

# TBX USER'S MANUAL

## Thermometer / Barometer System



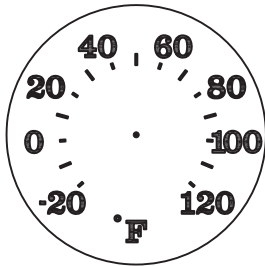
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## QUICK START GUIDE



- 1) DISCONNECT 115VAC POWER CIRCUIT BEFORE MAKING ANY WIRING CONNECTIONS



- 2) INSTALL ALL THERMOMETER OR BAROMETER DIALS

- IF POINTERS WERE PROVIDED SEPARATELY, DO NOT INSTALL THEM YET
- IF POINTERS ARE ALREADY INSTALLED, JUST GO ON TO STEP (3) BELOW

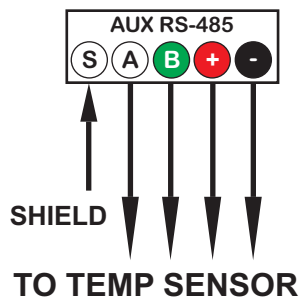


- 3) INSTALL TBX CONTROLLER IN ACCESSIBLE LOCATION (#10 SCREWS RECOMMENDED)



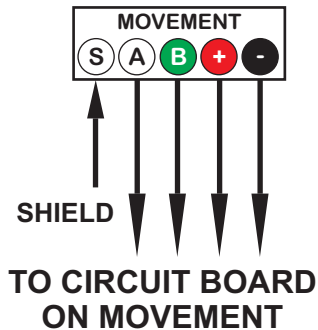
- 4) MOUNT TEMPERATURE SENSOR ASSEMBLY (THERMOMETERS ONLY)

- UNIVERSAL MOUNTING BRACKET INCLUDED
- 150' CABLE PROVIDED WITH SENSOR ASSEMBLY
- CLASS II SIGNAL CABLE - FOLLOW LOCAL CODES
- OBSERVE POLARITY AS SPECIFIED
- LOCATE SENSOR IN OPEN AIR
- DO NOT LOCATE NEAR HEATING OR COOLING EQUIPMENT



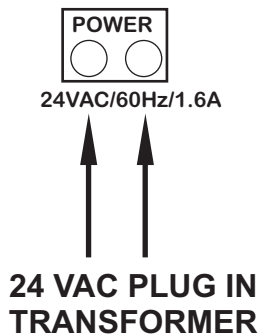
- 5) CONNECT TEMPERATURE SENSOR TO TBX CONTROLLER

## QUICK START GUIDE



6) CONNECT TBX CONTROLLER TO DIALS  
(24VDC - 16AWG RECOMMENDED)

- CONNECT SHIELD TO CONTROLLER ONLY
- CONNECT MULTIPLE DIALS IN PARALLEL



7) CONNECT PLUG IN TRANSFORMER TO 115VAC  
BRANCH CIRCUIT AND TO TBX CONTROLLER

8) TURN ON 115VAC POWER

- IF YOUR THERMOMETER DIALS WERE PROVIDED WITH POINTERS ALREADY INSTALLED, SKIP TO STEP (12)

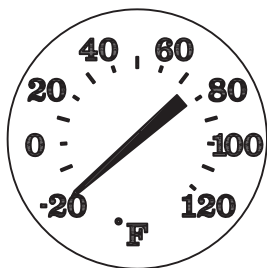
HOME



9) INSIDE TBX CONTROLLER, PRESS "HOME"  
BUTTON ONCE

**WAIT**

- WAIT AT LEAST 60 SECONDS BEFORE PROCEEDING TO STEP 9



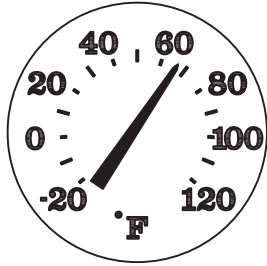
10) IF POINTER WAS PROVIDED SEPARATELY,  
INSTALL POINTER ONTO DIAL POINTING TO  
LOWEST READING ON DIAL (-20° F SHOWN)

## **QUICK START GUIDE**

HOME



11) INSIDE TBX CONTROLLER, PRESS "HOME"  
BUTTON ONE MORE TIME



12) THERMOMETER WILL AUTOMATICALLY RESET  
ITSELF TO CORRECT TEMPERATURE

## **INTRODUCTION**

The TBX Thermometer / Barometer System is comprised of a microprocessor based controller and a step-motor driven movement that provide accurate, completely automatic indication of Temperature or Barometric Pressure.

- Completely automatic operation - No user intervention required
- Maintenance free
- Automatically resets after power failures to ensure correct readings
- For indoor or outdoor use - Protected to Ip67

## **SPECIFICATIONS**

**Power Requirements** 24VAC/50-60 Hz/1.67A (Plug-in Wall Transformer Provided)

**Accuracy** +/- 1.5 °F

### **Inputs**

Temperature Sensor

- 3 Position Screw Terminal Connection
- 2 Terminals = Sensor Signal
- 1 Terminal = Shield Wire

Barometer Sensor

- Factory installed directly onto PC Board

### **Outputs**

Thermometer / Barometer Control Signal

- 5 Position Screw Terminal Connection
- 2 Terminals = 24VDC
- 2 Terminals = RS-485 Communication
- 1 Terminal = Shield Wire

\*\*Controls up to (2) Thermometers or Barometers total

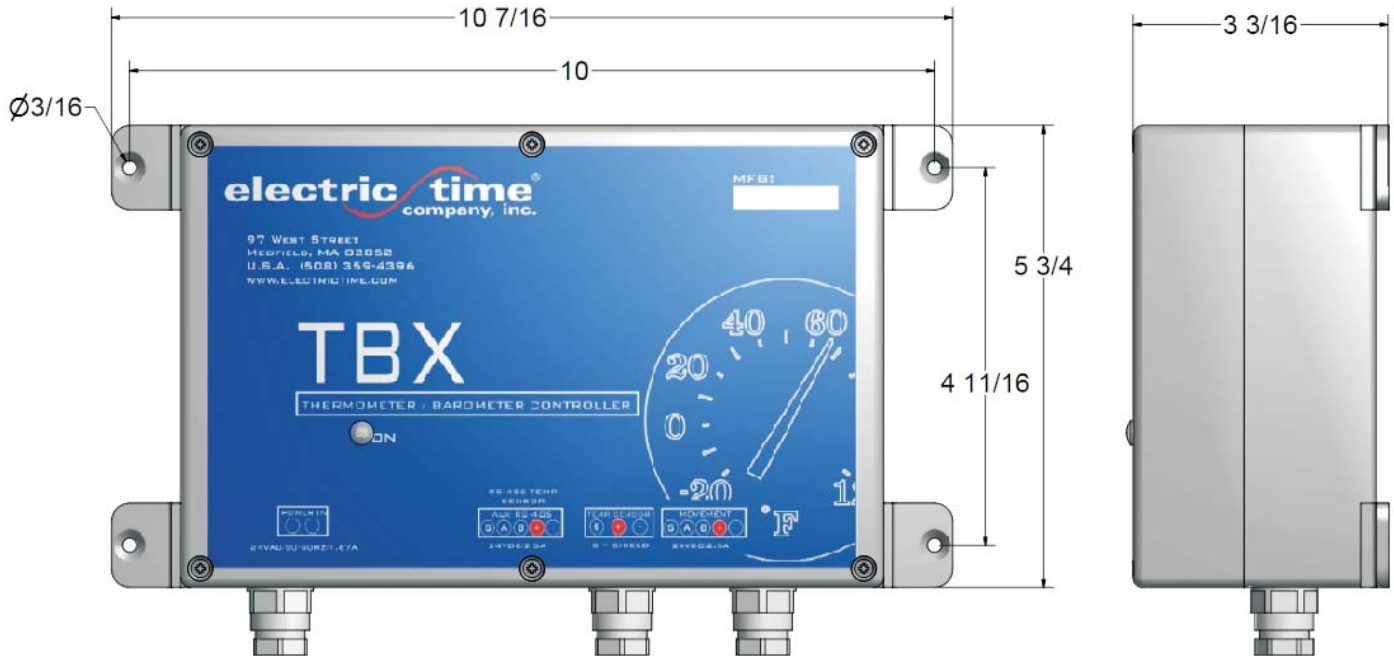
### **Communication**

RS-232

- Factory programming and setup (DB9 Connector)

RS-485

- Auxiliary communication port (3 Position Screw Terminal)



POWER INPUT  
(24VAC PLUG-IN  
WALL TRANSFORMER  
PROVIDED)

RS-485  
TEMPERATURE  
SENSOR INPUT

2-WIRE  
TEMPERATURE  
SENSOR INPUT

MOVEMENT  
CONTROL  
SIGNALS

Terminal Compartment Layout

## **FEATURES**

### 1) **LED's**

- **POWER:** Illuminates to Indicate Input Power is OK
- **HEART BEAT:** Blinks to indicate processor is functioning properly
- **TEMP SENS:** Indicates Temperature Sensor is connected
- **BARO SENS:** Indicates Barometer Sensor is installed on PC Board
- **1 - 16:** Indicate RS-485 Device Address of connected movements  
(See Table 1 - Pg. 9)

### 2) **“HOME” Button**

- Press once to send movement to its home index position
- Press again to resume normal operation
- Typically used to send movement to “home” position before installing pointer

### 3) **“FULL SCALE” Button**

- Press once to send movement to its full-scale reading
- Press again to resume normal operation
- Typically used to verify that movement is operating normally

## **OPERATION**

The TBX Controller is setup and calibrated at the factory to provide years of maintenance-free, accurate temperature / barometric pressure indication. After installing a Thermometer or Barometer per the setup instructions provided, the unit operates as follows:

- TBX reads Temperature Sensor or Barometric Pressure Sensor
- TBX converts reading to a known angular pointer position on display dial
- TBX sends command signal (via RS-485) to movement to drive pointer to correct position
- TBX repeats this process continually to constantly update pointer position as required
- After power outage, TBX will command movement to reindex (go to “HOME” position) and then bring pointer back to correct position to ensure accuracy of display



## **TROUBLESHOOTING**

### **“MY THERMOMETER / BAROMETER IS NOT CORRECT”**

- Pointer still moves, but readings shown are not correct

#### 1) Send the Pointer to “HOME” position

- Inside TBX Controller, press “HOME” button once
- Look at dial: Pointer should point to lowest reading on dial and stop (ex. -20° F)
- If Pointer is NOT pointing to lowest reading on dial, it must be adjusted manually
- Remove pointer from movement shaft and follow instructions in “Quick Start Guide” for proper setup of Thermometer / Barometer systems
- If Pointer IS pointing to lowest reading on dial, see “Calibration Procedure” on Page 11 to calibrate the thermometer

### **“MY THERMOMETER / BAROMETER DOESN'T MOVE”**

#### 1) Check AC Power Input

- Inside TBX Controller, is POWER LED illuminated?
- If not, have an electrician check circuit breakers or building electrical supply

#### 2) Check Temperature Sensor (for Thermometer Systems only)

- Inside TBX Controller, is Temperature Sensor connected?
- If not, reconnect sensor and hit “HOME” button once to re-index the thermometer
- WAIT 60 Seconds, then hit “HOME” button again to resume operation
- Is Pointer showing correct temperature?
- If not, contact Electric Time Company for service

#### 3) Is movement(s) connected to TBX Controller?

- Inside TBX Controller, are any address LED's illuminated (numbers 1-16)?
- If not, check all wiring connections to movement
- If all wiring connections are OK, contact Electric Time Company for service

## TROUBLESHOOTING

### CALIBRATION PROCEDURE

If the thermometer or barometer is operating, but does not indicate the correct reading, the following calibration procedure can be used to set the thermometer/barometer to the correct reading

**CAUTION:** The following calibration procedure requires opening the TBX Controller while it is powered. Although the supply voltage to the controller is typically only 24VAC or 24VDC, this procedure should only be performed by a qualified technician or electrician.

- With the thermometer operating normally, remove the cover to the TBX Controller Housing
- At the top edge of the circuit board near the middle of the board is a vertical row of 2-pin headers (identified as JP4 on the circuit board) and labeled THERM, BARO, CLEAR, & PARK
- There is a small black jumper located in the PARK position
- Move this jumper to the THERM or BARO position to enter calibration mode for either a Thermometer or Barometer respectively
- With the jumper in place, locate the adjustment potentiometer (identified as R39 on the circuit board) and labeled ADJUST
- Using a small screw driver, slowly turn the ADJUST potentiometer
- The pointer on the Thermometer / Barometer dial will move as the potentiometer is turned
- Turn the potentiometer until the pointer indicates the correct temperature or barometric pressure as required
- When the pointer indicates the correct reading on the dial, remove the jumper from the calibration position and return it to the PARK position for storage

## **SERVICE**

For assistance in troubleshooting problems with your TBX Controller, or to request service, contact the Electric Time Company Service Department at the address shown below:

Electric Time Company, inc.  
Service Department  
97 West Street  
Medfield, MA 02052 USA

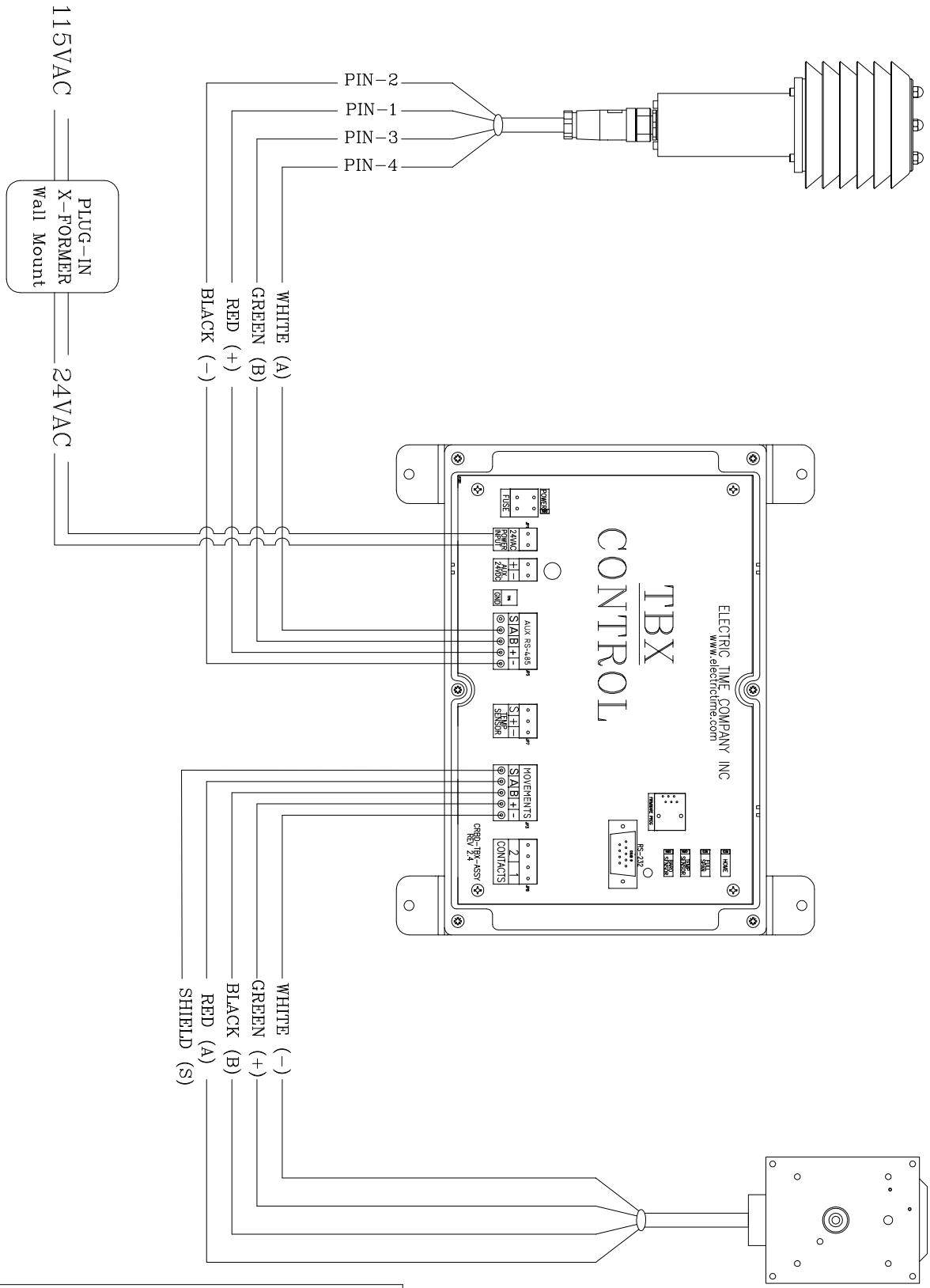
Ph: (508) 359-4396  
Fax: (508) 359-4482  
Email: [service@electrictime.com](mailto:service@electrictime.com)

## **REVISION HISTORY**

12-11-03 Revision A - Manual for new TBX System  
04-23-04 Revision B - Changed enclosure for easier wiring  
- added "Time movements" to addresses 1-4  
- Changed movement addresses.  
04-04-11 Revision C - Temperature Sensor changed to RS-485

# SENSOR

# MOVEMENT



VIEW	LASER			PATH	M:\ACAD10\A-12792.DWG		
TITLE	Wiring Diagram & Installation TBX Control w/ Temp. Sensor						
REVISIONS	● SCALE	DATE	DRAWN	APP'V			
	As Noted	04-04-2011	DMC	TDE			
DRAWING	A-12792						



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