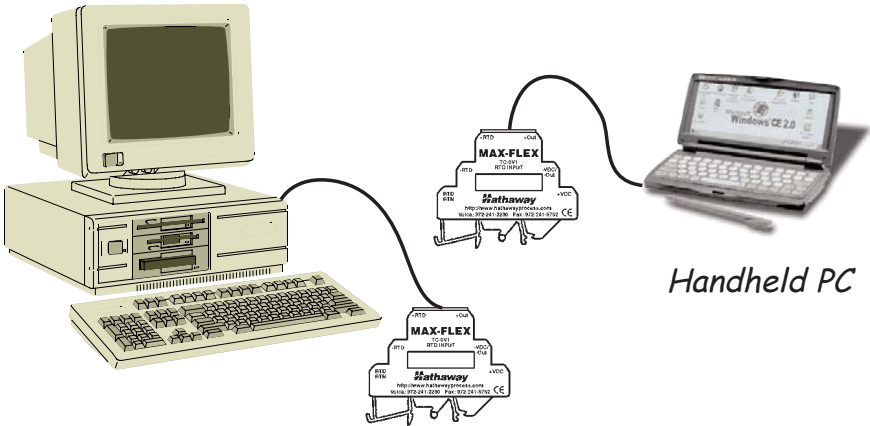




# MAX-FLEX™ Signal Conditioners PLC I/O Interface



# COMPUTER CONFIGURABLE



Handheld PC



**mTech TC Series** accepts thermocouple, RTD, potentiometer, DC V & I and frequency -- *models for most applications*



**mTech TC Series** features Computer Configuration by either PC or Handheld Computer (Windows® CE based) -- *no dedicated programmer required*



**mTech TC Series** has no potentiometers -- *high accuracy and long term stability*



**mTech TC Series** delivers a wide ambient operating temperature range, -40 to +167°F (-40 to 75°C) -- *no heat sinks or air spaces between units*



**mTech TC Series** provides smaller size, 88mm x 12.5mm x 69mm -- *24 units mounted on one foot of DIN rail*



**mTech TC Series** permits one unit to fit many applications -- *reduces spares and downtime*



**mTech TC Series** offers UL and CSA approvals and the CE mark -- *purchase and install with confidence*



**mTech TC Series** is lower cost than most conventional analog units -- *compare specifications vs price*

**mTech MAX-FLEX™** Signal Conditioners Meet Your Requested Features!

## TP SERIES PRODUCT DESCRIPTION

The **mTech** MAX-FLEX™ TP Series PLC I/O modules offer single device interface between the analog process signal and a PLC using inexpensive discrete I/O. The unique design provides a single-wire interface between the TP Series and the PLC, even PLC's without analog capability. The analog input signal is isolated, filtered, amplified, scaled and linearized, if required, by the internal microprocessor. The signal is then converted to a 16-bit, binary weighted, digital word which is transmitted serially (one bit at a time) at 24 Vdc, 120Vac or 240Vac signal level to the PLC's discrete port. At the PLC, each binary-weighted bit presented on the discrete input is temporarily stored until all 16-bits have been received, then the digital word is reassembled and its value placed in a working register of your choosing for decision making by the PLC program. **mTech** also has a model that works in reverse, it accepts a 16-bit signal from the PLC and provides a voltage or current analog output signal for positioning the final control device. The MAX-FLEX™ TP Series can be configured by utilizing the optional Configurator Utility Program. The program runs in a Windows/PC or Windows/CE HPC (Handheld Personal Computer) environment and uses the PC's RS-232C communication port. All the set-up parameters are stored in the non-volatile EEPROM within the device. The saved configuration files are always available for back-up and restoration of original settings. At the PLC, select from the mtech supplied pre-written PLC drivers for your PLC and paste the required drivers into your PLC program. Each driver provides a single channel of communication capability between TP unit and a PLC discrete port. PLC drivers are available for the majority of the major PLC manufacturer's. Also standard are both optical and transformer isolation plus short circuit, surge and reverse power protection. The small size allows mounting 24 units on one linear foot of DIN rail.

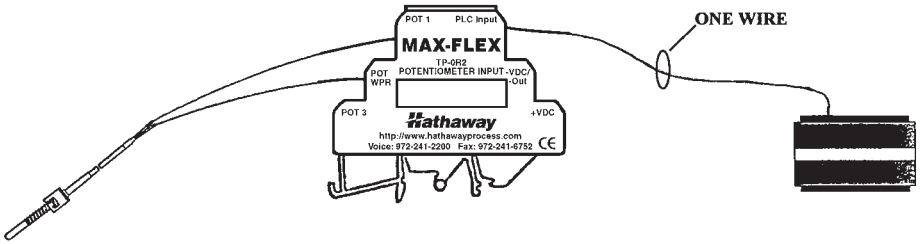
### TECHNICAL SPECIFICATIONS, COMMON TO ALL TP MODELS

Accuracy	±0.05% of span @ 25°C	Power Supply	15 to 32 Vdc
Update Speed	0.1 to 0.5 seconds (PLC dependent)	Power consumption	40 mA @ 24 Vdc supply
Resolution	16 Bit	Over Voltage	240Vrms reverse protected
Pulse Output	16-bit word transmitted @ 24Vdc, 120Vac or 240Vac (Solid State Relay required for AC signals)	RFI Immunity	5% full scale, 20 - 500MHz @ 10V/m
Analog Output, TP-0P	0-5 Vdc, 0-10 Vdc, 4-20mA, 0-20mA	Agency Approval	UL, CSA, CE
Status LED's	Active and Fault	Dimensions	88mmH x 12mmW x 68mmD
Isolation	1500 Vac, 2 Way	Mounting	32mm and 35mm DIN & "G" Rail
Operation Temperature	-40 to 75°C (-40 to 167°F)	Weight	1.4 ounces
Thermal Drift	0.01% full scale/°C	Storage Temperature	-40 to 85°C (-40 to 185°F)
Housing Material	Flame Retardant Polyamide Plastic, UL 94 (-50°C to 100°C Service Temp)		

### INDIVIDUAL MODEL SPECIFICATIONS

FUNCTION	Thermocouple	RTD	DC V	DCI	Potentiometer	Frequency	DCV or I Out
MODEL	TP-0T	TP-0V	TP-0D	TP-0I	TP-0R	TP-0F	TP-0L
INPUT	J: 0/760°C K: 0/1370°C T: -160/400°C E: -100/1000°C N: -200/1300°C	Pt 100W -385, 392 Pt 500W Cu 10W Ni 120W	0-10mV to 0-10V ±0-10mV to ±10V 1-5V	0-10mA to 0-20mA, ±10mA to ±20mA 4-20mA	500W to 100kW	0-5Hz to 50KHz 5V TTL or 24Vdc Levels	Pulse Input from PLC Discrete Output Point
MINIMUM SPAN	5mV	5W	5mV	5mA	10W	5Hz	N/A
RESOLUTION	0.05°C	0.05°C	16 Bit	16 Bit	16 Bit	16 Bit	16 Bit
OUTPUT	Pulse Output to PLC Discrete Input Point	Pulse Output to PLC Discrete Input Point	Pulse Output to PLC Discrete Input Point	Pulse Output to PLC Discrete Input Point	Pulse Output to PLC Discrete Input Point	Pulse Output to PLC Discrete Input Point	0-5Vdc, 0-10Vdc, 4-20mAdc, 0-20mAdc
INPUT OPEN	Up or Down Scale	Up or Down Scale	Up or Down Scale	Up or Down Scale	Up or Down Scale	Up or Down Scale	Up or Down Scale
Explicit Specification	Cold Junction Error: 0.6°C Linearity Error: 0.1°C	Excitation Current: 150µA Linearity Error: 0.1°C			Excitation 5 Vdc		

# COMPUTER CONFIGURABLE



**mTech** TP Series connect the process signal directly to almost any PLC via one wire -- *no need for expensive analog input modules*



**mTech** TP Series accepts thermocouple, RTD, potentiometer, DC V & I and frequency -- *models for most applications*



**mTech** TP Series features Computer Configuration by either PC or New Handheld Computer (Windows® CE based) -- *no dedicated programmer required*



**mTech** TP Series drivers make it easy to marry TP Series to your PLC, just paste and go -- *simple programming saves time and expense*



**mTech** TP Series delivers a wide ambient operating temperature range, -40 to +167°F (-40 to 75°C) -- *no heat sinks or air spaces between units*



**mTech** TP Series provides smaller size, 88mm x 12.5mm x 69mm -- *24 units mounted on one foot of DIN rail*



**mTech** TP Series permits one unit to fit many applications -- *reduces spares and downtime*



**mTech** TP Series offers UL and CSA approvals and the CE mark -- *purchase and install with confidence*



**mTech** TP Series is lower cost than most conventional analog units -- *compare specifications vs price*

**mTech** MAX-FLEX™ PLC I/O Interface Meet Your Requested Features!

## TC SERIES PRODUCT DESCRIPTION

The mTech MAX-FLEX™ TC Series of Computer Configurable Four-Wire Signal Conditioners features the latest digital technology at less cost than most fixed range analog circuitry units. The true digital design eliminates potentiometers, switches and other accuracy robbing and heat generating components. The TC Series can be configured by utilizing the optional Configurator Utility Program. The program runs in a Windows/PC or Windows/CE HPC (Handheld Personal Computer) environment and uses the PC's RS-232C communication port. All the set-up parameters are stored in the non-volatile EEPROM within the device. The saved configuration files are always available for back-up and restoration of original settings. Thermocouple units feature digital cold junction compensation and linearization for high accuracy and stability. The input circuit features 16 bit resolution with 13 to 16 bit output resolution. TC Series is available factory configured, the configuration can be changed by using the easy to follow computer program, eliminating dedicated hand held programmers. Also standard are both optical and transformer isolation plus short circuit, surge and reverse power protection. The small size allows mounting 24 units on one linear foot of DIN rail.

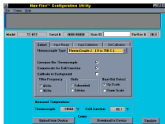
### TECHNICAL SPECIFICATIONS, COMMON TO ALL TC MODELS

Accuracy	±0.05% of span @ 25°C
Response Time	0.150 to 0.250 seconds (dependent on filter setting)
Current Output	4-20 mA <sub>dc</sub> or 0-20 mA <sub>dc</sub> , 600W max.
Voltage Output	0-5 V <sub>dc</sub> , 2K <sub>W</sub> min. or 0-10 V <sub>dc</sub> , 4K <sub>W</sub> min. and ±5V <sub>dc</sub> or ±10V <sub>dc</sub> on certain models
Status LED's	Active and Fault
Isolation	1500 Vac, either 3 Way or 2 Way (model dependent)
Thermal Drift	0.01% full scale/°C
Operation Temperature	-40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Power Supply	15 to 32 V <sub>dc</sub>
Power Consumption	40 mA @ 24 V <sub>dc</sub> supply
Over Voltage	240 V <sub>rms</sub> , reverse voltage protected
Housing Material	Flame Retardant Polyamide Plastic, UL 94 (-50°C to 100°C Service Temp)
RFI Immunity	5% full scale, 20 - 500MHz @ 10V/m
Agency Approvals	UL, CSA, CE
Dimensions	88mmH x 12mmW x 68mmD (3.46" x 0.49" x 2.78")
Mounting	32mm and 35mm DIN & "G" Rail
Weight	1.4 ounces

### INDIVIDUAL MODEL SPECIFICATIONS

FUNCTION	Thermocouple	RTD	DC V or Current	Potentiometer	Frequency	Loop Isolator
MODEL	TC-0T	TC-0V	TC-0D	TC-0R	TC-0F	TC-0L
INPUT	J: 0/760°C K: 0/1370°C T: -160/400°C E: -100/1000°C N: -200/1300°C	PT 100W -385, 392 PT 500W Cu 10W , Ni 120W	0-10mV to 0-10V ±0-10mV to ±10V 0-10mA to 0-20mA ±10mA to ±20mA 4-20mA, 1-5V	500W to 100KW	0-5Hz to 50KHz 5V TTL or 24V <sub>dc</sub> Levels	4-20mA
MINIMUM SPAN	5mV	10W	5mV	10W	5Hz	3.3mA - Repeater
RESOLUTION	0.05°C	0.05°C	13 to 16 Bit	13 to 16 Bit	±0.1%	N.A.
OUTPUT	0-5V, 0-10V 4-20mA, 0-20mA	0-5V, 0-10V, 4-20mA, 0-20mA	0-5V, 0-10V, 1-5V ±10V, ±5V, 4-20mA, 0-20mA	0-5V, 0-10V, 4-20mA, 0-20mA	0-5V, 0-10V, 4-20mA, 0-20mA	4-20mA (23mA max., 3.3mA min.
INPUT OPEN	Up or Down Scale	Up or Down Scale	Up or Down Scale	Up or Down Scale	Up or Down Scale	Down Scale
ISOLATION	3 Way	2 Way	3 Way	2 Way	3 Way	2 Way
Explicit Specification	Cold Junction Error: 0.6°C Linearity Error: 0.1°C	Excitation Current: 150µA Linearity Error: 0.1°C		Excitation 5 V <sub>dc</sub>		

## Windows™ Based Configuration Utility Software



### ORDERING CODE:

SIGNAL CONDITIONER TC - 0 X X - X

#### INPUT

- X = RTD
- X = Thermocouple
- F = Frequency
- R = Resistance
- D = DC Voltage/Current
- L = Loop Isolator

#### OUTPUT

- 1 = DC Voltage
- 2 = DC Current

#### CALIBRATION

- 1 = Customer
- 2 = Factory Configured

Specify: A. Input Calibration  
B. Output

Example: TC - 011 - 2 (0100, Type J Input - 420mA Output)  
TC - 012 - 2 (02500Hz Input - 1.5 V Output)

PLC I/O INTERFACE TP - 0 X X - X

#### INPUT

- X = RTD
- X = Thermocouple
- F = Frequency
- R = Resistance
- D = DC Voltage
- I = DC Current
- P = Digital from PLC

#### OUTPUT

- 1 = Digital to PLC
- 2 = DC Voltage
- 3 = DC Current

#### CALIBRATION

- 1 = Customer
- 2 = Factory Configured

Specify: A. Input Calibration

B. Output, when TP - 012 - 2 is ordered

Example: TP - 011 - 2 (0100, Type J Input)

TP - 012 - 2 (1.5 V Output)

SC - 01 ——— Configuration Utility Software and Cable (Purchased Separately)



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