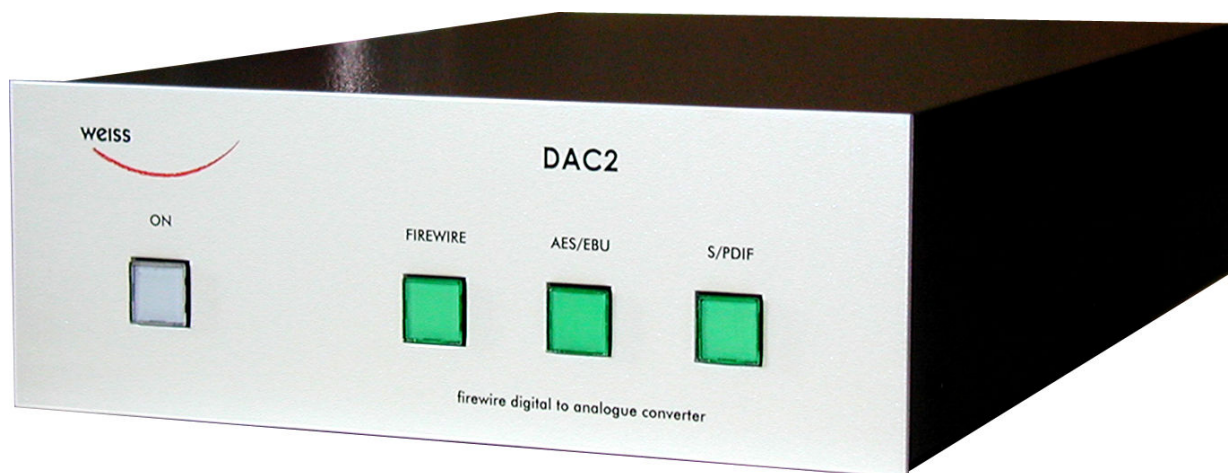# GAMBIT DAC2 FIREWIRE DAC
OPERATING MANUAL

INTRODUCTION

Congratulations on purchasing the Weiss Gambit Series DAC2 D/A Converter !

The DAC2 is a stereo 24 bit / 192khz D/A converter which supports the folowing conversions:

- Firewire to analog

- AES/EBU to analog

- Firewire to AES/EBU

- AES/EBU to Firewire

Features

- **Inputs:** There are two Firewire connectors and three AES/EBU (S/PDIF) inputs on XLR, RCA and Toslink (optical) connectors. There are two Firewire connectors in order to be able to chain more Firewire based units on a single Firewire bus. Which of the two Firewire connectors is used for the connection to the computer is not relevant. The accepted sampling frequencies are 44.1, 48, 88.2, 96, 176.4 or 192 kHz.

- **Outputs:** The analog cross-coupled type balanced outputs can drive complex loads without stability problems. The output level is fixed at +17.8dBu for both balanced and unbalanced outputs. The outputs are balanced on XLR connectors and unbalanced on RCA connectors.
  In addition to the analog outputs there are two digital outputs (AES/EBU on XLR and RCA connectors) which allow to use the DAC2 as an interface between computer and any other device which has AES/EBU inputs.

- **Sampling Rates, Wordlength:** 44.1, 48, 88.2, 96, 176.4, 192 kHz at up to 24 Bits.

- **Jitter suppression:** Several signal re-clocking schemes are combined for extremely high jitter attenuation, making the DAC2 virtually immune to jitter over a very wide bandwidth.

- **Converters:** Eight times oversampling sigma delta D/A converters are used.

- **Software:** Drivers for Windows™ and OSX™ operating systems.

- **Power Supply:** A non-switching power supply is used. All sensitive voltages have their own local regulators. The standby power supply leaves the Firewire chip powered. This allows to switch on the DAC2 via the Firewire link. The Firewire Bus Power is not used by the DAC2, this allows the DAC2 to be used with computers which do not supply Bus Power. The mains voltage can be set to 100..120V or 200..240V.

- **Frontpanel controls:** Three switches with corresponding LEDs are used for selecting one out of three input sources, which are Firewire, AES/EBU, S/PDIF. The S/PDIF selector selects both RCA and Toslink inputs. One power switch.

- **Backpanel Elements:**

  - Analog outputs on XLR and RCA connectors.

  - Digital inputs (two Firewire connectors, one XLR, one RCA and one Toslink connector).

  - Digital outputs (two Firewire connectors, one XLR, one RCA connector).

  - Mains connector with fuses and voltage selector.
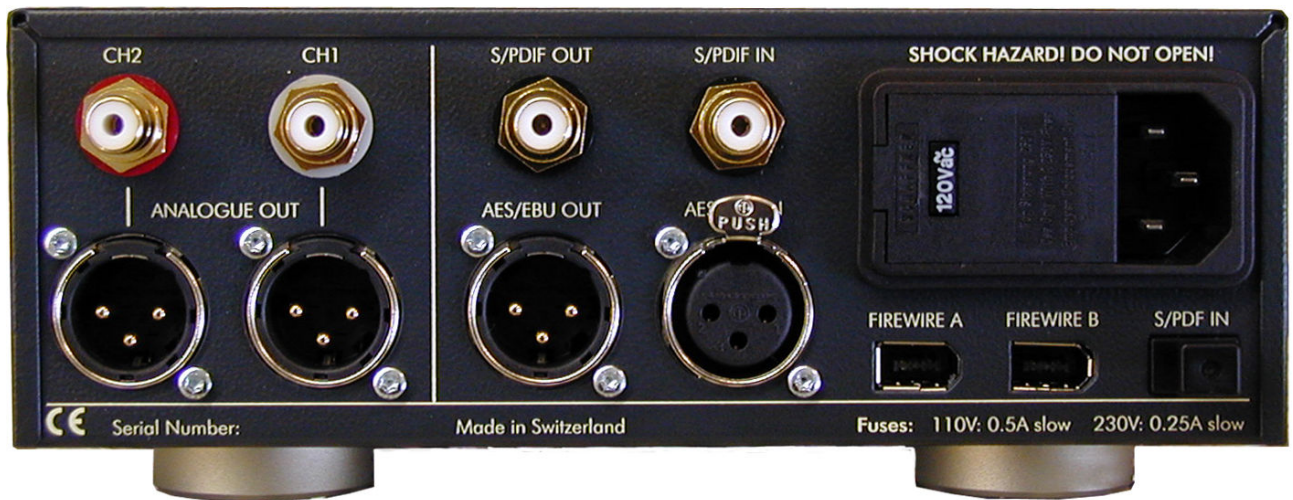
OPERATION

Unpacking and Setup of the DAC2

Carfully unpack the DAC2. The following items should be enclosed:
• The DAC2 D/A Converter unit
• A CD with the necessary Firewire drivers for Windows and OSX
• This Owners Manual

Mains Connection

Before connecting the mains cable make sure the voltage selector switch on the back of the unit (integrated into the mains connector) is set to the appropriate voltage. If this is not the case then open the mains selector lid with a strong screwdriver. The mains plug must not be plugged into the

connector for that purpose. Now you see a black selector drum with appropriate voltages written in white letters. Remove this drum, turn it to the appropriate voltage and reinsert it. Now firmly close the lid again. Connect the DAC2 to the wall outlet with the mains cable.

Input Source Connection, Selection and Synchronization

Connect sources with sampling frequencies of 44.1, 48, 88.2, 96, 176.4 or 192kHz to the input connectors at the back of the unit.
The input source pushbuttons correspond to the inputs as follows:
- Firewire: Selects the Firewire input, connected to a computer. Either one of the two Firewire connectors can be used.
- AES/EBU: Selects the XLR input.
- S/PDIF: Selects both RCA and Toslink inputs. At the first hit of the S/PDIF switch the
DAC2 selects the RCA input. If there is no signal recognized at the RCA input it
automatically selects the Toslink input. If you press the S/PDIF selection switch twice you
can skip the RCA input and select the Toslink input right away.

If a valid Firewire, AES/EBU or S/PDIF signal is present at the selected input, the LED stays lit.
If the format and/or the sampling frequency is not valid, the LED is flashing. In that case the analog outputs are muted. The DAC2 automatically synchronizes to the incoming signal.
The states of all buttons are stored in non-volatile memory, i.e. the actual input selection is retained when powering the unit off or when disconnecting the unit from the mains completely.

Output Connection

Connect your preamplifier or power amplifier to the output connectors of the DAC2. Use either the symmetrical (balanced) lines (XLR) or the asymmetrical (unbalanced) lines (RCA). The output level is fixed at +17.8dBu for both balanced and unbalanced outputs.

Software installation

Perform the following installation procedure before connecting the DAC2 to the computer. The necessary files are supplied on the enclosed drivers CD.

Windows:

0. Do not connect the device.
1. Double click "WeissFirewireInstaller.exe"
2. Click "Next"
3. Select the directory where you'd like to install the tools. Usually you can use the default values and click "Next"
4. Select if you'd like to create a desktop icon. "Next"
5. Click "Install"
6. You will be asked if you'd like to continue the installation because the driver/software didn't pass the Windows-Logo-Test.
Select "Continue".
7. Select "Yes, restart the computer now" and click "Finish"

Mac:

0. Mount the WeissFirewire.dmg diskimage by double clicking it
1. From the mounted drive double click Weiss-Firewire-3.1.1.334.pkg (the version numbers can be different of course)
2. Click "Continue"
3. Select the drive (usually you leave it at the defaults)
4. Click "Continue"
5. Click "Upgrade" or "Install"
6. You'll be asked to login as administrator
7. Confirm "Continue Installation" when warned that the computer requires a reboot after install.
8. Click Restart

After installing the drivers, connect the DAC2 to the computer and connect the power cord to the DAC2. Switch on the DAC2.
The DAC2 should now be recognized automatically. In Windows tell the installation window that you do not want to check the Microsoft website for drivers and then let it install the drivers automatically.

Software setup

The connected DAC2 device can be controlled through the Weiss DAC2 Control Panel.
The control panel can be accessed in Windows by clicking on the "Weiss Firewire IO" icon on the desktop. On Macintosh in the System Preferences under "Weiss Firewire I/O" in the "Other" category. Note that most settings controllable from the control panel are available only in firewire mode.

Device Settings

The device settings should be pretty self explanatory.

Master Device Settings

Master Device is the device which is sync master on the virtual bus in case multiple devices ("DAC2s") are connected.

Clock Source

The clock to which the DAC2 should sync to.

Sampling Rate

The sampling rate of the device when internally clocked. When clocked/synching to one of the other interfaces (XLR, RCA, TOS) you have to set the sample rate to the sample rate of the selected interface manually.

Other Settings

Available under Windows only.
- *Sample Rate Lock Mode:* Determines which parts of the driver are allowed to change the sample rate of the device.
- *Lock WDM/Windows:* allows WDM/Windows applications to change the sample rate.
- *Lock WDM/ASIO:* allows WDM and ASIO applications to change the sample rate.
- *Unlock:* no application is allowed to change the sample rate. The sample rate must be changed manually.
Enable WDM Audio: enables the WDM driver.
Operation Mode: determines the stability of the system. For weak systems you should select Safe Mode Level 3. For lower latency Normal or Save Mode Level 1 can be selected.

Buffer Size In Samples: Larger buffer sizes increase robustness against dropouts, lower buffer sizes provide low latency.
Minimum Buffer Size: the minimum buffer size allowed to use.
Isochronous Buffering: Available under Macintosh only.
Machine Type: determines if the device can handle low latencies. Slow machines will have higher latencies. Select Slow if you are not sure or if you should experience audio dropouts.

Note: If there are any problems connecting to the firewire port of your computer, it could well be that the Firewire chipset of your computer is the culprit. Texas Instruments (TI) or LSI chipsets are recommended for audio via Firewire. NEC type chipsets may cause problems.

TECHNICAL DATA

Digital Inputs:
- (1) XLR connector, (1) RCA connector, (1) Toslink connector (optical), (2) Firewire connectors.
- All inputs accept professional or consumer standard , i.e. accept AES/EBU or S/PDIF signals.
- Sampling Frequencies: 44.1, 48.0, 88.2, 96.0, 176.4 or 192kHz on any of the inputs.
- Maximum input wordlength: 24 Bits

Digital Outputs:
- (1) XLR connector, (1) RCA connector, (2) Firewire connectors.
- Professional Channel Status Data on the XLR and RCA outputs.

Analog Outputs:
- (2) XLR Connectors, (2) RCA Connectors.
- DC coupled, short circuit proofed output circuitry.
- Output impedance: 50 Ohm.
- Output level: 6Vrms (+17.8dBu) on both XLR and RCA outputs.

Synchronization:
- Synchronized via input signal.
- Extremely efficient Jitter attenuation down to subsonic frequencies.
- Sampling Frequencies: 44.1 kHz, 48.0 kHz, 88.2kHz, 96.0kHz, 176.4khz, 192kHz

Power:
- Mains Voltage: 100...120 / 200...240 Volt
- Fuse rating: 500 mA slow blow at 100…120V, 250mA slow blow at 200…240V
- Power consumption: 10VA max.
- Power consumption in standby: 5VA max.

Measurements:
The measurements below have been taken at the following conditions (unless noted otherwise):
1kHz measurement frequency, +17.8 dBu output level (equals 0dBr), 48.0kHz sampling frequency (fs), 22kHz measurement bandwidth.

Frequency Response: 0Hz ... 20kHz: within +- 0.2dB

Total Harmonic Distortion plus Noise (THD+N) : < -100 dBr @ -3 dBFS input level

Linearity: at 0 to -120dBFS input level: less than +-1dB deviation from ideal

Noise floor @ -20dBFS input: < -107dBr unweighted

Crosstalk: < -110dB, 0..20kHz

Interchannel Phase Response: < +- 0.5°, 10Hz ... 20kHz