24VDC Digital In
24VDC, 0.5A Sourcing Digital Out
±10V, ±20mA Analog In
HE500OCX003

Mini OCX/RCX

1 SPECIFICATIONS

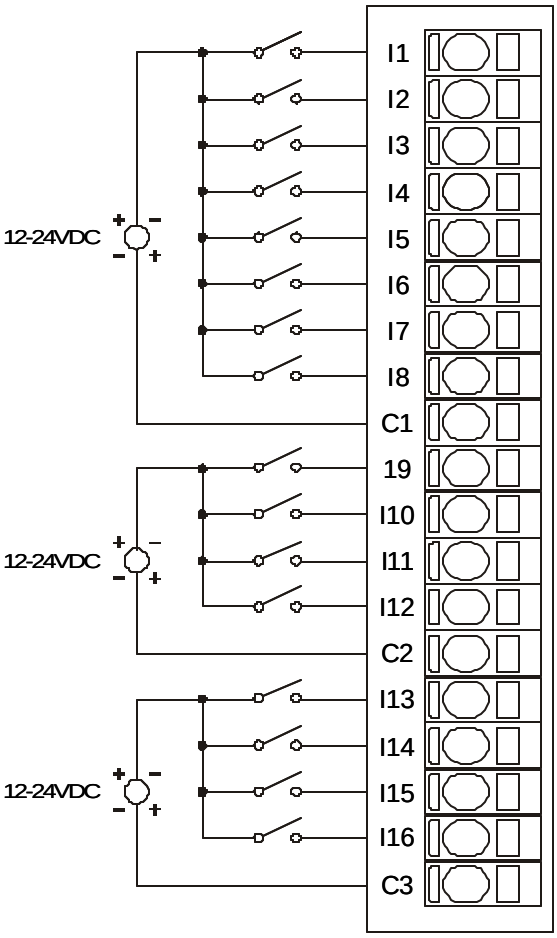
ANALOG INPUT			
Number of Channels	4	Analog Inputs Input Points Required	4
Input Ranges	±10 VDC ±20 mA	Conversion Time (PLC Update Rate)	Set by PLC Scan Time
Resolution	12-Bit	Converter Type	Successive Approximation
Input Impedance	±10 VDC 1 Megohm ±20 mA 100 Ohms , Clamped @ 12VDC, 35mA Max. Continuous	Additional error for temperatures other than 25°C	0.01% / °C
Maximum Error at 25°C	0.1%	Maximum Over-Current	35mA
DIGITAL INPUT			
Inputs per Module	16	Input Characteristics	Bidirectional
Isolated Commons per Module	2	Input Impedance	10K Ohms
Input Voltage Range	12-24VDC	Minimum ON Current	1mA
Peak Voltage	35VDC Max.	Maximum OFF Current	200µA
Isolation (Between isolated commons and Ground)	500VDC	OFF to ON Response	1ms.
ON Voltage Level	9VDC	ON to OFF Response	1ms.
OFF Voltage Level	3VDC		
Output Compliance Voltage for ±20mA	±10 VDC		
DIGITAL OUTPUT			
Outputs per Module	16	Maximum Inrush Current	650mA
Load Power Circuits 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

General Specifications			
Required Power (Steady State)	To Be Determined	Operating Temperature	0° to 50° Celsius
Required Power (Inrush)	To Be Determined	Terminal Type	Spring Clamp, Removable
Relative Humidity	5 to 95% Non-condensing	Weight	9.5 oz. (270 g)

MAN0556-02

2 WIRING

2.1 Input I/O Connector



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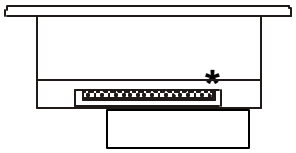
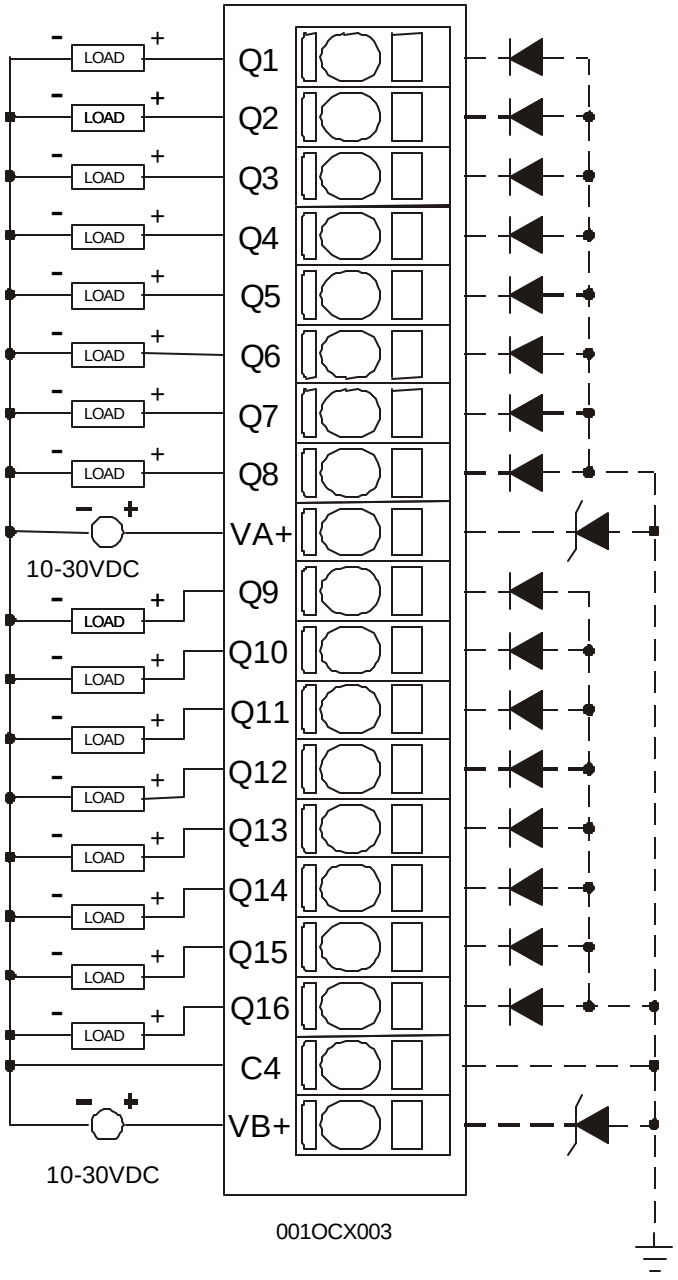
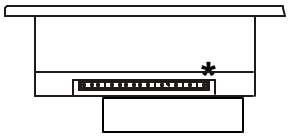


Mini Top View – Shows corresponding I/O pin location

Pin	Signal
	OCX003 INPUT
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 1 (Isolated)
I9	Input 9
I10	Input 10
I11	Input 11
I12	Input 12
C2	Common 2 (Isolated)
I13	Input 13
I14	Input 14
I15	Input 15
I16	Input 16
C3	Common 3 (Isolated)

2.2 Output

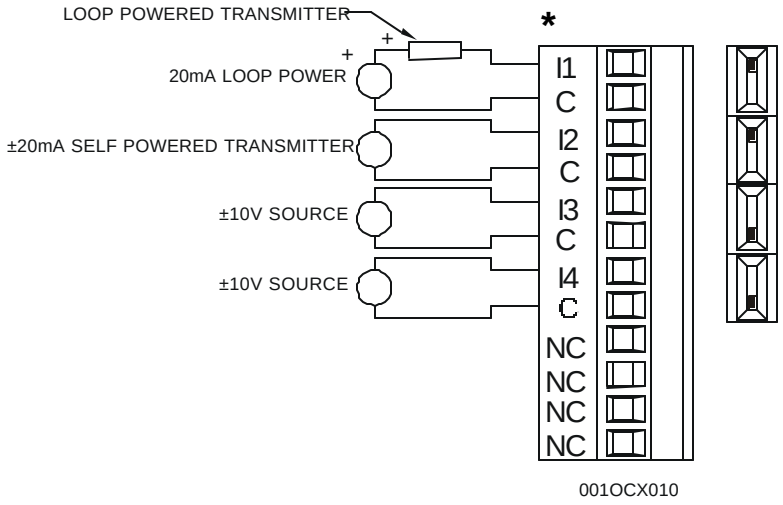


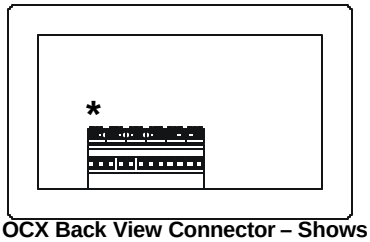


Mini Bottom View – Shows corresponding I/O pin location

Pin	Signal OCX003 Output
Q1	Output 1
Q2	Output 2
Q3	Output 3
Q4	Output 4
Q5	Output 5
Q6	Output 6
Q7	Output 7
Q8	Output 8
VA+	Load Power A
Q9	Output 9
Q10	Output 10
Q11	Output 11
Q12	Output 12
Q13	Output 13
Q14	Output 14
Q15	Output 15
Q16	Output 16
C4	Common
VB+	Load Power B

2.3 Analog Input / Output



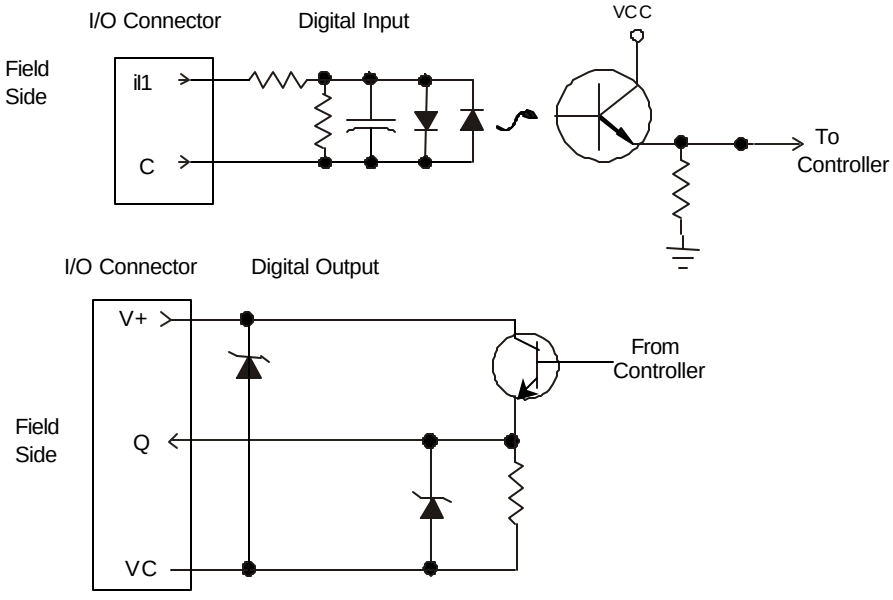


OCX Back View Connector – Shows corresponding I/O pin location

Pin	Signal OCX003 Analog In / Out
I1	Input 1
C	Common
I2	Input 2
C	Common
I3	Input 3
C	Common
I4	Input 4
C	Common
NC	No Connect
NC	No Connect
NC	No Connect
NC	No Connect

Note: The Voltage/Current mode switch is located directly above each input. Moving a switch towards Pin 1* selects ±20mA for the corresponding channel. Moving the switch towards Pin 12 selects ±10VDC. Each channel must be set up in Cscape for the desired mode in addition to the physical switch settings for proper signal scaling in the PLC registers.

3 INTERNAL SCHEMATIC



Specification for transient voltage suppressors used on digital output circuitry is 33V, 300W.

4 CONFIGURATION

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

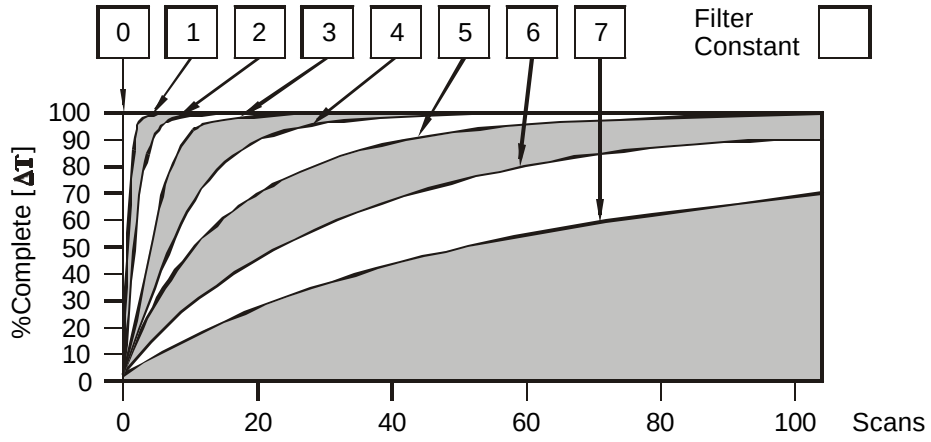
Module Setup Tab
The **Module Setup** is used to configure the Analog Inputs and Analog Outputs ±10V and ±20mA modes and for applications where it is necessary to change the default states or values of the outputs when the controller (e.g., OCS100) enters idle/stop mode.

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 Inputs
Mode: ±10V or ±20mA must be set for each channel. The associated slide switch on the back of the module must match the Cscape setting for each channel.
Filter Constant: Sets the level of digital filtering according to the following chart.

I/O Map Tab
The I/O Map describes which I/O registers are assigned. The I/O Map is not edited by the user.



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

5 ANALOG 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 ±20mA:

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

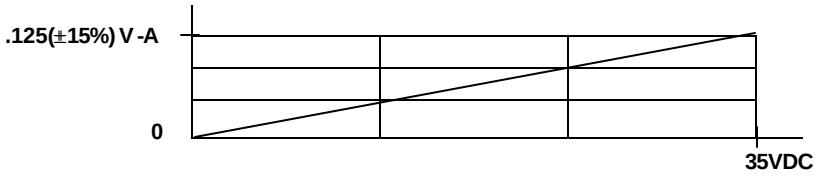
Conversion of Real-World Inputs into Controller			
Selected Range	**Input**	**Register Data**	**Conversion Factor**
±20mA	+20.00	32000	0.000625
	0.00	0	
	-20.00	-32000	

±10 V	+10.00	32000	0.0003125
	0.00	0	
	-10.00	-32000	

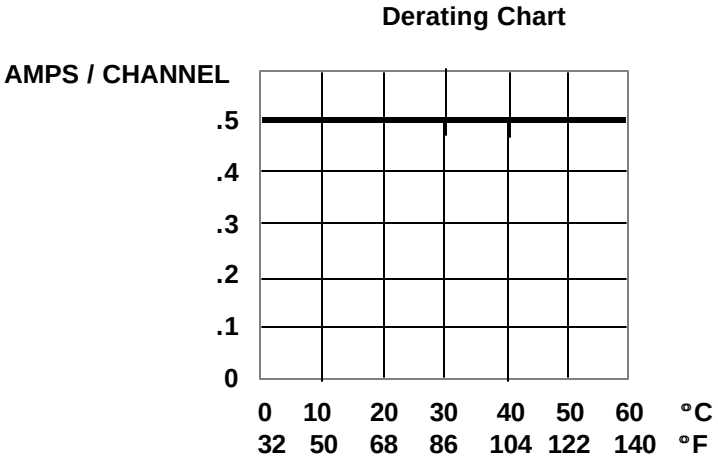
6 DIGITAL INPUT / OUTPUT CHARACTERISTICS

6.1 Digital Input

Digital Input Chart



6.2 Digital Output



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.
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 or equivalent.

For detailed installation information, refer to Mini Hardware Manual. A handy checklist 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

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