

INO^{mini}648

HD Radio® SiteStreamer™ II

Installation & User Guide



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Section I

INTRODUCTION

Product Description

The Inovonics family of SiteStreamers™ receive local broadcast stations off-air and stream program audio, program metadata and signal metrics over the Internet to any location worldwide. This allows station personnel to monitor programming and transmission issues when traveling or otherwise away from the station.

The INOmini 648 is Inovonics' second-generation FM/HD Radio SiteStreamer™. Its browser interface permits total remote operation and audio monitoring, and displays signal parameters, audio levels and RDS and HD Radio metadata. Failure alarms are logged and can be dispatched instantly as an email notification.

Product Features

Features of the SiteStreamer™ include:

- Tunes all current FM frequencies and stays on-channel and on-mode through signal and power loss; FM/HD1 auto-blend operation may be selected if desired.
- Easy setup and operation, remote control of all operational features, full SNMP support and simple remote firmware updating when issued.
- HE-AACv2 audio streaming via the dynamic Web interface for up to 10 simultaneous listeners; independent UDP streaming for 'skimmers' or audio loggers.
- RF signal, program audio and RDS/HD Radio alarms with logging, plus instant alarm email messaging to alert separately-designated personnel immediately.
- Decodes all RDS groups and most HD Radio metadata; shows RDS block error rate and RDS group statistics.
- AES3 AUX input to allow monitoring of the audio program source remotely, permits A/B audio monitoring of source and air signal.
- Accurate front-panel and remote Web-interface program audio level metering; front-panel headphone jack.

Product Specifications

Tuning Range: 87.5MHz-107.9MHz in 100kHz steps.

Antenna Input: 75-ohm (F).

Receiver Sensitivity: $\leq 10\mu\text{V}$ for 50dB monaural analog FM SNR.

Off-Air Audio Response:

FM: $\pm 1\text{dB}$, 30Hz-15kHz; 75 μs or 50 μs de-emphasis.

HD Radio: $\pm 0.25\text{dB}$, 20Hz-20kHz.

Reception Modes:

FM: Stereo/Auto-Blend/Forced-Mono.

HD Radio: HD1 through HD8; 'Split Mode' delivers L+R FM audio to the left audio channel, and L+R HD1 audio to the right channel.

RDS Fields Displayed:

PS, PI (and Call), RT, RT+1, RT+2, PTY, PTYN, CT, M/S, DI, TP, TA; RDS Block Error Rate, Groups Transmitted (with use statistics, AF, ODA.

HD Radio PAD Data Displayed:

SIS: Short Name, Universal Name, Station ID, Slogan, Message, Station Location.

Misc: Service Mode, Codec Mode, TX Gain, TX Blend Control.

PSD (HD1-HD8, each): Slogan, PTY, Artist, Title, Album and Genre.

Streaming Audio: Web-browser 'remote listening' stream features HE-AACv2 encoding at a sample rate of 44.1kHz or 48Hz and bit rates from 18kbps to 64kbps. The stream can accommodate up to 10 simultaneous listeners. HTTP/Icecast and raw UDP streams available simultaneously.

Program Line Input: Transformer-balanced (XLR) AES3 digital stereo AUX input. AUX stream metrics concurrent with off-air audio stream; selectable audio monitoring.

Headphone Jack: Front-panel 3.5mm (TRS) with menu-enabled volume control.

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

Alarms:

Global: Aux Audio Loss

Per-Preset: Radio Audio Loss, Low Signal, Pilot Loss, RDS Loss, RDS PI Error, RDS RadioText Not Updated, HD Loss, HD Program Loss, HD PSD Not Updated, HD Emergency Alerts. Alarms are logged and may be used to trigger instant email notifications.

Real-Time Clock: Auto-sets to Internet time; auto/manual DST setting; battery backup.

Power Requirement: 12VDC at 350mA (2.1mm x 5.5mm coaxial connector); a universal inline switchmode power supply is provided.

Mounting Options: An optional rack adapter accepts up to three INomini modules in a 1U, 19-inch rack space and is supplied with blanking panels and 'daisy chain' power cabling. The 648 may also be fastened to any convenient surface with two small screws.

Operating Environment: 32°F/0°C-122°F/50°C; 0%-95% non-condensing relative humidity; 10,000ft/3048m.

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

Conformances:



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:

<https://www.inovonicsbroadcast.com/support/productregistration>

Mounting

The 648 SiteStreamer is packaged in a compact ‘clamshell’ chassis that defines the standardized module in the INOmini series of products. The 648 may simply be set on top of an existing piece of 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 allow the 648 to be fastened to generic equipment rack shelves with two #4 screws.

An optional INOmini 1U rack-mount kit is available from Inovonics. The rack kit can hold up to three INOmini modules and is supplied with blanking panels for unused spaces, plus two ‘daisy-chain’ power cables so that two or three INOmini modules can share a single power supply, current capacity permitting.

AC Mains Power

All Inovonics INOmini modules are supplied with an out-board, inline switching-type power supply compatible with any destination mains voltage. The actual power consumed by the 648 SiteStreamer is 350mA at 12 volts DC. A second 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 SiteStreamer products will often be co-located with broadcast transmitters and other equipment, please do practice reasonable care in locating the unit away from *abnormally* high RF fields.

The Front-Panel Display and Menu Knob

The front-panel MENU knob scrolls the LCD through the various viewing and programming options. Section III of this manual explains the easy setup and various operating options of the 648.

Headphone Jack

The front-panel headphone 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 bring up the **HeadPhone Vol** screen. The front-panel knob adjusts the listening level, and when the volume has been set at a comfortable point, push the knob to return to the previous menu.

Rear Panel Connections

ANTENNA	The 648 ANTENNA input is a US-standard 75-ohm F connector. Adapters to other RF connector formats are readily available, as are premade cables of various lengths.
---------	--

AES3 DIGITAL LINE INPUT	This 'AUX' AES3 DIGITAL LINE INPUT XLR female connector accepts AES3 digital stereo program audio for remote monitoring. The level may be adjusted from the front panel or remotely.
LAN PORT	This RJ45 jack accepts traditional TCP/IP and UDP connections to a router or server, and from there to the Internet.
+12VDC POWER I/O	Two paralleled 'coaxial' power connectors allow 'daisy-chaining' INOmini modules. Two short 'pigtail' power patch cables are provided with the Inovonics INOmini rack adapter. The 648 draws 350mA. Check the label on the power supply to make sure that it is rated to accommodate all modules it must support. These power connectors do not lock, and the mating plugs do pull out rather easily. A Ty-Wrap® will secure the cables to the plastic anchor above the power jacks if this proves a problem.

Section III

SITESTREAMER™ II SETUP

Initial setup of the 648 SiteStreamer is most conveniently performed using a computer, once communications is established. A few basic setup functions are also available using the front-panel knob, and you may have to use this method to establish initial communications.

Front-panel LCD menu screens will be described in order, beginning with the 'home' screen at full counterclockwise rotation of the knob. Menus that can be edited will be identified as editable in the discussion subhead.

Flashing Alarms

The 648 has alarms that indicate and log transmission fault conditions. Alarms are displayed locally by the front panel LCD, which flashes red and spells-out the fault, multiple alarms displaying sequentially. Pushing or turning the knob gives you a 10-second respite from the flashing so that you can navigate among menus for front-panel setup options.

Menu Navigation Basics

The menu tree is really quite intuitive. Simply: 1) *turn* the knob to navigate from one menu to the next, 2) *push* the knob to enter any menu that allows editing from the front panel, 3) *turn* the knob to choose an option or to set a value, and then 4) *push* again to accept the selection and return to menu navigation.

The callouts for menu items that can be edited will blink at a rapid rate when you push the knob. Don't confuse *blinking* callouts with a *flashing*-red-screen alarm mentioned above.

Each 648 SiteStreamer menu screen will be discussed separately and in order, except that the last menu is discussed first, as it could conceivably be a show-stopper!

Locked Menus (Menu Screen 13 - editable)

To guard against inadvertent menu editing or casual tampering, the very last menu in the sequence allows the user to lock the knob out of the editing mode. If you find that when you push the knob you are unable to enter an editable menu, scroll all the way to this very last menu screen. Push the knob and 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 whatever screen you had been trying to edit. You may go back and relock the menus when you're finished.



Menus:Locked

Tuning the Radio & Reception Modes (Menu Screen 1 - editable)

When power is applied to the 648, a product-identifying 'splash screen' pops-up on the LCD. Within a few seconds this will revert to Menu Screen 1 shown here.



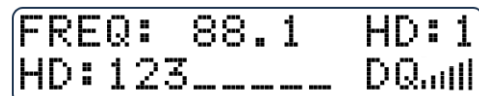
FREQ: 88.1 FM:S
2B6B KKJZ RF:||||

To *tune* the radio, push the knob and **FREQ** will begin to blink. Turn the knob to set the receive frequency.

Menu Screen 1 also shows the current reception mode, and allows switching between FM and HD Radio reception. For local mode selection, push the knob twice and **FM** (or **HD**) will begin to blink. Push the knob again to return to menu navigation.

FM reception modes are **FM:S** (stereo FM), **FM:B** (blended stereo FM) and **FM:M** (monaural FM). These are either signal-dependent, or may be manually selected using the Now Playing Webpage interface. The second line on this LCD menu will show the RDS PI code, the station's 'digital address,' and in the US and Canada, station call letters. **RF:||||** bars provide a coarse indication of the incoming signal level.

HD Radio channels **HD:1** through **HD:8**, (plus **FHD1**, (the FM-to-HD auto-blend mode) may be selected from the front panel. Available **HD:** channels will be listed, along with **DQ** bars, which give a rough indication of digital reception robustness. A better indication of digital reception

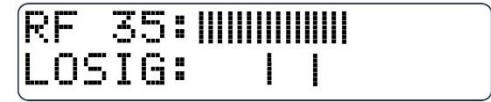


FREQ: 88.1 HD:1
HD:123_____ DQ:||||

quality is the **Cd/No:** readout on LCD Menu Screen 4. Note that Menu Screen 4 is skipped for FM-only stations.

Carrier Strength and Alarm (Menu Screen 2 - editable)

The **RF** bargraph on the upper line of this menu screen shows the incoming signal level, the **RF** numerical value represents dBμV at the antenna connector.



RF 35:|||||||
LOSIG: | |

The editable **LOSIG:** scale has a pair of tic marks off to the right. These refer to the RF Low Signal alarm, which is best set up using the Web interface, as alarm on/off timing parameters are not addressable from the front panel.

To set trip levels (only) from the front panel, push the knob. **LO** and the left tic mark will begin blinking. Turn the knob to position the left tic mark anywhere beneath the **RF** bargraph (the corresponding dBμV numerical value is shown as well). When the **RF:** bargraph falls below this point during normal receiver operation, it initiates a carrier-loss alarm.

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 **HI** and the right tic mark will blink. Turn the knob to set the tic mark to a point that the carrier level must rise to and remain above to reset the alarm, perhaps a few segments above the left tic mark. Push the knob again to set these points in memory and release the menu.

Again, **LOSIG** alarm settings are best accessed through the Web interface, along with the setup of other fault alarms that can dispatch email notifications. These alarms are detailed beginning on Page 27.

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

This screen displays two additional signal-quality measurements. Numerical values correspond to the number of bargraph segments.

SN is a first-order approximation of the signal-to-noise quality of the tuned RF signal. This measurement takes several signal quality factors into account. Although the displayed

numerical value is expressed as a dB readout, consider this measurement a relative, “more is better” indication as it does not relate to any standardized notation.

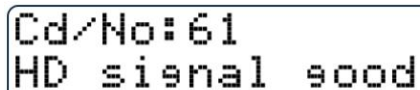
Likewise, MF represents multipath (signal reflection) effects that the incoming signal encounters on its trip to the receiver. Multipath degrades FM program quality with noise and other audible artifacts, and can disrupt digital HD Radio reception completely. Although the numerical value is expressed in percent, this measurement also should still be considered only a relative, “less is better” indication.

RF, SN, MF and Cd/No: numerical values make handy metrics when installing a rooftop antenna. In locating and aiming the antenna, do everything you can to maximize RF, SN, and Cd/No:, and to minimize MF.

HD Radio Signal Quality (Menu Screen 4)

NOTE: This menu is skipped during FM radio reception.

HD Radio signal quality, or ‘robustness,’ is indicated here, along with a translation of the quality factor in equivalent real-world terms. A ‘good’ signal is received in this example, other descriptions are HD not present and HD drops likely.

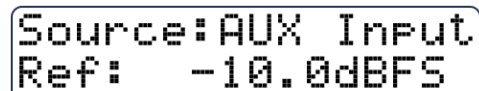


Cd/No:61
HD signal good

Monitor Source Switching (Menu Screen 5 - editable)

The 648 not only monitors the FM off-air broadcast, but can monitor and simultaneously meter the level of a stereo AES3 digital program audio feed applied to rear-panel XLR connector. This would, for example, enable A/B comparison between the air signal and the program audio feed to the exciter.

Source:Radio is the default, off-air monitoring mode. Push and turn the knob to switch to the AUX Input AES3 program source.



Source:AUX Input
Ref: -10.0dBFS

The rear-panel XLR connector accepts AES3 stereo program audio at *peak* digital levels up to 0dBFS. Press the knob a second time and Ref will blink. Turn the knob to match the *peak* level of your AES3 program signal. In the illustration, digital program audio applied to the rear-panel jack has a

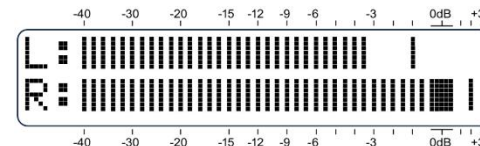
peak level that will never exceed -10dBFS. The monitoring level is actually being increased in this case to better match the off-air program audio.

NOTE: The AUX Input channel clips at 0dBFS. Set up as shown in the above illustration, program peaks exceeding -10dBFS would distort! It is assumed that audio fed to the rear-panel jacks will be peak-limited. Do not neglect this headroom limitation in your Ref: setting.

Program Audio Metering (Menu Screen 6)

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

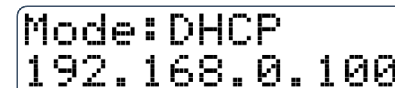
100% monaural FM modulation, or HD Radio modulation to an equivalent “zero” value, is denoted by the large block opposite the 0dB marking on the panel. The meter resolves +1, +2 and +3dB above 0dB, and from 0dB down in 0.5dB steps to -6dB, and then in 1dB steps to -20dB, and finally in 2dB steps to -40dB.



As 0dB represents ± 75 kHz carrier deviation for monaural off-air audio, a 400Hz mono test tone would take both meters to the 0dB point. FM receiver de-emphasis must necessarily be factored into the reading at higher frequencies, and of course the 19kHz stereo pilot consumes the top 1dB of stereo broadcast modulation. Aggressively-processed program audio will peak the bargraphs consistently to about -1dB.

Networking Mode and IP Address (Menu Screen 7 - editable)

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.



Mode:DHCP
192.168.0.100

Select `Mode:Static IP` and push the knob again to enter a fixed IP address manually. The first existing 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.



The image shows a rectangular LCD screen with a black background. The text 'Mode:Static IP' is displayed in a monospaced font. Below it, the IP address '111.168.000.100' is shown, with the first three digits of the first octet (111) represented by a bargraph of three vertical bars of increasing height. The rest of the IP address is in plain text.

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 screen to the last menu you'd been looking at.

HTTP Port (Menu Screen 8 - editable)

The default port assignment here 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 as described for `Mode:` setup. Leading zeroes will display; push the knob repeatedly to reach each digit you need to reset. When the last digit is set, press the knob one final time to commit the selection to memory and release the menu.

Gateway, Subnet Mask, Primary DNS (Menu Screens 9, 10, 11 - editable)

These three screens are available 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 7.

MAC Address (Menu Screen 12)

The MAC (Media Access Control) address of any piece of hardware with IP connectivity is a factory-set fixed value unique to that specific hardware. Menu Screen 12 displays the `MAC Address:` of your individual SiteStreamer and cannot be changed.

Headphone Monitoring (Menu Screen 13 - editable)

A front-panel PHONES jack offers convenient audio monitoring for SiteStreamer setup and casual listening. Plugging a pair of headphones into the front-panel jack automatically brings up LCD Menu Screen 13. `HeadPhone Vol` will begin blinking and the panel knob may be adjusted for a comfortable listening level.

Section IV

SITESTREAMER™ II WEB INTERFACE

Connecting Locally

Connect both the INOmini 648 and a computer to your local network. We'll assume DHCP operation for this exercise.

Go to Menu Screen 7 and jot-down the IP address that your router/server has assigned.

Mode: DHCP
10.0.0.49

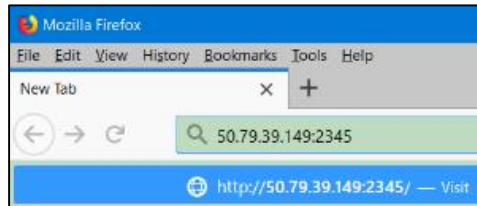
Typing the IP address into a browser will give you access to the 648. Alternatively, on your LAN you may also type the Hostname and / (a forward slash) into your browser address bar. (See Hostname: on Page 33.) The default Hostname for the 648 is MODEL648, meaning that you may address it as shown here.

MODEL648/

Remote (Internet) Access

To access it from the Internet, the 648 must be assigned a static IP address. If your router makes DHCP assignments for other equipment on the network, just assign a static IP that is outside the router's DHCP range.

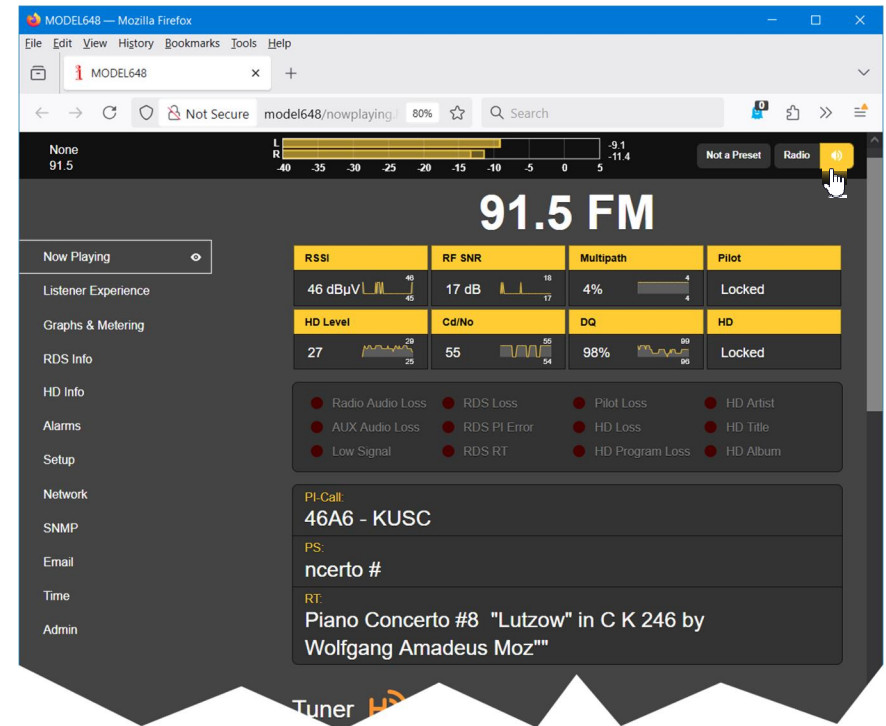
If your Internet Service Provider (ISP) assigns a static IP address to your LAN, it's a relatively simple matter to address the 648 externally. Your router does first require to be set up for port forwarding. Then you simply type the IP address and port number into your browser as pictured here.



But if your ISP issues a *dynamic* IP, which is quite often the case, this mandates 'Dynamic DNS' operation using the services of an IP-forwarding provider. This is an operation you should entrust to your IT department, though explanations and instructions are available from multiple Web resources.

Now Playing

Open a browser window on your computer and type the IP address of the 648 into the browser's address bar. One of two main Now Playing Web interface pages should pop-up on your screen. Shown is the page when monitoring an FM transmission; the HD main screen will be described separately.



Webpage Header

A header at the top of the page and the Menu list at the left are common to all Web interface pages. The header shows the tuned frequency, audio level metering, station presets (when programmed), the monitoring source and remote listening button. All 648 screens are described individually as listed in the Menu on the left-hand side of the screen.

Remote Listening

Click the loudspeaker icon in the header to monitor audio through your computer or device browser. The default source is the off-air Radio signal, shown on the button to the left of the loudspeaker icon. Click that button to select the AUX stream to monitor. Level metering in the header follows the monitoring selection.



Encoding, decoding and buffering time (latency) of the listening audio will depend in large degree on the connection path and network quality. Latency may be several seconds, even locally on your LAN. 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 listening audio and its level metering may be well out of sync.

Signal Metrics

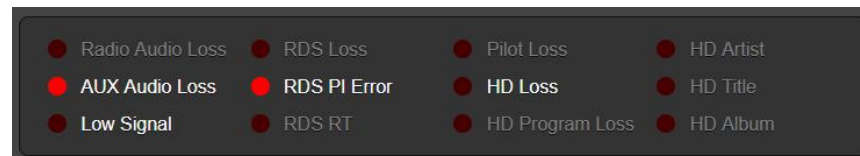
RSSI	RF SNR	Multipath	Pilot
50 dBμV 	17 dB 	4% 	Locked
HD Level	Cd/No	DQ	HD
58 	64 	100% 	Locked

Technical parameters regarding the received signal are shown just under the header. Numerical values are accompanied by a small rolling graph that displays the measurement over the past 30 seconds. Graph scaling adapts to represent high and low values over the 30-second time period.

RSSI, RF SNR and Multipath, labeled RF, SN and MP on front-panel Menu Screen 3, were detailed on Pages 12-13. The FM Stereo Pilot will indicate either Locked or No Lock, and HD will similarly show Locked, or Sync... as it attempts to lock.

Fault Alarms

A field of simulated red LEDs alert the user to various alarm conditions. Alarm explanations and setup procedures begin on Page 27.



Alarms that have been user-enabled will show a bright white callout here, and the 'LED' will glow when the alarm is tripped. Alarms that have not been enabled are grayed-out.

RDS and PAD Metadata Info

When the 648 is switched to monitor the FM component of the program, the Now Playing Web screen presents basic RDS RadioData information just below the alarm panel, typically what would be seen on a listener's radio.

PI-Call:
447D - KTWV
PS:
SMOOTH
RT:
SADE - Smooth Operator

PI is the hexadecimal identifier specific to this station, the station's "digital address" as it were. The PI code is derived from the station's Call (callsign) in North America, elsewhere only the hex value will show.

PS, the Program Service Name, is an 8-character field where station call letters or 'street name' will display on any RDS radio faceplate. The PS field is often made 'dynamic' to scroll song artist and title information as in the example.

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

Additional RDS data are displayed on the RDS Info Webpage, discussed on Page 25.

Radio Setup & 'Per-Preset' Explained

NOTE: Most radio settings are 'Per-Preset'; that is to say, when a station is tuned, and receive mode and alarm

parameters programmed, those settings pertain to just that station and become part of the Preset Stations memory.

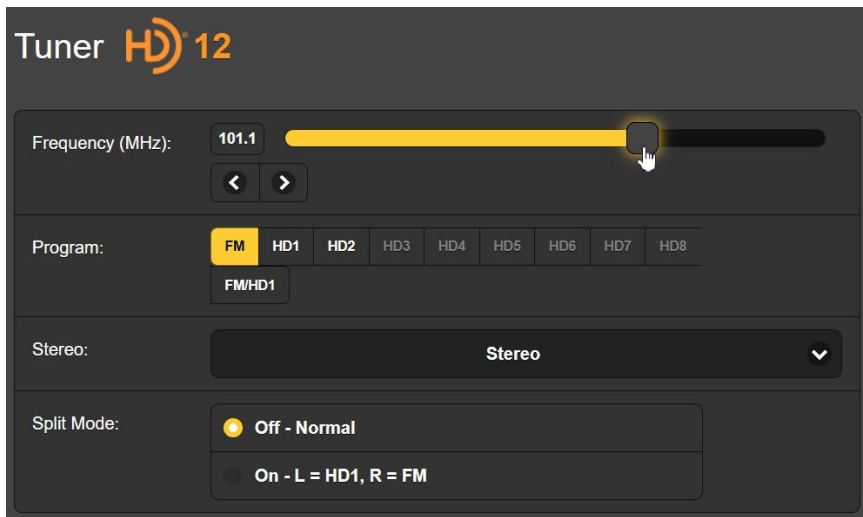
‘Global’ settings, on the other hand, have more to do with behind-the-scene aspects of 648 operation. Examples are regional settings and those associated with networking, access, passwords, and the AUX Input channel.

When a station is saved in Preset Stations memory, reception and alarm settings are saved with it. When re-tuning to that station, by selecting it from the Preset Stations list or in Station Rotation operation, those settings are automatically recalled.

However, when manually tuning away from a Preset Stations entry in memory (*not* using the Preset Stations list), setup parameters will transfer from the current station being monitored to the manually-tuned frequency. *This could initiate a false alarm!* Bear in mind that manual tuning does not call-up any settings specific to the received frequency, nor any factory-default reception and alarm parameters.

A station can be saved in more than one memory slot. For example, as an FM program channel and as any of that same station’s available HD Radio program channels.

The 648 indicates the presence of HD Radio channels by displaying the orange logo. Valid HD channels will be listed beside the logo.



You may tune the receiver remotely by four means:

- 1: Grab the ‘slider’ with your mouse and, holding down the mouse button, drag the slider back and forth as suggested in the illustration.
- 2: Highlight the slider (single click) and then use keyboard ◀ and ▶ cursor keys to step the frequency up and down.
- 3: Click the on-screen < and > buttons to step tuning up and down.
- 4: Highlight and overtype the Frequency (MHz): number with a valid FM channel frequency and press Enter.

Select the audio program to monitor using the Program: pushbuttons. Active channels will be shown in white, and the one button marked FM/HD1 allows the 648 to emulate a consumer receiver, auto-blending between analog FM and the HD1 simulcast as signal conditions dictate. Otherwise, only the selected FM or HD channel will be monitored, valid or not.

Clicking the Stereo: selection window brings up a menu to select the default Stereo reception of FM, automatic Blend for poor signal conditions, or forced Mono reception. This selection has no effect on HD Radio reception.

Station Presets

Stations are saved as Preset Stations by tuning-in the desired frequency, assigning various alarms for that station, and then clicking the Save as New button. You will be prompted to enter a ‘friendly ID’ for that station, and that identifier will show in the header when that station is tuned.

When a Preset is tuned-in, and you make any changes to alarm settings, the station ID on each Webpage header will revert to Not a Preset. You will also be prompted to click the Save Changes (Preset - -) bar. If you do not save the changes, those changes will be lost and the memory will revert to whatever values had previously been saved.

Alternatively, you may Save as New after making changes. For example: if you wanted one preset for the station in stereo with a full complement of alarms, and then another for the station in monaural, perhaps with one or more alarms disabled. Remember, alarms and other setup parameters are saved with that station in Preset Stations memory.

StationRotation™

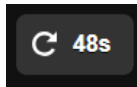
StationRotation describes a 648 function that allows sequencing through any or all of the saved Preset Stations entries in the order listed, and at a rate selected by the user. This might allow a station group or contract engineer to receive alarms from any of a number of stations in a given market.

NOTE: Placing the 648 in StationRotation will inhibit manual tuning! Front-panel station selection will be inhibited and Now Playing and Alarms setup sections will be grayed-out and unavailable.

There is a checkbox ahead of each entry in the list of Preset Stations. Check the box of any and all stations you wish to place in sequenced reception.

Begin StationRotation by setting Enable: to On. You need also to program the Rotation Time (Sec):. This takes some thought, as there are alarm setup considerations when using this feature. Alarms with Time On (Sec): and Time Off (Sec): settings will have to be factored into the Rotation Time (Sec): figure. See the Alarms discussion beginning on Page 27.

The Status: display gives a second-by-second countdown of remaining rotation time. This countdown also appears in the header of each Webpage when Station Rotation is enabled, as shown here.



Listener Experience

The term 'Listener Experience' encompasses both the meta-data (artist/title, etc.) text for both the FM and HD Radio programs. However, the 648 SiteStreamer lacks the horsepower to reproduce the graphic imaging that can optionally accompany each HD Radio channel.

Select appropriate Programs: buttons at the top of the page to enable data display. There are buttons for analog-FM and all eight HD Radio programs, and any may be selected, whether the tuned station has HD programs or not. Selecting these simply creates a display area farther-down on the page for the associated data, available or not.

Graphs and Metering

The Graphs & Metering Webpage gives high-resolution metering presentations of audio levels. The fast-acting level meters include a peak-hold function, and the held peaks are also displayed numerically in dB to the right of each bargraph.

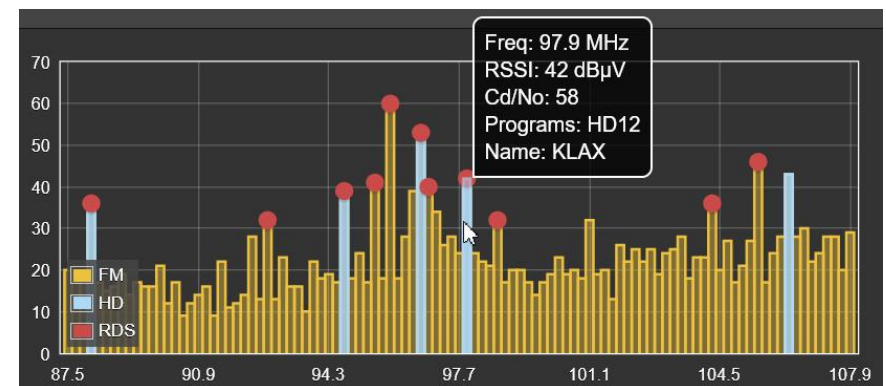
The Radio meter is a peak-responding readout of the off-air FM or HD Radio audio. Left and Right channel levels and L+R (stereo sum) and L-R (stereo difference) values are presented in real time. Keep in mind that audio streamed from the 648 may encounter significant delay, so don't expect correlation between visual metering and the streamed audio.

AUX channel levels are shown in similar fashion and simultaneously with the Radio channel. The AUX channel has limited headroom, thus program peaks should never exceed 0 (zero) on the AUX level meters.

The BandScanner™

The BandScanner is a useful utility of the 648 that displays the RF spectrum of the FM broadcast band.

Step Size: may be set to 100kHz or 200kHz. The closer intervals may yield a slightly better visual, and are of course essential in countries with 100kHz channel spacing. The closer, 100kHz step setting will take longer to scan.



A typical band scan plot is pictured here. Figures at the left represent the RSSI in dBμV at the antenna terminals. This level scaling is adaptive, changing automatically to accommodate the highest signal level in the monitored market.

In the example scan above, FM-only stations show up as vertical yellow lines poking-up above the noise floor. With Scan Type: set to RSSI + RDS, red dots sit atop the lines of stations that have an RDS presence. An RSSI + RDS + HD setting shows HD stations in blue.

Hover-over a line with your mouse and station info pops-up appropriate to the Scan Type:. Stations without RDS will display only the frequency and signal level, RDS stations will

provide additional info, and HD stations give appropriate metrics. Click on any line and the 648 will immediately tune to that frequency.

Stations are tabulated below the display, arranged by frequency, and include RDS and HD Radio particulars.

The band scanning process will interrupt measurements and mute audio monitoring during the scanning cycle, and alarms are also inhibited for the duration of the scan.

RDS Info Webpage

The RDS Info Webpage gives a complete accounting of all RDS data groups. The upper part of the RDS Info screen decodes and displays RDS information.

PS

THE WAVE

PI Code

447D

Callsign

KTWV

RadioText

38 / 64

Download the Audacy app! 94.7 The Wave

RT+1

RT+2

PTY

Soft

PTYN

Time

M/S

Music

DI

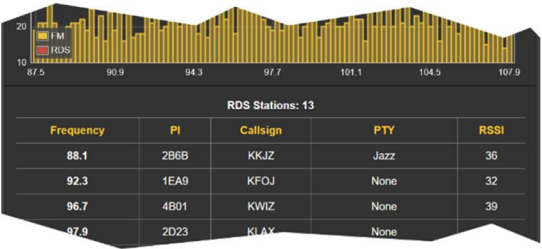
Stereo

TP

Off

TA

Off



Here, the PS, PI Code, Callsign and RadioText are duplicates of what's shown on the Now Playing page.

RT+1 and RT+2 are special identifiers used by some stations for 'song tagging' and advertising tie-ins. The station in the example does use RT+ tags, but none are active at the moment.

PTY identifies the format of the station as Soft (Rock), with no further PTYN format refinement by this station.

If the station were transmitting 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 conflicting DST or UTC offsets. Listeners of car radios become irate when their clocks are reset to the wrong time. (Time setup is described on Page 37.)

M/S, DI, TP and TA are RDS 'flags,' all part of RDS system housekeeping. *Wikipedia* gives a comprehensive overview of all RDS features, or you may refer to the appropriate RDS or RBDS Standard.

Statistical information on RDS data groups is tabulated in the lower section of the RDS Info Web interface screen.

The 648 SiteStreamer calculates RDS Block Error Rate along with the percentage of RDS system resources devoted to each data group. Our example station is using RDS to good advantage using only a few of the data groups.

RDS Block Error Rate

0.00%

0A

50.00%

0B

0%

8A

0%

8B

0%

1A

0%

1B

0%

9A

0%

9B

0%

2A

25.00%

2B

0%

10A

0%

10B

0%

3A

12.50%

3B

0%

11A

0%

11B

0%

4A

0%

4B

0%

12A

0%

12B

0%

5A

0%

5B

0%

13A

12.50%

13B

0%

6A

0%

6B

0%

14A

0%

14B

0%

7A

0%

7B

0%

15A

0%

15B

0%

Alternative Frequencies

0

Open Data Applications

2

11A

0xC3B0 (iTunes Tagging)

13A

0x4BD7 (RadioText+)

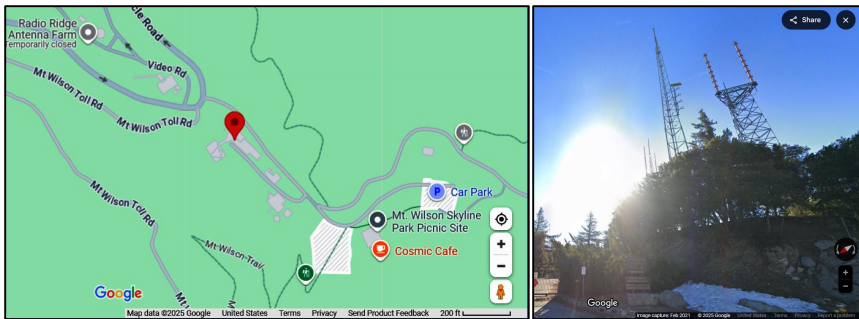
In this example the station has no rebroadcast 'translators,' so the Alternative Frequencies List is empty. The Open Data

Applications usage lists the 11A group for iTunes Tagging and the 12A group for RadioText+ use.

HD Info Webpage

Quite similar to its RDS counterpart, this page displays HD Radio metadata.

SIS, or Station Information Service, includes station-identification and technical data that each broadcaster with HD Radio programming is obliged to provide. Even the transmitter location is pinpointed with its GPS coordinates, which you can click-on to bring up a Google Maps image of the transmitter site. If the map supports the little yellow man in the corner, you might even pull-up a glimpse of a tower!



Alarm Basics

The Alarms setup area is an important aspect of the 648 Web interface that requires some forethought.

The time-stamp feature for email alarm notifications and the Alarm Log depends on an internal RTC (Real Time Clock) synchronized with Internet time. The proper time zone offset and DST relationship are maintained by the RTC, and correct time setup should be confirmed before alarm setup is considered complete. Page 37 covers RTC setup.

Several 648 alarms have similar threshold and timing setup requirements. Thresholds have two points to set. The first is the 'low' threshold point that the measured value must *fall below* to trigger an alarm, and then a second 'high' threshold point that the measured value must *return to* for the alarm to reset. This creates hysteresis in the alarm level settings, preventing 'chattering' as a metered value wobbles around the set points, even if the two thresholds set with only a small difference.

The second alarm parameter is 'on' and 'off' timing; that is, how long the metered value must remain *below* the low threshold point before an alarm is triggered, and then how long it must remain *above* the high threshold for the alarm to reset. These settings will depend entirely on whether you want to be apprised of a short-term fault, or if the condition has to remain for a greater number of seconds before it is considered valid and the alarm is triggered.

'Global' and 'Per-Preset' Alarms

Alarms are either (Global), or are (Per-Preset). The single Global alarm is for the rear-panel AES DIGITAL LINE INPUT, a.k.a.. the AUX Input. The term Global refers to its being totally independent of whatever station is tuned on the radio. Other Global, non-alarm parameters of the 648 involve network setup and other functions independent of what station is tuned.

Per-Preset means that the alarm setup is saved for the particular station it's set-up for, and remains in setup memory associated with just that station.

Audio and Low Signal Alarms

Both *level* and *time* alarm criteria apply to the AUX Audio Loss, Radio Audio Loss, and Low Signal alarms. These three alarms display a grayed-out dynamic bargraph measurement of the current metric to guide you in establishing threshold points.

An example setup of the Radio Audio Loss alarm panel is shown below. Instructions here also apply to the AUX Audio Loss alarm. Refer back a few paragraphs if you missed the explanation of alarm level and time criteria, otherwise setup should be obvious.

Radio Audio Loss

Alarm:	Off	On
Level (dB):	-2	
Threshold On (dB):	-30	
Threshold Off (dB):	-15	
Time On (Sec):	20	
Time Off (Sec):	5	

1. The Alarm: has been enabled by clicking the On button.
2. The grayed-out, off-air audio program peak Level (dB): is indicated in real time as consistently hovering near 100% modulation.
3. Threshold On (dB): has been set to -30, meaning that the program peak level must fall *below* -30 (dB) to qualify as a level that is too low.
4. Moreover, The Time On (Sec):, set here at 20, means that the program peak level *must fall and remain below* -30 (dB) for 20 seconds to actually trigger the alarm.
5. Threshold Off (dB): has been set to -15, meaning that the program peak level must rise *above* -15 (dB) to qualify as a valid, working modulation level.
6. Moreover, The Time Off (Sec):, set to 5, means that the program peak level *must stay above* -15 (dB) for 5 seconds for the alarm to reset.

Low Signal alarm programming has the same level and time criteria as the audio level alarms, but features an added Mute: function to silence the off-air audio during a low signal alarm condition. When Mute: is turned On, a Low Signal alarm will initiate an Audio Loss alarm when the station goes completely off the air. When Mute: is turned Off for FM reception, only the ‘dead air’ of an unmodulated carrier will trigger an Audio Loss alarm, as the ubiquitous no-station ‘FM hiss’ would most likely prevent the Audio Loss alarm from triggering.

Pilot Alarm

The Pilot Loss alarm monitors the presence of the 19kHz FM stereo pilot. With the Alarm: On, this alarm triggers when the pilot goes missing for the programmed Time On (Sec.): period, and resets when the pilot returns for the Time Off (Sec.): setting.

RDS Alarms

The RDS Alarm is triggered by either a missing RDS subcarrier (RDS Loss: On), an incorrect PI code (PI Error: On), or a Radio-Text update issue.

A PI error occurs when the station is ‘hijacked,’ or a translator receiver takes the notion to pull-in the wrong station. Simply copy-and-paste your station’s Current PI: into the PI Code: box and Save. This alarm will then trigger when the received PI

differs from that of your station. Both this RDS alarms and the missing RDS subcarrier use common Time On (Sec): and Time Off (Sec): settings.

Dynamic RadioText can appear ‘stuck’ when a current message is not updated with new text. When the RDS RadioText Not Updated alarm is set to Alarm: On, the alarm will be triggered if the message does not get updated within the number of minutes specified by Time On (Min):.

HD Radio Alarms

The separate alarms for HD Radio transmissions are set-up in similar fashion as the RDS alarms.

HD Loss indicates loss of the HD Radio program that is selected and being monitored at the moment, or of the HD1 program when listening to analog FM. Although this alarm may seem somewhat redundant to loss of audio, it may prove useful in catching intermittent exciter or HD exporter/importer issues. Other than what triggers it, this works just like the FM Pilot Loss alarm.

HD Program Loss notifies of a working HD program that has dropped out. Possibilities include a functioning Exporter (HD1 valid), but an Importer problem (HDs 2-8). Note that the HD programs to be monitored for loss must be specified, along with a common alarm Time On (Sec): and Time Off (Sec):.

HD PSD Not Updated can be set to issue an alert when the HD Radio Program Service Data (PSD) is not updated in the expected timely manner. Although there is a Time On (Min): setting common to all HD programs, each HD program may be selected to alarm when the Artist:, Title: or Album: fields for the specified HD program don’t receive an update in the Time On (Min): period. This feature is very similar to the RadioText Not Updated alarm for analog FM discussed above, except that it is a common alarm for all HD channels transmitted.

HD Emergency Alerts

Traffic, weather and other emergency messaging associated with the HD Radio system are still being refined and put into practice as this is written. This alarm function gives a flashing front-panel alarm and sends email notifications concurrently with alerts, advising selected station personnel of the event regardless of the type or seriousness of the alert sent.

Saving Alarm Setups

With the exception of the ‘Global’ AUX Level Alarm, alarm setups want to be saved in the memory slot for the station tuned-in while those settings are established. BUT... *after* setting-up, but *before* changing stations, you need to navigate back to the Now Playing page and click one of the buttons shown in the following example.

If this is a *new* station to add to the list of Preset Stations, then click Save as New and follow the prompt to name this preset. BUT if you are *changing* an alarm setup, you have a choice of saves.

1) Click Save Changes (Preset X) to simply update the new parameter...

2) Or click Save as New, and give the station a new name to specify the variation when prompted. In that case both alarm conditions will be in memory for that station, perhaps to send email alerts to different personnel.

Alarm Logs

The 648 logs all alarms, each with the station identified, the nature of the alarm, and with date, time and duration stamps. The logging utility can send emails Daily, Weekly or Monthly as a small .csv file attachment. The log is capable of holding an almost-infinite number of alarm events, so you may wish to go in and clear it every now and then.

Once the alarm log has accumulated some events, open the log by clicking the + next to View Alarm Log at the bottom of the screen. This brings the log contents onto your screen.

A particularly useful feature of the alarm utility is its ability to send instant email notifications *selectively* to appropriate station personnel. Setup of this feature is covered under the Email Notifications subheading on Page 35.

Miscellaneous Setups

The Setup Webpage lists a number of miscellaneous setup items that don’t fall into major categories. These are all ‘Global’ settings.

Under Radio you choose a couple of location-dependent options. Receiver De-Emphasis: of 75µs or 50µs, for North America or Europe, respectively, and RDS/RBDS: system selection of RDS (Europe) or RBDS (North America). These are ‘global’ settings, in that they are not saved selectively in Preset Stations memory.

AUX Settings consist solely of a single level-scaling adjustment. A separate and independent program feed applied to the AES3 DIGITAL LINE INPUT on the 648 rear panel must be scaled in level to remain below the streaming codec clipping point. Set the AUX Ref (dBFS): adjustment slider so that its associated numerical readout matches the aux digital input program peak level. For example, if your input audio peaks at -10dBFS, you would set the AUX Ref (dBFS): slider to -10. The grayed-out AUX Level (dBFS): meter should then rarely, if ever, reach 0 (zero).

Stream settings first address the streaming codec, which currently complies with HE-AACv2 protocols. Sample Rate: may be set either to 44.1kHz or to 48kHz, per system requirements, and Bitrate (kbps): to any figure between 18 and 64 kilobits per second as dictated by network quality and conditions.

The HTTP/Icecast Stream has two setup options. Audio Latency (Sec): allows the user to introduce additional delay in the program audio streaming path. While it may seem counterintuitive, additional delay may help overcome deficiencies of an uncertain network connection. Rather than allowing network latency to degrade packet transmission, building-in an intentional delay of a few seconds gives the system time to reassemble the data with fewer errors, sacrificing just a few seconds of listening delay.

Although the 648 is able to accommodate as many as 10 simultaneous HTTP/Icecast Stream Web listeners, the number of listeners may be truncated in the interest of better streaming service to fewer authorized listeners. The Max Listeners: slider can be set between 0 and 10.

The 648 can accommodate casual listening without Web interface privileges. To permit others to just listen to the stream, without being able to make settings changes, simply type the full IP address of the 648 (including a specific port number) into a browser address bar, followed by /stream. For example: <http://50.250.276.100:1567/stream>. Nevertheless, competent hackers could probably see through this ruse and access the Webpages and their setup options.

An independent UDP Stream is available concurrently with the HTTP/Icecast Stream for sending audio to remote equipment, such as loggers and ‘skimmers.’ The Transport: format can be either ADTS or ADTS in MPEG-TS. Data are sent to the IP Address: and Port: indicated when Enable: is set On.

Once modified, Stream settings must be saved by clicking on the Save bar. This does reset the utility, however, disconnecting any current Web listeners, who then must log back on.

Network Setup

The Network Webpage displays the current networking setup. Some entries are ‘grayed-out’ when the 648 Mode: is under automatic DHCP assignment. When using a Static IP, however, this Web interface is a far user-friendlier means of entering networking parameters than from the SiteStreamer’s front panel.

Hostname: is the ‘friendly’ name of the 648 that shows up on the browser tab, in various networking locations, and remote browser address bars. This can be changed as required to differentiate from another 648 on the network, usually in conjunction with an alternate HTTP Port: assignment.

SNMP Operation

SNMP (Simple Network Management Protocol) allows other TCP/UDP/IP equipment to communicate directly with the 648, and for the 648 to be able to initiate an alarm on the network. The SNMP setup field is shown on the following page.

The 648 will interface directly with a network controller, known as the SNMP ‘Manager.’ The 648 includes an embedded ASCII text file called a MIB (Management Information Base). In setting up for SNMP operation, download the MIB file from the 648, and then upload to the SNMP Manager.

The default mode for SNMP is Disabled. This inhibits communication between the 648 and SNMP gear. A pull-down menu shows operating choices.

A screenshot of the SNMP configuration page. It features a dark gray background with white text. At the top, there's a 'Mode:' field with a pull-down menu set to 'Disabled'. Below this are several input fields: 'Read Community:' with the value 'public', 'Write Community:' with the value 'private', 'SNMP Port:' with the value '161', 'Trap Port:' with the value '162', and three 'Trap Destination' fields, each with the value '0.0.0.0'. At the bottom, there's a large yellow button labeled 'Save'.

Mode: Read Only allows the 648 SiteStreamer to be interrogated by the SNMP Manager so that 648 settings, metering, RDS data and alarms can be read and integrated with other equipment on the network.

Mode: Read & Write further allows the SNMP Manager to send commands to the 648, permitting other equipment to change the station and adjust any other setup options.

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.

The default SNMP Ports, SNMP 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.

When the 648 SiteStreamer initiates an alarm, rather than being queried or polled for one, the 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 need to be apprised of 648 fault alarms.

NOTE: Once all SNMP Settings are complete, or following changes to any individual one, execute a Save.

The MIB File

The MIB File is a small text (.mib) file that is read by the SNMP Manager (network controller). To download and read this file yourself, click: Download MIB; it's in plain text and may be read with Windows Notepad. Copy, save and use the file in the usual Windows manner.

NOTE: This has been an abbreviated discussion of SNMP operation. SNMP is a complex utility managed exclusively by whatever SNMP Manager (monitoring equipment) is employed. Refer to all instructions supplied with, and for, the SNMP Manager hardware and/or software in setting-up the 648.

Email Notifications

The 648 SiteStreamer can send email notifications of reception or programming faults to one or more recipients. Which alarms go to whom is explained in this subsection.

NOTE: The time-stamp feature for email notifications and the Alarm Log depends on a network connection to sync with Internet time, along with setting the proper time zone and other options. See Page 37.

You need to set up an actual 'personal' email account for the 648, and the procedure is just like setting up any conventional email account. Information to be entered here depends on the provider you choose. When you apply for the account, much of this information will be assigned to you. Consult your IT professional for setting up email accounts if need be.

Under SMTP Server:, enter the provided outgoing mail server info (e.g.: smtp.gmail.com), the required Port: number and whether TLS: is On or Off.

From: is the 'friendly' name that identifies your SiteStreamer to the email recipient. You could use station call letters, or something like Streamer Alarm. User: is the full email address of the unit. You'll want to assign a Password: to the account.

You can enter up to ten potential email recipients, typing-in their full email addresses. These recipients will be numbered, and each may be assigned individualized alerts.

Email addresses will take the form of the upper example here. It may also be possible to send a text message to a recipient's mobile phone, using an email-to-text utility provided by the mobile carrier or by a third-party provider. In that case the entry may approximate the second example. Further information on sending email notifications to a mobile phone can be found on the Web, or you can check with the wireless carrier to ascertain availability and the proper addressing protocols for direct, Web-texting delivery.

When all recipients have been entered, click Save. You may also click Send Test Email, which will memo-message all recipients to confirm proper communications setup.

Notifications setup is easy. Once recipients are listed under SMTP Settings, select the email message recipient from the pull-down list and check the alarms for that person to receive. When finished, click Save at the bottom

Notifications setup is easy. Once recipients are listed under SMTP Settings, select the email message recipient from the pull-down list and check the alarms for that person to receive. When finished, click Save at the bottom

Recipient 1:	engineering@krok.com
Recipient 4:	8185559090@vtext.com

Recipient:	1. engineering@krok.com	
Send Emails For:	☒ Radio Audio Loss ☐ AUX Audio Loss ☒ Low Signal ☐ Pilot Loss ☒ RDS Loss	1. engineering@krok.com 2. PD Tom@krok.com 3. sgt_smith@fcc.gov 4. 8185559090@vtext.com 5. 6.

In this example, the station Chief Engineer will receive email notifications of Radio Audio Loss, Low Signal and RDS Loss conditions. Other personnel can be programmed to receive email notifications for these same or any combination of other alarm conditions.

Timekeeping

Open the Time 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 UTC (Coordinated Universal Time) with 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 as well. Choose Off to disregard DST altogether, On for fulltime DST, or Auto to accept pre-programmed seasonal changes automatically.

The Time Server defaults to a Web-based time authority pool, but you may enter an alternative Server: if desired. Status: indicates the Last sync: (internet time update), which also shows that Internet communications is working properly,

Be sure to click: Save to commit timekeeping choices to 'Global' memory.

The Admin Screen and Passwords

The Security heading under Admin allows you to set up a password tier for the 648 SiteStreamer Web interface. A Web Admin Password (Read/Write): is required to do 648 setup and make any subsequent changes or adjustments. A Web User Password (Read Only): allows that user to look at, but not change, the Webpages.

Type the Web Admin (Read/Write): password into that field and click: Save. You'll get a pop-up window asking for login credentials; leave the Username field blank and type your Password into its field, and then click Sign In. At that point you may create a Web User Password (Read Only): entry in similar manner. Click Save when finished.

A password can be changed or purged, simply by overtyping or clearing the entry and doing a Save.

If you lose or forget your password, you'll have to perform a 'hard reset' from the front panel of the unit (see below). This will purge all setup and other information from memory. To obviate the inconvenience of having to set the unit up 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.

NOTE: There are password ramifications to the Hardware Profile setup-recovery process that you will need to follow. The old, lost password is part of the Hardware Profile that you have previously saved. If that profile were immediately loaded into the 648, you'd be back where you started, still locked-out and needing to do another Hard Reset. See the final paragraphs under The Hardware Profile to purge passwords from the file.

Hard Reset

A hard reset can be performed only from the front panel of the 648. It will purge all setup information from memory. Please see the Hardware Profile discussion that follows to save settings and restore them to the 648.

To perform a hard reset, hold down the front-panel MENU knob while power-cycling the unit. Remember: this restores the SiteStreamer™ to 'factory-fresh' condition; you will lose all setup information.

The Hardware Profile

The entire 648 SiteStreamer setup, which includes both Global and Per-Preset setup choices... radio settings, alarm parameters, alarm notification preferences, SNMP options and passwords, 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.

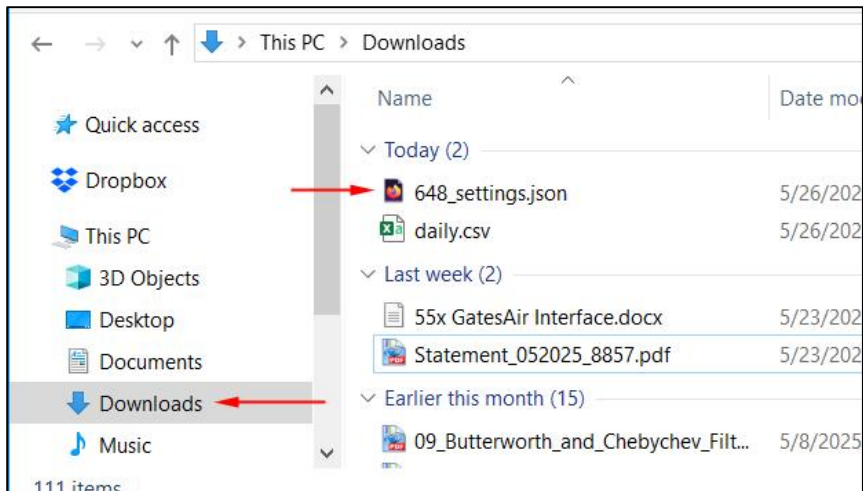
Under Configuration on the Admin Webpage, click Download Hardware Profile to save the profile to your system. Depending on your browser and version, the file will normally be saved to a Downloads folder unless you are asked for a specific 'save to' location. The file has a default name of 648_settings.json.

To upload a saved Hardware Profile to your SiteStreamer, first click: Browse... to locate the saved profile on your computer, and then click Upload Hardware Profile. This will replace all setup parameters that are currently loaded and running in your unit.

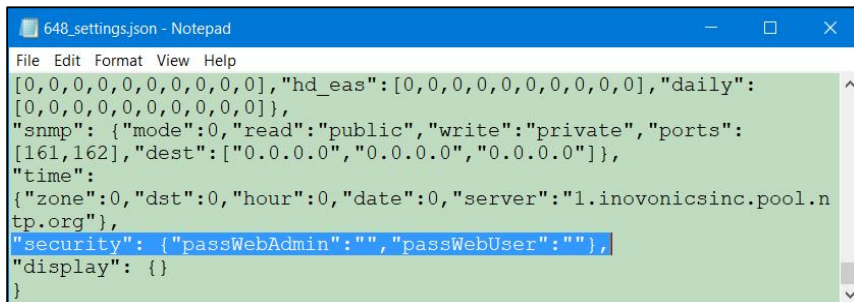
Here are the steps required to eliminate the old password from the Hardware Profile.

1. Locate the .json Hardware Profile file that you want to upload back into your 648. This may either still be in your Windows Downloads folder, or a folder set-aside for

incidental data files, probably looking something like the following illustration:



2. Right-click the file and then click Open with > Notepad.
3. Scroll to the very bottom of the file and locate and highlight the line of text beginning with **"security":**, just as that line is highlighted below:



4. Delete the highlighted line of text.
5. At the top of the Notepad window, Click File > Save, and then close Notepad.

Now you may upload this Hardware Profile without fear of being locked out.

Section V

UPDATING THE SITESTREAMER™ II

The Firmware Updater

The 648 SiteStreamer hosts operating files that may easily be updated by the user in the field. These files are the primary firmware that controls the functions, memories and Webpage interface of the unit.

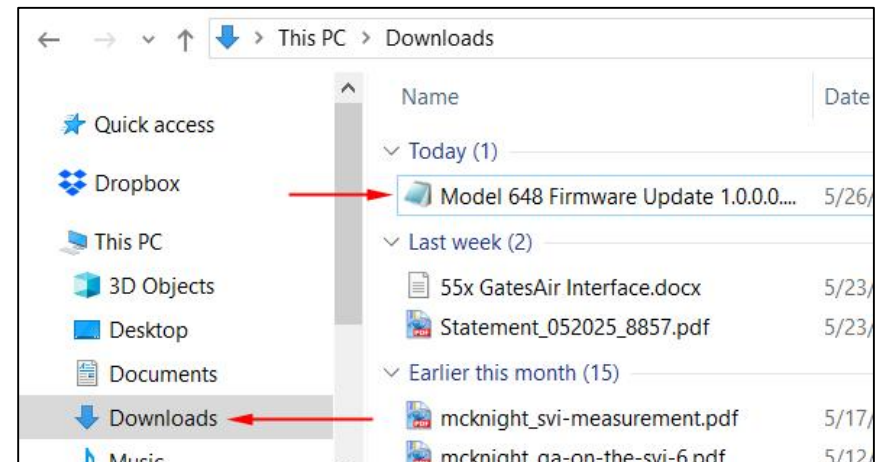
A built-in 'bootloader' utility allows firmware to be updated whenever Inovonics issues changes to add features, to improve performance, or otherwise to expand the usefulness of the product. Inovonics supplies firmware updates free of any additional charges.

Warning

A firmware update *may* restore the 648 to factory defaults, in which case *all settings and presets would be overwritten!* The changelog, included with the firmware update, will indicate whether this is a danger or not. Always save a Hardware Profile (Page 38) before proceeding with an update. This will retain all user setup parameters that can be restored afterward.

Update Files

A firmware update will be supplied as a small .bin file, part of a ZIP-file update folder



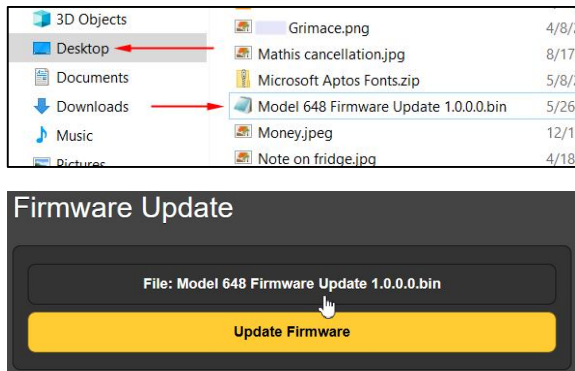
When downloaded from the Inovonics website, the ZIP file should reside in your Windows system Downloads folder as shown on the previous page, where the update is highlighted and indicated with a red arrow.

Either 'Save as' or drag the update ZIP folder to your Windows Desktop, and then double-click the ZIP folder. This will unzip the folder, revealing the .bin update file, plus a changelog text file and perhaps other information pertinent to this update. Drag the .bin update file out of the ZIP folder and place it at another spot on your Desktop.

Now bring up the 648 Admin page and scroll down to the Firmware Update section. Click Select Firmware File... , which will open a Windows Explorer window.

In this window, navigate to the Desktop and locate the .bin file you have just placed there. Double-click this .bin update file. It should then show up in the Firmware Update pane as illustrated here. Now click Update Firmware and the entire process should be completed in about one minute.

From the Admin Webpage you may bring a copy of this manual up on your screen. You can also check the Serial Number: and Firmware Rev.: of your 648, and even view the Uptime:, or how long your unit has been running since the last boot-up.



Section VI

TECHNICAL MATTERS

Firmware Version

With 648 powered-up, hold the knob down for 3 seconds or so. The menu screen you have been viewing will be replaced by the 648 Firmware screen. This shows the firmware version installed in your unit, information that may prove important when communicating with the factory.

LCD Tint Options

With the 648 Firmware screen showing, turn the knob once more and you'll find a utility to change the background color of your front-panel LCD display. Push and turn to change the R: (red), G: (green) and B: (blue) values. The factory defaults are 255, 90, and 60, respectively.

Turn back to the 648 Firmware screen and push the knob again to return to the normal menu sequence.

'Under the Hood'

The 648 SiteStreamer is compact and sophisticated, utilizing mostly surface-mounted (SMD) components. Many of these are application-specific, and all of them 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 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.

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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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