WallTime NTP Clock and Notification System

Operations Manual

WallTime NTP Clock and Notification System: Operations Manual

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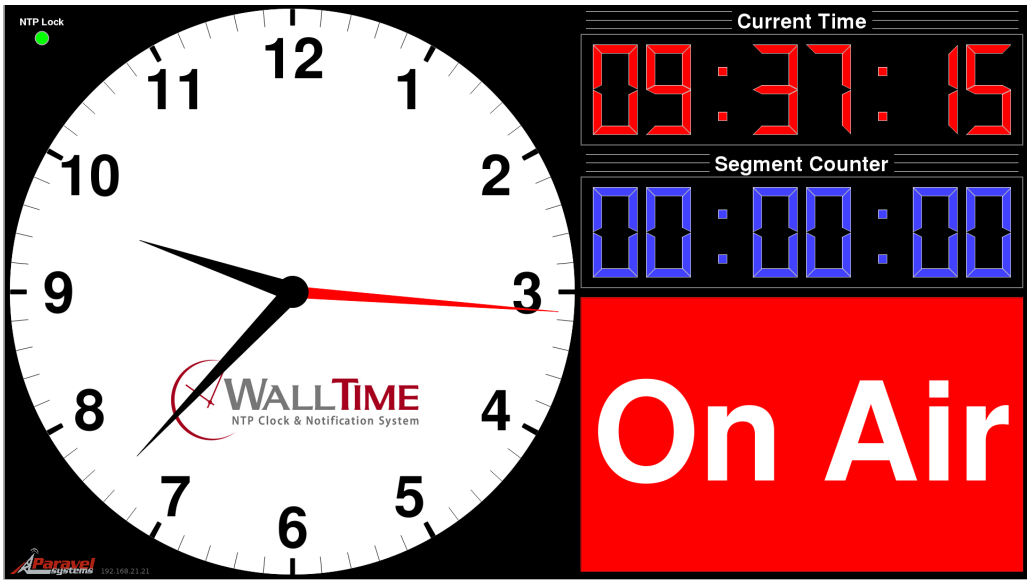
Chapter 1. Getting Started



WallTime is a digital device that provides a stylish realtime clock display in both analog and digital formats by means of a connected video monitor or television (not included). In addition to the time displays, WallTime can act as a segment timer, status display device (via LiveWire GPIO events) and HTML display. All time readouts in WallTime are kept accurate automatically by synchronization with one or more external time servers running the Network Time Protocol (NTP), including those freely accessible via the public Internet. All device interfacing is done by means of the unit's integrated 100BaseTX Ethernet port.

The WallTime display is divided into three functional areas known as "widgets", with the left-hand portion occupied by the Analog Clock widget and the right-hand portion by two user-configurable widgets. As set at the factory, these two right-hand widgets are the Digital Clock and OnAir Light widgets. Other available widgets include the Web Widget (used for displaying HTML content) and the GPIO Widget (used for displaying the status of up to 36 LiveWire GPIO lines in real time).

Connections

Video Output

WallTime will work with most any monitor or television with a 16:9 aspect ratio (often referred to as "HDTV" or "widescreen") and an HDMI input, with optimum results on units capable of displaying 1920x1080 resolution (also known as "1080p" mode). 16:9 displays with a DVI input can also be used though use of an inexpensive HDMI-to- DVI adapter dongle (not included). The WallTime unit can be attached to the back of the display by means of adhesive velco tape (included).

Ethernet

Connect the unit to an Ethernet switch port capable of 100BaseT or better connections. If operation with LiveWire GPIO is desired, the unit must be connected directly to a LiveWire switch.

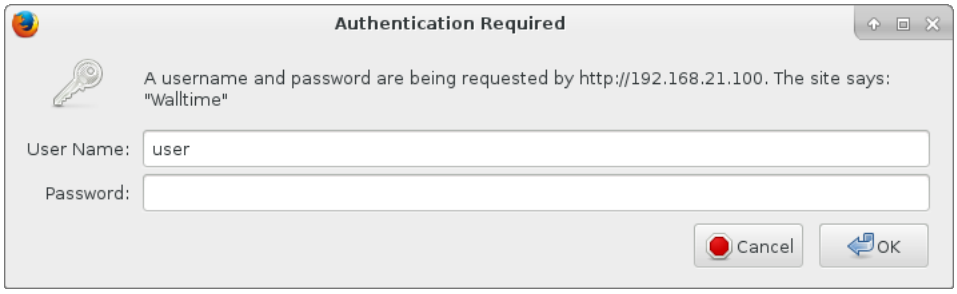
Power

WallTime can be powered by means of any standard 5 vdc micro-USB power source with a capacity of 2.4 A or more. An appropriate "wall-wart" type supply is included with the unit.

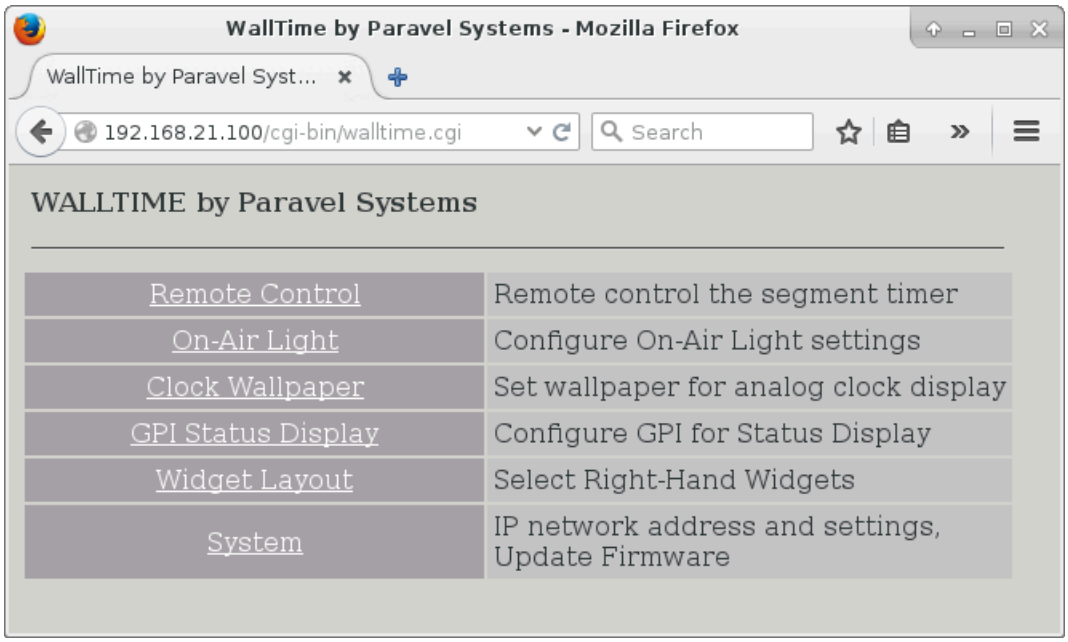
Initial Configuration

Before being placed into service, the WalTime unit must be configured with valid IP address parameters. As shipped from the factory, the unit is set to use an IP address of **`192.168.21.100`**.

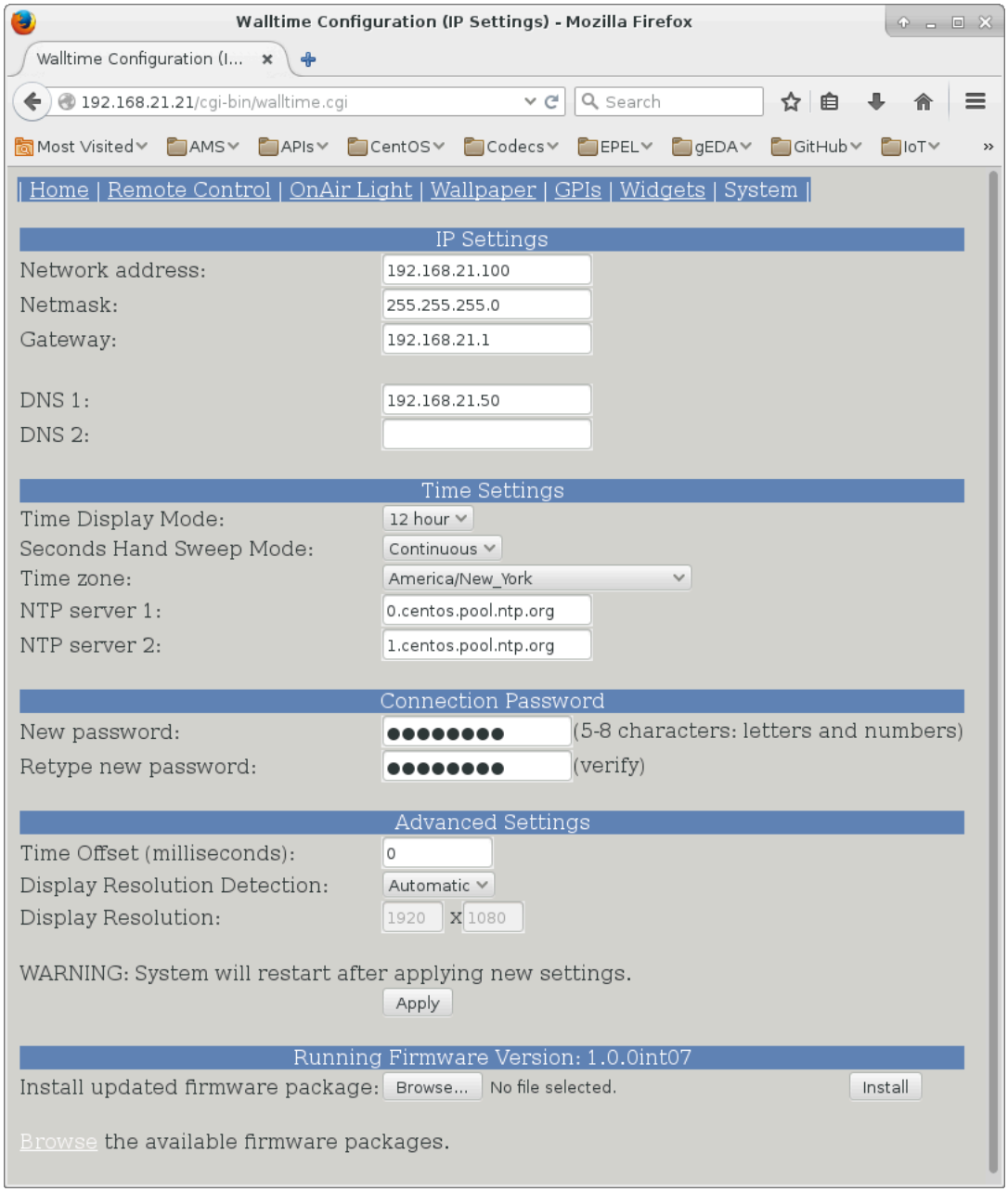
Using any standard we browser, navigate to that IP address. Log in with a User Name of **`user`** and no password.



The system will then display the main menu.



Click the `System` link to display the System Settings page.



Enter the appropriate IP configuration information in the `IP Settings` section. If the network connection does not have access to the public Internet, it will also be necessary to change the default `NTP Server` values so as to specify at least one address for a reachable NTP server in the `Time Settings` section. The timezone to be used can also be set in this section, as well as the display mode (12 hour "AM/PM" or 24 hour "military" style).

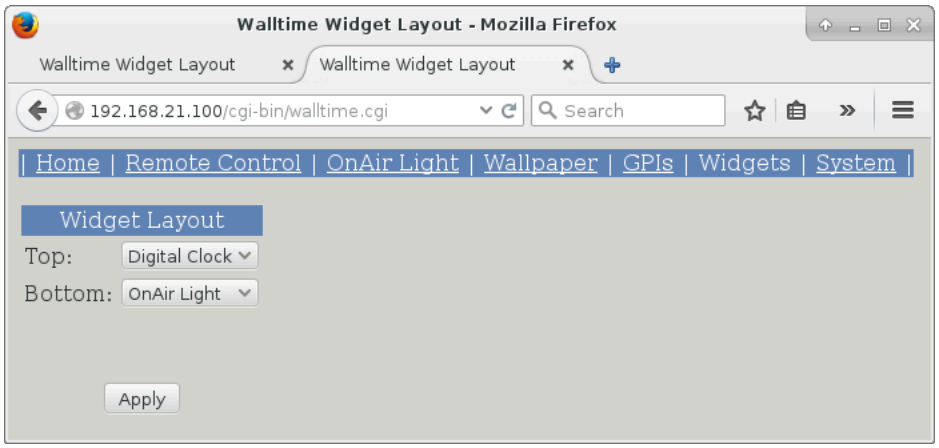
The style of the seconds-hand motion on the analog clock can also be set by means of the `Seconds Hand Sweep Mode` dropdown menu, with **`Continuous`** or **`Step`** modes available.

For situations where it is desireable to offset the time display --e.g. to compensate for a broadcast delay or satellite signal propagation delay-- the desired offset (in milliseconds) can be entered in the `Time Offset`.

Click the `Apply` button when finished. After restarting, WallTime will be ready for service.

Selecting Widgets

The widgets to be displayed on the right-hand portion of the display can be set by clicking the `Widgets` link on the main menu of the WallTime web interface.



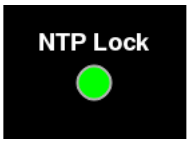
Select the desired widget for each location and then click the `Apply` button. (NOTE: it is not possible to have the same widget appear in both positions).

See the following chapters for detailed information on each of the available WallTime widgets.

Chapter 2. The Analog Clock Widget

The analog clock widget occupies the left-hand portion of WalTime's display and consists of three elements:

NTP Lock Display



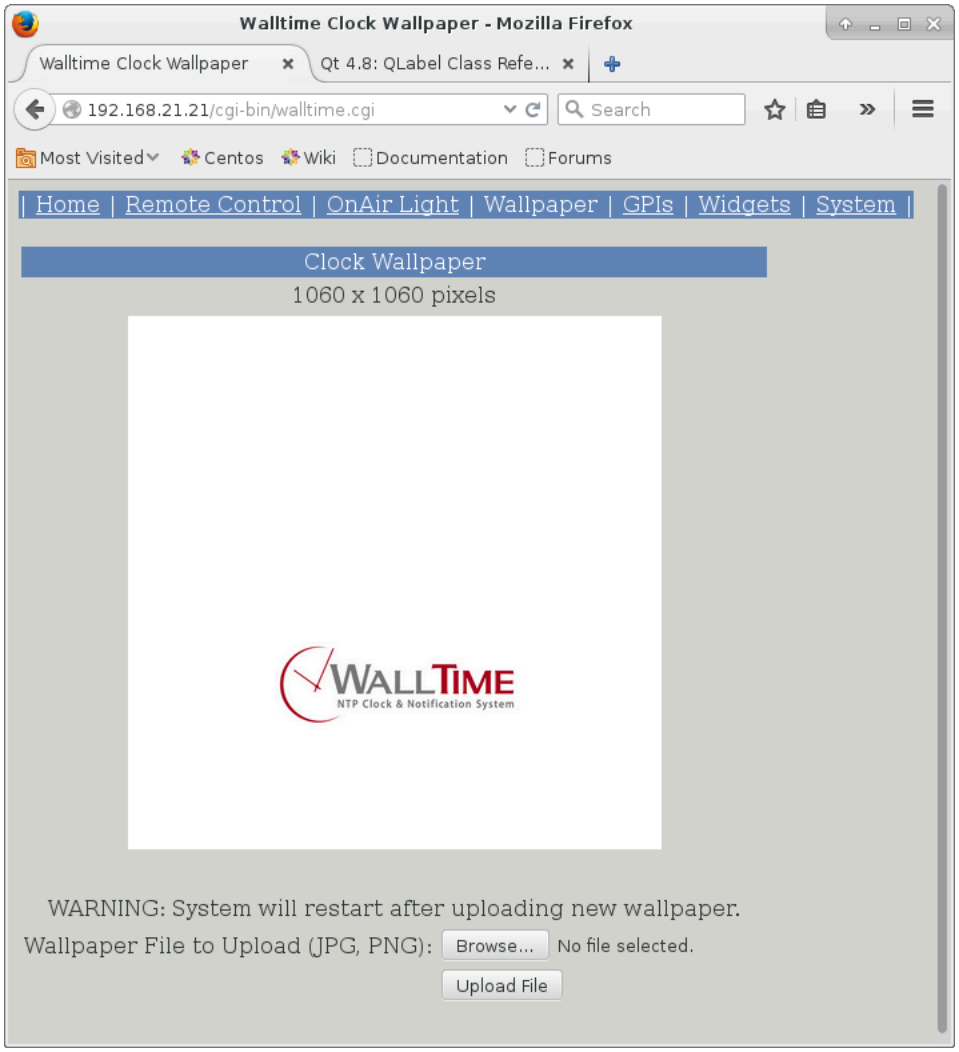
The 'NTP Lock' display in the upper left-hand corner of the analog clock widget indicates the status of WallTime's connection to the NTP server(s). A green light indicates that the connection is good and the clock synchronized, while red indicates that the clock is not currently synchronized and thus may not be displaying accurate time.

IP Address Display

The 'IP Address Display' in the lower left-hand corner of the analog clock widget shows the currently configured IP address of the unit.

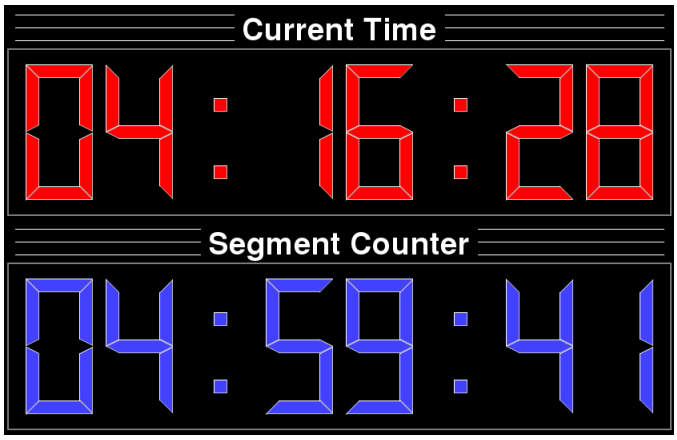
Analog Clock

The logo displayed on the analog clock is user-configurable. To set it, click the `Clock Wallpaper` link on the main menu of the WallTime web interface.



The logo consists of a 1060x1060 pixel PNG image, which becomes the background to the overall analog clock face when uploaded.

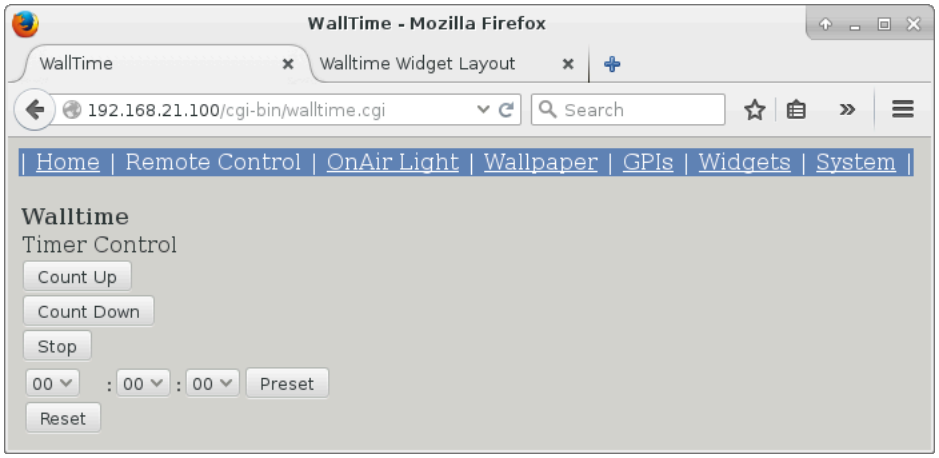
Chapter 3. The Digital Clock Widget



The Digital Clock Widget consists of two digital readouts: the `Current Time` value, which is a repeat of the time displayed in the Analog Widget in digital format, and the `Segment Counter` value, a built-in timer which can be remotely controlled by means of WallTime's integrated web interface.

Controlling the Segment Counter

To control the Segment Counter, click the `Remote Control` link on the main menu of the WallTime web interface.



The value of the `Segment Counter` can be set by selecting the desired value and then clicking the `Preset` button, or set to all zeros simply by clicking the `Reset` button. The run status of the timer is controlled by clicking the appropriate `Count Up`, `Count Down` or `Stop` buttons.

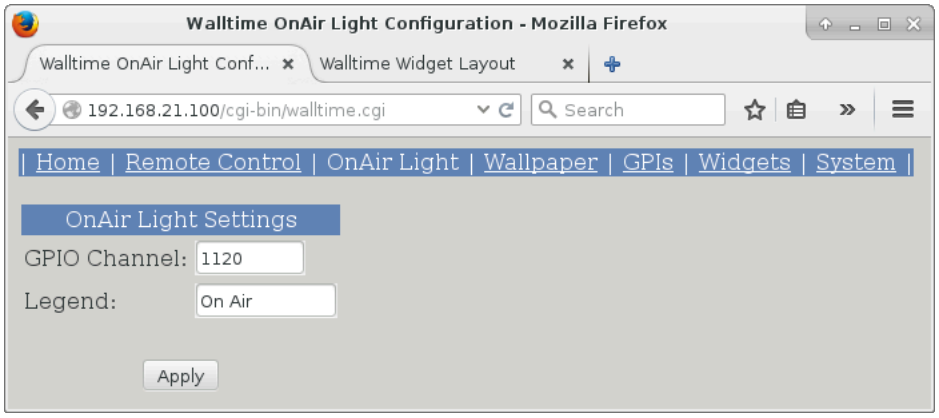
In addition to WallTime's integrated web interface, the Segment Counter can be directly controlled by means of TCP/IP commands. See Chapter 7 "Remote Control" for details.

Chapter 4. The On-Air Light Widget

The On-Air Light Widget is digital version of the traditional warning light fixtures found in and around many studios. It can be controlled by means of a LiveWire GPIO input or via WallTime's TCP/IP interface.

Configuring the OnAir Light

The OnAir Light can be configured by clicking on the `OnAir Light` link on the main menu of the WallTime web interface.



The `Computer Output` field is for the LiveWire source number of the GPIO input.

The `Legend` field is for the text to appear on the widget.

In addition to LiveWire GPIO, the OnAir Light can be directly controlled by means of TCP/IP commands. See Chapter 7 "Remote Control" for details.

Chapter 5. The Web Widget

The Web Widget can display simple HTML documents, set in WallTime's integrated web interface or pushed to it by means of standard http PUSH calls.

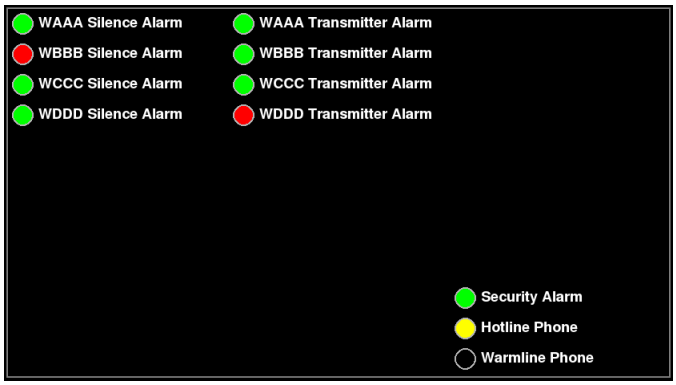
Updating the Web Widget

The content of the Web Widget can be set by clicking on the `Web Widget` link on the main menu of the WallTime web interface.

To change the HTML being displayed, edit it in the `Widget HTML` window and then click the `Update` button.

In addition to WallTime's integrated web interface, the Web Widget can be directly updated by means of standard http PUT commands. See Chapter 7 "Remote Control" for details.

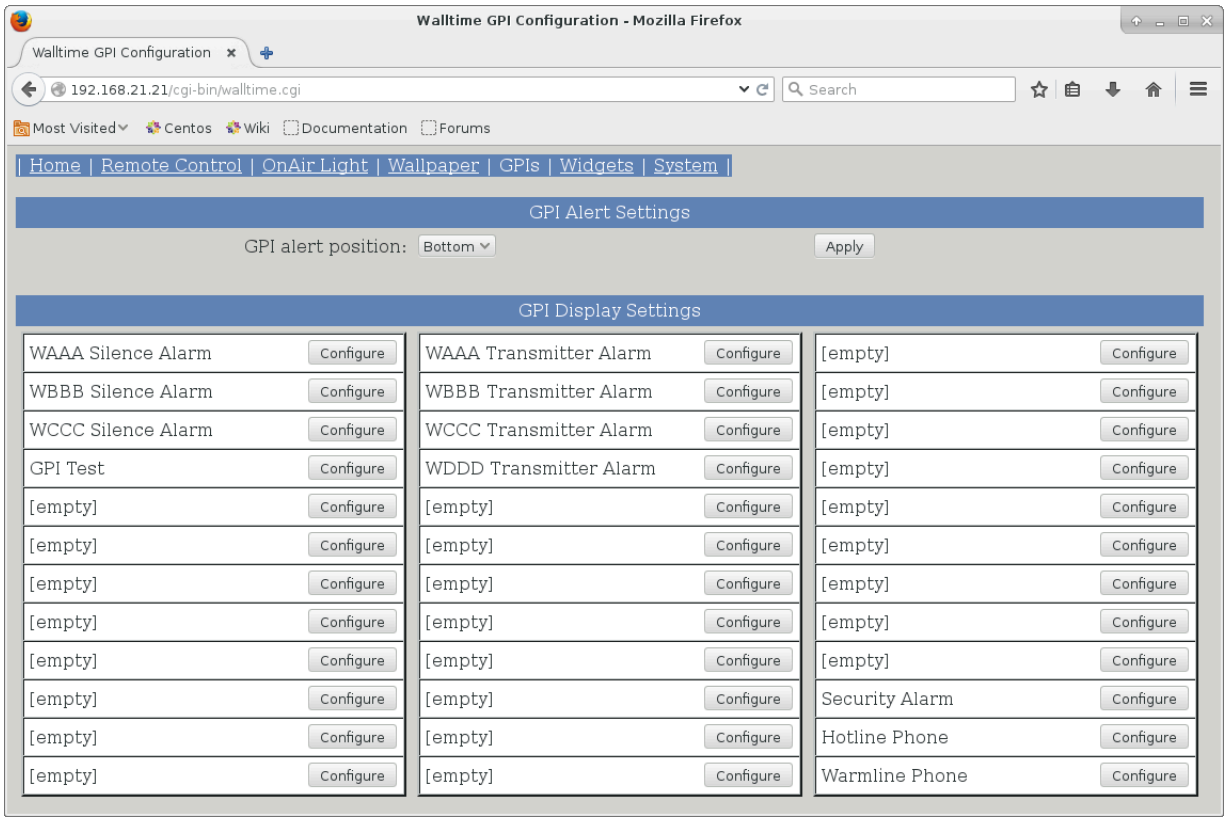
Chapter 6. The GPI Display Widget



The GPIO Widget can display the status of up to 36 GPIO lines, with customized labels and status light colors arranged in a 3x12 grid.

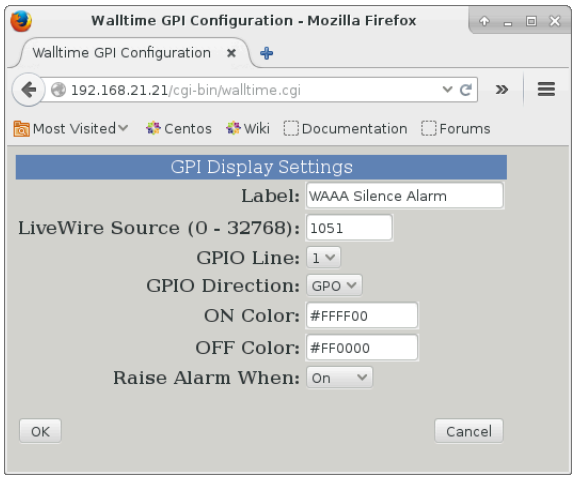
Configuring the GPI Display Widget

Configuration is done by clicking on the `GPIs` link on the main menu of the WallTime web interface.



The `GPI Alert Position` setting controls where GPI alerts will be displayed; with choices being being the `Top` or `Bottom` widget positions. While one or more alerts are active, the underlying widget will not be visible.

To configure a particular GPIO entry, click on its corresponding `Configure` button.



The following fields are available:

`Label` — The text to display for this GPIO line.

`LiveWire Source` — The LiveWire source number of the GPIO to be monitored.

`GPIO Line` — The line number (1 - 5) within the specified LiveWire source number to be monitored.

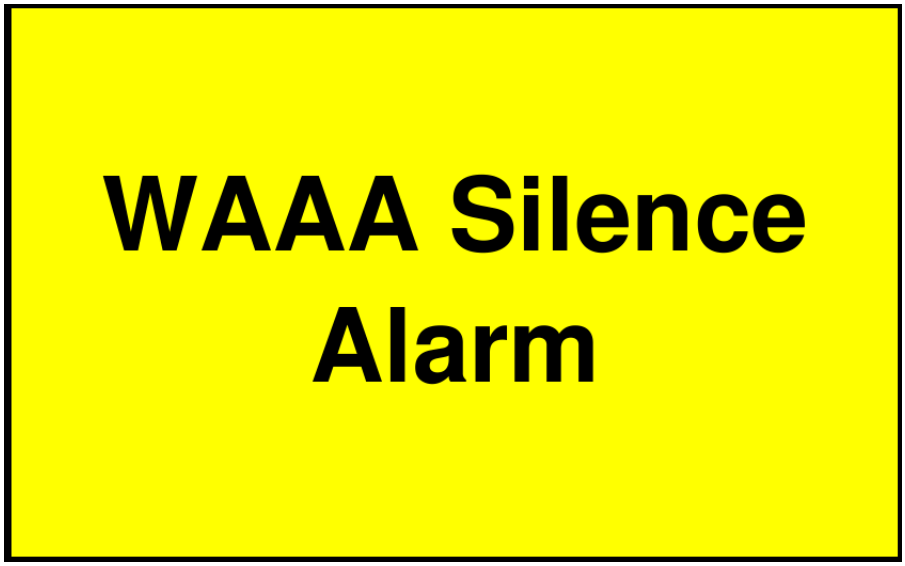
`GPIO Direction` — One of two directions can be specified:

- `GPI` — Signals coming from "outside" of the LiveWire network --i.e. from hardware GPIO ports.
- `GPO` — Signals coming from "inside" of the LiveWire network --i.e. from control surfaces.

`ON Color` — The color of the indicator to display when the selected GPIO line is in the ON state, in the format ***#RRGGBB***.

`OFF Color` — The color of the indicator to display when the selected GPIO line is in the OFF state, in the format ***#RRGGBB***.

`Raise Alarm When` — This setting controls under what condition (if any) this GPIO signal will cause an Alert to be displayed on the WallTime display; with available choices being `On`, `Off` or `Never`. When the specified condition exists, the WallTime display will show an appropriate alert, using the text specified in the `Label` field and covering the widget selected in the `GPI Alert Position` control.


WAAA Silence
Alarm

Appendix A. Remote Control

In addition to its built-in HTML web pages, many aspects of WallTime's operation can be controlled remotely by means of commands sent via TCP/IP. This opens many possibilities for integration with various other systems. This section examines the methods available and provides some simple "cookbook" receipes to demonstrate how these remote capabilites can be exercised. These receipes assume a basic familiarity and comfort with using the command-line interface on a computer.

Running the Receipes

Many of the examples given in this section use one of the following tools to exercise the specific function under disucssion. All are included in most default Linux / OS X / Windows setups or freely available for download via the Internet:

Curl — Open source command line tool and library for transferring data with URL syntax. Available at https://curl.haxx.se/.

Netcat — The classic "Swiss Army Knife" for TCP/IP networks. Included with most Linux and OS X setups. A version for Microsoft Windows™ is available at http://www.securityfocus.com/tools/139.

Time Offset

The time offset of both the analog and digital clock displays can be altered dynamically by means of the following command, sent to UDP port 6060:

TO *offset*!

Where ***offset*** is the offset to apply (in milliseconds).

Example

Use a series of netcat (nc) commands to change the time offset so that the displayed time is one hour behind normal (-3600000 milliseconds), then set it back to normal (0 milliseconds).

```
echo TO\ -3600000\! | nc -u ip-addr 6060

echo TO\ 0\! | nc -u ip-addr 6060
```

Segment Counter

In addition to the built-in web controls, WallTime's Segment Counter can be fully controled by means of text commands sent to UDP port 6060. The following commands are available:

Set Count Mode — **SM *mode*!**

Where ***mode*** is one of the following:

- **U** Count Up
- **D** Count Down

Preset Counter	**PS *secs*!**
	Where ***secs*** is the values to which to preset the counter, in seconds.
Reset Counter	**RS!**
	Set the counter to `00:00:00`.
Start Counter	**ST!**
	Start the counter.
Stop Counter	**SP!**
	Stop the counter.

Example

Use a series of netcat (nc) commands to put the Segment Counter into 'countdown' mode, preset it to 01:00:00 and then count down to 00:00:00:

```
echo SM\ D\! | nc -u ip-addr 6060

echo PS\ 60\! | nc -u ip-addr 6060

echo ST\! | nc -u ip-addr 6060
```

On-Air Light

In addition to LiveWire GPIO, WallTime's On-Air Light can be controlled by means of text commands sent to UDP port 6060. The following commands are available:

Turn On	**LP 1!**
Turn Off	**LP 0!**

Example

Use a netcat (nc) command to turn ON the On-Air Light:

```
echo LP\ 1\! | nc -u ip-addr 6060
```

Web Widget

The content of WallTime's Web Widget can be updated dynamically by means of standard http PUT commands, sent to the URL:

http://*ip-addr*/webwidget

Example

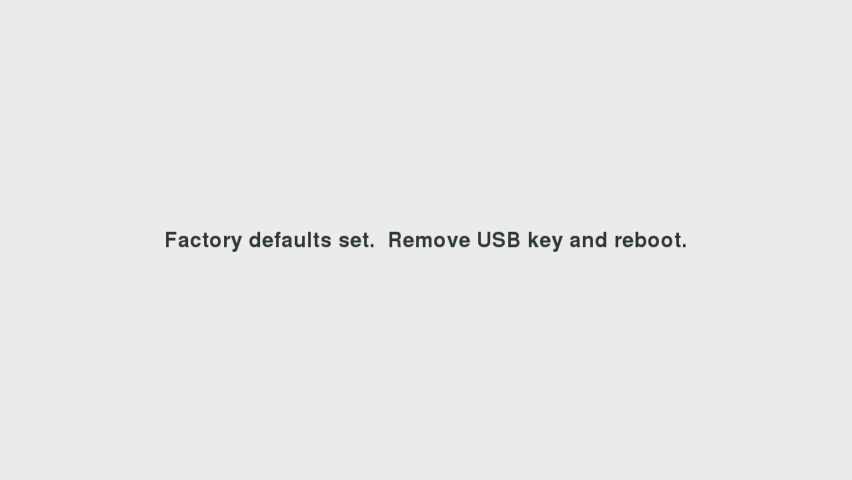
Use a curl command to display the phrase "Hello World!" in the Web Widget:

```
echo Hello\ World\! | curl -u user:password -T - http://ip-addr/webwidget
```

Appendix B. Restoring Factory Defaults

If necesary (due to a lost password or other reason), the WallTime unit can be restored to "factory default" settings by means of the following procedure:

1. Obtain a USB thumb drive. Download the file at http://static.paravelsystems.com/walltime/firmware/factory_defaults.dat to the root folder of the drive.
2. Remove power from the WallTime unit, then insert the thumb drive into one of the USB sockets located on the end of the unit.
3. Reapply power to the unit and let the unit boot up until the Factory Reset message appears.



4. Remove power from the WallTime unit, then remove the USB drive.
5. Reapply power to the unit and let it boot up normally. The unit will now be set back to factory defaults.