User's Guide

MADI Bridge

The MADI Patchbay

8 x 64 Channel MADI Switcher / Router

6 coaxial Inputs and Outputs
2 optical Inputs and Outputs
MIDI Remote Control
Preset Memory
64 Dot Matrix Display

Firmware 1.1 or up

Contents

1. Introduction

The MADI Bridge provides you with a versatile and powerful 8 x 8 patchbay for MADI signals. As a consequent continuation of RME's world-wide successful MADI series, the MADI Bridge also contains elaborate technology and the latest integrated circuits. In a few words: The MADI Bridge is a uniquely powerful and high-quality device, which will excite you even after many years of operation.

2. Package Contents

Please check that your MADI Bridge package contains each of the following:

- MADI Bridge
- Manual
- Power chord

3. Brief Description and Characteristics

Developed as the optimal missing link between MADI devices of any manufacturer, RME's MADI Bridge serves as patchbay, distributor, signal buffer and input selector - and is thus mandatory for every MADI user. Up to 16 devices can be freely connected with each other by 6 coaxial (BNC) and 2 optical in- and output pairs. Thanks to an intuitive and easy to navigate user surface, the device is easy to understand and to operate – even without a manual. Additionally the MADI Bridge can be remote controlled via MIDI.

All input signals are routed unaltered to the desired outputs. Like this, the MADI Bridge supports any format, no matter if it is 56 or 64 channels or includes special invisible control commands, any sample rates and even out-of-spec data rates, or violations of the MADI protocol. Thanks to a highly sensitive input stage, coaxial cable lengths of 100 m can be used - even between several devices.

4. Firmware

The MADI Bridge's main part has been realized using programmable logic. By exchanging a little component called EPROM, both function and behaviour of the unit can be changed at any time.

At the time of writing this manual, the unit is shipped with firmware 1.1. The firmware version is displayed after power on by the channel LEDs for about one second.

5. Technical Specifications

- Power supply: Internal, 100-240 V AC, 15 Watts
- Dimensions: 483 x 44 x 205 mm
- Weight: 2 kg

5.1 Inputs

MADI

- Coaxial via BNC, 75 Ohm, according to AES10-1991
- High-sensitivity input stage (< 0.2 Vpp)

- Optical via FDDI duplex SC connector
- 62.5/125 and 50/125 compatible

- Accepts any MADI signal

MIDI

- 16 channels MIDI
- 5-pin DIN jack
- Optocoupled, ground-free input
- Fixed MIDI Thru functionality

5.2 Outputs

MADI

- Coaxial via BNC, 75 Ohm, according to AES10-1991
- Output voltage 600 mVpp
- Cable length: more than 100 m

- Optical via FDDI duplex SC connector
- 62.5/125 and 50/125 compatible
- Fiber length: more than 500 m

MIDI

- 16 channels MIDI
- 5-pin DIN jack
- Fixed MIDI Thru functionality

6. First Usage

6.1 Quick Start

The user interface of the MADI Bridge is characterized by a clearly structured architecture and an unambiguous labelling of the front and rear sides. The device can thus be used easily without a manual, because numerous displays show the state of the device in a strictly logical way. However, we don't want to hold you back from reading this manual, as it includes a lot of important and useful information.

The follwing information is important to know for a successful usage of the unit:

- The alpha numerical input displays of the eight outputs always show the **REAL** state. Selecting a different input via the **Up/Down keys**, both display and routing change immediately.

- The 64 dot matrix shows the configuration of the selected preset. So when stepping through the presets the matrix display serves as **preview**.

- Directly after loading a preset (**Recall**) both matrix and alpha numerical displays show the REAL state. Changing the routing via the Up/Down keys does not cause a change in the matrix display. The changed channel displays get marked with a **dot**, to indicate a setting different from the formerly loaded preset (and with this from the matrix display).

- The preset 0 can not be edited. It **interrupts** (disconnects) all connections, thus operates like a MUTE functionality.

- The preset NONE (no number displayed) is no preset, therefore does not react on Save and Recall. In this setting the matrix shows the current routing instead of the currently selected preset. Changes via the Up/Down keys can then be monitored in **real-time** in the matrix display.

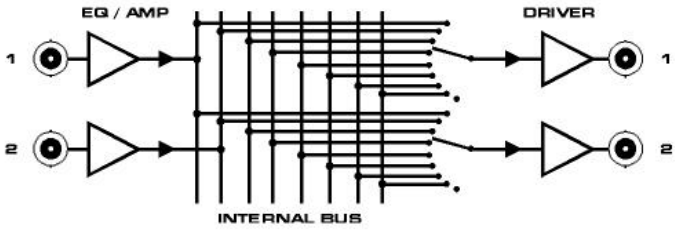
- To prevent accidental operating errors, the keys STORE and RECALL react delayed. For the specific function to be executed, the keys have to be pressed at least for a second.

The MADI Bridge remembers all settings before switching off and sets them automatically when switching on the next time.

6.2 Operation

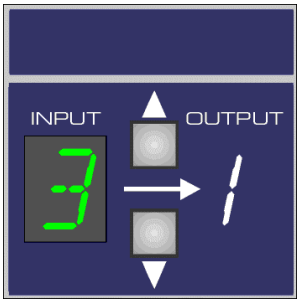
The **Lock** section allows both locking the keys on the device and locking the MIDI remote. This way the device can be secured against accidental operating errors.

The front panel has **eight output fields**. This clarifies the way the MADI Bridge operates. An output can be fed by any input, multiple outputs can be fed even from the same input. This way the device can be used as distributor.



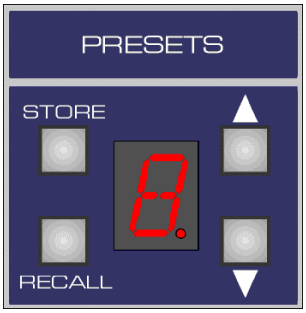
But it's not possible to route more than one input to one output. This would equal the functionality of a digital mixing desk, requiring the ability of mixing digital signals.

Eight alphanumerical LED displays seperately show the current **signal source** for each output. Using two keys, the Up/Down keys, the input source can be changed quickly. Besides input 1 to 8, input 0 (no input) can be chosen as well.



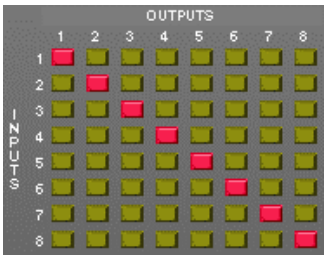
Above each configuration field, an **empty label area** allows to attach a tape to each output, with the name of the connected device. With this, the routing stays clear and easy to understand, even when all I/Os are in use.

The device stores the last settings when being switched off. The current setting can also be stored as **Preset**. The section Presets offers 9 free memories. Memory 0 is pre-configured as **panic button**, it cancels all connection points.



A preset is pre-selected first. The matrix field shows the configuration of the pre-selected preset. The desired preset is then loaded with the **Recall** key. As soon as one of the routings is being changed, both the changed output and the preset number show a dot in the display.

The 64 LED **matrix field** displays all routings in classical matrix view, a configuration can be viewed and understood in a glance. The matrix field is especially valuable for pre-selection of the presets, because the preset's routing is displayed in the matrix before recall. The preset NONE (no number displayed) switches the matrix into **real-time display**, showing the current routing.



The crosspoints of identical inputs/outputs are marked by red warning LEDs. A routing of an output to the same input causes a feedback when connecting external devices. Therefore, in most cases this kind of connection makes no sense. As such a connection might be desired in specific cases (see chapter 9.1), it is still available in the MADI Bridge.

7. Inputs and Outputs

7.1 MADI Inputs

The rear of the MADI Bridge has six coxial MADI inputs, available as BNC sockets. The sockets are ground-free and seperated from ground by capacitive coupling. This method prevents ground loops and other distortions by potential differences between the connected units. Note that the the transmission at the receiver still operates unbalanced.

The BNC input's ground-free design is built according to AES10-1991. The input's impedance is 75 Ohm. It will operate error-free from about 180 mVpp.

The two optical inputs use a FDDI (ISO/IEC 9413-3) compatible optical module each, according to AES10-1991. More information can be found in chapter 10.1, MADI Basics.

7.2 MADI Outputs

The rear of the MADI Bridge has six coxial MADI outputs, available as BNC sockets.

The BNC outputs are built according to AES10-1991. The output impedance is 75 Ohm. The output voltage will be 600 mVpp when terminated with 75 Ohm.

The two optical outputs use a FDDI (ISO/IEC 9413-3) compatible optical module each, according to AES10-1991. More information can be found in chapter 10.1, MADI Basics.

7.3 MIDI Input and Output

The rear of the MADI Bridge offers one MIDI input and output via two 5-pin DIN jacks. The MIDI input can be used to remote control the MADI Bridge. The MADI Bridge sends out status information via the MIDI output. All MIDI data at the MIDI input are passed on to the output, a method known as MIDI Thru function. This way the MADI Bridge can be easily integrated (inserted) into existing cablings and setups.

8. Software MIDI Remote

8.1 MIDI Control of the MADI Bridge

The MADI Bridge can be completely remote controlled via MIDI. It reacts on commands directed to the specific unit. Furthermore, on request the complete status is send back, which includes all front panel displays and key states. Each MADI Bridge can be programmed with its own ID. This allows to remote control multiple units, even via the same MIDI channel. A detailed description of the MIDI commands can be found in chapter 13.

The key LOCK MIDI turns off MIDI remote. This safety function prevents the current setup from unintended changes by MIDI commands. All input data are still passed through to the MIDI output.

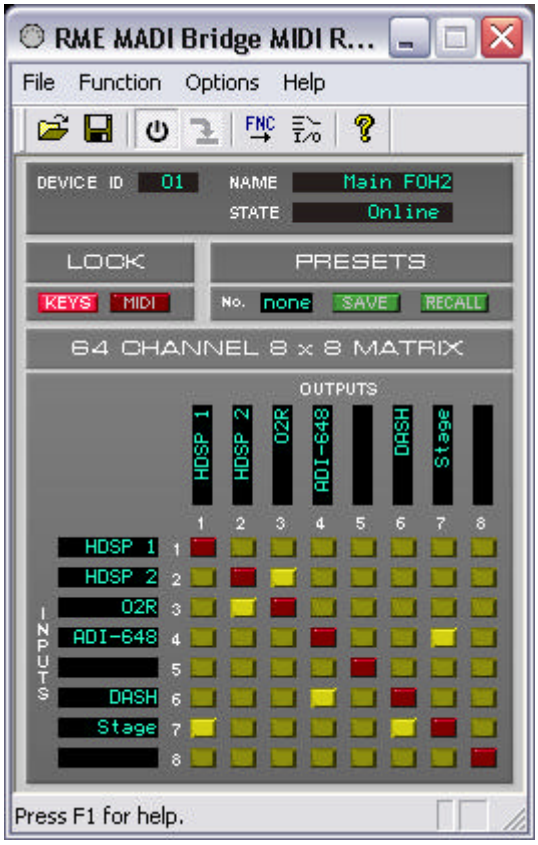
Especially recommended is the combination of HDSP MADI and ADI-648. They transmit MIDI directly embedded in MADI, thus allow controlling a MADI Bridge which is located far away from the computer.

8.2 General Notes on Operation

RME's free Windows software ***MIDI Remote*** is an extraordinairy MIDI remote control program. MIDI Remote allows for configuration and status request of different RME devices by a simple mouse click. Both ADI-648 and MADI Bridge are fully supported. The communication uses any free MIDI port available in the system.

Software download: http://www.rme-audio.de/download/midiremote.zip

After connecting the MADI Bridge to a MIDI port present in the system (input and output), start the software **MIDI Remote**. In the menu **Function** (or via F4) select the entry **MADI Bridge Matrix**. Next select the used MIDI port in the menu **Options**, **MIDI I/O Setup** (or use F3).



In the upper part of the window the current status of the communication is shown. It starts Offline. Via the menu **Options**, **Connect MIDI Ports**, or by a click on the **Power** icon in the Toolbar (third icon from the left) the MIDI communication is started. Now the **State** field changes to **Online**.

In case the display changes to **No Response** the program does not receive any reply from the MADI Bridge. Most probably this is caused by the usage of a wrong ID. The MADI Bridge has been programmed to ID 00 in the factory. When the device ID **00** or **All** are selected in the program, the communication must work. The device ID can be changed by a double click on the black field **Device ID**.

8.3 Brief description of the menu entries, Function MADI Bridge Matrix

File – New MIDI Remote Window
The program MIDI Remote is capable of multi-client operation. There is no limit in opening windows and thus controlling as many units at the same time as desired.

File – Open and Save Setup
All settings can be stored in and loaded from a file. This is especially useful to quickly load different routings, or to access different units with different IDs.

File – Load and Save Workspace
The settings and the position of multiple opened windows can be saved and loaded from a workspace file. In contrary to the settings file, the used MIDI ports are also stored and loaded.

Function
At this time, the MIDI Remote includes three operation windows: a front panel view of the ADI-648, a matrix view of the ADI-648, and a matrix view of the MADI Bridge.

Options – Connect MIDI Ports
Start / Stop of the MIDI communication. In the upper part of the window the current state is shown, like selected ID, Online / No Response / Offline.

Options – Send Single Set of Data
In Offline mode the program can be used to just send a single set of commands. With this, a change of the configuration can be performed at a specific moment. Additionally the load on the MIDI line is reduced, as no ongoing communication is taking place.

Options – Select Device (F2)
Opens a dialog box to select a device ID. Choosing 'All', the current device ID of the unit is ignored. The setting 'All' is not allowed when using more than one MADI Bridge.

Options – MIDI I/O Setup (F3)
Opens a settings dialog to configure the MIDI input and output port. This setting can be different for different windows (views).

Options – Function Select (F4)
Opens a settings dialog to select the current function. At this time, the MIDI Remote includes three functions: a front panel view of the ADI-648, a matrix view of the ADI-648, and a matrix view of the MADI Bridge.

Options – Edit Device Namens
Opens a settings dialog to assign a name to each device ID.

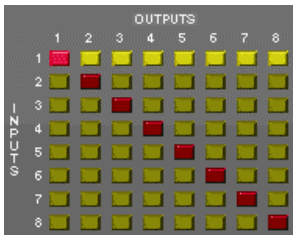
Options – Set I/O names to default
Double click on the the name fields in the matrix to type in any desired name. This option sets all fields back to the factory names.

Options – Ignore Position on Setup Load
With this option active, the window position stored in a setup file is not used when loading the setup. So the current window position will not change.

Options – Program Device ID
Opens a settings dialog to program a device ID into the MADI Bridge. Note: programming is fast and not confirmed. Attention: Programming is only possible when not more than one MADI Bridge is connected via MIDI!

9. Configuration Examples

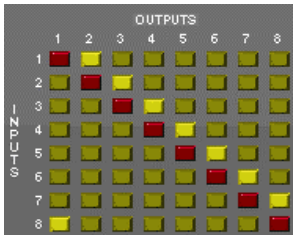
9.1 Distribution 1 to 8



Use the Up/Down keys to select 'INPUT 1' on all channels. The matrix displayes a horizontal line in the most upper line.

The input signal from input 1 is now sent to all eight outputs of the MADI bridge at the same time (in parallel).

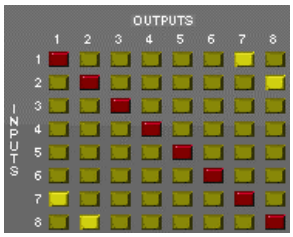
9.2 Passing On the signal



Use the Up/Down keys to set all inputs one below the current output channel. Output 1 is set to input 8, output 2 to 1, output 3 to 2 and so on. The matrix shows a 45° line from upper left to lower right, shifted one LED to the right of the red LEDs. In this configuration the input signal 1 is sent to the output 2, input 2 to output 3 and so on. With this, all MADI devices are connected in a serial way.

9.3 Conversion Optical to Coaxial and vice versa

Of course, the MADI Bridge can also serve as format converter from coaxial to optical, and at the same time from optical to coaxial. Thanks to its two optical I/Os, both functions are even available two times!



Coxial to optical: Configure output 7 and/or 8 to use one of the six coaxial inputs.

Optical to coaxial: Configure output 1 to 6 to use the optical input 7 and/or 8.

10. Technical Background

10.1 MADI Basics

MADI, the serial **M**ultichannel **A**udio **D**igital **I**nterface, has been defined already in 1989 as an extension of the existing AES3 standard following several manufacturers' wish. The format also known as AES/EBU, a balanced bi-phase signal, is limited to two channels. Simply put, MADI contains 28 of those AES/EBU signals in serial, i. e. after one another, and the sample rate can still even vary by +/-12.5%. The limit which cannot be exceeded is a data rate of 100Mbit/s.

Because an exact sampling frequency is used in most cases, the 64 channel mode was introduced officially in 2001. It allows for a maximum sample rate of 48 kHz + ca. 1%, corresponding to 32 channels at 96 kHz, without exceeding the maximum data rate of 100 Mbit/s. The effective data rate of the port is 125 Mbit/s due to additional coding.

Older devices understand and generate only the 56 channel format. Newer devices often work in the 64 channel format, but offer still no more than 56 audio channels. The rest is being eaten up by control commands for mixer settings etc.. The ADI-648 and the HDSP MADI show that this can be done in a much better way, with an invisible transmission of 16 MIDI channels and the MADI signal still being 100% compatible.

For the transmission of the MADI signal, proved methods known from network technology were applied. Most people know unbalanced (coaxial) cables with 75 Ohms BNC plugs, they are not expensive and easy to get. The optical interface is much more interesting due to its complete galvanic separation, but for many users it is a mystery, because very few have ever dealt with huge cabinets full of professional network technology. Therefore here are some explanations regarding 'MADI optical'.

- The cables used are standard in computer network technology. They are thus not at all expensive, but unfortunately not available in every computer store.

- The cables have an internal fibre of only 50 or 62.5 µm diameter and a coating of 125 µm. They are called network cables 62.5/125 or 50/125, the former mostly being blue and the latter mostly being orange. Although in many cases not clearly labeled, these are always (!) glass fibre cables. Plastic fibre cables (POF, plastic optical fibre) can not be manufactured in such small diameters.

- The plugs used are also an industry standard and called SC. Please don't mix them up with ST connectors, which look similar to BNC connectors and are being screwed. Plugs used in the past (MIC/R) were unnecessarily big and are not being used any longer.

- The cables are available as a duplex variant (2 cables being glued together) or as a simplex variant (1 cable). The ADI-648's opto module supports both variants.

- The transmission uses the multimode technique which supports cable lengths of up to almost 2 km. Single mode allows for much longer distances, but it uses a completely different fibre (8 µm). By the way, due to the wave-length of the light being used (1300 nm), the optical signal is invisible to the human eye.

10.2 MADI Bridge Technology

A MADI patchbay basically can be realized in two ways: using a complete signal regeneration (including reclocking), or by a buffered distribution of the un-processed input signal.

Complete Signal Regeneration: This method requires a complete MADI receiver per input, and a complete MADI transmitter per output. The signal must be processed and reclocked. The costs are extreme, as the special MADI chip (required 8 times!) is already very expensive. Additionally another very powerful FPGA is necessary. Operation gets clumbersome, as the unit has to provide full clock support and control. The advantage is that the MADI signal at the output is completely independent from the quality of the input signal, as it is fully newly generated.

Buffered Distribution: This method uses a sensitive receiver to amplify the input signal to a standard level, then puts out this signal with an active driver stage. The signal is not processed nor reclocked. The different combinations (routings) of the input and output signals as well as the MIDI control can be performed by a fast FPGA. The component costs are dramatically lower compared to the Signal Regeneration method. The operation is very easy, as the current clock situation is completely ignored. The disadvantage is that the quality of the output signal depends on that of the input signal, as the signal is passed on nearly unchanged. Additionally the maximum coaxial cable length is reduced, as a signal to/from the MADI Bridge travels double the distance.

RME's MADI Bridge uses *adapted termination* and a *special equalizing*, to reach higher cable lengths despite its simpler design. The MADI Bridge can even serve as cable buffer for the limited outpus of some manufacturers (90 meter coaxial instead of 30 meter...).

Real world tests with MADI devices of various manufacturers confirmed the outstanding performance of the MADI Bridge. There exists only one exception: The output signal of the Sony 3348 (digital tape machine of the first MADI generation) becomes unreadable when passed through the MADI Bridge. Fortunately this problem was easy to be fixed. The inputs 5 and 6 of the MADI Bridge can be made compatible to the 3348 by internal jumpers.

10.3 Setting Inputs 5/6 into Compatibility Mode (Sony 3348)

Before opening the unit, make sure the power cable is disconnected from the mains supply. Risk of electric shock by high voltage inside the unit!

1. Disconnect the power cord and all other cables from the MADI Brigde.

2. Remove the rack ears using a screwdriver (Phillips 1, 2 screws per ear).

3. Remove the screws of the cover (7 screws).

4. Slide the cover to the back and remove it.

5. Jumper JP1 and JP2 are placed near the BNC jacks of input 5 and 6. The jumper position is printed to the left on the pcb. The factory default is the setting 'Standard'. Changing the jumpers to the other position activates the Sony 3348 mode.

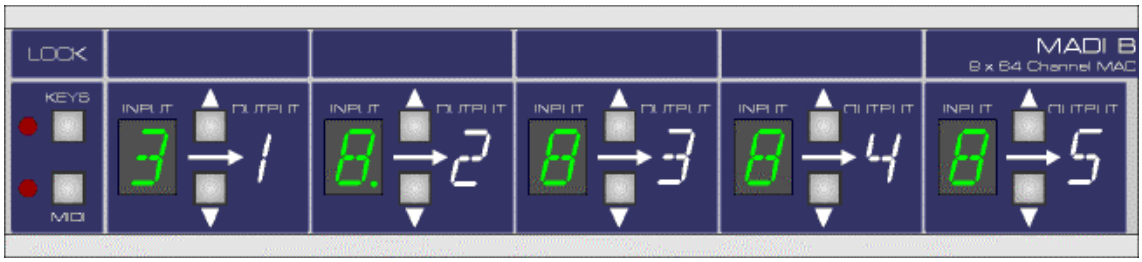
6. Put the cover back on and slide it into the front panel's frame, so that all 7 screws can be refit and tightened.

7. Mount the rack ears.

8. Connect power and other cables.

11. Controls and Connectors

Front Left Part

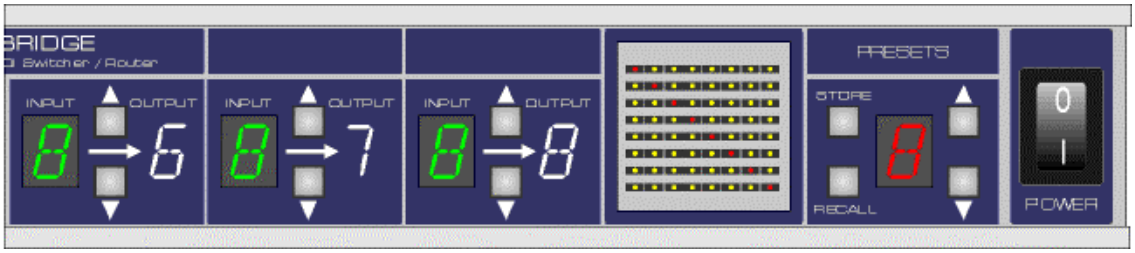


Locking of
Keys
MIDI

Input selection
for Output 2

Input selection
for Output 4

Front Right Part



Input selection
for Output 6

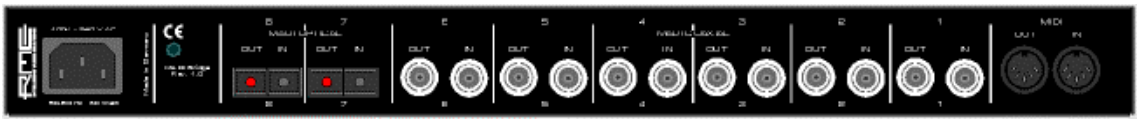
Input selection
for Output 8

Matrix display

Preset section
Store
Recall
Select

Power switch

Rear



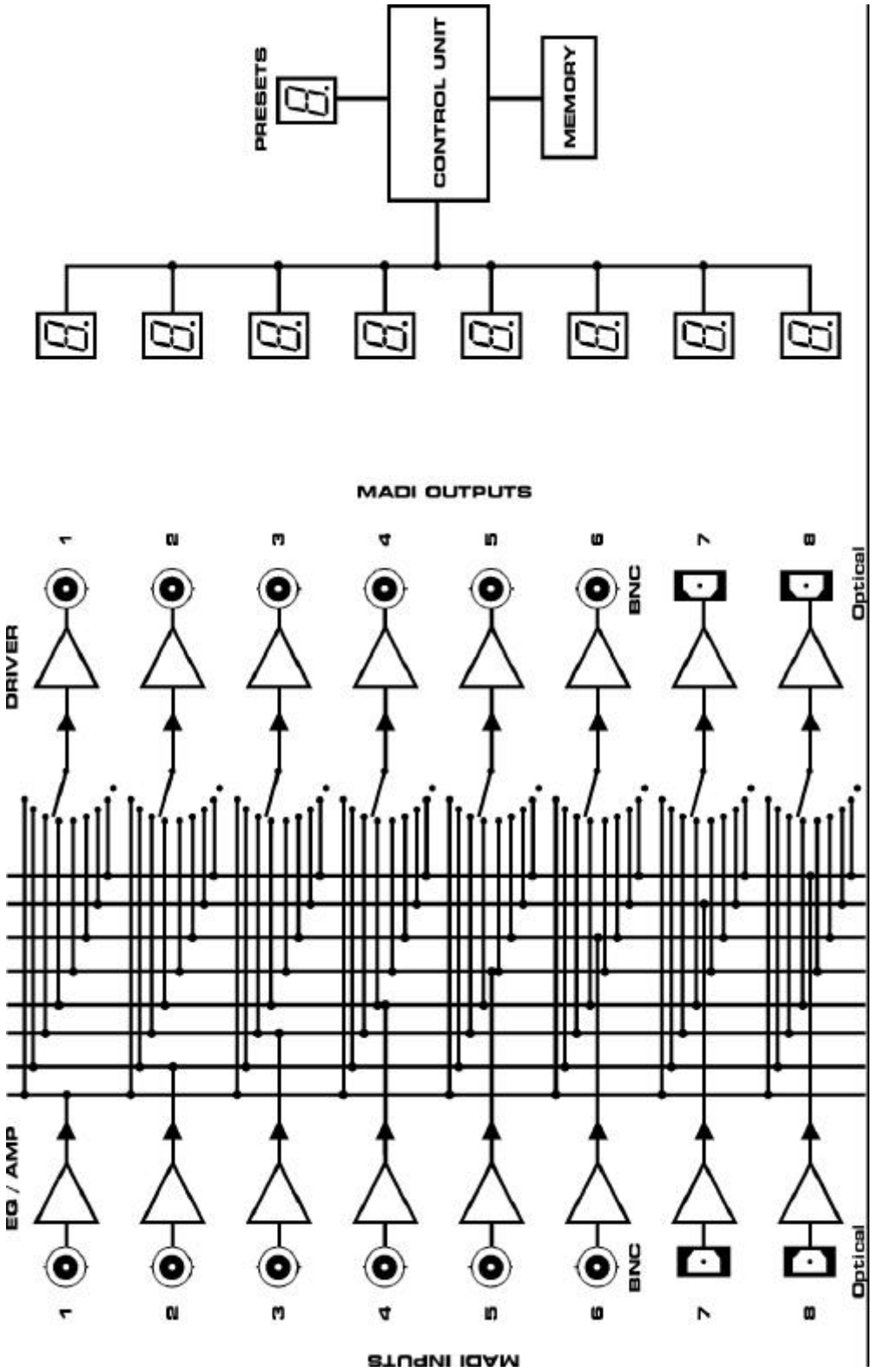
Power connector

MADI Optical
Inputs
Outputs

MADI coaxial
Inputs
Outputs

MIDI
Input
Output

12. Block Diagram



13. MIDI Implementation Chart

13.1 Basic SysEx Format

Value	Name
F0h	SysEx header
00h 20h 0Dh	MIDITEMP manufacturer ID
65h	Model ID (MADI Bridge)
00h..7Eh, 7Fh	Device ID. 7Fh = broadcast (all IDs)
mm	Message type
nn	Parameter number (see table 1)
oo	Databyte
F7h	EOX

13.2 Message Types

Value	Name
10h	Request value
20h	Set value
30h	Value response

Request Value

Format: F0 00 20 0D 65 (dev ID) 10 F7

This string triggers a complete dump of all value response data bytes.

Value Response

After being triggered by receiving a request value command, device sends a string of all value response data bytes. Message type is set to 30h.

Set Value

Sets any number of parameters.
nn / oo can be repeated freely.

13.3 Total Reset

Sending the following SysEx string to the MADI Bridge will perform a complete reset (factory default state). Device ID is set to 00, all presets are set to 0 (no connection active in any pre-set), and preset NONE is selected.

F0 00 20 0D 65 7F 20 0A 00 05 00 07 01 05 01 06 01 05 02 06 01 05 03 06 01 05 04 06 01 05 05 06 01 05 06 06 01 05 07 06 01 05 08 06 01 05 09 06 01 05 0A 07 01 F7

13.4 Table

No.	Name	Request Value	Set Value	Value Response	Databytes
05h	Preset number	x	x	x	1 Byte, value 0..10 (0..9 = Preset number, 0A = Matrix realtime display)
06h	Store		x		1 = set
07h	Recall		x		1 = recall
08h	Key Lock	x		x	
09h	MIDI Lock	x		x	
0Ah	Device ID	x	x	x	1 Byte (00h..7Eh, 7Fh = broadcast)
10h	Preset 1 Out 1	x		x	1 Byte, value 0..8 (0 = no input, 1..8 = input number)
11h	Preset 1 Out 2	x		x	Same
12h	Preset 1 Out 3	x		x	Same
13h	Preset 1 Out 4	x		x	Same
14h	Preset 1 Out 5	x		x	Same
15h	Preset 1 Out 6	x		x	Same
16h	Preset 1 Out 7	x		x	Same
17h	Preset 1 Out 8	x		x	Same
18h	Preset 2 Out 1	x		x	Same
19h	Preset 2 Out 2	x		x	Same
1Ah	Preset 2 Out 3	x		x	Same
1Bh	Preset 2 Out 4	x		x	Same
1Ch	Preset 2 Out 5	x		x	Same
1Dh	Preset 2 Out 6	x		x	Same
1Eh	Preset 2 Out 7	x		x	Same
1Fh	Preset 2 Out 8	x		x	Same
20h	Preset 3 Out 1	x		x	Same
21h	Preset 3 Out 2	x		x	Same
22h	Preset 3 Out 3	x		x	Same
23h	Preset 3 Out 4	x		x	Same
24h	Preset 3 Out 5	x		x	Same
25h	Preset 3 Out 6	x		x	Same
26h	Preset 3 Out 7	x		x	Same
27h	Preset 3 Out 8	x		x	Same
28h	Preset 4 Out 1	x		x	Same
29h	Preset 4 Out 2	x		x	Same
2Ah	Preset 4 Out 3	x		x	Same
2Bh	Preset 4 Out 4	x		x	Same
2Ch	Preset 4 Out 5	x		x	Same

No.	Name	Request Value	Set Value	Value Response	Databytes
2Dh	Preset 4 Out 6	x		x	1 Byte, value 0..8 (0 = no input, 1..8 = input number)
2Eh	Preset 4 Out 7	x		x	Same
2Fh	Preset 4 Out 8	x		x	Same
30h	Preset 5 Out 1	x		x	Same
31h	Preset 5 Out 2	x		x	Same
32h	Preset 5 Out 3	x		x	Same
33h	Preset 5 Out 4	x		x	Same
34h	Preset 5 Out 5	x		x	Same
35h	Preset 5 Out 6	x		x	Same
36h	Preset 5 Out 7	x		x	Same
37h	Preset 5 Out 8	x		x	Same
38h	Preset 6 Out 1	x		x	Same
39h	Preset 6 Out 2	x		x	Same
3Ah	Preset 6 Out 3	x		x	Same
3Bh	Preset 6 Out 4	x		x	Same
3Ch	Preset 6 Out 5	x		x	Same
3Dh	Preset 6 Out 6	x		x	Same
3Eh	Preset 6 Out 7	x		x	Same
3Fh	Preset 6 Out 8	x		x	Same
40h	Preset 7 Out 1	x		x	Same
41h	Preset 7 Out 2	x		x	Same
42h	Preset 7 Out 3	x		x	Same
43h	Preset 7 Out 4	x		x	Same
44h	Preset 7 Out 5	x		x	Same
45h	Preset 7 Out 6	x		x	Same
46h	Preset 7 Out 7	x		x	Same
47h	Preset 7 Out 8	x		x	Same
48h	Preset 8 Out 1	x		x	Same
49h	Preset 8 Out 2	x		x	Same
4Ah	Preset 8 Out 3	x		x	Same
4Bh	Preset 8 Out 4	x		x	Same
4Ch	Preset 8 Out 5	x		x	Same
4Dh	Preset 8 Out 6	x		x	Same
4Eh	Preset 8 Out 7	x		x	Same
4Fh	Preset 8 Out 8	x		x	Same

No.	Name	Request Value	Set Value	Value Response	Databytes
50h	Preset 9 Out 1	x		x	1 Byte, value 0..8 (0 = no input, 1..8 = input number)
51h	Preset 9 Out 2	x		x	Same
52h	Preset 9 Out 3	x		x	Same
53h	Preset 9 Out 4	x		x	Same
54h	Preset 9 Out 5	x		x	Same
55h	Preset 9 Out 6	x		x	Same
56h	Preset 9 Out 7	x		x	Same
57h	Preset 9 Out 8	x		x	Same
58h	Current Out 1	x	x	x	Same
59h	Current Out 2	x	x	x	Same
5Ah	Current Out 3	x	x	x	Same
5Bh	Current Out 4	x	x	x	Same
5Ch	Current Out 5	x	x	x	Same
5Dh	Current Out 6	x	x	x	Same
5Eh	Current Out 7	x	x	x	Same
5Fh	Current Out 8	x	x	x	Same

14. Warranty

Each individual MADI Bridge undergoes comprehensive quality control and a complete test at RME before shipping. The usage of high grade components allow us to offer a full two year warranty. We accept a copy of the sales receipt as valid warranty legitimation.

If you suspect that your product is faulty, please contact your local retailer. The warranty does not cover damage caused by improper installation or maltreatment - replacement or repair in such cases can only be carried out at the owner's expense.

RME does not accept claims for damages of any kind, especially consequential damage. Liability is limited to the value of the MADI Bridge. The general terms of business drawn up by Synthax Audio AG apply at all times.

15. Appendix

RME news, driver updates and further product information are available on our website:

http://www.rme-audio.com

Manufacturer:
IMM Elektronik GmbH, Leipziger Strasse 32, D-09648 Mittweida

Trademarks

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CE / FCC Compliance Statements

CE

This device has been tested and found to comply with the EN55022 class B and EN50082-1 norms for digital devices, according to the European Council directive on counterpart laws in the member states relating to electromagnetic compatibility (EMVG).

FCC

This device has been tested and found to comply with the requirements listed in FCC Regulations, part 15 for Class ‘B’ digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices.

This equipment generates radio frequencies and, if not installed and used according to the instructions in the User’s Guide may cause interference harmful to the operation of other electronic devices.

Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit off and on again, please try to eliminate the problem by using one of the following measures:

- Relocate either this product or the device that is being affected by the interference
- Use power outlets on different branch circuits, or install AC line filters
- Contact your local retailer or any qualified radio and television engineer

FCC compliance statement: Tested to comply with FCC standards for home or office use.