

Installation Instructions for Transformer Advantage_{II} TC & CT/LTC

WARNING: Hazardous voltages & currents may be present during installation & operation. 

Mounting

1. Unpack the Advantage, including any probes under the cardboard inserts. Check the part number on the unit to determine its configuration (see the Transformer Advantage Configuration Guide). A plastic bag inside the unit contains a fuse, spare screws, resistors & crimp lugs.
2. Select a location at eye level for control access and away from the sun for better display visibility. The surface style Advantage mounts to either the transformer or cabinet using the holes in the mounting flange. When transformer mounting, allow space behind the Advantage for air circulation. To maintain water tightness, do not bend the mounting flange (see illustration of recommended mounting methods in the back of the Owners Manual). Include vibration isolation bushings if the case has noticeable vibration. The panel style mounts to the cabinet wall or door using 1/4" bolts, with the display protruding through the panel.
- 3a. For transformers & LTC tanks with thermowells, verify that the diameter and threads match the probes supplied. To match the probe to the well ID, attach the appropriate tip sleeve using the supplied screw (first coat the end of the probe lightly with thermally conductive grease). Insert probe part way into well. Tighten outer probe fitting. Push probe to bottom of the well, then back off 1/16". Tighten compression fitting to probe body.
- 3b. If no thermowell is available, a surface magnetic probe must be used. Select a location away from direct sun, if possible. Apply thermally conductive grease to the center of the magnetic ring. Place the probe in the desired position with the cable pointed down. Seal the perimeter against the tank with silicone caulk.
- 3c. For the CT/LTC: If no thermowell is available on the LTC tank, a pair of surface magnetic probes must be used (for LTC tank temperature & main tank reference temperature). Select locations where they will be exposed to equal but minimal sun, wind and water (e.g. both probes on the north side). Mount per instructions in step 3b.
4. Remove the access cover on the Advantage by removing the two screws at the bottom corners and loosening the two screws under the display. All wiring, except probe wiring, is run through the two large holes on the bottom of the Advantage. These accept 1" conduit fittings. As shipped, one hole is covered by a watertight plug. This can be moved to cover the other hole or removed to use both holes. The optional SO cord fittings accept 0.6-0.7" cable. All holes must be sealed against moisture.

Wiring

Connections vary depending on the model and options installed. A wiring diagram for this model is on the back of the cover plate. It shows the typical module arrangement. However modules in the lower compartment can be installed in any slot, so check the specific configuration of your unit before starting to wire. For easiest access, wire to the lowest module first. Leave enough slack in the wiring to permit removal of a module without disconnecting wires to other modules. Missing screws on a connector indicate that an option is not installed.

Analog Retransmit & Relay Wiring

5. Connect analog SCADA wiring to the three channel analog retransmit module, if installed (see photo on page 3). Shielded twisted pair wire is recommended.
6. Wire alarm & control lines to relays on the cooling control module(s), as required for your system configuration. All terminals accept #6 ring or spade lugs.

CT Connections (CT/LTC model only)

Connections for a single CT input are on either the CCA relay module or the LCAM module. Connections for multiple CT inputs are always on the LCAM module.



- 7a. For direct CT wiring: De-energize the transformer or short the CT secondary circuit. Do not open the CT secondary leads with power applied! Identify a tap-in point and connect the secondary leads to the CT input terminals on the Advantage.

7b. The clamp-on CT option does not require breaking the existing CT secondary loop. Locate a sheltered point where one secondary wire is accessible and there is space for the clamp-on CT. The clamp-on is not weatherproof and must be installed in a protective enclosure. Run the clamp-on wires to the CT terminals on the Advantage. Note that this option must be factory configured since it uses a different module than the direct CT input.

Input/Output Module Connections

Note: The terminal block on the I/O module can be removed for easier wiring access. The colored metric screws on this module are not interchangeable with the #6 chrome plated screws on other modules.

8. Screws in I/O-11 thru I/O-13 indicate the presence of the Auxiliary relay option (Relay 7). Connect to this circuit as needed in your system.

9. Connect wiring to I/O-14 thru I/O-16 for Relay 8 (typically the Sensor Fail relay), if this function is used in your control scheme.

Temperature Probe Connections

10. Feed each probe cable thru one of the small fittings on the bottom of the unit. Tighten the plastic bushing around the metal braid. Connect the first probe (top oil for the CT/LTC model) to the RTD1 terminals. Small crimp lugs are provided for use on the fine sensor wire. For a four wire probe, connect the red wires to I/O-1 & I/O-2. Connect the white wires to I/O-3 & I/O-10. For a 3 wire probe, connect the two wires of the same color to I/O-1 & I/O-2. Connect the remaining wire to I/O-3. Then jumper I/O-3 to I/O-10, or slide out the I/O module and move J2 over the two pins.

11. Connect the second probe (LTC tank on the CT/LTC model) to the RTD2 terminals. For a four wire probe, connect the red wires to I/O-4 & I/O-5. Connect the white wires to I/O-6 & I/O-10. For a 3 wire probe, connect the two wires of the same color to I/O-4 & I/O-5. Connect the remaining wire to I/O-6. Then jumper I/O-6 to I/O-10, or slide out the I/O Module and move J3 over the two pins.

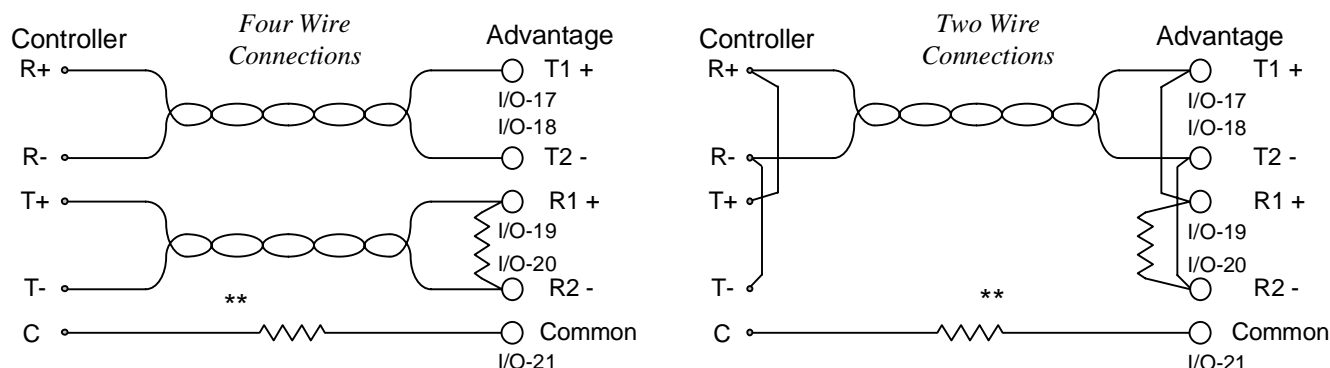
12. Connect the third probe (if used) to the RTD3 terminals. For a four wire probe, connect the red wires to I/O-7 & I/O-8. Connect the white wires to I/O-9 & I/O-10. For a 3 wire probe, connect the two wires of the same color to I/O-7 & I/O-8. Connect the remaining wire to I/O-9. Then jumper I/O-9 to I/O-10, or slide out the I/O Module and move J4 over the two pins.

13. On some probes, a fifth wire (connected to the metal braid) is included. This can be tied to the power supply earth terminal or left disconnected (see Owners Manual for more info).

Digital Communications

14a. For 4-wire communications (RS-422 or RS-485), use two twisted pair to connect transmit signals from the controller to the receive terminals on the Advantage, and receive signals from the controller to transmit terminals on the Advantage. Digital common from the controller ties to I/O-20. If needed, add a receive terminating resistor*.

14b. 2-wire RS-485 communication uses a single twisted pair. Wire the twisted pair from the controller to the Advantage (+ to +, - to -). Jumper transmit and receive terminals as shown below. If needed, add a receive terminating resistor*.



*Terminating resistors only used in device at the end of a multi-drop network. Value depends on controller and bus length.

**The resistor in the common line reduces circulating ground currents. For two wire communication, common connection usually not required.

14c. A separate RS-232 port is provided for temporary connection to a laptop's serial port. This requires Weschler #1000001701 PC adapter cable (Windows-based configuration and monitor software is available on request). Weschler fiber-optic options also use this port. Temporarily unplug the fiber interface to setup the Advantage from a laptop.

Power

15. Verify that the supply voltage matches the power supply rating of the Advantage. Turn off the power source. Follow the terminal markings on the power supply module to connect external power to the Advantage. An earth ground to terminal 2 is required for EMI surge protection.

16. Apply power. The Advantage will momentarily display model number and firmware revision level.

Front Panel Setup

The front panel setup menu varies by model. See Operators Manual for specific menu items and explanations.

Follow the setup worksheet or the flowchart in the manual to enter information via the Advantage front panel supervisor menu. Press the ENT button at the corresponding display prompt to begin the setup sequence for a parameter. Scroll thru the available choices using the up & down buttons. Press ENT to complete the entry process for that item. Many parameters require the selection of several sub-items to completely define the parameter (e.g. setpoint, source and non-alarm coil state for the auxiliary relay). Menu items will only appear for options installed in the unit. If there is no keypad press for 45 seconds while in any setup step, the Advantage will exit the setup mode and return to normal operation.

Note: If the Advantage is displaying USER, skip to step 3.

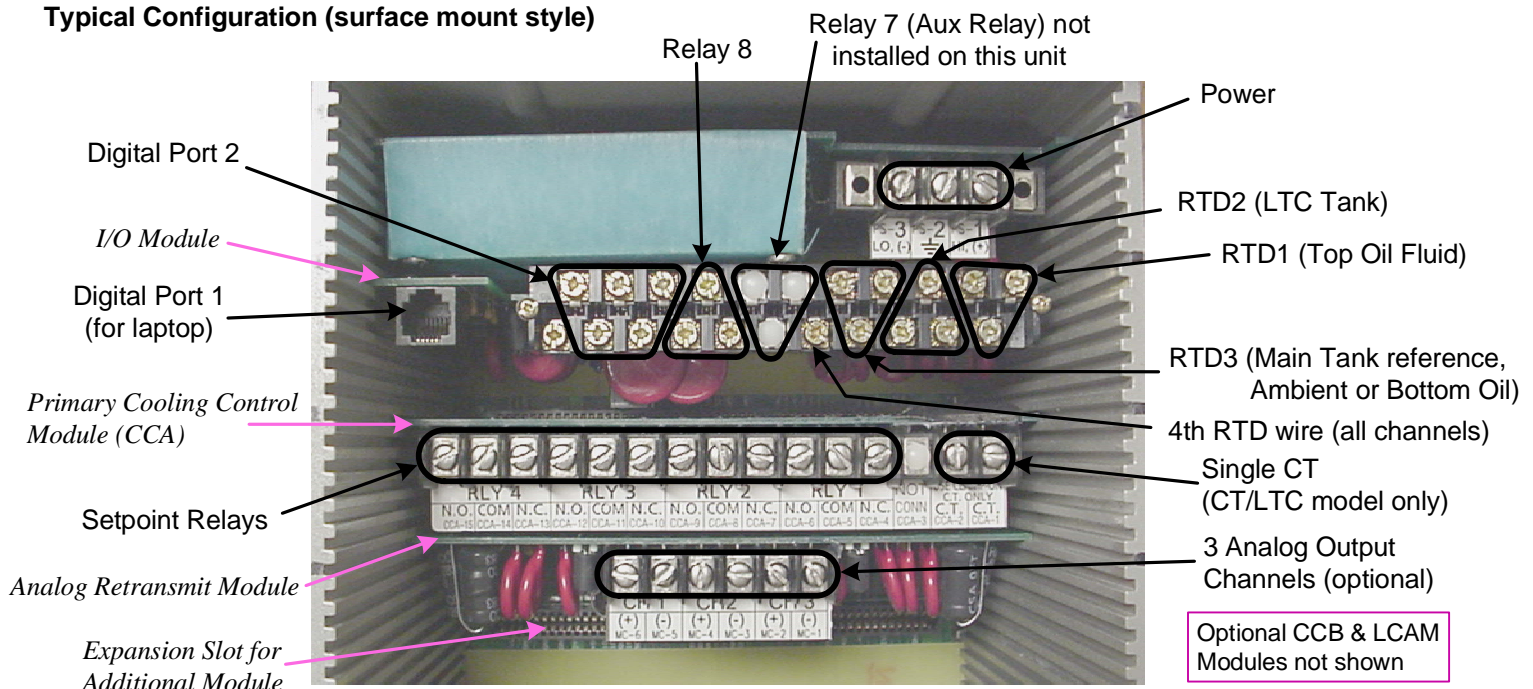
1. If the Advantage is displaying a temperature or load reading, press and hold the ENT button until CONFIG and OPER are displayed. Press the UP arrow to select SUPER mode. Press ENT.

2. At the PASWD prompt press ENT. Scroll the up & down arrows until the correct password number is displayed (the factory default is 0, contact factory for access if password is unknown). Press ENT to begin setup.

3. Press ENT to begin selection of the first parameter. Push the up & down arrows to change the value. Press ENT to finalize the selection and move to the next parameter.

Configuration software is available to simplify setup, using a laptop computer. This software is included on a CD provided with each unit.

Module Position & Terminal Arrangement for Typical Configuration (surface mount style)



Troubleshooting Common Startup Problems

Symptom

Check

No display

- correct power supply option ordered
- supply voltage & type (AC or DC) at power supply terminals
- internal fuse on power supply board
- common mode voltage present on DC source
- modules in upper compartment loosened in shipping

Only decimal point lights

- display converter enabled (see manual)

Flashing Display or
Sense Fail display message

- each probe wire connected to correct terminal
- jumper installed for 3 wire probe
- terminal block on I/O module firmly seated
- correct probe resistance (~110Ω at 25°C)
- unused input channels turned off in setup menu

No PC communication at port 1,
with Weschler software

- correct adapter for PC serial port
- correct PC com port & Advantage bus ID
- correct software for Advantage model and revision level

No digital communication at port 2

- polarity of transmit & receive lines
- Advantage bus ID & port 2 setup
- override by connection at port 1
- command syntax (see manual)
- terminating resistor in or out, as required

Incorrect analog output level

- zero & full scale current set in uA (e.g. 4000 - 20000 uA)
- source selected
- zero & full scale temperature set to correct levels

Incorrect alarm

- wiring to correct terminals
- alarm source selected
- threshold value entered
- non-alarm state entered correctly

Internal Failure display message

- perform self check calibration step (SLFCK) in SUPER menu
- check value displayed at INREF step in OPER menu
- cycle power to reset unit

Relay chatter or frequent cycling

- insufficient hysteresis

Aux Analog Inputs:

Reading incorrect on one channel

- check range and function jumpers on module

CT/LTC Model:

Unable to exit USER setup step

- required transformer parameter missing
- 'connected equipment' parameter not set for all relays

Oil temperature reading incorrect

- well heater not disabled
- offset entered in setup

Load current (CT) reading incorrect

- CT ratio incorrect
- CT on input or output side
- clamp-on probe used w/o special clamp-on CCA module
- verify proper ICAL calibration setup
- verify actual secondary current with clamp-on meter

Winding temperature reading incorrect

- gradient value incorrect
- reading not stabilized (30 minute time constant)

ILoad alarm setpoint too high

- value above IMAX (scroll down to setting less than IMAX)

WESCHLER INSTRUMENTS

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Transformer Advantage Configuration Guide

PART NUMBER (SEE BOTTOM OF PAGE FOR EXAMPLE)

Certain combinations of options are not available on all models. Call for configuration & application assistance.

SERIES G = Transformer Advantage										MODEL 3 = Advantage SC 4 = Advantage CT 5 = Advantage CTX 6 = Advantage LTC 7 = Advantage DC 8 = Advantage CT/LTC 9 = Advantage TC										VERSION R = Basic (not available on LTC) E = Enhanced										SETPOINT RELAYS D = 2 Form C E = 4 Form C 5 = 5 Form B & 1 Form C F = 8 Form C [^] G = 5 Form B & 5 Form C [^] S = Special										4 WIRE RTD PROBES [2 digits] Stainless, Well Mount (specify adapters): 1 = 12" long, 3/8" dia 12' cable (3.6m) 2 = 12" long, 3/8" dia 25' cable (7.2m) 4 = 18" long, 3/8" dia 25' cable 5 = 8" long, 3/8" dia 25' cable F = 8" long, 3/8" dia 50' cable G = 12" long, 3/8" dia 50' cable B = Two 12" long, 3/8" dia 12' cable C = Two 12" long, 3/8" dia 25' cable D = Two 8" long, 3/8" dia 25' cable E = Two 8" long, 3/8" dia 50' cable T = TR02 probe/heater replacement, 8.13"l x 1.7"dia, w/adaptor & 25' cable Magnetic, Surface Mount (no adapters req'd): 6 = 4" dia 25' cable 7 = Two 4" dia, each w/ 25' cable 8 = 4" dia w/weather cover & 25' cable 9 = Two 4" dia, w/weather covers & 25' cables A = Ambient Sensor w/25' cable & bracket (no adapter req'd) S = Special probe X = Not required										CT INPUT [2 digits] nn = full scale, % of 10 Amp [use 00 for 100%] example: 50 = 5 Amp full scale SA = >10 Amp (specify value) SP = <1 Amp or special XX = not required (SC, DC, TC & LTC models)										POWER 9 = 39-57VDC (48V nominal) U = 102-138VAC, 103-148VDC (120VAC/125VDC nominal) T = 204-276VAC, 205-295VDC (240VAC/250VDC nominal) W = 90-264VAC, 100-300VDC, 39-57VDC S = Special										MISCELLANEOUS OPTIONS [3 digits]** B = Thru Panel mount D = Substitute donut CTs for clamp-on CTs V = Auxiliary setpoint relay (Form C) H = 120/240VAC Heater for -55°C ambient N = Sunshade for display R = Two SO cord fittings (0.6-0.7" dia) T = Fiber Optic Transceiver & Adapter Cable } digital or DNP3 output required F = Fiber Optic Adapter Cable S = Special X = None										INPUT OPTIONS <table border="1"> <thead> <tr> <th 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[^] Requires one of the 3 available option slots.

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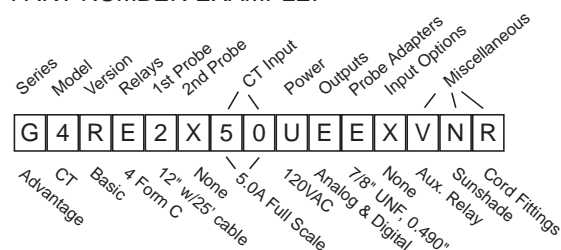
* One adapter for each probe.

** If more than 3 of the listed options are required, order additional items separately.

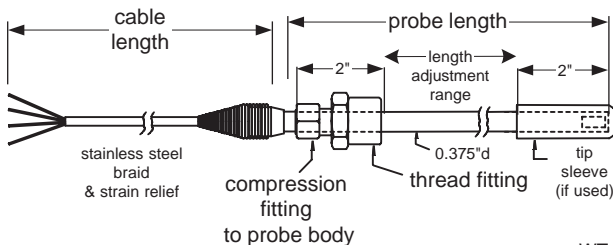
*** Single channel analog not available on CT/LTC & TC.

For PC connection to RS-232 port, order 10' adapter cable #1000001701.

PART NUMBER EXAMPLE:



THERMOWELL PROBE:



WT-02 3/07

WESCHLER INSTRUMENTS

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