4-20 mA Analog Input Module

HE800ADC020 / HE800ADC120
HE-ADC020* / HE-ADC120*
12-Bit Resolution
*** HE-denotes plastic case.**

This datasheet also covers products starting with IC300.

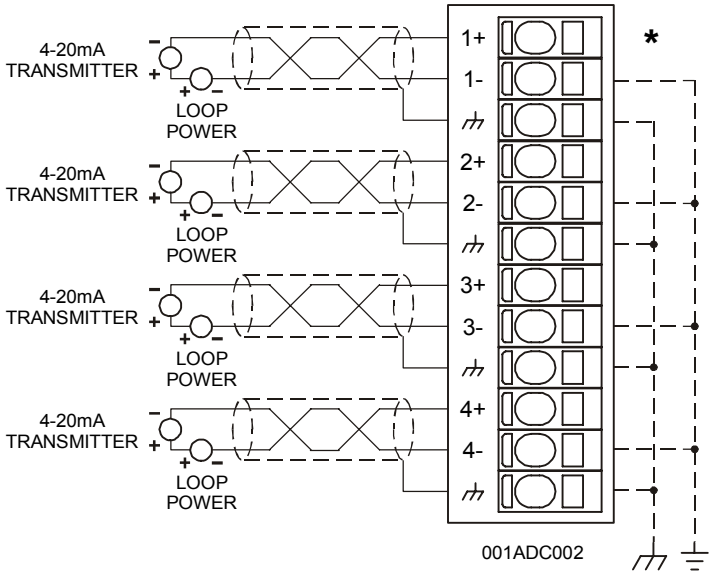
1 SPECIFICATIONS

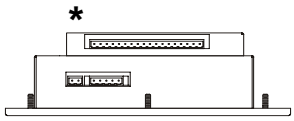
	ADC020	ADC120
Number of Channels	2	4
Input Ranges (including over-range)	Nominal: 0-20.47 mA, ±20.47 mA,	
Resolution	12-Bit	
Maximum Error at 25°C	0.05% Full Scale	
Input Impedance	100 Ω < 12 VDC, Clamped @ 12 VDC, 35 mA Max. Continuous	
Required Power (Steady State)	0.09 W (4.1 mA @ 24 VDC)	
Required Power (Inrush)	Negligible	
Maximum Over-Current	35 mA	
External Power Supply	None	

	ADC020	ADC120
Converter Type	Successive Approximation	
Conversion Time (PLC Update Rate)	Set by PLC Scan Time	
Terminal Type	Spring Clamp, Removable	
Additional error for temperatures other than 25°C	0.005% / °C	
Analog Inputs Input Points Required	2	4
Operating Temperature	0° to 60° Celsius	
Relative Humidity	5–95% Non-condensing	
Weight	9 oz. (256 g)	

CE UL	See Compliance Table at http://www.heapg.com/Support/compliance.htm

2 WIRING

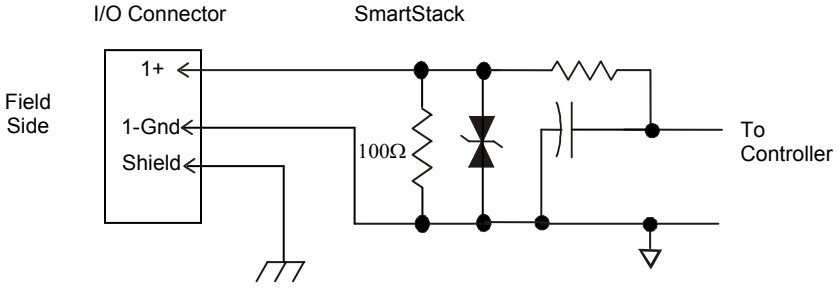




OCS Bottom View – Shows Corresponding I/O Pin

Pin #	ADC120	ADC020
1+	Channel 1+	Channel 1+
1-	Common	Common
⏚	Shield	Shield
2+	Channel 2+	Channel 2+
2-	Common	Common
⏚	Shield	Shield
3+	Channel 3+	
3-	Common	
⏚	Shield	
4+	Channel 4+	
4-	Common	
⏚	Shield	

3 INTERNAL CIRCUIT SCHEMATIC



4 CONFIGURATION

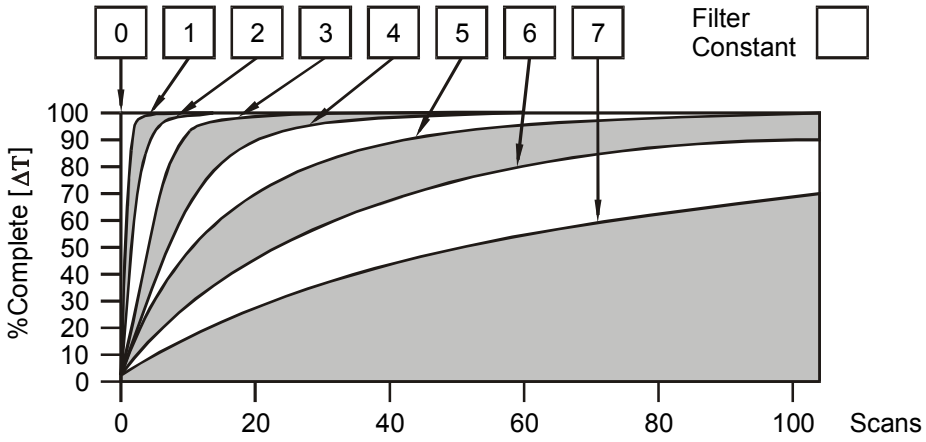
Note: The status of the I/O can be monitored in Cscape Software.

Preliminary configuration procedures that apply to SmartStack™ Modules are contained in the hardware manual of the controller you are using. Refer to the Additional References section in this data sheet for a listing of hardware manuals.

Selecting the **I/O Map** tab provides information about the I/O registers, which are assigned to a specific SmartStack™ Module and where the module is located in the point map. The I/O Map is determined by the model number and location within the SmartStack™. The I/O Map is not edited by the user.

Module Setup Tab

a) Input range for each channel may be selected independently.
b) Filter Constant sets the level of digital filtering according to the following chart.



Digital Filtering: The illustration above demonstrates the effect of digital filtering (set with Filter Constant) on module response to a temperature change.

5 INPUT CONVERSION FACTOR

The following table describes how real-world inputs are scaled into the controller. Given a known input current, the data value is configured by using the conversion factor from the table. The following formula is used: **Data = Input Current (mA) / Conversion Factor**

Example: The user selects a current range of 0 to +20 mA:

1) The known input current is 14 mA..
2) Using the table, the conversion factor for the current range of 0 to +20 VDC is 0.000625.
3) To determine the data value, the formula is used:
   Data = Input Current (mA) / Conversion Factor
   22400 = 14 mA / 0.000625

Conversion of Real-World Inputs into Controller			
Selected Current Range	**Input Current (mA)**	**Data**	**Conversion Factor**
0 to +20 mA	+20.47	32752	0.000625
	+20.00	32000	
	0	0	
-20 to +20 mA	-20.00	-32000	0.000625
	-20.47	-32752	

6 INSTALLATION / SAFETY

Warning: Remove power from the OCS controller, CAN port, and any peripheral equipment connected to this local system before adding or replacing this or any module.

a) All applicable codes and standards should be followed in the installation of this product.
b) Shielded, twisted-pair wiring should be used for best performance.
c) Shields may be terminated at the module terminal strip.
d) In severe applications, shields should be tied directly to the ground block within the panel.
e) Use the following wire type or equivalent:

   Belden 8441.

For detailed installation and a handy checklist that covers panel box layout requirements and minimum clearances, refer to the hardware manual of the controller you are using. (See the Additional References section in this document.).

When found on the product, the following symbols specify:

Warning: Consult user documentation.

Warning: Electrical Shock Hazard.

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.

For detailed installation and a handy checklist that covers panel box layout requirements and minimum clearances, refer to the hardware manual of the controller you are using. (See the Additional References section in this document.):

- All applicable codes and standards need to be followed in the installation of this product.
- For I/O wiring (discrete), use the following wire type or equivalent: Belden 9918, 18 AWG or larger.

Adhere to the following safety precautions whenever any type of connection is made to the module.

- Connect the green safety (earth) ground 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.

7 ADDITIONAL REFERENCES

The following information serves as a *general* listing of Horner controller products and other references of interest and their corresponding manual numbers. Visit our website listed in the Technical Support section to obtain user documentation and updates.

Note: This list is not intended for users to determine which products are appropriate for their application; controller products differ in the features that they support. If assistance is required, see the **Technical Support** section in this document.	
Controller	**Manual Number**
XLE Series (e.g., HE-XExxx)	MAN0805
QX Series (e.g., HE-QXxxx)	MAN0798
NX Series (e.g., HE-NXxxx)	MAN0781
LX Series (e.g., LX-xxx; also covers RCS116)	MAN0755
Color Touch OCS (e.g., OCSxxx)	MAN0465
OCS (Operator Control Station) (e.g., OCS1xx / 2xx; Graphic OCS250)	MAN0227
Remote Control Station (e.g., RCS2x0)	
MiniOCS (e.g., HE500OCSxxx, HE500RCSxxx)	MAN0305
Other Useful References	
CAN Networks	MAN0799
Cscape Programming and Reference	MAN0313
Wiring Accessories and Spare Parts Manual	MAN0347
DeviceNet™ Implementation	SUP0326
Wiring Accessories and Spare Parts Manual	MAN0347

8 TECHNICAL SUPPORT

For assistance and manual up-dates, contact Technical Support at the following locations:

North America:+

(317) 916-4274

www.heapg.com

Europe:

(+) 353-21-4321-266

www.horner-apg.com

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