GE UCEC I/O Port Expansion Module

Table of Contents

1.1.1.2   UCECH1x I/O Port Expansion Module

The UCECH1x module is a UCSCH1x controller coupled with a seven I/O port expansion board. The UCSCH1x controller contained within the UCECH1x module has the same features and benefits as the stand-alone UCSCH1x controller. The controller is loaded with software specific to its application.

The UCECH1x is available beginning with ControlST V07.03, and supports Excitation control applications.

UCECH1x Module and Platform Configuration Supported Features

Module	Platform	Expansion I/O Ports	Embedded PPNG	Embedded EtherCAT	EFA
UCECH1B	UCSCH1x	7, RJ-45	X	X	✓
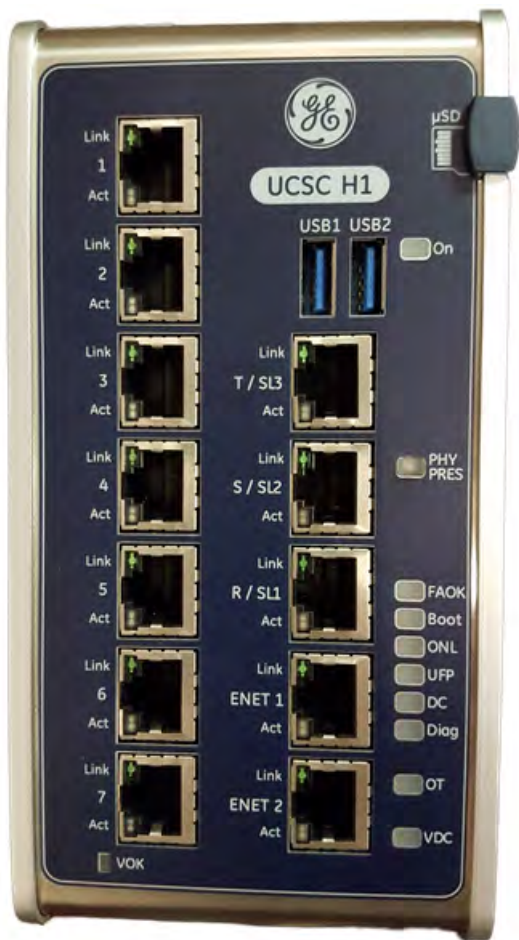
UCECH1x Module

*Example UCEC Data Nameplate*

1.1.4.2 UCEC Module Specifications

Note All specifications provided in the table *UCSC Specifications* are also applicable to the UCEC module, with the following exceptions.

| Item	UCEC Module Specification
Ports	7 expansion I/O ports (in addition to all UCSCH1x ports listed in *UCSC Specifications* table) Refer to the section *Interface Details*.
LEDs	Refer to the section *LEDs*.
Input Power	Refer to the section *Power Requirements*.
HMI	ControlST V07.03.00C or later
Dimensions	UCEC: 168 x 150 x 85 mm (6.61 x 5.91 x 3.35 in) (H x D x W)
	UCEC with mounting: 204 x 153 x 85 mm (8.03 x 6.02 x 3.35 in) (H x D x W)
Weight	2,060 g (72.7 oz)
Mounting	Refer to the section *UCEC Module Mounting Requirements*.
Cooling	Convection
Operating temperature	-40 to 70 °C (-40 to 158 °F), ambient 25 mm (0.98 in) from any point on UCEC
Storage Temperature	-40 to 85 °C (-40 to 185 °F)
Humidity	95% non-condensing
Altitude	Normal Operation: 0 to 1,000 m (0 to 3281 ft) at 101.3 to 89.8 kPa Extended Operation: 1,000 to 3,000 m (3281 to 9,843 ft) at 89.8 to 69.7 kPa; requires temperature derating up to 3000 m (9,843 ft) = 65°C (149 °F) max
Reliability MTBF at 30°C (86 °F)	IS420UCECH1: 329,615 hours
Certifications	Refer to the section *Agency Certifications and Standards*.

Public Information

1.1.5.2   UCEC Module Mounting Requirements

The following are requirements for mounting the UCEC module:

*   Directly mount the UCEC to the mounting base using the four mounting screws.
*   Vertical mount with unobstructed air flow through fins.
*   Leave a minimal 100 mm (3.94 in) air gap above and below the UCEC module.
*   Parallel mount UCEC to UCEC requires a minimal 50 mm (1.97 in) spacing to achieve full temperature rating
*   The _operating temperature_ envelope is 25 mm (0.98 in) from any point on UCEC.
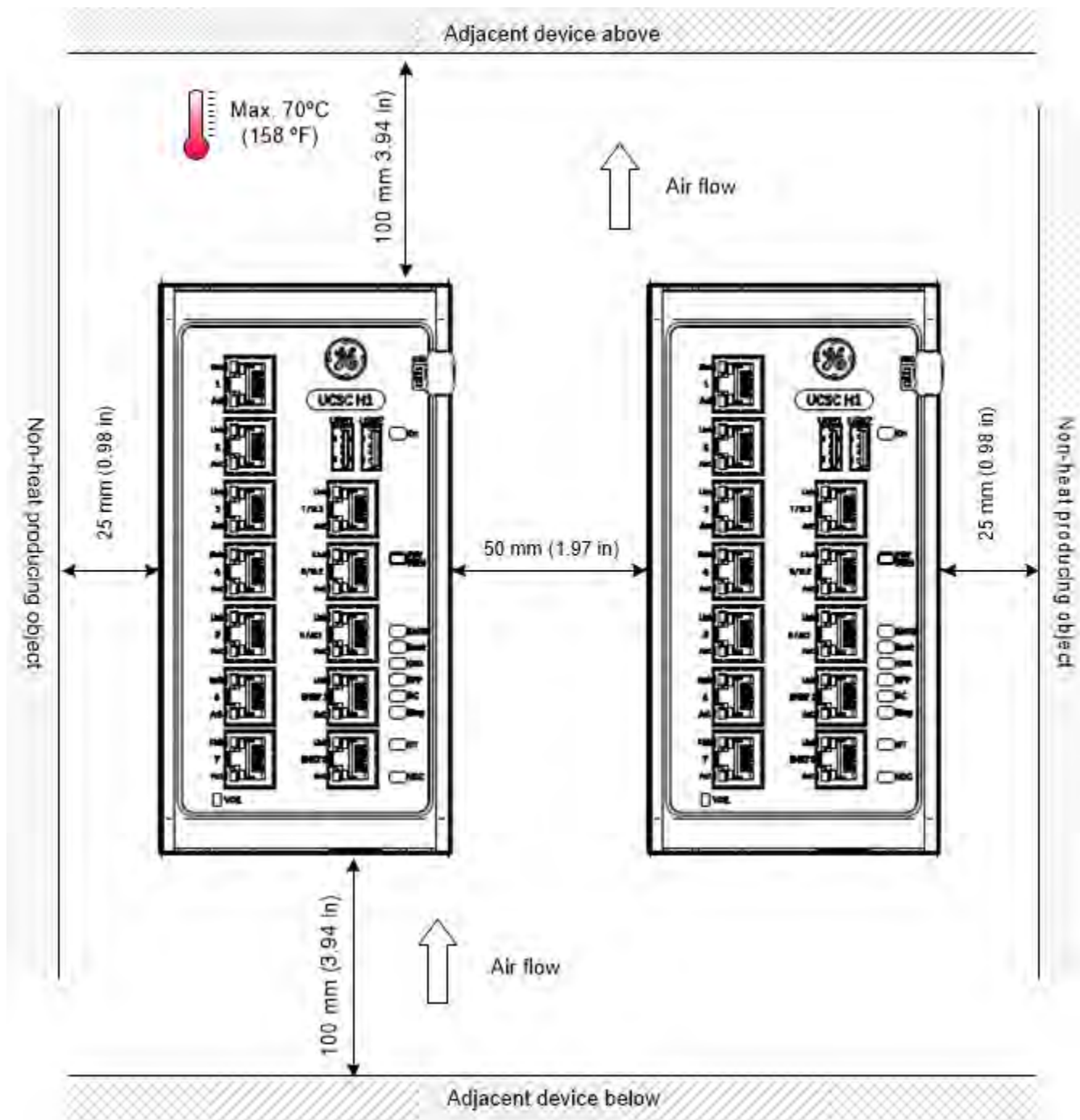
UCECH1 Mounting Requirements to Achieve 70ºC Operating Temperature
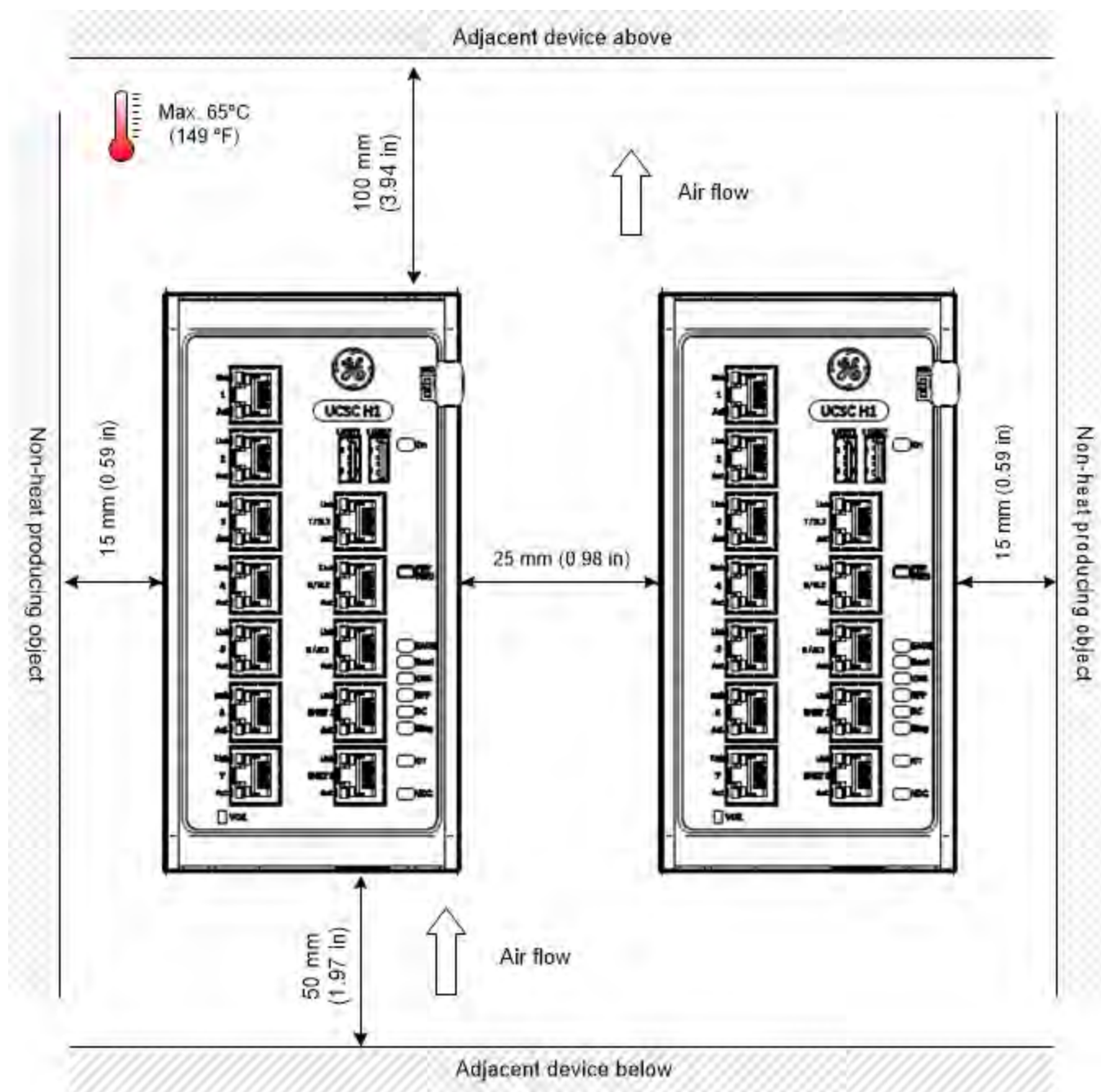
UCECH1 Mounting Requirements to Achieve 65ºC Operating Temperature
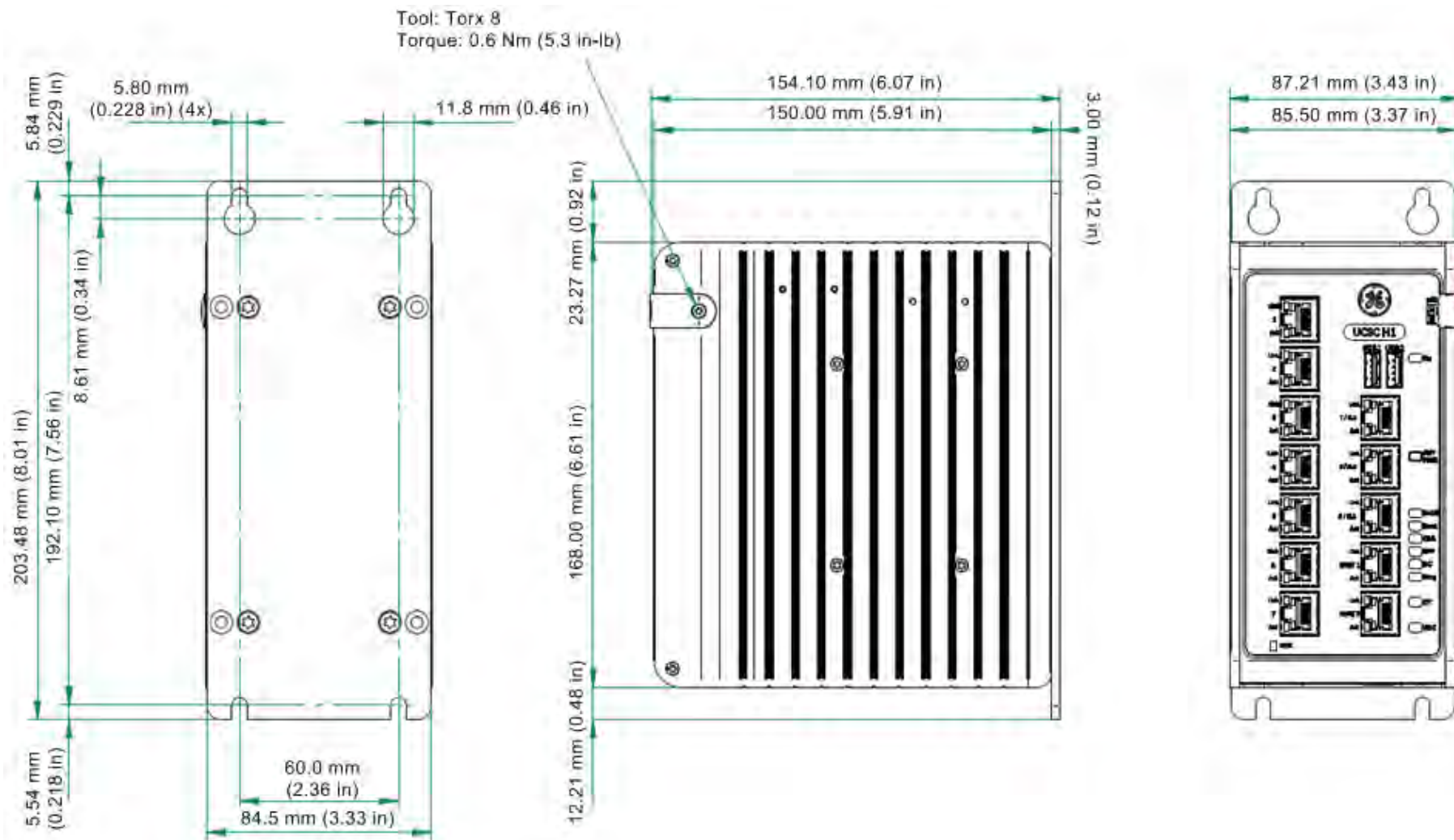
UCEC Module Mounting Dimensions

1.1.5.3 Power Requirements

Power Requirements

Item	Min	Nom	Max	Units
UCSC Controller Input Power	—	18	30.8	Watts
UCEC Module Input Power	—	28	42	Watts
Voltage	18	24/28	30	V dc
Input Capacitance	—	25	—	uF
Surge Protection	Non-replaceable 4 A 125 V dc rated fuse Nominal melting: 26 A squared seconds (A^2 sec)			
Reverse Polarity Protection	Provided *Reversing the + and - input will not damage the UCSC, nor will it power up.*			

3-pin Power Plug

Item	Description
Pin 1	Ground
Pin 2	Negative *The UCSC case is bonded to power supply negative.*
Pin 3	Positive
Wire Sizes	28 to 16 AWG
Screw Torque	0.23 Nm (2 in-lb)
Part Number	Phoenix Contact MC 1,5/ 3-STF-3,81 - 1827716

1.1.5.4 Interface Details

USB1 and USB2 connection ports used for initial setup of UDH IP address and to restore controller configuration and communication with ToolboxST

uSD micro-SD card slot (*not currently supported*)

Ethernet connections for R, S, and T I/O networks (IONet) (3 ports) for communication to I/O modules,
or
High-speed Serial Link (HSSL) connections SL1, SL2, and SL3 (3 ports) for communication to I/O modules.

PHY PRES button is pressed to initiate restore process, or during initial setup of controller's UDH IP address

ENET 1

ENET 2
(*not supported for Mark VIeS control*)

UCSC Connection Ports (Front View)

Note For further information, refer to the *ToolboxST User Guide for Mark Controls Platform* (GEH-6700 or GEH-6703), the section *System Controller Platforms*.
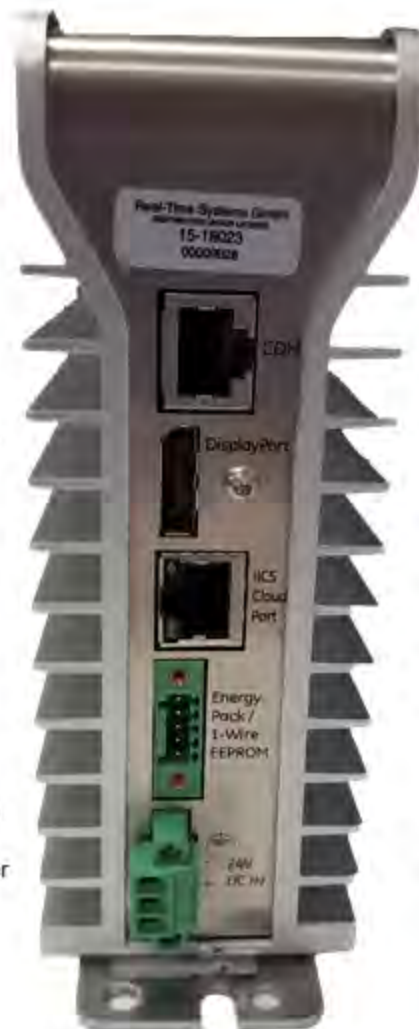
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† **COM** serial port can be used as an alternate way to set up controller IP address instead of using a flash device

DisplayPort provides signals for connecting a display monitor or video adapter (*not currently supported*)

IICS Cloud Port (Ethernet port) is used to configure the EFA and to communicate with the Predix cloud environment (*not supported for Mark VIeS or MarkStat control*)
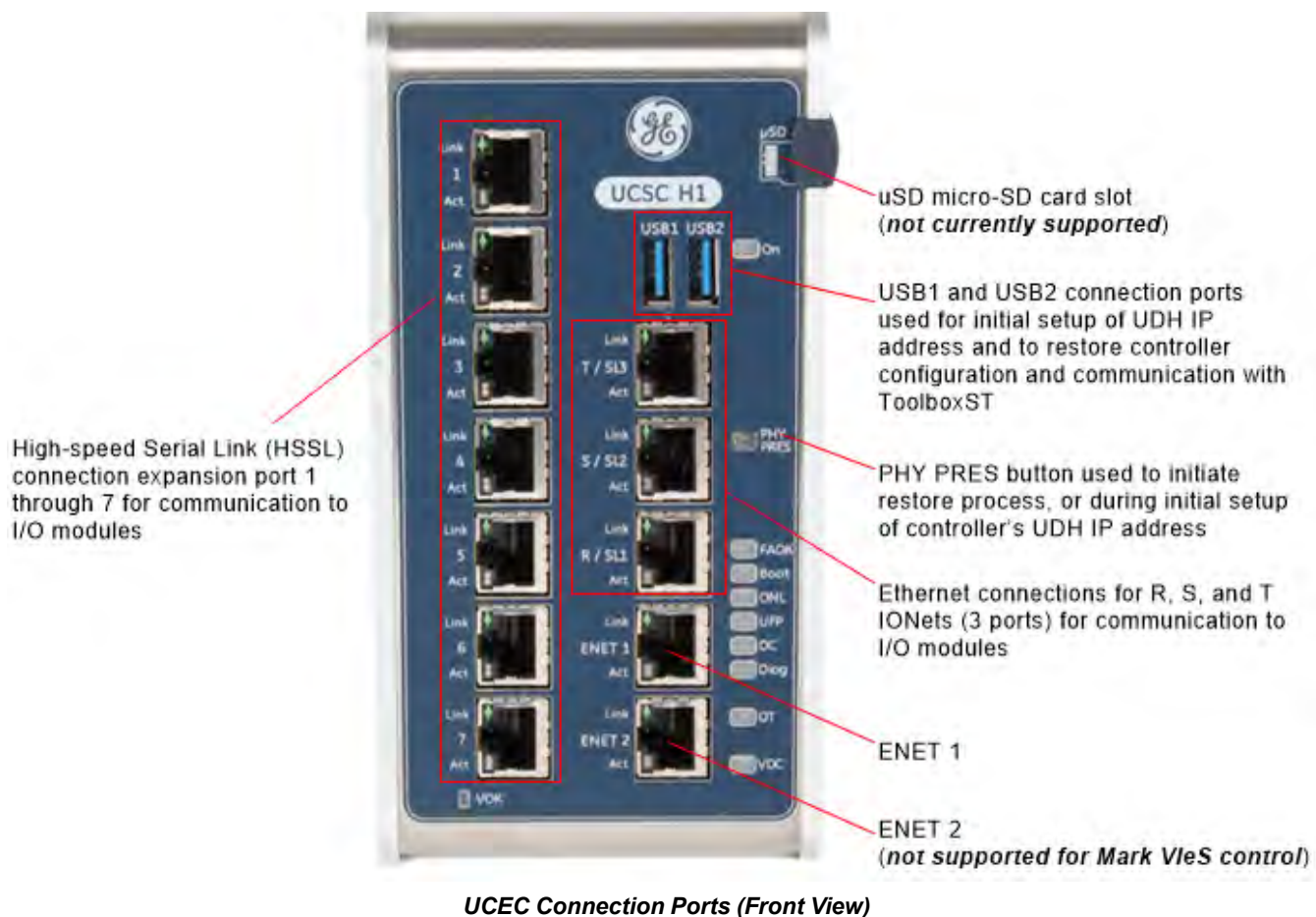
Energy Pack / 1-wire EEPROM allows energy pack connection to enable the controller to save its current state in the event of power loss (*not currently supported*)

24/28 V DC IN input power connection

UCSC Connection Ports (Bottom View)

Note † For instructions to set up the controller Internet Protocol (IP) address using the COM port, refer to the *ToolboxST User Guide for Mark Controls Platform* (GEH-6700 or GEH-6703), the section *Configure and Transfer IP Address to UCSB / UCSC Controller.*

UCEC Connection Ports (Front View)

Note For further information, refer to the *ToolboxST User Guide for Mark Controls Platform* (GEH-6700 or GEH-6703), the section *System Controller Platforms*.

† **COM** serial port can be used as an alternate way to set up controller IP address instead of using a flash device

DisplayPort provides signals for connecting a display monitor or video adapter (*not currently supported*)

IICS Cloud Port (Ethernet port) is used to configure the EFA and to communicate with the Predix cloud environment (*not supported for Mark VIeS or MarkStat control*)

24/28 V DC IN input power connection

UCEC Connection Ports (Bottom View)

Note † For instructions to set up the controller Internet Protocol (IP) address using the COM port, refer to the *ToolboxST User Guide for Mark Controls Platform* (GEH-6700 or GEH-6703), the section *Configure and Transfer IP Address to UCSB / UCSC Controller.*

Mark VIe UCSCH1x Ethernet Ports

Ethernet Port	Description
IONet Ethernet Interface (3 Ports)	UCSCH1A / UCSCH1B: T/SL3 is <T> network for TMR (using all three ports). S/SL2 is <S> network for Dual redundancy (used with R/SL1). R/SL1 is <R> network for Simplex redundancy. *Twisted pair 10Base-TX/100Base-TX, RJ-45 connector is used.* *TCP/IP protocols is used to communicate between controllers and I/O modules.* *For TMR and Dual configurations, IONet redundancy is equal to controller redundancy.* *For Simplex configurations, both Simplex and TMR IONet redundancy are supported.*
	UCSCH1C: T/SL3 is EtherCAT redundant (Ring topology). S/SL2 is not supported. R/SL1 is <R> IONet network *Twisted pair 100Base-TX, RJ-45 connector is used.* *TCP/IP protocols is used to communicate between controllers and I/O modules.* *Simplex IONet redundancy is the only supported configuration.*
ENET 1 Primary Ethernet Interface to LAN	UDH *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.* *TCP/IP protocol is used for communication between controller and ToolboxST application.* *TCP/IP protocol is used for alarm communication to HMIs.* *Modbus TCP Slave and/or OPC UA* *EGD protocol is used for application variable communication to HMIs.*
ENET 2	UCSCH1A: *PROFINET* *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.*
	UCSCH1B: Secondary plant network *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.* *Modbus TCP Slave, OPC UA, and/or EGD*
	UCSCH1C: EtherCAT Primary (Line and Ring topologies) *Twisted pair 100Base-TX, RJ-45 connector is used.*

UCECH1B Ethernet Ports

Ethernet Port	Description
High-speed Serial Link (HSSL) Interface (10 Ports)	GE Proprietary protocol that provides high-speed point-to-point synchronous communication between a controller and any HSSL–enabled I/O module. R/SL1, S/SL3, T/SL3, expansion ports 1 through 7 are 10 independent serial link interfaces. *Twisted pair 10Base-TX/100Base-TX, RJ-45 connector is used.* *HSSL I/O module support is defined by the controller firmware.*
ENET 1 Primary Ethernet Interface to LAN	UDH *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.* *TCP/IP protocol is used for communication between controller and ToolboxST application.* *TCP/IP protocol is used for alarm communication to HMIs.* *Modbus TCP Slave and/or OPC UA* *EGD protocol is used for application variable communication to HMIs.*
ENET 2	Secondary plant network *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.* *Modbus TCP Slave, OPC UA, and/or EGD*

Mark VIe UCSCH2x Ethernet Ports

Ethernet Port	Description
IONet Ethernet Interface (3 Ports)	T/SL3 is <T> network for TMR (using all three ports). S/SL2 is <S> network for Dual redundancy (used with R/SL1). R/SL1 is <R> network for Simplex redundancy. *Twisted pair 10Base-TX/100Base-TX, RJ-45 connector is used.* *TCP/IP protocols is used to communicate between controllers and I/O modules.* *For TMR and Dual configurations, IONet redundancy is equal to controller redundancy.* *For Simplex configurations, both Simplex and TMR IONet redundancy are supported.*
ENET 1 Primary Ethernet Interface to LAN	UDH *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.* *TCP/IP protocol is used for communication between controller and ToolboxST application.* *TCP/IP protocol is used for alarm communication to HMIs.* *Modbus TCP Slave* *EGD protocol is used for application variable communication to HMIs.*
ENET 2	Secondary plant network *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.* *Modbus TCP Slave, OPC UA, and/or EGD*

MarkStat UCSCH2x Ethernet Ports

Ethernet Port	Description
High-speed Serial Link (HSSL) Interface (3 Ports)	GE Proprietary protocol that provides high-speed point-to-point synchronous communication between a controller and any HSSL–enabled I/O module. R/SL1, S/SL3, T/SL3 are three independent serial link interfaces. *Twisted pair 10Base-TX/100Base-TX, RJ-45 connector is used.* *HSSL I/O module support is defined by the controller firmware.*
ENET 1 Primary Ethernet Interface to LAN	UDH *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.* *TCP/IP protocol is used for communication between controller and the ToolboxST application.* *TCP/IP protocol is used for alarm communication to HMIs.* *EGD protocol is used for application variable communication to HMIs.*
ENET 2	IONet Interface *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.*

Mark VIeS UCSCS2x Ethernet Ports

Ethernet Port	Description
IONet Ethernet Interface (3 Ports)	T/SL3 is <T> network for TMR (using all three ports). S/SL2 is <S> network for Dual redundancy (used with R/SL1). R/SL1 is <R> network for Simplex redundancy. *Twisted pair 10Base-TX/100Base-TX, RJ-45 connector is used.* *TCP/IP protocols is used to communicate between controllers and I/O modules.* *For TMR and Dual configurations, IONet redundancy is equal to controller redundancy.* *For Simplex configurations, both Simplex and TMR IONet redundancy are supported.*
ENET 1 Primary Ethernet Interface to LAN	UDH *Twisted pair 10Base-T/100Base-TX, RJ-45 connector is used.* *TCP/IP protocol is used for communication between controller and the ToolboxST application.* *TCP/IP protocol is used for alarm communication to HMIs.* *Modbus TCP Slave* *EGD protocol is used for application variable communication to HMIs.*
ENET 2	Not supported