

Sound Devices

Sony 9-Pin Remote Protocol Support

Revision 1.02

Overview

The Sony 9-pin protocol is used for remote control of various Sound Devices products via a 9-pin RS-422 connector. This protocol is based on the EIA RS-422-A signal standard at 38.4kBits/s baud rate. Sound Devices products implement a subset of this protocol as specified in this document.

RS-422 Port

The pin assignments for the 9-pin RS-422 Sound Devices Port

Pin	Master	SD RS-422 Port (Slave)
1	Ground	Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Receive Common	Receive Common
5	Not Connected	Not Connected
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Ground	Ground

Communication Format

Baud Rate (Bits/second)	38400
Start Bit	1
Data Bits	8
Parity	Odd
Stop Bit	1

Packet Format

Command 1	Command 2	Data...	Checksum
1 Byte	1 Byte	0-15 Bytes	1 Byte
CMD-1 (upper 4 bits) Data Count (lower 4 bits)	CMD-2 See below	DATA-1 to DATA-N	See below

CMD-1

Indicates the type and direction of the command packet received or sent.

CMD-1	Description	Direction
0	System Control	Master → Slave
1	Return for CMD-1 (0, 2 or 4)	Slave → Master
2	Transport Control	Master → Slave
4	Preset/Select Control	Master → Slave
6	Sense Request	Master → Slave
7	Sense Return	Slave → Master

Data Count

Indicates the number of bytes (maximum 15) inserted between Command 2 and the Checksum.

CMD-2

Indicates the command for the packet received or sent. See supported commands below.

Data

If data is added to the command defined by CMD-1 and CMD-2, DATA-1 to DATA-N are used to indicate the contents of the data. See the supported commands table below for data formats.

Checksum

The checksum byte is the least significant 8 bits of the summation of all the bytes in the packet, up to but not including the checksum byte.

Example: (0x61 0x4C 0x84)
 0x61 + 0x4C + 0x84 = 0x131
 Checksum = 0x31

Supported Commands

The following commands are supported.

CMD-1 CMD-2	Command	CMD-1 CMD-2	Response
0x20 0x00	Stop	0x10 0x01	Acknowledge
0x20 0x01	Play	0x10 0x01	Acknowledge
0x20 0x02	Record	0x10 0x01	Acknowledge
0x20 0x10	Fast Forward	0x10 0x01	Acknowledge
0x21 0x11	Jog Forward	0x10 0x01	Acknowledge
0x21 0x12	Var Forward	0x10 0x01	Acknowledge
0x21 0x13	Shuttle Forward	0x10 0x01	Acknowledge
0x20 0x20	Rewind	0x10 0x01	Acknowledge
0x21 0x21	Jog Reverse	0x10 0x01	Acknowledge
0x21 0x22	Var Reverse	0x10 0x01	Acknowledge
0x21 0x23	Shuttle Reverse	0x10 0x01	Acknowledge
0x61 0x0C	Current Time Sense	0x74 0x04	LTC Time Data
0x6X 0x20	Status Sense	0x7X 0x20	Status Data

Stop

When recording or paused, this command stops the device. When playing, fast forwarding or rewinding, this command will pause playback. From pause mode, it will stop the device.

Command: 0x20 0x00 0x20

Acknowledge: 0x10 0x01 0x11

Play

When stopped, this command starts playback. When the device is playing, this command will pause playback, which is equivalent to pressing play on the device.

Command: 0x20 0x01 0x21

Acknowledge: 0x10 0x01 0x11

Record

The device will start recording. This is equivalent to pressing record on the device.

Command: 0x20 0x02 0x22

Acknowledge: 0x10 0x01 0x11

Fast Forward

Causes the device to fast-forward at 32x playback speed.

Command: 0x20 0x10 0x30

Acknowledge: 0x10 0x01 0x11

Jog Forward

Var Forward

Shuttle Forward

These commands cause the device to advance forward with the speed indicated by DATA-1. DATA-2 is not supported. Tape speed is rounded to the nearest integer value. A tape speed of '0' or a "shuttle 0" will pause the device. See the Sony 9-pin remote protocol for more information.

$$\text{Tape Speed} = 10^{((N / 32) - 2)}$$

Where N = DATA-1

Example:

Jog Forward 1x Speed: 0x21 0x11 0x40 0x72
 Var Forward 22x Speed: 0x21 0x12 0x6B 0x9E
 Shuttle Forward 0x Speed (Pause): 0x21 0x13 0x00 0x34

Acknowledge: 0x10 0x01 0x11

Rewind

Causes the device to rewind at 32x playback speed.

Command: 0x20 0x20 0x40
 Acknowledge: 0x10 0x01 0x11

Jog Reverse

Var Reverse

Shuttle Reverse

These commands cause the device to move in reverse with the speed indicated by DATA-1. DATA-2 is not supported. Tape speed is rounded to the nearest integer value. A tape speed of '0' or a "shuttle 0" will pause the device. See the Sony 9-pin remote protocol for more information.

$$\text{Tape Speed} = 10^{((N / 32) - 2)}$$

Where N = DATA-1

Example:

Jog Reverse 1/2x Speed: 0x21 0x21 0x37 0x79
 Var Reverse 10x Speed: 0x21 0x22 0x60 0xA3
 Shuttle Reverse 1/10x Speed (Pause): 0x21 0x23 0x20 0x64

Acknowledge: 0x10 0x01 0x11

Current Time Sense

The current time sense command has one data byte (DATA-1). The device will respond according to the sense DATA-1 contents. Currently, only LTC time data is supported. The response data is binary coded decimal (BCD). See the LTC time data response below or the Sony 9-pin remote protocol for more information.

DATA-1

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
		VITC UBits	LTC UBits	Timer 2	Timer 1	VITC Time	LTC Time*

* Only LTC Time is supported.

Example: LTC Time = 12:24:08:05
 LTC Time Request: 0x61 0x0C 0x01 0x6E

LTC Time Data Response: 0x74 0x04 0x05 0x08 0x24 0x12 0xBB

Status Sense

This command requests the status of the device. It has only one data byte (DATA-1). The device will respond with a status data response. See the status data response below for more information.

DATA-1

Bits [7:4]	Bits [3:0]
The starting status byte index.	The requested number of status bytes.

Example: The device is in fast rewind and we are requesting status bytes 1 & 2.
 Status Sense Request: 0x61 0x20 0x12 0x93

Status Data Response: 0x72 0x20 0x08 0x04 0x9E

Acknowledge

This response is returned by the device when a command has been successfully received.

Acknowledge: 0x10 0x01 0x11

Non Acknowledge

This response is returned by the device when an error has been detected. This response has one data byte (DATA-1), which contains the error code.

DATA-1

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Time Out	Framing Error	Overrun Error	Parity Error	Unused	Checksum Error	Unused	Unknown/Unsupported Command

Example:

Unknown Command: 0x11 0x12 0x01 0x24

LTC Time Data

This response is returned by the device when the current time sense command requests the LTC time data. This response has four data bytes (DATA-1 to DATA-4). The data is sent in binary coded decimal (BCD).

DATA-1		DATA-2		DATA-3		DATA-4	
Tens	Ones	Tens	Ones	Tens	Ones	Tens	Ones
Frames	frames	seconds	seconds	minutes	minutes	hours	hours

Example: LTC Time = 16:59:32:23

LTC Time Data: 0x74 0x04 0x23 0x32 0x59 0x16 0x3C

Status Data

This response is returned by the device when a status sense command is received. The number of data bytes in this response is determined by the status sense command. The status sense command sends the starting byte index and the number of sequential bytes to return. See the Sony 9-pin remote protocol for more information.

This table lists only the supported status flags.

Byte #	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0								
1			Stop		Rewind	Fast Forward	Record	Play
2			Shuttle	Jog	Variable	Tape Direction	Still	

DATA-1

Play: This bit will be set to 1 when the device is in play mode.

Record: This bit will be set to 1 when the device is in record mode.

Fast Forward: This bit will be set to 1 when the device is in fast forward mode.

Rewind: This bit will be set to 1 when the device is in rewind mode.

Stop: This bit will be set to 1 when the device is in stop mode.

DATA-2

Still: This bit will be set to 1 when the device is in pause mode.

Tape Direction: This bit will be set to 1 when the device is rewinding or moving in reverse.

It will be 0 when moving in the forward direction.

Variable: This bit will be set to 1 when the device goes into variable speed mode.

Jog: This bit will be set to 1 when the device goes into jog mode.

Shuttle: This bit will be set to 1 when the device goes into shuttle mode.

Example: Device is paused.

Status Sense Request: 0x61 0x20 0x21 0xA2

Status Data Response: 0x71 0x20 0x02 0x93