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› Diamond Audio BTDSP-46 Digital Signal Processor User Manual

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Diamond Audio BTDSP-46 Digital Signal Processor User Manual

4-Input / 6-Output, 32-Bit Cirrus 192kHz DSP with Bluetooth App Control

1. INTRODUCTION

Thank you for choosing the Diamond Audio BTDSP-46 Digital Signal Processor. This advanced 4-input, 6-output DSP is designed to provide precise audio control and optimization for your vehicle's sound system. Featuring a 32-bit Cirrus Logic 192kHz DSP and Bluetooth connectivity, all adjustments can be conveniently made via a dedicated smartphone or tablet application. This manual will guide you through the installation, operation, and troubleshooting of your BTDSP-46 to ensure optimal performance.



Image 1.1: Top view of the Diamond Audio BTDSP-46 Digital Signal Processor.

2. SAFETY INFORMATION

Please read all instructions carefully before installation and use. Failure to follow these guidelines may result in damage to the product, vehicle, or personal injury.

- Always disconnect the vehicle's negative battery terminal before beginning any electrical work.
- Ensure proper grounding to prevent electrical shorts and damage.
- Use appropriate wire gauges for power and speaker connections.
- Mount the DSP securely in a dry, well-ventilated area away from excessive heat, moisture, or vibration.
- Do not open the DSP casing. There are no user-serviceable parts inside.
- Consult a professional installer if you are unsure about any part of the installation process.

3. PACKAGE CONTENTS

Verify that all items are present in your package:

- Diamond Audio BTDSP-46 Digital Signal Processor
- Power/High-Level Input Wiring Harness
- RCA to Terminal Block Adapters (if included)
- User Manual (this document)



Image 3.1: Contents of the BTDSP-46 package, including the DSP unit, manual, and wiring.

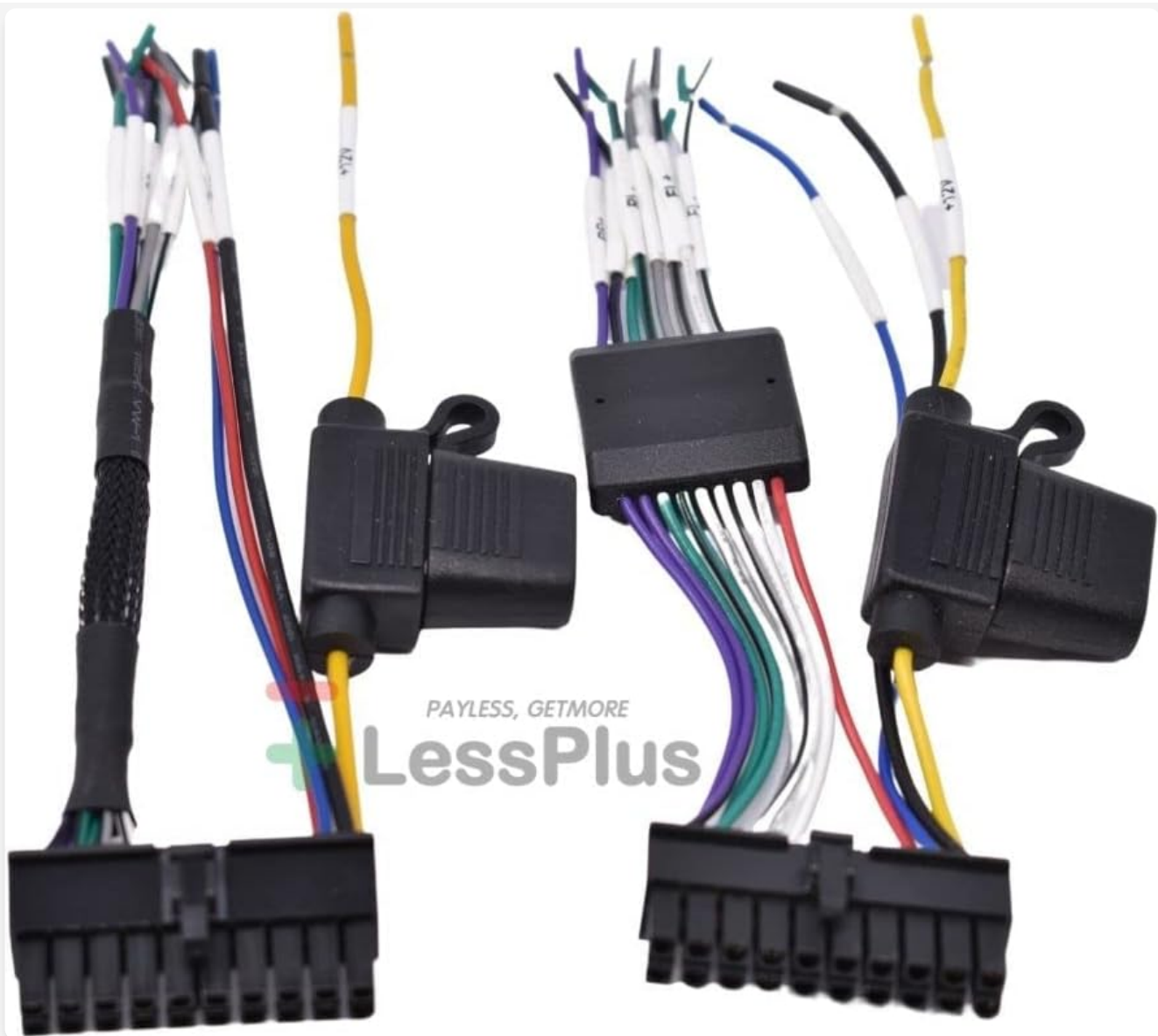


Image 3.2: Detailed view of the included wiring harnesses for the BTDSP-46.



Image 3.3: RCA to terminal block adapters, useful for certain input configurations.

4. SETUP AND INSTALLATION

4.1. Mounting the DSP

The BTDSP-46 should be mounted in a location that is dry, free from excessive heat, and protected from physical

damage. Ensure adequate ventilation around the unit. Its compact dimensions of 6.5 inches (L) x 4.25 inches (W) x 1.57 inches (H) allow for flexible placement, often behind the dashboard or under a seat.

4.2. Wiring Connections

Carefully follow the wiring diagram and instructions below. Incorrect wiring can damage the DSP or your vehicle's electrical system.



Image 4.1: Bottom view of the BTDSP-46 showing the input wiring code and serial number (BTDSP4618040474).



Image 4.2: Rear panel of the BTDSP-46, detailing the main input connector, AUX input, and remote turn-on switch.

- **Power (+12V):** Connect the yellow wire to a constant +12V power source from the vehicle's battery. Use an appropriate fuse (not supplied) close to the battery.
- **Ground (GND):** Connect the black wire to a solid chassis ground point in the vehicle. Ensure a clean, bare metal connection.
- **Remote (REM):** Connect the blue wire to the remote turn-on output of your head unit or ignition source. The DSP also features a VOX (signal sensing) activation option via the switch on the rear panel.
- **High-Level Inputs:** Use the provided wiring harness to connect to your vehicle's speaker outputs. The BTDSP-46 accepts high-level inputs up to 12V. Refer to the wiring diagram on the bottom of the unit for correct channel assignments (e.g., White/Black-LF, Grey/Black-RF, Green/Black-LR, Purple/Black-RR).
- **RCA Inputs:** The DSP features 4 balanced differential RCA inputs. Connect your head unit's RCA outputs to these inputs if using low-level signals.
- **AUX Input:** A dedicated RCA AUX input is available for additional audio sources.
- **RCA Outputs:** The BTDSP-46 provides 6 RCA outputs (Front Left, Front Right, Rear Left, Rear Right, Subwoofer Left, Subwoofer Right) to connect to your amplifiers.

4.3. App Installation and Bluetooth Pairing

The BTDSP-46 is controlled entirely via a smartphone or tablet application. Search for the Diamond Audio DSP app on the Apple App Store (for iPhone/iPad) or Google Play Store (for Android devices).



Image 4.3: Front panel of the BTDSP-46, showing RCA outputs and 'Music Connect' / 'App Connect' indicators.

- **Download the App:** Install the Diamond Audio DSP app on your device.
- **Power On DSP:** Ensure the BTDSP-46 is powered on. The 'App Connect' indicator on the front panel should be blinking or solid.
- **Bluetooth Pairing:** Open the app. It will automatically search for available BTDSP-46 units via Bluetooth (CSR4.2). Select your DSP from the list to connect. Once connected, the 'App Connect' indicator will become solid.
- **Music Bluetooth:** The 'Music Connect' indicator signifies a separate Bluetooth connection for audio streaming. Your phone's Bluetooth settings should show two entries for the DSP: one for app control and one for audio.

5. OPERATION

The BTDSP-46 offers comprehensive audio tuning capabilities through its intuitive smartphone/tablet application.

5.1. App Interface and Audio Adjustments

The app provides access to all DSP functions, allowing you to fine-tune your audio system with precision.

- **Equalization (EQ):** The DSP features 7-band adjustable parametric EQ for each channel. You can adjust frequency centers and Q-factor (from a wide Q of 1 to a very narrow Q of 9) to precisely shape the sound.
- **Crossover:** Set high-pass, low-pass, and band-pass filters for each output channel. Crossover frequencies are variable from 10 Hz to 19 kHz, with slopes of 6/12/18/24/32dB/Octave (Linkwitz-Riley).
- **Time Alignment:** Adjust the delay for each speaker output to ensure that sound from all speakers arrives at the listening position simultaneously, creating a focused soundstage.
- **Gain Control:** Independently adjust the output gain for each channel.
- **Input Mixing:** Configure how input signals are routed and mixed to the output channels.

5.2. User Presets

The BTDSP-46 allows you to save up to 8 user-defined presets. This is useful for storing different tuning configurations, such as settings optimized for different music genres, listening positions, or even different vehicles (2 vehicle memories are available).

5.3. Music Streaming

In addition to app control, the BTDSP-46 supports Bluetooth audio streaming (CSR4.2). Once paired, you can stream music directly from your smartphone or tablet to the DSP, which then processes and outputs the audio to your amplifiers.

6. MAINTENANCE

The BTDSP-46 is designed for reliable operation with minimal maintenance. Keep the unit clean and free from dust. Use a soft, dry cloth for cleaning. Do not use harsh chemicals or solvents. Ensure that all connections remain secure.

7. TROUBLESHOOTING

If you experience issues with your BTDSP-46, refer to the table below for common problems and solutions.

Problem	Possible Cause	Solution
No Power	Blown fuse; loose power/ground connection; no remote signal.	Check fuse, verify all power and ground connections are secure. Ensure remote wire receives +12V when head unit is on. Check REM/VOX switch.
No Sound Output	Incorrect input/output connections; gain set too low; DSP not configured.	Verify all RCA/speaker connections. Check gain settings in the app. Ensure input mixing and output routing are correctly configured in the app.
Distorted Sound	Input signal too high; output gain too high; incorrect EQ settings.	Reduce input signal level (if adjustable). Lower output gain. Review EQ settings for extreme boosts.
Bluetooth App Not Connecting	DSP not powered on; Bluetooth disabled on device; app not updated.	Ensure DSP is powered. Enable Bluetooth on your smartphone/tablet. Restart app and device. Try re-pairing.
Intermittent Sound	Loose wiring; poor ground connection.	Inspect all wiring for secure connections. Ensure ground point is clean and solid.

8. SPECIFICATIONS

Feature	Specification
Processor Type	32-Bit Cirrus Logic Single Core DSP
Sampling Rate	192 kHz
Inputs	4 x Differential Balanced RCA / High-Level, 1 x RCA AUX
Outputs	6 x RCA PreAmp Outputs

Feature	Specification
PreAmp Output Voltage	> 3 Volts RMS
Input Voltage (Low-Level)	Up to 4V
Input Voltage (High-Level)	Up to 12V (1.5V - 12V)
Input Impedance	20k Ohms
Output Impedance	200 Ohms
Frequency Response	20 Hz - 20 kHz +/- 0.5 dB
Signal to Noise Ratio (RCA/AUX)	> 100 dBA (A-weighted)
THD+N	< 1.0 %
Bluetooth Version	CSR4.2
EQ Bands	7-Band Parametric EQ per channel
EQ Q-Factor	Adjustable from 1 (wide) to 9 (narrow)
Crossover Type	High-Pass, Low-Pass, Band-Pass, All-Pass (Linkwitz-Riley)
Crossover Frequency	Variable: 10 Hz to 19 kHz
Crossover Slope	6/12/18/24/32 dB/Octave
User Presets	8 assignable memories (2 per vehicle)
Operating Voltage	9 - 16 VDC
Dimensions (L x W x H)	6.5 inches x 4.25 inches x 1.57 inches (16.51 x 10.8 x 3.99 cm)
Weight	1.36 kg (approx.)

9. WARRANTY AND SUPPORT

Diamond Audio Technology products are designed and manufactured to the highest quality standards. For warranty information and technical support, please refer to the warranty card included with your product or visit the official Diamond Audio website. Keep your purchase receipt as proof of purchase for warranty claims.

For further assistance, you may contact Diamond Audio customer support directly. Please have your product model (BTDSP-46) and serial number (e.g., [BTDSP4618040474](#)) ready when contacting support.

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