

# RS-232 PROTOCOL

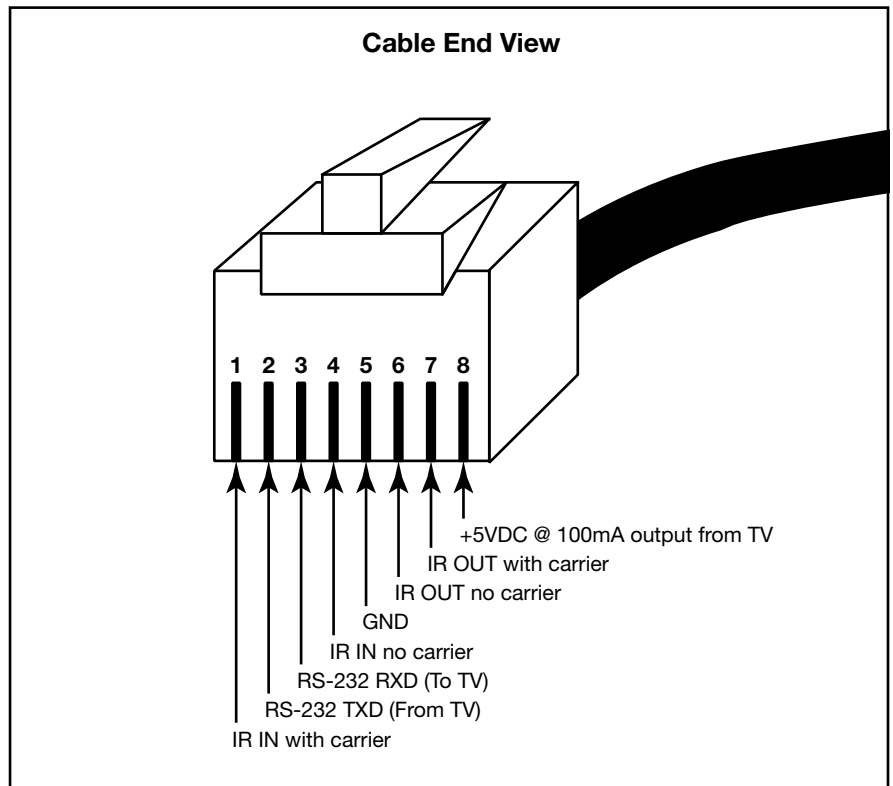
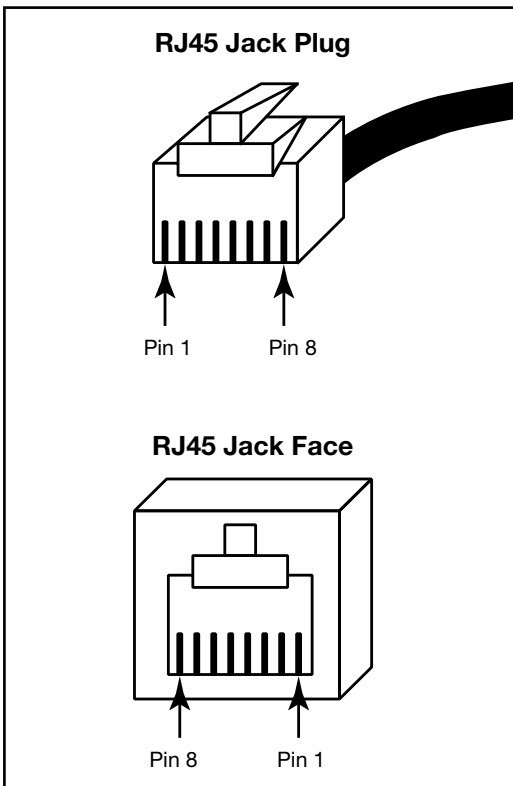
## TV Command and Control Interface:

### Female RJ45

1. IR IN with carrier
2. RS-232 TXD (From TV)
3. RS-232 RXD (To TV)
4. IR IN no carrier
5. GND
6. IR OUT no carrier
7. IR OUT with carrier
8. +5VDC @ 100mA output from TV



**Note: This connector is not an Ethernet connection. Do not connect this port to an Ethernet connection; damage can occur to the TV and the Ethernet port.**



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### Electrical Definition:

1. RS232 TXD and RXD Signal Level	RS232 Compliant Also should accept TTL (0 volts and 5 volt Logic)
Synchronization Method	Asynchronous
Baud Rate	9600
Parity	None
Character Length	8 Bits
Flow control	None
Start Bits	1
Stop Bits	1
2. Remote IR Out:	TTL (0-5 Volt)
3. Remote IR IN:	TTL (0-5 Volt)
4. Remote IR out with carrier:	To open collector input
5. Remote IR input with carrier:	Pull up resistor, 10 K ohm

### Basic Format for Control:

The Transmission of data from the Controller (Computer or A/V Controller) starts with an STX [0x02] signal, followed by the command, then the parameters, and lastly an ETX [0x03] signal. If there are no parameters, then the parameter does not need to be sent. A colon separates the commands from the parameters.

All Commands start with STX [0x02] and end with ETX [0x03]. Any data not contained between the STX and ETX commands will be ignored by the TV. **STX and ETX must be sent as hex commands; all other data must be sent as ASCII characters.**

**NOTE: The brackets [ ] in the rest of this document do not get sent or returned in the command/query. They are there to indicate characters to be sent in hex.**

All responses from the TV to Queries start with STX [0x02] and end with ETX [0x03]. Any data not contained between the STX and ETX commands must be ignored by the controller. **STX and ETX must be sent as hex commands; all other data must be sent as ASCII characters.**

**Optional ID number:** Three ASCII digits ranging from 000-255. Each TV will have the option in the Factory Menu of setting a Unit ID Number.

A Semicolon (;) separates the ID Number from the Command.

The ID number may be set on the TV in the Service Menu. ID number 000 sends to all devices regardless of the ID number of individual devices (global command).

Contact Séura Technical Support for instructions on accessing the Service Menu at 800-957-3872 or [techsupport@seura.com](mailto:techsupport@seura.com)

Each command is a string of ASCII characters plus a Parameter  
A colon separates the Command from the Parameter.

The Parameter is 1 to 5 ASCII characters long.

After each command is received, the TV shall send back an acknowledgment.  
For most commands, this will be a simple STX[0x02] , the ASCII letters "OK", and an ETX[0x03]

If there is an error, the TV shall return STX [0x02], the ASCII letters "ER", and ETX [0x03]. There may be parameters added after a colon if more details are possible.

If a command is sent to a TV that does not support this command, i.e. a tuner command for a monitor, the set shall return STX [0x02], the ASCII letters "INVALID" and ETX [0x03].

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**NOTE:** AMX programmers may need to add 100ms delays between parameters in commands.

### Examples:

All commands are ASCII, except STX and ETX, which must be sent in hex. **NOTE: The brackets [ ] in the rest of this document do not get sent or returned in the command/query. They are there to indicate characters to be sent in hexadecimal form.**

#### Example of a Power ON for Unit 001:

COMMAND: [0x02]001;PWD:1[0x03]  
TV Returns: [0x02]OK[0x03]

#### Example of a Power ON with No Unit Number:

COMMAND: [0x02]PWD:1[0x03]  
TV Returns: [0x02]OK[0x03]

### Query Examples:

Use a "?" as the parameter and the TV will return the current value for that command. There is no "OK" returned after a query.

#### Example of a Power Query with no Unit Number.

[0x02]PWD:[0x03]

Would return this status if the TV is ON:

[0x02]1[0x03]

Or, this status if the TV is OFF:

[0x02]0[0x03]

#### Example of a Volume Query with No Unit Number, assumes that the Volume is set at 50.

[0x02]VOL:[0x03]

TV Returns: [0x02]50[0x03]

### Query only works with the Following Commands

Power	PWD
Channel	CHA
Input	INP
Volume	VOL
Contrast	CON
Brightness	BRT
Color Saturation	SAT
Tint	TIN
Mute	MUT
Color Temp	TEM

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**KEY COMMANDS:** These commands are the equivalent of sending the IR code from the remote control.

KEY	COMMAND	RESPONSE
DIGIT 0	[0x02]KEY:0[0x03]	[0x02]OK[0x03]
DIGIT 1	[0x02]KEY:1[0x03]	[0x02]OK[0x03]
DIGIT 2	[0x02]KEY:2[0x03]	[0x02]OK[0x03]
DIGIT 3	[0x02]KEY:3[0x03]	[0x02]OK[0x03]
DIGIT 4	[0x02]KEY:4[0x03]	[0x02]OK[0x03]
DIGIT 5	[0x02]KEY:5[0x03]	[0x02]OK[0x03]
DIGIT 6	[0x02]KEY:6[0x03]	[0x02]OK[0x03]
DIGIT 7	[0x02]KEY:7[0x03]	[0x02]OK[0x03]
DIGIT 8	[0x02]KEY:8[0x03]	[0x02]OK[0x03]
DIGIT 9	[0x02]KEY:9[0x03]	[0x02]OK[0x03]
SLEEP	[0x02]KEY:11[0x03]	[0x02]OK[0x03]
CC	[0x02]KEY:12[0x03]	[0x02]OK[0x03]
MENU (TOGGLE)	[0x02]KEY:21[0x03]	[0x02]OK[0x03]
DISPLAY (TOGGLE)	[0x02]KEY:22[0x03]	[0x02]OK[0x03]
VOL+ (Navigate Right)	[0x02]KEY:23[0x03]	[0x02]OK[0x03]
VOL- (Navigate Left)	[0x02]KEY:24[0x03]	[0x02]OK[0x03]
CH+ (Navigate Up)	[0x02]KEY:25[0x03]	[0x02]OK[0x03]
CH- (Navigate Down)	[0x02]KEY:26[0x03]	[0x02]OK[0x03]
PICTURE MODE STANDARD	[0x02]KEY:27[0x03]	[0x02]OK[0x03]
PICTURE MODE DYNAMIC	[0x02]KEY:28[0x03]	[0x02]OK[0x03]
PICTURE MODE THEATER	[0x02]KEY:29[0x03]	[0x02]OK[0x03]
PICTURE MODE PERSONAL	[0x02]KEY:30[0x03]	[0x02]OK[0x03]
PLAY	[0x02]KEY:115[0x03]	[0x02]OK[0x03]
PAUSE	[0x02]KEY:116[0x03]	[0x02]OK[0x03]
STOP	[0x02]KEY:117[0x03]	[0x02]OK[0x03]
SKIP FORWARD/CHAPTER +	[0x02]KEY:118[0x03]	[0x02]OK[0x03]
PREVIOUS CHANNEL <sup>1</sup>	[0x02]KEY:35[0x03]	[0x02]OK[0x03]
ENTER	[0x02]KEY:36[0x03]	[0x02]OK[0x03]
OK	[0x02]KEY:37[0x03]	[0x02]OK[0x03]
INPUT SELECT (TOGGLE)	[0x02]KEY:38[0x03]	[0x02]OK[0x03]
SKIP BACKWARD/CHAPTER -	[0x02]KEY:19[0x03]	[0x02]OK[0x03]
FAST FORWARD	[0x02]KEY:109[0x03]	[0x02]OK[0x03]
FAST BACKWARD	[0x02]KEY:112[0x03]	[0x02]OK[0x03]
EXIT	[0x02]KEY:110[0x03]	[0x02]OK[0x03]
DIGIT . (dot) (ATSC SUB-CH) <sup>1</sup>	[0x02]KEY:104[0x03]	[0x02]OK[0x03]
GUIDE <sup>1</sup> (TOGGLE)	[0x02]KEY:105[0x03]	[0x02]OK[0x03]
RED	[0x02]KEY:32[0x03]	[0x02]OK[0x03]
GREEN	[0x02]KEY:114[0x03]	[0x02]OK[0x03]
YELLOW	[0x02]KEY:111[0x03]	[0x02]OK[0x03]
BLUE	[0x02]KEY:113[0x03]	[0x02]OK[0x03]

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## INPUT (INP)

	COMMAND	RESPONSE	QUERY	RESPONSE
<b>VGA</b>	[0x02]INP:0[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]0[0x03]
<b>HDMI 1</b>	[0x02]INP:1[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]1[0x03]
<b>TUNER</b>	[0x02]INP:2[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]2[0x03]
<b>AV1</b>	[0x02]INP:3[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]3[0x03]
<b>AV2</b>	[0x02]INP:4[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]4[0x03]
<b>HDMI 2</b>	[0x02]INP:6[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]6[0x03]
<b>COMPONENT</b>	[0x02]INP:7[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]7[0x03]
<b>HDMI 3</b>	[0x02]INP:9[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]9[0x03]
<b>USB</b>	[0x02]INP:12[0x03]	[0x02]OK[0x03]	[0x02]INP:[?] [0x03]	[0x02]12[0x03]

## POWER (PWD)

	COMMAND	RESPONSE	QUERY	RESPONSE
<b>OFF</b>	[0x02]PWD:0[0x03]	[0x02]OK[0x03]	[0x02]PWD:[?] [0x03]	[0x02]0[0x03]
<b>ON</b>	[0x02]PWD:1[0x03]	[0x02]OK[0x03]	[0x02]PWD:[?] [0x03]	[0x02]1[0x03]
<b>TOGGLE</b>	[0x02]PWD:3[0x03]	[0x02]OK[0x03]	N/A	N/A

## MUTE (MUT)

	COMMAND	RESPONSE	QUERY	RESPONSE
<b>MUTE</b>	[0x02]MUT:1[0x03]	[0x02]OK[0x03]	[0x02]MUT:[?] [0x03]	[0x02]1[0x03]
<b>UN-MUTE</b>	[0x02]MUT:0[0x03]	[0x02]OK[0x03]	[0x02]MUT:[?] [0x03]	[0x02]0[0x03]

## CHANNEL (CHA) <sup>1</sup>

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]CHA:xxx.x[0x03]	[0x02]OK[0x03]	[0x02]CHA:[?] [0x03]	[0x02]xxx.x[0x03]

## VOLUME (VOL)

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]VOL:xxx[0x03]	[0x02]OK[0x03]	[0x02]VOL:[?] [0x03]	[0x02]xxx[0x03]

xxx = Volume value 000 -100

## FORMAT (FOR)

FORMAT	COMMAND	RESPONSE
<b>4:3</b>	[0x02]FOR:0[0x03]	[0x02]OK[0x03]
<b>16:9</b>	[0x02]FOR:1[0x03]	[0x02]OK[0x03]
<b>ZOOM</b>	[0x02]FOR:3[0x03]	[0x02]OK[0x03]
<b>1:1</b>	[0x02]FOR:5[0x03]	[0x02]OK[0x03]
<b>SCREEN OFF (audio only)</b>	[0x02]FOR:6[0x03]	[0x02]OK[0x03]

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## CONTRAST (CON)

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]CON:+[0x03]	[0x02]OK[0x03]	[0x02]CON:[0x03]	[0x02]CON:xxx[0x03]
[0x02]CON:-[0x03]	[0x02]OK[0x03]		
[0x02]CON:xxx[0x03]	[0x02]OK[0x03]		

xxx = Contrast value 000-100

## BRIGHTNESS (BRT)

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]BRT:+[0x03]	[0x02]OK[0x03]	[0x02]BRT:[0x03]	[0x02]BRT:xxx[0x03]
[0x02]BRT:-[0x03]	[0x02]OK[0x03]		
[0x02]BRT:xxx[0x03]	[0x02]OK[0x03]		

xxx = Brightness value 000-100

## COLOR SATURATION (SAT)

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]SAT:+[0x03]	[0x02]OK[0x03]	[0x02]SAT:[0x03]	[0x02]SAT:xxx[0x03]
[0x02]SAT:-[0x03]	[0x02]OK[0x03]		
[0x02]SAT:xxx[0x03]	[0x02]OK[0x03]		

xxx = Color Saturation value 000-100

## TINT (TIN)

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]TIN:+[0x03]	[0x02]OK[0x03]	[0x02]TIN:[0x03]	[0x02]TIN:xxx[0x03]
[0x02]TIN:-[0x03]	[0x02]OK[0x03]		
[0x02]TIN:xxx[0x03]	[0x02]OK[0x03]		

xxx = Tint value 000 - 100

## SHARPNESS (SHA)

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]SHA:+[0x03]	[0x02]OK[0x03]	[0x02]SHA:[0x03]	[0x02]SHA:xxx[0x03]
[0x02]SHA:-[0x03]	[0x02]OK[0x03]		
[0x02]SHA:xxx[0x03]			

xxx = Sharpness value 000 - 100

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## COLOR TEMP (TEM)

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]TEM:x[0x03]	[0x02]OK[0x03]	[0x02]TEM:[0x03]	[0x02]x[0x03]

x = Color Temp value 0-2

0 = WARM

1 = NORMAL

2 = COOL

## Backlight Mode

COMMAND	RESPONSE	QUERY	RESPONSE
[0x02]BLT:x[0x03]	[0x02]OK[0x03]	[0x02]BLT:[0x03]	[0x02]x[0x03]

x = Backlight mode

0 = Day

1 = Night

2 = Auto

## GAME MODE (GAM)

COMMAND	RESPONSE
[0x02]GAM:x[0x03]	[0x02]OK[0x03]

x = Game Mode status

0 = OFF

1 = ON