XLE Motor Monitor: HEXE1MM / HEXE1MM-xx
4 Digital DC Inputs, 4 CT Inputs, 1 PTC Input, 4 Relay Outputs

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

1 Specifications

Specifications for 1MM / 1MM-xx	
Digital DC Inputs	
Inputs per Module	4
Commons per Module	2
Input Voltage Range	±12 VDC / ±24 VDC
Absolute Max. Voltage	35 VDC Max.
Nominal Input Impedance	10 kΩ
Max Upper Threshold	9 VDC
Min Lower Threshold	3 VDC
OFF to ON Response	1 ms
ON to OFF Response	1 ms
Isolation	1000 VAC
Digital Relay Outputs	
Outputs per Module	3 NO, 1 NO/NC
Commons per Module	4
Max. Output Current	3A at 230 VAC, resistive
Max. Total Current	12 A continuous
Max. Output Voltage	275 VAC , 30 VDC
Max. Switched Power	150 W, 1250 VA
Contact Isolation to XLE ground	1000 VAC
Max. Voltage Drop at Rated Current	0.5 V
Expected Life (See Derating section for chart.)	No load: 5,000,000 Rated load: 100,000
Max. Switching Rate	300 CPM at no load 20 CPM at rated load
Type	Mechanical Contact
Response Time	One update per ladder scan plus 10 ms
Analog Inputs, Medium Resolution	
Number of Channels	4 CT, 1 PTC
Input Ranges	CT: 1 A AC (option)
	CT: 5A AC (option)
	CT: 100mA AC (option)
	PTC: 0-5.1K ohm
CT Burden	1 VA
Nominal Resolution	10 Bits
%AI full scale	32,000 counts
Conversion Speed	All channels converted once per ladder scan
CT Response Delay Time	30 ms
Max. Error at 25°C (excluding zero)	1.0%
Additional error for temperatures other than 25°C	TBD
Isolation	None
Filtering	700 Hz hash (noise) filter 1-128 scan digital running average filter
General Specifications	
Required Power (Steady State)	130 mA @ 24 VDC
Required Power (Inrush)	30 A for 1 ms @ 24 VDC
Primary Power Range	10 – 30 VDC
Relative Humidity	5 to 95% Non-condensing
Operating Temperature	0° to 50° Celsius
Terminal Type	Screw Type, 5 mm Removable
Weight	12 oz. (340.19 g)
CE / UL	See Compliance Table at http://www.heapg.com/Support/compliance.htm

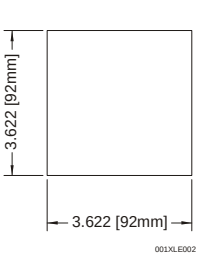
2 Models

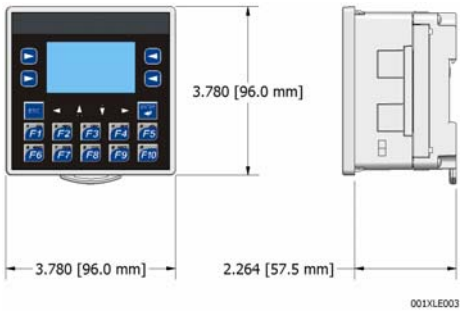
1MM / 1MM-xx Models	
HEXE1MM	XLe-based Motor Monitor with CsCAN and 0-5 A current inputs
HEXE1MM-51	XLe-based Motor Monitor with 0-100 mA current inputs*
HEXE1MM-52	XLe-based Motor Monitor with 0-100 mA current inputs and XDFO (XLe Dual Channel Fiber Optic Module) installed.*
HEXE1MM-53	XLe-based Motor Monitor with CsCAN and 0 – 1A current inputs
*CT Channels 1,2 and 3 Feature 10x Over Range	

3 Panel Cut-Out and Dimensions

Note: Max. panel thickness: 5 mm.

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).



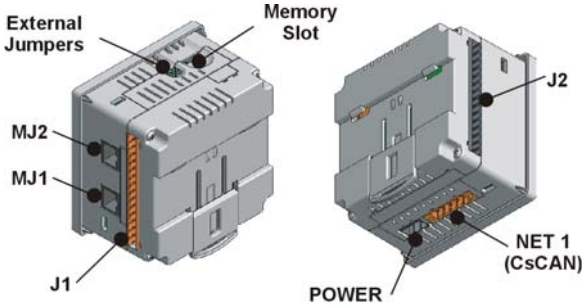


4 Ports / Connectors / Cables

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

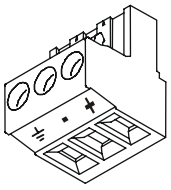
To Remove Back Cover:
Unscrew 4 screws located on the back of the unit.
Lift lid.

CAUTION: Do not over-tighten screws when screwing the lid back on.

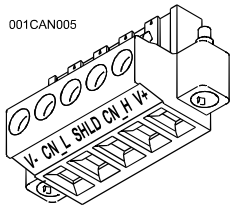


External Jumpers (RS-485) / Connectors (J1 / J2) are describe in *Wirings and Jumpers* in this document.
Memory Slot:

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



Power Connector



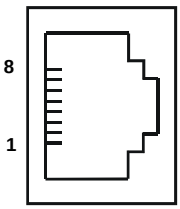
CAN Connector

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

Use the CAN Connector when using CsCAN network.

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.



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	NC	No Connect	NC	No Connect
4	RTS	OUT	TX-	OUT
3	CTS	IN	TX+	OUT
2	RX- / TX-	IN / OUT	RX-	IN
1	RX+ / TX+	IN / OUT	RX+	IN

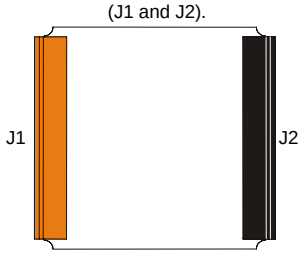
5 Wiring and Jumpers

Wire according to the type of inputs / outputs used.

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.

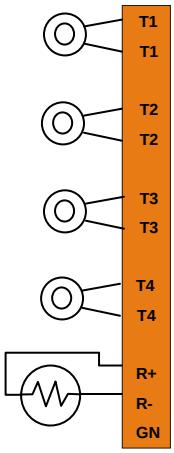
Location of I/O connectors (J1 and J2).



a. Wiring Examples

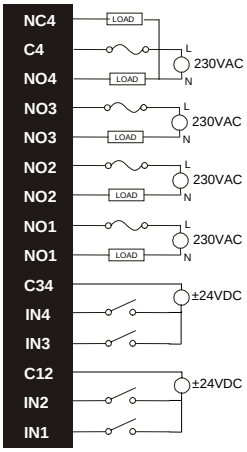
1 Orange Terminal Connector	1MM / 1MM-xx Name
T1	CT1
T1	CT1
T2	CT2
T2	CT2
T3	CT3
T3	CT3
T4	CT4
T4	CT4
	No connect
R+	PTC+
R-	PTC-
GN	Ground

J1 Orange
Analog Inputs



J2 Black Terminal Connector	1MM / 1MM-xx Name
NC4	Relay 4 NC
C4	Relay 4 COM
NO4	Relay 4 NO
NO3	Relay 3 NO
NO3	Relay 3 NO
NO2	Relay 2 NO
NO2	Relay 2 NO
NO1	Relay 1 NO
NO1	Relay 1 NO
C34	INPUT 3/4 COM
IN4	INPUT 4
IN3	INPUT 3
C12	INPUT 1/2 COM
IN2	INPUT 2
IN1	INPUT 1

J2 Black
Digital In / Relay Out

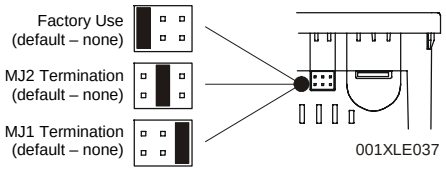


c. External Jumpers Settings

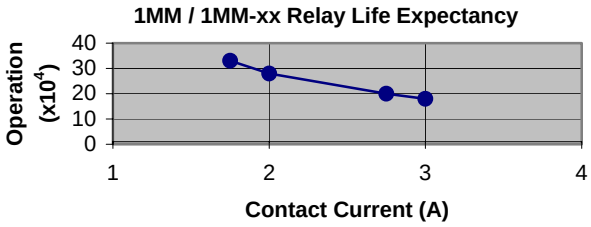
The External Jumpers are used for termination of the RS-485 ports. The XLE is shipped unterminated.

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.



6 Derating



7 I/O Map Register

I/O Register Map	
Registers	**Description**
%I1 to %I4	Digital Inputs
%Q1 to %Q4	Relay Outputs
%AI1 to %AI4	AC Current Inputs
%AI5	PTC Input

8 Additional References

If using **HEXE1MM-52**, the XDFO (XLe Dual Channel Fiber Optic Module) is installed. A datasheet is available for the XDFO (MAN0822). Visit our website listed in the **Technical Support** section to obtain the datasheet.

9 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.

10 Technical Support

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

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

Europe:
(+) 353-21-4321-266
www.horner-apg.com
email: techsupport@hornerirl.ie