



PM-XXX Series Power Meter

User Manual



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 **1.800.227.6784** FOR MORE INFORMATION
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1. Warranty

Limited One-Year Warranty; Limitations of Liability. MLI warrants that for a period of one year from delivery, MLI Products will be free from defects in material and workmanship under normal use. In the event that a defect in any MLI Product is discovered within the one-year warranty period, then the customer must notify MLI in writing within thirty (30) days of discovering the defect or before expiration of the one-year warranty period, whichever shall occur first. No claim may be made against MLI without strict compliance with this notice requirement. MLI shall have the option to repair or replace the MLI Product or any of its components solely to the extent that MLI deems it necessary to remedy the defect. Any incidental costs, including without limitation, the cost to ship the defective MLI Product or affected components to MLI, or to such other repair facility as Motion Laboratories, in its discretion, may designate, shall be the responsibility of the buyer.

THIS WARRANTY SHALL NOT APPLY, AND MLI SHALL HAVE NO OBLIGATIONS HEREUNDER UPON THE OCCURRENCE OF ANY OF THE FOLLOWING: (A) IF THE MLI PRODUCT IS SUBJECT TO ANY USE FOR WHICH IT WAS NOT INTENDED; (B) IF THE MLI PRODUCT IS MODIFIED IN ANY WAY BY ANY PARTY OTHER THAN MLI; OR (C) IF ANY PARTY OTHER THAN MLI ATTEMPTS TO REPAIR OR REPLACE ANY DEFECT IN THE MLI PRODUCT OR IN ANY COMPONENT THEREOF.

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User Manual **PM-XXX Series Power Meter**



2. Introduction

This Manual describes how to use the Motion Laboratories PM-XXX Series Power Meter.

The data and illustrations found in this manual are not binding. We reserve the right to modify our products in line with our policy of continuous product development. The information in this document is subject to change without notice and should not be construed as a commitment by Motion Laboratories.

Motion Laboratories assumes no responsibility for any errors that may appear in this document. If you have any suggestions for improvements, amendments, or have found errors in this document, please notify us. No part of this document may be reproduced in any form or by any means, without the express written permission of Motion Laboratories. All rights reserved.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to assure compliance with the documented system data, only the manufacturer should perform repairs to the components.

We value and welcome your comments about this product and product documents. You can reach us at www.motionlabs.com.



3. Overview

The PM Series of Power Meter comes in different current capacities. The Part Numbers and Descriptions are as follows:

PM-25	Three phase four wire 25 amps per phase
PM-100	Three phase four wire 100 amps per phase
PM-200	Three phase four wire 200 amps per phase
PM-400	Three phase four wire 400 amps per phase



3. Overview (Continued)

Motion Laboratories PM-XXX series is a multi-function power meter. Using different current transformers (CTs') the meter is available in 25, 100, 200 and 400 amp models. Current values up to 999 amps can be displayed when configured with CT's matching the intended range of use.

Front panel connectivity for USB and Ethernet provide data logging and remote data access.

Upon plugging in a USB memory stick data will begin data logging in CSV file format. Time stamp comes from the internal real time clock.

Ethernet connection has multiple functions. With the IP address known as indicated on the Menu screen, any device with a web browser on the same network can see data from the meter. Simply type the web address into the browser of the device on the same network.

Subscription based remote viewing of data and logging over time with advanced graphical presentation can be accomplished by web browser from anywhere in the world.

For applications where meter data would be used for a custom application registers can be read via MODBUS TCP.

Four LCD panels display data and a fifth screen controls modes of operation and display status which includes:

1. Standby Mode
2. Voltage Current Frequency Mode
3. Power Mode
4. Power Factor Mode
5. Total Harmonic Distortion Mode

Change between display modes by pressing the MODE button on the control screen. Ethernet status is also displayed.



4. Modes

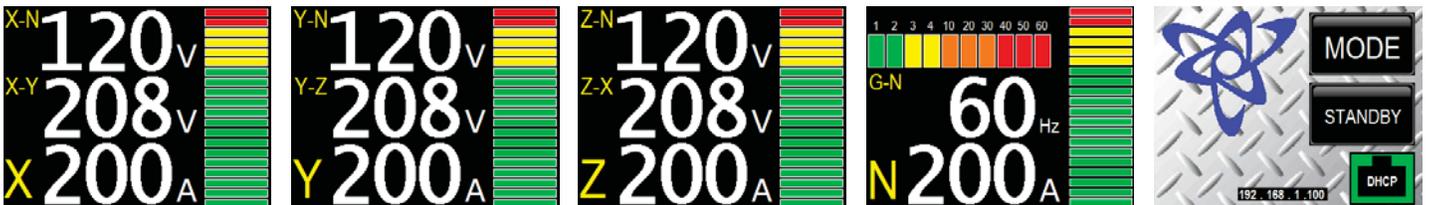
Standby Mode

Dim animated graphics are displayed while meter is active internally.



On power up or exiting standby mode the display always defaults to volt amp frequency display mode.

Voltage Current Frequency Mode



Voltage – current – frequency mode displays the following:

True RMS voltage phase to neutral

True RMS voltage phase to phase

Current per phase

Neutral current

20 segment current bar graph with user settable scaling

Frequency

Graphical Ground to neutral voltage displays 1,2,3,4,10,20,30,40,50,60 volts

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4. Modes (Continued)

Power Mode



- Power mode displays the following:
- Power in kilowatts per phase
- Total power in kilowatts
- Total kilowatt hours
- Relative kilowatt hours (user resettable)

Power Factor Mode



- Power factor mode displays the following:
- Power factor per phase
- Total power factor

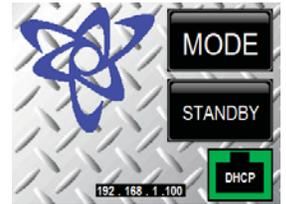




4. Modes (Continued)

Total Harmonic Distortion Mode

X 5.0% X-Y 5.0% X <small>CURRENT</small> 1.0% X Total Harmonic Distortion	Y 5.0% Y-Z 5.0% Y <small>CURRENT</small> 1.0% Y Total Harmonic Distortion	Z 5.0% Z-X 5.0% Z <small>CURRENT</small> 1.0% Z Total Harmonic Distortion	N <small>CURRENT</small> 1.0% Total Harmonic Distortion
--	--	--	---

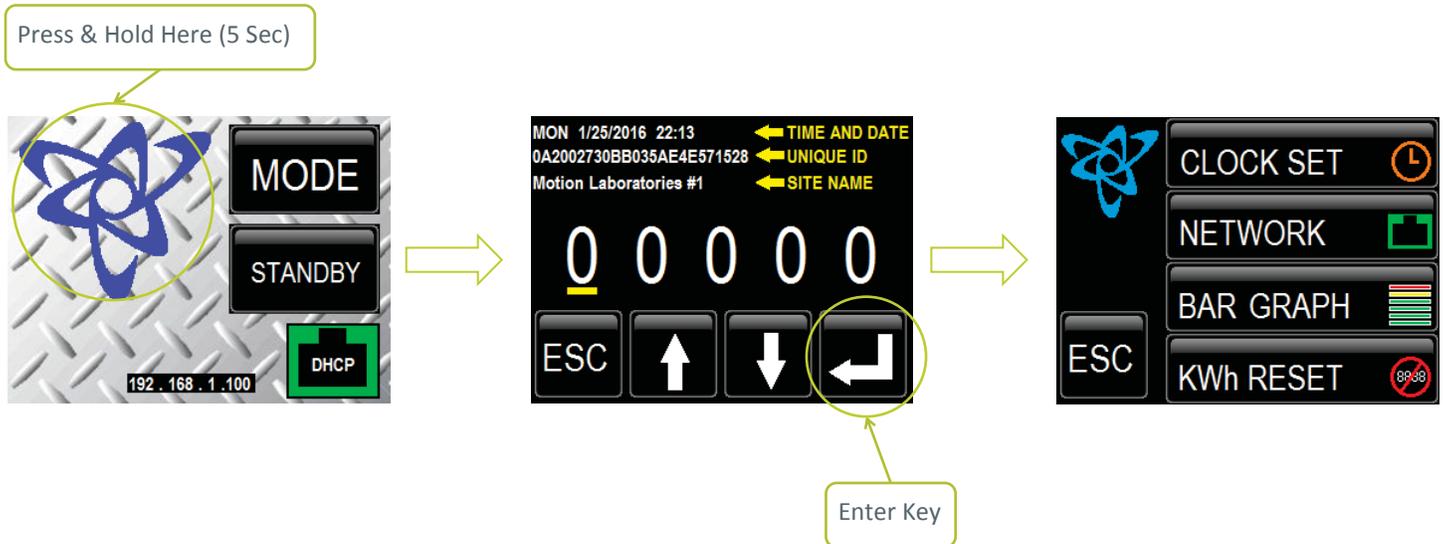


The Total Harmonic Distortion (THD) mode displays the following:

- THD per phase
- THD phase to phase
- THD current per phase
- THD neutral current



5. Setup



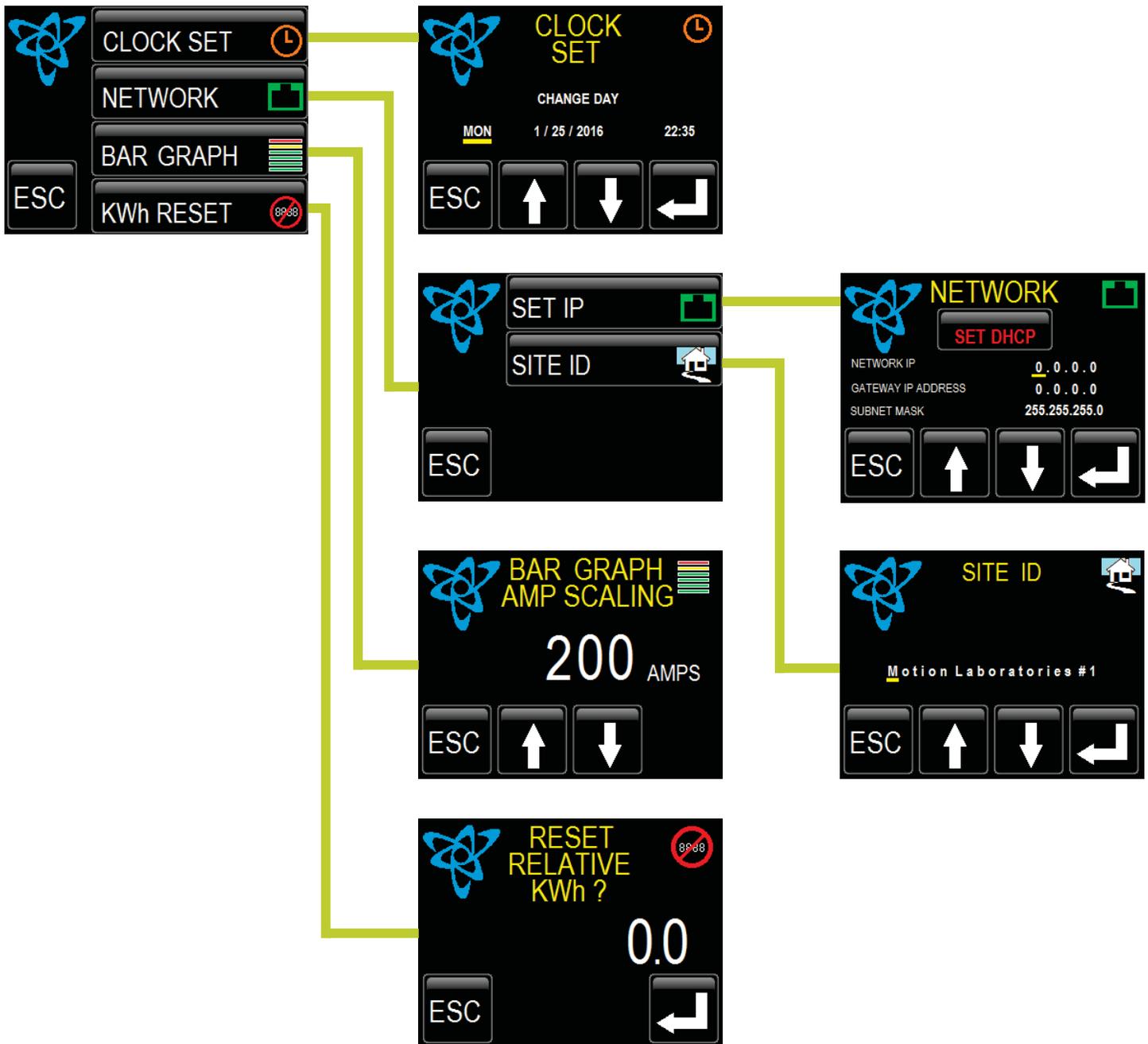
Enter setup mode by pressing the blue Motion Labs logo five seconds. A code entry screen will be displayed. Without entering the code you will be able to see the current time and date of the real time clock and the meter's 24 character unique ID number and the site ID. The unique ID number is required for setup of subscription based remote access website.

Using up and down arrow keys adjust each digit to code 65476. Press the enter key to change to a different digit. Once you have the correct code displayed press enter to get to the main setup menu. Pressing escape while on the code entry page will bring you back to the voltage current frequency mode.



5. Setup (Continued)

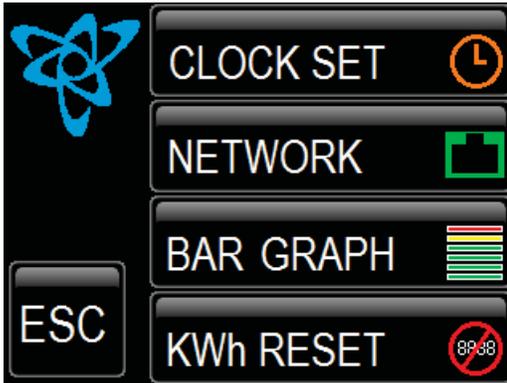
Setup Menu Structure





5. Setup (Continued)

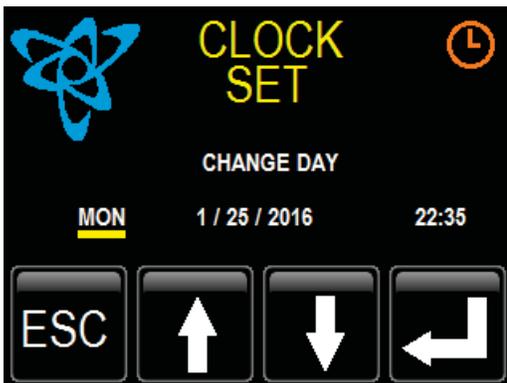
Main Setup Page



Pressing escape while on the setup menu page will bring you back to the default mode (voltage current frequency mode). When in any setup menu if there are no button presses within 60 seconds the meter will change back to default mode.

NOTE* With the exception of the “NETWORK” screens, in all of the other sub screens, once you adjust any value, pressing escape will write that new value and return to previous page. Pressing escape will exit without changes IF NO ADJUSTMENTS WERE MADE.

Clock Set



From the main set up page, press “CLOCK SET” to access this screen.

Use the up and down arrows to adjust any time/date parameter. Pressing the enter key will advance to the next parameter as indicated by the yellow underscore. Once all adjustments are complete press escape to set time. Seconds are set to 0 for any changes.



5. Setup (Continued)

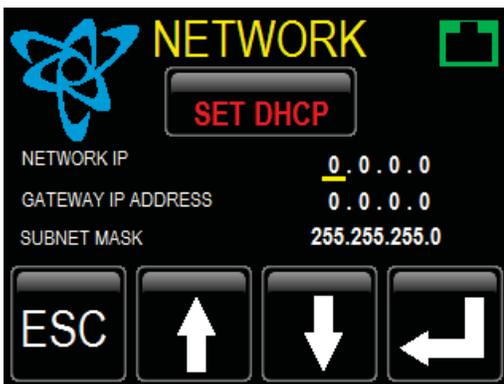
Network to SET IP and SITE ID

Because the “NETWORK” screen has two additional indents and makes non-volatile changes to the program, the process of updating and returning to previous pages is slightly modified.

As before, pressing escape without changes will return you to the previous page. In the “SET IP” window however, after making changes, pressing escape once will update and reboot the screen, then bring you back to the same page allowing you to verify your changes. Press the escape again to return to the previous page.

In the “SITE ID” window after making changes, pressing escape once will update the screen without rebooting allowing you to verify your changes. Press the escape again to return to the previous page.

Network (SET IP)



From the main set up page press the “NETWORK” button, then the “SET IP” button to access this window. The network setup page has the choice of changing IP settings for a fixed address or choosing DHCP for automatic addressing.

To change the IP, Use the UP and DOWN arrows to adjust any network octet. Pressing the enter key will advance to the next parameter as indicated by the yellow underscore.

Once all adjustments are complete press escape to set.

The screen will blank and display “UPDATING ...” and then “REBOOTING ...” for about 15 seconds. The network screen will RETURN displaying the new settings.



5. Setup (Continued)

Once all adjustments are complete press escape to set.

The screen will blank and display “UPDATING ...” and then “REBOOTING ...” for about 15 seconds. The network screen will RETURN displaying the new settings.



To set DHCP the following network settings must be active:

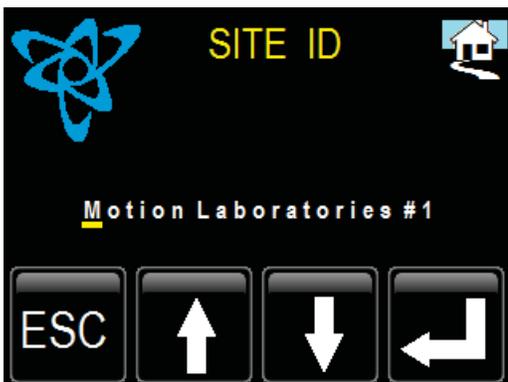
NETWORK IP = 0.0.0.0

GATEWAY IP ADDRESS = 0.0.0.0

SUBNET MASK = 255.255.255.0

For convenience press and hold the SET DHCP button for 3 seconds to set all network settings for DHCP automatically.

Site ID

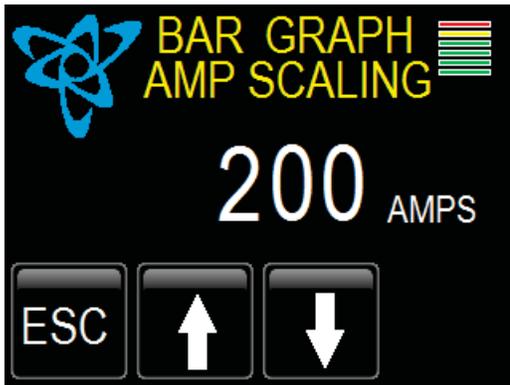


From the main set up page press the “NETWORK” button, then the “SITE ID” button to access this window. To change Site ID use the UP and DOWN arrows to select upper and lower case letters, numbers and standard characters as desired. Press and hold arrow keys for fast scroll through characters. Press the enter key to advance to the next position indicated by the yellow underscore. Up to 22 characters may be used including spaces.



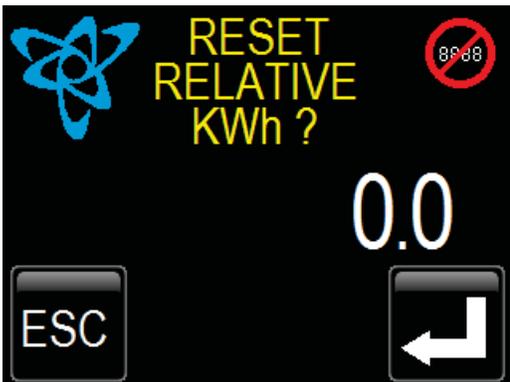
5. Setup (Continued)

Bar Graph Scaling



From the main set up page, press the “BAR GRAPH” button to access this window. Bar graph amp scaling allows you to set the range of the 20 segment current bar graph for the X, Y, Z and Neutral displays in the volt amp frequency mode. Use the up/down buttons to adjust the value from 20 to 1000 amps. The bar graph will display all 20 bars when measured current is the same as set current value. Press escape to return to the main setup menu.

KWh Reset



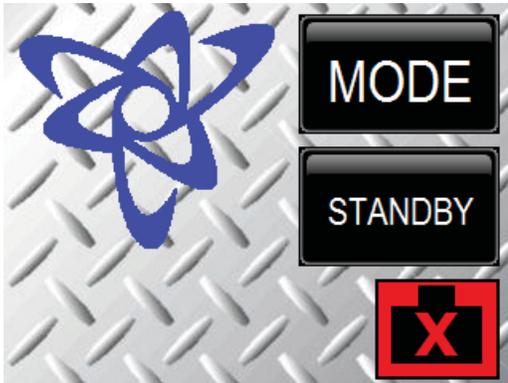
From the main set up page, press the “KWh RESET” button to access this window. When the display is in Power Mode, Kilowatt hours and relative kilowatt hours are displayed. While kilowatt hours is not changeable, relative kilowatt hours can be reset to zero. The display will show present relative KWh. If you escape no change will be made. Pressing the enter key will zero the relative KWh as indicated on the display.



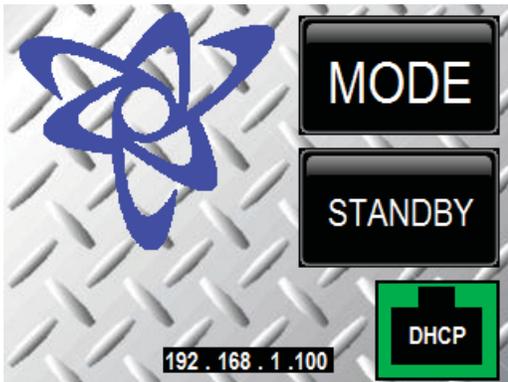
6. Ethernet

Note: see setup Ethernet setup

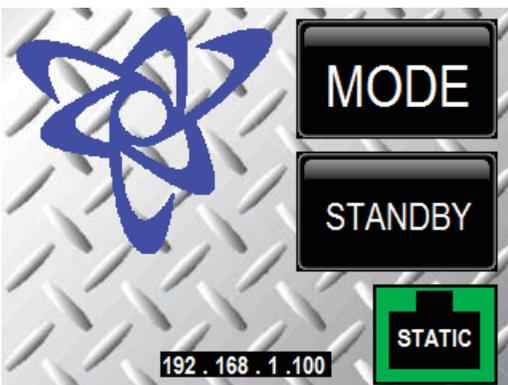
States



Control screen showing Ethernet disconnected



Control Screen showing Ethernet connected in DHCP mode with address



Control screen showing Ethernet connected in static mode with address



7. Internal Web Server

Through the front panel RJ-45 Ethernet connector you can see measurement values from the meters web page.



With the meter connected to a local network, open your web browser on a device connected to the same network and type in the IP address on the right screen of the meter.

The meter will display a web page with 4 tabs



7. Internal Web Server (Continued)

Measurements

WEB Scada					
Measurements		Counters	Events	Alarms	
LINE		POWER		THDs	
L1 Volt	120.8 V	Tot P	0.0 kW	THD L1	2.6 %
L2 Volt	122.5 V	Tot Q	0.0 kVAr	THD L2	1.9 %
L3 Volt	121.7 V	Tot S	0.0 kVA	THD L3	3.5 %
L12 Volt	211.1 V	PowFactor	0.000 ind	THD L12	1.3 %
L23 Volt	211.0 V	Demand I1	0.0 A	THD L23	2.1 %
L31 Volt	210.2 V	Demand I2	0.0 A	THD L31	2.2 %
L1 Amps	0.0 A	Demand I3	0.0 A	THD I1	0.0 %
L2 Amps	0.0 A	Demand Io	0.0 A	THD I2	0.0 %
L3 Amps	0.0 A	Demand P	0.0 W	THD I3	0.0 %
N Amps	0.0 A	Demand Q	0.0 kVAr	THD In	0.0 %
Frequency	59.98 Hz				
V-avg	121.6 V				
U-avg	210.7 V				
I-avg	0.0 A				

On the measurement tab you can view basic readings like voltage phase-to-phase, voltage phase-to-neutral, amps, frequency, average phase-to-neutral voltage, average phase-to-phase voltage, average current, Total power, total reactive power (KVA), total apparent power (KVA), power factor, demand, and total harmonic distortion (THD).



7. Internal Web Server (Continued)

Counters

DKM411 Web Scada SW:1.0

192.168.7.70/cnt.html

WEB Scada

Measurements **Counters** Events Alarms

COUNTERS

Import Power (kWh1-Im)	3.1 kWh
Export Power (kWh1-Ex)	0.0 kWh
Inductive Power (kVArh1-In)	0.0 kVArh
Capacitive Power (kVArh1-Cp)	0.3 kVArh
Import Power (kWh2-Im)	0.0 kWh
Export Power (kWh2-Ex)	0.0 kWh
Inductive Power (kVArh2-In)	0.0 kVArh
Capacitive Power (kVArh2-Cp)	0.0 kVArh
Input Counter 1 (InCnt-1)	0
Input Counter 2 (InCnt-2)	0

For the counters tab, only counter 1 is used. Import power is the total kWh's used (kWh1-Im). Since the meter is a line connected device export power is not used. There are also counters for inductive power (kVArh1-In) and capacitive power (kVArh1-Cp).



7. Internal Web Server (Continued)

Events

DKM411 Web Scada SW:1.0 x +

192.168.7.212/eve.html

WEB Scada

Measurements | Counters | **Events** | Alarms

##	Event	Alarm	Date	Time	State	Status	L1 Voltage	L2 Voltage	L3 Voltage	Frequency	L12 Voltage	L23 Voltage	L31 Voltage	L1 Current	L2 Current	L3 Current
0	Periodic	0	18-05-2016	14:55:03			119.0 V	120.0 V	120.0 V	60.0 Hz	208.0 V	208.0 V	207.0 V	55.6 A	18.4 A	46.2 A
1	Periodic	0	18-05-2016	14:54:03			118.0 V	120.0 V	120.0 V	60.0 Hz	208.0 V	208.0 V	206.0 V	56.8 A	16.2 A	38.6 A
2	Periodic	0	18-05-2016	14:53:02			119.0 V	120.0 V	120.0 V	60.0 Hz	208.0 V	208.0 V	207.0 V	55.8 A	16.2 A	39.0 A
3	Periodic	0	18-05-2016	14:52:01			118.0 V	120.0 V	120.0 V	59.9 Hz	208.0 V	208.0 V	206.0 V	52.8 A	16.2 A	39.0 A
4	Periodic	0	18-05-2016	14:51:01			118.0 V	120.0 V	120.0 V	59.9 Hz	208.0 V	208.0 V	206.0 V	52.4 A	16.2 A	38.8 A
5	Periodic	0	18-05-2016	14:50:00			118.0 V	120.0 V	120.0 V	59.9 Hz	208.0 V	208.0 V	206.0 V	52.6 A	16.2 A	38.8 A
6	Periodic	0	18-05-2016	14:48:29			118.0 V	120.0 V	120.0 V	59.9 Hz	208.0 V	208.0 V	206.0 V	52.4 A	16.2 A	38.8 A
7	Periodic	0	18-05-2016	14:47:28			119.0 V	121.0 V	120.0 V	60.0 Hz	209.0 V	208.0 V	207.0 V	52.6 A	16.2 A	38.8 A
8	Periodic	0	18-05-2016	14:46:28			118.0 V	120.0 V	120.0 V	59.9 Hz	208.0 V	208.0 V	206.0 V	52.8 A	16.2 A	38.8 A
9	Periodic	0	18-05-2016	14:45:27			118.0 V	120.0 V	120.0 V	59.9 Hz	208.0 V	208.0 V	206.0 V	52.0 A	16.2 A	38.8 A
10	Periodic	0	18-05-2016	14:44:27			119.0 V	120.0 V	120.0 V	59.9 Hz	208.0 V	208.0 V	207.0 V	52.0 A	16.2 A	38.8 A
11	Periodic	0	18-05-2016	14:43:26			119.0 V	121.0 V	120.0 V	59.9 Hz	209.0 V	209.0 V	207.0 V	51.4 A	16.2 A	46.6 A
12	Periodic	0	18-05-2016	14:42:25			119.0 V	121.0 V	121.0 V	60.0 Hz	209.0 V	209.0 V	207.0 V	51.8 A	16.2 A	38.6 A
13	Periodic	0	18-05-2016	14:41:25			120.0 V	121.0 V	121.0 V	59.9 Hz	210.0 V	210.0 V	208.0 V	51.6 A	16.2 A	38.6 A
14	Periodic	0	18-05-2016	14:40:24			119.0 V	121.0 V	121.0 V	59.9 Hz	209.0 V	210.0 V	208.0 V	52.0 A	16.2 A	38.8 A
15	Periodic	0	18-05-2016	14:39:23			119.0 V	121.0 V	121.0 V	59.9 Hz	209.0 V	210.0 V	208.0 V	58.6 A	16.2 A	38.6 A

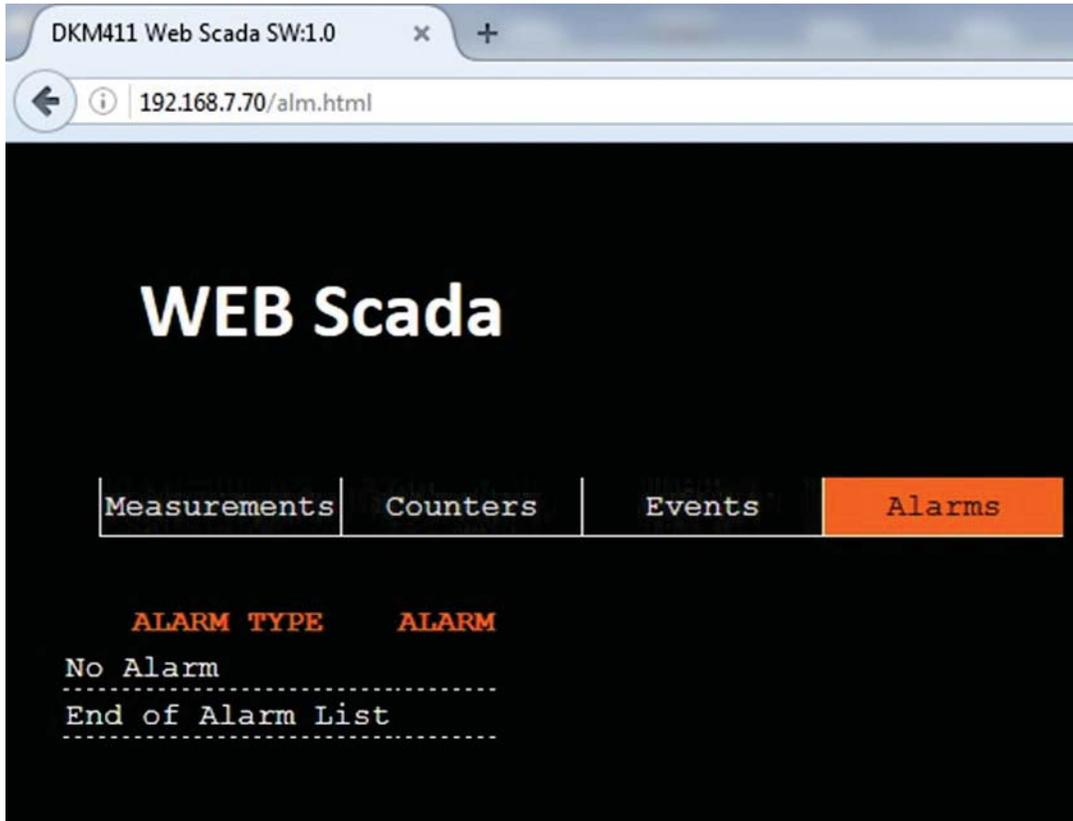
A periodic display of readings and alarms are displayed.





7. Internal Web Server (Continued)

Alarms



Any alarms that occurred are displayed here.



8. Local Data Logging

The front panel USB connector is for data logging on a USB flash drive. For correct operation the USB flash drive must be formatted for FAT32 file system. Detailed Data is time stamped and logged every 10 seconds.

A main folder will be created on the USB flash drive with a name made from the site ID. Within that folder, a folder for the year is created. The actual *.CSV data file is named with the convention of year, month and date.



A CSV file is a text file that can be opened with any text editor or in Microsoft Excel.



8. Local Data Logging (Continued)

Logged parameters are as follows:

- Date and time
- Ph-N voltages: V1-V2-V3
- Ph-Ph voltages: U12-U23-U31
- Phase currents: I1-I2-I3
- Frequency
- Average Ph-N voltage: Va
- Average Ph-Ph voltage: Ua
- Average current: Ia
- Total active power (kW)
- Total reactive power (kVAr)
- Total apparent power (kVA)
- Total power factor (pf)
- Demands: dI1-dI2-dI3-dIn-dkW-dkVAr
- Total harmonic distortion: V1-V2-V3-U12-U23-U31-I1-I2-I3-In



8. Local Data Logging (Continued)

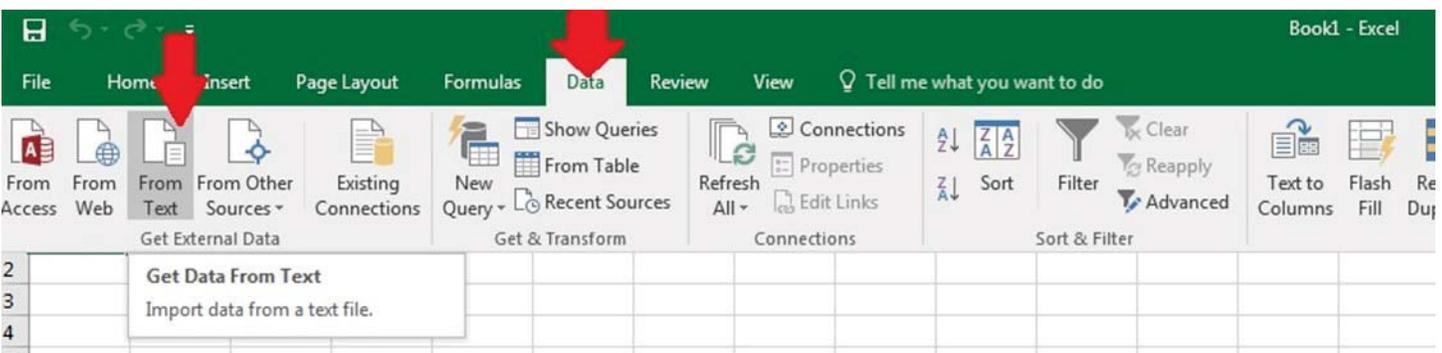
When you open a log file it will look like this:

Record Time	L1	L2	L3	L12	L23	L31	I1	I2	I3	In	Freq	V-avr	U-avr	I-avr	P	Q	S	PF	di1	di2	di3	dio	dkW	dkVar	THD L1	THD L2	THD L3	THD L12	
15:42:13	99.1 V	0.0 V	0.0 V	99.7 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.4 V	0.0 A	0.0 kW														
15:42:23	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.4 V	0.0 A	0.0 kW														
15:42:32	99.0 V	0.0 V	0.0 V	99.6 V	0.0 V	99.5 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.3 V	0.0 A	0.0 kW														
15:42:42	99.2 V	0.0 V	0.0 V	99.9 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.5 V	0.0 A	0.0 kW														
15:42:52	99.2 V	0.0 V	0.0 V	99.8 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.97 Hz	33.0 V	66.5 V	0.0 A	0.0 kW														
15:43:02	99.2 V	0.0 V	0.0 V	99.9 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.97 Hz	33.0 V	66.5 V	0.0 A	0.0 kW														
15:43:13	99.1 V	0.0 V	0.0 V	99.7 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	59.97 Hz	33.0 V	66.4 V	0.0 A	0.0 kW														
15:43:23	99.2 V	0.0 V	0.0 V	99.8 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.5 V	0.0 A	0.0 kW														
15:43:33	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	59.99 Hz	33.0 V	66.4 V	0.0 A	0.0 kW														
15:43:43	99.4 V	0.0 V	0.0 V	100.0 V	0.0 V	99.9 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.1 V	66.6 V	0.0 A	0.0 kW														
15:43:55	99.5 V	0.0 V	0.0 V	100.1 V	0.0 V	100.0 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.1 V	66.7 V	0.0 A	0.0 kW														
15:44:04	99.4 V	0.0 V	0.0 V	100.0 V	0.0 V	99.9 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.1 V	66.6 V	0.0 A	0.0 kW														
15:44:15	99.2 V	0.0 V	0.0 V	99.9 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.0 V	66.5 V	0.0 A	0.0 kW														
15:44:25	99.2 V	0.0 V	0.0 V	99.8 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.99 Hz	33.0 V	66.5 V	0.0 A	0.0 kW														
15:44:35	99.5 V	0.0 V	0.0 V	100.1 V	0.0 V	100.0 V	0.0 A	0.0 A	0.0 A	0.0 A	59.99 Hz	33.1 V	66.7 V	0.0 A	0.0 kW														
15:44:45	99.3 V	0.0 V	0.0 V	100.0 V	0.0 V	99.8 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.1 V	66.6 V	0.0 A	0.0 kW														
15:44:56	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.0 V	66.4 V	0.0 A	0.0 kW														
15:45:06	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.0 V	66.4 V	0.0 A	0.0 kW														
15:45:16	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.0 V	66.4 V	0.0 A	0.0 kW														
15:45:26	99.1 V	0.0 V	0.0 V	99.7 V	0.0 V	99.5 V	0.0 A	0.0 A	0.0 A	0.0 A	60.01 Hz	33.0 V	66.4 V	0.0 A	0.0 kW														
15:45:36	98.6 V	0.0 V	0.0 V	99.3 V	0.0 V	99.2 V	0.0 A	0.0 A	0.0 A	0.0 A	60.01 Hz	32.8 V	66.1 V	0.0 A	0.0 kW														

If you want to format the data into an excel sheet do the following (Excel 2016):

Open a new blank workbook

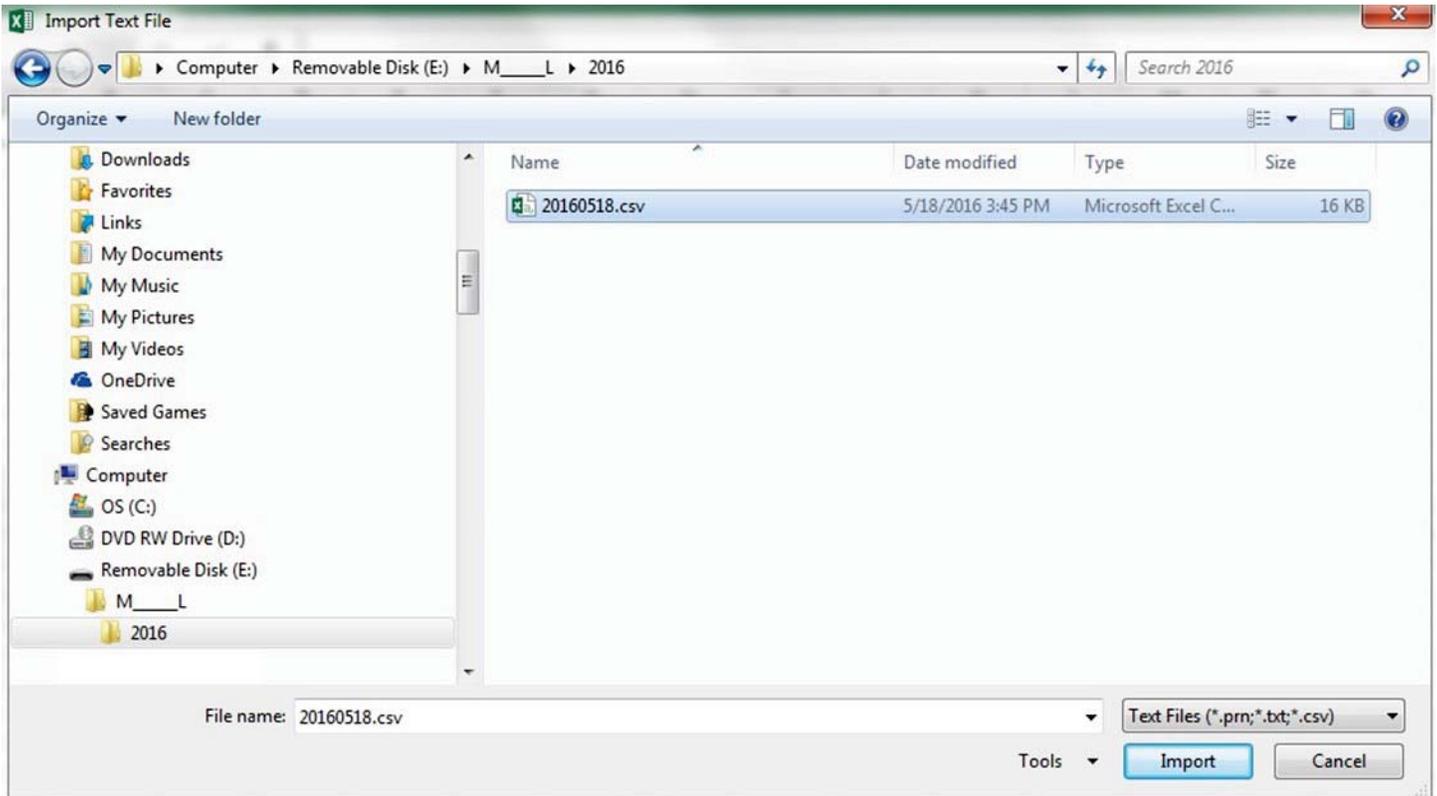
Select the DATA tab and then From Text





8. Local Data Logging (Continued)

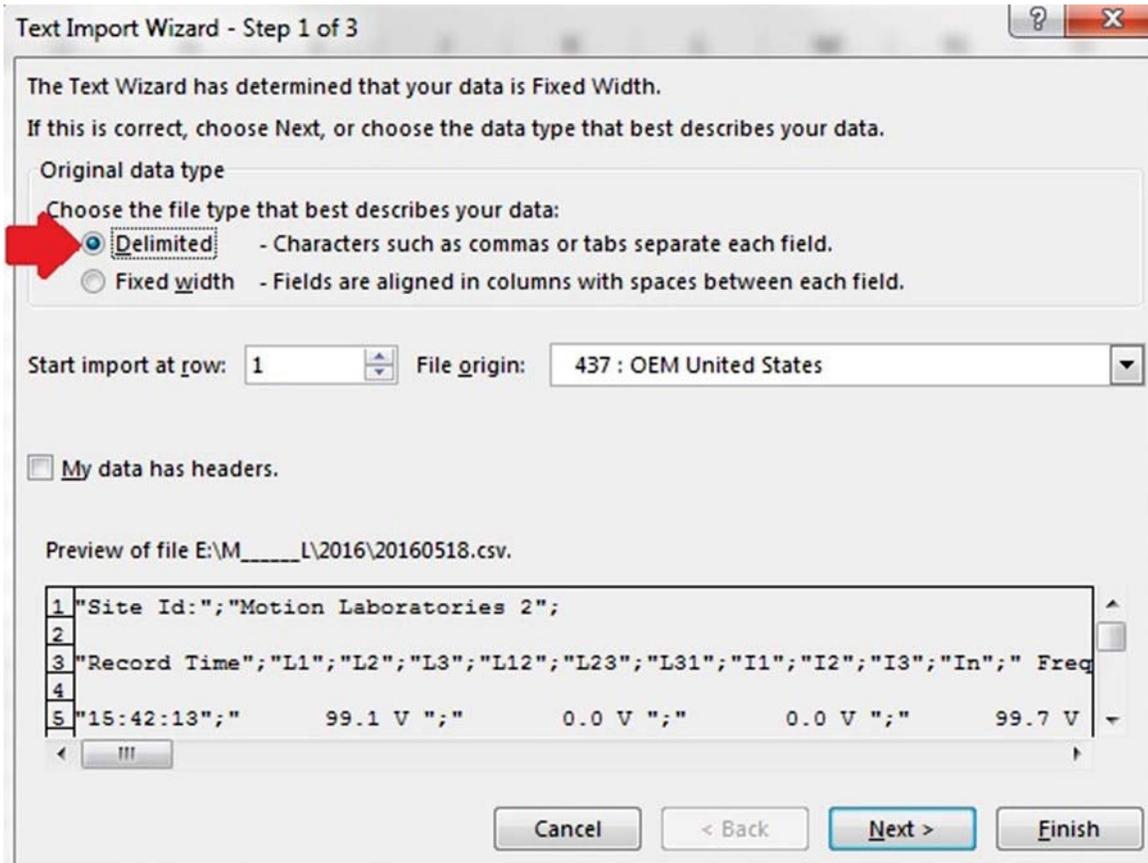
Choose the data log file you wish to import from your USB flash drive





8. Local Data Logging (Continued)

A text import window will display. Choose “delimited” then Next>





8. Local Data Logging (Continued)

For delimiters choose Semicolon then Finish

Text Import Wizard - Step 2 of 3

This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below.

Delimiters

Tab

Semicolon

Comma

Space

Other:

Treat consecutive delimiters as one

Text qualifier: "

Data preview

Site Id:	Motion Laboratories 2			
Record Time	L1	L2	L3	L12
15:42:13	99.1 V	0.0 V	0.0 V	99.7 V

Buttons: Cancel, < Back, Next >, Finish

A window will ask where you want to put the data. =SAS1 will put in the upper left corner. Choose OK.

Import Data

Select how you want to view this data in your workbook.

Table

PivotTable Report

PivotChart

Only Create Connection

Where do you want to put the data?

Existing worksheet:

=SAS1

New worksheet

Add this data to the Data Model

Buttons: Properties..., OK, Cancel



User Manual PM-XXX Series Power Meter



8. Local Data Logging (Continued)

Data will now be properly formatted for the spreadsheet. You can save and use the data as you wish.

Book1 - Excel																	
File Home Insert Page Layout Formulas Data Review View Tell me what you want to do																	
A1 Site Id: Motion Laboratories 2																	
Record Time	L1	L2	L3	L12	L23	L31	I1	I2	I3	In	Freq.	V-avr	U-avr	I-avr	P	Q	S
15:42:13	99.1 V	0.0 V	0.0 V	99.7 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.4 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:42:23	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.4 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:42:32	99.0 V	0.0 V	0.0 V	99.6 V	0.0 V	99.5 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.3 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:42:42	99.2 V	0.0 V	0.0 V	99.9 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.5 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:42:52	99.2 V	0.0 V	0.0 V	99.8 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.97 Hz	33.0 V	66.5 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:43:02	99.2 V	0.0 V	0.0 V	99.9 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.97 Hz	33.0 V	66.5 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:43:13	99.1 V	0.0 V	0.0 V	99.7 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	59.97 Hz	33.0 V	66.4 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:43:23	99.2 V	0.0 V	0.0 V	99.8 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.98 Hz	33.0 V	66.5 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:43:33	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	59.99 Hz	33.0 V	66.4 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:43:43	99.4 V	0.0 V	0.0 V	100.0 V	0.0 V	99.9 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.1 V	66.6 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:43:55	99.5 V	0.0 V	0.0 V	100.1 V	0.0 V	100.0 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.1 V	66.7 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:44:04	99.4 V	0.0 V	0.0 V	100.0 V	0.0 V	99.9 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.1 V	66.6 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:44:15	99.2 V	0.0 V	0.0 V	99.9 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.0 V	66.5 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:44:25	99.2 V	0.0 V	0.0 V	99.8 V	0.0 V	99.7 V	0.0 A	0.0 A	0.0 A	0.0 A	59.99 Hz	33.0 V	66.5 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:44:35	99.5 V	0.0 V	0.0 V	100.1 V	0.0 V	100.0 V	0.0 A	0.0 A	0.0 A	0.0 A	59.99 Hz	33.1 V	66.7 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:44:45	99.3 V	0.0 V	0.0 V	100.0 V	0.0 V	99.8 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.1 V	66.6 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:44:56	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.0 V	66.4 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:45:06	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.0 V	66.4 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:45:16	99.1 V	0.0 V	0.0 V	99.8 V	0.0 V	99.6 V	0.0 A	0.0 A	0.0 A	0.0 A	60.00 Hz	33.0 V	66.4 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:45:26	99.1 V	0.0 V	0.0 V	99.7 V	0.0 V	99.5 V	0.0 A	0.0 A	0.0 A	0.0 A	60.01 Hz	33.0 V	66.4 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA
15:45:36	98.6 V	0.0 V	0.0 V	99.3 V	0.0 V	99.2 V	0.0 A	0.0 A	0.0 A	0.0 A	60.01 Hz	32.8 V	66.1 V	0.0 A	0.0 kW	0.0 kVA	0.0 kVA





8. Local Data Logging (Continued)

An easier way to do this is to open the CSV file with a text editor (like notepad) and add one line to the file:

When you open the file with a text editor it will look like this:

```

20160617.csv - Notepad
File Edit Format View Help
"Site Id";"Motion Laboratories 2";
"Record Time";"L1";"L2";"L3";"L12";"L23";"L31";"I1";"I2";"I3";"In";" Freq."; "V-avr";"U-avr";"I-avr";"P";"Q";"S";" PF ";" dI1";" dI2";" dI3";"
"14:38:11";" 81.4 V ";" 0.0 V ";" 0.0 V ";" 82.2 V ";" 0.0 V ";" 82.1 V ";" 0.0 A ";" 0.0 A ";"
"14:38:22";" 81.7 V ";" 0.0 V ";" 0.0 V ";" 82.5 V ";" 0.0 V ";" 82.3 V ";" 0.0 A ";" 0.0 A ";"
    
```

Add at the top of the page SEP=; This will tell Excel a semicolon is the delimiter.

```

20160617.csv - Notepad
File Edit Format View Help
SEP=;
"Site Id";"Motion Laboratories 2";
"Record Time";"L1";"L2";"L3";"L12";"L23";"L31";"I1";"I2";"I3";"In";" Freq."; "V-avr";"U-avr";"I-avr";"P";"Q";"S";" PF ";" dI1";" dI2";" dI3";"
"14:38:11";" 81.4 V ";" 0.0 V ";" 0.0 V ";" 82.2 V ";" 0.0 V ";" 82.1 V ";" 0.0 A ";" 0.0 A ";"
"14:38:22";" 81.7 V ";" 0.0 V ";" 0.0 V ";" 82.5 V ";" 0.0 V ";" 82.3 V ";" 0.0 A ";" 0.0 A ";"
    
```

Data will now be properly formatted for the spreadsheet. You can save and use data as you wish.

Record Time	L1	L2	L3	L12	L23	L31	I1	I2	I3	In	Freq.
14:38:11	81.4 V	0.0 V	0.0 V	82.2 V	0.0 V	82.1 V	0.0A	0.0 A	0.0 A	0.0 A	60.01 Hz
14:38:22	81.7 V	0.0 V	0.0 V	82.5 V	0.0 V	82.3 V	0.0A	0.0 A	0.0 A	0.0 A	60.01 Hz



9. Specifications

FUESES

3 x 6 amp MDL Slo-Blo type



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9. Supplemental Documentation

There is currently no supplemental documentation available for this device.



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Notes