# LECTROSONICS DSR4 Four Channel Digital Slot Receiver User Guide



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## LECTROSONICS DSR4 Four-Channel Digital Slot Receiver

## Product Information

- **Product Name:** DSR4 Four-Channel Digital Slot Receiver
- **Model Variants:** DSR4-A1B1, DSR4-B1C1, DSR4-941, DSR4-961
- **Compatibility Modes:** The DSR4 receiver features AES 256-bit, CTR mode encryption, with 4 different key policies available.
- **Diversity Options:** The DSR4 offers two diversity options. For 4-channel operation, each channel combines signals from both antennas in or out of phase, depending on the field strength at each antenna. For 2-channel operation, receivers can be paired for Vector Diversity operation, which smoothly combines RF signals from both channels with different phase angles to obtain maximum energy.
- **RF Frequency Tracking Front-End:** The DSR4 utilizes RF frequency tracking front-end technology.
- **Smart Noise Reduction (SmartNR):** The DSR4 employs a Smart Noise Reduction algorithm that attenuates only portions of the audio signal that fit a statistical profile for randomness or electronic hiss. This algorithm does not affect desired high-frequency signals such as speech sibilance and tones.

## Product Usage Instructions

1. Before using the DSR4, ensure that the slot-mount camera you intend to use it with can supply enough current safely. Consult your camera manufacturer to confirm compatibility.
2. Download the most current version of the detailed user manual from the Lectrosonics website: www.lectrosonics.com
3. Connect the DSR4 receiver to your slot device, ensuring a secure connection.
4. If using the DSR4 in 4-channel operation, position the antennas appropriately for optimal signal reception.
5. If using the DSR4 in a 2-channel operation, pair the receivers for Vector Diversity operation.
6. Configure the encryption settings on the DSR4 receiver according to your requirements, choosing from the available key policies.
7. Adjust the levels properly at the transmitter to ensure reasonable audio quality and minimize noise.
8. Take advantage of the Smart Noise Reduction feature to attenuate unwanted noise while preserving desired high-frequency signals.

### Technical Description

The DSR4 digital 4-channel re-ceiver is a versatile slot receiver, equally appropriate for bag use, as well as reality TV and run and gun applications. Extremely high Third Order In-tercept (IP3) performance of +15 dBm, 24-bit/48 kHz audio perfor-mance, and AES-256 CTR mode encryption ensure that profession-als in all audio disciplines have the tools needed to get the job done, even in extremely tough environments.

### Compatibility Modes

The DSR4 receiver was designed to operate with Lectrosonics digital transmitters from the D2, DCH and M2 series. The receiver is also backward compatible with Digital Hybrid Wireless® trans-mitters including those with NA Hybrid, NU Hybrid, JA HYBRID and EU Hybrid modes.

### Encryption

The DSR4 receiver features AES 256-bit, CTR mode encryption, with 4 different key policies available.

### Diversity Options

The DSR4 offers two diversity options: for 4-channel operation, each channel combines signals from both antennas in or out of phase, depending on field strength at each antenna and which combination yields the best

results. For 2-channel opera-tion, receivers can be paired for www.lectrosonics.com Vector Diversity operation. The Vector subsystem smoothly and continuously combines RF signals from both channels, with dif-fering phase angles in order to obtain maximum energy. The four receivers in the DSR4 can be use separately or combined in pairs.

**RF Frequency Tracking Front-End**
In addition to the extremely high IP3 capability of the receiver, to significantly reduce unwanted interference and intermodulation problems, the DSR4 has a fre-quency selective front-end section that tracks and tunes to the de-sired signal frequency and rejects unwanted interfering signals. The low noise, high current RF ampli-fier was designed with feedback regulation for stability and precise gain in order to handle stronger RF signals without output over-load. This produces a robust front-end that is as selective as fixed single frequency designs and is suitable for use in close proximity to other receivers and transmitters commonly used in field production bag systems.

**Smart Noise Reduction (SmartNR™)**

- The DSR4 has been meticulously designed using the best avail-able low noise components and techniques. Nonetheless, the wide dynamic range of digital and Hybrid transmission technology, combined with flat response to 20 kHz, makes it possible to hear the -120 dBV noise floor in the transmitter's mic preamp, or the (usually) greater noise from the lav microphone itself. (To put this in perspective, the noise gener-ated by the recommended 4k bias resistor of many electret lavaliere mics is –119 dBV and the noise level of the microphone's elec-tronics is much higher.) In order to reduce this noise and thus increase the effective dynamic range of the system, the DSR4 is equipped with a selectable Smart Noise Reduction algorithm, which removes hiss without sacrificing high frequency response.
- The Smart Noise Reduction algo-rithm works by attenuating only those portions of the audio signal that fit a statistical profile for randomness or "electronic hiss." Desired high frequency signals having some coherence such as speech sibilance and tones are not affected.
- The Smart Noise Reduction al-gorithm has three modes – OFF/NORMAL/FULL – selectable from a user setup screen.
- When switched OFF (the default set-ting for digital compat modes) no noise reduction is performed and complete transparency is preserved. All signals presented to the transmitter's front end, including any faint microphone hiss, will be faithfully reproduced at the receiver.
- When switched to NORMAL, (the factory default setting for Hybrid modes) enough noise reduction is applied to remove most of the hiss from the mic preamp and some of the hiss from lavaliere microphones.
- The noise reduction benefit is dramat-ic in this position, yet the degree of transparency maintained is exceptional.
- When switched to FULL, enough noise reduction is applied to remove most of the hiss from nearly any signal source  of reasonable quality, assum-ing levels are set properly at the transmitter.
- This additional noise reduction comes at the cost of some transparency for low-level room noise, yet the algorithm remains undetectable under most circumstances

**Audio Output Level**
A setup screen is provided for ad-justing the audio output level in 1 dB increments from -50 to +7 dBu using the front panel MENU/SEL, UP, and DOWN buttons.

**Test Tone**
To assist in matching the audio levels of equipment connected to the DSR4, a 1 kHz audio test tone, adjustable from -50 to +7 dBu in 1 dB increments, is available at the outputs. If using AES3 outputs, the level is fixed and

cannot be adjusted.

**Power Supply**
The DSR4 is operated from an external DC power source (DCR15/4AU recommended). The receiver has a built-in Poly-Fuse for protection. This fuse automatically resets if the power supply is disconnected for about 15 sec. The power section also has protection circuits that prevent damage to the receiver if a positive ground power source is applied.

**Power Off**
When the Front Panel Power/Back button is pressed for sev-eral seconds, the audio output is instantly muted (squelched) and the message “POWERING OFF…” is displayed briefly before the receiver switches off.

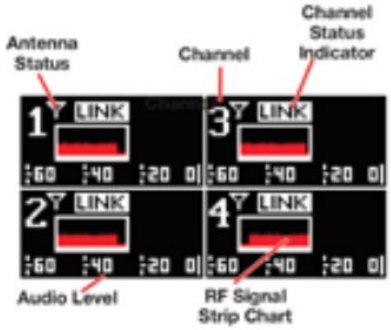
## DSR4 Front Panel Controls

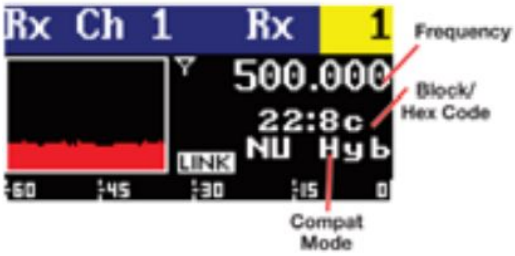
- **MENU/SEL Button**
  - The MENU button accesses the available menus and selects the desired setting.
- **PWR/BACK Button**
  - The PWR/BACK button is used to turn the receiver on and off. When browsing menus and making changes to settings, press PWR/BACK to return to previous menu.
- **Up/Down Arrow Buttons**
  - The UP/DOWN buttons are used to scroll or input the various op-tions within each menu selection.

**Antenna Port (2) TA5M Connector**
Routes analog audio Channels 3 and 4 or AES3 audio channels 1-4 to the top of the unit.

- **IR (infrared) Port**
  - (just under the front panel) Settings can be transferred be-tween transmitter and receiver or receiver and receiver.
- **USB Port**
  - (just under the front panel) [www.lectrosonics.com](http://www.lectrosonics.com) The microB USB port can be used to connect the DSR4 to the Lectrosonics Wireless Designer software and to perform firmware updates.

**Main Window Display**






The Main Window displays information concerning the RF levels at each antenna per chan-nel, audio modulation levels, the condition of the Pilot Tone (Hy-brid) or Link (digital), and power conditions for both the receiver and the associated transmitters. It is also the access portal to menu selections for setting up the receiver and searching for clear frequency channels. The PWR/BACK button will cycle between the Home screen, showing all four channels and the channel detail screens. Use the UP and DOWN arrows to go between individual channels in the Channel Detail view

- **Antenna Icons**: Status of the diversity system.
- **RF Signal Strength Strip Charts**: RF signal strength indicators.
- **Channel Status Indicator:** Pilot tone, link and encryption system status.

**Navigating the Menus**
From the Main Window, press MENU/SEL to enter the menu, then navigate with the UP and DOWN arrows to highlight the desired setup item. Press MENU/SEL to enter the setup screen for that item. Refer to the Menu Map on the following pages.

**Operating Instructions**
The following checklist includes the minimum required settings to start using the receiver:

- Install either a battery sled, camera slot adapter or other power source via EXT BOTTOM PLATE.
- Connect power to the re-ceiver.
- Set the COMPAT (compatibil-ity) mode for the transmitters to be used.
- Find clear operating frequen-cies for one or both receivers using SmartTune or manual scanning.
- Set transmitters on the matching frequencies, manu-ally or by using IR sync.
- Verify transmitters are set to the same compatibility mode as the receiver (see transmit-ter manual).
- Adjust transmitter input gain to match voice level and mic position (see transmitter manual).
- Adjust receiver output level as needed for the camera or mixer input level desired.

**IR Reflector – Purpose and Installation**
Some users, especally those who plan to use the DSR4 in a rack or closely-packed bag, may find syncing difficult due to the close spacing near the IR window. For these users, we include an IR Reflector (P/N 27372) and Adhesive Strip (P/N 27373). Once in place, this reflector allows IR sync to happen from the front of the control panel.

**Materials Needed**:

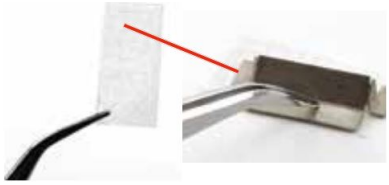
- IR Reflector
- Adhesive strip
- Alcohol pad or alcohol and a cotton swab

- Tweezers (or needle nose pliers)

### Instructions

1. Holding the reflector with twee-zers (or pliers), swab the reflector with the alcohol pad or alcohol on a cotton swab. Lay reflector with the flat side, as shown. The flat side is where adhesive will be placed. The oil from your fingers will hamper adhesion, which is why it is important not to touch the reflector.

2. Swab the area just below and directly on either side of the IR window on the DSR with the alco-hol pad. This is where the reflector will be placed.
3. Carefully remove the paper backing from the adhesive strip. Using your tweezers/pliers, place it sticky side up on a flat surface. Pick up the reflector and lay it on top of the adhesive strip. Press the center and end tabs into the adhesive with your tweezers.

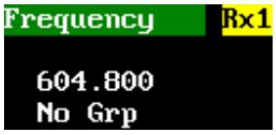


4. Slowly and carefully remove the reflector from the adhesive strip using your tweezers. It will leave the adhesive from the strip behind. Do not be concerned with the “coverage,” as the reflector only needs enough adhesive to stick to the DSR4. **www.lectrosonics.com**

5. Lay the DSR4 on a flat sur-face with adhesive facing up, and, using your tweezers, align the bottom edge of the reflector with the bottom of the “IR PORT” engraving. Press firmly with fingers to adhere the reflector to the DSR4. The bond is strong but can be removed if needed. You will need another adhesive strip to re-adhere (see Accessory pages for re-order information).

### DSR4 LCD Menu Map

The menus presented on the LCD are ar-ranged in a straightforward manner, with those that are likely to be used more often located at the top of the tree. You’ll notice that the menu headers are now in color, with symbols indicative of the menu section.




RF Setup

Smart Tune

Smart Tune
Rx 1
Rx 2
RX 3

Select option with arrow buttons to select.

Tx1 Range?
A1B1
A1

to select.

Use arrow buttons to toggle through range options

Searching...
470.600

Tuned Rx 1
525.100
Sync

to repeat and tune RX 2

Selects an open frequency.
Choose Down Arrow to Sync.

Frequency

Frequency 1
607.900
Grp u

Select Freq or Grp with arrow buttons to toggle.

Scan

Scanning...
607.000

to pause scan

to select channel.

to zoom view.
When zoomed, press MENU/SEL + UP or DOWN for fine tuning

Clear Scan Data

Scan data
CLEARED

After scan clears it automatically reverts to back the main menu tree.

* After adding a group, navigate to SD Card, then Save Group, then Save to Card to share groups with other units.

Group Edit

Group Edit u
(empty)
MENU + ↑ to ADD
MENU + ↓ to DEL

Use arrows to toggle and add freq range and groups. Use Down Arrow to save.

Vector Pairs

Vector Pairs
1&2: Paired
3&4: Not Paired

* Pilot Tone Bypass is only available in Hybrid Compat Modes

Pilot Bypass

Pilot Bypass
OFF
ON

Select option with arrow buttons to select.

TxInfo

TxInfo Rx 1
Block: A1B1
Step: 25

Audio Setup

Audio Level

Audio Level
1 +7 3 +00
2 +7 4 +00

Select option with arrow buttons to select.

Test Tone

Test Tone
Level: -48dB
Freq: 1000 Hz

Select option with arrow buttons to select.

Output Type

Output Type
1&2 AES3
3&4 ANLG

Select option with arrow buttons to select.

Smart NR

Smart NR
1 ON 3 OFF
2 OFF 4 OFF

Select option with arrow buttons. Values are Off, Norm and Full.
to select.

Talkback

Talkback
ON

Select option with arrow buttons to select.

Polarity

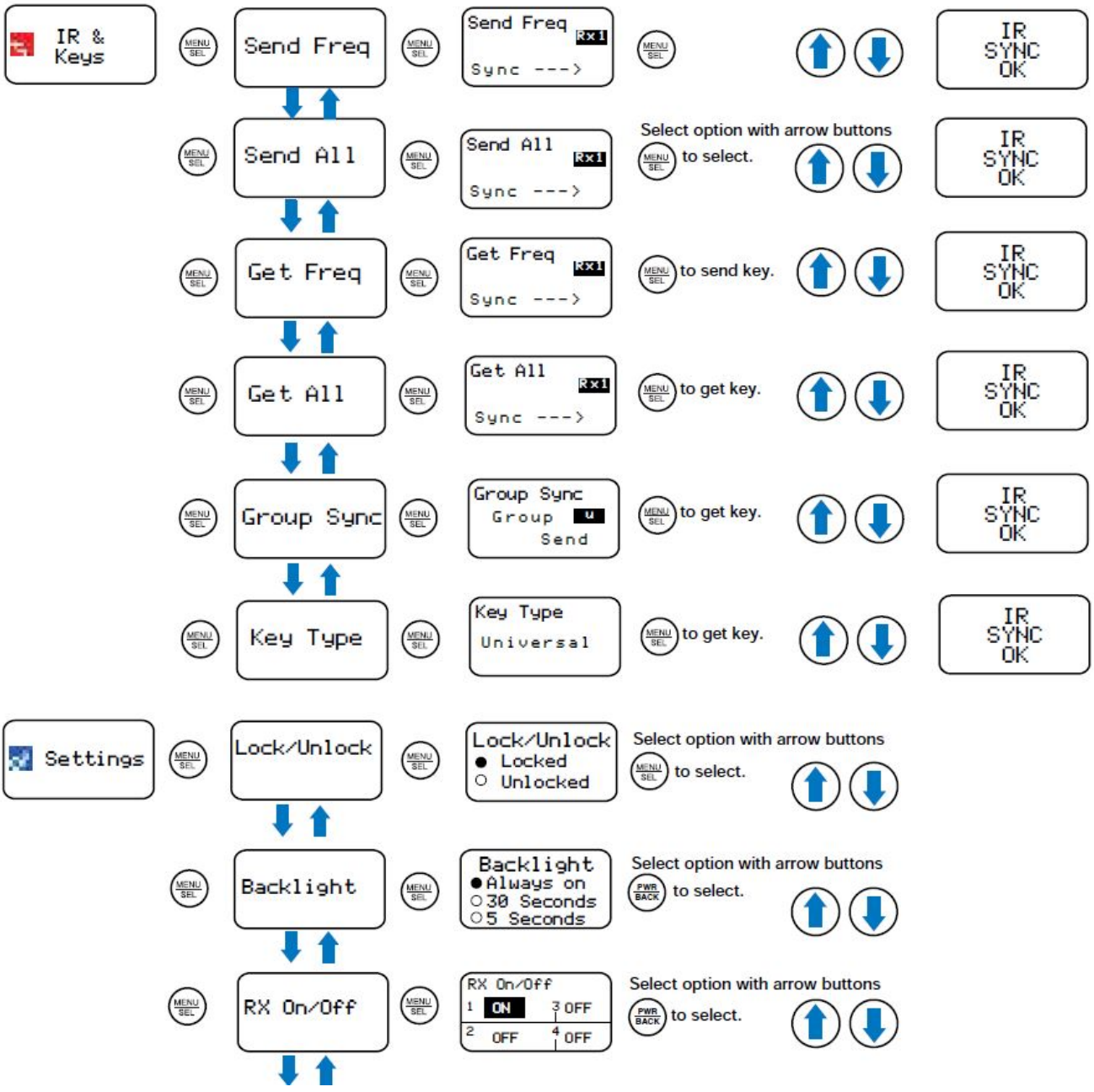
Polarity
1 POS 3 POS
2 POS 4 POS

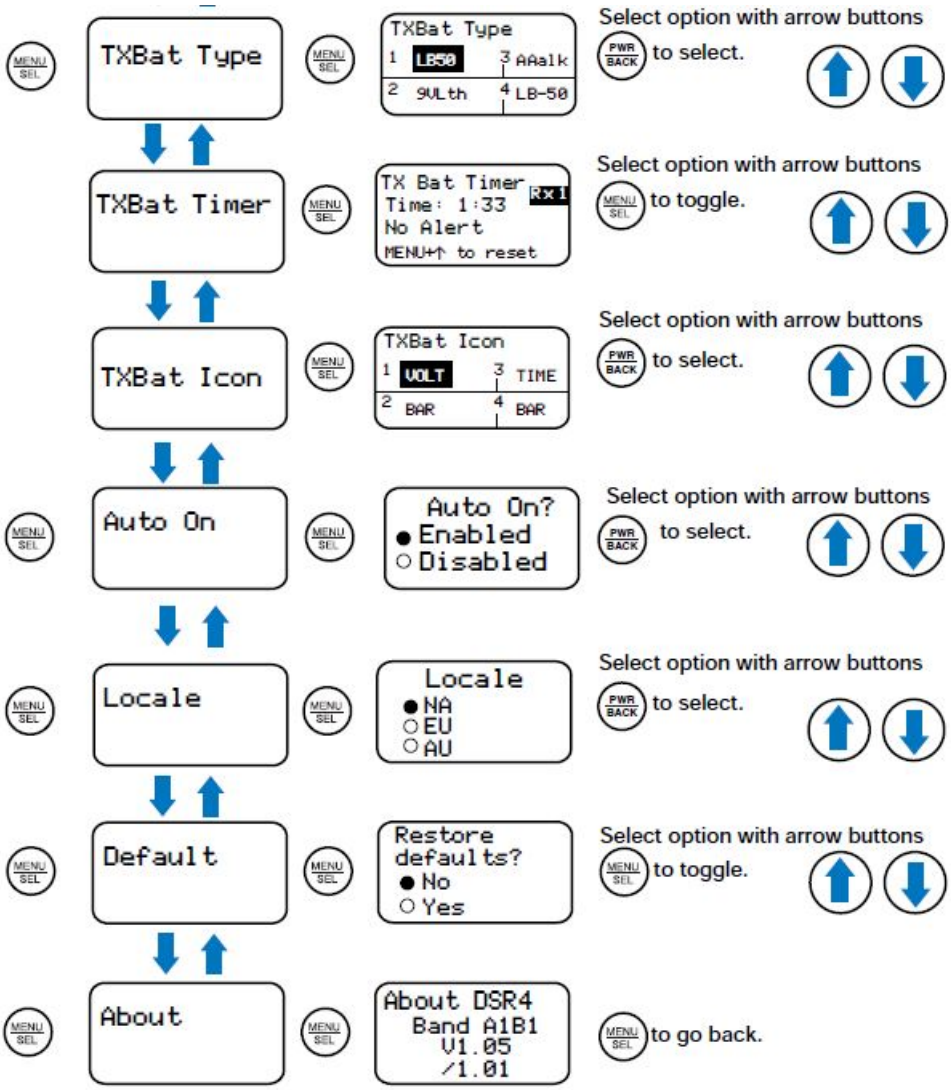
Select option with arrow buttons to toggle.

Compat Mode

CompatMode 1
D2

Select Rx1-4 with arrow buttons to toggle between Rx and mode options .


IR & Keys
Send Freq
Send All
Get Freq
Get All
Group Sync
Key Type
Send Freq RX1 Sync ---->
Send All RX1 Sync ---->
Get Freq RX1 Sync ---->
Get All RX1 Sync ---->
Group Sync Group U Send
Key Type Universal
Select option with arrow buttons
to select.
to send key.
to get key.
IR SYNC OK
Settings
Lock/Unlock
Backlight
RX On/Off
Lock/Unlock ● Locked ○ Unlocked
Backlight ●Always on ○30 Seconds ○5 Seconds
RX On/Off 1 ON 3 OFF 2 OFF 4 OFF




## Supplied Parts and Accessories

- **AMJ19**
  - Swivelling Whip Antenna with Standard SMA Connector, Block 19. Ships with A1B1 units only.
- **AMJ22**
  - Swivelling Whip Antenna with Standard SMA Connector, Block 22. Ships with A1B1 and B1C1 units.
- **AMJ25**
  - Antenna with swiveling SMA connector. Shipped with B1C1 units only.
- **AMJ944**
  - Antenna with swiveling SMA connector. Shipped with 941 units only.
- **AMJ961**
  - Antenna with swiveling SMA connector. Shipped with 961 units only.

## Optional Parts and Accessories

- **21770**
  - Male SMA to Female BNC Adapt-er.
- **21926**
  - MicroB USB cable for firmware updates.27372 IR Reflector. To be used with 27373.

- **27373**
  - Adhesive strip to be used with IR Reflector.
- **28979**
  - Replacement screws (4) for 36016 DSR4 mounting bezel kit.
- **ACOAXTX**
  - Antenna, Coaxial, SMA Plug; Specify Block.
- **DCR15/4AU**
  - Power Supply, 4ADC 100-240V In, 15VDC Regulated Output.
- **DSR4BATTSLEDBOTTOM**
  - A “battery sled” that positions the battery on the bottom of the re-ceiver for mounting on the bottom of the camera with the LCD and rear panel nomenclature oriented correctly. Two TA5 audio connec-tors and one DC coaxial connec-tor.
- **DSR4BATTSLEDTOP**
  - A “battery sled” that positions the battery on top of the receiver for mounting on the top of the camera with the LCD and rear panel nomenclature oriented correctly. Two TA5 audio connectors and one DC coaxial connector.
- **DSR4DB25**
  - DSR4 Superslot adapter connector plate for Sound Devices SL-2. This includes the adapter plate only with the two mounting screws plus one extra screw.
- **DSR4EXT**
  - Adapter kit for DSR4 re-ceiver, two TA5 audio output jacks, locking power connector, includes 6’ power cord. Has spare mounting screws in dummy holes in the adapter.
- **DSR4EXTUSB Adapter**
  - This kit includes an output and power panel with two TA5 male balanced output pairs, and a locking Hirose-4 DC power jack. A USB-C jack allows for connection of the DSR4 to Wireless Designer for monitoring, channel setup, scanning, and frequency coordination. Firmware updates must be done with the USB Micro B connector on the top panel of the unit. Power cord not incl.; order PS200A or use equivalent.
- **DSR4OCTOSPACER**
  - DSR4 mounting bezel kit with 4 screws for Octopack and Quadpack, no connector included. WARNING: Do not use Hirose 4 DC connector on the Octopack when mounting DSR4 receivers.
- **DSR4SUPER**
  - DB-25 bottom plate adapter for DSR4 receivers used in SuperSlot docks. This includes The end plate adapt-er, blue bezel (PN 27315-1), gasket, and hardware set. **www.lectrosonics.com**
- **MCTA5TA3F2**
  - Audio cable for portable digital receivers, TA5F to two TA3F connectors, 18” cable. For two analog balanced receiver outputs, or two AES digital pairs (four audio channels), into a mixer or recorder inputs.
- **MCTA5TPT2**
  - Audio cable for portable digital receivers, TA5F to two stripped and tinned wires, 18” cable. For two analog balanced receiver outputs, or two AES digital pairs (four audio channels).
- **MCSR/5PXLR2**
  - Audio cable for SR-type receivers, rotatable right-angle TA5 to two 3-pin male XLRs. 20” cable.
- **PS200A**

- Power Cable, 15 in., Hirose4 to LZR

- **PS2200A**
  - Power Cable, 15 in., Hirose4 to Dual LZR
- **SNA600A Omni Dipole Antenna**
  - Versatile Antenna, 100 MHz Bandwidth tunable from 550 to 800 MHz. Includes mounting screws and bracket. Requires SMA to BNC Adapter.

**LIMITED ONE-YEAR WARRANTY**

1. The equipment is warranted for one year from date of purchase against defects in materials or workmanship provided it was purchased from an authorized dealer.
2. This warranty does not cover equipment that has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment.
   Should any defect develop, Lectrosonics, Inc. will, at our option, repair or replace any defective parts without charge for either parts or labor. If Lectrosonics, Inc. cannot correct the defect in your equipment, it will be replaced at no charge with a similar new item. Lectrosonics, Inc. will pay for the cost of returning your equipment to you.
3. This warranty applies only to items returned to Lectrosonics, Inc. or an authorized dealer, shipping costs prepaid, within one year from the date of purchase.
4. This Limited Warranty is governed by the laws of the State of New Mexico. It states the entire liability of Lectrosonics Inc. and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER LECTROSONICS, INC. NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF ELECTRONICS, INC. HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF LECTROSONICS, INC. EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.
5. This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.

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## Documents / Resources

| | |
|---|---|
| | LECTROSONICS DSR4 Four Channel Digital Slot Receiver [pdf] User Guide<br>DSR4 Four Channel Digital Slot Receiver, DSR4, Four Channel Digital Slot Receiver, Digital Slot Receiver, Slot Receiver, Receiver |

## References

- Lectrosonics: Quality wireless microphone, encrypted digital wireless and DSP audio processing systems

Manuals+,