

USER MANUAL

Published December 2014

Software Version 0.36



ZAXCOM.COM

Zaxcom RX-12 / QRX212 Module

- KNOW YOUR RX12 4**
- FRONT PANEL 4
- RIGHT SIDE 5
- LEFT SIDE 6
- REAR 6
- INSERTING THE QRX212 MODULES 7
- HOME SCREEN EXPLAINED 8

- SYSTEM MENU..... 9**

- RECEIVER CONFIGURE MENU 9**
- RX MODE 9
- Mode..... 9
- Power..... 9
- FREQUENCY 9
- TRANSMITTER GAIN 9
- OUTPUT TYPE 10
- AES MODE..... 10
- TONE..... 10

- CENTER FILTER FREQUENCY SET10**

- SCAN MENU.....11**
- CENTER FREQUENCY 11
- MARKER 11

- FREQUENCY LIST / AUTO-PICK.....12**
- HOW TO USE AUTO-PICK 12

- ENCRYPTION.....12**

- SETTINGS.....13**
- FAN SPEED 13
- LCD BRIGHTNESS 13
- QRX PROGRAM 13
- RECALL FACTORY DEFAULTS 14
- ZAXNET FREQUENCY CONTROL 14
- SERIAL PORT MODE 14
- ADVANCED SET UP 14
- Burn Boot loader..... 14
- Debug Bits..... 14
- Allow Logging..... 14
- Log Screen..... 14

- RX-12 CONNECTOR ASSIGNMENTS15**
- AUDIO OUTPUT CONNECTORS 15
- Single Analog Channel out of one TA5..... 15
- Two Analog Channels out of one TA5..... 15
- AES Digital out of TA5 15
- DC power in (Hirose HR10A-7P 4 Pin Male)..... 15
- Serial Connector (USB RS-485)..... 16

UPDATING THE RX-12 FIRMWARE17
 Upgrading the Firmware 17

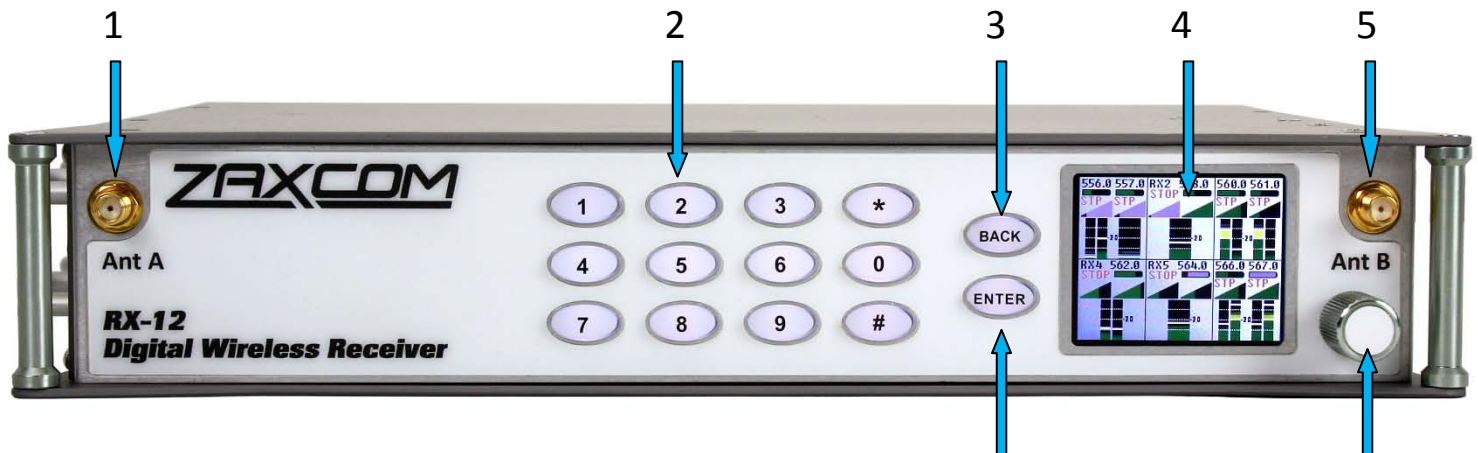
PRODUCT SUPPORT18

ZAXCOM RX-12 SPECIFICATIONS.....19

ZAXCOM WARRANTY POLICY AND LIMITATIONS.....20

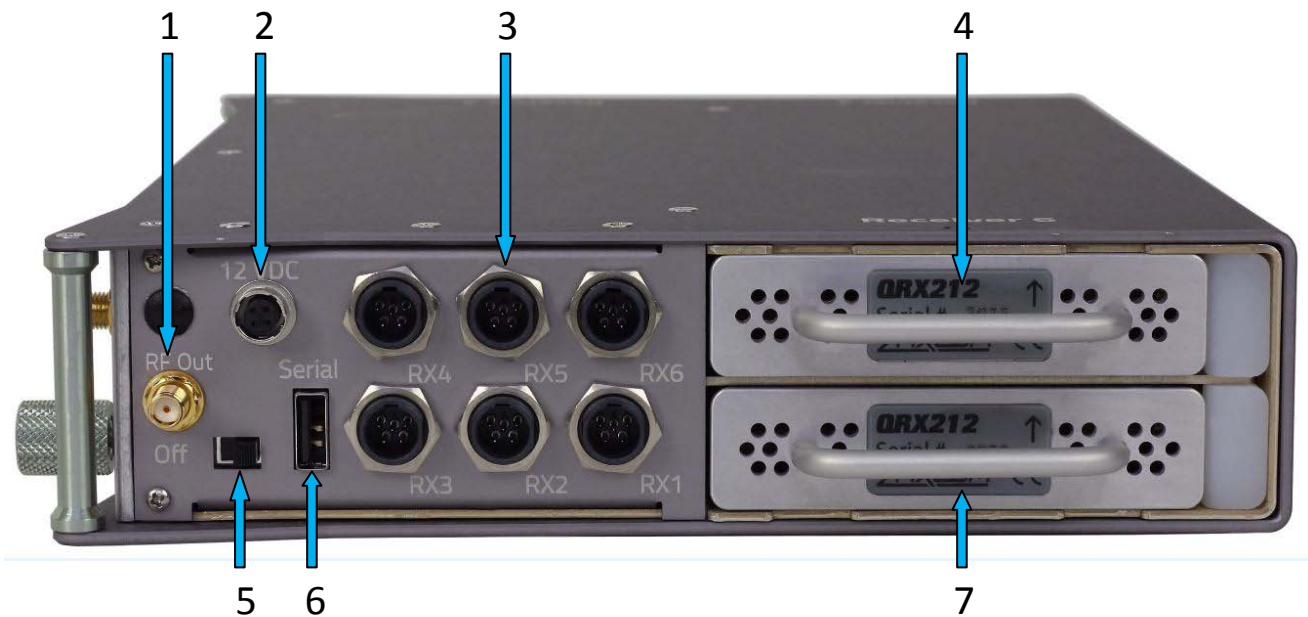
Know Your RX12

Front Panel



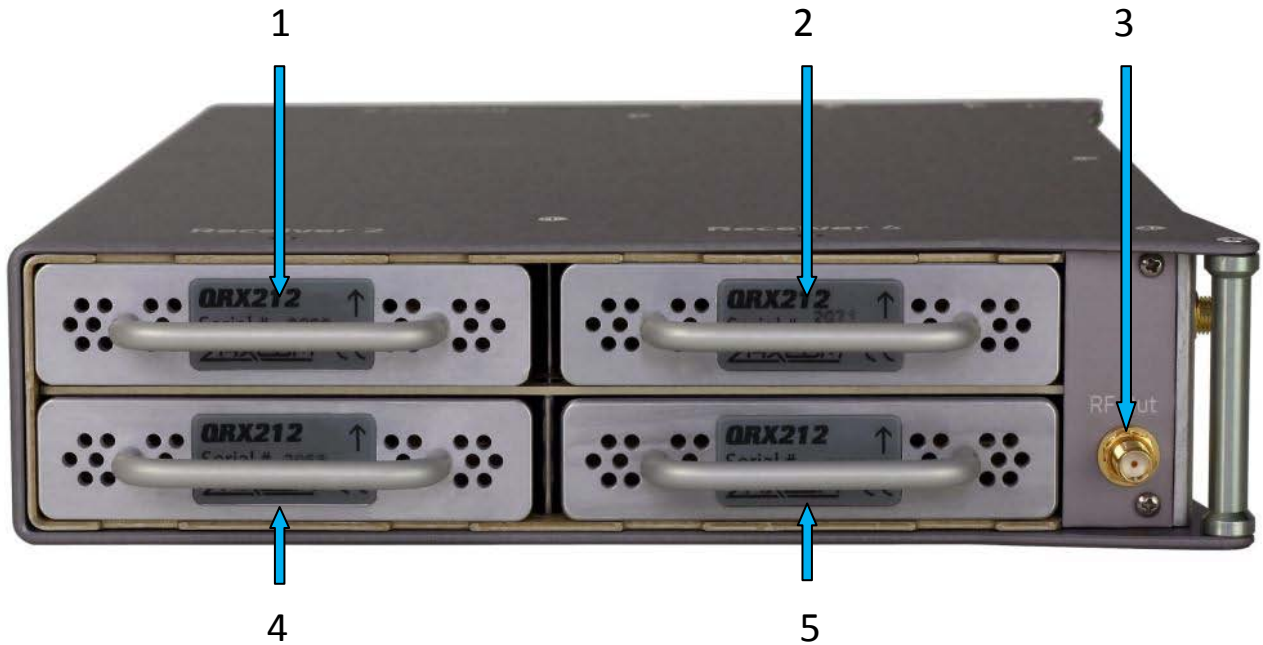
1. UHF Antenna A
2. Numeric keypad
3. Back Key
4. Daylight Readable Color LCD Screen
5. UHF Antenna B
6. Enter Key
7. **Menu Encoder Knob** – Press the menu knob to access the RX-12 menu. Rotate and press to adjust the menu perimeters.

Right Side



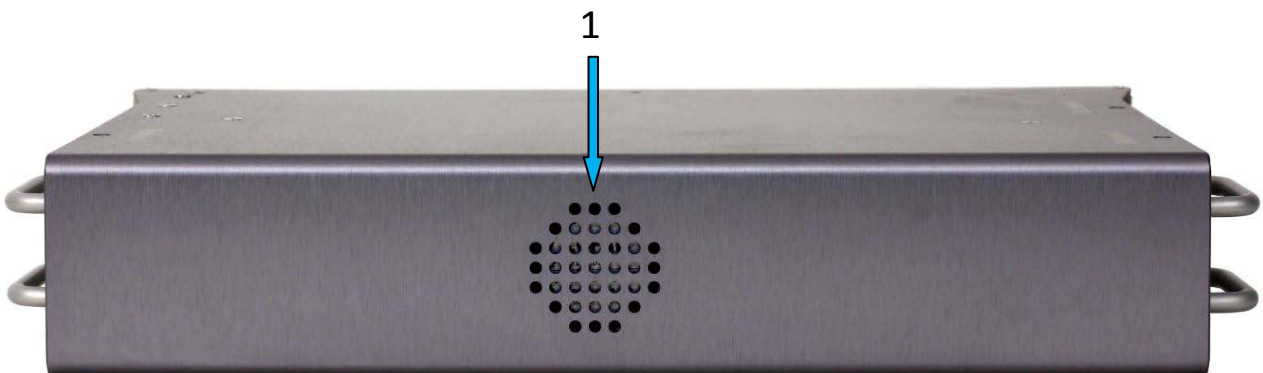
1. **UHF Antenna B RF Loop through RF Out** - The RF out is after the 35MHz filter and has 3dB of gain.
1. **External Power Connector (Hirose-4F)** Voltage range 10 to 18 VDC
2. **Audio Outputs for Modules 1 – 6 (TA-5M)**
Each output can be configured to output analog or AES audio.
Please note when outputting more than two signals the modules will need to output an AES signal.
3. **QRX212 Module Position 6**
4. **Power Switch**
5. **Serial Communication Port**
The Serial port is used to connect the RX12 to a Nomad or QRX with QIFB. When connected the RX-12 can send remote frequency and gain commands to the TRX transmitter.
6. **QRX212 Module Position 5**

Left Side



1. QRX212 Module Position 2
2. QRX212 Module Position 1
3. UHF Antenna B Loop through RF Out – The RF out is after the 35MHz filter and has 3dB of gain.
4. QRX212 Module Position 3
5. QRX212 Module Position 4

Rear



1. Vent Fan

Inserting the QRX212 Modules



Rear view of the QRX212 Module



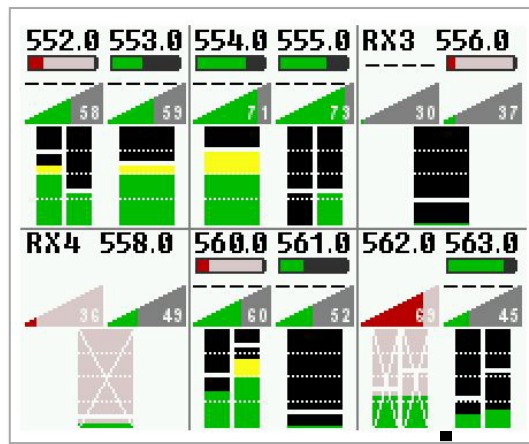
QRX212 Modules slide into the RX-12 with the arrow pointing to the top of the RX-12



Fastening screws

- With the arrow on the QRX212 module pointing to the top of the RX-12 gently insert the QRX212 into the RX-12 frame until you feel the module mate with the RX-12.
- Insert the supplied screw through RX-12 into the QRX212 to hold the module in place. Caution do not over tighten the screw. The screws for the top of RX212 modules will go through the top of the RX-12 and the screws for the bottom modules will go through the bottom of the RX-12.

Home Screen Explained



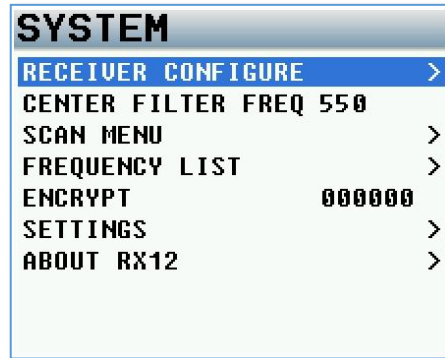
The home screen is divided into six sectors, one sector for each QRX 212 module. Each sector will display the following information:

- **Frequency** - The current selected frequency will be displayed for each receiver. If the module is in dual mode both frequencies will be displayed. The A frequency will be on the left and the B receiver will be on the right. If the frequency is highlighted in red that means the selected frequency is outside the 35MHz filter. Keep in mind while frequencies outside the range of the 35MHz will work you may not get optimal reception.
- **Battery level** - A battery indicator will display the approximate battery level for each transmitter. A fully charged battery will display green and then turn red as the battery depletes its charge. The battery icon will start blinking when the battery has roughly 15 to 30 minutes of charge left. Please note that when the battery is low the transmitter may not go into record.
- **Transport status** -The transport status of the TRX transmitter's onboard recorder will be indicated just above the RF signal strength meter:
 - STOP – Recording / Playback is stopped
 - REC – TRX is recording
 - PLAY – The TRX is playing back
- **RF Signal Strength** - Each module has two RF meters, one for each receiver. The meters show the amount of RF signal being received. The signal level is visually displayed in the ramp shaped RF meter icon. As the shading increases from the left to the right the more signal is present. If the icon is shaded red that means the receiver is seeing unwanted RF from a source other than from a TRX transmitter. If the icon is green the RF is being received from a TRX transmitter. Within the icon the actual signal strength, in decibels, is displayed numerically.
- **Audio meter** - Each module will display audio meter(s) for each signal received. If the module is set to single mode one large meter will be shown. If the module is set to dual mode two large meters will be shown. If the module is receiving a signal from a stereo transmitter the large meter will be split in half into two smaller meters, representing the left and right audio of the transmitter. The meters will show the audio modulation in dBFS. Within each meter the signal will be represented in green, yellow and red showing the levels, there is also a peak hold indicator. If a meter has a white X through it that is showing that the receiver is not receiving a valid signal.
- **Save Indicator** - A pixel on bottom of screen that moves right to left indicates that the RX-12 is saving a parameter setting to its memory. If you power down the RX-12 while the pixel is moving the settings will not be saved and could possibly corrupt the setting memory.

SHORTCUT: From the home menu pressing the star key will take you to the receiver configuration menu and pressing the pound key will take you to the scan menu.

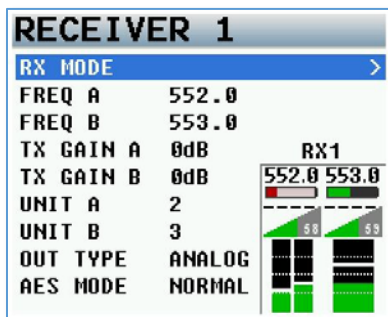
System Menu

To access the system menu press the MENU encoder knob.



Receiver Configure Menu

The receiver configure menu allows you to configure each of the 6 QRX212 receiver modules. To access the receiver configure menu press the star key from the home screen. Or select it from the system menu. Once in the receiver configure menu you can access the individual receiver modules by pressing the corresponding number key on the numeric keyboard.



In each receiver configuration menu the status of each transmitter will be shown. This is the same configuration that is in the home screen. Included are the frequency, battery level, signal strength and audio levels.

RX Mode

The RX mode allows you to power on and set each individual receiver to single or dual mode.

Mode

- Single – The QRX212 module is set to receive a single TRX transmitter.
- Dual – The QRX212 module is set to receive signal from two TRX transmitters

Power

Toggles on and off the power to the QRX212 module. Turning power off will shut off the individual module and will conserve power.

Frequency

Frequency displays and allows you to manually set the frequency for the A and B receiver.

To set the frequency highlight the frequency of the receiver you would like to change and rotate the menu encoder knob, or press the desired frequency on the numeric keypad.

Transmitter Gain

If the RX-12 is connected to a Nomad or a QRX with QIFB, the gain for each TRX transmitters can be adjusted from here and the gain can be remotely sent to the TRX transmitters via a serial port connection.

Output Type

The output type will set what audio signal the individual QRX212 module will output via the TA5 connector. You can choose to output the audio as either an analog signal or an AES signal.

AES Mode

There are two AES output pairs per QRX212 module. When receiving two mono transmitter signals on a single QRX212 module the two audio channels will appear on one AES pair. When receiving a single stereo transmitter the two audio channels can be made to appear on a single AES pair by choosing the AES swapped mode.

Tone

Each QRX212 module has its own tone oscillator. Engaging tone will turn on the QRX212 module's 1K test tone and output the tone at -20dBFS allowing you to calibrate levels.

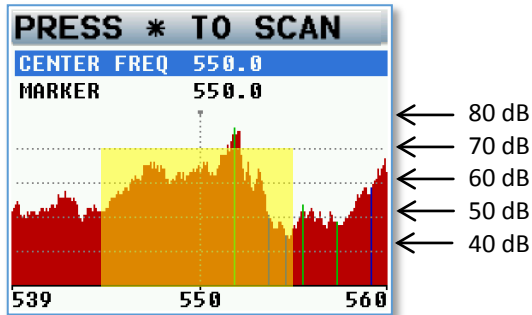
Center Filter Frequency Set

Each QRX212 module can receive signal on any frequency ranging between 512MHz to 698MHz. To allow for such a wide band operations and limit the stray RF from affecting the performance of the unit the RX12 has a 35MHz tracking front end filter that eliminates unwanted RF from outside of the 35MHz window. That stray RF can desensitize the receivers and result in poor RF performance. When you set the center filter frequency you omit unwanted RF that is outside of your desired operating range.

After deciding on the 35MHz operating range you would set the filter to be in the center of that range. The best performance of the RX-12 will be 17.5MHz above and 17.5MHz below the center filter frequency. Please note that this is a global setting for all QRX212 modules meaning that that the 35MHz window will be the same for all modules.

To adjust the center filter rotate the menu encoder knob to the desired frequency, or manually enter the desired frequency using the numeric keypad.

Scan Menu



The scan menu allows you to search the spectrum to determine what RF is present. This will aid in finding a clear operating frequency. After a scan the RF that is present will be represented in the graph by a series of vertical lines extending from the baseline up, the higher line the stronger the RF signal is.

The horizontal lines show the strength of the signal in decibels. Any stray below 40dB shouldn't have too much effect on the performance.

The yellow area shows the 35MHz window of the filter.

The colored vertical lines will show the frequencies that that the QRX212 modules are currently set to.

To initiate a scan press the star key when in the scan menu. After scanning the 35MHz window you can move the center of the filter and scan more of the spectrum; the RX-12 will remember the previous scans and add the new scan to the previous scans. When in the scan menu pressing the number 1 key will zoom out showing more of the scanned spectrum and pressing the number 2 key will zoom in magnifying the scanned spectrum.

After the scan is completed you can manually choose the operating frequencies or you can use Auto-Pick and allow the RX-12 to determine the frequencies.

Center frequency

The center frequency sets and displays the frequency that is in the middle of the 35MHz front end filter.

Adjusting the center frequency will adjust the location of the filter. To adjust the marker rotate the menu encoder knob or enter the desired frequency on the numeric keypad.

Marker

The marker is for visual identification, it will allow you to examine a specific frequency within the scan. To adjust the marker rotate the menu encoder knob or manually enter the desired frequency on the numeric keypad.

Frequency List / Auto-Pick

AUTO-PICK		
Select channels and press *		
RX1AB	SINGLE	552.0
RX2A	DUAL	554.0
RX2B	-	555.0
RX3AB	SINGLE	556.0
RX4AB	SINGLE	558.0
RX5A	DUAL	560.0
RX5B	-	561.0
RX6A	DUAL	562.0

This page displays the current chosen frequency of each receiver module. If the module is set to dual mode both frequencies will be displayed. From this page Auto-Pick can be set to have the RX-12 select and change the frequency of any receiver(s).

How to use Auto-Pick

AUTO-PICK		
Select channels and press *		
RX1A	DUAL	552.0
RX1B	-	553.0 ✓
RX2A	DUAL	554.0
RX2B	-	555.0
RX3AB	SINGLE	556.0 ✓
RX4AB	SINGLE	558.0 ✓
RX5A	DUAL	560.0
RX5B	-	561.0

- Select a receiver by rotating the menu encoder knob.
- Press the encoder knob to select the receiver. That will put a green check mark to the right of the frequency that will be changed.
- After all the receivers that you want to change are selected, press the star key to let the RX-12 choose a frequency with the cleanest scan for each receiver.
- Press the # Key to uncheck the receiver(s).

Encryption

This is where the encryption code of the RX-12 is set. If the TRX transmitter that is sending audio has encryption turned on the RX-12 can only listened to it if it has the same matching encryption code entered. When the codes do not match, all that will be heard is white-noise.

Each individual QRX212 module will share the same encryption code therefore if encryption is turned on all TRX transmitters will need to have encryption enabled as well.

The encryption code should always be set to 000000 for normal un-encrypted operation.

Settings

SETTINGS	
FAN SPEED	OFF
LCD BRIGHTNESS	10
QRX PROGRAM MENU	>
RECALL FACTORY DEFAULTS	>
ZAXNET FREQ CONTROL	OFF
SERIAL PORT MODE	NOMAD
ADVANCED SETUP	>

Fan Speed

The RX-12 has an adjustable cooling fan on the bottom of the unit. The fan can be turned off or adjusted from 1 through 10 with 10 being the highest setting.

LCD Brightness

The LCD screen and backlight key board is adjustable; this menu allows you to adjust the brightness. The brightness can be adjusted between 0 and 10 with 10 being the brightest.

QRX Program

This menu will show the status of each QRX212 module and the current software version that the module is running

How to update the software for the QRX212 modules:

1. Insure that a stable power supply is connected to the RX-12.
2. Set the frequency on all the receiver modules to the same frequency that the TRX transmitter that is being used to send the software is set to.
3. Confirm that the encryption code is set to off on the RX-12 and the TRX transmitter.
4. Go into the QRX program menu on the RX-12.
5. Press the star key each QRX212 module should then display that it is "waiting" for software.
6. Insert the micro SD with the program file (QRX-XXX.BIN) in the programing TRX transmitter.
7. At the TRX transmitter
 - Make sure the TRX has fully charged batteries installed.
 - Press and hold the MENU key while powering the TRX ON.
 - Verify the allow IFB remote control is set to OFF.
 - Go to the send QRX program menu.
 - Press the INC key.
 - The TRX will indicate that it found the program on the card and has started sending it.
8. When the program file is being received by the RX-12, and the QRX212 modules are receiving the program file, the sectors will start counting up.
9. When each module is updated "SUCCESS" will be displayed.
10. If a module does not receive all of the sectors wait, the TRX will begin resending the software again on its own, and will continue to transmit until manually stopped.
11. When all the modules are updated you may stop the TRX transmitter.
12. Power cycle the RX-12 and confirm that each QRX212 module is running the updated software.

Recall Factory Defaults

This setting resets the RX-12 to the factory default setting.

ZaxNet Frequency Control

If ZaxNet frequency control is turned on the RX-12 will send commands to the TRX transmitters to change the transmit frequency when the receiver frequency is changed.

Serial Port Mode

When the ZaxNet frequency control is turned on the RX-12 can communicate frequency and gain changes to the TRX transmitters via the serial port on the RX-12. The serial port will need to be plugged into the serial port of a Nomad with ZaxNet, or a QRX with the QIFB option. Please note the Nomad will need to be running software version 7.24 or higher. The QRX you need to be running software version 355 or higher and the serial port menu will need to be set to ZAXLAN.

Advanced Set up

Burn Boot loader

The boot loader is part of the software that helps boot up RX-12. Generally, you will not need to update the boot loader. If the boot loader needs to be updated there will be a note released with the software to do so. The boot loader software is already contained within the RX-12 software.

Debug Bits

The debug bits are a factory diagnostic setting and should stay set to 0.

Allow Logging

Allow logging will turn on the logging feature which will allow the RX-12 to log warning and error messages which then can be used by the factory to diagnose your RX-12. The logged messages are displayed on the log screen. If logging is not turned on then the RX-12 will not log the errors.

Log Screen

This is where the RX-12 displays the logged errors and warnings.

RX-12 Connector Assignments

Audio Output Connectors

Single Analog Channel out of one TA5

TA5 out on RX-12		XLR into Mixer
PIN 1	→	PIN 1
PIN 2	→	PIN 2
PIN 3	→	PIN 3
PIN 4		No Connection
PIN 5		No Connection

Two Analog Channels out of one TA5

TA5 Out on RX-12		XLR into Mixer
PIN 1	→	PIN 1 on both XLRs
PIN 2	→	PIN 2 - Left
PIN 3	→	PIN 3 - Left
PIN 4	→	PIN 2 - Right
PIN 5	→	PIN 3 - Right

AES Digital out of TA5

Please note while sending digital output, it is necessary that the unit on the other end (recorder, mixer, etc.) have digital inputs with sample rate convertors, as there is no way to synchronize the output data with the recorder's digital input.

TA5 out on RX-12		Into Mixer
PIN 1	→	Ground
PIN 2	→	AES 1/2
PIN 3	→	AES 1/2
PIN 4	→	AES 3/4
PIN 5	→	AES 3/4

DC power in (Hirose HR10A-7P 4 Pin Male)

DC Power Source		Hirose 4 - Pin
Negative (Ground)	→	PIN 1
No Connection	→	PIN 2
No Connection	→	PIN 3
Positive	→	PIN 4

Serial Connector (USB RS-485)

RX-12		Nomad or QRX
WHITE (TXM)	→	RED (RXP)
GREEN (RXM)	→	BLACK (TXP)
RED (RXP)	→	WHITE (TXM)
BLACK (TXP)	→	GREEN (RXM)

Updating the RX-12 Firmware

Each RX-12 is shipped with the latest firmware version installed. When newer firmware becomes available, it can be downloaded from the Zaxcom website: <http://www.zaxcom.com/software-updates>
Newer version of beta software may be found on the Zaxcom Forums: <http://www.zaxcom.com/forum>

Upgrading the Firmware

1. Format a micro SD card using a PC or Mac.
2. Using a PC or Mac download the new software (RX12Profile_vX.XX.bin) and copy it to the card. Make sure only one .BIN file is on the card.
3. Insure that a stable power supply is connected to the RX-12.
4. With RX-12 powered down, insert the micro SD card, that contains the .bin file, into the card slot inside the RX-12
5. Press and hold the STAR key while turning on the RX-12.
6. Once "FOUND PROGRAM FILE" is displayed, you can release the STAR key.
7. After "SUCCESS RESTART NOW" is displayed, cycle the power.
8. Verify that RX-12 is running the version you just installed in the about RX-12 menu.
9. After updating the software, it is generally advised to perform a restore to factory defaults.

Product Support

- Register** your product with Zaxcom: <http://zaxcom.com/support/product-registration/>
- Download the latest **Firmware** from: <http://zaxcom.com/support/updates/>
- Download the latest **User Manuals** from: <http://zaxcom.com/support/updates/>
- Submit Technical Questions** at: <http://www.zaxcom.com/submit-a-technical-question>
- Submit information for **Repair Services** at: <http://www.zaxcom.com/support/repairs>
- Join the **Zaxcom User Forum** at: <http://www.zaxcom.com/forum/forum.php>
- Join the **Zaxcom Face Book User Group** at: <https://www.facebook.com/groups/682199065139938/>

Zaxcom RX-12 Specifications

Frame specifications

Analog audio output	Balanced 0dB @-20dBFS (2 channels receiver)
Digital audio output	AESEBU (2 pair per receiver)
Audio connectors	6 - TA5M
RF connectors	4 SMA including loop trough
RF impedance	50 ohms
RF gain input-output	4.0dB
RF amp noise figure	.5dB
RF amp IP3	+30dB input
RF filter band pass	35 MHz
RF tuning range	512MHz- 698MHz
Power	8VDC -18VDC (12VDC nominal @100ma) Hirose- HR10A-7P-4P
LCD screen	TFT daylight readable color 2.2" diagonal
Size	L=10.5 W=8.0 H=2.0 inches
Weight	6lbs 2oz (6 receivers loaded)

QRX212 Module specifications

Receivers per module	2
Receiver modulation	Zaxcom digital
Tuning range	512MHz- 698MHz
Power consumption	300ma @12VDC
Size	.8" x 3.0" x 5.0"

Zaxcom Warranty Policy and Limitations

Zaxcom Inc. values your business and always attempts to provide you with the very best service.

No limited warranty is provided by Zaxcom unless your RX-12“Product” was purchased from an authorized distributor or authorized reseller. Distributors may sell Product to resellers who then sell Product to end users. Please see below for warranty information or obtaining service. No warranty service is provided unless the Product is returned to Zaxcom Inc. or a Zaxcom dealer in the region where the Product was first shipped by Zaxcom.

Warranty Policy

The Product carries a Standard Warranty Period of one (1) year.

NOTE: The warranty period commences from the date of delivery from the Zaxcom dealer or reseller to the end user.

There are no warranties which extend beyond the face of the Zaxcom limited warranty. Zaxcom disclaims all other warranties, express or implied, regarding the Product, including any implied warranties of merchantability, fitness for a particular purpose or non-infringement. In the United States, some laws do not allow the exclusion of the implied warranties.

Troubleshooting & Repair Services

No Product should be returned to Zaxcom without first going through some basic troubleshooting steps with the dealer you purchased your gear from.

To return a product for repair service, go to the Zaxcom Repair Services page <http://www.zaxcom.com/repairs> and fill in your information; there is no need to call the factory for an RMA. Then send your item(s) securely packed (in the original packaging or a suitable substitute) to the address that was returned on the Repair Services page. Insure the package, as we cannot be held responsible for what the shipper does.

Zaxcom will return the warranty repaired item(s) via two-day delivery within the United States at their discretion. If overnight service is required, a FedEx or UPS account number must be provided to Zaxcom to cover the shipping charges.

*Please note a great resource to troubleshoot your gear is the Zaxcom Forum: <http://www.zaxcom.com/forum>.

Warranty Limitations

Zaxcom’s limited warranty provides that, subject to the following limitations, each Product will be free from defects in material and workmanship and will conform to Zaxcom’s specification for the particular Product.

Limitation of Remedies

Your exclusive remedy for any defective Product is limited to the repair or replacement of the defective Product.

Zaxcom may elect which remedy or combination of remedies to provide in its sole discretion. Zaxcom shall have a reasonable time after determining that a defective Product exists to repair or replace a defective Product. Zaxcom’s replacement Product under its limited warranty will be manufactured from new and serviceable used parts. Zaxcom’s warranty applies to repaired or replaced Product for the balance of the applicable period of the original warranty or thirty days from the date of shipment of a repaired or replaced Product, whichever is longer.

Limitation of Damages

Zaxcom’s entire liability for any defective Product shall, in no event, exceed the purchase price for the defective Product. This limitation applies even if Zaxcom cannot or does not repair or replace any defective Product and your exclusive remedy fails of its essential purpose.

No Consequential or Other Damages

Zaxcom has no liability for general, consequential, incidental or special damages. These include loss of recorded data, the cost of recovery of lost data, lost profits and the cost of the installation or removal of any Product, the installation of replacement Product, and any inspection, testing or redesign caused by any defect or by the repair or replacement of Product arising from a defect in any Product.

In the United States, some states do not allow exclusion or limitation of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.

Your Use of the Product

Zaxcom will have no liability for any Product returned if Zaxcom determines that:

- The Product was stolen.
- The asserted defect:
- Is not present,
- Cannot reasonably be fixed because of damage occurring when the Product is in the possession of someone other than Zaxcom, or
- Is attributable to misuse, improper installation, alteration, including removing or obliterating labels and opening or removing external covers (unless authorized to do so by Zaxcom or an authorized Service Center), accident or mishandling while in the possession of someone other than Zaxcom.
- The Product was not sold to you as new.

Additional Limitations on Warranty

Zaxcom’s warranty does not cover Product, which has been received improperly packaged, altered or physically abused.