APPLICATION		REVISIONS			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
		A	ECN # 300	04/17/08	JWM
		B	ECN #301	03/19/09	JWM

CONTRACT NO. 1456		QUAD TRON, INC.				
APPROVALS	DATE	MICRO MODULE PCM ENCODER, MODEL MI_TC 4 CHANNEL THERMOCUPLE				
DRAWN MJC	02/08/08					
CHECKED RHM	02/08/08	SIZE	FSCM NO.	DRAWING NO.		REV B
ISSUE JWM	02/08/08	A	OBPE4	57-2623		SHEET 1 OF 4

MICRO PCM ENCODER SERIES

MODEL MI_TC

FOUR (4) CHANNEL THERMOCOUPLE MODULE

The 4 Channel thermocouple module, MI_TC, is a very accurate 4 channel Thermocouple Conditioner with Reference Junction Compensation, Amplifier Compensation and Real Time Linearization. To achieve accuracy, amplifier digital temperature compensation is employed. Each channels thermocouple type can be individually selectable for thermocouple types J, K, B, E, N, R, S, or T. Each channel has its own Analog to Digital converter for simultaneous sampling and to minimize errors with multiplexing. Each channel has an analog antialaising low pass filter. Provided are selectable digital FIR filters for each channel for noise reduction. Digital filter cutoff is selectable from 1 Hz to 500 Hz independently for each channel or can be bypassed. The Reference Junction Block is separate from the thermocouple conditioner module for ease of thermocouple connect, disconnect and reference junction temperature isolation. The Reference Junction Block (separate data sheet) uses digital temperature sensing of the thermocouple reference junction for reduced errors. Software is provided to calibrate the external cold junction block. The module requires one MI_CJ4 four (4) channel Cold Junction compensation block. Thermocouple data is digitized to 16-bit resolution for transmission in the system PCM output format. Each channel has programmable zoom and offset for user selectable temperature range and zoom features. All modules in a standalone or distributed PCM system are programmed via one PCM Base unit (MI_Base3 Module) connected to a PC with Windows based software -- (Single Point Programming.)

NOTE:
The MI_TC_ADD8 module can be used to increase the number of TC's to 12.

Electrical Specifications:

TRANSDUCER TYPE:	Thermocouple Types J, K, B, E, N, R, S, or T
ACCURACY:	± 0.5 degree C, from -35° to +70° C; Unit Temperature. ±1.0 degree C otherwise, or better; Unit Temperature.
INPUT TYPE:	Thermocouple connection to the reference junction. Copper wire from compensator to unit.
LOW PASS FILTERS:	Each channel is analog filtered. Each channel is digitally filtered after sampling.

Environmental:

Operating Temperature:	-40°C to +85°C
Storage Temperature:	-55°C to +125°C
Humidity:	Relative humidity of 85% for two hours at 65°C.
Altitude:	Unlimited
Vibration:	20g's RMS from 5 to 2000Hz in each major axis.
Acceleration:	Constant acceleration of 100g's in each axis.
Shock:	100g's for 10m second in each major axis.

Engraving:

MI_TC

Mechanical:

Size: 4 Channel Thermocouple Module:

Length: 3.50 inches; Width: 1.25 inches; Height: 0.310 inches.

MI_TC_PINOUT:

J1 CONNECTOR : NANONICS/TYCO, STM037M6HN / 4-1589487-0

MATE: NANONICS/TYCO, STM037PC2DC024N / 3-1589474-9

PIN	FUNCTION	PIN	FUNCTION
1	TC1+	19	TC2-
2	TC1-	20	TC2+
3	TC4-	21	TC3+
4	TC4+	22	TC3-
5	AGND	23	AGND
6	AGND	24	AGND
7	CS_N_CJ3	25	CS_N_CJ1
8	CS_N_CJ4	26	CS_N_CJ2
9	DOUT	27	SCLK
10	3.3VD	28	DIN
11	DGND	29	TDI_ATMEL1
12	NC	30	TDO_ATMEL1
13	DGND	31	TMS_PROM
14	NC	32	TCK_ATMEL1
15	DGND	33	TDO_PROM
16	STP2	34	TMS_ATMEL1
17	STP1	35	TDI_PROM
18	STP0	36	RESET_ATMEL1_N
		37	TCK_PROM