

**Multi - room
Amp R1**

AUDAC

PROFESSIONAL AUDIO EQUIPMENT

Multi-room Amplifier R1

Serial Data
Protocol (RS232)

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Serial Data Protocol (RS232)

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Introduction

The R1 Multi-room Amplifier can be controlled by a RS232 interface. This document describes the commands used to control the R1.

Protocol settings

To communicate with the R1 Multi-room Amplifier over the RS232 interface, the following settings are necessary :

Bits per second: 9600

Data bits: 8

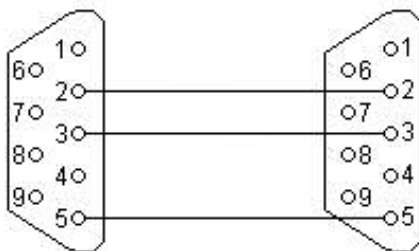
Parity: None

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 R1 over the RS232 interface exist out of the following bytes:

	Start	Source	Destination	Command	Data	Stop
nr. of bytes	1	1	1	1	0 - 11	1
value of byte	0x02	0xFF	See table			0x03

Start: Start byte: 0x02

Source: Source address: 0xFF

Destination: Destination address:

Destination	Cascade setting
0x01	Master
0x02	Slave 1
0x03	Slave 2
0x04	Slave 3
0x05	Slave 4
0x06	Slave 5
0x07	Slave 6
0x08	Slave 7

Destination	Cascade setting
0x09	Slave 8
0x0A	Slave 9
0x0B	Slave 10
0x0C	Slave 11
0x0D	Slave 12
0x0E	Slave 13
0x0F	Slave 14
0x10	Slave 15

Command: Code of the command

Data: Data bytes

Stop: Stop byte: 0x03

Sending and receiving data

If you want to send more than one command to the R1, please wait until you received an acknowledge (0x06 0x00) of the previous send command before sending the next command. If after 2 seconds no acknowledge is received, you can send the command again. If the command you have send retrieves data from the R1, 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 volume of output zone 2 on the master R1 to 0x20 :

0x02 0xFF 0x01 0x04 **0x02** 0x20 0x03

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

Gives:

0x02 0xFF 0x01 0x04 **0x1B 0x81** 0x20 0x03

Another more difficult example:

Select input channel 6 for output zone 3 of the “slave 1” R1:

0x02 0xFF **0x02** 0x01 **0x06 0x03** 0x03

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

0x02 0xFF **0x1B 0x81** 0x01 **0x1B 0x85 0x1B 0x82** 0x03

Command overview

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

Commands explained

Select input channel

Routes an input channel to a zone output.

	Command	Data 0	Data 1
Select input channel	0x01	nr. of input channel	nr. of output zone

Data 0: number of an input channel:

no input channel	0x00
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
input channel 8	0x08

Data 1: number of an output zone

output zone 1	0x01
output zone 2	0x02
output zone 3	0x03
output zone 4	0x04
output zone 5	0x05
output zone 6	0x06
output zone 7	0x07
output zone 8	0x08

Volume output zone

Sets the volume of the output zone, can be set from 0dB to -70dB.

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

Data 0: number of an output zone:

output zone 1	0x01
output zone 2	0x02
output zone 3	0x03
output zone 4	0x04
output zone 5	0x05
output zone 6	0x06
output zone 7	0x07
output zone 8	0x08

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.

Mute output zone

Mutes the specified output zone

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

Data 0: number of an output zone:

output zone 1	0x01
output zone 2	0x02
output zone 3	0x03
output zone 4	0x04
output zone 5	0x05
output zone 6	0x06
output zone 7	0x07
output zone 8	0x08

Un mute output zone

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

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

Data 0: number of an output zone:

output zone 1	0x01
output zone 2	0x02
output zone 3	0x03
output zone 4	0x04
output zone 5	0x05
output zone 6	0x06
output zone 7	0x07
output zone 8	0x08

Mute All

Mutes all the output zones.

	Command
Mute all	0x10

Un mute All

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

	Command
Unmute all	0x11

Get routing status

Command to retrieve the routing status of the R1.

	Command
Get routing status	0x17

Routing status

The command “routing status” is the answer of the R1 to the “Get routing status” command.

	Command	Data 0	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7
Routing status	0x18	zone 1	zone 2	zone 3	zone 4	zone 5	zone 6	zone 7	zone 8

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

	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
	input ch. 8	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								
Zone 5								
Zone 6								
Zone 7								
Zone 8								

Note: “ 0 ” is on, “ 1 ” is off

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 R1 to the “get volume status” command.

	Command	Data 0	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7
Volume status	0x1B	output zone 1	output zone 2	output zone 3	output zone 4	output zone 5	output zone 6	output zone 7	output zone 8

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 R1 to the “get mute status” command.

	Command	Data 0
Mute status	0x1E	status

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	output zone 8	output zone 7	output zone 6	output zone 5	output zone 4	output zone 3	output zone 2	output zone 1

Note: “ 1 ” is on, “ 0 ” is off.

Save

This command let's the R1 save its settings (routing and volume information).

	Command
Save	0x51

Recall

This command let's the R1 recall its previously saved settings (routing and volume information).

	Command
Recall	0x52

Personal Notes