



# 4-20mA Analog Input / Output Module

HE800MIX126 / HE-MIX126\*

12-Bit Resolution

\* HE- denotes plastic case.



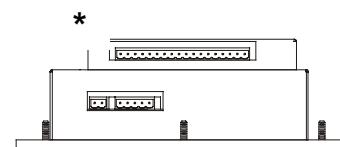
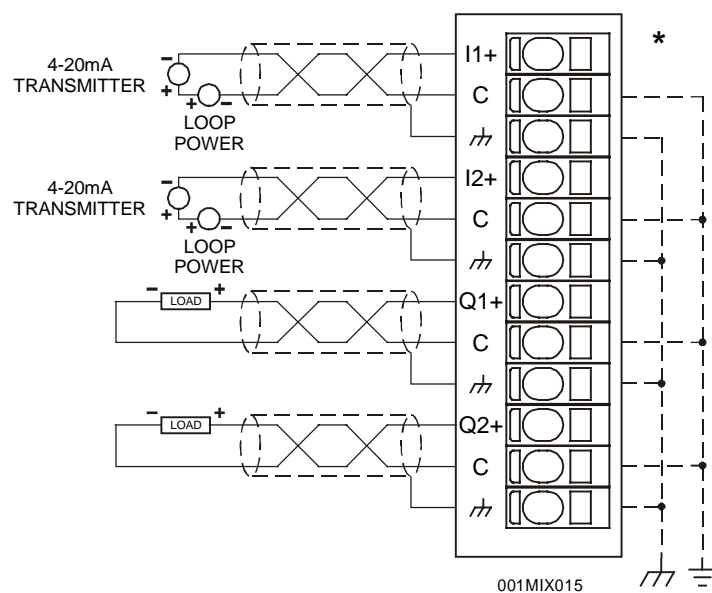
This datasheet also covers products starting with IC300.

## 1 SPECIFICATIONS

INPUT	MIX126		MIX126
Number of Channels	2	Analog Inputs Input Points Required	2
Input Range (including over-range)	Nominal: $\pm 0$ to 20.47mA, Optional: $\pm 20.47$ mA.	Input Current	0 to 20.47mA
Resolution	12-Bit	Conversion Time (PLC Update Rate)	Set by PLC Scan Time
Input Impedance	100 Ohm < 12VDC, Clamped @ 12VDC, 35mA Max. Continuous	Converter Type	Successive Approximation
Maximum Error at 25°C	0.3%	Additional error for temperatures other than 25°C	0.01% / °C
Maximum Over- Current	35mA	External Power Supply	None
ANALOG OUTPUT	MIX126		MIX126
Number of Channels	2	Analog Outputs; Output Points Required	2
Output Range (including over-range)	0 to 20.47mA; 10VDC Compliance	Additional error at temperatures other than 25°C	0.01% / °C
Resolution	12 Bits	Maximum Error at 25°C	0.1% of FS
Max. Output Voltage	10 VDC	Maximum Loop Resistance @ 20mA	500 Ohms

GENERAL SPECIFICATIONS			
	MIX126		MIX126
Required Power (Steady State)	2.64W (110mA @24VDC)	Relative Humidity	5 to 95% Non-condensing
Required Power (Inrush)	Negligible	Terminal Type	Spring Clamp, Removable
Operating Temperature	0° to 60° Celsius	Weight	9.5 oz. (270 g)
CE	See Compliance Table at <a href="http://www.heapg.com/Support/compliance.htm">http://www.heapg.com/Support/compliance.htm</a>		
UL			

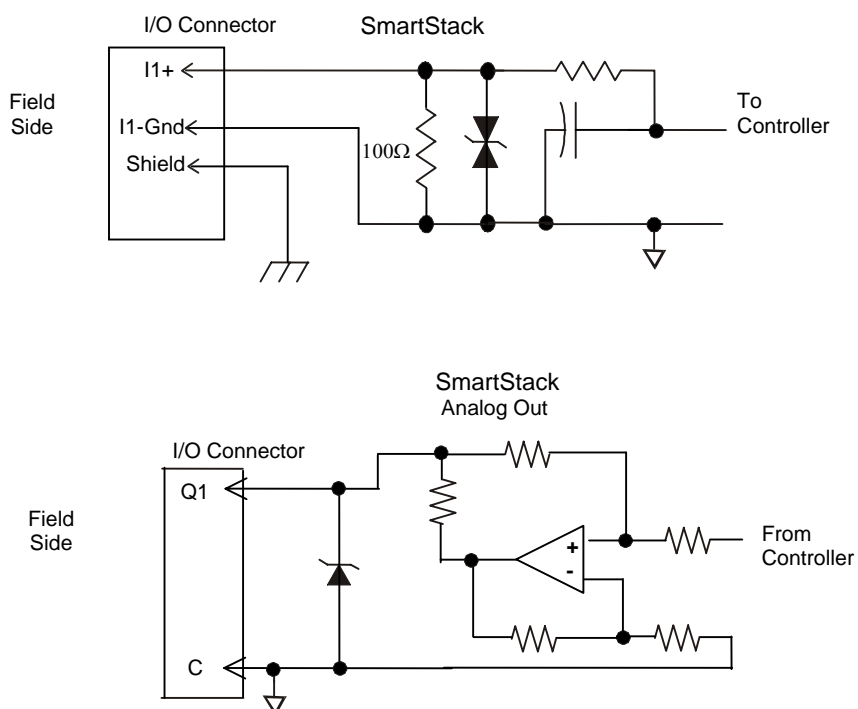
## 2 WIRING



OCS Bottom View – Shows  
Corresponding I/O Pin

Pin	Signal
MIX126	
I1+	Channel 1+
C	Common
	Shield
I2+	Channel 2+
C	Common
	Shield
Q1+	Channel 1+
C	Common
	Shield
Q2+	Channel 2+
C	Common
	Shield

## 3 INTERNAL CIRCUIT SCHEMATIC



Specification for transient voltage suppressors (transorbs) used on output circuitry is 15V, 300W.

## 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

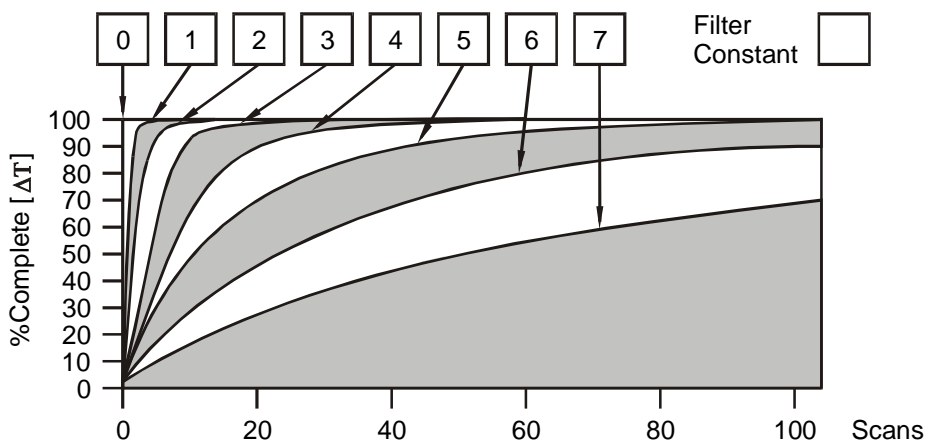
The **Module Setup** is used in applications where it is necessary to change the default states or values of the outputs when the controller (e.g., OCS100) enters idle/stop mode.

**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:  

$$\text{Data} = \text{Input Current (mA)} / \text{Conversion Factor}$$

$$22400 = 14\text{mA} / 0.000625$$

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:

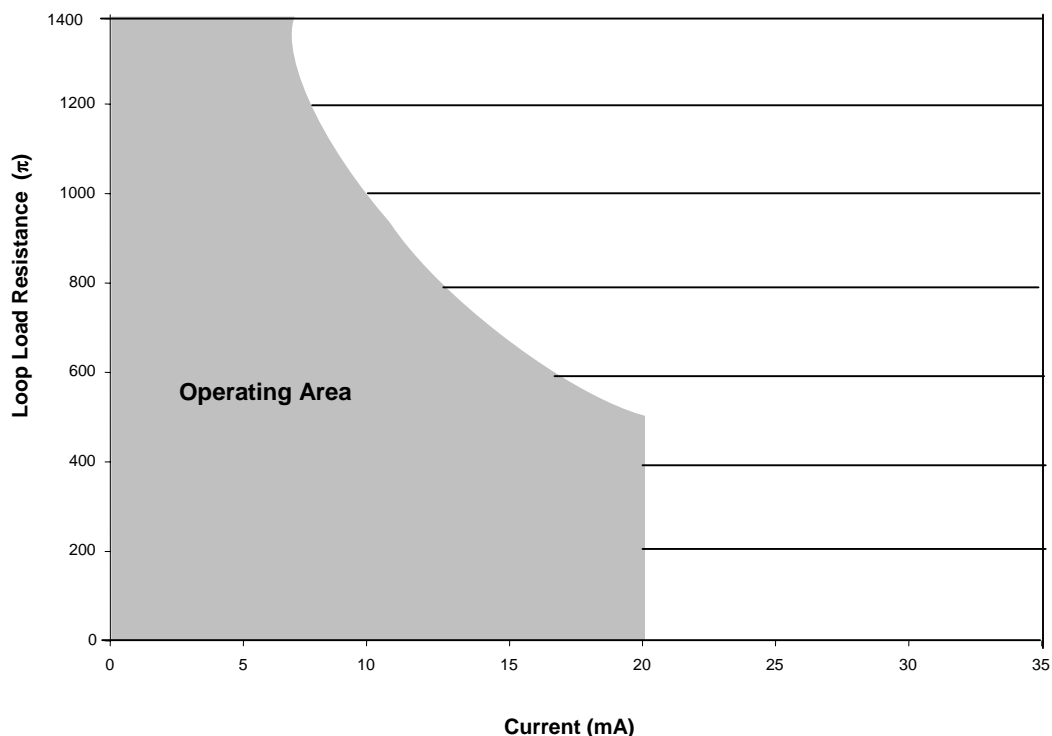
1. The desired output current is 12mA.
2. Using the table, the conversion factor for the current range of +20 mA is 0.000625.
3. To determine the data value, the formula is used:  

$$\text{Data} = \text{Output Current (mA)} / \text{Conversion Factor}$$

$$19200 = 12\text{mA} / 0.000625$$

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.

- All applicable codes and standards are to be followed in the installation of this product.
- Use the following wire type or equivalent: Belden 8917, 16 AWG or larger.
- Shielded, twisted-pair wiring should be used for best performance.
- Shields may be terminated at the module terminal strip.
- 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
<b>Operator Control Station Hardware</b> (OCS, OCX) e.g., OCS1XX / 2XX; Graphic OCS250	MAN0227
<b>Remote Control Station Hardware</b> (RCS [except RCS116], RCX) e.g., RCS210, RCS250	
<b>Color Touch OCS Hardware</b> e.g., OCS300, OCS301, OCS350, OCS351 e.g., OCS451, OCS551, OCS651	MAN0465
<b>OCS LX Series Hardware</b> e.g., LX280 / LX300; RCS116	MAN0755
<b>MiniOCS / MiniRCS / MiniOCX / MiniRCX Hardware</b> 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](http://www.heapg.com)**Europe:**

(+ ) 353-21-4321-266

[www.horner-apg.com](http://www.horner-apg.com)