

# **CW BROADCAST**

**Your Message Matters**

## **Webserver 32 Instruction Manual Addendum**

Hardware Version 1.33+  
Manual Rev 0.98  
Firmware Version 0.98

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# Introduction

The CW Broadcast Web interface connects your transmitter to the LAN or Internet. It has the ability to keep logs and it can email logs and alarms to you. By emailing your phone company's email to text gateway, you can also receive text messages.

This product has a lot of advanced features, but the basic operation can be as simple as logging into its IP address and using it to monitor and control the transmitter.

Among the advanced features found on this controller are:

1. Netbios support. On a Windows PC, it is not necessary to know the unit's IP address. You can open your browser and, in the address bar, enter <http://CWWEB32/> and hit enter. Netbios only works on Windows at this time. If you have more than one webserver on the same network, you must rename any duplicates.
2. Can export its settings to allow you to save the settings to a local file. Saves you from reprogramming from scratch if the settings are accidentally deleted or altered.
3. Supports up to 16 action sequences with up to 7 actions that can include muting and unmuting alarms, turning the transmitter on or off, raise and lower power, emailing alarms or logs, logging readings and more.
4. Includes an event scheduler that lets you run any sequence, either once or repetatively with various stop options.
5. Supports NTP time sync with optional daylight savings time (DST) support.
6. Supports up to five email lists so that different people or groups can be notified independently.
7. Three access levels include reader, controller and administrator. Only the admin can make settings changes
8. Firmware can be updated in the field. Your unit can be updated to the latest firmware whenever new firmware is released. We do not charge for firmware updates.
9. Webserver supports DHCP or static IP and allows changing the port number as well
10. The Web applet notifies you if connectivity is lost. If your network goes down, the browser will tell you that you have lost the connection. It will try to automatically reconnect, too.
11. Supports Dynamic DNS. Allows you to avoid paying for a static IP.
12. Metering alarms support both time and value hysteresis. Hysteresis is a way of preventing false alarms. Time hysteresis is simply a programmable delay before an alarmable condition actually triggers an alarm combined with another delay time when the alarm is "over". Value hysteresis comes into play once an alarm is triggered. This is a value that the meter must rise above (or below) before the alarm is considered over. This prevents repeated alarms when something is operating at the edge of an alarmable condition.

There are both internal Webserver s and external Webserver for the CW Broadcast transmitters. This book supports both versions. The Internal Webserver requires only that an Ethernet jack be plugged into the back of the transmitter. The external version requires Ethernet, power and a D-25 to D-25 cable to connect to the transmitter's I/O port. The external webserver 's hardware hookup is discussed at the end of this book.

# Using the Web Server

## Networking basics:

Before reading any further, we would like to mention that the following section is not intended to be a comprehensive guide to networks, nor does it necessarily describe your network. Indeed, we have found that networks vary quite a lot and yours will probably be different than is described here. We assume that you, or a network administrator, is familiar with your network and knows how to set it up to accommodate Web servers that exist within your network. The brief discussion provided below is only intended to be used as a very non-specific description of how a network might function.

In Internet land, devices on your network get unique IP addresses because each piece of hardware has a serial number embedded into it. Every device with a serial number, called a MAC address, has to get an IP address assigned to it in order to function using the networking protocol called TCP/IP, which is what is used for the Internet. The router in your network uses those IP addresses that it assigns to keep track of what data requests have been made and how to route responses to the devices that need data. In a way, the IP address is sort of like a nickname that computers use to talk to each other. A computer will only respond if it has been called by name. So, the IP addresses are what one computer uses to address or talk to another computer. The router also uses those IP addresses to manage the flow of communications between each computer so that they are not all talking at once like an old fashioned party-line.

IP addresses are usually doled out within a fixed range, so it's also easier for humans to remember a device's location via its IP address than to try to remember every item's MAC number. For instance an internal network might use the IP range of 192.168.1.### where ### can be 001 through 254. Once the network administrator has set up the address range, he or she only has to keep track of what's assigned to the last three digits of the address range.

Generally, simple networks are divided into two sets of addresses. There are the addresses that exist inside the network (called the private or LAN side) and then there are addresses that exist on the Internet (public or WAN) side of the network. We've already described the private side above, but getting stuff on the private side to talk to the public side can be tricky.

When you have one device that is connecting your internal network to the Internet, like a cable modem or DSL modem, it also has a unique serial number, so it gets assigned an IP address from your ISP. But the ISP only sees the modem, not other equipment on the inside of your network, so they cannot assign multiple IP addresses (actually they can, but that's another story). Although you probably only have one IP address, you will have a whole range of port numbers that you can use for each IP address that exists on the private side of your network. Usually, different types of communications use standardized ports to talk to devices. For instance http (Web browsing) is mostly done on port 80. FTP is usually port 21. E-mail might use port 25. Often, we want to set our network connection up to pass port 80 to some device on our network, like the CW Broadcast Transmitter Webserver, that serves up web pages. We do that by telling the router/firewall to pass port 80 requests to the IP address that we know we have previously assigned to the CW Broadcast Transmitter Webserver. To do that, we have to tell our firewall that it's okay to send port 80 requests to the CW Broadcast Transmitter Webserver, otherwise it'll just block those requests if they come from the public side of the firewall. As described earlier, each device on the private side needs a static IP address that is set by the network administrator. So, each item on the inside of a network that will be communicating with the outside world has to have an IP address within the local network **AND** it must also have the appropriate port opened on the firewall. On the Internet side of the firewall, there is usually only the main IP address and the port number.

When you put it all together it might look like this:

Public IP address 67.234.98.135, port 630 could be mapped to internal IP address 192.168.1.250, port 80. So a browser request made to 67.234.98.135:630 would serve up a web page because you would really be talking to 192.168.1.250:80. Once you have that properly configured, your CW Broadcast Webserver can serve up Web pages from inside of your network to the Internet.

## **Connecting to your CW Broadcast transmitter 's webserver for the first time:**

Most networks use a router as their central hardware. When a device is plugged into a router, the device normally obtains an IP address from the router using a process called DHCP. By default, the Webserver obtains a DHCP address from your network's DHCP server. In order to connect to the CW Broadcast Webserver, you can use one of two methods: First, the device has a default netbios name of "CWWEB32". You can type <http://CWWEB32/> (no www) and your browser should take you to the login screen. On some browsers, you must enter the entire <http://CWWEB32/> including the starting "http" and the backslash after the B. Some browsers will work either way. Note that netbios names are not supported in some operating systems such as Android or Apple. The second method requires you to know what its network IP address is. An IP address inside a network will usually look like XXX.XXX.X.XXX, for example 192.168.1.100. Your router knows this information and you can usually find out what the address is by logging into the setup page of your router. Most routers have a page that shows the attached devices. This can be shown as part of the router's DHCP page, or it may be shown in a separate LAN discovery page. Once you know the IP address of your device, you will be able to connect to it by entering the address into your browser's address bar. You can use the CircuitWerkes Netscanner utility, found on our Website or on the CD that came with your CW Broadcast Transmitter to locate the device on your network. Netscanner will identify the CW Broadcast Webserver by name ("CWWEB32") and can also show you the IP addresses of all objects on your network that respond to pings. Netscanner should always be run as the Administrator, otherwise, it can't clear your PC's ARP table. Netscanner has a "Scan" function and a "Ping" function. Try the "Scan" button first.

If you do not use a router in your network or if you want to configure your CW Broadcast Webserver via a direct connection, the default IP address for this device is 192.168.1.200. If making a direct connection, you must set your computer's network settings to match the CW Broadcast Webserver's settings. Your PC's TCP/IP properties must be set to 192.168.1.xxx with a netmask of 255.255.255.0. Once you have connected to the Webserver, you can set its IP address to whatever you wish from the configuration page.

## **About Port Numbers**

The Web server uses port 80, but this can be changed after login. Often, sites have multiple devices that want to use port 80, including some routers. You have two choices: first, you can change ports on the CW Broadcast Webserver. Second, your router can simply redirect a different outside (WAN) port to the individual Web servers' inside IP addresses. For instance, the CW Broadcast Webserver and another IP device each have Web servers using port 80. The CW Broadcast Webserver has an internal IP address of 192.168.1.250 and suppose that the site device has an IP of 192.168.1.200. If you are on the inside (LAN) of the network everything looks great. You can browse to either device and everything works. To access the site from the outside, you must open a "pinhole" that allow data to pass from browsers to your CW Broadcast Webserver. You will encounter a problem if you try to route WAN port 80 to LAN port 80 for both Web servers. Only one will be assigned. You will not gain access to the second one. Instead, redirect LAN port 80 for each device to a different outside port, such as 800 and 801. In practice, you would access your site by entering its IP address followed by a colon and the port number (xxx.xxx.xxx.xxx:800), or by its URL name followed by the port (www.mysite.com:800). Some routers do not support NAT transversal (redirect). In that case, you can simply change the

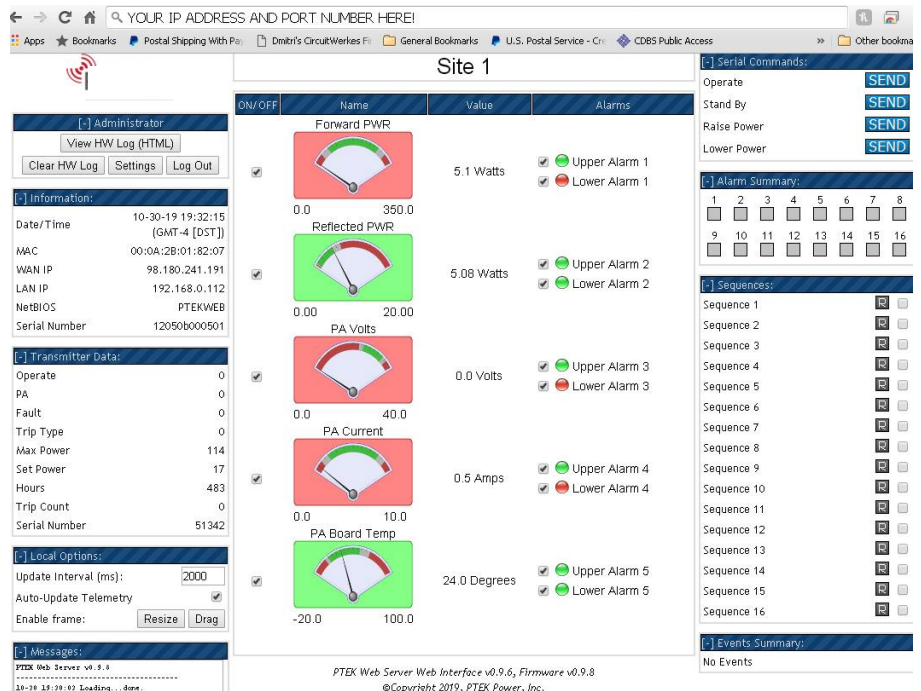
Webserver 's port (or the other device). Once changed, remember that you must use the port number after the IP address or netbios name.

### Differentiating multiple devices on a common network:

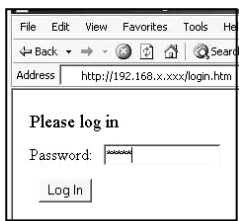
The CW Broadcast Webserver allows you to change the IP address and Netbios name of the device. These can be important when multiple CircuitWerkes Webserver based products are used at a common location. In that case, you will want to assign a unique Netbios name so that each device can be found by a unique name.

### Using the CW Broadcast Web server:

Your CW Broadcast Transmitter contains a powerful onboard Web server that is the heart of its networking capability. This Web server has proved to be very stable & supports multiple browsers. Although the interface looks simple, the real power of the Web server lies “under the hood”, in its speed and enhanced capabilities. Readings are continually updated, at a user-defined speed, which is much faster than many competing products. Your actual speed depends upon the network and upon your PC's horsepower. Your PC reads the raw data from the CW Broadcast Transmitter Webserver and “draws” the meter movements. Your computer's ability to draw quickly has a direct effect upon how frequently the meters move. The default update speed is 1500ms which updates the meter position each second. Speeds of 50ms can be achieved on fast networks, however, if you request data too fast, your network or your PC may not be able to handle it and you can get a periodic message saying that the CW Broadcast Webserver is not responding. If that happens frequently, slow the updating down by using a bigger number in the “Update Interval” box.



### Logging In:



By browsing to whatever IP address your Webserver has, you will be presented with a login screen. **The default administrator's login is 12345678**, unless you have previously set this differently from the configuration menu. There are three access levels to the CW Broadcast Transmitter, reader, controller, and administrator. Only administrators can configure the CW Broadcast Webserver. Controllers can operate the controls and acknowledge alarms while the reader

level has no control. The default administrator's access code is simply 12345678. Access codes can be changed at any time by the administrator by logging into the "settings" page and navigating to the Misc tab.

If you are using Internet Explorer (nobody should be anymore) and you incorrectly enter the password one time, you may have to close your browser and reload it because IE cache's the passwords and will try to use them even if they don't work and you have tried to enter a different password. To avoid that problem change your IE settings for temporary files so that Explorer checks for new versions of stored pages on every visit.

Once you have entered the correct password, it will take a few seconds to load the CW Broadcast Transmitter Webserver's main page. Once done, you will have access to the metering and controls of the CW Broadcast Transmitter Webserver. If you are an administrator, you will also be able to manage the settings. If the page does not properly load the first time, use the F5 key to refresh the page.

### Monitoring and control using the Web server:

**Site Name (not the same as Netbios Name)**

**Displays Current Access Level**

**Settings button opens the configuration menu in a new window.**

**General Info: IP address, WAN IP address, time, etc.**

**Transmitter's Internal Status Indicators (0 is Off, 1 is On)**

**Metering. Green background indicates normal operation. Red indicates an out-of tolerance condition. Grey means that channel is not being monitored.**

**Update interval defines how often your meters move.**

**Transmitter controls**

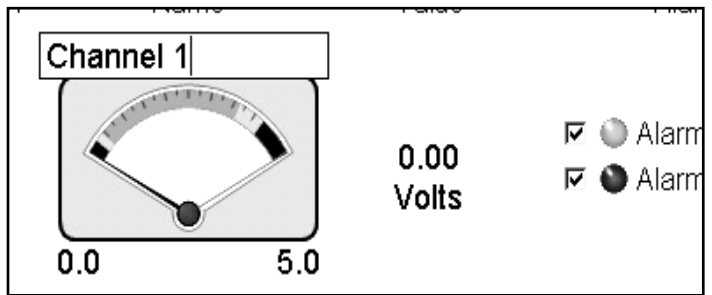
**Alarm trigger indicators show which triggers are active.**

**Sequence Status & Control: This box shows you all of the available sequences. The indicators at left of the labels change color to show active sequences. Controllers or administrators can manually run any sequence by pushing the "R" button. This is a very powerful control since it can perform multiple programmed steps.**

ON/OFF	Name	Value	Alarms
<input checked="" type="checkbox"/>	Forward PWR	5.1 Watts	<input checked="" type="checkbox"/> Upper Alarm 1 <input checked="" type="checkbox"/> Lower Alarm 1
<input checked="" type="checkbox"/>	Reflected PWR	5.08 Watts	<input checked="" type="checkbox"/> Upper Alarm 2 <input checked="" type="checkbox"/> Lower Alarm 2
<input checked="" type="checkbox"/>	PA Volts	0.0 Volts	<input checked="" type="checkbox"/> Upper Alarm 3 <input checked="" type="checkbox"/> Lower Alarm 3
<input checked="" type="checkbox"/>	PA Current	0.5 Amps	<input checked="" type="checkbox"/> Upper Alarm 4 <input checked="" type="checkbox"/> Lower Alarm 4
<input checked="" type="checkbox"/>	PA Board Temp	24.0 Degrees	<input checked="" type="checkbox"/> Upper Alarm 5 <input checked="" type="checkbox"/> Lower Alarm 5

## Webserver Configuration:

Administrators and controllers can operate relays and view the meters. Readers can login to see the meters, but cannot control anything. Administrators can read meters, operate relays and perform configuration setup tasks, including editing labels by just clicking on them from the main page. Basic calibrating (scaling) readings and changing labels can be done without ever opening the configuration page.



Above: Quick-changing a Label (Admin Only)  
Below: The main settings Form (labels tab)

Channel	Label	Unit	Minimum	Maximum	Decimals	Scalar	Scalar Type	Norm zone
Channel 1	Forward PWR	Watts	0	350	1	1	Scale (*)	Green
Channel 2	Reflected PWR	Watts	0	20	2	1	Scale (*)	Green
Channel 3	PA Volts	Volts	0	40	1	0.217	Scale (*)	Green
Channel 4	PA Current	Amps	0	10	1	1	Scale (*)	Green
Channel 5	PA Board Temp	Degrees	-20	100	1	1	Scale (*)	Green

In addition to quick changing the labels and calibrations, administrators can click on the “settings” button to open up the main configuration form in a new window.

The configuration form has 8 tabs. Each tab lets you configure a different aspect of the Webserver. Common tasks available include setting a static IP address, changing label names, defining what alarms the Webserver will respond to and what actions it will take during an alarm condition.

Changes are highlighted in green or red until saved. Changes highlighted in red are illegal operations and won't be saved.

The action sequences are user-defined functions that the CW Broadcast Webserver will perform whenever an event is triggered. These events are often called alarms, but they can also be simple responses to any particular input as defined by you.

The “alarms” are defined by two sets of parameters:

1. The triggering event (specified by you from the transmitter's parameters)
2. The step, or steps that you want to take when an event occurs.

There is more on alarms on pages viii and ix.

## Calibrating Meters:

Meters are usually pretty close to correct for the ES series of transmitters. However, small adjustments can be made by adjusting the calibration scaler value using very small changes, like 0.9 or 1.1 until you see what the effect will be. You should also set the meter maximum to 15% above the highest level that your transmitter will ever operate at. For an ES-300, 350 or 400 Watts would be a typical setting for the Forward Power Maximum. For an ES 500, 550 or 600W would be a typical power maximum.

The screenshot shows the 'Settings' page for 'ptekweb'. It features a navigation menu with tabs: Telemetry, Alarm Setup, Notifications, Connectivity, Misc, Logging, Sequences, and Time & Events. The main content area is titled 'Unit name' and contains a table of meter channels. A callout box points to the 'Maximum' column with the text 'Set the meter max scale here'. Another callout box points to the 'Scale (\*)' column with the text 'The scale type lets you select between scaling and offsetting. If the meters don't track for your power level, try scaling by another value. If the meters track properly but just need a slight adjustment to make the values read right, try offsetting by whatever amount the meter reads offset.'

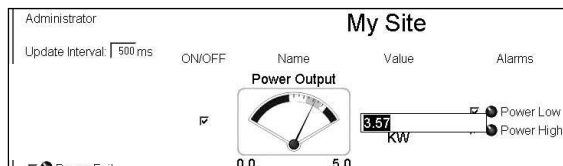
Channel	Label	Unit	Minimum	Maximum	Decimals	Scalar	Scalar Type	Norm zone
Channel 1	Forward PWR	Watts	0	350	1	1	Scale (*)	Green
Channel 2	Reflected PWR	Watts	0	20	2	1	Scale (*)	Green
Channel 3	PA Volts	Volts	0	40	1	0.217	Scale (*)	Green
Channel 4	PA Current	Amps	0	10	1	1	Scale (*)	Green
Channel 5	PA Board Temp	Degrees	-20	100	1	1	Scale (*)	Green

Below the table, there are options for 'Temperature Sensor Reading' (set to Fahrenheit), 'Enable Auto-Range for temperature sensor' (checked), and 'Display hysteresis zones on all channels' (checked). A 'Save' button is located at the bottom right.

Only administrators can calibrate the meters. This is best done when the output of your equipment is at its nominal operating voltage.

There is also an experimental meter quick calibrate function that may produce unexpected results. If you want to try the quick calibrate function this can be done in just a few simple steps:

1. Log into the Web server for the CW Broadcast Transmitter.
2. Make sure that the transmitter is operating at the desired power level.
3. Click on the value currently displayed. This will allow you to directly enter the value that you want to record. When through, hit the enter key to set the value. The meter pointer will now move to the new location on the meter face. The digital readout will also now reflect the correct reading. Note that you should set the meter scale before hand, so be careful not to exceed the meter's maximum or the meter will appear pinned.



Note that quick calibrations are linear only. Offsetting is not supported.

## Setting Alarm Points:

The CW Broadcast Webserver uses a simple but flexible system for handling alarms. It can perform actions when alarm conditions occur and it can perform actions when conditions return to normal, so it is possible to program a simple corrective action for one event and then to program another action to reverse the process when things return to normal. It has sixteen (16) event triggers (alarms) that can be programmed. Each trigger can respond to one of 51 possible metering alarms. In order to activate a trigger, it is necessary to program the desired alarms of the CW Broadcast Transmitter. Typically, these are lower or upper metering alarms. The Webserver keeps track of alarm triggers that are set in the lower and upper alarm limits. These can be displayed on the Webserver meter face. For instance, if the CW Broadcast Transmitter has upper alarm of 900 on a channel, the alarm will trigger whenever the reading exceeds 900. To be visible, the trigger value must be on the meter's visible range. If the meter is from 0 to 3,000 and a lower alarm is set to 1,000, that will occur at 33% on the meter. At the point that the meter's value is reduced below the alarm threshold, the meter background will change to red or whatever color you define in the setup. The alarm's hysteresis value and colors can also be setup.

Transmitter sets an alarm due to some out of tolerance condition. (Trigger event)

→

Associated Sequence Runs

**Alarm Labels:** We suggest that you give your alarms unique names. Each time an alarm is triggered, the alarm name is used in the subject of the associated email.

		Label	Value	Hysteresis ON delay	OFF delay	Critical zone	Hysteresis zone
<b>Lower</b>		Lower Alarm 1	35	70	45	5 Red	Silver
		Lower Alarm 2	0	0	45	5 Red	Silver
		Lower Alarm 3	23	25	45	5 Red	Silver
		Lower Alarm 4	1	2	45	5 Red	Silver
		Lower Alarm 5	0	5	45	5 Red	Silver
<b>Upper</b>		Upper Alarm 1	315	280	45	5 Red	Silver
		Upper Alarm 2	7	5	45	5 Red	Silver
		Upper Alarm 3	37	35	45	5 Red	Silver
		Lower Alarm 4	1	2	45	5 Red	Silver
		Lower Alarm 5	0	5	45	5 Red	Silver

**Auto-mute:** This is experimental. It will self-mute a Webserver32 alarm action after a user-defined number of occurrences. For example, a transmitter is fluctuating above and below the low power limit. You can set this so that the Webserver will stop texting you after XX times. Once muted, you can manually unmute to enable the action or you can automatically unmute based on the event schedule or any other trigger that operates a sequence that you program to unmute the alarm.

Per Mute	Auto Mute	Label	Event/Trigger	Response (Action)
<input type="checkbox"/>	0	Alarm #1	DISABLED	Sequence 1
<input type="checkbox"/>	0	Alarm #2	DISABLED	Sequence 2
<input type="checkbox"/>	0	Alarm #3	DISABLED	Sequence 3
<input type="checkbox"/>	0	Alarm #4	DISABLED	Sequence 4
<input type="checkbox"/>	0	Alarm #5	DISABLED	Sequence 5
<input type="checkbox"/>	0	Alarm #6	DISABLED	Sequence 6
<input type="checkbox"/>	0	Alarm #7	DISABLED	Sequence 7
<input type="checkbox"/>	0	Alarm #8	DISABLED	Sequence 8
<input type="checkbox"/>	0	Alarm #9	DISABLED	Sequence 9
<input type="checkbox"/>	0	Alarm #10	DISABLED	Sequence 10
<input type="checkbox"/>	0	Alarm #11	DISABLED	Sequence 11
<input type="checkbox"/>	0	Alarm #12	DISABLED	Sequence 12
<input type="checkbox"/>	0	Alarm #13	DISABLED	Sequence 13
<input type="checkbox"/>	0	Alarm #14	DISABLED	Sequence 14
<input type="checkbox"/>	0	Alarm #15	DISABLED	Sequence 15
<input type="checkbox"/>	0	Alarm #16	DISABLED	Sequence 16

**NOTE:** The Webserver works in conjunction with and as a slave to the transmitter. Muting alarms in the Webserver's setup page does not prevent the transmitter from setting an overload alarm. It does mute alarms, like power level. The transmitter still responds automatically to conditions like VSWR, even if the Webserver's VSWR reporting is muted.

DISABLED	▼
DISABLED	
Lower Alarm 1 TRIGGERED	
Lower Alarm 2 TRIGGERED	
Lower Alarm 3 TRIGGERED	
Lower Alarm 4 TRIGGERED	
Lower Alarm 5 TRIGGERED	
Lower Alarm 1 TRIGGERED AND Lower Alarm 2 TRIGGERED	
Lower Alarm 1 TRIGGERED OR Lower Alarm 2 TRIGGERED	
Lower Alarm 1 TRIGGERED AND Lower Alarm 2 CLEARED	
Lower Alarm 2 TRIGGERED AND Lower Alarm 1 CLEARED	
Lower Alarm 3 TRIGGERED AND Lower Alarm 4 TRIGGERED	
Lower Alarm 3 TRIGGERED OR Lower Alarm 4 TRIGGERED	
Lower Alarm 3 TRIGGERED AND Lower Alarm 4 CLEARED	
Lower Alarm 4 TRIGGERED AND Lower Alarm 3 CLEARED	
Lower Alarm 1 CLEARED	
Lower Alarm 2 CLEARED	
Lower Alarm 3 CLEARED	
Lower Alarm 4 CLEARED	
Lower Alarm 5 CLEARED	
Lower Alarm 1 CLEARED AND Lower Alarm 2 CLEARED	
Lower Alarm 1 CLEARED OR Lower Alarm 2 CLEARED	
Lower Alarm 1 CLEARED AND Lower Alarm 2 TRIGGERED	
Lower Alarm 2 CLEARED AND Lower Alarm 1 TRIGGERED	
Lower Alarm 3 CLEARED AND Lower Alarm 4 CLEARED	
Lower Alarm 3 CLEARED OR Lower Alarm 4 CLEARED	
Lower Alarm 3 CLEARED AND Lower Alarm 4 TRIGGERED	
Lower Alarm 4 CLEARED AND Lower Alarm 3 TRIGGERED	
Upper Alarm 1 TRIGGERED	
Upper Alarm 2 TRIGGERED	
Upper Alarm 3 TRIGGERED	
Upper Alarm 4 TRIGGERED	
Upper Alarm 5 TRIGGERED	
Upper Alarm 1 TRIGGERED OR Upper Alarm 2 TRIGGERED	
Upper Alarm 1 TRIGGERED AND Upper Alarm 2 CLEARED	
Upper Alarm 2 TRIGGERED AND Upper Alarm 1 CLEARED	
Upper Alarm 3 TRIGGERED AND Upper Alarm 4 TRIGGERED	
Upper Alarm 3 TRIGGERED OR Upper Alarm 4 TRIGGERED	
Upper Alarm 3 TRIGGERED AND Upper Alarm 4 CLEARED	
Upper Alarm 4 TRIGGERED AND Upper Alarm 3 CLEARED	
Upper Alarm 1 CLEARED	
Upper Alarm 2 CLEARED	
Upper Alarm 3 CLEARED	
Upper Alarm 4 CLEARED	
Upper Alarm 5 CLEARED	
Upper Alarm 1 CLEARED AND Upper Alarm 2 CLEARED	
Upper Alarm 1 CLEARED OR Upper Alarm 2 CLEARED	
Upper Alarm 1 CLEARED AND Upper Alarm 2 TRIGGERED	
Upper Alarm 2 CLEARED AND Upper Alarm 1 TRIGGERED	
Upper Alarm 3 CLEARED AND Upper Alarm 4 CLEARED	
Upper Alarm 3 CLEARED OR Upper Alarm 4 CLEARED	
Upper Alarm 3 CLEARED AND Upper Alarm 4 TRIGGERED	
Upper Alarm 4 CLEARED AND Upper Alarm 3 TRIGGERED	

## Sequences:

Telemetry	Alarm Setup	Notifications	Connectivity	Misc	Logging	Sequences	Time & Events			
	Sequence Label	Action #1	Pause	Action #2	Pause	Action #3	Pause	Action #4	Pause	Action #5
Sequence 1	Wake Up	Send Command Operate	10	Log Readings	5	Unmute Alarm Alarm #1	0	No Action	0	No Action
Sequence 2	Log Readings	Log Readings	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 3	Email & New Log	Log Readings	5	Email Log Recipient group #1	10	Perform Special Clear Hardware Log	10	Log Readings	0	No Action
Sequence 4	Sequence 4	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 5	Sequence 5	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 6	Sequence 6	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 7	Sequence 7	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 8	Sequence 8	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 9	Sequence 9	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 10	Sequence 10	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 11	Sequence 11	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 12	Sequence 12	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 13	Sequence 13	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 14	Sequence 14	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 15	Sequence 15	No Action	0	No Action	0	No Action	0	No Action	0	No Action
Sequence 16	Sequence 16	No Action	0	No Action	0	No Action	0	No Action	0	No Action

Save

Sequences are the heart of the Webserver's capabilities. Almost everything that can be done starts with creating a sequence.

Any trigger event can perform any of the 16 action sequences on the "sequences" list. There are nine basic actions available and a sequence can run up to seven actions. Available actions include operating transmitter buttons, sending e-mails and muting or unmuting actions associated with alarms.

Whenever actions are occurring, the Webserver will not respond to outside commands or to other events until the action has completed. If a pause is set to 60 seconds, then the CW Broadcast Webserver will not be responsive to outside control, nor will it update its meters, until that time, plus whatever amount of time to run the action steps has passed.

### Example: I want to be e-mailed or texted when certain alarms occur.

First we click on the notifications tab and enter the required information there. More about notifications can be found on page x.

Next, we setup a simple sequence to perform the actual e-mailing. We might use this sequence over and over for various alarms. So, we pick a sequence and pull down the list of actions. Here we select "email alarm event". We can then choose which list of recipients this email will be sent to. You can also name this sequence to make it easier to recognize. We save that page and open the "Alarm Setup" tab.

In alarms setup, we click on the drop down list of available alarms and select the condition that will be used to trigger the sequence. On the right side of the line, we pull the drop down list of sequences and select the one that we just setup for e-mailing alarms. We can name this alarm trigger so that we can keep track of it. Save this page. Now whenever that alarm condition happens, the Webserver will send the requested message to you.

NOTE: It is a very good idea to create unique labels for everything that you change in the Webserver. These come in handy during setup and during alarm reporting.

## E-mail notifications Setup

Telemetry Alarm Setup **Notifications** Connectivity Misc Streaming Sequences

---

**SMTP Server settings:**

Server:	<b>IMPORTANT!</b> Servers like gmail, hotmail and some others require TLS (Transport Layer Security). Although we do support SSL, the TLS protocol is not supported by the Webserver. If you try to send mail and see a message dialog at the bottom left of the main page that says "StartTLS" and nothing more, then you cannot use that mail server. <b>IN MOST CASES. YOU CANNOT SEND MAIL VIA GMAIL'S SERVERS.</b>	SMTP My-ISP.net
Port:		25
Username:		My user name
Password:		*****
From:		Type a valid reply address here
Subject:		Mail from My Transmitter

Last server response code: 32768

**Save SMTP Settings**

---

**Recipient list (max 80 characters per index location):**

Recipient(s) IDX 1:	Put as many addresses as desired in each index, separated by commas	Test Email
Recipient(s) IDX 2:		Test Email
Recipient(s) IDX 3:		Test Email
Recipient(s) IDX 4:		Test Email
Recipient(s) IDX 5:		Test Email

**Save Recipient List**

E-mail notifications can be sent to you for alarm purposes as part of your sequences. The Webserver supports SSL secure access, but does not support TLS only servers like gmail, hotmail or outlook. We do not guarantee that SSL will work on all mail servers, but it should work on most, as long as they don't require TLS. Most unsecured mail servers will use port 25 or 2525. If your server requires port 995 or 465, you will need to check the box marked "Use SSL." You will also need to submit your user name and password. These must be submitted individually.

For mail servers that require a user name and password, there are fields provided to enter the required information.

An open email server is: relay (dot) appriver (dot) com. Port = 2525. There is no authentication, so no user name or password should be entered. SSL/TLS should also not be checked.

The "From" field should normally contain a valid reply to address. Some mail servers will not deliver mail unless there is a valid "reply to" address.

The "Subject" field is the title that will be prepended to each e-mail's subject line.

The bottom half of the form has five fields for entering e-mail addresses. **Each field can contain more than one address, separated by a comma for each.**

SMS texts are actually just e-mails sent to the target mobile number at the carrier's SMS domain name. For example, [987-654-3210@txt.att.net](mailto:987-654-3210@txt.att.net) (no dashes would be entered in the phone number, of course).

When testing email, notice the message box area of the main Webserver page. If you get a DNS error, try entering a public DNS server into the DNS box on the connectivity tab. Public DNS servers are available from Google (8.8.8.8 and 8.8.4.4) and others. Normally, pointing to a good public DNS server will fix lookup errors.

One of the most common questions we get is: "Can I send mail via Gmail's servers?". Short answer is NO. As noted above, GMAIL, Hotmail, Outlook and others started requiring TLS a few years ago. Although gmail maintains mail servers that support SSL and even open SMTP, you cannot send mail outside of the gmail domain with them. For practical purposes, smtp.gmail.com (and some others) are no longer supported, unless you setup IP address authentication with Google.

## Connectivity (Network settings):

Your CW Broadcast Webserver allows you to change almost everything about the network configuration.

The HTTP port is typically 80, but you can change it to anything that you want.

The Netbios Name is optional and allows you to find computers or devices by name instead of knowing their IP address. When you call a Netbios name, a request is sent across the network for a response from any device with the matching name. If that device has a Webserver, it can be loaded into your browser directly without calling the IP address, much like a domain name works over the Internet.

The screenshot shows the 'Connectivity' settings page for Sicon Web 32 v1.0.1. The page is viewed in Google Chrome at the URL 192.168.0.205:8888/settings.htm. The page has a navigation bar with tabs for Telemetry, Alarm Setup, Notifications, Connectivity (selected), Misc, Logging, Sequences, and Time & Events. The main content area is divided into two sections. The top section is for general network settings, and the bottom section is for DDNS settings. The network settings section includes fields for WAN IP (74.179.98.187), LAN IP (192.168.0.205), MAC Address (00:0A:2B:01:80:A7), HTTP Port (8888), NETBIOS Hostname (SICOMWEB32), Static IP (192.168.0.205), Subnet Mask (255.255.254.0), Default gateway (192.168.0.1), Primary DNS server (8.8.4.4), and Secondary DNS server (8.8.8.8). There is an 'Enable DHCP' checkbox which is checked. The DDNS settings section includes a dropdown menu for Presets (members.dyndns.org), fields for Username and Password, and a 'Submit' button. A status message at the bottom of the DDNS section reads: 'Status: The IP Check indicated that no update was necessary.' The footer of the page contains the text: 'CircuitWerkes Sicon Web 32 Web Interface v1.0.1, Firmware v1.0.1 Copyright 2019, CircuitWerkes, Inc. Best viewed on IE\*, Chrome, Firefox 64 in 1024x768+ resolution'.

The Webserver is normally configured for DHCP by setting the four address octets to 0.0.0.0 or checking the box for “Enable DHCP”. If you want to enter a static IP address, you can direct enter it in the Static IP field as ###.###.###.### and uncheck the DHCP box.

When set to DHCP, the Webserver will detect the default gateway and enter its address in the “Default Gateway” field and also in the “Primary DNS Server” field. You can alter the DNS fields manually, if desired.

## Differentiating multiple devices on a common network:

The CW Broadcast Webserver allows you to change the IP address, port number and Netbios name of the device. These can be important when multiple CircuitWerkes Webserver based products are used at a common location. In that case, you will want to assign a unique Netbios name so that each device can be found by a unique name. If using static IP addresses, you will need to set a unique one for each device.

## Dynamic DNS (beta):

Dynamic DNS allows you to operate devices requiring a static address on networks that have only dynamic IP addresses. You make up a name for your location and register it with a DDNS service. Whenever your IP address changes, the device detects the change and notifies the host DNS service. The host service then modifies the address that the name points to. So when you try to login using the name, it always points to the right address. Currently the Webserver supports api.dynu.com, no-ip.com and dnsomatic.com. Other DNS redirect services that follow the openDNS protocol may work, too. Most of these services offer free and paid services. After setting up an account, enter your credentials into the fields of the DNS settings page and save them.

DDNS settings:  
DDNS Service: members.dyndns.org  
Username: members.dyndns.org  
Password: dynupdate.no-ip.com  
Host: updates.dnsomatic.com  
Status: undefined  
Save DDNS Settings

## Passwords and system utilities:

My Site - Sicon Web 32 v1.0.1 Settings - Google Chrome  
192.168.0.205:8888/settings.htm

Telemetry Alarm Setup Notifications Connectivity **Misc** Logging Sequences Time & Events

Admin Password: [input] Submit  
Controller Password: [input] Submit  
Reader Password: [input] Submit

Timed sequence run, 0 disables timed run Sequence 1 every 0 hour(s)  
Timed sequence run, 0 disables timed run Sequence 1 every 0 hour(s)  
Timed sequence run, 0 disables timed run Sequence 1 every 0 hour(s)

Save

Reboot webmodule Confirm Reboot  
Reboot system (soft) Confirm Reboot  
Reboot system (hard) Confirm Reboot  
Load factory defaults Load Factory Defaults (Only Connectivity)  
Load Factory Defaults (Everything)

Import/Export settings Import Export

In the MISC tab you can set sequences to run at a predefined interval. The interval is not clock based for this section. These relay on a timing loop and will not be hyper accurate. However, they will continue to run even if the clock doesn't work.

The resets/reboot section lets you restart your Webserver or even reboot the Webserver. It does not restart the actual transmitter. You can also load default values, but be careful since the IP address may change.

## Saving/Backing Up Your Unit's Configuration Settings

The Import/Export functions are VERY important. Here is where you can save your configuration data to a local file. You can also load saved data into a virgin Webserver without having to program everything in it from scratch. When you click the "Export" button, you will be presented with a text box containing a lot of information. Select the entire contents of the box (CTRL-A in Windows). Copy the entire contents to the clipboard (CTRL-C). Then open up a text writer like notepad and paste everything into it (CTRL-V). Save the new file. It is a process, but it's quick and worth the effort, if you ever need to reprogram your device.

To import saved data, open the text file that you previously saved and copy everything to the clipboard (CTRL-A, then CTRL-C). Then click the "Import" button and paste the contents of the clipboard to it and click the "Import" button on this form. When done importing, click the "Save" button at the bottom of the main form, or click any of the save buttons on any of the other tabs. Note that network settings are not automatically saved because they would cause the unit to potentially change IP addresses in the middle of the process and you might not find it if you don't know what IP address and range it is using. Therefore, you have to make those changes individually.

## Logging:

The Webserver can keep a log and can also e-mail it to you. Logging can be as simple or complex as desired. The log is a FIFO (First In, First Out) circular buffer. When the buffer is full, new entries push the oldest entries off the stack. The log can hold about 50 entries. Log entries can be by time or by action sequence, such as might occur in an alarm condition.

The output format of the logger is defined in the logging setup. The default HTML format produces an easily read log but the format can be altered to read in any way desired by using the items from the drop down list. The log is divided into two parts, the header and the body. The header is printed at the beginning of the log and periodically throughout the log as defined by you in the first setup field. Any text that does not match a keyword is printed exactly as typed. For example, if you want meter one to print the value followed by the label "Amps", you would simply add the label after the meter value. If meter 1 is the Amp meter, then it would be entered as %mv1Amps instead of just %mv1. In other words, when you look at the default template, you will see that %mv1 is already there. You just type "Amps" between the %mv1 and %mv2.

xvi The bottom half of the form is where you define the format of the log.

An example of a modified logging setup.:

The default header looks like this:

```
| Date/Time | Channels
```

In order to get the output below, the following header was created:

```
| Date/Time | Channels
| 1 2 3 4 Temp
```

The result is below....

```
      |      Date/Time      |      Channels
      |                    | 1    2    3    4    Temp
T | 12-09-13 14:12:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:13:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:14:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:15:57 | 0.000 0.000 0.000 4.987 77.000
T | 12-09-13 14:16:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:17:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:18:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:19:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:20:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:21:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:22:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:23:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:24:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:25:57 | 0.000 0.000 0.000 4.940 77.000
T | 12-09-13 14:26:57 | 0.000 0.000 0.000 4.940 77.000
```

The first character is either a T for time triggered or a sequence number (like S13) to indicate what caused the log reading to be taken.

## Date & Time:

The Webservice has the ability to calibrate itself to an NTP (Time) server. The Webservice will keep time if an NTP server is not available, unless the power goes out. The time setup box lets you set the current time and also selects how often to automatically sync the CW Broadcast Transmitter clock to an NTP server. The NTP server list is embedded in the stack and is not currently user adjustable. Setting NTP update to zero disables updating. You can also manually sync the CW Broadcast transmitter's clock to your PC, if desired.

<b>Telemetry</b>	<b>Alarm Setup</b>	<b>Notifications</b>	<b>Connectivity</b>	<b>Misc</b>	<b>Logging</b>	<b>Sequences</b>	<b>Time</b>
------------------	--------------------	----------------------	---------------------	-------------	----------------	------------------	-------------

Set date/time stamp manually MM-DD-YY HH:MM:SS NTP Server NTP Port NTP Update Interval (in minutes); 0 disables NTP GMT Offset (in minutes)	Setting the clock. Here you can sync the clock to your PC, setup the NTP server, set DST options and enter the time zone. Note that all times are referenced to GMT and the offset is in minutes. For example, Eastern Standard time is -300 minutes or 5 hours.	<input type="button" value="Sync with PC"/> <input type="text"/> <input type="text" value="pool.ntp.org"/> <input type="text" value="123"/> <input type="text" value="10"/> <input type="text" value="-300"/> <input type="button" value="Save"/>
--	--	---

## Event Scheduler:

The Webservice contains a basic event scheduler with 50 events. The granularity of time resolution is + or - 600ms. The event scheduler can be programmed to run once, repeat constantly, or repeat for a specific duration (such as a month). Repeating events that end can be programmed to repeat during the next year, if so desired.

The Webservice's clock syncs itself to NTP time servers but will continue to keep time if the network is disconnected, unless power is removed. However, if NTP is enabled, the clock will self-correct when power is re-applied.

To create an event that repeats every day for a month, first set up a sequence that your event will be triggering.

Next, enable the event by clicking in the "Enable Event" check box.

You next select Recurring type. Put in the start date and time. Select "Days" for the recurrence type and 1 for the interval.

The Exit Type will be by "Date" and select the last day of the month at 23:59:59.

The "repeat annually" box causes the event to recur every year.

The event scheduler is the best way to keep a routine log. Simple create an action sequence to log the readings, then call that sequence by creating an event that repeats every ## hours.

Once per week, or so, you'll want to have the log emailed to you and a new log started.

This is done by creating a second sequence that emails the log, then clears the log and starts a new log. A second event that runs weekly, possibly Monday morning, would then be created to handle this task.

The screenshot shows the 'Time & Events' settings page in Site Sentry 4 v1.5.3. The 'Events Summary' table lists 50 events, each with a status (active, expired, or disabled). A callout box points to a disabled event, stating 'Event is disabled'. Another callout box points to the first row of the table, stating 'To set an event, first click on the line of the event that you want to create or edit. Then, you can enter the parameters and save the event.' A third callout box points to the 'Selected Event information' section, stating 'This section gives you information about your events at a glance. Mouse over the event for more info and to see if it is enabled.'

The 'Selected Event information' section shows the following details:

Expired	Next occurrence	Occurrence count
N/A	N/A	N/A

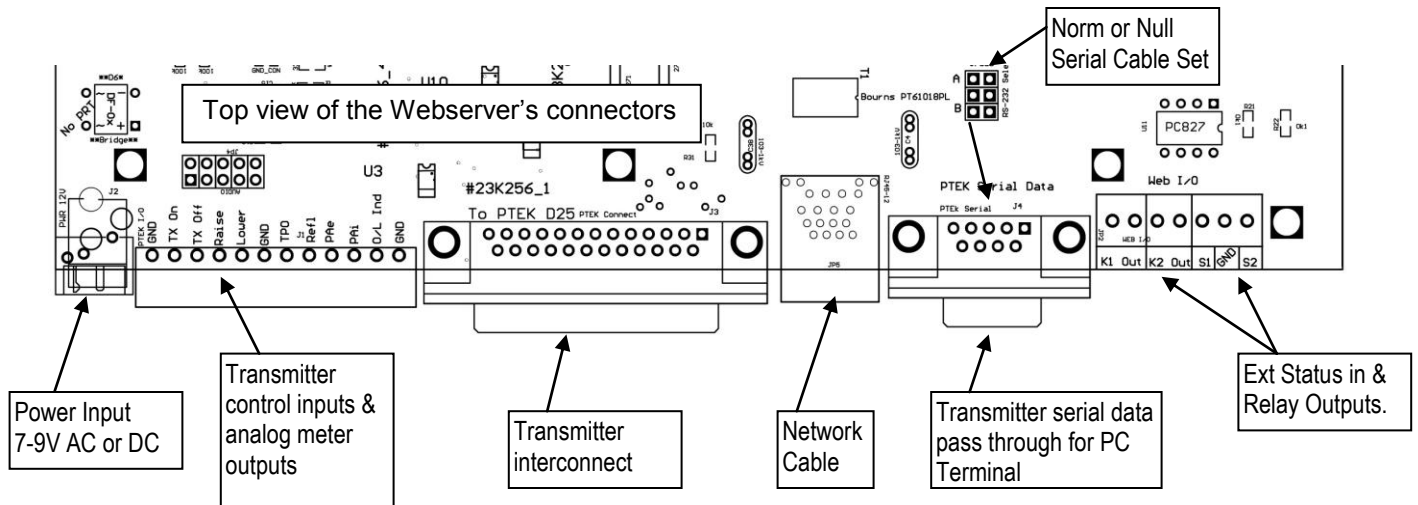
The 'Selected Event setup' section includes the following configuration options:

- Enable Event:
- On event trigger sequence: Sequence 1
- Entry Type:  One Time  Recurring
- Start Date/Time: 01-01-12 07:00:00
- Recurrence Type:  Minutes  Hours  Days  Weeks  Months  Years
- Recurrence Interval: 1
- Exit Type:  None  Date  Occurrences
- End by: 01-31-12 23:59:55
- Repeat Annually:

The 'Set date/time stamp manually' section includes fields for MM-DD-YY HH:MM:SS, NTP Server (pool.ntp.org), NTP Port (123), NTP Update Interval (10), GMT Offset (-300), and an option to Enable daylight saving time (DST/ST).

## External Webserver Connections:

CW Broadcast transmitters can be equipped with an external Webserver for retrofitting older transmitters. The external webserver requires Ethernet, 9V DC power and serial data. It also can break out the analog meter outputs and control inputs to convenient screw terminals for interfacing with external devices.



### Connectors and Description:

**Power input:** A coaxial connector. 7 to 9Vdc is suggested. Unit ships with 9V adapter.

**Transmitter controls:** These are the analog DC metering outputs and control inputs from your transmitter.

**Transmitter Interconnect:** Serial data and analog I/O from the transmitter. Must be a straight D25 to D25 cable.

**Network Jack:** RJ-45 for connecting to the network. Has two LEDs. Green for high speed (100 or gigabit) and yellow for data XFER. Normally, the green led will be on and yellow will flicker. Green is off for disconnected or 10mb connections

**PC Terminal Interconnect:** Serial data from the transmitter to your PC terminal. 9600B N,8,1. Can be used simultaneously with the Webserver.

**EXT Status & Relay outputs:** Provides method to control external equipment. Not yet active in the firmware, but provisioned for a future firmware release.