TED 5000 API

Based on Gateway Firmware Revision R330 and Footprints Revision 169

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Architectural Overview

Overview of TED 5000
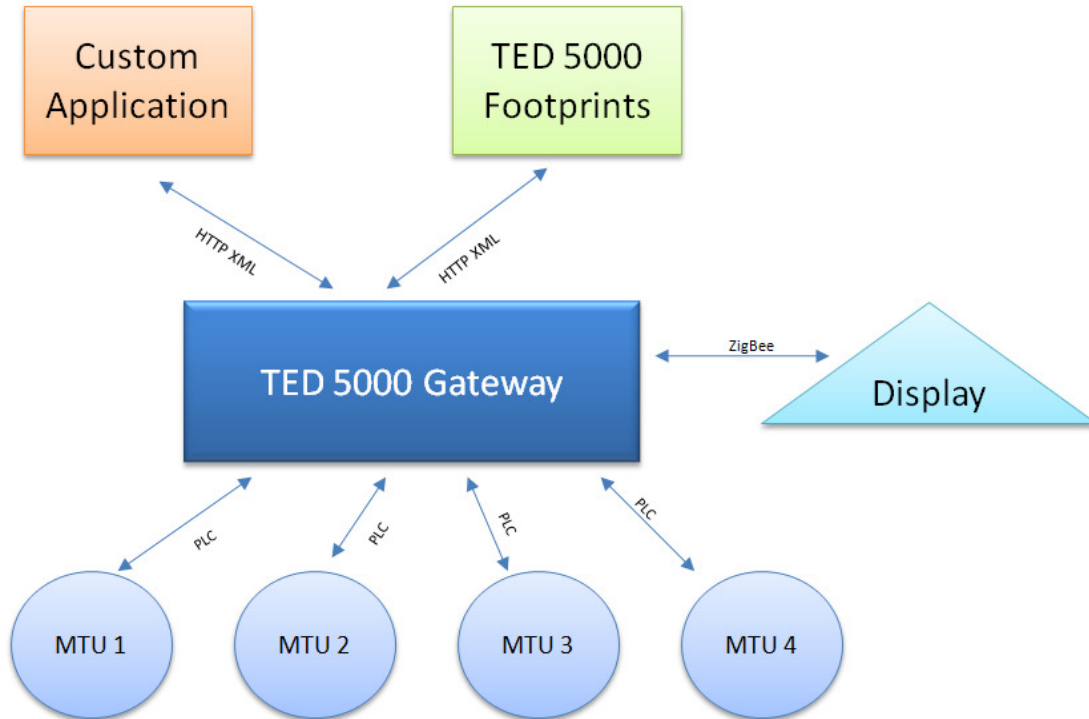
The heart of the TED 5000 is the *TED 5000 Gateway* which serves several functions:

- Receive and record live data from one or more MTU's
- Serve as a light-weight REST server to feed XML data to viewer applications
- Serve HTML pages to allow the TED Footprints Dashboard object to be embedded in a web browser or application.
- Interact w/ wireless ZigBee devices to display data

For the purposes of the API, we will focus on the REST and HTML features of the TED Service. **Third party applications can access both the live and historical data from the TED 5000 by making HTTP requests to the TED 5000.** Parameters are passed as a standard HTTP GET query and results are returned as simple XML, CSV, or Binary objects.

By default, TED 5000 listens on port 80 for HTTP request, or port 443 for a HTTPS request . However, this can be changed via the TED 5000 System Settings Wizard.

Live Data

Calling /**api/LiveData.xml** data returns the most recent live statistics recorded by the TED 5000. Voltage, Power, and Cost are displayed for each MTU (under the correlating element of MTU1, MTU2, MTU3, MTU4). Total is the "Net" calculation of these values based on the system configuration. If only a single MTU is used, "Net" is the same value as MTU1.

Sample URL: http://TED5000/api/LiveData.xml
Parameters: none.

XML Fields

Element	Field	Description	Units
GatewayTime		**The current system time of the gateway**	
	Hour		00-23
	Minute		00-59
	Second		00-59
	Month		1-12
	Day		1-31
	Year		2-digit +2000
Voltage		**The voltage readings for the net (Total) and individual MTU's (MTU1 to MTU 4)**	
	VoltageNow	The most recent voltage reading from the MTU	Volts * 10
	LowVoltageHour	The lowest voltage reading of the past hour	Volts * 10
	LowVoltageToday	The lowest voltage reading recorded today	Volts * 10
	LowVoltageTodayTimeHour	The hour (00-23) of the lowest voltage reading recorded today	Number
	LowVoltageTodayTimeMin	The minute (00-59) of the lowest voltage reading recorded today	Number
	VoltageNow	The most recent voltage reading from the MTU	Volts * 10
	HighVoltageHour	The Highest voltage reading of the past hour	Volts * 10
	HighVoltageToday	The Highest voltage reading recorded today	Volts * 10
	HighVoltageTodayTimeHour	The hour (00-23) of the highest voltage reading recorded today	Number
	HighVoltageTodayTimeMin	The minute (00-59) of the highest voltage reading recorded today	Number
	LowVoltageMTD	The lowest voltage recorded in the current billing period	Volts * 10
	LowVoltageMTDDateMonth	The month in which the low voltage was recorded.	Number
	LowVoltageMTDDateDay	The day of the month the low voltage was recorded	Number
	HighVoltageMTD	The highest voltage recorded in the current billing period	Volts * 10
	HighVoltageMTDDateMonth	The month in which the highest voltage was recorded.	Number
	HighVoltageMTDDateDay	The day of the month the highest voltage was recorded	Number
Power		**The Power readings for the net (Total) and individual MTU's (MTU1 to MTU 4)**	
	PowerNow	The most recent Power reading from the MTU	Watts
	PowerTDY	Cumulative Power since midnight	Watts
	PowerMTD	Cumulative Power since the beginning of the billing cycle	Watts
	PowerProj	Projected power usage this billing cycle	Watts
	KVA	Most recent Kilovolt-ampere reading	VA
	PowerAvg	The average daily power used this billing cycle	Watts

	PeakTdy	The highest power reading read since midnight	Watts
	PeakMTD	Highest power reading this billing cycle	Watts
	PeakTdyHour	The hour when the peak reading occurred	00-23
	PeakTdyMin	The minute when the peak reading occurred	00-59
	PeakMTDMonth	The month in which the peak reading occurred	1-12
	PeakMTDDay	The day of the month in which the peak reading occurred	1-31
	MinTdy	The highest power reading read since midnight	Watts
	MinMTD	Highest power reading this billing cycle	Watts
	MinTdyHour	The hour when the Min reading occurred	00-23
	MinTdyMin	The minute when the Min reading occurred	00-59
	MinMTDMonth	The month in which the Min reading occurred	1-12
	MinMTDDay	The day of the month in which the Min reading occurred	1-31
Cost		**The Cost readings for the net (Total) and individual MTU's (MTU1 to MTU 4)**	
	CostNow	The most recent Cost reading from the MTU	Watts
	CostTDY	Cumulative Cost since midnight	Watts
	CostMTD	Cumulative Cost since the beginning of the billing cycle	Watts
	CostProj	Projected Cost usage this billing cycle	Watts
	CostAvg	The average daily Cost used this billing cycle	Watts
	PeakTdy	The highest Cost reading read since midnight	Watts
	PeakMTD	Highest Cost reading this billing cycle	Watts
	PeakTdyHour	The hour when the peak reading occurred	00-23
	PeakTdyMin	The minute when the peak reading occurred	00-59
	PeakMTDMonth	The month in which the peak reading occurred	1-12
	PeakMTDDay	The day of the month in which the peak reading occurred	1-31
	MinTdy	The highest Cost reading read since midnight	Watts
	MinMTD	Highest Cost reading this billing cycle	Watts
	MinTdyHour	The hour when the Min reading occurred	00-23
	MinTdyMin	The minute when the Min reading occurred	00-59
	MinMTDMonth	The month in which the Min reading occurred	1-12
	MinMTDDay	The day of the month in which the Min reading occurred	1-31
System	NumberMTU	Numbe of MTU's currently configured for this TED	1-4
Utility		**Utility specific information used by the Dashboard**	
	CarbonRate	The carbon factor used to determine carbon usage	Pound Per kW * 100
	CurrentRate	The current rate in effect	Dollars * 10000
	MeterReadDate	Date of the month in which the billing cycle ends	
	DaysLeftInBillingCycle	Number of days remaining in the current billing cycle	
	PlanType	The plan type used by the utility	• 1 – Flat • 2- Tier • 3- TOU • 4-Tier + TOU
	CurrentTier	If a tiered plan is used, the current tier in effect	0-based
	CurrentTOU	If a TOU plan is used, the current TOU in effect	0-based
	CurrentTOUDescription	The description of the TOU tier as specified in the settings	String

Sample XML

```
<LiveData>
    <GatewayTime>
        <Hour>19</Hour>
        <Minute>27</Minute>
        <Month>3</Month>
        <Day>30</Day>
        <Year>10</Year>
        <Second>13</Second>
    </GatewayTime>

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```

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                <HighVoltageMTDDateMonth>0</HighVoltageMTDDateMonth>
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            </MTU2>

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        <CostMTD>14947</CostMTD>
        <CostProj>47015</CostProj>
        <MinTdy>207</MinTdy>
        <MinMTD>264</MinMTD>
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        <MinTdy>0</MinTdy>
        <MinMTD>0</MinMTD>
        <MinTdyHour>0</MinTdyHour>
        <MinTdyMin>0</MinTdyMin>
        <MinMTDMonth>0</MinMTDMonth>
        <MinMTDDay>0</MinMTDDay>
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        <CostTDY>0</CostTDY>
        <CostMTD>0</CostMTD>
        <CostProj>0</CostProj>
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        <MinTdyMin>0</MinTdyMin>
        <MinMTDMonth>0</MinMTDMonth>
        <MinMTDDay>0</MinMTDDay>
```

```
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                <MinMTD>0</MinMTD>
                <MinTdyHour>0</MinTdyHour>
                <MinTdyMin>0</MinTdyMin>
                <MinMTDMonth>0</MinMTDMonth>
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                <CostAvg>0</CostAvg>
        </MTU3>
        <MTU4>
                <CostNow>0</CostNow>
                <CostHour>-1</CostHour>
                <CostTDY>0</CostTDY>
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                <CostProj>0</CostProj>
                <MinTdy>0</MinTdy>
                <MinMTD>0</MinMTD>
                <MinTdyHour>0</MinTdyHour>
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                <MinMTDMonth>0</MinMTDMonth>
                <MinMTDDay>0</MinMTDDay>
                <CostAvg>0</CostAvg>
        </MTU4>
    </Cost>

    <System>
        <NumberMTU>1</NumberMTU>
    </System>

    <Utility>
        <CarbonRate>155</CarbonRate>
        <CurrentRate>14521</CurrentRate>
        <MeterReadDate>21</MeterReadDate>
        <DaysLeftInBillingCycle>22</DaysLeftInBillingCycle>
        <PlanType>1</PlanType>
        <CurrentTier>1</CurrentTier>
        <CurrentTOU>0</CurrentTOU>
        <CurrentTOUDescription></CurrentTOUDescription>
    </Utility>

</LiveData>
```

Historical Data

History can be queried in a variety of formats from the device: XML, CSV, and RAW. Each query can take the following parameters:

- MTU -0-based index of the MTU whose history is being requested
- INDEX (Optional) – By default the most recent data point is the first row returned. This will let you jump back "y" rows. An index of 1 is the most recent record.
- COUNT(Optional) - number of records to return. If count is not specified all records from the specified index and older will be returned.

Sample URL: http://TED5000/history/secondhistory.xml?MTU=1&COUNT=100&INDEX=10

This query returns 100 records for MTU #2 starting with the 10th newest record.

Historical Data (XML)

The following URL's can be used to retrieve historical data in XML format.

- /history/secondhistory.xml
- /history/minutehistory.xml
- /history/hourlyhistory.xml
- /history/dailyhistory.xml
- /history/dailyhistory.xml

Second History (XML)

Sample URL: http://TED5000/history/secondhistory.xml?MTU=1&COUNT=100&INDEX=10

XML Fields

Field Name	Description
MTU	0-based index of the MTU whose data is being returned
Date	The date of the recorded value
Power	The power sample (watts) recorded for that second
Cost	The cost (in cents) if the power average is maintained for an hour
Voltage	The voltage recorded for that second (volts * 10)

Sample XML

```
<History>
  <SECOND>
     <MTU>0</MTU>
     <DATE>03/30/2010 20:11:45</DATE>
     <POWER>3471</POWER>
     <COST>52</COST>
     <VOLTAGE>1193</VOLTAGE>
  </SECOND>
  <SECOND>
     <MTU>0</MTU>
     <DATE>03/30/2010 20:11:44</DATE>
     <POWER>3471</POWER>
     <COST>52</COST>
     <VOLTAGE>1193</VOLTAGE>
   </SECOND>
</History>
```

Minute History (XML)

Sample URL: http://TED5000/history/minutehistory.xml?MTU=1&COUNT=100&INDEX=10

XML Fields

Field Name	Description
MTU	0-based index of the MTU whose data is being returned
Date	The date of the recorded value
Power	The average power sample (watts) recorded for that minute
Cost	The cost (in cents) if the minute power average is maintained for an hour
Voltage	The average voltage recorded for that minute (volts * 10)

Sample XML

```
<History>
  <MINUTE>
     <MTU>0</MTU>
     <DATE>03/30/2010 20:17:00</DATE>
     <POWER>8300</POWER>
     <COST>125</COST>
     <VOLTAGE>1188</VOLTAGE>
  </MINUTE>
  <MINUTE>
     <MTU>0</MTU>
     <DATE>03/30/2010 20:16:00</DATE>
     <POWER>3446</POWER>
     <COST>52</COST>
     <VOLTAGE>1193</VOLTAGE>
  </MINUTE>
</History>
```

Hour History (XML)

Sample URL: http://TED5000/history/hourlyhistory.xml?MTU=1&COUNT=100&INDEX=10

XML Fields

Field Name	Description
MTU	0-based index of the MTU whose data is being returned
Date	The date of "Hour" being recorded. For example: a value of 19:00 would be for the hour starting at 19:00:00 and ending at 19:59:59
Power	The cumulative power used for the given hour (watts)
Cost	The cumulative cost of power used for the given hour (cents)
VMIN	The minimum voltage recorded for the hour (Volts * 10)
VMAX	The maximum voltage recorded for the hour (Volts * 10)

Sample XML

```
<History>
    <HOUR>
        <MTU>0</MTU>
        <DATE>03/30/2010 19:00:00</DATE>
        <POWER>3744</POWER>
        <COST>56</COST>
        <VMIN>1183</VMIN>
        <VMAX>1183</VMAX>
    </HOUR>
    <HOUR>
        <MTU>0</MTU><DATE>03/30/2010 18:00:00</DATE>
        <POWER>2842</POWER>
        <COST>42</COST>
        <VMIN>1193</VMIN>
        <VMAX>1193</VMAX>
    </HOUR>
</History>
```

Day History (XML)

Sample URL: http://TED5000/history/dailyhistory.xml?MTU=1&COUNT=100&INDEX=10

XML Fields

Field Name	Description
MTU	0-based index of the MTU whose data is being returned
Date	The date of "day" being recorded. For example, a record w/ the timestamp of 3/29/2010 would contain the cumulative recordings for the day of 3/29/2010 starting at 3/29/2010 00:00:00 and ending at 3/29/2010 23:59:59.
Power	The cumulative power used for the given day (watts)
Cost	The cumulative cost of power used for the given hour (cents)
PMIN	The minimum power recorded for the day. VAL is the power in Watts. DATE is the time of date the value was recorded.
PMAX	The max power recorded for the day. VAL is the power in Watts. DATE is the time of date the value was recorded.
CMIN	The minimum cost recorded for the day. VAL is the cost in cents. DATE is the time of date the value was recorded.
CMAX	The max cost recorded for the day. VAL is the cost in cents. DATE is the time of date the value was recorded.
VMIN	The minimum voltage recorded for the day. VAL is the voltage * 100. DATE is the time of date the value was recorded.
VMAX	The max voltage recorded for the day. VAL is the voltage * 10. DATE is the time of date the value was recorded.

Sample XML

```
<History>
  <DAY>
      <MTU>0</MTU>
      <DATE>03/29/2010 00:00:00</DATE>
      <POWER>92794</POWER>
      <COST>1494</COST>
      <PMIN><VAL>0</VAL><DATE>18:5</DATE></PMIN>
      <PMAX><VAL>13969</VAL><DATE>23:24</DATE></PMAX>
      <CMIN><VAL>0</VAL><DATE>18:5</DATE></CMIN>
      <CMAX><VAL>228</VAL><DATE>0:53</DATE></CMAX>
      <VMIN><VAL>2367</VAL><DATE>20:39</DATE></VMIN>
      <VMAX><VAL>2432</VAL><DATE>22:50</DATE></VMAX>
  </DAY>
  <DAY>
   <MTU>0</MTU>
   <DATE>03/28/2010 00:00:00</DATE>
   <POWER>89426</POWER>
   <COST>1494</COST>
   <PMIN><VAL>2195</VAL><DATE>14:11</DATE></PMIN>
   <PMAX><VAL>15424</VAL><DATE>3:8</DATE></PMAX>
   <CMIN><VAL>37</VAL><DATE>14:6</DATE></CMIN>
   <CMAX><VAL>258</VAL><DATE>3:8</DATE></CMAX>
   <VMIN><VAL>2358</VAL><DATE>19:38</DATE></VMIN>
   <VMAX><VAL>2433</VAL><DATE>23:25</DATE></VMAX>
  </DAY>
</History>
```

Month History (XML)

Sample URL: http://TED5000/history/monthlyhistory.xml?MTU=1&COUNT=100&INDEX=10

XML Fields

Field Name	Description
MTU	0-based index of the MTU whose data is being returned
Date	The date of "Month" being recorded. The Month value is recorded when a billing cycle expires. For example, if the billing cycle ends on the 15th, the Month of "03/01/2010" would be recorded for the billing cycle ending on March 15th, 2010.
Power	The cumulative power used for the given month (watts)
Cost	The cumulative cost of power used for the given month (cents)
PMIN	The minimum power recorded for the month. VAL is the power in Watts. DATE is the time of date the value was recorded.
PMAX	The max power recorded for the month. VAL is the power in Watts. DATE is the time of date the value was recorded.
CMIN	The minimum cost recorded for the month. VAL is the cost in cents. DATE is the time of date the value was recorded.
CMAX	The max cost recorded for the month. VAL is the cost in cents. DATE is the time of date the value was recorded.
VMIN	The minimum voltage recorded for the month. VAL is the voltage * 100. DATE is the time of date the value was recorded.
VMAX	The max voltage recorded for the month. VAL is the voltage * 10. DATE is the time of date the value was recorded.

Sample XML

```
<History>
      <MONTH>
            <MTU>0</MTU>
            <DATE>02/01/2010 00:00:00</DATE>
            <POWER>2909843</POWER>
            <COST>45013</COST>
            <PMIN><VAL>0</VAL><DATE>3/6</DATE></PMIN>
            <PMAX><VAL>25454</VAL><DATE>2/24</DATE></PMAX>
            <CMIN><VAL>0</VAL><DATE>3/6</DATE></CMIN>
            <CMAX><VAL>425</VAL><DATE>2/24</DATE></CMAX>
            <VMIN><VAL>2345</VAL><DATE>3/5</DATE></VMIN>
            <VMAX><VAL>2464</VAL><DATE>2/26</DATE></VMAX>
      </MONTH>

      <MONTH>
            <MTU>0</MTU>
            <DATE>01/01/2010 00:00:00</DATE>
            <POWER>4009827</POWER>
            <COST>61481</COST>
            <PMIN><VAL>0</VAL><DATE>2/1</DATE></PMIN>
            <PMAX><VAL>26009</VAL><DATE>1/27</DATE></PMAX>
            <CMIN><VAL>0</VAL><DATE>2/1</DATE></CMIN>
            <CMAX><VAL>435</VAL><DATE>1/27</DATE></CMAX>
            <VMIN><VAL>2308</VAL><DATE>2/16</DATE></VMIN>
            <VMAX><VAL>2478</VAL><DATE>2/17</DATE></VMAX>
      </MONTH>
</History>
```

Historical Data (RAW)

A raw binary format of the history can be exported from the Gateway as well. The benefit of using this approach is that the download time required to export the data is much less than the time it takes to export an XML or CSV file.

When a *.raw file is requested, each record is returned as an individually base-64 encoded line terminated w/ a newline character. For example, an export of 10 rows of second data may look like this:

```
CgMeFQgfIg4AADcAAABcCQ==
CgMeFQgeIg4AADcAAABcCQ==
CgMeFQgdIg4AADcAAABcCQ==
CgMeFQgcCQ4AADYAAABbCQ==
CgMeFQgbCQ4AADYAAABbCQ==
CgMeFQgaCQ4AADYAAABbCQ==
CgMeFQgZEg4AADYAAABcCQ==
CgMeFQgYEg4AADYAAABcCQ==
CgMeFQgXEg4AADYAAABcCQ==
CgMeFQgWEg4AADYAAABcCQ==
```

Each individual row must be decoded into an array of bytes.

Second History (RAW)

Sample URL: http://TED5000/history/rawsecondhistory.raw?MTU=1&COUNT=100&INDEX=10

A row of second data is in the following format (0-based index)

Starting Index	Field	Length (bytes)	Type	Notes
0	Year	1	Unsigned Char	This is the last 2 digits of the year. Note: 100 = 2100
1	Month	1	Unsigned Char	1-12
2	Day	1	Unsigned Char	1-31
3	Hour	1	Unsigned Char	0-23
4	Minute	1	Unsigned Char	0-59
5	Second	1	Unsigned Char	0-59
6	Power	4	Signed Int32	Watts
10	Cost	4	Signed Int32	Cents
14	Voltage	2	Unsigned Int16	Volts * 10

Minute History (RAW)

Sample URL: http://TED5000/history/rawminutehistory.raw?MTU=1&COUNT=100&INDEX=10

A row of minute data is in the following format (0-based index)

Starting Index	Field	Length (bytes)	Type	Notes
0	Year	1	Unsigned Char	This is the last 2 digits of the year. Note: 100 = 2100
1	Month	1	Unsigned Char	1-12
2	Day	1	Unsigned Char	1-31
3	Hour	1	Unsigned Char	0-23
4	Minute	1	Unsigned Char	0-59
5	Power	4	Signed Int32	Watts
9	Cost	4	Signed Int32	Cents
13	Voltage	2	Unsigned Int16	Volts * 10

Hour History (RAW)

Sample URL: http://TED5000/history/rawhourhistory.raw?MTU=1&COUNT=100&INDEX=10

A row of minute data is in the following format (0-based index)

Starting Index	Field	Length (bytes)	Type	Notes
0	Year	1	Unsigned Char	This is the last 2 digits of the year. Note: 100 = 2100
1	Month	1	Unsigned Char	1-12
2	Day	1	Unsigned Char	1-31
3	Hour	1	Unsigned Char	0-23
4	Power	4	Signed Int32	Watts
8	Cost	4	Signed Int32	Cents
12	Voltage Low	2	Unsigned Int16	Volts * 10
14	Voltage High	2	Unsigned Int16	Volts * 10

Day History (RAW)

Sample URL: http://TED5000/history/rawdayhistory.raw?MTU=1&COUNT=100&INDEX=10

A row of minute data is in the following format (0-based index)

Starting Index	Field	Length (bytes)	Type	Notes
0	Year	1	Unsigned Char	This is the last 2 digits of the year. Note: 100 = 2100
1	Month	1	Unsigned Char	1-12
2	Day	1	Unsigned Char	1-31
3	Power	4	Signed Int32	Watts
7	Cost	4	Signed Int32	Cents
11	Power Low	2	Signed Int16	Watts
13	Power Low Hour	1	Unsigned Char	
14	Power Low Min	1	Unsigned Char	
15	Power High	2	Signed Int16	Watts
17	Power High Hour	1	Unsigned Char	0-23
18	Power High Min	1	Unsigned Char	0-59
19	Cost Low	2	Signed Int16	Cents
21	Cost Low Hour	1	Unsigned Char	0-23
22	Cost Low Min	1	Unsigned Char	0-59
23	Cost High	2	Signed Int16	Cents
25	Cost High Hour	1	Unsigned Char	0-23
26	Cost High Min	1	Unsigned Char	0-59
27	Voltage Low	2	Signed Int16	Volts * 10
29	Voltage Low Hour	1	Unsigned Char	0-23
30	Voltage Low Min	1	Unsigned Char	0-59
31	Voltage High	2	Signed Int16	Volts * 10
33	Voltage High Hour	1	Unsigned Char	0-23
34	Voltage High Min	1	Unsigned Char	0-59

Month History (RAW)

Sample URL: http://TED5000/history/rawmonthhistory.raw?MTU=1&COUNT=100&INDEX=10

A row of minute data is in the following format (0-based index)

Starting Index	Field	Length (bytes)	Type	Notes
0	Year	1	Unsigned Char	This is the last 2 digits of the year. Note: 100 = 2100
1	Month	1	Unsigned Char	1-12
2	Power	4	Signed Int32	Watts
6	Cost	4	Signed Int32	Cents
10	Power Low	2	Signed Int16	Watts
12	Power Low Month	1	Unsigned Char	1-12
13	Power Low Day	1	Unsigned Char	1-31
14	Power High	2	Signed Int16	Watts
16	Power High Month	1	Unsigned Char	1-12
17	Power High Day	1	Unsigned Char	1-31
18	Cost Low	2	Signed Int16	Cents
20	Cost Low Month	1	Unsigned Char	1-12
21	Cost Low Day	1	Unsigned Char	1-31
22	Cost High	2	Signed Int16	Cents
24	Cost High Month	1	Unsigned Char	1-12
25	Cost High Day	1	Unsigned Char	1-31
26	Voltage Low	2	Signed Int16	Volts * 10
28	Voltage Low Month	1	Unsigned Char	1-12
29	Voltage Low Day	1	Unsigned Char	1-31
30	Voltage High	2	Signed Int16	Volts * 10
22	Voltage High Month	1	Unsigned Char	012
33	Voltage High Day	1	Unsigned Char	1-31

Historical Data (CSV)

The following URL's can be used to retrieve historical data in CSV format. These are the same CSV files that are returned by the Footprints application.

- /history/secondhistory.csv
- /history/minutehistory.csv
- /history/hourlyhistory.csv
- /history/dailyhistory.csv
- /history/dailyhistory.csv

The fields in the exported CSV file correlate to the same fields in the XML export (see XML export for descriptions) with the following exceptions:

- Power is reported in kW vs. Watts
- Cost is reported in dollars vs. cents
- Voltage is not multiplied by 10

Load Profile

Load Profile Configuration

It is not possible to alter the Load Profile Configuration via the API, but it is possible to download how it is set up. By accessing the Load Profile Configuration file, developers can see what devices have been set up for load profiling and what their individual stages are.

Sample URL: http://TED5000/api/LoadProfileConfig.xml
Parameters: none.

XML Fields

Element	Field	Description	Units
Number of Devices		The number of devices that have been configured on the gateway	Number
Highest Key		Each new device uses a unique key to help identify it within the gateway	Number
LoadProfileDevice#		**Element and Sub-elements that contain information about a specific load profile device**	
	Key	The unique device key	
	Description	The description of the device	
	MTU	The MTU that will be recording the load profile event	0-based
	Enabled	Whether or not this particular device is enabled	1 = True, 0 = False
	Steps	The total number of steps the load profile device has	
	OnStep	What step/level indicates that the device is fully "On"	
	CurrentStep	The current Step (Level) of the device.	
	DeviceStatus	Whether the device being profiled is on or off	1 = on, 0 = off
	Error	The % error that is allowed when determining if a new Step/Level has been reached	Percent * 10
	Level#	Levels 1-10 indicating each individual stage of the profile. The sum of all steps must equal zero.	Watts

Sample XML

```
<LoadProfileConfig>
    <NumberDevices>1</NumberDevices>
    <HighestKey>4</HighestKey>

    <LoadProfileDevice1>
        <Key>1</Key>
        <Description>Hot Water Heater</Description>
        <MTU>0</MTU>
        <Enabled>1</Enabled>
        <Steps>2</Steps>
        <OnStep>1</OnStep>
        <CurrentStep>0</CurrentStep>
        <DeviceStatus>0</DeviceStatus>
        <Error>100</Error>
        <Level1>4420</Level1>
        <Level2>-4420</Level2>
        <Level3>0</Level3>
        <Level4>0</Level4>
        <Level5>0</Level5>
        <Level6>0</Level6>
        <Level7>0</Level7>
        <Level8>0</Level8>
```

```
                <Level9>0</Level9>
                <Level10>0</Level10>
        </LoadProfileDevice1>


        <LoadProfileDevice2>
                <Key>0</Key>
                <Description>Deleted Device</Description>
                <MTU>0</MTU>
                <Enabled>0</Enabled>
                <Steps>2</Steps>
                <OnStep>1</OnStep>
                <CurrentStep>0</CurrentStep>
                <DeviceStatus>0</DeviceStatus>
                <Error>100</Error>
                <Level1>0</Level1>
                <Level2>0</Level2>
                <Level3>0</Level3>
                <Level4>0</Level4>
                <Level5>0</Level5>
                <Level6>0</Level6>
                <Level7>0</Level7>
                <Level8>0</Level8>
                <Level9>0</Level9>
                <Level10>0</Level10>
        </LoadProfileDevice2>


        <LoadProfileDevice3>
                <Key>0</Key>
                <Description>fan2</Description>
                <MTU>0</MTU>
                <Enabled>0</Enabled>
                <Steps>2</Steps>
                <OnStep>1</OnStep>
                <CurrentStep>0</CurrentStep>
                <DeviceStatus>0</DeviceStatus>
                <Error>100</Error>
                <Level1>0</Level1>
                <Level2>0</Level2>
                <Level3>0</Level3>
                <Level4>0</Level4>
                <Level5>0</Level5>
                <Level6>0</Level6>
                <Level7>0</Level7>
                <Level8>0</Level8>
                <Level9>0</Level9>
                <Level10>0</Level10>
        </LoadProfileDevice3>


        <LoadProfileDevice4>
                <Key>0</Key>
                <Description>SAMPLE4</Description>
                <MTU>0</MTU>
                <Enabled>0</Enabled>
                <Steps>0</Steps>
                <OnStep>0</OnStep>
                <CurrentStep>0</CurrentStep>
                <DeviceStatus>0</DeviceStatus>
                <Error>100</Error>
                <Level1>0</Level1>
                <Level2>0</Level2>
                <Level3>0</Level3>
                <Level4>0</Level4>
                <Level5>0</Level5>
                <Level6>0</Level6>
                <Level7>0</Level7>
                <Level8>0</Level8>
                <Level9>0</Level9>
                <Level10>0</Level10>
        </LoadProfileDevice4>


        <LoadProfileDevice5>
```

```
        <Key>0</Key>
        <Description>SAMPLE5</Description>
        <MTU>0</MTU>
        <Enabled>0</Enabled>
        <MTU>0</MTU>
        <Steps>0</Steps>
        <OnStep>0</OnStep>
        <CurrentStep>0</CurrentStep>
        <DeviceStatus>0</DeviceStatus>
        <Error>100</Error>
        <Level1>0</Level1>
        <Level2>0</Level2>
        <Level3>0</Level3>
        <Level4>0</Level4>
        <Level5>0</Level5>
        <Level6>0</Level6>
        <Level7>0</Level7>
        <Level8>0</Level8>
        <Level9>0</Level9>
        <Level10>0</Level10>
    </LoadProfileDevice5>
</LoadProfileConfig>
```

Load Profile History

A XML list of load profile history events can be returned by calling the Load Profile History xml file.

Sample URL: http://TED5000/history/loadProfileHistory.xml

XML Fields

Field	Description	Units
Device	The unique key of the device (matches a device downloaded in the Load Profile Config. If the device does not match up, the device no longer exists in the sytem.	
Date	Timestamp of the load profile event	
Rate	The utility rate at the time of the load profile event	Dollars * 10000
Status	Whether or not the device is "On" or "Off"	0 = off 1 = on
Power	The total cumulate power used by the device when its turned "On"	Watts

Sample XML

```
<History>
<LOADPROFILE>
        <DEVICE>1</DEVICE>
        <DATE>03/30/2010 21:40:58</DATE>
        <RATE>14957</RATE>
        <STATUS>0</STATUS>
        <POWER>4420</POWER>
</LOADPROFILE>
<LOADPROFILE>
        <DEVICE>1</DEVICE>
        <DATE>03/30/2010 21:35:36</DATE>
        <RATE>14957</RATE>
        <STATUS>1</STATUS>
        <POWER>4420</POWER>
</LOADPROFILE>
<LOADPROFILE>
        <DEVICE>1</DEVICE>
        <DATE>03/30/2010 20:44:02</DATE>
        <RATE>14957</RATE>
        <STATUS>0</STATUS>
        <POWER>4420</POWER>
</LOADPROFILE>
</History>
```

Settings

Utility Settings

It is not possible to modify Utility Settings via the API, but you can download the XML file that contains the utility rate configuration.

Sample URL: http://TED5000/api/UtilitySettings.xml
Parameters: none.

XML Fields

Element	Field	Description	Units
Seasons		**The Season configuration for the utility**	
	NumberOfSeasons	The number of seasons defined in the system based on the utilities rate plan	1-4
	Season ID	The ID of the Season	1-4
	SeasonEndMonth	The month in which the season ends	
	SeasonEndDay	The day of the month of the last day of the season	
	SeasonName	The name of the season that is displayed to the user	
PlanType		The plan type of the utility	1 = Flat 2 = Tiered 3 = TOU 4= Tiered + TOU
MeterReadDate		The day of the month that is the last day of the billing cycle	
TOU		**TOU Configuration info if the TOU tiered type is selected**	
	NumberTOU	The number of TOU's used by the utility	
	TOUApplicable	Whether or not TOU rates apply to weekends or holidays	
	TOUHolliday	FUTURE USE	
	TOUNames	The names of the TOU levels that are displayed for the user	
	TOUTimes	Per Season and Per TOU level… this contains up to 2 start and end times for each tou level.	
Tier		**The Tier configuration if a "Tiered" rate type is selected by the user**	
	NumberTiers	The total number of tiers tracked by the utility	
	Step#	Per Season and Per Tier, the Watts where the step ends	Watts
Demand		**FUTURE USE**	
EnergyRates		**EnergyRate set up per Season, Step, and TOU level.**	**Dollar * 1000**
AdditionalCharges		**Additional Charges that are applied to the utility rate (Per Season)**	
	EnergySurcharge	The $ per kW surcharge applied to the cost.	Cents
	Tax	The % tax to apply to the current rate	Percent * 100
	Fixed Charge	A fixed monthly charge that is applied to each bill	Cents
	MinCharge	The minimum amount the utility will charge per billing cycle.	

Sample XML

```
<UtilitySettings>
    <Seasons>
        <NumberOfSeasons>2</NumberOfSeasons>
        <Season>
            <SeasonID>1</SeasonID>
            <SeasonEndMonth>4</SeasonEndMonth>
            <SeasonEndDay>31</SeasonEndDay>
            <SeasonName>Winter</SeasonName>
        </Season>
        <Season>
            <SeasonID>2</SeasonID>
            <SeasonEndMonth>9</SeasonEndMonth>
            <SeasonEndDay>31</SeasonEndDay>
            <SeasonName>Summer</SeasonName>
        </Season>
        <Season>
            <SeasonID>3</SeasonID>
            <SeasonEndMonth>8</SeasonEndMonth>
            <SeasonEndDay>22</SeasonEndDay>
            <SeasonName></SeasonName>
        </Season>
        <Season>
            <SeasonID>4</SeasonID>
            <SeasonEndMonth>11</SeasonEndMonth>
            <SeasonEndDay>31</SeasonEndDay>
            <SeasonName></SeasonName>
        </Season>
    </Seasons>


    <PlanType>1</PlanType>
    <MeterReadDate>21</MeterReadDate>

    <TOU>
        <NumberTOU>1</NumberTOU>
        <TOUApplicable>
            <Saturday>FALSE</Saturday>
            <Sunday>FALSE</Sunday>
            <Holliday>FALSE</Holliday>
        </TOUApplicable>
        <TOUHolliday>
            <US>FALSE</US>
            <CANADA>FALSE</CANADA>
            <CUSTOM>FALSE</CUSTOM>
        </TOUHolliday>

        <TOUNames>
            <Level1Name></Level1Name>
            <Level2Name></Level2Name>
            <Level3Name></Level3Name>
            <Level4Name></Level4Name>
            <Level5Name></Level5Name>
        </TOUNames>

        <TOUTimes>
            <Season1>
                <TOULevel1>
                    <StartHour1>0</StartHour1>
                    <StartMin1>0</StartMin1>
                    <EndHour1>0</EndHour1>
                    <EndMin1>0</EndMin1>
                    <StartHour2>0</StartHour2>
                    <StartMin2>0</StartMin2>
                    <EndHour2>0</EndHour2>
                    <EndMin2>0</EndMin2>
                </TOULevel1>
                <TOULevel2>
                    <StartHour1>0</StartHour1>
                    <StartMin1>0</StartMin1>
```

```
                <EndHour1>0</EndHour1>
                <EndMin1>0</EndMin1>
                <StartHour2>0</StartHour2>
                <StartMin2>0</StartMin2>
                <EndHour2>0</EndHour2>
                <EndMin2>0</EndMin2>
            </TOULevel2>
            <TOULevel3>
                <StartHour1>0</StartHour1>
                <StartMin1>0</StartMin1>
                <EndHour1>0</EndHour1>
                <EndMin1>0</EndMin1>
                <StartHour2>0</StartHour2>
                <StartMin2>0</StartMin2>
                <EndHour2>0</EndHour2>
                <EndMin2>0</EndMin2>
            </TOULevel3>
            <TOULevel4>
                <StartHour1>0</StartHour1>
                <StartMin1>0</StartMin1>
                <EndHour1>0</EndHour1>
                <EndMin1>0</EndMin1>
                <StartHour2>0</StartHour2>
                <StartMin2>0</StartMin2>
                <EndHour2>0</EndHour2>
                <EndMin2>0</EndMin2>
            </TOULevel4>
            <TOULevel5>
                <StartHour1>0</StartHour1>
                <StartMin1>0</StartMin1>
                <EndHour1>0</EndHour1>
                <EndMin1>0</EndMin1>
                <StartHour2>0</StartHour2>
                <StartMin2>0</StartMin2>
                <EndHour2>0</EndHour2>
                <EndMin2>0</EndMin2>
            </TOULevel5>
        </Season1>


        <Season2>
            <TOULevel1>
                <StartHour1>0</StartHour1>
                <StartMin1>0</StartMin1>
                <EndHour1>0</EndHour1>
                <EndMin1>0</EndMin1>
                <StartHour2>0</StartHour2>
                <StartMin2>0</StartMin2>
                <EndHour2>0</EndHour2>
                <EndMin2>0</EndMin2>
            </TOULevel1>
            <TOULevel2>
                <StartHour1>0</StartHour1>
                <StartMin1>0</StartMin1>
                <EndHour1>0</EndHour1>
                <EndMin1>0</EndMin1>
                <StartHour2>0</StartHour2>
                <StartMin2>0</StartMin2>
                <EndHour2>0</EndHour2>
                <EndMin2>0</EndMin2>
            </TOULevel2>
            <TOULevel3>
                <StartHour1>0</StartHour1>
                <StartMin1>0</StartMin1>
                <EndHour1>0</EndHour1>
                <EndMin1>0</EndMin1>
                <StartHour2>0</StartHour2>
                <StartMin2>0</StartMin2>
                <EndHour2>0</EndHour2>
                <EndMin2>0</EndMin2>
            </TOULevel3>
```

```
                    <TOULevel4>
                        <StartHour1>0</StartHour1>
                        <StartMin1>0</StartMin1>
                        <EndHour1>0</EndHour1>
                        <EndMin1>0</EndMin1>
                        <StartHour2>0</StartHour2>
                        <StartMin2>0</StartMin2>
                        <EndHour2>0</EndHour2>
                        <EndMin2>0</EndMin2>
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        <Season4>
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    </AdditionalCharges>

</UtilitySettings>
```

System Settings

It is not possible to modify System Settings via the API, but you can download the XML file that contains the system configuration.

Sample URL: http://TED5000/api/SystemSettings.xml
Parameters: none.

XML Fields

Element	Field	Description	Units
NumberMTU		The number of MTU's configured in the system	
DemoMode		NOT USED	
NumberDisplay		The number of displays currently configured in the system	
DateTime		**Date and Time configuration for the TED 5000**	
	UseServer	Set to "1" if a NTP server is used to sync time	1=True, 0=False
	ServerAddress	Address of the time server being used	
	UseDLST	Set to "1" if the TED 5000 adjusts time for DLST	1=True, 0=False
	DateFormat	FUTURE USE	
	TimeFormat	FUTURE USE	
	TimeZone	How many hours need to be adjusted for the timezone	
SystemUnits		FUTURE USE	
CurrencyUnits		FUTURE USE	
SystemVoltage		Whether to display voltage as 240v or 120v based	0 = 240v 1 = 120v
ZipCode		The zip code used for weather	
CarbonCost		The multiplier to use against Power to determine how many pounds of carbon are generated	Factor * 100
Solar		**"Advanced" MTU settings**	
	SolarConfig#	The solar/advanced config type for each MTU	0 – Load 1 – Generation 2 – Adj. Load 3 – Stand Alone
MTUs		**Setup information for each MTU**	
	MTUNumber	1-based index identifying which MTU this is	
	MTUID	Serial number of the MTU	
	MTUDescription	User provided description of the MTU	
	SystemLineType	The connection type of the MTU	0 – 3 wire 1 – 2 wire
	PowerCalibrationFactor	The factor applied to incoming power readings	Factor * 100
	VoltageCalibrationFactor	The factor applied to incoming voltage readings	Factor * 100
Normal Mode / Enhanced Mode		MTU Operation settings based on the current operating mode of the system	
	EUTTF	Energy Update Time	Seconds
	EUMTF	Energy Update Minimum Change	Watts
	VTTF	NOT USED	
	VMTF	Voltage Update Minimum Change	Volts * 10
	EMTTF	NOT USED	
	EMMTF	NOT USED	
	PEUAT	Peak Energy Use Average Time	
	PVAT	Peak Voltage Average Time	
	BrownOut	FUTURE USE	

	OverVoltage	FUTURE USE	
	EnhancedModeTimer	Number of minutes enhanced mode should run	
Gateway		**Gateway Information**	
	GatewayID	Gateway Serial Number	
	GatewayDescription	User Defined Name of the gateway	
Displays		**Configuration information for the display**	
Normal Mode / Enhanced Mode		Display Operation settings based on the current operating mode of the system	
	BacklightUnderPower	% of backlight to be used when the display is on the charger	%
	BacklightUnderBattery	% of backlight to be used when the display in on the battery	%
	BacklightTimer	How long the backlight should remain on when running on the batter	seconds
	ScrollTimer	How long to remain on each screen when the display is in scroll mode	seconds
	SleepTimer	How long the display is to remain idle before powering down to "sleep" mode	seconds
	############Screen	Whether or not to display the screen	
	DisplayNumber	The index of the display in the system config	
	DisplayID	The serial number of the display	
	DisplayDescription	The user defined description of the display	
UserInterface		**Settings for the Footprints User Interface**	
		These settings are specific to Footprints.	
NetworkSettings		**Network Settings for the TED 5000**	
	UseDHCP	Whether or not DCHP is used	
	IPAddress	The current IP address of the device	
	SubnetMask	The current subnet mask of the device	
	GatewayAddress	The current gateway address of the device	
	PrimaryDNSServer	The primary dns server used by the device for name resolution	
	SecondaryDNSServer	The secondary dns server used by the device for name resolution	
	NetBiosName	The NetBIOS name used by the device on the network	
	HTTPPort	The current port used by the HTTP server	
	HTTPSPort	The current port used by the HTTPS server	
GatewayTransmitGain		The PLC TX gain used by the gateway	0 = 3x 1 = 2x
MTU/GatewayTransmit Amplifier		The amplifier level of the PLC modem on the MTU/Gateway	2 = full 1 = ¾ 0 = ½
MTU/GatewayNoiseBlanker		Whether or not the noise blanker is enabled on the MTU/Gateway	1 = on 2 = off
Username		The username of the password protected user on the device	
PasswordAll		Whether or not all screens on Footprints should be password protected	1 = true 0 = false
PasswordConf		Whether or not the system configuration settings should be password protected	1=true 0=false
GooglePowerMeter		Whether or not the device has been activated for Google PowerMeter	1=true 0=false
SendStatusGoogle		Whether or not statistical runtime information is being sent to Google	1=true 0=false

Sample XML

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```
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    <MTUTransmitAmplifier>2</MTUTransmitAmplifier>
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    <PasswordConf>1</PasswordConf>
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</SystemSettings>
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