TEL-TRU TEMPERATURE SOLUTIONS

Customer Focused Since 1916.

Digi-Tel Thermometer User Instructions

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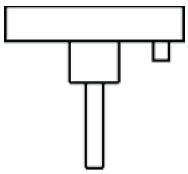
www.teltru.com

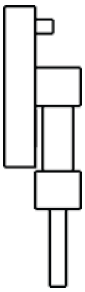
About Digi-Tel® Products

Digi-Tel thermometers are available in four configurations (back connect, bottom connect, adjustable angle, remote)

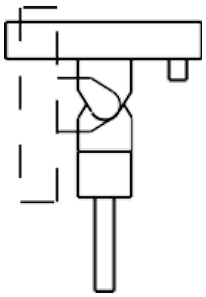
Each configuration is available as either battery or loop powered. Battery powered units have an onboard battery and can only display temperature locally. Loop powered units require an external DC power supply but can relay temperature data to other devices in the form of a 4-20mA signal in addition to displaying temperature locally. Loop powered units also feature a backlit display.



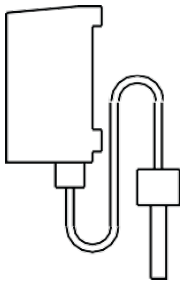
BACK CONNECT



BOTTOM CONNECT



ADJUSTABLE ANGLE

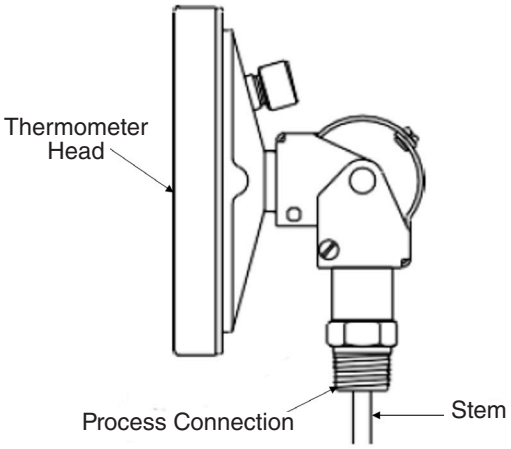


REMOTE

Mechanical Installation

Each model Digi-Tel has a process connection at the top of its stem. Install the process connection into a suitable fitting in the process. Use hand tools on the flats of the process connection to apply torque.

DO NOT TORQUE THE THERMOMETER HEAD. PERMANENT DAMAGE CAN OCCUR.



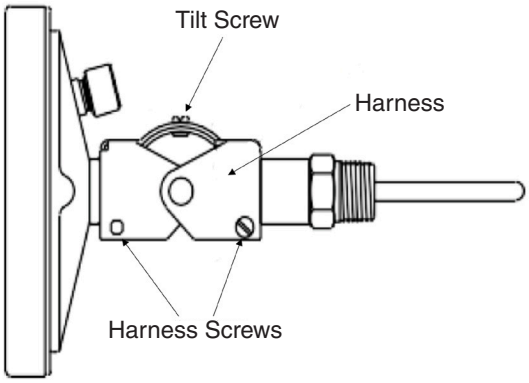
Remote Models

The display on Remote Digi-Tel units must be mounted independently from the process connection. The display housing has three, 0.24” holes evenly spaced on a 5.44” diameter suitable for wall mounting.

Adjustable Angle Models

Adjustable angle models have a harness which locks the position of the thermometer head. To adjust that position, loosen the harness and tilt screws. Rotate the harness around the stem to the desired orientation and tighten the harness screws to lock its position. Tilt the thermometer head to the desired position and tighten the tilt screw to lock its position.

ADJUSTING THE POSITION OF THE THERMOMETER HEAD WITHOUT LOOSENING THE HARNESS CAN RESULT IN PERMANENT DAMAGE.



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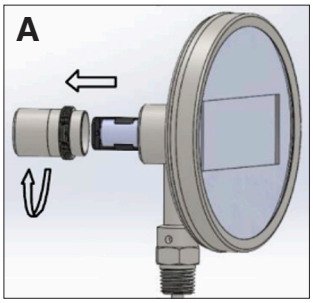
Electrical Installation

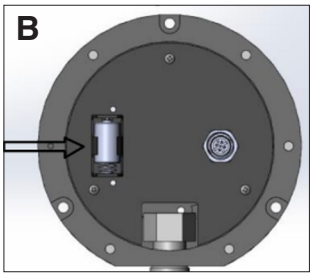
Battery Replacement

Battery powered units take a 3.6V 1/2AA lithium battery.

Loop powered units do not contain a battery.



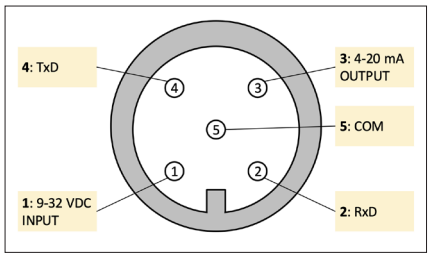
A. Back Connect, Bottom Connect, and Adjustable Angle Models: contain a battery on the back of the thermometer head. To replace the battery, unscrew the cover and remove the battery from its holder. Insert the replacement with the battery with the negative terminal contacting the spring in the holder then reinstall the cover.



B. Remote Models: contain a battery in the display housing. To replace the battery, remove the screw from the rear of the housing and pry the cover off the five pins holding it in position. Remove the cover and membrane to expose the battery holder. Remove the old battery and insert its replacement with the negative terminal contacting the spring in the holder. Reinstall the membrane, cover, and screw.

Loop Power Installation: must be powered from an external DC power supply input through a 5-pin M12 connector located on the rear of the thermometer head for back connect, bottom connect, and adjustable angle models. For remote models, the M12 connector is located at the base of the display housing. Older Digi-Tels may only have 4 pins. (For more information on 4-pin units, see **4-Pin vs 5-Pin Connections on page 7.**)

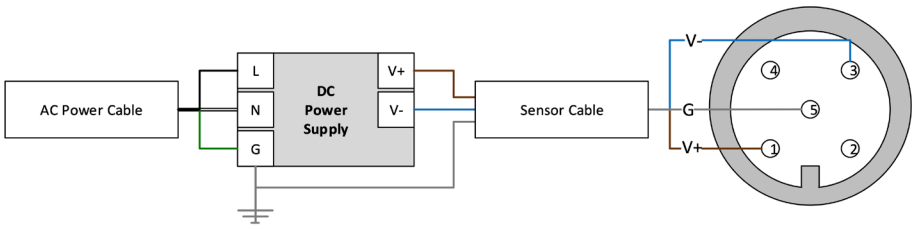
Pin	Description
1	Power Input. Must be 9 to 32 volts DC across pin 3.
2	Receive Data Pin. Used to communicate with calibration software during calibration.
3	Signal Output. Must be -9 to -32 volts DC across pin 1. Outputs 4-20 mA signal indicating temperature.
4	Transmit Data Pin. Used to communicate with calibration software during calibration.
5	DC Common Pin. Connects to ground on the circuit board. Should be connected to earth ground unless the installation requires isolation. For details on isolation, see section 5.1.3.



Wiring Examples

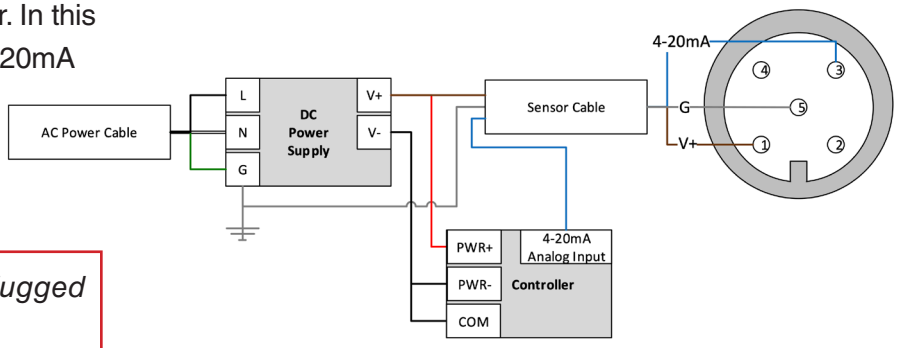
Hardwired Power

This diagram displays the wiring required to hardwire power to a Digi-Tel.



For Feedback Control

This diagram displays the wiring required to power a Digi-Tel and provide feedback to a controller. In this configuration, the controller will receive a 4-20mA signal indicating temperature.



NOTE: Loop power models cannot be plugged into an outlet for power.

TEL-TRU TEMPERATURE SOLUTIONS

Recalibrating Instructions

Digi-Tels are calibrated using a specialized cable/software at the factory prior to shipment.
RECALIBRATING WILL VOID THE FACTORY CALIBRATION.

Prerequisites

Requirement	Description
Windows PC	Operating system must be Windows 10 or newer. PC must have at least one Type A USB port.
Calibration Cable	**Users will need a special calibration cable kit purchased from Tel-Tru.** Battery powered units require cable 4906601. Loop powered units require cable 4906602.
Calibration Software	Calibration software 96031301.exe is included with either calibration cable.
Temperature Controlled Dry Block or Fluid Bath	Digi-Tels must be exposed to known temperatures for 2-point calibration using a controlled block(s)/bath(s). Tel-Tru's Check-Set Calibrator is recommended.
Calibrated Thermometer	The temperature at which calibration occurs must be read by a thermometer known to be accurate and whose precision is tighter than the Digi-Tel's.
Additional Requirements for Loop Powered Models Only	
DC Power Supply	A 12V or 24V DC power supply is recommended to power the Digi-Tel during calibration.
Calibrated Multimeter	The output amperage set during calibration must be read by a multimeter known to be accurate

Battery Powered Models

A. Connect the Digi-Tel to a Windows PC using the calibration cable.
Find the correct COM port in Device Manager under Ports (COM & LPT) (it appears/disappears when connecting/disconnecting).

B. Open the calibration software on a Windows PC.

C. Select the Digi-Tel COM port and click **Connect USB** (status turns green when connected).

D. Click **Connect Device** (fields populate when successful).

E. *Step 1* **General:** Enter the current date (leave Tag/Serial unchanged) **> Set** (device shows CAL).

F. *Step 2* **Units:** Select °C or °F **> Set**

G. *Step 3* **Range:**
Min: -75°F (-60°C) **> Set**
Max: 750°F (400°C) **> Set**

H. *Step 4* **Power Mode:** Select Battery **> Set**

I. *Step 4a* **RTD Config:** Select configuration (usually Single) **> Set**

J. *Step 4b* **4–20 mA Adjustment:** Skip.

K. *Step 4c* **Response Rate:** Select Standard or Fast > Set (Fast reduces battery life).

L. *Step 6* **Temperature Calibration (2-point):**
First Point: Set bath/block to minimum temp, stabilize, insert probe ≥5 min, enter reference reading **> Set**
Second Point: Repeat at maximum temp **> Set**

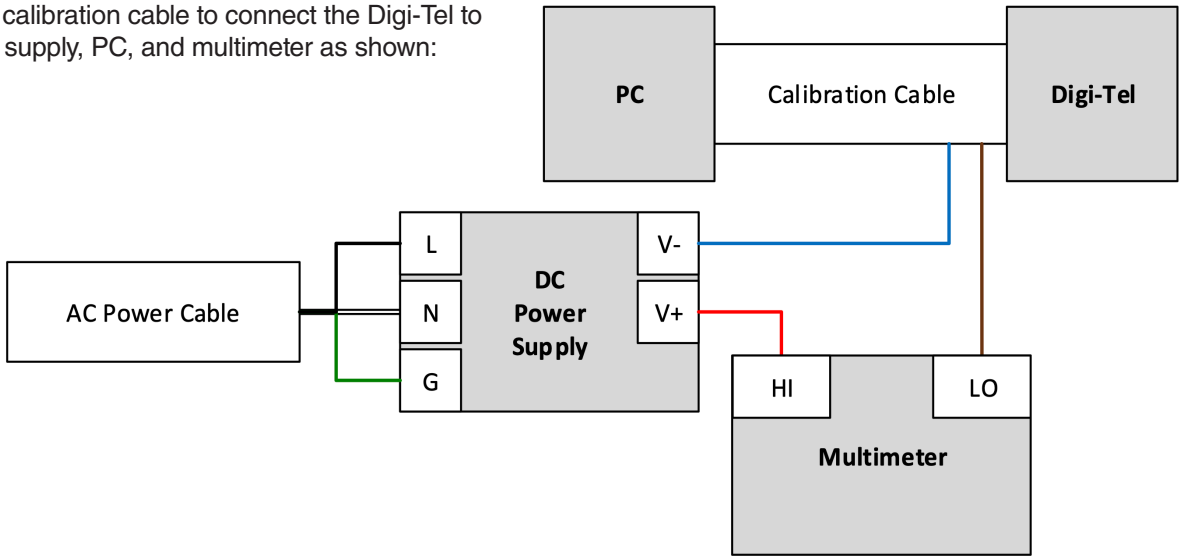
M. Click **Confirm Calibration > Yes** (device shows PAS).

N. Disconnect cable. Device is ready for installation.

TEL-TRU® TEMPERATURE SOLUTIONS

Loop Powered Models

A. Use the calibration cable to connect the Digi-Tel to a power supply, PC, and multimeter as shown:



B. Open the calibration software. Select the Digi-Tel COM port and click Connect USB (status turns green).

Find the COM port in Device Manager under Ports (COM & LPT) (it appears/disappears when plugging/unplugging).

C. Click **Connect Device** (fields populate when connected).

D. *Step 1* General: Enter current date (leave Tag/Serial unchanged) **> Set.** (CAL displays).

E. *Step 2* **Units:** Select °C or °F **> Set**

F. *Step 3* **Range:**
Enter 4 mA temperature in Min **> Set**
Enter 20 mA temperature in Max **> Set**

G. *Step 4* **Power Mode:** Select Current Loop **> Set**

H. *Step 4a* **RTD Config:** Select configuration (usually Single) **> Set**

I. *Step 4b* **4–20 mA Adjustment:**
4 mA: Select Output 4 mA, adjust (+/–, Fine/Coarse) to 4.000 mA (±0.001) **> Calibrate**
20 mA: Select Output 20 mA, adjust to 20.000 mA (±0.001) **> Calibrate**

J. *Step 4c* **Response Rate:** Skip.

K. *Step 6* **Temperature Calibration (2-point):**
First Point: Stabilize at min temp, insert probe ≥5 min, enter reference **> Set**
Second Point: Repeat at max temp **> Set**

L. Click **Confirm Calibration > Yes** (PAS displays).

M. Disconnect cable. Device is ready for installation.

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Error Codes

Code	Description
Err1	RTD circuit is open.
Err2	RTD circuit is shorted.
Err3	Circuit board error.
LO	Temperature reading is too low to display (below the 4mA minimum).
HI	Temperature reading is too high to display (above to 20mA maximum).
BATT (flashing)	The battery voltage is below 3.2VDC

Troubleshooting

1. Battery powered Digi-Tel keeps flashing BATT

This behavior indicates the battery is low.

2. Loop powered Digi-Tel backlight comes on, but without readout

This behavior indicates irreparable damage to the circuit board. The Digi-Tel's backlight is driven directly from input power (not controlled by logic). The presence of the backlight indicates the circuit board is powered. The lack of display indicates the logic on the circuit board is not functioning.

3. Loop powered Digi-Tel's temperature reading is close but drifts up/down unexpectedly

This behavior is generally associated with a grounding problem on loop powered models. Pin 5 on the Digi-Tel's M12 connector is connected to DC common on its circuit board (see section 3.2). The circuit board uses DC common as a reference point when reading temperature, so any charge that accumulates on DC common will affect the temperature reading. For most users, the primary source of noise charges is the device's mount. The default recommendation (per section 3.2) is to connect pin 5 to earth ground to prevent the accumulation of charge on DC common.

Cases where DC common should be isolated from earth ground are generally associated with industrial users operating high-power electrical equipment near the Digi-Tel. In these cases, the current flowing out of the high-power equipment creates noise in earth ground, which appears as noise in the display of any grounded Digi-Tel. Isolating pin 5 on the Digi-Tel also isolates it from any noise in the ground. Calibration in instances that require isolation should be done on laptop PC running on battery power (not plugged into ground).

4. 4-Pin vs 5-Pin Connections

Prior to 2021, a 4-pin connector was used on Digi-Tels. The 5th pin (DC common) was added to accommodate users who required the option to isolate the unit from earth ground. Units with a 4-pin connector have DC common grounded to the Digi-Tel's metal body. When replacing a 4-pin unit with a 5-pin unit, ground pin 5 to the same ground reference as the Digi-Tel's metal body (generally earth ground).

YOU MAY ALSO BE INTERESTED IN CHECK-SET® THERMOMETER CALIBRATORS

The Check-Set® Thermometer Calibrator Data Logger and the Check-set® Thermometer Calibrator are built for today's food safety, industrial processing, and temperature-sensitive industries — where accuracy, compliance, and traceability are non-negotiable.

The perfect temperature reference device for:
- Plant quality assurance
- Process control
- Food safety
- Instrument calibration and service
- HACCP compliance

CHECK-SET MODEL GUIDE AND SPECIFICATIONS

MODEL	Check-Set® Calibrator Data Logger	Check-Set® Calibrator
TEMPERATURE SET POINT(S)	32° (0°), 40° (4.4°), 160° (71.1), and 212°F (100°C)	32° (0°) and 212°F (100°C) OR 40° (4.4°) and 160° (71.1°)
FITS THESE PROBE DIAMETERS	0.125", 0.150", and 0.187"	0.125", 0.150", and 0.187"
NOTE: *For Digi-Tel Thermometers order the special well insert for a .250" probe diameter.*		
STABILITY	±0.03°F (0.02°C)	±0.03°F (0.02°C)

GENERAL

Accuracy: ±0.2°F (0.1°C)

Power: 115 volts, 50/60 Hz, 1.5 amps

Dimensions (L x W x H Inches): 8-3/4 x 8-7/8 x 4-1/4

Weight: Calibrator: 9 lbs. **Data Logger:** 9.5 lbs.

Minimum Insertion Depth: 3.5"

COMMON INDUSTRY SET POINTS

40°F (4.4°C) - Cold food holding

140°F (60°C) - Hot food holding

150°F (65.6°C) - CIP return lines

160-175°F (71.1-79.4°C) - E. Coli & Pasteurization safety ranges

212°F (100°C) - Boiling

CALIBRATION TEMPERATURES

Both Check-Set Calibrators verify the calibration of your temperature sensing devices at multiple temperatures. Their accuracy allows you to validate your temperature measuring devices at temperatures specific to your application.

STAY CALIBRATED YEAR AFTER YEAR

We offer an annual factory recertification service.

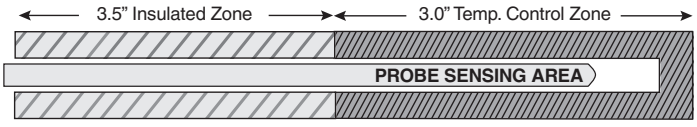
READY-TO-USE TIMES

Users often keep the Check-Set units on all day, so they're ready for use on demand. Typical ready-to-use times from ambient:

Calibration Temperature	Ready to Use Time	Stability
32°F	13 minutes	+/-0.03°F (0.02°C) for 20 Minutes
212°F	10 minutes	+/-0.03°F (0.02°C) for 10 Minutes

STEM LENGTH COMPATIBILITY

For best results, the sensing area of the probe must be inserted completely into the Temperature Control Zone. The minimum immersion depth is dependent on the thermometer type. Check the manufacturer's user manual of your thermometer for the correct immersion length.



The Check Set Calibrators can test any brand of thermometer including stems as short as 3.5" and with the following diameters: 0.125", 0.150" and 0.187".

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See our full-line of products and solutions at www.teltru.com
Including online ordering and industry application notes.

- Industrial and Sanitary Bimetal Thermometers
- Digi-Tel™ Digital Thermometers
- Digi-Tru™ Digital Thermometers
- Check-Set® Thermometer Calibrators
- Industrial and Sanitary RTDs
- Industrial and Sanitary RTDs with Compact Transmitters
- Glow Dial Thermometers
- Thermowells
- HVAC Instruments
- Non-Contact Thermometers
- Surface Thermometers
- Pressure Transmitters
- Pressure Gauges
- Sanitary Pressure Gauges
- Remo-Tel Remote SMART Temperature Monitoring

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