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    - [Kitsune DDR](#)
    - [Typhon DDR](#)
  - [SDK and API](#)
    - [DT Media Read](#)
    - [DT Media Write](#)
    - [DrasticPreview](#)
    - [RS-422 Device Emulation](#)
    - [RS-422 Device Control](#)
- [Sales](#)
  - [videoQC](#)
  - [CCConvert](#)
  - [MediaNXS](#)
  - [MediaReactor](#)
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## VVCR 422 Serial Protocol

This is a partial description of the Sony 9 Pin protocol as supported by Drastic's original VVCR products. While the basis of this protocol, Sony 9 Pin, has not changed, many of the extended commands have. This document is made available for historic interest only. For control of current Drastic DDGs, please contact [Drastic Support](#).

NOTE: This area contains legacy material from previous Drastic Technologies websites. It is provided for reference only, and contains information, products and links that may no longer exist and which are no longer supported by Drastic. For current Drastic Technologies products, please see our main site here:

<http://www.drastic.tv>

# DRASTIC VVCR 9-PIN REMOTE CONNECTOR PROTOCOL (Partial)

If you wish to control Sony VTRs, Louth and Odetics DDRs, or have your application be controlled as one of those devices, Drastic has ActiveX OEM software for both. Please see:

- Controlling serial devices [MediaCMDX Control SDK](#)
- Being controlled as a device [MediaCMDX Emulation SDK](#)

Products that control and/or are controlled as a serial device include:

- Hardware Products
  - [Titan series digital disk recorders](#)
  - [VVW series digital disk recorders \(Legacy\)](#)
  - [VVCR series digital disk recorders \(Legacy\)](#)
    - Software Products
- [MediaNXS I/O Solution](#) (Control of VTRs included)
- [MediaNXS Serial Emulation Add On](#) (For being controlled as a VTR)

Please note that this document is from 1994. Although it is probably mostly accurate, we cannot guarantee this document's accuracy or suitability for any purpose. For Titan/MediaNXS control please contact Drastic's engineering department.

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## CONTENTS

- [Introduction](#)
- [Document Conventions](#)
- [9-pin Connector Specification](#)
- [Communication Format](#)
- [Command Format](#)
- [Controller Commands](#)
- [General Returns](#)
- [System Control](#)
- [Transport Control](#)
- [Preset and Select Control](#)
- [Status Sense](#)
- [Time Code Return Table](#)
- [Status Return Table](#)
- [Return from Device](#)
- [Time Data Format](#)
- [Pioneer VDR 1000 Extensions](#)
- [Drastic Technologies Setup Protocol Extensions](#)
- [Global Setup](#)
- [Input Setup](#)
- [Output Setup](#)
- [Audio Setup](#)

[Go to top . . .](#)

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## Introduction

The following is an abridged version of the VVCR RS-422 Protocol Manual. This subset of commands may be used to control most broadcast VTRs including the VVCR. Most of the setup commands and extensions (such as the Pioneer VDR extension) will only work with specific decks, but the basic motion control and editing commands should work with all RS-422 controlled VTRs. For a complete protocol specification, please contact:

[Drastic Technologies](#)

[Go to top . . .](#)

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## Document conventions

In this protocol, the controller is defined as the equipment which controls a VTR, and the device is defined as the equipment which is being controlled.

When two VTRs are connected (SWAP editing), the record VTR is called the controller, and the play VTR is the device. When an editor is connected to a VTR, the editor becomes a controller, and the VTR becomes a device. Currently, the VVCR is available only as a device.

CAPITALS indicate a device or controller state.

The following section contains a description of the remote control signal used for Drastic Technologies VVCR 9-pin connector.

[Go to top . . .](#)

## Specification of a 9-pin connector

Interface connector: 9 pin D-sub female.

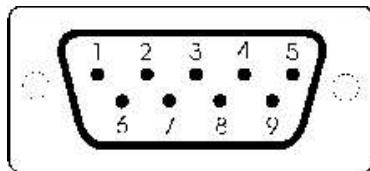


figure. Female 9 Pin DIN Connector

The VVCR uses RS-422 serial signals to accept commands and return status information. The connections between the VVCR and its controller are as follows:

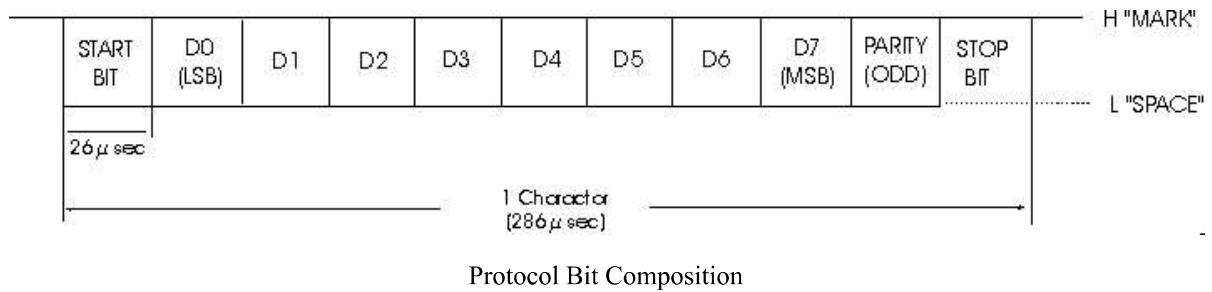
Pin	CONTROLLER	DEVICE
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground

figure. RS-422 Electrical Connections

[Go to top . . .](#)

## Communication format

Format: EIA RS-422A  
Mode: No Synchronization  
Character length: 1 Start bit + 8 Data bits + 1 Stop bit  
Data rate: 38400 bps  
Parity: Odd parity  $D_0 + D_1 + \dots + D_7 + P = \text{An odd number}$   
Start bit: 1 bit "SPACE"  
Stop bit: 1 bit "MARK"



[Go to top ...](#)

## Command format

The data communication is composed of the CMD1/DATA COUNT, CMD2, DATA and CHECKSUM. Commands are transmitted in order from the MSB of the CMD1/DATA COUNT. When the DATA COUNT is 0, no data is transmitted (the CMD1, CMD2 and checksum data bytes are still transmitted), but when the DATA COUNT is not 0, the number of data bytes which corresponds with the DATA COUNT are inserted between the CMD2 and CHECKSUM.

### 1. COMMAND BLOCK FORMAT

The data communication between the controller and the device is performed as follows:

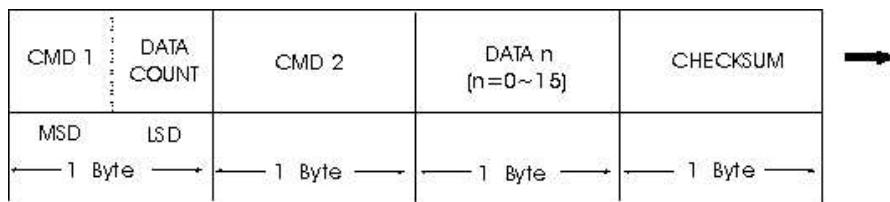


figure. Command Block Format

### 2. COMMAND CONTENTS

#### CMD 1 :

Indicates the value according to the function and direction of the command.

CMD1 FUNCTION	DIRECTION	
	Controller	Device
0 SYSTEM CONTROL	---	---
1 SYSTEM CONTROL RETURN	<-->	
2 TRANSPORT CONTROL	---	---
4 PRESET & SELECT CONTROL	---	---
6 SENSE REQUEST	---	---
7 SENSE RETURN	<-->	

#### DATA COUNT:

Indicates the number of DATA bytes (0-15) inserted between the CMD2 and `CHECKSUM.

#### CMD2:

Designates the particular command.

#### DATA :

When the data is added to the command defined by the CMD1 and CMD2, DATA-1 to DATA-15 shows the value corresponding to their contents.

## CHECKSUM:

This is used for checking the data communication error, this process adds from the first byte of the command block to the last DATA byte, and indicates the least significant 8 bits.

i.e.: COMMAND "61 4C 84"

LSB MSB

1000 0110 (=61) +

0011 0010 (=4C) +

0010 0001 (=84) +

-----  
1000 1100 (=31) =

CHECKSUM "31"

[Go to top . . .](#)

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## CONTROLLER COMMANDS

### GENERAL RETURNS

Most common commands (such as play, stop, pause, etc.) simply return an acknowledgement or failure of a command. Unless an alternate return type is specified, one of the following two returns should be expected and checked before sending the next command.

#### 10.01 ACK

Returned by the device when a command has been successfully received. Although the ACK indicates that the device has begun processing that command, it does not necessarily mean that the command was completed and the device is in the required state.

#### 11.12.XX NAK

When an error has been detected, the device will return the NAK (negative acknowledgement) with the following error status in the third byte of the return. If the reason for the device's failure is unknown, then this byte will be zero.

NAK Return Byte 3 (XX):

BIT	DESCRIPTION
-----	-------------

0	Unknown command was received. Check the command in this document and check your hardware.
---	---

1	Not used.
---	-----------

2	A checksum error occurs when the last byte of the command is not equal to all the previous bytes added together and logically 'anded' with FF hex.
---	--

3	Not used.
---	-----------

4	A parity error occurs when one or more of the bytes in a command do not have an odd parity bit transmitted with them. This indicates a serial setup problem, or hardware/cabling problem.
---	---

5	Overrun error indicates that the command has overrun the device's internal
---	--

command buffer, and that the command cannot be used. This is an error internal to the device that should not occur unless more than one command per frame is sent.

- 6 A framing error indicates a serial setup or hardware problem with the controller.
- 7 A time out occurs when a command takes too long to be sent between bytes, or a checksum is sent too late.

[Go to top . . .](#)

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## SYSTEM CONTROL

### 00.0C LOCAL DISABLE

When receiving this command, all local operational functions of the device will be disabled. This includes front panel transport controls, but not front panel setup controls.

*Send: 00 0C 0C*

*Returns: 10 01 11*

### 00.11 DEVICE TYPE

When the device receives the DEVICE TYPE REQUEST command REQUEST the DEVICE TYPE return with 2 bytes data will be returned:

Return: 12.11 DEVICE TYPE

<u>VTR Model</u>	<u>Data - 1</u>	<u>Data - 2</u>
Drastic VVCR	FE	01
JVC BR-S822U	F0	1F
Panasonic AG-7750	A0	81
Panasonic AU-65	A0	15
Pioneer VDR-1000A	F0	15
Sony BVW-75	20	25
Sony PVW-2800	20	41

*Send: 00 11 11*

*Returns: 12 11 FE 01 22*

### 00.1D LOCK ENABLE

When receiving this command, the front panel operation of the device will be enabled. When the device is initially powered on, it will be set to the LOCAL ENABLE state.

*Send: 00 1D 1D*

*Returns: 10 01 11*

[Go to top . . .](#)

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## TRANSPORT CONTROL

## **20.00 STOP**

Stop the device and pass the device's input to the device's output. Cease all processing of the current material.

*Send: 20 00 20*

*Returns: 10 01 11*

## **20.01 PLAY**

Plays from the current position at normal play speed for the material.

*Send: 20 01 21*

*Returns: 10 01 11*

## **20.02 RECORD**

Records from the current position at normal play speed.

*Send: 20 02 22*

*Returns: 10 01 11*

## **20.04 STANDBY OFF**

The STANDBY OFF command places the device in a stop state, passing all material from the current inputs to the outputs. This should be sent after a stop command to place the device in a fully idle state.

*Send: 20 04 24*

*Returns: 10 01 11*

## **20.05 STANDBY ON**

Places the device in ready, pause mode. The current material is ready for use and the current material, if possible, is presented at the output.

*Send: 20 05 25*

*Returns: 10 01 11*

## **20.0F EJECT**

If the device supports removable media, remove the media from the device.

*Send: 20 0F 2F*

*Returns: 10 01 11*

## **20.10 FAST FORWARD**

Moves forward through the material at the highest allowable speed (Usually FORWARD 32 to 90 times play speed).

*Send: 20 10 30*

*Returns: 10 01 11*

## **20.20 FAST REVERSE**

Moves backward through the material at the highest allowable speed (Usually REWIND 32 to 90 times play speed).

*Send: 20 20 40*

*Returns: 10 01 11*

### **NOTE: For the commands that follow**

When receiving one of the following commands (JOG, VAR or SHUTTLE), the device will play forward or backward according to the speed data. When the command byte low nibble is 1 and only DATA-1 is used, the material speed is defined as follows:

TAPE SPEED=10(N/32-2)

N : SPEED DATA OF DATA-1 (DECIMAL)

When the command byte low nibble is 2 and both DATA-1 and DATA-2 are used, the material speed is more precise. In this case the tape speed will be defined as follows:

TAPE SPEED= 10(N/32-2) + N'/256 {10(N+1/32-2) -10(N+1/32-2)}

N : SPEED DATA OF DATA-1

N' : SPEED DATA OF DATA-2

## **2X.11 JOG FORWARD**

Move forward through the material, usually with varying speeds sent by the FORWARD controller for fine positioning.

*Send: 21 11 40 48 (Jog @ play speed)*

## **2X.12 VAR FORWARD \***

Move forward through the material, while creating the smoothest possible FORWARD output of the material. This 'smoothing' process may slightly vary the requested speed.

*Send: 21 11 20 52 (Jog @ half play speed)*

## **2X.13 SHUTTLE FORWARD**

Move forward through the material, at the exact play speed, regardless of FORWARD results. Usually used for visual searching.

*Send: 21 13 42 76 (Shuttle @ slightly faster than play speed)*

## **2X.11 JOG REVERSE**

Move backward through the material, usually with varying speeds sent by the REVERSE controller, for fine positioning.

*Send: 21 11 3E 70 (Jog @ slightly slower than play speed)*

## **2X.12 VAR REVERSE \***

Move backward through the material, while creating the smoothest possible REVERSE output of the material. This 'smoothing' process may vary the speed slightly from the requested speed.

*Send: 21 11 4A 7C (Jog @ two times reverse play speed)*

## **2X.13 SHUTTLE REVERSE**

Move backward through the material, at the exact play speed, regardless of REVERSE results. Usually used for visual searching.

*Send: 21 13 66 9A (Shuttle @ fifteen times play speed)*

**20.30 PRE-ROLL \***

Positions the device at the current in point (IN ENTRY) minus the length of the current pre-roll (PRE-ROLL TIME PRESET).

*Send: 20 30 50*

*Returns: 10 01 11*

## **24.31 CUE UP WITH DATA \***

Cues up the device to the position defined by DATA-1 to DATA-4. Once the DATA device begins cueing, the PRE-ROLL/CUE-UP data bit (Byte 4, Bit 0) will be set on in the STATUS return. Upon successful completion, the CUE-UP COMPLETE data bit (Byte 2, Bit 0) will be set ON and the PRE-ROLL/CUE UP data bit will be set OFF. If the device is unable to seek to that point, then the PRE-ROLL/CUE-UP data bit will be set OFF and the CUE-UP COMPLETE will NOT be set ON.

DATA-1		DATA-2		DATA-3		DATA-4	
10 Frames	1 Frame	10 Seconds	1 Second	10 Minutes	1 Minute	10 Hours	1 Hour
MSD	LSD	MSD	LSD	MSD	LSD	MSD	LSD

figure. Time Data Format

*Send: 24 13 58 16 02 A7 (Cue to 2 hours, 16 minutes, 58 seconds, 13 frames)*

*Returns: 10 01 11*

*Send: 24 24 36 52 21 F1 (Cue to 21 hours, 52 minutes, 36 seconds, 24 frames)*

*Returns: 10 01 11*

## **20.14 FRAME STEP \***

Move the device's material one frame (actual or logical depending on the FORWARD media) forward and pause.

*Send: 20 14 34*

*Returns: 10 01 11*

## **20.14 FRAME STEP \***

Move the device's material one frame (actual or logical depending on the REVERSE media) backward and pause.

*Send: 20 24 44*

*Returns: 10 01 11*

## **20.40 PREVIEW \***

Play the current edit. Cue the device to the pre-roll point (in point minus pre-roll duration), play the device through the in point to the point two seconds (assuming a two second post-roll) after the out point.

*Send: 20 40 60*

*Returns: 10 01 11*

#### **20.41 REVIEW \***

Play the last edit. Cue the device to the last pre-roll point (last in point minus pre-roll duration), play the device through the last in point to the point two seconds (assuming a two second post-roll) after the last out point.

*Send: 20 41 61*

*Returns: 10 01 11*

#### **20.42 AUTO EDIT \***

Pre-roll the device to the pre-roll point (in point minus the pre-roll). Play the device from the pre-roll point to the in point. At the in point, begin recording the selected material (as per EDIT PRESET) from the in point to the out point. Upon reaching the out point, play the material after the out point for two seconds.

*Send: 20 42 62*

*Returns: 10 01 11*

#### **20.60 FULL EE OFF**

Full 'Edit To Edit' mode off attempts to pass all material from the device to the output. This device has no effect on the current EDIT PRESET, but it does set all channels to the device, unless the device is in an idle state.

*Send: 20 60 80*

*Returns: 10 01 11*

#### **20.61 FULL EE ON**

Full 'Edit to Edit' mode on attempts to pass all inputs to the device to the device's output. This device has no effect on the current EDIT PRESET but it does set all channels to the device's inputs.

*Send: 20 61 81*

*Returns: 10 01 11*

#### **20.63 SELECT EE ON**

Sets each EDIT PRESET channel assigned by the DATA-1 of the EDIT PRESET command to the edit to edit mode. All selected channels are passed through from the device's inputs to the device's outputs. To clear the SELECTED EE mode, use the EE OFF or the EDIT OFF command.

*Send: 20 63 83*

*Returns: 10 01 11*

#### **20.64 EDIT OFF**

An EDIT OFF completes an edit in progress, or resets the channels on a preview started with a SELECT EE ON. The edit is initiated by an EDIT ON command that begins recording on the device's channels that were selected with the EDIT PRESET command. The EDIT OFF command stops the recording exactly 8 (default setting for EDIT OFF) frames after the command is received.

*Send: 20 64 84*

*Returns: 10 01 11*

#### **20.65 EDIT ON**

The EDIT ON command initiates the recording of an edit setup by EDIT PRESET, exactly 8 (default setting for EDIT ON) frames after the command is received. Normally, to create an edit, all devices in the edit are pre-rolled, each device is placed in play mode, and the speed of each device is adjusted until all devices are running synchronously. Eight frames before the recording device's in point, and EDIT ON command is sent to begin recording. Eight frames before the device's out point, an EDIT OFF command is sent to end the edit.

*Send: 20 65 84*

*Returns: 10 01 11*

[Go to top ...](#)

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## **PRESET & SELECT CONTROL**

### **44.00 TIMER-1 PRESET**

This command presets the device's control (CTL) counter to the value which has been given by the DATA-1 to DATA-4 bytes in the command. For the data format, refer to the CUE UP WITH DATA command. The mode of the Drop Frame (DF) or Non Drop

Frame (NDF) is decided according to bit-6 of DATA-1:  
DATA 1, BIT 6 Drop Frame

0 OFF

1 ON

*Send: 44 00 00 10 20 01 75 (CTL counter set to 1 hour, 20 minutes, 10 seconds, 0 frames)*

*Returns: 10 01 11*

#### **44.04 TIME CODE PRESET**

Presets the value, given by DATA-1 to DATA-4, to the time code start of the PRESET time code generator. This command will only effect devices capable of recording time code independent of the inputs. For the data format, refer to the CUE UP WITH DATA command. The mode of the Drop Frame (DF) or Non Drop Frame (NDF) is decided according to bit-6 of DATA-1:

DATA 1, BIT 6 Drop Frame

0 OFF

1 ON

*Send: 44 04 00 15 30 00 75 (Preset TC set to 30 minutes, 15 seconds, 0 frames)*

*Returns: 10 01 11*

#### **44.05 USER-BIT PRESET**

Presets the user bit values in the time code recording of the device, if the device supports user bits, to the value given by DATA-1 to DATA-4 as follows:

*Send: 44 05 60 63 44 45 95 (Set UB to 06364454)*

*Returns: 10 01 11*

#### **40.08 TIMER-1 RESET**

Resets the control (CTL) counter to zero.

*Send: 40 08 48*

*Returns: 10 01 11*

#### **40.10 IN ENTRY**

Store the current position of the device as the in point for the next edit.

*Send: 40 10 50*

*Returns: 10 01 11*

#### **40.11 OUT ENTRY**

Store the current position of the device as the out point for the next edit.

*Send: 40 11 51*

*Returns: 10 01 11*

#### **44.14 IN PRESET**

Set the in point for the next edit to the time specified by DATA-1 through DATA-4. See the CUE UP WITH DATA command for the data format.

*Send: 44 14 21 16 25 04 68 (Set in point to 4 hours, 25 minutes, 16 seconds, 21 frames)*

*Returns: 10 01 11*

#### **44.15 OUT PRESET**

Set the out point for the next edit to the time specified by DATA-1 through DATA-4. See the CUE UP WITH DATA command for the data format.

*Send: 44 15 05 09 27 04 92 (Set out point to 4 hours, 27 minutes, 9 seconds, 5 frames)*

*Returns: 10 01 11*

#### **40.18 IN SHIFT + \***

Adds one frame to the current in point time code value.

*Send: 40 18 58*

*Returns: 10 01 11*

#### **40.19 IN SHIFT - \***

Subtracts one frame from the current in point time code value.

*Send: 40 19 59*

Returns: 10 01 11

#### 40.1A OUT SHIFT + \*

Adds one frame to the current out point time code value.

Send: 40 1A 5A

Returns: 10 01 11

#### 40.1B OUT SHIFT - \*

Subtracts one frame from the current out point time code value.

Send: 40 1B 5B

Returns: 10 01 11

#### 40.20 IN RESET \*

Reset the value of the in point to zero.

Send: 40 20 60

Returns: 10 01 11

#### 40.21 OUT RESET \*

Reset the value of the out point to zero.

Send: 40 21 61

Returns: 10 01 11

#### 40.24 IN RECALL

Sets the current in point to the last in point that was set. Whenever the in point is changed or used, a backup copy of the time code is saved. This time code can be recovered by the IN RECALL command.

Send: 40 24 64

Returns: 10 01 11

#### 40.25 OUT RECALL

Sets the current out point to the last in point that was set. Whenever the out point is changed or used, a backup copy of the time code is saved. This time code can be recovered by the OUT RECALL command.

Send: 40 25 65

Returns: 10 01 11

#### 41.30 EDIT PRESET

The EDIT PRESET command sets which channels will be recorded in the next edit, or previewed during the next SELECTED EE ON preview. The edit may be created in either 'insert' or 'assemble' mode. Insert mode allows any channel combination, whereas assemble mode selects all available channels. DATA-1 bits indicate whether the channel is to be recorded (set on) or passed through (set off) as follows:

Bit-7	6	5	4	3	2	1	0
	INSERT	ASSEMBLE	VIDEO		TIME CODE	AUD-2	AUD-1

figure. Basic Edit Preset Data

Send: 41 30 62 D3 (Insert Video and Audio-2 in next edit)

Returns: 10 01 11

#### 44.31 PRE-ROLL TIME

Presets the duration of the pre-roll to the length given by the DATA-1 to PRESET DATA-4. For the data format, refer to the CUE UP WITH DATA command.

Send: 44 31 00 05 00 00 7A (Set the pre-roll duration to 5 seconds)

Returns: 10 01 11

#### 41.36 TIMER MODE SELECT

Selects the default timer to return, by the DATA-1 value as follows:

## DATA-1

00 : Time Code

01 : Control (CTL) Counter

FF: device setting dependent.

*Send: 41 36 11 88 (Set the device to time code head)*

*Returns: 10 01 11*

### 40.40 AUTO MODE OFF

This command switches the device from AUTO mode.

*Send: 40 40 80*

*Returns: 10 01 11*

### 40.41 AUTO MODE ON

This command switches the device to AUTO mode.

*Send: 40 41 81*

*Returns: 10 01 11*

[Go to top . . .](#)

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## STATUS SENSE

### 61.0A TC GENERATOR DATA

Request the type of time code data the device is generating, based on the type SENSE of data required. It will then respond according to the contents of DATA-1.

Bit-7	6	5	4	3	2	1	0
...	...	...	GEN UB	...	...	...	GEN TC

figure. Time Code Generator Return

DATA-1=01: Request for GEN TC -> GEN TIME DATA 74.08 Respond

DATA-1=10: Request for GEN UB -> GEN UB DATA 74.09 Respond

DATA-1=11: Request for GEN TC &UB -> GEN TC &UB DATA 78.08 Respond

*Send: 61 0A 11 7C*

*Returns: 10 01 11*

### 61.0C CURRENT TIME

Requests the time data or user bit. The device will respond according to the SENSE DATA-1 contents, indicated by the CURRENT TIME SENSE RETURN chart.

Bit-7      6      5      4      3      2      1      0

...	...	VITC UB	LTC UB	...	CTL COUNTER	VITC TIME	LTC TIME
MSD				LSD			
		Request command DATA-1		01	02	03	04
		Response command		10	20	30	11
74:00	CTL COUNTER DATA			*			
74:04	LTC TIME DATA	*	*				
74:14	LTC INTERPOLATED TIME DATA	*	*				
74:05	LTC U-BIT DATA			*	*		
78:04	LTC TIME & U-BIT DATA					*	*
78:14	LTC INTERPOLATED TIME & U-BIT DATA					*	*
74:06	VITC TIME DATA	*	*				
74:16	VITC INTERPOLATED TIME DATA	*	*				
74:07	VITC U-BIT DATA				*	*	
78:06	VITC TIME & U-BIT DATA						*
78:16	VITC INTERPOLATED TIME & U-BIT DATA						*

figure. Time Code Return

*Send: 61 0C 04 11 (Request CTL counter position)*

*Returns: 74 00 01 02 03 04 7E (Return 04:03:02:01)*

*Send: 61 0C 03 11 (Request LTC or VITC time code position)*

*Returns: 74 14 10 20 30 24 7E (Return 24:30:20:10 LTC Interpolated w/CTL)*

*Send: 61 0C 02 10 (Request LTC or VITC time code position)*

*Returns: 78 16 12 25 00 00 10 56 9A C5 (Return 24:30:20:10 LTC Interpolated w/CTL)*

#### 60.10 IN DATA SENSE

Requests the current in point. See the CUE UP WITH DATA command for the time code return format.

*Send: 60 10 70*

*Returns: 74 10 10 20 30 24 7E (Return in point of 24:30:20:10)*

#### 60.11 OUT DATA SENSE

Requests the current out point. See the CUE UP WITH DATA command for the time code return format.

*Send: 60 11 71*

*Returns: 74 11 24 30 20 10 7F (Return in point of 10:20:30:24)*

#### 61.20 STATUS SENSE

Requests the device status. The device will respond with the STATUS DATA

7X .20 command according to the contents of DATA-1 of the controller command.

DATA-1

MSD (Bit7~4): Indicates the initial DATA No.1 of the 7X .20 STATUS DATA to be returned.

LSD (Bit3~0): Indicates the number of data bytes in 7X .20 STATUS DATA to be returned.

ex. When the DATA-1 is 34.

The device will return four bytes starting from the third byte,

i.e. DATA No.3 to DATA No.6 of the 74 .20 STATUS DATA

[Go to top . . .](#)

#### **STATUS RETURN TABLE**

BIT DATA	BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
DATA-0			CASSETTE OUT			HARD ERROR		LOCAL
DATA-1	STANDBY ON	TENSION RELEASE	STOP	EJECT	REW	F.FWD	REC	PLAY
DATA-2	SERVO LOCK	TSO	SHUTTLE	JOG	VAR	REV/FWD	STILL	CUE UP COMPLETE
DATA-3	AUTO MODE	FREEZE ON					OUT	IN
DATA-4	* SELECT EE ON	FULL EE ON		EDIT	* PREVIEW	* AUTO EDIT	* REVIEW	PREROLL OR CUE UP
DATA-5		INSERT	* ASSEMBLE	* VIDEO		* TIME CODE	AUDIO CH-2	* AUDIO CH-1
DATA-6		LAMP STILL	LAMP FWD	LAMP REV				
DATA-7				SYNC ACTIVE				IN~OUT STATUS
DATA-8			NEAR END OF TAPE	END OF TAPE				REC INHIBIT
DATA-F								

figure. Status Return Chart

Note: \* indicates a bit not set to 1 on a PLAYER device.

DATA-0

## BIT-0 LOCAL

This bit will be set to 1 when the device will only accept commands from the controller, and not the panel.

## BIT-2 HARDWARE ERROR

This bit will be set to 1 when a hardware error occurs in the device.

## BIT-5 CASSETTE OUT

The removable media is not present in the device.

## DATA-1

## BIT-0 PLAY

This bit will be set to 1 when the device goes into the PLAY, REC or EDIT mode, or the device is in the CAPSTAN OVERRIDE mode.

## BIT-1 RECORD

This bit will be set to 1 when the device goes into the REC mode, or when the DATA-4/BIT-4 : EDIT is set to 1.

## BIT-2 FAST FORWARD

This bit will be set to 1 when the device goes into the FAST FORWARD mode.

## BIT-3 REWIND

This bit will be set to 1 when the device goes into the FAST REVERSE mode.

## BIT-4 EJECT

This bit will be set to 1 when the device ejects its media.

## BIT-5 STOP

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

## BIT-6 TENSION RELEASE

This bit will be set to 1 when the device is in idle mode.

## BIT-6 STANDBY ON

This bit will be set to 1 when the device is in standby mode.

## DATA-2

## BIT-0 CUE UP COMPLETE

This bit will be set to 1 when the device completes a CUE UP WITH DATA command and the material is at the requested position.

## BIT-1 STILL

This bit will be set to 1 when the device is stopped and displays the current frame of media.

## BIT-2 REVERSE/FORWARD

This bit will be set to 1 when the device is outputting its material in reverse of the normal order. When moving in the normal direction, it will be 0.

## BIT-3 VAR MODE

This bit will be set to 1 when the device goes into the VAR command mode.

## BIT-4 JOG MODE

This bit will be set to 1 when the device goes into the JOG command mode.

## BIT-5 SHUTTLE MODE

This bit will be set to 1 when the device goes into the SHUTTLE command mode.

## BIT-7 SERVO LOCK

This bit will be set to 1 when the playback or record is servo locked with the input or reference sync.

## DATA-3

## BIT-0 IN

Set to 1 if an in point has been set.

#### BIT-1 OUT

Set to 1 if an out point has been set.

#### BIT-7 AUTO MODE

Set to 1 if the device has been placed in AUTO mode.

#### DATA-4

#### BIT-0 PRE-ROLL OR CUE UP COMPLETE

This bit will be set to 1 when the device goes into the PRE-ROLL and CUE-UP modes (a PRE-ROLL is also performed in the auto-edit, preview and review modes).

#### BIT-1 REVIEW

This bit will be set to 1 when the device is in REVIEW mode.

#### BIT-2 AUTO EDIT

This bit will be set to 1 when the device is preform an AUTO EDIT.

#### BIT-3 PREVIEW

This bit will be set to 1 when the device is in the PREVIEW mode.

#### BIT-4 EDIT MODE

Both the bit and the DATA-1/BIT-1 : REC will be set to 1 when the device is in EDIT mode (between EDIT ON and EDIT OFF or AUTO EDIT between the in and out points).

#### BIT-6 FULL EE ON

This bit will be set to 1 when the device is in full edit to edit mode.

#### BIT-7 SELECTED EE

This bit will be set to 1 when the device is in 'Selected Edit To Edit' mode.

#### DATA-6 (Not supported on most devices)

#### BIT-4 LAMP REVERSE

This bit will be set to 1 when the device is searching backwards.

#### BIT-5 LAMP FORWARD

This bit will be set to 1 when the device is searching forwards.

#### BIT-4 LAMP STILL

This bit will be set to 1 when the device has finished searching.

#### DATA-7

#### BIT-0 IN-OUT STATUS

This bit will be set to 1 in the device PREVIEW or AUTO EDIT mode and the material is running between the in point and out point.

#### BIT-4 SYNC ACTIVE

This bit will be set to 1 in the device sensing valid sync on the device's input.

#### DATA-8

#### BIT-0 RECORD INHIBIT

If this bit is set to 1, record/edit commands will be ignored.

#### BIT-4 END OF TAPE

Set to 1 if the device has reached the end of its media.

#### BIT-5 NEAR END

Set to 1 if the device is near the end of its media.

### **60.30 PRE-ROLL TIME**

This command is used for requesting the current pre-roll duration. For the SENSE return data format, see the CUE UP WITH DATA command.

*Send: 60 30 90*

*Returns: 74 30 00 05 00 00 A9 (Pre-roll is five seconds)*

## 60.36 TIMER MODE

This command is used for requesting the device's default timer SENSE return type, based on return DATA-1: DATA-1 :

00: Time Code

01: Control (CTL) Counter

*Send: 60 36 96*

*Returns: 71 36 00 A6 (Sense mode time code)*

[Go to top ...](#)

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## RETURN FROM DEVICE

### 10.01 ACK

Returned by the device when a command has been successfully received. Although the ACK indicates that the device has begun processing that command, it does not necessarily mean that the command was completed and the device is in the required state.

### 11.12.XX NAK

When an error has been detected, the device will return the NAK (negative acknowledgement) with the following error status in the third byte of the return. If the reason for the device's failure is unknown, then this byte will be zero.

NAK Return Byte 3 (XX):

BIT	DESCRIPTION
0	Unknown command was received. Check the command in this document and check your hardware.
1	Not used.
2	A checksum error occurs when the last byte of the command is not equal to all the previous bytes added together and logically 'anded' with FF hex.
3	Not used.
4	A parity error occurs when one or more of the bytes in a command do not have an odd parity bit transmitted with them. This indicates a serial setup problem, or hardware/cabling problem.
5	Overrun error indicates that the command has overrun the device's internal command buffer, and that the command cannot be used. This is an error internal to the device that should not occur unless more than one command per frame is sent.
6	A framing error indicates a serial setup or hardware problem with the controller.
7	A time out occurs when a command takes too long to be sent between bytes, or a checksum is sent too late.

## **12.11 DEVICE TYPE**

Returns the type of device connected and configured.

<u>VTR Model</u>	<u>Data - 1</u>	<u>Data - 2</u>
Drastic VVCR	FE	01
JVC BR-S822U	F0	1F
Panasonic AG-7750	A0	81
Panasonic AU-65	A0	15
Pioneer VDR-1000A	F0	15
Sony BVW-75	20	25
Sony PVW-2800	20	41

## **74.08 GENERATOR TC DATA**

Returned with the TC TIME data, generated by the device.

For the data format, refer to the CUE UP WITH DATA command.

## **74.09 GENERATOR UB DATA**

Returned with the UB data of the TC generated by the device.

For the data format, refer to the U-BIT PRESET.

## **78.08 GENERATOR TC &mp; UB**

Returned with the TIME and UB data of the TC generated by the device. DATA DATA-1 through DATA-4 are time data and DATA-4 through DATA-8 are User Bit data. For the data format, refer to the CUE UP WITH DATA command and U-BIT PRESET.

## **74.10 IN DATA**

Returned with the in point data. For the data format, refer to the CUE UP WITH DATA command.

## **74.11 OUT DATA**

Returned with the out point data. For the data format, refer to the CUE UP WITH DATA command.

## **74.14 LTC TIME DATA**

When the device LTC TIME DATA is requested, if the data of LTC played INTERPOLATED back by the device is corrected by the CTL or it is read incorrectly, this TIME DATA command will be returned to the controller with the LTC TIME data. For the data format, refer to the CUE UP WITH DATA command.

## **71.36 TIMER MODE**

Refer to the TIMER MODE SENSE command.

## **74.00 TIMER-1**

Returned with the CTL counter data. At this time, the BIT-6 of DATA-1 is DATA set to 1, and 0, when the device CTL counter is set to DF/NDF mode. For the data format, refer to the CUE UP WITH DATA command.

## **74.04 LTC TIME DATA**

When the LTC TIME DATA device is requested, and the LTC data is read correctly, this command is returned to the controller with four data items. For the data format, refer to the CUE UP WITH DATA command.

#### 78.04 LTC TIME & UB

Returned with data that is added to DATA-1 to DATA-4 as LTC TIME DATA UB DATA and DATA-5 to DATA-8 as LTC UB DATA. For the data format, refer to the CUE UP WITH DATA and U-BIT PRESET command.

#### 74.05 LTC UB DATA

Returned with the LTC UB DATA. For the data format, refer to the U-BIT PRESET 44.05 command.

#### 78.14 LTC INTERPOLATED

When the device's LTC TIME DATA and UB DATA is requested, and the INTERPOLATED LTC data is played back by the device, corrected by the CTL, or read TIME & UB DATA incorrectly, this command will be returned to the controller with data added to DATA-1 to DATA-4 as LTC TIME DATA, and DATA-5 to DATA-8 as LTC UB DATA. For the data format, refer to the CUE UP WITH DATA and U-BIT PRESET command.

#### 74.06 VITC TIME DATA

Returned with the VITC TIME DATA. For the data format, refer to the CUE UP WITH DATA 24.31 command.

#### 78.06 VITC TIME & UB

Returned with data that is added to DATA-1 to DATA-4 as VITC TIME DATA DATA and DATA-5 to DATA-8 as VITC UB DATA. For the data format, refer to the CUE UP WITH DATA and U-BIT PRESET command.

#### 74.16 VITC HOLD TIME

When the device VITC TIME DATA is requested, and is read correctly, this DATA command will be returned to the controller with the VITC TIME DATA. For the data format, refer to the CUE UP WITH DATA command.

#### 78.16 VITC HOLD TIME

When the VITC TIME DATA and VITC UB DATA of the device are & UB DATA requested and read incorrectly, this command will be returned to the controller with data which is added to DATA-1 to DATA-4 as VITC TIME DATA and DATA-5 to DATA-8 as VITC UB DATA. For the data format, refer to the CUE UP WITH DATA and U-BIT PRESET command.

#### TIME DATA FORMAT

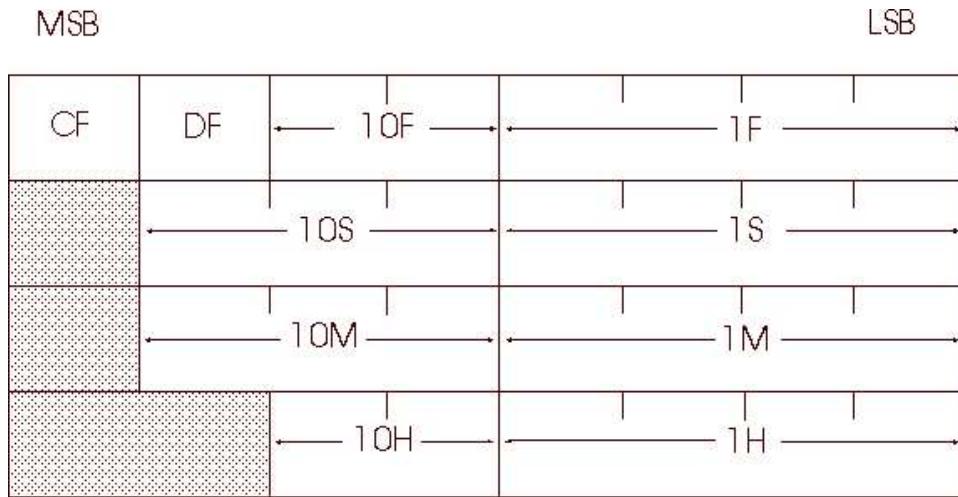


figure. Time Data Return Format

##### 1. DATA-1/BIT-6:DF FLAG ("1" DF, "0" NDF)

When the device receives the CURRENT TIME SENSE 61.0C command, and has been set to the DB mode, the device will be set to 1.

When the device receives the TIME CODE PRESET 44.04 command, and the TIME CODE GENERATOR has been set to the DF mode, the device will be set to 1.

## 2. DATA-1/BIT-7: CF FLAG (1 CF ON, 0 CF OFF)

When the device receives the CURRENT TIME SENSE 61.0C command, and has been set to the CG mode, the device will be set to 1.

[Go to top ...](#)

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# PIONEER VDR-1000 EXTENSIONS

## E1.11 VDR STATUS

Returns the current VDR status. The VDR status is similar to the STATUS SENSE SENSE command. DATA-1 describes what portion of the status is required.

Please note that the AUTO MODE and VDR DUAL PLAY modes should be set before this status becomes valid.

### DATA-1

MSD (Bit7~4): Indicates the initial DATA No.1 of the 7X .20 STATUS DATA to be returned.

LSD (Bit3~0): Indicates the number of data bytes in 7X .20 STATUS DATA to be returned.

ex. When the DATA-1 is 02.

The device will return two bytes starting from the zero byte,

i.e. DATA No.0 to DATA No.1 of the F2 .20 VDR STATUS DATA

## FX.11 VDR STATUSSENSE

Returned after a VDR STATUS SENSE command.

### DATA-1

BIT-0 NEXT CMD OK If this bit is set, it indicates that the next segment command may be sent. The VDR is capable of holding two segments (the current segment and the next segment).

BIT-7 DUAL PLAY If this bit is set, then the VDR is in dual play mode. Dual play mode allows the VDR to cue one video segment while playing another.

### DATA-2

BIT-0 VDR PLAY If this bit is set, then the VDR is currently playing a segment.

BIT-1 VDR STILL If this bit is set, the VDR has finished playing all entered segments.

*Send: E1 11 02 F4*

*Returns: F2 11 81 01 85 (VDR playing seg, ready for next seg)*

## E0.15 VDR AUTO PLAY

VDR auto play is the command that causes the VDR to play an edit list non linearly. The auto play command instructs the VDR to set the next segment based on the standard in point and out point values (ENTRY IN/OUT, PRESET IN/OUT). When the first AUTO PLAY is called, the VDR sets and begins playing back the segment. Each successive AUTO PLAY command, so long as it is sent during the current segment play, sets a segment to be played upon completion of the current segment. The next segment's in point, out point and auto play command should not be set until the NEXT CMD OK bit in the VDR status is set to 1.

*Send: E0 15 F5 (Set seg to in/out and set to play)*

*Returns: 10 01 11*

## E0.2A DUAL PLAY ON

Before using any VDR commands, the AUTO MODE ON command should be sent as well as the DUAL PLAY ON command. This will enable the VDR extension commands, and prepare the system for VDR playback.

*Send: E0 2A 0A*

*Returns: 10 01 11*

## E0.2B DUAL PLAY OFF

After the VDR dual play has completed, the DUAL PLAY mode should be turned off, allowing for normal 422 commands to be used.

*Send: E0 2B 0B*

Returns: 10 01 11

[Go to top ...](#)

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## DRASTIC VVCR PROTOCOL EXTENSIONS

### GLOBAL SETUP

#### C1.08 SET VTR TYPE

Set the emulation response type (see table in setup doc)

DATA-1

00-53 Decimal

*Send: C1 08 2D D4 (Set VDR-1000 response type)*

*Returns: 10 01 11*

#### C0.09 GET VTR TYPE

Get the emulation response type (see table in setup doc)

DATA-1 (return)

00-53 Decimal

*Send: C0 09 C9*

*Returns: D1 09 2D 07 (Emulation set to VDR-1000)*

#### C1.18 SET TC TYPE

Set time code return type to Drop or Non-Drop frame returns (NTSC Only).

DATA-1 00: Non drop frame time code

01: Drop frame time code

*Send: C1 18 01 DA (Set time code to Drop Frame)*

*Returns: 10 01 11 (NTSC) Returns: 11 12 01 24 (PAL)*

#### C0.19 GET TC TYPE

Get time code return type to Drop or Non-Drop frame returns (NTSC Only).

DATA-1 (return)

00: Non drop frame time code

01: Drop frame time code

*Send: C0 19 D9*

*Returns: D1 19 00 EA (Non Drop frame time code)*

#### C1.1A SET QUALITY

Set the recording quality for the compression.

DATA-1

0-64: 0 lowest quality, 64 highest quality

*Send: C1 1A 32 E0 (Set quality to half)*

*Returns: 10 01 11*

#### C0.1B GET QUALITY

Get the recording quality of the compression.

DATA-1

0-64: 0 lowest quality, 64 highest quality

*Send: C0 1B DB*

*Returns: D1 1B 64 50 (Highest quality set)*

### **C1.1C SET GENLOCK**

Set the genlock on or off.

DATA-1

00: Master lock internally

01: Genlock to external reference in

*Send: C1 1C 01 DE (Set Genlock to external)*

*Returns: 10 01 11*

### **C0.1D GET GENLOCK**

Get the current genlock setting.

DATA-1 (return)

00: Master is locking internally

01: Genlocking to external in

*Send: C0 1D DD*

*Returns: D1 1D 00 EE (Genlock is internal)*

### **C1.1E SET GENLOCK TYPE**

Set the genlock type.

DATA-1

00: Genlock Type Broadcast

01: Genlock Type VTR

*Send: C1 1E 01 DD (Genlock type is VTR)*

*Returns: 10 01 11*

### **C0.1F GET GENLOCK TYPE**

Get the genlock type.

DATA-1 (return)

00: Genlock Type TV

01: Genlock Type VTR

*Send: C1 1F E0*

*Returns: D1 1F 00 F0 (Genlock type is TV)*

### **C0.51 GET FIELDS/SECOND**

Get the number of fields per second.

DATA-1 (return)

3C: NTSC (decimal 60 fields)

32: PAL (decimal 50 fields)

*Send: C0 51 11*

*Returns: D1 51 3C 5E (NTSC 60 fields per second)*

[Go to top . . .](#)

## **INPUT SETUP**

### **C1.60 SET INPUT**

Select the current video input.

DATA-1

00: S-Video

01: Component Video

02: Composite Video

03: D1 Digital Video

*Send: C1 60 01 22 (Set input to component)*

*Returns: 10 01 11*

### **CO.61 GET INPUT**

Returns the current input.

DATA-1 (return)

00: S-Video

01: Component Video

02: Composite Video

03: D1 Digital Video

*Send: C0 61 12*

*Returns: D1 61 00 32 (Input is set to S-Video)*

[Go to top ...](#)

## **OUTPUT SETUP**

### **C1.80 SET ENCODER CHROMA BANDWIDTH**

Set the output bandwidth of the encoder based on output type.

DATA-1

00: Standard Band (Composite)

01: High Band (Y/C, Component)

*Send: C1 80 00 40 (Set bandwidth to standard band)*

*Returns: 10 01 11*

### **CO.81 GET ENCODER CHROMA BANDWIDTH**

Get the encoder output bandwidth.

DATA-1 (return)

00: Standard Band (Composite)

01: High Band (Y/C, Component)

*Send: C0 81 40*

*Returns: D1 81 01 53 (Encoder bandwidth set to high band)*

### **C1.84 SET SUB-CARRIER PHASE**

Set the output sub-carrier phase of the encoder.

DATA-1

00-FF

00: 0 Degrees

FF: 360 Degrees

(1.4 degree increments)

*Send: C1 84 7F C4 (Set sub-carrier phase to 180)*

*Returns: 10 01 11*

### **CO.85 GET SUB-CARRIER PHASE**

Get the encoder output horizontal phase.

DATA-1 (return)

00-FF

00: 0 Degrees

FF: 360 Degrees

(1.4 degree increments)

*Send: C0 85 45*

*Returns: D1 85 00 56 (Encoder Sub-Carrier is set to 0 degrees)*

### **C1.8A SET COMPONENT OUT BLANKING PEDESTAL**

Set the component output blanking pedestal.

DATA-1

00: Pedestal Off

01: Pedestal On

*Send: C1 8A 00 46 (Set component output pedestal off)*

*Returns: 10 01 11*

### **CO.8B GET COMPONENT OUT BLANKING PEDESTAL**

Get the component output blanking pedestal.

DATA-1 (return)

00: Pedestal Off

01: Pedestal On

*Send: C0 8B 46*

*Returns: D1 8B 01 5D (Component output pedestal is on)*

[Go to top . . .](#)

## **AUDIO SETUP**

### **C0.90 GET AUDIO INPUTS**

Get the number of audio inputs.

DATA-1 (return)

00-20: 1 to 32 inputs

*Send: C0 90 51*

*Returns: D1 90 02 63 (The device has two audio inputs)*

### **C0.91 GET AUDIO OUTPUTS**

Get the number of audio outputs.

DATA-1

00-20: 1 to 32 inputs

*Send: C0 91 52*

*Returns: D1 91 02 64 (The device has two audio outputs)*

### **C2.92 SET AUDIO IN LEVEL**

Set one of the audio inputs level.

DATA-1

00-20: Channel to set

DATA-2

00-FF: New channel level.

*Send: C2 92 01 7F D4 (Set audio channel 1 to level 127)*

*Returns: 10 01 11*

### **C1.93 GET AUDIO IN LEVEL**

Get one of the audio input's level.

DATA-1

00-20: Channel to return

DATA-1 (return)

00-FF: Current channel level

*Send: C1 93 00 54 (Request level for audio channel 0)*

*Returns: D1 93 5F C3 (Audio channel 0 at level 95)*

### **C2.9C SET AUDIO OUT LEVEL**

Set one of the audio output level.

DATA-1

00-20: Channel to set

DATA-2

00-FF: New channel level

*Send: C2 9C 01 7F DE (Set audio output 1 to level 127)*

*Returns: 10 01 11*

### **C1.9D GET AUDIO OUT LEVEL**

Get one of the audio output's level.

DATA-1

00-20: Output to return

DATA-1 (return)

00-FF: Current output level

*Send: C1 9D 00 5E (Request level for audio output 0)*

*Returns: D1 9D 5F CD (Audio output 0 at level 95)*

### **C0.EF SHUTDOWN DEVICE**

Closes and exits the current device.

*Send: C0 EF AF*

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