

## **Azur 540R v3 Serial Control Protocol V1.0**

### **1.1 RS232 Protocol**

The protocol is accessed via the RS232 protocol, i.e. a PC's rear panel com port.

**Notes:**

- 1) All data consists of ASCII bytes.
- 2) Settings for RS232 comm port are 9600,N,8,1 with no handshaking.
- 3) CR is carriage return, ASCII value 13 decimal.

Command Packet Structure:

	Header	Command Group		Command Number		Command Data	Footer
	#	1 to 11	,	01 to 19	,	XXXX	CR
byte num:	1	1	1	2	1	XX	1

## 1.2 Command Groups

Commands are split into the following groups:

Command Group	Command Description		
1	Amplifier Commands		
2	Source Commands		
3	Tuner Commands		
4	Audio Processing Commands		
5	Version Commands		
6	Replies from Amplifier Commands		
7	Replies from Source Commands		
8	Replies from Tuner Commands		
9	Replies from Audio Processing Commands		
10	Replies from Version Commands		
11	Error Messages		

## 1.3 Commands and Messages

### 1.3.1 Group 1 - Amplifier Commands

Command Number	Command Description	Command Data	Example
01	Power State	0 - Standby, 1 - On	#1,01,0\r - Put 540R in standby
02	Volume Up	No Data	#1,02\r - Volume up
03	Volume Down	No Data	#1,03\r - Volume down
04	Bass Up	No Data	#1,04\r - Bass up
05	Bass Down	No Data	#1,05\r - Bass down
06	Treble Up	No Data	#1,06\r - Treble up
07	Treble Down	No Data	#1,07\r - Treble down
08	Sub On	No Data	#1,08\r - Sub woofer on
09	Sub Off	No Data	#1,09\r - Sub woofer Off
10	Set LFE trim	0 = 0db, 1 = -1db... -10 = -10dB	#1,10, 03\r - LFE trim set to -3dB
11	Mute State	0 - Off, 1 - On	#1,11,00\r - 540R mute off
12	Dynamic Range Set	0 - 0/4, 1 - 1/4, 2 - 2/4, 3 - 3/4, 4 - 4/4	#1,12, 02\r - Set dynamic range limit to 2/4
13	OSD On	No Data	#1,13/r - OSD on
14	OSD Off	No Data	#1,14/r - OSD off
15	OSD Up	No Data	#1,15/r - OSD up
16	OSD Down	No Data	#1,16/r - OSD down
17	OSD Left	No Data	#1,17/r - OSD left
18	OSD Right	No Data	#1,18/r - OSD right
19	OSD Enter	No Data	#1,19/r - OSD enter

### 1.3.2 Group 2 - Source Commands

Command Number	Command Description	Command Data	Example
01	Input Select	1 - DVD, 2 - Video 1, 3-Tuner, 4 - Video2, 5 - Video3, 6 - Tape/MD/CDR, 7 - CD/Aux, 8 - 6.1 Direct In	#2,01,02\r - Select Video 1
02	Input Select Up	No Data	#2,02\r - Next input up
03	Input Select Down	No Data	#2,03\r -Next input down
04	Set input mode	0 - analogue, 1 - Digital	#2,04,01\r - digital source selected

### 1.3.3 Group 3 – Tuner Commands

Command Number	Command Description	Command Data	Example
01	Tuner Stereo/Mono	0 - Stereo, 1 = Mono	#3,01,01\r - tuner in mono
02	Frequency Up	No Data	#3,02\r - Frequency up
03	Frequency down	No Data	#3,03\r - Frequency down
04	Up	No Data	#3,04\r - Tuner up
05	Down	No Data	#3,05\r - Tuner down
06	Tuner Mode	1 - Frequency up/down, 2 - search up/down, 3 - Preset up/down	#3,06,03\r - Tuner up/down control presets
07	Tuner Search Stop	No Data	#3,07\r - Tuner search stop
08	Tuner Auto Search	No Data	#3,08\r - Tuner auto search
09	Tuner Band	0 - FM, 1 = AM	#3,09,01\r - tuner in AM mode
10	Tuner PTY select	1- News, 2-Affairs, 3-Info, 4-Sport, 5-Educate, 6-Drama, 7-Culture, 8-Science, 9-Varied, 10-Pop, 11-Rock, 12-MOR, 13-Light, 14-Classics, 15-Other	#3,10,11\r - PTY Rock selected
11	Store Station	1 - preset 1, 2 - preset 2, ..... 15 - preset 15	#3,11,12\r - Store current frequency in preset 12
12	Get Preset	1 - preset 1, 2 - preset 2, ..... 15 - preset 15	#3,12,6\r - Set tuner to preset 6
13	Tuner Display mode	1-Frequency, 2-Program name, 3-Program Type, 4-Clock time, 5-Radiotext	#3,13, 04\r - Display in clock time mode
14	Get Frequency	No Data	#3,14\r
15	Get Station name	No Data	#3,15\r
16	Get PTY	No Data	#3,16\r
17	Stop PTY Select	No Data	#3,17/r

#### 1.3.4 Group 4 - Audio Processing Commands

Command Number	Command Description	Command Data	Example
01	Set Audio to Stereo	00 = Stereo, 01 = Stereo + sub	#4,01,01\r - Audio set to stereo plus sub mode
02	Set PLII/Neo	No Data	#4,02/r - Cycles to next mode (same as pressing PLII/NEO button)
03	Set DD/DTS	No Data	#4,03/r - Cycles to next mode (same as pressing DD/DTS button)
04	Get Current PLII/Neo/DSP mode	No Data	#4/04\r
05	Get current DD/DTS mode	No Data	#4,05\r
06	Set DSP	No Data	#4,06\r - Cycles to next mode (same as pressing the DSP button)

#### 1.3.4 Group 5 - Version Commands

Command Number	Command Description	Command Data	Example
01	Get Main Software Version	No Data	#5,01,\r - Get software version
02	Get Protocol Version	No Data	#5,02,\r - Get protocol version

### 1.3.6 Group 6 - Replies from Amplifier Commands

Command Number	Command Description	Command Data	Example
01	Power State	0 - Standby, 1 - On	#6,01,0\r - Put 640R in standby
02	Volume Up	-90 to 00 (where -90 = mute, 00 = max volume)	#6,02,-16\r - Vol = -16dB
03	Volume Down	-90 to 00 (where -90 = mute, 00 = max volume)	#6,03,-16\r - Vol = -16dB
04	Bass Up	-10 to 10	#6,04,-6\r - Bass = -6db
05	Bass Down	-10 to 10	#6,05,-6\r - Bass = -6db
06	Treble Up	-10 to 10	#6,06,-7\r - treble = -7db
07	Treble Down	-10 to 10	#6,07,-7\r - treble = -7db
08	Sub On	No Data	#6,08\r - Sub woofer on
09	Sub Off	No Data	#6,09\r - Sub woofer off
10	Set LFE trim	0 = 0db, 1 = -1db... -10 = -10dB	#6,10, 03\r - LFE trim set to -3dB
11	Mute State	0 - Off, 1 - On	#6,11,00\r - 540R mute off
12	Dynamic Range Set	0 - 0/4, 1 - 1/4, 2 - 2/4, 3 - 3/4, 4 - 4/4	#6,12, 02\r - Set dynamic range limit to 2/4
13	OSD On	No Data	#6,13\r - OSD On
14	OSD Off	No Data	#6,14\r - OSD Off
15	OSD Up	No Data	#6,15\r - OSD up
16	OSD Down	No Data	#6,16\r - OSD down
17	OSD Left	No Data	#6,17\r - OSD Left
18	OSD Right	No Data	#6,18\r - OSD Right
19	OSD Enter	No Data	#6,19\r - OSD Enter

### 1.3.7 Group 7 - Replies from Source Commands

Command Number	Command Description	Command Data	Example
01	Input Select	1 - DVD, 2 - Video 1, 3-Tuner, 4 - Video2, 5 - Video3, 6 - Tape/MD/CDR, 7 - CD/Aux, 8 - 6.1 Direct In	#7,01,2\r - Video 1 selected
02	Input Select Up	No Data	#7,02\r - Next input up
03	Input Select Down	No Data	#7,03\r -Next input down
04	Set input mode	0 - analogue, 1 - Digital	#7,04,01\r - digital input selected



### 1.3.8 Group 8 - Replies from Tuner Commands

Command Number	Command Description	Command Data	Example
01	Tuner Stereo/Mono	0 - Stereo, 1 = Mono	#8,01,01\r - tuner in mono
02	Frequency Up	No Data	#8,02\r - Frequency up
03	Frequency down	No Data	#8,03\r - Frequency down
04	Up	1 - command complete, 2 - tuner searching	#8,04,02\r - Tuner searching
05	Down	1 - command complete, 2 - tuner searching	#8,05,01\r - Tuner down executed
06	Tuner Mode	1 - Frequency up/down, 2 - search up/down, 3 - Preset up/down	#8,06,03\r - Tuner up/down control presets
07	Tuner Search Stop	xxx.xx	#8,07,09525\r - Current frequency is 95.25MHz
08	Tuner Auto Search	No Data	#8,08\r - Tuner auto search
09	Tuner Band	0 - FM, 1 = AM	#8,09,01\r - tuner in AM mode
10	Tuner PTY select	1- News, 2-Affairs, 3-Info, 4-Sport, 5-Educate, 6-Drama, 7-Culture, 8-Science, 9-Varied, 10-Pop, 11-Rock, 12-MOR, 13-Light, 14-Classics, 15-Other, 16-Searching in progress, 17-Search failed	#8,10,11\r - PTY Rock selected
11	Store Station	1 - preset 1, 2 - preset 2, ..... 15 - preset 15	#8,11,12\r - Store current frequency in preset 12
12	Get Preset	1 - preset 1, 2 - preset 2, ..... 15 - preset 15	#8,12,6\r - Set tuner to preset 6
13	Tuner Display mode	1-Frequency, 2-Program name, 3-Program Type, 4-Clock time, 5-Radiotext	#8,13, 04\r - Display in clock time mode
14	Get Frequency	xxx.xx	#8,14,09525\r - Current frequency is 95.25MHz
15	Get station name	xxxxxxxx	#8,15,Radio666\r - Current station name is Radio666. If no RDS station name available, return with string of stars, i.e. *****
16	Get PTY	0-No Pty,1- News, 2-Affairs, 3-Info, 4-Sport, 5-Educate, 6-Drama, 7-Culture, 8-Science, 9-Varied, 10-Pop, 11-Rock, 12-MOR, 13-Light, 14-Classics, 15-Other	#8,16,11\r - Current PTY is Rock Music
17	Stop PTY Select	No Data	#8,17\r

### 1.3.9 Group 9 - Replies from Audio Processing Commands

Command Number	Command Description	Command Data	Example
01	Set Audio to Stereo	00 = Stereo, 01 = Stereo+ SW	#9,01,01\r - Audio set to stereo mode plus sub
02	Set PLII/Neo/DSP	xxxxxxx	#9,02, PCM + PLIIx Movie \r - Describes the mode it's just switched to exactly as on front panel
03	DD/DTS	xxxxxxx	#9,03, Dolby Digital (2/0) \r - Describes the mode it's just switched to, exactly as displayed on the front panel
04	Get current PLII/Neo/DSP mode	xxxxxxx	#9,04, PCM + PLIIx Movie \r - Describes the current mode
05	Get current DD/DTS mode	xxxxxxx	#9,05, Dolby Digital (2/0) \r - Describes the current mode

### 1.4.0 Group 10 - Replies from Version Commands

Command Number	Command Description	Command Data	Example
01	Get Main Software Version	X.X	#10,01,1.2\r - Software is version 1.2
02	Protocol Version	X.X	#10,02,1.6\r - Protocol is version 1.6

### 1.4.1 Group 11 - Error Messages

Command Number	Command Description	Command Data	Example
01	Command Group Unknown	No Data	#11,01\r - Command group error
02	Command Number in Group Unknown	No Data	#11,02\r - Command number error
03	Command Data Error	No Data	#11,03\r - Command data error

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