engine with 1K MAC addresses. Learning, aging and migration.
Ethernet isolation	1500Vrms
Visual Indicators	Each port - ACT/LINK and 10/100 (Speed). Power
Input Power	External Power: 11-30Vdc 1.8W at 12Vdc 2.2W at 30Vdc Bus Power: 5V at 375mA
Input Power Terminations	4 pole terminal strip and removable terminal block 12 to 22 AWG (0.33 to 3.3 mm²)
Dimensions	4.25 inch (144 mm) wide 4.625 inch (118 mm) high 2.00 inch (51 mm) deep
Mounting	desktop, rubber feet or 7.5 x 35 DIN rail
Packaging	corrosion resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing -40°C to 70°C -40°F to 158°F

Approvals and Certifications

Safety	Non-Incendive Electrical Equipment for Use in Class I, Division 2 Groups A, B, C and D Hazardous Locations. UL Listed to the following standards: • CSA Std. C22.2 No. 213-M1987 - Hazardous Locations. • CSA Std. C22.2 No. 142-M1987 - Process Control Equipment. • UL Std. No. 508 - Industrial Control Equipment.
Digital Emissions	FCC Part 15, Subpart B, Class A Verification EN61000-6-4: Electromagnetic Compatibility Generic Emission Standard Part2: Industrial Environment C-Tick compliance. Registration number N15744.
Immunity	EN61000-6-2: Electromagnetic Compatibility Generic Standards Immunity for Industrial Environments
Declaration	This product conforms to the above Emissions and Immunity Standards and therefore conforms with the requirements of Council Directive 2004/108/EC (as amended) relating to electromagnetic compatibility and is eligible to bear the CE mark. The Low Voltage Directive is not applicable to this product.