# SmartM⌕n

Energy Plus
[HS-EXPM]

Quick Start Guide

Prior to configuration:

1. Reference document TDS0909, which provides instructions on the installation and wiring of the SmartMon Energy Plus.
2. Physically install the SmartMon unit per TDS0909. For a SmartMon unit purchased in a factory fitted control enclosure, install the enclosure in its permanent location.
3. Mount the CT's and/or optional PT's, wiring them to the SmartMon per TDS0909.
4. Ensure that the appropriate power is provided to the SmartMon. For a SmartMon unit purchased in a factory fitted enclosure, provide 120Vac for power. For a SmartMon unit purchased as a stand-alone unit, 10-30Vdc is appropriate control power.
5. Apply power to the SmartMon, which will display its initial splash screen upon power-up.

SmartMon Energy Plus Function Keys
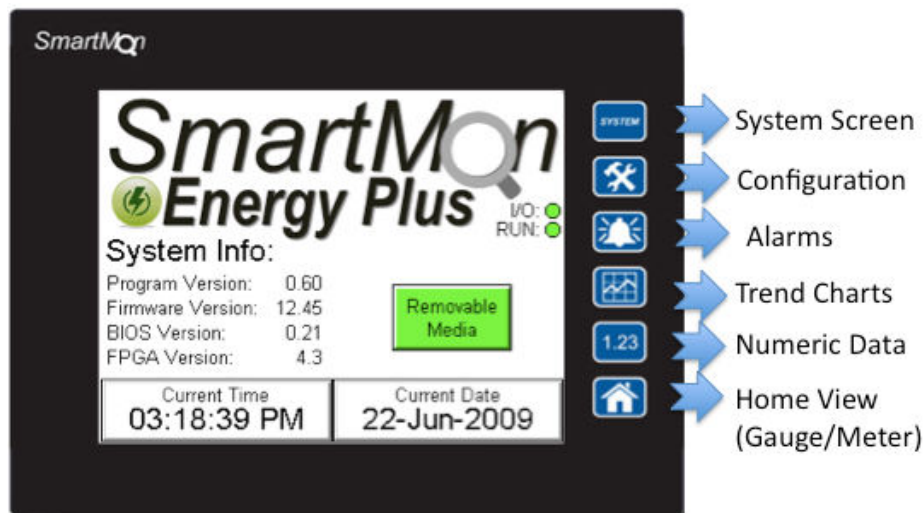
- <u>System</u> – navigates to system screen, where time may be set, removable media exchanged, etc.
- <u>Configuration</u> – where operational parameters are set for the unit (CT Ratios, PT Ratios, Alarm levels, etc.
- <u>Alarms</u> – displays current alarms (Alarm Status) and past alarms (Alarm History)
- Trend Charts – pressing this key multiple times toggles between a variety of trend charts for the main energy values (kW, V, A, pF, etc.) over time
- <u>Numeric Data</u> – displays current energy values numerically, as well as the minimum and maximum levels, and the date/time those levels were achieved
- <u>Home</u> – pressing this key toggles between the Gauge View and the Meter View. These are screens that provide an overview of the current Energy values.
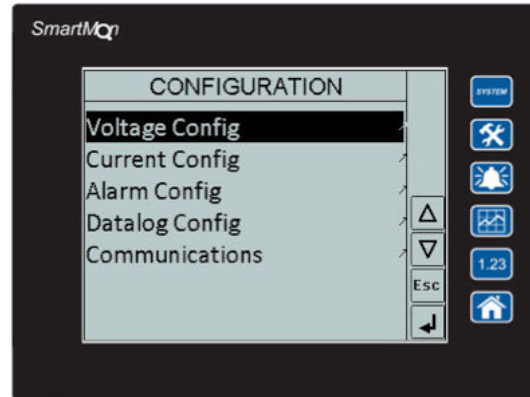
Steps to Configure the SmartMon Energy Plus:

1. After applying power, the SmartMon will go through a startup sequence, and then display its splash screen.
2. To initiate configuration, press the CONFIGURATION key. This displays the CONFIGURATION menu. Most parameters on the SmartMon are configured using a menu system. The menu is navigated as follows:
   - Highlight a selection using the UP/DOWN arrow keys or by touching the selection.
   - Once the desired selection is highlighted, pressing the Enter softkey will either;
     i. Navigate to a sub-menu, or
     ii. Bring up the pop-up keypad, to allow editing of a parameter value.
   - Values may be edited from the pop-up keypad as follows
     i. For a numeric field, simply key-in the value using the number keys and Enter.
     ii. To exit from the pop-up kepad without entering a value, press the Escape key.
   - You can "back out" of any menu item, as well as the Configuration Menu itself, using the Esc key.
3. Configuration Menu Items. The following items are accessible from the Configuration Menu:
   - Voltage Config
   - Current Config
   - Alarm Config
   - Datalog Config
   - Communications
4. Voltage Config. The following items can be configured from the Voltage Configu menu item(s):
   - PT ratios for each phase. A ratio of 1.00:1 indicates a 480V direct input.
   - Nominal Voltage (expected voltage)
   - High Voltage Alarm
   - Low Voltage Alarm
   - High/Low Alarm Delay (time value must exceed setpoint prior to Alarm enunciation)
   - Zero-cross Timeout (amt of time without a zero-cross prior to Alarm enunciation)
5. Current Config. The following items can be configured from the Current Config menu item(s):
   - CT ratios for each phase. A ratio of 1.00:1 indicates a 5A input.
   - Full-load Current (expected current)
   - Advanced Setup
     i. CT Phase Compensate for each phase (no. of degrees to adjust each phase +/-)
   - High Phase Current
   - Low Phase Current
   - High Total Current
   - Low Total Current
   - High/Low Alarm Delay (amt. Of time value must exceed setpoint prior to Alarm enunciation)

6. Alarm Config. The following items can be configured from the Alarm Config menu item(s):
   - Alarms Enabled/Disabled (no alarms will be logged while this is set to the default of disabled)
   - Low Power Factor
   - High kW Alarm
   - Delay Above Alarms
   - High 5-min Demand
   - High 15-min Demand
   - High kWh Today
   - High kWh This Month
   - Voltage Alarms (High, Low, Alarm Delay, Zero-Cross Timeout)
   - Amperage Alarms (High & Low Phase, High & Low Total, High/Low Alarm Delay
7. Datalog Config. The following item(s) can be configured from the Datalog Config menu item(s):
   - Datalog Enabled/Disabled. No datalogging to removable memory (microSD) will take place while this parameter is set to the default of disabled.
   - Datalog Frequency. The elapsed time period before new data values are logged. Initially fixed at 1 Minute.
8. Communications. This screen allows the RS-232/RS-485 Modbus port (MJ2) to be configured, as well as the Modbus/TCP Ethernet port (LAN) to be configured. There are also indication LEDs on this screen to indicate activity and status. The SmartMon's web status page (using a web browser) and datalog files (using a FTP client) are accessible from the IP address configured on this screen.
9. **Note: You cannot navigate to another display/screen until exiting from the Main Configuration Screen using the ESC key.**

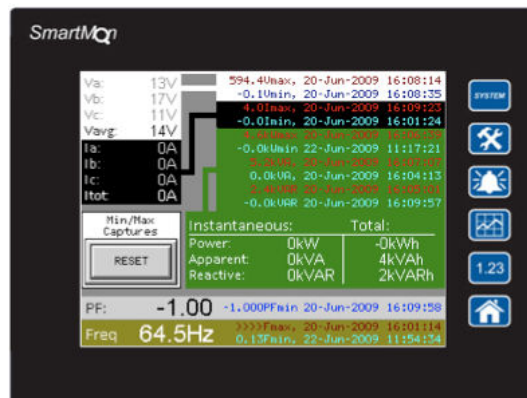**Viewing Alarms on the SmartMon Energy Plus (ALARMS)**

Pressing ALARMS on the SmartMon displays the Alarm screen. From here, the current alarms (Alarm Summary) and historical alarms (Alarm History) may be viewed, and cleared if desired. To Clear an alarm, touch the Alarm Summary or Alarm History window on the screen, which will bring up the Alarm Viewer. From the Alarm Viewer, you can choose to view but take no action (Press Esc), clear an individual alarm (highlight the alarm, Press Clr), or clear all alarms (Press Clr All).
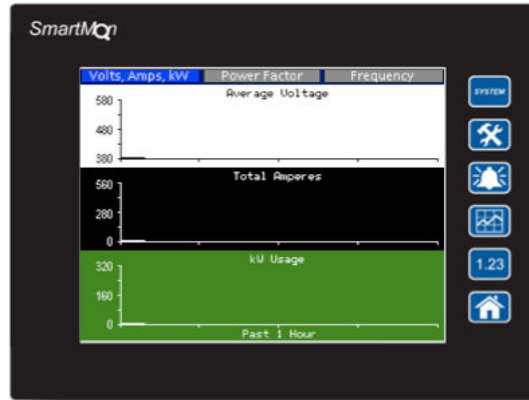
Viewing Trends on the SmartMon Energy Plus (TRENDS)

Pressing TRENDS on the SmartMon displays trend data. There are three tabs; Volts-Amps-kW, Power Factor, and Frequency. There are multiple time frames available for each tab. Pressing a Tab at the top will jump to the desired trend set. Pressing TRENDS repeatedly will cycle through the available time frames for each trend set, and then move on to the next trend set. The following Trends are available:

- Volts,Amps,kW Tab. Voltage, Amperes, and kW – Past 24 hours, Past Week, Past 30 Days.
- Power Factor Tab. Power Factor - Past Hour, Past Day, Past Week, Past 30 Days
- Frequency Tab. Frequency – Past Minute, Past Day.

Viewing Numeric (Min-Max) Data on the SmatMon Energy Plus (NUMERIC)

Pressing NUMERIC on the SmartMon displays the Instantaneous Values, as well as Minimum and Maximum Values for several energy parameters. The Minimum and Maximum values are date and time-stamped as well. The following parameters are displayed on this screen:

- Voltage (A, B, and C phases) - Instantaneous
- Voltage Average - Instantaneous and Min/Max
- Current (A, B and C phases) - Instantaneous
- Current Total - Instantaneous and Min/Max
- kW – Instantaneous, Total and Min/Max
- kVA – Instantaneous and Min/Max
- kVAR – Instantaneous and Min/Max
- Power Factor – Instantaneous and Min
- Frequency – Instantaneous and Min/Max
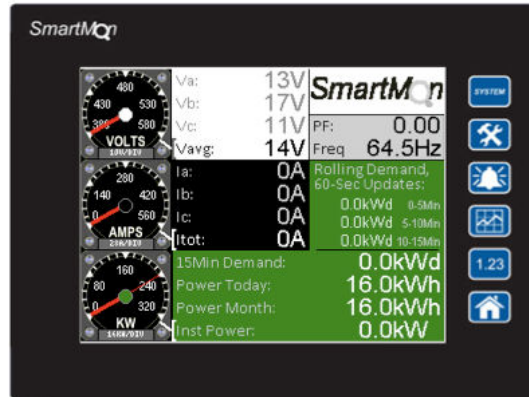
Viewing Data with a Gauge-style Interface on the SmartMon Energy Plus (HOME VIEW)

Pressing HOME VIEW on the SmartMon displays current values for a variety of energy parameters, in numeric and gauge format. The following parameters are displayed on this screen:
- Volts Phase A, Phase B & Phase C (V, numeric)
- Volts Average (V, numeric & analog gauge)
- Current Phase A, Phase B & Phase C (A, numeric)
- Current Total (A, numeric & analog gauge)
- Power Factor (numeric)
- Frequency (Hz, numeric)
- Rolling Demand, 60-second updates (kWd, numeric) [0-5 min, 5-10min, 10-15min]
- 15-minute Demand, 60-second updates (kWd, numeric)
- Power Used Today (kWh, numeric)
- Power Used This Month (kWh, numeric)
- Instantaneous Power (kW, numeric & analog gauge)
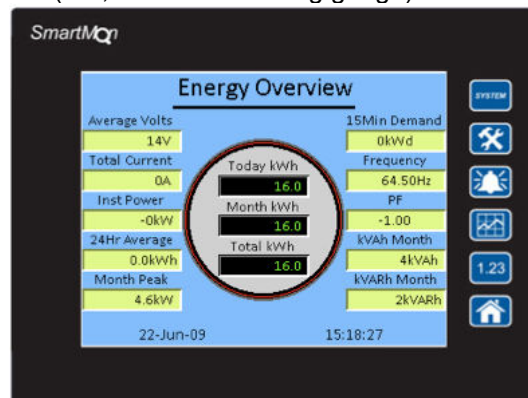
Viewing Data with a Meter-style Interface on the SmartMon Energy Plus (HOME VIEW)

Pressing HOME VIEW on the SmartMon again displays current values for a variety of energy parameters, in numeric format. The following parameters are displayed on this screen:
- Energy Consumed Today, This Month, and Total (kWh)
- Volts Average (V)
- Current Total (A)
- Instantaneous Power (kW)
- 24Hr. Average Power (kW)
- Month Peak (kW)
- 15-minute Demand, 60-second updates (kWd)
- Frequency (Hz)
- Power Factor

- Apparent Power, Month (kVAh)
- Reactive Power, Month (kVARh)

Accessing/Viewing Logged Energy Data (.CSV format) from Removable Memory

The SmartMon Energy Plus automatically logs energy data to its 2GB removable memory card every 1 minute. This data is stored in a spreadsheet & database compatible format (.csv). Every day at midnight, new .csv files are started for each log. The following logs can be found in the root directory of the SmartMon:

- OVERVIEW folder. Each daily OVERVIEW log file contains the following data columns, with rows of new data every one minute:
    - Date
    - Time
    - Vavg
    - Itot
    - kW
    - kVA
    - kVAR
    - PF
    - Hz
    - kWh Today
- PHASES folder. Each daily PHASES log files contains the following columns, with rows of new data every one minute:
    - Date
    - Time
    - Va
    - Vb
    - Vc
    - Vavg
    - Ia
    - Ib
    - Ic
    - Itot
  - POWER folder. Each daily POWER log files contains the following columns, with rows of new data every one minute:
    - Date
    - Time
    - Power Factor (60 second average)
    - kW (60 second average)
    - kVA (60 second average)
    - KVAR (60 second average)
    - kWh Today
    - kVAh_Today
    - KVARh_Today
    - Vavg (60 second average)
    - Itot (60 second average)

There are two primary ways to access the datalog files from the Removable Memory card. The simplest is to remove the memory card, copy the files to a computer, and then replace the memory card in the SmartMon. If using this method, the user has over an hour to complete this process before any data is lost.

The second method is to access the files using FTP (file transfer protocol) over Ethernet. From a computer residing on the same network as the SmartMon, an FTP client program is used to read/write files from/to the SmartMon microSD card. FileZilla (available from filezilla-project.org/download.php) is a

free program that offers reliable operation. To access the files, simply connect to the SmartMon over FTP by specifying its IP address in the FTP client software. Note – you CAN access files safely over FTP, even if it is currently being written to by the SmartMon. The SmartMon will buffer the data and properly handle the file transfers to prevent corruption.

Accessing Current Data from a Web Browser

The SmartMon Energy Plus also has built-in web page, that allows the latest instantaneous energy data to be viewed in real-time. From a computer residing on the same network as the SmartMon, type the following into the url line of your web browser:

http://*nnn.nnn.nnn*/Web/index.htm

Where *nnn.nnn.nnn* is the IP address of the SmartMon unit.

SmartMon Status Screen

By pressing the System button on the SmartMon unit, a Status screen displaying a variety of status info is shown. This includes the current time, current date, as well as the Program & firmware information for the SmartMon unit. By touching the current time or current date fields allow them to be edited from the pop-up keypad.

TECHNICAL SUPPORT

For assistance and manual up-dates, contact Technical Support at the following locations:

North America:+	**Europe:**
(317) 916-4274	(+) 353-21-4321-266
www.heapg.com	www.horner-apg.com