

X OCS MODEL: HE-X7

MODEL A BUILT-IN I/O: 12 DIGITAL INPUTS, 12 DIGITAL OUTPUTS, 4 ANALOG INPUTS, 2 ANALOG OUTPUTS
MODEL R BUILT-IN I/O: 12 DIGITAL INPUTS, 6 RELAY OUTPUTS, 2 PWM OUTPUTS, 4 ANALOG INPUTS, 2 ANALOG OUTPUTS

GETTING STARTED

- 1 Read this document to fully understand the X7 and safety requirements.
- 2 Connect 24VDC power and I-O according to the quick start guide and data sheet.
- 3 Refer to the X7 User Manual, MAN1155, and Datasheet, MAN1156, for further instructions.



MAN1157-03-EN

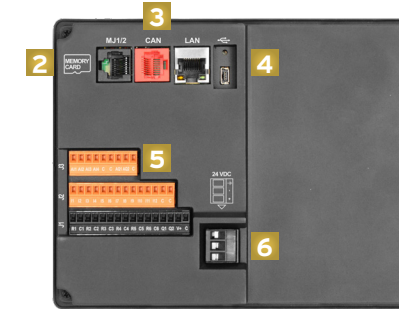
1 - General Specifications

1.1 General	
Primary Pwr. Range	24VDC +/- 20%
Typical power-backlight 100%	190mA @ 24VDC
Power Backlight Off	123mA @ 24V
Inrush Current	30A < 1ms
Real Time Clock	Battery backed; lithium coin cell CR2450
Clock Accuracy	+/- 90 Secs/Month
Relative Humidity	5 to 95% Non-condensing
Operating Temp.	-10°C to +60°C
Storage Temp.	-20°C to +70°C
Weight	20.8 oz./ 590 g
Included in Box	Controller, 3 x I/O connectors, 4 x mounting clips, 1 x power connector, Quick Reference Guide
Certifications (UL/CE)	USA: https://hornerautomation.com/certifications/ Europe: http://www.horner-app.com/en/support/certification.aspx

1.2 Connectivity	
Serial Ports	1 x RS232, 1 x RS485
485 Terminations	On-board, software controlled
USB Programming Support	USB mini-B 2.0
CAN Hardware	Non-isolated
CAN Port Connector	RJ45 (red)
CAN Port Termination	On-board, software controlled
Ethernet	1 x 10Mbps/100Mbps
Removable Memory In	microSD (SDHC, SDXC IN FAT32 format, support for 32 GB max. Application Updates, Datalogging, more)
Remote I/O	SmartRail, SmartStix, SmartBlock, SmartMod

1.3 User Interface / Control & Logic	
Display	7" Color Transmissive
Resolution	480 x 272 pixels
Backlight	White LED, 20,000 hrs.
Backlight Control	Yes, software controlled (ON/OFF)
Control Language Support	Advanced ladder logic Full IEC 61131-3 languages

2 - Port Connectors



1. Touch Screen
2. High Capacity microSD Slot
3. RS232/RS485 Serial Connector, CAN port (via RJ45), LAN Port (Ethernet)
4. USB Mini-B Port
5. Analog I/O, DC Inputs, DC Outputs
6. DC Power

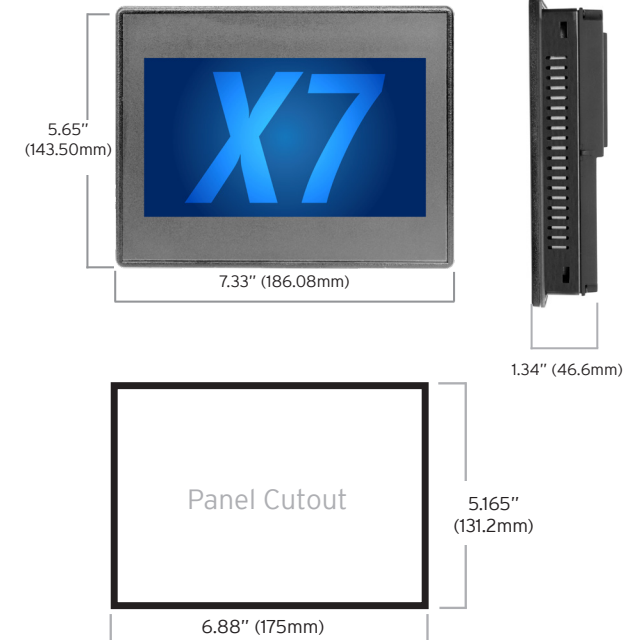
NOTE: See Precaution #16 about USB and grounding.

3 - Installation Procedure

The X7 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 X7. 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 on Page 1, creating a 131.2mm x 175mm (with a tolerance of +/- 0.5mm/ -0mm) opening into which the X7 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. Install and tighten the four mounting clips (provided in the box) until the gasket forms a tight seal. For standard composite mounting clips (included with product), use a torque rating of 2-3 in-lbs (0.23-0.34 Nm). For optional metal mounting clips, use a torque rating of 4-8 in lbs (0.45-0.90 Nm).
5. Connect communications cables to the serial port, USB ports, and CAN port as required.

4 - Panel Cut-Out



5 - Warnings

5.1 - 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:

1. Connect the safety (earth) ground on the power connector first before making any other connections.
2. When connecting to the electric circuits or pulse-initiating equipment, open their related breakers.
3. Do NOT make connection to live power lines.
4. Make connections to the module first; then connect to the circuit to be monitored.
5. Route power wires in a safe manner in accordance with good practice and local codes.
6. Wear proper personal protective equipment including safety glasses and insulated gloves when making connections to power circuits.
7. Ensure hands, shoes, and floor are dry before making any connection to a power line.
8. Make sure the unit is turned OFF before making connection to terminals.
9. Make sure all circuits are de-energized before making connections.
10. Before each use, inspect all cables for breaks or cracks in the insulation. Replace immediately if defective.
11. Use copper conductors in Field Wiring only, 60/75°C.
12. Do not disconnect while circuit is live unless area is known to be non-hazardous.
13. Do not remove or replace jumpers or connectors while circuit is live unless the area is known to be free of ignitable concentrations of flammable gases or vapors.
14. EXPLOSION HAZARD - substitution of components may impair suitability for Class I, Division 2.

15. Use caution when making connections to the controller to protect against static discharge. Special care must be taken when replacing the battery or inserting or adjusting I/O or communication boards.
16. Use caution when connecting controllers to PCs via serial or USB. PCs and especially laptops may use "floating power supplies" what are ungrounded. This could cause a voltage potential between the laptop and controller. Make sure the controller and laptop are grounded for maximum protection. Consider using a USB isolator due to voltage potential between the laptop and controller.
17. Failure to follow these guidelines can damage the controller and/or controller.
18. If the equipment is used in a manner not specified by Horner APG, the protection provided by the equipment may be impaired.

5.2 - Hazardous Location Notice

Power, input and output (I/O) wiring must be in accordance with Class 1, Division 2 wiring methods [Article 501-4(b) of the National Electrical Code, NFPA 70] for installations in the U.S. or as specified in Section 18-1J2 of the Canadian Electrical Code for installations within Canada and in accordance with the authority having jurisdiction.

1. THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A B C D or NON-HAZARDOUS LOCATIONS ONLY.
2. WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
AVERTISSEMENT - RISQUE D'EXPLOSION LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2

3. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS AND FREE OF IGNITABLE CONCENTRATIONS.
ATTENTION - RISQUE D'EXPLOSION - NE DECONNECTEZ PAS L'EQUIPEMENT A MOINS DE L'AVOIR MIS HORS TENSION OU QUE LA ZONE EST CONNUE NON-DANGEREUSE ET NE CONTIENT PAS DE CONCENTRATIONS INFLAMMABLES.

5.3 - FCC Compliance

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

Contact Information

Technical Support

For further details, please refer to the Datasheet, MAN1155. For assistance and manual updates, contact Technical Support at the following locations:

North America
+1 (317) 916-4274
www.hornerautomation.com
techsppt@heapg.com

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

6 - Connecting the X7 to a PC

The X7 OCS can communicate with Cscape using USB to USB, USB to serial adapters, serial port communications via MJ1 Port, or CAN (CsCAN).

To communicate with the X7 via USB you will need the Automated Driver Installer located on our website. The drivers may be loaded from the HE-XEC Ethernet Utility / HTTP Web Server Demo / Communications Driver section of the support files page found at : <https://hornerautomation.com/support-files>

Next, connect a PC's (Personal Computer running a Windows Microsoft operating system) USB port via USB cable to the USB mini B port on the X7 OCS.

Now that the X7 is plugged in, go to the Cscape menu **Controller** --> **Connection Wizard**, choose your connection method. If you're connecting for the first time, we suggest connecting via USB.

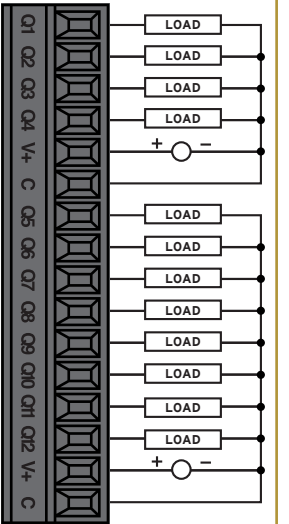
If communication is established, the target indicator will show the mode of the controller Target: yy(R).

If the controller is not communicating, you may need to set the Target ID of the controller in Cscape or change the controllers ID on the unit itself. The Target ID allows directing communications to a particular unit when multiple units are connected via a CsCAN network. Units without CsCAN network ports respond to any network ID and do not require the ID to be configured.

For more information, review the Cscape Configuration chapter of the X7 OCS User Manual, MAN1155.

7.1 - Wiring Connectors: Model A Digital Out: J1 Wiring

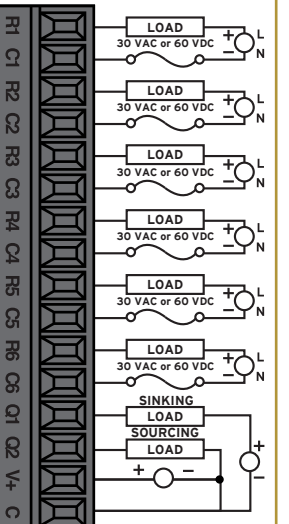
POSITION/PIN	DIGITAL MODEL
1	Q1 Output 1 (PWM)
2	Q2 Output 2 (PWM)
3	Q3 Output 3
4	Q4 Output 4
5	V+ External V+
6	C Common
7	Q5 Output 5
8	Q6 Output 6
9	Q7 Output 7
10	Q8 Output 8
11	Q9 Output 9
12	Q10 Output 10
13	Q11 Output 11
14	Q12 Output 12
15	V+ External V 2 +
16	C Common



X7 MODEL A ONLY

7.2 - Wiring Connectors: Model R Relay & Digital Out: J1 Wiring

POSITION/PIN	DIGITAL MODEL
1	R1 Relay 1 N.O.
2	C1 Relay 1 C
3	R2 Relay 2 N.O.
4	C2 Relay 2 C
5	R3 Relay 3 N.O.
6	C3 Relay 3 C
7	R4 Relay 4 N.O.
8	C4 Relay 4 C
9	R5 Relay 5 N.O.
10	C5 Relay 5 C
11	R6 Relay 6 N.O.
12	C6 Relay 6 C
13	Q1 Output 1
14	Q2 Output 2
15	V+ External V+
16	C Common

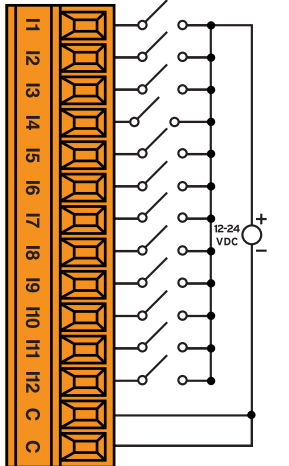


NOTE: Internal 10kΩ resistors between: V+ and Q1; V+ and Q2

X7 MODEL R ONLY

7.3 - J2 Wiring: Model R & A Digital Input

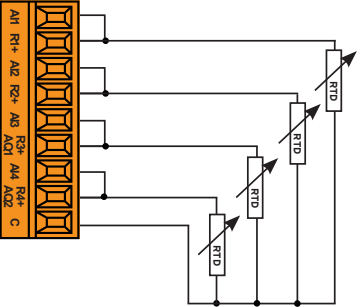
POSITION/PIN	DIGITAL MODEL
1	I1 Input 1
2	I2 Input 2
3	I3 Input 3
4	I4 Input 4
5	I5 Input 5
6	I6 Input 6
7	I7 Input 7
8	I8 Input 8
9	I9 Input 9 (HSC1)
10	I10 Input 10 (HSC2)
11	I11 Input 11 (HSC3)
12	I12 Input 12 (HSC4)
13	C Common
14	C Common



X7 MODELS R & A BOTH

7.4 - J3 Wiring: RTD Wiring

PIN	4x2-Wire RTD Connections
1	AI1
2	RTD1+
3	AI2
4	RTD2+
5	AI3
6	RTD3+/AQ1
7	AI4
8	RTD4+/AQ2
9	Common



7.5 - Wiring Connectors: Model R & A Power

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

Primary Power Range: 24VDC +/- 20%

