4-20mA Analog Input / Output Module

HE800MIX022 / HE800MIX122
HE-MIX022 / HE-MIX122*
12-Bit Resolution
*** HE- denotes plastic case.**

This datasheet also covers products starting with IC300.

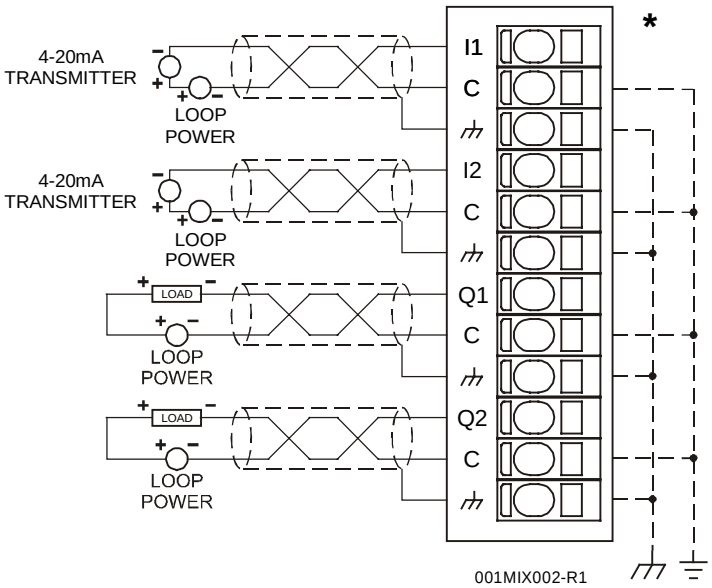
1 SPECIFICATIONS

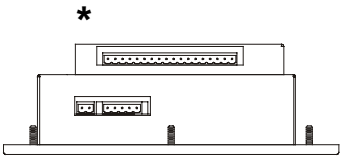
INPUT	MIX022	MIX122		MIX022	MIX122
Number of Channels	1	2	Analog Inputs Input Points Required	1	2
Input Ranges (including over-range)	Nominal: ±0-20.47mA, Optional: ±20.47mA.		Conversion Time (PLC Update Rate)	Set by PLC Scan Time	
Resolution	12-Bit		Converter Type	Successive Approximation	
Input Impedance	100 Ohm < 12VDC, Clamped @ 12VDC, 35mA Max. Continuous		Additional error for temperatures other than 25°C	0.01% / °C	
Maximum Error at 25°C	0.3%		External Power Supply	None	
Maximum Over-Current	35mA				
Input Current	0-20mA (.48mA)				

OUTPUT	MIX022	MIX122		MIX022	MIX122
Number of Channels	1	2	Analog Outputs; Output Points Required	1	2
Output Ranges (including over-range)	20.47mA; Clamped @-0.5 - +38VDC Nominal		Additional error for temperatures other than 25°C	0.01% / °C	
Resolution	12 Bits		External Power Supply	None	
Peak Output Voltage	36VDC Max.		Maximum Error at 25°C	0.1%	
Current Output Resolution	12 Bits		Loop Voltage	1.5 – 36VDC	

GENERAL SPECIFICATIONS					
	MIX022	MIX122		MIX022	MIX122
Required Power (Steady State)	1.32W (55mA @ 24VDC)		Operating Temperature	0° to 60° Celsius	
Required Power (Inrush)	Negligible		Terminal Type	Spring Clamp, Removable	
Relative Humidity	5 to 95% Non-condensing		Weight	9.5 oz. (270 g)	
CE	See Compliance Table at http://www.heapg.com/Support/compliance.htm				
UL					

2 WIRING

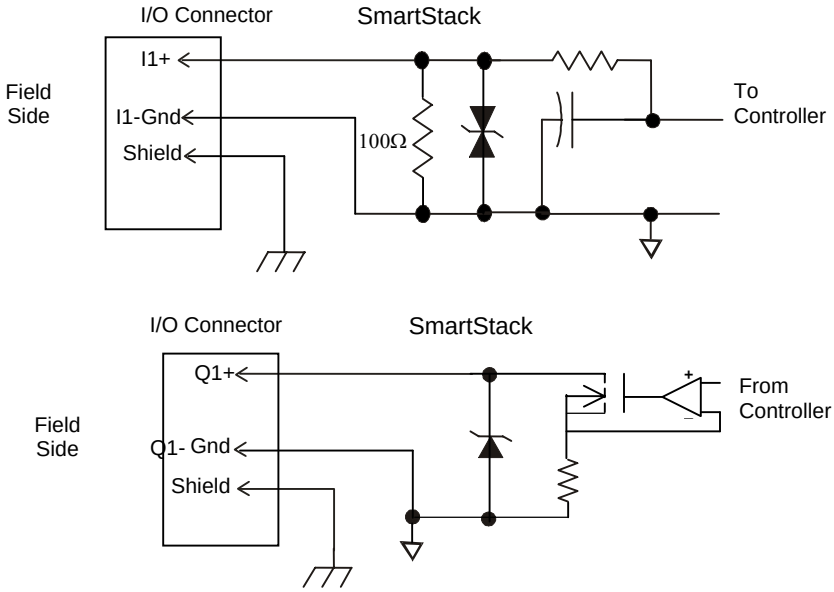




OCS Bottom View – Shows Corresponding I/O Pin

Pin	Signal	
	MIX022	MIX122
I1+	Channel 1+	Channel 1+
C	Common	Common
⏚	Shield	Shield
I2+		Channel 2+
C		Common
⏚		Shield
Q1+	Channel 1+	Channel 1+
C	Common	Common
⏚	Shield	Shield
Q2+		Channel 2+
C		Common
⏚		Shield

3 INTERNAL CIRCUIT SCHEMATIC



Specification for transient voltage suppressors (transorbs) used on output circuitry is 43VDC, 1500 watts.

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.

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

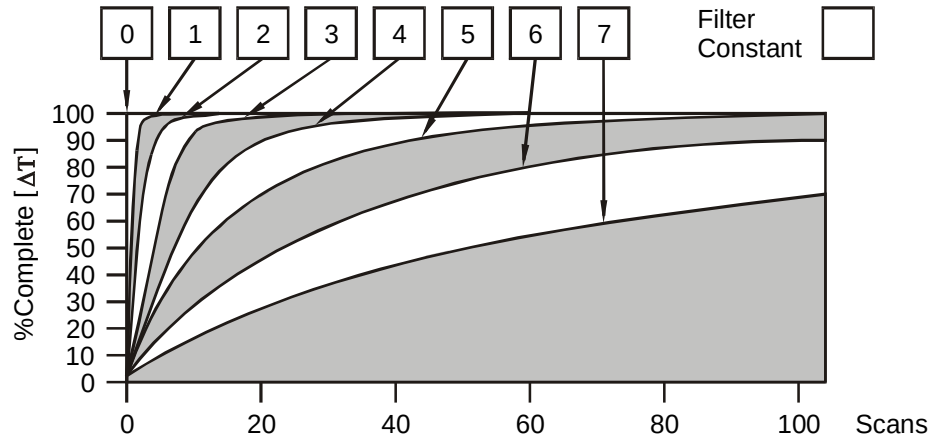
The **Module Setup** is used in applications where it is necessary to change the default states or values of the outputs when the controller (e.g., OCS100) enters idle/stop mode.

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.

2. Analog Inputs:

a. Input and output 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 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 +20mA:

1. The known input current is 14mA.
2. Using the table, the conversion factor for the current range of 0 to +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**
0 to +20mA	+20.47	32752	0.000625
	+20.00	32000	
	0	0	
-20 to +20mA	-20.00	-32000	0.000625
	-20.47	-32752	

6 OUTPUT CHARACTERISTICS

6.1 Output Conversion Factor

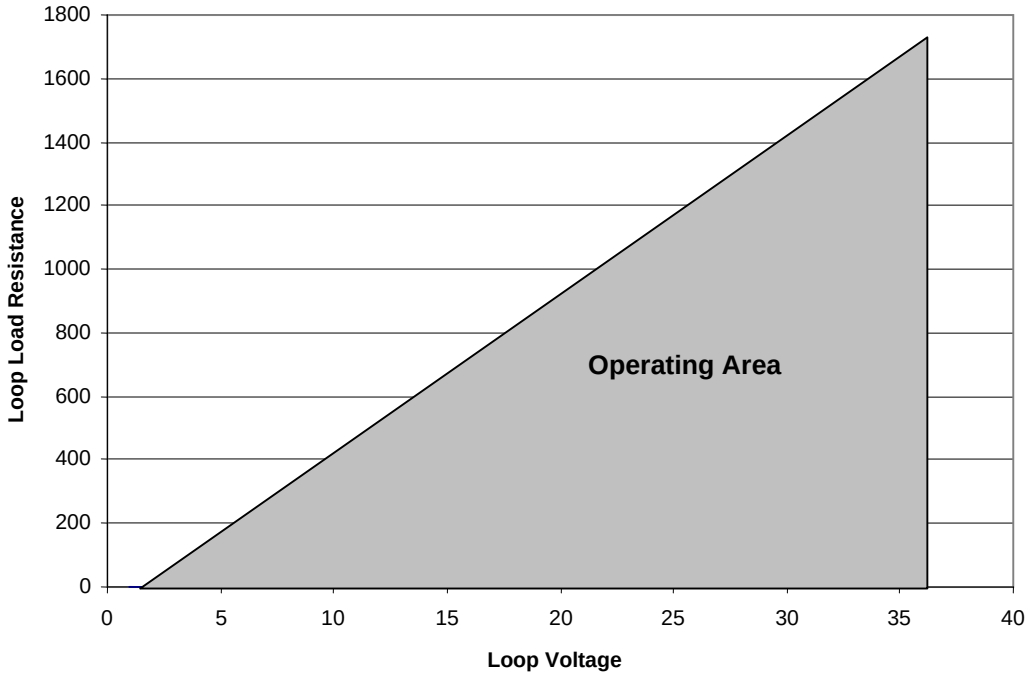
The following table describes how program data values are scaled to real-world analog voltage outputs by the module. Given a desired output current, the data value is converted by using the conversion factor from the table. The following formula is used: **Data = Output Current (mA) / Conversion Factor**

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

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**
0 to +20mA	+20.47	32752	0.000625
	+20.00	32000	
	0	0	

6.2 Operating Areas



7 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 are to be followed in the installation of this product.
b. Use the following wire type or equivalent: Belden 8441.
c. Shielded, twisted-pair wiring should be used for best performance.
d. Shields may be terminated at the module terminal strip.
e. In severe applications, shields should be tied directly to the ground block within the panel.

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.

8 ADDITIONAL REFERENCES

For detailed installation, configuration and other information, refer to the hardware manual of the controller you are using. See the **Technical Support** section in this document for the web site address to download references and to obtain revised editions.

Additional References	
Controller	**Manual Number**
Operator Control Station Hardware (OCS, OCX) e.g., OCS1XX / 2XX; Graphic OCS250	MAN0227
Remote Control Station Hardware (RCS [except RCS116], RCX) e.g., RCS210, RCS250	
Color Touch OCS Hardware e.g., OCS300, OCS301,OCS350, OCS351 e.g., OCS451, OCS551, OCS651	MAN0465
OCS LX Series Hardware e.g., LX280 / LX300; RCS116	MAN0755
MiniOCS / MiniRCS / MiniOCX / MiniRCX Hardware e.g., HE500OCSxxx	MAN0305
Other Useful References	
Cscape Programming and Reference	MAN0313
DeviceNet™ Implementation	SUP0326
Wiring Accessories and Spare Parts Manual	MAN0347

9 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