



Mixed Inputs / Outputs

HE800GCM911 / HE-GCM911*



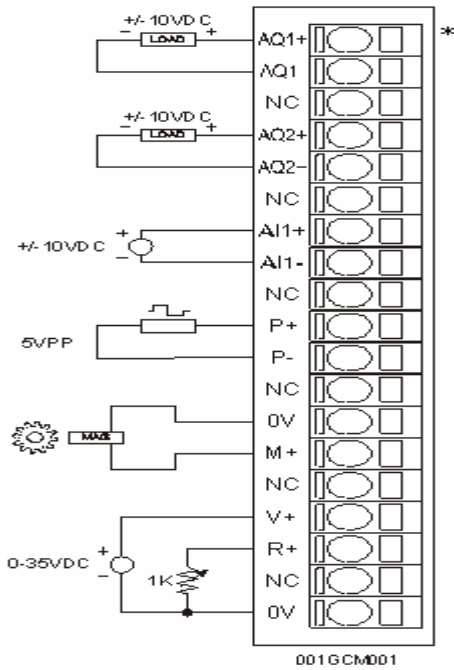
2 Analog Inputs / 1 Analog Resistance Input / 1 Magnetic Pickup Input
2 Analog Outputs / 1 PWM Analog Output

* Denotes Plastic Case.

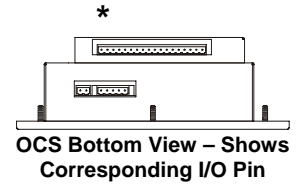
1 Specifications

INPUTS			
Number of Channels	4	Analog Inputs Input Points Required	4
Input Ranges	Ch. 1: ± 10 VDC Ch. 2: 100 Hz – 15 K Hz 1–25 VAC Ch. 3: 0–35 VDC Ch. 4: 0–1000 Ω	Maximum Over-Voltage	TBD
Resolution	Ch. 1 & Ch. 3: 14-Bits Ch. 2: 1 Hz Ch. 4: 12-Bits	Additional error for temperatures other than 25°C	0.003% / °C
Input Impedance	Ch. 1 & Ch. 3: 1 M Ω Ch. 2: 15 k Ω Ch. 4: 1 k Ω	External Power Supply	None
Maximum Error at 25°C	Ch. 1 & Ch. 3: 0.1% Ch. 2: 10 Hz Ch. 4: 1.5 Ω		
Isolation voltage (Channel to Channel and Channel to Ground)	Ch. 1: 1000 VRMS		
OUTPUTS			
Number of Channels	3	Analog Outputs; Output Points Required	3
Output Ranges	Ch. 1 & Ch. 2: ± 10 VDC Ch. 3: 500 Hz PWM, 5 V p-p, 0–100%	Additional error for temperatures other than 25°C	0.003% / °C
Resolution	14-Bits	Maximum Error at 25°C	0.1%
Output Current	50 mA	External Power Supply	None
Load Capacitance	0.01 μ F Max.	PLC Update Rate	Set by PLC Scan Time
Isolation voltage (Channel to Channel and Channel to Ground)	1000 VRMS		
General Specifications			
Required Power (Steady State)	1.8 W (75 mA @ 24 VDC)	Operating Temperature	0°–60° Celsius
Required Power (Inrush)	600 mA @ 24 VDC for 200 μ s	Terminal Type	Spring Clamp, Removable
Relative Humidity	5–95% Non-condensing	Weight	9.5 oz. (270 g)
CE	See Compliance Table at http://www.heapg.com/Support/compliance.htm		
UL			

2 Wiring



Pin	Signal
	GCM911
AQ1 +	Output 1+
AQ1 -	Output 1-
NC	NC
AQ2 +	Output 2+
AQ2 -	Output 2-
NC	NC
AI1 +	Input 1+
AI1 -	Input 1-
NC	NC
P+	PWM+
P -	PWM-
NC	NC
0 V	Ground
M+	Mag Pulse
NC	NC
V +	35 V In
R +	1 k Ω
NC	NC
0 V	Ground



3 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.

I/O Map Tab: The I/O Map describes which I/O registers 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: The **Module Setup** is used in applications where it is necessary to change the default states or values of the outputs when the controller (e.g., OCS100) enters idle/stop mode.

3.1 For Analog Outputs:

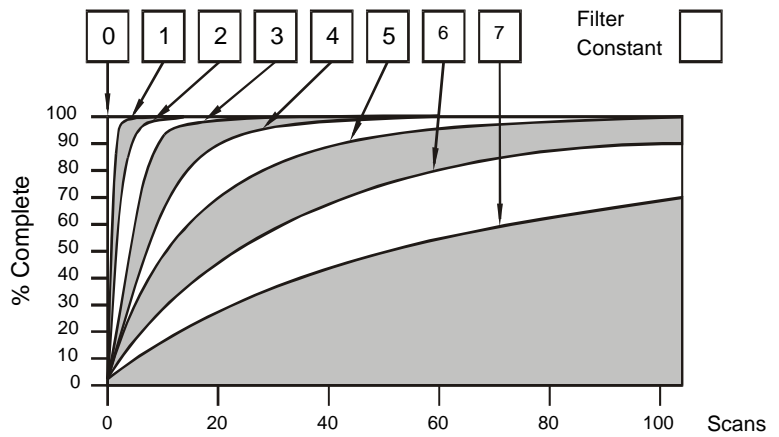
The default sets the output values to zero when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to a specific value or hold the last value. Generally, most applications use the default settings.

Warning: The default sets the output values to zero when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the Module Setup tab.

3.2 Analog Inputs

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

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



4 Input Conversion Factor

The following table describes how real-world inputs are scaled into the controller. Given a register data value, the input voltage may be determined using the appropriate conversion factor from the table. The following formula is used:

Voltage In (Vin) = Data * Conversion Factor

Example: The input range is ±10 VDC.

- 1) The data returned by the OCS is 19200.
- 2) The conversion factor for ±10 VDC is 0.0003125.
- 3) Determine the physical input value from the formula:
 $V_{in} = \text{Data} * \text{Conversion Factor}$
 $6 \text{ VDC} = 19200 * 0.0003125$

Conversion of Real-World Inputs into Controller			
Range	Input	Register Value	Conversion Factor
±10.00 VDC	+10.00 VDC	32000	0.0003125
	0.00 VDC	0	
	-10.00 VDC	-32000	
100 Hz – 15 KHz	15 KHz	15000	1.0
	100 Hz	100	
0–35 VDC	+35.00 VDC	32000	0.00109375
	0 VDC	0	
	0–1000 Ω	1000.0 Ω	
	0 Ω	0	

5 Output Conversion Factor

The following table describes how register data values are converted to real-world analog voltage outputs by the module. For a desired output voltage, the data value is determined by using the conversion factor from the table. The following formula is used

Voltage Out (V out) = Data * Conversion Factor

(Example Output range is ±10 VDC)

- 1) The desired output voltage is 3 VDC.
- 2) The conversion factor for the voltage range of ±10 VDC is 0.0003125.
- 3) Determine the data value from the formula:
 $V_{out} = Data * Conversion\ Factor$
 $3\ VDC = 9600 * 0.0003125$

Conversion of Real-World Outputs From Controller			
Output Range	Register Value	Output	Conversion Factor
± 10 VDC Analog Out	+ 32000	+10.00 VDC	0.0003125
	0	0.00 VDC	
	- 32000	-10.00 VDC	
0–100% PWM Out	4096	100.0 %	0.024414
	2048	50.0%	
	0	0.0%	

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 updates, contact Technical Support at the following locations:

<p>North America: (317) 916-4274 http://www.heapg.com email: techsppt@heapg.com</p>	<p>Europe: (+) 353-21-4321-266 http://www.horner-apg.com email: techsupport@homerirl.ie</p>
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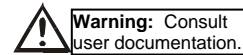
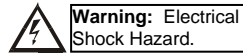
6 Safety

Use the following wire type or equivalent:

- Belden 8917
- 16 AWG or larger

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:



This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or Non-hazardous locations only

WARNING – EXPLOSION HAZARD – Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DECONNECTER L'EQUIPMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.

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 – EXPLOSION HAZARD – Substitution of components may impair suitability for Class I, Division 2

AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIAL INACCEPTABLE POUR LES EMBLEMES DE CLASSE 1, DIVISION 2.

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.