

Zaxcom Diversity Receiver Quick Start Guide

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Document Revision 1.020.00
For Firmware Revision 20

This guide is intended to quickly initiate the user with the basic functions of the Zaxcom Digital Diversity Receiver. This guide assumes the firmware version displayed above has been installed. The firmware revision code is displayed shortly every time the receiver is turned on. The end of this document shows the changes made in each firmware revision.

Receiver Connections

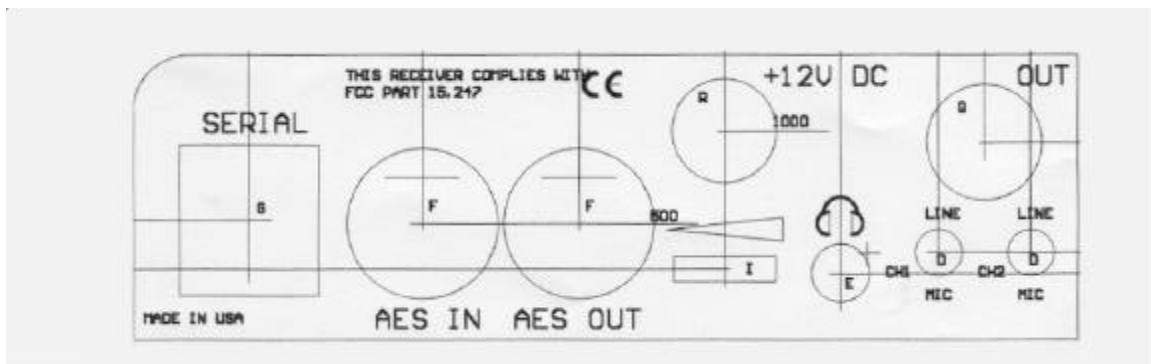
The receiver is powered by a bullet type connector supplying 12 VDC at 500ma (center pin is positive). A transformer is included in the wireless kit to provide this power. Both the receiver and the battery charger use the same power connector so **be sure not to use the wall-type transformer since it will not supply the receiver with enough current.** This will result in AC hum and poor audio quality. The receiver can be powered by a battery system ranging from +9 VDC to +15 VDC. Lower voltages will degrade audio quality and receiver performance.

The serial connector is an RS-485 differential serial interface for the Cameo location mixer and/or a PC. This is not a USB port and should not be connected to a personal computer. Damage to your PC and receiver may result. The functions associated with this connector are described towards the end of this document.

The BNC connector labeled AES IN is designed for external AES audio sync and control data for multiple receiver configurations.

The BNC connector labeled AES OUT is an AES digital audio output.

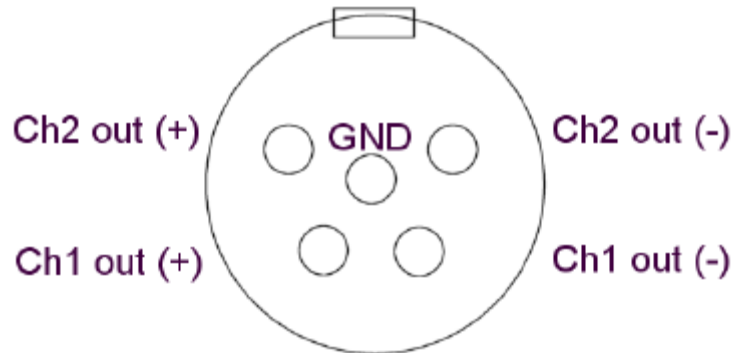
The 1/8-inch stereo headphone jack is for monitoring the main channel of audio. The volume of the headphone is adjusted by the variable potentiometer located next to the headphone jack.



Connector diagram of rear of Receiver

The 5-pin Lemo type connector provides the user with a line level or mic level audio output. There are two audio channels available but currently both channels supply the same audio.

5 pin Lemo connector pinout as viewed from back of receiver



The front of the receiver contains two SMA thread-on connectors. These are 50-Ohm antenna connections designed to feed two external log-periodic or dipole antennas. It is recommended that the antennas be mounted 8 or more feet in the air to prevent transmitters from coming into close proximity to the antennas. Such strong radio frequency sources will reduce the receiver's sensitivity. Be sure to use high quality 50-Ohm coax and only as much coax as is needed otherwise the receiver's sensitivity may suffer. This receiver is optimized for properly tuned external antennas. Whip antennas will noticeably reduce the sensitivity of the receiver.

Receiver Menu System

The receiver's basic menu system consists of four pages plus three hidden pages.

HOME STATUS PAGE

The home page is designed to provide the user with several pieces of information at a glance. The display will read something similar to "A---R9T9". The first letter will be an "A" or a "B" to indicate which antenna diversity channel is being used.

The next two characters are signal strength meters for each of the antenna inputs. When these characters turn into a checkered pattern it indicates excessive RF input from a transmitter too close to the antennas. The receiver will still operate properly under this condition but other receivers connected to the same antenna system will potentially have substantially reduced sensitivity.

The fourth character indicates the audio level. When this character turns into a checkered pattern the transmitter is limiting the gain of its mic preamp due to excessive audio input levels. If this occurs, reduce the audio gain on the transmitter. This will insure the highest level of unprocessed audio quality.

The next two characters indicate the receiver input voltage. This function is not currently supported and will always read "R9".

The last two characters represent the transmitter's battery level. This will range from 0 to 9. When the battery level reads zero, the transmitter has only a few minutes left before it fails. When a transmitter fails due to a low battery, remove the battery from the transmitter to prevent a total discharge of the battery. **Full discharge of a Lithium Ion cell can reduce the overall lifetime of the battery.**

CHANNEL CODE SELECT PAGE

This page allows the user to change the channel while observing the signal strength of each antenna input. This channel code is identical to the transmitter's channel code. See the transmitter's guide for a full description of the channel code. When a valid, error-free transmitter has been detected on a given channel the "ch" characters will become capitalized. The user may hold the INC or DEC key to scan through all channels. To change channels more quickly the user may hold the INC key and press the DEC key repeatedly to skip forward in 5MHz steps.

CHANNEL FREQUENCY SELECT PAGE

This allows the user to view and change the frequency of the channel in MHz instead of the channel code. The channel code is merely the last 3 digits of the channel frequency. So a channel code of 321 represents a frequency of 532.1 MHz.

LOW NOISE AMPLIFIER PAGE

The receiver contains a sensitive low-noise amplifier (LNA) on each antenna input. ***If one or more transmitters are expected to come within 10 to 15 feet of the receiver's antennas it is recommended that the LNA be turned off.*** This will dramatically improve the range of the receiver under high-RF conditions and will improve the inter-modulation performance of the receiver's front end. Forcing the LNA off will also mildly reduce the useable range of the receiver under ideal RF conditions. ***When the user is using external preamps in the antenna chain (i.e. with a quadbox) the LNA should be forced off to avoid excessive antenna gain.*** The

LNA may be forced ON when all transmitters are expected to be far away from the antennas and proper IP3 channel spacing considerations have been met.

Normally the LNA selection should be left in OFF mode when operating in a closed-in area where transmitters (within the same block as the receiver) may come close the receiver's antennas. If you are experiencing range problems or unacceptable intermittent operation turn the LNA off. If the range improves, then there is a transmitter too close to the receiver. The transmitter that is too close be received properly in this case but also will drown out the signal from transmitters that are far away (similar to the party effect where it is difficult to hear a person talking at the other end of a room when someone else is shouting in your ear). The LNA may be set to ON when only one transmitter is being used or multiple transmitters are all far away from the receiver's antennas.

If an IFB or intercom transmitter is located close to the receiver then the IFB must be transmitting in a different block than the receiver is operating in. If any transmitter within the receiver's frequency block is within 10 feet, the receiver will suffer poor range when trying to listen to other transmitters that are far away. If the IFB or intercom transmitter is operating in a different block, then the receiver's front-end filter will remove the strong interference from the IFB.

IP3 channel selection:

Below are a list of frequencies that can be chosen to reduce the potential for IP3 related interference which can occur when a transmitter gets too close to a receiver. (These frequencies are in MHz and assume that your receiver is operating in block 21)

536.0	536.4	537.0	537.7	538.7	539.0	539.7	541.5	542.0	542.6
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If your receivers are on a different block, then pick a low starting frequency and add these offsets to it:

0.0	0.4	1.0	1.7	2.6	3.0	3.7	5.5	6	6.6
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For example, if you picked a starting channel of 700 MHz, the result would be:

700.0	700.4	701.0	701.7	702.6	703.0	703.7	705.5	706.0	706.6
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Proper choice of frequencies will dramatically improve your performance when a transmitter comes too close to a receiver.

SPECIALIZED FUNCTIONS MENU PAGES

To access the SPECIALIZED FUNCTIONS menu, make sure the Receiver is turned off. Hold down the FUNCTION key while powering up the receiver. This will increase the number of menu items available to the user.

DIMMER PAGE

The display brightness can be changed in this page. The brighter the display, the more current the receiver will consume. Keep the display only as bright as necessary.

TRANSMISSION FORMAT SELECTION

The display will show the current format selection. ***If this item is not set correctly the receiver will not be able to receive any audio from the transmitter.*** This item allows the user to choose between US mode and European/ENG mode. ***This user selection will not take effect until the unit has been powered down and restarted.*** See the Transmitter's guide for a further description of the available transmission formats.

Visit www.zaxcom.com for future software additions and updates. By upgrading the software in the transmitter and receiver the range and feature set will dramatically increase over time. Zaxcom has a reputation for constantly adding new features and user suggestions during the entire lifetime of a product. This ensures that your wireless system will perform better and better the longer you own it.

TEST TONE PAGE

This page allows a 1 kHz test tone to be generated by the receiver. The tone amplitude is +0 dB (20 dB less than full scale). When the user exits this page the tone will automatically be disabled.

ID CODE 0 PAGE

This code should be set to 000 for normal operation. See the Transmitter's guide for a description of the security mode.

ID CODE 1 PAGE

This code should be set to 000 for normal operation. See the Transmitter's guide for a description of the security mode.

Rx Number PAGE

The receiver has an RS485 serial port that allows communication with a personal computer or a Cameo Digital Location Mixer. This feature allows several receivers to be remotely controlled by a PC or a Cameo. This facilitates large installations where manually adjusting and monitoring the status of each receiver may be cumbersome.

The PC or Cameo must also be running the proper software in order to recognize the receiver's serial data. The RxNumber page allows the user to give each receiver a unique address for serial networking purposes. To enable a group of receivers to operate with a Cameo, number each receiver incrementally starting from 0. The special case of Master mode is engaged when a receiver is given an RxNumber equal to zero. This causes that receiver to poll the network and ask all other receivers for their respective data. Cameo listens in on the network passively and displays the appropriate status on its screen.

When attaching multiple receivers to a PC use the ZaxLan software (sold separately by Zaxcom). A special adaptor is required that allows the receivers to be attached to a PC's RS232 port. Number the receivers starting at RxNumber 1. **When using a PC do not set any of the receivers to RxNumber 0.** The PC is the master and all other receivers are slaves on the RS422 network. If any receiver on this network is assigned an RxNumber of zero, the network will become unreliable. Receiver software version 019 or greater is required for this networking feature. The software version is displayed shortly during a receiver's power-up sequence.

AES MODE PAGE

This page allows the user to choose between *Starter* and *Follower* mode. Receiver software version 020 or greater contains an AES audio mixing feature used to mix AES audio from two separate receivers onto a single AES cable. To acquire AES audio from a receiver an external AES audio reference must be present. This can be any AES audio channel from a digital recorder or digital mixer. Once an AES reference is fed into a receiver in *Starter* mode it will lock onto the sample rate of that reference signal. The starter receiver will place its audio onto the *left* channel of its AES audio output and mute the *right* channel of its AES audio output. This audio can be fed back to the mixer/recorder or may be fed into a *Follower* receiver. The *Follower* receiver will accept the AES audio from the starter and apply its audio onto the right AES audio channel while leaving the left channel intact. The AES audio that comes out the follower receiver contains the two separate channels of audio on one cable.

Receiver Software Revision History

12-20-01 rom03: print lower case letters when no TXer found

01-28-02 rom04: experimental mode - not released

02-12-02 rom05: major release:
totally new formats US, Europe/ENG
much better rejection of noise when signal is lost
split menu up into 2 menus: FN key = extended menu
added tone generation page
made T1, T0 blink to warn of low TX battery
increased display rate on main page and channel page
added 5Mhz UP+DN on channel page for impatient users
replaced HEX channel with "ch#395" to represent 539.500MHz

02-27-02 rom09: added security mode , added idcode screens, (in HEX)

03-06-02 rom10: made channel limits fall on TV channel boundaries

03-12-02 rom11: internal changes

03-19-02 rom12: initial serial RS485 routines

03-26-02 rom13: changes to AES output
fixed noise floor bug (was mostly a txer problem)
added menu page for changing RSrxnum
initial voting

04-02-02 rom14: beta voting software

05-21-02 rom15 internal changes

06-12-02 rom16 fixed SS metering spill over (minor change)

07-12-02 rom916 European mode changes

07-18-02 rom17 changed European mode to higher quality (don't use with old transmitters)

08-15-02 rom18 started to rs485 remote control - partial

08-23-02 rom19 added remote commands (change freq,idcode from rs485)
rom19 swapped menus for ID0,ID1 for better intuitiveness

09-19-02 rom20 added AES L/R merge mode (added page_aes =start/follow)