Foxboro™ DCS

Model H94 Server for Windows Operating Systems

PSS 41H-4H94

Product Specification

January 2025

https://www.se.com

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.

The Schneider Electric brand and any trademarks of Schneider Electric SE and its subsidiaries referred to in this document are the property of Schneider Electric SE or its subsidiaries. All other brands may be trademarks of their respective owner.

Schneider Electric does not grant any right or license for commercial use of the document or its content, except for a non-exclusive and personal license to consult it on an "as is" basis.

Schneider Electric reserves the right to make changes or updates with respect to or in the content of this document or the format thereof, at any time without notice.

To the extent permitted by applicable law, no responsibility or liability is assumed by Schneider Electric and its subsidiaries for any errors or omissions in the informational content of this document, as well as any non-intended use or misuse of the content thereof.

Overview

Demand for increased software capability requires increases in processing power, storage, and connectivity to peripherals. Server class computers provide these capabilities in standard rack enclosures. This greatly concentrated capability reduces the volume needed and permits both physical and cybersecurity measures to be effectively put into practice.

As a multipurpose server running the Microsoft Windows Server® 2022 operating system, the Model H94 Foxboro DCS server supports hosting Foxboro DCS Control Core Services (Control Core Services) or Foxboro DCS Control Software (Control Software) workstations, historian, domain controller function, data acquisition, and processing related to a broad range of applications, file serving capabilities, and the display of graphics and text. It also interfaces with corporate communication networks.

These servers support a USB mouse, an optional USB speaker set, an alphanumeric keyboard, up to four USB annunciator keyboards including one optional annunciator keyboard with numeric keyboard, plus up to four video monitors.

The H94 can be configured with either 1 or 2 Intel Xeon® processors. The 600 GB drives allow a maximum hard drive capacity of 4.8 TB. Alternatively, Serial Attached SCSI (SAS) Hard Disks or Solid State Disks are preconfigured as a system disk, expansion disks, or RAID1 or RAID5 hard drive arrays. Client/server communications are accomplished using the TCP/IP networking protocol.

NOTE: This cover image represents a fully configured server and might show configuration options (for example, hard disks or PCI cards) that are not part of an actual product order.

Features

- A premium level system with high-end processor speed, 32 GB of base memory, up to eight internal hard drives configurable as a Redundant Array of Independent Disks (RAID) with optional hot swappable spare drives, and redundant hot swappable power supplies
- The ability to host control stations and/or support data acquisition and monitoring functions
- Serves as a Control Core Services software or Control Software application platform and a human interface station
- The ability to support viewing Foxboro DCS applications from remote client stations over local area networks (LANs)
- The latest version of Veritas System Recovery software is included with each new Gen11 Server when purchased as part of the model code. This software is **not** available to be ordered as a standalone part and cannot be purchased separately from Schneider Electric.

NOTICE
POTENTIAL LACK OF RECOVERY SOFTWARE If you do not purchase a Gen11 server with Veritas System Recovery software included, you will be unable to purchase it later. **Failure to follow these instructions can result in lack of recovery software.**

Network Connections

The Model H94 servers are connected to the Foxboro DCS Control Network (the Control Network) through dual Ethernet PCIe cards. It can also be simultaneously connected to one or more generic Ethernet based information networks via the four integrated Ethernet ports. Standard security practices should be followed when this is done.

Server Security

H94 Foxboro DCS servers support optional product features to allow customers to meet plant compliance for enhanced workstation security. Plant requirements for enhanced security can be met through a combination of new product security enhancements as well as current best practices, policies, and procedures.

Foxboro DCS server enhanced product security requirements are supported in two broad categories, namely, server software including passwords and server platform hardening.

Server software:

- Changeable login passwords
- Individual user passwords
- Password lock-out after a user-configurable number of unsuccessful login attempts and secured mechanisms to reset login
- Password aging that requires password change on a periodic basis
- Password support of alphanumeric and symbol characters as per Microsoft conventions
- Password file protection
- User accounts and firewalls for Microsoft Server 2022 managed from a central location through Microsoft Domains and Active Directory
- User account creation, deletion, and modifications tracking
- User logon/ logoff tracking
- Least privilege file and account access
- Necessary system services running in non-admin accounts where possible
- Security patches from software suppliers, including Microsoft, are supported, plus patch status reporting
- Security by Local Group Policies to provide a layer of protection
- Enhanced security by Secure Boot feature
- Trellix Endpoint Security provides additional security enhancement features to help complement the security features already built into our products. For stations operating in Local Edition mode, Trellix Endpoint Security (ENS) provides advanced Threat Prevention. For stations operating in Enterprise Edition mode, Trellix ePolicy Orchestrator (ePO) provides all the security of ENS plus Rogue System Detection, Application and Change Control (TACC), and Device Control for Data Loss Prevention (DLP). The license entitlement for the first five years after purchase for all of the listed options is included for the H94 server. After the five years, a renewal is required with the purchase of the Trellix five year license (J0202AS) for each H94 server using any Trellix products.

Foxboro DCS server operating system hardening:

- Unnecessary services, software, and programs removed
- Unneeded software ports disabled

- Documentation on how to re-enable services and ports where required by special circumstances
- Security-related BIOS changes

The H94 Server ships with standard Microsoft® security software.

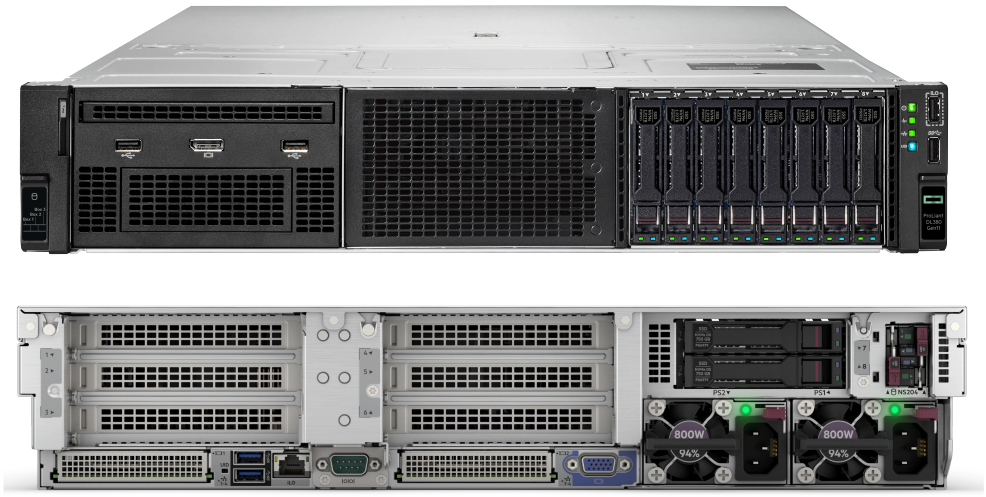
Installation Considerations

These new security enhancements are supported on Windows Server 2022 stations which support the Control Network and require a software update to the latest Foxboro DCS software release. The security enhancements can be deployed on a subset of servers to help increase security, but in order to maximize security protection, all workstations need to be updated to the latest software release to obtain the full benefits.

Current applications, such as Control HMI, can require logon using a Microsoft Domain Controller. A Foxboro DCS Server in the system as the Primary Domain Controller runs standard Microsoft domain services. A Secondary Domain Controller is recommended as a back-up, but not strictly required. The Foxboro DCS Control Core Services Enterprise Edition installation creates Schneider Electric specific Organizational Units, Security Groups, and Group Policies (see *EcoStruxure™ Foxboro™ DCS Security Implementation Guide* (B0700HM) or *EcoStruxure™ Foxboro™ DCS Security for Windows 10 21H2 LTSC and Windows Server 2022 Implementation Guide* (B0700WX)). Customization of the Domain Server configuration requires Microsoft knowledgeable personnel.

The Primary and Secondary Domain Controller servers are installed as Foxboro DCS servers. However, they must be dedicated to their domain controller tasks, and must not be used to run Foxboro DCS applications, or Remote Desktop Services. An exception to this rule is the Trellix ePolicy Orchestrator® which is allowed to execute on one of the Domain Controllers. Domain Controllers are key resources since they provide user authentication and security policy enforcement for all the workstations in the domain.

Model H94 Base Configuration



NOTE: This image represents a fully configured server and might show configuration options (for example, hard disks or PCI cards) that are not part of an actual product order.

The default configuration of the Model H94 server includes:

- Intel Xeon Silver 4510 Processor
  - HPE DL380 Gen11 Intel Xeon-Silver 4510 (2.4 GHz/12-core/150W) Processor Kit (P/N RH103HJ) is available for a field upgrade/expansion to a second processor.
  - Additional HPE 32 GB (2x16GB) Single Rank x8 DDR5-5600 Registered Memory (P/N RH103HH) is needed in the second CPU memory slot with the second processor.
- Preconfigured and installed Microsoft Windows Server 2022 operating system, 64-bit package

  NOTE: The Windows Server 2022 license does not include Client Access Licenses (CALs). These can be purchased separately.
- Latest version of Veritas System Recovery Software (if configured in the model code)
- 32 GB DDR-5 Registered Memory
- One internal 600 GB hard drive
- Internal SATA CD-RW/DVD drive
- Quad mini-DP 1.4 port PCIe graphics card with adapters to standard display port, up to 4 x 1920x1080 (Full HD) pixel resolution
- 4 Integrated 10/100/1000BaseT Ethernet ports
- Mouse (USB)
- Keyboard (USB)
- Redundant hot swappable power supplies
- Two rear USB ports and VGA analog video port
- Three front USB ports and one DisplayPort
- Mounting rail kit

Model H94 Options

The Model H94 server offers these options:

- Expandable to 384 GB of system RAM

> **NOTICE**
>
> **POTENTIAL PERFORMANCE DEGRADATION**
>
> Do not install a total memory configuration of either 10 or 20 DIMMs in the H94 server. A memory imbalance will occur as these two configurations are not supported and will degrade the performance of the server.
>
> Supported memory configurations are listed in *EcoStruxure™ Foxboro™ DCS Model H94 (HPE DL380 Gen11) Server for Windows Server 2022 User's Guide* (B0700JD).
>
> **Failure to follow these instructions can result in performance degradation.**

- Expandable up to eight 600 GB hard drives or up to eight 800 GB solid state hard drives (SSD)
- Ethernet adapter cards (copper or fiber)
- GPS Time Synchronization card
- RAID1 or RAID5 internal hard drive arrays with optional hot spare drives
- Up to four USB annunciator keyboards
- A Human Interface up to 550 m (1804 ft) on 50/125 micrometer multi-mode cable, up to 5 km (3.1 mi.) with 9/125 micrometer single mode cable extension unit (RGU) servicing these devices:
  - Up to four video monitors
  - Up to six USB devices

Windows Server Client Access License (CAL)

All CALs must be purchased separately from your server.

P/N	CAL Type	Amount
J0202AT	Microsoft Windows Server 2016 Device	5
J0202AU	Microsoft Windows Server 2016 User	5
J0202DJ	Microsoft Windows Server 2016 Device	1
J0202DK	Microsoft Windows Server 2016 User	1
J0202DZ	Microsoft Windows Server 2022 Device	5
J0202EA	Microsoft Windows Server 2022 User	5
J0202ED	Microsoft Windows Server 2022 Device	1
J0202EE	Microsoft Windows Server 2022 User	1

Server CALs are a paper license only and do not require activation.

Mounting Options

NOTICE
POTENTIAL EQUIPMENT DAMAGE Do not mount the H94 in a standard single depth rack enclosure. Enclosures must accommodate a depth of at least 39.4 in (1000 mm) to allow space for air flow at the front and back of the unit, plus cables at the back of the unit. **Failure to follow these instructions can result in equipment damage.**

The Model H94 rack mount server can be placed in commercially available enclosures that have provisions for adequate ventilation and cooling to help ensure the ambient temperature inside the enclosure does not exceed 95°F (35°C). The Model H94 server is a 2U high, rack mount server which offers rail mounting as standard equipment.

The Model H94 servers can be located up to 100 ft (30.5 m) from the monitor using direct connect, analog video, and other human interface cables available from Foxboro.

> **NOTE:** This video connection will only operate when the Foxboro P/N P0924DF (100 ft VGA cable) is used in conjunction with RH103ER Mini Displayport to VGA adapter.

Two optional Remote Graphics Unit (RGU) offerings are provided for each server to enable video devices to be located at a distance from the workstation or server. For more information, see Remote Graphics Unit For H94 Servers Overview, page 13.

Devices that can be remote mounted via the RGU include monitors, the keyboard and mouse (or trackball) and audio via USB speakers.

As indicated by the CE logo, the Model H94 server conforms to the applicable European Union Directives.

Functional Specifications

Processor Type	Intel Xeon
Memory	32 GB DDR4 Registered Memory
Devices Served	SAS Peripherals • One internal system disk drive, up to eight optional internal expansion disk drives Controller Peripherals • One SATA CD-RW/DVD drive Video Displays (Up to 4) • 23-inch LCD USB Touchscreen Monitor • 24-inch LCD Monitor Interfaces to External Devices (USB) • Mouse • Alphanumeric Keyboard • Up to four USB annunciator keyboards via an optional USB hub, local (up to 1.8 m (6 ft)) or up to 30.5 m (100 ft) away. For these extended connections, see the USB extension kits in *EcoStruxure™ Foxboro™ DCS Annunciator Keyboard* (PSS 41H-4USBKBD). • Audio Speakers Time Synchronization • Optional GPS Time Synchronization card provides GPS support. See *EcoStruxure™ Foxboro™ DCS Time Synchronization Overview* (PSS 41S-1TIME).
Internal Diagnostics	Self-checking performed at power-up
Video	Output Type • Quad mini-DP 1.4 port PCIe graphics card with adapters to standard display port, up to 4 x 1920x1080 (Full HD) pixel resolution Remote Graphics Unit (optional) supports dual or quad analog or DVI graphics Screen Presentation • Refresh Rate ◦ Up to 85 Hz • Colors ◦ 32 bit • Resolution ◦ Widescreen (16:9) (Supported by 23-inch and 24-inch LCD Monitors) ◦ Up to 1920x1080 pixels
Ethernet Interface Communications	PCIe Ethernet network interface cards providing connection to Ethernet data bus (10/100Base-TX or 100Base-FX) Four Integrated Ethernet ports (10/100/1000Base-T)
Power Supplies	Two redundant, hot swappable, 1000 W auto-switching input power supplies, each with a separate power cord

<table>
<tr><td>Power Requirements</td><td>

Table 1 - Power Parameters

<table>
<tr><th colspan="9">HPE 1000 W Power Supply Kit (P03178-B21)</th></tr>
<tr><td>Normal Input Voltage (V rms)</td><td>100</td><td>120</td><td>127</td><td>200</td><td>208</td><td>220</td><td>230</td><td>240</td></tr>
<tr><td>Normal Input Current (A rms)</td><td>11</td><td>9.0</td><td>8.5</td><td>5.3</td><td>5.1</td><td>4.8</td><td>4.6</td><td>4.4</td></tr>
</table>

Input Power

- 100-240 VAC, 50 to 60 Hz, auto ranging

Inrush Current

- 30 A power supply for 10 ms

Heat Dissipation

- 3741 BTU/hr (at 100 VAC)
- 3596 BTU/hr (at 200 VAC)

Consumption:

- To determine the nominal power consumption for your configuration, visit the HPE Power Advisor website.

</td></tr>
<tr><td>Cooling</td><td>Hot swappable, redundant I/O and processor fans. Each redundant power supply contains a fan.</td></tr>
<tr><td>Regulatory Compliance, Electromagnetic Compatibility (EMC)</td><td>

USA and Canada

- Complies with FCC Part 15, Class B
- Complies with ICES-003 Class B

European Union

- Complies with the European Union EMC Directive 2014/30/EU and the following Harmonized Standards:
  - EN 61000-3-2:2014
  - EN 61000-3-3:2013
  - EN 55035:2017/A11:2020
  - EN 55032:2015/A11:2020 Class A

</td></tr>
<tr><td>Regulatory Compliance, Product Safety[a]</td><td>

USA and Canada

- UL® and cUL Listed

European Union

- Complies with the Low Voltage Directive 2014/35/EU and the following Harmonized Standards:
  - EN 62368-1:2014
  - EN 62479:2010

</td></tr>
<tr><td>RoHS Compliance[a]</td><td>Complies with EU RoHS Directive 2011/65/EU under the following Harmonized Standard: EN IEC 63000:2018</td></tr>
<tr><td colspan="2">(a) Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.</td></tr>
</table>

Environmental Specifications

	Operating	Storage
Temperature	10° to 40°C (50° to 104°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft); no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit might be limited by the type and number of options installed. ***NOTICE*** **POTENTIAL SYSTEM PERFORMANCE DEGRADATION** Do not operate with a fan fault or above 30°C (86°F). **Failure to follow these instructions can result in system performance degradation.**	-30° to 60°C (-22° to 140°F) Maximum rate of change is 20°C/hr (36°F/hr)
Relative Humidity	8% to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, noncondensing	5% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, noncondensing
Altitude	3050 m (10,000 ft). This value might be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min)	-16 to 9144 m (-50 ft to 30,000 ft) Maximum allowable altitude change rate is 457 m/min (1500 ft/min)
Contamination	Class G1 (Mild) as defined in ISA Standard S71.04	
Location	UL/UL-C listed as suitable for use in ordinary locations and meets ordinary safety standards for fire and shock hazards.	

Physical Specifications

	Keyboard	Chassis
Dimensions	Height • 35 mm (1.4 in) Width • 445 mm (17.5 in) Depth • 150 mm (5.9 in)	Maximum outside dimensions with bezel and feet Height • 87.5 mm (3.44 in) with bezel Width • 448 mm (17.64 in) Depth • 727 mm (28.2 in)
Weight	1.8 kg (4.0 lbs)	Rack • 33 kg (72.75 lbs) maximum configuration

Remote Graphics Unit For H94 Servers Overview

The H94 server can be configured with a Remote Graphics Unit that connects either dual or quad video by way of fiber-optic cabling. The USB keyboard, mouse, trackball, touchscreens, and audio can be connected through the RGU, which can be located at distances from the H94 of up to 70 m (230 ft) with 62.5/125 µm fiber or 150 m (492 ft) with 50/125 µm fiber cable. Fiber cable with LC/LC connections greater than 50 m (164 ft) is user-supplied.

The RGU features up to six USB 2.0 ports (one which supports a BIOS level keyboard), and passive (fanless) cooling. The RGU also includes a universal input power supply.

For video connections, the RGU includes four DisplayPort ports, which can directly connect to up to four DisplayPort monitors.

Figure 1 - Remote Graphics Unit for H94 Servers

RGU (H94) Functional Specifications

Interfaces to External Devices	• Up to six USB 2.0 ports for mouse, optional trackball, keyboard, USB speakers, or up to four optional touchscreens • Audio connections, including microphone, audio input, and audio output connections **NOTE:** If a speaker option and four USB touchscreens are to be utilized, a USB hub must be selected for use with this server. (Refer to part number RH103FU for the touchscreens.) • RGU solution includes up to four DisplayPort ports, and can directly support connections to up to four DisplayPort monitors	
Distance Specifications	The RGU allows distances between the H94 server and attached devices of up to 70 m (230 ft) with 62.5/125 µm fiber or 150 m (492 ft) with 50/125 µm fiber cable. Fiber cable with LC/LC connections greater than 50 m is user-supplied.	
Kit Contents	Remote Graphics Units Kit, Dual (RH103DX) • Remote Graphics Unit Transmitter (RH103DY) • Remote Graphics Unit Receiver (RH103DZ) • 15 m (50 ft) starter LC/LC fiber cable (P0972TP)	Remote Graphics Units Kit, Quad (RH103EA) • Remote Graphics Unit Transmitter (RH103EB) • Remote Graphics Unit Receiver (RH103EC) • 15 m (50 ft) starter LC/LC fiber cable (P0972TP)

RGU (H94) Environmental Specifications

	Operating	Storage/Transportation
Temperature	0° to 40°C (32 to 104°F) (indoors, in cabinet)	-40° to + 70°C (-40 to +158°F)
Relative Humidity	20% to 80%, noncondensing (indoors)	5% to 95% (in packaged configuration)
Vibration	NEBS level 3 Seismic Zone 4[a]	NEBS level 3 Seismic Zone 4[a]
Maximum Atmospheric Pressure	650hPa (3,580 m / 11,745 ft) to 1013hPa (0 m / 0 ft)	192hPa (12,000 m / 39,370 ft) to 1020hPa (-50 m / -164 ft)
EMC Certifications	Class A (commercial, industrial, or business) • ACMA, CE, FCC, VCCI	
Laser Emissions	850 nm laser compliant to 21CFR, Subpart J, Class 1	
Contamination	Class G1 (Mild) as defined in ISA Standard S71.04	
Location	UL/UL-C listed as suitable for use in ordinary locations and meets ordinary safety standards for fire and shock hazards.	
(a) Zone 4 = 7.0 to 8.3 on the Richter scale		

RGU (H94) Physical Specifications

Resolution	Maximum Analog Resolution • 1920x1200 ◦ (DisplayPort to HD-15 adapter sold separately) Maximum Digital (DVI) Resolution • Up to 2048x1152 Maximum DisplayPort Resolution • Up to 2048x1152 • 2560x1600
Operating Systems Supported	Windows Server 2022
Dimensions Transmitter and Receiver Units)	Height • 4.26 cm (1.67 in) Width • 18.9 cm (7.45 in) Depth • 21.66 cm (8.53 in)
Cable Type Supported	LC-LC optical, Duplex

Maximum Distances	**NOTE:** Fiber cable with LC/LC connections greater than 50 m is user-supplied. • OM1[(a)] multimode 62.5/125 µm (max. 275 m / 902 ft) • OM2[(a)] multi-mode 50/125 µm cable (max. 550 m / 1804 ft) • OM3[(a)] multi-mode 50/125 µm cable (max. 550 m / 1804 ft) • OM4[(a)] multi-mode 50/125 µm cable (max. 550 m / 1804 ft) • OS1,OS2[(b)] Single-mode 9/125 µm cable (max. 5 km / 3.10 mi)
Power Consumption and Supply Voltage	Extio Unit • Power Requirements ◦ 12 VDC, maximum 5 A ◦ (5 A fuse for overcurrent protection) • Power Connector ◦ Mini-DIN 4 socket (4-pin) Maximum Power Consumption Calculated for the following configuration: a USB keyboard and mouse, two other USB devices, and four DisplayPort monitors. External Power Supply • Input AC Voltage Range ◦ 100 to 240 VAC • Input Frequency ◦ 50 to 60 Hz • Input Connector ◦ IEC 60320-C13 • Output Voltage ◦ 12 VDC • Output Connector ◦ Mini-DIN 4 plug (4-pin) with lock • Maximum Power Output ◦ 60 W

(a) OM1, OM2, OM3, and OM4 are Matrox cable kits. You must either order them from Matrox or build equivalent cables to specification.

(b) OS1 and OS2 are Matrox single-mode fiber kits for distances greater than 400 m (1312 ft) that must be user-supplied.

Ordering Information

Part Number	Description
H94	Foxboro DCS Standard Server
K0177GB	NVIDIA Driver
K0204AZ	GPS Time Synchronization card
RH103HG	HPE ProLiant DL3XX Gen11 Easy Install Rail 3 Kit
RH103HC	HPE DL38X Gen10 Plus 2U Cable Management Arm for Rail Kit

Related Documents

Topic	Document
Model H94 (Gen11)	*EcoStruxure™ Foxboro™ DCS Model H94 (HPE DL380 Gen11) Server for Windows Server 2022 User's Guide* (B0700JD)
Domain Services	*EcoStruxure™ Foxboro™ DCS Security Implementation Guide* (B0700HM)
	EcoStruxure™ Foxboro™ DCS Security for Windows 10 21H2 LTSC and Windows Server 2022 Implementation Guide (B0700WX)
Security Products	*EcoStruxure™ Foxboro™ DCS Trellix Security Products* (PSS 41S-4Trellix)
	EcoStruxure™ Foxboro™ DCS Trellix ENS 10.7 and ePO 5.10 SP1 for Windows Server 2022 Installation and User's Guide (B0700XD)
System Recovery	*EcoStruxure™ Foxboro™ DCS Veritas System Recovery 23 User's Guide* (B0700WY)
USB extension kits	*EcoStruxure™ Foxboro™ DCS Annunciator Keyboard* (PSS 41H-4USBKBD)

⚠ **WARNING**: This product can expose you to chemicals including lead and lead compounds, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.p65warnings.ca.gov/.

Schneider Electric Systems USA, Inc.
70 Mechanic Street
Foxboro, Massachusetts 02035–2040
United States of America

Global Customer Support: https://pasupport.se.com

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

PSS 41H-4H94, Rev B