

## **SRC-64**

Asynchronous Sample Rate Converter  
Add-on Module for MVR-64

User's Manual

**(en)**

## Table of Contents

1. GENERAL.....	3
1.1. Features.....	3
1.2. Box Contents.....	4
1.3. Conventions used in this manual.....	4
2. INSTALLATION.....	5
2.1. Multiverter Firmware Check.....	5
2.2. Hardware Installation.....	6
3. OPERATION.....	8
3.1. General.....	8
3.2. Select the async input.....	8
3.3. Select the async output.....	9
3.4. Select the async clock source.....	10
3.5. ASRC Status Display.....	10
4. CONFIGURATION EXAMPLES.....	12
4.1. Typical Setups.....	12
5. MAINTENANCE.....	14
5.1. ASRC selftest.....	14
5.2. Determining ASRC Firmware/Hardware version.....	14
5.3. ASRC Firmware Upgrade.....	14
6. SPECIFICATIONS.....	16
7. APPENDIX.....	17
7.1. Warranty.....	17
7.2. Manufacturer contact.....	17
7.3. Recycling.....	17
7.4. Document Revision History.....	17
7.5. About this document.....	17

## 1. GENERAL

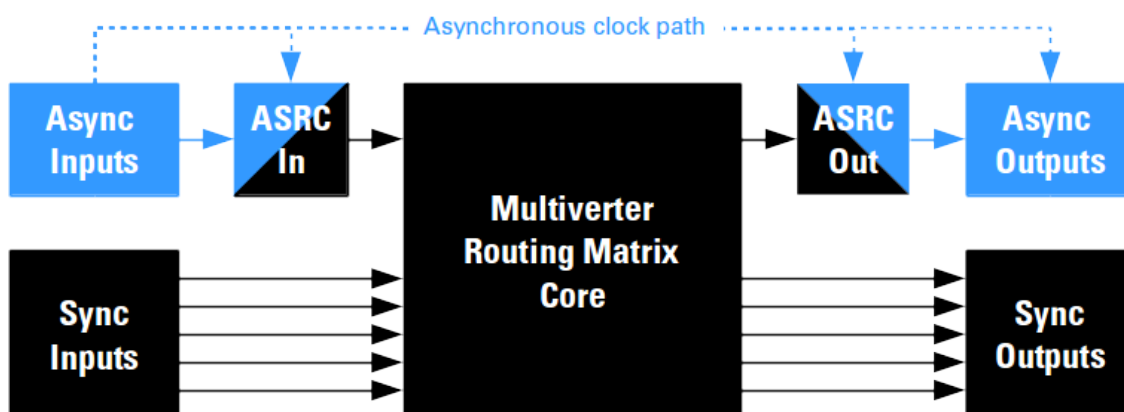
### 1.1. Features

The SRC-64 add-on module adds the capability of asynchronous sample rate conversion to your multiverter. Designed as internal add-on module, it leaves the "Extension" port available to other break-out boxes.

(Note: The module is called "ASRC" in this manual for clarity).

It features highest analog performance (THD+N -134dB typ.) , 64-channel, bi-directional conversion between any interfaces supported by the multiverter plus a number of special modes for maximum flexibility.

The ASRC can be assigned to any input interface and also any output of the multiverter, giving a true bi-directional conversion between both clock domains:



- Asynchronous clock domain („Async clock“).  
Clock can be taken from async input, or BNC, or generated internally.
- Main clock domain.  
Clock is taken from selected multiverter clock source

- The ASRC is inserted (by software) between the selected input and the rest of the multiverter. The input can run independently, and the ASRC takes care of matching the data to the main clock of the multiverter.
- For the output, the ASRC can be inserted between the main clock of the multiverter and the selected output. The data is then converted to match the ASRC's asynchronous clock ("async clock") and sample rate before it is sent out.
- Existing multiverter routing capabilities are fully preserved.

- Special modes allow the use of two MADI or AES50 ports together, to send and receive all 64 channels at 96 kHz (48ch for AES50). Conversions between MADI 64ch@96k => MADI 64ch@48k or vice versa - using two MADI ports for the 96k part and one for the 48k part - are also supported.

## 1.2. Box Contents

- 1 SRC-64 PCB Module
- 2 Screws M3x20 T10
- 2 Spacers
- This manual

## 1.3. Conventions used in this manual

- A button on the front of the device is shown like this: **Set**
- The encoder can be pushed. This is shown as **OK**
- A particular LED on the front of the device is shown like this: **WCLK**
- Text indicated on the seven-segment display is shown as **02**



A section marked with a warning sign mark tells you that the information is particularly important to avoid damage or malfunction.



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



A section marked with a prohibited sign tells you that the action indicated is prohibited ("Prohibited")



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

## 2. INSTALLATION

### 2.1. Multiverter Firmware Check



The multiverter requires **at least firmware 2.0** for the SRC to work.  
Please check and update if required (see below).

- Check the multiverter's firmware version: Press **Recall**, move to **☼ Function**, press **OK**, move to **☼ 12**, press **OK**, move to **☼ AD**
- If the seven-segment display shows **02** or higher, your firmware is already capable of addressing the ASRC, and you can proceed with the next section (2.2 Hardware Installation).
- If **01** is shown, a firmware update is required. Download the firmware update from [our website](#) and follow the instructions in the README.TXT file contained in the package.

## 2.2. Hardware Installation

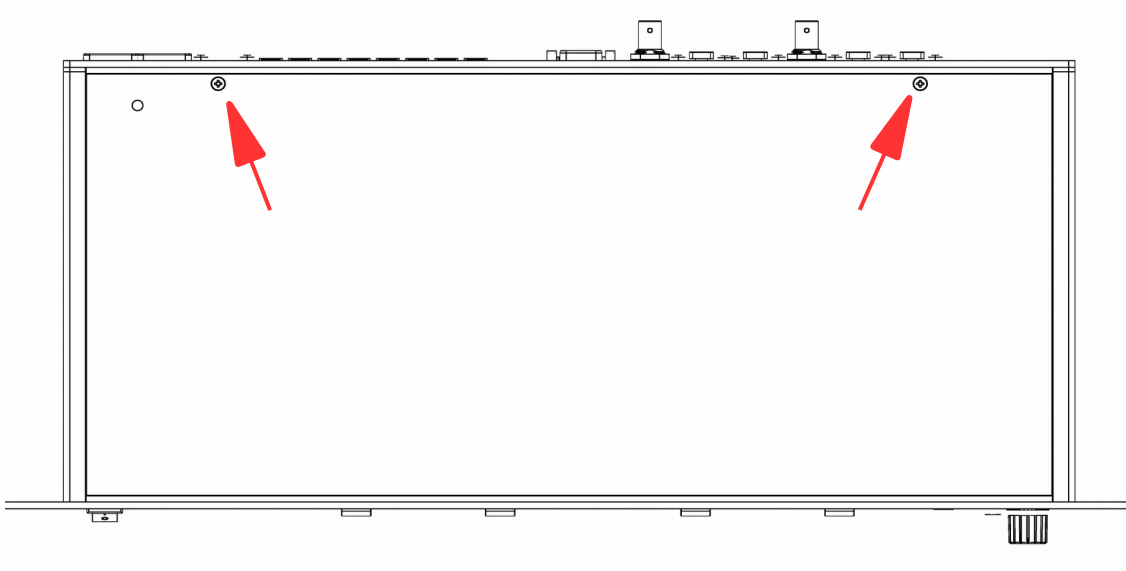


**CAUTION:** To prevent electric shock, remove all mains power plugs from the multiverter before opening!



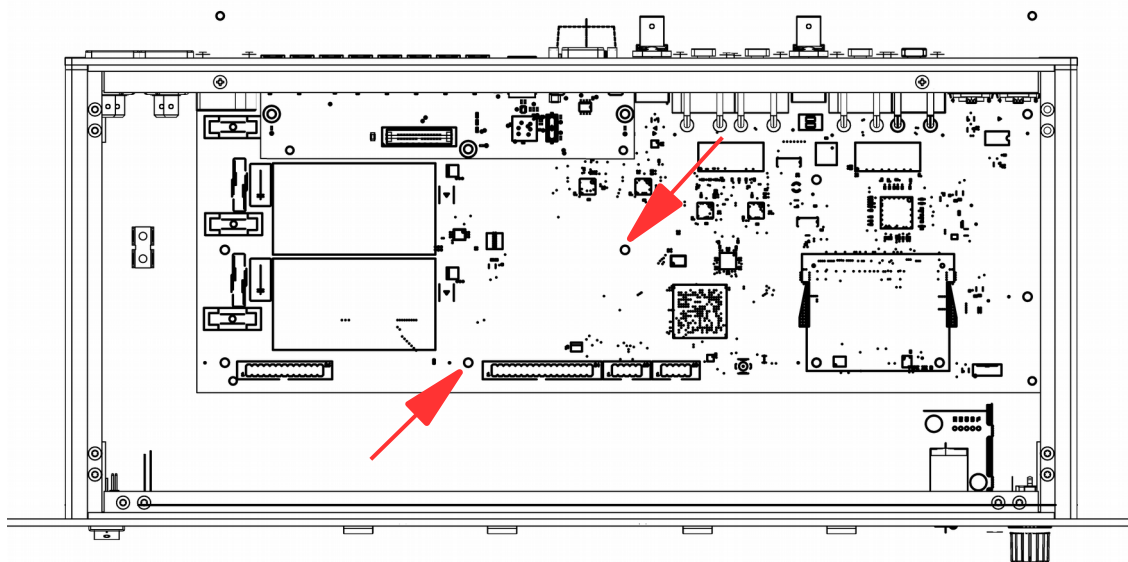
**ATTENTION:** Static Sensitive Devices  
Observe Precautions for Handling!

- Remove the two screws at the rear of the multiverter's top cover (Torx T10):



- Flip the multiverter to detach the top cover. Disconnect the cover's ground connection at the base.

- Remove the indicated two screws from the multiverter's main board:



- Place the supplied spacers on top of the holes, and carefully plug the ASRC into the main board.
- Insert the supplied screws through the ASRC holes and the spacers, then fasten them.
- Re-connect the cover's ground connection to the base.
- Slide the top cover into the front panel slit, then close the lid and mount the cover using the two black screws.

### 3. OPERATION


#### 3.1. General

The ASRC is configured and enabled/disabled through the "Clock" menu in a few simple steps, described below.

**The general sequence is:**

- 1) Select the async input
- 2) Select the async output
- 3) Select the async clock (the clock source for async input+output)
- 4) Configure the routing matrix (same as without ASRC)

You can always go back to the previous step by pushing the **↩ Back** button.

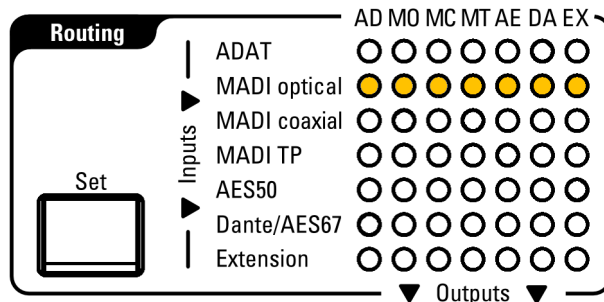


See chapter "4. Configuration Examples" for typical setups.

#### 3.2. Select the async input

This selects the input interface whose data is received at its own asynchronous clock and sample rate, and is then converted to the multiverter's main clock and sample rate.

- Push the **Set** button in the "Clock" menu.
- Navigate the cursor to the **☼ ASRC** LED and push **OK** to confirm. The seven-segment display shows **in** to indicate the input selection mode.
- You can now select the appropriate input row(s). The example shows how to select "MADI optical" as asynchronous input:




**Note:** For some configurations it is possible to select two rows at once. This is used if you want to concatenate the channels from two inputs to make use of all



64 channels at 96kHz (48ch with AES50), or 32ch at 192kHz.


- When ready, push **OK** to confirm.



**If you need only asynchronous outputs, select "X" for the inputs.**  
 This disables the receive part of the ASRC, and all inputs run now on the main clock.

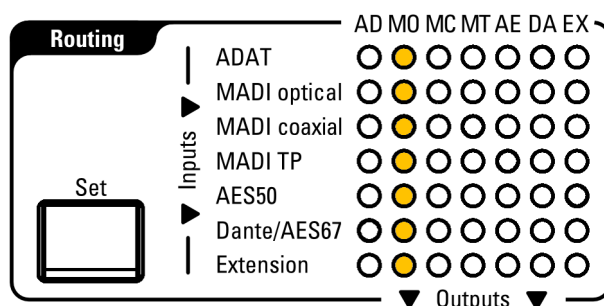
### 3.3. Select the async output

This selects the output interface whose data is converted from the multiverter's main clock/sample rate to the *async clock* on output.



Some interfaces (AES50, Dante/AES67) do not allow different receive and transmit clocks. When such an interface is selected as input, the output runs automatically at the same clock and cannot be chosen separately.

- Assign the input as described. When this is finished, the seven-segment display shows **OL** to indicate the output selection mode.
- Select the appropriate output column(s). The example shows how to select "MADI optical" as asynchronous output:



- **Note:** For some configurations it is possible to select two rows at once. This is used if you want to concatenate two outputs together to make use of all 64 channels at 96kHz (48ch with AES50), or 32ch at 192 kHz. Selecting "X" disables the ASRC for the output direction.



**If you need only asynchronous inputs, select "X" for the outputs.** Transmitted data is then output at the multiverter's main clock/sample rate (no samplerate conversion happens for transmit data).

If no async input and no async output is selected (**both "X"**), the ASRC function is disabled and **the ASRC is turned off.**

### 3.4. Select the async clock source

This selects the source for the asynchronous clock (the clock which is used for the selected async inputs and outputs).

Depending on the async interfaces selected, not all interfaces can be used as source for the async clock. Usually, it's possible to select a) the async input as clock source, b) the BNC wordclock input, or c) an internally generated clock.

- The seven-segment display shows **AS** to indicate the "async" clock selection mode, and the LED shows yellow.
- Navigate the cursor to the desired clock source and push **OK** to confirm.
- Depending on the clock source, the multiverter may ask you now to choose the SMUX mode (how single-speed data should be interpreted) or the samplerate (if you are using an internal clock). Push **OK** to confirm.

### 3.5. ASRC Status Display

The status LEDs for "Routing", "Clock" and "Monitor" show yellow instead of green to indicate that the respective function makes use of the ASRC.

- When the ASRC is active, the LED is lit. Yellow color indicates that the selected input clock is valid, while red color indicates that the input clock is missing or invalid.
- The ASRC clock source and samplerate are shown in yellow if the clock is valid, otherwise in red.
- In the routing matrix, connections using the ASRC are displayed yellow (in contrast to the normal green) when the selected conversion involves the use of the ASRC. If there is any condition which prevents the data from being converted (i.e. missing input data or clock) the respective connection is shown in red.

- In the "Monitor" section, the selected input is displayed in yellow (in contrast to the normal green) when the selected input runs through the ASRC.

## 4. CONFIGURATION EXAMPLES

The examples below show typical conversion setups with their configuration of the ASRC inputs, outputs, possible async clock sources and typical routings.

**Although the "Routing" matrix examples show only conversions involving the ASRC, more conversions can run at the same time:**



- An arbitrary number of additional conversions within the main clock domain can run in parallel.
- Any ASRC'ed input can additionally be routed to an arbitrary number of outputs in the main clock domain.

### 4.1. Typical Setups

Setup <=> bidirectional => unidirectional	Step 1: <b>ASRC input</b> "Which input comes async and should go through the ASRC?"	Step 2: <b>ASRC output</b> "Which output should run at the ASRC samplerate?"	Step 3: <b>ASRC clock source</b> "From where should the ASRC take its clock?"	Step 4: <b>Routing</b> "Which input should go to which output?" <b>You can add additional routings as required!</b>																																																																																																																																																																																																
<b>AES50 48ch/96kHz</b> <b>&lt;=&gt;</b> <b>Dante 48ch/48kHz</b>  Use "MT" port in AES50 mode, see multiverter Manual	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MO</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MC</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MT</th><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><th>AE</th><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><th>DA</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>EX</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO								MC								MT	O	O	O	O	O	O	O	AE	O	O	O	O	O	O	O	DA								EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td></td><td></td><td></td><td>O</td><td>O</td><td></td><td></td></tr> <tr><th>MO</th><td></td><td></td><td></td><td>O</td><td>O</td><td></td><td></td></tr> <tr><th>MC</th><td></td><td></td><td></td><td>O</td><td>O</td><td></td><td></td></tr> <tr><th>MT</th><td></td><td></td><td></td><td>O</td><td>O</td><td></td><td></td></tr> <tr><th>AE</th><td></td><td></td><td></td><td>O</td><td>O</td><td></td><td></td></tr> <tr><th>DA</th><td></td><td></td><td></td><td>O</td><td>O</td><td></td><td></td></tr> <tr><th>EX</th><td></td><td></td><td></td><td>O</td><td>O</td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD				O	O			MO				O	O			MC				O	O			MT				O	O			AE				O	O			DA				O	O			EX				O	O			AE MT WCLK INT	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MO</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MC</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MT</th><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><th>AE</th><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><th>DA</th><td></td><td></td><td>O</td><td>O</td><td></td><td></td><td></td></tr> <tr><th>EX</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO								MC								MT						O		AE						O		DA			O	O				EX							
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO																																																																																																																																																																																																				
MC																																																																																																																																																																																																				
MT	O	O	O	O	O	O	O																																																																																																																																																																																													
AE	O	O	O	O	O	O	O																																																																																																																																																																																													
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD				O	O																																																																																																																																																																																															
MO				O	O																																																																																																																																																																																															
MC				O	O																																																																																																																																																																																															
MT				O	O																																																																																																																																																																																															
AE				O	O																																																																																																																																																																																															
DA				O	O																																																																																																																																																																																															
EX				O	O																																																																																																																																																																																															
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO																																																																																																																																																																																																				
MC																																																																																																																																																																																																				
MT						O																																																																																																																																																																																														
AE						O																																																																																																																																																																																														
DA			O	O																																																																																																																																																																																																
EX																																																																																																																																																																																																				
<b>MADI optical</b> <b>32ch/96kHz</b> <b>&lt;=&gt;</b> <b>Dante 32ch/48kHz</b>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MO</th><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><th>MC</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MT</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>AE</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>DA</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>EX</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO	O	O	O	O	O	O	O	MC								MT								AE								DA								EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MO</th><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MC</th><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MT</th><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>AE</th><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>DA</th><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>EX</th><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD	O							MO	O							MC	O							MT	O							AE	O							DA	O							EX	O							MO WCLK INT	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MO</th><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><th>MC</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MT</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>AE</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>DA</th><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>EX</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO						O		MC								MT								AE								DA		O						EX							
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO	O	O	O	O	O	O	O																																																																																																																																																																																													
MC																																																																																																																																																																																																				
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD	O																																																																																																																																																																																																			
MO	O																																																																																																																																																																																																			
MC	O																																																																																																																																																																																																			
MT	O																																																																																																																																																																																																			
AE	O																																																																																																																																																																																																			
DA	O																																																																																																																																																																																																			
EX	O																																																																																																																																																																																																			
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO						O																																																																																																																																																																																														
MC																																																																																																																																																																																																				
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA		O																																																																																																																																																																																																		
EX																																																																																																																																																																																																				
<b>MADI optical+</b> <b>MADI coaxial</b> <b>64ch/96kHz</b> <b>&lt;=&gt;</b> <b>Dante 64ch/48kHz</b>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MO</th><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><th>MC</th><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><th>MT</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>AE</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>DA</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>EX</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO	O	O	O	O	O	O	O	MC	O	O	O	O	O	O	O	MT								AE								DA								EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td>O</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MO</th><td>O</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MC</th><td>O</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MT</th><td>O</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>AE</th><td>O</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>DA</th><td>O</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>EX</th><td>O</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD	O	O						MO	O	O						MC	O	O						MT	O	O						AE	O	O						DA	O	O						EX	O	O						MO MC WCLK INT	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><th>AD</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>MO</th><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><th>MC</th><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><th>MT</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>AE</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><th>DA</th><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> <tr><th>EX</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO						O		MC						O		MT								AE								DA		O	O					EX							
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO	O	O	O	O	O	O	O																																																																																																																																																																																													
MC	O	O	O	O	O	O	O																																																																																																																																																																																													
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD	O	O																																																																																																																																																																																																		
MO	O	O																																																																																																																																																																																																		
MC	O	O																																																																																																																																																																																																		
MT	O	O																																																																																																																																																																																																		
AE	O	O																																																																																																																																																																																																		
DA	O	O																																																																																																																																																																																																		
EX	O	O																																																																																																																																																																																																		
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO						O																																																																																																																																																																																														
MC						O																																																																																																																																																																																														
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA		O	O																																																																																																																																																																																																	
EX																																																																																																																																																																																																				

<p><b>MADI optical+ MADI coaxial 64ch/96kHz =&gt; MADI optical 64ch/48kHz</b></p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><td>MC</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO	O	O	O	O	O	O	O	MC	O	O	O	O	O	O	O	MT								AE								DA								EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MC</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td>O</td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>DA</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO		O				O		MC			O		O			MT				O				AE			O		O			DA		O				O		EX								<p>MO MC WCLK INT</p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MC</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO		O						MC		O						MT								AE								DA								EX							
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO	O	O	O	O	O	O	O																																																																																																																																																																																													
MC	O	O	O	O	O	O	O																																																																																																																																																																																													
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO		O				O																																																																																																																																																																																														
MC			O		O																																																																																																																																																																																															
MT				O																																																																																																																																																																																																
AE			O		O																																																																																																																																																																																															
DA		O				O																																																																																																																																																																																														
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO		O																																																																																																																																																																																																		
MC		O																																																																																																																																																																																																		
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
<p><b>MADI optical 64ch/48kHz =&gt; MADI optical+ MADI coaxial 64ch/96kHz</b></p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MC</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td>O</td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>DA</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO		O				O		MC			O		O			MT				O				AE			O		O			DA		O				O		EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> <tr><td>MC</td><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD		O	O					MO		O	O					MC		O	O					MT		O	O					AE		O	O					DA		O	O					EX		O	O					<p>MO WCLK INT</p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr> <tr><td>MC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO		O	O					MC								MT								AE								DA								EX							
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO		O				O																																																																																																																																																																																														
MC			O		O																																																																																																																																																																																															
MT				O																																																																																																																																																																																																
AE			O		O																																																																																																																																																																																															
DA		O				O																																																																																																																																																																																														
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD		O	O																																																																																																																																																																																																	
MO		O	O																																																																																																																																																																																																	
MC		O	O																																																																																																																																																																																																	
MT		O	O																																																																																																																																																																																																	
AE		O	O																																																																																																																																																																																																	
DA		O	O																																																																																																																																																																																																	
EX		O	O																																																																																																																																																																																																	
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO		O	O																																																																																																																																																																																																	
MC																																																																																																																																																																																																				
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
<p><b>MADI optical at any samplerate =&gt; anything else* at main samplerate</b></p> <p>* ) All outputs shown</p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><td>MC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO	O	O	O	O	O	O	O	MC								MT								AE								DA								EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MC</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td>O</td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>DA</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO		O				O		MC			O		O			MT				O				AE			O		O			DA		O				O		EX								<p>MO WCLK</p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><td>MC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO	O	O	O	O	O	O	O	MC								MT								AE								DA								EX							
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO	O	O	O	O	O	O	O																																																																																																																																																																																													
MC																																																																																																																																																																																																				
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO		O				O																																																																																																																																																																																														
MC			O		O																																																																																																																																																																																															
MT				O																																																																																																																																																																																																
AE			O		O																																																																																																																																																																																															
DA		O				O																																																																																																																																																																																														
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO	O	O	O	O	O	O	O																																																																																																																																																																																													
MC																																																																																																																																																																																																				
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
<p><b>Any input* at main samplerate =&gt; Dante 48kHz</b></p> <p>* ) ADAT shown</p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO								MC								MT								AE								DA	O	O	O	O	O	O	O	EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MO</td><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MC</td><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>DA</td><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD						O		MO						O		MC						O		MT						O		AE						O		DA						O		EX						O		<p>DA INT</p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MO</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD						O		MO								MC								MT								AE								DA								EX							
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO																																																																																																																																																																																																				
MC																																																																																																																																																																																																				
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA	O	O	O	O	O	O	O																																																																																																																																																																																													
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD						O																																																																																																																																																																																														
MO						O																																																																																																																																																																																														
MC						O																																																																																																																																																																																														
MT						O																																																																																																																																																																																														
AE						O																																																																																																																																																																																														
DA						O																																																																																																																																																																																														
EX						O																																																																																																																																																																																														
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD						O																																																																																																																																																																																														
MO																																																																																																																																																																																																				
MC																																																																																																																																																																																																				
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
<p><b>Any input* at main samplerate =&gt; MADI optical 48kHz</b></p> <p>* ) ADAT shown</p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MC</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td>O</td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>DA</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO		O				O		MC			O		O			MT				O				AE			O		O			DA		O				O		EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MC</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD		O						MO		O						MC		O						MT		O						AE		O						DA		O						EX		O						<p>WCLK INT</p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>DA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD		O						MO								MC								MT								AE								DA								EX							
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO		O				O																																																																																																																																																																																														
MC			O		O																																																																																																																																																																																															
MT				O																																																																																																																																																																																																
AE			O		O																																																																																																																																																																																															
DA		O				O																																																																																																																																																																																														
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD		O																																																																																																																																																																																																		
MO		O																																																																																																																																																																																																		
MC		O																																																																																																																																																																																																		
MT		O																																																																																																																																																																																																		
AE		O																																																																																																																																																																																																		
DA		O																																																																																																																																																																																																		
EX		O																																																																																																																																																																																																		
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD		O																																																																																																																																																																																																		
MO																																																																																																																																																																																																				
MC																																																																																																																																																																																																				
MT																																																																																																																																																																																																				
AE																																																																																																																																																																																																				
DA																																																																																																																																																																																																				
EX																																																																																																																																																																																																				
<p><b>ASRC disabled</b></p>	<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MC</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td>O</td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>DA</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO		O				O		MC			O		O			MT				O				AE			O		O			DA		O				O		EX								<table border="1"> <thead> <tr><th></th><th>AD</th><th>MO</th><th>MC</th><th>MT</th><th>AE</th><th>DA</th><th>EX</th></tr> </thead> <tbody> <tr><td>AD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MO</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>MC</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>MT</td><td></td><td></td><td></td><td>O</td><td></td><td></td><td></td></tr> <tr><td>AE</td><td></td><td></td><td>O</td><td></td><td>O</td><td></td><td></td></tr> <tr><td>DA</td><td></td><td>O</td><td></td><td></td><td></td><td>O</td><td></td></tr> <tr><td>EX</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		AD	MO	MC	MT	AE	DA	EX	AD								MO		O				O		MC			O		O			MT				O				AE			O		O			DA		O				O		EX								<p>any</p>	<p>any</p>																																																																
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO		O				O																																																																																																																																																																																														
MC			O		O																																																																																																																																																																																															
MT				O																																																																																																																																																																																																
AE			O		O																																																																																																																																																																																															
DA		O				O																																																																																																																																																																																														
EX																																																																																																																																																																																																				
	AD	MO	MC	MT	AE	DA	EX																																																																																																																																																																																													
AD																																																																																																																																																																																																				
MO		O				O																																																																																																																																																																																														
MC			O		O																																																																																																																																																																																															
MT				O																																																																																																																																																																																																
AE			O		O																																																																																																																																																																																															
DA		O				O																																																																																																																																																																																														
EX																																																																																																																																																																																																				

## 5. MAINTENANCE

### 5.1. ASRC selftest

If there is any doubt on the correct operation of the ASRC, it can easily be checked by running the ASRC selftest. The selftest works by passing an internally generated sine wave forward and back through the ASRC (running two conversions, from 96kHz => 88.2kHz => 96kHz) on all 64 channels.

- To enter ASRC selftest mode: Press **Recall**, move to **☼ Function**, move to **☼ 11**, press **OK**, turn the encoder until the seven-segment display shows **03** ("ASRC selftest") and press **OK**.
- The resulting data is output on the headphones where it can be verified by listening to it. The ASRC works correctly if a clean, non-distorted 1000Hz sine tone can be heard on all channels.  
Use **☼ Ch** to listen to the appropriate channel. The output volume can be adjusted using **☼ Vol.**
- The resulting data is also output on MADI optical (channels 1-32) and MADI coaxial (channels 33-64) as two 96kHz/32ch streams, clocked by the internal clock of the multiverter. You can use any signal meter to check the result; the output level should be -20dB on all channels.
- To exit ASRC selftest mode, press the **↶ Back** button.

### 5.2. Determining ASRC Firmware/Hardware version

To check the firmware and hardware version of the ASRC module:

Press **Recall**, move to **☼ Function**, press **OK**, move to **☼ 12**, press **OK**

- Move the cursor to
  - **☼ EX** to show the ASRC Firmware Major Version number
  - **☼ Ch** to show the ASRC Firmware Minor Version number
  - **☼ Vol** to show the ASRC Hardware Versionin the seven-segment display.

### 5.3. ASRC Firmware Upgrade

Although seldom required, the ASRC firmware itself can be upgraded. This is done similar to the multiverter upgrade, with the difference that the USB plug has to be connected directly to the ASRC (not on the multiverter).

**RISK OF ELECTRIC SHOCK:**

It is strongly advised to power the Multiverter from the DC source (9..24V) during upgrade.

When powering via AC mains, it is possible to touch live parts inside during the upgrade! Only qualified personnel should do this, obeying the safety rules when working with live mains voltage.

- The ASRC module must be mounted within the multiverter during update (the multiverter supplies power to it).
- The cover of the multiverter must remain open throughout the upgrade process to allow plugging of the USB cable into the ASRC's USB jack.
- Follow the instructions in the README.TXT file of the firmware update.

## 6. SPECIFICATIONS

Parameter	Value																																																					
Dimensions	115x94x27mm (BxHxD)																																																					
Weight	65 g																																																					
Operating temperature	0..+70°C, non-condensing																																																					
Storage temperature	-40..+85°C, non-condensing																																																					
Power consumption	7W max.																																																					
Channel count	Up to 64 per direction in x1 modes (44.1 / 48 kHz) Up to 64 per interface in x2 modes (88.2 / 96 kHz) Up to 32 per interface in x4 modes (176.4 / 192 kHz)																																																					
Sample rates	Arbitrary sample rates between 32kHz and 192kHz																																																					
Analog performance	THD+N: -133 dB typ. / -120dB max. Dynamic range (A-weighted, 20 Hz to 20 kHz): 139 dB																																																					
Latency	<p>For <b>up-sampling</b> conversions: <math>t/s = 16/fs_{in} + 32/fs_{in}</math></p> <table border="1"> <thead> <tr> <th>fs_in / kHz</th> <th>t / ms</th> </tr> </thead> <tbody> <tr> <td>44.1</td> <td>1.09</td> </tr> <tr> <td>48</td> <td>1.03</td> </tr> <tr> <td>88.2</td> <td>0.54</td> </tr> <tr> <td>96</td> <td>0.5</td> </tr> <tr> <td>176.2</td> <td>0.27</td> </tr> </tbody> </table> <p>For <b>down-sampling</b> conversions: <math>t/s = 16/fs_{in} + (32/fs_{in})*(fs_{in}/fs_{out})</math></p> <table border="1"> <thead> <tr> <th>fs_in / kHz</th> <th>fs_out / kHz</th> <th>t / ms</th> </tr> </thead> <tbody> <tr> <td rowspan="3">48</td> <td>44.1</td> <td>1.06</td> </tr> <tr> <td>88.2</td> <td>0.91</td> </tr> <tr> <td>48</td> <td>0.84</td> </tr> <tr> <td rowspan="3">96</td> <td>44.1</td> <td>0.89</td> </tr> <tr> <td>48</td> <td>0.83</td> </tr> <tr> <td>88.2</td> <td>0.53</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>fs_in / kHz</th> <th>fs_out / kHz</th> <th>t / ms</th> </tr> </thead> <tbody> <tr> <td rowspan="4">176.4</td> <td>44.1</td> <td>0.82</td> </tr> <tr> <td>48</td> <td>0.76</td> </tr> <tr> <td>88.2</td> <td>0.45</td> </tr> <tr> <td>96</td> <td>0.42</td> </tr> <tr> <td rowspan="4">192</td> <td>44.1</td> <td>0.81</td> </tr> <tr> <td>48</td> <td>0.75</td> </tr> <tr> <td>88.2</td> <td>0.45</td> </tr> <tr> <td>96</td> <td>0.42</td> </tr> <tr> <td></td> <td>176.4</td> <td>0.26</td> </tr> </tbody> </table>	fs_in / kHz	t / ms	44.1	1.09	48	1.03	88.2	0.54	96	0.5	176.2	0.27	fs_in / kHz	fs_out / kHz	t / ms	48	44.1	1.06	88.2	0.91	48	0.84	96	44.1	0.89	48	0.83	88.2	0.53	fs_in / kHz	fs_out / kHz	t / ms	176.4	44.1	0.82	48	0.76	88.2	0.45	96	0.42	192	44.1	0.81	48	0.75	88.2	0.45	96	0.42		176.4	0.26
fs_in / kHz	t / ms																																																					
44.1	1.09																																																					
48	1.03																																																					
88.2	0.54																																																					
96	0.5																																																					
176.2	0.27																																																					
fs_in / kHz	fs_out / kHz	t / ms																																																				
48	44.1	1.06																																																				
	88.2	0.91																																																				
	48	0.84																																																				
96	44.1	0.89																																																				
	48	0.83																																																				
	88.2	0.53																																																				
fs_in / kHz	fs_out / kHz	t / ms																																																				
176.4	44.1	0.82																																																				
	48	0.76																																																				
	88.2	0.45																																																				
	96	0.42																																																				
192	44.1	0.81																																																				
	48	0.75																																																				
	88.2	0.45																																																				
	96	0.42																																																				
	176.4	0.26																																																				



## 7. APPENDIX

### 7.1. 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.

### 7.2. 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

### 7.3. 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.

### 7.4. Document Revision History

2: Layout improved  
1: Initial release

### 7.5. About this document

All trademarks mentioned in this document are property of the respective owners. All information provided here is subject to change without prior notice.

Document Revision: 2 · 2018-09-04  
Copyright © 2017-2018 Appsys ProAudio · Printed in Switzerland