

In-Home Display - User Guide V2.4 HQ



Overview

The In-Home Display from Aztech Associates Inc. is an easy-to-use product for monitoring energy consumption and its associated cost within the home. It communicates wirelessly to the smart electricity meter. Electricity used and its associated estimated cost, and historical power consumption can all be shown. This guide explains what information can be displayed and how to use the Aztech In-Home Display.

The In-Home Display is lightweight and compact so that it can be placed in a convenient easy to view location. The top indicator light bar (green, yellow, or red) is used to indicate the different electricity rates at an easy glance from across the room. The LCD display clearly shows numerical and graphical information, and has adjustable backlighting.

The In-Home Display operates via an AC adapter connected to the USB port.

Utility messaging to notify of a pending Critical Peak event is also possible with the Aztech In-Home Display. The indicator light bar changes to Red to attract the resident's attention for messaging and during Critical Peak rates.

Although efforts have been made to provide accurate electricity cost information, it should be noted that *all electricity cost data are estimates for informational only, not for billing.*

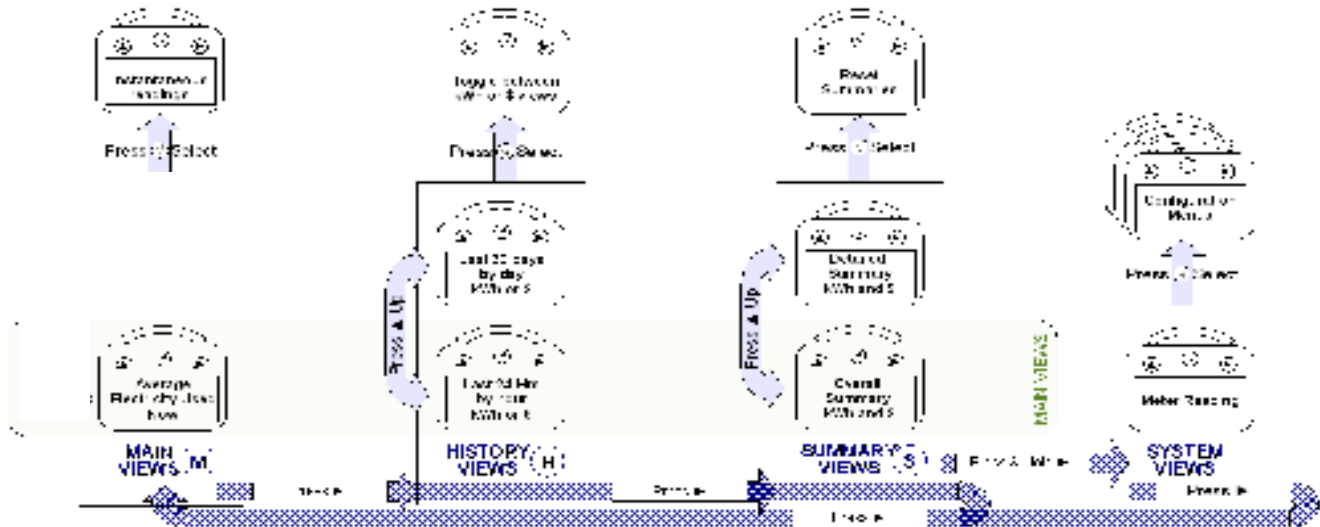
FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons. This device must not be co-located or operating in conjunction with any other antenna or transmitter.

Display Screen Layout



How to use the Buttons

The three buttons are located on the front of the enclosure, above the display screen. All viewing and programming functions can be done with these three buttons, as described below.

The **middle** **button** turns ON the In-Home Display. Pressing and holding this button turns OFF the unit. (Note that the In-Home Display also turns on when the AC adapter is plugged in.)

When ON, this button allows for specific actions to occur, depending on which screen is being displayed.

- In the Main views pressing the button switches from averaged consumption to instantaneous consumption.
- In the Summary views, this button accesses the Reset Summaries screens to reset the Summary information.
- In the History views, this button selects between kWh and \$ views.
- In the System views, this button assesses the Configuration Menus.
- In the Configuration Menus, this button selects the menu items listed.

The **right** **button** moves from one view to another. It normally cycles between the **Main**, **History** and **Summary** views. It also functions as a DOWN button in the Configuration Menus.

- Press to move from the Main to History to Summary views.
- Press and Hold to view the absolute meter reading and access the menus
- The button also functions as a DOWN button in the Configuration Menus.

The **left** **button** allows for the display of additional **Main**, **History** or **Summary** views. It also functions as an UP button in the Configuration Menus.

- In the Summary views, press to alternate between the Overall Summary and the Detailed Summary.
- In the History views, press to alternate between the Last 24 Hours and Last 30 Days.
- In the Configuration Menus, the UP button scrolls up between selections.

Indicator Light Bar

The Indicator Light Bar can light up in Red, Yellow or Green. The color selection is determined by the Time-of-Use (TOU) rate period. Red is used in the most expensive (Critical Peak, \$\$\$) rate period, Green is used for the least expensive (Off-Peak, \$) rate period, and Yellow is used for the mid-rate (On-Peak, \$\$) period. For non-TOU applications, the light bar glows in Yellow only.

The Indicator Light Bar normally rotates from Left to Right at a rate corresponding to the amount of power being consumed. The higher the amount of power consumed, the faster the rate of light movement.



When the AC power adapter is connected, the Indicator Light Bar sweeps continuously. When operating on batteries, the Indicator Light Bar normally stays off to conserve battery power. It turns on for a short duration when changing display screens or when the buttons are pressed.

The Indicator Light Bar can be turned on (default) or off. See the Configuration Menu screens below for details.

Time-of-Use Rates and Times

The times and rates for TOU periods are factory programmed, as per instructions from your utility. Rates can also be updated manually in the Configuration Menu.

Prior to a Critical Peak event, you should be notified on your In-Home Display by your utility of the pending event. During the Critical Peak time, your In-Home Display light bar will be red with the sweeping motion at a rate corresponding to your electricity consumption at that time.

The costs associated with the rate periods can be viewed in the Configuration Menus. Although efforts have been made to ensure cost accuracy, *all cost information is estimates for informational and educational purposes only, not for billing.*

AC vs. DC Operation

The AC power adapter should be used at all times. Battery operation is only meant for temporary use to retain data during loss of AC power. While operating on batteries, the Indicator Light Bar and LCD backlight will normally turn off after a delay to preserve battery power. Pressing a button will turn them on for a short duration.

Note: In-Home Displays contain rechargeable batteries. The unit should be operated on AC power only for at least 8 hours before operating on battery power only.

Critical Peak Operation

If supported by your utility, the Aztech In-Home Display is capable of specialized operation before and during a Critical Peak event. Critical Peak events are rare times when electricity demand exceeds or nearly exceeds the available electricity supply. During this time, which usually lasts for only a few hours, the cost of electricity goes up.

The In-Home Display is capable of notifying the user of a pending Critical Peak event. This timing of the advance notification is programmable by the utility and can occur up to 2 days in advance of the Critical Peak event. When notification occurs, the time of the Critical Peak rate change is displayed. The display will replace the current view for a message this will remain on the screen until a button press. The message will re-appear every 30 minutes until the start of the Critical Peak Period.

During Critical Peak, the light bar will be Red and will sweep at a rate corresponding to the amount of electricity being consumed. The Critical Peak symbol (\$\$\$) will display in the upper right corner of the display for most views.

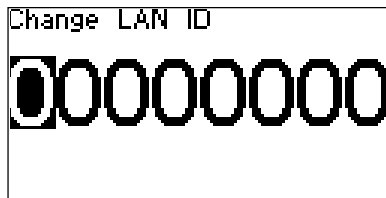
During Critical Peak, the Main, History and Summary views will all function as normal. The cost per hour will be displayed on the Main view. The accumulated Critical Peak electricity costs can be viewed in the Detailed Summary screen.

Messaging

If supported by your utility, the Aztech In-Home Display is capable of displaying messages from your utility. These may be for a scheduled power outage, Amber Alerts in case of a missing child, a weather related warning, or for some other purpose

Screen Descriptions

Initialization Screens



When powered up for the first time, the language selection screen is displayed. Simply use the left **▲** or right **►** buttons to scroll up or down to the desired language. Then press the middle **√** button to select. All subsequent screens will be in the language chosen: English, French, or Spanish.

If desired, the language selection can be changed again through the Configuration Menus. See below for details.

After selecting language, the next screen will ask for the setting of the meter ID.

Enter the 8 digits for your particular smart electricity meter, as provided by your utility or In-Home Display provider. The correct meter ID must be entered for your In-Home Display to communicate with your smart electricity meter.

For more information on entering or changing your meter ID, refer to the Configuration Menu – Meter ID section below.

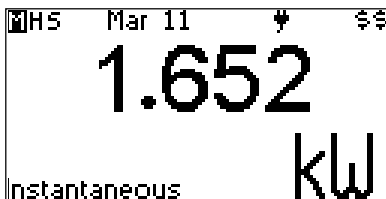
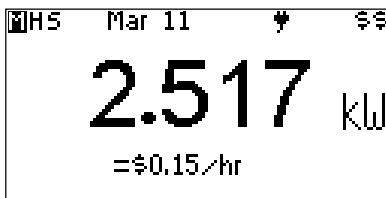
After entering the meter ID for the first time, or upon power-up, the Initialization Screen will be displayed with the message “Acquiring Data”, indicating that the unit is searching for a meter connection. During this time, the Light Bar will sweep back and forth in RED. If the AC Power Adapter is connected, the Indicator Light Bar stay on while it tries to synchronize with electricity meter. If operating on batteries and a meter connection is not quickly established, the Light Bar will turn off after a short time to conserve battery life.

If no connection is found after 10 minutes, a message “No Signal Found” will be shown. The unit will continue to search for a meter connection.

When a meter connection is found, the Main view will be displayed.

To set or change the Meter ID during initialization, the Configuration Menu screen can be accessed at any time by pressing and holding the right **►** button and then pressing the middle **√** Button. See Configuration Menu (top level) and– Meter ID for further details.

Main View - Numerical



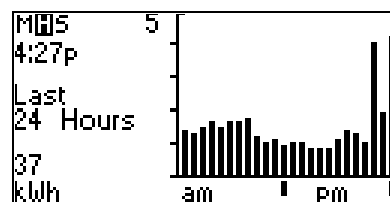
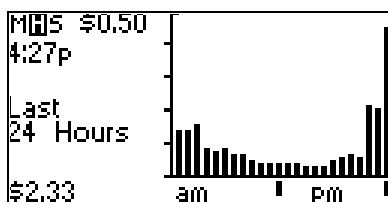
The **M**ain view - Numerical screen is displayed immediately after the unit's connected to a meter. The value is updated at a minimum every 1 minute and represents the average of how much electricity is presently being used.

The top line contains status indicators that show the following:

- three possible views, – **M**ain, **H**istory or **S**ummary, a highlighted **L**etter is the current view
- Today's date. This value is obtained automatically from your smart meter.
- AC or Battery indicator. Battery operation is for temporary backup operation only (<8 hours). The AC adapter should normally be used at all times. A solid battery icon indicates battery operation only, not the amount of battery charge remaining..
- Rate indicator. The present rate period indicator is displayed showing relative cost (\$ for Off-Peak, \$\$ for On-Peak, \$\$\$ for Critical Peak).

The middle **√** button will access the Instantaneous mode. In this display, the electricity meter is queried five times with six seconds between each reading, and each real-time electricity consumption value is displayed, Afterward 30 seconds the display reverts back to the Main view.

History View – Last 24 Hours



The History view – Last 24 Hours is selected by pressing the ► button when in the Main view

This screen displays up to 24 vertical bars showing the hourly consumption for the last 24 hours. Each bar contains the amount of electricity consumed in kWh or \$ during each hour long interval. For example, in the above graphs, the last bar shows the amount of consumed during 1:01pm to 2:00pm. Bars above the tick marks are for the period during 11:01pm to 12 midnight and 11:01am to 12 noon. Pressing the √ button will alternate between displaying in kWh or \$.

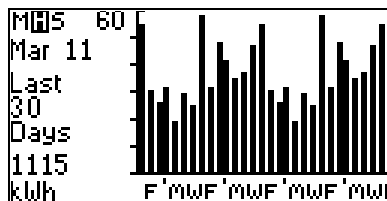
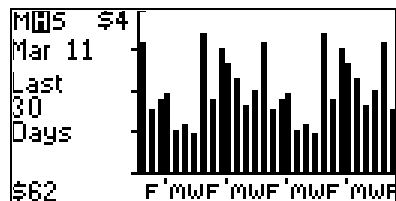
The bar graph automatically scales to the largest column. The size of each bar is shown by the tick marks along the vertical axis together with the number at the top of the axis. The total amount for the time period is displayed in the bottom left of the screen.

The upper left highlights the "H" for the History view. The time this screen was viewed is displayed below it.

It should be noted that the History view is a static display, unlike the other views which are updated as they are displayed. The History views are not updated automatically while they are being displayed.

Note: although efforts are made to provide accurate electricity cost information, ALL COSTS ARE ESTIMATES FOR INFORMATIONAL PURPOSES ONLY, NOT FOR BILLING.

History View – Last 30 days



The History – Last 30 Days view is selected by pressing the ▲ button from the History - Last 24 Hours view

This screen displays up to 30 vertical bars showing the daily consumption for the last 30 days. Each bar contains the amount of electricity consumed in kWh or \$ during each day long interval. The bars for Saturday and Sunday are placed directly beside each other to easily distinguish weekend days. For example, in the above graphs, the last bar shows the amount of electricity consumed during the last full day, Sunday, Dec 9. Along the bottom scale are MWF below the Monday, Wednesday and Friday daily bars. Pressing the √ button will alternate between displaying in kWh or \$.

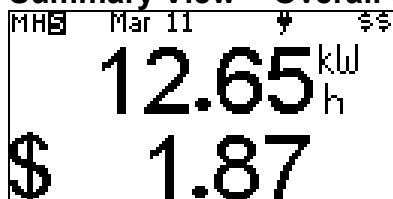
The bar graph automatically scales to the largest column. The size of each bar is shown by the tick marks along the vertical axis together with the number at the top of the axis. The total amount for the time period is displayed in the bottom left of the screen.

The upper left highlights the "H" for the History view. The Date this screen was viewed is displayed below it.

It should be noted that the History view is a static display, unlike the Main and Summary views which are updated as they are displayed. The History views are not updated automatically while they are displayed.

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Summary View – Overall Summary



The Overall Summary view is accessed by pressing the ► button from any of the History views. The upper left highlights the "S" for the Summary view

The total power consumed and its associated estimated cost are displayed. The cost is factory programmed as per your utility. The values are updated every minute, although if your consumption is low, it may take several minutes or longer to notice any changes.

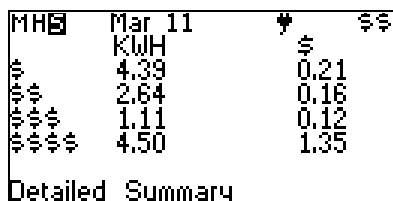
Both Overall and Detailed Summary information can be reset to a user-selected date. To reset, press the √ button and follow the menu options.

Pressing the ▲ button will access the Detailed Summary view.

Pressing the √ button will access the Reset Summaries menu.

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Summary View – Detailed Summary



The Detailed Summary view is accessed by pressing the ▲ button when in Overall Summary.

This screen displays the breakdown by rate period for the total power consumed and the associated cost for each rate period. The sum of the kWh and \$ columns add up to the amounts displayed in the Overall Summary view.

The kWh and \$ values are updated every minute, although if your consumption is low, it may take several minutes or longer to notice any changes.

The electricity rates are factory programmed per your utility

Both Overall and Detailed Summary information can be reset to a user-selected date. To reset, press the √ button and follow the menu options.

Pressing the ▲ button will access the Overall Summary view.

Pressing the √ button will access the Reset Summaries menu.

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Summary View – Reset Summaries

Reset Summaries

Now
By Date

Are you sure?
Yes

Set Start Date
Saturday
 Mar 01

Pressing the button from the Overall or Detailed Summary views accesses the Reset Summaries menu.

If the summaries are reset Now, then both the Overall Summary and Detailed Summary views will be reset to zero as soon as the action is confirmed. Before implementing the reset, the user will be asked “Are you sure?” to confirm the reset operation. The Summary views will then be reset immediately with new cost and usage information being effective the date and time the reset action occurred.

If the summaries are reset By Date, a different screen will appear. The user will be asked to “Set Start Date” which is the date for which the Summary information will be effective from, as of 12:01am on that date. For example, if January 1, 2007 is selected for the reset date, then the Overall and Detailed Summary views will display the electricity consumed in kWh and \$ from Jan 1, 2007 till today. Any dates chosen before the date of installation for your In-Home Display will not contain any electricity usage information.

The date shown when viewing the Set Start Date screen is the last date reset.

The difference between resetting to today's date vs resetting Now is the amount and cost of electricity consumed from 12:01am today until Now.

In the Reset Summaries screens, the button and button allow for scrolling up and down respectively. The button makes the menu selection.

System View – Meter Reading

Mar 11

A 0383
B 0088
C 0089

01000 kWh

The Meter Reading screen is displayed by pressing and *holding* the button from any of the Main, History or Summary views.

The large number on this screen matches the kWh reading on the smart electricity meter's display, together with tier details, if applicable.

From this screen, the Configuration Menus can be accessed by pressing the button

Configuration Menu (Top Level)

English
Español
Français
Set Date/Time
Setup

The Configuration Menu can be accessed from the System view – Meter Reading screen by pressing the middle Button.

Use the left or right buttons to scroll UP or DOWN. Then press the Button to make the desired selection.

To change the language for all screens, go to the language desired and press the button. All screens will then appear in the selected language.

Set Date/Time allows for manual setting of Date and Time. If selected, a sub-menu will appear. This is normally not required as the date and time are automatically obtained from the electricity meter. If manual setting of the date/time are implemented, these values may be overwritten by the date/time from the electricity meter.

The Setup option allows for setting or viewing other system parameters such as Setting Meter ID, Light Pipe On/Off, Tone On/Off, Display Settings, Viewing the programmed Electricity Rates, and Viewing key System parameters.

Select Exit to return back to the System view – Meter Reading screen.

Configuration Menu – Set Date/Time

Set Time
Set Date
24 Hour Clock
Time Zone Offset

Set the time

PM 33:19

Set the date

Tuesday
 Mar 11

Time Zone offset

-000

This menu is accessed via the Set Date/Time selection in the top level Configuration Menu

Use the left () or right () buttons to scroll UP or DOWN. Then press the Button to make the desired selection.

Setting the Date and Time should not normally be required since it is automatically obtained from the meter. The meter's date and time will be selected over the manually chosen values.

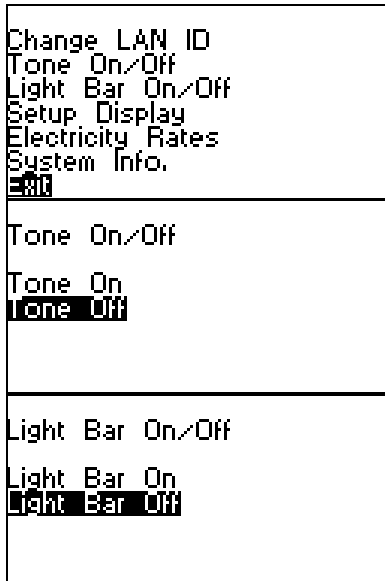
To Set Time, scroll to this option and select. A new screen will appear. Use the left () or right () buttons to select the desired hour, minute and seconds setting. Press to select and advance to the next entry or to complete the time setting.

To Set Date, scroll to this option and select. A new screen will appear. Use the left (▲) or right (▶) buttons to select the desired year, month and day. To help verify the date selected, the day of the week will be automatically displayed. Press √ to select and advance to the next entry or to complete the date setting.

To change from 12 hour format to 24 hour format, select "24 hour clock". Time will then be displayed in 24 hour format on the all applicable display screens. Once in 24 hour format, select "12 hour clock" to return to a 12 hour format for all display screens. Default mode is 24 hour format.

If desired, you can select a Time Zone Offset to set an offset to match the time in your local area. This is done in minutes. Use the left (▲) or right (▶) buttons to select the desired time offset to obtain your local time. Press √ to select and return back to the Set Date/Time menu. Select Exit to return back to the Configuration Menu top level.

Configuration Menu - Setup



The Configuration Menu - Setup is accessed from the Configuration Menu (top level).

This menu allows for setting or viewing system parameters such as Setting Radio ID, Light Pipe On/Off, Tone On/Off, Display Settings, Viewing the programmed Electricity Rates, and Viewing key System parameters.

Use the left (▲) or right (▶) buttons to scroll UP or DOWN. Then press the √ Button to make the desired selection.

To Change Meter ID, scroll to this option and select. Refer to the Configuration Menu – Meter ID section below.

To turn the button Tone On or Off, scroll to this option and select. Another screen will appear. Simply scroll to the desired option and select. You will then return to the Setup menu.

To turn the Light Bar On or Off, scroll to this option and select. Another screen will appear. Simply scroll to the desired option and select. You will then return to the Setup menu.

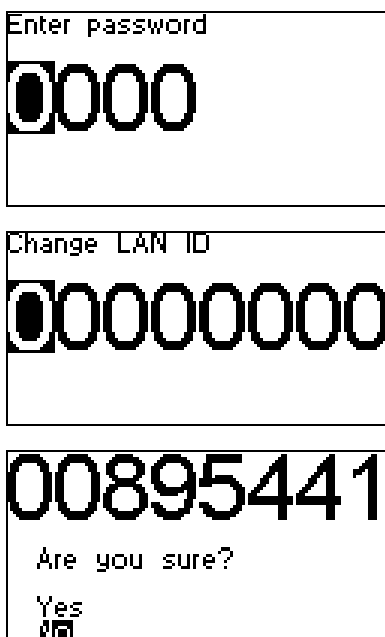
To change the LCD display contrast and backlight settings, scroll to the Setup Display option and select. Another screen will appear. Refer to the Configuration Menu – Setup Display section below.

To view the programmed electricity rates, scroll to Electricity Rates and select. Another screen will appear. Refer to the Configuration Menu – Electricity Rates section below.

To view internal system information, scroll to the System Info option and select. Another screen will appear. Refer to the Configuration Menu – System Information section below.

Select Exit to return back to the Configuration Menu top level.

Configuration Menu - Meter ID



The LAN ID menu is accessed from the Change LAN ID option in Configuration Menu – Setup screen

The LAN ID menu screen allows for programming the unique identifier of the radio in your smart electricity meter.

This unique identifier must be properly entered for your In-Home Display to communicate with your smart electricity meter.

Note: This unique identifier may have already been programmed into your unit when you received it, or it should be provided by your In-Home Display provider. If you do not have it, consult your In-Home Display provider.

The ability to change this LAN ID is password protected.

Once the meter ID has been successfully entered, it should not be changed. Entering a wrong meter ID will prevent your In-Home Display from communicating to your smart electricity meter.

To enter the radio ID, use the left (▲) or right (▶) buttons to increase or decrease the number for each digit. Then press the √ Button to move to the next digit.

When the last digit has been entered, a confirmation message will be displayed. If you wish to correct your meter ID, select No to go back and correct it. If you are satisfied that you have entered the correct number, select Yes to continue. You will then return to the Configuration Menu – Setup screen.

Configuration Menu - System Info.

```
SN AZTS01029A
SW 3.7.2 HW -1.2550.FF
DF 1.0-00000
12345678
SW 1.0 HW 0.0
EA ref ID 1561936
LAN ID 1991075
SSB 7290 4.07V
```

System Information is accessed from the Configuration Menu – Setup.

System Info displays the Serial Number for the main internal circuit assembly, followed by its Software and Hardware Versions.

The 3rd line contains the version of the DataFlash memory

The 4th to 7th lines contain radio information.

At the bottom of the display are the Seconds Since Boot up or Power up (SSB) and internal Battery voltage.

Pressing any button will return to the previous menu.

Configuration Menu – Setup Display

Setup Display

Set Contrast

Set Backlight

Exit

Contrast

Backlight

The Setup Display menu is accessed from the Configuration Menu – Setup.

This menu allows for setting the LCD contrast and backlight levels.

Use the left (▲) or right (▶) buttons to scroll UP or DOWN. Then press the √ Button to make the desired selection.

To Set Contrast, scroll to this option and select. Another screen will appear. Use the left (▲) or right (▶) buttons to increase or decrease the setting. Then press the √ Button to make the desired selection.

To Set Backlight, scroll to this option and select. Another screen will appear. Use the left (▲) or right (▶) buttons to increase or decrease the setting. Then press the √ Button to make the desired selection.

Select Exit to return to the Configuration Menu – Setup screen.

Configuration Menu – Electricity Rates

Enter password

0000

```
$      $0.04986/kWh
$$     $0.06204/kWh
$$$    $0.11573/kWh
$$$$   $0.30866/kWh
```

Electricity Rates

The Electricity Rates programmed into the unit are viewable in this screen.

These rates are used by the Summary and History views for displaying costs based on usage.

Electricity costs are calculated and stored using the rates in effect at the time the electricity is consumed. New electricity rates will impact electricity costs as of their effective date and time. They will not change stored electricity costs. Electricity usage and cost data are stored every hour for recall by the History and Summary views.

The rates show each Time-of-Use (TOU) period starting with the lowest cost rate period first (\$= Off-Peak, \$\$=Mid-Peak, \$\$\$= Critical Peak). For non-TOU applications, the rates shown are for each tier level, together with the kWh level they are valid to. The \$ symbol is for the lowest cost rate; with each successive level represented by an additional \$. The Base rate, a default cost for each billing period, is also included.

The TOU Electricity Rates are initially factory programmed. They are manually adjustable.. Manual entry has password protection as per LAN ID adjust

Note: although efforts are made to provide accurate electricity cost information, ALL COSTS ARE ESTIMATES FOR INFORMATIONAL PURPOSES ONLY, NOT FOR BILLING.