



Millivolt Input Module

Product Specifications and Installation Data

1 DESCRIPTION

The Horner APG HE693ADC409-22 allows DC millivolt-level signals to be directly connected to the PLC without external signal processing (transducers, transmitters, etc.). All analog and digital processing of the signal is performed on the module, and millivolt values are written to the PLC %AI input table with 14-bit resolution. The module features 4 channels, and an input range that is selectable from +/-250mV, +/-500mV, and +/-1000mV (1V). The input range is selectable via the configuration software and Hand-Held Programmer (HHP). Selectable digital filtering can assist in providing a steady input signal in noisy environments. Field wiring is made to a removable 20-pin terminal strip.

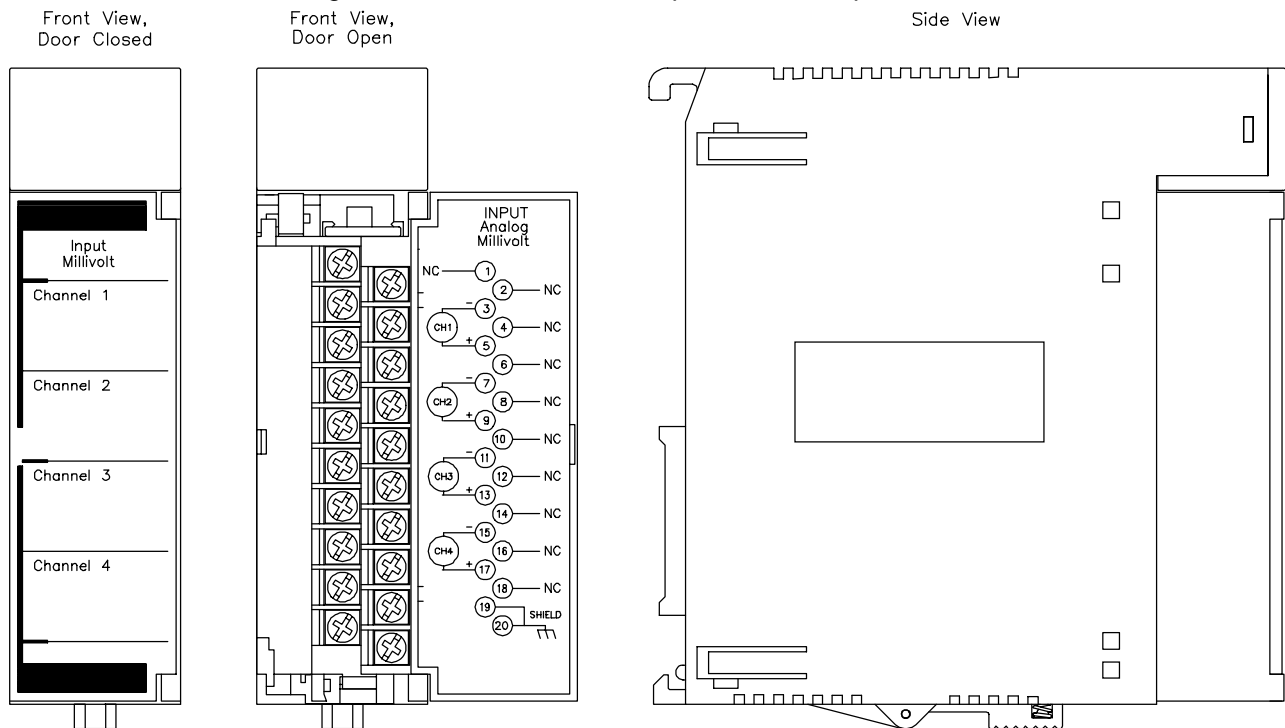


Figure 1 – HE693ADC409-22 Module

2 SPECIFICATIONS

Table 1 – HE693ADC409-22 Specifications			
Power Consumption	100mA @ 5VDC	Input Impedance	>20 Mohms
Number of Channels	4	Maximum Safe Overload	+/-35VDC
I/O Points Required	4%AI	Common Mode Range	+/-12VDC
Strain Gages Supported	Bridged (Load Cell)	A/D Conversion Type	Integrating
Input Range (VDC)	+/-250mV, +/-500mV, and +/-1000mV (1V)	Module Update Rate	35 Channels per second
Resolution	30µV, 60µV, 90µV, respectively	Operating Temperature	0 to 60°C (32 to 140°F)
Accuracy	+/-0.05%	Relative Humidity	5% to 95% non-condensing

3 CONFIGURATION

3.1 Logicmaster 90 Configuration

To reach the Foreign Module Configuration Screen in LM90, perform the following steps:

1. Initiate LM90.
2. Select LogicMaster 90 configuration package (F2).
3. Select/Create a program folder.
4. Select I/O Configuration (F1).
5. Cursor over to the slot containing the module.
6. Select Other (F8). Then, select Foreign (F3).

SOFTWARE CONFIGURATION		FOREIGN MODULE			
SLOT 2	Catalog #: FOREIGN				
FRGN	Module ID : 3				
	%I Ref Adr : %I0001	Byte 1	: 00000001	Byte 9	: 00
	%I Size : 0	Byte 2	: 00000100	Byte 10	: 00
	%Q Ref Adr : %Q0001	Byte 3	: 00	Byte 11	: 00
	%Q Size : 0	Byte 4	: 00	Byte 12	: 00
	%AI Ref Adr : %AI001	Byte 5	: 00	Byte 13	: 00
	%AI Size : 4	Byte 6	: 00	Byte 14	: 00
	%AQ Ref Adr : %AQ001	Byte 7	: 00	Byte 15	: 00
	%AQ Size : 0	Byte 8	: 00	Byte 16	: 00

Figure 2 – Example Configuration

3.2 Configuration Parameters

The necessary configuration parameters are %AI Reference Address, %AI Size, Byte 1, Byte 2 (digital filtering), and Byte 3 (input range).

Table 2 – Configuration Parameters				
%AI Reference Address	%AI Size	Byte 1	Byte 2	Byte 3
User Selectable	4	1	0000 through 0111 (see Figure 3)	00: +/-250mVDC 01: +/-500VDC 02: +/-1000mVDC
Note: Configuration with a Hand-Held Programmer (HHP) indicates scale values of 25mV, 50mV, and 100mV. The user must understand that the actual scale values are 10x the value displayed on the HHP screen.				

3.3 Digital Filtering

Figure 4 shows the effects of digital filtering (set with Byte 2) on module response to a voltage change. (Indicates the % voltage change completed vs. time.)

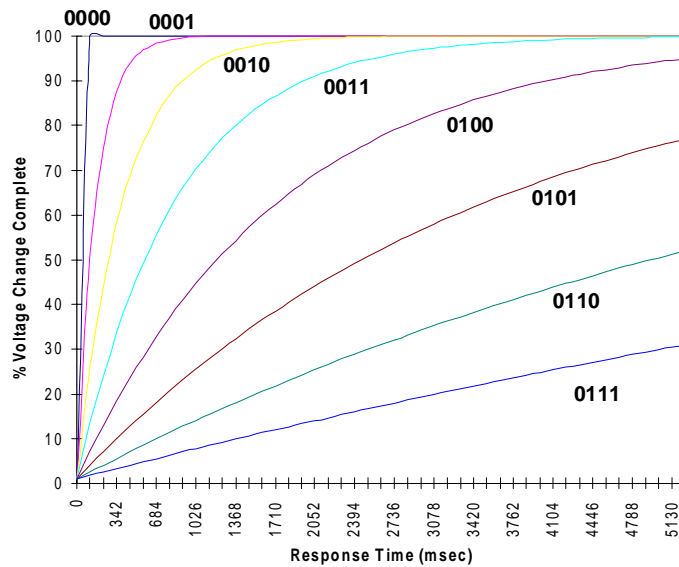


Figure 3 – Digital Filtering Response

4 INPUT SCALING

The value of each %AI input varies from -32,000 to +32,000 as the millivolt input ranges from minus full scale (-FS) to positive full scale (+FS). Full scale is either 250mVdc, 500mVdc, or 1000mVdc (1 Vdc) as set by configuration. The granularity of the %AI value is 4.

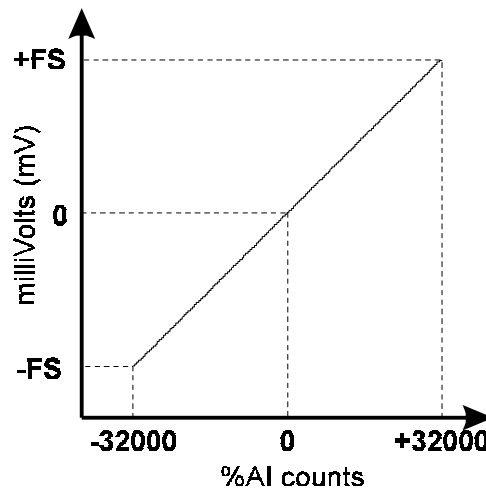


Figure 4 – Input Scaling

5 WIRING / INSTALLATION

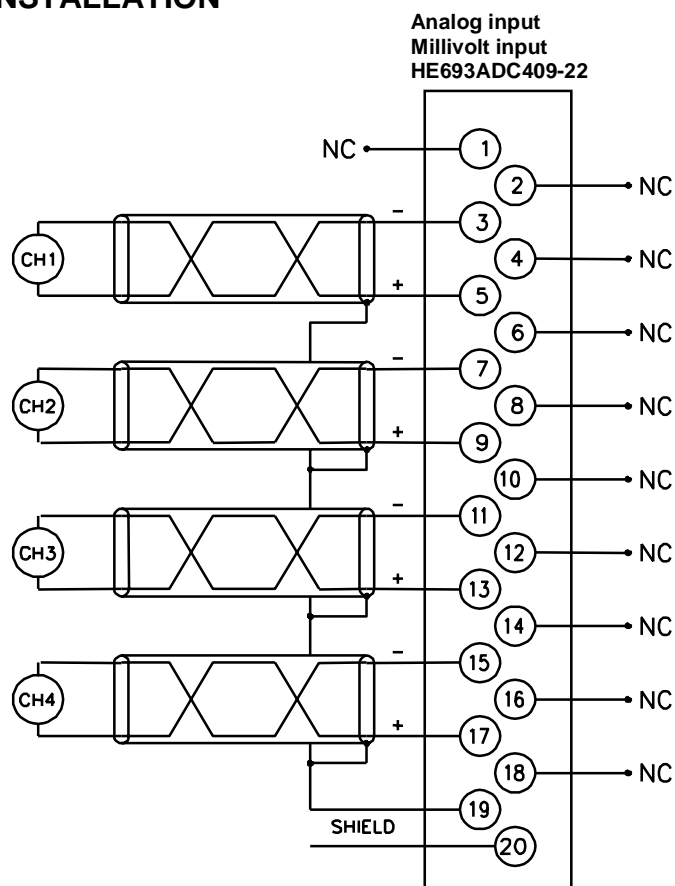


Figure 5 – Wiring

5.1 Installation Hints

1. Keep total wire resistance less than 100Ω to maintain rated accuracy.
2. Wiring should be routed in its own conduit.
3. Shielded, twisted pair extension wiring offers best noise immunity.
4. If shielded wiring is used, a good earth ground connection (on one end only) is critical. If shields are connected at the module end, Terminals 19 & 20 may be used as the shield ground point.
5. Short all unused channels to frame ground (See Figure 5 - Pins 19 and 20).

6 TECHNICAL ASSISTANCE

For user manual updates, contact Horner APG, Technical Support Division, at (317) 916-4274 or visit our website at www.heapg.com.