INO mini 635

SiteStreamer™ FM/RDS Monitor

Installation & User Guide

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INOVONICS
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Section I

INTRODUCTION

Product Description

The INOmini 635 SiteStreamer™ is a Web-enabled FM receiver for remote signal monitoring. Installed at a broadcast transmitter/translator site, or any remote location with an Internet connection, the unit streams audio from single or multiple (sequenced) off-air sources, or from a hardwired program audio feed. Program audio and signal parameters may be monitored by any computer, tablet or mobile device. The browser interface enables remote tuning and source switching, and displays audio levels and RDS data. Signal parameters may be logged, and signal failure alarms are dispatched by email or SMS/text messaging.

Product Features

Features of the SiteStreamer™ include:

- Monitor an off-air FM signal from anywhere.
- 'StationRotation' can sequence through as many as six tuning presets to monitor multiple stations, each with its specific alarm parameter settings.
- Tunes the 'extended' FM band: 64MHz–108MHz.
- Analog AUX inputs to monitor hardwired audio program feeds; A/B between source and air.
- Full dynamic browser support of all operational features, including audio streaming through the dynamic Web interface.
- Sends instant error messages via email or SMS texts; logs RSSI, audio loss and RDS errors (hijacking).
- Accurate front-panel and Web interface program audio level display.
- Easy setup and operation; full SNMP support.
- Front-panel headphone jack.

Product Specifications

Tuning Range: 64.0MHz–108.0MHz in 100kHz steps.

Antenna Input: 75-ohm (F)

Receiver Sensitivity: ≤10µV for 50dB monaural SNR

Audio Response: ±1dB, 30Hz–15kHz; 75µs/50µs de-emphasis

Program Line Input: Active-balanced (XLR) left/right analog AUX inputs; menu-selectable +4dBu or –10dBu nominal reference levels; local and remote switching between off-air and AUX line-in feeds.

Headphone Jack: font-panel (TRS) 3.5mm

Network Connection: LAN (RJ45) jack accepts universal TCP/IP connection to Local Area Network, and via router to the Internet.

Alarms: Low Signal, Audio Loss, RDS Loss or Mismatch

Power Requirement: 12VDC at 110mA (2.1mm x 5.5mm coaxial); a universal inline 'brick' switchmode power supply is provided.

Mounting Options: An optional rack adapter accepts up to three INOmini modules in a 1U, 19-inch rack space. The SiteStreamer™ may also be fastened to any convenient surface with two small screws.

Size and Weight: 1.6"H x 5.5"W x 5.5"D; 4 lbs. shipping weight.

Section II

INSTALLATION AND CONNECTION

Unpacking and Inspection

Inspect for shipping damage immediately upon receipt of the equipment. If damage is found or suspected, notify the carrier at once, and then contact Inovonics.

We recommend that you set aside the original shipping carton in the event that return for Warranty repair is required. Shipping damage sustained as a result of improper packing for return may invalidate the Warranty!

Warranty Registration

Please complete the Warranty Registration process. Not only does this assure coverage of the equipment under terms of the Warranty (printed inside the back cover of this manual), but the user will receive any specific service and modification instructions, including software/firmware updates. Register online at:

www.inovonicsbroadcast.com/product-registration

Mounting

The INOmini 635 is packaged in a compact 'clamshell' chassis that defines the standardized module in this series of Inovonics products. The INOmini 635 may simply be placed atop existing rack-mounted equipment, as long as at least 1U of panel space is left open above the rack-mounted 'host' to access the unit. Alternatively, a pair of mounting holes on the chassis base allows the INOmini 635 to be fastened to the inside of an equipment rack cabinet with two #4 screws.

An optional rack-mount kit is available for the INOmini 635. The rack kit can hold up to three INOmini modules and comes with blanking panels for unused spaces and with two 'daisy-chain' power cables so that two or three INOmini modules may share a single power supply.

AC Mains Power

All Inovonics INOmini modules are supplied with an inline 'brick' switching power supply compatible with any destination mains voltage. The actual power consumed by the SiteStreamer™ is 110mA at 12 volts DC. A second, paralleled DC connector on the rear panel allows 'daisy-chaining' INOmini modules. This means that two or more units may be fed from the same AC supply, but with the obvious caution that the total input power specification of a given assortment of INOmini modules must not exceed the current rating noted on the power supply label.

Radio Frequency Interference (RFI)

Although we have anticipated that the SiteStreamer™ will be used in the vicinity of broadcast transmitting equipment, please do practice reasonable care in locating the unit away from *abnormally* high RF fields.

The Front-Panel Display and Menu Knob

Turning the front-panel MENU knob scrolls the LCD through the various menus, pushing the knob enters the menu for programming options. Section III of this manual explains the easy setup and various operating preferences of the INOmini 635.

Headphone Jack

The front-panel PHONES jack will accommodate stereo headphones of virtually any impedance with a 3.5mm stereo plug. When headphones are plugged in, the LCD menu will automatically go to the Headphone Vol screen, and the front-panel knob will adjust the listening level. Once you set the volume to a comfortable level, push the knob to returns to the previous menu.

Rear Panel Connections

ANTENNA — The SiteStreamer™ antenna input is a US-standard 75-ohm F connector. Inexpensive, ready-made cables of various lengths are common in this format, and adapters to other RF cable connectors are readily available.

<table>
<tr><td>ANALOG LINE INPUTS</td><td>These XLR female inputs accept program audio based on either a +4dBu or –10dBu nominal input level selected with MENU screen 4.</td></tr>
</table>

ANALOG LINE INPUTS These XLR female inputs accept program audio based on either a +4dBu or –10dBu nominal input level selected with MENU screen 4.

PLEASE NOTE: These AUX inputs have limited headroom and will clip at about 6dB above the stated, 0dB nominal level. To assure consistency in loudness as monitoring is switched between the off-air signal and the AUX inputs, these analog inputs are assumed to be hard-limited to the nominal line level selected, just as the off-air signal is hard-limited to ±75kHz FM deviation. Apply an external pad, if required, to avoid input clipping.

LAN PORT This RJ45 jack accepts traditional TCP/IP connections to a router or server, and from there to the Internet.

+12VDC POWER I/O These two connecters are in parallel to allow 'daisy-chaining' INOmini modules. This allows one DC supply to power up to three modules mounted in a single rack adapter, provided that the rating of the supply is not exceeded. Two short 'pigtail' cables are provided with each rack adapter.

The SiteStreamer™ draws 110mA. Check the rating on the label of the power supply to make sure that it is rated to accommodate all the modules it must support.

These power connectors do not lock, and the mating plugs pull-out rather easily. A Ty-Wrap® will secure the cables to the plastic anchor above the jacks if this becomes a problem.

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Section III

SITESTREAMER™ SETUP

SiteStreamer™ setup is explained in this section using the front-panel LCD screen and MENU knob. All menu functions, plus some additional ones, are available through the Web interface, but we recommend using local control first to get familiar with the product.

Flashing Alarm

The SiteStreamer™ has several alarms that indicate and log transmission fault conditions, and can dispatch email or SMS/text-messages as well. All alarms utilize the Web interface and are detailed in Section IV. One alarm also shows up on the front panel, and you may encounter this when you first apply power to the unit.

If the SiteStreamer™ is not receiving a broadcast, the LOW SIGNAL alarm will begin to flash soon after the unit is powered-up. The alarm is held off once the unit is operating normally.
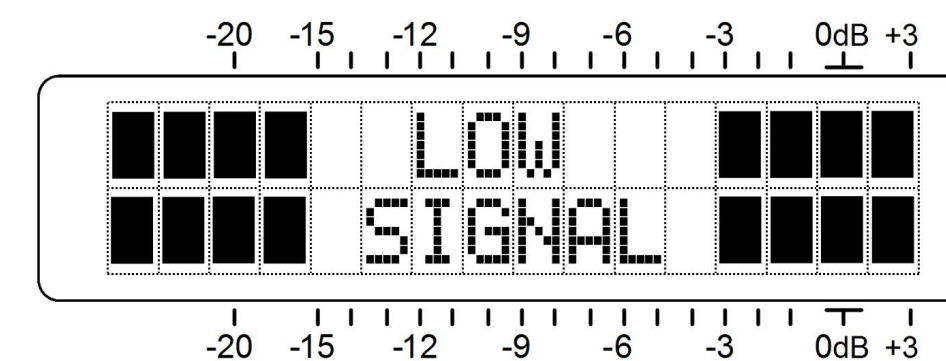
If you push or turn the knob, you'll get a brief respite from the flashing. This will allow you to navigate through the menus and complete the setup.

Menu Navigation Basics

You may already have figured-out the menu tree for yourself; it's really quite intuitive. Quite simply: 1) *turn* the knob to navigate from one menu to the next, 2) *push* the knob to enter any 'blinking' menu with editable settings, 3) *turn* the knob to choose an option or to set a value, and then 4) *push* again to accept the selection and send it to non-volatile memory, and to return to menu navigation.

If you *turn* the knob to an editable value and fail to *push* it, the new value will be committed to memory automatically after a 30-second timeout period.

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As you navigate to a specific menu and push the knob, items that can be edited will 'blink' at a rapid rate. Don't confuse blinking menu callouts, such as the one illustrated here, with the 'flashing' alarm discussed above.
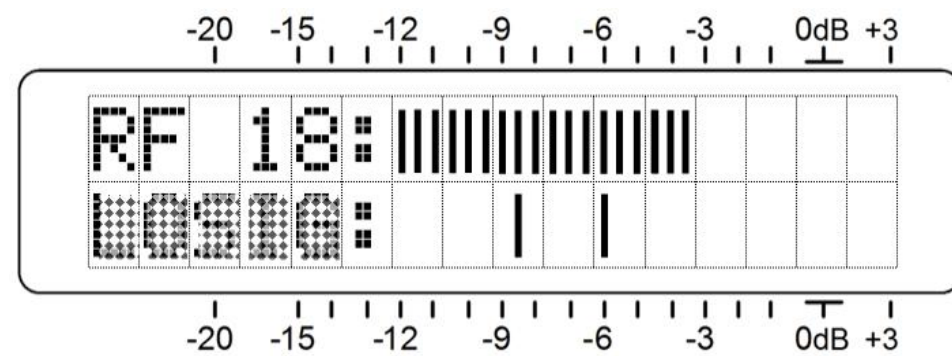
To recap: in setup menus, any parameter that can be edited will begin blinking as soon as you push the knob. Blinking indicates that a different option or value may be selected. Turn the knob to make your choice, and then push it once again to transfer that selection to memory. If a menu has two line-items that can be edited, you must push the knob a second time to release the menu, whether you make a change to the second item or not.

Each SiteStreamer™ menu screen will be discussed separately and in order, except that the last menu is discussed first, as it could constitute a show-stopper.

Locked Menus (Menu Screen 13)

To guard against inadvertent menu editing or casual tampering, the very last menu in the sequence allows locking the knob out of the editing mode. If you find that when you push the knob you are unable to enter a setup menu to change a parameter, scroll all the way to very last menu screen. Push the knob, the word Menus will begin blinking. Turn the knob to select Menus: Unlocked. Push the knob again to set this selection, and then navigate back to whichever screen you were trying to edit. You may re-lock the menu in the same manner when setup is finished.
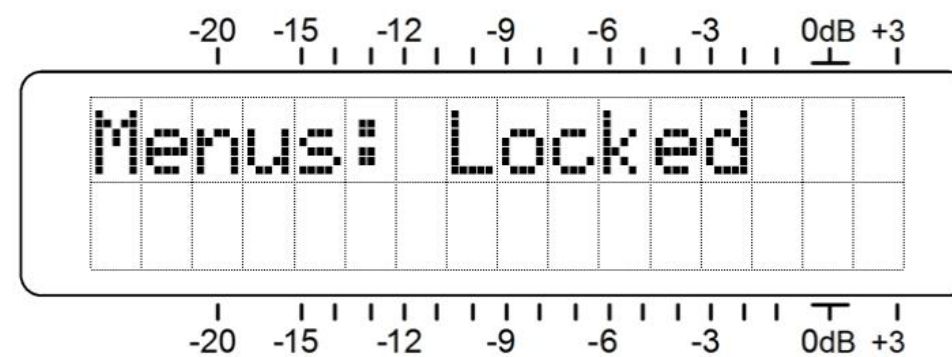
Setting the Frequency (Menu Screen 1)

When power is applied to the SiteStreamer™, a 'splash screen' with the product ID pops up immediately on the LCD. Within a few seconds this will revert to Menu Screen 1 shown at the top of the next page.

Push the knob and FREQ: will start to blink. Turn the knob to set the receive frequency. Push the knob again to set the frequency in memory and release the menu.
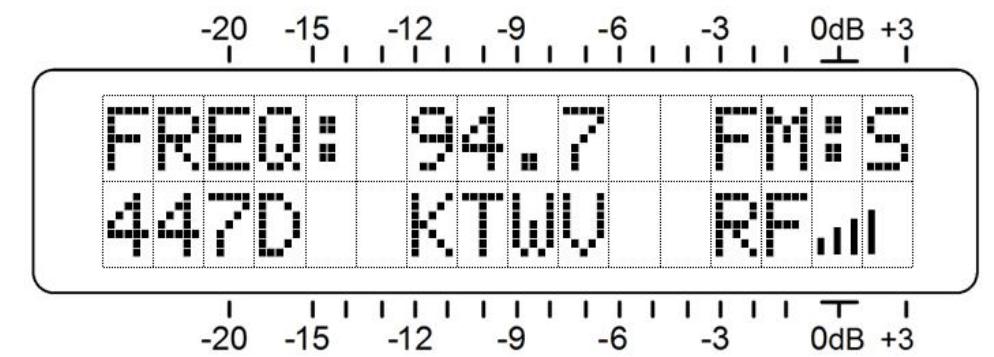
The top line of Menu Screen 1 shows the frequency of the station and whether it is received in stereo (FM:S), blended stereo (FM:B), or monaural (FM:M).

The second line shows the station's RDS PI code, its 'digital address.' In the US and Canada, the station's PI code is derived from call letters, and callsign will be displayed. The bars to the right of RF give a first-order indication of incoming signal level.

Carrier Strength and Alarm (Menu Screen 2)

The RF bargraph on the upper line of this menu screen shows incoming signal level. The RF numerical value simply represents the number of lighted bargraph segments and is not a voltage measurement. This display is strictly a *relative* indication of the FM carrier strength and has no association with the dB scale alongside the LCD. (The dB scales are used only for audio level measurements in Menu Screen 5.)
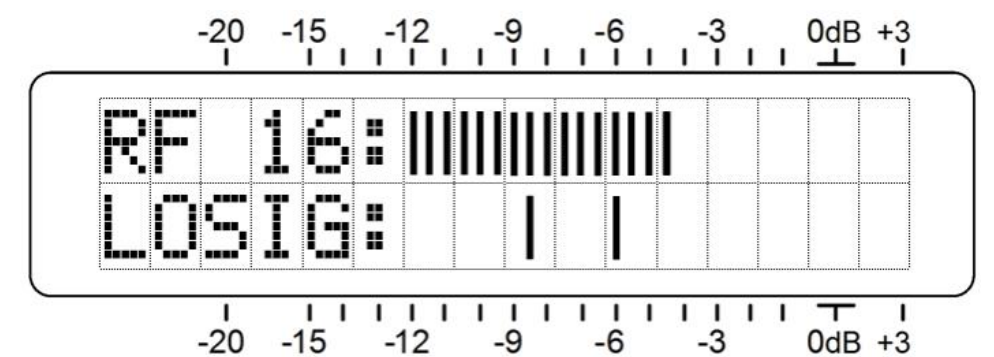
The lower LCD scale is labeled LOSIG: and has a pair of tic marks off to the right. Push the jog wheel and LOSIG, and the left-hand tic mark, will begin to blink. Turn the knob to position the left tic mark anywhere beneath the RF bargraph. When the RF bargraph falls *below* this tic mark during normal receiver operation, it initiates a carrier-loss alarm. This causes LOW SIGNAL to flash on the LCD screen and can trigger email or text messages as described later.

As a starting point, you might set the carrier-loss trigger point about half the way down from the top of the RF bargraph as shown in the illustration. This should allow for typical signal fading over the receive path, but will still alert the user to a valid carrier loss or transmitter power problem.

Push the knob again and the right-hand tic mark will blink. Turn the knob to set this tic mark to a point that the carrier level must return to for the alarm to reset… maybe a few segments above the left tic mark, but certainly not beyond the normal signal range. Push the knob again to set these points in memory and release the menu.

Additional alarm settings are accessed through the Web interface, and alarm parameters are stored independently with their associated station presets. These fault alarms can be programmed to dispatch email and SMS/text messages as detailed on Pages 22 and 29.

Signal-to-Noise and Multipath (Menu Screen 3)

This screen displays two additional signal-quality measurements. Numerical values are assigned to each of these readouts as well, but again signify only the number of active bargraph segments for relative comparisons.

SN is a first-order approximation of the signal-to-noise relationship of the tuned signal. This measurement takes several signal parameters into account, but is strictly a relative indication. No hard-and-fast rule can be derived from this display, except that "higher is better."

Likewise, MP gives a relative indication of multipath (signal reflection) effects that the broadcast carrier encounters in its trip to the receiver. Multipath effects degrade the quality of the recovered audio program, affecting noise and introducing other audible artifacts. The object here is to keep MP as low as possible. 00 is ideal and should be attainable when receiving a solid signal.

The RF, SN and MP numerical values are handy metrics when installing and optimizing an antenna. In locating and aiming the antenna, do everything you can to maximize RF and SN, and to minimize MP.

Monitor Source Switching (Menu Screen 4)

The SiteStreamer™ normally monitors the FM off-air broadcast, but can also switch to an analog program audio feed applied to the rear-panel XLR connectors. This allows A/B comparisons between the off-air signal and the program audio feed to the exciter.

This snapshot shows the primary, default monitor mode, the off-air FM Radio signal. Push the knob and turn it to switch to the AUX Input analog program source.

Now, with Source: AUX Input showing, press the knob again to select AUX Gain:. Two input sensitivities accommodate left and right analog inputs that nominally reference +4dBu or –10dBu program line levels. The signals applied to these inputs are assumed to be limited, to a *peak* value seldom exceeding the stated nominal line level. Do make allowance for the limited headroom of this input, which will clip about 6dB above the 0dB marking on the front-panel level metering scale in the next menu.
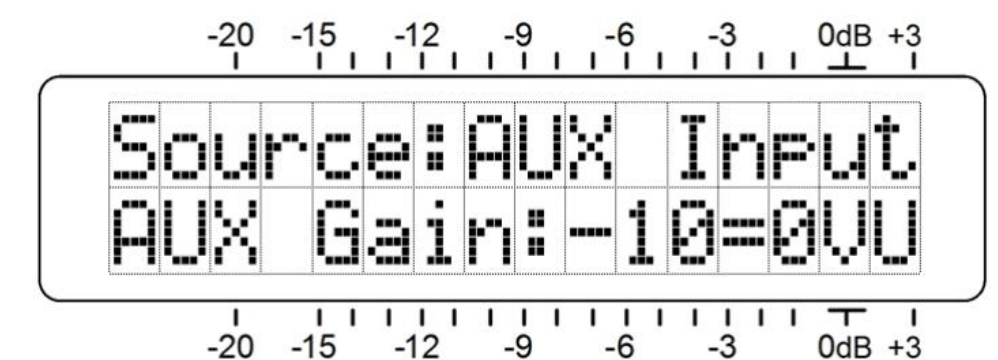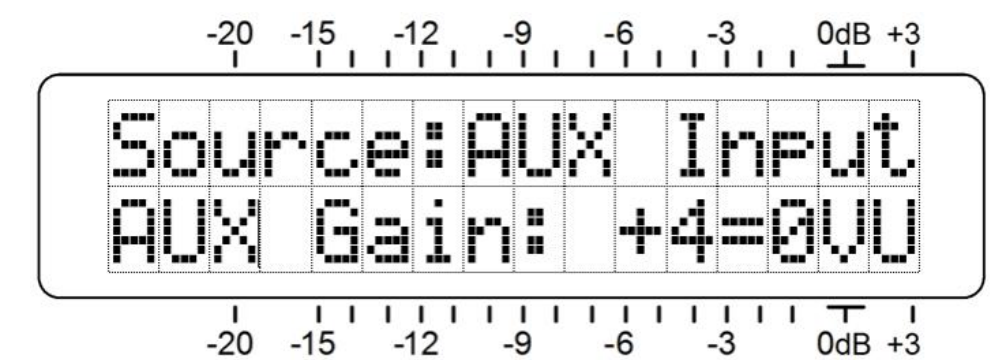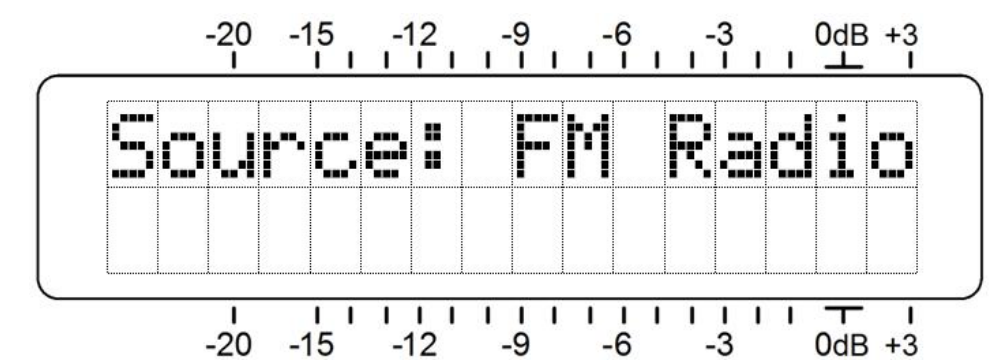
Program Audio Levels (Menu Screen 5)

Menu Screen 5 presents an accurate bargraph readout of program audio levels. This is a peak-responding meter with a floating peak-hold function.

100% modulation is denoted by the large block opposite the 0dB marking on the panel. The meter resolves +1, +2 and +3dB above 0dB, and from 0dB down is calibrated in 0.5dB steps to –15dB, and then in 1dB steps to –21dB.
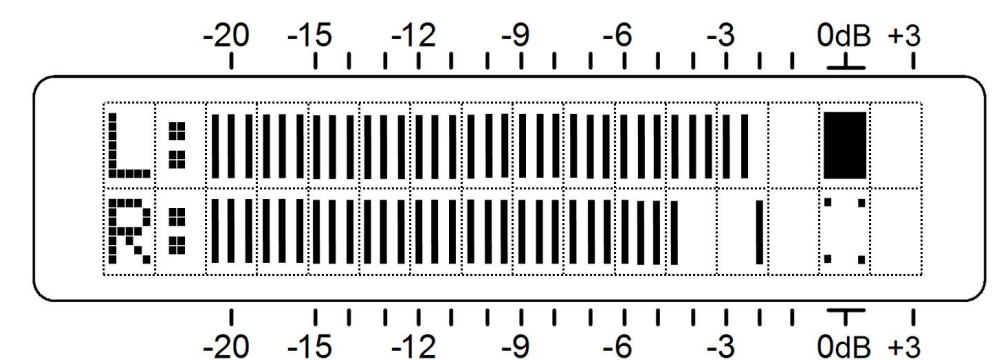
0dB represents ±75kHz carrier deviation. A 400Hz monaural test tone would take the meter to the 0dB point. Receiver de-emphasis must necessarily be factored into the reading at higher frequencies, and of course the 19kHz stereo pilot consumes the top 9% of carrier modulation. Aggressively-processed program audio should peak the bargraphs consistently at –1dB.

Networking Mode and IP Address (Menu Screen 6)

The IP networking mode and address are set on this Menu Screen. Push the knob and Mode: will blink. Select either DHCP or Static IP as dictated by your network configuration. When DHCP is selected, the IP address is automatically assigned by the router/server and cannot be changed manually.
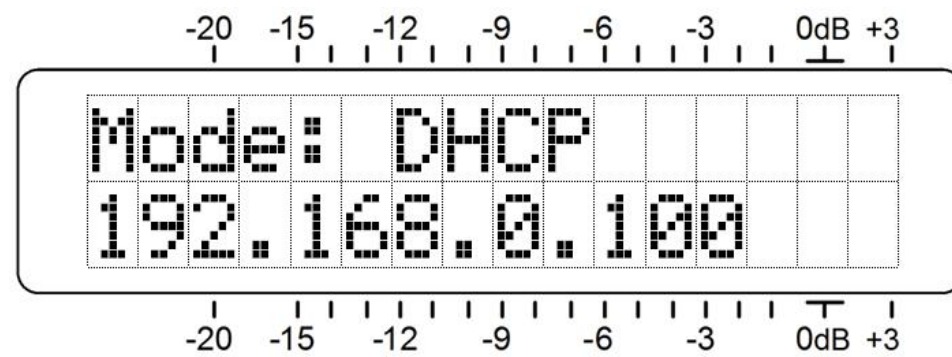
With Mode: Static IP selected, push the knob again to enter a fixed IP address manually. The first address group will begin to blink. Turn the knob to dial-in the required number. Continue to press the knob and dial-in numbers until all four IP address fields are filled. Push the knob a final time to commit all selections to memory and release the menu.
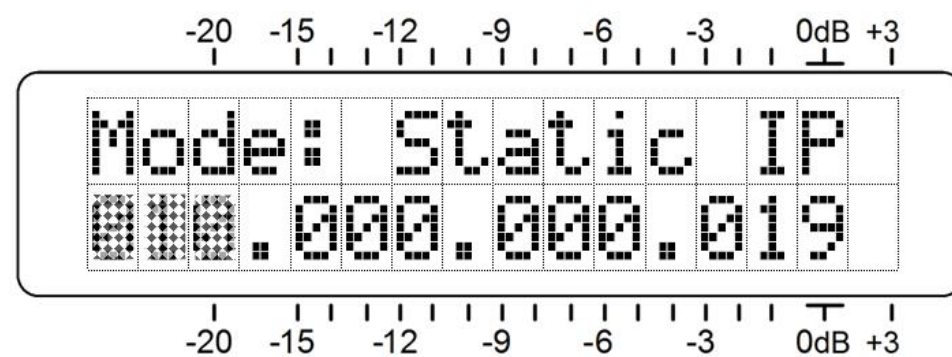
Once the SiteStreamer™ is on your network you may use the Web interface for the remaining LAN port menu items. Nonetheless, setup using front-panel controls continues here.

IP Port (Menu Screen 7)

The default IP port assignment is the commonly-used Port 80, which will show on the second line of Menu Screen 7.

To change this port assignment, push the knob to enter the setup field. Leading zeroes will display, and each digit must be set independently. Push the knob repeatedly to reach the digit you need to reset, starting on the left and proceeding right. When all digits are set, press the knob one final time to commit the selection to memory and release the menu.
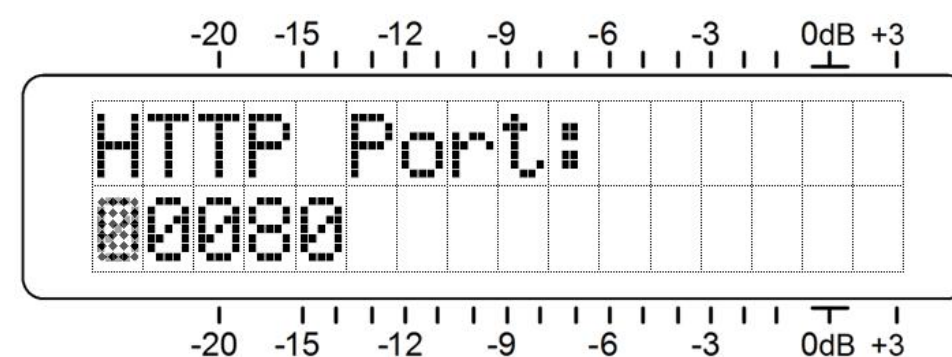
Gateway, Subnet Mask, Primary DNS (Menu Screens 8, 9, 10)

It's really not within the scope of this manual to cover the intricacies of network configuration, and you may need to involve an IT professional in this. These three screens relate to a static IP address and are addressable only when Mode: Static IP is selected under Menu Screen 6. The Gateway:, Subnet Mask: and Primary DNS: are entered manually in exactly the same manner as Static IP addressing was described under Menu Screen 6.

MAC Address (Menu Screen 11)

The MAC (Media Access Control) address of any piece of hardware with IP connectivity is a fixed value unique to that particular unit. Menu Screen 11 displays the MAC Address: of your specific SiteStreamer™ and cannot be changed.

Headphone Monitoring (Menu Screen 12)

A front-panel PHONES jack offers a convenient monitoring point for SiteStreamer™ setup and casual listening. Whenever a pair of headphones is plugged into the front-panel jack, the LCD automatically jumps to Menu Screen 12. Headphone Vol will begin blinking and the panel knob may be adjusted for a comfortable listening level.

The LCD shows an arbitrary numerical value and a bargraph representation of the headphone volume. Once volume is set, push the knob to save the setting to memory and to return the LCD to the previous menu.

Hidden Menu Items

The SiteStreamer™ has a 'hidden' menu of items that are accessed infrequently.

Push the front-panel knob and hold it down. In about 5 seconds the LCD will switch to display 635 Firmware, showing the current firmware version on the second line.

Turn the knob to bring up the next hidden menu, De-emphasis:. This is the FM de-emphasis characteristic, which may be toggled between USA - 75us and Europe - 50us standards.

IF Bandwidth: heads the next hidden menu, and may be cycled among various options. Auto is the default setting.

The last selection initiates an `Update Firmware:` procedure. *Do not experiment with this informally.* Refer to the firmware updating procedure, which begins on Page 32.

To return to the Main Menu, rotate the knob back to the `635 Firmware` screen and push.

Section IV

SITESTREAMER™ WEB INTERFACE

Connecting

Connect both the Site-Streamer™ and a computer to your local network. We'll assume DHCP operation for this exercise. Next go to

Menu Screen 6 and jot-down the IP address that your router/server has assigned. In this example the assigned DHCP IP address is 10.0.0.17. Then open a browser window on your computer and type the IP address into the address bar, which should bring-up the Now Playing screen:
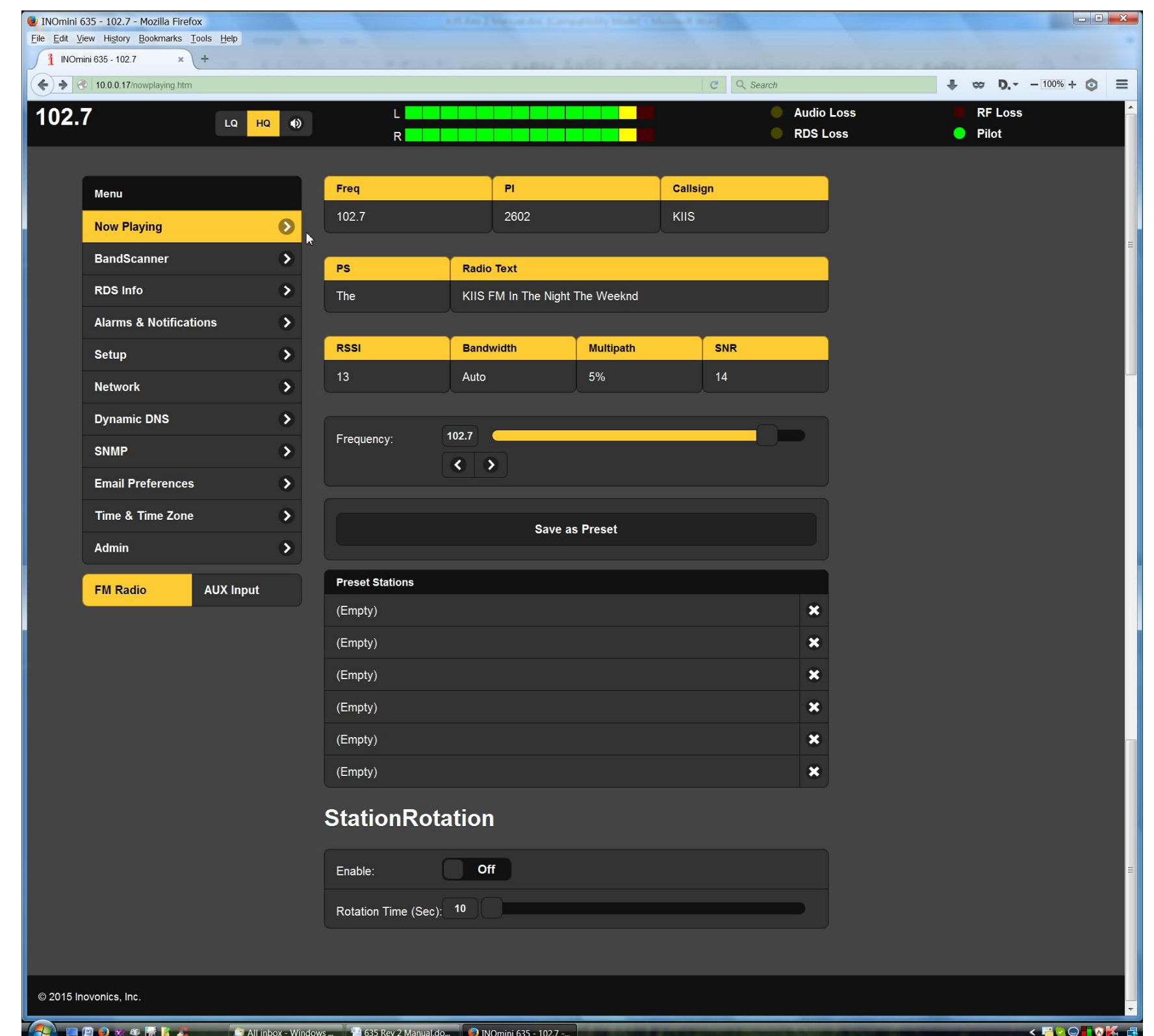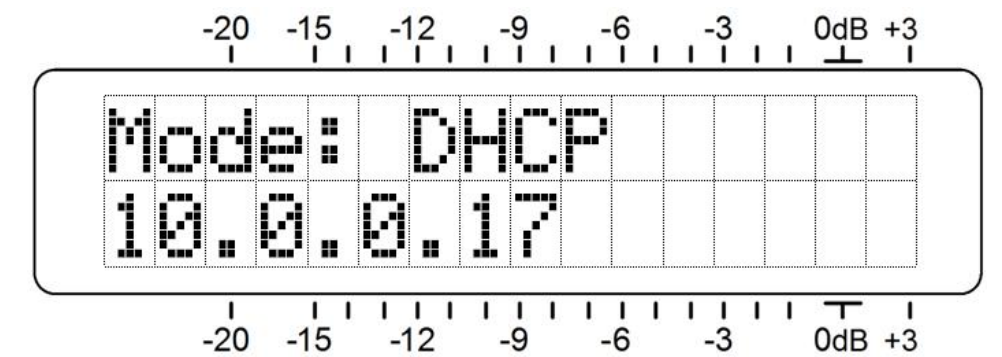
Remote Listening

Click the loudspeaker icon in the header to listen to the station from a remote location.

Two audio quality options are available. LQ has an MP3 data rate of 64kbps, and HQ is 128kbps. With marginal network connections LQ may prove the better choice.

The encodings/decoding and buffering time (latency) of the audio will depend to some degree on the connection path and network quality. Latency may be several seconds, even on a Local Area Network. This listening utility has been included more to confirm the presence of audio than to perform a critical assessment of off-air audio quality. Keep in mind that the audio will always lag the on-screen meter activity.

All SiteStreamer™ screens will be described individually as they are listed in the Menu on the left-hand side of the screen.

Now Playing

The header at the top of the page and the Menu list on the left are common to all SiteStreamer™ Web interface pages. The header displays the tuned frequency, the remote listening utility, audio levels and alarm status indicators.

The Now Playing Web screen presents the more basic RDS RadioData information.

Freq	PI	Callsign
102.7	2602	KIIS

PS	Radio Text
Lil' Jon	KIIS FM Yeah! Usher / Lil' Jon / Ludacris

RSSI	Bandwidth	Multipath	SNR
12	Auto	4	14

PI is a hexadecimal identifier specific to this station, the station's "digital address" as it were. The PI code is derived from the station's callsign in the US and Canada. These two are related only in those countries. Elsewhere Callsign will be blank.

PS, or Program Service Name, is an 8-character display of station call letters or 'street name,' such as Live 95. PS is what shows up on any RDS radio faceplate. The PS field is often made 'dynamic' to scroll song artist and title information in this field, although this practice is historically either 'forbidden' or discouraged.

Radio Text is a 64-character field displayed by some radios, but not by all. This field is generally used to convey program information, such as artist and title, but may also carry station information (Website, phone, etc.) or even advertising tie-ins.

Additional RDS data are displayed on the RDS Info Web screen discussed on Page 20.

RSSI is the same measure of signal strength shown on front-panel Menu Screen 2. The number is strictly relative, indicating the number of illuminated segments on the front panel bargraph display. Display range is zero to 30.

Bandwidth is the effective IF bandwidth of the receiver. In this example the default Auto selection is shown, but this can be edited manually (see Hidden Menu Items, Page 14), or with the Web interface Setup page as described on Page 25.

Multipath and SNR are the same measurements displayed on front-panel Menu Screen 3. The range of both these readouts is zero to 30, useful for relative comparisons as described on Page 11.

The receiver may be tuned from the remote location in four different ways. 1) grab the 'slider' with your mouse and drag it back and forth, 2) highlight the slider and then use computer → and ← cursor keys to change frequency, 3) click the on-screen > and < buttons to increment tuning up or down, or 4) clear and re-type a frequency directly into the display window and then hit Enter.

Station Presets

Once a station is tuned, it can be entered into memory. Just click: Save as Preset and a box will open where you can type-in the station call letters or any identifier of your choice with
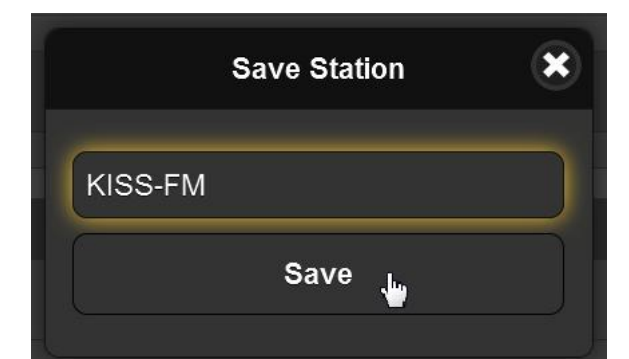
eight characters or less. What you entered will be committed to the first (Empty) memory slot as shown below.
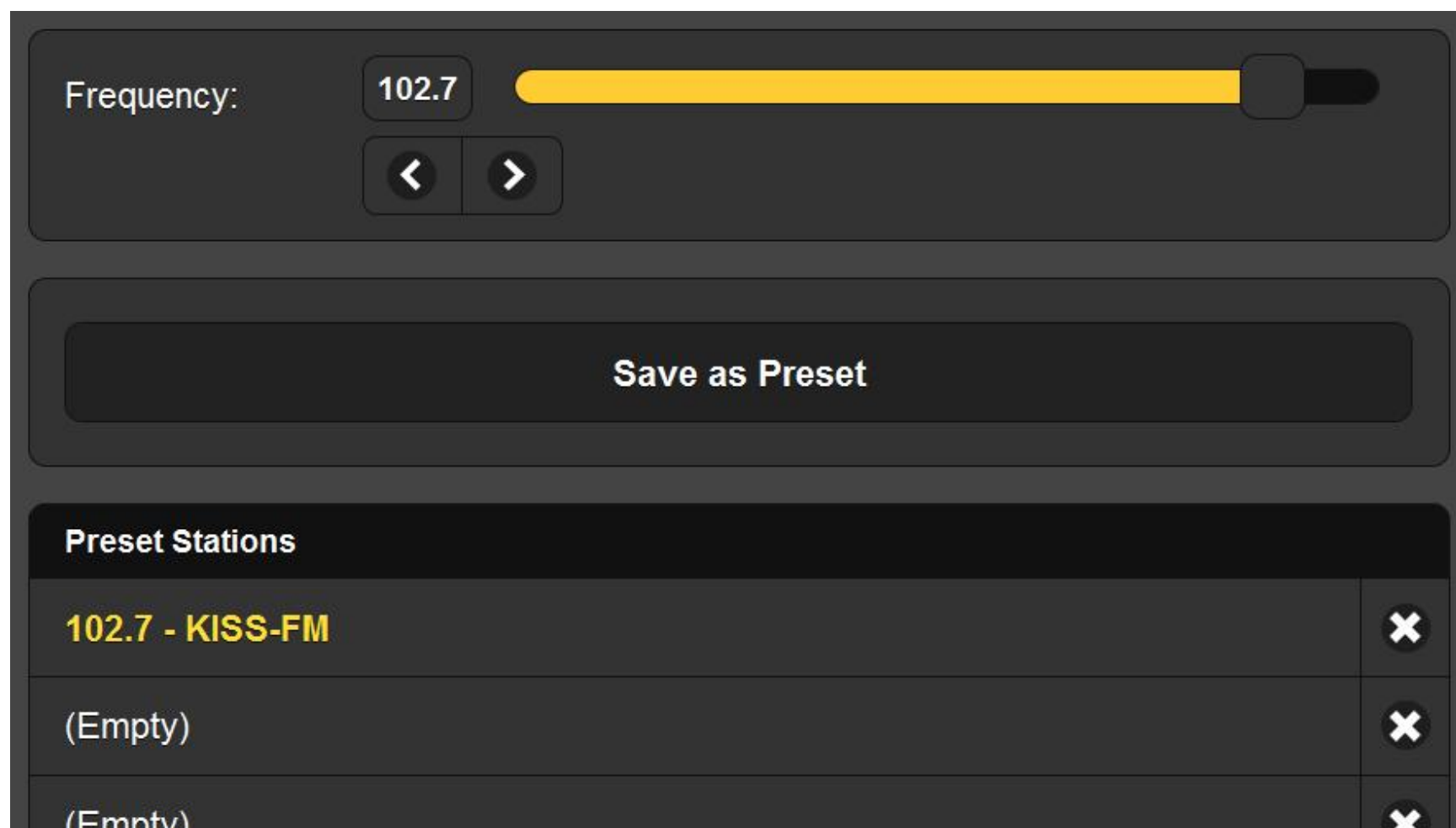
Clicking on any Preset Stations entry will immediately tune the SiteStreamer™ to that station, along with all reception options selected before the preset is saved. Click the **X** to the right of the entry to delete it.

StationRotation

The SiteStreamer™ is able to monitor all station presets by 'round robin' sequencing. When the StationRotation function is enabled, the unit will tune to the next station on the list, 'listen' to

that station for the interval programmed into the Rotation Time (sec): box, and then cycle to the next preset.
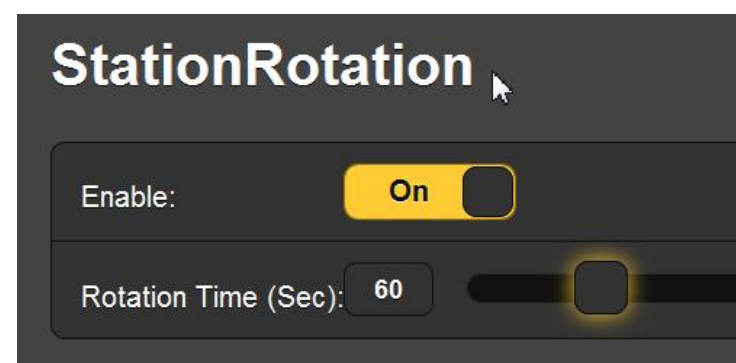
In addition to the frequency and ID, the station memories also retain the parameters for failure alarms. This means that the Audio Loss, Low Signal and RDS alarm settings are specific to the station being monitored at the time. It is therefore important to factor-in the Rotation Time (Sec): figure when setting alarm parameters. This is explained in additional detail on Page 23.

BandScanner™

The SiteStreamer™ incorporates a useful scanning utility that displays the RF spectrum of the FM broadcast band. An example plot is shown at the top of the next page.
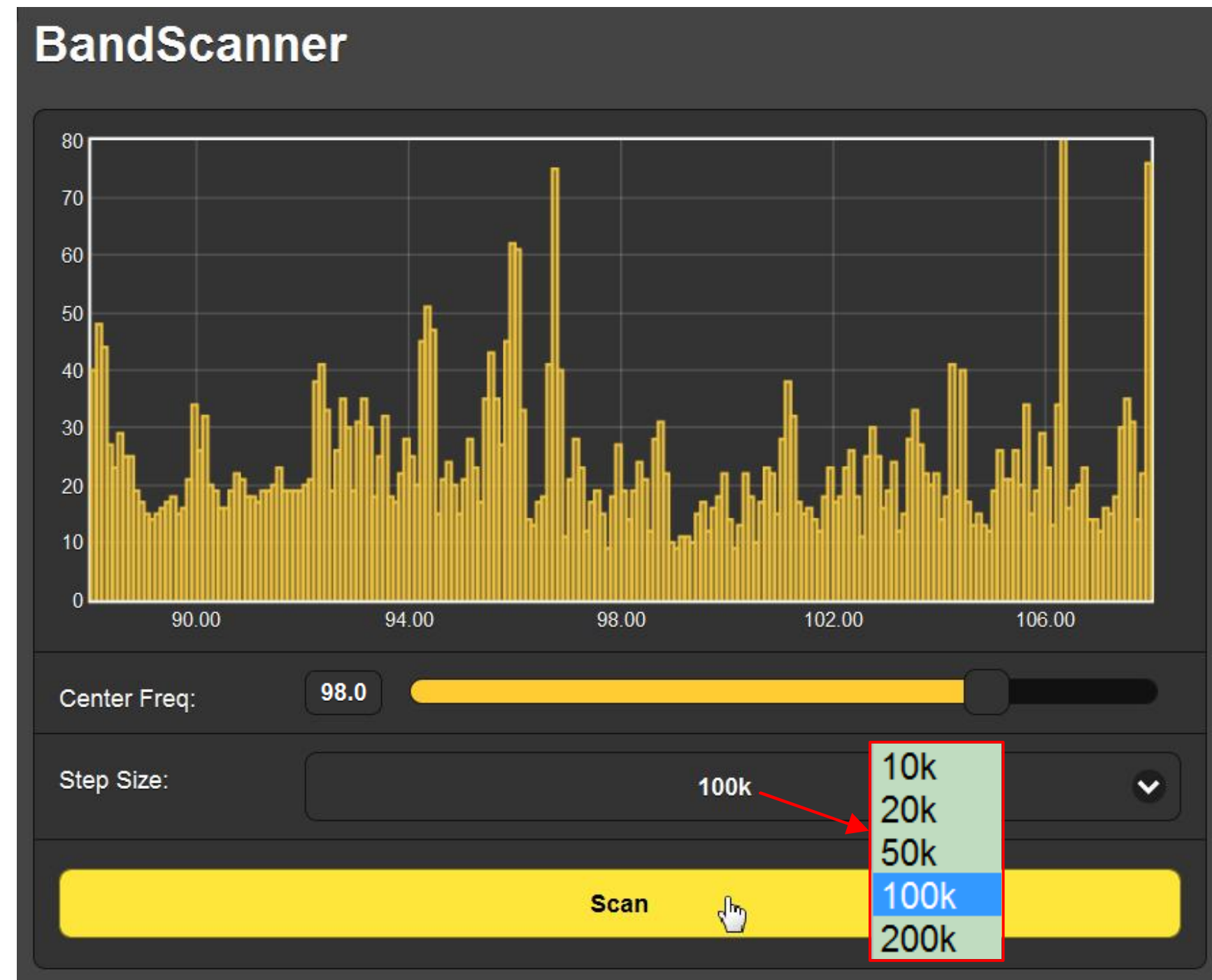
In this example, the Center Freq: was set to 98.0MHz and the scanning Step Size: to 100kHz. This gives a plot of the entire standard FM band. Any part of the band or an individual carrier may be zoomed-in-on by selecting other settings. Center Freq: can be entered directly or with the slider, and the checkmark to the right of Step Size: opens the pull-down menu shown in the inset.

Hovering the screen cursor over the scanned area will insert an information box showing the frequency and the incoming signal level at that specific cursor point.
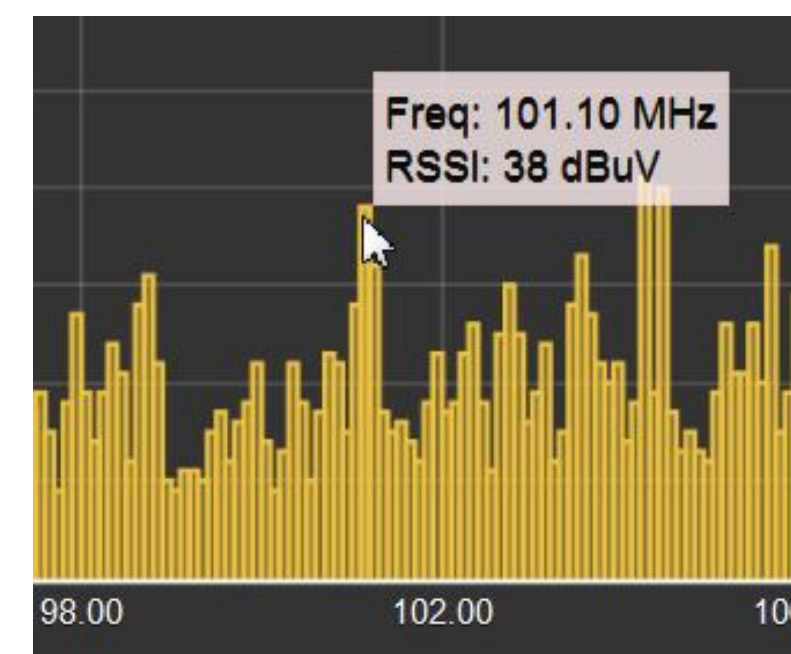
A band scan will interrupt the audio program while scanning, and alarms are inhibited for the duration of the scan.

RDS Info

The SiteStreamer™ gives a complete accounting of all the RDS data groups on this Web interface page.

The upper part of the RDS Info screen decodes and displays RDS information.

PS	PI Code	Callsign
Jones &	2B6B	KKJZ

Radio Text		
The Witching Hour BY Quincy Jones & His Orchestra KJazz 88.1		

Time	PTY	PTYN
	Serious Classics	

M/S	DI	TP	TA
Music	Stereo	On	Off

RT+1	RT+2
1 Title - The Witching Hour	4 Artist - Quincy Jones & His Orchestra

Here, the PS, PI Code and Callsign are repeated, as were shown and discussed on the Now Playing page. If the station transmits local clock time, this would show in the Time box. Many stations choose not to send time data rather than risk sending incorrect time or the wrong DST or UTC offsets, an easy mistake that tends to make listeners quite irate.

M/S, DI, TP and TA are RDS 'flags,' part of RDS housekeeping. RT+1 and RT+2 are special identifiers, used by the station in this example for 'song tagging.' For a comprehensive overview of the RadioData System, *Wikipedia* is a good source that covers most all RDS features, or you may refer to the appropriate RDS or RBDS Standard.

Statistical information on all RDS data groups being transmitted is tabulated at the bottom of the RDS Info Web interface screen. This is shown on the next page.

The SiteStreamer™ calculates the percentage of RDS resources devoted to each data group. Our example station is using RDS to good advantage, yet only a few of the data groups are actually needed.

0A	80.17%	0B	0%	8A	0%	8B	0%
1A	0%	1B	0%	9A	0%	9B	0%
2A	8.98%	2B	0%	10A	0%	10B	0%
3A	0.84%	3B	0%	11A	0%	11B	0%
4A	0%	4B	0%	12A	0%	12B	0%
5A	0%	5B	0%	13A	3.97%	13B	0%
6A	0%	6B	0%	14A	0%	14B	0%
7A	0%	7B	0%	15A	0%	15B	0%

Alternative Frequencies List	0

Open Data Applications	1
13A	4BD7

In this example the station has no rebroadcast 'translators,' so the Alternative Frequencies List is empty. The Open Data Applications usage is part of the 'song tagging' utility of the subject station.

Alarms and Notifications

This is an important aspect of the SiteStramer™ Web interface and requires thoughtful setup.

The time-stamp feature for email notifications and the Alarm Log depend on Internet time, plus the proper time offset and relationship to DST. Correct time setup should be confirmed before considering setup of this page complete. Internet time setup is explained on Page 30.

SiteStreamer™ alarm parameters are held independently for each station preset in station memory, but all these alarms have similar threshold and timing setup parameters.

Thresholds have two points to set. The first is the threshold *below* which an alarm will initiate, and then a second point that the measured value must re-attain to *reset* the alarm. This implies *hysteresis* in the alarm level settings, and prevents 'chattering' as a metered value varies about one set point or the other. Usually the two points will be set with a difference of only a few segments.

The other common alarm parameter is on and off timing. In other words, *how long* the metered value must remain below the low threshold point before an alarm occurs, and then *how long* it must return and remain above the higher, 'reset' threshold before the alarm resets. These settings will depend entirely on whether you want to be apprised of a short-term loss, or if the condition has to remain for a greater number of seconds before the alarm is triggered.

These alarm Time On/Time Off settings will have special significance when the StationRotation feature is enabled. Common sense says that if you have an alarm Time On of 60 seconds, but a Rotation Time of 30 seconds, an alarm will not be triggered. And the same goes for Time Off, of course.
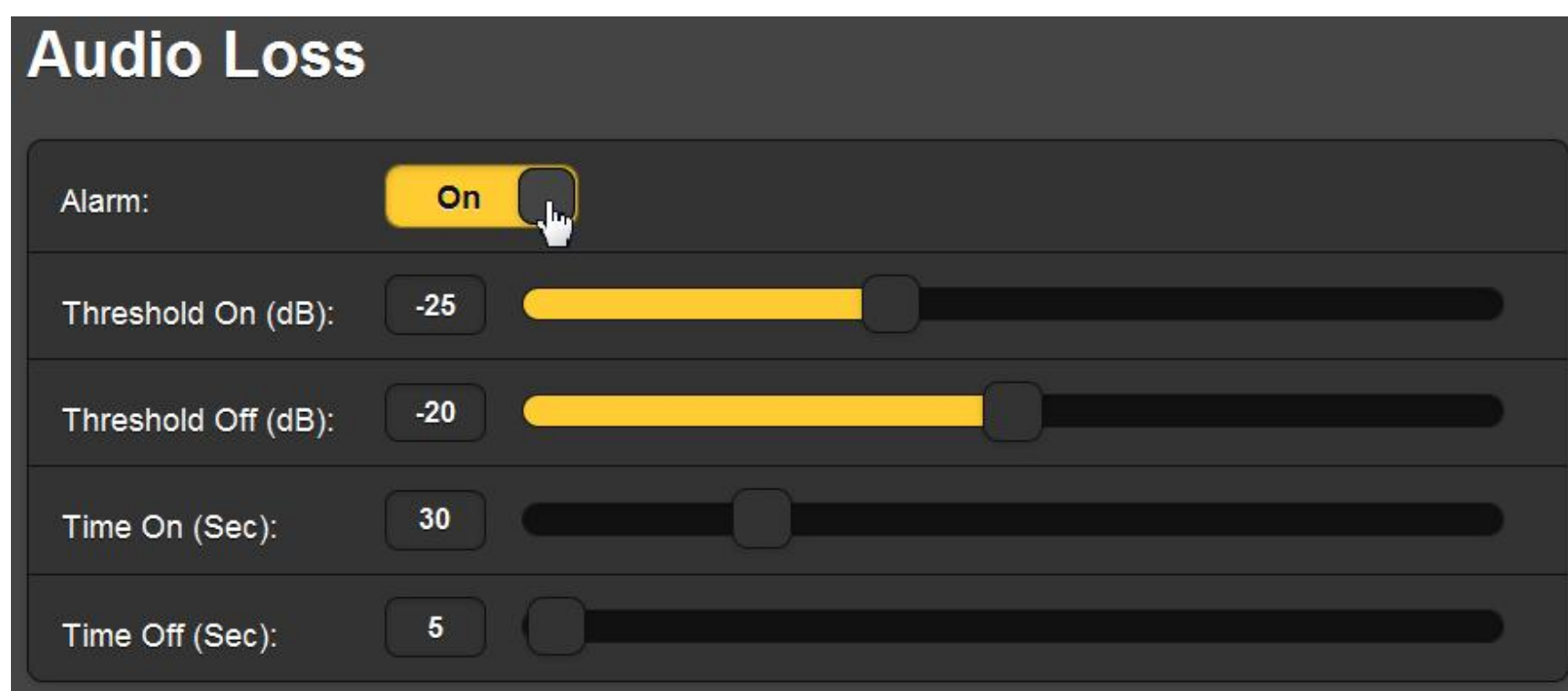
Level and timing alarm criteria apply to both the Audio Loss and Low Signal alarms. The Low Signal alarm duplicates front-panel setup on Menu Screen 2, but the Web interface adds a Mute: function that silences the monitored audio during a low signal alarm condition when Mute: is turned On. This means that a Low Signal alarm will automatically trigger an Audio Loss alarm when the station goes completely off the air. The typical loud hissing from an FM receiver in the absence of a carrier will be muted, enabling an Audio Loss alarm to respond. This means that unless Mute: is turned On, an Audio Loss alarm will be triggered only by 'dead air'; that is, an unmodulated carrier.

The RDS Alarm is triggered by either a missing RDS subcarrier (RDS Loss: On), and/or an incorrect PI code (PI Error: On). A PI error occurs when the station is 'hijacked,' or a translator receiver takes the notion to pull-in the wrong station. Enter the proper hexadecimal value in the PI Code: box

and click: Save to trigger and alarm when the received PI code does not match the entered value.

The Pilot Loss alarm simply responds to the 19kHz FM stereo pilot. Should the stereo-gen drop the pilot for some reason, this alarm will trigger. This is a go/no-go function. It includes on/off timing, but no level set points.

Email Notifications let you specify which staff member gets which alarm message, and whether the notification is an email or an SMS/text message. Before this can be set up, you must first enter the recipients on the Email Preferences Web interface page. This is detailed on Page 29.

Email Notifications setup is pretty-much self-explanatory. Once recipients are listed under Email Preferences, and the outgoing SMTP mail server has been set up (see Page 28), all you need do is select the email and/or text message recipient from the pull-down list, and then check the alarms for that person to receive. In this example, the station Chief Engineer has both an SMS/text and an email address on the list. In this example he'll receive text message notifications of Audio Loss, RF Loss and RDS Alarm conditions.
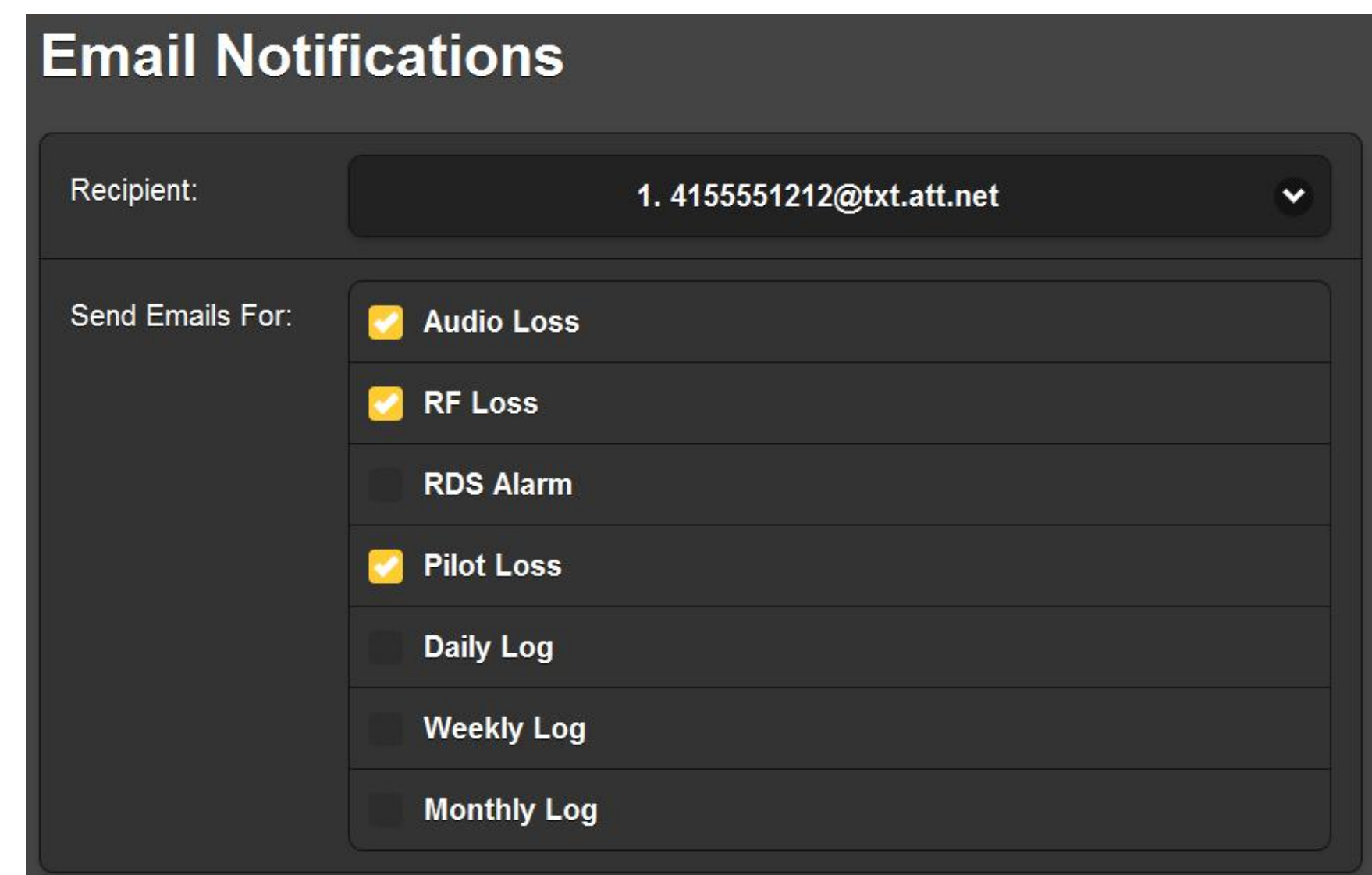
The Alarm Log

The SiteStreamer™ logs all alarms, including a date and time stamp. In addition to sending emails with a daily, weekly or monthy log as a small .csv file attachment, the

logging utility can also send an alert when it has reached a certain memory capacity. The log is capable of holding 2000 entries, so you'll probably want to go in and clear it periodically.

Open the log by clicking the **+** next to Alarm Log at the bottom of the screen. This will open the log to view the contents on the Web interface screen as shown here.

The current contents of the log may be downloaded by clicking: Download Alarm Log, which will prompt you to pick a location to place the .csv file. Click: Clear Alarm Log to purge all entries, but keep in mind that this will affect any daily, weekly or monthly logs being accumulated for automatic scheduled email dispatch.

Setup

The Setup Web interface page presents options, a few of which are not available from the SiteStreamer™ front panel. Setup selections include De-Emphasis: selection, either 75µs or 50µs; Bandwidth:, or the effective IF bandwidth of the SDR receiver; Stereo/Mono: with a selection of (normal) Stereo, 'forced' Mono operation, or a Blend option that blends stereo to mono as reception conditions deteriorate. Other selections include RDS (European) or RBDS (North American)

RadioData standards; Source:, monitor switching between FM Radio and the rear-panel analog AUX Input; plus AUX Gain: to scale the sensitivity of the external analog input for +4dBu or –10dBu program lines.

Network

This screen displays the current networking setup. Some entries are 'grayed-out' when the SiteStreamer™ is under automatic DHCP assignment. But when using a Static IP, this Web interface page is a user-friendlier means of entering the various network setup parameters.

Hostname: is the 'friendly' name of the SiteStreamer™ that shows up on the browser tab and in various networking locations. This can be changed, as indeed might be desirable if more than one unit is connected to the network, usually in conjunction with an alternate HTTP Port: assignment.

Dynamic DNS

It would be impossible to address equipment behind a dynamic IP address if it were not for IP-forwarding providers available on the Internet. Their services are either free or come at very modest cost, and allow the SiteStreamer™ to

keep the forwarding provider apprised of its reassigned IP address each time that address is updated by the ISP. The IP-forwarding provider intercepts data attempting to connect with the SiteStreamer™ using an old address, replacing that IP address with the ISP-updated one.

Three popular forwarding service providers may be found on the Internet. Their basic service (all you really need) may be free of charge, but advanced features may command a nominal annual fee. All services require registration on the appropriate Website.

The dynamic DNS function is shown Disabled. Click the arrow to bring up the list of popular providers.

Jot down these provider names and enter each in your Web browser to learn more about their services, and to register with whichever provider seems best to meet your needs.

The provider will issue a Hostname:, a Username: and a Password:. Highlight the provider's name, type this information into the boxes, and then click: Save. This will allow access to your SiteStreamer™ behind a dynamic IP address.

SNMP Operation

Click: SNMP to bring up the Webpage displayed here.

SNMP Settings

|	
Mode:	Disabled
Read Community:	public
Write Community:	private
General Port:	161
Traps Port:	162
Trap Destination 1:	0.0.0.0
Trap Destination 2:	0.0.0.0
Trap Destination 3:	0.0.0.0

Save

MIB File

Download MIB

SNMP, or Simple Network Management Protocol, allows other TCP/UDP/IP equipment on the same Local Area Network (LAN) to communicate directly with the SiteStreamer™, and for the SiteStreamer™, itself, to initiate an alarm on the network.

The SiteStreamer™ interfaces directly with a network controller, technically known as the SNMP 'Manager.' The SiteStreamer™ incorporates an embedded ASCII text file called a Management Information Base, or MIB. In setting up for SNMP operation, the MIB file is downloaded from the SiteStreamer™ and then uploaded to the SNMP Manager.

The default mode for SNMP is Disabled, which inhibits communication between the SiteStreamer™ and the SNMP Manager. Click the arrow on the right to view the operating choices as shown here.
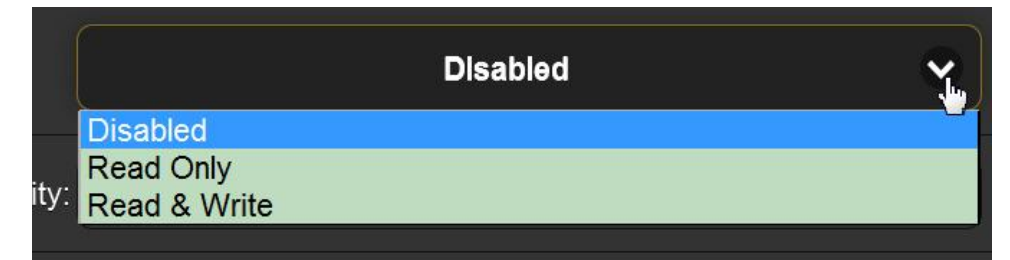
Changing Mode: to Read Only allows the SiteStreamer™ to be interrogated by the SNMP Manager so that SiteStreamer™ settings, metering, RDS data and alarms can be read and integrated with other equipment on the network.

Setting Mode: to Read & Write allows the SNMP Manager to send commands to the SiteStreamer™. Other equipment can then change the station and adjust other setup parameters.

SNMP 'Communities' serve as passwords for this function. Go into the Read Community: and Write Community: boxes to enter text that is specified for the read/write strings on the SNMP Manager monitoring device. As with similar text-entry screens, execute a Save after entering.

When the SiteStreamer™ initiates an alarm, rather than being polled or interrogated for one, that alarm is known as a 'trap.' You may enter three local network IP addresses as Trap Destinations, each corresponding to other devices on the LAN that want to be apprised of alarms.

The default SNMP Ports, General Port 161 and Trap Port 162, are customary assignments for the majority of SNMP operations. These may be changed as required by typing-in new values.
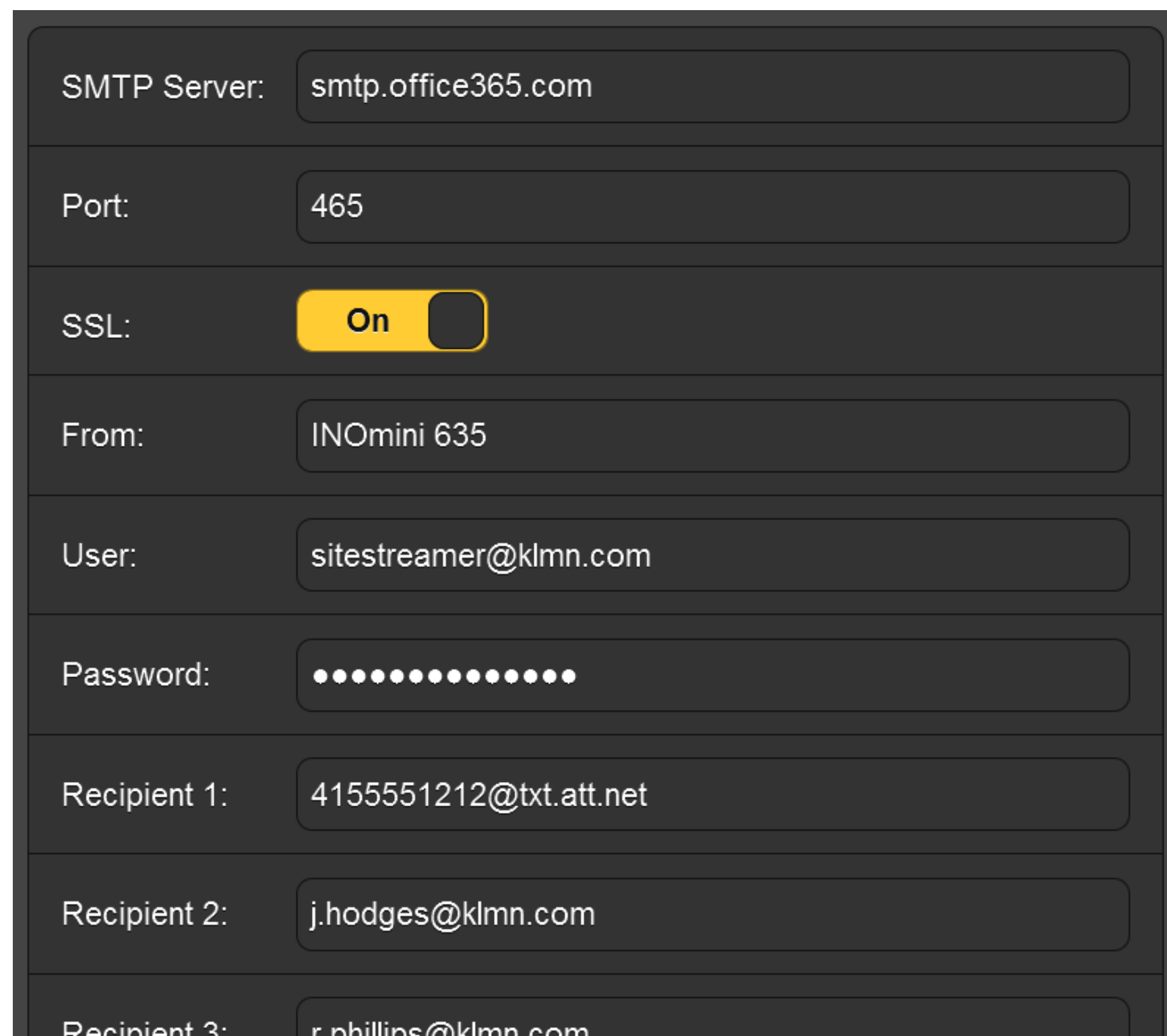
The MIB File

The MIB file is a small text (.txt) file that is read by the network controller, or SNMP Manager. To download and read this file yourself, click: Download MIB. The file may be saved in the usual Windows manner. The MIB file is in plain text and may be read with Windows Notepad.

Email Preferences

Enter the email server settings and email addresses for the various recipients of email or SMS text messages here on the Email Preferences menu page. These entries determine 'who gets it and how.' However, the alarm preferences for email notifications, or 'who gets what,' that is, which alarm messages, are set on the Alarms and Notifications menu page. This is described with the alarms discussion on Page 22.

The example below shows typical setup for an SMTP mail server. Mail server settings vary, but essentially you create a separate email account for your SiteStreamer™. The User: name can be anything you like, and will actually be the formal name of the sender, sitestreamer@klmn.com in this case. But with most email clients, messages are received with the sender identified by a 'friendly' name: INOmini 635 in the example here.

SMTP Server:	smtp.office365.com
Port:	465
SSL:	On
From:	INOmini 635
User:	sitestreamer@klmn.com
Password:	••••••••••••••
Recipient 1:	4155551212@txt.att.net
Recipient 2:	j.hodges@klmn.com
Recipient 3:	r.phillips@klmn.com

Recipient 1: and Recipient 2: in this example are the SMS/text message and email addresses, respectively, for the station's Chief Engineer. Other recipients might include the Program

Director, General Manager or a backup contract engineer. Each can be programmed to receive specific alarms, as described on Page 24.

When this utility has been set up, click: Save at the bottom of the page to commit this information to memory. You may also click: Send test Email to dispatch a confirming test message immediately to all recipients.

Timekeeping

Open the Time & Time Zone Web interface screen to set up the internal timekeeping functions. Correct timekeeping is essential for time-stamping alarm notifications and for meaningful Alarm Log listings.

Select your offset from Universal Coordinated Time using the Time Zone (Hours): slider. When this is set correctly, local time will show at the top of the window. You may make allowance for Daylight Saving Time here too. Choose either Auto DST for automatic updates, DST to force fulltime 'daylight saving,' or disregard DST altogether by leaving both boxes unchecked.

Time Server defaults to the US Government Web-based time authority, but you may enter an alternative Server: if desired. Be sure to click: Save at the bottom of the window to commit all your timekeeping choices to memory.
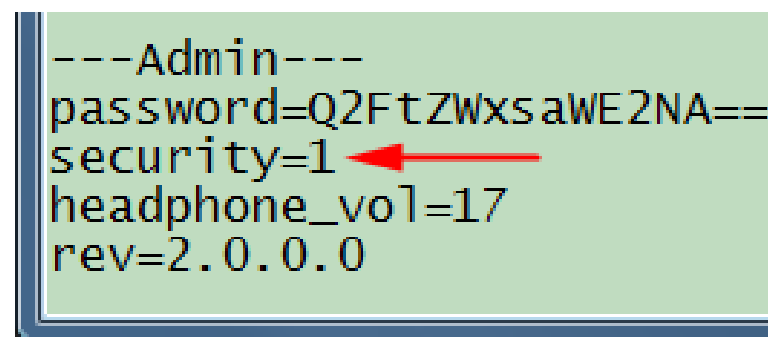
SiteStreamer™ Password

Set up a SiteStreamer™ password under Security at the top of the Admin screen. Simply type the password into the Password: field, click: Save, and then click: Enable. You'll be immediately prompted with a pop-up window asking for a User Name: and Password:. User Name: is optional and may be left blank; it is not used with any other SiteStreamer™ function at this time. Just enter your new password in the Password: field. This pop-up will greet you each time you launch the SiteStreamer™ Web interface pages but does not lock-out the front panel. Again User Name: is optional.

If you lose or forget your password, you must perform an on-site 'hard reset' (see below). This will purge all setup and other information from memory. To avoid the inconvenience of starting from scratch, we recommend periodically downloading and saving a Hardware Profile, which retains all the setup data and can be uploaded back to the unit. This procedure is described on the following page.

Of course the old, lost password is encrypted and part of the Hardware Profile, so you must edit this file before uploading it to the SiteStreamer™; otherwise you'll be back to where you started.

The snapshot at the right shows the very bottom of the Hardware Profile where the administrative data is held. The numeral '1' marked with the arrow signifies that the password is enabled. Use MS Notepad or a similar text editor to change the one to a zero. This turns password protection off. Re-save the edited file and perform a hard reset of the SiteStreamer™. Then upload the edited Hardware Profile. This will restore your previous settings, and even let you see the old password!

```
---Admin---
password=Q2FtZWxsaWE2NA==
security=1 ←
headphone_vol=17
rev=2.0.0.0
```

Hard Reset

A hard reset will purge all setup information from memory. Please see the Hardware Profile discussion that follows to save settings and restore them to the SiteStreamer™.

To perform a hard reset, hold down the MENU knob while power-cycling the unit. This restores the SiteStreamer™ to 'factory-fresh' condition, meaning that you will *lose all setup information.*

The Hardware Profile

The entire SiteStreamer™ setup, which includes receiver setup choices, alarm parameters, alarm notification preferences and SNMP options, may be saved to your computer as a small text file.

The Hardware Profile is useful for restoring a previous setup or for 'cloning' a second unit for backup service. Click: Download Hardware Profile to save the profile to your system. Depending on your browser and version, the file will normally be saved to a Downloads folder unless you are asked for a specific 'save to' location. The file has a default name of 635settings.ini.

To upload a saved Hardware Profile to your SiteStreamer™, first click: Choose File: / Browse… to locate the saved profile on your computer. Then click: Upload Hardware Profile to replace all setup parameters that are currently loaded and running in your unit.

Section V

UPDATING THE SITESTREAMER™

The Firmware Updater

The SiteStreamer™ is host to two operating files that may be easily updated by the user in the field. These files are the primary firmware, which controls the functions, memories and Web interface of the unit, and the individual Web pages that comprise the Web interface screens.

The SiteStreamer™ includes a 'bootloader' utility that allows firmware to be updated whenever Inovonics issues changes for added features and performance, or otherwise to expand the usefulness of the product. Inovonics supplies firmware updates free of any additional charges.

A bootloader is a simple software routine that runs on any PC connected to the same network as the SiteStreamer™. Refer to Page 16 for specifics on assuring a connection between the SiteStreamer™ and your computer. This *must* be a wired, LAN connection for both the PC and for the SiteStreamer™. Attempting to use a Wi-Fi link will almost guarantee failure.

Warning

A firmware update will restore the SiteStreamer™ to factory defaults. *All settings and presets will be overwritten!* Always save a Hardware Profile (Page 31) before proceeding with an update. This will retain all user setup parameters, which may then be restored after the update.

Update Files

A firmware update will be supplied as a 'zipped' folder containing a number of files. Make a temporary New Folder on your PC Desktop and unzip these files to it as shown at the top of the next page.
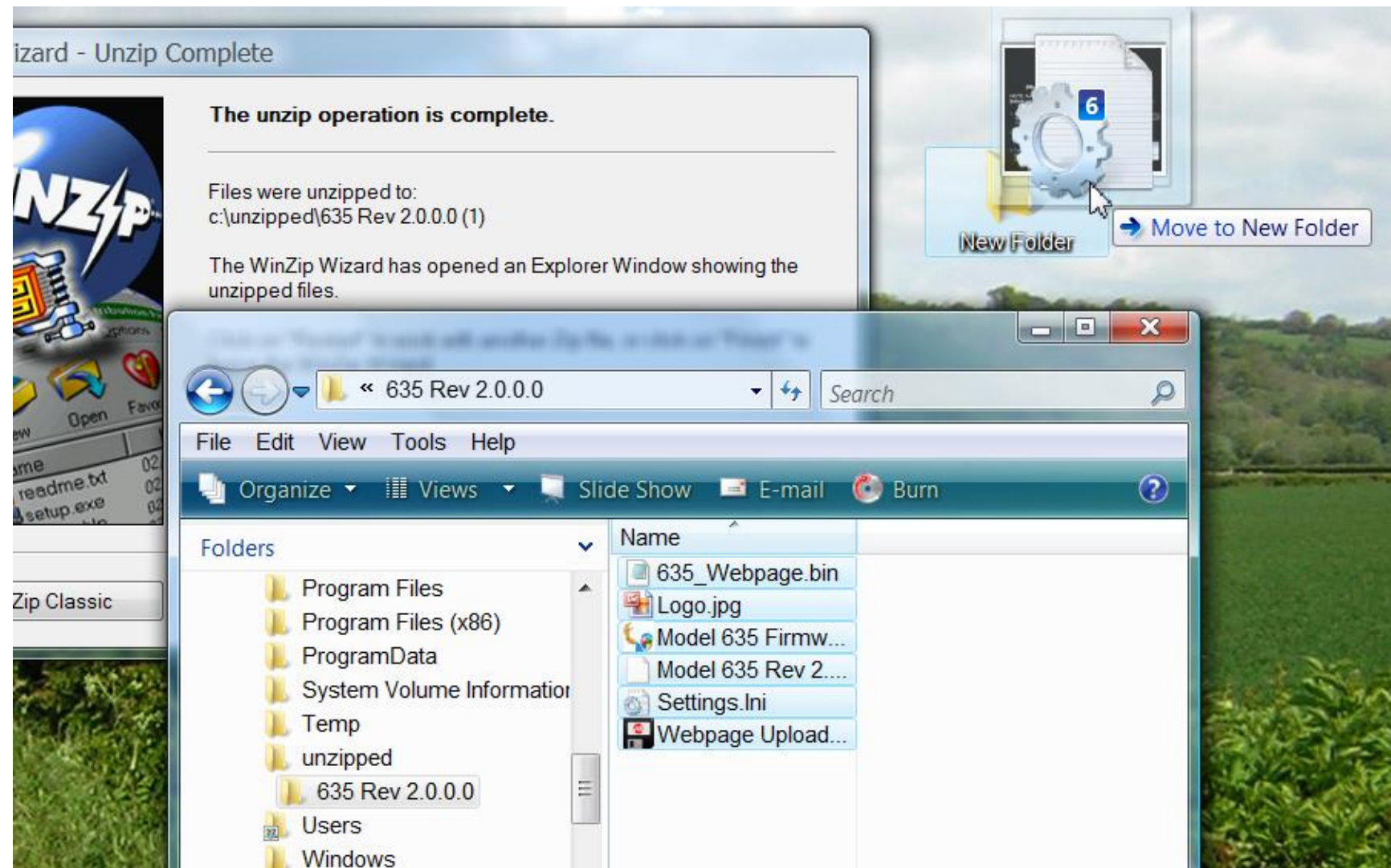
One of the supplied files is the third-party bootloader utility, an 'executable' (.exe) file. Because executables are notorious for propagating viruses, many antivirus programs will not allow .exe files to be downloaded and will urge you not to install them. But we insist that you trust us and throw caution to the wind.

Firmware Update

Navigate to your temporary Desktop folder (New Folder) and double-click the Firmware Update.exe file. This is the file marked with the arrow in the upper snapshot here. This will bring up the Information message in the second snapshot, advising that the Firmware Updater does not yet find the SiteStreamer™. Click: OK to start the firmware updating utility anyway and to display its main screen, shown at the top of the next page.
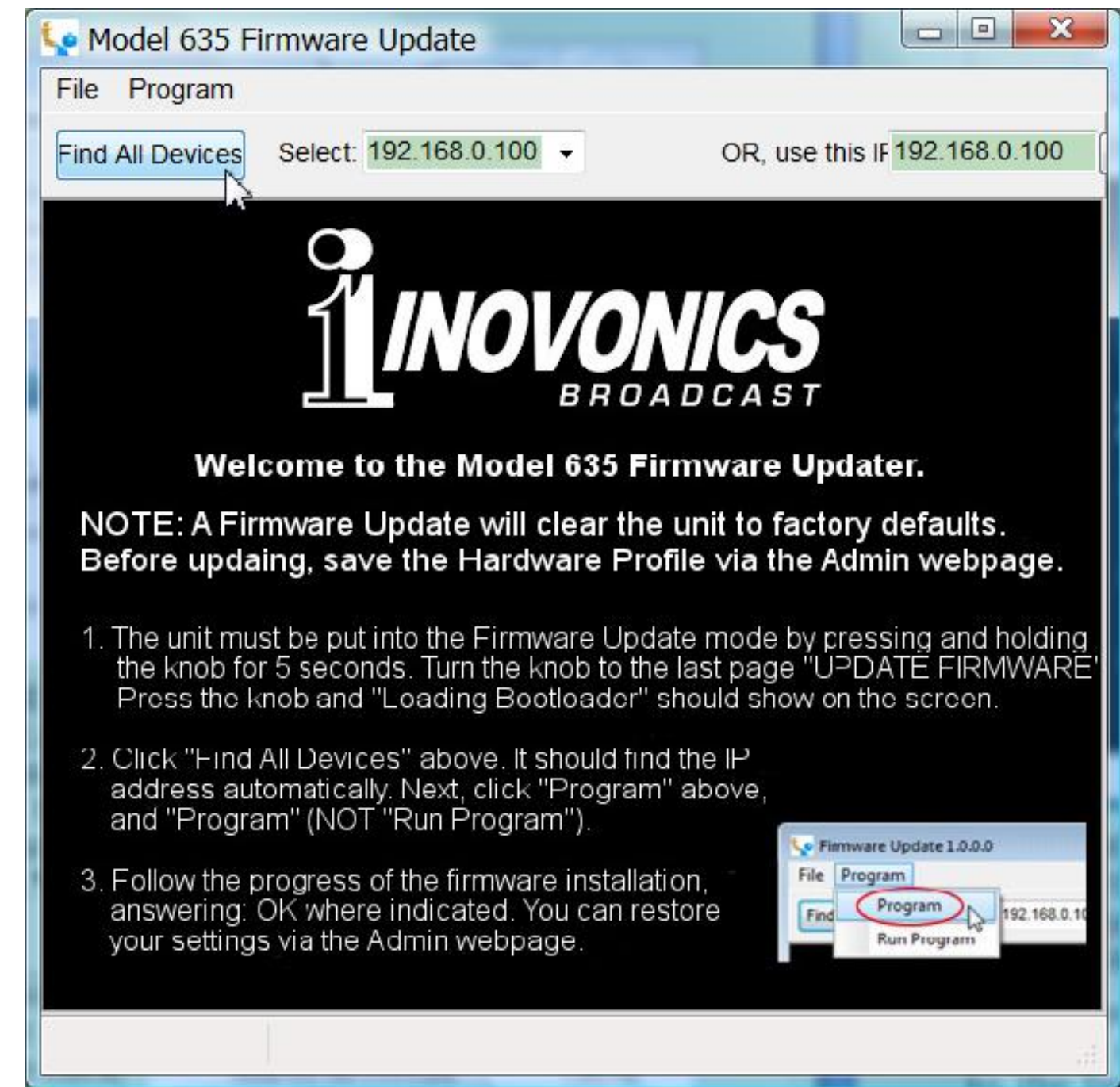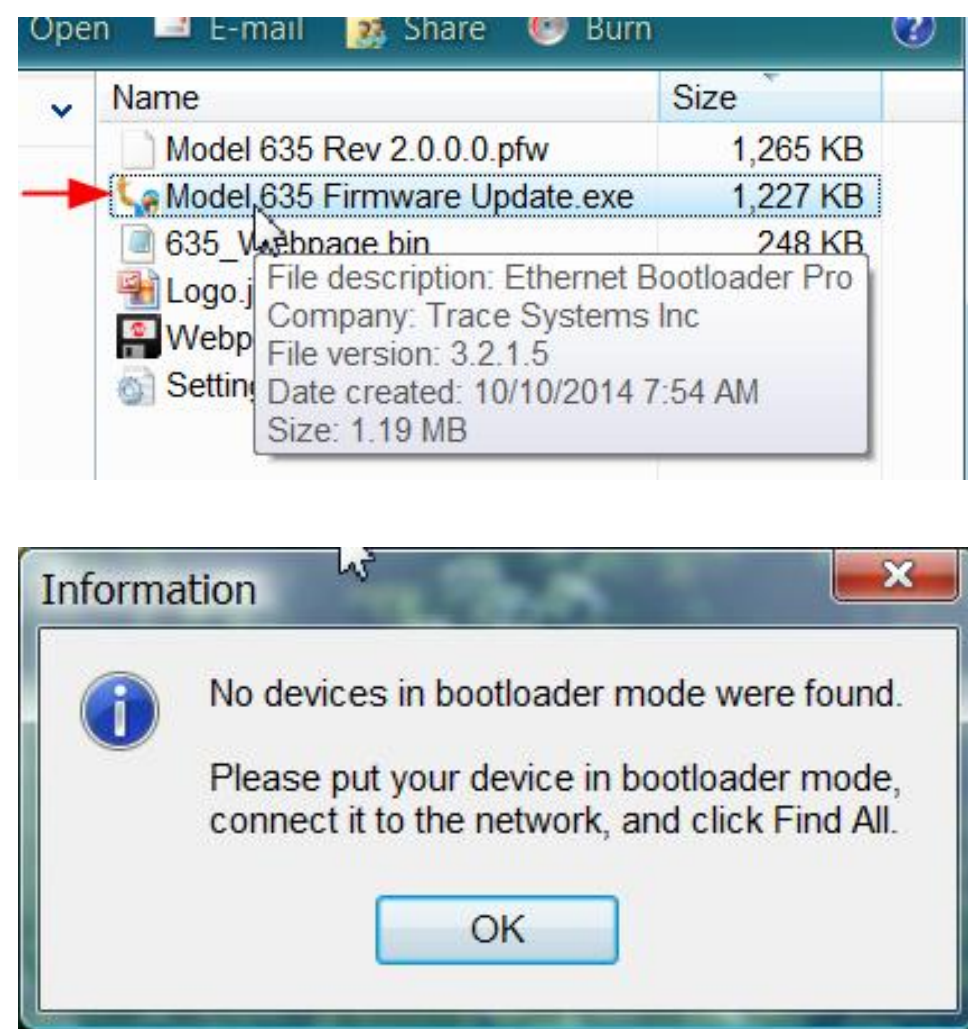
The bootloader window outlines the firmware update process in three easy steps. The first step advises that the SitesStreamer™ must, itself, be in the bootloader mode.

Hold down the front-panel Menu knob until 635 Firmware pops-up on the front-panel LCD. Next, turn the Menu knob to the last LCD menu screen: Update Firmware. Push the knob and select YES, and then push the knob again. This will bring up Loading Bootloader on the LCD.

Click: Find All Devices at the top of the Firmware Update window. Look for the SiteStreamer™ IP address to populate the Select: area, and a Confirm box to pop-up on the screen as well.

The Confirm box is a 'watchdog' feature included in the third-party bootloader utility, but it is not pertinent to the SiteStreamer™ update procedure. Click: No in the Confirm box to close it, and then click: Program at the top

of the window, and finally click: Program, the first item in the drop-down list. The update utility will run and then return the SiteStreamer™ to normal operation with factory-default values. You may then upload a Hardware Profile to reclaim all user setup parameters (Page 30).
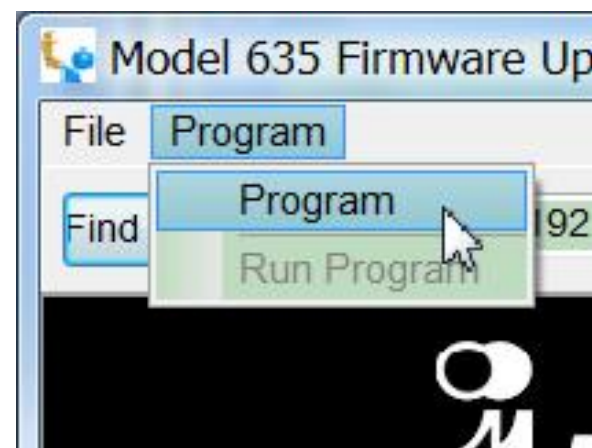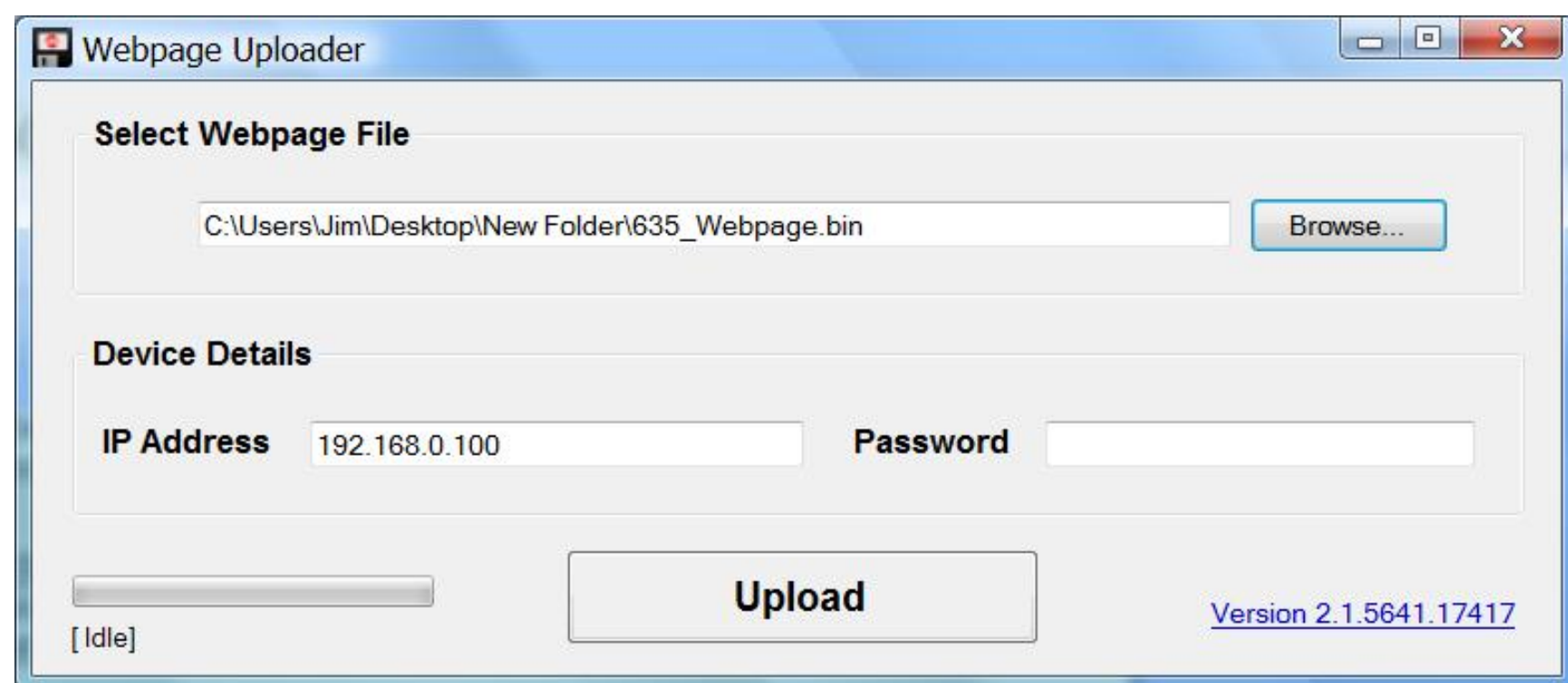
Updating Web Interface Pages

If a new version of firmware calls for a Web interface page update, there will be an extra Webpage Uploader.exe file in the Firmware Update folder (New Folder). The snapshot at the right shows this file identified with an arrow.
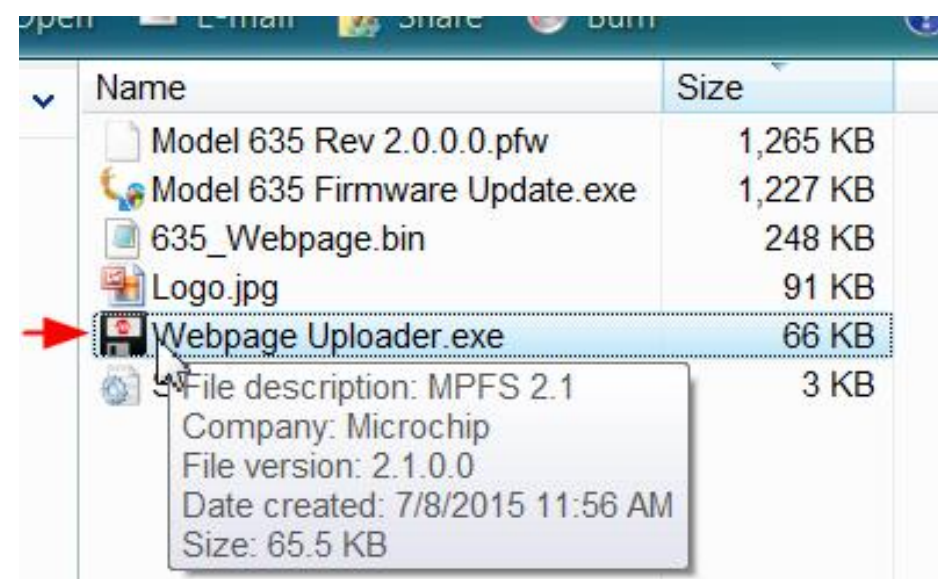
Immediately after the firmware update has been bootloaded, while the SiteStreamer™ is still in communication with your computer, return to the New Folder on you Desktop and double-click the Webpage Uploader.exe file.

The utility should find the proper Webpage .bin file in the New Folder on your Desktop. Enter the specific IP address of *your* SiteStreamer™ in the IP Address box, leave the Password box blank, and then click: Upload. The existing Web interface pages will summarily be replaced with the new ones.

Section VI

TECHNICAL MATTERS

Firmware Version

With the SiteStreamer™ powered-up, hold the knob down for 5 seconds or so. The menu screen you have been viewing will be replaced by the 635 Firmware screen. This shows the firmware version installed in your unit, information that may prove important when communicating with the factory. Push the knob again to return to the normal menu sequence.

'Under the Hood'

The SiteStreamer™ is compact and sophisticated, utilizing mostly surface-mounted (SMD) components. Many of these are application-specific and/or pre-programmed at the factory, but all of them are impossibly tiny. This makes servicing the unit in the field a difficult proposition at best. For these reasons, and also because of the small format of this manual, we have dispensed with schematic diagrams, servicing instructions and a listing of component parts.

Having said that, our policy has always been one of 'full disclosure.' We feel that, unless we are doing something nefarious (or are acting in the interest of national security!), there should never be a reason to hide information from the user. With a clear conscience, and upon request, we will cheerfully provide additional documentation and divulge all but the very darkest secrets concerning any Inovonics product.

Because it is so small and lightweight, returning the SiteStreamer™ for factory servicing, firmware upgrades, etc. is an option that we encourage. Inovonics has never considered factory repair charges a significant source of revenue, and we are confident that you will be astonished at how reasonable our rates actually are!

ï INOVONICS WARRANTY

I **TERMS OF SALE:** Inovonics products are sold with an understanding of "full satisfaction"; that is, full credit or refund will be issued for products sold as new if returned to the point of purchase within 30 days following their receipt, provided that they are returned complete, and in "as received" condition.

II **CONDITIONS OF WARRANTY:** The following terms apply unless amended *in writing* by Inovonics, Inc.

  A. The Warranty Registration Card supplied with the product *must* be completed and returned to Inovonics, or the Warranty registered online at www.inovonicsbroadcast.com, within 10 days of delivery.

  B. The Warranty applies only to products sold "as new." It is extended only to the original end-user and may not be transferred or assigned without prior written approval by Inovonics.

  C. The Warranty does not apply to damage caused by misuse, abuse, accident or neglect. This Warranty is voided by unauthorized attempts at repair or modification, or if the serial identification tag has been removed or altered.

III **TERMS OF WARRANTY:** Inovonics, Inc. products are warranted to be free from defects in materials and workmanship.

  A. Any discrepancies noted within THREE YEARS of the date of delivery will be repaired free of charge, or the equipment will be replaced with a new or remanufactured product at Inovonics' option.

  B. Parts and labor for factory repair required after the three-year Warranty period will be billed at prevailing prices and rates.

IV **RETURN OF GOODS FOR FACTORY REPAIR:**

  A. Equipment will not be accepted for Warranty or other repair without a Return Authorization (RA) number issued by Inovonics prior to its return. An RA number may be obtained by calling the factory. The number should be prominently marked on the outside of the shipping carton.

  B. Equipment must be shipped prepaid to Inovonics. Shipping charges will be reimbursed for valid Warranty claims. Damage sustained as a result of improper packing for return to the factory is not covered under terms of the Warranty and may occasion additional charges.

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