DSP501 / DSP502 Digital Signal Processor and network renderer

The DSP501 / DSP502 are our new state of the art Digital Signal Processors with an unprecedented level of sophistication and versatily.
The DSP502 uses a larger frame but else sports the same features as the DSP501.
With the DSP50x we are creating a new high-end audio unit which hasn't been available on the market before. It is a digital signal processor with various algorithms with the purpose to enhance the audio signal or to adapt the audio signal to the room acoustics or speakers at hand.
Weiss Engineering has a 30 year history in designing signal processing algorithms for the professional audio market, namely Mastering Studios. In that time span we have learned a thing or two about algorithm design. The DSP50x is the essence of our experiences.

- **MAIN FEATURES**

Mechanics
The DSP50x uses a stainless steel chassis with a solid 10 mm aluminium front plate.
Power Supply
A powerful non-switching power supply is used. All sensitive voltages have their own regulators for best jitter performance at the digital outputs. The power switch activates a semiconductor relay which only switches on or off at zero crossings of the mains voltage. This assures a glitch free power switching. The two mains transformers are toroidal types. Mains voltage selection is done automatically by measuring the mains voltage before power is applied to the rest of the electronics.
Synchronization
An internal high precision / low jitter clock generator is responsible for clocking the digital output section. The sampling frequency of that generator can be user selected between the values of 88.2kHz, 96kHz, 176.4kHz, 192kHz. The input signals are converted to the sampling frequency selected.
Digital Inputs
There are a total of five inputs:

- AES/EBU or S/PDIF via XLR, Toslink and RCA sockets
- UPnP / DLNA via Ethernet
- USB

Accepted formats: PCM 44.1kHz up to 384 kHz, DSD 64x / 128x.
Future formats can be accommodated for via software updates.

Roon compatibility is currently in the works.

Signal Processing

The DSP50x has a digital signal processing chip built in (DSP).
The following DSP algorithms are currently implemented or implemented soon:

- Room Equalizer - to suppress room modes for a decent bass reproduction.
- Creative Equalizer - a tone control with low boost/cut, high boost/cut and mid boost/cut. Very useful to correct those recordings which do not quite sound right.
- De-Essing - the automatic removal of overly bright sibilances from human voices. The sibilance effect can be more or less pronounced depending on your speakers or room acoustics.
- Constant Volume - adjusts the audio volume (loudness) to a constant value across all tracks played. Useful for "party mode" when the volume control should stay untouched.
- Vinyl Emulation - get that special sonic character of a record player based playback chain. We also employ an emulation of the DMM-CD procedure offered by the Stockfisch label.
- Crosstalk Cancelling (XTC) - for the playback of dummy head recordings or live recordings via speakers for an incredible live sensation. Dummy head recordings usually are listened to via headphones because they only work properly if the left channel goes to the left ear only and the right channel to the right ear only. With speakers this is difficult to achive as the left channel goes to the left and the right ear. But with some clever signal processing of the speaker channels is is possible to suppress the crosstalk, i.e. the audio going from the left speaker to the right ear and vice versa. If that works properly then the recording sounds as if one would be in the space where the recording has taken place. All the reverberation and 3D representation of the sound sources is there.(For speaker based playback only.)
- Loudness Control - a listening volume dependent equalization of the audio.
- Headphone Equalizer - to adapt any headphone to the listener's ears in terms of frequency response.

Digital Outputs

Two S/PDIF outputs on RCA connectors, two AES/EBU outputs on XLR connectors.
Up to 4 audio channels (2 Stereo channels) are supported. This allows to e.g. have two different D/A Converters connected, one for the speakers and one for the headphones.
For the two outputs independent DSP processing can be selected.
The output levels can be set in a coarse manner to adapt the output to the D/A Converter / Amplifier chain. Plus the output levels can be set in fine steps for normal level control.
Front panel controls

- A rotary encoder knob for changing parameters and for powering the unit on/off.
- A touch screen colour LCD display.
- An IR receiver.

Back panel elements

- Digital outputs on XLR and RCA connectors.
- Digital inputs on XLR, RCA, TOSLINK, USB, Ethernet connectors.
- USB type A connector for various applications.
- Mains connector with fuses.

IR Remote Control
Allows to control several functions of the DSP50x, namely:

- The input selected for processing.
- The output type, level, muting, absolute polarity.
- Power on/off.
- DSP presets.

Web Interface
The DSP50x has a web interface for configuring it via a web browser. The following functions are accessible via the web interface:

- Volume and Balance controls.
- Input selection.
- Output type.
- DSP algorithms configuration.
- DSP snapshots configuration.

- **TEHNICAL DATA**

Power
Mains voltage: 100…120 V or 200…240 V
Fuse rating: 500 mA slow blow at 100…120 V, 250 mA slow blow at 200…240 V
Power consumption: 15 VA max.
Power consumption in standby: 0.5 VA max.
Size DSP501
Depth: 30 cm
Width: 18,8 cm
Height: 6,6 cm
Height with feet: 7,2 cm

Size DSP502
Depth: 30 cm
Width: 45 cm
Height: 6,6 cm
Height including feet: 7,4 cm

Size Remote
Depth: 2,1 cm
Width: 4,5 cm
Height: 16,6 cm

Available Color
Silver, Black

Digital Inputs
(1) XLR connector
(1) RCA connector

(1) TOSLINK connector (optical)
(1) USB type B connector
(1) RJ45 Ethernet connector
All inputs accept professional or consumer standard , i.e. accept AES/EBU or S/PDIF signals .

Digital Outputs
(2) RCA Connectors
(2) XLR connectors
One pair of RCA and XLR connectors carry a stereo audio channel. Two stereo channels can be output.

Analog Outputs
None

Headphone Output
None

Synchronization
Via the input signal
Via the internal oscillator

Sampling frequencies supported at the input: 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz, 352.8 kHz, 384 kHz, DSD64, DSD128 (not all frequencies are supported with all inputs).

Sampling frequencies selectable for the outputs: 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz

https://www.weiss.ch/products/dsp501-dsp502-processors