TED Pro Commercial

ENERGY MONITORING AND CONTROL SYSTEM

Three-Phase Electrical Service

OVERVIEW

The **TED Pro** Energy Monitoring and Control System is a state-of-the-art system for use in residential, commercial and government buildings and small industrial complexes. The system allows the user to monitor energy usage, thereby managing energy use through awareness of energy use and costs. Energy use and alerts can be presented on a custom display, computer, over the Internet, on mobile devices or by text or email messages. Colored LEDs alert the user to rate-tier changes, high demand, cost or other user-defined parameters.

There are no additional software charges or monthly subscriptions. All firmware is embedded in the system.

Optionally, the system can be configured to automatically adjust thermostat settings or turn off loads based on user-selectable criteria such as cost of electricity, total use, cost, time of day, budget, or request from a utility or electric provider.

The system is designed to work on any 3-phase electrical system anywhere in the world and is compatible with numerous energy or demand-rate billing systems, including fixed, time-of-use, step/tiered, seasonal, demand, or any combination of those mentioned. The system also accommodates taxes, fixed charges, and fuel surcharges to accurately reflect the monthly electric bill.

The basic system consists of an MTU-HV and a ECC, descriptions of each follow below.

The **Measuring Transmitting Unit** (MTU) measures the energy consumption, demand, voltage, current, and power factor. The MTU-HV is generally located at the main electrical panel and transmits the information collected, over the building's existing electrical wiring, using state-of-the-art **P**ower **L**ine **C**arrier communication (PLC) to a ECC which receives and interprets the data. Multiple MTU-HVs can be used to give individual measurement of panels or loads. For systems with solar, wind or other generation, multiple MTU-HVs will tell the user consumption, generation and net, from-or-to the utility.

The **Energy Control Center (ECC)** is the communication hub for the system. It receives raw energy-use data from the MTU-HV(s), interprets the data and calculates the current energy cost, cost today, month-to-date, etc. The ECC can be configured to communicate with display devices, computers, networks, mobile devices, thermostats via Ethernet, PLC, WiFi, ZigBee, USB, or XBee.

System and Utility Rate setup is simple and intuitive using a PC running our web-based setup wizards.

To this basic system can be added numerous options:

- Numerous MTU-HVs can be added to separately measure various loads or generation.
- TED Spyder – The Spyder mounts in, or beside the electrical panel and is connected to the MTU-HV. The Spyder records detailed usage of up to 8 single or multi-phase circuits. These individual readings are stored in the ECC for display. Two Spyders can be attached to each MTU-HV, thus up to 16 independent circuits can be measured per MTU-HV. (Spyder system will be available mid-2013)

- Display Devices
  - Wired-in Display connects directly to ECC.
  - Optional Wireless Display with battery backup can be mounted anywhere or carried around for load checking.
- Communication Ports for Development. ECC includes two USNAP ports and one USB port.
  - WiFi modules – Allow wireless communication with a router or other WiFi-enabled device.
  - ZigBee modules – Allows communication with Smart Meters, Smart Thermostats and other ZigBee-enabled devices.
- Smart Thermostats
  - WiFi or ZigBee-based
- Load Shedding Devices
  - PLC, WiFi or ZigBee-based

ECC shown with Display

[TED Pro CT Clamp Commercial Energy Monitor]
[TED Pro CT Clamps Commercial Energy Monitor]
[TED Pro WD Wireless Display for Commercial Energy Monitor] [TED Pro MTU-HV Commercial Energy Monitor]
[TED Pro MTU-HV Commercial Energy Monitor]
[TED Pro ECC Commercial Energy Monitor]
[TED Pro MTU-HV ECC Commercial Energy Monitor]

MTU-HV

TECHNICAL SPECIFICATIONS

Measuring Transmitting Unit	
PRODUCT NAME	**MTU-HV**
Types of Services	All single or 3-phase
	3-phase 4W Wye
	3-phase 3W Delta
	3-phase 4W Hi-Leg Delta
Maximum voltage – Phase/Phase	600V
Maximum voltage – Phase/Neutral	277V
Minimum Voltage	180V
Maximum Current – per Phase	400A (1200A – ***Note 1A**)
Maximum wire size	500 MCM (25mm OD)
Voltage Measurement	Voltage Divider Circuit
Current Measurement	400A:3V Split-Core CTs
Operating Temperature	-40˚C < T_A < +50˚C
Energy Measurement & Calculations	Analog Devices ADE7854ACPZ
Overall Accuracy	Better than ± 2%
Measure and Transmit Energy	± 1W
Measure and Transmit Demand	± 1VA
Measure and Transmit Voltage	± 0.1V
Measure and Transmit Phase Currents	± 1A
Measure and Transmit Power Factor	± 0.1%
Communication Interface	PLC/Ethernet
PLC System	Yitran IT700 System
Data-Receiving Units	
Product Name	**ECC**
Works w/3-phase & Single-phase MTU	Yes
Maximum Voltage Phase/Neutral	277V
Minimum Voltage Phase/Neutral	95V
Cord Types Available	UL/EU/UK/AU
Operating Temperature	+5˚C < T_A <+40˚C
Communication Methods Available	PLC, Ethernet, Wifi, ZigBee, USB, XBee
USB 2.0 Port	1
USNAP 2.0 Port	2
Display Port	1
Compatible w/ ZigBee SE 2.0 Smart Meter	Yes
Accept Demand Reduction Request from utility	Yes
Maximum number of MTUs on one system	4
Maximum Spyders on one MTU	2 (8-circuits w/each Spyder)
Maximum number of loads measured	16 - Future release
Power-on LED	Blue
Link status LED	Green/Yellow
Transmit/Receive LED	Green/Red
Energy Use Meter	Green/Yellow/Red

* **Note 1A** – Will measure up to 1200A with 3 Parallel 400A feeds using optional ADP CT Adapter

OPERATIONAL SPECIFICATIONS

Software	ECC
TED Footprints – Historical, Graphical, Profiling	Included
TED Smart Load Shedding Software	Included – avail 2nd Qtr
System and Utility Setup	Wizard Setup
Solar/Wind Generation	
Display System Load	Yes
Display System Generation	Yes
Display Net Metering	Yes
Data Display Options	
Computer – TED Footprints Software	Yes
Desktop LCD Display	Yes Available 2nd QTR
Wireless LCD Display	Yes
Mobile Phones or Pads	Yes
AggreData – Aggregates data from multiple systems	Yes
Third party applications	Yes
Data Storage/Display	
Second Data	Every second for 2 hours
Minute Data	Every minute for 48 hours
Hour Data	Every hour for 90 days
Day Data	Every day for 2 years
Month Data	Every month for 10 years
Rate Structures	
Rates downloadable from Internet	Yes Available 2nd Qtr
Rates can be pre-programmed	Yes
Number of TOU Rates	4
Number of Tier/Step Rates	4
Critical Peak Rates	Yes
Weekend Rates	Yes
Holiday Rates (Canada or USA)	Yes
Seasonal Rates (4 seasons)	Yes
Tier/Step Rates within Seasons	Yes
TOU Rates within Seasons	Yes
Demand Charges or Demand Penalties	Yes
Number of House Codes	unlimited
Update Time	1 second
Optional Devices/Equipment	
Wireless Display with Backlight/Battery	WD – Silver
Smart Thermostats	Wifi or ZigBee Avail 2nd Qtr
USNAP Modules	Wifi or ZigBee Avail 1st Qtr
USB Dongle	Wifi or ZigBee Avail 1st Qtr
Load Shedding Devices 20A 1P	PLC, Wifi or ZigBee Avail 2nd Qtr
Load Shedding Devices 40A 2P	PLC, Wifi or ZigBee Avail 2nd Qtr