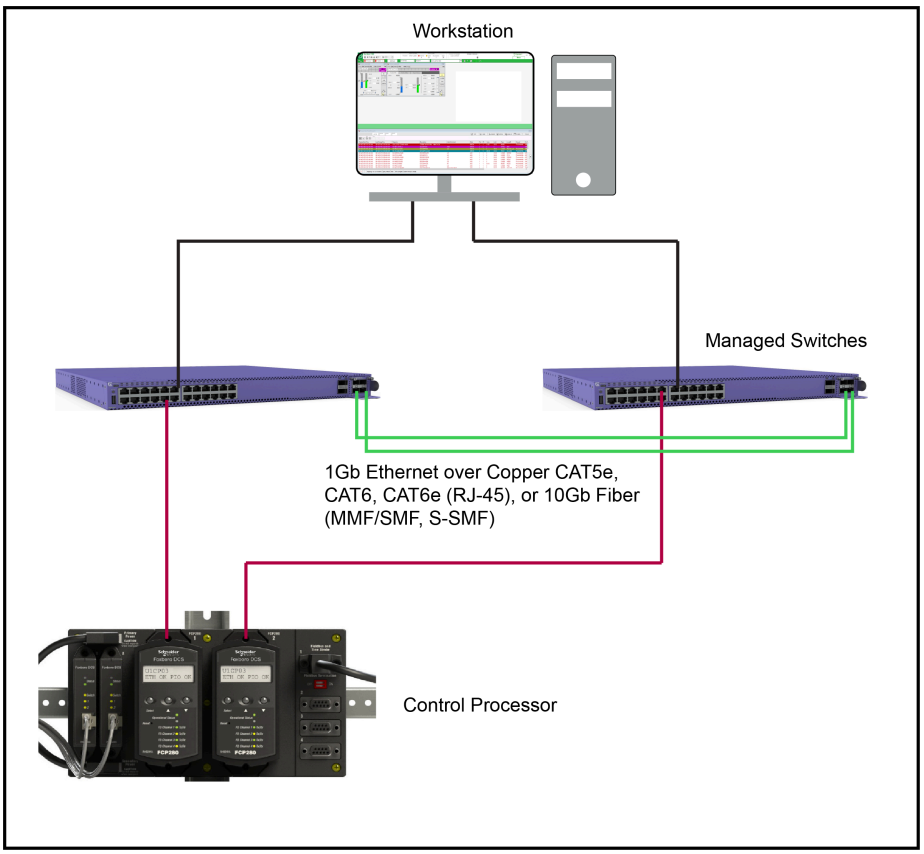
Foxboro™ DCS

The Foxboro DCS Control Network Ethernet Equipment

PSS 41H-7NWEQUIP

Product Specification

April 2025



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Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

Overview

The EcoStruxure Foxboro DCS Control Network uses Foxboro qualified Ethernet equipment allowing you to configure your system to meet your functional, performance, and plant requirements. With our switches, you can interconnect system components (controllers, workstations, servers) effectively to help minimize the quantities and lengths of interconnectivity cabling.

The Foxboro DCS Control Network equipment described in this document has been tested and qualified for use with the Foxboro DCS. The qualified Ethernet switches offered are listed in the table in Qualified Ethernet Switches, page 6.

Features

- System scalability by interconnecting Ethernet switches, each having eight ports or more in various increments.
- Modular uplinks to high-speed backbones using:
  - 1000Base-T
  - 1000Base-SX
  - 1000Base-LX
  - 1000Base-LX/LH
  - 1000Base-BX
  - 1000Base-TX
  - 1000Base-ZX standards
  - 10GbBase-LR
  - 10GbBase-LRM
  - 10GbBase-SR
  - 10GbBase-ZR
- System Management software for monitoring the health of the control system and managing the equipment within the system.
- Compatible with the optional Network Monitoring software. For more information, see *EcoStruxure™ Foxboro™ DCS ExtremeCloud™ IQ (XIQ) - Site Engine* (PSS 41S-2XIQ-SE).
- Configure tasks through a local console port Command Line Interface (CLI) and monitor through any SNMP/RMON based management application.
- Ethernet switches are European Union (EU) Low Voltage and EMC directives safety certified “CE” logo marked on the product.

Table 1 - Licensing for (10 Gb) ISL Ports

Switch P/N	Switch Type	License required for 10 GbE support	Supported Ports
RH102BF	5520-Series (24x)	Not Required	Any port or QSFP ports
RH102BG/ RH102BH	5520-Series (48SE/24t)	Not Required	QSFP ports
RH102BM/ RH102BN	5420-Series (24t/ 24s)	Not Required	SFP+ ports
RH102FM/ RH102FN	5320-Series (24t, 24t/24s)	Not Required	SFP+ ports
GRS1030 8T8Z/ 16T9	GREYHOUND	Not supported	N/A

Table 2 - VRRP Router Required License (Advanced Edge License)

Switch Type P/N	Port Utilization for VRRP routing	Advanced Edge License
RH102BF	All SFP ports	N/A
RH102BG	All SFP ports	N/A
RH102BH	All ports (Copper) SFP	N/A

Table 2 - VRRP Router Required License (Advanced Edge License) (Continued)

Switch Type P/N	Port Utilization for VRRP routing	Advanced Edge License
RH102BM	All SFP ports	N/A
RH102BN	All SFP ports	N/A
GRS1030 8T8Z/16T9	Not supported	N/A
RH102FM	Not supported	N/A
RH102FN	Not supported	N/A

Qualified Ethernet Switches

Root and Distribution: 5520-Series

Switch	Reference
24-Gigabit SFP+ Managed Switch	RH102BF, page 8
24-Gigabit 10/100/1000Base-Tx Managed Switch	RH102BH, page 11
350 W AC Power Supply (requires two units for redundant power)	RH102BJ, page 14
48-Gigabit SFP 2 QSFP Managed Switch	RH102BG, page 16
Ethernet Managed Switch QSFP to SFP+ Adapter	RH102BL, page 19

Distribution: 5420-Series

Switch	Reference
24-Gigabit 4 SFP Managed Switch	RH102BN, page 22
24-Gigabit 10/100/1000Base-Tx Managed Switch	RH102BM, page 20
150 W AC Power Supply (redundant power only)	RH102BP, page 24

Edge: 5320-Series

Switch	Reference
24-Gigabit 10/100/1000Base-Tx and 24 SFP Managed Switch	RH102FN, page 26
24-Gigabit 10/100/1000Base-Tx Managed Switch	RH102FM, page 28
150 W AC Power Supply (redundant power only)	RH102FQ, page 31

Switches: 5520 Power Supplies

Switch	Reference
Auto-Ranging Primary Power Supply	RH102BJ, page 14(for RH102BF/BG/BH)
Redundant Power Supply	RH102BJ, page 14 (for RH102BF/BG/BH)

Edge: Industrial GREYHOUND

Switch	Reference
Fast Ethernet Media Module	GRM20, page 33
Industrial Managed Fast, Gigabit Managed Switch	GRS-1030 16T9, page 34
Industrial Managed Fast, Gigabit Managed Switch	GRS-1030 8T8Z, page 34

GBICs: General Use

These GBICs are industrial, but cannot be used on the GRS switches.

Switch	Reference
2 km (1.24 mi) MGBIC module LC (LX/LH) 1300 N-m 1000Base-LX	P0972YQ
275 m (902 ft) MGBIC module LC (SX) 850 N-m 1000Base-SX	RH102AG
10 km (6.2 mi) MGBIC module LC (LX) 1310 N-m 1000Base-LX, SMF	RH102AH
80 km (49.7 mi) MGBIC module LC (ZX) 1550 N-m 1000Base-ZX	RH102AJ
100 m (330 ft) RJ-45 MGBIC Uplink module (TX) 10/100/1000Base-T	RH102AL
100Base-FX 2 km (1.24 mi) MGBIC device module LC (1310 N-m)	RH102BK
10 Gb SR SFP+ module 300 m (984 ft) MMF 850 N-m	RH102BQ
10 Gb LR SFP+ module 10 km (6.2 mi) SMF	RH102BR
10 Gb LRM SFP+ module 220 m (721 ft) MMF, 300 m (984 ft) SMF	RH102BS
10 Gb ZR SFP+ module 80 km (49.7 mi) SMF	RH102BT

GBICs: Industrial

These GBICs are to be used with all switch types and are required to be used with the GRS-1030 GREYHOUND switches.

100Base-FX 2 km (1.24 mi) Transceiver required for device module LC (1310 N-m)	RH102HA
1000Base-LX, 550 m (1804 ft) 50/125 µm MMF, 550 m (1804 ft) 62.5/125 µm MMF, 10 km (6.2 mi) 9/125 µm SMF	RH102HB
275 m (902 ft) MGBIC module LC (SX) 850 N-m 1000Base-SX	RH102HC
80 km (49.7 mi) Transceiver module LC (ZX) 1550 N-m	RH102HD
1 Gb Bi-directional Transceiver Kit containing both downlink and uplink 10K MGBIC	RH102HF
1 Gb Bi-directional Transceiver downlink and uplink 40K MGBIC	RH102HG
1 Gb Bi-directional Transceiver downlink and uplink 40K MGBIC	RH102HH
1 Gb Bi-directional Transceiver downlink and uplink 120K MGBIC	RH102HJ
1 Gb Bi-directional Transceiver downlink and uplink 120K MGBIC	RH102HK

Root and Distribution: 5520-Series

RH102BF 24-Gigabit (SFP+) 5520 Managed Switch

RH102BF managed switch 24-port SFP+ 1000Base-X 1 GbE/10 GbE uplink (ISL) ports, and two (2) QSFP ports that must be configured as 10 GbE, with a total of 26 active ports.

RH102BF 5520-Series switch is designed for use at the Root and Backup Root locations to support 10 GbE connectivity or replacing chassis based switches in a Star or Tree topologies for Standard Configuration networks.

Figure 1 - 24-Gigabit (SFP+) 5520 Managed Switch (RH102BF)

Features

The 24-1 GbE or 10 GbE 5520 port managed switch (RH102BF) has these features:

- 24 x 1 GbE/10 GbE (SFP+) unpopulated ports: Two (2) QSFP port that can be configured as 10 GbE ports. (The SFP+ ports cannot be configured as 100Base-FX or 100Base-Tx.)
- Two (2) QSFP+ (unpopulated ports), accommodates 10 GbEBase-X transceiver modules only.

  NOTE: The 10 Gigabit QSFP ports can only be installed with 10 GbEBase-x GBIC, utilizing the QSFP to SFP+ Adapter (RH102BL), and must be reserved for 10 GbE ISL ports.
- Full-duplex operation
- High performance, managed layer-2/3 Ethernet switching
- Monitoring and configuration tasks using the local console port, or any SNMP/RMON based management application
- Port and VLAN mirroring technology and diagnostics that allows local network traffic to be redirected to an external probe for detailed analysis
- Compliance with industry standards, including IEEE 802.3ae 10 GbE, IEEE 802.3u Fast Ethernet and 802.1w Rapid Spanning Tree Protocol (RSTP)

- Optional internal redundant power supply
- Shelf, desk, or 19-inch rack mounting

NOTE: The 5520-Series switches do not ship with power supplies. Power supplies must be ordered separately. They are not included in the base switch model.

Power Supply

The RH102BF/BG/BH 5520-Series managed switch's power supplies (RH102BJ), ordered separately, automatically adjust to the input voltage and frequency, which allows for an input voltage of 100-127 VAC/6A or 200-240 VAC/3A VAC, and a frequency between 50 and 60 Hz. A second power supply can be added for power supply redundancy.

Optional Redundant Power Supply

For more information, see RH102BJ 350 W AC Power Supply (5520-Series), page 14.

Installation Guidelines

NOTICE

POTENTIAL EQUIPMENT DAMAGE

These guidelines must be observed when an installation location is selected for this switch. If the guidelines are not followed, unsatisfactory network performance can result.

- To provide for proper ventilation and help prevent overheating, leave a minimum clearance space of 2.0 in (5.1 cm) at the top, bottom, left, right, and rear of the switch. Do not connect the switch to the AC power source until instructed to do so during the installation process.
- During operation, ambient temperature at the installation site must be maintained between 0° and 50°C (32° to 122°F). Temperature changes must be maintained within 10°C (18°F) per hour.
- Fore more information, see the installation document.

Failure to follow these instructions can result in equipment damage.

Functional Specifications

Ethernet Standards Supported	• IEEE 802.1q VLAN support • IEEE 802.1d MAC Bridging (including STP) • Quality of Service (QoS, Priority) IEEE 802.1w Rapid Spanning Tree (RSTP) IEEE 802.3 including: ◦ Fast Ethernet: IEEE 802.3u, 100Base-T (Copper) ◦ Gigabit Ethernet: IEEE 802.3z, 1000Base-X (Fiber) ◦ Gigabit Ethernet: IEEE 802.3ab, 1000Base-T (Copper) ◦ 10 Gigabit Ethernet: IEEE 802.3az 10GbBase-x
Power	• Internal: AC Input power (auto-sensing) 100-127 at 6A, or 200-240 at 3A VAC, 50 to 60 Hz • External: N/A • Heat Dissipation: 585 Btu/hr • Power Consumption: 48 Watts

Environmental Specifications

	Operating	**Storage**
Temperature	0° to 50°C (32° to 122°F)	-40° to +70°C (-40° to +158°F)
Relative Humidity	10 to 95% (non-condensing)	10 to 95% (non-condensing).

Physical Specifications

Mounting	Desk or Enclosure: 19 in (48.3 cm) equipment rack, 1U high
Dimensions (Nominal)	• Height: 4.4 cm (1.7 in) • Width: 44.1 cm (17.36 in) • Depth: 43.2 cm (17.0 in)
Weight (Approximate)	• 6.01 kg (13.2 lb)
Cable Connectors	• 1GBase (RJ-45 copper or LC fiber) 10GBase (LC Fiber)
Vibration	• Vibration: IEC 60068-2-64, IEC 60068-2-6 • Shock: IEC 60068-2-27 • Drop: ETSI/EN 300 019 2-2

Regulatory and Safety

Regulatory Compliance, Product Safety	UL Listed, CSA Certified, European Low Voltage Directive 2014/35/EU, CB Scheme, complies with FCC 21 CFR 1030.10, US FDA Approval, AS/NZS RCM Certified
Regulatory Compliance, Electromagnetic Compatibility (EMC)	European EMC Directive 2014/30/EU Complies with FCC Part 15, Subpart B, Class A ICES-003: 2012, Class A
Regulatory Compliance, Environmental	2011/65/EU RoHS Directive

RH102BH 24-Gigabit 10/100/1000Base-Tx Managed Switch

RH102BH managed switch provides 24 ports of 10/100/1000 Base-TX ports, with two QSFP ports that must be configured as 10 GbE, with a total of 26 active ports.

Figure 2 - 24-Gigabit 10/100/1000Base-Tx Managed Switch (RH102BH)

Features

The 24-Port Tri-Speed 10/100/1000Base-Tx port managed switch (RH102BH) has these features.

NOTE: The 5520-Series switches do not ship with power supplies. Power supplies must be ordered separately. They are not included in the base switch model.

- 24 x 10/100/1000Base-Tx “Fixed” (RJ-45) ports: Two (2) QSFP port that can be configured as 10 GbE.
- Two (2) QSFP (unpopulated ports), accommodates 10GbBase-X transceiver modules only.

  NOTE: The 10 GbE QSFP ports can only be installed with 10GbBase-x GBIC, utilizing the QSFP to SFP+ Adapter (RH102BL) and must be reserved for 10 GbE ISL ports.
- Full-duplex operation.
- High performance, managed layer-2/3 Ethernet switching.
- High performance direct end-station copper connectivity.
- Monitoring and configuration tasks using the local console port.
- Port and VLAN mirroring technology and diagnostics that allows local network traffic to be redirected to an external probe for detailed analysis.
- Compliance with industry standards, including IEEE 8023.ae 10 GbE, IEEE 802.3u Fast Ethernet and 802.1w Rapid Spanning Tree Protocol (RSTP).
- Optional internal redundant power supply.
- Shelf, desk, or 19-inch rack mounting.

Power Supply

The RH102BF/BG/BH 5520-Series managed switch's power supplies (RH102BJ), ordered separately, automatically adjust to the input voltage and frequency, which allows for an input voltage of 100-127 V/6A or 200-240 V/3A VAC, and a frequency between 50 and 60 Hz. A second power supply can be added for power supply redundancy.

Optional Redundant Power Supply

For more information, see RH102BJ 350 W AC Power Supply (5520-Series), page 14.

Installation Guidelines

NOTICE

POTENTIAL EQUIPMENT DAMAGE

These guidelines must be observed when an installation location is selected for this switch. If the guidelines are not followed, unsatisfactory network performance can result.

- To provide for proper ventilation and help prevent overheating, leave a minimum clearance space of 5.1 cm (2.0 in) at the top, bottom, left, right, and rear of the switch. Do not connect the switch to the AC power source until instructed to do so during the installation process.
- During operation, ambient temperature at the installation site must be maintained between 0° and 50°C (32° to 122°F). Temperature changes must be maintained within 10°C (18°F) per hour.
- For more information, see the installation document.

Failure to follow these instructions can result in equipment damage.

Functional Specifications

Ethernet Standards Supported	• IEEE 802.1q VLAN support • IEEE 802.1d MAC Bridging (including STP) • Quality of Service (QoS, Priority) IEEE 802.1w Rapid Spanning Tree (RSTP) IEEE 802.3 including: ◦ Fast Ethernet: IEEE 802.3u, 100Base-T (Copper) ◦ 10 Gigabit Ethernet: IEEE 802.3az, 10GbBase-X (Fiber)
Power	• Internal: AC Input power (auto-sensing) 100-127/6A, or 200-240/3A VAC, or 200-240 at 3A VAC, 50 to 60 Hz +/- 5% • External: N/A • Heat Dissipation: 483 Btu/hr • Power Consumption: 52 Watts

Environmental Specifications

	Operating	**Storage**
Temperature	0° to 50°C (32° to 122°F)	-40° to +70°C (-40° to +158°F)
Relative Humidity	10 to 95% (non-condensing)	10 to 95% (non-condensing).
Altitude	0 to 3,000 meters (9,850 feet)	

Physical Specifications

Mounting	Desk or Enclosure: 48.3 cm (19 in) equipment rack, 1U high
Dimensions (Nominal)	• Height: 4.4 cm (1.7 in) • Width: 44.1 cm (17.36 in) • Depth: 43.2 cm (17.0 in)
Weight (Approximate)	• 6.4 kg (14.1 lb)
Cable Connectors	• Uplink Ports: 1GBase (RJ-45 copper or LC fiber) 10GBase (LC Fiber)
Vibration	• Vibration: IEC 60068-2-64, IEC 60068-2-6 • Shock: IEC 60068-2-27 • Drop: ETSI/EN 300 019 2-2

Regulatory and Safety

Regulatory Compliance, Product Safety	UL Listed, CSA Certified, European Low Voltage Directive 2014/35/EU, CB Scheme, complies with FCC 21 CFR 1030.10, US FDA Approval, AS/NZS RCM Certified
Regulatory Compliance, Electromagnetic Compatibility (EMC)	European EMC Directive 2014/30/EU Complies with FCC Part 15, Subpart B, Class A ICES-003: 2012, Class A
Regulatory Compliance, Environmental	2011/65/EU RoHS Directive

RH102BJ 350 W AC Power Supply (5520-Series)

The RH102BF/BG/BH 5520-Series managed switch's power supplies (RH102BJ), ordered separately, automatically adjust to the input voltage and frequency, allowing an input voltage of 100-127V/6A or 200-240V/3A VAC, and a frequency between 50 and 60 Hz. A second power supply can be added for power supply redundancy.

Figure 3 - RH102BJ 350 W AC Power Supply (5520)

NOTE: RH102BJ power supply modules are not supplied with the switch and are sold separately.

If the RH102BJ primary power supply stops working, the RPSM assumes the entire load of the switch without interrupting network traffic. The switch's internal power supply and RPSM each have their own AC power connection, which enables the connection of each power supply to a different AC power circuit for additional AC power source redundancy.

NOTE: The RH102BF/BG/BH 5520-Series switches do not ship with or power supplies. Power Supplies *must* be ordered separately. They are not included in the base switch model.

Installation Guidelines

To install an RH102BJ power supply in a 5520-Series switch, see *EcoStruxure™ Foxboro™ DCS 5520-Series Switches for the Control Network Installation and Configuration Guide* (B0700HN).

Functional Specifications

Power	• AC Input power (auto-ranging) • 100-127V/6A or 200-240V/3A VAC, 50 to 60 Hz
Heat Dissipation	• 872 Btu/hr

Environmental Specifications

	Operating	**Storage**
Temperature	-0°C to 50°C (32°F to °F)	-45°C to 85°C (-49°F to 185°F)
Relative Humidity	10 to 90% (non-condensing)	10 to 95% (non-condensing).
Altitude	0 to 3,000 meters (9,850 feet)	

Physical Specifications

Mounting	Internal
Dimensions (Nominal)	• Height: 2.7 cm (1.06 in) • Width: 7.8 cm (3.09 in) • Depth: 27.7 cm (10.9 in)
Weight (Approximate)	1.02 kg (2.25 lb)
Vibration	• Vibration: IEC 60068-2-64, IEC 60068-2-6 • Shock: IEC 60068-2-27 • Drop: ETSI/EN 300 019 2-2

Regulatory and Safety

Regulatory Compliance, Product Safety	UL Listed, CSA Certified, European Low Voltage Directive 2014/35/EU, CB Scheme, complies with FCC 21 CFR 1030.10, US FDA Approval, AS/NZS RCM Certified
Regulatory Compliance, Electromagnetic Compatibility (EMC)	European EMC Directive 2014/30/EU Complies with FCC Part 15, Subpart B, Class A ICES-003: 2012, Class A
Regulatory Compliance, Environmental	2011/65/EU RoHS Directive

RH102BG 48-Gigabit (SFP) two (2) QSFP Managed Switch

RH102BG managed switch provides 48 SFP 1000Base-X 1 Gb uplink (ISL) ports, with two QSFP ports that must be configured as 10 GbE, with a total of 50 active ports. All Ports are SFP with two QSFP ports. RH102BG switch can only support 3rd Generation 100 Mb SFP modules to support 100 Mb connectivity (RH102BK).

Figure 4 - 48-Gigabit (SFP) 5520 managed switch (RH102BG)

Features

The 48-Gigabit (SFP) 5520-Series managed switch (RH102BG) has these features:

- 48 x 100/1000Base-X (SFP) unpopulated ports. (The SFP ports can be configured as 100Base-FX or 100Base-Tx with the appropriate GBIC transceiver.)
- Two QSFP+ (unpopulated ports) ports, accommodates 10 GbEBase-X GBIC only

  NOTE: The 10 GbE QSFP modules ports are SFP+ GBIC ports that can only be installed with 10 GbEBase-x GBIC, utilizing the QSFP to SFP+ Adapter (RH102BL) and must be reserved for 10 GbE ISL ports.
- Full-duplex operation
- High performance, managed layer-2/3 Ethernet switching
- High performance direct end-station connectivity when utilizing the RH102BK/ P0973JE 100 Mb Fiber or RH102AL Copper SFP modules
- Monitoring and configuration tasks using the local console port
- Port and VLAN mirroring technology and diagnostics that allows local network traffic to be redirected to an external probe for detailed analysis
- Compliance with industry standards, including IEEE 8023.ae 10 GbE, IEEE 802.3u Fast Ethernet and 802.1w Rapid Spanning Tree Protocol (RSTP)
- Optional internal redundant power supply
- Shelf, desk, or 19-inch rack mounting

Power Supply

The RH102BF/BG/BH 5520-Series managed switch's power supplies (RH102BJ), ordered separately, automatically adjust to the input voltage and frequency, which allows for an input voltage of 100-127V/6A or 200-240V/3A VAC, and a frequency between 50 and 60 Hz. A second power supply can be added for power supply redundancy.

Optional Redundant Power Supply

For more information, see RH102BJ 350 W AC Power Supply (5520-Series), page 14.

Installation Guidelines

NOTICE

POTENTIAL EQUIPMENT DAMAGE

These guidelines must be observed when an installation location is selected for this switch. If the guidelines are not followed, unsatisfactory network performance can result.

- To provide for proper ventilation and help prevent overheating, leave a minimum clearance space of 5.1 cm (2.0 in) at the top, bottom, left, right, and rear of the switch. Do not connect the switch to the AC power source until instructed to do so during the installation process.
- During operation, ambient temperature at the installation site must be maintained between 0° and 50°C (32° to 122°F). Temperature changes must be maintained within 10°C (18°F) per hour.
- For more information, see the installation document.

Failure to follow these instructions can result in equipment damage.

Functional Specifications

Ethernet Standards Supported	• IEEE 802.1q VLAN support • IEEE 802.1d MAC Bridging (including STP) • Quality of Service (QoS, Priority) IEEE 802.1w Rapid Spanning Tree (RSTP) IEEE 802.3 including: ◦ Fast Ethernet: IEEE 802.3u, 100Base-T (Copper) ◦ Fast Ethernet: 802.3u (CL24/26), 100Base-FX (LC Fiber) ◦ Gigabit Ethernet: IEEE 802.3z, 1000Base-X (Fiber) ◦ Gigabit Ethernet: IEEE 802.3ab, 1000Base-T (Copper) ◦ 10 Gigabit Ethernet: IEEE 802.3az 10GbBase-x
Power	• Internal: AC Input power (auto-sensing) 100-127 @6A or 200-240 @3A VAC, 50 to 60 Hz • External: N/A • Heat Dissipation: 872 Btu/Hr • Power Consumption: 61 Watts

Environmental Specifications

	Operating	**Storage**
Temperature	0° to 50°C (32° to 122°F)	-40° to +70°C (-40° to +158°F)
Relative Humidity	10 to 95% (non-condensing)	10 to 95% (non-condensing).
Altitude	0 to 3,000 meters (9,850 feet)	

Physical Specifications

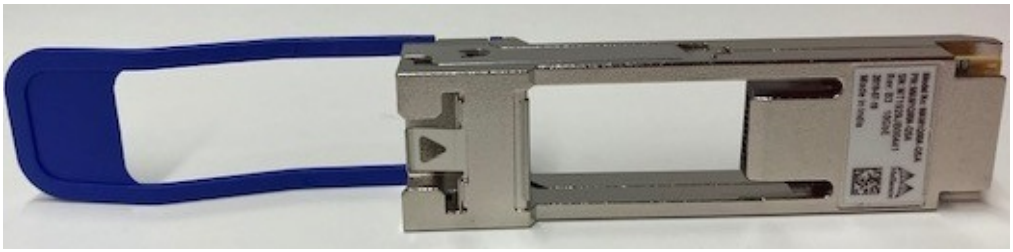
Mounting	• Desk or Enclosure: 48.3 cm (19 in) equipment rack, 1U high
Dimensions (Nominal)	• Height: 4.4 cm (1.7 in) • Width: 44.1 cm (17.36 in) • Depth: 43.2 cm (17.0 in)
Weight (Approximate)	• 6.4 kg (14.1 lb)
Cable Connectors	• Uplink Ports: 1GBase (RJ-45 copper or LC fiber) 10GBase (LC Fiber)
Vibration	• Vibration: IEC 60068-2-64, IEC 60068-2-6 • Shock: IEC 60068-2-27 • Drop: ETSI/EN 300 019 2-2

Regulatory and Safety

Regulatory Compliance, Product Safety	UL Listed, CSA Certified, European Low Voltage Directive 2014/35/EU, CB Scheme, complies with FCC 21 CFR 1030.10, US FDA Approval, AS/NZS RCM Certified
Regulatory Compliance, Electromagnetic Compatibility (EMC)	European EMC Directive 2014/30/EU Complies with FCC Part 15, Subpart B, Class A ICES-003: 2012, Class A
Regulatory Compliance, Environmental	2011/65/EU RoHS Directive

RH102BL Ethernet Managed Switch QSFP to SFP+ Adapter

Figure 5 - 5520-Series Ethernet Managed Switch QSFP to SFP+ Adapter (RH102BL)



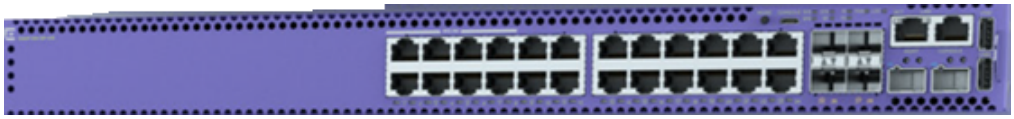
The QSFP to SFP+ Adaptor allows the QSFP ports to adapt to the 10 GbE transceiver modules listed in the 10 Gb SFP+ Module Support Table. The QSFP port must be configured to support this adapter, see *EcoStruxure™ Foxboro™ DCS Switch Configurator Application Software (SCAS) for the Control Network User's Guide* (B0700CA) (Rev AB or later) to configure these ports.

Edge / Distribution: 5420-Series

The 5420-Series is a family of high-performance, feature-rich, stackable edge switches. Available in 24- and 48-port models, the 5420 features both gigabit and multi-gigabit (1/2.5G) versions with up to 90 W PoE, enabling it to be deployed across a range of edge and wiring closet environments.

RH102BM 24-Gigabit 10/100/1000Base-Tx Managed Switch

Figure 6 - 24-Port Tri-Speed 10/100/1000Base-Tx Managed Switch



The 24-Port Tri-Speed 10/100/1000Base-Tx port managed switch (RH102BM) has these features:

- 24 x 10/100/1000Base-Tx “Fixed” (RJ-45) ports. 6 SFP+ port that can be configured as 10 GbE.
- 4 SFP+ (unpopulated ports) ports 25-28, accommodates 10 GbEBase-X GBIC.
- 2 SFP-DD (unpopulated ports) ports 29 and 31, accommodates 10 GbEBase-X GBIC.
- Full-duplex operation.
- High performance, managed layer-2/3 Ethernet switching.
- High performance direct end-station copper connectivity.
- Monitoring and configuration tasks using the local console port.
- Port and VLAN mirroring technology and diagnostics that allows local network traffic to be redirected to an external probe for detailed analysis.
- Complies with industry standards, including IEEE 8023.ae 10 GbE, IEEE 802.3u Fast Ethernet and 802.1w Rapid Spanning Tree Protocol (RSTP).
- Optional internal redundant power supply.
- Shelf, desk, or 19-inch rack mounting.
- 5420-Series switch models come with a fixed power supply, fixed fan(s), and 4 x 1/10 Gb built-in uplink ports, with support for a second optional field-replaceable power supply.

  NOTE: The RH102BM 5420-Series switches do not ship with redundant power supplies. If power redundancy is required, you *must* order a redundant Power supply (RH102BP) separately. The 5420-Series switches ship with one internal power supply.

Functional Specifications

Ethernet Standards Supported	• IEEE 802.1q VLAN support • IEEE 802.1d MAC Bridging (including STP) • Quality of Service (QoS, Priority) IEEE 802.1w Rapid Spanning Tree (RSTP) IEEE 802.3 including: ◦ Fast Ethernet: IEEE 802.3u, 100Base-T (Copper) ◦ Fast Ethernet: 802.3u (CL24/26), 100Base-FX (LC Fiber) ◦ Gigabit Ethernet: IEEE 802.3z, 1000Base-X (Fiber) ◦ Gigabit Ethernet: IEEE 802.3ab, 1000Base-T (Copper) ◦ 10 Gigabit Ethernet: IEEE 802.3az 10GbBase-x
Power	• Internal: AC Input power (auto-sensing) 100-127 @6A or 200-240 @3A VAC, 50 to 60 Hz • External: N/A RH102BM 5420-Series switches do not ship with redundant power supplies. If power redundancy is required, you *must* order a redundant Power supply (RH102BP) separately. • Heat Dissipation: 211 Btu/hr • Power Consumption: 61 Watts

Physical Specifications

Dimensions (Nominal)	• Height: 44 mm (1.7 in) • Width: 442 mm (17.4 in) • Depth: 442 mm (17.4 in)
Weight (Approximate)	• 4.1 kg (9.03 lb)
Cable Connectors	• RJ45 or SFP (LC Fiber). See the switch figure tables for all specific port types.
Vibration	• ASTM D3580 Random Vibration Unpackaged 1.5 G • Operational Random vibration: 3 to 500 Hz at 1.5 G rms • Packaged Vibration: 5 Hz to 20 Hz @ .01 g2/Hz (PSD), 20 to 500 Hz @-3 dB/Octave (PSD) • Packaged Random Vibration: 5 Hz to 62 Hz, 5mm/s velocity, 62 Hz to 500 Hz, 2.0 m/s2, 5 sweeps of each axis (15 total), Sweep Rate = 1 octave/min

Environmental Specifications

	Operating	Storage
Temperature	0° to 50°C (32° to 122°F)	-40° to +70°C (-40° to +158°F)
Relative Humidity	10 to 95% (non-condensing)	10 to 95% (non-condensing).
Altitude	0 to 3,000 meters (9,850 feet)	

RH102BN 24-Gigabit 4 SFP+ Managed Switch

Figure 7 - 24-Gigabit (SFP) 4 SFP+ Managed Switch (RH102BN)

The 24-Gigabit (SFP) 5420-Series managed switch (RH102BN) has these features:

- 24 x 100/1000Base-X (SFP) unpopulated ports. (The SFP ports can be configured as 100Base-FX or 100Base-Tx with the appropriate GBIC transceiver.)
- 4 SFP+ (unpopulated ports) ports 25-28, accommodates 10 GbEBase-X GBIC
- 2 SFP-DD (unpopulated ports) ports 29 and 31 accommodate 10 GbEBase-X GBIC.
- Full-duplex operation.
- High performance, managed layer-2/3 Ethernet switching.
- High performance direct end-station connectivity when utilizing the RH102BK/ P0973JE 100 Mb Fiber or RH102AL Copper SFP modules.
- Monitoring and configuration tasks using the local console port.
- Port and VLAN mirroring technology and diagnostics that allows local network traffic to be redirected to an external probe for detailed analysis.
- Complies with industry standards, including IEEE 8023.ae 10 GbE, IEEE 802.3u Fast Ethernet and 802.1w Rapid Spanning Tree Protocol (RSTP).
- Optional internal redundant power supply.
- 5420-Series switch models come with a fixed power supply, fixed fan(s), and 4 x 1/10 Gb built-in uplink ports, with support for a second optional field-replaceable power supply.

  NOTE: The RH102BN 5420-Series switches do not ship with redundant power supplies. If power redundancy is required, you *must* order a redundant Power supply (RH102BP) separately. The 5420-Series switches ship with one internal power supply.

Functional Specifications

Ethernet Standards Supported	• IEEE 802.1q VLAN support • IEEE 802.1d MAC Bridging (including STP) • Quality of Service (QoS, Priority) IEEE 802.1w Rapid Spanning Tree (RSTP) IEEE 802.3 including: ◦ Fast Ethernet: IEEE 802.3u, 100Base-T (Copper) ◦ Fast Ethernet: 802.3u (CL24/26), 100Base-FX (LC Fiber) ◦ Gigabit Ethernet: IEEE 802.3z, 1000Base-X (Fiber) ◦ Gigabit Ethernet: IEEE 802.3ab, 1000Base-T (Copper) ◦ 10 Gigabit Ethernet: IEEE 802.3az 10GbBase-x
Power	• Internal: AC Input power (auto-sensing) 100-127 @6A or 200-240 @3A VAC, 50 to 60 Hz • External: N/A The RH102BN 5420-Series switches do not ship with redundant power supplies. If power redundancy is required, you *must* order a redundant Power supply (RH102BP) separately. • Heat Dissipation: 388 Btu/Hr • Power Consumption: 61 Watts

Physical Specifications

Mounting	• Desk or Enclosure: 48.3 cm (19 in) equipment rack, 1U high
Dimensions (Nominal)	• Height: 4.4 cm (1.7 in) • Width: 44.2 cm (17.4 in) • Depth: 44.2 cm (17.4 in)
Weight (Approximate)	• 4.12 kg (9.08 lb)
Cable Connectors	• Uplink Ports: 1GBase (RJ-45 copper or LC fiber) 10GBase (LC Fiber)
Vibration	• Vibration: IEC 60068-2-64, IEC 60068-2-6 • Shock: IEC 60068-2-27 • Drop: ETSI/EN 300 019 2-2

Environmental Specifications

	Operating	**Storage**
Temperature	0° to 60°C (32° to 140°F)	-40° to +80°C (-40° to +176°F)
Relative Humidity	10 to 95% (non-condensing)	10 to 95% (non-condensing).
Altitude	0 to 3,000 meters (9,850 feet)	

RH102BP (for RH102BM/N) 150 W AC Power Supply (Redundant Power Only)

The 5420-Series (RH102BM/BN) managed switches power supplies (RH102BP), ordered separately, automatically adjust to the input voltage and frequency, which allows for an input voltage of 100-127V/6A or 200-240V/3A VAC, and a frequency between 50 and 60 Hz. A redundant power supply can be added for power supply redundancy.

Power supplies in the 5420-Series (RH102BM/BN) managed switches are removable, so you can replace then in the field.

If the primary power supply stops working, the RPSM assumes the entire load of the switch without interrupting network traffic. The switch's internal power supply and RPSM each have their own AC power connection, which enables the connection of each power supply to a different AC power circuit for additional AC power source redundancy.

NOTE: The 5420-Series (RH102BM/BN) switches do not ship with redundant power supplies. If power redundance is required, a redundant power supply (RH102BP) *must* be ordered separately. The 5420-Series switches ship with one internal power supply.

RH102BP Power Supply Specifications

RH102BP has an air flow from front to back.

These tables list the specifications for the 150 RH102BP Power Supply Module.

Table 3 - RH102BP RPSM Power Specifications

AC Input Frequency	50-60 Hz (range 47-63 Hz)
AC Input Voltage	100-127/200-240 VAC
Maximum Output Power	150 W

Table 4 - RH102BP RPSM Environmental Specifications

Operating Temperature	-0°C (32°F) to 50°C (122°F)
Storage Temperature	-45°C (-49°F) to 85°C (185°F)
Operating Relative Humidity	10% to 90% operating/95% non-condensing

Table 5 - Power Supply Module (PSM) RH102BP Specifications

Regulatory Compliance, Product Safety	UL Listed, CSA Certified, European Low Voltage Directive 2014/30/EU
Regulatory Compliance, Electromagnetic Compatibility (EMC)	European EMC Directive 2014/30/EU Complies with FCC 47 CFR Parts 2 and 15 CSA Certified C108.8 VCCI Tested AS/NZS Certified

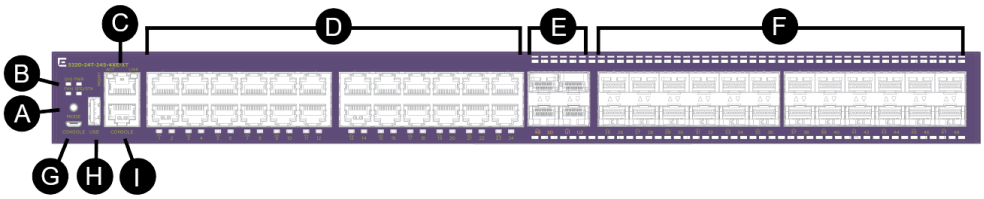
Edge 5320-Series

RH102FN 24-Gigabit 10/100/1000Base-Tx and 24 SFP Managed Switch

The 24-Gigabit RJ45 and 24-Gigabit SFP 5320-Series managed switch (RH102FN) has these features:

- 24 x 100/1000Base-X (SFP) unpopulated ports.
- 24 SFP (unpopulated ports) ports 25-48 accommodate 100Mb/1GbEBase-X GBIC (Use RH102FP for 100Mb). (The SFP ports can be configured as 100Base-FX or 100Base-Tx with the appropriate GBIC transceiver.
- 4 SFP+ (unpopulated ports) ports 49-52, accommodates 1Gb/10GbEBase-X GBIC.
- Full-duplex operation.
- High performance, managed layer-2/3 Ethernet switching.
- High performance direct end-station connectivity when utilizing the RH102FP 100Mb Fiber or RH102AL Copper SFP modules.
- Monitoring and configuration tasks using the local console port.
- Port and VLAN mirroring technology and diagnostics that allow local network traffic to be redirected to an external probe for detailed analysis.
- Complies with industry standards, including IEEE 8023.ae 10 GbE, IEEE 802.3u Fast Ethernet and 802.1w Rapid Spanning Tree Protocol (RSTP).
- Optional internal redundant power supply.
- 5320-Series switch models come with a fixed power supply, fixed fan(s), and 4 x 1/10 Gb SFP+ uplink ports, with support for a second optional (External) field replaceable power supply.

Figure 8 - 5320-24T-24S-4XE-XT Front Panel



A	Mode button
B	System LEDs
C	10/100/1000BASE-T out-of-band management port (RJ-45)
D	24 x 10/100/1000BASE-T (autosensing) full or half duplex MACsec capable ports **NOTE:** The 10/100 ports support half duplex, and the 1000 port supports full duplex. The half duplex is not supported on these ports when operating at 1Gbps.
E	4 x 1/10Gb SFP+ MACsec capable uplink
F	24 x 100Mb/1G SFP ports
G	USB Micro-B console port
H	USB Type-A port
I	Serial console port (RJ-45)

NOTE: The RH102FN 5420-Series switches do not ship with redundant power supplies. If power redundancy is required, you *must* order a redundant Power supply (RH102FQ) separately.

Functional Specifications

Ethernet Standards Supported	• IEEE 802.1q VLAN support • IEEE 802.1d MAC Bridging (including STP) • Quality of Service (QoS, Priority) IEEE 802.1w Rapid Spanning Tree (RSTP) IEEE 802.3 including: ◦ Fast Ethernet: IEEE 802.3u, 100Base-T (Copper) ◦ Fast Ethernet: 802.3u (CL24/26), 100Base-FX (LC Fiber) ◦ Gigabit Ethernet: IEEE 802.3z, 1000Base-X (Fiber) ◦ Gigabit Ethernet: IEEE 802.3ab, 1000Base-T (Copper) ◦ 10 Gigabit Ethernet: IEEE 802.3az 10GbBase-x
Power	• Internal: AC Input power (auto-sensing) 100-127 @6A or 200-240 @3A VAC, 50 to 60 Hz • External: N/A RH102FN 5420-Series switches do not ship with redundant power supplies. If power redundancy is required, you *must* order a redundant Power supply (RH102BP) separately. • Heat Dissipation: 328 Btu/hr • Power Consumption: 61 Watts

Physical Specifications

Dimensions (Nominal)	• Height: 44 mm (1.7 in) • Width: 441 mm (17.4 in) • Depth: 454 mm (17.9 in)
Weight (Approximate)	• 4.0 kg (8.8 lb)
Mounting	• Desk or Enclosure: 48.3 cm (19 in) equipment rack, 1U high
Cable Connectors	• Uplink Ports: ◦ 1GBase (RJ-45 copper or LC fiber) ◦ 10GBase (LC Fiber) • Device connectivity: ◦ 24 port Fixed 100/1000Mb RJ-45 ◦ 24 port SFP 100Mb or 1Gb MGBIC
Vibration	• IEC 60068-2-64, IEC 60068-2-6 • Shock: IEC 60068-2-27 • Drop: ETSI/EN 300 019 2-2

Environmental Specifications

	Operating	**Storage**
Temperature	0° to 50°C (32° to 122°F)	-40° to +70°C (-40° to +158°F)
Relative Humidity	10 to 95% (non-condensing)	10 to 95% (non-condensing).
Altitude	0 to 3,000 meters (9,850 feet)	

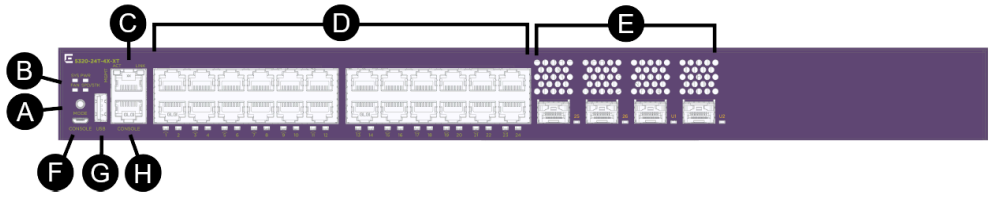
RH102FM 24-Gigabit 10/100/1000Base-Tx Managed Switch

The 24-Port Tri-Speed 10/100/1000Base-Tx port managed switch (RH102FM) has these features:

- 24 x 10/100/1000Base-Tx "Fixed" (RJ-45) ports.
- 4 SFP+ (unpopulated ports) ports 25-28, accommodates 10 GbEBase-X GBIC.
- Full-duplex operation.
- High performance, managed layer-2/3 Ethernet switching.
- High performance direct end-station copper connectivity.
- Monitoring and configuration tasks using the local console port.
- Port and VLAN mirroring technology and diagnostics that allow local network traffic to be redirected to an external probe for detailed analysis.
- Complies with industry standards, including IEEE 8023.ae 10 GbE, IEEE 802.3u Fast Ethernet and 802.1w Rapid Spanning Tree Protocol (RSTP).
- Optional internal redundant power supply.
- Shelf, desk, or 19-inch rack mounting.

- 5320-Series switch models come with a fixed power supply, fixed fan(s), and 4 x 1/10 Gb SFP+ uplink ports, with support for a second (External) optional field replaceable power supply.

Figure 9 - 5320-24T-4X-XT Front Panel



A	Mode button
B	System LEDs
C	10/100/1000BASE-T out-of-band management port (RJ-45)
D	24 x 10/100/1000BASE-T (autosensing) full or half duplex ports (not MACsec capable) **NOTE:** The 10/100 ports support half duplex, and the 1000 port supports full duplex. The half duplex is not supported on these ports when operating at 1Gbps.
E	4 x 1/10Gb SFP+ uplink (not MACsec capable)
F	USB Micro-B console port
G	USB Type-A port
H	Serial console port (RJ-45)

NOTE:

The RH102FM 5320-Series switches do not ship with redundant power supplies. If power redundancy is required, you *must* order a redundant Power supply (RH102FQ) separately.

Functional Specifications

Ethernet Standards Supported	• IEEE 802.1q VLAN support • IEEE 802.1d MAC Bridging (including STP) • Quality of Service (QoS, Priority) IEEE 802.1w Rapid Spanning Tree (RSTP) IEEE 802.3 including: ◦ Fast Ethernet: IEEE 802.3u, 100Base-T (Copper) ◦ Fast Ethernet: 802.3u (CL24/26), 100Base-FX (LC Fiber) ◦ Gigabit Ethernet: IEEE 802.3z, 1000Base-X (Fiber) ◦ Gigabit Ethernet: IEEE 802.3ab, 1000Base-T (Copper) ◦ 10 Gigabit Ethernet: IEEE 802.3az 10GbBase-x
Power	• Internal: AC Input power (auto-sensing) 100-127 @6A or 200-240 @3A VAC, 50 to 60 Hz • External: N/A RH102BM 5420-Series switches do not ship with redundant power supplies. If power redundancy is required, you *must* order a redundant Power supply (RH102FQ) separately. • Heat Dissipation: 211 Btu/hr • Power Consumption: 61 Watts

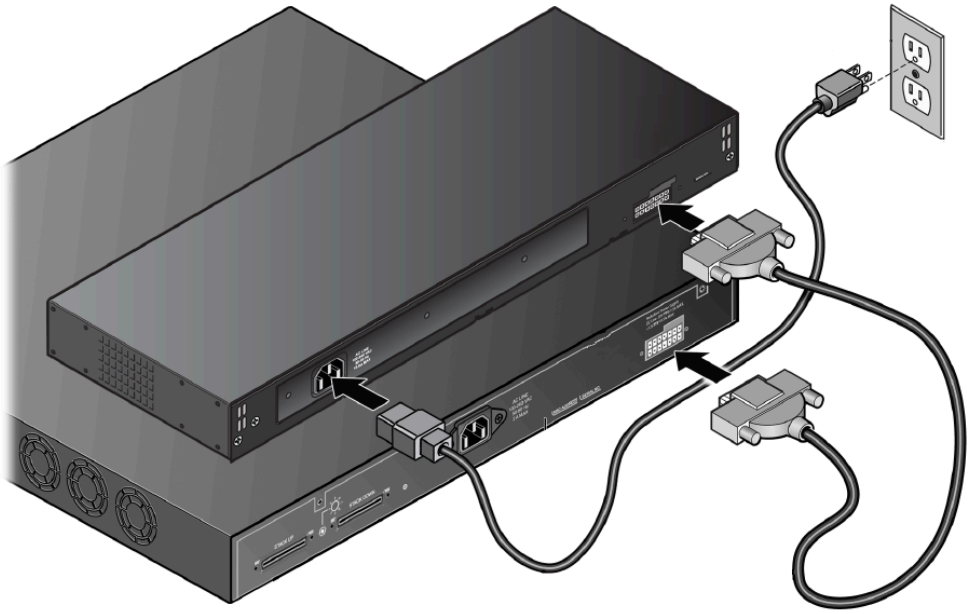
Physical Specifications

Dimensions (Nominal)	• Height: 44 mm (1.7 in) • Width: 441 mm (17.4 in) • Depth: 454 mm (17.9 in)
Weight (Approximate)	• 3.2 kg (7 lb)
Mounting	• Desk or Enclosure: 48.3 cm (19 in) equipment rack, 1U high
Cable Connectors	• Uplink Ports: ◦ 1GBase (RJ-45 copper or LC fiber) ◦ 10GBase (LC Fiber) • Device connectivity: ◦ Fixed 100/1000Mb RJ-45
Vibration	• IEC 60068-2-64, IEC 60068-2-6 • Shock: IEC 60068-2-27 • Drop: ETSI/EN 300 019 2-2

Environmental Specifications

	Operating	Storage
Temperature	0° to 60°C (32° to 140°F)	-40° to +70°C (-40° to +158°F)
Relative Humidity	10 to 95% (non-condensing)	10 to 95% (non-condensing).
Altitude	0 to 3,000 meters (9,850 feet)	

RH102FQ (for RH102FM/N) 150 W AC Power Supply (Redundant Power Only)



The 5320-Series (RH102FM/FN) managed switches external power supplies (RH102FQ), ordered separately, automatically adjust to the input voltage and frequency, which allows for an input voltage of 100-127V/6A or 200-240V/3A VAC, and a frequency between 50 and 60 Hz. You can add a redundant power supply for power supply redundancy. If the primary power supply stops working, the RPSM assumes the entire load of the switch without interrupting network traffic. The switch's internal power supply and RPSM each have their own AC power connection, which enables the connection of each power supply to a different AC power circuit for additional AC power source redundancy.

NOTE:

The 5320-Series (RH102FM/FN) switches do not ship with redundant power supplies. If power redundancy is required, a redundant power supply (RH102FQ) *must* be ordered separately. The 5320-Series switches ship with one internal power supply.

RH102FQ Power Supply Specifications

RH102FQ has an air flow from front to back. These tables list the specifications for the 150 RH102FQ External Power Supply Module.

For more information, see *EcoStruxure™ Foxboro™ DCS 5420/5320-Series Switches for the Control Network Installation and Configuration Guide* (B0700XA).

Table 6 - RH102FQ RPSM Power Specifications

AC Input Frequency	50-60 Hz (range 47-63 Hz)
AC Input Voltage	100-127/200-240 VAC
Maximum Output Power	150 W

Table 7 - RH102FQ RPSM Environmental Specifications

Operating Temperature	-0°C (32°F) to 50°C (122°F)
Storage Temperature	-45°C (-49°F) to 85°C (185°F)
Operating Relative Humidity	10% to 90% operating/95% non-condensing

Table 8 - Power Supply Module (PSM) RH102FQ Specifications

Regulatory Compliance, Product Safety	UL Listed, CSA Certified, European Low Voltage Directive 2014/30/EU
Regulatory Compliance, Electromagnetic Compatibility (EMC)	European EMC Directive 2014/30/EU Complies with FCC 47 CFR Parts 2 and 15 CSA Certified C108.8 VCCI Tested AS/NZS Certified

Table 9 - RH102FQ RPS-150XT Power Supply Physical Specifications

Dimensions	4.1 H x 15.4 W x 30.0 D (cm) 1.61 H x 6.1 W x 11.8 D (in)
Weight (unit only)	15 kg (3.3 lb)
Weight (unit and packaging)	Approximately 3 kg (6.6 lb)

Edge: Industrial GREYHOUND

- The Industrial-Series Ethernet switches have a maximum operating temperature range of -40º C (-40º F) to +70º C (158º F).
- They have been tested and qualified by Foxboro for use with the DCS Control Network and other Foxboro DCS products:
  - GRS1030-8T8Z managed switch 16 port, with eight (8) ports of dual-speed 10/100Base-Tx copper ports, eight (8) ports SFP 100Base-X, and four (4) SFP Gigabit Ethernet Combo ports, with two for Inter Switch Links (ISL) and two for 1 G device ports (Servers), for a total of 20 active ports.
  - GRS1030-16T9 managed switch 16 port dual-speed 10/100Base-Tx copper ports and four (4) SFP Gigabit Ethernet Combo ports, with two for Inter Switch Links (ISL) and two for 1 G device ports (Servers), for a total of 20 active ports.

The Industrial-Series switches are meant to be used in:

- Inverted tree and modified inverted tree for small-, medium-, or large-sized networks, as discussed in the introduction of *EcoStruxure™ Foxboro™ DCS Control Network Architecture Guide* (B0700AZ).
- Locations at the edge only, as discussed in the introduction of *EcoStruxure™ Foxboro™ DCS Control Network Architecture Guide* (B0700AZ).

NOTE: The Industrial-Series switches are shipped with AC or DC power supplies or one of each.

- If the primary power supply is DC, then the backup power supply must be DC.
- If the primary power supply is AC, then the backup power supply can be either AC or DC.

The type of feed (AC or DC) must be the same for the primary and backup power supply on each switch. Power supply types must be configured separately via the product code.

GRM20 Fast Ethernet Media Module

There are options of choosing various media to connect to the end devices and other network components:

- Multi-mode F/O
- Twisted pair cable

The different interfaces of the media modules provide you with these functions:

- Specific functions of the TP/TX interface
- Auto Polarity Exchange
- Auto-crossing (device might be connected with a crossed-over or an uncrossed cable)
- 8 x (100 MB) ports in total:
  - 4x FE SFP ports with 4x FE/RJ-45 (as shown)
  - 8x FE SFP ports
  - 8x FE/RJ-45 ports

- Power supply via switch
- Available supported temperature ranges:
  - 0° to 60° C (32° to 140° F)
  - –40° to 70° C (–40° to 158° F)
  - –40° to 70° C (–40° to 158° F) conformal coated

GRS-1030 16T9 Industrial Managed Fast, Gigabit Managed Switch

Industrial managed Fast, Gigabit Ethernet Switch, 19-inch rack mount, fanless design according to IEEE 802.3, Store-and-Forward-Switching:

- Ports in total up to 20 x 4 Fast Ethernet, Gigabit Ethernet Combo ports; Basic unit: Four Gigabit Ethernet Combo ports and 16 FE (Copper) ports, expandable with media module with eight FE (SFP/Copper) ports
- Full-duplex operation
- High performance, managed layer-2 Ethernet switching
- Monitoring and configuration tasks using the local console port or any SNMP/ RMON based management application
- Complies with industry standards, including IEEE 802.3u Fast Ethernet and 802.1w Rapid Spanning Tree Protocol (RSTP)
- Configure an internal redundant power supply:
  - Power Supply 1: 110 – 250 VDC (88 V – 288 VDC) and 110 – 240 VAC (88 V – 276 VAC)
  - DC Power Supply 2: 24 – 48 VDC (16.8 – 60 VDC)
- Shelf, desk, or 19-inch rack mounting
- Available supported temperature ranges:
  - 0° to 60° C (32° to 140° F)
  - –40° to 70° C (–40° to 158° F)
  - –40° to 70° C (–40° to 158° F) conformal coated
- Available certifications for switches:
  - CE, FCC, EN61131, EN60950
  - CE, FCC, EN61131, EN60950, DNV, cUL60950
  - CE, FCC, EN61131, EN60950, DNV, cUL60950, ISA 12. 12, DNV
  - CE, FCC, EN61131, EN60950, DNV
  - CE, FCC, EN61131, EN60950, cUL60950

GRS-1030 8T8Z Industrial Managed Fast, Gigabit Managed Switch

Industrial managed Fast, Gigabit Ethernet Switch, 19" rack mount, fan-less design according to IEEE 802.3, Store-and-Forward-Switching:

- Ports in total up to 20 x 4 Fast Ethernet, Gigabit Ethernet Combo ports; Basic unit: Four (4) Gigabit Ethernet Combo ports and 16 FE (SFP/Copper) ports, expandable with media module with eight (8) FE (SFP/Copper) ports
- Full-duplex operation
- High performance, managed layer-2 Ethernet switching
- Monitoring and configuration tasks using the local console port or any SNMP/ RMON based management application
- Complies with industry standards, IEEE 802.3u Fast Ethernet, and 802.1w Rapid Spanning Tree Protocol (RSTP)
- Configure an internal redundant power supply:
  - Power Supply 1: 110 – 250 VDC (88 V – 288 VDC) and 110 – 240 VAC (88 V – 276 VAC)
  - DC Power Supply 2: 24 – 48 VDC (16.8 – 60 VDC)
- Shelf, desk, or 19-inch rack mounting
- Available supported temperature ranges:
  - 0° to 60° C (32° to 140° F)
  - –40° to 70° C (–40° to 158° F)
  - –40° to 70° C (–40° to 158° F) conformal coated
- Available certifications for switches:
  - CE, FCC, EN61131, EN60950
  - CE, FCC, EN61131, EN60950, DNV, cUL60950
  - CE, FCC, EN61131, EN60950, DNV, cUL60950, ISA 12. 12, DNV
  - CE, FCC, EN61131, EN60950, DNV
  - CE, FCC, EN61131, EN60950, cUL60950

GBICS

GBICs convert serial electrical signals to serial optical signals and vice versa. GBIC modules are hot swappable and contain ID and system information for the switch.

GBICs: General Use

- RH102AL: 100 m (328 ft) RJ-45 MGBIC Uplink module (TX) 10/100/1000Base-T
- RH102BK/P0973JE: 100Base-FX 2 km (1.24 mi) MGBIC device module LC (1310 N-m)
- RH102BQ: 10 Gb SR SFP+ module 300 m (984 ft) MMF 850 N-m
- RH102BR: 10 Gb LR SFP+ module 10 km (6.2 mi) SMF
- RH102BS: 10 Gb LRM SFP+ module 220 m (656 ft) MMF, 300 m (984 ft) SMF
- RH102BT: 10 Gb ZR SFP+ module 80 km (49.7 mi) SMF
- RH102HF: Bi-directional MGBIC Kit containing both Downlink and Uplink 10K MGBIC
- RH102HG: Bi-directional Uplink 40K MGBIC module BX (1310 N-m)
- RH102HH: Bi-directional Downlink 40K MGBIC module BX (1490 N-m)
- RH102HJ: Bi-directional Uplink 120K MGBIC module BX (1490 N-m)
- RH102HK: Bi-directional Downlink 120K MGBIC module BX (1590 N-m)

GBICs: Industrial

You can use these switches with all switch types. They are required to be used with the GRS-1030 GREYHOUND switches.

- RH102HA: 100Base-FX 2 km (1.24 mi) Transceiver device module LC (1310 N-m)
- RH102HB: 1000Base-LX, 550 m (1804 ft) 50/125 µm MMF, 550 m (1804 ft) 62.5/125 µm MMF, 10 km (6.2 mi) 9/125 µm SMF
- RH102HC: 275 m (902 ft) MGBIC module LC (SX) 850 N-m 1000Base-SX
- RH102HD: 80 km (49.7 mi) Transceiver module LC (ZX) 1550 N-m
- RH102HF: 1 Gb Bi-directional Transceiver Kit containing both downlink and uplink 10K MGBIC
- RH102HG: 1 Gb Bi-directional Transceiver Downlink and Uplink 40K MGBIC
- RH102HH: 1 Gb Bi-directional Transceiver Downlink and Uplink 40K MGBIC
- RH102HJ: 1 Gb Bi-directional Transceiver Downlink and Uplink 120K MGBIC
- RH102HK: 1 Gb Bi-directional Transceiver Downlink and Uplink 120K MGBIC

Mini-GBIC SFP Connector Modules for Each Switch Type

Switch Type Supported	Mini-GBIC SFP Connector Modules	
	Description	**Foxboro Part No.** **For more information, see Link Power Budget for Fiber Optic Mini-GBIC Modules table, page 39 to determine the maximum range for each device and application.**
All switch types that support SFP and SFP+ ports	SFP MMF module 1000Base-SX with LC connector, multi-mode fiber transmitting frequency @ 850 N-m	RH102AG: LC connector, Multi-mode Fiber Distance: • 275 meters with OMF1 MMF fiber • 550 meters with OM4 fiber
	SFP SMF module 1000Base-LX with LC connector, single-mode Fiber transmitting frequency @ 1310 N-m	RH102AH: LC connector, Single-mode Fiber Distance: • 10K meters with SMF OS1 fiber cables
	SFP MMF module 1000Base-LX/LH with LC connector, multi-mode Fiber transmitting frequency @ 1300 N-m	P0972YQ: LC connector, Multi-mode Fiber Distance: • 2K meters with OM1 fiber cable • 1K meters with OM4 fiber cable
	SFP SMF module 1000Base-ZX with LC connector, single-mode Fiber transmitting frequency @ 1310 N-m	RH102AJ: LC connector, Single-mode Fiber Distance: • 80K meters with OS1 fiber cable
	SFP S-SMF module 1000Base-BX with LC connector, bi-directional Simplex single-mode fiber transmitting frequency @ 1310 N-m/ 1490 N-m downlink/uplink Mini-GBIC Kit: Includes both Uplink and Downlink modules	RH102HF[a]: LC connector, Bi-directional Simplex Single-mode Fiber Distance: • 10K meters with Simplex-SM F
	SFP S-SMF module 1000Base-BX with LC connector, bi-directional simplex-single-mode fiber transmitting frequency @ 1310 N-m/ 1490 N-m downlink/uplink	RH102HG/HH[b]: LC connector, Bi-directional Simplex Single-mode Fiber Distance: • 40K meters with Simplex-SM F
	SFP S-SMF module 1000Base-BX with LC connector, bi-directional simplex single-mode fiber transmitting frequency @ 1310 N-m/ 1490 N-m downlink/uplink	RH102HJ/HK[c]: LC connector, Bi-directional Simplex Single-mode Fiber Distance: • 120K meters with Simplex-SM F

Switch Type Supported	Mini-GBIC SFP Connector Modules	
	Description	**Foxboro Part No.** **For more information, see Link Power Budget for Fiber Optic Mini-GBIC Modules table, page 39 to determine the maximum range for each device and application.**
	SFP+ 10GBase-SR with LC connectors	RH102BQ: LC connectorDistance: • 300 meters with OM4 fiber cable
	SFP+ 10GBase-LR with LC connectors	RH102BR: LC connector Distance: • 10K meters with OM1 SMF fiber cable
	SFP+ 10GBase-LRM with LC connectors	RH102BS: LC connector Distance: • 220 meters with OM4 MMF fiber cable • 300 meters with OS1 SMF fiber cable
	SFP+ 10GBase-ZR with LC connectors	RH102BT: LC connector Distance: • 80K meters with OM1 SMF fiber cable
1000Base-T is supported on all switch types that support SFP and SFP+ ports	SFP module 100/1000Base-T with RJ-45 connectors	RH102AL: RJ-45 connector, copper Distance: • 100 meters with CAT6 cable
100Base-T is supported on X-Series switches and only SFP ports (no SFP+ ports)		
100Base-LX supports SFP ports (no SFP+ ports)	SFP MMF module 100Base-LX with LC connector, Multi-mode Fiber transmitting frequency @ 1310 N-m	RH102BK / RH102HA: LC connector Multi-mode Fiber Distance: • 2K meters with OM1 MMF fiber cable
(a) Kit RH102HF is comprised of two Mini-GBICs that transmit “downstream” (from the core of the network to the edge) using the 1490 N-m wavelength, and the “edge” transmits “upstream” using the 1310 N-m wavelength. (b) RH102HG/HH (40 km (25 mi)). RH102HG transmits “downstream” (from the core of the network to the edge) using the 1490 N-m wavelength, and the “edge”. RH102HH transmits “upstream” using the 1310 N-m wavelength over Simplex Single-mode Fiber (S-SMF). (c) RH102HJ/HK (120 km (124 mi)). RH102HJ transmits “downstream” (from the core of the network to the edge) using the 1590 N-m wavelength, and the “edge” RH102HK transmits “upstream” using the 1490 N-m wavelength over Simplex Single-mode Fiber (S-SMF) at a minimum distance of 30 km (19 mi).		

Operating Range for Mini-GBIC Uplink Connector Modules

Link Power Budget

The maximum drive distance depends on the quality of the installed single-mode and multi-mode fiber-optic cable segment. In association with your cable attenuation, use the link power budget to calculate the maximum cable length of the attached segment. The link power budget must not be exceeded.

The Link Power Budget for Fiber Optic Mini-GBIC Modules table, page 39 lists the operating ranges for the Mini-GBIC connector modules that can be used with the Control Network switches. For more information, see the Mini-GBIC SFP Connector Modules for Each Switch Type table, page 37 for the Mini-GBIC modules which can be used with each switch type.

Link Power Budget for Fiber Optic Mini-GBIC Modules[a]

Product Part Number	Cable Type	Tx/Rx Wavelength	MHz/km	Range	
				Min. (Meters)	Max. (Meters)
P0972WT	62.5µm	850	160	2	220
	62.5µm		200	2	275
	50µm		400	2	500
	50µm		500	2	550
P0972YQ	62.5µm	1310	160	2	2000
	50µm		400	2	1000
RH102AH / RH102HB	9-10µm	1310	—	—	10000
RH102AJ / RH102HD[b]	9-10µm	1550	—	—	80000
RH102HF[c]	9µm	1490/1310	—	—	10000
RH102HG[c]	9µm	1310/1490	—	5000	40000
RH102HH[c]	9µm	1490/1310	—	5000	40000
RH102HJ[c]	9µm	1490/1590	—	30000	120000
RH102HK[c]	9µm	1590/1490	—	30000	120000
RH102BQ	62.5µm	850	160	-	26
	62.5µm	850	200	-	33
	50 µm	850	400	-	66
	50 µm	850	500	-	82
	50 µm	850	2000	-	300
RH102BR	9-10 µm	1310	-	-	10000
RH102BS	62.5µm	1260	-	-	220
	9-10 µm	1355	-	-	300
RH102BT	9-10 µm	1550	-	2000	80000

Product Part Number	Cable Type	Tx/Rx Wavelength	MHz/km	Range	
				Min. (Meters)	Max. (Meters)
RH102BK/ P0973JE	62.5µm	1310	160 µm	2	2000

(a) Transmission distances are provided as a nominal guide only. For more information, see the optical specifications and the specific characteristics of your fiber installation to determine targeted distances.

(b) Do not use the RH102AJ/HD MGBIC over distances less than 8 km (5.0 mi).

(c) RH102HF/HG/HH/HJ/HK are bidirectional Mini-GBICs. Both upstream and downstream switches transmit on the same fiber but at different frequencies. When ordering these Mini-GBICs, you must acquire a matching pair, one of each type. For a matching pair, order kits RH102HF (10 km (6.2 mi)).

(d) This Mini-GBIC (RH102BK/RH102HA) are not to be used as an uplink (ISL) port. This Mini-GBIC has been qualified to be used for an end device (CP, ATS, FCM, workstation, and so on) 100 Mb switch port.

NOTE:

- 62.5µm = OM1
- 50µm = OM4
- 9–10µm = OS1

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

PSS 41H-7NWEQUIP, Rev L