HORNER APG

PRELIMINARY

XLE OCS Model: HE-XE105
12 Digital DC Inputs / 12 Digital DC Outputs
2 Analog Inputs (High Resolution)
2 Analog Outputs

Want More Information?
To download the XLE User Manual (MAN0805), refer to *Technical Support* in this document.

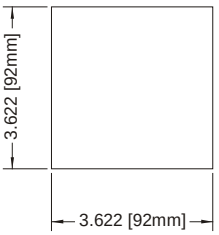
1 Specifications

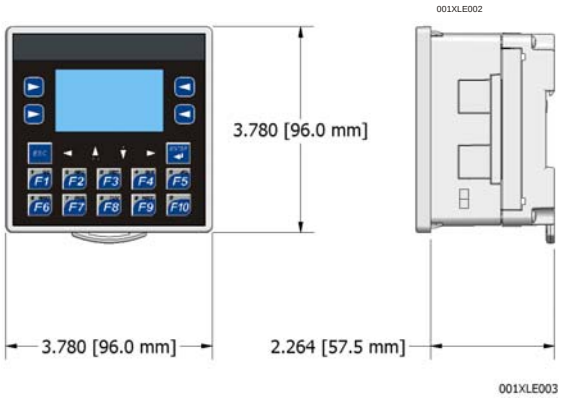
HE-XE105 Specifications				
Digital DC Inputs			**Digital DC Outputs**	
Inputs per Module	12 including 4 configurable HSC inputs		Outputs per Module	12 including 2 configurable PWM outputs
Commons per Module	1		Commons per Module	1
Input Voltage Range	12 VDC / 24 VDC		Output Type	Sourcing / 10 K Pull-Down
Absolute Max. Voltage	35 VDC Max.		Absolute Max. Voltage	28 VDC Max.
Input Impedance	10 kΩ		Output Protection	Short Circuit
Input Current	Positive Logic	Negative Logic	Max. Output Current per point	0.5 A
Upper Threshold	0.8 mA	-1.6 mA	Max. Total Current	4 A Continuous
Lower Threshold	0.3 mA	-2.1 mA	Max. Output Supply Voltage	30 VDC
Max Upper Threshold	8 VDC		Minimum Output Supply Voltage	10 VDC
Min Lower Threshold	3 VDC		Max. Voltage Drop at Rated Current	0.25 VDC
OFF to ON Response	1 ms		Max. Inrush Current	650 mA per channel
ON to OFF Response	1 ms		Min. Load	None
HSC Max. Switching Rate	10 kHz		OFF to ON Response	1 ms
Analog Inputs, High Resolution			ON to OFF Response	1 ms
Number of Channels	2		Output Characteristics	Current Sourcing (Pos logic)
Input Ranges (Selectable)	0 - 10 VDC 0 – 20 mA 4 – 20 mA PT100 RTD, and J, K, N, T, E, R, S, B Thermocouples		**Analog Outputs**	
Safe input voltage range	10 VDC: -0.5 V to +15 V 20 mA: -0.5 V to +6 V RTD / T/C: ±24 VDC		Number of Channels	2
Nominal Resolution	14 Bits		Output Ranges	0-10 VDC, 0-20 mA
Input Impedance (Clamped @ -0.5 VDC to 12 VDC)	Current Mode: 100 Ω, 35mA Max. Continuous Voltage Mode: 500 kΩ, 35mA Max. Continuous		Nominal Resolution	12 Bits
			Update rate	Once per PLC scan
			Minimum 10 V load	5 kΩ
			Maximum 20 mA load	500 Ω
			Analog Outputs; Output Points Required	2
			Maximum Error at 25°C	0.1%
%AI full scale	10 V, 20 mA, 100 mV: 32,000 counts full scale. RTD / T/C: 20 counts / °C		Additional error for temperatures other than 25°C	0.01% / °C
Max. Over-Current	35 mA		**General Specifications**	
Open Thermocouple Detect Current	50 nA		Required Power (Steady State)	130 mA @ 24 VDC
Conversion Speed	All channels converted once per ladder scan		Required Power (Inrush)	30 A for 1 ms @ 24 VDC
RTD Excitation Current	250 µA		Primary Power Range	10 - 30 VDC
Thermocouple Common Mode Range	±10V		Operating Temperature	0° to 50° Celsius
			Relative Humidity	5 to 95% Non-condensing
Converter Type	Successive Approximation		CE / UL	See Compliance Table at http://www.heapg.com/Support/compliance.htm
Max. Error at 25°C	TBD			
Additional error for temperatures other than 25°C	TBD		Terminal Type	Screw Type,5 mm Removable
Filtering	160Hz hash (noise) filter 1-128 scan digital running average filter		Weight	12.5 oz. (354.36)

2 Panel Cut-Out and Dimensions

Refer to XLE User Manual (MAN0805) for panel box information and a handy checklist of requirements.

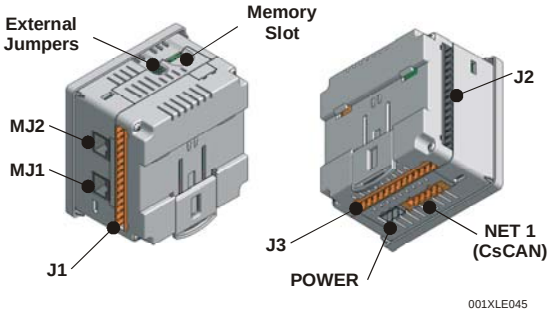
Note:
The tolerance to meet **NEMA** standards is ± 0.005" (0.1 mm).





3 Ports / Connectors / Cables

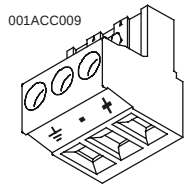
Note: The case of the XLE is black, but for clarity, it is shown in a lighter gray color.



To Remove Back Cover:
Unscrew 4 screws located on the back of the unit.
Lift lid.

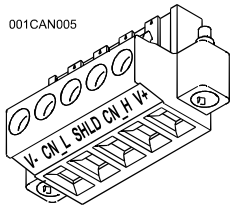
CAUTION: Do not overtighten screws when screwing the lid back on.

I/O Jumpers: (Not Shown)
I/O Jumpers (JP) are located internally. To access, remove back cover of unit.
The I/O Jumpers, External Jumpers and **Connectors** (J1- J3) are described in the ***Wiring and Jumpers*** section of this document.



Power Connector

Power Up:
Connect to Earth Ground.
Apply 10 - 30 VDC.
Screen lights up.

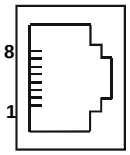


CAN Connector

Use the CAN Connector when using CsCAN network.

Memory Slot:
Uses **Removable Memory** for data logging, screen captures, program loading and recipes.
Horner Part No.: HE-MC1

Serial Communications:
MJ1: Use for Cscape programming and Application-Defined Communications.
MJ2: Use for Application-Defined Communications.



Pin	MJ1 Pins		MJ2 Pins	
8	TXD	OUT	TXD	OUT
7	RXD	IN	RXD	IN
6	0 V	Ground	0 V	Ground
5	NC	No Connect	NC	No Connect
4	CTS	OUT	TX-	OUT
3	RTS	IN	TX+	OUT
2	RX- / TX-	IN / OUT	RX-	IN
1	RX+ / TX+	IN / OUT	RX+	IN

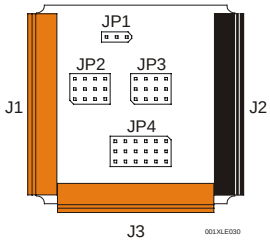
4 Wiring and Jumpers

Wire according to the type of inputs / outputs used and select the appropriate jumper option.

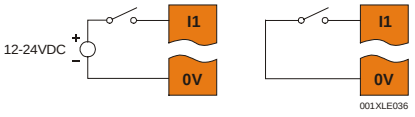
Wiring Specifications

- For I/O wiring (discrete), use the following wire type or equivalent: Belden 9918, 18 AWG or larger.
- For shielded Analog I/O wiring, use the following wire type or equivalent: Belden 8441, 18 AWG or larger.
- For CAN wiring, use the following wire type or equivalent: Belden 3084, 18 AWG or larger.

Location of I/O jumpers (JP) and wiring connectors (J1 – J3).



Positive Logic vs. Negative Logic Wiring
The XLE can be wired for Positive Logic inputs or Negative Logic inputs.

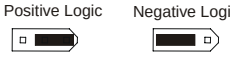


Positive Logic In Negative Logic In

a. I/O Jumpers Settings (JP1 – JP4)

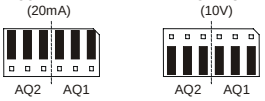
Note: The Cscape Module Setup configuration must match the selected I/O (JP) jumper settings.

JP1 Digital DC Inputs



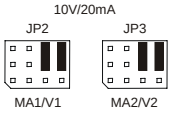
Default

JP4
ANALOG OUTPUT SETTING
VOLTAGE OR CURRENT

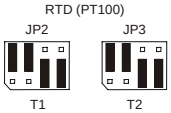


Default

Analog In Settings



Default

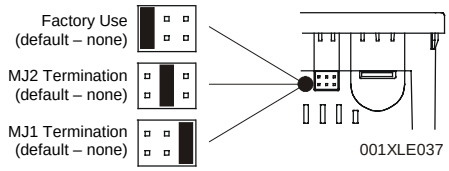


b. External Jumpers Settings

The External Jumpers are used for termination of the RS-485 ports. The XLE is shipped unterminated.

To terminate, select one of the jumpers shipped with the product and insert it based upon the option that is desired.

As seen when looking at the top of the XLE unit. Refer to Section 3 for the location of the External Jumpers.

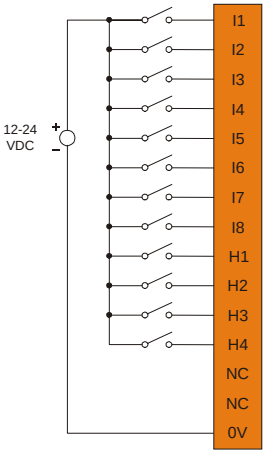


c. Wiring Examples

Note: The wiring examples show **Positive Logic** input wiring.

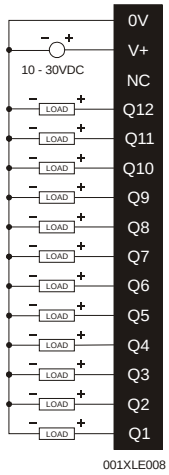
J1 Orange	XE105 Name
I1	IN1
I2	IN2
I3	IN3
I4	IN4
I5	IN5
I6	IN6
I7	IN7
I8	IN8
H1	HSC1 / IN9
H2	HSC2 / IN10
H3	HSC3 / IN11
H4	HSC4 / IN12
NC	No Connect
NC	No Connect
0V	Ground

XE105 J1 Orange
Positive Logic
Digital In / /Digital Out



J2 Black	XE105 Name
0V	Ground
V+*	V+*
NC	No Connect
Q12	OUT12
Q11	OUT11
Q10	OUT10
Q9	OUT9
Q8	OUT8
Q7	OUT7
Q6	OUT6
Q5	OUT5
Q4	OUT4
Q3	OUT3
Q2	OUT2 / PWM2
Q1	OUT1 / PWM1
V+* Supply for Sourcing Outputs	

XE105 J2 Black
Positive Logic
Digital Outputs

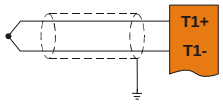


J3 Orange	XE105 Name
T1+	T/C / RTD IN1+ / 100 mV+
T1-	T/C / RTD IN1- / 100 mV-
T2+	T/C / RTD IN2+ / 100 mV+
T2-	T/C / RTD IN2- / 100 mV-
AQ1	10 V / 20 mA OUT1
AQ2	10 V / 20 mA OUT2
0V	Ground
MA1	20 mA IN1
V1	10 V IN1
0V	Ground
MA2	20 mA IN2
V2	10 V IN2
0V	Ground

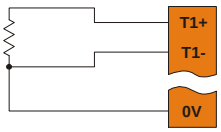
XE105 J3 Orange
Analog In / Analog Out

Note: A total of 2 Analog Inputs can be used (T/C, RTD, mV, mA, and V).

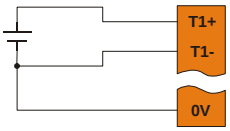
Thermocouple In



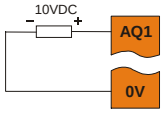
RTD In



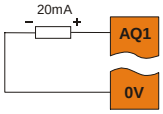
mV In



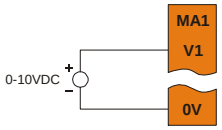
0 -10 V Analog Out



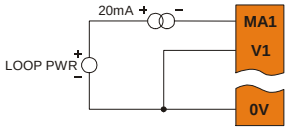
4 - 20 mA Analog Out



0 – 10 V Analog In



20 mA Analog In



5 Safety

When found on the product, the following symbols specify:

Warning: Electrical Shock Hazard.

Warning: Consult user documentation.

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: 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.

- 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.