

TE Temperature Controller System

Installation Guide

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Accuthermo Technology Corp.



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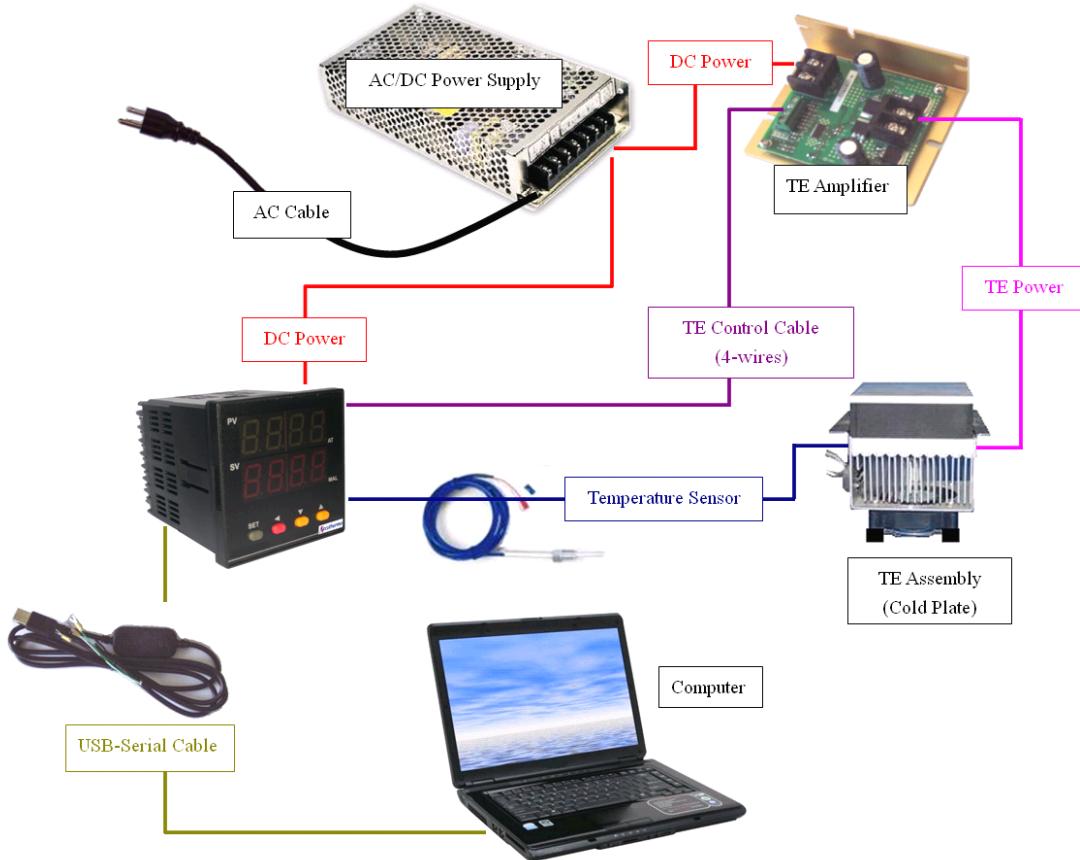
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1. Introduction

This manual will help the users put the system together in an easy and graphical format. However, the basic knowledge of electronics and PC software is required.

1.1 System Configuration Overview

The following diagram represents a standard configuration of a TE system. The color lines representing a wire connection and also showing the components relationship.

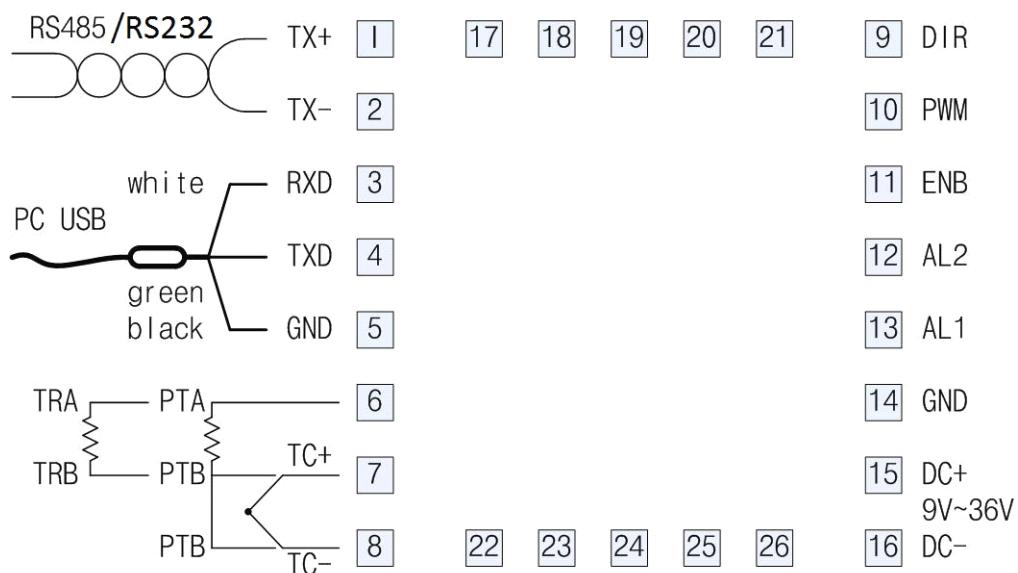


1.2 Preparation

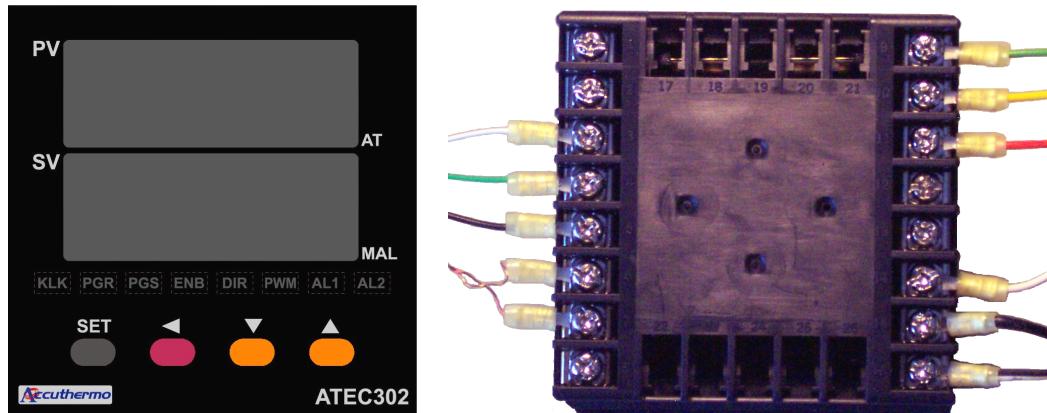
The user should prepare and make sure the following items are ready:

1. AC to DC Power supply
2. 4-conductor wire for control signal connection between Panel Controller and TE Amplifiers
3. 2-conductor wire from power supply to Panel Controller
4. 2-conductor wire from power supply to TE Amplifier. (select proper gauge wires for amp rating)
5. 2-conductor wire from TE amplifier to TE assembly/Cold Plate. (select proper gauge wires for amp rating)
6. TE Panel Controller
7. TE Amplifier(Driver)
8. USB-Serial Cable
9. Temperature Sensor
10. PC software: USB-Serial driver, TE control software
11. PC Computer with USB port
12. Some basic tools. Ex: screw drivers, wire cutter, etc...

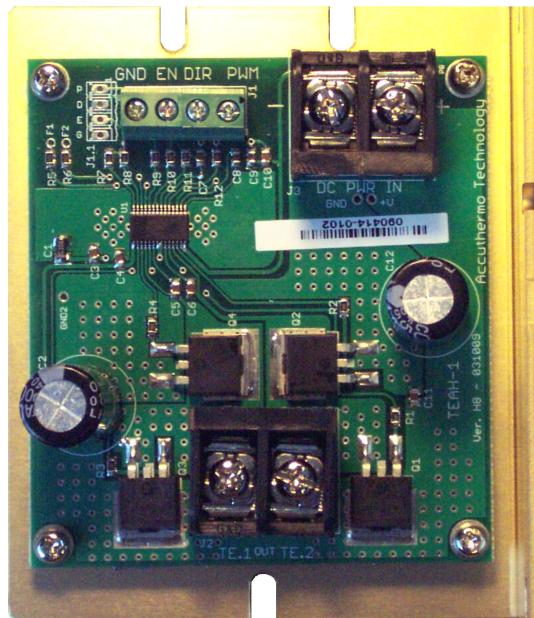
1.3 Controller Wiring Diagram



1.4 Front/Back Panel of the ATEC Controller



1.5 Top View of the TE Amplifier



2. Putting System Together

2.1 Sensor Type Setting

The controller default setting is T/C-T Type sensor. If user want to use RTD PT100 or Thermistor (2252 ohm or 10K ohm), there will be hardware/firmware/software changes.

2.1.1 Controller Dip-Switch Setting

	SW1.1	SW1.2	SW1.3	SW2.1	SW2.2
TC	ON	OFF	OFF	ON	ON
PT	ON	OFF	OFF	OFF	ON
TR	OFF	ON	ON	OFF	OFF

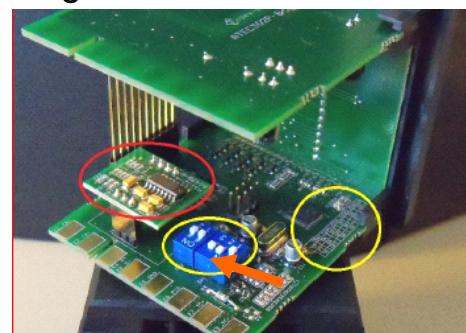
There is a Dip-Switch at the inside of the controller. The user needs to pull out the controller from back case. There are two blue-color Dip-Switch. Adjust the on/off setting according to the sensor type you want to use.

Example: TR: Thermistor 2252 or 10k ohm – SW1:OFF-ON-ON, SW2:OFF-OFF

2.1.2 Pull Out Cover for Switch Setting

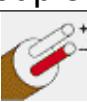


1. Pull out the Panel Cover



2. Sensor Setting Switch

2.1.3 Thermocouple Wire Color Code Table

J-Type		K-Type		T-Type	
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Type	Material		Color Code		Overall Jacket		Range (°C)	
Thermocouple Grade	Positive Wire	Negative Wire	Positive Wire	Negative Wire	Extension	Overall Jacket	Minimum	Maximum
J	Iron	Constantan	White	Red	Black	Brown	0	750
K	Chromel	Alumel	Yellow	Red	Yellow	Brown	-200	1250
T	Copper	Constantan	Blue	Red	Blue	Brown	-200	350

2.2 Wiring Components Together

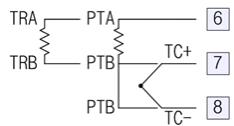
2.2.1 Connect DC power to the controller

[15] DC+
9V~36V
[16] DC-

The controller can take DC voltage from 9~36Vdc. Connect Positive to pin15, Negative to pin16. **Do NOT power up at this point.**

Ps. there is a hardware jumper setting inside the controller for 5Vdc connection. Be careful with that setting; do not supply other voltage than 5V.

2.2.2 Connecting Temperature Sensor



Thermocouple(TC+,TC-): The wires have polarity, make sure the color code of the wires correspond to the connectors pin7 & pin8.

Thermistor(TRA,TRB): The two wires have no polarity. Connect them to pin6 & Pin7.

RTD/PT100(PTA,PTB): For 2-wire sensor, there is no polarity. Connect wires to pin6, pin7; but have a spare wire and short pin7-pin8. For 3-wire sensor, connect the same color wires to pin7 & pin8; connect the single color wire to pin6.

2.2.3 Change Sensor Setting (if it is not the default sensor)



If you are not using the default Sensor: you need to change the sensor setting on the controller by using buttons on the panel. Follow these steps:

Note: if you make mistake, just press & two buttons, it will return to normal state.

- i. Press and hold & two buttons for 5 seconds, the screen will jump to menu mode. The RED LED line should show “Pid1”.
- ii. Press 5 times until RED LED line show “oPt1”.
- iii. Press once, the GREEN LED line show “type”. The RED LED line shows sensor type. Use or button to find the correct sensor

tr1 - Thermistor 2252 ohm	tr2 - Thermistor 10K ohm	dpt - RTD PT100
T - Thermocouple T-type	k - Thermocouple K-type	j - Thermocouple J-type

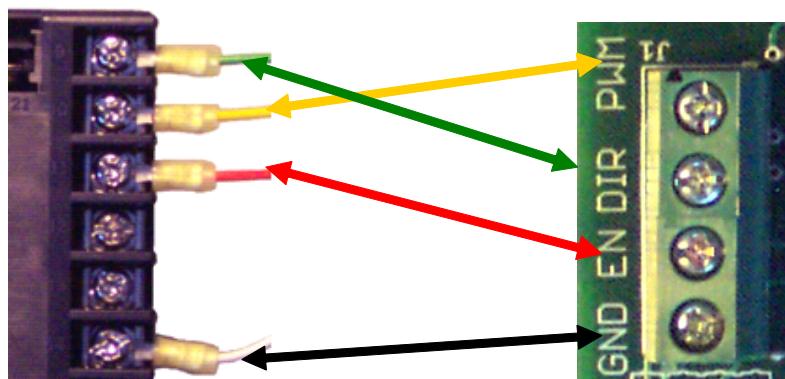
- iv. Press  &  two buttons and return to normal state. And the controller should display the correct temperature.

2.2.4 First Power-Up Test

- i. If you can confirm again all wirings are correct.
- ii. Turn on the power. The PV number (top line of the controller) should be the sensor temperature.
- iii. Power down – **Turn OFF & unplug the power supply.**

2.2.5 Connect Control Signal Wire (4-conductors)

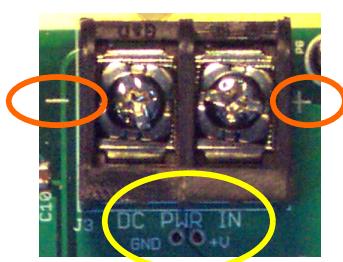
The four conductors are DIR/PWM/EN/GND that needed to be connected between the controller and amplifier.



- pin9 - DIR
- pin10 - PWM
- pin11 - EN
- pin14 - GND

2.2.6 Connect Power Line to Amplifier

Connect DC power from power supply to the Amp DC PWR IN, Make sure the polarity is correct.



2.2.7 Connect Power line between Amplifier and Peltier Device

Connect wires from Amp TE1 & TE2 to Peltier device. Polarity can be changed by software.



2.2.8 Connect USB Signal Cable between controller and PC

The USB cable is a special designed cable. It converts the serial data to USB compliance data to talk to PC. There is a software driver that user need to load it to the computer prior to running the TE controller system. It is suggested to **connect the wires on the controller side first**. The wires to the TE controller are color coded. Connect USB connector to the PC next.



2.2.9 Connect multiple units with RS485 Communication

Make sure there is a RS485 daughter card plugged in the controller (*optional selection). Using RS485 communication, multiple ATEC controllers connect the communication wires together. Using one PC communicate with multiple controller units.

The PC software does not work with RS485 communication. The users will need to write their software for it.

2.3 serial connect all pin1(TX+) of the controller to RS485(DATA+)

2.4 serial connect all pin2(TX-) of the controller to RS485(DATA-)

2.2.10 Connect RS232 Signal Cable between controller and PC

Make sure there is a RS232 daughter card plugged in the controller (*optional selection). The ATEC302 software can communication with the RS232 port.

Panel terminal pin1(TX) connect to RS232-DB9 pin2

Panel terminal pin2(RX) connect to RS232-DB9 pin3

Panel terminal pin5(GND) connect to RS232-DB9 pin5

2.2.11 All connections are completed

Verify each connection is correct and is secured again for safety. Then the hardware installation is completed.

3 Software Installation

There are two software user needs to install into PC. Please follow the instruction in “Software User Manual” for installation.

3.2.10 USB software driver

3.2.11 ATEC Control Center software