

EXL10 OCS DATASHEET

MODEL 0 No Built-In I/O

1 TECHNICAL SPECIFICATIONS

1.1 General Specifications

Required Power (Steady State)	650mA @ 24VDC
Required Power (Inrush)	25A for < 1ms @ 24VDC, DC switched
Primary Power Range	10 - 30VDC
Relative Humidity	5 to 95% non-condensing
Clock Accuracy	+ / - 20 ppm maximum at 25°C (+/- 1 min/month)
Real Time Clock	Battery Backed, Rechargeable Lithium
Surrounding Air Temp	-10°C to +60°C
Storage Temp	-20°C to +60°C
Weight	4.375 lbs. / 1984.45g
Certifications (UL/CE)	North America: https://hornerautomation.com/certifications/ Europe: http://www.horner-apg.com/en/support/certification.aspx

1.2 Control & Logic

Control Language Support	Advanced Ladder Logic Full IEC 61131-3 Languages Tag-Based Editor
Logic Program Size	1 MB, maximum
Logic Scan Rate	0.013ms/kB
Digital Inputs	2048
Digital Outputs	2048
Analog Inputs	512
Analog Outputs	512
Gen. Purpose Registers	50,000 (words) Retentive 16,384 (bits) Retentive 16,384 (bits) Non-retentive

1.3 Connectivity

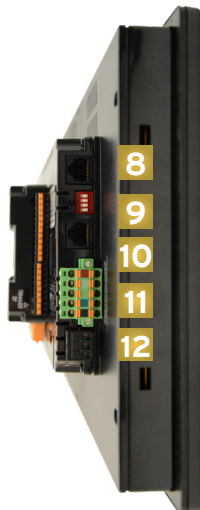
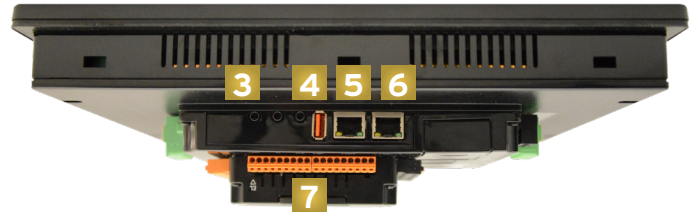
Serial Ports	1 RS-232 and 1 RS-485 on first Modular Jack (MJ1/2) 1 RS-232 or 1 RS-485 on second Modular Jack
USB mini-B	USB 2.0 (480MHz) Programming & Data Access
USB A	USB 2.0 (480MHz) for USB flash drives (2TB)
CAN Port Isolated 1 kV	Remote I/O, Peer-to-peer Comms, Cscape
CAN Protocols	CsCAN, CANopen, DeviceNet, J1939
2 x Ethernet	10/100 Mb (Auto-MDX)
Ethernet Protocols	TCP/IP, Modbus TCP, FTP, SMTP, EGD, ICMP, ASCII, Cscape, Ethernet IP, HTTP
Remote I/O	SmartRail, SmartStix, SmartBlock, SmartMod
Removable Memory	microSD, SDHC, SDXC IN FAT32 format, support for 32GB max. Application Updates, Datalogging, and more
Audio	Mic In, Line In, Line Out

1.4 User Interface

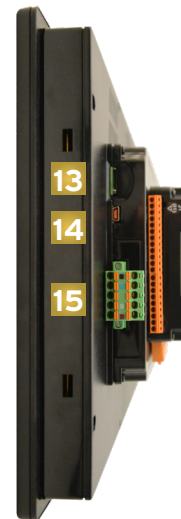
Display Type	10.4" VGA TFT (550 nit typical)
Resolution	640 x 480
Color	16-bit (65,536)
Screen Memory	27MB
User-Program. Screens	1023
Backlight	LED - 50,000 hour life
Screen Update Rate	User Configurable within the scan time. (Perceived as instantaneous in many cases.)

2 CONTROLLER OVERVIEW

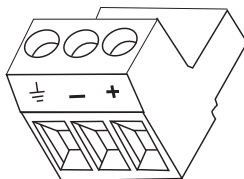
2.1 - Overview of EXL10



1. Touchscreen
2. Function Keys
3. Audio Out/In
4. USB 2.0 'A': Flash Storage
5. LAN1 Port
6. LAN2 Port
7. Built-In I/O
8. MJ1/MJ2: RS-232 & 1/2 Duplex RS-485
9. Dip Switches
10. MJ3: RS-232/485
11. CAN1: Can I/O & Fieldbus Port
12. Power: 10-30VDC In
13. microSD: Data Storage
14. USB mini 'B': Programming
15. CAN 2: CAN I/O



2.2 - Power Wiring



Primary Power Port Pins

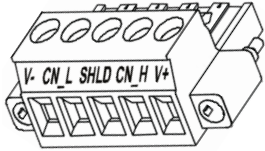
PIN	SIGNAL	DESCRIPTION
1	Ground	Frame Ground
2	DC-	Input Power Supply Ground
3	DC+	Input Power Supply Voltage

DC Input / Frame

Solid/Stranded wire: 12-24 awg (2.5-0.2mm)
 Strip length: 0.28" (7mm)
 Torque rating: 4.5 - 7 in-lbs (0.50 - 0.78 N-m)
 DC- is internally connected to I/O V-, but is isolated from CAN V-.
 A Class 2 power supply must be used.

3 COMMUNICATIONS

3.1 - CAN Communications

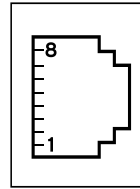


CAN Pin Assignments		
PIN	SIGNAL	DESCRIPTION
1	V-	CAN Ground - Black
2	CN L	CAN Data Low - Blue
3	SHLD	Shield Ground - None
4	CN H	CAN Data High - White
5	V+ (NC)	No Connect - Red

CAN

Solid/Stranded wire: 12-24 awg (2.5-0.2mm)
 Strip length: 0.28" (7mm)
 Locking spring-clamp, two-terminators per conductor.
 Torque Rating: 4.5 in-lbs (0.50 N-m).
 V+ pin is not internally connected, the SHLD pin is connected to Earth ground via a 1 MΩ resistor and 10nF capacitor.

serial communications continued...

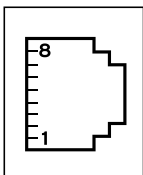


MJ3 SERIAL PORT

2 Multiplexed Serial Ports on One Modular Jack (8posn)

MJ3 PINS		
PIN	SIGNAL	DIRECTION
8	TXD RS232	OUT
7	RXD RS232	IN
6	0V	GROUND
5	+5V @ 60mA	OUT
4	TX- RS485	OUT
3	TX+ RS485	OUT
2	RX- RS485	IN
1	RX+ RS485-	IN

3.2 - Serial Communications

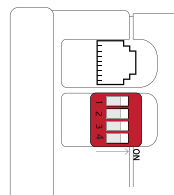


MJ1/2 Independent Serial Ports

MJ1: RS-232 w/full handshaking
 MJ2: RS-485 Half-Duplex

MJ1 PINS			MJ2 PINS	
PIN	SIGNAL	DIRECTION	SIGNAL	DIRECTION
8	TXD	OUT	--	--
7	RXD	IN	--	--
6	0V	GROUND	0V	GROUND
5	+5V @ 60mA	OUT	+5V @ 60mA	OUT
4	RTS	OUT	--	--
3	CTS	IN	--	--
2	--	--	RX- / TX-	IN / OUT
1	--	--	RX+ / TX+	IN / OUT

3.3 - Dip Switches

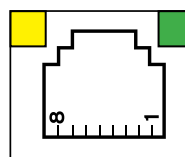


DIP SWITCHES

PIN	NAME	FUNCTION	DEFAULT
1	MJ3 RS485 Termination	ON = Terminated	OFF
2	MJ3 Duplex	ON = Half	OFF
3		OFF = Full	OFF
4	MJ2 RS485 Termination	ON = Terminated	OFF

The DIP switches are used to provide a built-in termination to both the MJ1, MJ2 & MJ3 ports if needed. The termination for these ports should only be used if this device is located at either end of the multidrop/daisy-chained RS-485 network.

3.4 - Ethernet Communications



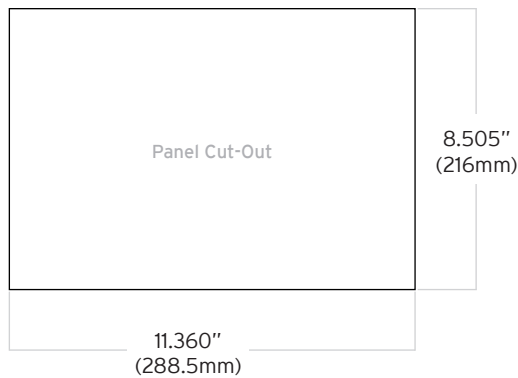
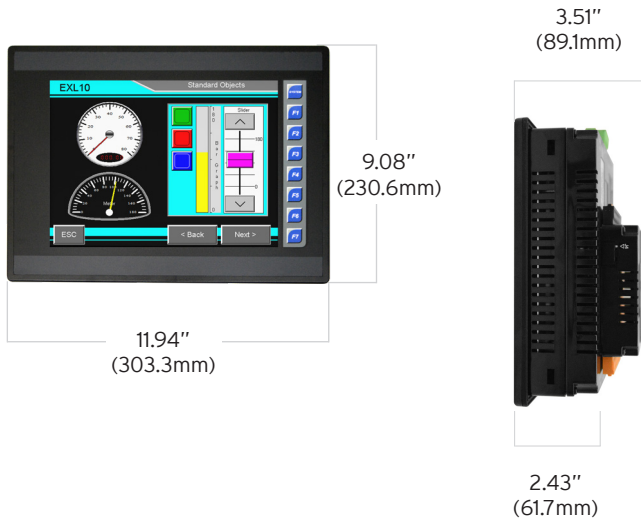
Green LED indicates link - when illuminated, data communication is available.

Yellow LED indicates activity - when flashing, data is in transmission.

4 BATTERY

The EXL10 has an advanced battery system that uses a rechargeable lithium battery. The battery powers the real time clock when power is removed, and it is needed for register data retention. Please reference MAN1029 providing instructions on how to replace the battery.

5 DIMENSIONS & INSTALLATION



dimensions & installation continued...

5.1 - Installation Procedure

The EXL10 utilizes a clip installation method to ensure a robust and watertight seal to the enclosure. Please follow the steps below for the proper installation and operation of the unit.

1. Carefully locate an appropriate place to mount the EXL10. Be sure to leave enough room at the top of the unit for insertion and removal of the microSD™ card.
2. Carefully cut the host panel per the diagram, creating a 216mm x 288.5mm +/-0.1 mm opening into which the EXL10 may be installed. If the opening is too large, water may leak into the enclosure, potentially damaging the unit. If the opening is too small, the OCS may not fit through the hole without damage.
3. Remove any burrs and or sharp edges and ensure the panel is not warped in the cutting process.
4. Remove all Removable Terminals from the EXL10. Insert the EXL10 through the panel cutout (from the front). The gasket must be between the host panel and the EXL10.
5. Install and tighten the four mounting clips (provided in the box) until the gasket forms a tight seal (max torque 0.8 to 1.13 N m, or 7-10 in-lbs).
6. Reinstall the EXL10 I/O Removable Terminal Blocks. Connect communications cables to the serial port, USB ports, Ethernet port, and CAN port as required.

Wiring Details:

Solid/Stranded wire - 12-24 awg (2.5-0.2mm²).
Strip length - 0.28" (7mm).
Torque rating: 4.5 - 7 in-lbs (0.50 - 0.78 N-m).

6 SAFETY & WARNINGS

6.1 - WARNINGS

- To avoid the risk of electric shock or burns, always connect the safety (or earth) ground before making any other connections.
- 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.
- Replace fuse with the same type and rating to provide protection against risk of fire and shock hazards.
- In the event of repeated failure, do NOT replace the fuse again as repeated failure indicates a defective condition that will NOT clear by replacing the fuse.
- 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.

6.2 - FCC COMPLIANCE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation

6.3 - PRECAUTIONS

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 the electric circuits or pulse-initiating equipment, open their related breakers.
- Do NOT make connection 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.
- Use copper conductors in Field Wiring only, 60/75°C.

7 PART NUMBER

EXAMPLE PART NUMBERS

GLOBAL MODEL NUMBERS

	Ethernet	I/O	Options
HE-X	<input type="text"/>	<input type="text"/>	<input type="text"/>
	0 (no ethernet) E (ethernet)	0 (model 0) 2 (model 2) 3 (model 3) 4 (model 4) 5 (model 5) 6 (model 6)	-10 Thermistor Support -22 Display Heater

EUROPEAN MODEL NUMBERS

	screen	Ethernet	CAN option	I/O	overlay type
HEX	<input type="text"/>	<input type="text"/>	C <input type="text"/>	<input type="text"/>	<input type="text"/>
		0 (no Ethernet) 1 (Ethernet)	0 (no CAN*) 1 (CsCAN) 2 (CANopen) 4 (DeviceNet) 5 (J1939)	00 (model 0) 12 (model 2) 13 (model 3) 14 (model 4) 15 (model 5) 16 (model 6)	00 (dark colour) 01 (light colour) 02 (blank) 03-99 (custom)

8 TECHNICAL SUPPORT

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

North America
(317) 916-4274
www.hornerautomation.com
techsppt@heapg.com

Europe
(+) 353-21-4321-266
www.horner-apg.com
technical.support@horner-apg.com