



# HE693THM884/888

## High Resolution Thermocouple Module Product Specifications and Installation

### 1 DESCRIPTION

The Horner APG High Resolution Thermocouple Input Module allows thermocouple temperature sensors to be directly connected to the PLC without external signal processing (transducers, transmitters, etc.). All analog and digital processing of the thermocouple signal is performed on the module. This high-resolution module (0.1°C), can report values to the PLC I/O table in 0.5°C, 0.5°F, 0.1°C, or 0.1°F increments. The module features eight thermocouple channels assigned to 8 %AI input registers. There are 16 %I Alarm Bits, one open circuit alarm and one setpoint alarm for each channel. Alarm setpoints are set for each channel through 8 %AQ registers. Open circuit alarm bits for each channel correspond to the first eight successive %I bits, and the alarm setpoints for each channel correspond to the second eight successive %I bits.

On the THM888, A feature available on Revision H or later is auto detected external AD592 cold junction compensation. This allows cold junction compensation to be accomplished in a remote isothermal terminal strip, with standard copper wire run from the remote terminal strip to the module. AD Converter on THM888 hardware has been optimized for 60Hz rejection.

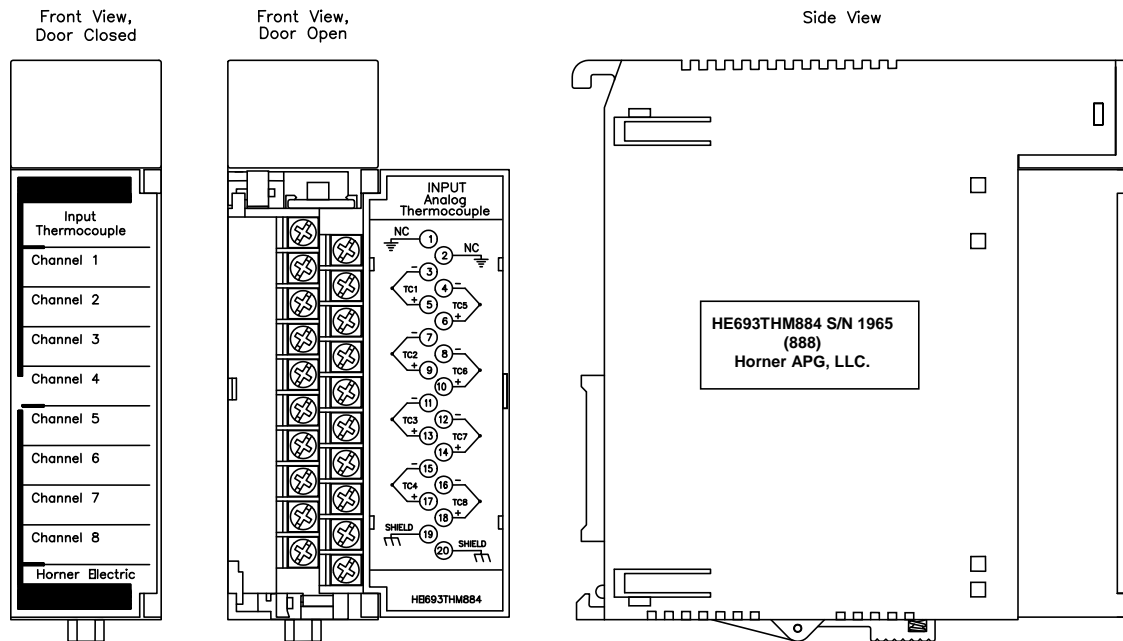


Figure 1 – HE693THM884/888 Module

## 2 SPECIFICATIONS

HE693THM884 Specifications				Accuracy Specifications	
Power Consumption	100mA @ 5VDC		I/O Points Required	8%AI, 8%AQ, 16%I	
Number of Channels	8		Input Impedance	>20Mohms	
Types Supported	J, K		Maximum Sustained O/L	+/-35V	
Input Range (Temp.)	J: -210 to +760°C K: -270 to +1372°C		Common Mode Rejection	>100dB	
			A/D Conversion Type	18-Bit Integrating	
			A/D Conversion Time	5 ms	
			Scan Rate	40 channels per second	
Resolution	0.1°C		Operating Temperature	0 to 60°C (32 to 140°F)	
Accuracy	See "Accuracy Specifications" table		Relative Humidity	5% to 95% non-condensing	
			Type	J	
			Rated	+ / - 1°C	
			Range of Rating	-210 to +760°C	
			Type	K	
			Rated	+ / - 1°C + / - 2°C	
			Range of Rating	-100 to +1000°C -200 to +1372°C	

HE693THM888 Specifications					
Power Consumption	100mA @ 5VDC			I/O Points Required	8%AI, 8%AQ, 16%I
Number of Channels	8			Input Impedance	>20Mohms
Types Supported	J, K, N, T, E, R, S, B, C, X			Maximum Sustained O/L	+/-35V
Input Range (Temp.)	J: -210 to +760°C	E: -270 to +1000°C	C: 0 to +2320°C	Common Mode Rejection	>100dB
	K: -270 to +1372°C	R: 0 to +1768°C	X: -178 to +982.3°C	A/D Conversion Type	18-Bit Integrating
	N: -270 to +1300°C	S: 0 to +1768°C		A/D Conversion Time	5 ms
	T: -270 to +400°C	B: 0 to +1820°C		Scan Rate	16 channels per second
Resolution	0.1°C			Operating Temperature	0 to 60°C (32 to 140°F)
Accuracy	See Table Below			Relative Humidity	5% to 95% non-condensing

Accuracy Specifications					
Type	Rated	Range of Rating	Type	Rated	Range of Rating
J	+ / - 1°C	-210 to +760°C	R	+ / - 1°C + / - 2°C	0°C to 1300°C 1300°C to 1768°C
K	+ / - 1°C + / - 2°C	-100 to +1000°C -200 to +1372°C	S	+ / - 1°C + / - 2°C	0°C to 1300°C 1300° to 1768°C
N	+ / - 1°C	-270 to +1300°C	B	+ / - 1°C	0 to +1820°C
T	+ / - 1°C + / - 2°C	-100°C to 400°C -240°C to -100°C	C	+ / - 1°C + / - 2°C + / - 3°C	0°C to 1000°C 1000°C to 1800°C 1800°C to 2320°C
E	+ / - 1°C + / - 2°C	-100°C to 1000°C -200°C to -100°C	X	+ / - 1°C	-178 to +982.3°C

3 CONFIGURATION

		SOFTWARE CONFIGURATION			
SLOT 2		Catalog #: FOREIGN		FOREIGN MODULE	
FRGN					
		Module ID :	3		
		%I Ref Adr :	%I0001	Byte 1 :	00000001
		%I Size :	16	Byte 2 :	00000010
		%Q Ref Adr :	%Q0001	Byte 3 :	00
		%Q Size :	0	Byte 4 :	00
		%AI Ref Adr :	%AI001	Byte 5 :	00
		%AI Size :	8	Byte 6 :	00
		%AQ Ref Adr :	%AQ001	Byte 7 :	00
		%AQ Size :	8	Byte 8 :	00
				Byte 9 :	00
				Byte 10 :	00
				Byte 11 :	00
				Byte 12 :	00
				Byte 13 :	00
				Byte 14 :	00
				Byte 15 :	00
				Byte 16 :	00

Figure 2 – Foreign Module Configuration

To reach this screen, select I/O Configuration (F1), move to the slot containing the module and select Other (F8), and Foreign (F3).

Configuration Parameters						
Byte 1	Byte 2	Byte 3	Byte 4	Bytes 5-12	Bytes 5-12 (THM 888)	Bytes 5-12 (THM 884)
Smart Module	Digital Filtering	Engr. Units	Up/Downscale Break	T/C Type	T/C Type	T/C Type
1	0000-0111 (see Chart)	00: 0.5°C	00: Upscale Break	00: J	08: C	00: J
		01: 0.5°F		01: K	09: X	01: K
		02: 0.1°C		02: N		
		03: 0.1°F	01: Downscale Break	03: T		
				04: E		
				05: R		
				06: S		
				07: B		
				08: C		
				09: X		

The necessary parameters are %I Size, %AI Size, %AQ Size, and Bytes 1-12.

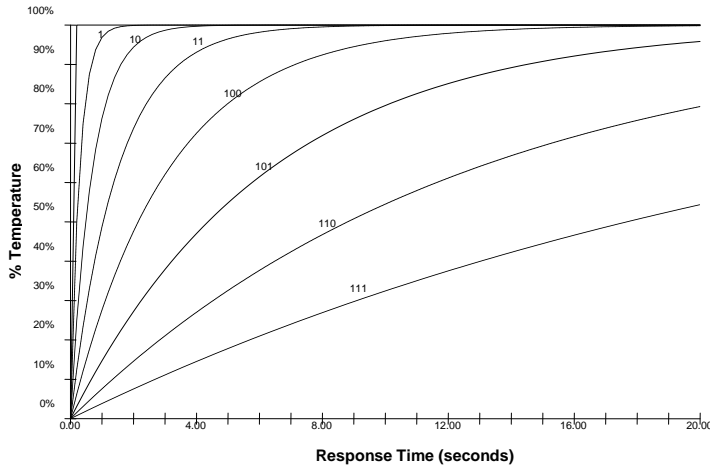


Figure 3 – Digital Filtering

The effect of digital filtering (set with Byte 2) on module response to a temperature change. (% temp change completed vs. time).