



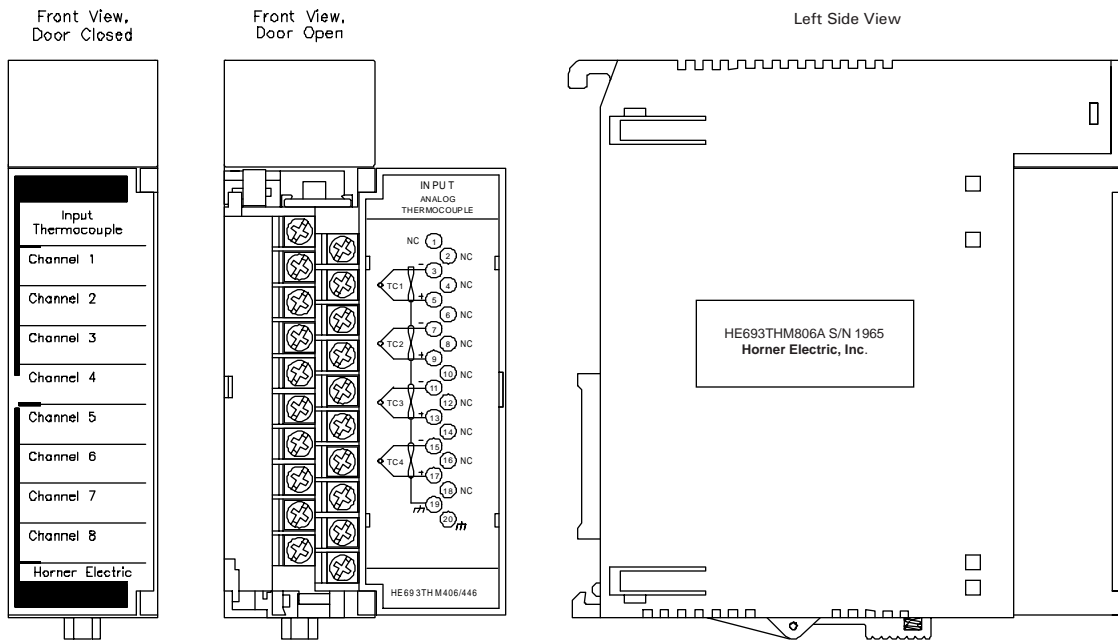
**HORNER  
ELECTRIC  
ADVANCED  
PRODUCTS  
GROUP**

# Thermocouple Input Module Product Specifications and Installation Data

DESCRIPTION

The Horner APG Thermocouple Input Modules allow 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. These modules have a resolution of 0.5°C, and temperature values may be reported to the PLC %AI I/O table in 0.5°C or 0.5°F increments. There are four standard resolution models available, with four input channels (HE693THM406/HE693THM446), and with eight input channels (HE693THM806/HE693THM886). All models feature open circuit detection, where the temperature value written to the %AI register goes to its maximum value upon an open circuit condition. Two models (HE693THM446 and HE693THM886) also feature %I alarm bits which energize on an open circuit condition. The first four %I bits are used for the HE693THM446 and the first eight %I bits are used for the HE693THM886.

ILLUSTRATION



SPECIFICATIONS

Specification	THM406[446]	THM806[886]	Specification	THM406[446]	THM806[886]
Power Consumption	100mA @ 5VDC		I/O Points Required	4%AI [&16%I]	8%AI [&16%I]
Number of Channels	4	8	Input Impedance	>20Mohms	
Types Supported	J,K,N,T,E,R,S		Maximum Safe Overload	+/- 35V	
Input Range (Temp) (J,K,N,T,E,R,S)	J: -210 to +760°C	E: -270 to +1000°C	Common Mode Range	+/- 12V	
	K: -270 to +1372°C	R: 0 to +1768°C	Common Mode Rejection	>100dB	
	N: -270 to +1300°C	S: 0 to +1768°C	A/D Conversion Type	Integrating	
	T: -270 to +400°C		Module Update Rate	45 Channels per second	
Resolution	0.5°C		Operating Temperature	0 to 60°C (32 to 140°F)	
Accuracy	+/- 0.5°C typical (Type J)		Relative Humidity	5% to 95% non-condensing	

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

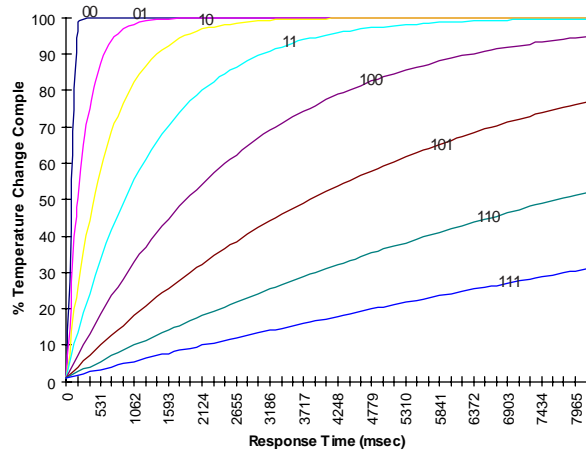
**LM90 Foreign Module Configuration.** To reach this screen in the LM90 Configuration Package, select I/O Configuration (F1), cursor over to the slot containing the module and select Other (F8), and Foreign (F3). This configuration is for the HE693THM806.

Model	%AI Size	%I Size	Byte				
			1	2	3	4	5
THM406	4	0	1	(see chart)	0: 0.5°C	0	00: J
THM446							01: K
THM806	02: N						
THM886	03: T						
	8	16			1: 0.5°F		04: E
							06: S

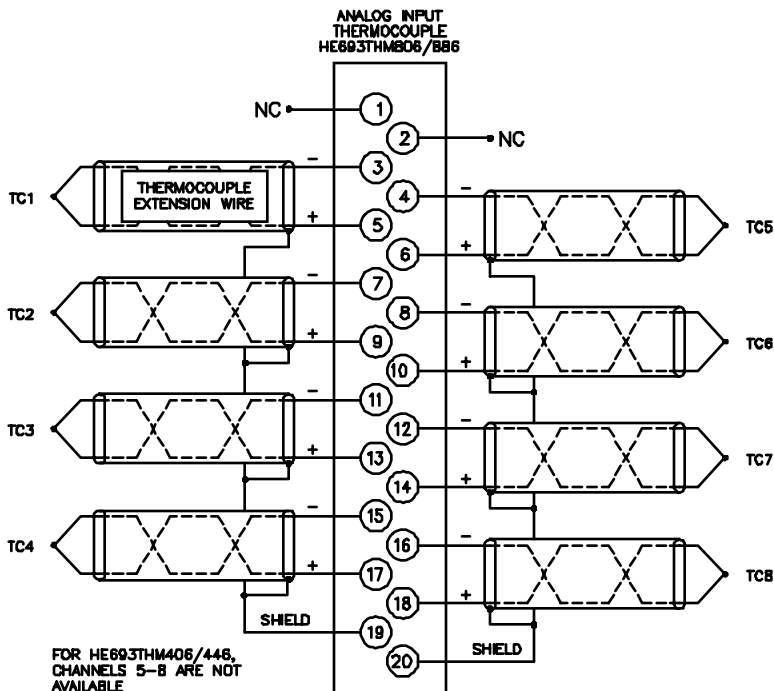
**Configuration Parameters.** Byte 2 sets digital filtering, Byte 3 sets the module resolution, and Byte 5 sets the thermocouple type.

Byte 3	Formula
0	°C = %AI / 2
1	°F = %AI / 2

**Temperature Scaling.** Temperature values are written to the %AI registers in 0.5°C or 0.5°F increments, depending upon the value of Byte 3.



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



### Installation Suggestions

- Special care must be taken with grounded junction sensors to avoid applying a voltage potential to the thermocouple junction. Ensure that the ground potential at the thermocouple location matches the ground potential at the PLC before connecting grounded thermocouples.
- Extension wire of the proper thermocouple type must be used. Keep total wire resistance less than 100Ω to maintain rated accuracy.
- Extension 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 (at one end only) is critical. Terminals 19 and/or 20 may be used as the shield ground point.