

RS232 control of Musicplayer

E-series musicplayer devices with software version 1.30 or higher can be controlled by any control device having a RS232 serial output port (PC, CRESTRON home automation system etc.).

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 E-series devices use 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 E-System slave device 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 (always 0x01)	Telegram length (R-Link address + R-Link command + R-Link flag byte = 0x03)	R-Link Address (0x2E=source/DBR device → see also note below)	R-Link command (here: SystemON = 0x57) → see command table "appendix 1"	R-Link flag byte (always 0x02)	Check sum = sum of bytes 1..5 mod. 0x100
0x01	0x03	0x2E (see below)	0x57	0x02	0x8B

Byte 1, 2, 5 : these bytes have the fixed values as shown in the table above for all R-System devices

Byte 3 : E-Link address for the E-Link Musicplayer

Byte 4 : E-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

Format of the acknowledge (ACK) telegrams

The E-System source device 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 master device is ready for the next command.

Control of T+A Source devices

There are two different modes of external control of the musicplayer:

Standalone mode:

The **T+A** Musicplayer can be controlled directly by a control device (PC, CRESTRON home automation system etc.) using a RS232 cable.

E-Link System mode:

If the musicplayer will be used in conjunction with an E-Link master device (e.g. **T+A** PowerPlant) only the master device should be connected to the control device via a RS232 cable. All external control commands will be processed by the master device and – if necessary – routed to the appropriate source via the E-Link connection.

Please also see document E_PowerPlant_RS232.

Appendix 1: List of Musicplayer commands (ADROx2E)

Command	Command Code (HEX)	toggle	short/long	Remark
ON/OFF	0x01	x		Hint: better use the “discrete” System ON, OFF commands.
Device ON	0x57			Switch the device ON
Device OFF	0x7A			Switch the device completely OFF
Input Selection				
Note: If in STANDBY the master device and the addressed E-Link source device are both switched ON				
Select SCL	0x14			Select Source: SCL
Select D1	0x3D			Select Source: D1
Select D2	0x07			Select Source: D2
Select Disc	0x23			Select Source: Disc
Select Tuner	0x17			Select Source: Tuner
Navigation Control Commands				
CMD_CUR_UP	0x34			browse view: navigate up / play view: next track (F100^)
CMD_CUR_DN	0x2A			browse view: navigate up / play view: next track (F100v)
CMD_CUR_RIGHT	0x25			select (F100 >)
CMD_CUR_LEFT	0x1A			cancel(F100 <)
CMD_NEXT	0xCD			next (F100 >>)
CMD_PREV	0xCC			prev (F100 <<)
CMD_FFW	0xCB			Fast Forward (F100 >> / iPod only)
CMD_REW	0xCA			Fast Rewind (F100 << / iPod only)
CMD_OK	0x26			
CMD_PAUSE	0x05			
CMD_STOP	0x24			
CMD_LIST	0x88			jump to favourite list
CMD_INFO	0x8B			toggle between browse / play view
CMD_HOME	0xE4			jump to home menu
CMD_BLUE	0x86			trigger search function / menu: toggle upper / lower case
CMD_F5	0x8E	x		toggle repeat mode
CMD_F6	0x8F	x		toggle mix mode
CMD_LIKE	0x89			store current track as favourite
CMD_DISLIKE	0x8A		x	long: delete favourite
CMD_STORE	0x1E			store preset
misc commands				
CMD_1	0x3A			key 1/.
CMD_2	0x06			key 2/a/b/c
CMD_3	0x16			key 3/d/e/f
CMD_4	0x02			key 4/g/h/i
CMD_5	0x09			key 5/j/k/l
CMD_6	0x3B			key 6/m/n/o
CMD_7	0x31			key 7/p/q/r/s
CMD_8	0x11			key 8/t/u/v
CMD_9	0x39			key 9/w/y/z
CMD_0	0x03			key 0/ ' ‘
CMD_BW_NORM	0xE9			Output Bandwidth normal

CMD_BW_HIGH	0xEA			Output Bandwith high
CMD_INV_ON	0xEE			invert on
CMD_INV_OFF	0xEF			invert off
CMD_OVS_1	0xF0			OVS Filter 1
CMD_OVS_2	0xF1			OVS Filter 2
CMD_YELLOW	0x87			select mono / stereo (Tuner only)
preamplifier commands (only for musicplayer in standalone mode / without Power-Amp)				
CMD_VOLPL	0x00			Volume up (for standalone mode only)
CMD_VOLMI	0x20			Volume down (for standalone mode only)
CMD_LOUD	0x2c	x		toggle audio setup menu on / off (better use LOUD_ON/OFF)
CMD_LOUD_ON	0x75			Loudness on
CMD_LOUD_OFF	0x55			Loudness off
CMD_MUTING	0x13	x		Muting (better use PRE1_ON/OFF)
CMD_PRE1_ON	0x6B			Preamplifier Output ON
CMD_PRE1_OFF	0x4F			Preamplifier Output OFF
CMD_BASS_+	0xE3			Bass plus
CMD_BASS_-	0xE4			Bass minus
CMD_TREB_+	0xE5			Treble plus
CMD_TREB_-	0xE6			Treble minus
CMD_BAL_RIGHT	0xE7			Balance right
CMD_BAL_LEFT	0xE8			Balance left
Menu commands				
CMD_SYS_SETUP	0xD8	x		Open / Close System Setup
CMD_F1	0x83	x		Open / Close Audio Setup menu (without Tone Control)
CMD_CURUP	0x1F	x	x	short: jump to home menu (better use 0xE4) long: open and close src setup menu (better use 0xc6 / 0xc7)
CMD_SRC_OP_LG	0xC6			Open Source Setup
CMD_SRC_CLOSE	0xC7			Close Source Setup

Appendix 2: Document History

25/07/2008 (jk)	initial version	V1.00
20/11/2012(JF)	Checksum computation corrected (mod 0x100)	V1.01