

# Acurus Processor Control Command Guide

**All Models**

Version 1.1

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# Control Interface

All Acurus Processors are designed to provide simple, reliable control via a variety of control interfaces.

This document details all available control protocols and specs for interfacing Acurus Processor with a computer and/or 3<sup>rd</sup> party automation system. *Note: The Acurus 16 Channel Processor does not support TCP/IP or UDP 2 Way, see Legacy Control Protocol section.*

All Acurus processors are design to receive commands and execute upon receiving the command. This simple format allows for very efficient communication between the processor and the control system.

Listed below are all of the Control Interfaces available:

- RS-232 ( DB9 | 2 Way Control )**
- UDP Network ( Ethernet | 2 Way Control )**
- TCP/IP Network ( Ethernet | 2 Way Control )**
- TCP/IP Network ( Ethernet | Web UI )**

## RS-232 ( Control )

All Acurus processors uses a standard RS-232 connection via the DB9 connector located on the back.

The RS-232 Control system is enabled out of the box.

*NOTE: A Null Modem Cable must be used to connect to the RS-232 connector located on the back of the pre-amp processor.*

The RS-232 (DB-9) pin out is defined below:

PIN	TYPE
2	TX DATA (Transmit)
3	RX DATA (Receive)
5	GND (Ground)

Serial communications format is as follows:

FORMAT	SETTING
Baud Rate	9600
Data Bits	8
Stop Bit	1
Parity	No
Flow Control	No

## Ethernet

The Ethernet port is compliant with industry standard IEEE 802.3 protocol via a 10/100Mbps connection.

All Acurus processors are also designed to support DHCP or Static IP type address. This setting can be configured on the Front Panel LCD UI under the settings tab.

Select Home Screen → Settings → Network Settings

DHCP IP address is the default IP address type. If a static IP is selected, then it can be directly entered via the LCD UI. Once a static IP Address is selected, it will always reload this address until a new address is loaded or DHCP is selected. The static address is stored in memory such that even during power outages, it will return to the static IP address

If no DHCP server is enabled on the network, then the processor will default to this Static IP address:

TYPE	ADDRESS
Default Address	192.168.1.245

## Ethernet ( UDP - Control )

All Acurus processors are designed to receive User Datagram Protocol ( UDP ) packets via the Ethernet port.

The UDP Port is defined below:

FORMAT	PORT
UDP	26482

## Ethernet ( TCP / IP – Control )

All Acurus processors are also designed to receive Transmission Control Protocol / Internet Protocol (TCP/IP) packets via the Ethernet port.

The TCP/IP Port is defined below:

FORMAT	PORT
TCP / IP	26483

## Ethernet ( TCP / IP - UI )

All Acurus processors are also designed with a built in web controlled User Interface ( UI ) designed to help facilitate installation and tuning.

This interface is not designed to receive commands from external control systems, but is made available via the IP address of the processor on the local network using a standard web browser.

The UI TCP/IP Port is defined below:

FORMAT	PORT
TCP / IP	80

# Control Protocol

Commands are comprised of 6 ASCII characters. The Control Commands Table A contains a list of all commands available.

Each ASCII command can be sent via RS232 / UDP / or TCP/IP.

## Sending Commands

### EXAMPLE: Sending “Select Input 1”

This command string will select input number #1.

“INPP01”

## Sending Multiple Commands

### EXAMPLE: Sending “Select Input 2” and Set Volume to “50”

Each command should be delayed by roughly 500ms to insure proper execution from the 3<sup>rd</sup> party control system.

“INPP01” + Delay(500ms) + “VOL050”

## Verbose Response

Verbose response mode returns human-readable confirmation messages in response to system changes or adjustments (originating from any source). Verbose Responses are enabled by default. For the above example command, here is the verbose response:

“OK INPUT i1\r\n”

## Verbose Response ( Power On & Input Select )

Some specific commands will automatically return multiple responses to completely update the 3<sup>rd</sup> party control system. The Power On command and Input Select Command will provide additional responses. All other commands will just return single response listed in the Control Command Table A. Verbose Level 2 is the default Verbose Level for all interfaces. Via the RS232 interface only, you can change the Verbose Response type to level 1. This simpler response will be “OK\r\n” only after every command.

All Acurus Processors will automatically remember the last Sound Mode and Volume Level used per input. These additional responses help control systems properly stay synced. All responses are the same as the responses to the Status Request Commands / Responses Table B, just sent back to back.

**Power On Command Response:** This will return power state, current input, current sound mode, and current volume level. The table of possible responses are outlined in the Status Request Command / Response Table.

**COMMAND: “PWRONN”**

**RESPONSE:**

“OK POWER ON\r\nOK INPUT i1\r\nOK SM AUTO\r\nOK VOL010\r\n”

**Input Select Command Response:** This will return the selected input, current sound mode, and current volume level.

**COMMAND: “INPP03”**

**RESPONSE:**

“OK INPUT i3\r\nOK SM AUTO\r\nOK VOL010\r\n”

## Command Sequencing

### Preload and Go!

A unique feature of all Acurus processors is the ability process commands while in the standby state. This allows a 3<sup>rd</sup> party control system to the power on the Acurus processor into a predetermined state resulting in smoother behavior for the end user.

**EXAMPLE:** The control system could set the Acurus processor to “Input 3”, then set the volume level to “35”, then turn the power ON. The processor would power ON very quickly and then all of these settings would already be loaded.

### Mute and Update

Another unique control option is that a control system could MUTE the processor and then change inputs, volume level, and other parameters during MUTE.

**EXAMPLE:** The processor would receive the MUTE ON command and then the control system would switch to another input, set the volume level to “60” then deliver the MUTE OFF command.

## Status Command Requests

All Acurus processors will also respond to status requests. Responses will only be provided via RS232 or TCP/IP. UDP Response are not supported at this time. UDP will accept the command, but not provide a response.

### EXAMPLE: Request Input Status Command

This status request command will return any of the response listed in the Status Request Commands / Responses Table B. This table contains all possible responses.

**COMMAND: “STSI NP”**

**RESPONSE: “OK INPUT i3\r\n”**

**TABLE A - Control Command ( Page 1 of 3 )**

Category	Function	ASCII Command	ASCII Response	Notes
POWER	Power Toggle On / Off	PWRTGL	OK POWER ON\r\n OK POWER OFF\r\n	
	Power On	PWRONN	OK POWER ON\r\n	
	Power Off	PWROFF	OK POWER OFF\r\n	
MUTE	Mute Toggle On / Off	MUTTGL	OK MUTE ON\r\n OK MUTE OFF\r\n	
	Mute On	MUTONN	OK MUTE ON\r\n	
	Mute Off	MUTOFF	OK MUTE OFF\r\n	
VOLUME	Volume Level Up	VOLUPP	OK VOL0XX\r\n	XX = 01 to 99
	Volume Level Down	VOLDWN	OK VOL0XX\r\n	XX = 01 to 99
	Volume Direct	VOLOXX	OK VOL0XX\r\n	XX = 01 to 99
INPUT	Input i1 ( HDMI )	INPP01	OK INPUT i1\r\n	
	Input i2 ( HDMI )	INPP02	OK INPUT i2\r\n	
	Input i3 ( HDMI )	INPP03	OK INPUT i3\r\n	
	Input i4 ( HDMI )	INPP04	OK INPUT i4\r\n	
	Input i5 ( HDMI )	INPP05	OK INPUT i5\r\n	
	Input i6 ( HDMI )	INPP06	OK INPUT i6\r\n	
	Input i7 ( HDMI )	INPP07	OK INPUT i7\r\n	
	Input i8 ( HDMI )	INPP08	OK INPUT i8\r\n	
	Input i9 ( Optical )	INPP09	OK INPUT i9\r\n	
	Input i10 ( Optical )	INPP10	OK INPUT i10\r\n	
	Input i11 ( ACT4 - Optical   MUSE - Coax )	INPP11	OK INPUT i11\r\n	
	Input i12 ( Coax )	INPP12	OK INPUT i12\r\n	
	Input i13 ( ACT4 - Coax   MUSE - Analog L/R )	INPP13	OK INPUT i13\r\n	
	Input i14 ( ACT4 - Coax   MUSE - Analog L/R )	INPP14	OK INPUT i14\r\n	
	Input i15 ( ACT4 - Phono → ACT4 ONLY )	INPP15	OK INPUT i15\r\n	
	Input i16 ( ACT4 - XLR → ACT4 ONLY )	INPP16	OK INPUT i16\r\n	
	Input i17 ( ACT4 - Analog L/R → ACT4 ONLY )	INPP17	OK INPUT i17\r\n	
	Input i18 ( ACT4 - Analog L/R → ACT4 ONLY )	INPP18	OK INPUT i18\r\n	
	Input i19 ( ACT4 - Analog L/R → ACT4 ONLY )	INPP19	OK INPUT i19\r\n	
	Input i20 ( ACT4 - 7.1 Analog L/R → ACT4 ONLY )	INPP20	OK INPUT i20\r\n	
	Input i21 ( ACT4 - 7.1 Analog L/R → ACT4 16 ONLY )	INPP21	OK INPUT i21\r\n	
SOUND MODE	Sound Mode - Auto	SDMAUT	OK SM AUTO\r\n	
	Sound Mode - Direct	SDMDIR	OK SM DIRECT\r\n	
	Sound Mode - Stereo	SDMSTR	OK SM STEREO\r\n	
	Sound Mode - Analog	SDMANA	OK SM ANALOG\r\n	Only an option with analog inputs
	Sound Mode - Party	SDMPAR	OK SM PARTY\r\n	
	Sound Mode - Night	SDMNGT	OK SM NIGHT\r\n	

**TABLE A - Control Command ( Page 2 of 3 )**

Category	Function	ASCII Command	Verbose Response	Notes
SOUND MODE	Sound Mode – DTS Neural X	SDMDTS	OK SM DTS\r\n	
	Sound Mode – Dolby	SDMDLB	OK SM DOLBY\r\n	
	Sound Mode – 2.1	SDM2D1	OK SM 2.1\r\n	
	Sound Mode – 3.1	SDM3D1	OK SM 3.1\r\n	
	Sound Mode – 5.1	SDM5D1	OK SM 5.1\r\n	
	Sound Mode – 7.1	SDM7D1	OK SM 7.1\r\n	
VERBOSE	Verbose Response Enabled	VERBON	OK\r\n	Simple "OK" response
	Verbose Response Level 2	VERBN2		<b>DEFAULT CASE</b> Response sent after any change including front panel, IR, etc...
	Verbose Response Disabled	VERBOF		No response returned
SYSTEM	Restart ACT 4	YSRST	OK\r\n	
FRONT PANEL BRIGHTNESS	Front Panel Brightness - Auto	FPBAUT		
	Front Panel Brightness - Low	FPBLOW	OK FPB LOW\r\n	
	Front Panel Brightness - Med	FPBMED	OK FPB MED\r\n	
	Front Panel Brightness - High	FPBHGH	OK FPB HIGH\r\n	
LIPSYNC	Lipsync Delay Direct	LPSDXX	OK LIPSYNC DELAY YYY\r\n	<b>XX = 0 to 50 ( 10ms per )</b> <b>YYY = 000 to 500 ( Delay in ms )</b> <b>EX: LPSD31 = 310ms Delay</b> <b>RESPONSE:</b> OK LIPSYNC DELAY 310\r\n
BASS	Bass Level = -10dB	BASM10	OK BASS -10\r\n	Level in dB
	Bass Level = -9dB	BASM09	OK BASS -09\r\n	Level in dB
	Bass Level = -8dB	BASM08	OK BASS -08\r\n	Level in dB
	Bass Level = -7dB	BASM07	OK BASS -07\r\n	Level in dB
	Bass Level = -6dB	BASM06	OK BASS -06\r\n	Level in dB
	Bass Level = -5dB	BASM05	OK BASS -05\r\n	Level in dB
	Bass Level = -4dB	BASM04	OK BASS -04\r\n	Level in dB
	Bass Level = -3dB	BASM03	OK BASS -03\r\n	Level in dB
	Bass Level = -2dB	BASM02	OK BASS -02\r\n	Level in dB
	Bass Level = -1dB	BASM01	OK BASS -01\r\n	Level in dB
	Bass Level = +0dB	BASP00	OK BASS +00\r\n	Level in dB
	Bass Level = +1dB	BASP01	OK BASS +01\r\n	Level in dB
	Bass Level = +2dB	BASP02	OK BASS +02\r\n	Level in dB
	Bass Level = +3dB	BASP03	OK BASS +03\r\n	Level in dB
	Bass Level = +4dB	BASP04	OK BASS +04\r\n	Level in dB
	Bass Level = +5dB	BASP05	OK BASS +05\r\n	Level in dB
	Bass Level = +6dB	BASP06	OK BASS +06\r\n	Level in dB
	Bass Level = +7dB	BASP07	OK BASS +07\r\n	Level in dB
	Bass Level = +8dB	BASP08	OK BASS +08\r\n	Level in dB
	Bass Level = +9dB	BASP09	OK BASS +09\r\n	Level in dB
	Bass Level = +10dB	BASP10	OK BASS +10\r\n	Level in dB

**TABLE A - Control Command ( Page 3 of 3 )**

Category	Function	ASCII Command	Verbose Response	Notes
TREBLE	Treble Level = -10dB	TRBM10	OK TREBLE -10\r\n	Level in dB
	Treble Level = - 9dB	TRBM09	OK TREBLE -09\r\n	Level in dB
	Treble Level = -8dB	TRBM08	OK TREBLE -08\r\n	Level in dB
	Treble Level = -7dB	TRBM07	OK TREBLE -07\r\n	Level in dB
	Treble Level = -6dB	TRBM06	OK TREBLE -06\r\n	Level in dB
	Treble Level = -5dB	TRBM05	OK TREBLE -05\r\n	Level in dB
	Treble Level = -4dB	TRBM04	OK TREBLE -04\r\n	Level in dB
	Treble Level = -3dB	TRBM03	OK TREBLE -03\r\n	Level in dB
	Treble Level = -2dB	TRBM02	OK TREBLE -02\r\n	Level in dB
	Treble Level = -1dB	TRBM01	OK TREBLE -01\r\n	Level in dB
	Treble Level = +0dB	TRBP00	OK TREBLE +00\r\n	Level in dB
	Treble Level = +1dB	TRBP01	OK TREBLE +01\r\n	Level in dB
	Treble Level = +2dB	TRBP02	OK TREBLE +02\r\n	Level in dB
	Treble Level = +3dB	TRBP03	OK TREBLE +03\r\n	Level in dB
	Treble Level = +4dB	TRBP04	OK TREBLE +04\r\n	Level in dB
	Treble Level = +5dB	TRBP05	OK TREBLE +05\r\n	Level in dB
	Treble Level = +6dB	TRBP06	OK TREBLE +06\r\n	Level in dB
	Treble Level = +7dB	TRBP07	OK TREBLE +07\r\n	Level in dB
	Treble Level = +8dB	TRBP08	OK TREBLE +08\r\n	Level in dB
	Treble Level = +9dB	TRBP09	OK TREBLE +09\r\n	Level in dB
	Treble Level = +10dB	TRBP10	OK TREBLE +10\r\n	Level in dB
DOLBY	Dolby Dynamic Range Control OFF (DRC OFF)	DLBDRF	OK DOLBY DRC OFF\r\n	
	Dolby Dynamic Range Control ON (DRC ON)	DLBDRN	OK DOLBY DRC ON\r\n	
	Dolby Surround Center Spread OFF	DLBCSF	OK DOLBY CENTER SPD ON\r\n	
	Dolby Surround Center Spread ON	DLBCSN	OK DOLBY CENTER SPD OFF\r\n	
DTS	DTS Dynamic Range Control OFF (DRC OFF)	DTSDRF	OK DTS DRC OFF\r\n	
	DTS Dynamic Range Control ON (DRC ON)	DTSDRN	OK DTS DRC ON\r\n	
	DTS Dialog ControlX = 0 to 6 dB	DTSDGX	OK DTS Dialog X\r\n	<b>X = 0 - 6</b> Steps of 1dB Only works when DTSX is playing

**TABLE B - Status Request Command / Response ( Page 1 of 2 )**

Category	Function	ASCII Command	Verbose Responses	Notes
POWER	Power - On / Off	STSPOW	OK POWER OFF\r\n OK POWER ON\r\n	
MUTE	Mute - On / Off	STSMUT	OK MUTE OFF\r\n OK MUTE ON\r\n	
INPUT	Input Selected – i1 to i21	STSINP	OK INPUT i1\r\n OK INPUT i2\r\n OK INPUT i3\r\n OK INPUT i4\r\n OK INPUT i5\r\n OK INPUT i6\r\n OK INPUT i7\r\n OK INPUT i8\r\n OK INPUT i9\r\n OK INPUT i10\r\n OK INPUT i11\r\n OK INPUT i12\r\n OK INPUT i13\r\n OK INPUT i14\r\n OK INPUT i15\r\n OK INPUT i16\r\n OK INPUT i17\r\n OK INPUT i18\r\n OK INPUT i19\r\n OK INPUT i20\r\n OK INPUT i21\r\n	Product : ACT4 16 ( i1 to i21 ONLY ) Product: ACT4 20 ( i1 to i20 ONLY ) Product: MUSE 16( i1 to i14 ONLY )
VOLUME	Volume Level Value	STSVOL	OK VOL0XX\r\n	XX = 01 to 99
SOUND MODE	Sound Mode Selected	STSMOD	OK SM AUTO\r\n OK SM DIRECT\r\n OK SM STEREO\r\n OK SM ANALOG\r\n OK SM PARTY\r\n OK SM NIGHT\r\n OK SM DTS\r\n OK SM DOLBY\r\n OK SM 2.1\r\n OK SM 3.1\r\n OK SM 5.1\r\n OK SM 7.1\r\n	
BRIGHTNESS	Front Panel Brightness	STSF PB	OK FPB LOW\r\n OK FPB MED\r\n OK FPB HIGH\r\n	Low / Med / High
LIPSYNC	Lipsync Delay	STSLPS	OK LIPSYNC DELAYXXX\r\n	XXX = 000 to 500 ms
DOLBY	Dolby DRC – On / Off	STSDLD	OK DOLBY DRC OFF\r\n OK DOLBY DRC ON\r\n	
DOLBY	Dolby Center Spread – On / Off	STSDLC	OK DOLBY CENTER SPD OFF\r\n OK DOLBY CENTER SPD ON\r\n	



**TABLE B - Status Request Command / Response ( Page 2 of 2 )**

Category	Function	ASCII Command	Verbose Responses	Notes
DTS	DTS DRC – On / Off	STSDTD	OK DTS DRC OFF\r\n OK DTS DRC ON\r\n	
DTS	DTSX Dialog Control – 0 to 6dB	STSDTL	OK DTS Dialog 0\r\n OK DTS Dialog 1\r\n OK DTS Dialog 2\r\n OK DTS Dialog 3\r\n OK DTS Dialog 4\r\n OK DTS Dialog 5\r\n OK DTS Dialog 6\r\n	
BASS	Bass Level Value – 10db to +10dB	STSBAS	OK BASS -10\r\n OK BASS -09\r\n OK BASS -08\r\n OK BASS -07\r\n OK BASS -06\r\n OK BASS -05\r\n OK BASS -04\r\n OK BASS -03\r\n OK BASS -02\r\n OK BASS -01\r\n OK BASS +00\r\n OK BASS +01\r\n OK BASS +02\r\n OK BASS +03\r\n OK BASS +04\r\n OK BASS +05\r\n OK BASS +06\r\n OK BASS +07\r\n OK BASS +08\r\n OK BASS +09\r\n OK BASS +10\r\n	
TREBLE	Treble Level Value – 10db to +10dB	STSTRB	OK TREBLE -10\r\n OK TREBLE -09\r\n OK TREBLE -08\r\n OK TREBLE -07\r\n OK TREBLE -06\r\n OK TREBLE -05\r\n OK TREBLE -04\r\n OK TREBLE -03\r\n OK TREBLE -02\r\n OK TREBLE -01\r\n OK TREBLE +00\r\n OK TREBLE +01\r\n OK TREBLE +02\r\n OK TREBLE +03\r\n OK TREBLE +04\r\n OK TREBLE +05\r\n OK TREBLE +06\r\n OK TREBLE +07\r\n OK TREBLE +08\r\n OK TREBLE +09\r\n OK TREBLE +10\r\n	

# IR Control Protocol

## IR Remote Control

All Acurus processors can receive standard IR commands via the IR Sensor window on the front of the product ( Internal ) or via the 3.5mm jack located on the back of the product ( External ). This selection can be made via the LCD touch screen interface on the front of the product.

External IR Sensor Input Pin out → Pin 1 ( GND ) | Pin 2 ( Signal ) | Pin 3 ( 5V DC )



Select Home Screen → Settings → Trigger Settings

**TABLE C – IR Commands ( Page 1 of 2 )**

Category	Function	RC5 Code ( HEX )	HEX Code
POWER	Power Toggle On / Off	31 3F	5000 0073 0000 0001 001f 003F
	Power On	31 15	5000 0073 0000 0001 001f 0015
	Power Off	31 28	5000 0073 0000 0001 001f 0028
MUTE	Mute Toggle On / Off	31 26	5000 0073 0000 0001 001f 0026
	Mute On	31 14	5000 0073 0000 0001 001f 0014
	Mute Off	31 16	5000 0073 0000 0001 001f 0016
VOLUME	Volume Level Up	31 2A	5000 0073 0000 0001 001f 002A
	Volume Level Down	31 1F	5000 0073 0000 0001 001f 001F
INPUT	Input i1 ( HDMI )	31 36	5000 0073 0000 0001 001f 0036
	Input i2 ( HDMI )	31 38	5000 0073 0000 0001 001f 0038
	Input i3 ( HDMI )	31 3A	5000 0073 0000 0001 001f 003A
	Input i4 ( HDMI )	31 3C	5000 0073 0000 0001 001f 003C
	Input i5 ( HDMI )	31 37	5000 0073 0000 0001 001f 0037
	Input i6 ( HDMI )	31 39	5000 0073 0000 0001 001f 0039
	Input i7 ( HDMI )	31 3B	5000 0073 0000 0001 001f 003B
	Input i8 ( HDMI )	31 3D	5000 0073 0000 0001 001f 003D
	Input i9 ( Optical )	31 08	5000 0073 0000 0001 001f 0008
	Input i10 ( Optical )	31 04	5000 0073 0000 0001 001f 0004
	Input i11 ( ACT4 – Optical   MUSE - Coax )	25 05	5000 0073 0000 0001 0019 0005
	Input i12 ( Coax )	31 0A	5000 0073 0000 0001 001f 000A
	Input i13 ( ACT4 – Coax   MUSE – Analog L/R )	31 1E	5000 0073 0000 0001 001f 001E
	Input i14 ( ACT4 – Coax   MUSE – Analog L/R )	25 1C	5000 0073 0000 0001 0019 001C
	Input i15 ( ACT4 – Phono → ACT4 ONLY )	25 19	5000 0073 0000 0001 0019 0019
	Input i16 ( ACT4 – XLR → ACT4 ONLY )	25 1A	5000 0073 0000 0001 0019 001A
	Input i17 ( ACT4 – Analog L/R → ACT4 ONLY )	25 1D	5000 0073 0000 0001 0019 001D
	Input i18 ( ACT4 – Analog L/R → ACT4 ONLY )	25 24	5000 0073 0000 0001 0019 0024
	Input i19 ( ACT4 – Analog L/R → ACT4 ONLY )	25 29	5000 0073 0000 0001 0019 0029
	Input i20 ( ACT4 – 7.1 Analog L/R → ACT4 ONLY )	25 22	5000 0073 0000 0001 0019 0022
	Input i21 ( ACT4 – 7.1 Analog L/R → ACT4 16 ONLY )	31 1B	5000 0073 0000 0001 001f 001B
Analog Input Toggle – i15 to i21	31 01	5000 0073 0000 0001 001f 0001	
Digital Input Toggle – i9 to i14	31 1A	5000 0073 0000 0001 001f 001A	

# IR Control Protocol

**TABLE C – IR Commands ( Page 2 of 2 )**

Category	Function	RC5 Code ( HEX )	HEX Code
SOUND MODE	Sound Mode - Auto	31 1D	5000 0073 0000 0001 001f 001D
	Sound Mode - Direct	31 3E	5000 0073 0000 0001 001f 003E
	Sound Mode - Stereo	31 17	5000 0073 0000 0001 001f 0017
	Sound Mode - Analog	31 18	5000 0073 0000 0001 001f 0018
	Sound Mode - Party	31 27	5000 0073 0000 0001 001f 0027
	Sound Mode - Night	31 03	5000 0073 0000 0001 001f 0003
	Sound Mode – DTS Neural X	31 02	5000 0073 0000 0001 001f 0002
	Sound Mode – Dolby	31 1C	5000 0073 0000 0001 001f 001C
	Sound Mode – 2.1	25 28	5000 0073 0000 0001 0019 0028
	Sound Mode – 3.1	25 27	5000 0073 0000 0001 0019 0027
	Sound Mode – 5.1	25 26	5000 0073 0000 0001 0019 0026
	Sound Mode – 7.1	25 25	5000 0073 0000 0001 0019 0025
FRONT PANEL BRIGHTNESS	Front Panel Brightness - Auto	25 1E	5000 0073 0000 0001 0019 001E
	Front Panel Brightness - Low	25 1F	5000 0073 0000 0001 0019 001F
	Front Panel Brightness - Med	25 20	5000 0073 0000 0001 0019 0020
	Front Panel Brightness - High	25 21	5000 0073 0000 0001 0019 0021
BASS	Bass Level ( Minus )	31 13	5000 0073 0000 0001 001f 0013
	Bass Level ( Plus )	31 12	5000 0073 0000 0001 001f 0012
TREBLE	Treble Level ( Minus )	31 11	5000 0073 0000 0001 001f 0011
	Treble Level ( Plus )	31 10	5000 0073 0000 0001 001f 0010
DOLBY	Dolby Dynamic Range Control OFF ( DRC OFF )	31 0B	5000 0073 0000 0001 001f 000B
	Dolby Dynamic Range Control ON ( DRC ON )	31 29	5000 0073 0000 0001 001f 0029
	Dolby Surround Center Spread OFF	31 2B	5000 0073 0000 0001 001f 002B
	Dolby Surround Center Spread ON	31 19	5000 0073 0000 0001 001f 0019
DTS	DTS Dynamic Range Control OFF ( DRC OFF )	25 03	5000 0073 0000 0001 0019 0003
	DTS Dynamic Range Control ON ( DRC ON )	25 04	5000 0073 0000 0001 0019 0004
	DTS Dialog Control ( Minus )	31 0E	5000 0073 0000 0001 001f 000E
	DTS Dialog Control ( Plus )	31 0F	5000 0073 0000 0001 001f 000F

# Legacy Control Protocol

## ACT4 16CH Processor ( Legacy Protocol )

The ACT 4 16 Channel processor is designed to receive commands via RS-232 and UDP. RS-232 behavior is the same as outlined in the beginning part of the document. UDP packets are to the same port, 26482, but they do not provide responses and they are packaged into a slightly different format outlined below.

An XML file is available to be parsed to get the current real time status of some key parameters in the product. This XML file is used as a means of providing feedback to the control system of current state.

TCP/IP commands are not supported by the ACT4 16 Channel processor.

Listed below are all of the Control Interfaces available:

**RS-232 ( DB9 | 2 Way Control )**

**UDP Network ( Ethernet | 1 Way Control )**

**TCP/IP Network ( Ethernet | Web UI )**

## Sending RS-232 Commands

### EXAMPLE: Sending “Select Input 1”

This command string will select input number #1.

**“INPP01”**

## Verbose Response

Verbose response mode returns human-readable confirmation messages in response to system changes or adjustments (originating from any source). Verbose Responses are enabled by default. For the above example command, here is the verbose response:

**“OK INPUT i1\r\n”**

## UDP Command Structure:

The UDP data to be sent consists of HEX codes that will be transmitted to the designated IP address and Port 26482. The format is shown below.

### ACT 4 16CH UDP SEND COMMAND FORMAT:

06 F9 19 FF **S1 S2 S3 S4 S5 S6** 00 00

**UDP PREFIX COMMAND:** 06 F9 19 FF

**UDP DATA COMMAND:** S1 S2 S3 S4 S5 S6 ( ASCII Command in HEX )

**UDP SUFFIX COMMAND:** 00 00

## Sending UDP Command Example

**COMMAND: “PWRPTG” ( Power Toggle )**

06 F9 19 FF **50 57 52 50 54 47** 00 00

This UDP command will toggle ACT 4 power on and off.

For testing purposes, you can use a UDP Test program to verify UDP operation of the pre-amp processor once set up. Some examples of free UDP test tools available online:

<https://packetsender.com/>

<http://www.simplecomtools.com/ProductCart/pc/viewPrd.asp?idproduct=6&idcategory=5>

## Sending UDP Direct Volume Command Example

The ACT 4 also contains a set of UDP commands that you can directly set parameters such as the volume level via UDP directly without restrictions.

ASCII	UDP COMMAND	VOL LEVEL
V66	06 F9 19 FF 56 4F 4c 30 <b>36 36</b> 00 00	66

For example, to directly change volume, simply change the two hex bytes highlighted in RED ( byte #9 and #10) to the HEX value of the number that you wish to set. Valid volume numbers range from 01 to 99 in increments of 1.

# Legacy Control Protocol

## XML Status Monitoring

When control commands are issued to the Acurus processor, quite often, real-time status feedback is needed by the control system. Real-time status monitoring can be done by an external control system by reading the *status.xml* file available on the processor web server.

Many modern 3<sup>rd</sup> party control systems have means of reading and parsing xml files.

The XML file can be found at this address on the Acurus processor:

**FORMAT:** `http:// IP ADDRESS/status.xml`

**EXAMPLE:** `http://192.168.1.245/status.xml`

The XML format contains three levels of information:

- 1) Identifies the brand
- 2) Identifies the model
- 3) Provides the Type of unit and the Data for the unit.

The example below illustrates the format of the possible data values for each object in the XML file:

```
<ACURUS>
  <SC>
    <TYPE>TYPE NAME</TYPE>
    <DATA1>DATA VALUE 1</DATA1>
    <DATA2>DATA VALUE 2</DATA2>
    ...
    <DATA3>DATA VALUE 3</DATA3>
  </SC>
</ACURUS>
```

### EXAMPLE: status.xml

The following is a complete XML file example for the processor. The data provided can be read and parsed as often as needed by the control system.

```
<ACURUS>
  <A4>
    <TYPE>PROCESSOR</TYPE>
    <XPWR> 1</XPWR>
    <XMUT> 0</XMUT>
    <XVOL> 14</XVOL>
    <XINP> 1</XINP>
    <XSMD> 0</XSMD>
  </A4>
</ACURUS>
```

## Decoding status.xml

The data values will change based on current status in the Acurus processor. Two tables below show the meaning behind each value.

Data Type	Definition
XPWR	Power Status ( 0 = OFF   1 = ON )
XMUT	Mute Status ( 0 = OFF   1 = ON )
XVOL	Volume Status ( 1 to 99 )
XINP	Input Status ( 1 to 21 )
XSMD	Sound Mode Status ( 0 to 11 )

Sound Mode Status Decoding is outlined below:

XSMD Value	XSMD Decoding
0	Sound Mode = Auto
1	Sound Mode = Direct
2	Sound Mode = Stereo
3	Sound Mode = Analog
4	Sound Mode = Party
5	Sound Mode = Night
6	Sound Mode = DTS
7	Sound Mode = Dolby
8	Sound Mode = 2.1
9	Sound Mode = 3.1
10	Sound Mode = 5.1
11	Sound Mode = 7.1

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