

# User Manual Version 1.3

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### Overview

**TED Footprints** is data-logging software designed to provide very detailed information about your use of electricity. **TED Footprints** is available as an option for TED and requires an unlock key to activate the data port.

How does **TED Footprints** work? Simply connect TED to your PC via USB or Serial connection (depending on the model of TED that you have), and **TED Footprints** will begin tracking and logging your usage every second.

### Some additional key dynamics:

- Dashboard view of real-time usage, displaying all data stored within TED on your PC
- View data in kW, Dollar, or in CO2 format at the push of a button
- Logs Time of Use in kWh, Dollars and Voltage
- Graphs/charts all logged data in kWh, Dollars, or Voltage
- Graphs/charts are printable
- Calendar for viewing is flexible: view day, week, month, year.
- Data is logged in background
- Data is also logged in Excel format for further user analysis or graphing/charting
- Load-Profile major appliances, such as Water Heater, HVAC system, or other heavy loads. Records time-of-use, run-time and cost-to-run specified loads.

**TED Footprints** consists of three separate applications.

- TED Logging Service (TEDService) The TED Logging service is a Windows service that receives data from the RDU and stores it into a local database. By default, this service is started when Windows boots up and will continue logging until the PC Is shut down or the service is manually stopped.
- TED Footprints Viewer This is the desktop interface to the logged Footprints data. It provides a live dashboard of all current measurements as well as access to historical and load profile information
- TED Footprints Watcher This is a small "*always on top*" dialog box that will present you with the current voltage, dollar, and CO2 emission information.

# Installation

Do not plug in the RDU to the PC USB port until after the TED Footprints software is installed.

### Step 1 – Install the TED hardware

Prior to installing the TED Footprints software, please be sure to install the TED Measuring Transmit Unit (MTU) and TED Receiving Display Unit (RDU) hardware and validate that it is operational. More information on installing this hardware is available in the *TED Installation and Operations Manual* that was supplied with the hardware.

### Step 2 – Install the TED Footprints Software

Now that the RDU Driver has been installed, you are ready to install the TED Footprints Software. Be sure to disable any anti-virus or firewall software prior to starting the installation process.

The installation process should start automatically once you insert the **TED Footprints mini-cd** into your PC's CD-ROM drive (it may take 30-45 seconds to start up). If the installer does not automatically start, you can manually start it by opening up the CD-ROM with *Windows Explorer* and then clicking **SETUP.EXE.** 



**NOTE:** During installation, your PC will be checked to make sure it is running the latest version of the **Microsoft .NET Framework**. If it is not installed, you will be prompted to download and install the .NET framework.

After checking to ensure your PC is running the latest version of the **Microsoft** .**NET Framework**, you will be prompted with the **TED Footprints Installation Wizard**.

闄 TEDFootprints	- • 💌
License Agreement	
Please take a moment to read the license agreement now. If you accept the terr Agree'', then ''Next''. Otherwise click ''Cancel''.	ns below, click ''l
COPYRIGHTS:	<u>^</u>
Copyright 2007 Energy, Inc. All Rights Reserv	ed.
The Footprints software is Copyright 2007 Ene All	rgy, Inc.
I Do Not Agree I Do Not Agree	
Cancel < <u>B</u> ack	] <u>N</u> ext >

On the Welcome screen, click "Next".

The second screen of the installation wizard will prompt you for the directory where TED Footprints will be installed:



Once you have chosen which directory to install the application, click "Next".

10 TEDFootprints	- • 💌
Confirm Installation	
The installer is ready to install TEDFootprints on your computer.	
Click "Next" to start the installation.	
Cancel	Back Next >

Confirm that you are ready to install footprints and click "Next"

🛃 TEDFootprints	
License Agreement	
Please take a moment to read the license agreement Agree", then "Next". Otherwise click "Cancel".	now. If you accept the terms below, click "I
COPYRIGHTS:	
Copyright 2007 Energy, Inc. Al	l Rights Reserved.
The Footprints software is Cop All	yright 2007 Energy, Inc.
I Do Not Agree I Agree	
Cance	I < <u>B</u> ack <u>N</u> ext >

You will then be prompted to accept the EULA license agreement. Check the "I Agree" box and click "Next".

🛃 TEDFootprints			- • •
Installing TEDFootprint	S		
TEDFootprints is being installed.			
Please wait			
	Cancel	< <u>B</u> ack	<u>N</u> ext >

After the EULA has been Accepted, TED Footprints will then be installed.



After installation is complete, you will be presented with the "Quick Start" guide. Click "Next".

🛃 TEDFootprints	- • •
Installation Complete	
TEDFootprints has been successfully installed.	
Click "Close" to exit.	
Please use Windows Update to check for any critical updates to the .NET Frame	ework.
Cancel < <u>B</u> ack	

After installation is complete you will be given a confirmation that installation is complete. Click "Close" to exit the installer.

# Step 3 – Plug the USB cable (or serial cable) into the RDU and into your PC.

Once the USB cable is plugged into the PC, the TED RDU device will be detected and the driver should be installed automatically.

If you are prompted for a FTDI Driver, cancel out of the driver installation wizard and run *CDM 2.02.06.exe* that is provided in the */drivers* directory of the TED Footprints CD (however, do not install and run the TED Footprints installer (setup.exe) at this point). After the drivers have been loaded, unplug the USB cable from your PC, reboot the PC, and reconnect the RDU USB cable after reboot.

To validate that the TED RDU drivers are installed, open up the Windows Device manager. For more information about the Windows Device Manager please visit the following link: <u>http://support.microsoft.com/kb/307970</u>

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To open the Device Manager on Windows XP:

- 1. Click Start
- 2. Click Control Panel
- 3. Click **Performance and Maintenance** (this step is skipped in "Classic View")
- 4. Click System.
- 5. On the Hardware tab, click Device Manager.

To open the Device Manager on Windows Vista:

- 1. Click Start
- 2. Click Control Panel
- 3. Click System and Maintenance
- 4. Click Device Manager.

Once the Device Manager is opened, you should see the TED RDU listed under the *Ports* (COM & LPT) devices. It will be displayed as a **USB SERIAL PORT**. Be sure to make a note of the Serial Port it is assigned to (COM3 in the example below). You will need this later when installing the Footprints software.

🚔 Device Manager	- • ×
<u>File</u> <u>Action</u> <u>View</u> <u>H</u> elp	
Human Interface Devices	
🗄 🖓 📷 IDE ATA/ATAPI controllers	
🛓 🖉 IEEE 1394 Bus host controllers	
🖶 🔚 Imaging devices	
🗄 🛲 Keyboards	
🗄 🖓 Mice and other pointing devices	
🕀 🖳 Monitors	
🖶 👰 Network adapters	
Portable Devices	
Ports (COM & LPT)	
Printer Port (LPT1)	=
USB Serial Port (COM3) <- TEI	D RDU
Processors	
Sound, video and game controllers	
🗄 🗢 Storage controllers	
🗄 📭 System devices	
🗄 🖷 🏺 Universal Serial Bus controllers	
	-

**NOTE:** On *some* systems, immediately after the TED RDU drivers have been installed, you will need to disable a second device driver that was also installed on your PC. Because it uses the same USB chipset, the **Microsoft Serial Ballpoint** device may also show up in the device manager. This driver **MUST** be disabled prior to operating TED Footprints. **TED Footprints will not work until this driver has been** *disabled*. Do not delete this device as it will re-install automatically after the next PC reboot.

If the **Microsoft Serial Ballpoint** does not show up on your system, you will not need to disable this device.

🚔 Device Manager 💼 💼	x
<u>File Action View H</u> elp	
🗄 🦓 Human Interface Devices	*
E IDE ATA/ATAPI controllers	
🗄 🖷 🖳 IEEE 1394 Bus host controllers	
🗄 🔚 Traging devices	
🗄 🖓 Mice and other pointing devices	m
🖞 HID-compliant mouse	
Microsoft Serial BallPoint <-THIS DEVICE MUST	
Monitors BE DISABLED	
🖶 💀 Network adapters	
Devices	=
Ports (COM & LPT)	
Printer Port (LPT1)	
USB Serial Port (COM3)	
Processors	
Sound, video and game controllers	
Storage controllers	
i international	Ŧ

To disable the Microsoft Serial Ballpoint device:

- *Right* click on the device in the Windows Device Manager.
- Select "Disable" from the pop-up menu.
- Click "Yes" to confirm when the confirmation dialog pops up.

HID-compliant mo	ouse	
Monitors		Update Driver Software
Network adapters		Disable
Ports (COM & LPT)		Uninstall
Communications		Com for bondures about the
USB Serial Port (C		Scan for hardware changes
Processors		Properties
	_	

### Step 4 – Running TED Footprints for the First Time

After TED Footprints is installed, you will notice two icons added to your desktop.



Click on the TED Footprints Viewer to begin the configuration process.

When the Viewer is run initially, you will be presented with the following screen:



You will first need to configure the COM Port for the Footprints Application. The COM Port for the application is the same COM port that was noted in STEP 2 of the installation process (in this example, its COM 3).

To configure the COM port, select Tools->Change COM Port from the Viewer application menu.



You will then be able to select the appropriate COM port.



Once the COM port is selected (in this case, COM 3), click OK.

After several seconds, the TED Footprints Service will be automatically started. If it is successfully started, you will be presented with the Footprints welcome graphic.



*Although this is rare*, you may also need to change the **DataServer Port** that the TED Logging Service uses to communicate with other applications. If you have another application that listens on port 9090, you will need to change this port. To change the dataport, select Tools->Change DataServer Port and type in an unused port number when prompted.

😮 Select DataServer Port 📃 💷 💌
Please select the port that the dataserver will run on. This port can be used to view the application from a remote location as well.
DataServer Port: 9090
OK Close

# The TED Logging Service (TEDService)

The **TED Logging Service** is a Windows Service that is installed as part of the TED Footprints application. The Logging Service is responsible for receiving data packets from the RDU and storing them in a local database. Since the Logging Service is installed as a Windows *Service*, it will start automatically\* as soon as Windows boots up and will remain running as long as Windows is running.

The TED Logging Service can be controlled just like any other Windows Service. To access the Windows Service Menu, select Control Panel -> Administrative Tools -> Services. To change TED Logging Service properties, double click on the service named *TEDService.* Once it is double clicked, the following pop-up will appear.

TEDService Propert	ies (Local Computer)		
General Log On	Recovery Dependencies		
Service name:	TEDService		
Display <u>n</u> ame:	TEDService		
Description: Logging service for the TED Footprint Application. This service must run to retreive data from the RDU.			
Pat <u>h</u> to executabl "C:\Program Files	e: \EnergyInc\TEDFootprints\TEDService.exe''		
Startup typ <u>e</u> :	Automatic		
Help me configure	e service startup options.		
Service status:	Started		
<u>S</u> tart	Stop         Pause         Resume		
You can specify th from here.	he start parameters that apply when you start the service		
Start para <u>m</u> eters:			
	OK Cancel Apply		

\*You generally should never have to change any of the parameters of the TED Logging Service. **Startup Type** should be set to **Automatic** to ensure that the service starts automatically when your PC boots up. The **Automatic** setting will allow the service to continue to log RDU data even if the Footprints Viewer is not running or if the user has logged out.

# **TED Footprints Viewer**



The TED Footprints Viewer is the main portal to view the logging and historical data. It consists of several tabbed screens:

- Live Dashboard The current readings being produced by the RDU
- **Historical Graph-** The historical graph of data being recorded by the TED Logging Service
- Load Profile The historical graph of "Load Profile" events
- Settings Settings for the TED Footprints and TED Logging Service applications.

The TED Footprints Viewer also has the following menu options located at the top of the application:

### I. File

- a. **Print** sends a screenshot of the current screen to your default printer
- b. Exit closes the TED Footprints Viewer (but *does not* stop the TED Logging service)

### II. Tools

- a. Logging Service Use to Start/Stop the Logging Service. NOTE: the logging service can also be started through the Control Panel->Administrative Tools->Systems dialog box.
- b. **Change COM Port** Changes the COM port that the TED Logging Service is currently listening to (*see Installation for more information*)
- c. Change Data Server Port Changes the TCP/IP port used for communication between the TED Logging Service and the TED Footprints Viewer (*see Installation for more information*)
- d. **Reset Default Settings** Resets all of the Footprints Settings to the default settings used after first installing the software
- e. **Ted Watcher** Launches the TED Watcher pop-up (*see TED Watcher section for more information*)
- f. **Data Export** This allows you to export recorded TED Footprints data to your file system (*see Data Export*).

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### Live Dashboard

TED Viewer				
LIVE DASHBOARD	HISTORICAL GRAPH	LOAD PROFILE	SETTINGS	
PRESENT READINGS	REAL-TIME KW USAGE	RE	RECORDINGS	
January 27, 2008 9:41 P.M. Days Left in Billing Cycle: 20 Current Rate In Effect: \$0.0893 per kWh Select View: $\displaystyle \fbox{50}$	10.00 12.00 14.00 14.00 10.00 12.00 14.00 10.00 12.00 14.00 10.00 12.00 14.00 10.00 12.00 14.00 10.000	Peak kW Today Peak \$ Spent Today Low Voltage Today High Voltage Today Peak kW MTD Peak \$ Spent MTD Low Voltage MTD High Voltage MTD	: 18.640 : \$ 1.71 : 118.8 at 19:05 : 125.5 at 10:44 : 47.220 : \$ 4.55 : 112.4 on Jan. 4 : 125.5 on Jan. 27	
KWH USED SINCE MIDNIGHT	KWH USED THIS MONTH	PROJECT	ED KWH USAGE	
26 60 76 176 176 200	400 1200 1200 2400 2400 2400	4000 4000 4000 4000 4000 4000 4000 400	2000	
1 88.7kWH	+- 1306k	WH EE	3714kWH	
CURRENT VOLTAGE	AVERAGE DAILY KWH USage	ALA	RM STATUS	
	90 90 90 90 90 90 90 90 90 90 90 90 90 9	220 220		
A REAL PROPERTY AND INCOME.	and the second		Copyright 2007 Energy, Inc.	

The *Live Dashboard* tab shows all present readings currently being taken by the RDU. By default, it shows all values in terms of kilowatts (kW) or kilowatt hours (kWh). However, by clicking on one of the following icons in the **Present Readings** section of the window, you can immediately switch views.



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The **Present Readings** also displays the current system time (of your PC), the number of days left in the billing cycle, and the current rate being charged by your utility.

PRESENT READINGS	5
January 28, 2008	
10:07 P.M.	
Days Left in Billing Cycle:	19
Current Rate In Effect: \$ 0.08	93 per kWh
Select View: 🍟 🔇	

Next to the Present Readings section is your **Real-Time** usage. Depending on the view, this displays your current real-time usage in terms of kW, dollars, or CO2 pounds.



Notice on the bottom left hand corner there are **plus** and **minus** icons. These allow you to adjust the scale (range) of the meter. For example, the default range for Real-Time CO2 Emissions usage is 0 to 50. Clicking the plus icon increases the high end of this range (e.g. clicking it once will change the range from "0 to 50" to "0 to 55." Clicking the minus decreases it. The maximum amount of the meter and the scale to use when

increasing/decreasing the range are adjustable via the *Settings* tab of the TED Footprints application.

On the top, right hand corner of the dashboard is the **Peak Recordings**.

REC	CORDINGS
Peak kW Today:	20.860
eak \$ Spent Today:	\$ 1.91
.ow Voltage Today:	119.4 at 00:22
ligh Voltage Today:	125.4 at 06:18
Peak kW MTD:	47.220
Peak \$ Spent MTD:	\$ 4.55
Low Voltage MTD:	112.4 on Jan. 4
High Voltage MTD:	125.5 on Jan. 27

On the second and third rows of the Live Dashboard, you will also see several bar meters that display your total, daily average, and projected usage amounts. Depending on your current view, these amounts are:

<b>kW</b>	(\$)	
kWh Used Since Midnight	Money Spent Since Midnight	CO2 Emissions Since Midnight
kWh Used This Month	Money Spent This Month	CO2 Emissions This Month
Projected kWh Usage	Projected Bill	Projected CO2 Emissions
Average Daily kW Usage	Average Daily Spending	Average Daily CO2 Emissions



Just like the Real-Time Usage meter, these values also have a **plus** and **minus** icon that allows you to change the scale. The maximum amount of the range and the amount to change when scaling the range are both configurable on the *Settings* tab.



In addition to the kWh, Spending, and CO2 Emission bar meters, there is an additional meter that displays **Current Voltage**. This works similar to the other bar meters; however, you are able to configure a low end for the range (in addition to the high end) on the *Settings* tab.

PAST MONTHLY USAGE				
KwH	Dir			
22	\$ 2.20			
	AST MONT KwH 22			

The final panel of the **Live Dashboard** is **Past Monthly Usage**. This displays a list of the past KwH and Dlr totals recorded by the RDU for the previous 12 month.

### Multiple MTU Display

If the RDU is configured to receive recordings from multiple MTU's, the individual MTU display values will automatically show up on the dashboard. The overall values displayed are the cumulative values recorded by both MTU's. The individual MTU kWh, Dlr, and Voltage values will appear on the Real-Time Usage and Voltage Panels.



### Historical Graph



The second tab of the Footprints application is the **Historical Graph**. This allows you to display hourly, daily, and monthly averages of readings based on a date range.

To change what **type** of data is being displayed, choose the type with the "Select Historical Data to Display" dropdown box.

Select Historical Data to Display:	kWh	-
January 28, 2008 - Mon	kWh	
Total kWh Used : 4	Dollars	
Total \$/hr Spent : \$.	Voltage	_

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You can then choose the start and end date by selecting the date range by using the two calendar controls.

	Se	lect	Star	rt D	ate			Se	lect	End	d Da	ate	
•		Jan	uarv	2008		۲	4		Jan	uarv	2008	6	
s	м	т	w	т	F	S	s	M	т	w	т	F	
		1	2	3	4	5			1	2	3	4	
6	7	8	9	10	11	12	6	7	8	9	10	11	
13	14	15	16	17	18	19	13	14	15	16	17	18	
20	21	22	23	24	25	26	20	21	22	23	24	25	
27	28	29	30	31			27	28	29	30	31		

When selecting the date range, there are two things to note:

- You will not be able to select an end date prior to the Start date
- If your Start date and End date fall on the same day, that day's hourly averages will be displayed.

The type of averages being displayed is dependent on the date range being selected. If less than three days of data is being requested in range, **hourly averages** will be displayed. If between 3 and 60 days of data is being requested, **daily averages** will be displayed. Finally, if more than 60 days of date is being requested, **monthly average** will be displayed.

The availability of data is dependent on the **Archive Settings** found in the *Settings* tab of the application. Historical data is only available for periods where the TED Logging Service is running and that the RDU is connected to the PC.

### Load Profile

TED Footprints provides the ability to monitor simple changes in kW usage to create **Load Profile Events.** This allows you to watch usage of major appliances, such as Water Heater, HVAC system, or other heavy loads. For example, a hot water heater turning on might register a 4.6kW increase over a few seconds. The Footprints Logging service will watch for a 4.6 kW increase and register an event signaling that the device has been turned on. Once a 4.6kW decrease is measured, Footprints will log an additional event signaling that the device has been turned off. Please not that this is only intended to indicate when an appliance might have **possibly** been turned on or off, and that many factors may cause an event to be incorrectly registered (i.e. an appliance that has a similar kW usage being turned on/off, etc).

Load Profile data is only available for periods where the TED Logging Service is running and that the RDU is connected to the PC.

### Load Profile Graph



The Load Profile Graph is the visual display of what load profile events have occurred.



The bar chart portion of the Load Profile graph indicates when a load profile event has begun or ended. It also displays the duration and cost of each event.



Sel	Select Load Profile Date					
•		Jan	uarv	2008		•
s	м	т	w	т	F	s
		1	2	з	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Multiple devices can be tracked for Load Profile events. To pick which device to display, select the device in the list box on the bottom right hand side of the screen.

You can also force the graph to redraw by clicking the **Refresh Status** button just below the list box.

As mentioned earlier, other events may cause a device to be registered as on or off by mistake. To manually fix the devices current status, use the **Toggle Device On/Off** button.

To select a date to display, use the calendar control on the bottom left hand corner of the

### Managing Load Profile Devices

To add, remove, or edit a device, click the **Edit Load Event Types** button on the bottom of the Load Profile screen. This will launch the Load Profile Device Editor.

Edit Load Event Types

The Load Profile Device Editor allows you to Edit, Add, or Delete a Load Profile Appliance. Each defined appliance is listed in the list box found at the center of the page. The appliance name, along with the kW change that is being watched for, is listed.

To delete an appliance, select it from the appliance list box and press the **Delete Selected Appliance** button. To edit an existing appliance, select the appliance from the list box and press the **Edit Selected Appliance** button. To add a new appliance, press the **Add New Appliance** button.



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#### Setting the Device Name

Clicking the **Edit Selected Appliance** or **Add New Appliance** buttons will launch the wizard to edit/add a Load Profile Device. The first page of the wizard will prompt you for the name of the device. **Appliance Names must be unique.** If you attempt to add a second appliance with the same name as an appliance that already exists, you will overwrite the settings of the original appliance.

ED Viewer	r				
Icol	s <u>H</u> elp	the state of the state	AND DECK OWNERS AND	and the second second	ALC: NO TRACT
		LIVE DASHBOARD	HISTORICAL GRAPH	LOAD PROFILE	SETTINGS
	Welcome to that corresp	o the Load Profile Event Wizan pond to major appliance (HVAC	d. This will take you step by step Water Heater) usage.	through the process of identify	ing kW changes
6	STEP 1: F signature	Please Enter the name of the a is currently being used.	ppliance you wish to track. If the	name is already in use, you wil	l overwrite the kW
		Appliance Name: UWU		Current kWh	Usage
					14.980kW
			Back	Next Cancel	
e			F Files		
		1. A	million and the second	- Company and	Copyright 2007 Energy, Inc

After you have named the device, click **Next** or press **Cancel** to return to the Load Profile Device Editor.

#### Setting the kW Trigger Amount

The next step of the wizard will check for an increase in kW usage as the appliance is powered up. **The kW Trigger Amount** is the amount we expect to see our kW increase when the device is turned on.. You can input this amount manually, or you can have Footprints monitor for the next event by clicking the "**Learn**" button.

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When the **Learn** button is pressed, Footprints software will monitor the RDU feed for the next large kW increase. The device being profiled may need to be on for over 30 seconds to be detected. Once a kW change is detected, you will be notified that the process is complete and the value will be entered into the kW Trigger amount field.

For best results, turn off as many appliances as possible prior to adding a profile. You may want to use **Learn** more than once to ensure you are getting an accurate reading.

Viewer				0
	No. of Concession, Name		CA THE ALL MOLE	
<b>JED</b>	LIVE DASHBOARD	HISTORICAL GRAPH	LOAD PROFILE	SETTINGS
KW Trig At this site amount we from that a for an incr STEP 2: P "SCANNIN detected, p KW Perce	ger p, we will now check for an inc e expect to see our kW increase amount that we will use to creat ress the "Learn" button to mon IG" is taking place. The device you will be notified that the proc Trigger Amount: 4.45 Int Error Allowed: 10	rease in kW usage as the appliance when the device is turned on. The e a match. You may enter the valu lits, turn off as many appliances as itor the kW usage for an event. Tur may need to be on for over 30 r ess is complete and the value will t 	e is powered up. The kW Trigge Percent Error Allowed is the am opasible during this process. In on the appliance you wish to seconds to be detected. Once be entered into the kW Trigger a Current kWh	ar Amount is the bount of variation N' button to wait detect while the a kW change is mount field. Usage
				D Convicted 2007 Energy I

The Percent Error Allowed is the amount of variation from that amount that we will use to create a match. For example, if we are looking for a 4.45kW increase and specify a 10 percent error, the Load Profile event will be triggered by any increase that is in the 4.00 to 4.895kW range.

After you are satisfied with the kW Trigger and Percent Error Allowed amounts, click **Next** to proceed to the next step of the wizard.

#### **Advanced Settings**

For most appliances, you only have to enter the kW increase amount and can assume that the device is turned OFF when the inverse kW decrease is detected. In this case, you can skip the advanced settings and save your profile by clicking the **Finish** button.

D Viewer					
Tools	Help	VICE OF BUILDING STREET, STREE			100 - Co
JE		LIVE DASHBOARD	HISTORICAL GRAPH	LOAD PROFILE	SETTINGS
	Advance	ed Setup?			
-	In most car stages. For two stages you are do	ses, appliances ramp up and ra r example, some HVAC system i. If you need to add additional ne entering in the appliance an	imp down power at the same rate. is power the compressor down firr stages to your appliance, please p d can now click the "Finish" buttor	However, some appliances ra st, then the fan. In this case, t proceed to the advanced setup a.	mp up or down in the drop can be in o page. Otherwise,
				Current M	(h Hanna
		Take me to the Advan	ced Settings	Gurrent KY	in Usage
				N 4 0 0 5	2 7 5 5 8
				+E	6.400kW
			Back	Next Canc	el Finish
8 6					
					Copyright 2007 Energy, In

However, some devices register as ON or OFF in stages versus a single kW change. For example, an HVAC system might have 2 stages to register that is has been turned off. The first decrease would occur when the compressor turns off, and the second decrease may happen a few minutes later when the fan turns off. In these complex cases, you would be able to enter the various stages by pressing the **Take me to the Advanced Settings** button on this page.

Once you click on the Advance Settings button, you will be taken to the following screen:

### TED Footprints User Manual

TED Viewer					- • •
<u>File Iools H</u> e	lp				
SEL.	LIVE DASHE	OARD	HISTORICAL GRAPH	LOAD PROFILE	SETTINGS
Ad Thi and sta afte	ivanced - Multiple Sta is page allows you to edit m d power down each. Howev ge; However, you will need er it has been "learned" in o	ges ultiple stages er, all of the u to time the lea rder to get the	of the an appliance event sign p stages must equal all of the rn to occur before the stage be totals to balance out.	ature. You can enter up to 3 sta down stages. You can run the egins. You may also need to edit	ges for power up "Learn" for each each stage level
	kW Stage 1 Up:	4.45	Learn	Current kWł	n Usage
	kW Stage 2 Up:	0	Learn		
	kW Stage 3 Up:	0	Learn	N 4 0 0 9	61 01 02
	kW Stage 1 Down:	4.45	Learn		
	kW Stage 2 Down:	0	Learn	Ŧ	6.500kW
	kW Stage 3 Down:	0	Learn		100000000000000000000000000000000000000
	То	Total Up: 4,48 tal Down: 4,48	Back	Next Cancel	Finish
	-	-			Copyright 2007 Energy, Inc.

You can enter up to 3 power-up stages, and 3 power-down stages for each device. However, you **do not** have to have the same number of stages in both the power up and power down modes. Continuing with the HVAC example, you might have a unit that turns both the compressor and fan on at the same time. This might register as a 5kW increase. However, using the 2-stage cool-down example, the compressor shutting off might register as a 4kW decrease, and the fan powering down would register as a 1kW decrease. In this case, the stages would look like this:

kW Stage 1 Up	5.0
kW Stage 2 Up	0.0
kW Stage 3 Up	0.0
kW Stage 1 Down	4.0
kW Stage 2 Down	1.0
kW Stage 3 Down	0.0

If a stage is not used, enter a value of zero for that stage. While you do not have to have an equal number of stages, the total kW increase and total kW decrease must be equal. In his example, we have a 5kW increase with a 5kW decrease to balance it out. Note also,

that the initial 1-2 second ramp-up where a very high kW is noted by TED should not be considered a "stage."

### Settings

Teen Teen	104 100	ALL ROLL	100 Mar 19	and the second second		
LIVE DAS	SHBOARD	HISTORIC	CAL GRAPH	LOAD PROFILE	SET	TINGS
Deskhaan	1.0 - 111					
Dashboard	1 Setti	ngs	Arch	nive Settings		Equivalent Ti
Display Name	Max Value	Scale Value	Number of Seco	nd Recordings to Keep in Archive	360000	100.0 hours
Real-Time kW Usage	20	1	Number of Mine	te Recordings to Keep in Archive	144000	100.0 days
kWH Usage Since Midnight	250	10	Number of Ho	our Recordings to Keep in Archive	9800	408.3 days
kWH Usage This Month	4000	100	Number of D	ay Recordings to Keep in Archive	365	12.2 months
Projected kWH Usage	4000	100		Estimated Database Siz	a 21.58 MB	
Average Daily kWH Usage	250	1				
Current Spending Per Hour	10	1				
Money Spent Since Midnight	50	5				
Money Spent This Month	500	50				
Projected Bill	500	50				
Average Daily Spending	50	1				
Real-Time CO2 Emissions	50	5				
CO2 Emissions Since Midnight	500	10				
CO2 EmissionsThis Month	100	6000				
Projected CO2 Emissions	6000	200				
Average Daily CO2 Emissions	50					
Current Voltage	123	2				
Addition	al Sett	ings				
CO2 Multiplier	1.55	ings				
Voltana History Balton	117					
vollage history bodom						
Debug Level	INFO	·				

The settings screen allows you to change the various settings of the TED Footprints Viewer. It is broken down into three parts:

- **Dashboard Settings**: These settings allow you to change the max value and scale value of the various meters on the Live Dashboard page.
- Archive Settings: These settings let you determine how much historical data you wish to keep in the local database.
- Additional Settings: These are miscellaneous settings that affect various parts of the application.

Dashboard Settings			
Display Name	Max Value	Scale Value	
Real-Time kW Usage	20	1	
kWH Usage Since Midnight	250	10	
kWH Usage This Month	4000	100	
Projected kWH Usage	4000	100	
Average Daily kWH Usage	250	1	
Current Spending Per Hour	10	1	
Money Spent Since Midnight	50	5	
Money Spent This Month	500	50	
Projected Bill	500	50	
Average Daily Spending	50	1	
Real-Time CO2 Emissions	50	5	
CO2 Emissions Since Midnight	500	10	
CO2 EmissionsThis Month	100	6000	
Projected CO2 Emissions	6000	200	
Average Daily CO2 Emissions	50	5	

### **Dashboard Settings**

Each meter on the Live Dashboard page has a range of 0-to-its-maximum value. The maximum value is adjustable on the Settings page. To change the maximum value, increase the value next to the corresponding bar name. As soon as any value is entered, it is saved.

For example, the setting for the Real-Time kW usage has a Max value of 20. This means that the Real-Time kW graphic on the Live Dashboard page will have a range of 0 to 20. If the value is changed to 50, the Realtime kW graphic on the Live Dashboard will have a range of 0 to 50.

The "Scale Value" is how much the maximum value should increase/decrease when the plus-or minus button next to the corresponding graph is pressed.

Additiona	al Settings
CO2 Multiplier	1.55
Voltage History Bottom	117
Debug Level	ERROR

123

Current Voltage

5

### **Additional Settings**

**CO2 Multiplier-** different utility companies use different multipliers when calculating the CO2 emissions. This value can be changed in the settings to correspond with you utility's CO2 emission rate.

**Voltage History Bottom-** This value is the "low end" of the voltage range when voltage is displayed on Live Dashboard or Historical Data.

**Debug Level** – This is the local level of logging used for the various TED

applications. This should only be modified for debugging purposes if an error condition occurs.

Archive Settings		Equivalent Time
Number of Second Recordings to Keep in Archive	3600	1.0 hours
Number of Minute Recordings to Keep in Archive	1440	1.0 days
Number of Hour Recordings to Keep in Archive	9800	408.3 days
Number of Day Recordings to Keep in Archive	365	12.2 months
Estimated Database Siz	e: 0.64 MB	

Archive settings allow you to adjust how much historical data should be retained in the database. **Each field is mutually exclusive**; each recording is made independently. Each average type (second, minute, hour, and day) is stored in its own table. The value specified in each field is the amount of entries for each type to keep in the database. Using the above example, we are storing 3600 entries of **second** average in the database (the equivalent of one hour), but are also keeping over a days worth of minute data.

### Data Export

Data can be exported from the TED Footprints database and stored on your local file system. The data is stored in a Comma Separated Value format (CSV) which can then be imported into other applications. CSV files can be viewed directly with a text editor or opened in a spreadsheet program like Excel.

To begin the data export process, select the Tools->Data Export option from the TED Footprints viewer menu.



Choosing data export will launch the following pop-up:

🖳 Data Export	- • ×	
This will export data from the TED Footprints database. The data will be saved in a Comma Separated Value (CSV) file to the directory specified below. Larger datasets may take up to several minutes to export. Footprints will continue to log live data while the export is taking place.		
Destination Directory:		
C:\Users\newki\Desktop\Documents\exportSeconds Browse		
Please select which data to export:	Monthly Data 🗸	
Please select the start date/time:	01/30/2008 00:00	
Please select the end date/time:	01/31/2008 00:00	
	Export Cancel	

From this popup, you must first choose the destination file by clicking the **Browse** button. Next you can pick which table you wish to export. The available tables are:

Table Name	Description
Monthly Data	Table containing the monthly totals recorded by the TED
	Footprints application.
Daily Data	Table containing the daily totals recorded by the TED Footprints
	application.
Hourly Data	Table containing the hourly totals recorded by the TED Footprints
Minute Data	Table containing the per-minute totals recorded by the TED
Second Data	Table containing the per accord totals recorded by the TED
Second Data	Footprints application
Load Profile Event History	Table containing the Load Profile Events recorded by the TED
Data	Footprints application.
Monthly Data (MTU1)	Table containing the monthly totals recorded from the first MTU
	by the TED Footprints application. NOTE: This table will be
	empty if only a single MTU is used.
Daily Data (MTU1)	Table containing the daily totals recorded from the first MTU by
	the TED Footprints application. NOTE: This table will be empty if
	only a single MTU is used.
Hourly Data (MTU1)	Table containing the hourly totals recorded from the first MTU by
	the TED Footprints application. NOTE: This table will be empty if
	only a single MIU is used.
Minute Data (MTU1)	I able containing the per-minute totals recorded from the first
	MIU by the TED Footprints application. NOTE: This table will be
Second Data (MTU1)	Table containing the per accord totals recorded from the first
	MTU by the TED Ecotorints application NOTE: This table will be
	empty if only a single MTH is used
Monthly Data (MTU2)	Table containing the monthly totals recorded from the second
	MTU by the TED Footprints application. NOTE: This table will be
	empty if only a single MTU is used.
Daily Data (MTU2)	Table containing the daily totals recorded from the second MTU
	by the TED Footprints application. NOTE: This table will be
	empty if only a single MTU is used.
Hourly Data (MTU2)	Table containing the hourly totals recorded from the second MTU
	by the TED Footprints application. NOTE: This table will be
	empty if only a single MTU is used.
Minute Data (MTU2)	Table containing the per-minute totals recorded from the second
	MTU by the TED Footprints application. NOTE: This table will be
	empty if only a single MTU is used.
Second Data (MTU2)	I able containing the per-second totals recorded from the second
	MIU by the IED Footprints application. NOTE: This table will be
	empty il only a single M I U is used.

Table Names

The amount of data that is retained in the database is configured via the *Settings* tab of Footprints Viewer application (*Archive Data*).

Finally, you can pick a start date and end date for the report using the two calendar controls. By default, the time is assumed to be midnight on each date, but that value can be edited directly by typing in the hour and minute in 24-hour format. For example:

Please select which data to export:	Monthly Data	•
Please select the start date/time:	01/31/2008 13:00	
Please select the end date/time:	01/31/2008 14:30	

Pressing the **Export** button will begin the export process. You will be notified by a popup when the export is complete.

Sample Export			
"TI	MESTAMP","KW","DLR","VRMS"		
"1/30/2008	12:00:01 AM","7.68","0.7","123.1"		
"1/30/2008	12:00:02 AM","7.65","0.7","123.1"		
"1/30/2008	12:00:03 AM","7.67","0.7","123.1"		
"1/30/2008	12:00:04 AM","7.63","0.7","122.9"		
"1/30/2008	12:00:05 AM","8.74","0.8","122.5"		

### Sample Export

# **TED Watcher**

The TED Watcher is a small application that provides a quick view of the real-time readings. The TED Watcher dialog is designed to always run on top of all applications and can be launched either by its desktop icon, or by TED Footprints Viewer.



By default, the Watcher displays the real-time kW usage. However, if you click on this value, you can toggle between real-time kW usage, real-time spending, and real-time CO2 emissions.

# **Frequently Asked Questions**

### Will TED Footprints work on a MAC as well as a PC?

No. Not at the present time.

#### I have a TED1000. Will Footprints work on this?

Yes. Please visit the TED website at <u>www.theenergydetective.com</u> for more information.

### Will Footprints work on my TED 1002?

Yes. Please visit the TED website at <u>www.theenergydetective.com</u> for more information.

#### How frequently does the data get recorded in my computer?

Every one (1) second.

#### Can I access the data that has been logged to create my own graphs?

Yes. Footprints exports the data in Excel for user-defined charting and graphing.

### How much data will Footprints log?

You are limited only by the amount of storage on your PC. You can set up your own parameters.

#### How accurate is Footprints?

TED Footprints is accurate to within 2%.

#### What does Footprints log?

Footprints logs KW, kWh, Dollars, and voltage.

### Will Footprints display Greenhouse Gas Emissions?

Yes.

### If I buy Footprints now, can it be upgraded if you make changes to it?

Yes. You will be able to access upgrades from our website.

### Can I print the graphs?

Yes.

#### Will TED Footprints work under Microsoft Vista?

Yes. However, you will either need to disable UAC (User Access Control) or run the TED Footprints Viewer/ TED Watcher as an Administrator (or as a user with permissions to write data to the installation directory).

#### Will TED Footprints run if I am using the Microsoft Windows Firewall?

Yes. However, you will need to add the following applications to the "Exceptions" list:

TEDService.exe TEDViewer.exe TEDWatcher.exe

All three of these are located in the TED Footprints installation directory.