HORNER

24VDC Bipolar Digital In
10-30VDC, 0.5A Sourcing Digital Out
4-20mA Isolated Analog In/Out

Mini OCS/RCS

HE500OCS057 / HE500OCS087
HE500RCS 087

1   SPECIFICATIONS
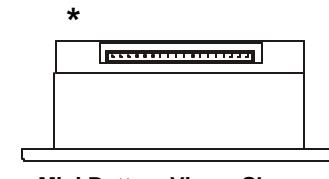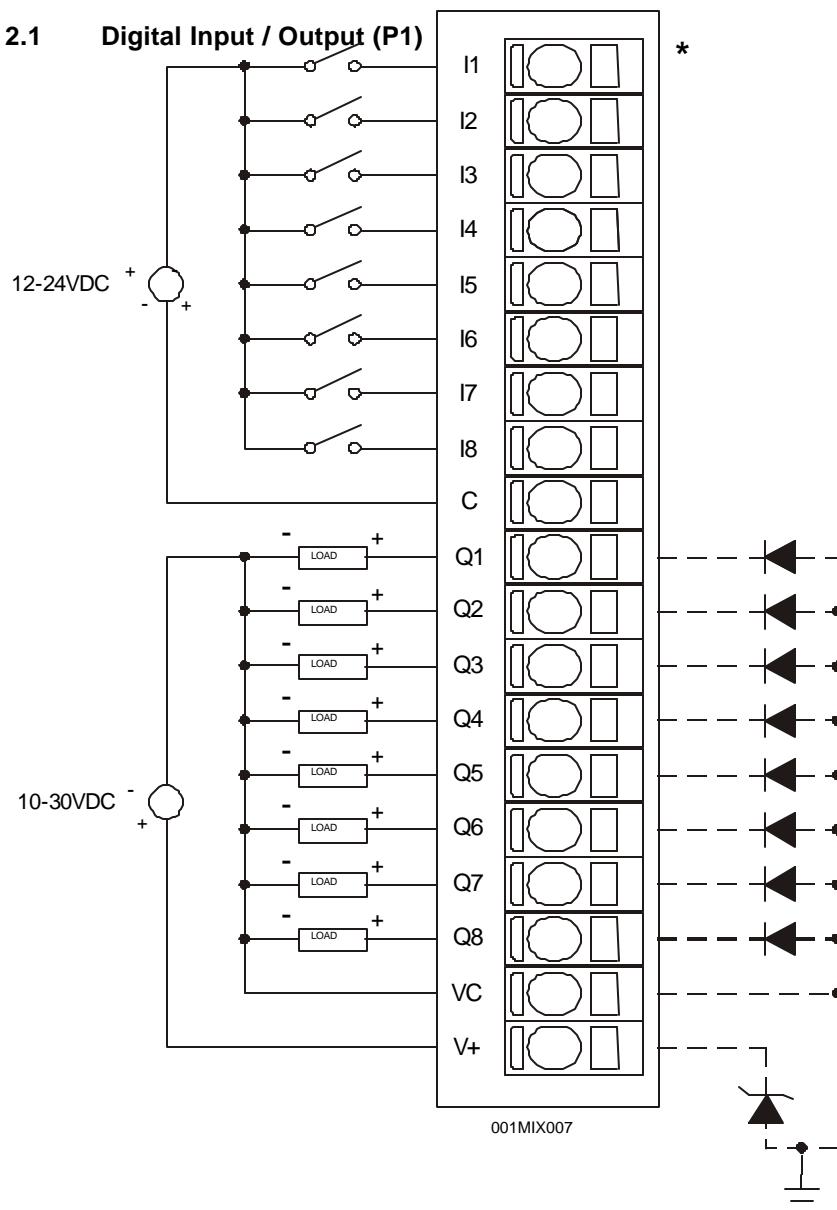
| ANALOG INPUT					
Number of Channels	4		Analog Inputs Input Points Required	4
Input Ranges	Nominal: 4-20mA		Conversion Time (PLC Update Rate)	All channels updated once per PLC scan.
Resolution	12-Bits		Analog Isolation Channel to Channel and Channel to Common	1000VDC
Input Burden	50 Ohms + 3VDC, Clamped @ 6VDC, 35mA Max. Continuous		Additional error for temperatures other than 25°C	0.01% / °C
Maximum Error at 25°C	0.5%		Maximum Over-Current	35mA
DIGITAL INPUT					
Inputs per Module	8		Input Characteristics	Bidirectional
Commons per Module	1		Input Impedance	10K Ohms
Input Voltage Range	12-24VDC		Minimum ON Current	1mA
Peak Voltage	35VDC Max.		Maximum OFF Current	200µA
Channel to channel and Channel to common	500VDC		OFF to ON Response	1ms.
ON Voltage Level	9VDC Minimum		ON to OFF Response	1ms.
OFF Voltage Level	3VDC Maximum			
ANALOG OUTPUT					
Number of Channels	2		Analog Outputs; Output Points Required	2
Output Range	Nominal: 4-20mA Clamped @-0.5 - +30VDC		Conversion Time (PLC Update Rate)	All channels updated once per PLC scan.
Resolution	12 Bits		Isolation Channel to Channel and Channel to Common	1000VDC
Maximum Error at 25°C	0.3%		Additional error for temperatures other than 25°C	0.01% / °C
			Output Voltage	4 - 30VDC
DIGITAL OUTPUT					
Outputs per Module	8		Maximum Inrush Current	650mA per channel
Commons per Module	1		Minimum Load	None
Operating Voltage	10 - 30VDC		OFF to ON Response	1ms.
Output Type	Sourcing / 10K Pull-Down		ON to OFF Response	1ms.
Peak Voltage	30VDC Max.		Output Characteristics	Current Sourcing
Maximum Load Current per Output	0.5A Max.		Output Protection	Short Circuit
Maximum Total Output	4A			

MAN0368-02

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| General Specifications			
Required Power (Steady State)	4.8W (200mA @ 24VDC)		
Required Power (Inrush)	900mA max. @ 24VDC for 1ms.		
Relative Humidity	5 to 95% Non-condensing	Terminal Type	Spring Clamp, Removable
Operating Temperature	0° to 50° Celsius	Weight	9.5 oz. (270 g)
UL	See Compliance Table at http://www.heapg.com/Support/compliance.htm		
CE			
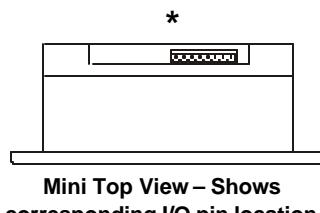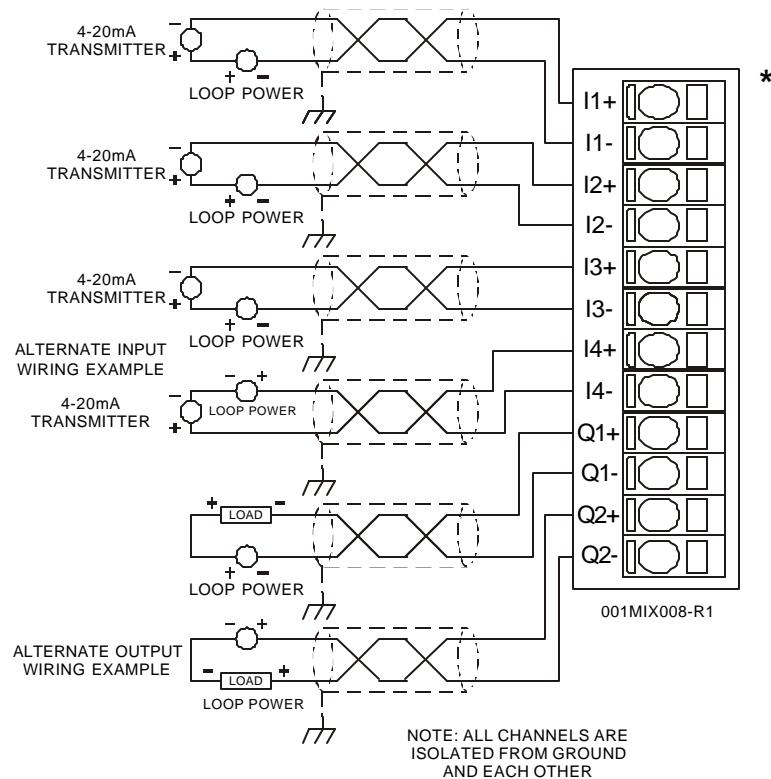
2   WIRING

2.1   Digital Input / Output (P1)

Mini Bottom View – Shows corresponding I/O pin location

001MIX007
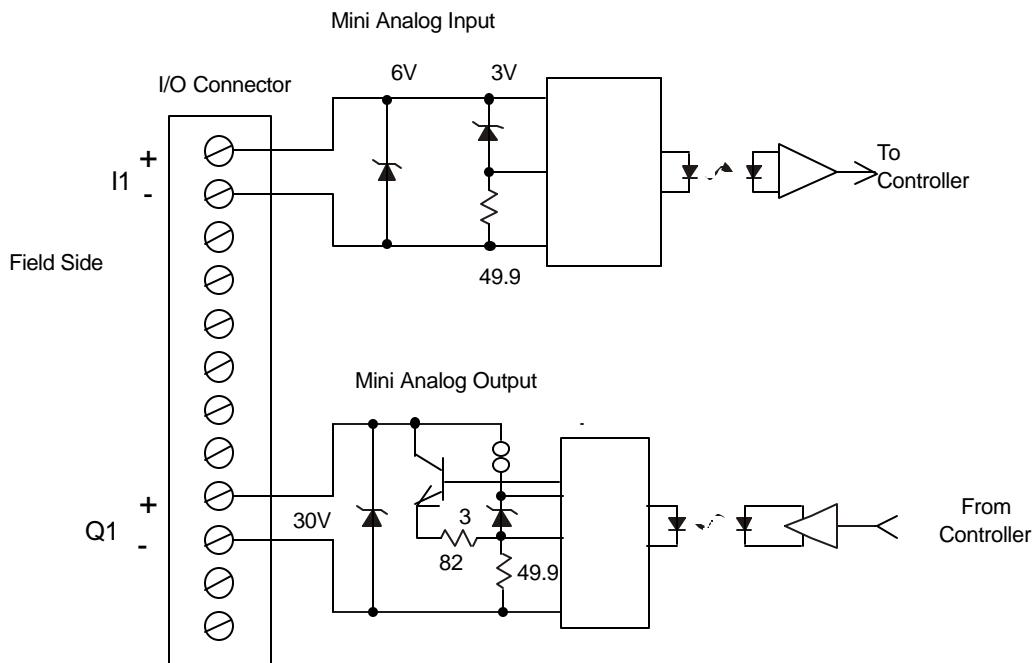
Pin	Digital Input / Output
I1	Input 1
I2	Input 2
I3	Input 3
I4	Input 4
I5	Input 5
I6	Input 6
I7	Input 7
I8	Input 8
C1	Common (Isolated)
Q1	Output 1
Q2	Output 2
Q3	Output 3
Q4	Output 4
Q5	Output 5
Q6	Output 6
Q7	Output 7
Q8	Output 8
VC	Load Power Common
V+	Load Voltage +

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2.2   Analog Input / Output (P2)

Mini Top View – Shows corresponding I/O pin location

001MIX008-R1

NOTE: ALL CHANNELS ARE ISOLATED FROM GROUND AND EACH OTHER
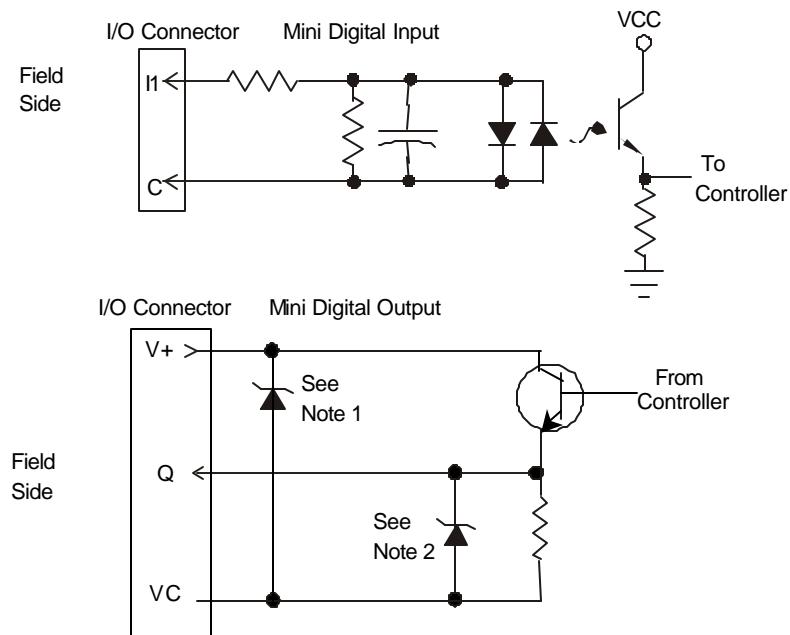
Pin	Analog Input / Output Signal
I1+	Input 1+
I1-	Input 1-
I2+	Input 2+
I2-	Input 2-
I3+	Input 3+
I3-	Input 3-
14+	Input 4+
14-	Input 4-
Q1+	Output 1+
Q1-	Output 1-
Q2+	Output 2+
Q2-	Output 2-

3   INTERNAL CIRCUIT SCHEMATIC

Mini Analog Input

Mini Analog Output

Specification for transient voltage suppressors (transorbs) used on output circuitry is 30V, 300W.

Mini Digital Input

Mini Digital Output

Note 1: Specification for transient voltage suppressors (transorbs) used on output circuitry is 33V, 1500W.

Note 2: Specification for transient voltage suppressors (transorbs) used on output circuitry is 33V, 300W.

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4   CONFIGURATION

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

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.

1. For Digital Outputs: The default turns the outputs OFF when the controller enters idle/stop mode. By selecting the Module Setup tab, each output can be set to either turn ON, turn OFF or to hold the last state. Generally, most applications use the default settings.

   Warning: The default turns the digital outputs OFF when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default settings.

2. 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.
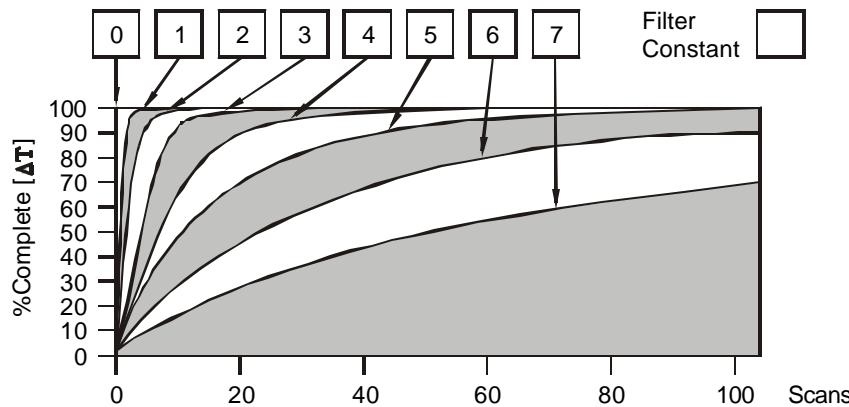
   Warning: The default sets the output values to zero when the controller enters idle/stop mode. To avoid injury of personnel or damages to equipment, exercise extreme caution when changing the default setting using the **Module Setup** tab.

3. For Analog Inputs:
Filter Constant sets the level of digital filtering according to the following chart.

I/O Map Tab
The I/O Map describes I/O registersThe I/O Map is <u>not</u> edited by the user.

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

5   ANALOG INPUT / OUTPUT CHARACTERISTICS

5.1   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:
1.   The known input current is 14mA.
2.   Using the table, the conversion factor for the current range of 4 - +20mA is 0.000625.
3.   To determine the data value, the formula is used:
            Data = Input Current (mA) / Conversion Factor
            22400 = 14mA / 0.000625

Conversion of Real-World Inputs into Controller			
Selected Current Range	**Input Current (mA)**	**Data**	**Conversion Factor**
4 – 20mA	20.00	32000	0.000625
	4.00	6400	

5.2   Output Conversion Factor

The following table describes how program data values are scaled to real-world analog voltage outputs by the module. Given a desired output current, the data value is converted by using the conversion factor from the table. The following formula is used: **Data = Output Current (mA)   / Conversion Factor**

Example:
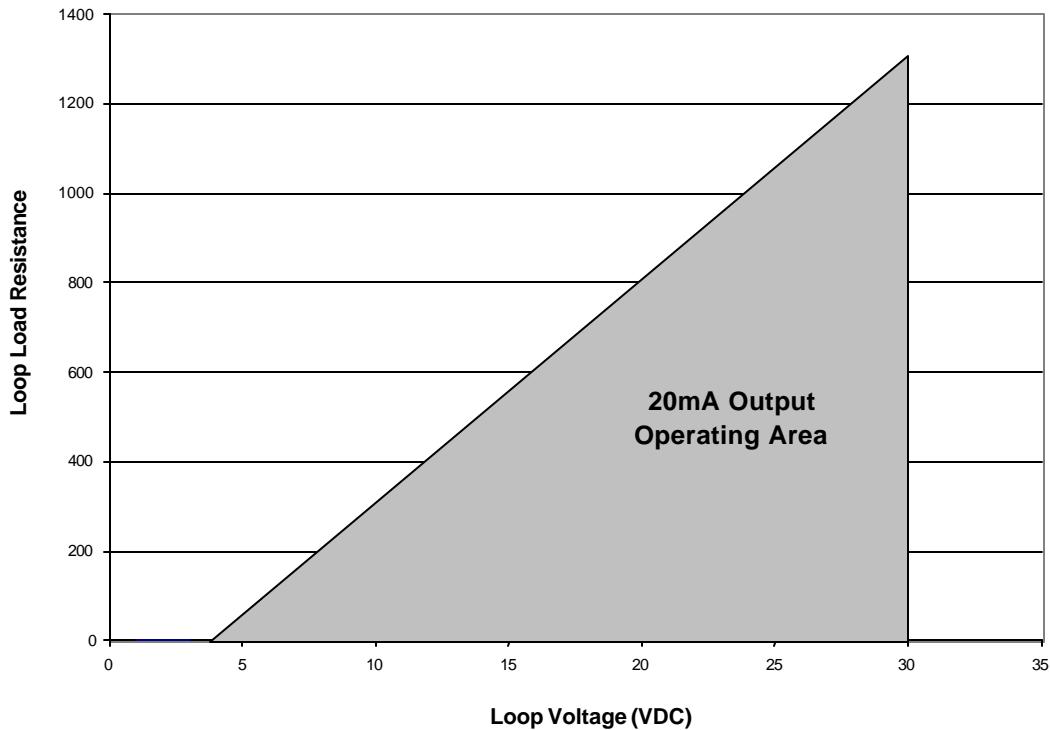
1.   The desired output current is 12mA.
2.   Using the table, the conversion factor for the current range of +20 mA is 0.000625.
3.   To determine the data value, the formula is used:
            Data = Output Current (mA) / Conversion Factor
   19200 = 12mA / 0.000625
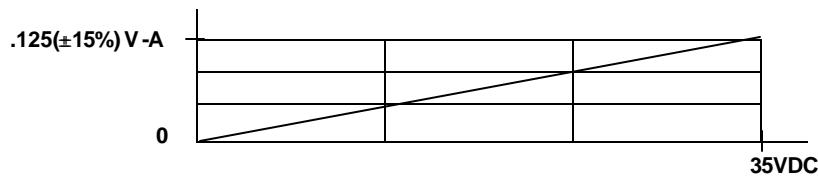
Conversion of Real-World Outputs into Controller			
Selected Current Range	**Output Current (mA)**	**Data**	**Conversion Factor**
4 – 20mA	20.00	32000	0.000625
	4.00	6400	

5.3   Output Operating Area
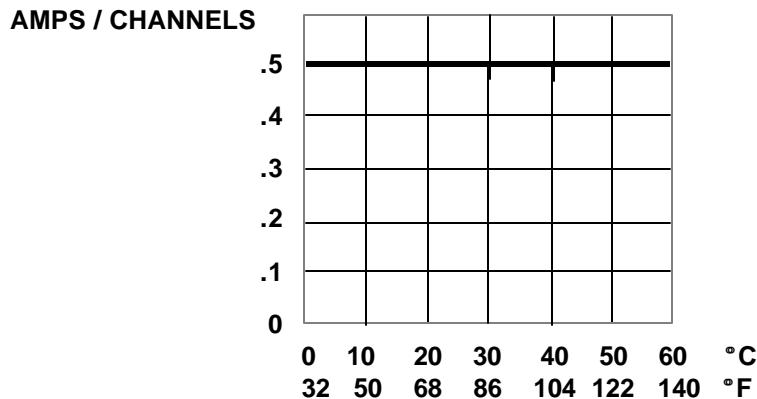
6   DIGITAL INPUT / OUTPUT CHARACTERISTICS

Digital Input Chart

Derating Chart

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7   INSTALLATION / SAFETY

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 (Analog I/O).
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 8917, 16 AWG or larger for digital I/O and Belden 8441 for Analog I/O.

For detailed installation information, refer to Mini Hardware Manual. A <u>handy checklist</u> is provided that covers panel box layout requirements and minimum clearances.

8   TECHNICAL ASSISTANCE

For assistance, contact Technical Support at the following locations:

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

Europe:
(+) 353-21-4321-266
www.horner-apg.com