SHURE

LEGENDARY
PERFORMANCE™

ULXD Digital Wireless System

Draft 9/14/11

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xxxxxxx (Rev. 1)

IMPORTANT SAFETY INSTRUCTIONS

1. READ these instructions.
2. KEEP these instructions.
3. HEED all warnings.
4. FOLLOW all instructions.
5. DO NOT use this apparatus near water.
6. CLEAN ONLY with dry cloth.
7. DO NOT block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. DO NOT install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. DO NOT defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. PROTECT the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. ONLY USE attachments/accessories specified by the manufacturer.
12. 
    USE only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. UNPLUG this apparatus during lightning storms or when unused for long periods of time.
14. REFER all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. DO NOT expose the apparatus to dripping and splashing. DO NOT put objects filled with liquids, such as vases, on the apparatus.
16. The MAINS plug or an appliance coupler shall remain readily operable.
17. The airborne noise of the Apparatus does not exceed 70dB (A).
18. Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.
19. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
20. Do not attempt to modify this product. Doing so could result in personal injury and/or product failure.


This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.


This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

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⚠ **WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

WARNING: No user-serviceable parts inside. Refer all servicing to qualified service personnel.

⚠ **WARNING**

- Battery packs may explode or release toxic materials. Risk of fire or burns. Do not open, crush, modify, disassemble, heat above 212°F (100°C), or incinerate
- Follow instructions from manufacturer
- Never put batteries in mouth. If swallowed, contact your physician or local poison control center
- Do not short circuit; may cause burns or catch fire
- Do not charge or use battery packs with other than specified Shure products
- Dispose of battery packs properly. Check with local vendor for proper disposal of used battery packs

General Description

Features

Digital Audio

Receiver-controlled gain

Frequency Band Selection

More bands

Transmitter Presets

Send presets to the transmitter over a sync

Rechargeability

Shure's lithium ion batteries offer unparalleled reliability and longevity in rechargeable technology. Transmitters offer accurate and instantaneous monitoring of battery life.

Networking

Each receiver has an RJ-45 port on the back for connecting to other receivers over an Ethernet network. Networking receivers allows you to automatically set channels for all the receivers with a single group scan command. You can also control and monitor all networked receivers through the Shure Wireless Workbench PC software.

PLACEHOLDER - COMING FROM MIKE J

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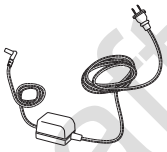
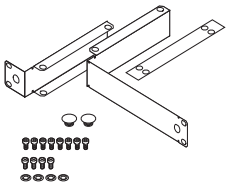
Furnished Accessories

All Systems

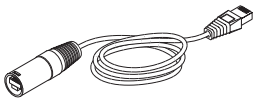
ULXD4S Receiver



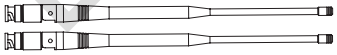
PS41 Power Supply



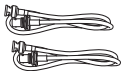
Rackmount Kit (1)



5' Ethernet Cable (1)



1/2 Wave Antenna (2)



2' BNC Cable (2)

AA Alkaline batteries (2)

BNC Bulkead Adapters (2)

Handheld Systems

ULXD2 Handheld Transmitter

Microphone Cartridge

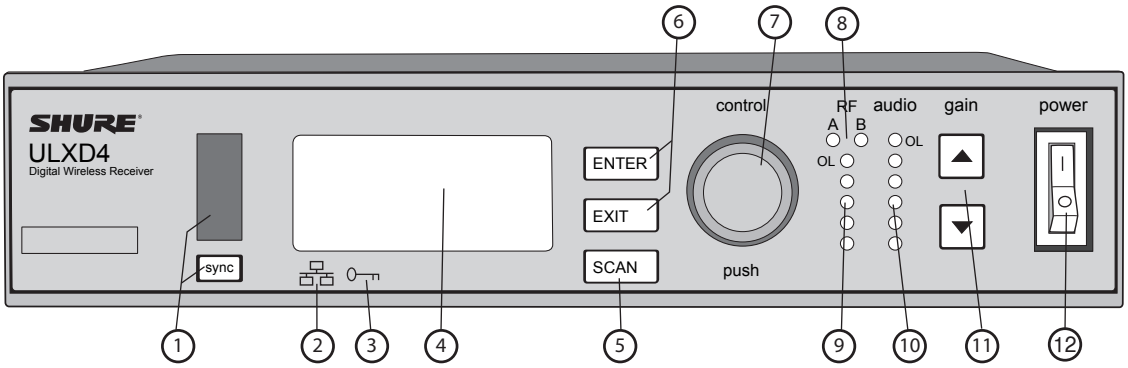
Microphone Clip

Bodypack System

ULXD1 Bodypack Transmitter

- One of the following:WA302 instrument cable
- Beta 98H/C instrument microphone
- Lavalier microphone (MX150, MX153, WL183, WL184, WL185)
- WH30 headworn microphone

Receiver



Front Panel

① **Sync Button**
Press the **sync** button while the receiver and transmitter IR windows are aligned to transfer settings from the receiver to the transmitter

② **Infrared (IR) Sync Window**
Sends IR signal to the transmitter for sync

③ **Network Icon**
Illuminates when the receiver is connected with other Shure devices on the network. IP Address must be valid to enable networked control

④ **Encryption Icon**
Illuminates when AES-256 encryption is activated: **Utilities** > **Encryption**

⑤ **LCD Display**
Displays settings and parameters

⑥ **Scan Button**
Press to find the best channel or group

⑦ **Menu Navigation Buttons**
Use to select and navigate through parameter menus

⑧ **Control Wheel**
Push to select menu items for editing, turn to edit a parameter value

⑨ **RF Diversity LEDs**
Indicate antenna status:
- Blue = normal RF signal between the receiver and transmitter
- Red = interference detected
- Off = No RF connection between the receiver and transmitter

Note: the receiver will not output audio unless one blue LED is illuminated

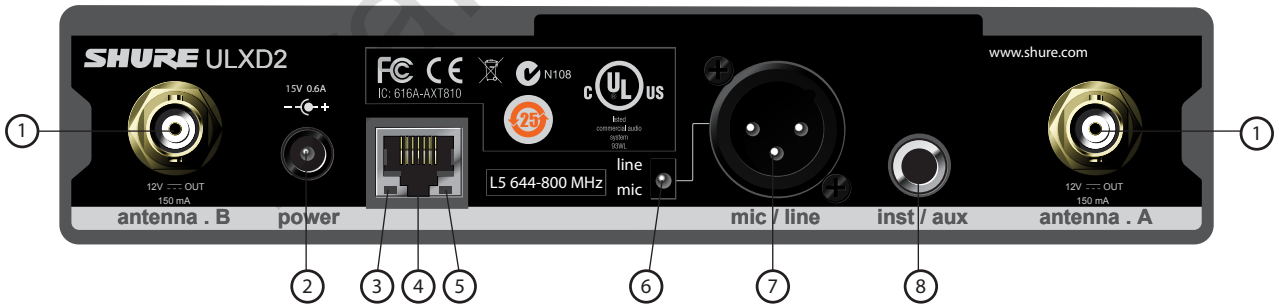
⑩ **RF Signal Strength LEDs**
Indicate the RF signal strength from the transmitter:
- Amber = Normal (-90 to -70 dBm)
- Red = Overload (greater than -25 dBm, see Troubleshooting)

⑪ **Audio LEDs**
Indicate average and peak audio levels:

LED	Audio Signal Level	Description
Red (6)	-0.1 dBFS	Overload/ limiter
Yellow (5)	-6 dBFS	Normal peaks
Yellow/ Green (4)	-12 dBFS	
Green (3)	-20 dBFS	Signal Present
Green (2)	-30 dBFS	
Green (1)	-40 dBFS	

⑫ **Gain Buttons**
Adjust channel gain

⑬ **Power Switch**
Powers the unit on or off



Back Panel

① **RF Antenna Diversity Input Jack (2)**
For antenna A and antenna B.

② **Power Supply Jack**
Connect the supplied 15 V DC external power supply

③ **Network Speed LED (Amber)**
- Off = 10 Mbps
- On = 100 Mbps

④ **Ethernet Port**
Connect to an Ethernet network to enable remote control and monitoring

⑤ **Network Status LED (Green)**
- Off = no network link
- On = network link active
- Flashing = network link active, flash rate corresponds to traffic volume

⑥ **Mic/Line Switch**
Applies a 30 dB pad in **mic** position (XLR output only)

⑦ **Balanced XLR Audio Output**
Connect to a mic or line level input

⑨ **Balanced 1/4" (6.35 mm) TRS Audio Output**
Connect to a mic or line level input

Receiver Output Gain

Output Jack	Output Level (system gain = 0)	Full Scale Output
1/4" TRS	0 dB (unity)	+12 dBV
XLR (line setting)	+6 dB	+18 dBV
XLR (mic setting)	-24 dB	-12 dBV

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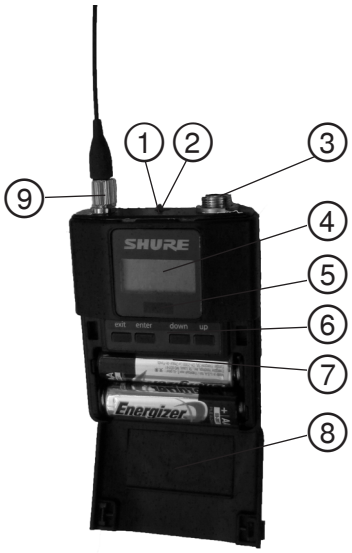
Transmitters



ULXD2 4-Way Menu Navigation Button

① **Power LED**
- Green = unit is powered on
- Red = low battery or battery error (see Troubleshooting)
- Amber = power switch is disabled

② **On/Off Switch**
Powers the unit on or off

③ **TA4M Input Jack**
Connects to a 4-Pin Mini Connector (TA4F) microphone or instrument cable

④ **LCD Display:**
View menu screens and settings. Press any control button to activate the backlight

⑤ **Infrared (IR) Port**
Align with the receiver IR port during an IR Sync for automated transmitter programming

⑥ **Menu Navigation Buttons**
Use to navigate through parameter menus and change values.

exit	Acts as a 'back' button to return to previous menus or parameters without confirming a value change
enter	Enters menu screens and confirms parameter changes
▼▲	Use to scroll through menu screens and to change parameter values

⑦ **Battery Compartment**
Requires Shure SB900 rechargeable battery or 2 AA batteries.

⑧ **AA Battery Adapter**
Handheld: rotate and store in the battery compartment to use a Shure rechargeable battery pack

Bodypack: remove to accommodate a Shure rechargeable battery pack

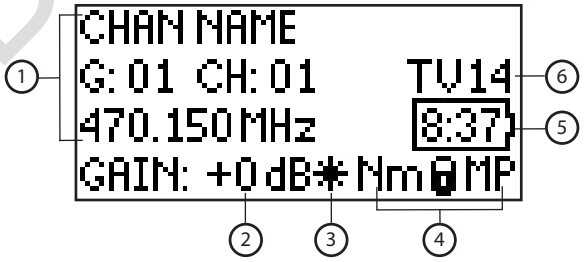
⑨ **Detachable Bodypack Antenna**
For RF signal transmission

⑩ **Integrated Antenna**
For RF signal transmission

⑪ **Microphone Cartridge**
See Optional Accessories for a list of compatible cartridges

Home Screen

Receiver



① **Receiver Information**
Use **UTILITIES** > **HOME INFO** to rearrange the following information:
- Channel name
- Group
- Channel
- Frequency

② **Gain Setting**
0 to +60 dB, or Mute

③ **Mic. Offset Indicator**
Indicates the transmitter is set to a gain offset value

④ **Transmitter Settings**
The following information cycles when a transmitter is tuned to the receiver's frequency:
- Transmitter Type (ULXD1=Bodypack; ULXD2=Handheld)
- Input Pad (Bodypack only)
- RF Power Level (**Lo**=1 mW; **Nm**=10 mW; **Hi**=20 mW)
- Transmitter Lock Status (**M**=Menu; **P**=Power)

Note: -No TX- is displayed when there is no RF connection between a receiver and transmitter

⑤ **Battery Runtime Indicator**
Shure SB900 battery: runtime is displayed in minutes remaining
AA Batteries: runtime is displayed with a 5-bar indicator

⑥ **TV Channel**
Displays the TV channel that contains the tuned frequency

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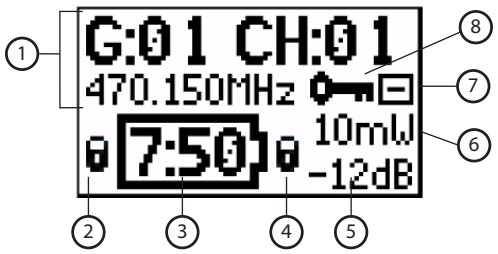
Transmitter



① **Transmitter Information**
Scroll ▲▼ at the home screen to rearrange the following information:
- Channel name
- Group
- Channel
- Frequency

② **Power Lock Indicator**
Indicates power switch is disabled

③ **Battery Runtime**
See Batteries for more details

④ **Menu Lock Indicator**
Indicates menu navigation buttons are disabled

⑤ **Mic. Offset**
Displays microphone offset gain value

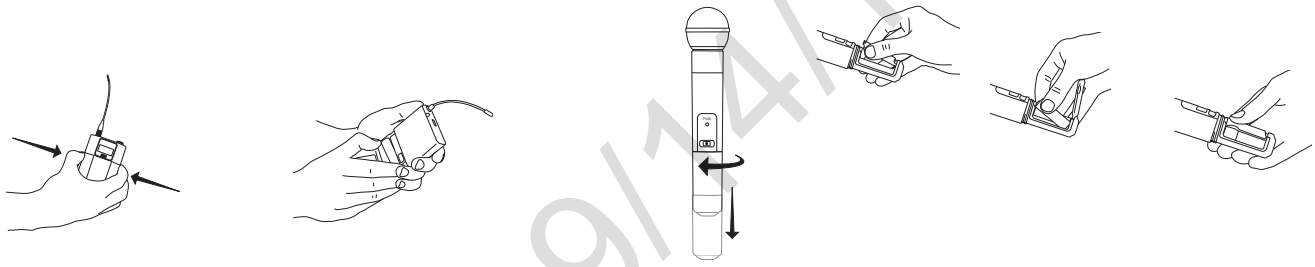
⑥ **RF Power**
Displays RF power setting

⑦ **Bodypack Input Pad**
The input signal is attenuated 12 dB

⑧ **Encryption Icon**
Indicates encryption is enabled on the receiver and has been transferred to the transmitter from a sync

Batteries

The transmitter runs on two AA batteries or the Shure SB900 rechargeable battery.



Drawings Needed:
1. Polarity
2. AA Clip storage

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AA Batteries

A 5-segment icon on the receiver and transmitter menu screens indicates battery charge.

For accurate battery runtime monitoring, set the transmitter to the appropriate battery type: **UTILITY** > **BATTERY** > **SET TYPE**.

AA Battery Runtime Chart

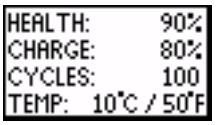
Battery Indicator	LED Color	RF Power Setting	
		1/10 mW	20 mW
	Green		
	Green		
	Green		
	Green		
	Red		
	Red		
Total Battery Runtime		##	##

Shure SB900 Rechargeable Battery

When using an SB900 rechargeable battery, the receiver and transmitter home screens display the number of hours and minutes remaining.

Detailed information for the SB900 is displayed in the receiver **BATTERY INFO** menu and the transmitter menu: **UTILITY** > **BATTERY** > **BATT. STATS**

HEALTH: Overall battery health
CHARGE: Percentage of a full charge
CYCLES: Number of times the battery has been charged
TEMP: Battery temperature in Celsius and Fahrenheit



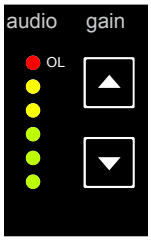
Note: Reference the SB900 Battery and SBC800 Charger user guides for additional rechargeable battery information.

Setting Gain

Adjust gain at the receiver so that the average signal levels are solid green and yellow with peaks that flicker the red overload LED. Attenuate the gain if the signal overloads repeatedly.

Set the XLR output to line-level when possible to optimize noise performance.

Reading the Audio Meter



Audio peaks illuminate the LEDs for 2 seconds while RMS signal is displayed in realtime.

OL (Overload) LED: Illuminates red when the internal limiter is engaged, preventing digital clipping.

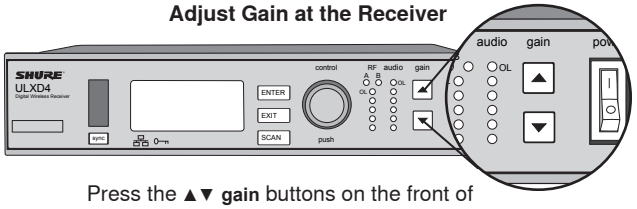
Mute

To mute the audio, use Wireless Workbench or a third-party control device.

Receiver Gain Controls

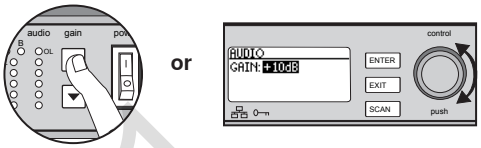
The receiver adjusts the system audio gain from 0 to +60 dB. No transmitter gain is necessary to optimize the gain structure. This allows you to make adjustments during a live performance.

Adjust Gain at the Receiver



Press the ▲▼ **gain** buttons on the front of the receiver to adjust in 1 dB increments.

Large Gain Adjustments



Press and hold a gain button

Use the control wheel in the **AUDIO** menu

Transmitter Input Clip

The following warning displays on the receiver LCD panel when the transmitter input is clipped:

To correct, attenuate the signal source. If the source cannot be attenuated while using a bodypack transmitter, select **INPUT PAD** from the main menu to attenuate the input signal 12 dB.

Mic. Offset

Use this to compensate for signal level differences between transmitters that share the same receiver.

Set the offset gain on a low signal level transmitter to match a louder transmitter: **Utility** > **Mic.Offset**

Note: For normal gain adjustments, use the receiver gain buttons.

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RF

RF Power

Reference the following table for setting RF Power:

RF Power Setting	Range	Application
1 mW	≤100 ft.	For increased channel reuse at close distances
10 mW	≤300 ft.	Typical setups
20 mW	≤420 ft.	For hostile RF environments or long-distance applications

Note: Using the 20 mW setting decreases the transmitter battery runtime and reduces the number of compatible systems. See the specifications section for details.

Interference Detection

Interference Detection analyzes the quality of the RF signal and detects interference conditions that have caused an audio signal dropout. When interference is identified, the RF LEDS illuminate red and the following warning displays on the receiver LCD panel.

Perform a Scan and Sync during a performance break if the warning display persists or the audio drops out repeatedly.

Scan and Sync

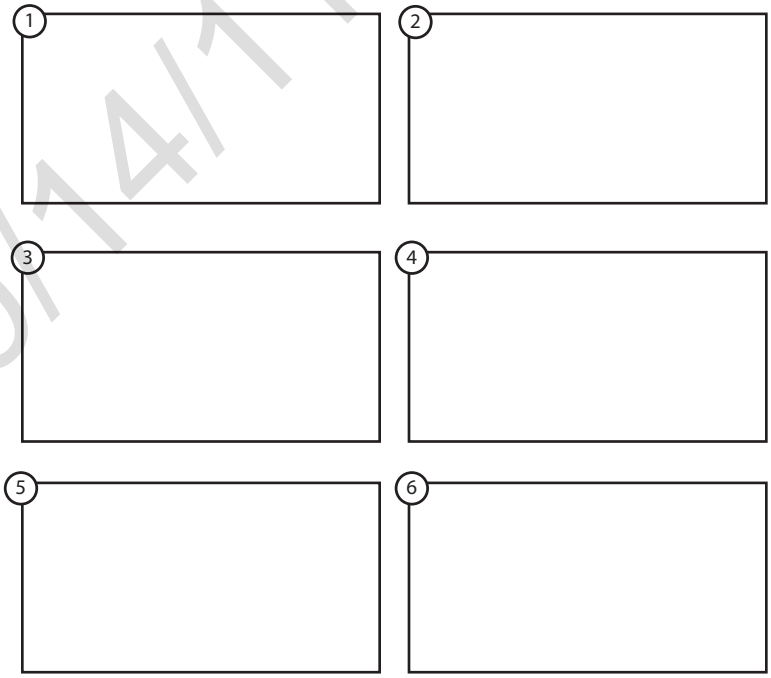
Use this procedure to tune a receiver and transmitter to the best open channel.

Important! Before you begin:

Turn off all transmitters for the systems you are setting up. (This prevents them from interfering with the frequency scan.)

Turn on potential sources of interference such as other wireless systems or devices, computers, CD players, large LED panels, effects processors, and digital rack equipment so they are operating as they would be during the presentation or performance (so the scan will detect and avoid any interference they generate).

1. Perform a channel scan on the receiver: **SCAN** > **CHANNEL SCAN**.
2. Select a group and press the **SCAN** button. **SCANNING** displays on the LCD while it searches for an open frequency.
3. After the scan completes, the receiver displays the group, channel and frequency of the best available channel. Press the flashing **ENTER** button to save the value to the receiver.
4. Power on the ULXD transmitter.
5. Press the **sync** button on the receiver.
6. Align the IR windows until the receiver IR port illuminates red.
7. When complete, **SYNC SUCCESS!** appears. The transmitter and receiver are now tuned to the same frequency.



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Multiple System Setup

A setup using networked receivers is the fastest and easiest way to distribute the best open channel to each system. See Networking Receivers for networking details.

Networked Receivers

1. Turn on all receivers.
2. Conduct a group scan on the first receiver to find the best group of frequencies in your RF environment: **SCAN** > **GROUP SCAN**.
3. Press **ENTER** to accept the group number and automatically assign the next best channel to each receiver on the network.
4. Turn on a transmitter and sync to the receiver. **Repeat this step for each additional system.**

Non-networked Receivers

1. Turn on all receivers.
2. Conduct a group scan on the first receiver to find the best group of frequencies in your RF environment: **SCAN** > **GROUP SCAN**
3. Select a group that contains enough open frequencies to accommodate the entire setup.
4. Turn on the transmitter and sync to the first receiver.

Repeat the following steps for each additional system:

5. Go to **SCAN** > **CHANNEL SCAN** on the receiver to select the group assigned in step 2
6. Press the **SCAN** button to find the next best open frequency.
7. Press **ENTER** to assign the channel to the receiver.
8. Sync the transmitter to the receiver.

Manual Frequency Selection

To manually adjust group, channel or frequency, use the **RADIO** > **SET FREQ** menu.

Device ID

Name the receiver's Device ID to easily identify it through the network or in Wireless Workbench: **UTILITIES** > **NETWORKING** > **Dev. ID**

Networking Receivers

The receiver uses an Ethernet connection to network with other components. For automatic network configuration, use a DHCP enabled Ethernet switch such as the Shure AXT620. Use multiple Ethernet switches to extend the network for larger installations.

Note: Note use only one DHCP server per network.

Automatic IP Addressing

1. If using a Shure AXT620 Ethernet switch, set the DHCP switch to ON.
2. Set the IP Mode to Automatic for all receivers: **UTILITIES** > **NETWORKING** > **CTRL NETWORK**

Manual IP Addressing

1. Connect the receivers to an Ethernet switch.
2. Set the IP Mode to Manual for all devices (**UTILITIES** > **NETWORKING** > **MODE**)
3. Set compatible IP addresses for all devices.
4. Set the subnet mask to the same value for all devices.

Troubleshooting

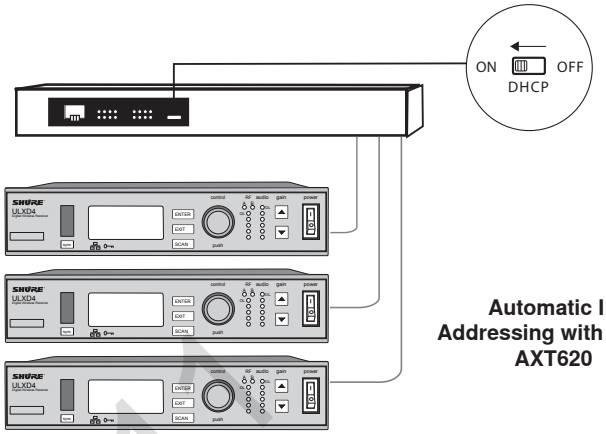
- Use only one DHCP server per network
- All devices must share the same subnet mask
- All receivers must have the same level of firmware revision installed
- Look for the illuminated network icon on the front panel of each device:

  If the icon is not illuminated, check the cable connection and the LEDs on the network jack.

  If the LEDs are not on and the cable is plugged in, replace the cable and recheck the LEDs and network icon.

To check connectivity of WWB6 to the network:

1. Start WWB6 software and use Inventory view to see devices connected to the network.
2. If not, find the IP address from one of the devices on the network (such as an ULXD receiver) and see if you can ping it from the computer running WWB6.
3. From a WINDOWS/MAC command prompt, type 'ping IPADDRESS' of the device (e.g. "ping 192.168.1.100").
4. If the ping returns success (no packet loss), then the computer can see the device on the network. If the ping returns failure (100% packet loss), then check the IP address of the computer to ensure it's on the same subnet as the Axient device.
5. If the pings are successful and the devices still do not show up in the WWB6 inventory, check to ensure all firewalls are either disabled or allow the WWB network traffic to pass to the application. Check that firewall settings are not blocking network access.



Automatic IP Addressing with Shure AXT620

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Home Screen Display Options

Receiver

Edit the following parameters in the **UTILITIES** menu:

EDIT NAME: Edits the receiver's channel name (transfers to the transmitter during a sync).
HOME INFO: Changes the information displayed on the LCD home screen:

DISPLAY: Use **BRIGHTNESS** parameter to adjust the brightness of the LCD panel, meter LEDs and front panel icons and **CONTRAST** parameter to adjust the contrast of the LCD panel.

Transmitter

Home Screen: Press the ▲▼ arrows at the home menu to display one of the following screens:

Locking Controls and Settings

Use the **LOCK** feature to prevent accidental or unauthorized changes to the hardware. Attempting to access a locked feature will display the following message:

Receiver

UTILITIES > **LOCK**

MENU: All menu paths are inaccessible. To unlock, press the **EXIT** button, turn the control wheel to select **UNLOCKED** and press **ENTER** to save.
GAIN: Gain adjustment is locked
POWER: Power switch is disabled
SCN/SYC: Cannot perform a Scan and Sync

Transmitter

UTILITY > **LOCK**

MENU: All menu paths are inaccessible. To unlock, press the **ENTER** 4 times:
UTILITY > **LOCK** > **UNLOCKED**
POWER: Power switch is disabled

Quick-Lock Option: To turn on the transmitter with its power and menu navigation buttons locked, press and hold the ▼ button during power-on until the locked message is displayed.

To unlock, turn the power switch to the off position, then press and hold the ▼ button while turning the power switch to the on position.

Transmitter Presets

Use the **TX SYNC SETUP** menu to store settings on the receiver to transfer to the transmitter during a sync. Each parameter has the default value **KEEP**, which leaves that setting unaffected by a sync.

Feature	Setting
BP PAD	0 dB, -12 dB
LOCK	All, Power, Menu, None
RF POWER	High, Mid, Low
BP OFFSET, **HH OFFSET**	0 dB to +21 dB (in 3 dB increments)
BATT	NiMH, Lithium, Alkaline
Cust. Group	On, Off

Note: When Cust. Groups is set to on, it may take up to 30 seconds to complete an IR sync.

Encryption

ULXD features Advanced Encryption Standard (AES-256) encryption, conforming to the US Government National Institute of Standards and Technology (NIST) publication FIPS-197.

1. Enable encryption on the receiver: **UTILITIES** > **ENCRYPTION**. The encryption symbol illuminates green and the LCD displays **SYNC NOW FOR ENCYPTION**.
2. Sync the transmitter to the receiver. The encryption symbol displays on the transmitter.

Note: Any change to the encryption status on the receiver requires an sync to transfer the setting to the transmitter. The Encryption Mismatch warning will display on the receiver LCD panel if they are not on the same setting.

System Reset

Use this feature to overwrite current settings with saved or factory default settings.

Save a System Preset

To save the current receiver setup as a new preset: **UTILITES** > **SYSTEM RESET** > **SAVE** > **CREATE NEW PRESET**.

Restore Settings

To restore saved or factory default settings:

1. Go to **UTILITES** > **SYSTEM RESET** > **RESTORE**.
2. Scroll to the preset or default settings option and press **ENTER**. The following warning will display:
3. Press the flashing **ENTER** button to overwrite the current settings.

Advanced RF

RF Mute

Use this to turn on a transmitter without interfering with the RF spectrum.

Press and hold the **exit** button during power-on until **RF MUTED** is displayed. To un-mute, restart the transmitter.

Custom Groups

Use this feature to create up to six groups of manually selected frequencies that can be exported to networked receivers to simplify system setup.

To create a custom group: **UTILITES** > **ADVANCED RF** > **CUSTOM GROUPS**

Note: Use Wireless Workbench or Wireless Frequency Finder to select the best compatible frequencies. See www.shure.com for more information.

To export a custom group:

1. Go to **UTILITES** > **ADVANCED RF** > **CUSTOM GROUPS** > **EXPORT**. The following screen will display.
2. Press the flashing **ENTER** button to export all custom groups to all receivers on the network.

Antenna Bias

To turn off: **UTILITES** > **ADVANCED RF** > **ANTENNA BIAS**.

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Connecting to an AMX or Crestron System

The following messages can be used to communicate with an AMX or Crestron unit across an Ethernet connection.

Message Types

The control system sends the following command messages:

SET	Sent from the control system to the Shure device to change the value of a parameter. Used to set the parameter to a specific value. Once a **SET** command is sent, the Shure device sends back a **REPORT** string with the current resultant setting.
GET	Gets the current value of a parameter. Once a **GET** command is sent, the Shure device will send back a **REPORT** string with the current setting.
REPORT	Reports the current value for a parameter. The **REPORT** string is sent from the Shure device to the Control system in response to a **SET** or **GET** command. The **REPORT** string is also sent when the value of the parameter is changed on the Shure device.

Syntax

All messages sent and received are ASCII characters.

1. Each message begins with a "<" followed by a space.
2. Each message ends with a space followed by an ">"
3. Each message is terminated by a carriage return and line feed (CRLF). The control system may need to enter the hex value, equivalent to 0x0D0A. Please see the control system user guide for information on entering carriage returns.
4. If the message is a box parameter, there should be no channel number in the string.

Example Messages

Example Messages for Channel Parameters

- <REPORT 1 FREQUENCY 578000 >/0d/0a

Example Messages for Box Parameters

- <SET DEVICE_NAME Shure >/0d/0a
- <REPORT DEVICE_NAME Shure >/0d/0a

Command Response Table

Action	COMMAND	RESPONSE
View Transmitter Name	GET DEVICE_NAME	REPORT DEVICE_NAME vvvvvvvv
Set Channel Name	SET x CHAN NAME vvvvvvvv	REPORT x CHAN_NAME vvvvvvvv
Get Channel Name	GET x CHAN NAME	REPORT CHAN_NAME vvvvvvvv
Set Audio Level	SET x AUDIO_IN_LVL vvvv	REPORT x AUDIO_IN_LVL vvvv
View Audio Level	GET x AUDIO_IN_LVL	REPORT x AUDIO_IN_LVL vvvv
Set Transmitter Group & Channel	SET x GROUP_CHAN gg,cc	REPORT x FREQUENCY vvvvvvvvvv REPORT x GROUP_CHAN gg,ccvvv
View Transmitter Group & Channel	GET x GROUP_CHAN	REPORT x GROUP_CHAN gg,cc
Set Transmitter Frequency	SET x FREQUENCY vvvvvvvvvv	REPORT x FREQUENCY vvvvvvvvvv REPORT x GROUP_CHAN --,--vvv
View Transmitter Frequency	GET x FREQUENCY	REPORT x FREQUENCY vvvvvvvvvv
Set RF Tx Level	SET x RF_TX_LVL vvvvvv	REPORT x RF_TX_LVL vvvvvv
View RF Tx Level	GET x RF_TX_LVL	REPORT x RF_TX_LVL vvvvvv
Set RF Mute	SET x RF_MUTE vvvv 1 = mute, 0 = unmute	REPORT x RF_MUTE vvvv 1 = mute, 0 = unmute
View RF Mute	GET x RF_MUTE 1 = mute, 0 = unmute	REPORT x RF_MUTE vvvv 1 = mute, 0 = unmute
Set Audio Tx Mode	SET x AUDIO_TX_MODE vvvv 1 = mono, 2 = point to point, 3 = stereo	REPORT x AUDIO_TX_MODE vvvv 1 = mono, 2 = point to point, 3 = stereo
View Audio Tx Mode	GET x AUDIO_TX_MODE	REPORT x AUDIO_TX_MODE vvvv 1 = mono, 2 = point to point, 3 = stereo
Set Audio Input Line Level	SET x AUDIO_IN_LINE_LVL vvvv 0 = off (Aux), 1 = on (Line)	REPORT x AUDIO_IN_LINE_LVL vvvv 0 = off (Aux), 1 = on (Line)
View Audio Input Line Level	GET x AUDIO_IN_LINE_LVL	REPORT x AUDIO_IN_LINE_LVL vvvv 0 = off (Aux), 1 = on (Line)
Set Metering Rate	SET x METER_RATE vvvvvvvvvv 0 = off, value in milliseconds	REPORT x METER_RATE vvvvvvvvvv 0 = off, value in milliseconds
View Metering Rate	GET x METER_RATE	REPORT x METER_RATE vvvvvvvvvv 0 = off, value in milliseconds
Audio Meter Level	REPORT x AUDIO_IN_LVL_L vvvvvvvvvv	REPORT x AUDIO_IN_LVL_L vvvvvvvvvv REPORT x AUDIO_IN_LVL_R vvvvvvvvvv

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Firmware

Firmware is embedded software in each component that controls functionality. Periodically, new versions of firmware are developed to incorporate additional features and enhancements. To take advantage of design improvements, new versions of the firmware can be uploaded and installed using the Firmware Update Manager tool available in Shure's Wireless Workbench® (WWB) software. Software is available for download from http://www.shure.com/wwb.

Perform the following steps to update the firmware for the ULXD system:

1. Download the latest firmware to WWB software: **Tools** > **Firmware Update Manager**. Click **Check Now** to view and download the latest versions.
2. Connect the receiver and computer to the same network.
3. Download the latest firmware to the receiver.
4. To transfer firmware to the transmitter, go to **UTILITIES** > **TX FW UPDATE** on the receiver.
5. Align the transmitter and receiver IR ports.
6. Press **ENTER** on the receiver to begin the download to the transmitter. IR ports must be aligned for the entire download, which can take 50 seconds or longer.

Once the download is complete, the receiver automatically begins the firmware update, which overwrites the existing firmware.

CAUTION! Do not turn off the receiver until the update is complete.

Troubleshooting

Issue	See Solution...
No Sound	Power, Cables, or RF
Faint sound or distortion	Gain
Lack of range, unwanted noise bursts, or dropouts	RF
Cannot turn transmitter off or change frequency settings, or can't program receiver	Interface locks
Encryption error message	Encryption Mismatch

Power

Make sure that the receiver and transmitter are receiving sufficient voltage. Use the 15 V DC power supply furnished with the ULXD4 receiver. Check the battery indicators and replace the transmitter batteries if necessary.

Gain

Adjust the system gain on the front of the receiver. Ensure the output level (XLR output only) on the back of the receiver corresponds to the input of the mixing console, amplifier, or DSP.

Cables

Check that all cables and connectors are working correctly.

Interface Locks

The transmitter and the receiver can be locked to prevent accidental or unauthorized changes. A locked feature or button will produce the **Locked** screen on the LCD panel.

Encryption Mismatch

Re-sync the receiver and transmitter after enabling or disabling encryption.

Radio Frequency (RF)

RF LEDs

If neither blue **RF** Diversity LED is illuminated, then the receiver is not detecting the presence of a transmitter.

The amber **RF** Signal Strength LEDs indicate the amount of signal being received. This signal could be from the transmitter, **or it could be from an interfering source, such as a television broadcast**. If more than one or two of the amber **RF** LEDs are still illuminated while the transmitter is off, then that channel has too much interference, and you should try a different channel.

The red **RF** LED indicates RF overload. This will usually not cause a problem unless you are using more than one system at the same time, in which case, it can cause interference **in the other system**.

Compatibility

- Perform a Scan and Sync to ensure the transmitter and receiver are set to the same group and channel.
- Look at the label on the transmitter and receiver to make sure they are in the same band (G50, J50, L50, etc...).

Reducing Interference

- Perform a group or channel scan to find the best open frequency. Perform a sync to transfer the setting to the transmitter.
- For multiple systems, check that all systems are set to channels in the same group (systems in different bands do not need to be set to the same group).
- Maintain a line of sight between transmitter and receiver antennas.
- Move receiver antennas away from metal objects or other sources of RF interference (such as CD players, computers, digital effects, network switches, network cables and Personal Stereo Monitor (PSM) wireless systems).
- Eliminate RF overload (see below).

Increasing Range

If the transmitter is more than 6 to 60 m (20 to 200 ft) from the receiver antenna, you may be able to increase range by doing one of the following:

- Reduce interference (see above).
- Increase transmitter RF power level.
- Use an active directional antenna, antenna distribution system, or other antenna accessory to increase RF range.

Eliminating RF Overload

If you see the red RF LED on a receiver, try the following:

- Reduce the transmitter RF power level
- Move the transmitter further away from the receiver—at least 6 m (20 ft)
- If you are using active antennas, reduce antenna or amplifier gain.
- Use omnidirectional antennas

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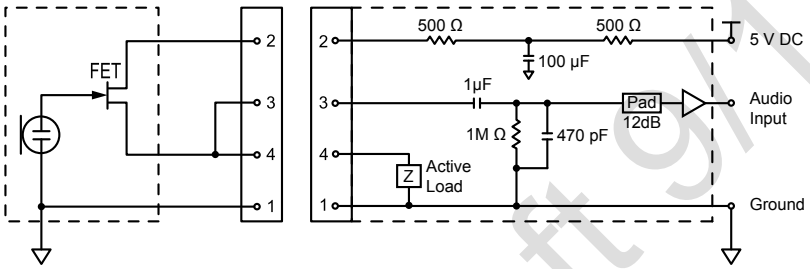
Tables and Diagrams

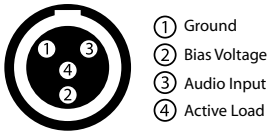
Frequency Range and Transmitter Output Power

Band	Frequency Range (MHz)	Power (mW)
G50	470 to 534	1/10/20
G51	470 to 534	1/10/20
G52	479 to 534	1/10
H51	534 to 598	1/10/20
H52	534 to 565	1/10
J50	572 to 636	10/50
K51	606 to 670	1/10
L50	632 to 696	1/10/20

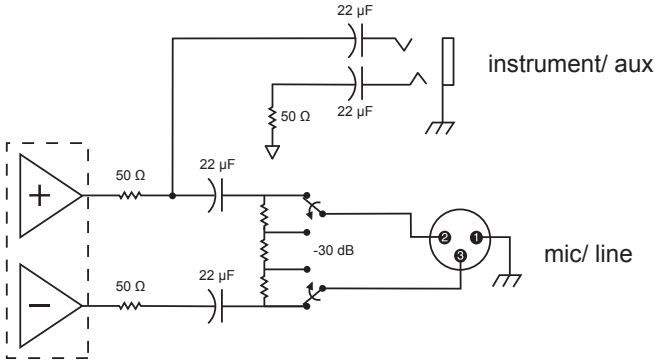
Band	Frequency Range (MHz)	Power (mW)
L51	632 to 696	1/10/20
P51	710 to 782	1/10/20
R51	800 to 810	1/10/20
JB (Tx only)	806 to 810	1/10
AB (Rx and Tx)	770 to 810	“A” Freq (770.250-805.750) : 20mW / 10mW / 1mW “B” Freq: (806.125-809.750) = 10mW / 1mW
Q51	794 to 806	10/50
X50	925 to 932	10

ULXD1 TA4M Connector





ULXD4 Audio Outputs



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Certifications

ULXD1, ULXD2, ULXD4

Meets essential requirements of the following European Directives:

- Low Voltage Directive 2006/95/EC
- R&TTE Directive 99/5/EC
- WEEE Directive 2002/96/EC, as amended by 2008/34/EC
- RoHS Directive 2002/95/EC, as amended by 2008/35/EC

Note: Please follow your regional recycling scheme for electronic waste

- Conforms to European Regulation (EC) No. 1275/2008, as amended.

Meets requirements of the following standards: EN 300 422 Parts 1 and 2, EN 301 489 Parts 1 and 9.

ULXD1, ULXD2

Certified under FCC Part 74.

Certified by IC in Canada under RSS-123 and RSS-102.

IC: 616A-ULXD1 G50, 616A-ULXD1 J50, 616A-ULXD1 L50; 16A-ULXD2 G50, 616A-ULXD2 J50, 616A-ULXD2 L50.

FCC: DD4ULXD1G50, DD4ULXD1J50, DD4ULXD1L50; 16A-ULXD2G50, DD4ULXD2J50, DD4ULXD2L50.

ULXD4

Approved under the Declaration of Conformity (DoC) provision of FCC Part 15.

Certified in Canada by IC to RSS-123.

IC: 616A-ULXD4 G50, 616A-ULXD4 J50, 616A-ULXD4 L50

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation of this device is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Note: EMC conformance testing is based on the use of supplied and recommended cable types. The use of other cable types may degrade EMC performance.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The CE Declaration of Conformity can be obtained from Shure Incorporated or any of its European representatives. For contact information please visit www.shure.com

The CE Declaration of Conformity can be obtained from: www.shure.com/europe/compliance

Authorized European representative:
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Headquarters Europe, Middle East & Africa
Department: EMEA Approval
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Phone: 49-7262-92 49 0
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Email: info@shure.de

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Information to the user

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

LICENSING INFORMATION

Licensing: A ministerial license to operate this equipment may be required in certain areas. Consult your national authority for possible requirements. Changes or modifications not expressly approved by Shure Incorporated could void your authority to operate the equipment. Licensing of Shure wireless microphone equipment is the user's responsibility, and licensability depends on the user's classification and application, and on the selected frequency. Shure strongly urges the user to contact the appropriate telecommunications authority concerning proper licensing, and before choosing and ordering frequencies.