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Neo RS232 specification

Version	Date	Changes		Author(s)
1.3	20-03-2024	Updated some On/Off values according to implementation (highlighted in **bold**)	P&I	Hans Crijns
1.2	14-07-2023	Updated default speed and 0x00 / 0x01 → On / Off values	P&I	Hans Crijns
1.1	15-03-2023	Added RC commands; un-greyed several implemented commands (requires firmware 1.2.x)	P&I	Hans Crijns
1.0	16-01-2023	First release	P&I	Hans Crijns

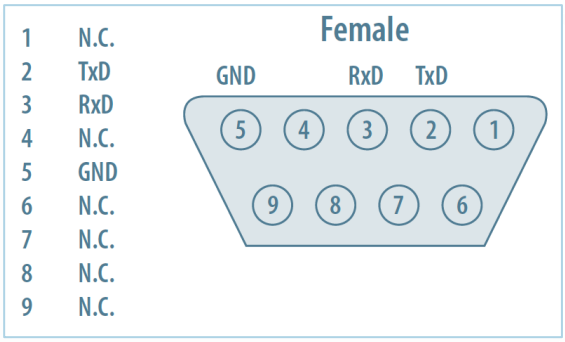
Author: Hans Crijns

Introduction

This document explains a RS232 protocol that can be used to control the Neo screen via RS232 cable. It includes settings, the protocol format and specific commands supported and allowed values.

Protocol

RS-232C Pin Map:



Communication parameter

- baud rate : 115200 (default)
- data : 8
- parity : NONE stop bit : 1

Communication general spec

- ID should show hexadecimal value of assigned ID. This ID is set in the screen's settings menu.
- If you want to control every mechanism connected with Serial Cable regardless of its ID, set ID to « 0x00 » and send commands. Then each SET will follow commands but it will not respond without ACK.
- Don't use 0x00, 0x8A(138) and 0xA9(168) for Set ID.

Packet format specification

Basic packet format:

START	*COMMAND*	*ID*	*DATA*	*END*
0xA9	0xXX		0xYY	0x8A

Request and response format:

Note: Command and data values can be found in Command Overview chapter

Get request:

START	*COMMAND*	*ID*	*DATA*	*END*
0xA9	0xXX		0xAA	0x8A

Set request:

START	*COMMAND*	*ID*	*DATA*	*END*
0xA9	0xXX		Value	0x8A

Acknowledge:

START	*COMMAND*	*ID*	*CMD*	*DATA*	*END*
0xA9	0x41		0xXX	Value	0x8A

Negative acknowledge:

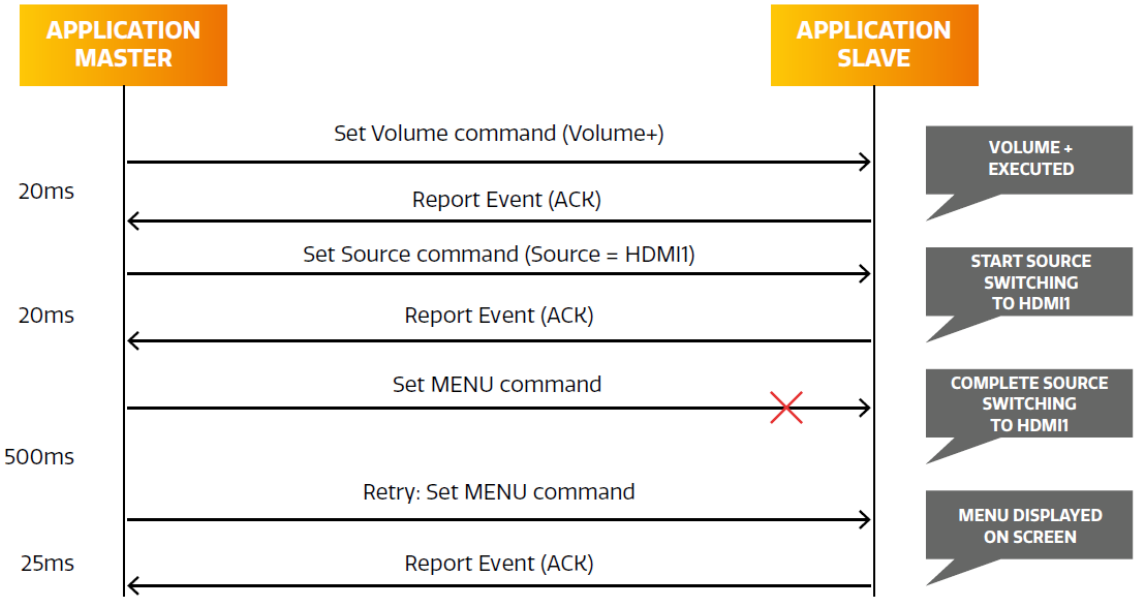
START	*COMMAND*	*ID*	*CMD*	*DATA*	*END*
0xA9	0x4E		0xXX	Error	0x8A

Error values:

0x01	Invalid command
0x02	Invalid data
0xFF	Misc.

Communication Procedure

A new command should not be sent until the previous command is acknowledged. However, if a response is not received within 500 milliseconds, a retry may be triggered. This use case is true if commands are sent during the screen busy state and the screen set decides that the processing of the commands cannot be carried out. As a result, no acknowledgement will be sent. An example would be the application sends a set OSD command while the screen is still preforming source switching. No fixed retry mechanism is mandated by RS232 Serial communication and it's up to the application to decide upon if a retry I needed for command integrity. Overall, no new command should be sent before receiving an acknowledgement on its previous command. If no acknowledgement is received, the application can only send the next command (or retry the failed command) after the 500ms timeout is over. The sequence diagram below illustrates the communication procedure.



Command overview

Parameter	CMD value	Parameter values
Power	0x11	Off 0x00 / On 0x01
Backlight mute	0x12	**Off 0x01 / On 0x00**
Volume	0x13	0-100: 0x00 – 0x64
Mute	0x14	Off 0x00 / On 0x01
Input source	0x15	HDMI1 0x05 / HDMI2 0x006 / HDMI3 0x08 / DP 0x07 / OPS 0x09 / Android 0x0C / USB-C 0xE
IR remote control codes	0x16	Keycode (see below)
CTOUCH button	0x17	**Off 0x01 / On 0x00**
Picture mode	0x18	Dynamic 0x00 / Standard 0x01 / Soft 0x02
Sound mode	0x19	Standard 0x00 / Music 0x01 / Movie 0x02 / Sport 0x03
Baud rate	0x1A	1200 0x00 / 4800 0x02 / 9600 0x03 / 19200 0x04 / 38400 0x05 / 57600 0x06 / 115200 0x07
IR lock	0x1D	**Off 0x01 / On 0x00**
Touch lock	0x1E	Off 0x00 / On 0x01
Energy mode	0x30	Normal 0x00 / Automatic 0x01 / Eco friendly 0x03

Key codes (use with A9 16 00 xx 8A formatted codes):

Parameter	KEYCODE	Notes
Power	0xD7	
Input	0xC0	
Enter	0x9B	
Menu	0x84	Opens settings menu
Home	0xBC	Switches to Home
Exit	0xD4	
Mute	0xDF	
Volume up	0x83	
Volume down	0x86	
Screenshot	0x62	Opens screenshot tool
Annotation	0x55	Opens annotation tool

Appendix: Tools and testing

To be able to test your configuration, you can use all kind of tools. The one we recommend is Docklight (Scripting) since we made a pre-configured file that you can use with it. Docklight can be downloaded via https://docklight.de/ and can be used without a license (free version). Only if you would like to edit and store configurations, you will need a full version.

Example screenshot: