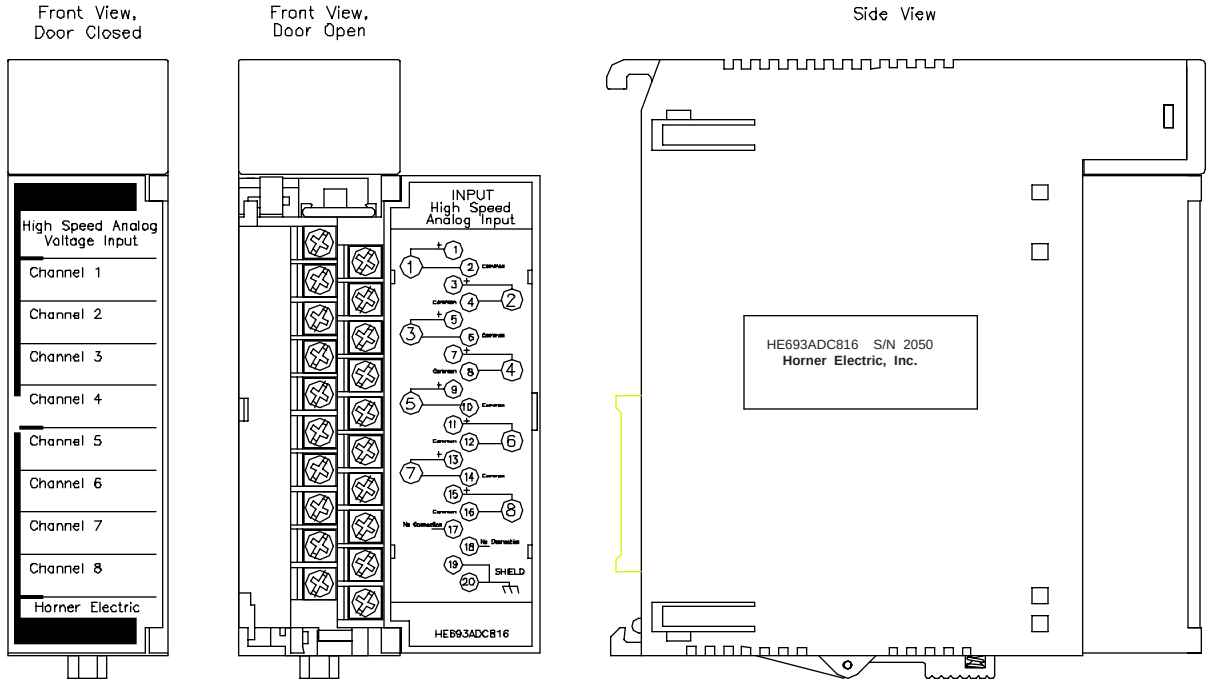
High Speed +/- 10V Analog Input Module

Product Specifications and Installation Data

DESCRIPTION

The Horner Electric High Speed +/-10V Analog Input Module provides eight single ended or four differential analog input channels, with 16-bits of resolution. The HE693ADC816 has 500VDC backplane isolation. This module converts the voltage input signals into digital values (-32,000 to +32,000), which are placed directly into the %AI table of the PLC CPU. Each of the eight channels has a programmable setpoint, the level of which is set in the PLC program via %AQ output registers. If the analog input value reaches or exceeds the setpoint, a corresponding digital input %I is energized.

ILLUSTRATION



ADC816.DWG

SPECIFICATIONS

Specification		Specification	
Power Consumption, Typical	230mA@5VDC (440mA inrush)	Analog Filtering	1.6KHz low pass
Number of Channels	8 single ended 4 differential	Digital Filtering	1-128 samples/update
I/O Required	8 %AI, 8 %AQ, 16%I	Maximum Error	.04% full scale
Input Range	+/- 10V	Maximum Input Voltage	75VDC
A/D Type, Resolution	Successive Approx.16 bits	Backplane Isolation	500VDC
Useable Resolution	16 bits	Common Mode Rejection	>100dB
Sample Rate	3000 channels/S, No Filtering *(See Installation Hints)	Operating Temperature	0 to 60°C
Input Impedence	1 Megohm	Relative Humidity	5% to 95%, non-condensing

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|RACK
1|pcm  |2|hsc  |3|frgn  |4|pi  |5|apm  |6|iolink  |7|iop  |8|  |9|  |10|
>
        SERIES 90-30 MODULE IN RACK 3 SLOT 2
                    SOFTWARE CONFIGURATION
 SLOT                Catalog #: FOREIGN              FOREIGN MODULE
  2
 FRGN
        Module ID  :   3
        %I Ref Adr :   %I0001   Byte 1   : 00000001   Byte 9    : 00
        %I Size    :    16      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:  %AI0001   Byte 5   : 00         Byte 13   : 00
        %AI Size   :    8       Byte 6   : 00         Byte 14   : 00
        %AQ Ref Adr:  %AQ001    Byte 7   : 00         Byte 15   : 00
        %AQ Size   :    8       Byte 8   : 00         Byte 16   : 00
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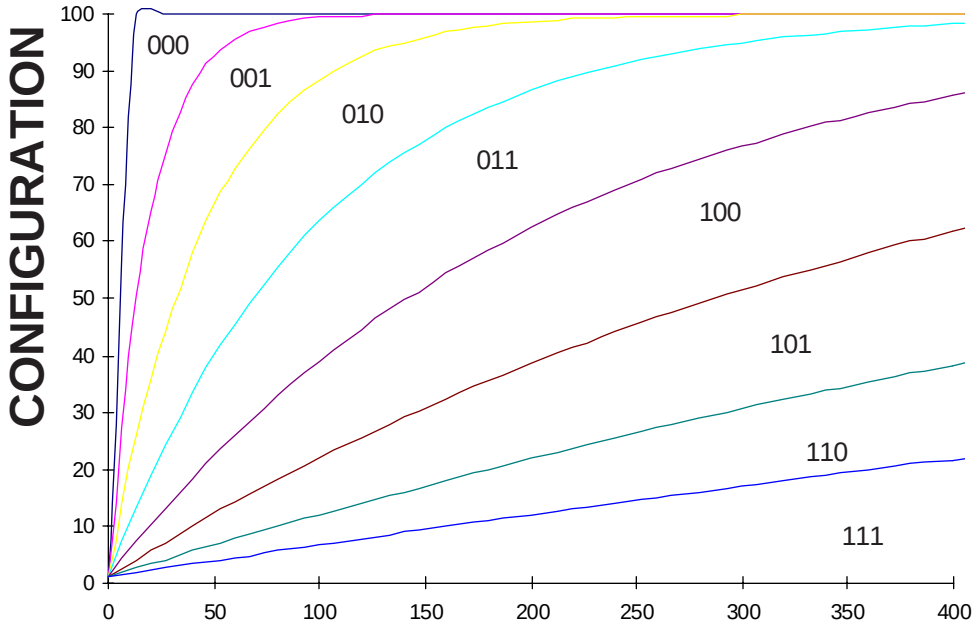
Foreign Module Configuration. To reach this screen, select I/O Configuration (F1), cursor over to the slot containing the module and select Other (F8), and Foreign (F3).



I/O Description			
SINGLE ENDED	Channel	Setpoint Bit	Setpoint
	1	%I1	%AQ1
	2	%I2	%AQ2
	3	%I3	%AQ3
	4	%I4	%AQ4
	5	%I5	%AQ5
	6	%I6	%AQ6
	7	%I7	%AQ7
	8	%I8	%AQ8
DIFFERENTIAL	Channel	Setpoint Bit	Setpoint
	1/2	%I1	%AQ1
	3/4	%I3	%AQ3
	5/6	%I5	%AQ5
	7/8	%I7	%AQ7

Digital Filtering. The effect of digital filtering (set with Byte 2) on module response to a voltage change. *(% voltage change completed vs. time in milliseconds).*

%I Size	%AI Size	%AQ Size	Byte 1	Byte 2	Bytes 3-6
16	8	8	0001	0000 thru 0111 (see chart)	0=Single Ended 1=Differential

Configuration Parameters. The nine necessary parameters are %I Size, %AI Size, %AQ Size, and Bytes 1 through 6.

Scaling	Smallest Step Change
Volts = %AI / 32,000 x 10	1 (dec) = 0.3125mV

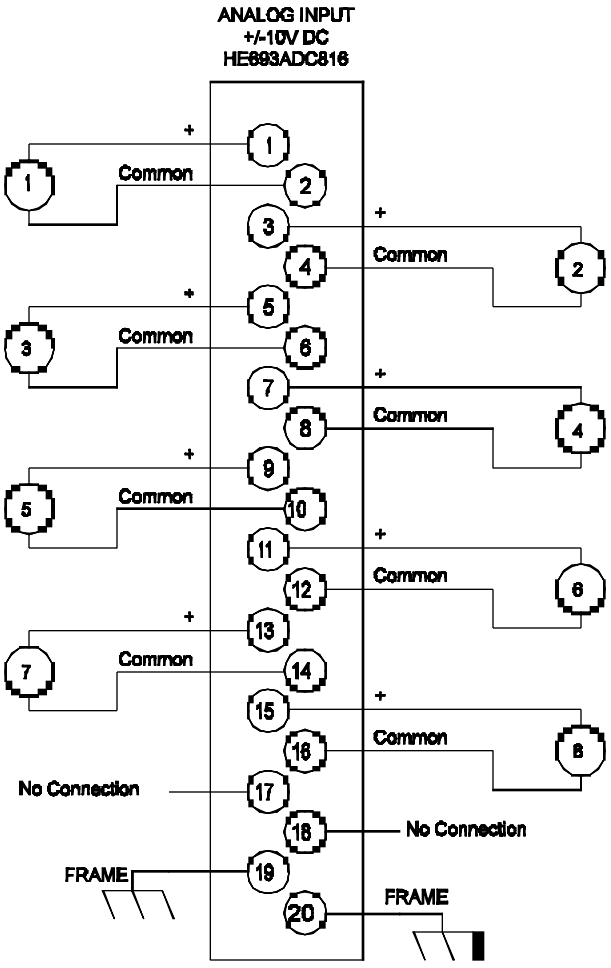
Scaling. *The module converts each analog voltage into a decimal value between +/-32,000. Each bit is significant, therefore the smallest decimal step change is 1.*

Single Ended		Differential	
Reference	Description	Reference	Description
%AI1	Input Value of Channel 1	%AI1	Difference Between Channel 1 and 2
%AI2	Input Value of Channel 2	%AI2	Average of Channel 1 and 2
%AI3	Input Value of Channel 3	%AI3	Difference Between Channel 3 and 4
%AI4	Input Value of Channel 4	%AI4	Average of Channel 3 and 4
%AI5	Input Value of Channel 5	%AI5	Difference Between Channel 5 and 6
%AI6	Input Value of Channel 6	%AI6	Average of Channel 5 and 6
%AI7	Input Value of Channel 7	%AI7	Difference Between Channel 7 and 8
%AI8	Input Value of Channel 8	%AI8	Average of Channel 7 and 8

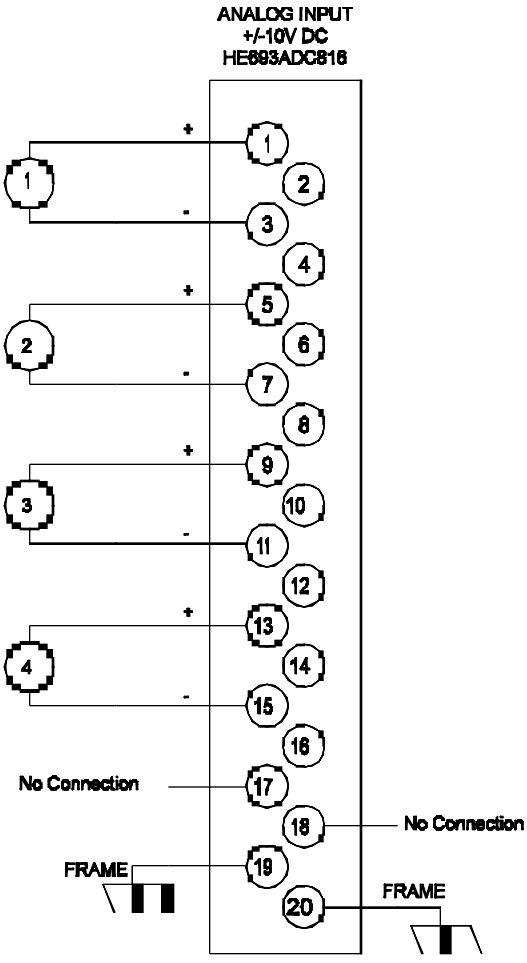
Input Description. When configured as a single ended input, each channel reports the analog value in the appropriate %AI register. When configured as a differential input, the odd numbered %AIs report the difference between the two channels and the even numbered %AIs report the average between the two channels.

Installation Hints

- ☑ Wiring should be routed in its own conduit.
- ☑ Shielded, twisted pair extension wiring offers best noise immunity.
- ☑ If shielded wiring is used, a good earth ground connection is critical. If shields are connected at the module end, terminals 19 and 20 should be used as the shield ground point.
- ☑ 3000 channels/S is acheived if there are 2 or more modules present in the rack. With the HE693ADC816 in the rack alone or using the DO/IO command, the Sample Rate is 2700 channels/S.



Single Ended Wiring



Differential Wiring