Check our website for the most recent user guides, firmware, and drivers:
www.msbtechnology.com

Technical support email is:
techsupport@msbtech.com

05.29.18
## Technical specifications

| Supported Formats (Input dependent) | 44.1kHz to 3,072kHz PCM up to 32 bits
| 1xDSD, 2xDSD, 4xDSD, 8xDSD  
Supports DSD via DoP on all inputs |
| **Digital Inputs** | 4x Advanced isolated input module slots |
| **XLR Analog Inputs** | 100K Ohm Balanced  
12Vrms Maximum  
Isolated when not selected |
| **XLR Analog Outputs** | 3.57Vrms Maximum (Digital Input)  
12Vrms Maximum (Analog Input)  
75 Ohm Balanced  
Galvanically isolated |
| **Preamp Output Module Volume Control** | Purely passive constant impedance analog attenuation  
1dB steps |
| **Base Output Volume Control** | 1dB steps |
| **Display** | Custom discrete LED audio clock synchronous display  
Adjustable brightness and auto-off feature |
| **Controls** | Isolated RS-232  
IR Remote  
Knob + 3 Buttons |
| **Chassis Dimensions** | Width: 17.5 in (444 mm)  
Depth: 17.5 in (444 mm)  
Height without feet: 2.2 in (56 mm)  
Stack height: 2.85 in (72 mm)  
Weight: 29 lbs (13 kg) |
| **Shipping Dimensions** | Width: 25 in (635 mm)  
Depth: 25 in (625 mm)  
Height: 10 in (254 mm)  
Weight: 50 lbs (23 kg) |
| **Included Accessories** | User Manual  
MSB Remote  
Micro USB Charging Cable  
4x Spiked Feet  
4x Plastic inserts for feet |
The Heart of the System - Preamp and DAC

This product is a unique combination of a very high performance DAC and the ultimate passive preamp. For the best possible sound in your system, it should be connected directly to your audio amplifiers. Our preamp philosophy is based on the belief that from the moment analog audio is created, every transition that is made degrades the sound quality. This is why we offer a passive preamp within the DAC, to achieve the simplest, shortest possible signal path, with the least possible degradation of the true music. The DAC’s modular design is very flexible with the option for one or more analog inputs, and many digital inputs. It is designed to be the last component in your system before the amplifiers and replaces the need for a traditional preamp. The analog input can be enabled in the menu and can be set to volume control the analog input or bypass the analog input if you want to use another volume control for your analog source.

Setup and Quick Start

The interface is quite simple with few user controls. Input source defaults to auto switching. The display will let you know if you have an active input. On power up, the volume is reset to the programmed startup level. Shipping default is 70. Turn the volume knob up until you hear music.

| Power       | The DAC comes with a high performance powerbase. The powerbase automatically detects and switches between 240V and 120V. This is not a switching supply that works at any voltage, but a linear supply with automatic switching of the transformer leads. The power supply is switched on and off with a button on the front or via the IR remote. The LED in the front of the Power Base indicates red when OFF and white when ON. Always allow three to five hours for the DAC to warm up and reach optimal operating temperature. |
| Inputs      | The DAC comes with the digital input modules of your choice. Connect any digital input to any active digital audio source. The frequency and bit depth of the incoming signal will be displayed on the front panel. |
| Outputs     | A range of Output Modules are available. Connect the balanced or single-ended analog outputs to any amplifier. The output level is controlled with the knob or remote. |

When stacking the units, you will find enclosed black plastic square inserts. These inserts fit into the square holes in the top of each chassis. This will allow you to stack the units without scratching the chassis.

Burn-In

The feedback we receive leads us to recommend at least 100 hours of burn-in on this DAC. Customers generally report improvement up to one month.
**User Interface**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Menu Button</strong></td>
<td>The square button is single purpose. It will enter the setup mode at the top of the menu tree. If in the setup, and it doesn't matter where, this button will exit the setup and return to the normal operational mode.</td>
</tr>
<tr>
<td><strong>Input Selection</strong></td>
<td>The right and left arrows switch inputs. The ‘Auto’ mode will be in the list of inputs. The right and left arrows switch inputs. If ‘Auto’ is selected, the unit will automatically switch inputs based on priority (Input slot B is higher than Input slot A) with the analog input being lowest priority. When a source with a higher priority becomes active, the unit will automatically switch to the new higher priority input. Toggling through the inputs manually will defeat any auto switching. When in the setup menu the arrows move right and left through the menu structure.</td>
</tr>
<tr>
<td><strong>Volume Knob</strong></td>
<td>This knob adjusts the volume between 0 and 106.</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>The display shows the Input, sample rate, bit depth, and volume.</td>
</tr>
</tbody>
</table>
About the 4 input module slots
The DAC has four input module slots. They are labeled A through D. There are two classes of input modules, analog and digital. Analog modules must be placed adjacent to the analog output module. They can be either additional analog inputs or a second analog output module. Digital modules can be placed in any position. Each module is completely self-contained. It is recognized by the DAC and identified on the display. When the module is not in use it is disabled.

Available Digital Input Modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProI²S</td>
<td>MSB’s proprietary interface for use with MSB transports. This module provides two inputs.</td>
</tr>
<tr>
<td>XLR S/PDIF</td>
<td>A single XLR digital input with a word sync output.</td>
</tr>
<tr>
<td>Optical/Coaxial S/PDIF</td>
<td>A Toslink and Coaxial digital input with a word sync output.</td>
</tr>
<tr>
<td>MQA USB</td>
<td>A single USB interface for playback via a computer based device. This module provides support for MQA decoding. (See USB manual for operation and setup details)</td>
</tr>
<tr>
<td>Renderer</td>
<td>A renderer interface for use on a home network or server. (See Renderer manual for operation and setup details)</td>
</tr>
<tr>
<td>Pro ISL</td>
<td>MSB proprietary interface for use with MSB transports. This module provides one input.</td>
</tr>
</tbody>
</table>

Base Output

<table>
<thead>
<tr>
<th>Output Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balanced output</td>
<td>Offers one set of balanced analog outputs. Provides volume control.</td>
</tr>
<tr>
<td>Single-Ended output</td>
<td>Offers one set of single-ended analog outputs. Provides volume control.</td>
</tr>
</tbody>
</table>

Available Preamps
The DAC is available with one of two output modules.

<table>
<thead>
<tr>
<th>Preamp Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balanced Preamp</td>
<td>Offers one set of balanced analog inputs and outputs. Provides volume control with our passive constant impedance volume control technology.</td>
</tr>
<tr>
<td>Single-Ended Preamp</td>
<td>Offers one set of single-ended analog inputs and outputs. Provides volume control with our passive constant impedance volume control technology.</td>
</tr>
</tbody>
</table>

Additional Analog Inputs and Outputs
In addition to the primary output module, additional analog inputs and a secondary analog output can be added.

<table>
<thead>
<tr>
<th>Output Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated Analog Output</td>
<td>Provides a second analog output as single-ended or balanced. Only one analog output module can be added per DAC.</td>
</tr>
<tr>
<td>Isolated Sub Analog Output</td>
<td>Provides an isolated sub-woofer output as single-ended or balanced. Only one can be added per DAC.</td>
</tr>
<tr>
<td>Additional Analog Input</td>
<td>Provides an extra analog input connection as single ended or balanced. Multiple inputs can be installed.</td>
</tr>
</tbody>
</table>
Removing and Installing Modules
Removal and installation of modules is a completely tool free process that is easily performed at the back of the unit. Under the lower lip of each module is a lever arm. Simply pull the lever out and away until it is perpendicular with the back of the unit. Then gently, but firmly, pull the module lip and lever until the module releases and slide it out of the unit.

Analog output and analog input modules must be installed in a special fashion. When installing any analog output or analog input module, you must remove the preamp output module and attach the analog output or analog input module into the side connector of the larger preamp module and then slide the connected pair into the back of the unit as one while making sure both levers are out and tightened at the same time.

Loading new firmware
Always be certain that you are updated with the current firmware by checking our website. The DACs’ firmware is always updated using a .WAV file. If you experience issues with playback of the update file, be sure to check for bit-perfect playback in your system.

All firmware updates can be found at:
www.msbtechnology.com/Support

Bit-Perfect Source Testing
The following files can be downloaded from the MSB website to verify bit-perfect playback on any transport:

| 16 bit x 44.1 kHz sample rate file (CD standard) | 24 bit x 44.1 kHz sample rate file |
| 16 bit x 48 kHz sample rate file. | 24 bit x 48 kHz sample rate file. |
| 16 bit x 88.2 kHz sample rate file. | 24 bit x 88.2 kHz sample rate file. |
| 16 bit x 96 kHz sample rate file. | 24 bit x 96 kHz sample rate file. |
| 16 bit x 176.4 kHz sample rate file. | 24 bit x 176.4 kHz sample rate file. |
| 16 bit x 192 kHz sample rate file. | 24 bit x 192 kHz sample rate file. |

They are .WAV test files that when played, will be identified by the DAC and checked, and will be reported on the display if they are bit-perfect. If there is a problem with the test, it will play but the display will not indicate any change. Be sure upsampling is turned off in any transport as this prevents a file from remaining bit-perfect. This system will allow you to easily test your source, especially computer sources, to see if all your settings are correct. There are files at all sample rates for both 16 bit and 24 bit operation.
## The MSB Remote

<table>
<thead>
<tr>
<th></th>
<th></th>
<th><strong>While in use:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Indicator LED</td>
<td><strong>White</strong> - Command Sent</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Red and White</strong> - Command Sent and Low Battery</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Red Flashing</strong> - Needs Charging</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>While charging:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Red</strong> - Charging</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>White</strong> - Fully Charged</td>
</tr>
</tbody>
</table>

### Power

- Powerbase on and off. When the powerbase is linked to an amplifier or MSB product, this button will turn off the entire system (See powerbase manual for details).

### Input

- Toggles directly through DAC inputs.

### Action 1

- Toggles phase invert.

### Action 2

- Toggles video mode.

### DAC Menu

- Enter DAC menu
  - **While in menu:**
    - **Up** - Volume Up
    - **Down** - Volume Down
    - **Enter** - Mute
    - **Return** - DAC Menu

### Volume

- The center scroll wheel controls DAC volume.

### Mute

- DAC mute.

### Track Backward

- Skip/scan backward (MSB Transport Only)

### Play/Pause

- Play and pause (MSB Transport Only)

### Track Forward

- Skip/scan forward (MSB Transport Only)

### Eject

- Eject media disc (MSB Transport Only)

### Stop

- Stop media (MSB Transport Only)

### Track Repeat

- Track or album repeat (MSB Transport Only)

### Charging Port

- Micro-USB to charge the remote battery
<table>
<thead>
<tr>
<th>Setup Menu Options</th>
<th>Bright (Display brightness)</th>
<th>Disp (Display On/Off)</th>
<th>Screen (Display detail)</th>
<th>Switch (Input switching)</th>
<th>Reset</th>
<th>DSD (DSD playback mode)</th>
<th>Volume (Startup volume)</th>
<th>Analog* (Analog input)</th>
<th>Output** (Output Level)</th>
<th>SN:</th>
<th>Code</th>
<th>IN1 to IN4</th>
<th>Output Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bright (Display brightness)</td>
<td>This can be adjusted from 1 - 10. Default is 8.</td>
<td>On (Default)</td>
<td>Small</td>
<td>Manual</td>
<td>Yes</td>
<td>Optim</td>
<td>This can be adjusted from 0 - 10. This is the default volume the DAC will power up at. If you choose to use the DAC with a external preamp, we recommend setting the default volume to 98. (Default is 70)</td>
<td>Off (Default)</td>
<td>Low</td>
<td>This screen displays the serial number of the DAC.</td>
<td>Code</td>
<td>This screen displays the current revision # of firmware installed in the DAC.</td>
<td>Lists the installed input module in slot A, B, C, and D</td>
</tr>
</tbody>
</table>
Technical Support
If you are experiencing any issues with your MSB product, please contact your nearest dealer or try our support page at www.msbtechnology.com/support. Please be sure you have the most current edition of your products firmware installed. If your issue persists please feel free to contact MSB directly. Emails are usually responded to in 24 - 48 hours.

Email: techsupport@msbtech.com

MSB Return Procedure (RMA)
If a customer, dealer, or distributor has a problem with an MSB product, they should email tech support before sending anything back to the factory. MSB will do their best to respond within 24 hours. Should it be clear that a product must be returned, tech support should be informed and all the following relevant information should be provided:

1. Product in question.
2. Serial number.
3. Detailed fault of the problem.
4. Exact configuration when symptom is observed along with a list with the input used, source material, system connections, and amplifier.
5. Customer name.
6. Customer shipping address.
7. Customer phone number and email.
8. Special return shipping instructions.

MSB will issue an RMA number and create an invoice with all details outlined except the final price as the product has not yet been seen. This invoice will be emailed so all the above information can be checked and verified by the customer.

The product should be returned with the RMA number present on the box. Work can then begin immediately and the product can be sent back quickly.

Any repair that is difficult and cannot be completed in two weeks will be identified and the customer will be informed when it is to be expected. Otherwise the majority of repairs should be shipped back within two weeks if all the required information is present on the invoice.

Link to page:
The Reference DAC Limited Warranty

Warranty includes:

- MSB warrants the unit against defects in materials and workmanship for a period of 5 years from the date the unit was originally shipped from MSB.

- This warranty covers parts and labor only, it does not cover shipping charges or tax/duty. During the Warranty period, there will normally be no charge for parts or labor.

- During the warranty period, MSB will repair or, at our discretion, replace a faulty product.

- Warranty repairs must be carried out by MSB or our authorized dealer. Please contact your dealer if your unit requires service.

Warranty excludes:

- The Warranty does not cover standard wear and tear.

- The product is misused in any way.

- Any unauthorised modifications or repairs were performed.

- The product is not used in accordance with the Operating Conditions stated below.

- The product is serviced or repaired by someone other than MSB or a authorized dealers.

- The product is operated without a mains earth (or ground) connection.

- The unit is returned inadequately packed.

- MSB reserves the right to apply a service charge if the product returned for warranty repair is found to be operating correctly, or if the product is returned without a returns number (RMA) being issued.

Operating Conditions:

- Ambient temperature range: 32F to 90F, non-condensing.

- The supply voltage must remain within the A.C. voltage specified on the power base.

- Do not install the unit near heat sources such as radiators, air ducts, power amplifiers or in direct strong sunlight.