Installation Manual for TED 5000

TED®
The Energy Detective™

NOTICE - IMPORTANT

TED OPERATIONAL LIMITATIONS

- TED is only suitable for use on 120/240V single-phase 60Hz services.
- TED is only suitable for services of 200 Amps or less, or 400 Amps with parallel 200A feeds.
- TED is only suitable for services with maximum 350 MCM conductors.
- TED 5000 Energy Management System complete system includes:
  - Two (2) Current Transformers (CTs)
  - One (1) Measuring Transmitting Unit (MTU)
  - One (1) Gateway
  - One (1) Display
  - Associated cables, power supplies; TED Footprints Software.
- Use with any other product will void limited warranty, and may cause an electrical or fire hazard.

SAFE OPERATING RANGE AND CONDITIONS:

	Display & Gateway	MTU & CTs
Use	Indoor	Indoor/Outdoor
Condition	Dry	Dry /Damp
Temperature	10° - 40°C	0° - 40°C
Relative Humidity	< 80%	< 90%
Altitude	3,300M	3,300M
Voltage	100-130 V	100-250 V

If any of the following are true, this version of TED ***WILL NOT*** work:

- If you have a 3-Phase service, TED ***WILL NOT*** work.
- If you have a 230V 50Hz service typical in most areas outside North America, TED WILL NOT work.
- If your main circuit breaker or fuse panel is larger than 200 Amps, TED WILL NOT work.
- If your main service circuit conductors (wires) are larger than 1-inch diameter, TED WILL NOT work.

- Other TED models may be available for these applications. Please see our web site for details - www.theenergydetective.com

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INSTALLATION MANUAL

PART I – INTRODUCTION

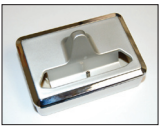
This brief manual summarizes the steps necessary to safely install the MTU and Current Transformers (CTs). For detailed installation and operation of other components and software, please refer to the HELP Section of the TED Footprints Software, find it on the TED 5000 Footprints CD, or check out the TED website at www.theenergydetective.com.

Unpacking

Unpack TED and ensure that all parts are included in the package.

A) One (1) Display (if purchase included Display)

B) One (1) Display Recharging Stand (if purchase included Display)



C) One (1) Measuring Transmitting Unit (MTU)

D) One (1) Gateway.

E) Power Cable for MTU, Ethernet Cable, Low-voltage power adapter (for optional Display)

F) Two (2) Model QX200CT Current Transformers (CT's)

G) Installation Manual - Please Read Carefully

PART II – SAFETY

Every effort has been made in providing for the safe, secure installation of TED. The installation of TED requires the cover of the main electrical circuit breaker panel to be removed. After the circuit breaker panel has been removed, the potential hazard of shock, burn, or even electrocution now exists. Do not attempt to complete this installation unless you are very familiar with the electrical components and operation of the circuit breaker panel. Even when the main circuit breaker has been turned to the "OFF" position, certain areas within the circuit breaker panel may still be electrified. Do not attempt installation unless you know where these electrified areas are.

This symbol will be found throughout the instructions where there is a potential for electric shock, burn, or even electrocution. Do not attempt to complete the noted section if you are not an electrician, or qualified installer.

WARNING - These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, DO NOT perform any servicing other than that contained in these operational instructions, unless you are qualified to do so.

WARNING - The MTU must be connected to a switch or circuit breaker in close proximity to the equipment and within easy reach of the operator. It must be marked as the disconnecting device for the MTU.

WARNING - If the equipment is used in a manner not specified in these instruction, the protection provided by the equipment may be impaired.

ENERGY, INC. MODEL 5000

FC TESTED TO COMPLY WITH FCC STANDARDS

FOR HOME AND OFFICE USE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operations.

BEFORE YOU START

- Do not begin installation until you have read the “Safety” section of this manual.
- Read all instructions before beginning installation.

Estimated Installation Time:
Professional Installer: 15 minutes

Equipment Needed:
- Flathead screwdriver - small and large
- Phillips screwdriver - small and large
- Flashlight

QUALIFIED ELECTRICIANS OR PROFESSIONAL INSTALLERS FAMILIAR WITH ALL ASPECTS OF ELECTRICAL WIRING AND THEORY, MAY USE THE FOLLOWING CONDENSED INSTRUCTIONS FOR INSTALLATION OF TED. NON-PROFESSIONALS SHOULD READ AND FOLLOW THE DETAILED INSTRUCTIONS INCLUDED ON THE TED 5000 FOOTPRINTS CD

TED is suitable for installation on a single 120/240V single phase 60Hz service, normally found in North America (USA, Canada, Mexico and portions of the Caribbean). It is **not** suitable for three-phase service, or for service where there are more than two main circuit breaker panels or for 230V 50Hz service commonly found in other regions of the world.

All wiring in the United States must be installed in accordance with the latest adopted edition of the National Electrical Code (ANSI/NFPA 70, NEC) and state or local requirements. All wiring in Canada must be installed in accordance with the latest adopted edition of the Canadian Electrical Code (CSA C22.2 CEC, Part I) and any provincial or local requirements.

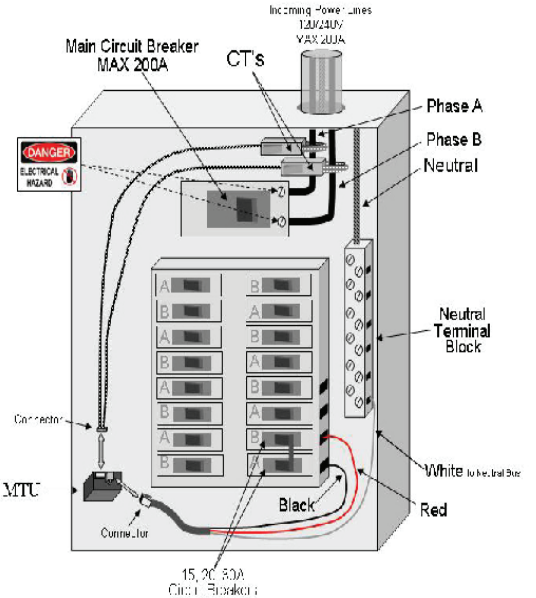


Fig. 3
Installing MTU Inside Panel
Typical Combination Circuit Breaker Panel

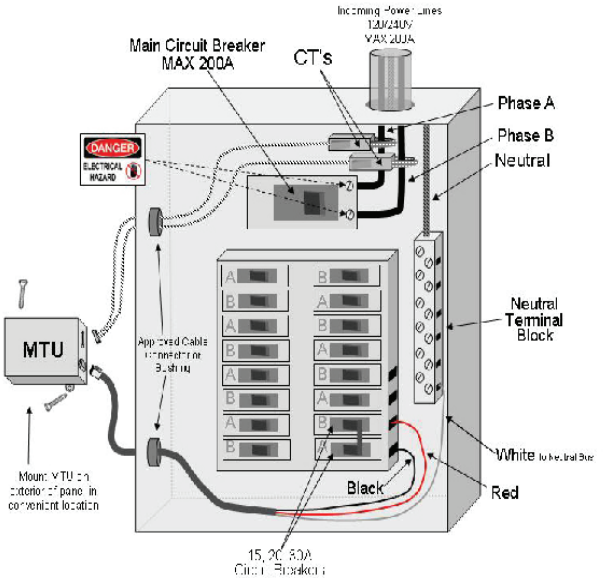
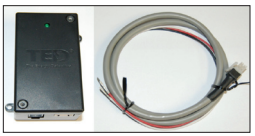


Fig. 4
Installing MTU Outside Panel
Typical Combination Circuit Breaker Panel

Quick Start Installation

STEP 1 - INSTALLING THE MEASURING TRANSMITTING UNIT (MTU) with associated Power Cable and Current Transformers (CTs).



(Refer to FIG 3)

TURN OFF ALL POWER TO THE CIRCUIT BREAKER PANEL BY TURNING OFF THE MAIN BREAKER OR MAIN SWITCH.

A) Turn off power.

B) Remove circuit breaker panel cover.

C) Note the ID Number of the MTU as shown on the label. It consists of six digits in the form 12 34 56. You will need to know this number to connect the MTU to the Gateway Network.

D) Connect the black and red wires from the MTU power cord to a spare 15,20 or 30 Amp two-pole circuit breaker in the panel.

E) If there is no spare circuit breaker, it can be attached to any 15, 20 or 30 Amp 2-pole circuit breaker in the panel, provided that the circuit breaker is approved for 2 conductors (most are) and this is acceptable to the "authority having jurisdiction in the installation location" (it is generally acceptable); If a 2-pole circuit breaker is not available, then use an approved handle-tie to create one. Note that the black and red wires *must* create a 240V circuit. **They cannot be connected to circuit breakers on the same phase.**

F) Connect the white wire from the MTU to the neutral bus on the panel.

STEP 2 - INSTALLING AND CONNECTING THE CURRENT TRANSFORMERS (CTs)

A) **CAUTION – IF THIS IS A COMBINATION PANEL, THE LUGS ON THE PRIMARY SIDE OF THE MAIN BREAKER ARE PROBABLY STILL HOT**.

B) The CTs must be installed with the red polarity dots either both facing towards the main breaker, or both away from the main breaker to maintain the correct polarity. If both CTs are not installed in this manner, the readings will be wrong.

- **Note: Do not install the CT over the neutral (N) (grounded) conductor**.

C) Install one CT over each incoming power line A or B, by pressing on the handle to open the split-core then clipping it over the power line as shown below.

D) The CTs should be installed on the secondary side of the main switch or main circuit breaker, however, if this is not possible, such as in the case of a combination breaker panel, then install on the primary side of the main breaker.

E) Ensure that the two sides of the split core CTs are mated tightly together over the in-coming power line. (The CTs should be loose-fitting around the wires).

F) Connect the CTs and Power Cable to the MTU by plugging the plastic mating connectors together.

Note: The connectors are polarized and can only be inserted one way – do not force.

G) Determine the best location to mount the MTU.

   a. Choose a location where it will not interfere with existing equipment or wiring.
   b. The MTU may be attached using double-sided tape (if allowed in your jurisdiction), or with sheet metal or machine screws.

H) Arrange and tie-wrap all wiring in a neat and tidy manner.

I) Turn the power back on.

The MTU will blink approximately 10 times when power is first applied. After this, it will blink when transmitting or receiving data.

Step 3 – Refer to Quick Start Guide for detailed instructions on installing the Gateway and Display Devices, setup and operation of the TED Energy Management System.

Solar, Wind or Auxiliary Generator Installation Addendum

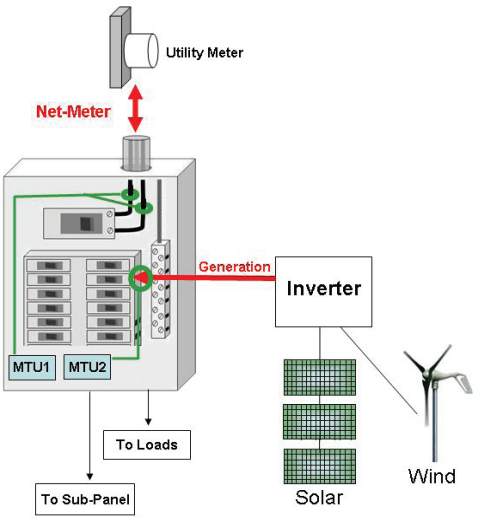
Installing the Solar/Wind, or Auxiliary Generator components ("Solar" for short) needs to be completed ***after*** the installation instructions have been followed for the installation of MTU 1 (beginning on page 6 of this Instruction Guide). `

Assuming that you have successfully installed MTU 1 as detailed above, it is time to connect MTU 2 to your Solar system. While there are many different variations in Solar connections, we are presenting the installation of MTU 2 in the most common scenario.

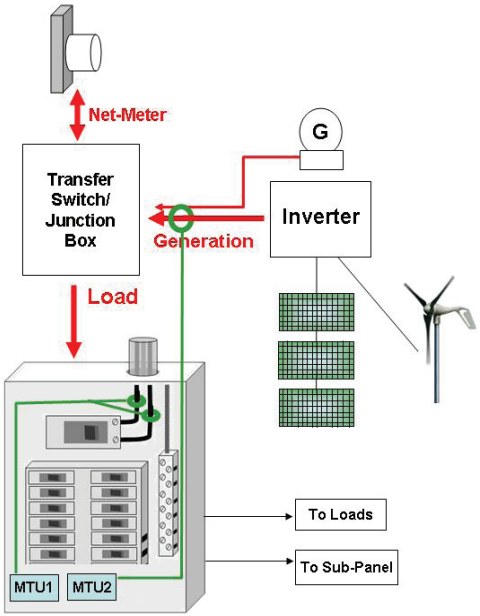
Solar panels connect to an inverter which changes DC to AC. In most cases it will be 120/240V. The connection can tie into the main switch/Circuit Breaker, a transfer switch, a junction box, a splitter box, etc. It really doesn't make any difference.

In the case of an auxiliary generator, it will likely tie into a transfer switch because generally speaking, a generator is not run in parallel with the utility. (You will use both CTs if 240v...otherwise, if it is 120V, you only use one CT).

In the following drawing, the MTU/CTs are connected similarly as you did connecting MTU 1. If possible, both MTUs should be powered from the panel. This will give the cleanest Power Line Carrier signal. (Try NOT to power the MTU from the inverter, as there will be a lot of line noise that could interfere with the signal).



Typical Solar/Wind/AuxGenerator Installation



Typical Solar/Wind/AuxGenerator Installation

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