HE-XDAC007 & HE-XDAC107
2 channel & 4 channel Analog Output Module

1. SPECIFICATIONS

HE-XDAC007/107, Analog Outputs, 12-bit Resolution		
Number of channels	2 channels (HE-XDAC007)	
	4 channels (HE-XDAC107)	
Installation location	XL I/O COM option slot (no serial ports used)	
Output ranges	0 - 10 VDC -10 – +10V 0 – 20 mA 4 – 20 mA	
Safe input voltage range	-0.5 V to +12V	
Output impedance (clamped @ -0.5 to 12 VDC)	Current Mode 100Ω	Voltage Mode 500kΩ
Nominal resolution	12 bits	
%AQ full scale	32,000	
Maximum overcurrent	35mA	
Conversion speed	All channels converted once per ladder scan	
Maximum error @ 25ºC (excluding zero) *(~0.25% with the digital filter setting at 3)	4-20 mA 1.00% 0-20 mA 1.00% 0-10 VDC 1.50%* ±10V 1.50%	
Filtering	160 Hz hash (noise) filter 1-128 scan digital running avg. filter	
Compliance	CE, UL http://www.hornerautomation.com/certifications/	

2. 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.

3. TECHNICAL SUPPORT

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

- **North America:**
  (317) 916-4274   www.hornerautomation.com   email: APGUSATechSupport@heapg.com

- **Europe:**
  (+) 353-21-4321-266   www.hornerautomation.eu

4. INSTALLATION INSTRUCTIONS

1. Disconnect all connectors from the XL unit including power.
2. Remove the four screws on the back of the XL unit and remove the back cover. The back cover will be replaced with the extended back cover that ships with the XDAC. Screws are re-used (Figure 1).
3. Plug the XDAC board onto the 24-pin connector. Make sure all the pins are properly aligned (Figure 2).
4. Seat the XDAC board fully by snapping the two standoffs into place on the I/O board below.
5. Be sure to replace plastic inserts for unused terminal openings.
6. Place the extended back cover onto the unit. It can be helpful to tip it at an angle so the connector on the I/O board passes through the opening on the back cover.
7. Place the screw back into the hole and turn the screw slowly counter clockwise until it clicks into the threads. This prevents the screw from being cross-threaded. Now, turn the screw clock-wise until the cover is firmly secured. Repeat this process for all four (4) screws. Do not tighten the screws to more than 0.4Nm

NOTE: When using this module with an HE-XE104, HE-XE105, or similar XL models with a 13 pin bottom I/O connector, the add-on module connector interferes with the stock I/O board connector. It is necessary to order a replacement I/O connector available as part number HE-XKIT45. This is not necessary for the 102 and 103 style XL units.
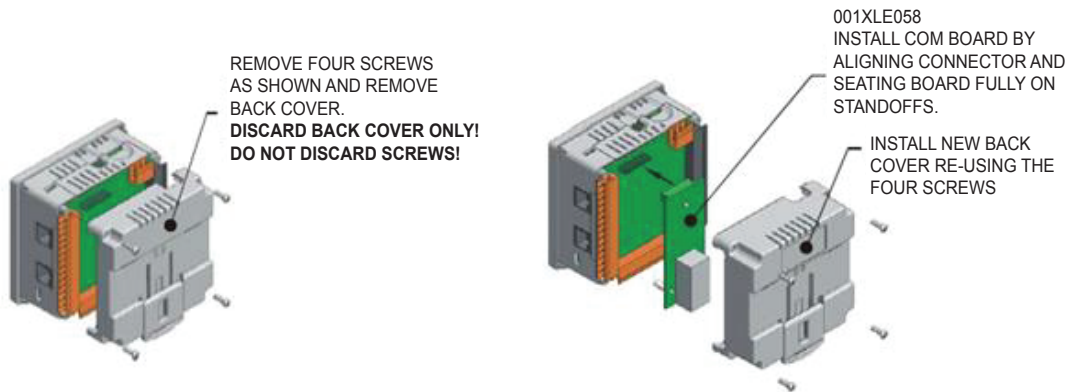
REMOVE FOUR SCREWS AS SHOWN AND REMOVE BACK COVER.
DISCARD BACK COVER ONLY!
DO NOT DISCARD SCREWS!

001XLE058
INSTALL COM BOARD BY ALIGNING CONNECTOR AND SEATING BOARD FULLY ON STANDOFFS.

INSTALL NEW BACK COVER RE-USING THE FOUR SCREWS

Figure 1 - Removing Back Cover of the XLE

Figure 2 - Installing the COM Board in the XLE

5. I/O MODULE CONFIGURATION

Each channel of the HE-XDAC can be configured to support one of three output modes; 20mA (default), 0-10V or +/-10V. Each channel has a Jumper Array (6x3) for configuring the mode. If a channel is to be used in mA current mode, the factory jumper settings are sufficient. If one of the voltage output modes is desired, the jumper array for that channel must be set appropriately.

Figure 3 below shows the location of the jumper array for each channel. Figure 4 at right shows the appropriate jumper settings for each channel, for each output mode. **JUMPERING IS NOT THE SAME FOR EACH CHANNEL, EVEN FOR IDENTICAL MODES**.

The output mode selected in Cscape (under hardware configuration) must match the jumper settings. In the case of 20mA, the user can select in Cscape between 0-20mA or 4-20mA.
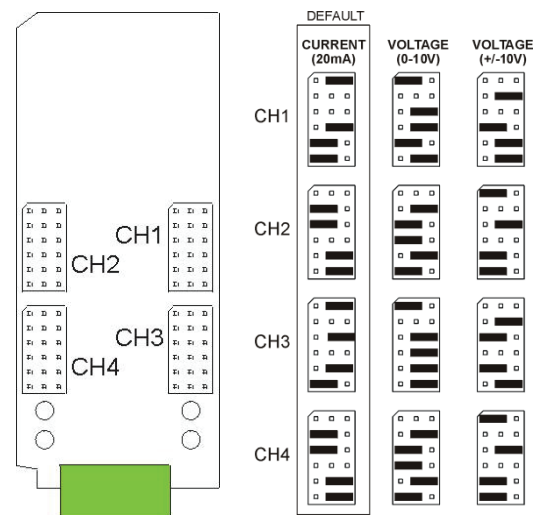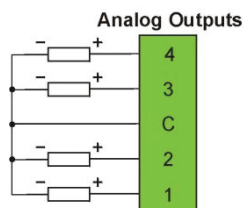

6. WIRING AND JUMPERS

Wiring Specifications: For shielded Analog I/O wiring, use the following wire type or equivalent: Belden 8441, 18 AWG or larger.

HE-XDAC Pinout	
Terminal	Function
4	Analog Out 4+*
3	Analog Out 3+*
C	0V (Common)
2	Analog Out 2+
1	Analog Out 1+
*Active on HE-XDAC107 only	

Analog Outputs

Shielding: For best results, use twisted-pair, shielded wiring. The shield drain should be connected to earth ground at one end only.

7. I/O REGISTER MAP

Registers	Description
%AQ32	Analog Out Channel 1
%AQ33	Analog Out Channel 2
%AQ34	Analog Out Channel 3
%AQ35	Analog Out Channel 4

8. ANALOG SCALING

The XDAC has a resolution of 12-bits, which results in 4000 distinct output values over the full scale of 32,000 counts. For example, in milliamp mode, a digital output change of 8 counts will result in an analog output change of 0.005mA. In +/-10V mode, a digital output change of 16 counts will result in an analog output change of 0.625mV.

Mode	Digital Value for Min Output	Digital Value for Max Output	Analog Resolution (@12 bits)
0-20mA	0	32,000	0.005mA
4-20mA	6,400	32,000	0.005mA
0-10V	0	32,000	0.3125mV
-10V to +10V	-32,000	32,000	0.625mV