QX OCS
Datasheet
for
HE-QX501

1   Specifications

| Specifications	
Required Power (Steady state)	650 mA @ 24 VDC 1.3A @ 12 VDC
Required Power (Inrush)	25 A for <1 ms @ 24 VDC – DC Switched 15 A for <1 ms @ 12VDC – DC Switched 2.5 A for 1 ms @ 24 VDC - AC Switched
Primary Power Range	10 – 30 VDC
Relative Humidity	5 to 95% Non-condensing
Clock Accuracy	+/- 35 ppm maximum at 25° C (+/- 1.53 Minutes per Month)
Operating Temp	-10°C to +60°C
Storage Temp	-30°C to +70°C
Display Type	10.4" VGA TFT (550 nit typical)
Screen Resolutions	640 x 480
Display Memory	2.75 MB
Scan Rate	Controller 0.2 mS/K
Display Life	Minimum 50000 hours (50% brightness, 25 deg C)
User Keys	7 user-defined Function keys and a System Key
Screens supported	1023
Colors	32768
Weight	70 oz. (2 kg)
CE / UL	USA: http://www.heapg.com/Pages/TechSupport/ProductCert.html Europe: http://www.horner-apg.com/en/support/certification.aspx
Connectivity	
Serial	2 Serial Ports – Each RS232 & RS485
Ethernet	10/100-Mbps – Auto MDX
USB-A	For USB Flash Drives
USB-B	Mini B for connecting to PC (Programming, Envision…)
Removable Media	Removable Media for upto 2 GB of storage for programs, data logging or screen capture…
CAN	Remote I/O, Peer to Peer, PC, Programming…
Remote I/O	SmartStix, SmartBlock, SmartMod or SmartRail
Local I/O	SmartStack

2   Installation

1. Prior to mounting, carefully plan the permanent location of the unit.

2. Cut the host panel.

3. Insert the OCS through the panel cutout (from the front). The gasket material needs to be between the host panel and the OCS.

> **Caution: Do not force the OCS into the panel cutout. An incorrectly sized panel cutout can damage the touch screen.**

4. Install and tighten the mounting clips (provided with the OCS) until the gasket material forms a tight seal.

5. Connect cables as needed such as communications, programming, power and CsCAN cables to the ports using the provided connectors.

6. Begin configuration procedures.

3   Panel Cut-Out and Dimensions

9.08" (230.6mm)

11.94" (303.3mm)

2.43" (61.7mm)
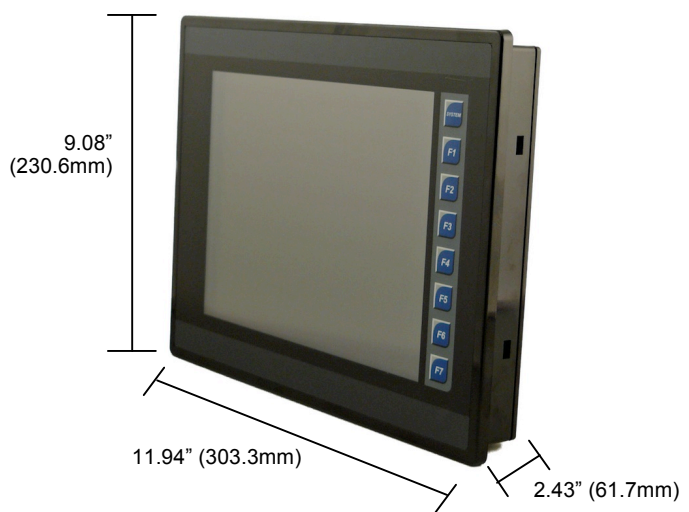
Notes: Max. panel thickness: 5 mm.
Each SmartStack I/O module adds 0.75" (19mm) of depth

> **Note:**   The tolerance to meet NEMA standards is ± 0.005" (0.1 mm).

8.505 (216.0 mm)

11.360 (288.5 mm)

001OCS013

Mounting Clip Locations
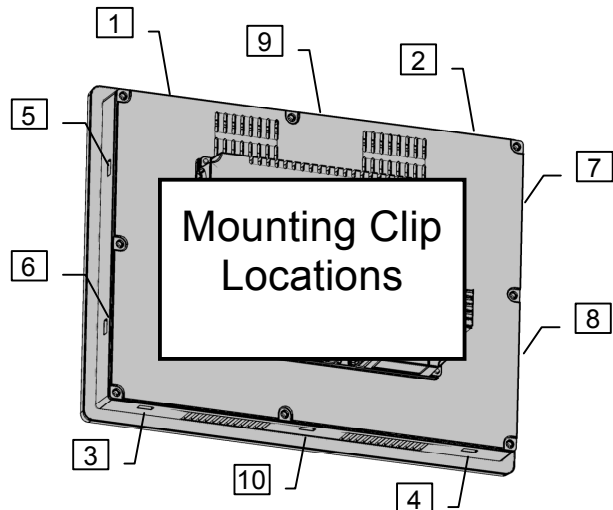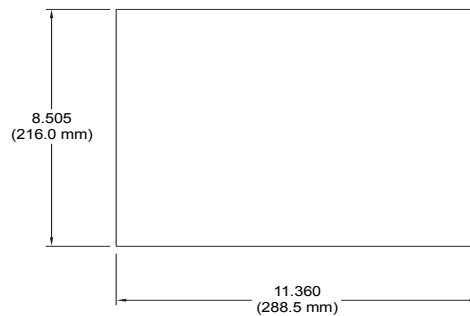
There are 10 mounting clip locations on the QX501.
For minimal mounting use four clips at 1, 2, 3 & 4 or 5, 6, 7 & 8.
For IP67 mounting use eight clips at locations 1 to 8.
For NEMA 4X mounting use ten clips in all locations.
The unit includes 8 clips order HE500ACC604 for additional clips

4.1   Serial Communications:

MJ1: (RS-232 / RS-485) Use for Cscape programming and Application-Defined Communications.

MJ2: (RS-232 / RS-485) Use for Application-Defined Communications.

MJ2 Pinouts in Half and Full Duplex Modes
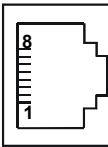
Pin	MJ1 Pins		MJ2 Pins	
	Signal	Direction	Signal	Direction
8	TXD	OUT	TXD	OUT
7	RXD	IN	RXD	IN
6	0 V	Ground	0 V	Ground
5*	+5 60mA	OUT	+5 60mA	OUT
4	RTS	OUT	TX-	OUT
3	CTS	IN	TX+	OUT
2	RX- / TX-	IN / OUT	RX-	IN
1	RX+ / TX+	IN / OUT	RX+	IN
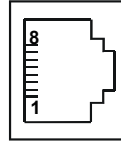
Pin	MJ2 Pins	
	Signal	Direction
8	TXD	OUT
7	RXD	IN
6	0 V	Ground
5*	+5 60mA	OUT
4	TX-	OUT
3	TX+	OUT
2	TX-/RX-	IN/OUT
1	TX+/RX+	IN/OUT

* +5V 60mA Max

MJ2 Half Duplex Mode
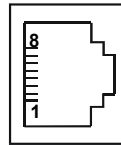
Pin	MJ2 Pins	
	Signal	Direction
8	TXD	OUT
7	RXD	IN
6	0 V	Ground
5*	+5 60mA	OUT
4	TX-	OUT
3	TX+	OUT
2	RX-	IN
1	RX+	IN

* +5V 60mA Max

MJ2 Full Duplex Mode

Table - Ports and Functions		
Functions	Port 1 (MJ1)	Port 2 (MJ2)
RS-232	✓	✓
Hardware Handshaking	✓	X
Programming	✓	X
Ladder function controlled	✓	✓
Serial Downloable Protocols	✓	✓
RS 485 Full duplex	X	✓
RS 485 Half duplex	✓	✓

4.2   External DIP Switch Settings

As seen when looking at the side of the XL10 unit:

The DIP Switches are used for termination of the RS-485 ports. The XL10 is shipped un-terminated.

To terminate, select one of the DIP Switches and configure it based upon the option that is desired.
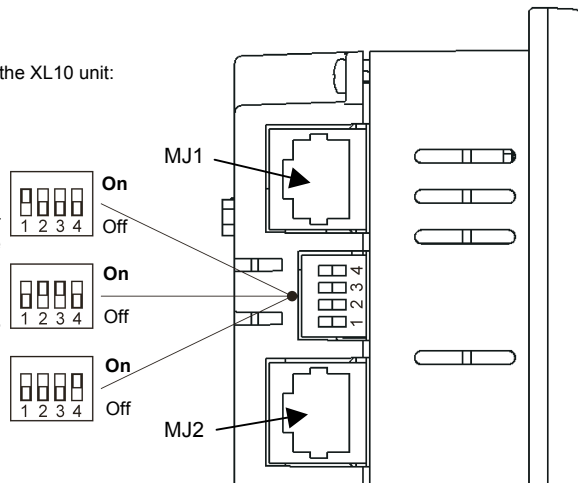
SW1 -   ON enables *MJ2* RS485 port termination (121 Ohms). OFF disables *MJ2* RS485 port termination.

SW2 & SW3 - ON places *MJ2* RS485 port in half-duplex mode. OFF places *MJ2* RS485 port in full-duplex mode.

SW4 -   ON enables *MJ1* RS485 port termination (121 Ohms). OFF disables *MJ1* RS485 port termination.

4.3   CAN Network Port and Wiring
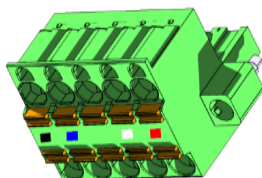
**CAN Connector**

Use the CAN Connector when using CsCAN network.

Torque rating 4.5 – 7 Lb-In (0.50 – 0.78 N-m)

NET1 Port Pin Assignments			
Pin	Signal	Signal Description	Direction
1	V-	CAN Ground - Black	–
2	CN_L	CAN Data Low - Blue	In/Out
3	SHLD	Shield Ground - None	–
4	CN_H	CAN Data High - White	In/Out
5	V+ (NC)	No Connect - Red	–

4.4   Ethernet Port

Speeds	10 BaseT Ethernet (10-Mbps) 100 BaseTx Fast Ethernet (100-Mbps)
Modes	Half or Full Duplex
Auto-Negotiation	Both 10/100-Mbps and Half/Full Duplex
Connector Type	Shielded RJ-45
Cable Type (Recommended)	CAT5 (or better) UTP
Port	Auto MDI/MDI-X

4.5   Power Port and Wiring
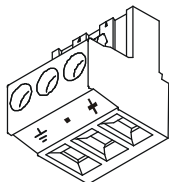
Torque rating 4.5 – 7 Lb-In
(0.50 – 0.78 N-m)

Primary Power Port Pins		
Pin	Signal	Description
1	Ground	Frame Ground
2	V-	Input Power Supply Ground
3	V+	Input Power Supply Voltage

4.6   Memory Card and USB Support

Micro SD Memory Slot:
Uses **Removable Memory** for data logging, screen captures, program loading and recipes. Supports cards up to 2GB in capacity.
Horner Part No.: HE-MC1 (2GB MicroSD Card)

USBA: For flash drive connectivity for transferring data to and from the microSD Card using Removable Memory Functions (Copy, Erase, etc.). Uses FLASH drives up to 2GB capacity.

USBB: For data communications and programming of OCS. Uses mini-B Type Connector.

4.7   SmartStack I/O (local & connected via FOX)

The QX501 supports local expansion I/O utilizing SmartStack I/O. Up to 4 Plastic SmartStack I/O modules may be stacked directly on the back of the QX unit. For applications with harsh shock and vibration conditions, it may be advisable to limit the number of local SmartStack I/O modules to two.

The QX also supports Remote Expansion of the SmartStack I/O bus via Fiber Optic Expansion (FOX) ports. FOX utilizes plastic fiber optic cables (available from Horner APG) to remotely locate bases of additional SmartStack I/O up to 10m away from the QX unit.

6   Technical Support

For assistance and manual updates, contact Technical Support at the following locations:

North America:
Tel: 317 916-4274
Fax: 317 639-4279
Web: http://www.heapg.com
Email: techsppt@heapg.com

Europe:
Tel: +353-21-4321266
Fax: +353-21-4321826
Web: http://www.horner-apg.com
Email: tech.support@horner-apg.com

5   Safety

When found on the product, the following symbols specify:

 Warning: Electrical Shock Hazard.

 Warning: Consult user documentation.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or Non-hazardous locations only.

WARNING – EXPLOSION HAZARD – Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DECONNECTOR L'EQUIPMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX.

WARNING: To avoid the risk of electric shock or burns, always connect the safety (or earth) ground before making any other connections.

WARNING: To reduce the risk of fire, electrical shock, or physical injury it is strongly recommended to fuse the voltage measurement inputs. Be sure to locate fuses as close to the source as possible.

WARNING: Replace fuse with the same type and rating to provide protection against risk of fire and shock hazards.

WARNING: In the event of repeated failure, do not replace the fuse again as a repeated failure indicates a defective condition that will not clear by replacing the fuse.

WARNING – EXPLOSION HAZARD – Substitution of components may impair suitability for Class I, Division 2
AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIAL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE 1, DIVISION 2.

WARNING - The USB parts are for operational maintenance only. Do not leave permanently connected unless area is known to be non-hazardous.

WARNING – EXPLOSION HAZARD - BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT - RISQUE D'EXPLOSION - AFIN D'EVITER TOUT RISQUE D'EXPLOSION, S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX AVANT DE CHANGER LA BATTERIE.

WARNING - Battery May Explode If Mistreated. Do Not Recharge, Disassemble or Dispose Of In Fire

WARNING: Only qualified electrical personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, or service this equipment. Read and understand this manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
1.   This device may not cause harmful interference.
2.   This device must accept any interference received, including interference that may cause undesired operation.

Radiated Emission Compliance: For compliance requirement, a ferrite (Horner P/N FBD006 supplied with the unit) needs to be placed on the AC/DC line with one loop.

♦ All applicable codes and standards need to be followed in the installation of this product.
♦ Adhere to the following safety precautions whenever any type of connection is made to the module:

▪ Connect the safety (earth) ground on the power connector first before making any other connections.
▪ When connecting to electric circuits or pulse-initiating equipment, open their related breakers.
▪ Do not make connections to live power lines.
▪ Make connections to the module first; then connect to the circuit to be monitored.
▪ Route power wires in a safe manner in accordance with good practice and local codes.
▪ Wear proper personal protective equipment including safety glasses and insulated gloves when making connections to power circuits.
▪ Ensure hands, shoes, and floor are dry before making any connection to a power line.
▪ Make sure the unit is turned OFF before making connection to terminals.
▪ Make sure all circuits are de-energized before making connections.
▪ Before each use, inspect all cables for breaks or cracks in the insulation. Replace immediately if defective.

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