Appsys ProAudio

flexiverter

FLX-AES3/SRC

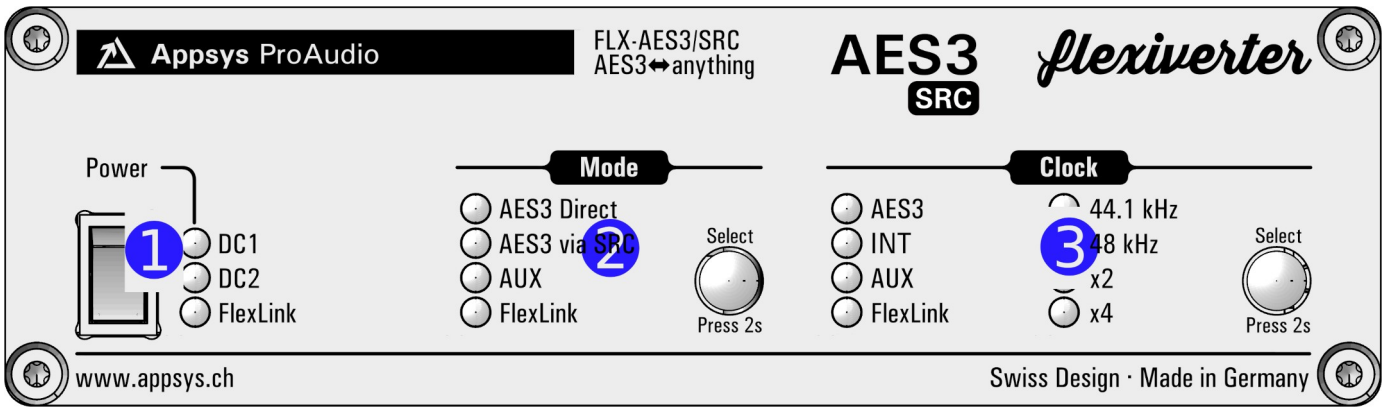
AES3-to-anything Digital Audio Converter with built-in Sample Rate Converter

User's Manual

((en))

Table of Contents

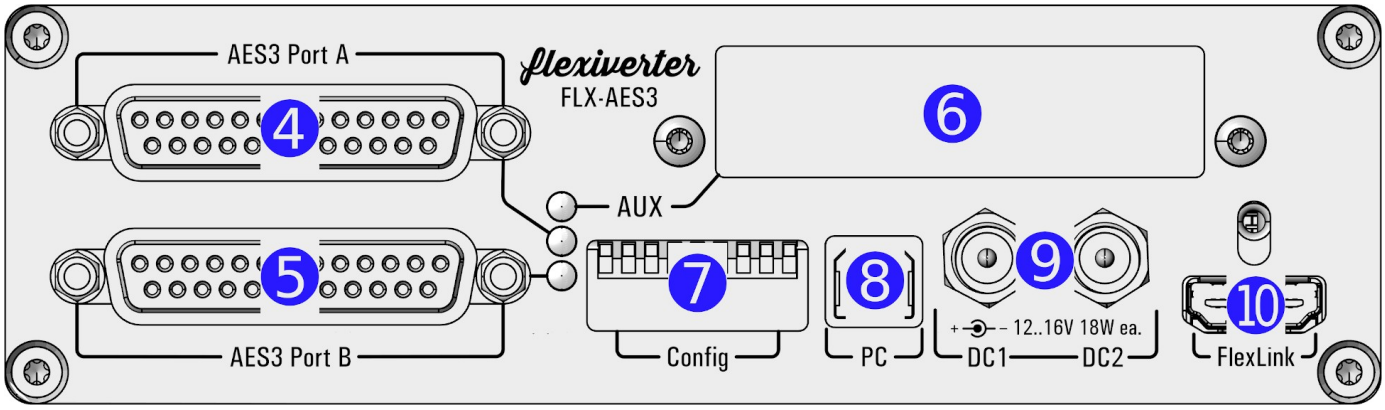
1. QUICK REFERENCE



❶ Power switch and "power good" indicators.
LEDs light up blue when power is available on the respective port.

❷ Mode indicators/selector. Long-press the "Select" button to change the audio routing between the interfaces. Wait four seconds to activate the selected mode.

❸ Clock indicators/selector. Long-press the "Select" button to change the clock source and sample-rate. Wait four seconds to activate the selected mode.



❹ ❺ AES3 ports A (ch1-8) and B (ch9-16).
Each stereo input is connected to a separate Sample Rate Converter

❻ AUX slot. Accepts optional card for standalone use, or additional AES3 channels

❼ DIP switches, mostly to control output data format. See 8. DIP Settings

❽ USB port (remote control & firmware update)

❾ Redundant DC input ports

❿ FlexLink: optional connection to second flexiverter, or to multiverter.

2. INTRODUCTION

2.1. Purpose

The FLX-AES3/SRC device is as digital audio converter, providing up to 16x16 channels (8x8 lines) of AES/EBU, with individual Sample Rate Conversion for each AES3 input line. This makes it possible to bring differently clocked inputs to a common output clock.

The device can be used in different setups, depending on the user's needs:

- standalone, to convert between the built-in AES3 ports and an AUX card
- together with another flexiverter, connected via FlexLink
- together with the multiverter, connected via FlexLink. This provides remote control, channel-wise routing and SRC (Sample Rate Conversion).

For a detailed description of possible configurations see 3. Possible Setups.

2.2. Box Contents

- 1 FLX-AES3/SRC Converter
- 1 HDMI cable 0.5m / 1.7 ft with locking screws
- 1 Power supply
- 1 Power cord (country specific)
- This manual

2.3. Conventions used in this manual

- A button on the front is shown like this: Mode or Clock
- A LED is shown like this: ○ off / ● on / ✳ blinking

Filled circles with an exclamation mark indicates an action that must be performed ("Required").

A section marked with an "information" icon indicates a useful tip.

3. POSSIBLE SETUPS

The device can be used in three different setups, shown below:

	SETUP		
	flexiverter + AUX card	**Double-flexiverter**	**flexiverter + multiverter**
			
How it works	Converts between built-in interface and the AUX card. For a list of AUX cards, see 3.1. Available AUX cards.	Devices are connected via FlexLink cable. Converts between one FLX(+AUX) and the other FLX(+AUX).	Flexiverter connected to multiverter via FlexLink cable. FLX(+AUX) serves as extension to the MVR-mkII
Channels (all can be used at the same time)	16x16 AES3 @ 32..192kHz or maximum capacity of the AUX card, whichever is less	16x16 AES3 @ 32..192kHz plus what the AUX card provides	448x448 from multiverter plus 16x16 AES3 plus what the AUX card provides
Redundant power supply	up to 2x	up to 3x	up to 3x
Battery-powered operation (DC 12-15V)	yes	yes	yes
Sample Rate Conversion	yes (AES3 inputs only)	yes (AES3 inputs only)	yes (all I/O individually assignable with SRC-64 card in Multiverter)
Signal splitting	yes (to AUX or FlexLink)	yes (to AUX or FlexLink)	yes, to everything
Channel-wise routing	no	no	yes, via MVR-mkII (web, telnet or serial terminal)
Remote control	no	no	yes, via MVR-mkII (web, telnet or serial terminal)
Rack mount	1U total	1U total	2U total

3.1. Available AUX cards

At the time of writing (2024-10), the following AUX cards are available. More will come, please check www.appsys.ch for updates.

Item	Description
AUX-ADAT	16x16ch ADAT I/O (2x In + 2x out). Supports also S/PDIF
AUX-ADAT-64	64x64ch ADAT I/O (8x In + 8x out). Connectors on breakout box
AUX-AES3	8x8ch AES3 I/O on 1x DB25, fully transformer isolated
AUX-DANTE	64x64ch DANTE network card

AUX-MADI-COAX	64x64ch MADI for coaxial cable (BNC connectors)
AUX-MADI-OPTO	64x64ch MADI optical, SC connector (Multimode 125um 1310 nm)
AUX-MADI-SFP	64x64ch MADI for SFP (Small-Factor Pluggable) modules
AUX-MADI-TP	64x64ch MADI-TP (Cat5 cable) compatible to DiGiCo/Soundcraft/Studer
AUX-TDM	TDM I/O card (3.3V CMOS level)
AUX-WORDCLOCK	BNC wordclock I/O

3.2. Available FLX devices

At the time of writing (2024-04), the following FLX devices are available. More will come, please check www.appsys.ch for updates.

Item	Description
FLX-AES3	16x16 channel AES3 flexiverter (with AUX slot)
FLX-AES3/SRC	16x16 channel AES3 flexiverter with SRCs on input (with AUX slot)
FLX-AES50	96x96 channel AES50 flexiverter (with AUX slot)
FLX-DANTE	64x64 channel DANTE flexiverter (with AUX slot)
FLX-MADI	128x128 channel MADI SFP & MADI coaxial module (with AUX slot)

3.3. FlexLink connection

The FlexLink connection is designed to connect Flexiverters with each other, or with the Multiverter. It provides:

- 192x192 channels bi-directional transmission of 24-bit uncompressed audio (fully transparent to AES3 compatible metadata bits)
- Super-low link latency of 4 samples (ca. 83μs)
- Dedicated, high-quality reference clock signal with automatic configuration
- Power supply for connected devices (to reduce cabling), alternatively serves as redundancy scheme when both devices are powered: in case of power failure, both devices keep working from the remaining power supply.
- Uses standard HDMI cables (with locking screws), to provide easy field replacement in case of defects.

4. AUDIO ROUTING

The flexiverter can operate in various routing modes, allowing you to pass audio between the available interfaces (AES3, AUX and FlexLink) in many different ways. The LEDs in the "MODE" section indicate the involved interfaces.

4.1. Modes and indication

During setup, the source and destination interfaces are blinking alternately yellow.

▶ Non-SRC (direct) modes

Mode (route between)	Operation (Example)	Setup (blinking alternately)	Remarks
AES3 Direct(+AUX) <> FlexLink	● AES3 Direct ○ AES3 via SRC ● AUX ● FlexLink	○ ○ AES3 Direct ✳ ○ AES3 via SRC ✳ ○ AUX ○ ✳ FlexLink	AUX LED only active when card installed
AES3 Direct <> AUX	● AES3 Direct ○ AES3 via SRC ● AUX ○ FlexLink	✳ ○ AES3 Direct ○ ○ AES3 via SRC ○ ✳ AUX ○ ○ FlexLink	Only available with AUX installed. Additional split of everything to FlexLink[1]
AES3 Direct+FLX <> AUX	● AES3 Direct ○ AES3 via SRC ● AUX ● FlexLink	✳ ○ AES3 Direct ○ ○ AES3 via SRC ○ ✳ AUX ✳ ○ FlexLink	

1 All incoming data is also split (output) to FlexLink: AES3 A+B are split to Lane 1 (ch1-64), AUX is split to Lane 2 (ch65-128). The split is not indicated on the LEDs for clarity but is always active.

▶ SRC modes

Mode (route between)	Operation (Example)	Setup (blinking alternately)	Remarks
AES3 via SRC(+AUX) <>FlexLink	○ AES3 Direct ● AES3 via SRC ● AUX ● FlexLink	✳ ○ AES3 Direct ○ ○ AES3 via SRC ✳ ○ AUX ○ ✳ FlexLink	
AES3 via SRC <> AUX	○ AES3 Direct ● AES3 via SRC ● AUX ○ FlexLink	○ AES3 Direct ✳ AES3 via SRC ○ ✳ AUX ○ ○ FlexLink	
AES3 via SRC+FLX <> AUX	○ AES3 Direct ● AES3 via SRC ● AUX ● FlexLink	○ ○ AES3 Direct ✳ ○ AES3 via SRC ○ ✳ AUX ✳ ○ FlexLink	
AES3 via SRC > AES3[2]	● AES3 Direct ● AES3 via SRC ○ AUX ○ FlexLink	✳ ○ AES3 Direct ○ ✳ AES3 via SRC ○ ○ AUX ○ FlexLink	Audio is converted from individual to common clock. In and correspoding Out are on the same connector

LED color	Meaning
○ off	Interface not active / involved
● green	IN and OUT valid
o white	OUT valid, but no IN detected
● red	No valid signal or no valid clock. ◆ If the **clock** LEDs show red, make sure the clock mode is set correctly and a valid clock is supplied. ◆ If the **clock** LEDs show green, the clock is ok but the input is not detected. Check the respective connection.
✳ red blinking	Interface is currently booting and not yet active
✳ yellow blinking	Mode setting active: Alternately blinking LEDs indicate the interfaces between which data is converted; constant lit LEDs indicate splitting destinations. Press MODE button again to cycle through available modes. After 4 seconds, the selected mode is applied automatically.

2 AES3 => AES3 Sample Rate Conversion mode is available from Firmware 2.7 on

4.2. Selecting the Route Mode

- Long-press the Mode button until the LEDs are blinking yellow.
- Current routing mode is shown by alternately yellow blinking LEDs, indicating the interfaces where the signal is passed between.
- Press the Mode button repeatedly to cycle between available modes, until the desired mode is shown.
- After four seconds without interaction, selection mode is terminated and the current setting comes into effect.

4.3. Remarks

- Routing between the selected interfaces is always bi-directional, meaning that audio is passed between them both ways.[3] A working bi-directional link shows green for both interfaces. If the LED shows ∘ white, the corresponding interface does only output data but no input on it has been detected. If the LED shows red, the interface is not connected, or the clock is invalid or missing.

- When routing channels to the AUX or FlexLink interface, channels of AES3 Port A and B are concatenated together and appear on the FlexLink interface channels 1-16 and vice versa. The channels of the AUX card can either be mapped to the FlexLink interface directly after that (commencing at channel 17), or to a different block. See 8.4. FlexLink channel mapping (DIP3, 7..9).

- Channel-wise routing and splitting (crosspoint switch/matrix) between all channels is possible when the flexiverter is connected to a multiverter. Routing is then done via the multiverter's web interface or via the command line.

3 The SRC is only in the AES3 Input path. The output rate of AES3 is equal to the system clock.

5. CLOCK SETTINGS

5.1. Clock sources and indication

The flexiverter can be clocked from every interface (acting as clock slave), or can run on its internal clock (acting as clock master).

Clock source	"Clock" Indication (Example)	Remarks
AES3	● **AES3** ○ **44.1 kHz** ○ **INT** ● **48 kHz** ○ **AUX** ○ **x2** ○ **FlexLink** ○ **x4**	**In AES3 direct mode**: Clock is taken from the first AES3 input which carries a valid signal. **In AES3 via SRC mode**: Clock is always taken from the first line of AES3 connector A.
Internal ("INT")	○ **AES3** ○ **44.1 kHz** ● **INT** ● **48 kHz** ○ **AUX** ○ **x2** ○ **FlexLink** ○ **x4**	Flexiverter acts as clock master.
AUX	○ **AES3** ○ **44.1 kHz** ○ **INT** ● **48 kHz** ● **AUX** ○ **x2** ○ **FlexLink** ○ **x4**	Only available with AUX installed. AUX card acts as clock master. Use an AUX-WORDCLOCK if you need BNC wordclock I/O.
FlexLink	○ **AES3** ○ **44.1 kHz** ○ **INT** ● **48 kHz** ○ **AUX** ○ **x2** ● **FlexLink** ○ **x4**	Clock is taken from the peer device (Flexiverter or Multiverter)

LED color	Meaning
○ off	Interface not active / not involved
● green	Selected, locked and synced
● red	No valid clock. No input connected or no master clock signal detected
✳ yellow blinking	Clock setting active. Press CLOCK button to go to the next clock source. After 4 seconds, selection mode is terminated and the selected mode comes into effect.

5.2. Selecting the Clock Source

- Long-press the **Clock** button until the LEDs are blinking yellow.
- Current clock source/modes is shown by blinking LED(s).
- Press the **Clock** button repeatedly to cycle between the available clock sources. Depending on the source, you might need to select the desired sample rate (✳ **44.1 kHz** or ✳ **48 kHz**) and/or the appropriate multipliers (✳ **x2** / ✳ **x4**).

- After four seconds without interaction, clock setting is automatically terminated and the selected clock source comes into effect.

When the samplerate is incorrectly set (e.g. 48k with 96k data), unwanted effects (double samples, zero samples, channel crosstalk etc.) may occur and might not be noticed immediately. Always double-check that the samplerate is set correctly on all involved devices!

6. REMOTE CONTROL

6.1. Browser-based control

This does not require any software to be installed. It works as hybrid app where the user interface is fetched from the web, and your browser talks to the device via USB connection.

Web control requires “Web Serial API” which is currently only available in **Chrome, Edge and Opera** on Windows and Mac. Not supported on mobile devices and Safari/Firefox.

To use web control,

- Connect the device to your computer using an USB cable
- Open your browser and go to appsys.ch/remote
- When the browser requests access to the serial port, give permission on the first port listed

6.2. Command line control

A command line is available via the USB serial port. To use it, you need a terminal software (Hyperterminal, PuTTY, minicom or similar) which can talk to a serial (“COM”) port.

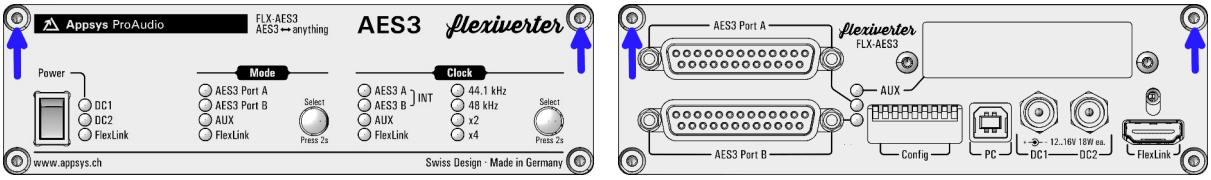
To use the command line,

- Connect the device to your computer using an USB cable
- Open the terminal software. Select the first COM port which appears when plugging in the device
- Select 115200 bps, 8N1 as communication parameters
- To see what you’re typing, turn local echo “on” in the terminal software
- To see a list of available commands, type **`help`** at the **`FLX>`** command prompt

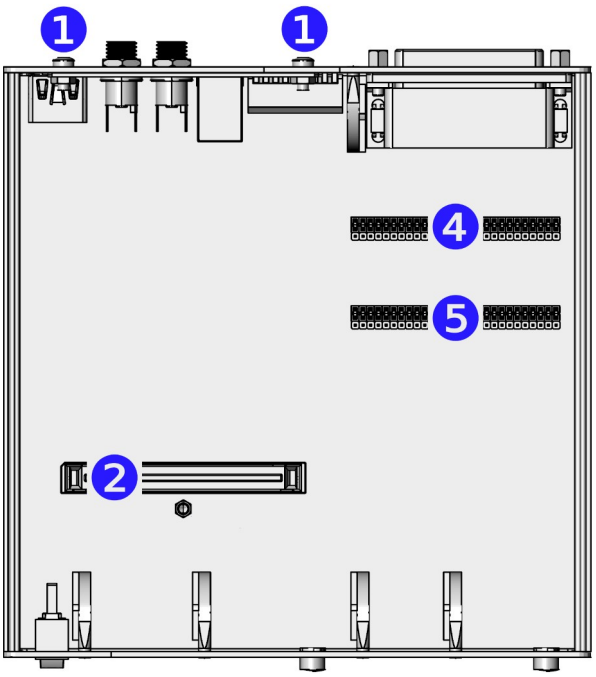
7. ACCESSING INTERNALS

7.1. Opening the device

- Required: Torx T10 screwdriver.
- Power off the device and detach all cables to avoid short-circuit or damage.
- Detach the device from the rack-mount kit.
- Remove the four top screws and the top cover by pulling it upwards:



7.2. Inside view



1. Screws for AUX cover plate
2. AUX card connector
4. Pinout select jumpers for lower DB25 connector (AES3 Port B)
5. Pinout select jumpers for upper DB25 connector (AES3 Port A)

7.3. Installing AUX cards

- Remove the screws holding the cover plate, and the blank cover plate 1
- Insert the AUX card from inside, using the supplied cover plate. Make sure it is correctly fitted to the card connector 2
- Secure the card using two cover screws 1
- The card has been installed correctly if you are able to select an audio routing mode involving AUX (long-press MODE button to enter Route Mode Selection).

7.4. Variable DB25 pinout

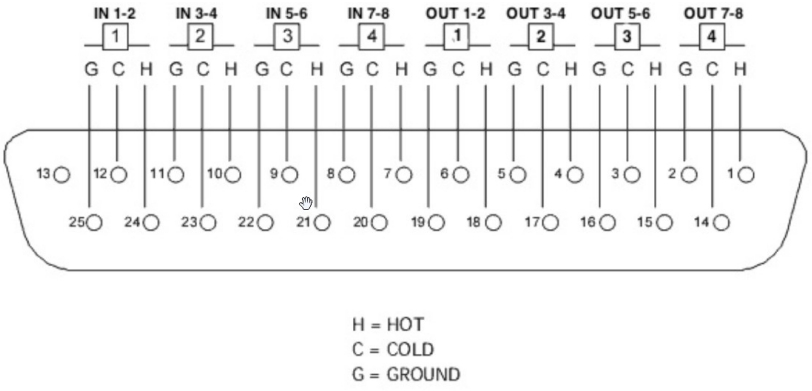
Historically, there are two different pin assignments for the AES/EBU DB25 connectors around, commonly known as **"Yamaha"** and **"Tascam"** style. The **FLX-AES3/SRC supports both pinouts** by means of internal jumpers. Pinout can be set for both ports independently, meaning you could use the FLX-AES3/SRC as cabling adapter. To select the pinout:

- Locate the jumper blocks ❹ and/or ❺ and move all jumper blocks (3 each) to the desired position.
- CAUTION: Take care when remove the jumper blocks, pulling both sides equally gently upwards. You might use a knife or a screwdriver to push the blocks upwards. **Make sure not to bend any pins!**
- The jumper position is not visible when the case is closed, but you can determine it from the color of the LEDs on the back side.

▶ Tascam Pinout

Rear LED:
● red/● green/○ white
(error/input ok/output only)

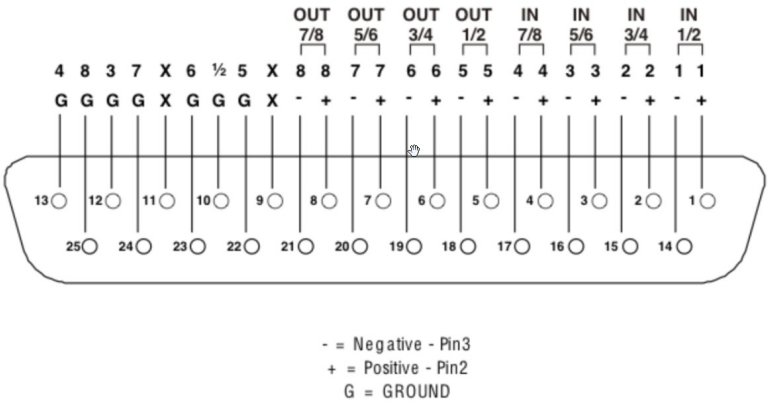
Used with:
- AES59 annex D
- Avid
- Digidesign
- PreSonus
- RME
- Tascam
- Universal



▶ Yamaha Pinout

Rear LED:
● pink/● cyan/● beige
(error/input ok/output only)

Used with:
- Apogee
- Mackie
- Lynx
- SSL
- Yamaha



8. DIP SETTINGS

Fine-tuning of the flexiverter's built-in interface behavior and of the AUX card can be achieved via DIP settings on the back side. Changing the DIP settings will come immediately into effect. **Default setting: all switches up.**

8.1. Base device config (DIP1..2)

	Single Wire (full channel count at 48k, 96k and 192k), professional format for metadata*
	Double wire (half channel count), only in 96k and 192k modes
	Quad wire (quarter channel count), only in 192k mode
	Single wire, SPDIF (consumer) format for metadata

* Default setting

- **Single Wire / Double wire / Quad wire:**
  This is to maintain compatibility with legacy devices. Has only an effect for 88.2/96/176.4/192kHz data (44.1/48kHz data is always "single wire").

  In **Single Wire** mode, always two channels are sent per AES3 connection. In 96kHz modes, they are sent at twice the speed as with 48kHz, and at quadruple speed in 192kHz modes. Supported by most up-to-date devices.

  Double Wire mode is a legacy technique to send 96kHz data over 48kHz links, by halving channel count (one channel per AES3 connection). It is also sometimes found on 192kHz devices, allowing 192kHz data to be sent over 96kHz links.

  Quad Wire mode takes this principle further by allowing 192kHz data to be sent over 48kHz links, by quartering the channel count (0.5 channels per AES3 connection).

- **SPDIF**: Metadata is sent as"consumer" (S/PDIF) format instead of "professional" (AES3) format. This does ONLY apply to metadata, the actual audio sample data is always transmitted in the same way.

8.2. AUX config (DIP4..6)

Many AUX card provide additional settings, which can be adjusted using these switches. The actual meaning depends on the type of AUX card installed:

AUX-ADAT	4 Channels 1-8: ADAT format*[4]	5 Channels 9-16: ADAT format*[4]	6 AES3 (Professional)[4] only for non-ADAT
	4 Channels 1-2: AES3/SPDIF format[4]	5 Channels 9-10: AES3/SPDIF format[4]	6 SPDIF (Consumer)[4] only for non-ADAT

AUX-AES3	4 5	Single Wire (full channel count at 48k, 96k and 192k), professional format for metadata*
	4 5	Double wire (half channel count), only in 96k and 192k modes
	4 5	Quad wire (quarter channel count), only in 192k mode
	4 5	Single wire, SPDIF (consumer) format for metadata

AUX-MADI-COAX **AUX-MADI-OPTO** **AUX-MADI-SFP**	4 96k frame*[4]	5 6 64ch output*[4]
	4 48k frame[4]	5 6 57ch (use for DiGiCo stagebox control)[4]
		5 6 56ch output[4]
		5 6 reserved

AUX-WORDCLOCK	4	True to samplerate*
	4	Always x1 (single speed)

* Default setting

For cards not listed, refer to the manual of the respective card, or check for a newer version of this manual.

4 Applies to outputs only. Input format is always auto-detected, regardless of the switch setting

8.3. AUX channel offset (DIP7...9)

When used in standalone mode (i.e. with AUX card), the AES3 is normally embedded in the AUX data stream from channel 1 to 16. Also, channels 1-16 of the audio stream coming from AUX are extracted to AES3.

Sometimes (i.e. in a MADI daisy-chain configuration) it is desired to map the AES3 stream to different channels, i.e. 17-32, 33-48 or 49-64. This is done using DIP switches 7 to 9.

This works only in standalone operation modes:
"AES3 Direct < > AUX" and "AES3 via SRC < > AUX"

DIP	
	**Channel offset 0:** AES3 will be mapped to AUX channels 1-16
	**Channel offset 16:** AES3 will be mapped to AUX channels 17-32
	**Channel offset 32:** AES3 will be mapped to AUX channels 33-48
	**Channel offset 48:** AES3 will be mapped to AUX channels 49-64

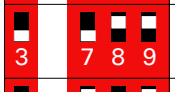
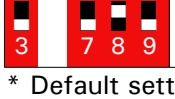
8.4. FlexLink channel mapping (DIP3, 7..9)

The FlexLink interface can transmit 192x192 channels, organized in three lanes with 64 channels each. The channel assignment can be adjusted to meet the user's needs, particularly when the device is used in double-FLX configuration (to make sure that all interfaces and channels are mapped to the desired target on the peer FLX device.

- **Concat/Separate**: Determines if AUX channels are seamlessly concatenated after AES3 A + B (commencing at channel 17), or if they are mapped to a separate block. "Concat" is useful e.g. with the AUX-AES3 card, to obtain a contiguous block total of 24x24 channels of AES3.

- **Lane Assignment** (DIP7..9): Controls the mapping of the blocks to the FlexLink lanes. This is useful in double-flexiverter configurations, to make each data appear on the desired interface on the peer device.

DIP	Lane 1 (ch1-64)	Lane 2 (ch65-128)	Lane 3 (ch129-192)
	**AES3A + B(+ AUX)***	-	-
		AES3A + B(+ AUX)	-

	-	-	AES3A + B(+ AUX)
	AES3 A + B	AUX	-
	AES3 A + B		AUX
	AUX	AES3 A + B	-
	AUX	-	AES3 A + B
	-	AES3 A + B	AUX
	-	AUX	AES3 A + B

* Default setting

9. SPECIAL OPERATING MODES

Special operating modes are accessible by *holding down the* **Mode** *button while switching on the device.* Press **Mode** again to switch to the next mode:

Version Display ⇨ **LED Test** ⇨ **Interface Self-Test** ⇨ **Normal operation**

9.1. Version Display

The hardware and firmware version are indicated on the MODE and CLOCK leds[5]. The values are binary encoded. To get the version number, add all numbers from the "value" column where the corresponding LED is lit. The example below shows: hardware version 1, firmware version 2.6:

Value	MODE Hardware version: green LEDS	CLOCK Firmware version: white LEDs	
		Major	Minor
8	○	○	○
4	○	○	●
2	○	●	●
1	●	○	○

- Blinking LEDs mean that the currently installed firmware is a "beta" version. It is advised to upgrade to an official release version as soon as it is released.
- Press **Mode** again to proceed to LED test.

9.2. LED Test

- All LEDs on the front and on the back should show ○ white.
- Press **Mode** again to proceed to Interface Self-Test.

5 In firmware 2.5. and earlier, the system was different: number of green LEDs = hardware version, number of pink LEDs = firmware major version, number of orange LEDs = firmware minor version.

9.3. Interface Self-Test

All built-in interfaces and the optional AUX card can be tested for correct operation by the user. This is done using the special self-test mode, in which the device outputs a special random test pattern on all channels. This pattern is looped back via an external cable into the corresponding inputs, where it is checked for consistency.

- Self-test mode is indicated with "CLOCK" showing INT/48kHz in cyan color. The "MODE" LEDs indicate red (error/no connection) or green (loopback data received ok) for the respective interface.
- Make sure both ports "AES3 A" and "AES3 B" are set to the same pinout, matching the pinout of the loop-back cable.
- Connect "AES3 A" to "AES3 B" using the loop-back cable.
- If an AUX card is installed, connect all output ports of the AUX card to the respective inputs using a loop-back cable. Note: NOT supported with AUX-ADC, AUX-AES67, AUX-AVB, AUX-DANTE.

9.4. Firmware update

The firmware can be updated from any **Windows PC** over the rear **USB** port.

▶ **To update:**

- Download the latest firmware from www.appsys.ch/FLX-AES3SRC
- Unpack the firmware package FLX-AES3SRC-Firmware_x.y.zip
- Connect your PC via USB to the flexiverter
- Power ON the device
- Run the **`FLX-AES3_Updater.bat`** file from the firmware package and follow the instructions on the screen.
- Power cycle the device to effect the update.

Thanks to the special design of the updater, it is virtually impossible to damage ("brick") the device during update. If updating fails or is interrupted, restart the procedure. You can also can go back to any older firmware version at any time

10. SPECIFICATIONS

<table>
<tr><th>Parameter</th><th colspan="2">Value</th></tr>
<tr><td>Dimensions</td><td colspan="2">152x44x153mm (WxHxD) excluding connectors/buttons
152x44x163mm (WxHxD) including device-side connectors/buttons</td></tr>
<tr><td>Weight</td><td colspan="2">590g</td></tr>
<tr><td>Operating temperature</td><td colspan="2">0..+55°C, non-condensing</td></tr>
<tr><td>Storage temperature</td><td colspan="2">-40..+85°C, non-condensing</td></tr>
<tr><td>Power consumption</td><td colspan="2">+15V DC, 9W max (18W to power two devices via FlexLink)
Triple-redundant input (2x DC, 1x via FlexLink)</td></tr>
<tr><td>AES3 ports (A, B)</td><td colspan="2">Input and output fully transformer-isolated according to AES/EBU requirements

Samplerate range: 32kHz-5% ... 192kHz+5% single-wire, independent on each input when SRC is active

Pinout: Tascam(AES) or Yamaha, selectable for each port via internal jumper blocks</td></tr>
<tr><td>Cable lengths</td><td>FlexLink</td><td>1m / 3ft. max. recommended</td></tr>
<tr><td></td><td>AES3</td><td>100m / 300 ft., depending on the peer device</td></tr>
<tr><td>Channel count</td><td colspan="2">16x16 @ 32....192 kHz (Single-wire)
8x8 @ 96kHz, 8x8 @ 192kHz (Dual wire), 4x4 @ 192 kHz (Quad wire)
Additional AUX channels depending on AUX card</td></tr>
<tr><td>Sample rates</td><td colspan="2">32/44.1/48kHz, 64/88.2/96kHz, 128/176.4/192kHz
64/88.2/96kHz can operate in single-wire or double-wire mode
128/176.4/192kHz can operate in single-wire, double-wire or quad-wire mode</td></tr>
<tr><td>Audio latency</td><td colspan="2">Conversion AES3 Direct <> FlexLink: 2 samples
Conversion AES3 Direct <> AUX: 4 samples plus AUX card latency

When using the Sample Rate Converter (SRC), there is ~0.5ms...1ms latency added. The table below contains the exact values.

For up-sampling conversions: t/s = 16/fs_in + 32/fs_in

<table>
<tr><th>fs_in / kHz</th><th>t / ms</th></tr>
<tr><td>32</td><td>1.5</td></tr>
<tr><td>44.1</td><td>1.09</td></tr>
<tr><td>48</td><td>1.03</td></tr>
<tr><td>64</td><td>0.75</td></tr>
<tr><td>88.2</td><td>0.54</td></tr>
<tr><td>96</td><td>0.5</td></tr>
<tr><td>128</td><td>0.375</td></tr>
<tr><td>176.2</td><td>0.27</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Parameter</th><th>Value</th></tr>
<tr><td></td><td>For down-sampling conversions: t/s = 16/fs_in + (32/fs_in)*(fs_in/fs_out)
<table>
<tr><th>fs_in / kHz</th><th>fs_out / kHz</th><th>t / ms</th></tr>
<tr><td>48</td><td>44.1</td><td>1.06</td></tr>
<tr><td>88.2</td><td>44.1</td><td>0.91</td></tr>
<tr><td></td><td>48</td><td>0.84</td></tr>
<tr><td>96</td><td>44.1</td><td>0.89</td></tr>
<tr><td></td><td>48</td><td>0.83</td></tr>
<tr><td></td><td>88.2</td><td>0.53</td></tr>
</table>
<table>
<tr><th>fs_in / kHz</th><th>fs_out / kHz</th><th>t / ms</th></tr>
<tr><td>176.4</td><td>44.1</td><td>0.82</td></tr>
<tr><td></td><td>48</td><td>0.76</td></tr>
<tr><td></td><td>88.2</td><td>0.45</td></tr>
<tr><td></td><td>96</td><td>0.42</td></tr>
<tr><td>192</td><td>44.1</td><td>0.81</td></tr>
<tr><td></td><td>48</td><td>0.75</td></tr>
<tr><td></td><td>88.2</td><td>0.45</td></tr>
<tr><td></td><td>96</td><td>0.42</td></tr>
<tr><td></td><td>176.4</td><td>0.26</td></tr>
</table>
</td></tr>
<tr><td>Internal clock precision</td><td>Jitter: Phase RMS: <1ps, Peak-peak: <50ps.
Stability: ±25 ppm including all effects including aging, temperatur, supply, calibration, shock, vibration</td></tr>
</table>

11. ACCESSORIES

11.1. Rack mount kits

For integration in 19" racks, two kinds of rack mount kits / brackets are available:

- **RM-FLX1**: For mounting one FLX device into 1U 19" space
- **RM-FLX2**: For mounting two FLX devices into 1U 19" space

11.2. Additional (redundant) power supply

- **PWR-FLX**: Additional power supply to provide redundancy for single-FLX configurations
- **FlexLink Cable** 0.5m. HDMI cable with locking screws

12. APPENDIX

12.1. Warranty

We offer a full two (2) year warranty from the date of purchase. Within this period, we repair or exchange your device free of charge in case of any defect*. If you experience any problems, please contact us first. We try hard to solve your problem as soon as possible, even after the warranty period.
* Not covered by the warranty are any damages resulting out of improper use, willful damage, normal wear-out (especially of the connectors) or connection with incompatible devices.

12.2. Manufacturer contact

Appsys ProAudio
Rolf Eichenseher
Bullingerstr. 63 / BK241
CH-8004 Zürich
Switzerland

www.appsys.ch
info@appsys.ch
Phone: +41 43 537 28 51
Mobile: +41 76 747 07 42

12.3. FCC Compliance

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

This equipment has been verified to comply with the limits for a class B computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

12.4. Recycling

According to EU directive 2002/96/EU, electronic devices with a crossed-out dustbin may not be disposed into normal domestic waste. Please return the products back for environment-friendly recycling, we'll refund you the shipping fees.

12.5. About this document

Document Revision: 3 · 2024-10-04

Rev 3: Added AES3 = > AES3 Sample Rate Conversion mode
Rev 2: Changes for firmware version 2.6
Rev 1: Initial release

IDENT 9.00.17334.00

Declaration of Conformity

The manufacturer:

Appsys ProAudio
Rolf Eichenseher
Bullingerstr. 63 BK 241
CH-8004 Zürich
Switzerland

declares under sole responsibility that the products mentioned below:

Flexiverter FLX-AES3/SRC

meet the requirements of the following standards:

EN 55024:2010
EN 55032:2015 Class B
EN 61000-3-2:2006/A1/A2:2009
EN 61000-3-3:2009
EN 61000-6-3:2007/A1:2011

Therefore the product fulfills the demand of the following EC directives:

73/23/EWG
(Directive related to electrical equipment designed for use within certain voltage limits)

89/336/EWG
(Directive related to electromagnetic compatibility)

The devices are marked accordingly.
Zürich, 15.04.2024

Rolf Eichenseher (CEO)