

**Features**

- Signal conditioning for type J or type K thermocouples
- Excellent immunity to EMI/RFI
- Built-in ice point compensation
- Built-in open-thermocouple indicator
- Low power consumption
- Rugged construction and small size
- Watertight mini sure-seal<sup>®</sup> connector

**Description**

The module provides cold junction compensation and amplification for type J or type K thermocouples. These modules are used for various temperature measurements, e.g. exhaust gas, cylinder head, rolling tire surface and brake rotors. (TCKEGT, TCJCHT, TCKSTK).

Different models for different temperature types and ranges

Part Number	Type	Temp. Range
MODTMJ-301	J	-100°C to 300°C
MODTMK-301	K	-100°C to 300°C
MODTMK-501	K	0°C to 500°C
MODTMJ-751	J	0°C to 750°C
MODTMK-102	K	0°C to 1000°C
MODTMK-122	K	0°C to 1250°C

**Description of the LED status:**

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

**Installation**

**Setup:**

- Connect the thermocouple to the module. Typically the yellow wire to #10-32(+) and the red wire to #8-32(-). Verify that the LED is OFF
- Connect the module to an analog input of the system: A, B or C. Carefully align indexing rib when mating mini sure-seal<sup>®</sup> connectors.
- 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



**MODTMK-102, MODTMK-501 and MODTMJ-751**



**MODTMJ-301, MODTMK-301 and MODTMK-122**

**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)

## Calibration

**Calibration parameters for Analyzer V7:**

Analyzer V7 USERS only	
<b>Name</b>	MODTMJ-301
<b>Predefined Equation</b>	<custom>
<b>Category</b>	Temperature
<b>Units</b>	Celsius or Fahrenheit
<b>Equation Type</b>	Formula
$-5.251594E-8 * QUANTA^4 + 3.349789E-5 * QUANTA^3 - 8.03831E-3 * QUANTA^2 + 2.81657 * QUANTA - 150.556$	

Analyzer V7 USERS only	
<b>Name</b>	MODTMK-301
<b>Predefined Equation</b>	<custom>
<b>Category</b>	Temperature
<b>Units</b>	Celsius or Fahrenheit
<b>Equation Type</b>	Formula
$-1.210075E-7 * QUANTA^4 + 6.382313E-5 * QUANTA^3 - 1.177482E-2 * QUANTA^2 + 2.84387 * QUANTA - 138.606$	

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

Analyzer V7 USERS only	
<b>Name</b>	MODTMJ-751
<b>Predefined Equation</b>	<custom>
<b>Category</b>	Temperature
<b>Units</b>	Celsius or Fahrenheit
<b>Equation Type</b>	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	
<b>Name</b>	MODTMK-102
<b>Predefined Equation</b>	<custom>
<b>Category</b>	Temperature
<b>Units</b>	Celsius or Fahrenheit
<b>Equation Type</b>	Formula
$3.276389E-8 * QUANTA^4 - 1.049587E-5 * QUANTA^3 + 2.639622E-4 * QUANTA^2 + 3.928968 * QUANTA - 3.216541E-2$	

Analyzer V7 USERS only	
<b>Name</b>	MODTMK-122
<b>Predefined Equation</b>	<custom>
<b>Category</b>	Temperature
<b>Units</b>	Celsius or Fahrenheit
<b>Equation Type</b>	Formula
$5.620091E-12 * QUANTA^6 - 4.672873E-09 * QUANTA^5 + 1.498031E-06 * QUANTA^4 - 2.156185E-04 * QUANTA^3 + 1.257893E-02 * QUANTA^2 + 4.808710E+00 + 1.579238E+00$	

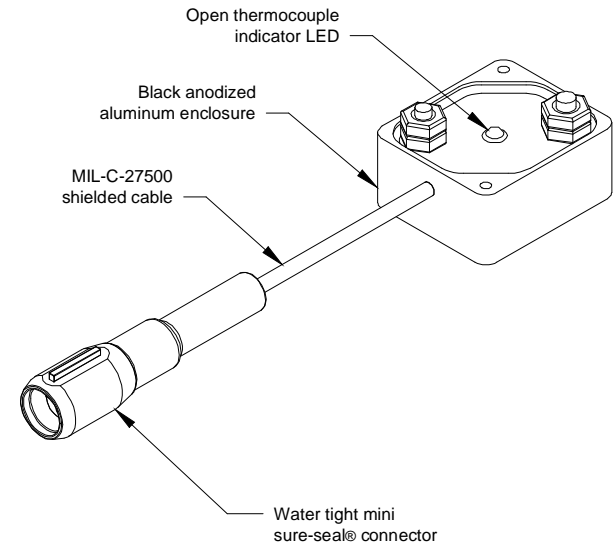
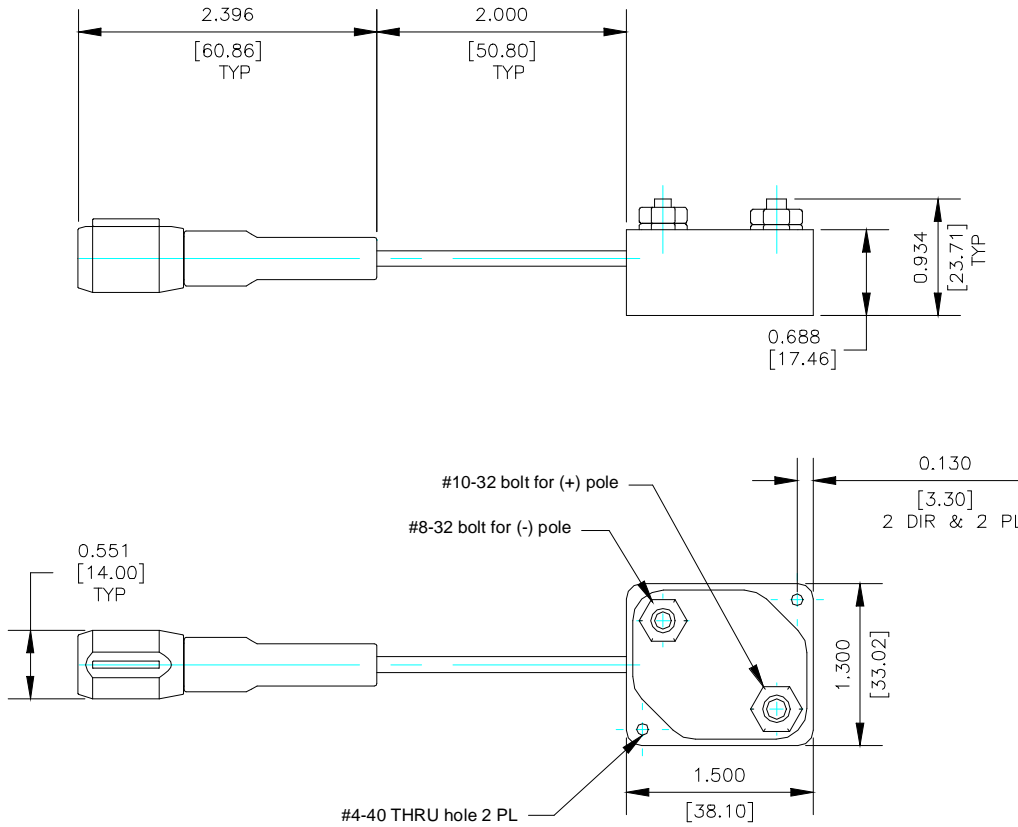
**Specifications**

	Symbol	Min	Typ	Max	Unit
Power requirements					
Supply Voltage					
MODTMK-102	$V_{in}$	12		30	V
MODTMK-122					
MODTMJ-301	$V_{in}$	10		30	V
MODTMK-301					
MODTMK-501					
MODTMJ-751					
Supply Current <sup>1</sup>	$I_{in}$		3.5	11.1	mA
Output Voltage swing	$V_{Out}$	0		5.00	V
Temperature Measurement					
Calibration Error @ $T_{Ambient} = 25^{\circ}C$	Calib <sub>25</sub>	-1	0.5	+1	$^{\circ}C$
Calibration Error @ $T_{Ambient}$ from $-40^{\circ}C$ to $85^{\circ}C$	Calib <sub>-40 to 85</sub>	-2		+2	$^{\circ}C$
Temperature stability	$T_{STAB}$		$\pm 0.02$	$\pm 0.05$	$^{\circ}C / ^{\circ}C$
Gain Error	$G_{ERROR}$	-1.5		+1.5	%
Thermocouple Input Current	$I_{THIN}$		0.1		$\mu A$
Module 3dB Bandwidth	$f_{3dB}$		15		kHz
Environment					
Operating temperature	$T_{oper}$	-40		85	$^{\circ}C$
Weight					
MODTMx-102, MODTMx-501, MODTMx-751	W		65 (2.293)		g (oz)
MODTMx-301 and MODTMx-122	W		130 (4.586)		g (oz)

<sup>1</sup> The supply current is maximum when the indicator LED is on.

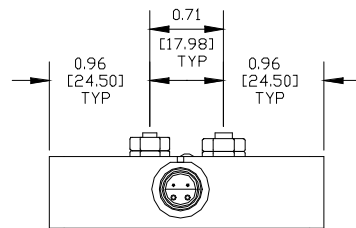
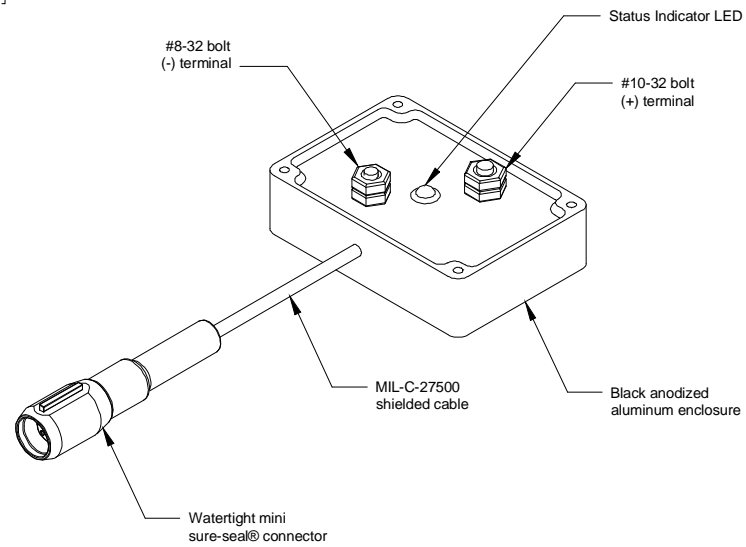
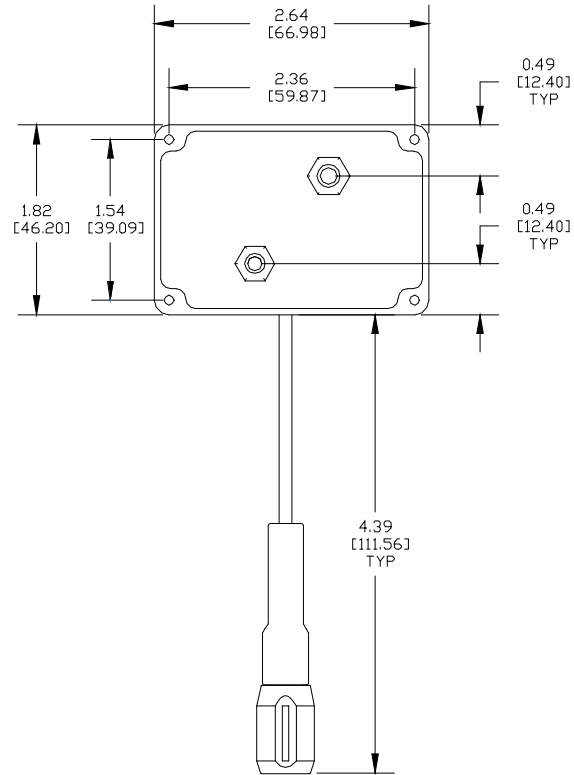
**Thermocouple Conditioner – MODTMx**

**MODTMK-102, MODTMK-501 and MODTMJ-751**



All dimensions are in inches [millimeters].

**MODTMJ-301, MODTMK-301 and MODTMK-122**



All dimensions are in inches [millimeters].