digital audio
weiss engineering ltd.
Florastrasse 42, 8610 Uster, Switzerland
✆ +41 1 940 20 06 🖷 +41 1 940 22 14
http://www.weiss.ch / http://www.weiss-highend.com

GAMBIT

SFC2

OPERATING MANUAL

Software Version: 0S: 1.0

CONTENTS

CONTENTS 2

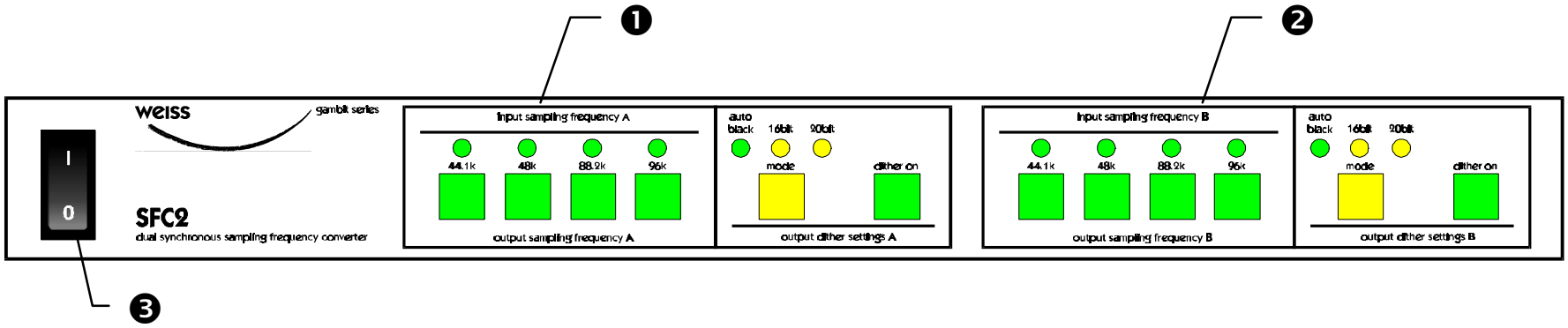
FRONT PANEL 3

INTRODUCTION 4
Features 4

OPERATION 5
Connections 5
Changing Output Sampling Frequency 5
Dither 5

TECHNICAL DATA 6
AES/EBU Input A & B 6
AES/EBU Output A & B 6
Power 6
Dither 7
Conversion Spectra 8

FRONT PANEL



Graph 1: Front Panel Elements

The front panel of the SFC2 offers several control and display features. These can be grouped according to Graph 1:

❶ - Control Elements for Channel A

❷ - Control Elements for Channel B

❸ - Mains power switch

This manual will explain how to operate the SFC2 according to these groups

INTRODUCTION

Congratulations on purchasing the Weiss Gambit Series SFC2 !

The main function of the SFC2 will be integrating playback or outboard equipment into an environment that either runs at double- or standard-sampling frequency. To allow this equipment to be positioned anywhere in the processing chain, the SFC2 features two completely independent two-channel sampling frequency converters, A & B, to simultaneously down- and up-sample a signal. Alternatively, it can also be used to convert the sample frequency and reduce the wordlength of any two arbitrary audio signals at the same time.

Standard sampling frequency converter chips continuously measure the input frequency and then generate the output frequency and the filter specifications accordingly. This results in coefficient "jitter" because the input signal sampling frequency jitter modulates the cutoff frequency of the digital filter. However, the SFC2 uses a fixed-ratio scheme where the output is directly derived from the input sampling frequency - therefore no coefficient "jitter", no filter modulation, more transparency.

Features

* Auto detection and display of input sampling frequency
* Selection of output sampling frequency with large, backlit push buttons
* Supported input and output sampling frequenncies:
  44.1 / 48 / 88.2 / 96 kHz
* Bit transparent for 1:1 conversions
* 24bit I/O on single wire AES/EBU interfaces
* Noiseshaped dither for wordlength reduction of output signal to 16 or 20bit
* Selectable autoblacking for dither – mutes dither if no signal present.
* 40bit floating point digital signal processing

OPERATION

Connections

Connect the AES/EBU signal to the input and output plugs at the rear of the SFC2.

The sampling frequency of the connected signal will either display in ❶ (channel A) or in ❷ (channel B), according to which channel was chosen.

Two stereo signals can be connected simultaneously to the the two channels A and B – they need not be in sync.

Changing Output Sampling Frequency

If none of the push buttons are pressed (none of the buttons is lit), the SFC is in input signal follow mode: the output will always be at the same sampling frequency as the input. If no dither is selected, then the output will be bit equal to the input in this mode.

To choose another output sampling frequency, simply press the appropriate button – it will be lit so that the status of the SFC can be confirmed visually.

Dither

The SFC2 is able to apply shaped dither noise to remove distortion when re-quantizing from 24bit to 16bit or 20bit output word length (see TECHNICAL DATA for dither specifications).

To toggle dither on/off, press the button marked “dither” in the “dither output settings” field. The button is lit when dither is active.

Word Length and Autoblacking

Pressing the “mode” button int the “dither output settings” field will toggle through the following modes:

- 16bit without autoblacking
- 20bit without autoblacking
- 16bit with autoblacking
- 20bit with autoblacking

The selected mode is displayed above the “mode” button.

If auto-blacking is activated, dither will be turned off if the input signal is digital zero for more than 256 consecutive samples. As soon as the input signal changes, dither will be turned on again. This ensures that breaks between programs are still at digital zero, regardless of dither.

TECHNICAL DATA

AES/EBU Input A & B

Sampling Frequencies:	44.1 kHz, 48.0 kHz, 88.2 kHz, 96kHz
Maximum Input Wordlength:	24 Bits
Channel Status Data:	Input accepts professional or consumer format.
Channel Status Bits forwarded to AES/EBU output:	all
Connector:	XLR female

AES/EBU Output A & B

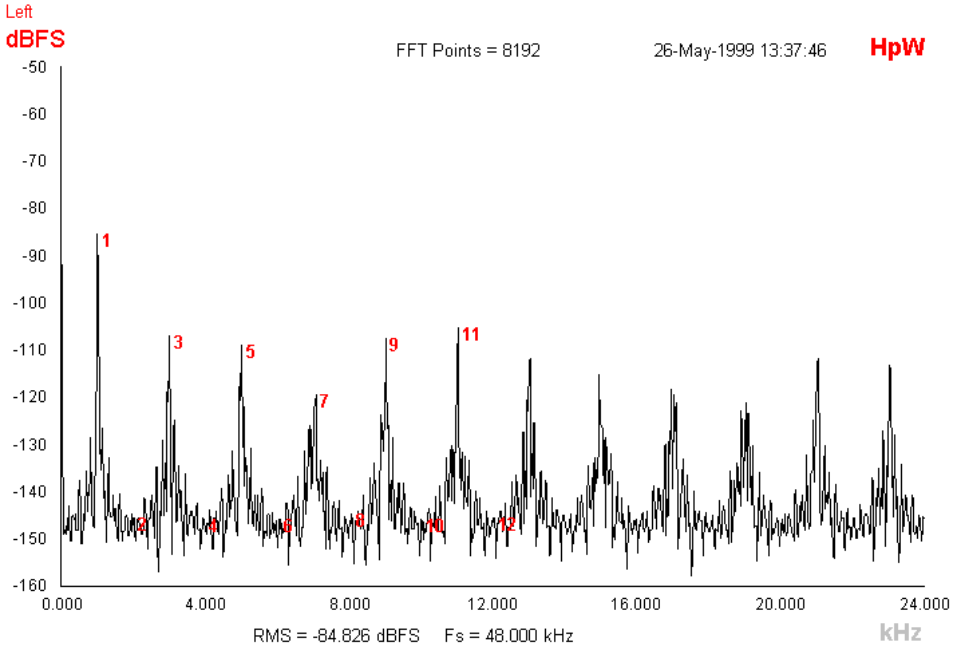
Sampling Frequencies:	44.1 kHz, 48.0 kHz, 88.2 kHz, 96kHz
Output Wordlength:	24 Bits
Connector:	XLR male

Power

Mains Voltage:	110 / 220 Volts with voltage selector
Fuse rating:	500 mA slow blow
Power Consumption:	40VA max

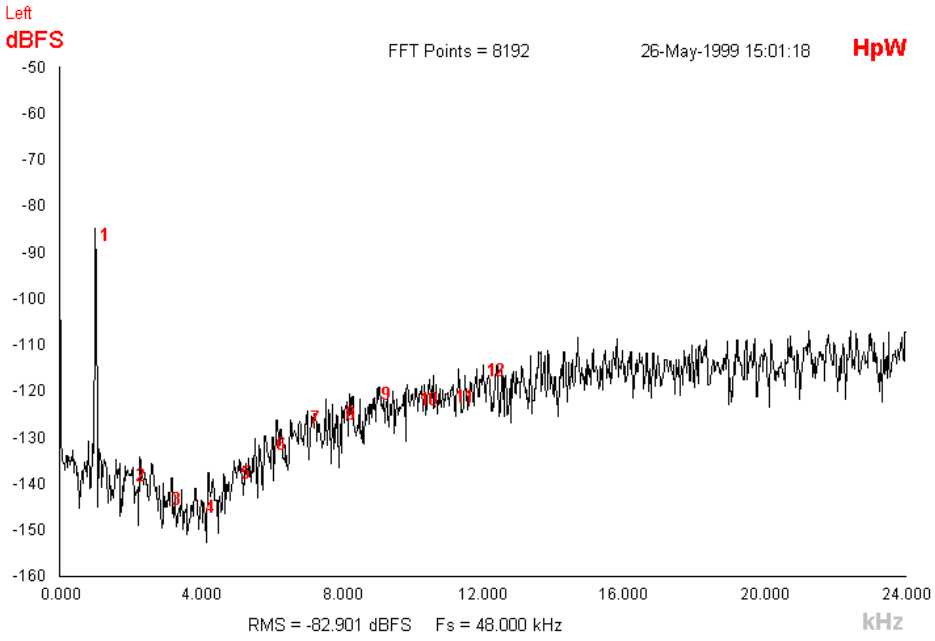
Dither

If no dither is applied to the digital signal when recording to 16bit or 20bit media (e.g. DAT, CD-R etc), the signal will be truncated, which leads to quantization noise. Graphic 2 shows a 24bit sine wave at –85dBFS truncated to 16bit.



Graphic 2: Sine wave truncated

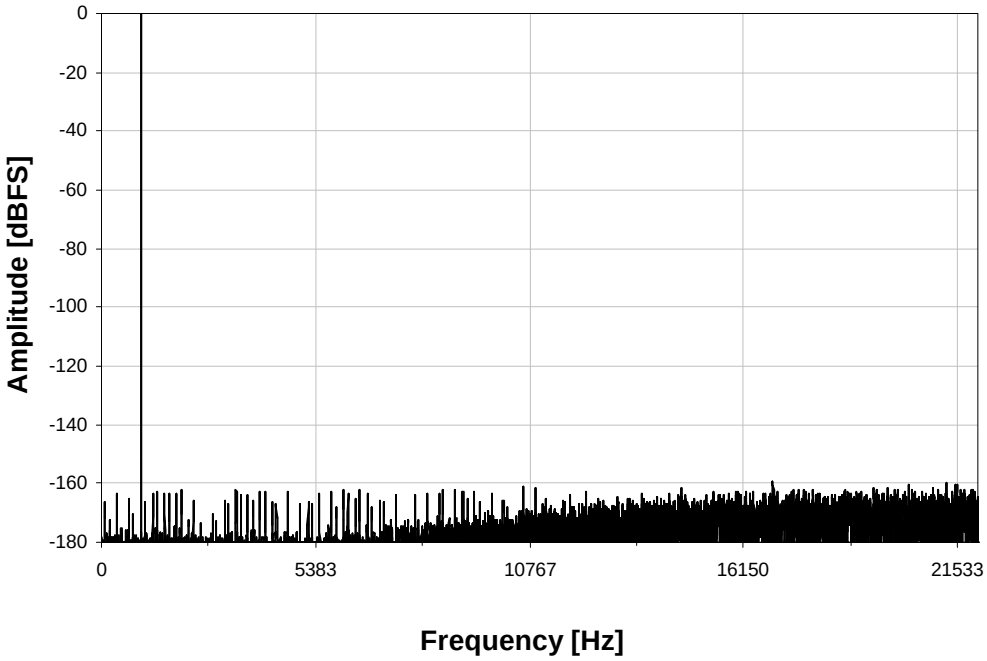
Graphic 3 shows the same sine wave, but dithered to 16bit. This eliminates quantization distortion.



Graphic 3: Sine wave dithered

CONVERSION SPECTRA

1kHz Sine 0dB Converted From 96kHz to 44.1kHz



1kHz Sine 0dB Converted From 44.1kHz to 96kHz