

Quadruple Thermocouple Conditioner – MODTQx

Features

- Signal conditioning for type J or type K thermocouples
- Excellent immunity to EMI/RFI
- Built-in ice point compensation
- Built-in open-thermocouple indicators
- Low power consumption
- Rugged construction and small size
- MIL spec vibration-lock D-sub connector

Description

The module provides cold junction compensation, amplifies and linearizes electrical signals from type J or type K thermocouples. Each input is built with a LED which is lit when there is no thermocouple attaching to its input. The MODTQx are used for various temperature measurements, e.g. exhaust gas, cylinder head, rolling tire surface and brake rotors. Refer to thermocouple datasheets (TCKEGT, TCJCHT, TCKSTK)

Different models are available:

Part Number	Type	Temp. Range
MODTQK-501	K	0°C to 500°C
MODTQK-102	K	0°C to 1000°C
MODTQJ-751	J	0°C to 750°C

Description of the LED status:

LED status	Description
ON	Open-thermocouple indicator
OFF	Thermocouple is present

Installation

Setup:

- Connect each terminal of the thermocouple to the module's leads: #10-32 (+) and #8-32 (-). Verify that the LED is OFF.
- Connect the D-SUB connector to an analog input (A, B or C) of the Recorder.
- Verify that the cable is not pinched or stretched by moving parts
- Route the cable at least 20cm (8") away from high interference electrical devices, such as: ignition coils, plug leads, high-current leads, high emission electronic modules or antennas



- Do not bend cable with curvature radius smaller than 40mm (1.60")
- Avoid exposing the sensor to extreme vibrations

Software configuration:

Analyzer V8

- Use the *sensor calibration wizard* to retrieve the calibration parameters from the part number and/or serial number
- or
- Use the parameters from the supplied sensor calibration sheet.

Analyzer V7

Use the calibration parameters in the *Calibration* section of the Datasheet (page 2)

Cable and Connector pin-out		
8 conductors cable color	DD15M10JVLX PIN #	Signal description
Red	1	SIGN_TH1
Green	2	SIGN_TH2
Yellow	3	SIGN_TH3
White	4	SIGN_TH4
Shield	5	SHD
Orange	6	V+ (11 - 18 VDC)
Blue	11	GND
Black	N.C.	N.C.
Violet	N.C.	N.C.

Calibration

Calibration Parameters for Analyzer V7:

Analyzer V7 USERS only			
Name	MODTQK-501		
Predefined Equation	<custom>		
Category	Temperature		
Units	Celsius or Fahrenheit		
Equation Type	3 rd order		
P1	0.877045	P2	1.913788
P3	5.21744E-4	P4	-1.920786E-6

Analyzer V7 USERS only	
Name	MODTQJ-751
Predefined Equation	<custom>
Category	Temperature
Units	Celsius or Fahrenheit
Equation Type	Formula
$-1.114487E-7 * QUANTA^4 + 3.637494E-5 * QUANTA^3 - 4.46708E-3 * QUANTA^2 + 4.150544 * QUANTA - 4.6356$	

Analyzer V7 USERS only	
Name	MODTQK-102
Predefined Equation	<custom>
Category	Temperature
Units	Celsius or Fahrenheit
Equation Type	Formula
$3.276389E-8 * QUANTA^4 - 1.049587E-5 * QUANTA^3 + 2.639622E-4 * QUANTA^2 + 3.928968 * QUANTA - 3.216541E-2$	

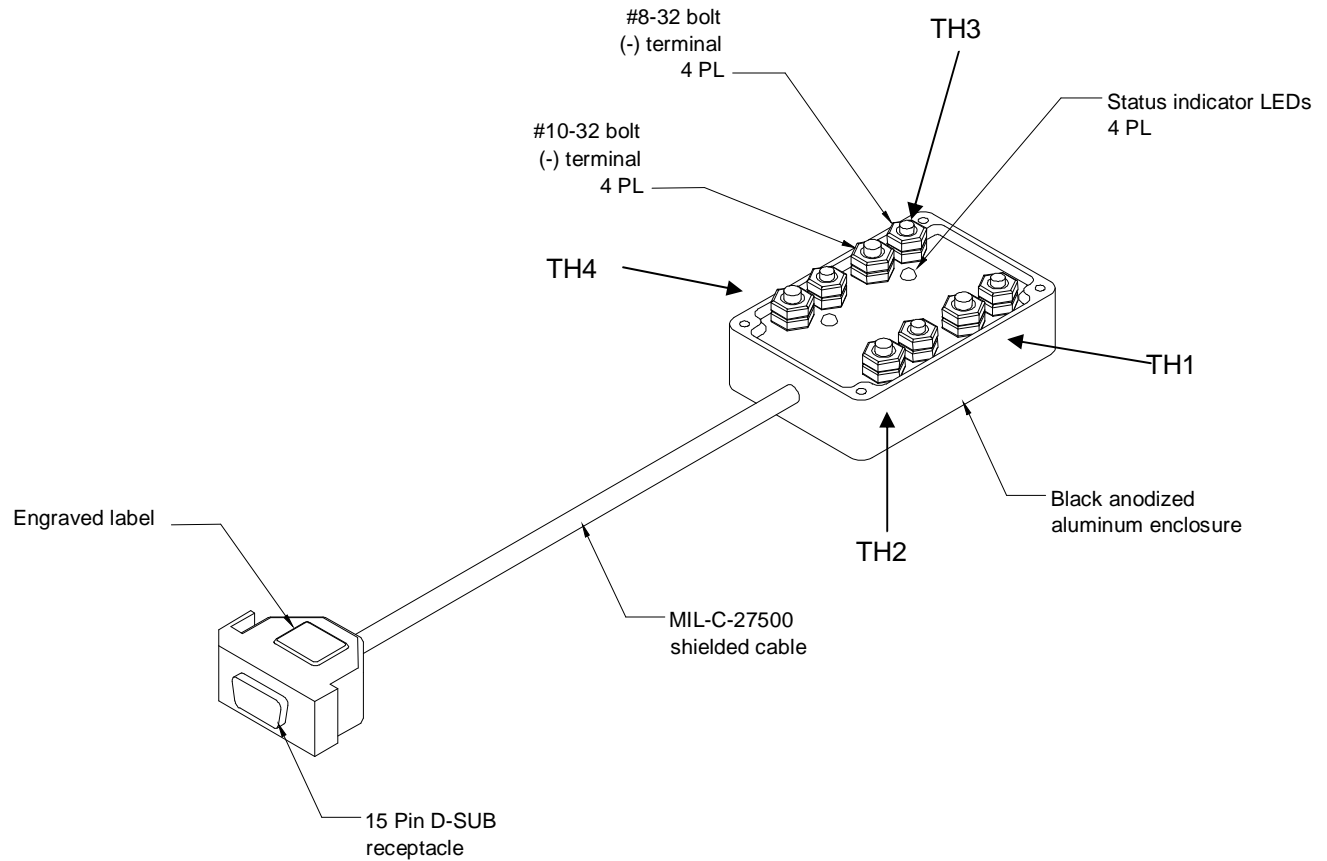
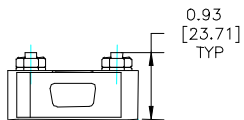
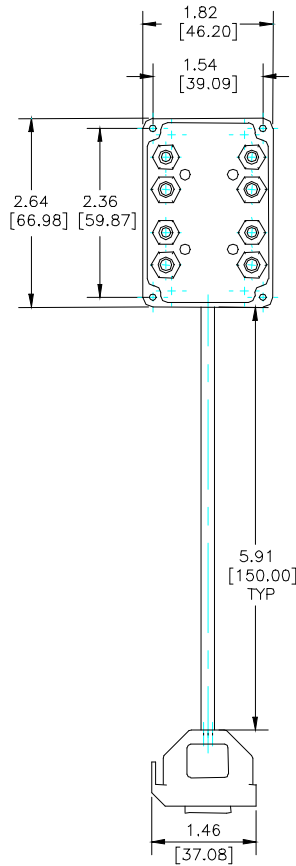
Specifications

	Symbol	Min	Typ	Max	Unit
Power requirements					
Supply Voltage	V _{in}	7		30	V
Current ¹	I _{in}	8		45	mA
Output Voltage swing	V _{Out}	0		5.00	V
Temperature Measurement					
Calibration Error @ T _{Ambient} = 25°C	Calib ₂₅	-1	0.5	+1	°C
Calibration Error @ T _{Ambient} from -40°C to 85°C	Calib _{.40 to 85}	-2		+2	°C
Temperature stability	T _{STAB}		±0.02	±0.05	°C /°C
Gain Error	G _{ERROR}	-1.5		+1.5	%
Thermocouple Input Current	I _{THIN}		0.1		uA
Module 3dB Bandwidth	f _{3dB}		15		kHz
Environment					
Operating temperature	T _{oper}	-40 (-40)		85 (185)	°C (F)
Mechanical Specifications					
Height	H		17 (0.7)		mm (in)
Width	W		46 (1.8)		mm (in)
Depth	D		67 (2.6)		mm (in)
Weight	WT		167 (5.891)		g (oz)

¹ The supply current is maximum when the indicator LED is ON

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MODTQx



All dimensions are in inches [millimeters].