

# Installation Manual for TED 5000



# 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 (with Footprints firmware embedded)
  - One (1) Display (if purchase included Display)
  - One (1) Display Recharging Stand (if purchase included Display)
  - Associated cables, power supplies;

### SAFE OPERATING RANGE AND CONDITIONS:

	Display & Gateway	MTU & CTs
Use Condition	Indoor	Indoor/Outdoor
Temperature	Dry	Dry /Damp
Relative Humidity	10° - 40°C	0° - 40°C
Altitude	< 80%	< 90%
Voltage	3,300M	3,300M
	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 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](http://www.theenergydetective.com)

## TABLE OF CONTENTS

PART I	<b>Introduction</b> .....	Page 4
PART II	<b>Safety</b> .....	Page 6
PART III	<b>Quick Start Installation</b> .....	Page 9
	(For Electricians and Professional Installers ONLY)	
PART IV	<b>Solar/Wind Installation</b> .....	Page 12

# INSTALLATION MANUAL

**The Installation of TED is intended for professional electricians or highly technical amateurs only.**

## 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](http://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.

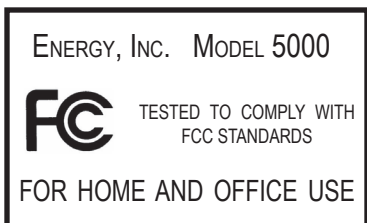


This symbol will be found throughout the instructions where there is a potential for electric shock, burn, or even electrocution. Do not attempt to complete the noted section if you are not an electrician, or qualified installer.

**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.



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

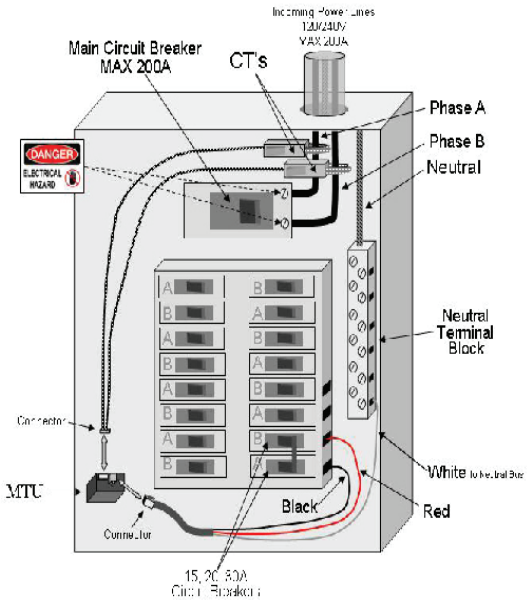
### Equipment Needed:

- Flathead screwdriver - small and large
- Phillips screwdriver - small and large
- Flashlight

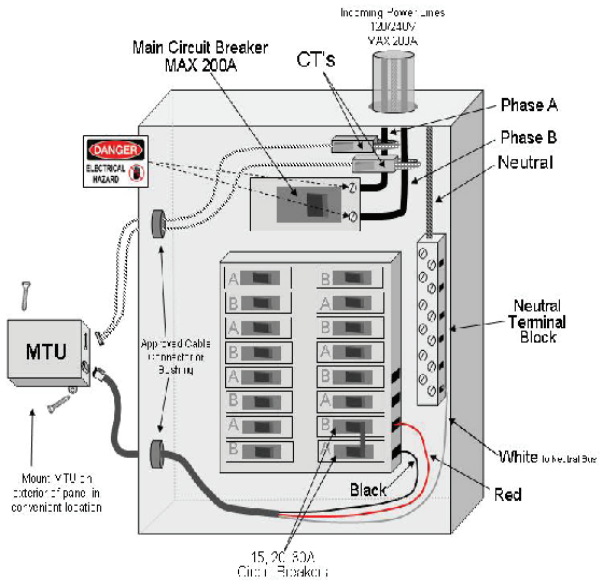
**QUALIFIED ELECTRICIANS OR PROFESSIONAL INSTALLERS FAMILIAR WITH ALL ASPECTS OF ELECTRICAL WIRING AND THEORY, MAY USE THE FOLLOWING CONDENSED INSTRUCTIONS FOR INSTALLATION OF TED. NON-PROFESSIONALS SHOULD READ AND FOLLOW THE DETAILED INSTRUCTIONS INCLUDED ON THE TED 5000 FOOTPRINTS CD**

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 POWER CABLE AND MEASURING TRANSMITTING UNIT (MTU).



(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) Note that the black and red wires *must* create a 240V circuit. **They cannot be connected to circuit breakers on the same phase.** If there is no spare circuit breaker, the black/red wires 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.
- F) Connect the white wire from the MTU to the neutral bus on the panel.
- G) Do not connect the Power Cable to the MTU until you have the CTs connected (see below)

### 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) Make sure the thumb-squeeze split core CTs clamp tightly. (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.

Do not close the electrical panel until you have completed the installation of the Gateway and verified that correct data is being received from the MTU. If, after the entire system is setup, and the energy being displayed seems very low, or incorrect, try reversing one of the CTs (either one of them).

Close the Electrical Panel only after you have confirmed the correct operation of TED,

**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

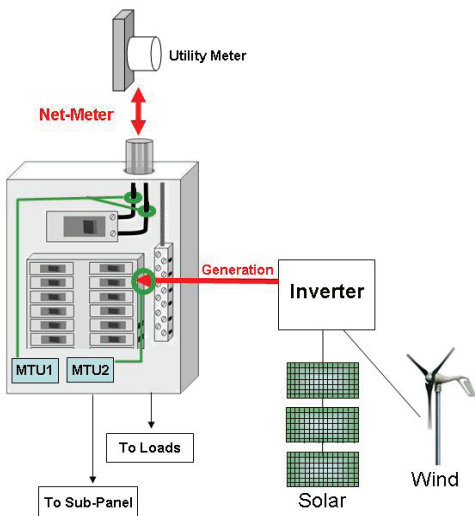
Installing the Solar/Wind, or Auxiliary Generator components (“Solar” for short) needs to be completed **after** the installation instructions have been followed for the installation of MTU 1 (beginning on page 6 of this Instruction Guide).

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.

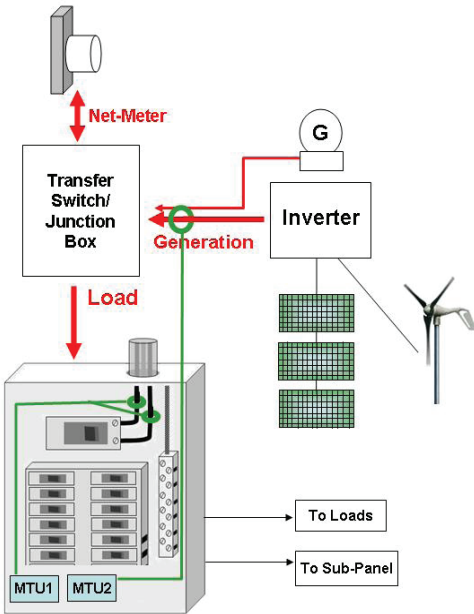
Solar panels connect to an inverter which changes DC to AC. In most cases it will be 120/240V. The connection can tie into the main switch/Circuit Breaker, a transfer switch, a junction box, a splitter box, etc. It really doesn't make any difference.

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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