



dBbox

the manual





Introduction

The dBbox was designed primarily for use by sound and audio installation engineers. The unit allows monitoring, metering and generation of both analogue and AES/EBU audio from a pocket sized unit. The dBbox includes a simple soft key menu driven interface to make any test as simple as possible. With the dBbox you can listen to and meter AES/EBU, analogue line and microphone level signals with or without phantom power. The unit can analyse sample rate, bits, status word and errors. It can send tone at various levels and frequencies, send microphone input to analogue line or AES/EBU output, test phantom power, test MIDI transmit and receive and much more.

This manual will deal with each menu item individually. Each function will be described by the button press sequence to access that item from the main menu as in:

Main / Outputs / AES-EBU BNC / Tone

Where from the main menu button sequence is: Outputs then AES-EBU BNC then Tone.

Some general information

The metering system has PPM ballistics and fully conforms to PPM specifications.

The battery symbol on the top right of the display shows if you have enough battery power for the current function. A solid block is a full battery. The dBbox has an intelligent battery management system which switches off all electronics not in use for a particular test. Different functions use varying amounts of power, worst case is microphone input with phantom power on selected to AES output. Any battery power display below one third may start to impair meter accuracy. This will be especially noticeable if monitoring through the loudspeaker.

Press 'main' and 'back' together to toggle the LCD display backlight on and off.

The headphone socket in all analogue functions provides a mono output to both ears. When in AES/EBU mode monitoring is stereo providing the Left/Right monitor selector is set to 'L' (Left). Inserting a jack into the headphone socket will cut the internal loudspeaker.

Meter scale may be set to either PPM or VU for analogue inputs or PPM,VU,-18dBFS or -20dBFS for digital inputs.



Main / Inputs / Line

This is a fast way to listen to and meter an analogue line level signal. Press up / down to alter the speaker volume.

Main / Inputs / Mic

Listen to and meter a low level source or a microphone output. Phantom power is available to power a connected microphone.

Press 48v to toggle phantom on/off.

Press Mic gain to adjust gain in 10dB steps from zero level to +60dB. Keep pressing and the level will start to increase back to zero level.

Use vol up/down to alter the speaker volume.

Main / Inputs / BNC or XLR

Apart from the different input connectors and impedances all functions of the XLR and BNC inputs are the same and so will be described together.

If there is not a valid AES/EBU source plugged into the dBBox then 'No valid AES input' will flash on the screen.

Use vol up/down keys to adjust volume.

Main / Inputs / BNC or XLR / LR

If selected to L then monitoring and metering the Left AES channel

If selected to R then monitoring and metering the Right AES channel

Any analysing of the signal will be performed on the channel selected here.

Main / Inputs / BNC or XLR / Analyse

This will display various important details of the AES audio input.

Sample rate Sample rate is calculated directly from the incoming clock. Possible values are 22.05kHz, 32kHz, 44.1kHz, 48kHz, 64kHz, 88.2kHz, 96kHz, 176.4kHz and 192kHz. Any other sample rates will be displayed as '???'.

Audio bits Possible values 16 bit, 20 bit, 24 bit.

Emphasis On or off.



Copyright Yes or No.

Format Possible data types PCM, IEC61937, DTS_LD, DTS_CD.

Main / Inputs / BNC or XLR / Analyse / Status word

This displays the first five (and most important) bytes of the AES status word in binary format.

Main / Inputs / BNC or XLR / Analyse / Errors

Checks for the following errors:

- CRC Q Subcode
- CRC channel status
- Unlock
- Data validity
- Biphase Encode
- Parity

On selecting this item it will be in loop mode. Any error will be shown but only for the duration of the error. If an error only occurs in one subframe it may well be missed. If 'Sticky' is selected then when an error is encountered it will be 'latched' into the display and will continue to be displayed even if the error is recovered. 'Reset' will clear all errors until they occur again. When selecting 'Sticky' always press 'Reset' directly afterwards to clear any false errors that may occur on switching.

Main / Outputs / Tone

Press 'Level Freq' to move the cursor between level adjustment and tone oscillator frequency. Level adjustment moves in 10dB steps from +10dB to -60dB. Oscillator range is from 50Hz to 25kHz in analytical steps.

Main / Outputs / Mic

With mic set to 'int' the small internal electret mic is routed to the XLR output. The microphone amplifier for the internal mic includes a noise gate and a compressor.

With mic set to 'ext' plug a microphone into the XLR input. Amplified microphone output is routed to the output XLR. Press level to adjust the microphone gain in 10dB steps.



Press 48v to toggle the phantom power on and off.

When phantom is switched on or off it may take a few seconds for the mic input (or the microphone) to settle.

Main / Outputs / XLR BNC

These outputs work in exactly the same way as Main / Outputs / Tone and Main / Outputs / Mic but the routing will be through either the XLR or BNC AES outputs.

Format will be broadcast standard 24 bit 48kHz.

Main / Phantom Test

This will measure an external phantom power voltage. Please note that since a female XLR will supply power to the microphone then the XLR male (Out) connector is used to measure the voltage. Accuracy is +/- 1 volt.

Any voltage over 60 volts will be displayed as ???.

This is also useful to check beltpack system power. Powered channel may be identified as well as voltage levels. Beltpack voltages will be approximate as voltage readings are optimized for phantom power.

Main / More / 4 wire box

The dBbox will act as a four wire box using the internal microphone and speaker. Listen to incoming audio and adjust the volume using Vol Down and Vol Up. Press talk and speak into the internal mic. The internal speaker will dim on talk to prevent feed back. Incoming level will also be metered.

Main / More / MIDI

Press **Read** to check incoming MIDI. The 'Wait' display will change to RX when incoming MIDI is received. The display will scroll up as MIDI messages are received. Press **Clear** to clear the display. MIDI note, channel number and note on/off will be displayed.

Press **Send** to send MIDI note 60 ON using MIDI channel 1. Please note that MIDI send is on non-standard pins for future MIDI through applications and an adaptor lead will be required for the send function. Please contact us for more details.

Main / More / Tone loop

Perfect for testing the frequency response of a piece of equipment. Connect the XLR output to equipment input and equipment output to XLR input. Sweep through the various tone frequencies and meter the response.

This function is also useful for a fast check of an XLR cable.



Main / More / System Setup

The software version installed in the dBbox is shown here. Please check our website for the latest available version.

Press **ana to** select the metering system used in analogue mode. Possibilities are PPM or VU. While VU will hold true for steady tone please note that the meter ballistics are PPM.

Set Zero will enable fine adjustment of input level meter reading. A range of approximately +/- 2dB is available. Please don't touch this unless you have a fully calibrated reference source available.

AES enables selection of scale shown for digital inputs. This may be -18dBFS (UK, most of Europe), 20dBFS (USA, Japan), VU scale, PPM scale.

How to update your dBbox software

The dBbox has a mini USB connector to allow for software update. Please see our website page <http://www.ctpsystems.co.uk/support.html> for the latest information.

Output Levels

The dBbox '0dB' output level is 0dBu, that is it generates 0.775 volts into a 10k ohm load, the most common input impedance these days. Into a 600 ohm load it will be approximately 0.3dB lower. Inevitably the dBbox will sometimes be plugged into a source with phantom power or something unpleasant on the line and the unit must be able to protect itself. This protection comes at a price which includes a higher output impedance in order to overcome these possibilities, hence the variation.

If you have any software problems with your dBbox or you spot any incorrect details in our manual please let us know so we can correct. Thank you.



Technical Specifications

Input level tolerance Analogue and AES/EBU

0dBu	+ -0.1dB
-10dBu	+ -0.1dB
-20dBu	- 0.5dB
-30dBu	- 0.5dB
-40dBu	- 0.5dB
-50dBu	- 0.5dB
-60dBu	+ 2dB

Output level tolerance Analogue and AES/EBU

+10dBu	-0.4dB
0dBu	+ -0.01dB
-10dBu	+ -0.1dB
-20dBu	+ 0.6dB
-30dBu	- 2.5dB
-40dBu	- 2.0dB
-50dBu	+ 1..5dB
-60dBu	+ 2dB

Analogue and AES/EBU Tone generator THD <0.07%