

**Multimedia Amp
M1**

AUDAC

PROFESSIONAL AUDIO EQUIPMENT

Multimedia Amplifier M1

Serial Data Protocol (RS232)

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<http://www.audac.be>
info@audac.be

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Introduction

The M1 Multimedia Amplifier can be controlled by a RS232 interface. This document describes the commands used to control the M1.

Protocol settings

To communicate with the M1 Multimedia Amplifier over the RS232 interface, the following settings are necessary :

Bits per second: 9600

Data bits: 8

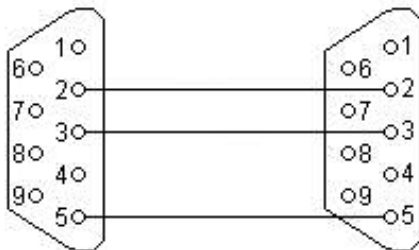
Parity: None

Stop bits: 1

Flow control: none

Cable

A straight RS232 cable will do the job. Make sure line 4 (DTR) is not connected !



Structure of the protocol

The protocol used to control the M1 over the RS232 interface exist out of the following bytes:

	Start	Destination	Source	Command	Data	Stop
nr. of bytes	1	1	1	1	0 - 11	1
value of byte	0x02	0x05	don't care			0x03

Start: Start byte

Destination: Destination address (M1 = 0x05)

Source: Source address (don't care)

Command: Code of the command

Data: Data bytes

Stop: Stop byte

Sending and receiving data

If you want to send more then one command to the M1, please wait until you received an acknowledge (0x06 0x00) of the previous sended command before sending the next command. If after 2 seconds no acknowledge is received, you can send the command again. If the command you sended retrieves data from the M1, please wait until all data is received before sending the next command.

Escape character

If you want to use the data bytes which are normally preserved for controlling the RS232 bus, you should use the escape character (put 0x1B in front of the byte and add 0x7F to the byte).

Preserved data bytes:

0x02	Startbyte
0x03	Stopbyte
0x06	Acknowledge
0x15	No Acknowledge
0x1B	Escape Character

If for instance we want to set the input volume of channel 1 to 0x20 :

0x02 0x05 0x00 **0x02** 0x01 0x20 0x03

Applying the escape character to the second 0x02: 0x1B (0x02 + 0x7F) => 0x1B 0x81

Gives:

0x02 0x05 0x00 **0x1B 0x81** 0x01 0x20 0x03

Another more difficult example:

Change the input volume of channel 2 to 0x1B:

0x02 0x05 0x00 **0x02 0x03 0x1B** 0x03

Applying the escape character (3 times in this example) gives:

0x02 0x05 0x00 **0x1B 0x81 0x1B 0x82 0x1B 0x9A** 0x03

Command overview

	Command	Data 0	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8	Data 9	Data 10
Volume input channel	0x02	nr. of input channel	value in dB from 0x00 to 0x3E									
Volume output channel	0x04	nr. of output channel	value in dB from 0x00 to 0x3E									
Routing	0x05	nr. of input channel	nr. of output channel	status: on = 0x01 off = 0x00								
Mute input channel	0x07	nr. of input channel										
Unmute input channel	0x08	nr. of input channel										
Mute output channel	0x0E	nr. of output channel										
Unmute output channel	0x0F	nr. of output channel										
Mute All	0x10											
Unmute All	0x11											
Select channel 7-10	0x12	nr. of channel										
Get routing status	0x17											
Routing status	0x18	zone 1	zone 2	zone 3	zone 4							
Get channel 7-10 status	0x19	nr. of channel										
Get volume status	0x1A											
Volume status	0x1B	input channel 1	input channel 3	input channel 2	input channel 4	input channel 5	input channel 6	input channel 7	output channel 1	output channel 3	output channel 2	output channel 4
Get mute status	0x1D											
mute status	0x1E	status 1	status 2									
Save settings	0x51											
Recall settings	0x52											

Commands explained

Volume input channel

Sets the volume of the input channel, can be set from 0dB to -70dB

	Command	Data 0	Data 1
Volume input channel	0x02	nr. of input channel	value in dB from 0x00 to 0x3E

Data 0: number of an input channel:

input channel 1	0x01
input channel 2	0x03
input channel 3	0x02
input channel 4	0x04
input channel 5	0x05
input channel 6	0x06
input channel 7	0x07

Note: input channel 7 can be configured using the “select channel 7-10” command

Data 1: volume of the specified input channel

0x00: 0dB

0x3e: -70dB

To use an intermediate level, leave the minus-sign and convert the decimal value to hexadecimal.

Volume output channel

Sets the volume of the input channel, can be set from 0dB to -70dB

	Command	Data 0	Data 1
Volume output channel	0x04	nr. of output channel	value in dB from 0x00 to 0x3E

Data 0: number of an output channel:

output channel 1	0x01
output channel 2	0x03
output channel 3	0x02
output channel 4	0x04

Data 1: volume of the specified output channel

0x00: 0dB

0x3e: -70dB

To use an intermediate level, leave the minus-sign, convert the decimal value to hexadecimal.

Routing

Makes the routing between the input channels and the zone outputs. With this command it is possible to select multiple input channels for 1 zone output.

	Command	Data 0	Data 1	Data 2
Routing	0x05	nr. of input channel	nr. of output channel	status: on = 0x01 off = 0x00

Data 0: number of an input channel:

input channel 1	0x01
input channel 2	0x02
input channel 3	0x03
input channel 4	0x04
input channel 5	0x05
input channel 6	0x06
input channel 7	0x07

Note: input channel 7 can be configured using the “select channel 7-10” command

Data 1: number of a zone output

Zone output 1	0x01
Zone output 2	0x02
Zone output 3	0x03
zone output 4	0x04

Data 2: Status

Off: 0x00: removes the specified routing connection

On: 0x01: sets the specified routing channel

Mute input channel

Mutes the specified input channel

	Command	Data 0
Mute input channel	0x07	nr. of input channel

Data 0: number of an input channel:

input channel 1	0x01
input channel 2	0x03
input channel 3	0x02
input channel 4	0x04
input channel 5	0x05
input channel 6	0x06
input channel 7	0x07

Note: input channel 7 can be configured using the “select channel 7-10” command

Un mute input channel

Un mutes the specified input channel. The volume will return to the value it was before the mute command was given.

	Command	Data 0
Unmute input channel	0x08	nr. of input channel

Data 0: number of an input channel:

input channel 1	0x01
input channel 2	0x03
input channel 3	0x02
input channel 4	0x04
input channel 5	0x05
input channel 6	0x06
input channel 7	0x07

Note: input channel 7 can be configured using the “select channel 7-10” command

Mute output channel

Mutes the specified output channel

	Command	Data 0
Mute output channel	0x0E	nr. of output channel

Data 0: number of an output channel:

output channel 1	0x01
output channel 2	0x03
output channel 3	0x02
output channel 4	0x04

Un mute output channel

Un mutes the specified output channel. The volume will return to the value it was before the mute command was given.

	Command	Data 0
Unmute output channel	0x0F	nr. of output channel

Data 0: number of an output channel:

output channel 1	0x01
output channel 2	0x03
output channel 3	0x02
output channel 4	0x04

Mute All

Mutes all the input channels and zone outputs.

	Command
Mute all	0x10

Un mute All

Un mutes all input channels and zone outputs. The volume will return to the value it was before the mute command was given.

	Command
Unmute all	0x11

Select channel 7-10

Selects one of the input channels 7,8,9 or 10.

	Command	Data 0
Select channel 7-10	0x12	nr. of channel

Data 0: number of input channel 7-10:

input channel 7	0x01
input channel 8	0x02
input channel 9	0x03
input channel 10	0x04

Get routing status

Command to retrieve the routing status of the switching matrix..

	Command
Get routing status	0x17

Routing status

The command “routing status” is the answer of the M1 to the “Get routing status” command.

	Command	Data 0	Data 1	Data 2	Data 3
Routing status	0x18	zone 1	zone 2	zone 3	zone 4

The returned data forms a matrix which gives an overview of the routing between input channels and zone outputs.

	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
		input ch. 7	input ch. 6	input ch. 5	input ch. 4	input ch. 3	input ch. 2	input ch. 1
Zone 1								
Zone 2								
Zone 3								
Zone 4								

Note: “0” is on, “1” is off, bit 7 is not used so don’t care

Get channel 7-10 status

The “get channel 7-10 status” command returns which channel of the input channels 7 - 10 has been selected.

Send:

	Command
Get channel 7-10 status	0x19

Returned :

	Command	Data 0
Get channel 7-10 status	0x19	nr. of channel

Data 0: number of input channel 7-10:

input channel 7	0x01
input channel 8	0x02
input channel 9	0x03
input channel 10	0x04

Get volume status

Gets the status of the volume of input channels and zone outputs.

	Command
Get volume status	0x1A

Volume status

The “volume status” command is the answer of the M1 to the “get volume status” command.

	Command	Data 0	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8	Data 9	Data 10
Volume status	0x1B	input ch 1	input ch 3	input ch 2	input ch 4	input ch 5	input ch 6	input ch 7	output ch 1	output ch 3	output ch 2	output ch 4

Each data byte needs to be converted from hexadecimal to decimal and the decimal value needs to be multiplied by “-1”. Now you have the volume level in dB.

Get mute status

Gets the status of the mute bits of the input channels and output zones.

	Command
Get mute status	0x1D

Mute status

The “mute status” command is the answer of the M1 to the “get mute status” command.

	Command	Data 0	Data 1
Mute status	0x1E	status 1	status 2

The returned data forms a matrix which gives an overview of the mute status of the input channels and zone outputs.

	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Status 1		input ch 7	input ch 6	input ch 5	input ch 4	input ch 2	input ch 3	input ch 1
Status 2					output zone 4	output zone 2	output zone 3	output zone 1

Note: “ 1 ” is on, “ 0 ” is off.

Save

This command let's the M1 save its settings (routing and volume information).

	Command
Save	0x51

Recall

This command let's the M1 recall its previously saved settings (routing and volume information).

	Command
Recall	0x52

Personal Notes