

RS232 control of the V10

V10 amplifiers with software version 1.10 or higher can be controlled by any control device having a RS232 serial output port (PC, CRESTRON home automation system etc.) through the RS232/R-Link interface adapter.

For details about connecting and operating the adapter see the user manual of the adapter "UM_RS232_Adapt.doc".

Settings for the RS232 interface of the control device are as follows:

Baud rate:	115.200
Data bits:	8
Stop bits:	1
Parity:	none
Flow Control:	none

T+A RS_232 Protocol

The V10 uses the standard T+A RS232 command protocol as described in detail in the documents "TA_RS232_protocol.doc" and "RS_232_Command_Codes.doc".

Format of the command telegrams

A command telegram to the V10 consists of 6 bytes. The complete telegram should be sent without pauses between the bytes.

Example: SYSTEM_ON command

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
RS232 adapter Address	Telegram length	R-Link Address	R-Link command	R-Link flag byte	Check sum
(always 0x01)	(R-Link address + R-Link command + R-Link flag byte = 0x03)	(0xC8=V10 → see also note below)	(here: SystemON = 0x57) → see table "V10 commands"	(always 0x02)	= sum of bytes 1..5 mod. 0x100
0x01	0x03	0xC8	0x57	0x02	0x25

Byte 1, 2, 3, 5 : for the V10 these bytes have the fixed values as shown in the table above

Byte 4 : R-Link command according to the table of RCII commands (see "RS_232_Command_Codes.doc")

Byte 6 : check sum == (byte1+byte2+byte3+byte4+byte5) modulo 0x100

Note:

The R-Link address **0xC8** is used for all standard V10 commands.

There exist a few additional commands (system commands) for some special functions. For these commands the address **0xC4** has to be used. A list of these commands is given in appendix 1.

Format of the acknowledge (ACK) telegrams

The V10 will process each received command telegram and it will send an acknowledge telegram approx. 25...35 ms after receiving the command.

The ACK telegram consists of 2 bytes:

Byte_1 is the RS232 address of the command telegram received before (=byte 1 of the command telegram = 0x01).

Byte_2 is the acknowledge byte. If this byte is equal to the check sum of the command telegram (byte6 of the command) then the command was received correctly.

If byte 2 has a value different from the check sum of the command, an error has occurred (see table below).

Format of the ACK telegram:

Byte 1	Byte 2
RS232 address	ACK byte
0x01	= check sum of command: command correctly received = check sum -1: command ignored (system busy) = check sum -2: command not executed
	Note: If no ACK telegram is received within 35 milli-seconds after sending a command, there is either a hardware problem (cable etc.) or the telegram is erroneous (wrong address, wrong check sum)

After the ACK telegram, the V10 is ready for the next command.

List of V10 commands (Address \$C8)

Command	Command Code (HEX)	toggle	Remark
System ON	0x57		Switch the V10 ON to the "HV" position (from STANDBY)
System Standby	0x77		Switch the system (V10 and source devices) to STANDBY
System OFF	0x7A		Switch the system completely OFF Note: From this position the V10 can only be switched ON again by the rotary switch on its front panel. If V10 shall be switched ON again by the remote control or by the RS232 interface, switch to STANDBY !
MUTE/OFF	0x01		When a listening source is active, this commands switches to the "HV" position (MUTING). When in "HV" position this command switches OFF the last used listening source Hint: To switch OFF the currently active listening source, send this command twice (with a pause of > 1sec between the two commands)
SPKR	0x13	x	Toggles the speaker output ON and OFF Hint: better use the "discrete" Speaker_A ON + OFF commands
Speaker_A ON	0x68		Speaker output ON
Speaker_A OFF	0x48		Speaker output OFF
Volume +	0x00		Performs 1 volume step
Volume -	0x20		Hint: Repeat these commands for continuous volume increase/decrease (command repetition rate = 100...110 ms)
Disc	0x23		Select input. Note: If in STANDBY the V10 and the addressed R-Link source device are switched ON.
Tuner	0x17		
AUX	0x07		
AUX/PH	0x3D		
Recorder	0x35		

Control of T+A Source devices

All T+A „R-Link“ source devices connected to the V10 can be controlled through the RS232 adapter.

A) Control of the active listening source

All source commands (like PLAY, STOP, >| etc.) sent to the V10 R-Link address 0xC8 are forwarded by the V10 to the currently active listening source device.

Note1: The V10 will need about 40 ms after the ACK telegram to forward the command to the source. Within this forwarding time the V10 will not respond to other RS232 commands !

Note2: A listening source command sent to the V10 address 0xC8 will be acknowledged by the V10, not by the source device !

An “ACK” for such a command only means, that the command was received correctly **by the V10** and that it will be forwarded to the active listening source.

Hint: If an acknowledge from the source device is needed, it is advisable to control the source devices directly by sending source commands to the source device directly (see chapter below).

B) Direct control of source devices

To control a source device directly (independent from the current listening source), use the R-Link device address of the source device instead of the V10 address. The ACK telegram received for a direct source command reflects if the command was correctly received by the source device.

Example: To control a **D10** CD/SACD player: use the R-Link address 0x22 (=CD)

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
RS232 Address	R-Link command length (R-Link address + R-Link command + R-Link flag byte = 0x03)	R-Link Address (0x22=CD)	R-Link command (here: NEXT = 0x34) *see note below	R-Link byte	flagcheck sum = sum of bytes 1..5 mod. 0xFF
0x01	0x03	0x22	0x34	0x02	0x5C

Byte 1, 2, 5 : these bytes have the fixed values as shown in the table above

Byte 3 : R-Link address of the source device

Byte 4 : R-Link command according to the table of RCII commands (see annex)

Byte 6 : check sum == (byte1+byte2+byte3+byte4+byte5) modulo 0xFF

Note:

For a complete list of all R-Link source commands refer to the document “[RS_232_Command_Codes.doc](#)”.

Appendix 1: V10 System commands (Address 0xC4)

Command	Command Code (HEX)	toggle	Remark
AMP_STAT	0x64		V10 returns status bytes
RL_VER	0x44		V10 returns R-Link Version
TST	0x54		V10 returns test pattern