

Technical Reference
020-102321-03

Christie Link

Serial API Commands

CHRISTIE®

NOTICES

COPYRIGHT AND TRADEMARKS

Copyright © 2020 Christie Digital Systems USA Inc. All rights reserved.

All brand names and product names are trademarks, registered trademarks or trade names of their respective holders.

GENERAL

Every effort has been made to ensure accuracy, however in some cases changes in the products or availability could occur which may not be reflected in this document. Christie reserves the right to make changes to specifications at any time without notice. Performance specifications are typical, but may vary depending on conditions beyond Christie's control such as maintenance of the product in proper working conditions. Performance specifications are based on information available at the time of printing. Christie makes no warranty of any kind with regard to this material, including, but not limited to, implied warranties of fitness for a particular purpose. Christie will not be liable for errors contained herein or for incidental or consequential damages in connection with the performance or use of this material. Manufacturing facilities in Canada and China are ISO 9001 certified. Manufacturing facilities in Canada are also ISO 14001 certified.

WARRANTY

Products are warranted under Christie's standard limited warranty, the complete details of which are available by contacting your Christie dealer or Christie. In addition to the other limitations that may be specified in Christie's standard limited warranty and, to the extent relevant or applicable to your product, the warranty does not cover:

- a. Problems or damage occurring during shipment, in either direction.
- b. Problems or damage caused by combination of a product with non-Christie equipment, such as distribution systems, cameras, DVD players, etc., or use of a product with any non-Christie interface device.
- c. Problems or damage caused by misuse, improper power source, accident, fire, flood, lightning, earthquake, or other natural disaster.
- d. Problems or damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized repair service provider.
- e. Use of third party product enclosures for environmental protection during outside use must be approved by Christie.
- f. Problems or damage caused by use of a product on a motion platform or other movable device where such product has not been designed, modified or approved by Christie for such use.
- g. Except where the product is designed for outdoor use, problems or damage caused by use of the product outdoors unless such product is protected from precipitation or other adverse weather or environmental conditions and the ambient temperature is within the recommended ambient temperature set forth in the specifications for such product.
- h. Defects caused by normal wear and tear or otherwise due to normal aging of a product.

The warranty does not apply to any product where the serial number has been removed or obliterated. The warranty also does not apply to any product sold by a reseller to an end user outside of the country where the reseller is located unless (i) Christie has an office in the country where the end user is located or (ii) the required international warranty fee has been paid.

The warranty does not obligate Christie to provide any on site warranty service at the product site location.

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.


REGULATORY

The product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment. The product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

CAN ICES-3 (A) / NMB-3 (A)

이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며, 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

ENVIRONMENTAL

The product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol  means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

Content

Communicating with Christie Link.	4
Product documentation.	4
Related documentation.	4
Connection and use.	4
Understanding message format.	5
Basic message structure.	5
Special characters for text.	6
What is sent in a message.	7
Maximizing message integrity.	7
Error messages.	8
Descriptive error.	8
Serial API commands.	9
BST–Built-in Self Test.	9
DEF–Factory Defaults.	10
EDO–EDID Override.	10
FCT–Factory.	11
SIN–Select Input.	11
TMD–Time and Date.	12

Communicating with Christie Link

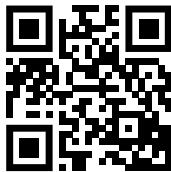
Understand the information and procedures for communicating with Christie Link from a remote location.

You can communicate with the projector through the RS232 IN port or the Ethernet port. When connecting the projector to a computer, use a direct connection. Docking ports can cause software upgrade failures.

Product documentation

For installation, setup, and user information, see the product documentation available on the Christie Digital Systems USA Inc. website. Read all instructions before using or servicing this product.

1. Access the documentation from the Christie website:
 - Go to this URL: <http://bit.ly/2tIHckq> or <https://www.christiedigital.com/en-us/products/accessories/christie-link-transmitter>
 - Scan the QR code using a QR code reader app on a smartphone or tablet.



2. On the product page, switch to the **Downloads** tab.

Related documentation

Additional information on this product is available in the following documents.

Connection and use

Once you have connected your computer to the Ethernet port on Christie Link, you can remotely access controls and setups, issue serial API commands or queries, and receive replies.

Understanding message format

Commands sent to and from Christie Link are formatted as simple text messages consisting of a three letter command code, an optional four letter subcode, and optional data.

Source	Format	Function	Example
From controller	(Code Data)	SET (execute the test suite)	(BST0) or (BST 0)
	(Code+Subcode Data)	SET (set input mode)	(SIN+MODE 0)
	(Code ?)	REQUEST (what is current test suite?)	(BST?) or (BST ?)
	(Code+Subcode ?)	REQUEST (what is current input mode?)	(SIN+MODE?)
From	(Code Data)	REPLY (all test suites is 0 "All Tests")	(BST!001 001 00000 "All Tests")
	(Code+Subcode Data)	REPLY (input mode is 1 "HDMI")	(SIN+MODE!001 "HDMI")

Available message types

Message type	Description
Set	A command to modify Christie Link settings, such as configuring the device to DisplayPort mode.
Request	A request for information, such as what input mode is currently selected.
Reply	Returns the data in response to a request or as confirmation of a command.

Basic message structure

Understand the component fields that comprise a standard ASCII message.

Components	Description
Start and end of message	Every message begins with the left bracket character and ends with the right bracket character. If the start character is received before an end character of the previous message, the partial (previous) message is discarded.
Prefix characters (optional)	To acknowledge that Christie Link has responded, and/or maximize message integrity, insert one or two special characters before the three-character function code: <ul style="list-style-type: none"> • \$ (Simple Acknowledgment)—Causes a dollar sign (\$) character to be sent from Christie Link when it has finished processing the message. • # (Full Acknowledgment)—Causes an echo of the message as a reply to be sent from Christie Link when it has finished processing the message. • & (Checksum)—Allows a checksum to be put as the last parameter in the message for verification at Christie Link.

Components	Description
Function code	The Christie Link function you want to work with is represented by a three-character ASCII code (A-Z, upper or lower case). This function code appears immediately after the leading bracket that starts the message. In messages sent to Christie Link that do not have a subcode, a space between the function code and the first parameter (or special character) is optional.
+Subcode	The Christie Link function you want to work with may have one or more subcodes that allow you to select a specific mode or subfunction. The subcode is represented by a four-character ASCII code (A-Z, upper or lower case, and 0-9). This subcode appears immediately after the function code, with a plus sign (+) character to separate the code and subcode. If there is no subcode, the plus sign (+) is also omitted. In messages sent to Christie Link that have a subcode, a space between the subcode and the first parameter (or special character) is optional.
Request/reply symbols	A request for information is represented by a question mark (?) that appears directly after the function code. A reply is represented by an exclamation mark (!) that appears directly after the function code or subcode, if one is provided. The first parameter located after the exclamation mark (!) reply character cannot have a space, for example (PWR!000).
Data	The value for a given Christie Link state, such as on or off, appears in ASCII-decimal format directly after the request/reply symbol. You can add an optional space after the symbol—such as before the data—in a set message, but data in replies follow the exclamation mark (!) symbol without a space. Other details to remember about data: <ul style="list-style-type: none"> • All values returned by Christie Link (reply messages) have a fixed length, regardless of the actual value. For a specific parameter, the length is always the same (for example, contrast is always returned as three characters, Christie Link number is always returned as five characters). The minimum parameter size is three characters. Values less than the predefined size are padded with leading zeros as needed. Parameters which have negative signs are zero padded after the negative sign, and have one less digit to make space for the sign. • Data in set messages to Christie Link do not require padding with zeros. • Within each message, multiple parameters of data must be separated by one space character. • Text parameters such as channel names are enclosed in double quotes following the data, as in Name.
Text parameters	Most data is simply a numerical value; however, some messages also require text. For example, the time command requires time to be provided in text enclosed in double quotation mark, as in "19:45:23". Use all characters as required except for special characters—these require a two-character combination.

Special characters for text

To use special characters in the API commands, you must use a two-character combination.

Special character	Two-character combination	Description
"	\"	Double quotation mark

Special character	Two-character combination	Description
\	\\	Backslash
(\(Left bracket
)	\)	Right bracket

What is sent in a message

Although you send and read messages as strings of ASCII characters, the actual message travels as a sequence of bytes. Each character in this sequence requires one byte.

Maximizing message integrity

For additional reassurance and/or maximum message integrity, insert one or two special characters.

Message requirement	Description
Acknowledgments	<p>For assurance from Christie Link that a set message has been processed, request an acknowledgment.</p> <p>The acknowledgment is returned after the message has been received and fully executed by Christie Link (such as in the case of a source switch it is not sent until the switch is complete). If the message cannot be executed for some reason (such as invalid parameters, time-out, and so on) a NAK is returned instead (not-acknowledge). Requesting an acknowledgment serves no purpose when included in a request message, as the acknowledgment is redundant to the actual reply from Christie Link. However, if requested, the dollar sign (\$) acknowledgment from Christie Link follows the reply.</p> <p>There are two types of acknowledgments:</p> <ul style="list-style-type: none"> • Simple Acknowledgments—Insert a dollar sign (\$) character just after the start code bracket. This only returns a \$. This only returns a dollar sign (\$) on success, or a caret (^) on failure (NAK). • Full Acknowledgments—Insert a hash (#) character just after the start code bracket. This returns the message sent, as a reply. <p>This is a quick way to confirm success with set messages and is useful with long distance communication links or where the images are not visible from the controller. Acknowledgments can also be a type of flow control.</p>
Checksums	<p>For maximum message integrity, add a checksum character ampersand (&) just after the start code bracket. You must also include the correct checksum total (0-255) just before the end code bracket. Make sure to add a space before the calculated checksum to separate it from the last data parameter:</p> <p>The checksum is the low byte of the sum of the ASCII values of all characters between the start bracket and the beginning of the checksum, but not including either. It does include the space in front of the checksum.</p> <p>Calculate the checksum for the above set contrast to 64 command as follows:</p> <p>CHECKSUM EXAMPLE = & + T + M + D + '+' + T + I + M + E + ? 'space'</p>

Message requirement	Description
	<p>= 26h + 54h + 4Dh + 44h + 2Bh + 54h + 49h + 4Dh + 45h + 3Fh + \$20h</p> <p>= 02C4h</p> <p>= C4h when only the low byte is used</p> <p>= 128</p> <p>Christie Link collects all of the message bytes as defined in the first byte of the message, then creates its own checksum value for comparison with the checksum included in the controller's message. If the values match, the message is considered to have been correctly received; otherwise, the message is discarded.</p> <p>Note the following:</p> <ul style="list-style-type: none"> • h indicates a hex number. • If a request message has a checksum, so does the reply. • If using both acknowledge and checksum, either character can occur first.

Error messages

If a command cannot be performed, a descriptive error identifying the problem appears.

For example, the following message indicates a syntax error:

```
(65535 00000 ERR00005 "TMD+TIME: Too Few Parameters")
```

Descriptive error

The following error codes indicate a problem if a command cannot be performed.

Error code	Description	Error code	Description
3	Invalid parameter	105	Disabled control
4	Too many parameters	106	Invalid language
5	Too few parameters	107	Exceeded list size
6	Channel not found	110	Communication timeout
7	Command not executed	111	Communications failure
8	Checksum error	112	Failed to set hardware
9	Unknown request	113	Bad file
10	Error receiving serial data	114	Memory failure
101	Control not found	115	Not implemented
102	Subcontrol not found	116	Invalid security
103	Wrong control type	117	Invalid access group
104	Invalid value	118	System busy - Try again later

Serial API commands

The Christie Link commands can be used to modify product settings.

BST–Built-in Self Test

Performs self-checks in Christie Link that can be safely executed either in standby, on, or cool down mode. Do not execute this command while Christie Link is warming up.

Commands

Command	Description	Values
BST?L	Returns a list of available test suites. (Read-only)	—
BST <suite>	Executes the test suite specified.	0 = All Tests
BST+TEST?L	Returns a list of available tests. (Read-only)	—
BST+TEST <index>	Executes the specified test.	0 = Verify VCCINT on FPGA 1 = Verify VCCAUX on FPGA 2 = Verify VCCBRAM on FPGA 3 = Verify Frame Buffer memory

Examples

Retrieve the list of test suites/tests:

```
(BST+TEST?L)
```

Result:

```
(BST!L001 001 00000 "Verify VCCINT on FPGA")
(BST!L001 001 00001 "Verify VCCAUX on FPGA")
(BST!L001 001 00002 "Verify VCCBRAM on FPGA")
(BST!L001 001 00003 "Verify Frame Buffer Memory on FPGA")
(BST!L111 "--END--")
```

Run all tests successfully:

```
(BST 0)
```

Result:

```
(BST!000 "--Passed--")
```

Example of failed tests within the All Tests test suite:

```
(BST 0)
```

```
Result:
(BST!001 "Fail" "Expected 1.71V to 1.89V, Got 1.69V")
(BST!000 "Fail")

Example of failing test 1:
(BST+TEST 1)

Result:
(BST+TEST!001 "Fail" "Expected 1.71V to 1.89V, Got 1.69V")
```

DEF–Factory Defaults

Resets Christie Link to its factory default values.

Commands

Command	Description	Values
DEF 111	Restores all settings to the factory defaults. To prevent accidental use of this command, the number 111 must follow the command.	111

Examples

```
Reset Christie Link to factory defaults:
(DEF 111)

Results:
(65535 00000 FYI00919 "All settings have been restored to their factory defaults.")
(65535 00000 FYI00915 "Configured network: IP:192.168.232.61 Mask:255.255.254.0
Gateway:192.168.232.1")
```

EDO–EDID Override

Configures which EDID is presented using inputs that support EDIDs (such as DisplayPort and HDMI).

Use this command to configure what Christie Link advertises regarding the type of signals it accepts. This command does not need to be set to accept a particular type of signal. This command is applied to the currently selected mode, such as DisplayPort or HDMI.

Commands

Command	Description	Values
EDO <rate>	Defines the expected frame rate regardless of the active window size of the signal. This command is only available if video electronics are on. (Saved value)	24 25 30 50

Command	Description	Values
		60 (Default) 120 240 360 480

Examples

Define the expected frame rate to be 24:

(EDO 24)

Define the expected frame rate to be 60:

(EDO 60)

FCT–Factory

Manages factory data for the device.

Commands

Command	Description	Values
FCT?0	Returns factory information about the device in the following format (Read-only): <date> <time> <model> <serial#> <type> <typeID> where: <date> = The date that the device was built <time> = The time that the device was built <model> = Descriptive name of the device <serial#> = Serial number of the device <type> = Type of model (sub-classification) <typeID> = Numeric representation of the model and type	—

SIN–Select Input

Selects the active input.

Commands

Command	Description	Values
SUB+HDCP	Selects which HDCP decryption to use in HDMI mode. (Saved value) Disabled when SIN+MODE is set to 0 (DisplayPort).	1 = HDCP 1.4 2 = HDCP 2.2

Command	Description	Values
SIN+QSFP <config>	Enables the selection of multi-stream, input 1, or input 2. (Saved value)	0 = Multi-stream (Default) 1 = Input 1 2 = Input 2
SIN+MODE <config>	Selects between HDMI and DP (DisplayPort) mode. (Saved value)	0 = DisplayPort (Default) 1 = HDMI
SIN+TYPE <config>	Selects the input type for the current mode of operation. (Saved value)	0 = One-Port (Default) 1 = Two-Port 2 = Dual-Input 3D

Examples

<p>Set DP (DisplayPort) mode:</p> <pre>(SIN+MODE 0) (SIN+MODE ?) Result: (SIN+MODE!000 "DP")</pre>
<p>Set HDMI mode:</p> <pre>(SIN+MODE 1) (SIN+MODE ?) Result: (SIN+MODE!001 "HDMI")</pre>
<p>Set QSFP to multi-stream:</p> <pre>(SIN+QSFP 0) (SIN+QSFP ?) Result: (SIN+QSFP!000 "Multi Stream")</pre>

TMD–Time and Date

Sets the date and time in the real-time clock.

Commands

Command	Description	Values
TMD+DATE <date>	Sets the date for the clock.	<date> = String in the following format: YYYY/MM/DD
TMD+TIME <time>	Sets the time for the clock.	<time> = String in the following format: hh:mm:ss

Examples

<p>Set the date to January 17th, 2020: (TMD+DATE "2020/01/17") Result: (65535 00000 FYI00916 "Setting Date to 2020/01/17")</p>
<p>Get the local time: (TMD+TIME?) Result: (TMD+TIME! "19:45:23")</p>
<p>Set the time to 3pm: (TMD+TIME "15:00:00") Result: (65535 00000 FYI00916 "Setting Time to 15:00:00")</p>

Corporate offices

Christie Digital Systems USA, Inc.
ph: 714 236 8610

Christie Digital Systems Canada Inc.
ph: 519 744 8005

Worldwide offices

Africa
ph: +27 (0)11 510 0094

Australia
ph: +61 (0) 7 3624 4888

Brazil
ph: +55 (11) 2548 4753

China (Beijing)
ph: +86 10 6561 0240

China (Shanghai)
ph: +86 21 6030 0500

Columbia
ph: +57 (318) 447 3179

France
ph: +33 (0) 1 41 21 44 04

Germany
ph: +49 (0) 221 99512 0

India
ph: +91 (080) 6708 9999

Japan (Tokyo)
ph: 81 3 3599 7481

Korea (Seoul)
ph: +82 2 702 1601

Mexico
ph: +52 55 4744 1790

Singapore
ph: +65 6877 8737

Spain
ph: +34 91 633 9990

Middle East
ph: +971 (0) 503 6800

United Kingdom
ph: +44 (0) 118 977 8000

United States (Arizona)
ph: 602 943 5700

Independant sales consultant offices

Italy
ph: +39 (0) 2 9902 1161

Russia
ph: +36 (0) 1 47 48 100



For the most current technical documentation, visit www.christiedigital.com.

