Energy Tracking, LLC.

Web Enabled Multi-Channel Pulse Data Logger (WEPM) with Ethernet Communications

Installation and Operation Manual

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Document Number: WEPM_2.0
Revision Date: July 2nd, 2007
Updated: August 18, 2008
Firmware Version: 080908_DLCE_A

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1.0 Overview:

The WEPM is a highly versatile and compact pulse input data logger with 10/100 Base-T Ethernet support and advanced reporting capabilities via email, ftp or it's built in web server.

2.0 Firmware Applications:

- DHCP or Fixed IP
- DNS client
- FTP client
- FTP server
- Email client
- Web Server
- SNTP client
- Day Time client
- International Time Zone Support

3.0 Standard Ports:

- Web Server - Port 80
- FTP Server - Port 21
- Email SMTP - Port 25
- Email POP3 - Port 110
- SNTP Server - Port 123
- Day Time Server - Port 13
- Real Time Output - Port 12345

4.0 Inbound / Outbound Services:

1. Simple Network Time Protocol: (SNTP) Is used to acquire / synchronize the time on the logger. Day Time Servers are accessed if SNTP fails to acquire time. The periodicity is hourly - based on user defined setting of 1 to 23 hours.

2. Email Client: Can be setup to send periodic reports via email immediately following the interval log. This is described later on in this manual.

3. FTP Client: Will behave similar to the email client. Files are uploaded to a user defined ftp server at the same instant that the email is being sent or only to the ftp server if email reporting is disabled.

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4. Real Time Output: Allows user to view ongoing operations of the logger.

5. FTP Server: Is used to upload new firmware version updates.

6. Internet Connection Check: The WEPM tries to connect to a user defined web server to confirm Internet availability before executing operations such as email or ftp. Default recommendation is to disable this access.

7. Web Server: Provides html web pages for Load Profile / Interval data, summation registers preview and allows user to setup and configure the WEPM.

5.0 Data Channels:

4 Pulse inputs (dry contact)
Maximum Pulse rate: 100 Hz

6.0 Memory:

4 MB Flash
8 MB SDRAM

7.0 Network Display LEDs:

Yellow: Provides indication of Ethernet link.
Green: Blinks on Ethernet activity.

8.0 Environmental:

Ambient Temperature: - 40 F to + 185 F (- 40 C to + 85 C)
Humidity: 5% to 90%
Altitude: 12,000 feet (3657.60 meters)

9.0 Network interface:

RJ-45 connector (8-pin)
10/100 BASE-T

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10.0 DC characteristics:

Supply Voltage: + 9 to 30 Volts DC
Supply Current: 300 mA (typical)

11.0 International EMC standards:

The embedded module meets the following electromagnetic emissions standards:

EN55022: 1998
EN55024: 1998
VCCI
AS 3548

12.0 Safety standards:

The embedded module meets the following electromagnetic emissions standards:

UL 60950
CSA 22.2 No. 60950
EN60950

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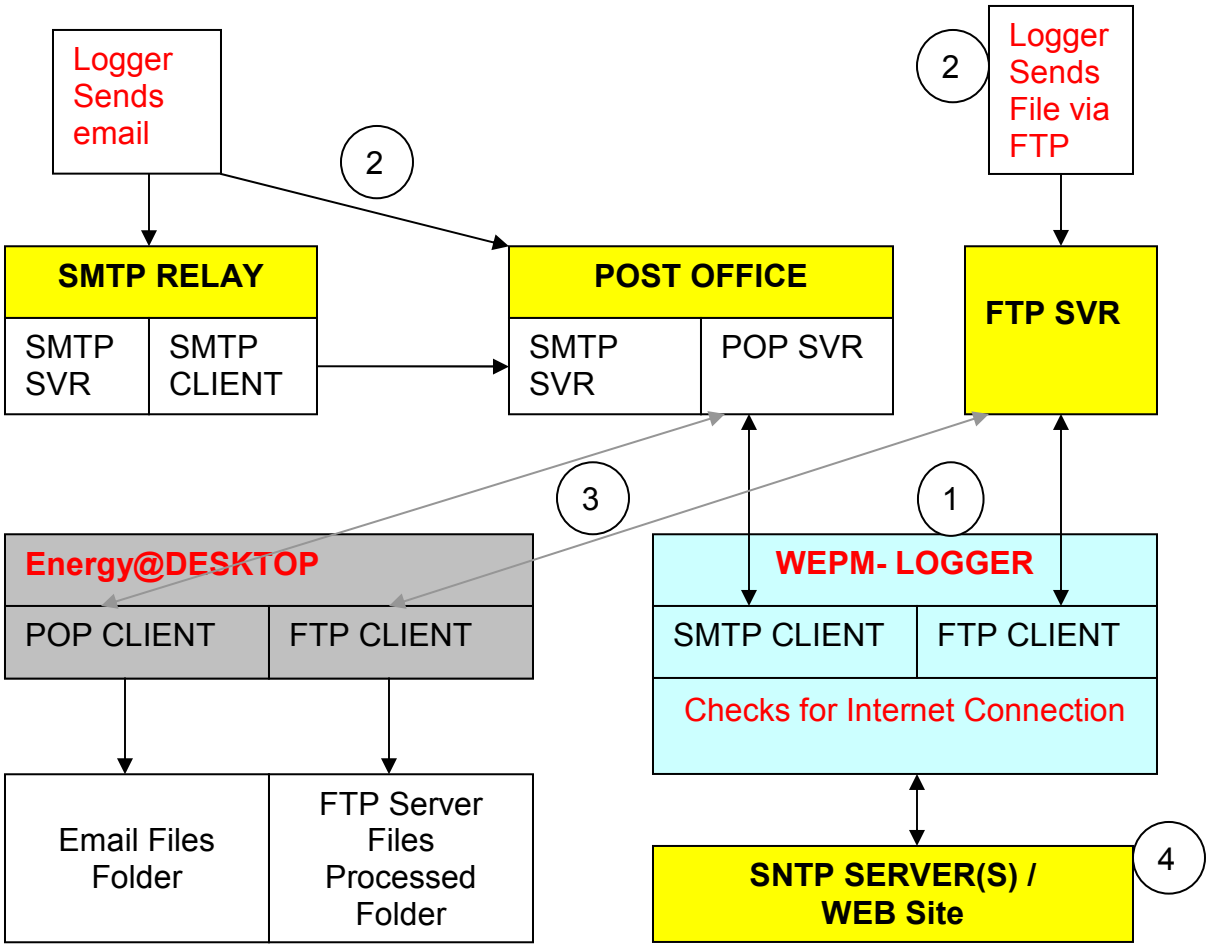

13.0 Sequence of Operations:

a. Logger can check for an Internet Connection periodically before initiating an email of ftp process. Note: Default recommendation is that you disable this checking in 'Main Configuration' as defined later in this manual.

b. Logger sends reports via email and / or data via FTP concurrently.

c. Energy@DeskTop software application periodically polls the POP and FTP Servers for data and stores the data in a local database.

d. SNTP Server is polled periodically for Time Synchronization.

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End User **MUST** have the following information prior to setup: (ALL fields under 31 characters). If the FTP is not used, disable the ftp access. Example:

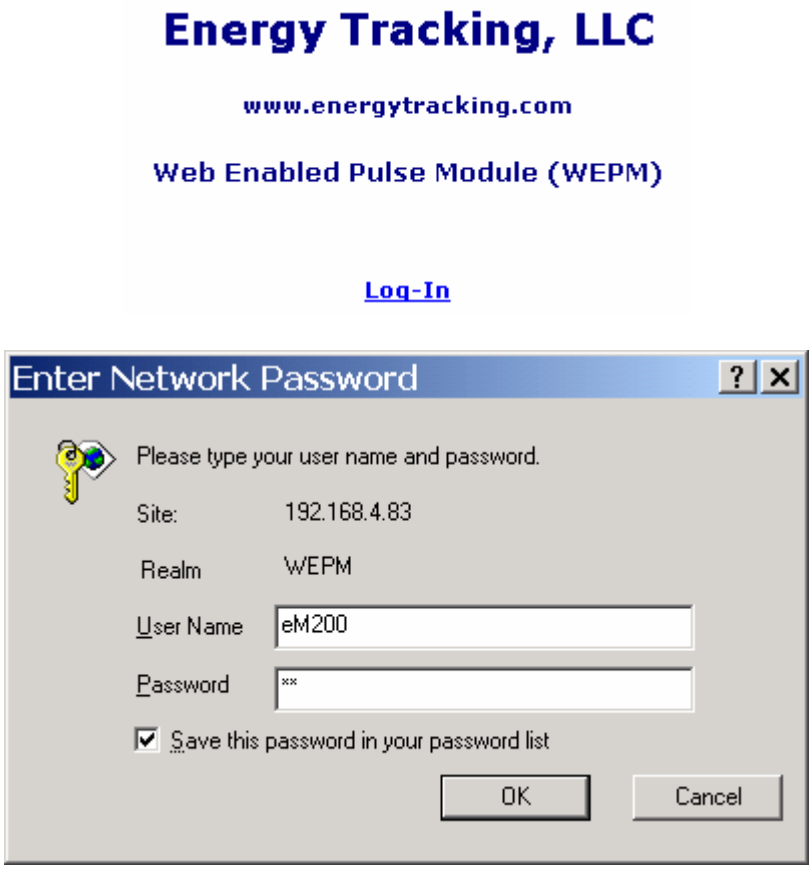
a. Outgoing mail server [SMTP]: smtp.1and1.com
b. email domain name: mydomain.com
c. FTP Address: ftp.mydomain.com
d. FTP user name: logger
e. FTP password: your password
f. FTP Directory: Directory / Folder name or leave blank if not required.

14.0 Default Operation:

The default setting on the logger has DHCP enabled. So, upon power up it will acquire an IP address. You can change this to a fixed IP Address if desired.

15.0 Web Server:

Log-In Page:



Logging In: Please note that the username and password **are** case sensitive.

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The username is: eM200
The password is: PW

Navigation:

Upon login you should see on the left frame:

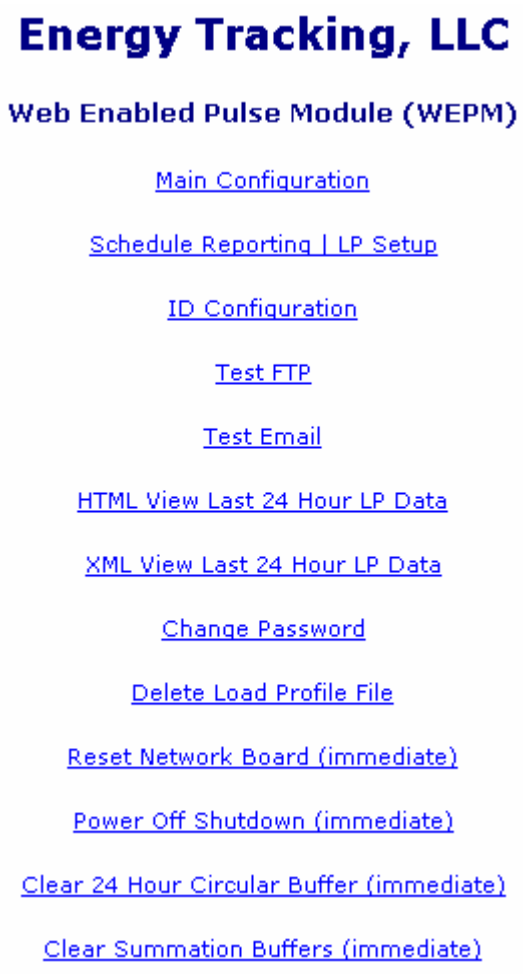
Home

Load Profile 24 Hrs.

Load Profile Flash

Setup

Clicking on 'Setup' you should see on the right frame:



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16.0 Version Display on Home Page:

ID	00000000000000000003
Address	Your Location
Time	07/13/08 02:40 Sunday
Serial Number	WEPM_LAB_UNIT
Version	071208_DLCE_B

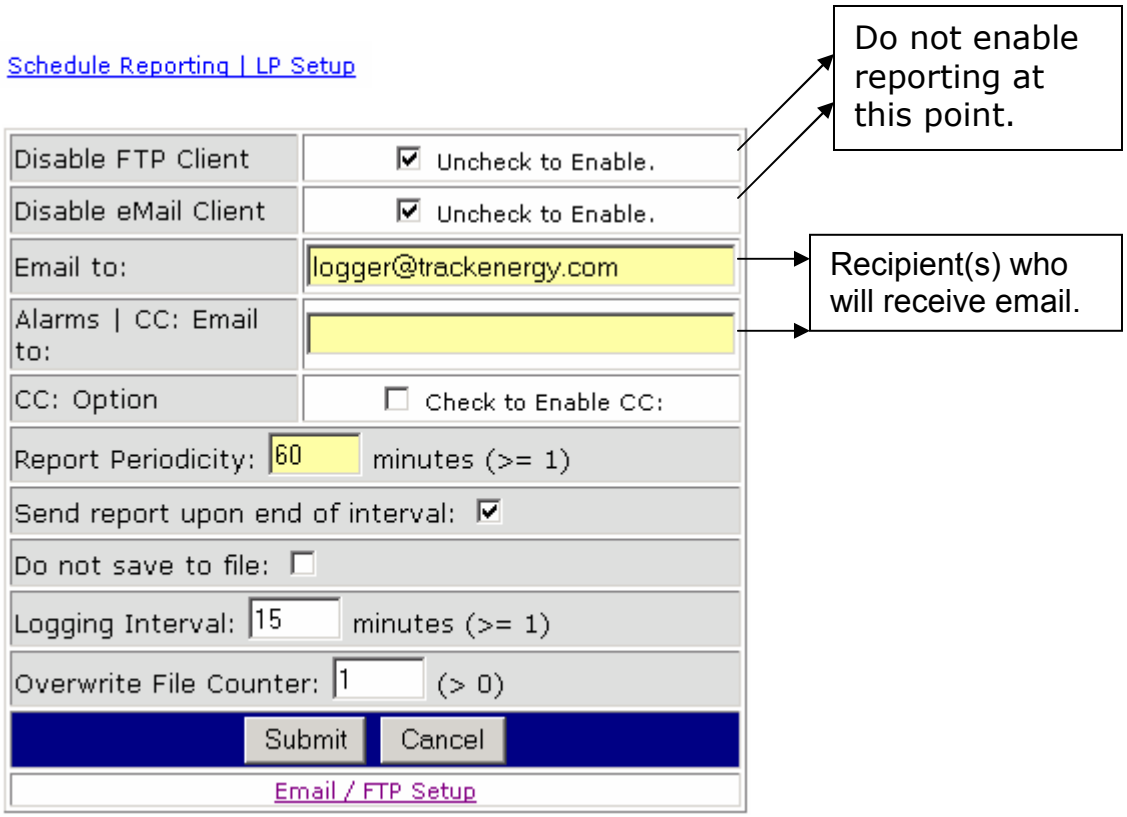
17.0 Saving Setup:

Note: Upon Clicking the 'Save' Button after modifying / entering information may take up to 30 seconds. Please be patient for the page to refresh.

18.0 Setting Up Logging Interval & Reporting:

Setup the logging interval, reporting periodicity and other key fields related to the logger's function.

Click on:



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Note: If a carbon copy (cc) is being sent, enable the checkbox.

Report Periodicity: This field defines how often the reports should be sent. For example; you may want to log data every 15 minutes and request the report every hour as shown above.

Send report upon end of interval: This field should be checked if you want the logger to immediately dispatch a report immediately after the log interval. The 'Report Periodicity' value will be ignored if this field is selected.

Logging Interval: This field defines how often the time stamped pulse data is logged (in minutes) to the file. Typically this is set to 15 or 30.

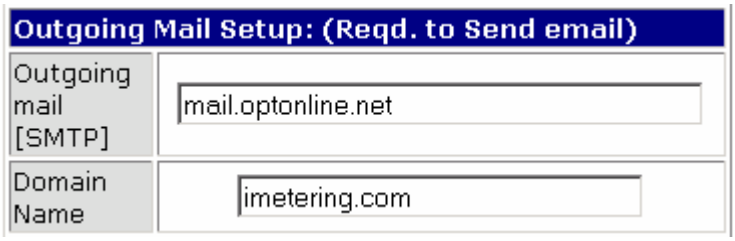
Overwrite File Counter: This defines when to delete the pulse data log file after a successful email and ftp update. Recommended values are between 1 to 2. Note: When the value is set to 2, it means that 2 reports must be successfully sent successfully in succession before the file is erased. The primary use of this field is to enable redundant data transmission to ensure data loss is minimized.

Do not save to file: This checkbox should be checked only if you are **not** enabling reporting via ftp or email.

Now, let's setup the mail and ftp servers.

Click on:

Main Configuration



Note: A very common startup question is about setting the SMTP server. You must use the SMTP mail server that is provided by your ISP. This is of course if you do not have your own mail server.

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19.0 Setting Up FTP:

Click on:

Main Configuration

FTP Setup:	
Ftp Server IP	ftp.imetering.com
FTP Account Name	logger
FTP Password	*******
FTP Directory	Data

20.0 DNS Client:

If you are going to use the logger with a fixed IP address, then you must enter DNS1 and / or DNS2 fields. If DHCP is used, then disregard unless you wish to enter your specific DNS servers.

DNS Setup: (Reqd. if using a Fixed IP Address)	
DNS 1	
DNS 2	

21.0 Disabling Email or FTP:

Application Setup	
Disable FTP Client	☐ Uncheck to Enable.
Disable eMail Client	☐ Uncheck to Enable.

If the check box is checked, then the feature is disabled.

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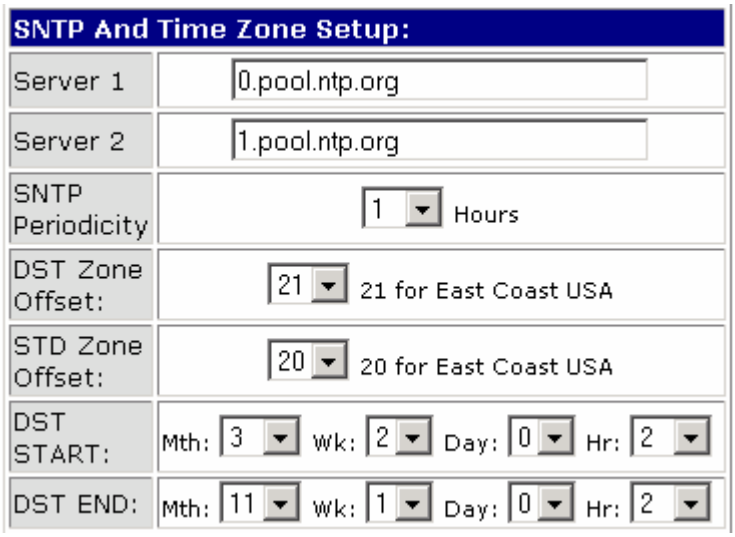
22.0 SNTP and Time Zone:



Servers 1 & 2: Allows you to define the SNTP Servers where Server 2 is the backup.

Periodicity: This setting defines how often the internal Real Time Clock should be synchronized with the Internet Time Server(s) defined in Server 1 & 2.

DST Zone Offset: This selection is for Daylight Savings Time.

STD Zone Offset: This selection is for Standard Time.

Based on the values selected for DST / STD Zone, the Time Clock on the meter will automatically get adjusted.

Note: For UK, the DST Zone offset is: 1 STD Zone Offset is: 0

Values 1 to 12 represent **positive** hour offsets from UTC (Universal Coordinated Time) where a selected value of 1 means 1+ hour from UTC.

Values 13 to 24 represent **negative** hour offsets from UTC where a selected value of 13 means, '-12' hours from UTC and a selected value of 24 means, '-1' hour from UTC.

23.0 Saving Setup:

Note: Click 'Save' (at the bottom of page) after modifying / entering information. This may take up to 30 seconds. Please be patient for the page to refresh.

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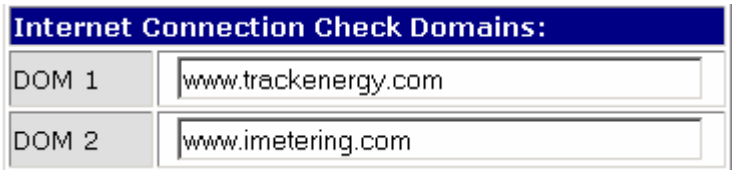
24.0 Identifying if an Internet Connection Exists:

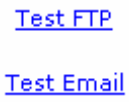
The WEPM needs to identify if Internet access is feasible before it sends email or for functions such as acquiring the time via SNTP. It will try to connect to User defined domain web server using port 80.



User can disable this feature. DOM1 is the primary domain that is checked for internet connection and DOM2 acts as a backup. **Please Note: We strongly recommend that the default (disabled) setting be utilized.**

25.0 Confirming the FTP or Email Setup:

Click on:



'Test FTP' will provide an immediate response if a test file was placed on the ftp server.

To confirm Test Email, click on the link that is displayed after 5 seconds or check the email mail box for confirmation.

Alternatively, use the Discover IP Application (ET Debugger) and check the logger's operation. This is available from our corporate web site.

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26.0 How and When to Reset the WEPM:

Click:

Reset Network Board (immediate)

This will result in an immediate reset of the WEPM and the Web Server page will not respond. This should typically not take more than 1 minute if an Internet connection is available else, it may take as much as 3 minutes. Close your browser and access the WEPM's web server after 2 – 3 minutes.

A reset should be done when key information is modified such as email setup, SNTP server configuration, changes in fixed IP address, etc.

27.0 Deleting the Load Profile File in the WEPM:

Click:

Delete Load Profile File

This option can be utilized if you want to delete the load profile data.

28.0 Viewing Interval Data on the web server:

Click:

Load Profile 24 Hrs.

Load Profile Flash

The 'Load Profile 24 Hrs' link will display the last 24 hours interval data provided it has not been already reported to the FTP server.

The 'Load Profile Flash' link will display interval data that is resident in the WEPM's internal flash memory. Under normal operation, this file will be blank.

If data does exist, you should see Summation counts for each channel followed by the time stamped interval data.

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W.E.P.M

Summation Values

Time (mm.dd.yyyy)	C0	C1	C2	C3
07/13/2008 02:15:00	1435593452	1435593426	1435594405	1435593426

Format: Time Stamp, Channel 1, Channel 2, Channel 3, Channel 4

Time (mm.dd.yyyy)	C0	C1	C2	C3
07/13/2008 02:15:00	89886	89886	89886	89886
07/13/2008 02:00:00	89877	89877	89877	89877
07/13/2008 01:45:00	89874	89874	89874	89874
07/13/2008 01:30:00	89873	89873	89873	89873
07/13/2008 01:15:00	88050	88050	88050	88050
07/13/2008 01:00:00	91703	91703	91703	91703

29.0 Circular Buffer Details (CB):

a. If communications via email and ftp are disabled, then the WEPM will only log interval data to the circular buffer (CB). The CB can vary in size depending on the load profile interval from 1 minute to 60 minutes. The CB will have 1440 entries if the load profile interval is 1 minute. The CB will have 24 entries if the load profile interval is 60 minutes.

b. If communications are enabled via email and/or ftp and a loss in communications occurs for an extended period; the CB will fill up. In such a case, the load profile data is then written to the on board flash memory. When communications resume, the entire contents of the CB and flash memory will be reported via ftp.

Note: The flash memory is 400kB and when this gets filled, no load profile data is stored. The Summation registers will continue to be updated. This leads to the question of the amount of storage space in the WEPM.

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30.0 Storage Space:

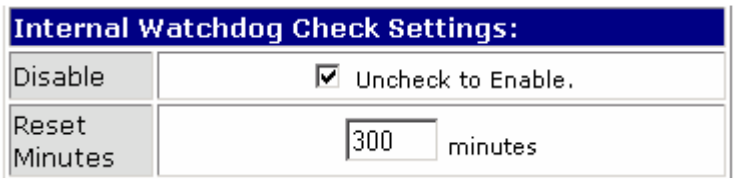
On an average, the 15 minute load profile logging will consume around 75 bytes. 1440 minutes per day / 15 = 96 entries. One Day memory usage is: 96 X 75 = 7200 bytes.

Capacity: 400000 / 7200 = **55 days**

Note: Please contact our support department for more details. The storage capacity has been purposely limited and can be further increased if required. Typical operation does not utilize the flash storage memory. The device will directly save the load profile data to RAM and generate reports from it. In the event of a power failure, the CB and summation registers are saved to flash memory.

31.0 Using the Internal Watchdog:

It is possible under extremely rare conditions when the email or ftp modules fail to execute periodically. Causes are surges, improper socket disconnection by remote host, network instability, etc. The user can set a value in minutes to allow the logger to auto re-boot if no network activity occurs within that time. The application only looks at this value when no access is made to the web server, or no emails are sent or no ftp files are sent within the set period. Our strong recommendation is to keep this field Disabled.



32.0 Date Time Format US – Europe:

This feature allows you to change the display and logging of the date and time.

US: mm/dd/yyyy hh:mm:ss

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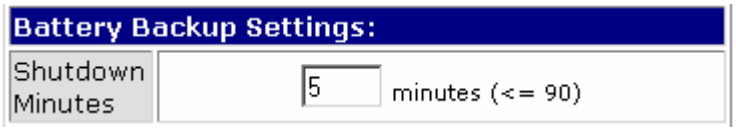
Europe: dd/mm/yyyy hh:mm:ss

33.0 Battery Backup Option and Duration:



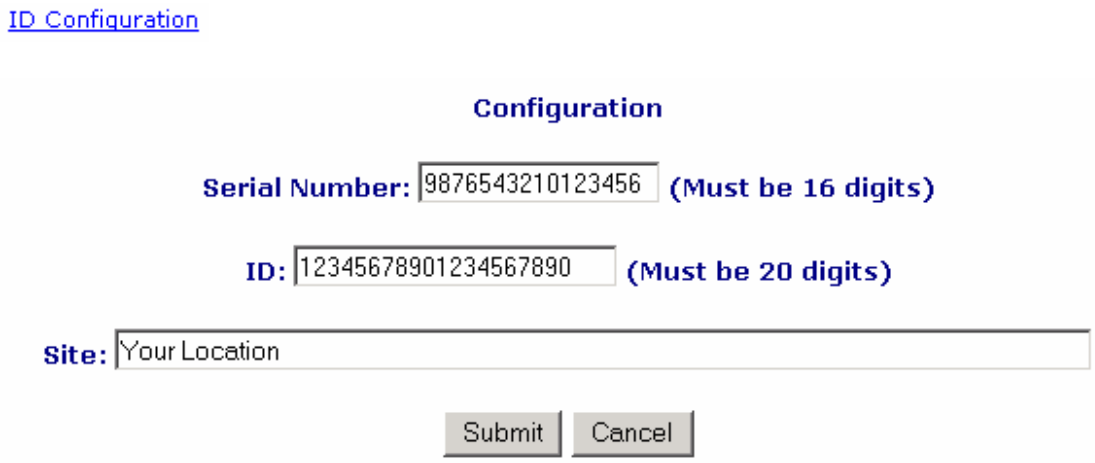
The logger comes with a Lithium-Ion rechargeable battery capable of operation for 90 minutes upon a full charge. A recharging circuit is built-in. You can set the value for how long you would like the logger to wait for external power to return.

34.0 Power Off – Shutting the WEPM Off:

The WEPM has an internal Lithium ion battery that serves as a back up when a power failure occurs as defined above. This link is added when you want to immediately power down the device. Another example of this functionality is when you want to immediately move the WEPM from one LAN to another where the dynamically acquired IP address, subnet and gateway are discarded.

35.0 Customizing ID and Serial Number:

Click:



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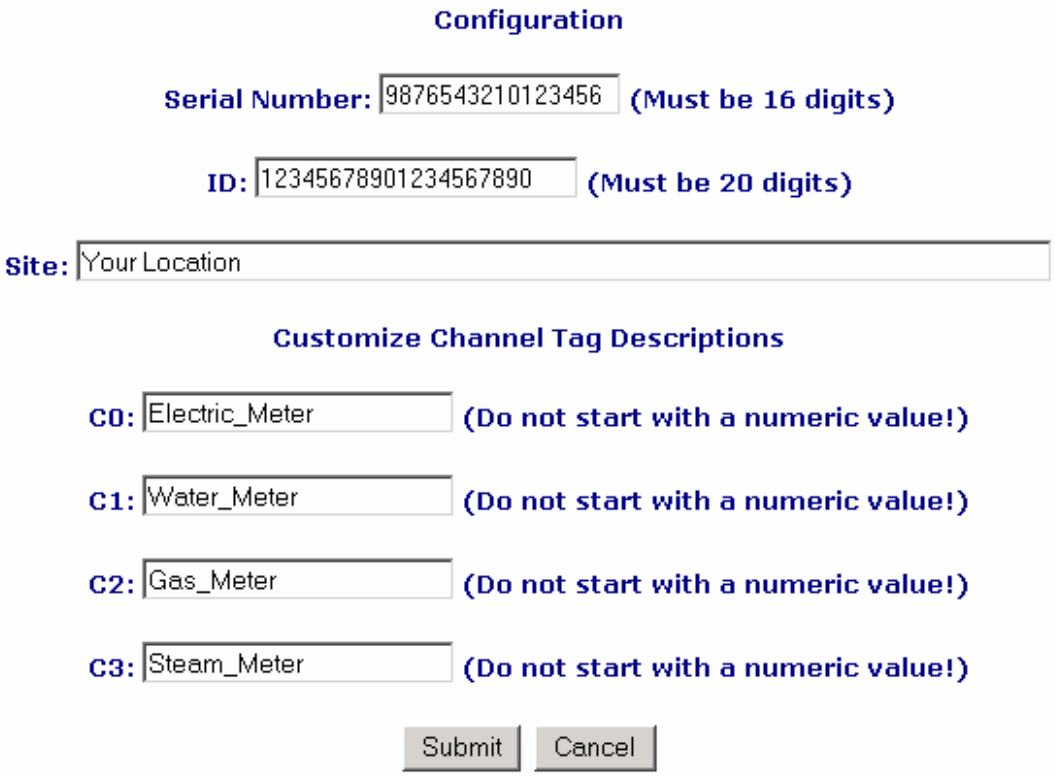
Via this web page you can setup a unique alpha numeric Serial Number and / or ID including the location of the WEPM.

36.0 Custom Channel Tags:

The default CO, C1, C2 and C3 channel tags can be replaced with user identified tags.



Please Note: Energy@DeskTop application will not work using custom tag description.

37.0 Accessing Load Profile Data via Local Network:

This functionality is provided for third party developers who want to access the load profile / interval data.

Click:

XML View Last 24 Hour LP Data

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This page will be blank. Right click on the page and select ‘View Source’. The XML data will be displayed in notepad.exe

The page can be accessed via:

http://xxx.xxx.xxx.xxx/ShowXMLPulseData.htm

38.0 FTP Reporting Format:

```
  <VER>071208_DLCE_B</VER>
- <SB>
    <TS>07/13/2008 02:30:00</TS>
    <C0>1435683341</C0>
    <C1>1435683315</C1>
    <C2>1435684294</C2>
    <C3>1435683315</C3>
  </SB>
+ <LPD>
- <REC id="150">
    <TS>07/13/2008 02:30:00</TS>
    <C0>89889</C0>
    <C1>89889</C1>
    <C2>89889</C2>
    <C3>89889</C3>
  </REC>
- <REC id="135">
    <TS>07/13/2008 02:15:00</TS>
    <C0>89886</C0>
    <C1>89886</C1>
    <C2>89886</C2>
    <C3>89886</C3>
  </REC>
```


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39.0 FTP Field Reporting Structure:

Tag	Description
<XML id = "meter">	XML Starting Tag
<DATA>	DATA Starting Tag
<Email_Sch>	Primary Email Recipient
<Email_Alarm>	Email CC:
<SRL_NUM>1111111111110103</SRL_NUM>	Meter Serial Number
<METER_ID>11111111111111110103</METER_ID>	Meter Identification Number
<METER_ADDR>WEM Location</METER_ADDR>	Meter Address
<METER_TIME>02/15/07 15:58 Thursday</METER_TIME>	Meter Time
<IP>192.168.4.98</IP>	Meter's IP Address
<TSF>1</TSF>	Time Stamp Format
<MODEL>WEPM</MODEL>	Product Model
<VER>042808_DLCE_A</VER>	Firmware Version
<SB>	Summation Counts
<LPD>	Latest Interval Load Profile Data
<REC id = "xxx">	Historical Load Profile Data

<TSF> - Time Stamp Format.

Values: 1 – US format. 2 – UK format.

<SB> - Summation Counts:

The WEPM will report the total pulse counts for each channel.

<TS> - Date Time Stamp

<LPD> - Latest load profile interval. This is the last load profile interval that was logged before the report was sent.

<REC id="xxx"> Historical load profile data where the id = Hours X 60 + Minutes.

<C0> - Channel 1 pulse counts
<C1> - Channel 2 pulse counts
<C2> - Channel 3 pulse counts
<C3> - Channel 4 pulse counts

40.0 Debugging and Setting Up:

Download the 'Discover IP' Application from our corporate web site.

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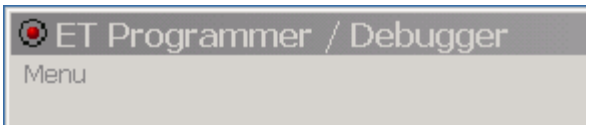
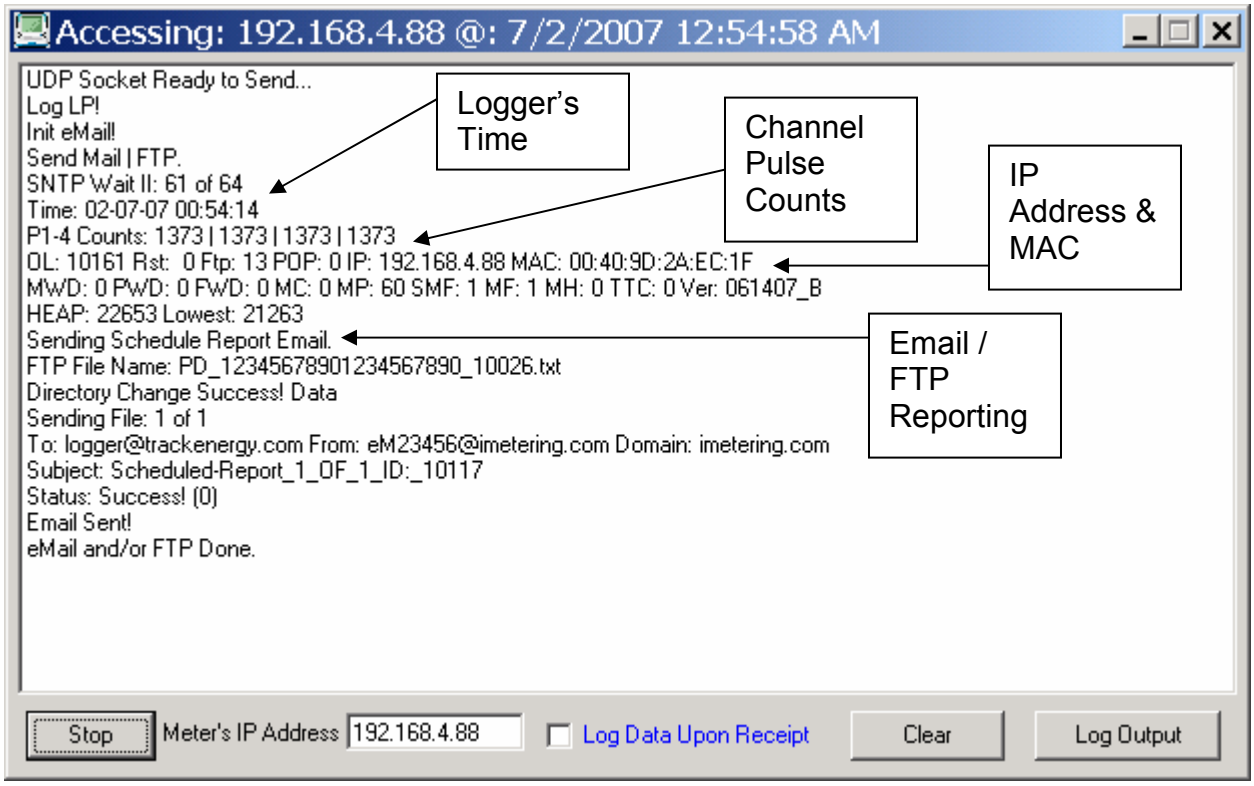


Under the menu command, you will have a sub menu option ‘Debug’.

Click on the ‘Start’ button on the lower left hand corner. Within a minute you will see responses as shown.



The goal of this application is to help identify the logger’s IP address; setup and test email / ftp as well as display start up operation.

41.0 Clearing the 24 hour Circular Buffer:

Click:

Clear 24 Hour Circular Buffer (immediate)

This will clear the buffer.

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42.0 Clearing Summation Counters:

This will clear the summation values for each channel.

43.0 Product Warranty / Service:

A. Limited Warranty Statement

1. Energy Tracking ("ET") warrants to the end-user customer, who provides adequate proof of purchase that ET hardware products purchased from ET or its authorized dealers will be free from defects in materials and workmanship for a period of one (1) year from the date of purchase. This warranty applies only to the original end-user purchaser and is non-transferable. Conditions and limitations of ET's warranty are stated below.

2. ET's limited warranty covers only those defects which arise as a result of normal use of the hardware and does not apply to any:

a. improper or inadequate maintenance;
b. incompatibilities due to the user's hardware or software applications with or in which the ET product interfaces;
c. product of a special or custom-made nature;
d. unauthorized modification or misuse;
e. improper installation, misapplication or negligence;
f. operation outside the product's environmental specifications;
g. improper site preparation or maintenance;
h. software;
i. other causes that do not relate to a product defect;
j. defects or damage suffered as a result of force majeure (including theft);
k. defects or damage suffered as a result of normal wear and tear; and/or
l. stolen goods.

3. If ET receives, during the applicable warranty period, notice of a defect in a warranted hardware product and the defective ET product in question, ET shall at its sole option, either repair or replace the product, and shall return the repaired product or a replacement product within a reasonable time. The replacement product may not be new, provided that it has functionality at least equal to that of the product being replaced.

4. This warranty is valid in any country where ET hardware products are distributed by ET or its authorized dealers.

5. This Limited Warranty Statement gives the customer specific legal rights. The customer may also have other rights which vary from state to state in the United States, from province to province in Canada, and from

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country to country elsewhere in the world.

B. Limitations of Warranty

1. NEITHER ET NOR ANY OF ITS THIRD PARTY SUPPLIERS MAKES ANY OTHER WARRANTY OF ANY KIND, WHETHER EXPRESSED OR IMPLIED, WITH RESPECT TO ET PRODUCTS. ET SPECIFICALLY DISCLAIMS (and the customer, by accepting the ET product, specifically accepts such disclaimer and waives) ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR OR INTENDED PURPOSE OR USE AND THE WARRANTY AGAINST LATENT DEFECTS, WITH RESPECT TO THE HARDWARE AND/OR SOFTWARE. ET FURTHER DISCLAIMS ANY WARRANTY THAT ET PRODUCTS, IN WHOLE OR IN PART, WILL BE FREE FROM INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY OR PROPRIETARY RIGHTS.

2. To the extent that this Limited Warranty Statement is inconsistent with the law of the locality where the customer purchases the ET product, this Limited Warranty Statement shall be deemed modified to be consistent with such local law. Under such local law, certain limitations of this Limited Warranty Statement may not apply to the consumer.

3. To the extent allowed by local law, the remedies provided in this Limited Warranty Statement are the customer's sole and exclusive remedies.

C. Limitations of Liability

1. EXCEPT FOR THE OBLIGATIONS SPECIFICALLY SET FORTH IN THE LIMITED WARRANTY STATEMENT, IN NO EVENT SHALL ET BE LIABLE FOR:

a. any direct, indirect, special, incidental, consequential, foreseeable or unforeseeable, or punitive damages, whether based on contract, tort, delict or any other legal theory and whether advised of the possibility of such damages; and/or

b. damages arising from the loss of use, data, production revenue and/or profit of in connection with the ET product or any business interruption.

2. Without prejudice to the foregoing, any liability of ET for any breach of warranty shall be limited to the amount paid by the customer for the defective hardware in question.

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3. To the extent allowed by local law, ET's entire liability and the customer's exclusive remedy shall be the repair or replacement of any defective product during the warranty period. ET does not offer any other warranty with respect to ET hardware or software or any other hardware or software.

4. Customer shall be responsible for all applicable taxes, duties and customs fees on any replacement unit, as well as all transport, insurance, storage and other charges incurred on all returned products.

D. Obtaining Service

1. Verify that your ET product was installed and configured according to the information in its accompanying documentation.

2. Read the "Support / FAQ" information included with the ET product to see if you can solve the problem yourself.

3. If you are still experiencing difficulties, please contact your dealer where you purchased your ET product. Email support: support@energytracking.com

4. If you must return a ET product, leave the configuration as it was when you were using it, and leave all identification stickers on the product. Pack the product in its original box and return to ET or your ET dealer where the product was purchased, together with your proof of purchase. Your ET dealer will return the product for you. Alternatively, if this first option is unavailable to you, you may contact the ET Technical Support group (support@energytracking.com) who will issue an Return Merchandise Authorization (RMA) number, upon receipt of adequate proof of purchase, and inform you of shipping instructions.

DO NOT RETURN THE PRODUCT TO ET WITHOUT ET'S RMA NUMBER AND EXPRESS AUTHORIZATION.

E. General

This limited warranty shall be governed by the laws of the New Jersey, USA and the federal laws of the United States applicable therein and the courts of New Jersey shall have exclusive jurisdiction to hear and decide any dispute instituted by the customer in connection with this limited warranty; the customer waives, by accepting the product, its rights to institute proceedings in connection with this warranty against ET in any jurisdiction other than New Jersey.

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