

Titan RS232 Document

Version 0.92

Applies for sw-version G6_6.58 and above

Change history

Ver	Change date/prepared by	Remarks
0.1	12.03.2002 / MPM	
0.2	04.04.2002 / ROK	
0.3	12.06.2002 / ROK	UI_STEREO96 added
0.4	25.07.2002 / ROK	Layout updated
0.5	05.08.2002 / ROK	Neo6 CGAIN information added
0.6	22.01.2003 / ROK	EEPROM information updated, test commands added
0.7	28.02.2003 / ROK	Major changes, removed obsolete codes and all repeat codes. New codes for zone controlling added.
0.8	06.04.2003 / ROK	Lipsync added to eeprom definitions, THX EX autoenable removed
0.9	08.04.2003 / ROK	Test commands added
0.91	23.03.2004 / ROK	Vinci Labs name added
0.92	26.05.2004 / ROK	Removed obsolete codes, added new test commands

CONTENTS

- Technical Specification of the Titan RS232 Port.....3***
- Input commands.....4***
 - Single Byte User Commands4
 - Multi Byte User Commands6
 - Special Commands7
 - Commands for Testing Purposes9
 - Output data 10
- Appendix 1 - RS_STORE_EEPROM and RS_READ_EEPROM.....14***

This document describes the Titan RS232 protocol for normal end-user operations and some test specific features.

Send questions and comments to rolf.koski@fi.flextronics.com

Technical Specification of the Titan RS232 Port

- 9600bps with TCV v4 or later or with TVC v3 and the Baud Rate Converter, 12000bps with TCV v3 and without the Baud Rate Converter
- 8 data bits, one stop bit, no parity
- binary transmission, no flow control

NOTE!

Not necessarily all commands and sub-commands work with all software releases. Users of the older software releases should consult older revisions of the manual. New commands are added continuously to this document as they are added to the software.

Input commands

Single Byte User Commands

The following commands are all single bytes sent to the RS-232 port. They create various output data depending on the system status, so a comprehensive output data feedback cannot be given. The reception of these commands must be first activated by sending **RS_ENABLE_CONTROL** command before each command. See *Special Commands* section below.

For further information of the commands, refer to Titan Manual section *User Interface Commands*.

UI_DUMMY	1	UI_COMPRESSION_ON	37
REMOTE_CONTROL_PLUS	2	UI_COMPRESSION_OFF	38
REMOTE_CONTROL_MINUS	3	UI_TAPEMON_OFF	39
UI_ZONE_STANDBY	4	UI_TAPEMON_STICKY_ON	40
UI_ZONE_WAKEUP	5	UI_TAPEMON_NONSTICKY_ON	41
UI_STANDBY_TOGGLE	6	UI_MONO	42
UI_MUTE	7	UI_STEREO	43
UI_SOURCEPLUS	8	UI_PROLOGIC	44
UI_SOURCEMINUS	9	UI_MUSIC1	45
UI_MODEMINUS	10	UI_MUSIC2	46
UI_MODEPLUS	11	UI_MUSIC3	47
UI_COMPRESSION_TOGGLE	12	UI_MUSIC4	48
UI_AUDIO_IN1	13	REMOTE_VOLUME_PLUS	49
UI_AUDIO_IN2	14	REMOTE_VOLUME_MINUS	50
UI_AUDIO_IN3	15	NOP	51
UI_AUDIO_IN4	16	NOP	52
UI_AUDIO_IN5	17	FRONTPANEL_VOLUME_PLUS	53
UI_AUDIO_IN6	18	FRONTPANEL_VOLUME_MINUS	54
UI_AUDIO_IN7	19	NOP	55
UI_AUDIO_IN8	20	NOP	56
FRONTPANEL_CONTROL_PLUS	21	NOP	57
FRONTPANEL_CONTROL_MINUS	22	NOP	58
UI_NOISE	23	NOP	59
NOP	24	NOP	60
NOP	25	NOP	61
UI_TAPEMON_STICKY_TOGGLE	26	NOP	62
UI_THX	27	NOP	63
NOP	28	NOP	64
NOP	29	NOP	65
NOP	30	NOP	66
UI_TAPEMON_NONSTICKY_TOGGLE	31	NOP	67
UI_MUTE_ON	32	UI_BASS_PLUS	68
UI_MUTE_OFF	33	UI_BASS_MINUS	69
UI_STANDBY	34	UI_TREBLE_PLUS	70
UI_WAKEUP	35	UI_TREBLE_MINUS	71
UI_NORMAL	36	UI_AUDIO_IN9	72

UI_AUDIO_IN10	73
UI_ZONE_IN1	74
UI_ZONE_IN2	75
UI_ZONE_IN3	76
UI_ZONE_IN4	77
UI_ZONE_IN5	78
UI_ZONE_IN6	79
RS_USER_PING	80
UI_AUDIO_IN_BALANCED (testing only)	81
UI_TUNER_FM	82
UI_TUNER_AM	83
UI_TUNER_1	84
UI_TUNER_2	85
UI_TUNER_3	86
UI_TUNER_4	87
UI_TUNER_5	88
UI_TUNER_6	89
UI_TUNER_7	90
UI_TUNER_8	91
UI_TUNER_9	92
UI_TUNER_0	93
NOP	94
NOP	95
NOP	96
UI_SUBWOOFER_PLUS	97
UI_SUBWOOFER_MINUS	98
UI_CINE_EQ_TOGGLE	99
UI_AUDIO_IN_EXT71	100
UI_TRIM_PLUS	101
UI_TRIM_MINUS	102
UI_OSD_SETUP	103
UI_CURSOR_UP	104
UI_CURSOR_DOWN	105
UI_CURSOR_LEFT	106
UI_CURSOR_RIGHT	107
UI_CURSOR_ENTER	108
UI_ESCAPE	109
UI_ZONE_IN7	110
UI_ZONE_IN8	111
UI_ZONE_IN9	112
UI_ZONE_IN10	113
UI_OSD_SETUP_STEP	114
UI_TONE_CTRL	115
UI_AUDIO_SOURCE_CTRL	116
UI_VIDEO_SOURCE_CTRL	117
UI_MULTIROOM_CTRL	118
UI_MODE_CTRL	119
UI_SOURCE_CTRL	120
UI_BRIGHTNESS	121

UI_OSD_STATUS	122
UI_SYSTEM_SELECT	123
UI_PRESET1	124
UI_PRESET2	125
UI_PRESET3	126
UI_PRESET4	127
UI_PRESET5	128
UI_CENTER_PLUS	129
UI_CENTER_MINUS	130
UI_SURROUND_PLUS	131
UI_SURROUND_MINUS	132
UI_BASS_MIX_TOGGLE	133
NOP	134
NOP	135
UI_AUDIO_IN_EXT71_TOGGLE	136
UI_VIDEO_DISPLAY_MODE	137
UI_EXTERNAL_BRIGHTNESS	138
UI_ZONE_VOLUME_PLUS	139
UI_ZONE_VOLUME_MINUS	140
UI_ZONE_SOURCE_PLUS	141
UI_PHONES_VOLUME_PLUS	142
UI_PHONES_VOLUME_MINUS	143
UI_INPUT_SEARCH	144
UI_FRONT_PANEL_LOCK_TOGGLE	145
UI_TRIM_MODE_PLUS	146
UI_TRIM_MODE_MINUS	147
UI_SYSTEM_OFF_TOGGLE	148
UI_HOME	149
UI_TUNER_SEEK_UP	150
UI_TUNER_SEEK_DOWN	151
UI_TUNER_REVIEW	152
UI_VIDEO_DISPLAY_ZONE	153
UI_MAIN_VOLUME_PLUS	154
UI_MAIN_VOLUME_MINUS	155
UI_BASS_MIX_ON	156
UI_BASS_MIX_OFF	157
UI_ZONE_MUTE_ON	158
UI_ZONE_MUTE_OFF	159
UI_PROLOGIC2_MOVIE	160
UI_PROLOGIC2_MUSIC	161
UI_DTSES_NEO6	162
UI_DTSES_MATRIX61	163
UI_DIRECT	164
UI_ZONE_MUTE_TOGGLE	165
UI_REMOTE_MULTIROOM_CONTROL	166
UI_DTSES_NEO6_MUSIC	167
UI_DOLBY_EX	168
UI_STEREO96	169
NOP	170

Multi Byte User Commands

The following commands need two or more bytes: <command> <data1> [<data2>] ...
The reception of these commands must be first activated by sending **RS_ENABLE_CONTROL** command before each command! See *Special Commands* section below.

Command	Data	Description
UI_SET_VOLUME	1 180	Sets main zone volume
	2 10...100	main zone volume: 10 = -90dB, 100 = 0dB
UI_SET_COMP_VIDEO	1 181	Selects component video input
	2 0...3	component video input: 0 = Off, 1 = Component1, etc.
UI_SET_ZONE_VOLUME	1 182	Sets zone B volume
	2 11...100	Zone B volume: 11 = -89dB, 100 = 0dB
UI_SET_ZONE_SOURCE	1 183	Selects zone B souce
	2 1...16	Zone B source
UI_SET_PL2_PARAMETERS	1 184	Sets PL2 parameters (<i>Polaris or later</i>) Note: Parameters can be read without write by sending invalid data bytes, for example by setting all data bytes to 255. See the output data description below.
	2 0/1	Panorama: 0 = Off, 1 = On
	3 0...7	Center Width: 0 = Narrow, 7 = Wide
	4 0...6	Dimension: 0 = Front biased, 6 = Max surround
Output data	1 216	Response to the read command
	2 0/1	Panorama
	3 0...7	Center Width
	4 0...6	Dimension
UI_SET_NEO6_PARAMETERS	1 185	Sets Neo6 parameters (<i>Polaris or later</i>) Note: Parameters can be read without write by sending invalid data bytes, for example by setting all data bytes to 255. See the output data description below.
	2 0...5	Center Image: 0 = Narrow, 5 = Wide
Output data	1 251	Response to the read command
	2 0...5	Center Image

Special Commands

The following commands need one, two or several bytes: <command> [<data>] [<data>] ...

Command	Data	Description	
RS_ENABLE_CONTROL	1 224	Enables the reception of most RS232 commands Reception is disactivated after every received command, so this command must be sent again before the next command.	
	2 82		
	3 83		
	4 33		
RS_DISABLE_CONTROL	1 225	Disables the reception of RS232 commands. This command is seldom need as control is usually disabled after every RS command.	
RS_QUERY_SYSTEM_STATUS	1 227	Request for various status information. No need to enable RS control. This command sends out the information described below.	
Output data	1 223	Header	
	2 255	Header EOT	
	x	For the exact output see the command description of the each command on the right	RS_VOLUME (see Output data section)
			RS_MUTE (see Output data section)
			RS_AUDIO_SOURCE (see Output data section)
			RS_VIDEO_SOURCE (see Output data section)
			RS_OPER_MODE (see Output data section)
			RS_ZONE_AUDIO_SOURCE (see Output data section)
			RS_ZONE_VIDEO_SOURCE (see Output data section)
			RS_ZONE_VOLUME (see Output data section)
			RS_ZONE_MUTE (see Output data section)
			RS_DIMMER (see Output data section)
			RS_TAPEMONITOR (see Output data section)
			RS_STEREO_MODE (see Output data section)
			RS_SIGNAL_TYPE (see Output data section)
			RS_SEND_CHANNEL_INFO (see Output data section)
			RS_AUDIO_INPUT_TYPE (see Output data section)
			RS_COMPRESSION (see Output data section)
			RS_CINEEQ (see Output data section)
			RS_THX (see Output data section)
			RS_VIDEO_INPUT_TYPE (see Output data section)
			RS_BASS (see Output data section)
			RS_TREBLE (see Output data section)
			RS_CENTER (see Output data section)
			RS_SURROUND (see Output data section)
			RS_SUBWOOFER (see Output data section)
			RS_TRIGGER1 (see Output data section)
			RS_TRIGGER2 (see Output data section)
RS_TV_SYSTEM (see Output data section)			

RS_QUERY_VERSION	1	229	Sends out the software version number. RS control must be enabled first.
Output data	1	219	
	2	1...255	version number MSB (6.25)
	3	0...255	version number LSB (6.25)
	4	0...255	Customer/product ID
RS_STORE_EEPROM	1	230	Writes a byte to the EEPROM See <i>Appendix 1</i> for more information.
	2	0...255	MSB address byte
	3	0...255	LSB address byte
	4	0...255	Stored data
Output data	1	218	
	2	0/1	0 = write unsuccessful, 1 = write succesful
RS_READ_EEPROM	1	231	Reads a byte from the EEPROM. See Appendix 1 for more information.
	2	0...255	MSB address byte
	3	0...255	LSB address byte
Output data	1	217	
	2	0...255	Byte read from the EEPROM

Commands for Testing Purposes

The following commands need one or two bytes: <command> [<data1>]

The reception of these commands must be first activated by sending **RS_ENABLE_CONTROL** command before each command. See *Special Commands* section above.

Command	Data	Description	
RS_TEST_OPERATIONS	1	226	
	2	0...	0 = Balanced input bypass off
			1 = Balanced input bypass on
			2 = Microphone off
			3 = Microphone on
			4 = Button ID transmission on
			5 = VFD test pattern 1
			6 = VFD test pattern 2
			7 = VFD test pattern 3
			8 = Mute Tuner
			9 = Unmute Tuner
			10 = Send Tuner test signals
			11 = Read Tuner test signals, <i>see RS_TEST_DATA in Output Data section below</i>
			12 = Set Tuner PLL
			13 = Clear Tuner PLL
			14 = PAL blueback
			15 = NTSC blueback
			16 = Aux channel test ON
			17 = Aux channel test OFF
			18 = change RS232 protocol
			19 = Set Balanced Source to current input
			20 = Set Balanced Source to OFF
			21 = init speaker setup to all large, sub on, Xover 80
			22 = reset EEPROM defaults
			23 = update speaker configurations from EEPROM
			24 = update bass management from EEPROM
			25 = update tone controls from EEPROM
			26 = Bass limiter noise ON
			27 = Bass limiter noise OFF
			28 = Input level monitoring ON
			29 = Input level monitoring OFF
		30 = Button ID transmission OFF	
RS_LIGHT_LED		228	Lights a LED. Switches off all other LEDs.
		0...	User interface LED ID
		255	Test all LEDs

Output data

The following data is sent out to RS port whenever the status of the current parameter or function is changed. The output data consists of at least three bytes: <command> <data> <EOT>. For example when the main zone volume is changed to -25dB, the following three bytes are sent out: 225/75/255.

Command	Data	Description	
RS_SEND_CHANNEL_INFO	1	215	Channel information of the current audio signal
	2	b00??????	Channel info
		bits 0 - 2 (LSB):	000 = 1 + 1 (dual mono)
			001 = 1/0
			010 = 2/0
			011 = 3/0
			100 = 2/1
			101 = 3/1
			110 = 2/2
			111 = 3/2
	bit 3	0 = no LFE, 1 = LFE	
	bits 4 - 5	00 = not indicated	
		01 = not Dolby Surround decoded	
		10 = Dolby surround decoded	
		11 = reserved	
	Bit 6	0 = non ES / EX signal 1 = ES / EX flag present	
	Bit 7	reserved	
RS_SEND_PL2_PARAMETERS	1	216	Pro Logic II parameters
	2	0/1	Panorama: 0 = Off, 1 = On
	3	0...7	Width
	4	0...6	Dimension
RS_SEND_READ_EEPROM	1	217	The contents of the EEPROM memory location. This command is a response only for the RS_READ_EEPROM command
	2	0...255	Data byte read from the EEPROM
RS_SEND_STORE_EEPROM	1	218	A reply to the RS_STORE_EEPROM command
	2	0/1	0 = write unsuccessful, 1 = write successful
RS_SEND_VERSION	1	219	A reply to the RS_QUERY_VERSION command
	2	1...255	Major version number (6.22)
	3	0...255	Minor version number (6.22)
	4	0...255	Customer/product ID
RS_TEST_DATA	1	220	A reply to the RS_TEST_OPERATIONS
	2	0/1	Scanning signal
	3	0/1	MPX signal
	4	0...255	Signal strength
RS_BUTTON_ID	1	221	Sends the button ID pressed. The button ID is HW button ID, not Titan button ID.
	2	1...40	Button ID

RS_HEADPHONES	1	224	Send the status of the headphones
	2	0/1	Headphones connected (1) or not (0)
RS_VOLUME	1	225	Main zone volume
	2	10...120	Volume: 10 = -90dB, 100 = 0dB, 115 = +15dB
RS_MUTE	1	226	Status of the main zone user mute
	2	0/1	Main zone mute: 0 = unmuted, 1 = muted
RS_AUDIO_SOURCE	1	227	Current main zone source
	2	1...64	Main zone source: 1...16 = normal source, 62 = internal tuner, 63 = balanced audio in, 64 = external 7.1 input
RS_VIDEO_SOURCE	1	228	The current main zone composite/SVideo video source. Even when audio (7-16) source is selected, the video input of the last selected video source remains active, which is indicated by this command.
	2	1...6	Last selected video source
RS_OPER_MODE	1	229	Operating mode
	2	0/1	0 = standby, 1 = on
RS_ZONE_AUDIO_SOURCE	1	230	Zone B source
	2	1...16	
RS_ZONE_VIDEO_SOURCE	1	231	Zone B video source. Even when audio (7-16) source is selected, the video input of the last selected video source remains active, which is indicated by this command.
	2	1...6	
RS_ZONE_VOLUME	1	232	Volume of zone B
	2	10...115	Volume: 10 = -90dB, 100 = 0dB, 115 = +15dB
RS_ZONE_MUTE	1	233	Status of zone B mute
	2	0/1	0 = unmuted, 1 = muted
RS_DIMMER	1	234	VFD brightness
	2	0/1	0 = bright, 1 = dimmed
RS_TAPEMONITOR	1	235	TapeMonitor status
	2	0/1	0 = TapeMonitor off, 1 = TapeMonitor on
RS_STEREO_MODE	1	236	Current post processing mode
	2	0...17	0 = Direct (Stereo with 2 channel audio material)
			1 = Dolby Pro Logic
			2 = Natural
			3 = Club
			4 = Concert
			5 = Stadium
			6 = Party
			7 = Mono downmix
			8 = Custom music mode
			9 = Surround 6.1
			10 = Custom music mode
			11 = <i>not used</i>
			12 = Stereo downmix
		13 = Pro Logic II Movie	
		14 = Pro Logic II Music	

			15 = Dolby Digital EX
			16 = Neo:6 Cinema
			17 = Matrix / Neo:6
			18 = Hall
			19 = Church
			20 = Neo:6 Music
			21 = Stereo 96
			22 = Dolby Headphones (<i>not used</i>)
			23 = Pro Logic IIX Music
			24 = Pro Logic IIX Movie
RS_SIGNAL_TYPE	1	237	Current audio signal
	2	0...10	0 = <reserved>
			1 = Digital zero signal (currently not used)
			2 = Digital PCM
			3 = Dolby Digital
			4 = DTS
			5 = MPEG
			6 = Noise (generated by the DSP)
			7 = Analog
			8 = Digital Error (unrecognized or corrupted digital signal)
			9 = DTS-ES Matrix
			10 = DTS-ES Discrete
			11 = DTS 96/24
			12 = DTS 96 Matrix
		13 = DTS 96 Discrete	
RS_AUDIO_INPUT_TYPE	1	238	Audio input type of the current source
	2	0...5	0 = Non-balanced Analog
			1 = Coaxial
			2 = Optical
			3 = RF Demodulator (AC-3)
			4 = AES/EBU
		5 = Balanced Analog	
RS_COMPRESSION	1	239	Late Night compression status
	2	0/1	0 = compression off, 1 = compression on
RS_CINEEQ	1	240	Cine EQ status
	2	0/1	0 = Cine EQ off, 1 = Cine EQ on
RS_VIDEO_INPUT_TYPE	1	241	Type of the input video signal
	2	0...2	0 = unknown / no input signal
			1 = Composite
			2 = SVideo
RS_TREBLE	1	242	Treble setting
	2	0...24	0 = -12dB, 12 = 0dB, 24 = +12dB
RS_BASS	1	243	Bass setting
	2	0...24	0 = -12dB, 12 = 0dB, 24 = +12dB
RS_CENTER	1	244	Center trim level
	2	0...24	0 = -12dB, 12 = 0dB, 24 = +12dB

RS_SURROUND	1	245	Surround trim level
	2	0...24	0 = -12dB, 12 = 0dB, 24 = +12dB
RS_SUBWOOFER	1	246	Subwoofer trim level
	2	0...24	0 = -12dB, 12 = 0dB, 24 = +12dB
RS_TRIGGER1	1	247	Trigger 1 status
	2	0/1	0 = trigger inactive, 1 = trigger active
RS_TRIGGER2	1	248	Trigger 2 status
	2	0/1	0 = trigger inactive, 1 = trigger active
RS_TV_SYSTEM	1	249	TV system of the video input signal
	2	0...2	0 = unknown, 1 = PAL, 2 = NTSC
RS_THX	1	250	THX status
	2	0...4	0 = THX off
			1 = THX Cinema
			2 = THX Surround EX
			3 = THX Ultra2 Cinema
		4 = THX Music Mode	
RS_EOT		255	Sent out as a last byte of each transmission from the serial port

Appendix 1 - RS_STORE_EEPROM and RS_READ_EEPROM

This appendix gives further information about RS_STORE_EEPROM and RS_READ_EEPROM commands.

RS_STORE_EEPROM is used to store one byte to the EEPROM, where all user settings are stored. This commands lets third parties to configure setup values during installation. The command is not intended to change any values during normal operation, since the values are only stored to the EEPROM and are not automatically updated to the system. Some changes may not become effective until re-boot.

The address is calculated by the following formula:

$$address = MSB\ address * 256 + LSB\ address$$

The table below has both MSB and LSB addresses already calculated

EXAMPLE

The analog sensitivity of the Source2 is set to -3dB:

- first send the RS_ENABLE_CONTROL <224><82><83><33>
- send the RS_STORE_EEPROM command <230>
- send the address <3><81>
- send the sensitivity <82>

Data description	Data range		Address		
			MSB	LSB	MSB+LSB
BalancedSource	80-96	80= Off, 81 = Video1, 82 = Video2 etc.	0	6	6
BalancedBypass	80/81	80 = through DSP 81 = DSP bypassed	0	7	7
BassLimiter	80-130	80 = 0dB, 130 = -50dB	0	8	8
BassLimiterSwitch	80/81	80 = Bass Limiter Off 81 = Limiter On	0	9	9
SpecialVFDBrightness (only for some VFDs)	80-90	80 = dimmest, 90 = brightest	0	10	10
LDelay	80-115	80 = 0ms, 115 = 35ms	0	11	11
CDelay	80-115	80 = 0ms, 115 = 35ms	0	12	12
RDelay	80-115	80 = 0ms, 115 = 35ms	0	13	13
RsDelay	80-115	80 = 0ms, 115 = 35ms	0	14	14
LsDelay	80-115	80 = 0ms, 115 = 35ms	0	15	15
SubDelay	80-115	80 = 0ms, 115 = 35ms	0	16	16
LLevel	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	0	17	17
CLevel	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	0	18	18
RLevel	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	0	19	19
RsLevel	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	0	20	20
LsLevel	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	0	21	21
SubLevel	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	0	22	22

LfeLevel	70-80	70=-10dB, 80=0dB	0	23	23
MainSpeakers	80/81	80=small, 81 = large	0	24	24
CenterSpeaker	80-82	80=no, 81=small, 82=large	0	25	25
SurroundSpeakers	80-82	80=no, 81=small, 82=large	0	26	26
Subwoofer	80/81	80=no, 81=yes	0	27	27
SpeakerSetup	-	<i>Obsolete, do not use</i>	0	28	28
Volume	90-195	90=-90dB, 180=0dB, 195=+15dB	0	29	29
Input1Mode	80...	0 = Mono 1 = Stereo 2 = Direct 3 = Dolby Pro Logic 4 = Music1 5 = Music2 6 = Music3 7 = Music4 8 = Music5 11 = Dolby Pro Logic II Movie 12 = Dolby Pro Logic II Music 13 = Dolby Digital EX 14 = Neo:6 15 = DTS-ES Matrix 19 = Music6 30 = DSP Bypass	0	30	30
InputxMode, x = 2 - 16	See above		0	31 - 45	31 - 45
DistanceUnit	80/81	80=meters 81=feet	0	47	47
PhonesVolumeOffset	60-90	60=-20dB, 80=0dB, 90=+10dB	0	48	48
SubFilter	80/81	80=SubFilter On 81=SubFilter Off	0	49	49
PLIIPanorama	80/81	80=Panorama Off 81=Panorama On	0	50	50
PLIIWidth	80-87	80=Min Width, 87=Max Width	0	51	51
PLIIDimension	80-86	80=Min Dimension, 86=Max Dim.	0	52	52
EffectWetness <i>for Pictor and later</i>	80-84	80=Dry, 84=Wet	0	53	53
THXUltra2_BGC	80/81	80=Boundary Gain Compensation Off 81=Boundary Gain Compensation On	0	54	54
THXUltra2_ASA	80-82	80 = Speakers together 81 = Speakers close 82 = Speakers apart	0	55	55
THXUltra2_Sub	80/81	80=No THX Ultra2 Sub 81=THX Ultra2 Sub connected	0	56	56
Neo:6 Center Image	80-85	80=Min width, 85=Max width	0	57	57
SkipWelcome	0/1	0 = Welcome message displayed 1 = Welcome message not displayed	0	62	62
OsdMode	81/82	81 = Superimpose 82=Blueback	0	63	63
OsdTemporary	80-82	80=No temporary display 81=Simple 82=Full	0	64	64
OsdRouting	80-83	80=No OSD 81=OSD to composite 82=OSD to SVIDEO 83=OSD to both	0	65	65
OsdInputSelect	80-83	80=OSD Input Off 81=Svideo to OSD 82=Composite to OSD 83=Auto mode	0	66	66

TVSystem	1/2	Blueback TV mode 1=PAL 2=NTSC	0	77	77
OsdStyle	0-29	0=Factory default style 1-29=Preset Style	0	78	78
OsdBackgrColor	0-7	Background color for Factory default style 0 = black 1 = blue 2 = green 3 = cyan 4 = red 5 = magenta 6 = yellow 7 = white	0	79	79
OsdCharColor	0-7	Character color, <i>see above for color codes</i>	0	80	80
OsdErrorColor	0-7	Error line color, <i>see above for color codes</i>	0	81	81
BackSpeakers	80-84	80=no back 81=one small back 82=one large back 83=two small backs 84=two large backs	0	101	101
RbLevel	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	0	102	102
LbLevel	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	0	103	103
RbDelay	80-115	80 = 0ms, 115 = 35ms	0	104	104
LbDelay	80-115	80 = 0ms, 115 = 35ms	0	105	105
SubFreq	120/130/ 140/150/ 160/170/ 180/190/ 200/210/ 220	120=40Hz, 220=140Hz	0	106	106
EnhancedBass	80/81	80=Enhanced bass On 81= Enhanced bass Off	0	107	107
Trigger1Source	80-106	80 = Trigger Off (81-96, Source[1-16]) 81=Source1 ... 96=Source16 97 = Tuner selected 98 = External 7.1 99 = Balanced input 100 = System On 101 = Brightness 102 = Composite in 103 = SVideo in 104 = Composite/SVideo in 105 = Video source selected (1-6) 106 = Audio source selected (7-16) 107 = Zone B power	0	108	108
Trigger1Polarity	80/81	80=negative 8 1=positive	0	109	109

Trigger1Delay	80-94	80 = 100ms 81 = 1s 82 = 2s 83 = 3s 84 = 5s 85 = 7s 86 = 10s 87 = 15s 88 = 20s 89 = 30s 90 = 45s 91 = 1min 92 = 1min30s 93 = 2min 94 = 3min	0	110	110
Trigger1Duration	80-96	80 = Infinity 81 = 10ms 82 = 100ms 83 = 1s 84 = 2s 85 = 3s 86 = 5s 87 = 7s 88 = 10s 89 = 15s 90 = 20s 91 = 30s 92 = 45s 93 = 1min 94 = 1min30s 95 = 2min 96 = 3min	0	111	111
Trigger2Source	80-106	<i>see Trigger1Source above</i>	0	112	112
Trigger2Polarity	80/81	80=negative 81=positive	0	113	113
Trigger2Delay	80-94	<i>see Trigger1Delay above</i>	0	114	114
Trigger2Duration	80-96	<i>see Trigger1Duration above</i>	0	115	115
ZoneVolume	90-195	90=-90dB, 180=0dB,195=+15dB	0	116	116
CurrentZoneInput	81-86	81=Source1, 86=Source16	0	117	117
Bass	68-92	68=-12dB, 80=0dB, 92=+12dB	0	118	118
Treble	68-92	68=-12dB, 80=0dB, 92=+12dB	0	119	119
Bass type	80-84	Non-propus: 80 = Gen5 type, 81 = Gen6 type > Propus: 82 = 80 Hz, 83 = 110 Hz, 84 = 140 Hz	1	44	300
Treble type	80-84	Non-propus: 80 = Gen5 type, 81 = Gen6 type > Propus: 82 = 6 kHz, 83 = 8 kHz, 84 = 10 kHz	1	45	301
Analog Bass Management	80-82	0 = Off, 1 = Mains Large, other speakers small, 2 = All speakers small	1	46	302
WelcomeMessage	ASCII code	All bytes are ASCII codes. 400-419 has the 20 characters of the first row and 420-439 of the second row	1	144-183	400-439
ShutdownMessage	ASCII code	All bytes are ASCII codes. 440-459 has the 20 characters of the first row and 460-479 of the second row	1	184-223	440-479
ChannelNames	ASCII code	All bytes are ASCII codes. The label of the Source1 is stored in 702-708 (seven characters), Source2 in 709-715, etc	2 3	190-255 0-45	702-767 768-813
SourceAnalogSensitivity	80-95	80=-5dB,85=0dB,95=+10dB (848 has the sensitivity for the Source1, 849 for Source2, etc.)	3	80-95	848-863

DigitalAssoc	80-88	80 = Digital input Off 81-88 = Digital input [1-8] (864 has the digital input for the Source1, 865 for the Source2, etc.)	3	96-111	864-879
CompVideoAssoc	80-83	80 = Component video Off 81-83 = Component video [1-3] (880 has the component video input for the Source1, 881 for the Source2, etc)	3	112-127	880-895
Preset1Center	68-92	68=-12dB, 80=0dB, 92=+12dB	4	0	1024
Preset1Surround	See above		4	1	1025
Preset1Subfoower	See above		4	2	1026
Preset1Bass	See above		4	3	1027
Preset1Treble	See above		4	4	1028
Preset1Lipsync	80-230	80 = off, 230 = 150 ms	4	5	1029
Preset1Data	-	Reserved	4	5-9	1030-1033
Preset2	See Preset1 structure above		4	10-19	1034-1043
Preset3	See Preset1 structure above		4	20-29	1044-1053
Preset4	See Preset1 structure above		4	30-39	1054-1063
Preset5	See Preset1 structure above		4	40-49	1064-1073
PresetAssoc	80-85	80=No preset, 81=Preset1, 82=Preset2, etc. (1074 has the Preset for the Source1, 1075 for the Source 2, etc.)	4	50-65	1074-1089
TunerFMPresetAss1	Not documented		4	86-94	1110-1118
TunerAMPresetAss1	Not documented		4	95-104	1119-1128
TunerFMPresetFreq1	Not documented		4	106-123	1130-1147
TunerAMPresetFreq1	Not documented		4	124-141	1148-1165
TunerBand	Not documented		4	142	1166
TunerCurrentFMPreset	Not documented		4	143	1167
TunerCurrentAMPreset	Not documented		4	144	1168
TunerCountry	Not documented		4	145	1169
TunerTuneMode	Not documented		4	146	1170
RS_Mode	Not documented		4	147	1171
TunerLabels	Not documented		4 5	148-256 0-17	1172-1280 1281-1297
RS_IRConverter_mode	Not documented		5	18	1298
Ch9_left_mix	0-200	0=-100%, 100=0%, 101=1%, 200=100%	5	20	1300

Ch9_center_mix	See above		5	21	1301
Ch9_right_mix	See above		5	22	1302
Ch9_rightsurr_mix	See above		5	23	1303
Ch9_back_mix	See above		5	24	1304
Ch9_leftsurr_mix	See above		5	25	1305
Ch9_lfe_mix	See above		5	26	1306
Ch9_sub_mix	See above		5	27	1307
Ch10_left_mix	See above		5	28	1308
Ch10_center_mix	See above		5	29	1309
Ch10_right_mix	See above		5	30	1310
Ch10_rightsurr_mix	See above		5	31	1311
Ch10_back_mix	See above		5	32	1312
Ch10_leftsurr_mix	See above		5	33	1313
Ch10_lfe_mix	See above		5	34	1314
Ch10_sub_mix	See above		5	35	1315
Ch9_filter1_type	80-82	80=No filter 81=Lowpass 82=Highpass	5	36	1316
Ch9_filter2_type	See Ch9_filter1_type		5	37	1317
Ch9_filter1_freq	80-136	80=20, 81= 25, 82=30, 83=35, 84=40, 85=45, 86=50, 87=55, 88=60, 89=65, 90=70, 91=75, 92=80, 93=85, 94=90, 95=95, 96=100, 97=105, 98=110, 99=115, 100=120, 101=125, 102=130, 103=135, 104=140, 105=145, 106=150, 107=155, 108=160, 109=165, 110=170, 111=175, 112=180, 113=185, 114=190, 115=195, 116=200, 117=250, 118=500, 119=1000, 120=2000, 121=3000, 122=4000, 123=5000, 124=6000, 125=7000, 126=8000, 127=9000, 128=10000, 129=11000, 130=12000, 131=13000, 132=14000, 133=15000, 134=16000, 135=17000, 136=18000	5	38	1318
Ch9_filter2_freq	See Ch9_filter1_freq		5	40	1320
Ch10_filter1_type	See Ch9_filter1_type		5	42	1322
Ch10_filter2_type	See Ch9_filter1_type		5	43	1323
Ch10_filter1_freq	See Ch9_filter1_freq		5	44	1324
Ch10_filter2_freq	See Ch9_filter1_freq		5	46	1326
Ch9_delay	0-80	0=0ms, 80=80ms	5	48	1328
Ch9_level	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	5	49	1329
Ch10_delay	0-80	0=0ms, 80=80ms	5	50	1330
Ch10_level	50-110	50=-15.0dB, 80=0.0dB, 81=0.5dB, 110=15.0dB	5	51	1331
Ch9_preset	80-?	80=User Aux9 settings, 81=AuxPreset1, etc. Currently not used!	5	52	1332
Ch10_preset	80-?	80=User Aux10 settings, 81=AuxPreset1, etc. Currently not used!	5	53	1333