# TransPak™

## Programmable, Isolating Two-Wire Temperature Transmitter

### Model T787

**Provides an Isolated, Linearized Current Loop in Proportion to a Thermocouple, RTD, Millivolt, Voltage, Milliamp, Potentiometer or Resistance Input**

- **Universally pre-calibrated from the factory**
- **User-friendly configuration via Windows® based software**
- **Unique *PC-Only*™ Communications Adapter allows configuration without bench equipment**
- **In-service self-calibration ensures long term stability without manual recalibration**
- **Cast aluminum housing for high EMI/RFI immunity (pending)**
- **Three year warranty**

## APPLICATION

Model T787 is an extremely versatile two-wire transmitter that may be used in any application requiring an isolated 4-20mA current loop proportional to a thermocouple, RTD, millivolt, milliamp, voltage, resistance or potentiometer input. Typical applications include providing accurate, stable signals to distributed control systems (DCS), supervisory control and data acquisition systems (SCADA), environmental monitoring and control systems (EMCS), data acquisition and control systems (DACS) and custody transfer / pipeline systems. The output of the T787 may also be used by an analog or digital display device.

The model T787 has conformally coated circuit boards to withstand corrosive environments. The diecast aluminum housing is sealed against moisture and shields the electronics from radio frequency interference (RFI) and electromagnetic interference (EMI) noise.

## DESCRIPTION

The T787 is a programmable two-wire transmitter that is configured to provide an isolated 4-20mA signal in proportion to the desired range of its input signal. The T787-0000 accepts thermocouple, 2-,3-, or 4 wire RTD, potentiometer, and millivolt inputs. The T787-0001 accepts millivolt, voltage, and milliamp inputs.

Configuration is performed by connecting the transmitter to a standard PC serial port (9-pin RS232C) using an isolated interface adapter and running a user-friendly, Windows-based program. Unique *PC-Only* technology in the T787 allows all configuration information to be defined and modified with only a PC, the interface adapter, and the transmitter. No loop supply, input simulation, or meter on the output is required! The fully isolated adapter reduces the risk of expensive damage to the PC which can be caused by spikes and surges on field wiring entering the computer via its unprotected serial port.

The T787 utilizes state of the art microprocessor technology and yields higher accuracy and long-term stability with lower power consumption than prior generation transmitters. The device automatically performs frequent self-testing and auto-calibration while in service, resulting in very stable long-term performance - stability greater than 0.1% of span over 12 months.

To maximize traceability, each unit may be assigned a tagID, a job or a project number, the purchase order and date on which it was procured, and a message in addition to its serial number. This data, along with the selected input type and range, last calibration date, and serial number are stored in the transmitter.

## OPERATION

Every T787 is factory calibrated and may be simply configured to perform the desired function using the Device Configuration screen (figure 1) and the Sensor Selection screen (figure 2) shown. Just fasten the DB-9 connector to the computer's serial port and the keyed 5-pin connector to the port under the access cover on the top or the transmitter. There is no need to provide an external power supply and load to the T787's output to configure the transmitter.

Units previously placed in service may have their configuration " uploaded" to the PC. Their operating parameters may be reviewed and if

ACTION INSTRUMENTS

necessary revised and downloaded again. All configuration parameters may be stored in a "configuration file" on the PC for future use.

After configuration, and at periodic intervals, the calibration may be verified by simulating and varying the input signal over the defined range and comparing the output signal to the ideal. If calibration is necessary, the PC software is used to adjust the transmitter's digital references. Because of the self-calibrating technology utilized in the T787, the calibration verification interval may be significantly longer than for earlier technology transmitters.

The Calibration and Configuration Software, Isolated RS232/T787 Communications Adapter and User's Guide are included in the model C680-0000.

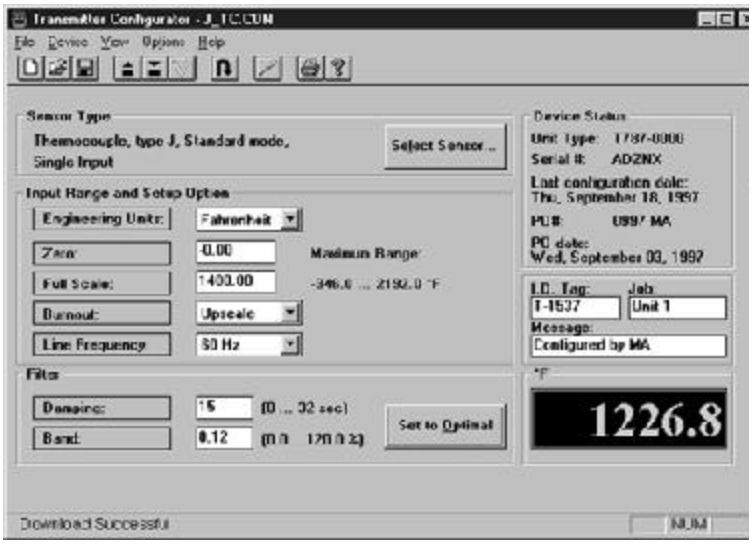



***Figure 1***
***Device Configuration***

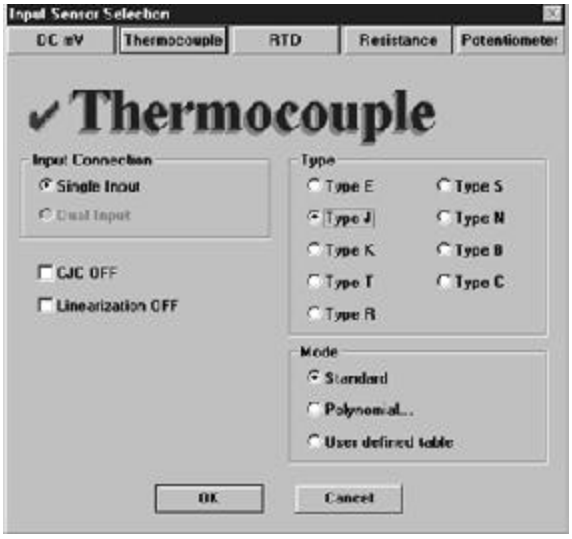



***Figure 2***
***Sensor Selection***

| | Input Type | Conformance Range | End to End Accuracy (1) | Full Scale Input |
|---|---|---|---|---|
| THERMOCOUPLE | Type B | 400 to 1820ºC | ±2.5ºC | 0 to 1820ºC<br>32 to 3308ºF |
| | Type C | 400 to 1820ºC | ±1.1ºC | 0 to 2320ºC<br>32 to 4172ºF |
| | Type E | 0 to 870ºC | ±0.55ºC | -270 to 1000ºC<br>-454 to 1832ºF |
| | Type J | -100 to 870ºC | ±0.55ºC | -210 to 1200ºC<br>-346 to 2192ºF |
| | Type K | -100 to1370ºC | ±0.65ºC | -270 to 1370ºC<br>-454 to 2498ºF |
| | Type N | -100 to 1300ºC | ±0.70ºC | -270 to 1300ºC<br>-454 to 2372ºF |
| | Type R | 200 to1300ºC | ±1.60ºC | -50 to 1770ºC<br>-46 to 3218ºF |
| | Type S | 200 to 1760ºC | ±1.60ºC | -50 to 1760ºC<br>-46 to 3200ºF |
| | Type T | 0 to 400ºC | ±0.55ºC | -270 to 400ºC<br>-454 to 752ºF |
| RTD (2) | Pt-100 (3) | -210 to 850ºC | ±0.30ºC | -210 to 850ºC<br>-346 to 1562ºF |
| | Ni-110 | -110 to 310ºC | ±0.25ºC | -110 to 310ºC<br>-166 to 590ºF |
| | Cu-10 | -80 to 160ºC | ±1.50ºC | -80 to 160ºC<br>-112 to 320ºF |

***Table 1***

| Input Type | Full Scale Range | Minimum Span | Accuracy (4) | |
|---|---|---|---|---|
| Ohms | 0 to 390Ω | 10Ω | 0.1% | T787-X000 |
| Potentiometer | 100 to 10kΩ | n/a | 0.1% | |
| DC mV | -10 to 120mV (-0000) | 10 mV | 0.1% | |
| | -30 to 300mV (-0001) | | | T787-X001 |
| DC Volts | -1 to 10V | 300 mV | 0.1% | |
| DC mA | -5 to 50mA | 2mA | 0.1% | |

***Table 2***

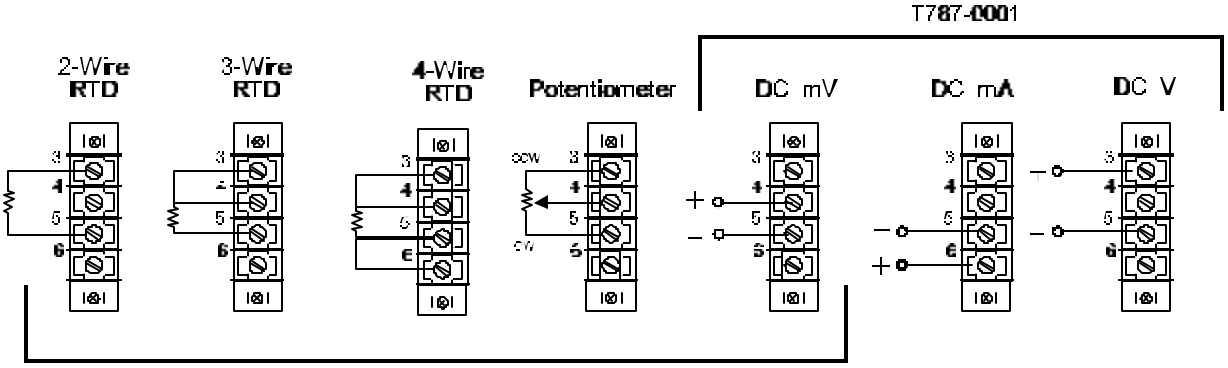
(1) Accuracy includes input accuracy, output accuracy, and linearity for any 250ºC span within the conformance range at a stable 25ºC ambient temperature; minimum accuracy over entire conformance range is ±0.1% of full conformance span.

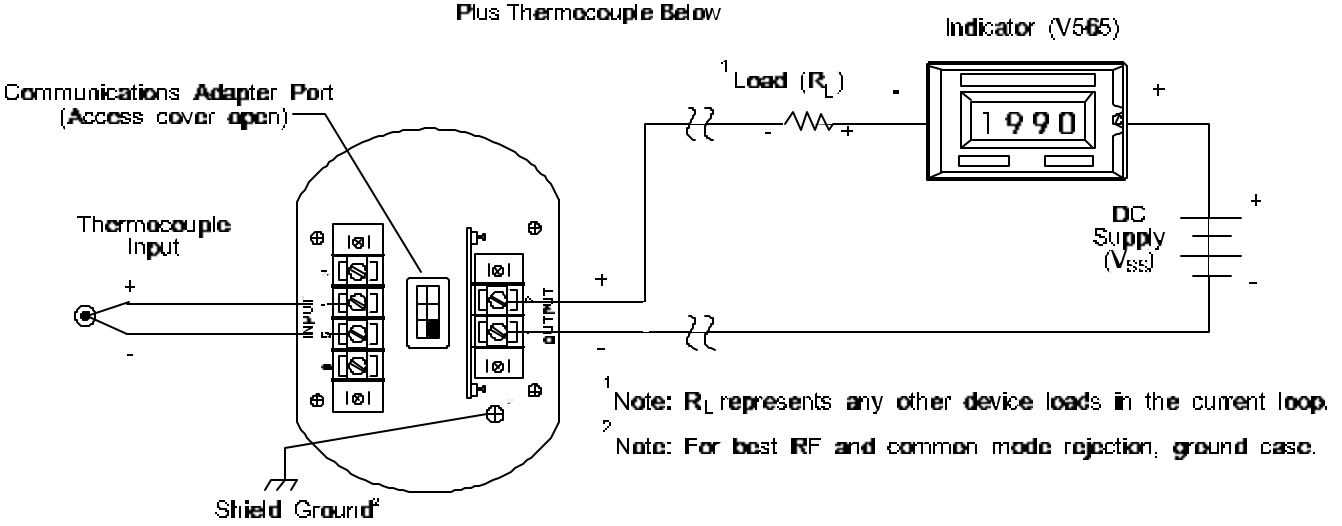
(2) For other RTD Types, consult Factory

(3) $\alpha$ =.00385 and .003916

(4) Percent of full scale range

## INPUT CONNECTIONS



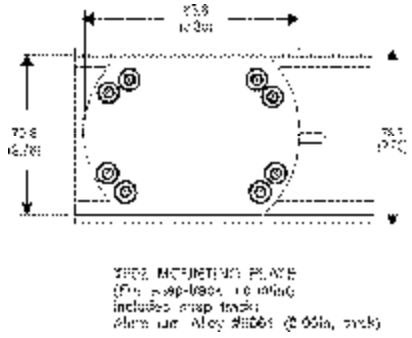

[1] Note: $R_L$ represents any other device loads in the current loop.

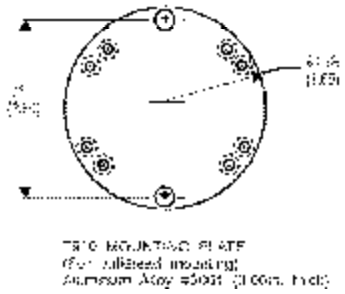
[2] Note: For best RF and common mode rejection, ground case.

---

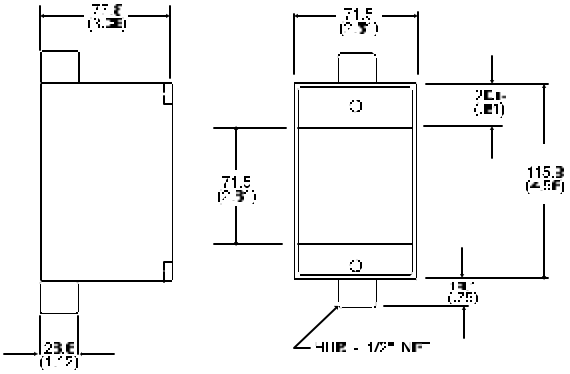
## MOUNTING HARDWARE

All dimensions are shown in millimeters (inches)

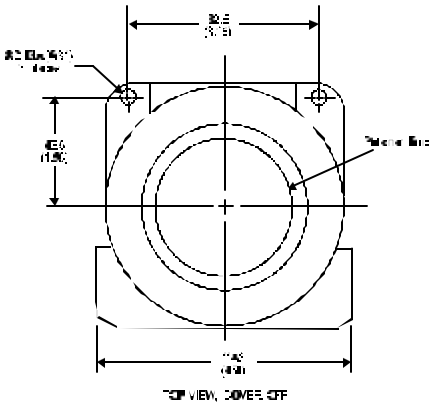


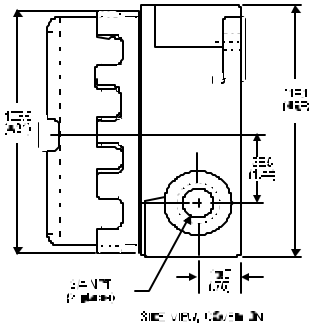


### T804 Conduit Device Housing



### T805 Explosion Proof Enclosure



## SPECIFICATIONS

**Minimum Span**

**t/c:** 20°C if zero offset ≤ 650°C
50°C if zero offset > 650°C
125°C if zero offset > 1250°C
(type C only)

**RTD:** 12°C if zero offset ≤ 75°C
20°C if zero offset ≤ 275°C
50°C if zero offset > 275°C

**mV:** 1mV if zero offset ≤ 25mV
5mV if zero offset ≤ 150mV
10mV if zero offset > 150mV

**mA:** 1mA if zero offset ≤ 15mA
3mA if zero offset > 15mA

**Volts:** 0.3V if zero offset ≤ 5V
0.5V if zero offset > 5V

**Input Impedance**
Volts: 200kΩ
Millivolts: 10MΩ
Milliamps: 5Ω

**t/c Burnout Function**
Programmable: upscale or downscale

**t/c Burnout Detection Current**
<0.2µA

**RTD Excitation Current**
0.3mA (nominal)

**Long Term Stability**
Better than 0.1% of span in 12 months

**Temperature Stability**
<0.01% of span per °C

**Isolation**
1000VDC input to output

**Minimum Output Current**
3.85mA

**Maximum Output Current**
22.5mA

**Loop Voltage Drop**
≤ 9VDC at 20mA

**Supply Voltage Range**
9 - 36 VDC

**Maximum Effect of Change in Supply Voltage**
<0.002% of span per Volt

**Effect of Ambient Temperature Change on Cold Junction Compensation**
0.02°C/ °C

**CJC Accuracy**
0.5°C

**Update Time**
>3 Conversions per second

**Turn On Time**
< 4 Seconds

**Filter Band**
Programmable from 0 to 120%

**Damping**
Programmable from 0.0 to 32.0 seconds

**Common Mode Rejection**
120dB

**Operating Temperature Range**
-20 to 70°C

**Dimensions mm(inches)**
H 55.3 (2.10) X W 77.7 (3.06) X D 61.0 (2.40)

**Weight**
0.56lbs

**Warranty**
3 years

---

## FIELD MOUNTING

The T787 is designed for installation in industrial field environments. A sealed, die-cast aluminum housing protects against corrosion, moisture, dust and electrical noise such as radio frequency (RFI) and electromagnetic (EMI) interference. All circuit boards are urethane coated for environmental protection.

Three enclosures are available for the T787: The model T804 is a general purpose housing with two 1/2" NPT hubs; the model T805 is a rugged NEMA 4/EP housing with two 3/4" NPT hubs; and the models V560/565 Loop Powered Displays with the "C Option" offer a NEMA 4X housing with 1/2" NPT hub and all T787 mounting hardware.

## ACCESSORIES

| Model | Description |
|---|---|
| **M004** | Snap-in Channel Track, 4 feet. |
| **T902** | Mounting plate for M004, includes 4" track. |
| **T910** | Bulkhead (flat surface) Mounting plate. |
| **T804** | Conduit device housing. |
| **T805** | Explosion Proof/NEMA4 enclosure. |
| **9046** | Action Pak 24/40VDC, 65mA Power Supply. |
| **T609** | 24V, 600mA Loop Power Supply. |
| **V560/565** | 3-1/2 digit remote loop powered indicator with wide ranging display, NEMA 4X enclosure. CSA & FM approval standard. Specify Option C to house Transpak. |

## ORDERING INFORMATION

**Specify**:

1. Model: T787-0000 (t/c, PTD, pot, Ohm, mV)
   or: T787-0001 (V, mA, mV)

Note: Unless otherwise specified, the factory will preset model T787 as follows:
T787-000; 0-100 input, 4-20mA output
T787-0001; 4-20mA input; 4-20mA output.

2. Model: C680-0000 Isolated Communications Adapter, Configuration and Calibration Software, and User's Guide.
3. C620: Factory Configuration (optional)

---


大连爱克新仪器有限公司 www.actionio.com.cn
地址:辽宁省大连市中山区七七街23号403室
电话：0411-82650498 82597851 13909856458
传真：0411-82650478 邮编：116001
E-mail:sales@actionio.com.cn xctlcy@mail.dlptt.ln.cn
support@actionio.com.cn
DALIAN ACTION INSTRUMENTS