Foxboro DCS™ Process Automation System

Product Specifications

Foxboro®

by Schneider Electric

PSS 31H-4THNCLNT

t730 Thin Clients

t730 HP Quad Monitor Thin Client

With a smaller footprint than a workstation, the t730 HP® thin clients are mounted local to their remote user and used in traditional and virtualized I/A Series or Foxboro DCS systems. Thin clients perform similar tasks as a workstation or terminal at a lower cost and provide ease of use and increased security as compared to a physical station. When thin clients connect remotely to Foxboro DCS stations with the needed displays, this leads to reduced time and cost associated with startup and repair of the thin clients.

OVERVIEW

Thin clients are physical hardware terminals with a compact form factor that are capable of monitoring and responding to system events using the operating software via a remote connection to a remote server through the use of Microsoft Remote Desktop Services (formally known as Terminal Services). Schneider Electric qualified the following HP® thin client for use with the I/A Series and Foxboro DCS systems: HP Quad Monitor Thin Client (RH103BS and RH103CU) with support for up to four monitors.

Thin clients support the following configuration options:

- A mouse or an optional trackball (purchased separately)
- A QWERTY keyboard
- Up to four optional annunciator keyboards (purchased separately)
- A 23- inch flat panel LCD monitor that is also available with either a USB touchscreen or acrylic protective shield (purchased separately)
- An optional USB printer (purchased separately)

- An optional USB speaker set (purchased separately).

Additionally, thin clients support an external USB DVD drive (purchased separately) which is necessary for installing the thin client image.

NOTE

The thin clients can now support the USB annunciator keyboard for accessing or acknowledging process alarms. However, for thin clients with QWERTY keyboards only, FoxPanels can be used as an alternative to the annunciator keyboard.

Thin clients can access the I/A Series, Control Core Services software (CCS), or Control Software (CS) via network connections to two different types of remote servers:

- A Model H90 server running Microsoft Windows Server 2008 R2 Standard operating system.
- A virtual machine (VM) running on an I/A Series V90 or V91 server virtualization host.

Thin clients communicate with the I/A Series or Foxboro DCS system through an Auxiliary Communications Network (ACN) via a 1 GB copper Ethernet. The ACN is a 1 GB off Control Network comprised of managed Ethernet switches that must not share any of the same network hardware (switches) with the Control Network. Thin Clients have to use the ACN for communication to the I/A Series or Foxboro DCS system in order to help prevent visualization traffic from adversely affecting the control communication on the Control Network.

FEATURES

The HP® thin clients can:

- Serve as human to machine interface (HMI) stations with remote connections to remote servers running Microsoft® Remote Desktop Services
- Remotely, allow the user to view and manage information on systems with the following system software:
  - I/A Series v8.8
  - Foxboro DCS Control Core Services (CCS) 9.1 or later
  - Foxboro DCS Control Software (CS) 6.0 or later
- Communicate with the system through an off Control Network called the Auxiliary Communications Network (ACN) via a single NIC or redundant NICs
- Automatically shift between RDP servers if one has a detected failure

CONFIGURATIONS

Thin clients may be set-up in one of the following configurations:

1. A configuration in which a specific thin client is restricted to connect to one particular virtual machine or one physical I/A Series or Foxboro DCS server.
2. A configuration in which a specific thin client is connected automatically to only one particular virtual machine, or one physical I/A Series server when the thin client boots up.
3. A configuration in which a specific thin client has the option to connect to one of several different virtual machines and/or physical I/A Series or Foxboro DCS servers for one at a time redundancy.

4. A configuration in which a specific thin client has the option to connect to multiple virtual machines and/or multiple physical I/A Series and/or Foxboro DCS servers simultaneously.
5. A configuration in which a specific thin client is connected automatically to multiple virtual machines and/or multiple physical I/A Series and/or Foxboro DCS servers when the thin client boots up.

SIZING

A single remote server running Microsoft Remote Desktop Services can support up to 30 FoxView simultaneous remote sessions and up to 10 Control HMI remote sessions. Collectively, the V90 or V91 server virtualization host cannot support more than 60 RDP sessions across the VMs due to bandwidth constraints of the V90 or V91 physical Ethernet ports.

NOTE

The allowable number of RDP sessions depends on the number and types of applications being run in the remote sessions.

SECURITY

Thin clients can be configured to restrict connections to certain remote servers. Once a thin client establishes a connection with a remote server, the remote server's configuration determines what privileges to grant the user based on the user profile logged into the remote server. In addition, thin clients also support a write protect filter that enhances security by helping to prevent unintended changes from being made to the thin client configuration.

LICENSING

There are two types of licensing that apply when using thin clients with an I/A Series or Foxboro DCS system:

- I/A Series, Control Core Services, or Control Software licensing
- Microsoft licensing

I/A Series, Control Core Services, and Control Software Licensing

- There is no specific I/A Series, CCS, or CS *hardware* license for thin clients.
- There is no specific I/A Series, CCS, or CS *software* license for thin clients.
- Existing I/A Series, CCS, and CS licensing still applies with regards to remote sessions. However, the license resides with the remote server NOT with the remote client.
    - For example, the I/A Series S10 license is needed for any Foxboro DCS server (physical machine or virtual machine). Within the S10 license, there is a selection for the quantity of display managers being run on the Foxboro DCS server. Since thin clients have the ability to access a Foxboro DCS server and run one or more display managers, the S10 license for the remote server has to include the correct quantity of display managers being used by thin clients.

Microsoft Licensing

- There are additional Microsoft licenses needed if a thin client is being used for connections to Microsoft Remote Desktop Services servers (formally known as Terminal Services sessions). These licenses are available in BuyAutomation in five license packs for both a "license per user" or "license per device" model.

Remote Desktop Services Client Access License (RDS CAL)

- Formally known as Terminal Services Client Access License (TS CAL)
- A RDS CAL is necessary for every additional remote session that connects to and displays applications running on a Remote Desktop Services server.
- I/A Series or Foxboro DCS servers (V91, V90, H90) *do not* ship with any RDS CALs included.

Windows Server Client Access License (CAL)

- A CAL is necessary for every remote session that will connect to a Remote Desktop Services server.
- A physical I/A Series or Foxboro DCS server (H90) ships with five CALs included.
- An I/A Series or Foxboro DCS V90 or V91server virtualization host ships with a minimum of five CALs included but may include up to 25 based on the particular V90 or V91 model code.

T730 HP QUAD MONITOR SERIES THIN CLIENT

Base Configuration

The HP Quad Monitor Series t730 Thin Client contains the following elements:

- AMD® processor
- Four integrated DisplayPort 1.2 connections with four Display Port to DVI-D adapters for up to a total of four Displays Integrated
- 10/100/1000BaseT Ethernet port
- Universal Serial Bus (USB) interface ports for:
  - Mouse
  - Trackball (optional)
  - QWERTY Keyboard
  - Annunciator Keyboard (up to four optional)
  - Audio speakers (optional)
  - Touchscreens (optional)
  - USB Digital Color printers (optional)
  - External USB DVD drive (optional)
- Standard onboard NIC card(s) for communication on the ACN:
  - Single NIC card for Thin Client (RH103BS) without redundancy
  - Two NIC cards for Thin Client (RH103CU) with redundancy

Mounting Options

The HP t730 thin clients can be either mounted:

- Vertically on a plastic base (supplied)
- Horizontally with four mounting feet (supplied) attached to one side of the thin client.

Networking Redundancy

Only available when a second NIC and redundant network configuration is implemented

Reliability

The low cost of thin clients provides the option of having additional thin clients as spares for quick, easy replacement, if needed.

FUNCTIONAL SPECIFICATIONS (T730 HP QUAD MONITOR SERIES THIN CLIENT)

Processor Type
AMD® processor

Devices Served

VIDEO DISPLAYS (UP TO 4)
23-inch LCD USB Touchscreen Monitor
23-inch LCD Monitor

INTERFACES TO EXTERNAL DEVICES

USB
Mouse or optional trackball
QWERTY keyboard
Annunciator keyboard (up to 4)
External speakers
Digital Color Printer
External DVD drive (P0928GY)

Internal Diagnostics
Self-checking is performed at power-up.

Video

OUTPUT TYPE
Four DisplayPort 1.2 video port

SCREEN PRESENTATION

Refresh Rate
Up to 85 Hz

Colors
Over 65,000(1)

Resolution
Widescreen (16:9) Aspect Ratio
Up to 1920 x 1080 pixels for CCS and CS displays

Network

Ethernet Interface Communications
One Integrated Ethernet port (10/100/1000Base-T)

Network Interface Card
One onboard NIC card standard with the RH103BS Thin Client
One onboard NIC card and a second Plugin 10/100/1000 CATS NIC card for the redundancy standard with the RH103CU Thin Client

DCS Auxiliary Communications Network Interface

TYPE
IEEE 802.11
TCP-IP

Power Requirements

INPUT VOLTAGE
100 or 240 V ac (nominal), auto select
50 to 60 Hz Operating Line Frequency Range

POWER CONSUMPTION(2)
85 W maximum output power supply

(1) May be limited by specific software specifications.
(2) The actual power consumption at your location could vary and is dependent on many factors including but not limited to software load on the thin client, attached peripherals, and environmental factors.

ENVIRONMENTAL SPECIFICATIONS (T730 HP QUAD MONITOR SERIES THIN CLIENT)

Operating[3]

TEMPERATURE
10 to 40°C (50 to 104°F)

RELATIVE HUMIDITY
10% to 90%, noncondensing
20% to 80%, condensing

ALTITUDE
-15.2 to +3,048 m (-50 to 10,000 ft)

Storage

TEMPERATURE
-30 to +60 °C (-22 to +140°F)

RELATIVE HUMIDITY
10% to 90%, noncondensing

ALTITUDE
-15.2 to +9,144 m (-50 to +30,000 ft)

Location

UL/UL-C listed as suitable for use in ordinary locations and meets ordinary safety standards for fire and shock hazards.

Contamination

Class G1 (Mild) as defined in ISA Standard S71.04

REGULATORY COMPLIANCE (T730 HP QUAD MONITOR SERIES THIN CLIENT)

Safety Certifications

USA
UL® (UL Std 60950-1)

CANADA
CSA® (CSA C22.2 No. 60950-1-07)

EUROPE
TÜV-GS (EN 60950-1:2006+A11:2009+A1:2010 +A12:2011+A2:2013)

EMC

USA / CANADA
FCC Class B
ICES-003, Issue 6

EUROPE
CE Mark;
EN 301 489-1 V2.1.1
EN 301 489-17 V3.1.1
CISPR 32:2012 Class B
EN 300 328 V2.1.1
EN 301 893 V2.1.1

JAPAN
VCCI Mark

(3) Specifications are at sea level with no direct, sustained sunlight. Upper limit may be limited by the type and number of options installed.

PHYSICAL SPECIFICATIONS (T730 HP QUAD MONITOR SERIES THIN CLIENT)

Dimensions

PROCESSOR - VERTICAL ORIENTATION

Height
239 mm (9.4 in)
Width
221 mm (8.7 in)
Depth
66 mm (2.6 in)

Mounting

Tabletop

Weight

Exact weights depend on configuration.

PROCESSOR - WITHOUT STAND
1.98 kg (4.37 lbs)

PROCESSOR - WITH STAND
2.04 kg (4.50 lbs)

Heat Dissipation(4)

85 W POWER SUPPLY

@ 100-115 V ac (60 Hz)
42.34 BTU/hour, idle state
5.39 BTU/hour, sleep state
2.63 BTU/hour, Off mode
@ 230 V ac (50 Hz)
43.47 BTU/hour, idle state
5.80 BTU/hour, sleep state
2.80 BTU/hour, Off mode

(4) Heat dissipation is calculated based on the measured Watts, assuming the service level is attained for one hour.

REFERENCE DOCUMENTS

For more information regarding the thin client product offering, please refer to the following documents. The latest revisions are available through the Global Customer Support Center at *http://pasupport.schneider-electric.com*.

Configuration	Document Part No.	Document Title
Supported Monitors	PSS 41H-4VDU	*Liquid Crystal Display (LCD) Monitors*
V90 Server Virtualization Host	PSS 31H-4V90	*Virtualization Server Host Hardware Model V90*
	B0700VA, Rev. E or Later	*Hardware and Software Specific Instructions for I/A Series Model V90 Server Virtualization Host (DL380) (Windows Server 2008 R2 Enterprise Operating System)*
V91 Server Virtualization Host	PSS 41H-4V91	*Virtualization Server Host Hardware Model V91*
	B0700VS, Rev. B or Later	*Hardware and Software Specific Instructions for Foxboro Evo Control Core Services and I/A Series Model V91 Server Virtualization Host (HP DL380 Gen9) Windows Server 2012 R2 Standard Operating System*
Virtualization	PSS 21S-8A9 B3	*Overview of Hypervisor Technology - Microsoft Hyper-V Hypervisor*
	B0700VM, Rev. J or Later	*Virtualization User's Guide for Windows Server 2008 R2*
	B0700VQ, Rev. B or Later	*Virtualization User's Guide for Windows Server 2012 R2*
DCS Auxiliary Communications Network (ACN) Configuration	B0700CA, Rev. AB or Later	*EcoStruxure Foxboro DCS Switch Configurator Application Software for the Control Network User's Guide*
Thin Client Hardware and Configuration	B0700VN, Rev. H or Later	*Thin Client User's Guide*

Foxboro®

by Schneider Electric

Schneider Electric Systems USA, Inc.
38 Neponset Avenue
Foxboro, MA 02035-2037
United States of America
https://www.se.com

Global Customer Support
https://pasupport.schneider-electric.com

MB 031 1120