

RINGDALE[®]
1569 Energy Monitor
and
Energy Analyzer Application
Quick Integration Guide
Ethernet Version

Revision: 1.0
Date: October 14, 2008

Copyright, Disclaimer and Trademarks

Copyright

Copyright 1997-2008 © Ringdale, Inc. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or any computer language, in any form or by any third party, without prior permission of Ringdale UK Limited.

Disclaimer

Ringdale, Inc. reserves the right to revise this publication and to make changes from time to time to the contents hereof without obligation to notify any person or organisation of such revision or changes. Ringdale, Inc has endeavoured to ensure that the information in this publication is correct, but will not accept liability for any error or omission.

NOTE:

Because of the fast pace of software development it is possible that there will be minor differences between the manual and the actual release of the program.

Trademarks

All trademarks are hereby acknowledged.

Table of Contents

Copyright, Disclaimer and Trademarks	2
Table of Contents	3
Introduction	5
Energy Monitor Hardware	5
Energy Monitor Current Sensors (Current Transformers)	6
Energy Analyzer Application	6
Configure	6
Program	6
Monitor	6
Connecting an Energy Monitor	7
Programming Location	7
Once programmed and ready to install	7
Configuring an Energy Monitor	9
General	11
TCP/IP	12
E-mail Settings	14
Time and Date	15
CT Select	16
Debug	17
Controlling the Energy Monitor	18
Listen to Device	18
Manual Control	19
Device Status	19
Calibration	19
Records Panel	20
Incoming Records	20
Save Records	20
Log Records	21
Programming an Energy Monitor	22
Program Device	23
Sample Frequency	23
Start and Stop Times	24
Monitor Mode	25
Alarms	26
Setting up an Energy Monitor – Using a Web Browser	27
Configuration	28
Configuration - General Settings	28
Configuration – Password	28
Configuration – TCP/IP	29
Configuration – E-Mail Settings	30
Configuration – Time and Date	31
Configuration – CT Select	32
Configuration – Reset to Defaults	33
Programming	34
Control	35
Monitor Control	35
View Waveform	36
Status	37
Contents	37
About	38
Collecting Monitor Records	39
Output files	40

Technical Specifications	41
Records Definitions.....	41
Glossary.....	43
Technical Support Contact Information	44

Introduction

The Energy Monitor is a 3-phase current transformer data logger with either an Ethernet or a USB interface. The Energy Monitor may be programmed to monitor various different aspects of electrical power. An application is required to set up the Energy Monitor and to analyse the various types of readings it will produce.

The application has multiple modes of operation. It is first used to set up the Energy Monitor so that it may collect data. Later it is used to retrieve and analyse that data. It may also analyse data as it arrives in real time.

The part number for the Ethernet version of the product is 00-11-0569-0000. For the USB Version, see part number 00-11-0569-0001.

Energy Monitor Hardware

The Energy Monitor is available with either an Ethernet or a USB interface.

Ethernet Connected

The device is connected to a LAN and may be powered by either PoE or a 12V supply. In this mode the unit may send emails or other alerts when programmed conditions are encountered or in response to a programmed schedule. Data may be transmitted on the LAN and also stored on an external flash drive. The User interface will be through either the Energy Analyzer application or with a web browser.

USB Flash Drive

Data may be transmitted to the computer for storage and/or stored on an external flash drive.

The Energy Monitor offers a USB port for connection of a Flash Drive. Data samples will be written to a compatible Flash Drive as they are obtained and may be viewed and analysed later. The Flash Drive may be removed (when safe to do so) and plugged directly into a PC for data analysis using the EnergyAnalyzer application.

The Flash Drive must use the 'USB Mass Storage Class' with a sub-class of 'SCSI transparent' and the transport protocol 'Bulk-Only Transport'.

Examples of Flash Drives that use these standards are:

- Ringdale USB 2.0 1GB
- Pretec I-Disk
- SanDisk 1GB Cruzer Micro

The Flash Drive should be formatted as FAT16.

The Energy Monitor expects a file named "Datalog.bin" in the root directory and the data area of that file to be contiguous. Once created, the same file will be re-used. Do not move or copy the file on the drive as this may result in fragmentation and the possible corruption of the disk storage structures.

The file size determines the maximum number of samples that may be stored within it. At the maximum file size of 512MB, approximately 16.7 million data sample records may be stored, 19.4 days when sampling at a 1/10 second frequency.

Energy Monitor Current Sensors (Current Transformers)

The Energy Monitor must be ordered with appropriate Current Sensors, also known as amp clamps, or Current Transformers. There are two points to be aware of when ordering your Current Sensors:

- 1) Current Sensors are not accurate if the current is below 10% of the current rating. So it is important to order the Current Sensor that has the lowest current rating to fit your needs.
- 2) You must order a Current Sensor that has a burden resistor to protect the Energy Monitor circuitry. Do not order Current Sensor's with part number that end in -0000 if it is to be used with the Energy Monitor.



Energy Analyzer Application

The Energy Analyzer Application is used to configure, program and monitor one or more devices.

Configure

The term "configure" means setting up the Energy Monitor's name, TCP/IP, E-mail, and Time & Date parameters.

Program

This refers to instructing the Energy Monitor when to start sampling and how often.

Monitor

This function is used to 1) set the application to listen to the device, 2) set it to collect records and determine where the record file is kept, and 3) whether to save records and/or logs.

Records are binary data.

Log Records are interpreted records that are readable text.

Connecting an Energy Monitor

Programming Location

For convenience, an Energy Monitor should be configured before locating it at the place where it will be coupled to the power lines. Although this is not mandatory, there may not be easy access to the network.

For the purpose of programming, connect the device to the network in any convenient location.

Connect the power supply into the wall socket and the Energy Monitor.

Once programmed and ready to install



- 1) Plug the USB Flash in if you have it.
- 2) If Ethernet is available plug the Ethernet cable into the RJ45 jack. PoE cables can be a maximum of 36 feet. If not using PoE, you can connect up to a maximum of 100 Meters (328 feet, 109 yards).



IMPORTANT NOTE: The user should exercise caution in connecting the voltage and current inputs since the connection points may be live. It would be best to disconnect power when connecting but that may not be practical in all cases. Inspect the voltage and current sensing cables for damaged insulation and exposed conductors before each use and do not use if damage is found. Replacement voltage cables and current transformers may be purchased from Ringdale and current transformers with damaged cables may be returned for repair.

3) There is only one way to connect the voltage and current sensing cables to the Energy Monitor:

- ✓ The current transformers clip around current-carrying conductors and connect to the Energy Analyzer at the AØ, BØ, and CØ Current inputs.
- ✓ The red and green connectors are used to measure voltage.
- ✓ The green connects to the neutral (grounded) conductor.
- ✓ The red wires connect to each of the 3 voltage phases. The red wire adjacent to the green wire is for the AØ. The next red wire is the BØ. The last red wire is the CØ.

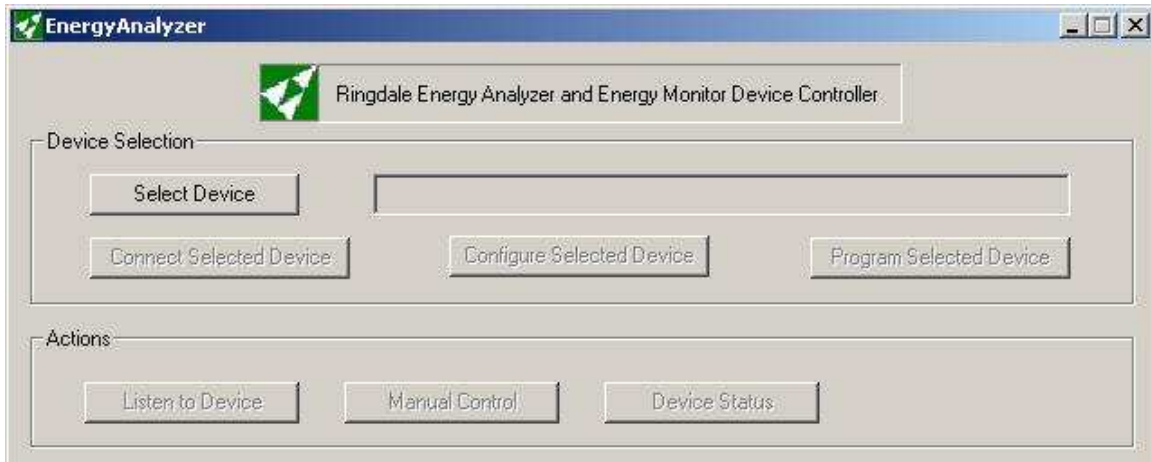
4) Unless using PoE, connect the power supply into the wall socket and the Energy Monitor.

Configuring an Energy Monitor

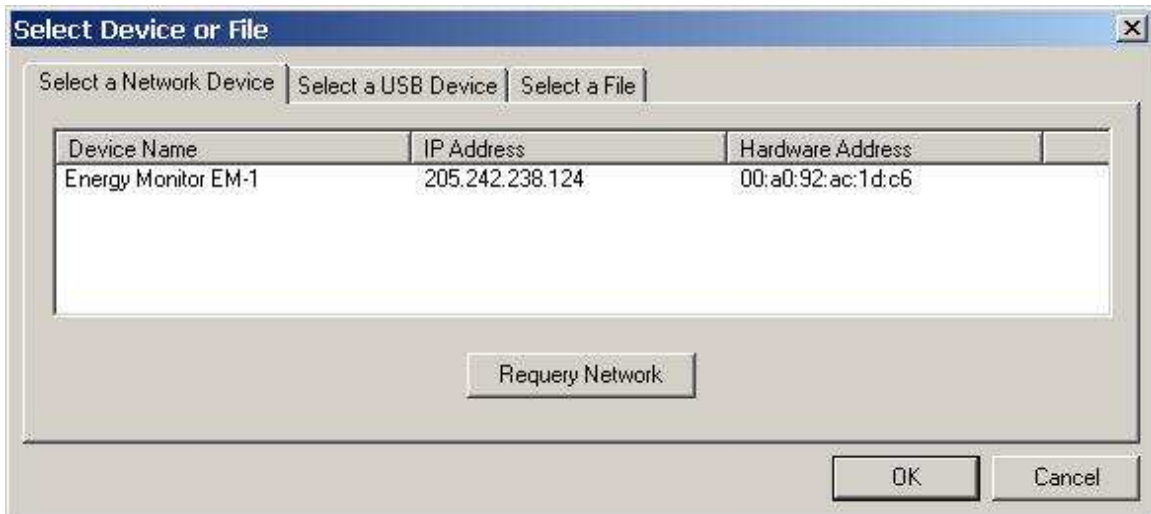
Network configuration of an Energy Monitor device may be done using the Energy Analyzer Application or a web browser. Basic setup includes setting the device IP address, specifying the e-mail server address and destination e-mail recipients for alert messages.

For configuration using a web browser, please go to page 14. To use the application, please read on.

Start the Energy Analyzer Application.



A device must first be selected. Click "Select Device".



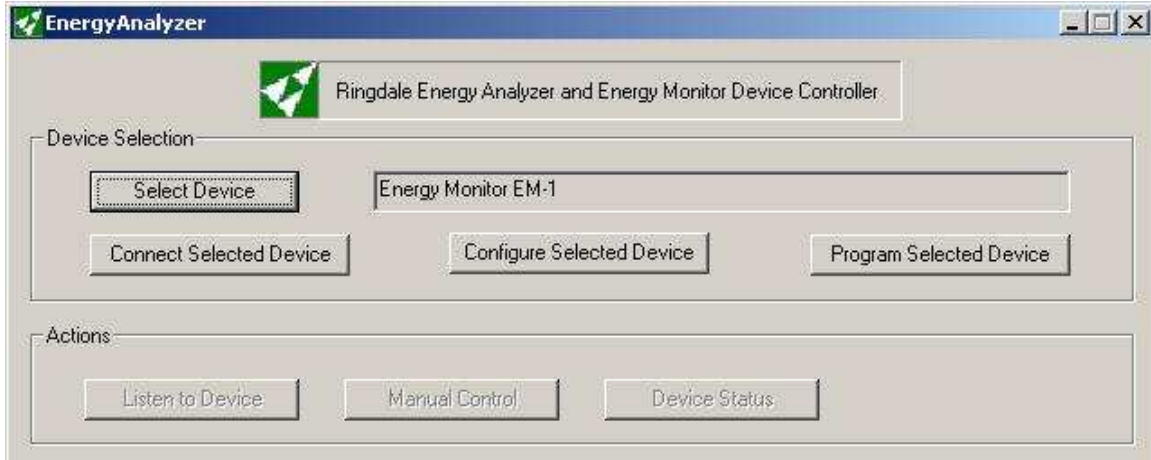
Any Energy Monitors on your network will show up in the panel as shown above. If it doesn't appear straight away, use the Requery Network button to try again to find the device. Click on the device that is to be configured to highlight it and then click the **OK** button.

If you have a USB version of the Energy Monitor, select that tab to see it.

Use the Select a File for a previously saved file.

IMPORTANT NOTE:

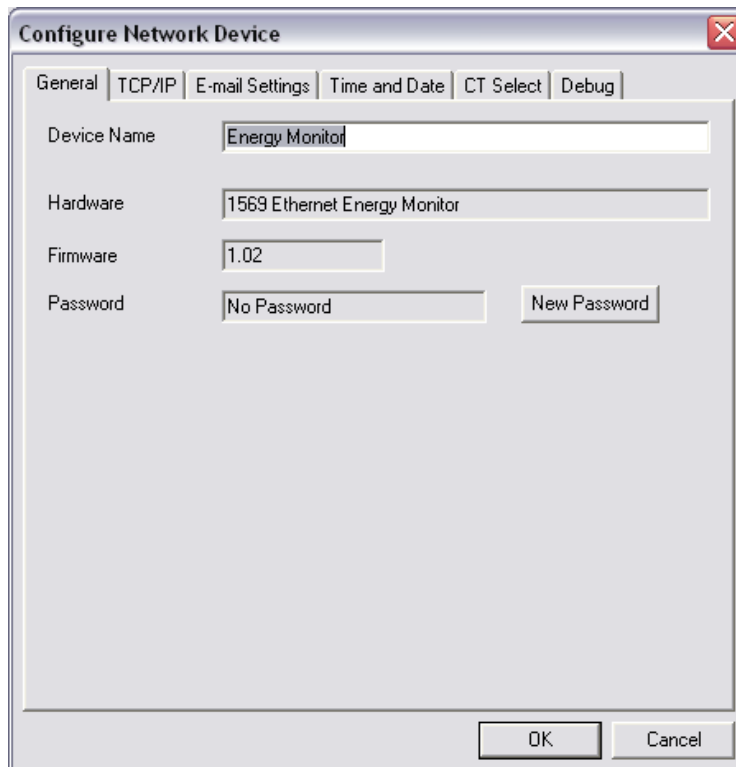
All Energy Monitors are shipped with a factory default IP address of 11.22.33.44. To avoid TCP/IP conflicts, only one device that has not been configured should be connected to the network at a time.



Once selected, the device's name will appear in the main panel and the three options "**Connect Selected Device**", "**Configure Selected Device**", and "**Program Selected Device**" will become available.

The first step is to configure the Energy Monitor's name, TCP/IP, E-mail, and Time & Date parameters.

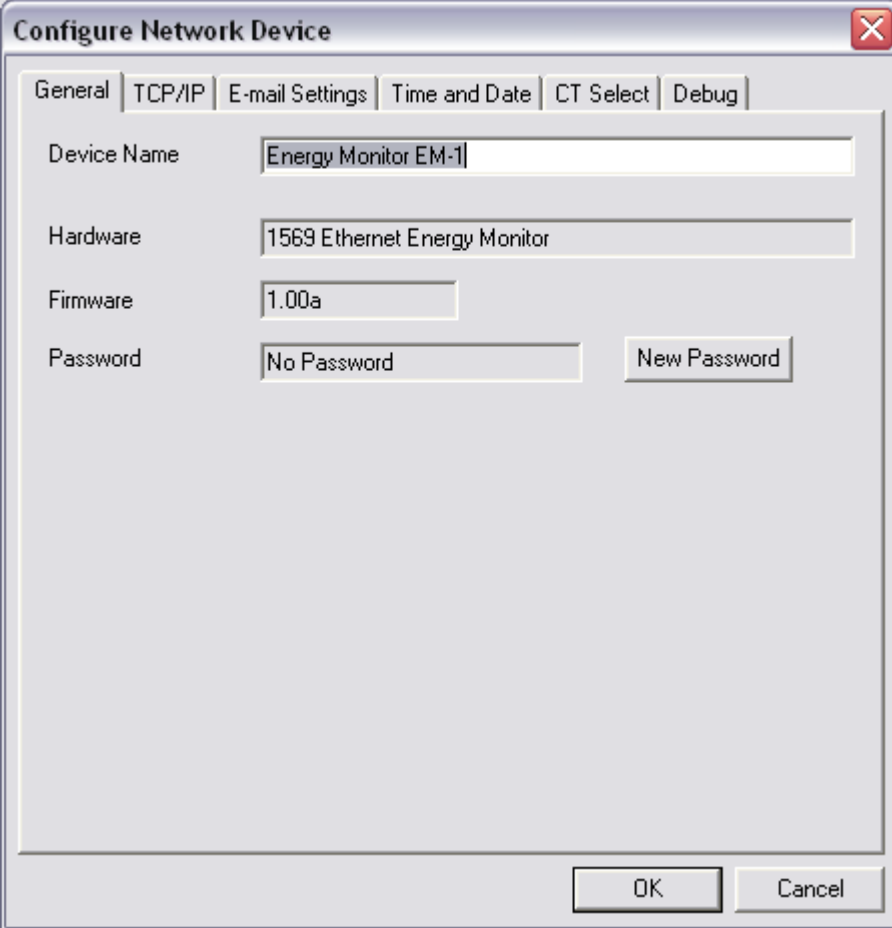
Click on the **Configure Selected Device** button and the **Configure Network Device** panel will come up.



General

The General tab allows you to modify the device name and set or change a password.

It also shows the Hardware model and Firmware revision.



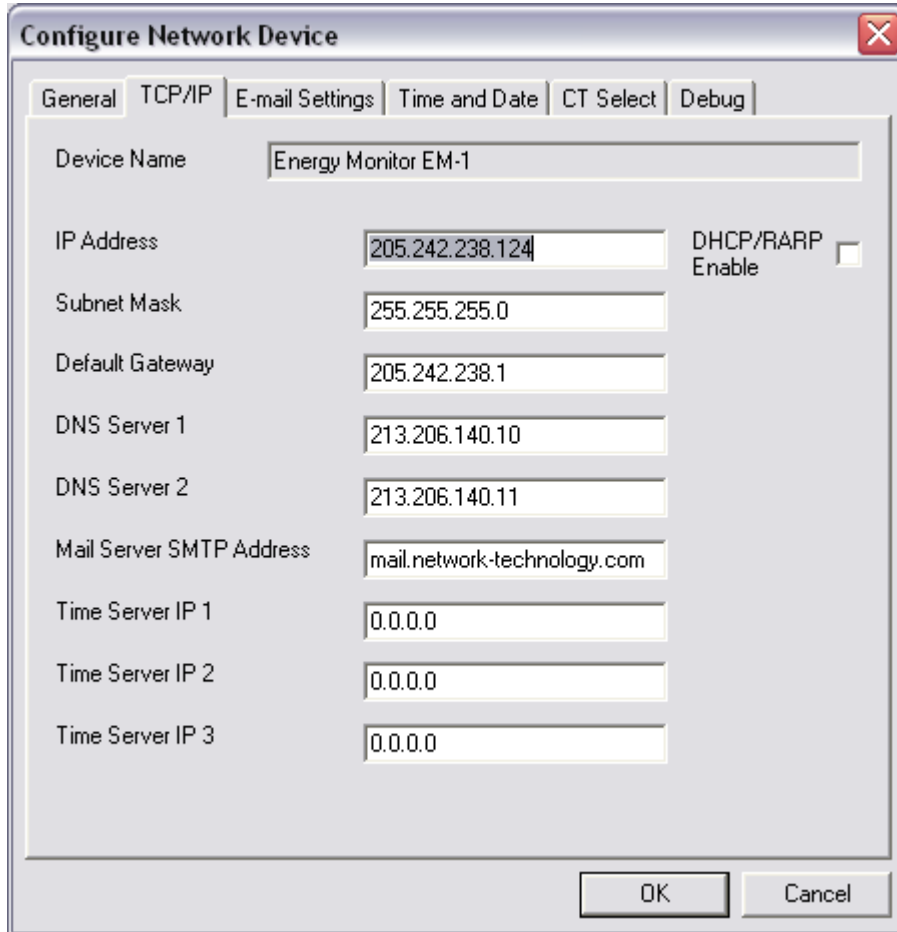
The screenshot shows a dialog box titled "Configure Network Device" with a close button (X) in the top right corner. The dialog has several tabs: "General", "TCP/IP", "E-mail Settings", "Time and Date", "CT Select", and "Debug". The "General" tab is selected. The fields are as follows:

Field	Value
Device Name	Energy Monitor EM-1
Hardware	1569 Ethernet Energy Monitor
Firmware	1.00a
Password	No Password

There is a "New Password" button next to the password field. At the bottom of the dialog are "OK" and "Cancel" buttons.

TCP/IP

This tab is used to assign the Energy Monitor with an appropriate IP address for your network. It also allows you to set the IP addresses that the Energy Monitor will contact for e-mail sending and accurate time keeping. When changing the IP address of the Energy Monitor, it is best to make just that change first, then go back to "Select Device" to re-select the device using its new IP address, and then make the other changes.



Field	Value	Option
Device Name	Energy Monitor EM-1	
IP Address	205.242.238.124	DHCP/RARP Enable <input type="checkbox"/>
Subnet Mask	255.255.255.0	
Default Gateway	205.242.238.1	
DNS Server 1	213.206.140.10	
DNS Server 2	213.206.140.11	
Mail Server SMTP Address	mail.network-technology.com	
Time Server IP 1	0.0.0.0	
Time Server IP 2	0.0.0.0	
Time Server IP 3	0.0.0.0	

- 1) Enter an unused IP Address from your network, or click on the DHCP/RARP Enable.

NOTE: If you change to an address that is NOT in the same network range that your PC is, you will still be able to see the Energy Monitor with the Energy Monitor utility, but you will not be able to change any parameters until you are on the same subnet.

- 2) If you are not using DHCP or RARP, enter the Subnet Mask.
- 3) If you are not using DHCP or RARP, set the Default Gateway.
- 4) DNS Servers, 1 and 2, are the Domain Name Servers provided by your ISP. It is used to convert the Mail Server SMTP Address's URL to an IP Address.

- 5) If you have a DNS server defined, the Mail Server SMTP Address can be entered either as a URL (for example smtp-server.austin.rr.com) or an IP Address. Using the URL is recommended if you may be changing your network, and you have your own mail server.
- 6) Time Server IP 1,2, & 3. You can either set the time manually on the Time and Date panel or configure up to three preferred timeservers. Without the correct time, the timestamp will be incorrect on all records, and if you email Alert conditions, your spam filter may trap the email. The 192.043.244.018 address is the timeserver at NCAR.

TIME SERVER NOTE: All timeservers send the time UTC. In order to set the time stamps correctly you must adjust your **Time Zone Offset** under the **Time and Date** tab. There is a list of public timeservers at this URL: <http://tf.nist.gov/service/time-servers.html>

E-mail Settings

The e-mail settings are used to send an Alert message if certain triggers are met.



Configure Network Device

General | TCP/IP | **E-mail Settings** | Time and Date | CT Select | Debug

Device Name: Energy Monitor EM-1

Mail Server SMTP Address: mail.network-technology.com

Mailserver SMTP IP Port: 25 (1 - 9999) Default 25

Mailserver Login Name: canderson@ringdale.com

Mailserver Login Password: *****

Reply e-mail Address: canderson@ringdale.com

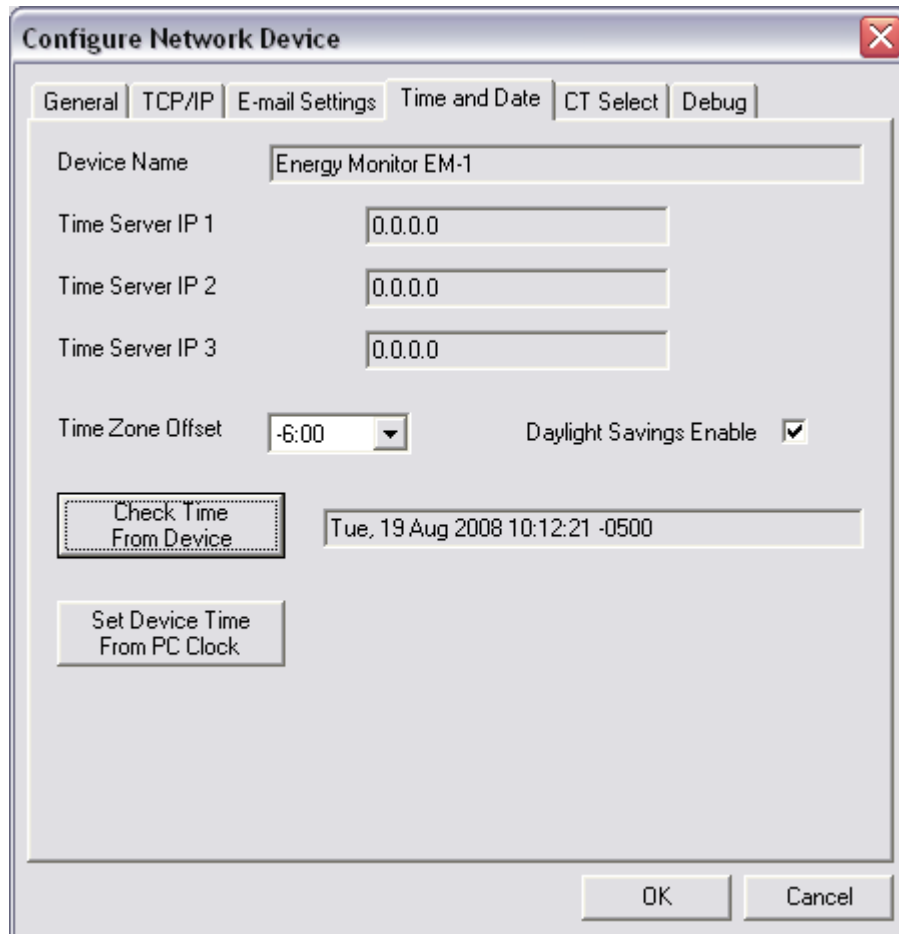
Reply Name: EnergyMonitor

Destination e-mail Address(es): canderson@nextus.com

OK Cancel

- 1) **Mail Server SMTP Address** – Use the TCP/IP tab to change this.
- 2) **Mailserver SMTP IP Port** – The default is 25. This is most common. Other common ports used are 26, and 2525.
- 3) **Mailserver Login Name** – Often this is an email address. When a fax is received in the email box, it will come from this user. Max 58 characters.
- 4) **Mailserver Login Password** – This is the password for the above email account. There is a maximum of 58 characters. **NOTE:** case-sensitive.
- 5) **Reply e-mail Address** – If the person who receives the fax does a reply, it will go to this address.
- 6) **Reply Name** – This is the name that shows in the email header when you receive a fax.
- 7) **Destination e-mail Address(es)** - This is where the email will be sent. This can be the same as item 2) or it may be an alias set up to forward to multiple users. Simply enter the addresses you wish to send to as one entry, each address separated by either a semi-colon (;) or a comma (.). There is a limitation of a maximum of 80 characters for all addresses. Max 80 characters. No spaces are allowed. Enter each address on a new line.

Time and Date



The Energy Monitor features a battery backed up clock. When first set up and periodically after, the clock may be (re) synchronized with a time server or the PC running the Energy Analyzer application.

If at least one Time Server IP address has been specified, the Energy Monitor will automatically contact a Time Server to keep its clock accurate. Note that it will not adjust its clock while it is monitoring to avoid spoiling the record sequence.

The **"Set Device Time From PC Clock"** function allows you to synchronize the device time with the PC time. This option is only available if no Time Servers have been specified.

TIME SERVER NOTE: Some local timeservers and all Internet timeservers send the time in UTC. In order to set the time stamps correctly you may need to adjust your **Time Zone Offset** and select or de-select the **Daylight Savings Enable** option.

CT Select



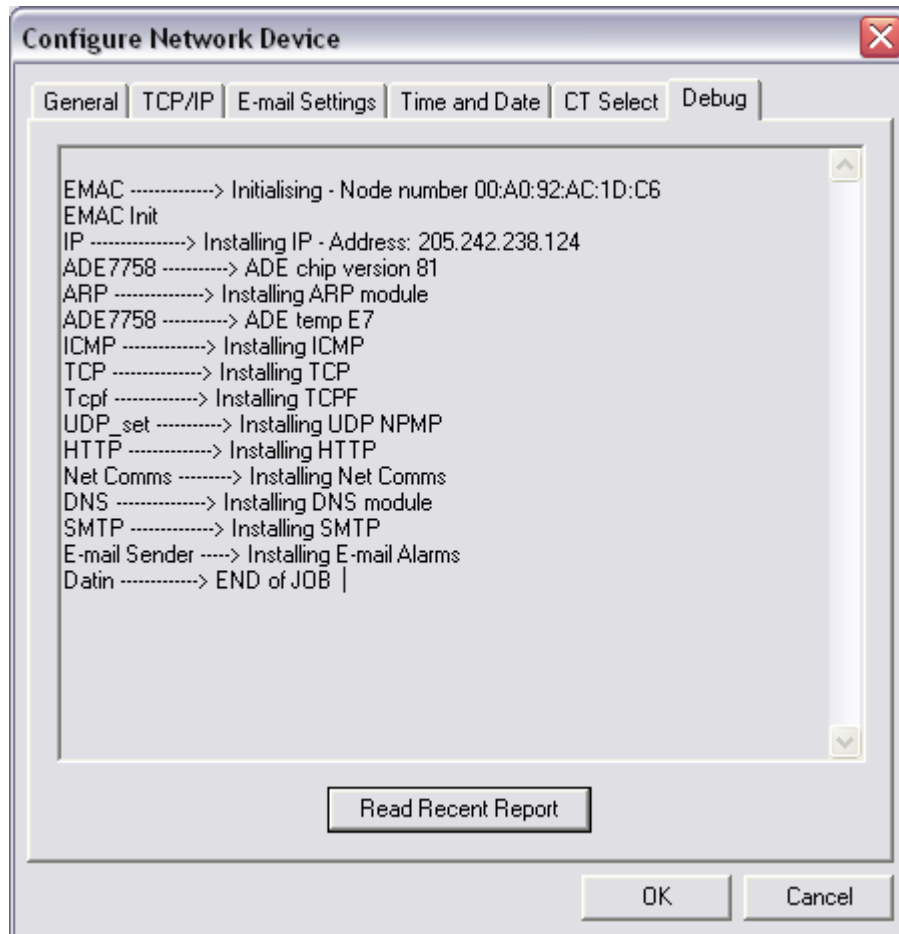
Select the value of the current transformers that you are using. CT selection panel offers the follow CT values: 10,15,20,25,30,50,60,70,150,200,250,300,400,500,600,800,1000,1200,1500 Amps.

NOTE:

The Energy Monitor must be ordered with appropriate Current Sensors, also known as amp clamps, or Current Transformers. There are two points to be aware when ordering your Current Sensors:

- 3) Current Sensors are not accurate if the current is below 10% of the current rating. So it is important to order the Current Sensor that has the lowest current rating to fit your needs.
- 4) You must order a Current Sensor that has a burden resistor to protect the Energy Monitor circuitry. Do not order Current Sensor's with part number that end in -0000 if it is to be used with the Energy Monitor.

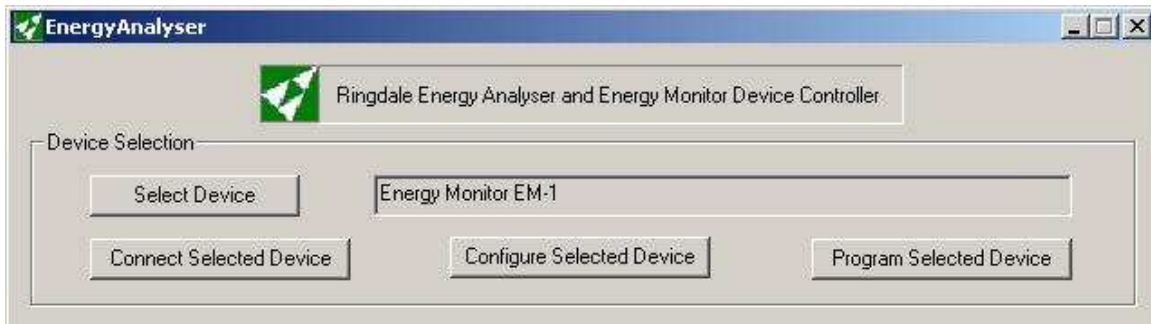
Debug



The Energy Monitor keeps a log of various messages. This panel is useful only if a problem should arise, at which time obtaining the recent messages may prove informative. Under normal circumstances there is no need to use this panel.

Controlling the Energy Monitor

Select the device to monitor and connect to it using the **Connect Selected Device** button.

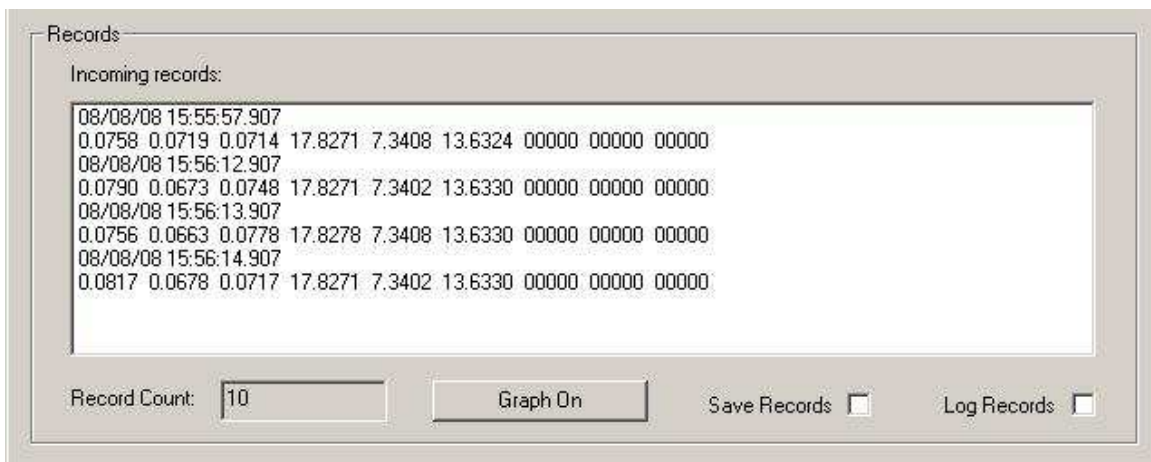


When successfully connected the **Actions** buttons will become available.



Listen to Device

This will tell the Energy Monitor to send a copy of each sample record to you. If the device is not actually running, then you will not receive any records. Sample records will still be recorded into a flash drive if fitted, regardless of this setting.



Manual Control

This window only stays up for 30 seconds. The four buttons give you the choice of action you want the device to take.



Start and Stop are normally used to begin and end a sampling session. If the Energy Monitor is running, the Stop Sampling button must be used before removing a flash drive to ensure that the sample record file is closed properly, and to ensure that the flash drive can safely be removed.

Pause and Resume are used where sampling is temporarily stopped.

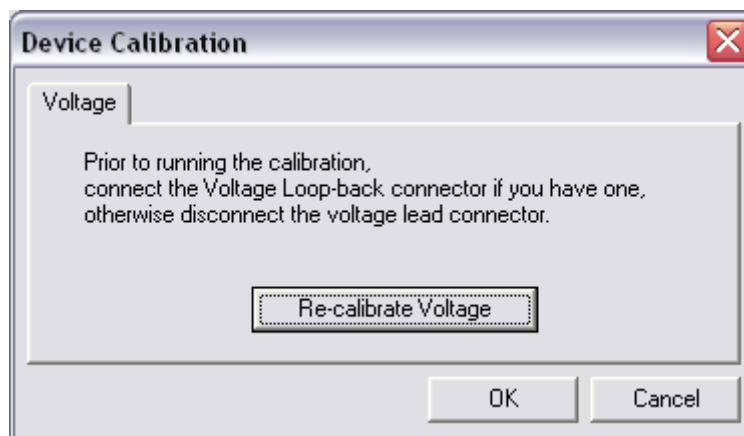
IMPORTANT NOTE: The flash drive should not be removed while the device is running or paused. Removal of the flash drive without stopping the unit may result in corrupted data.

Device Status

This button will show you the status of the Energy Monitor.

Calibration

The Calibration button brings up the Device Calibration window. You must either connect the Voltage Loop-back connector or disconnect the voltage lead connector. Then click Re-calibrate Voltage.



Records Panel



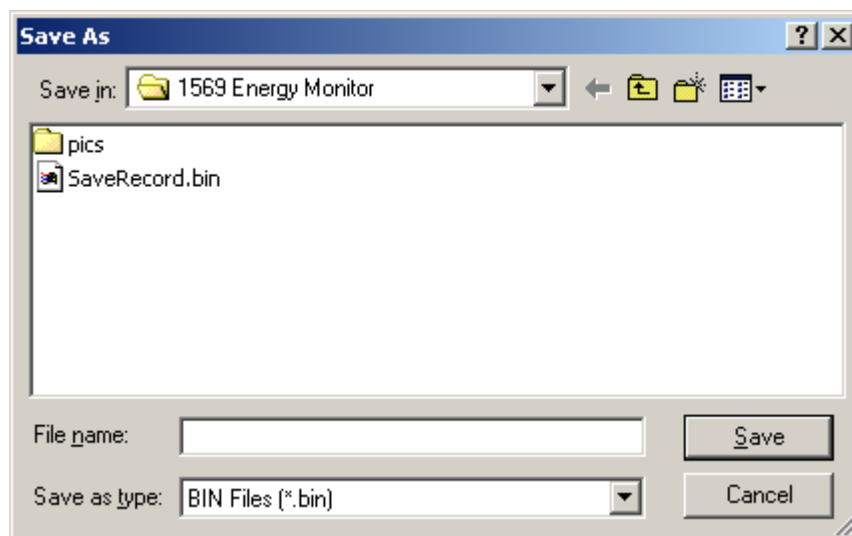
Incoming Records

The device must be in Listen mode by selecting the **Listen to Device** button. You must also set the device to sample records either manually or using the Program Start/Stop Times.

Save Records

Put a check in the **Save Records** box to bring up the location where the records binary file will be kept. If you select the same name as a previously saved bin file, it will be overwritten.

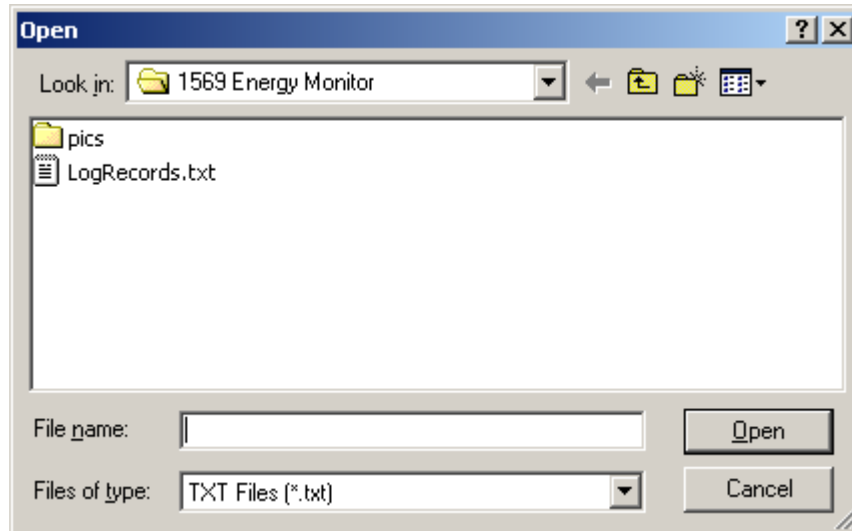
The device must be in Listen mode by selecting the **Listen to Device** button. You must also set the device to sample records either manually or using the Program Start/Stop Times.



Log Records

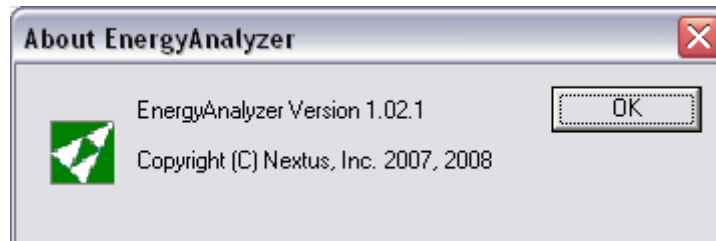
Put a check in the **Log Records** box to bring up the location where the records binary file will be kept. If you select the same name as a previously saved bin file, it will append to the previous data.

The device must be in Listen mode by selecting the **Listen to Device** button. You must also set the device to sample records either manually or using the Program Start/Stop Times.



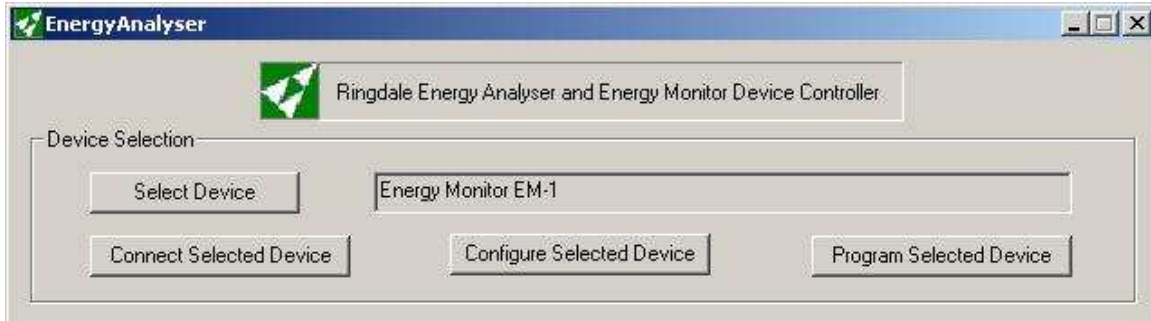
About

Click on the **About** button to find the version of the EnergyAnalyzer software.



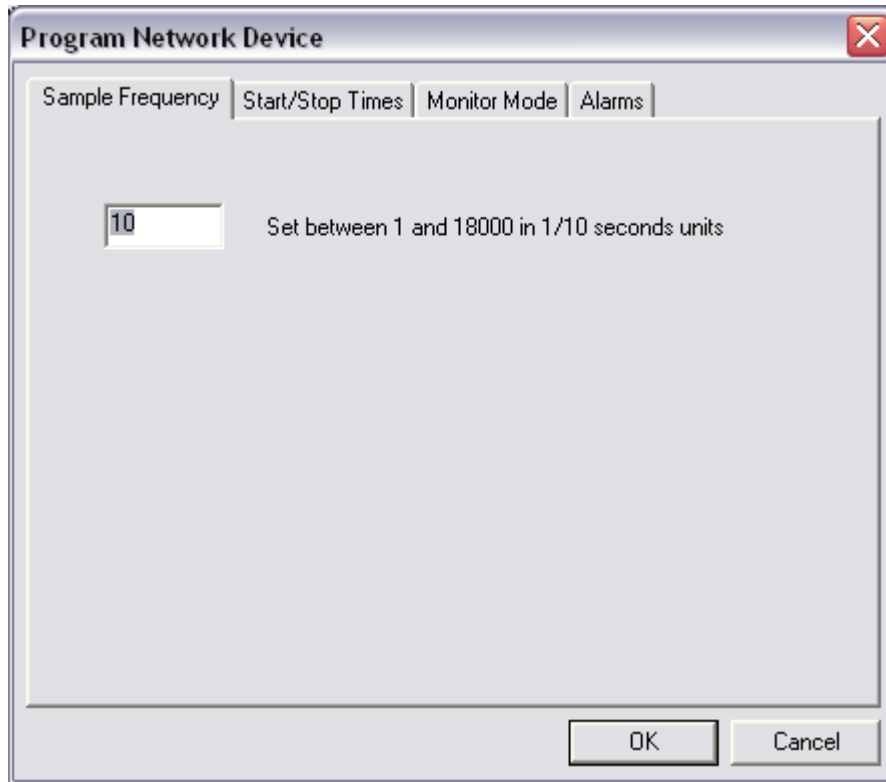
Programming an Energy Monitor

Sample records will be recorded into a flash drive (if one is plugged in) as soon as either the Manual Control / Start Sampling has been selected or it is between the Start Time and Stop Time.



Click on the **Program Selected Device** button to call up the **Program Device** panel.

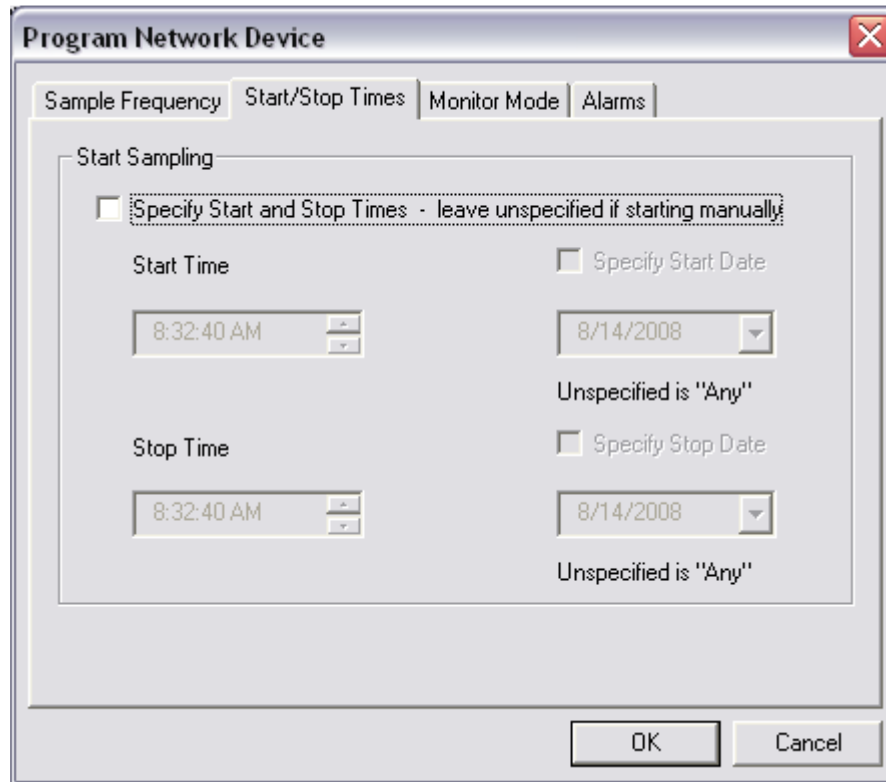
Program Device



Sample Frequency

The sample frequency determines how often a sample is reported. At 18000, one sample is taken every 30 minutes. At 10, one sample is taken per second. At 1, ten samples are taken per second.

Start and Stop Times



Each of the Start and Stop Times, Start Date and Stop Date may be given a value or left undefined. Leave all of these values undefined if you intend to start and stop the device manually.

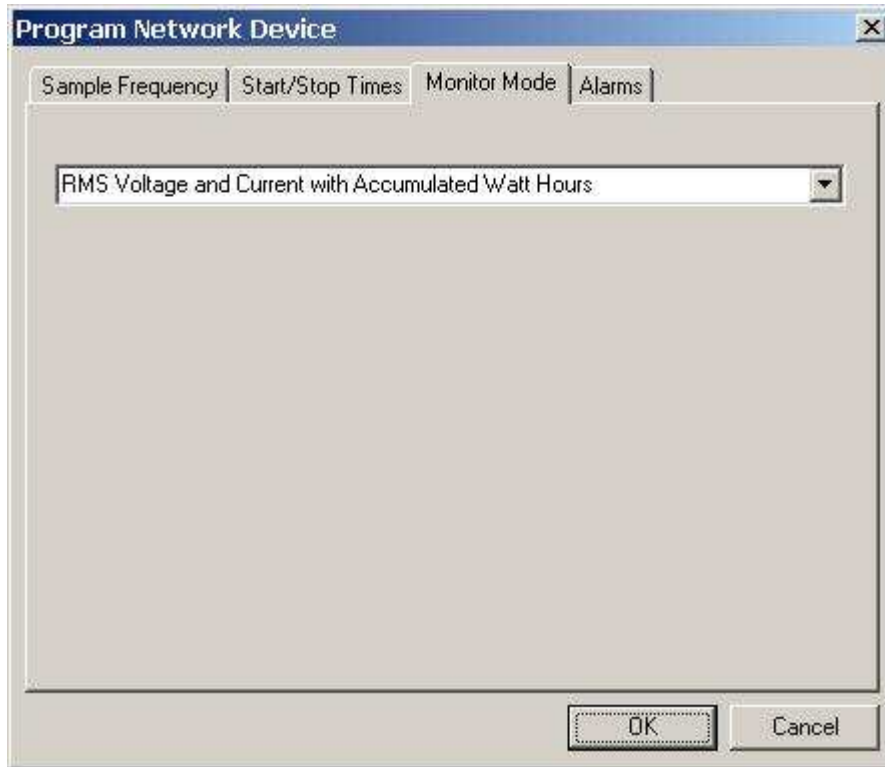
Specifying Start and Stop times but leaving the Dates undefined will set a repetition pattern. It is possible to define the Start Time as 9:00 pm and the Stop Time as 6:00 am for monitoring through each night if the dates are left undefined, or for a particular night or nights if the dates are defined.

Specifying a Start Date without specifying a Start Time, and the same for the Stop values, will have no effect.

NOTE:

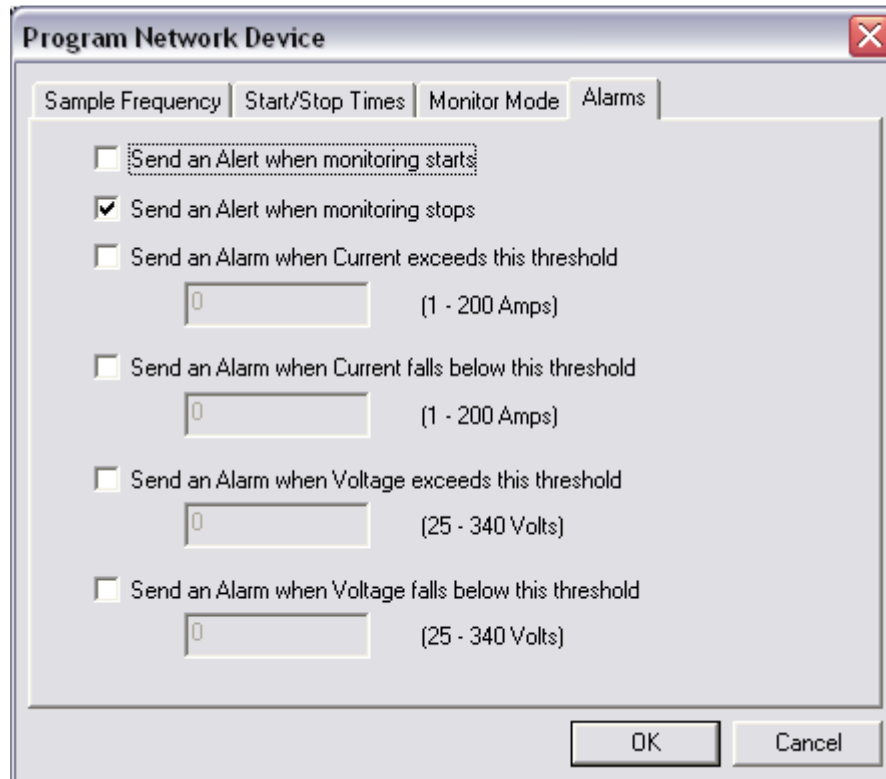
If Start and Stop times defined, you will not always be able to start and stop the device manually. For example, if the device is programmed to start at 4:00 pm and stop at 10:00 pm, the device will automatically restart if manually stopped between 4:00 pm and 10:00 pm. Similarly, manually starting the device after 10:00 pm will result in an automatic stop. As a rule, it is better to not define Start and Stop times if you wish to manually start and stop the unit, or to re-program with undefined times prior to manually starting or stopping.

Monitor Mode

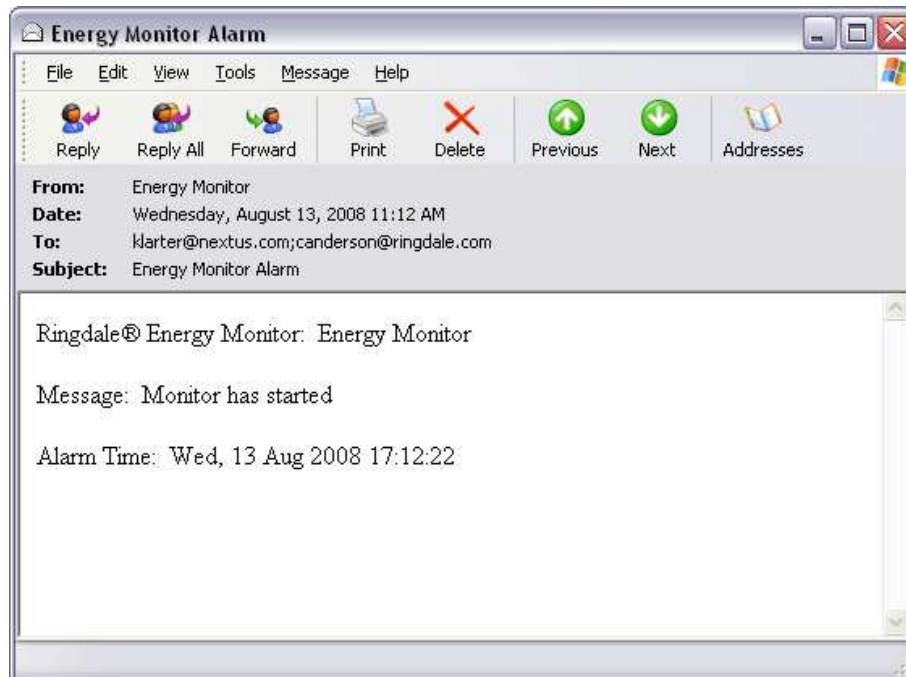


The initial option is RMS Voltage and Current with Accumulated Watt Hours. Other Monitor Mode options may be available by requesting through Technical Support. Email support@ringdale.com.

Alarms

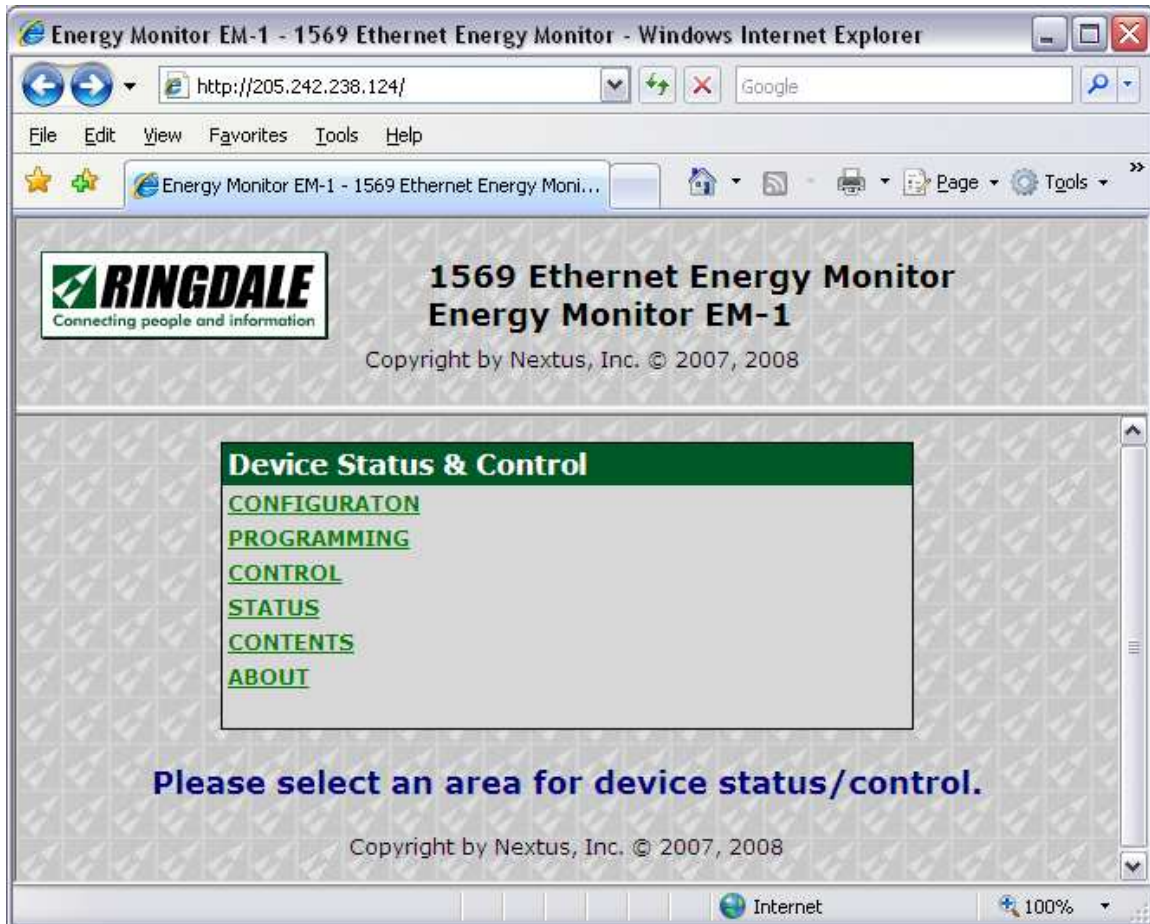


You can set an Alert to be sent to the Destination Email Address when monitoring starts and/or stops. Future revisions will current/voltage threshold triggers.



Setting up an Energy Monitor – Using a Web Browser

Open the Home page of the device. In our example here the device has an IP address of 205.242.238.124. Note that you need to be on the same virtual network as the device in order to be able to communicate with it.



The upper panel shows the device description and the name currently assigned to the device – “Energy Monitor EM-1” in our example.

Configuration

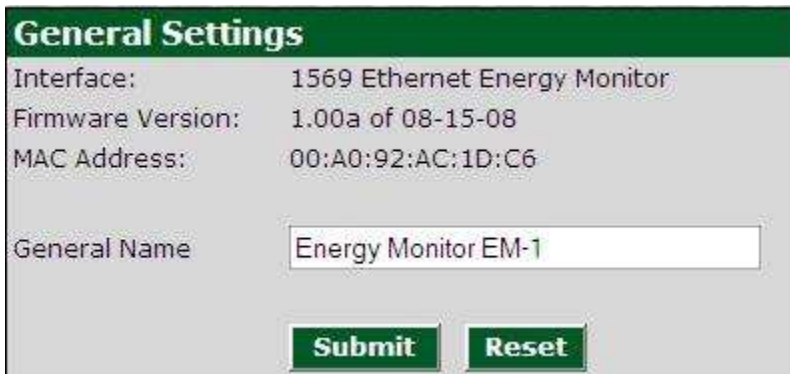
Configuration is used for setting up the Energy Monitor's name, TCP/IP, E-mail, and Time & Date parameters. It also will allow you to change the password, download firmware, and reset to defaults.



Configuration

GENERAL	TIME AND DATE
CHANGE PASSWORD	CT SELECT
TCP/IP	RESET TO DEFAULTS
E-MAIL SETTINGS	HOME

Configuration - General Settings



General Settings

Interface: 1569 Ethernet Energy Monitor
Firmware Version: 1.00a of 08-15-08
MAC Address: 00:A0:92:AC:1D:C6

General Name:

This section allows you configure a unique name for each Energy Analyzer that you have.

Configuration – Password



Change Password

Current Password:

New Password:

Confirm Password:

Configuration – TCP/IP

TCP/IP Settings	
IP Address	<input type="text" value="205.242.238.124"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
DHCP	<input checked="" type="radio"/> Off <input type="radio"/> On
Gateway IP	<input type="text" value="205.242.238.1"/>
DNS Server 1	<input type="text" value="213.206.140.10"/>
DNS Server 2	<input type="text" value="213.206.140.11"/>
Mail Server IP/URL	<input type="text" value="mail.network-technology.com"/>
<input type="button" value="Submit"/> <input type="button" value="Reset"/>	

IP Address – Enter an unused IP Address from your network, or click on the DHCP/RARP Enable.

NOTE: If you change to an address that is NOT in the same network range that your PC is, you will still be able to see the Energy Monitor with the Energy Monitor utility, but you will not be able to change any parameters until you are on the same subnet.

Subnet Mask – Enter the subnet mask.

DHCP can be used if you do not use static IP addresses on the network.

Gateway IP is the default gateway.

DNS Server 1,2 – DNS Servers can be used to resolve the Mail Server IP from the URL.

Mail Server IP/URL - If you will be configuring the Energy Monitor to report threshold trigger events, you must enter an IP Address for the SMTP mail server.

Configuration – E-Mail Settings

E-mail Settings	
Mail Server SMTP Address:	mail.network-technology.com
Mail Server SMTP IP Port	<input type="text" value="25"/>
Mail Server Login Name	<input type="text" value="em1@ringdale.com"/>
Mail Server Login Password	<input type="password" value="••••••••"/>
Reply e-mail Address	<input type="text" value="em1@ringdale.com"/>
Reply Name	<input type="text" value="EM1"/>
Destination e-mail Address(es)	<input type="text" value="em1@ringdale.com"/>
<input type="button" value="Submit"/> <input type="button" value="Reset"/>	

Mail Server SMTP Address – Use the TCP/IP tab to change this.

Mail Server SMTP IP Port – The default is 25. This is most common. Other common ports used are 26, and 2525.

Mail Server Login Name – Often this is an email address. When a fax is received in the email box, it will come from this user. Max 58 characters.

Mail Server Login Password – This is the password for the above email account. There is a maximum of 58 characters. **NOTE:** case-sensitive.

Reply e-mail Address – If the person who receives the fax does a reply, it will go to this address.

Reply Name – This is the name that shows in the email header when you receive a fax.

Destination e-mail Address(es) - This is where the email will be sent. This can be the same as the Mail Server Login Name or it may be an alias set up to forward to multiple users. Simply enter the addresses you wish to send to as one entry, each address separated by either a semi-colon (;) or a comma (,). There is a limitation of a maximum of 80 characters for all addresses. Max 80 characters. No spaces are allowed. Enter each address on a new line.

Configuration – Time and Date

The **Time and Date** option brings up the **Clock Setting** options and the current time. You can either select time servers, or set the time and date manually. If the time is not set correctly the timestamp will be incorrect and your spam filter may trap the email.



The screenshot shows a configuration form titled "Use Time Server(s)". It contains four input fields: "Time Server 1 IP Address" with the value "129.006.015.029", "Time Server 2 IP Address" with the value "129.006.015.028", "Time Server 3 IP Address" with the value "0.0.0.0", and "Time Zone Offset" with a dropdown menu set to "-6:00". At the bottom of the form are two buttons: "Submit" and "Reset".

Time Server IP 1,2, & 3 – You can either set the time manually or use time servers. You can add up to three time servers.

TIME SERVER NOTE: There is a list of public time servers at this URL: <http://tf.nist.gov/service/time-servers.html>

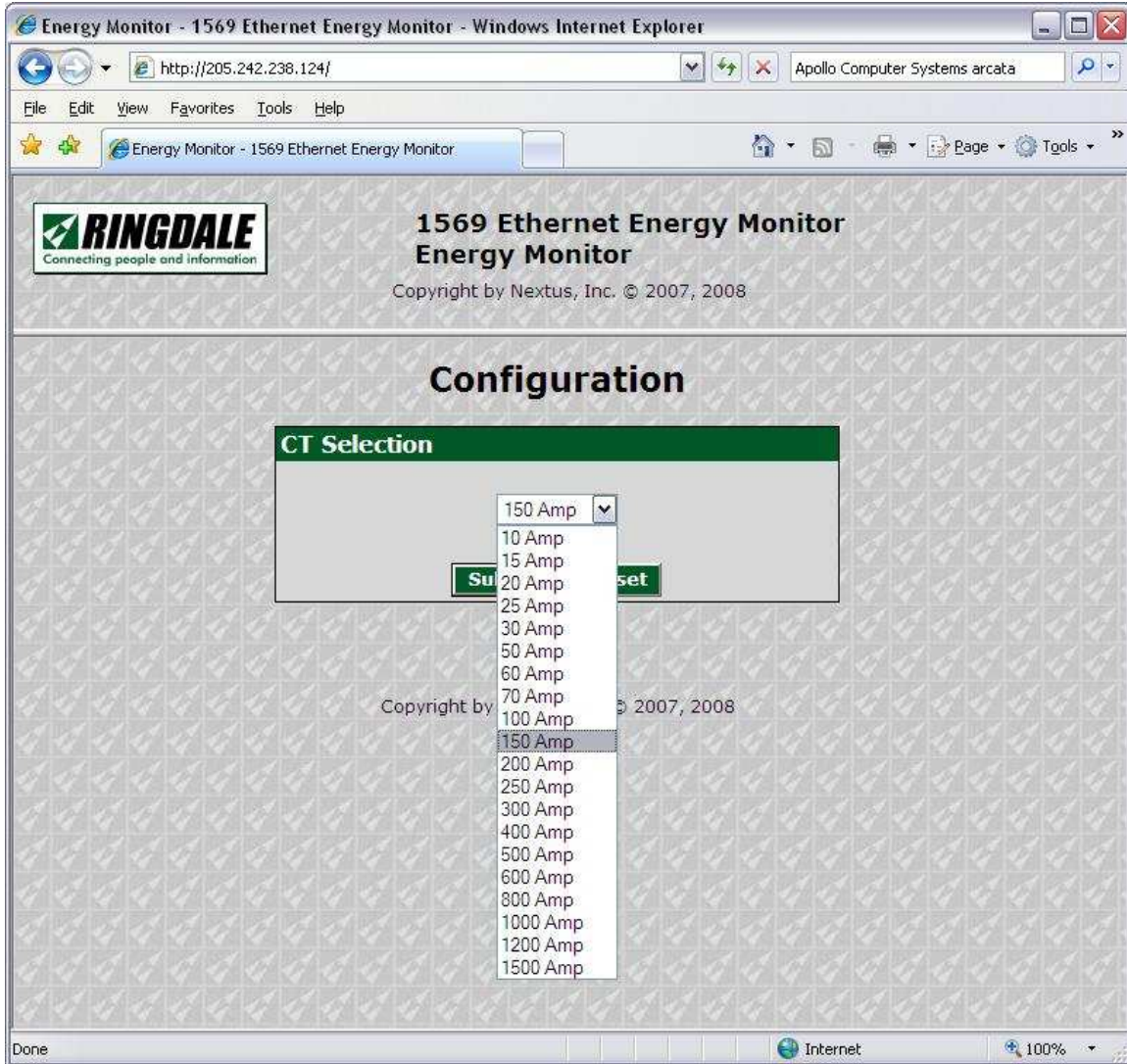
Time Zone Offset – All time servers send the time UT. In order to set the time stamps correctly you must adjust your **Time Zone Offset**. This is the offset from UT. If you are in Greenwich, England, this number will be 0. If your time zone is east of Greenwich, England), the number is positive. If your time zone is west of GMT, the number is negative. For EST, use -5, CST -6, MST -7, PST -8, AKST -9, and HAST -10.



The screenshot shows a configuration form titled "Enter Current Time". It contains two rows of dropdown menus. The first row is for the date, with "Date" followed by three dropdowns: "20", "August", and "2008". The second row is for the time, with "Time" followed by four dropdowns: "08", "hrs", "56", "mins", and "am". At the bottom of the form is a "Submit" button.

Configuration – CT Select

The **CT Select** option brings up the CT Selection menu where you can select the following CT values: 10, 15, 20, 25, 30, 50, 60, 70, 150, 200, 250, 300, 400, 500, 600, 800, 1000, 1200, or 1500 Amps. You must match this selection to the actual Current Transformer that you have connected.



Configuration – Reset to Defaults

Reset to Defaults

Do you want to restore factory defaults, and lose all current settings? Yes

Submit **Reset**

This will normally only be used under the direction of Technical Support. It will not change the IP Address of the Energy Monitor.

Programming

The **Programming** option brings up the following Programming page.



Sample Frequency



The sample frequency determines how often a sample is reported. At 18000, one sample is taken every 30 minutes. At 10, one sample is taken per second. At 1, ten samples are taken per second.

Start / Stop Times

Each of the Start and Stop Times, Start Date and Stop Date may be given a value or left undefined. Leave all of these values undefined if you intend to start and stop the device manually.

Specifying Start and Stop times but leaving the Dates undefined will set a repetition pattern. It is possible to define the Start Time as 9:00 pm and the Stop Time as 6:00 am for monitoring through each night if the dates are left undefined, or for a particular night or nights if the dates are defined.

Specifying a Start Date without specifying a Start Time, and the same for the Stop values, will have no effect.

NOTE:

If Start and Stop times defined, you will not always be able to start and stop the device manually. For example, if the device is programmed to start at 4:00 pm and stop at 10:00 pm, the device will automatically restart if manually stopped between 4:00 pm and 10:00 pm. Similarly, manually starting the device after 10:00 pm will result in an automatic stop. As a rule, it is better to not define Start and Stop times if you wish to manually start and stop the unit, or to re-program with undefined times prior to manually starting or stopping.

Control

The **Programming** option brings up the following Programming page.



Monitor Control

The **MONITOR CONTROL** option brings up the following **Monitor Control** page.



Start or Stop Monitor Now

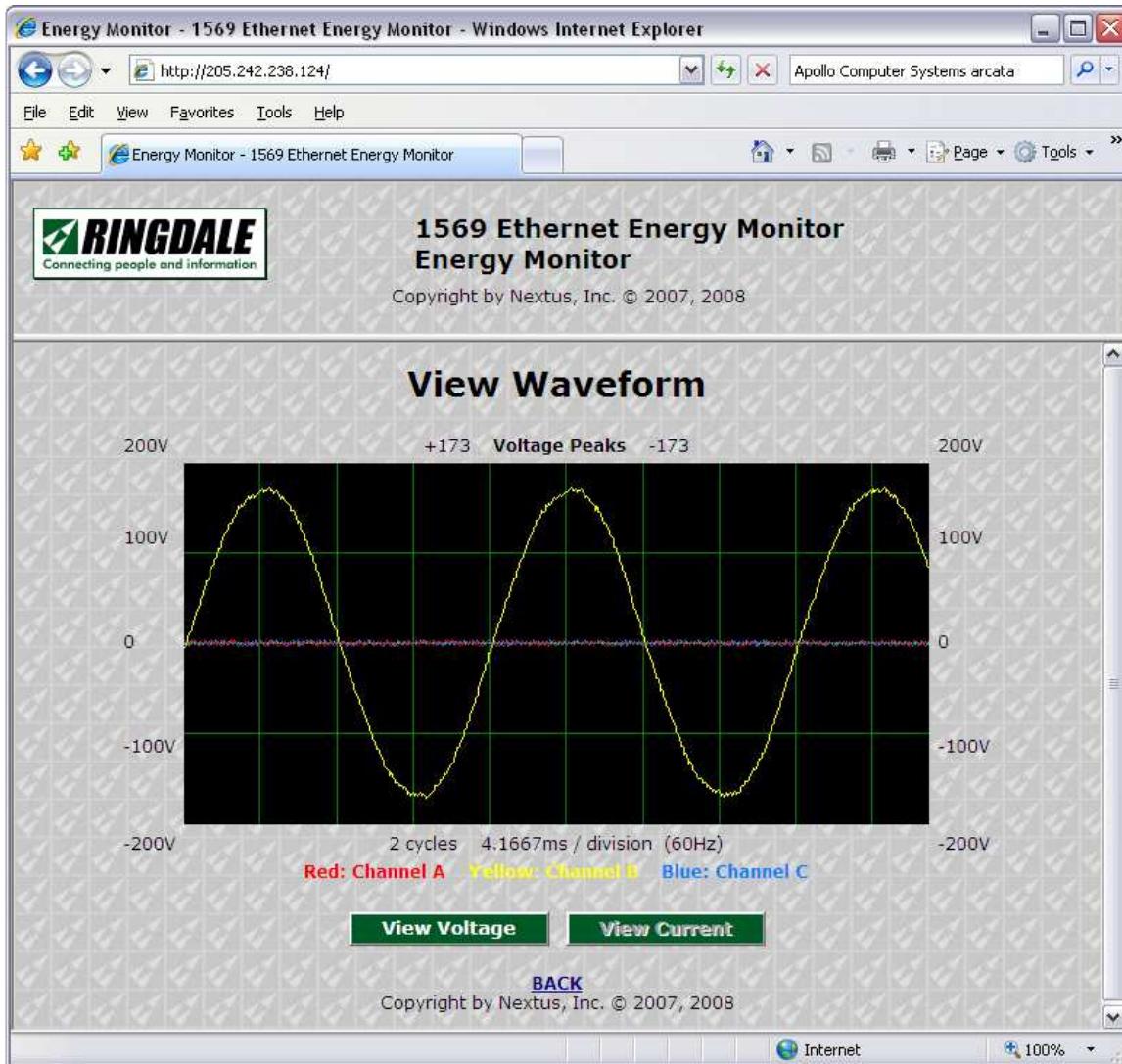
Start and Stop are normally used to begin and end a sampling session.

Pause and Resume are used where sampling is temporarily stopped.

IMPORTANT NOTE: The flash drive should not be removed while the device is running or paused. Removal of the flash drive without stopping the unit may result in corrupted data.

View Waveform

The **VIEW WAVEFORM** option brings up the following **View Waveform** page.




Status


Click the **Status** option to verify if the unit is running or not.



Contents

Clicking on Contents brings up an Index page. The functions on this page are the same as those on the Home page.




Connecting people and information

1569 Ethernet Energy Monitor

Index Page

[Home](#)

[Status](#)

[Control](#)

Configuration

- [General](#)
- [Clock](#)
- [TCP/IP](#)
- [Change Password](#)
- [Download firmware](#)
- [Reset To Defaults](#)

[About](#)

About

This page provides information about the unit.

Information	
Interface:	1569 Ethernet Energy Monitor
Serial Number:	AC1DC6
Firmware Version:	1.00b of 08-19-08
For support go to	Ringdale Support
To learn more about this or other Ringdale products, visit our website at	www.ringdale.com

Collecting Monitor Records

Data Records may be obtained from one of three sources, 1) from a Network device, 2) from a USB device and 3) from a folder that includes the file from the USB flash drive that has been written by the device.

Records should be considered to come in a stream.

The Energy Monitor may be started and stopped manually using the Manual Control panel, or it can be programmed to start and/or stop automatically at certain times and dates.

You can take the compact flash; plug it into a PC with the EnergyAnalyzer for analysis. This is the procedure:

- 1) Take the compact flash, plug it into a PC.
- 2) Open the EnergyAnalyzer application. Click the **Select Device** button, then the **Select A File** tab
- 3) Click the **Browse** button and choose the datalog.bin
- 4) Click Connect Selected Device.
- 5) Put a check in Log Records. Provide a file name for the text file.
- 6) Click Listen to Device to see the data go by.

The text file is space delimited.

When it is done you can import the file into Excel and generate a chart.

Output files

Sample log file:

Date	Time	IA	IB	IC	VA	VB	VC	WHA	WHB	WHC
08/03/07	12:39:11.499	0.2124	0.1941	0.1960	1.5327	12.6650	7.0988	00000	00000	00000
08/03/07	12:39:13.499	0.2017	0.2061	0.1985	1.5327	12.6650	7.0988	00000	00000	00000
08/03/07	12:39:15.499	0.2029	0.2174	0.1847	1.5327	12.6650	7.0988	00000	00000	00000
08/03/07	12:39:17.499	0.2048	0.2168	0.1973	1.5327	12.6650	7.0988	00000	00000	00000
08/03/07	12:39:19.499	0.2193	0.2010	0.1966	1.5321	12.6650	7.0988	00000	00000	00000
08/03/07	12:39:21.499	0.2080	0.2092	0.2036	1.5327	12.6650	7.0988	00000	00000	00000
08/03/07	12:39:23.499	0.2004	0.2162	0.1985	1.5327	12.6650	7.0988	00000	00000	00000
08/03/07	12:39:25.499	0.2067	0.1998	0.1954	1.5327	12.6643	7.0982	00000	00000	00000
08/03/07	12:39:27.499	0.2055	0.2136	0.1992	1.5327	12.6650	7.0988	00000	00000	00000
08/03/07	12:39:29.499	0.1979	0.1960	0.1966	1.5327	12.6643	7.0988	00000	00000	00000
08/03/07	12:39:31.499	0.2080	0.1985	0.2036	1.5327	12.6643	7.0988	00000	00000	00000
08/03/07	12:39:33.499	0.2061	0.2143	0.2029	1.5321	12.6650	7.1789	00000	00000	00000
08/03/07	12:39:35.499	0.2080	0.2111	0.1865	1.5327	12.6643	7.0988	00000	00000	00000
08/03/07	12:39:37.499	0.2023	0.2067	0.1809	1.5327	12.6643	7.0988	00000	00000	00000
08/03/07	12:39:39.499	0.2092	0.1941	0.1985	1.5327	12.6650	7.1789	00000	00000	00000
08/03/07	12:39:41.499	0.2017	0.1947	0.1941	1.5327	12.6650	7.1789	00000	00000	00000
08/03/07	12:39:43.499	0.2029	0.1960	0.1985	1.5321	12.6650	7.1789	00000	00000	00000

IA-IC = Current readings for channel A-C.

VA-VB= Voltage readings for channel A-C.

WH=Watt/Hours for channel A-C.

Technical Specifications

Power Supply	External All Voltage
Power Input	12 Volt DC, 1 A
Power Consumption	3 watts typical
Operating Temperature	-40°C to +85°C
LAN Connection	RJ-45
Network Type	Ethernet 10/100baseTx
Data Collection	USB Thumb Drive or via Ethernet to a PC running application

Records Definitions

This is the general record description. It is beneficial to programmers performing an analysis of the .bin record file.

```

struct dataloggerRecord {
    BYTE        rectype;
    BYTE        length;           // length following
    USHORT      dateStamp;       // 16 bit date stamp
    ULONGtimeStamp;             // 32bit 1/32768sec count from midnight
    BYTE        data[length - 6];
};

5.3 powerRecord
//
// Record Type == 0
// RMS Power consumption monitor
//
struct powerRecord {
    BYTE  rectype = 0;
    BYTE  length = 30;
    USHORT  dateStamp;
    ULONGtimeStamp;
    BYTE  phaseACurrent[3];      // 24bit Phase A current RMS
    BYTE  phaseBCurrent[3];      // 24bit Phase B current RMS
    BYTE  phaseCCurrent[3];      // 24bit Phase C current RMS
    BYTE  phaseAVoltage[3];      // 24bit Phase A voltage RMS
    BYTE  phaseBVoltage[3];      // 24bit Phase B voltage RMS
    BYTE  phaseCVoltage[3];      // 24bit Phase C voltage RMS
    BYTE  phaseAWattHr[2];       // 16bit Phase A Watt-Hour Accumulation
    BYTE  phaseBWattHr[2];       // 16bit Phase B Watt-Hour Accumulation
    BYTE  phaseCWattHr[2];       // 16bit Phase C Watt-Hour Accumulation
};

//
// Record Type == 1
// Alarm

```

```
//  
    to be specified  
//  
// Record Type == 2  
// Waveform data  
//  
struct waveRecord {  
  
    BYTE        rectype = 2;  
    BYTE        reserved;  
    USHORT     dateStamp;  
    ULONG      timeStamp;  
    BYTE        waveData[16][3];    // 6x x 24bit values  
};
```

waveRecords will come in batches of 32 records

Notes

For non waveRecord types:
dateStamp is bit packed yyyyyymmddddd
timeStamp is 1/32768sec from midnight

For waveRecord type:
To be specified

Glossary

CT – **C**urrent **T**ransformer is the device used to determine the amount of current flow based on the electrical induction of the wire.

IEC -- The **I**nternational **E**lectrotechnical **C**ommission is the international standards and conformity assessment body for all fields of electrotechnology.

NCAR – **N**ational **C**enter for **A**tmospheric **R**esearch

NPMP -- **N**etwork **P**eripheral **M**anagement **P**rotocol. A protocol developed by Ringdale for communicating with Ringdale devices.

NTP – **N**etwork **T**ime **P**rotocol - It uses ports 123 for TCP and UDP.

RMS - **R**oot **M**ean **S**quare - The RMS value is the effective value of a varying voltage or current.

USB - **U**niversal **S**erial **B**us A widely used hardware interface for attaching peripheral devices

Technical Support Contact Information

Ringdale, Inc.
101 Halmar Cove
Georgetown
Texas 78628
USA

Toll-free: +1 888-288-9080
Phone: +1 512-288-9080
Fax: +1 512-288-7210
Web: www.ringdale.com

Ringdale, Inc. Sales Office
8303 N Mopac Expressway
Suite 230 - Building C
Austin
Texas 78759
USA

Toll-free: +1 888-288-9080
Phone: +1 512-241-0247
Fax: +1 512-288-7210
Web: www.ringdale.com

Ringdale (UK) Ltd.
26 Victoria Way
Burgess Hill
West Sussex
RH15 9NF
United Kingdom

Freephone: 0800 214503
Phone: +44 (0) 1444 871349
Fax: +44 (0) 1444 870228
Web: www.ringdale.co.uk

Ringdale Gesellschaft für Netzwerktechnik mbH
Fabrikstationsstraße 43 A
D-68163 Mannheim
Germany

Phone: +49 (0) 621 7186-0
Fax: +49 (0) 621 7186-20
Web: www.ringdale.de

Ringdale Japan
Shinjuku Nomura Building
1-26-2 Nishi Shinjuku
Shinjuku-ku
Tokyo 163-0535
Japan

Phone: +81 (3) 3345 2180
Fax: +81 (3) 3344 3949
Web: www.ringdale.com

Ringdale Singapore
No.1 Sims Lane
#04-06
Singapore 387355

Phone: +65 6749 2285
Fax: +65 6749 5095
Web: www.ringdale.com

Ringdale Hong Kong
Suite No.6-7,10F,Tower1
Hong Kong City
33 Canton Rd. Tsimshatsui
Kowloon, Hong Kong
China

Phone: +852-2865-5393
Fax: +852-2865-5376
Web: www.ringdale.com