



**CPHYXpress**  
**Printable Application Help**







**CPHYXpress**

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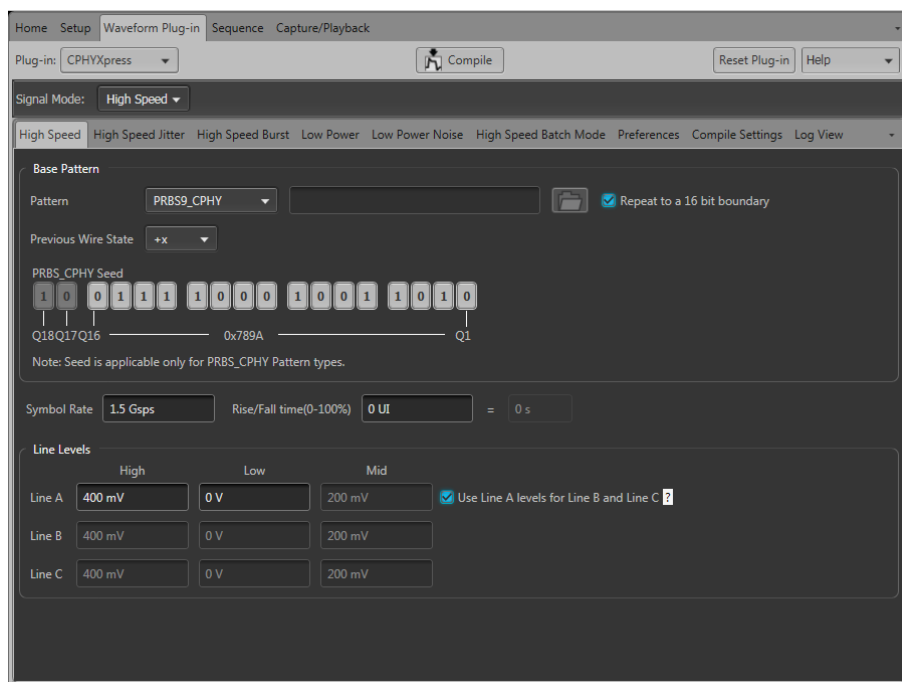
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# Welcome

The CPHYXpress application is used to create signals as per C-PHY standards.



- Generates waveform as per C-PHY standard.
- Programmable signal generation.
- Generates different types of waveforms like Low Power (LP), High Speed (HS), and Low Power- High Speed (LP-HS).
- Programmable Rise-time and Fall-time values.
- Easily insert periodic jitter and random jitter to CPHY HS waveforms.
- Embed the channel effect using S-Parameter and Filter files.
- Configure different HS burst timing configuration.
- Adds Sine noise in waveform using LP mode impairments.
- Waveform creation using Batch mode for stress testing.
- Enables Master-Slave configuration of AWG to support three waveforms simultaneously.
- Enhanced waveform generation for receiver margin testing.
- Generate three levels of signal from AWG.

This software can be run in the following ways:

- Install CPHYXpress on a PC (through SourceXpress) and connect to AWG70002A series arbitrary waveform generator via LAN connection.
- CPHYXpress integrated with AWG70002A series arbitrary waveform generator (CPHYXpress installed in the AWG).

# Introduction

## Related Documentation

The following information is available as part of the CPHYXpress documentation set.

Item	Purpose	Location
Help	Application operation and User Interface help	Application Help menu
PDF of the help	Printable version of the compiled help	PDF file that ships with CPHYXpress software. Downloadable from <a href="http://www.tek.com">www.tek.com</a>

## Abbreviation and Conventions

The online help uses the following conventions:

- When steps require a sequence of selections using the software interface, the ">" delimiter marks each transition between a menu and an option. For example, **File > Save**.
- DUT refers to the Device Under Test.
- The terms "waveform" and "signal" are used interchangeably.
- The term AWG refers to a Tektronix Arbitrary Waveform Generator.

**Table 1: Text Conventions and abbreviation**

Icon	Meaning
<b>Bold</b>	Used to indicate selections on the user interface (such as options, buttons, and command names). For example, <ul style="list-style-type: none"><li>■ Click <b>OK</b>.</li></ul>
<i>Italics</i>	Used to note emphasized definitions, messages, file names, and paths.

## Feedback

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- In North America, call 1-800-833-9200.
- Worldwide, visit [www.tektronix.com](http://www.tektronix.com) to find contacts in your area.



# Getting started

## Instruments and accessories

Supported instruments required for CPHY setup.

Supported Instrument	Description
Tektronix Arbitrary Waveform Generators (AWG)	Two 70002A instruments
Sync hub	One instrument
Real-time oscilloscope	Tektronix DPO70804C, 71254C, 71604C, 72004C, 72304DX, 72504D, 72504DX, 73304D, 73304DX, 73304SX oscilloscopes Tektronix DSA72504D and 73304D oscilloscopes. Tektronix MSO70804C, 71254C, 71604C, 72004C, 72304DX, 72504DX, 73304DX oscilloscopes
MDC box	One instrument MDC4500-4B
Matched pair SMA cables	Two pairs
TCA-SMA connector	Minimum Three pairs
MIPI CPHY Termination board	One instrument

## Minimum system requirements

The minimum requirements of the CPHYXpress application are listed in the following table:

**Table 2: Minimum system requirements**

<b>Supported OS</b>	Windows 7 Professional
<b>Operating Systems</b>	Same as the oscilloscope
<b>Firmware</b>	AWG 5.0.0178 or later
<b>Software</b>	<ul style="list-style-type: none"><li>■ CPHYXpress - 1.0.0</li><li>■ Microsoft Internet Explorer 7.0 or later</li><li>■ Adobe Reader 7.0 or equivalent software for viewing portable document format (PDF) files</li></ul>
<b>Other Devices</b>	<ul style="list-style-type: none"><li>■ Matched pair of SMA cables, minimum two sets for single lane</li><li>■ Microsoft compatible mouse or compatible pointing device</li></ul>

**Prerequisites** TekVisa version 4.0.4.2 or above to communicate with the AWG70002A signal generators (or other test instruments) over a LAN. If TekVisa is not already installed in your system, you can download the software from [www.tektronix.com/software](http://www.tektronix.com/software).

## Installing the software

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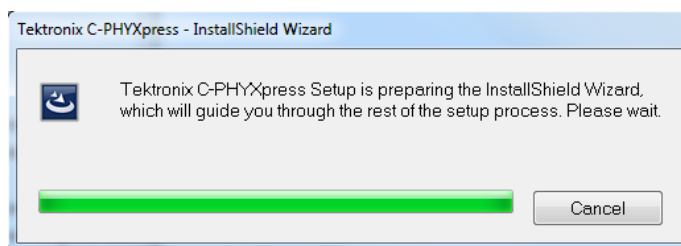
**NOTE.** Use the following steps to instal the software on either a PC or an AWG. The procedure is identical.

---

From the Tektronix website, select the latest version of the software and follow the instructions to download.

Follow the steps to install the latest CPHYXpress software.

1. Double click the executable file. An installation wizard initiates installation of CPHYXpress.



---

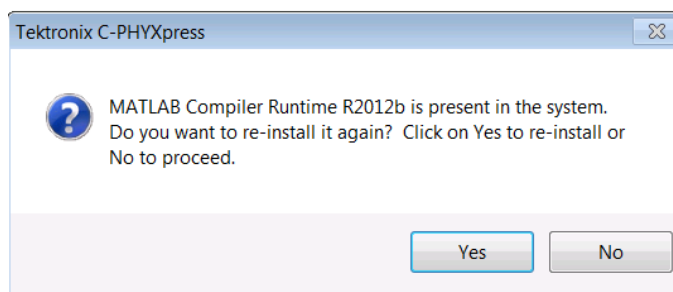
### **NOTE.**

*If you have not installed MATLAB Compile Runtime version 8.0, the installer will detect and install it.*

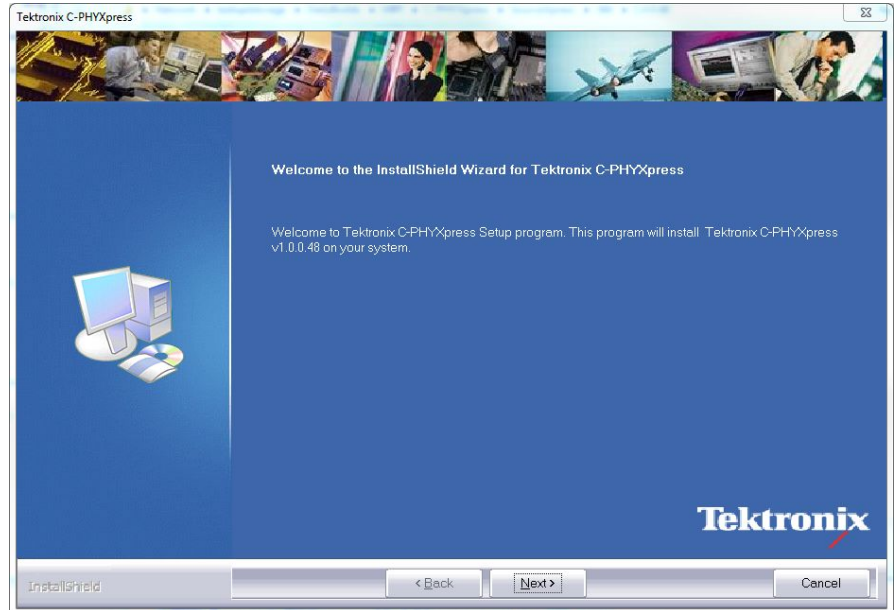
*You can download the TekVISA software from [www.tektronix.com/software](http://www.tektronix.com/software).*

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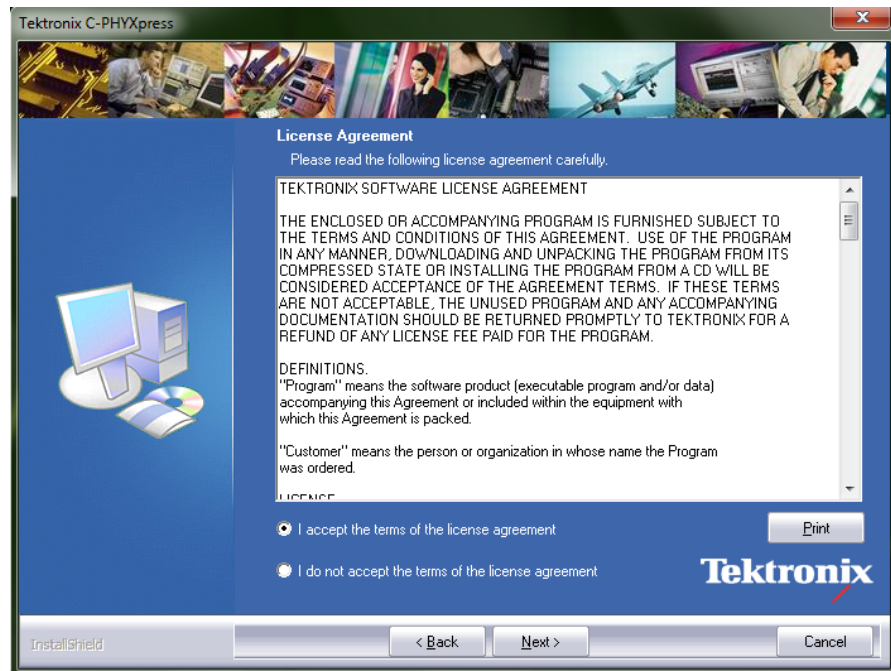
2. A popup appears stating that the MATLAB runtime R2012b is present in the system.



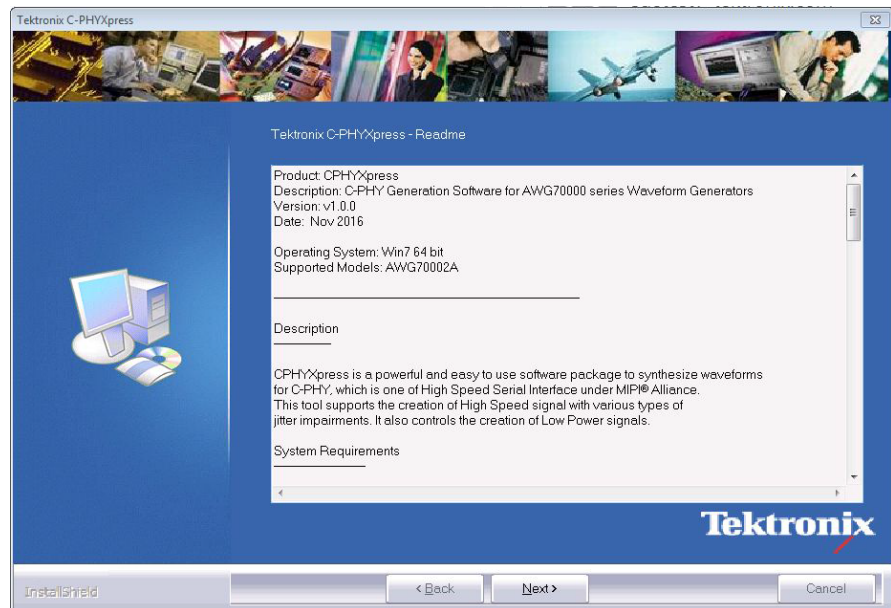
- Click **Yes** to re-install the MATLAB again.
- Click **No** to Proceed with CPHYXpress installation.



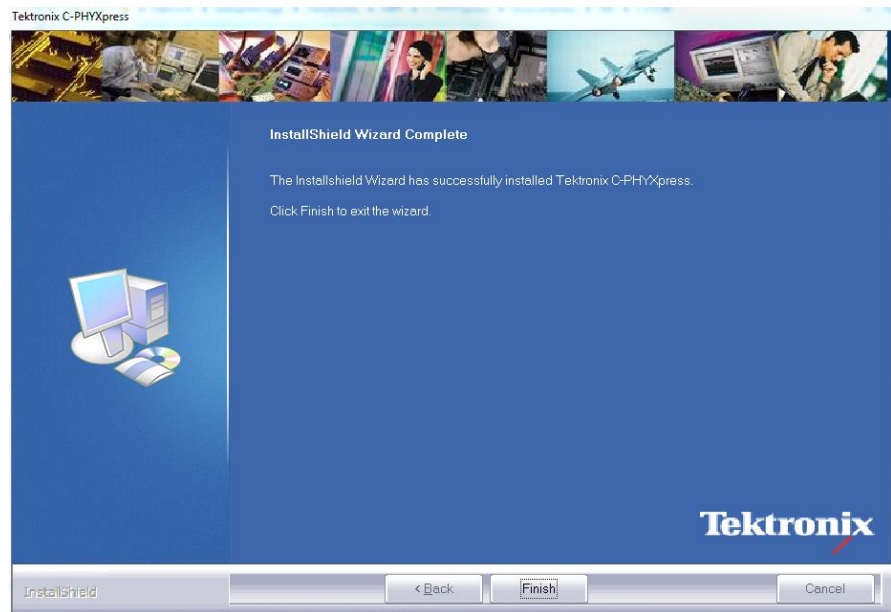
3. Click **Next** to continue the installation.



Select 'I agree the terms of the licence agreement', and click **Next**.



4. Click **Next**.



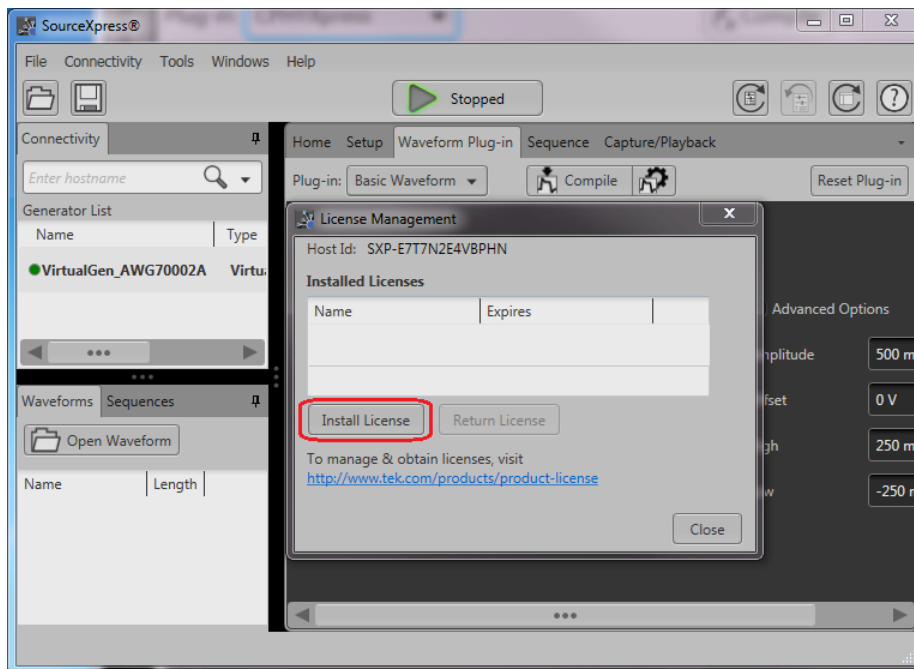
5. Click **Finish** to finish the installation.

**See also**    [\*Minimum system requirements\*](#)  
                  [\*Instruments and accessories\*](#)

## Activate the license

To activate the license:

On a PC (SourceXpress application):



**Figure 1: License activation from PC (SourceXpress)**

1. Select **Tools > Licenses**; **License Management** window opens.
2. Click **Install License**.
3. Browse to the license file location and select it.



On an AWG:

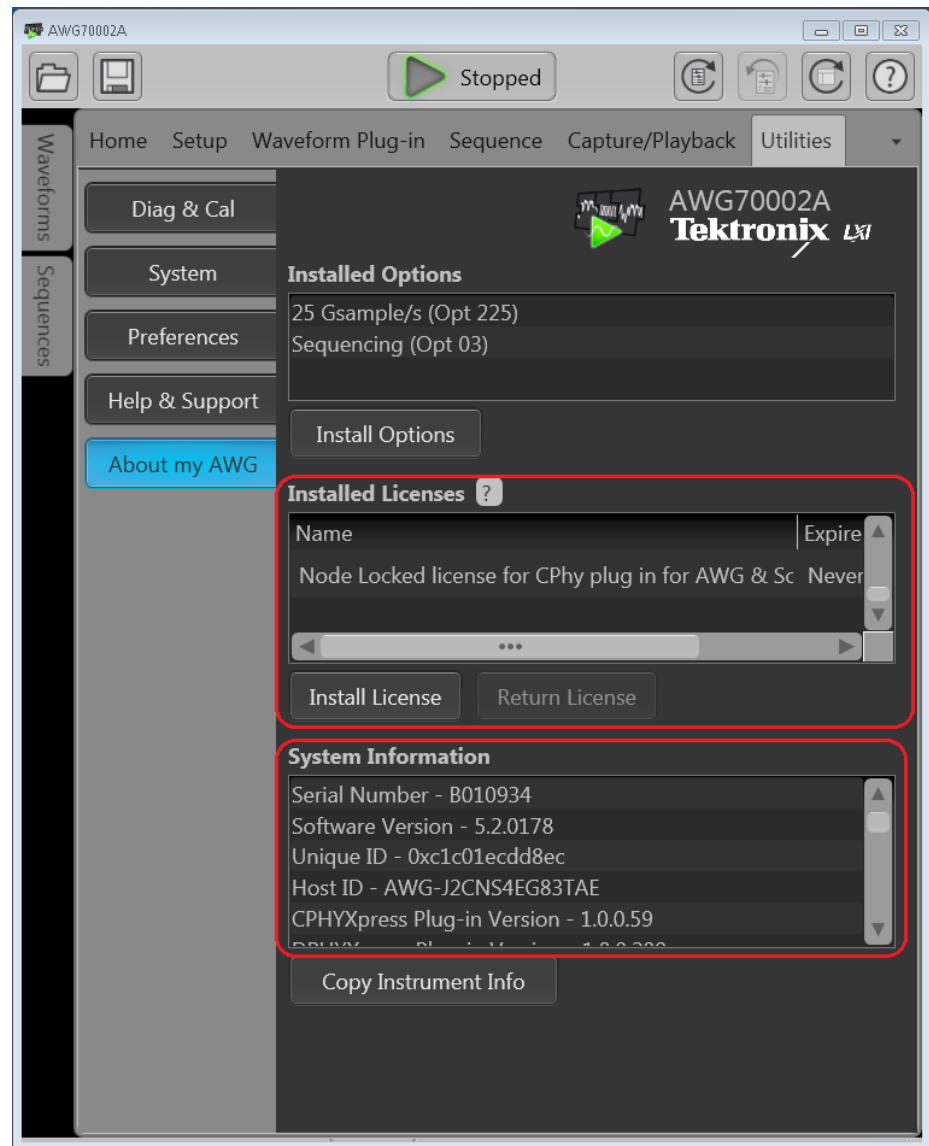


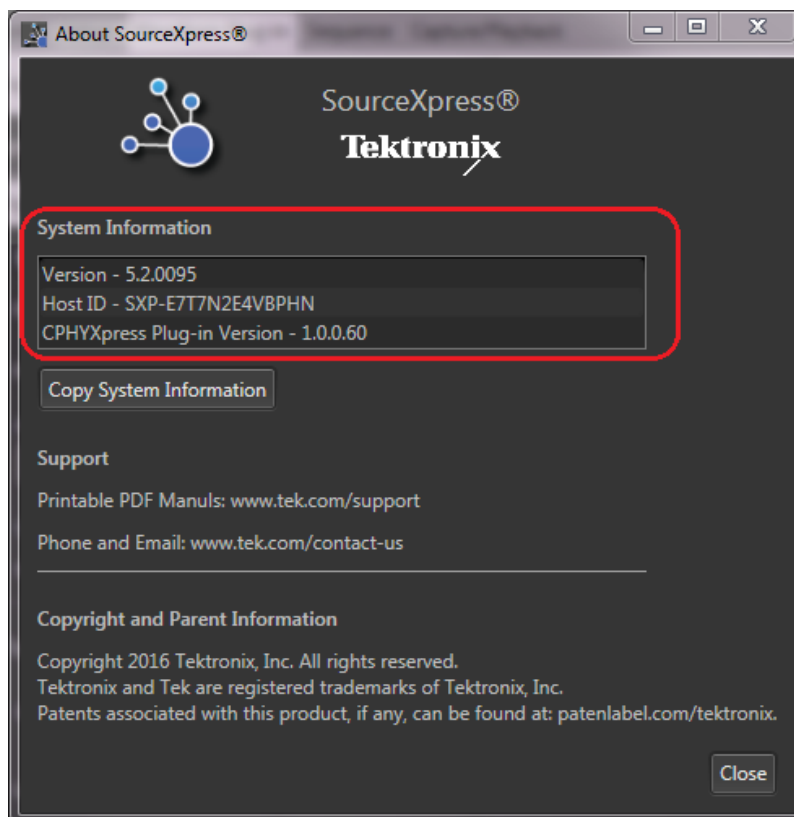
Figure 2: License activation from AWG

1. Select **Utilities > About my AWG**.
2. Click **Install License**.
3. Browse to the license file location and select it.

**View software version and license information**

To view version details:

1. From PC, click **Help > About SourceXpress** and view the version information in the **System Information** group box.



2. From AWG, click **Utilities > About my AWG** and view version information in the **System Information** group box.

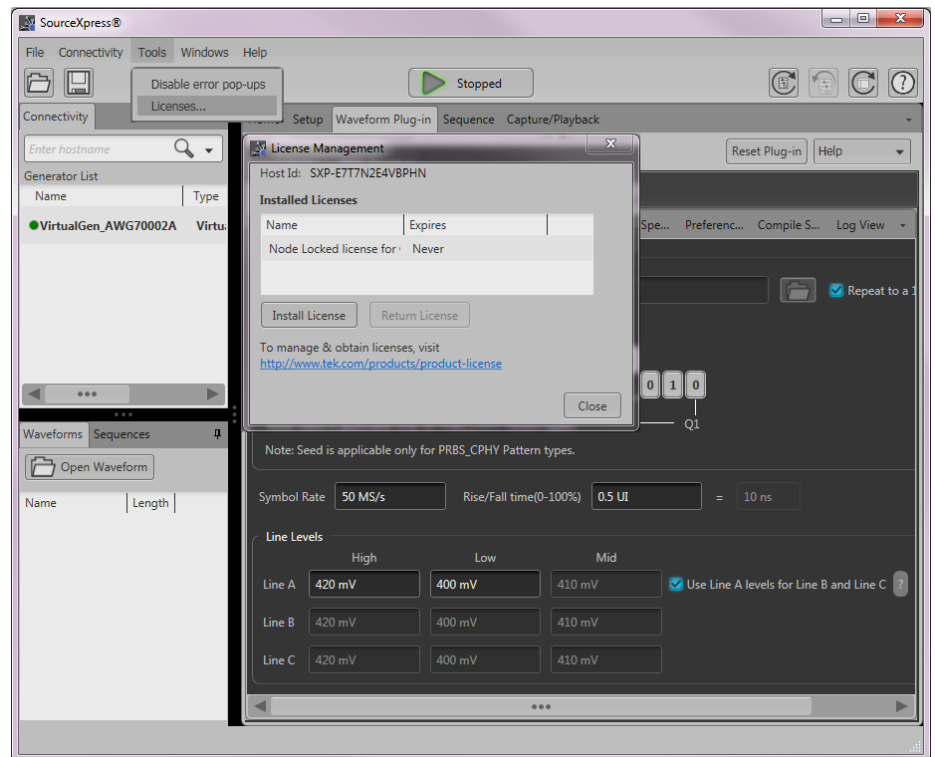
---

**NOTE.** Host id for every PC is unique. CPHYXpress installed on PC will have a unique license.

---

To view license information:

1. From a PC, click **Tools > Licenses**. View license information from **License Management** window, **Installed Licenses** group box.



2. From AWG, click **Utilities > About my AWG**. View version details in the **Installed Licenses** group box.

# Application directories and license information

The following table lists the default application directory names and their usage:

Directory names	Contains
C:\Program Files\Tektronix\SourceXpress\SourceXpress	Path to the root application directory.
C:\Users\Public\tektronix\CPHYXpress\DataFiles	Filter files, S-parameter files, setup files, and pattern files.

# Ordering Information

Contact your Tektronix representative to learn more about ordering C-PHYXpress.

# Connection setup

## CPHY setup back panel

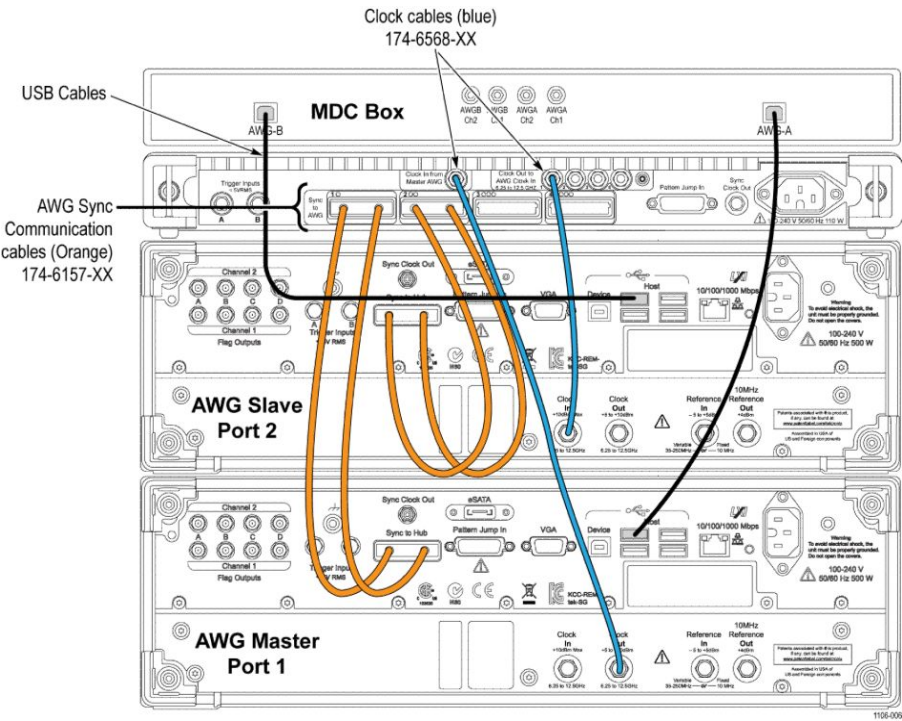


Figure 3: Set-up back panel with MDC box

## CPHY receiver test setup

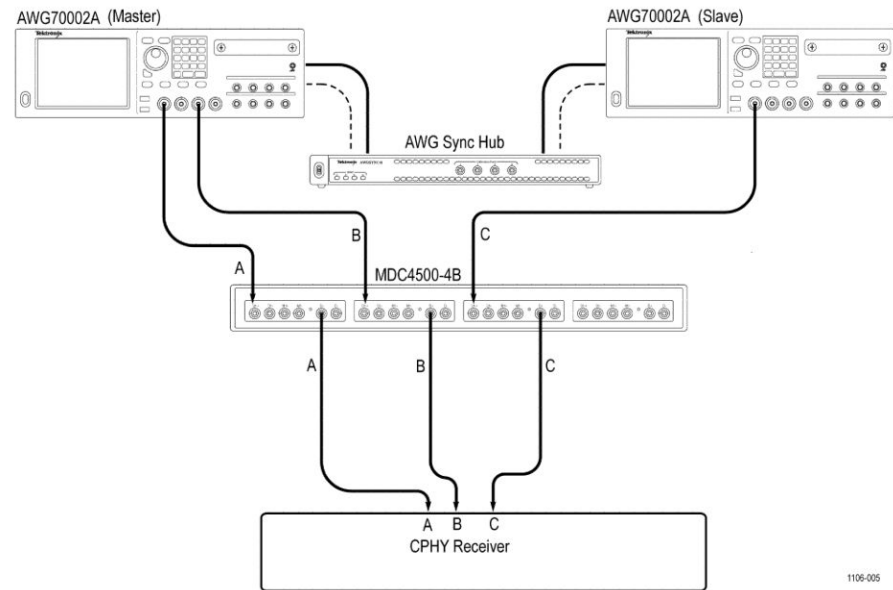


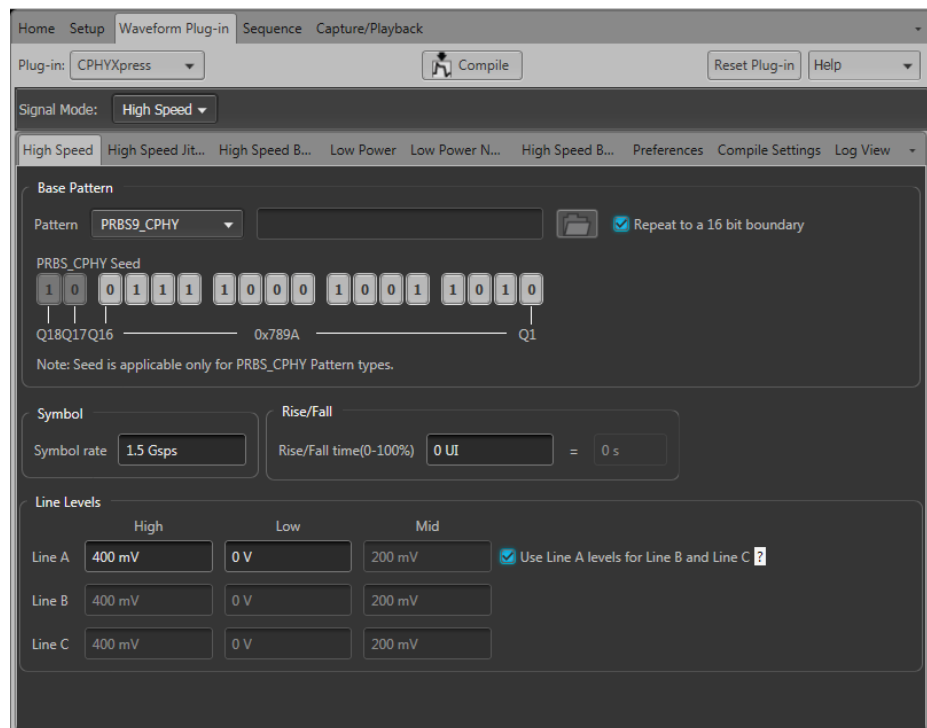
Figure 4: CPHY - with MDC box



# Operating basics

## About CPHYXpress

The following figure displays the CPHYXpress screen, the menu, the toolbar, and other elements of the display. This section describes these elements.



## Overview of the software

CPHYxpress is an application for the AWG which enables the generation of various kinds of stimuli for CPHY Receiver testing. The application takes input as bit stream, encoded it to CPHY signal scheme, adds impairments such as Jitter, cable effect and generates the trio signal.

### Key Features

Key features supported are:

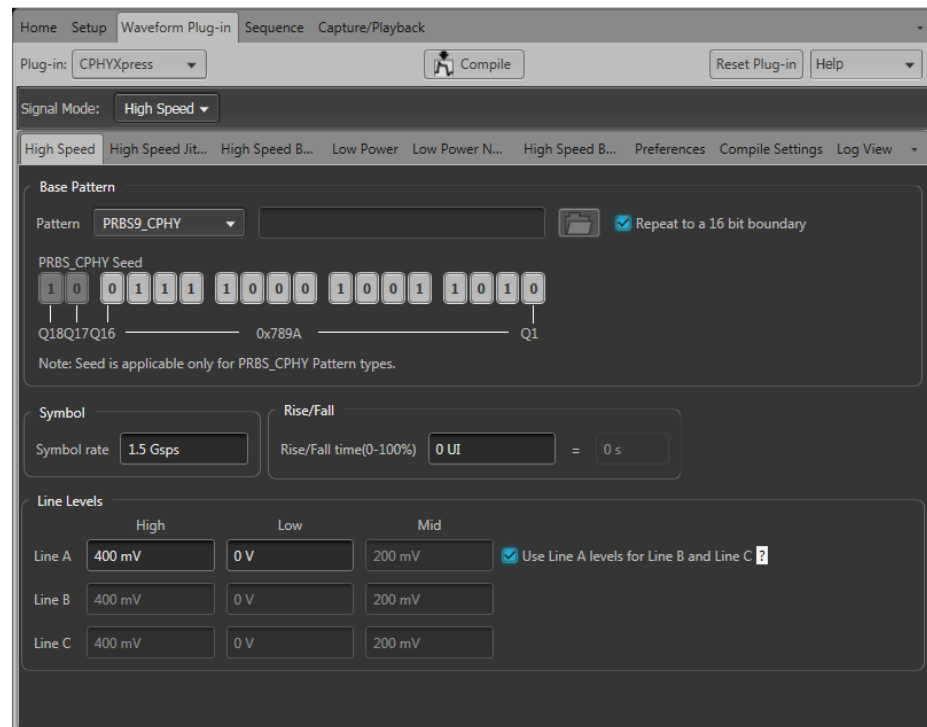
- High Speed Mode, Low Power Mode, and Low Power - High Speed mode signaling
- Voltage and Rise/Fall time control
- Jitter insertion and Channel embedding

## Run the application

### Run the CPHYXpress from a PC (SourceXpress)

To run the application, open SourceXpress from the **Waveform Plug-in** menu, select **CPHYXpress** from Plug-in field.

It displays the **CPHYXpress** application.

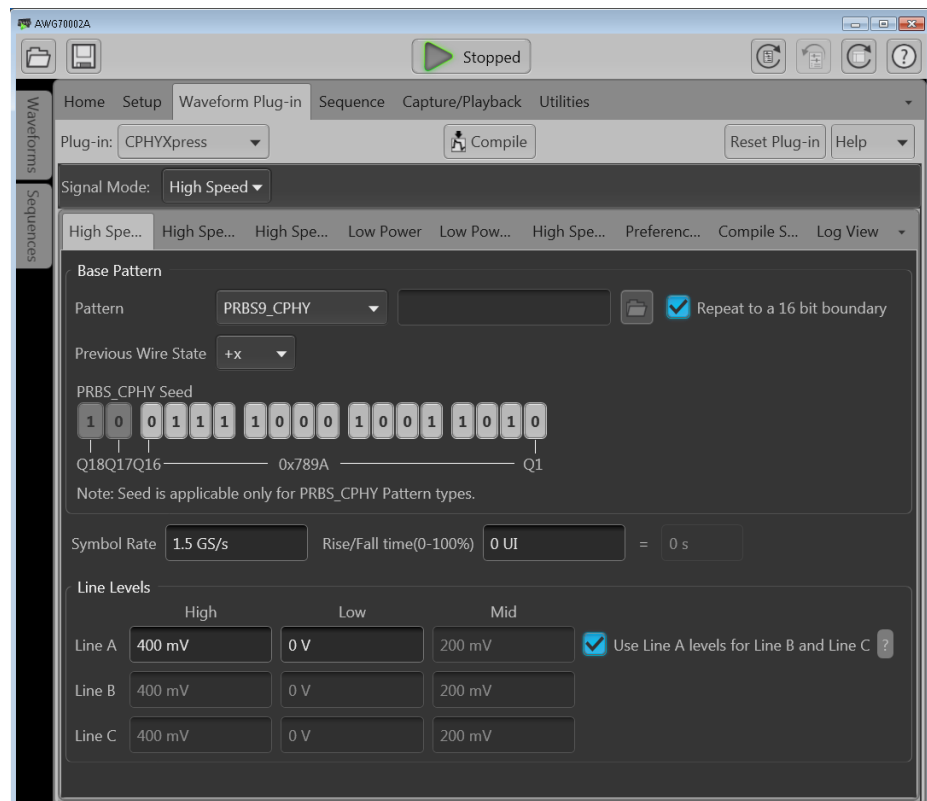


### Run the CPHYXpress from AWG



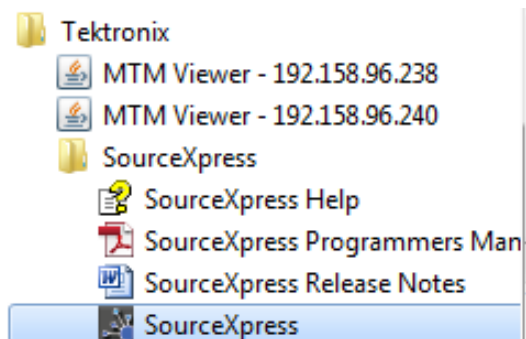
To run the application, open AWG application and from the Plug-in menu, select **Waveform Modules > CPHYXpress**.

The AWG application opens the **CPHYXpress**.



## Starting the software

From the Start menu, click **All Programs > Tektronix > SourceXpress > select SourceXpress**. From the waveform plug-in tab, select CPHYXpress.



You can also double-click the **SourceXpress** application shortcut on the desktop. From the waveform plug-in tab, select **CPHYXpress**



## Exiting the software

**Exiting CPHYXpress from the PC:** Select **File > Exit** to exit the application. If you have not saved the waveforms, you are prompted to do so. This option is always enabled.

---

**NOTE.** Using other methods to exit the application results in abnormal termination of the application.

---

**Exiting CPHYXpress from the AWG:** Select  button to exit the application.

## File name extensions and directories

The application uses the following file name extensions:

**Table 3: File name extensions**

File name extension	Description
.txt	Text file with ASCII text with no formatting. This file format may be read by any ascii text editor (such as Microsoft Notepad, Wordpad).
.wfm	Binary file containing an AWG waveform record in a recallable, proprietary format.
.flt	Files containing the inverse filter co-efficient.
.awgx	Saved session files for AWG and SourceXpress.

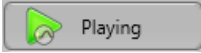
The following table lists the default application directory names and their usage:

**Table 4: Directory names**

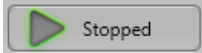
Directory	Description
Application installation path\Tektronix\SourceXpress	Path to the root application directory.
Tektronix\SourceXpress\AWG\Plugins\CPHYXpress	Contains CPHYXpress software executables along with the required dlls are deployed.
C:\Users\Public\Tektronix\CPHYXpress	Contains AWGSetups, DataFiles, Setups, Waveforms.
C:\Users\Public\Tektronix\CPHYXpress\Datafiles	Contains Filter files, S-Parameter files, Setup files and pattern files.
C:\Users\Public\Tektronix\CPHYXpress\Waveforms	Waveform files.

## Toolbar options and dialog boxes

### Playing

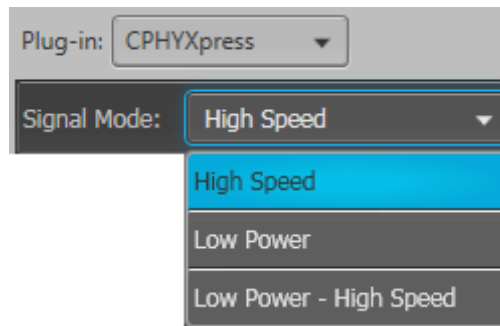
Displays  when the waveform is transferring from the AWG to the oscilloscope.

### Stop

Displays the  button before or after the waveform is transferred to the oscilloscope. By default, the AWG displays this button.

### Signal Mode

CPHYXpress operates in three modes: High Speed, Low Power, and Low Power - High Speed. By default, High Speed mode is selected.



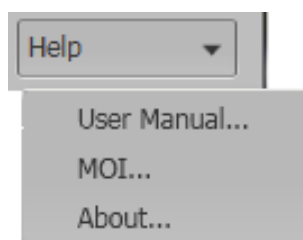
- **High Speed (HS):** In High Speed mode you can create a high speed signal using a set of patterns and compile jitter waveforms. The waveforms created using the High Speed tab, High Speed Burst tab, High Speed Jitter tab, and High Speed Batch mode tab are independent.
- **Low Power (LP):** In Low Power signal mode you can create low power signal using a set of patterns.
- **Low Power - High Speed (LP-HS):** In Low Power High Speed signal mode you can create a complete CPHY burst, that is a low power high speed waveform.

**Plug-in** To use the plug-in menu, select **Plug-in > CPHYXpress**.

**Compile** Click **Compile** to compile currently active waveform.  
The compiled waveform is displayed in the Waveform List. You can save the waveform data in .wfm file format using the Waveform list shortcut menu. This option is not enabled when the compilation is in progress.

**Reset module** Resets the present settings into default settings.

**Help** Click **Help** > select:



- **User Manual** to view the CPHYXpress user manual.
- **MOI** to view the CPHYXpress method of implementation manual.
- **About** to view information about the plug-in.

**Busy** Displays **Busy** button, before the waveform transfer starts.  
Click **Run** to turn on or turn off the run state of the AWG.

# User interface feature

This section describes the user interface.

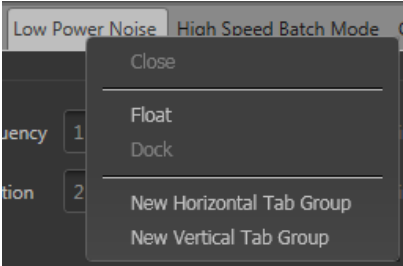
## Docking and undocking tabs

Any tab can be undocked from the GUI. This allows you to reposition a tab to a new location or completely separate it from the main GUI.

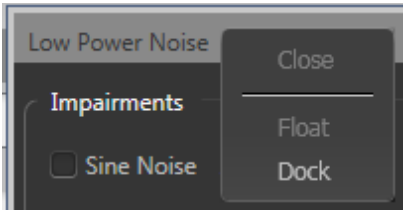
- Touch and hold the touchscreen (or right mouse click) to grab a tab and slide it to a new area. The docking icon shows that you can dock (reposition) the tab by releasing it at the new location.

Use **Reset Window Layout**  to return the display to the default (docked) settings.

- Right click and select **Float**, for the selected window to float.



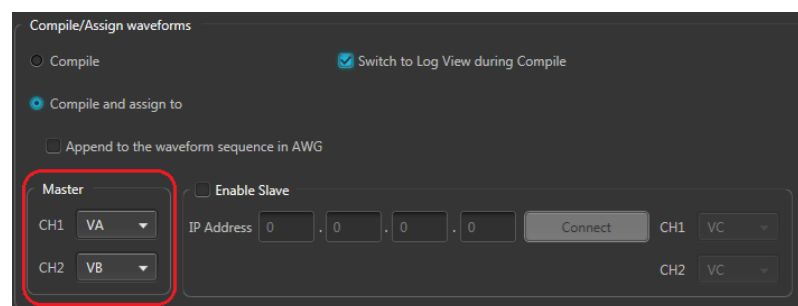
Right click and select **Dock** to dock the window.



## Splitting or resizing the application window

The window panes can be adjusted in size wherever the panels are divided. Select the three-dot-indicator and slide horizontally or vertically to increase or decrease the size of the grid.

- Small or large font** You can change the font size using **Utilities > Preferences**.
- Save log feature** The log file details the results of the created waveform. You can save the log file from the Log View tab, right mouse click and select **Save log as**.  
In the Save log as window, the log file will be saved with the .log extension.  
The factory location is C:\Users\Public\Tektronix\CPHYXpress\Temp.
- Slave and master features** **Master feature:**  
To enable the master feature select **Compile and assign to** in the **Compile Settings** tab.

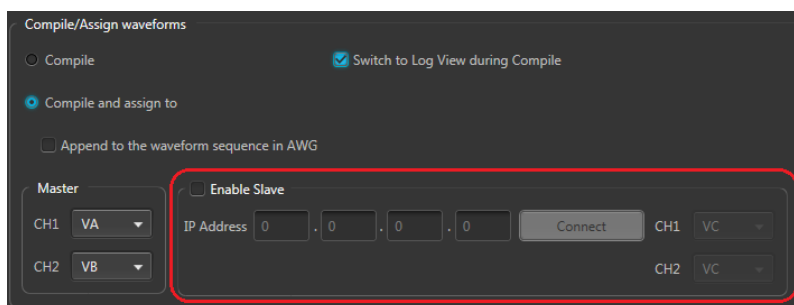


Select **Append to the waveform sequence in AWG** to append the waveform with a previously saved waveform in the waveform list.

Select the waveforms to be assigned to the respective channels.

**Slave feature:**

To enable slave feature select **Compile and assign to** in **Compile Settings** tab.



1. Select **Enable Slave** to enable slave specific controls.
2. Provide the IP Address of the slave
3. Click **Connect**.

---

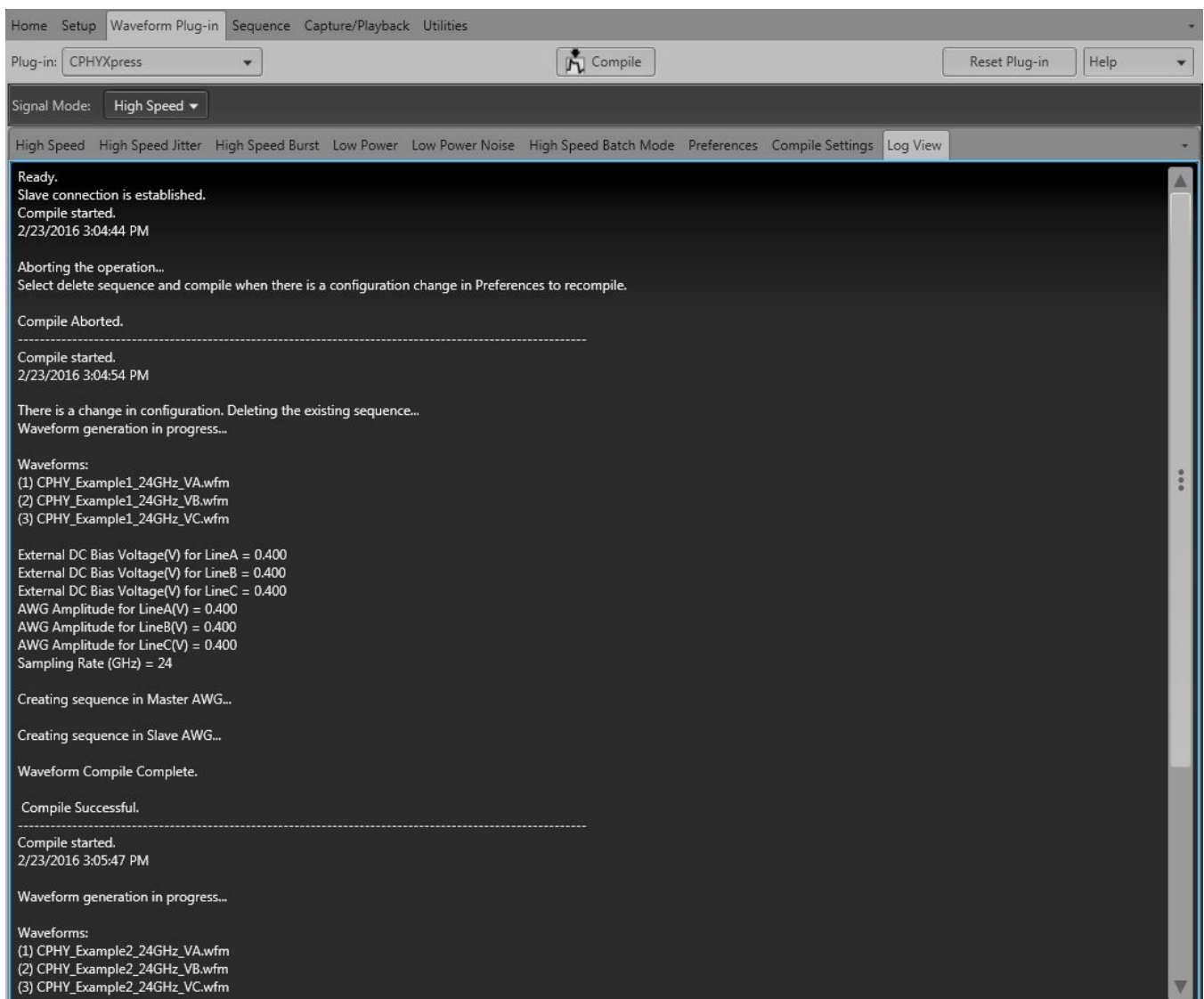
**NOTE.**

- *Enter valid Slave IP Address.*
- *Slave should be online.*
- *The control channels is enabled.*

- 
4. Select the waveforms to be assigned to the respective channels.

**Log View** Log view provides the information log of the waveform creation and also displays the information about the waveform compilation.





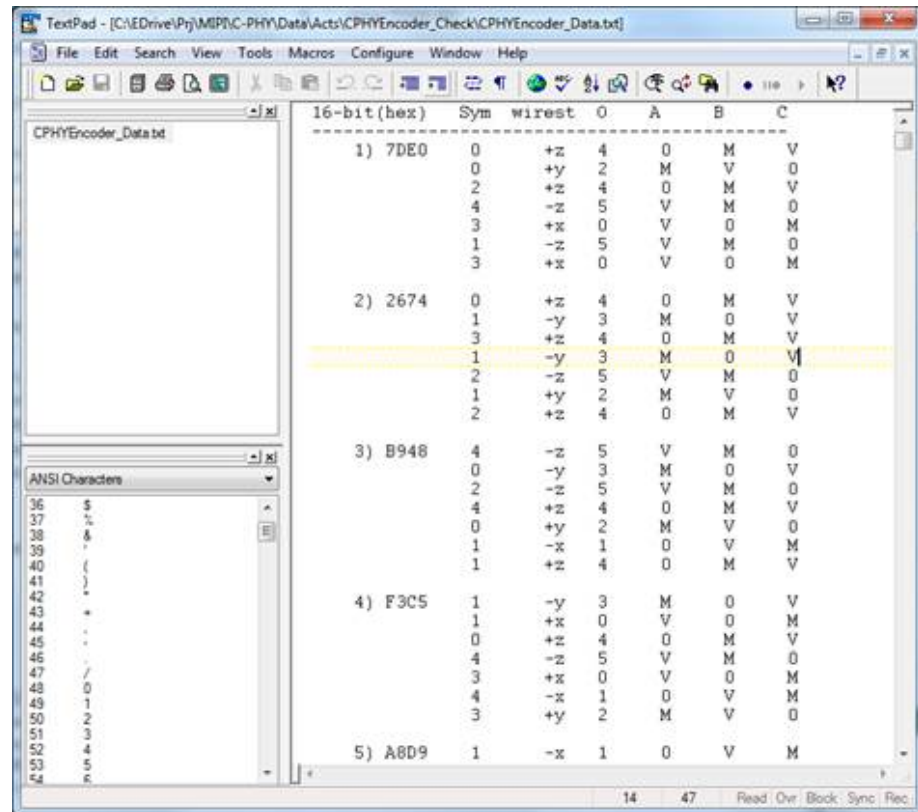
You can save the log by right-click -> **Save log as**. The created log will be saved in the below location:

C:\Users\Public\Tektronix\CPHYXpress\Temp

You can clear the created log by right-click > **Clear**.

**Encoder log** After a waveform is compiled, the intermediate details of the encoder bits, symbols and wire states is available in a text file labeled 'CPHYEncoder\_Data.txt'. The encoder log is saved to this location, C:\Users\Public\Tektronix\CPHYXpress.

Below is the example of the encoder log.



16-bit(hex)	Sym	wire	st	0	A	B	C
1) 7DE0	0	+z	4	0	M	V	
	0	+y	2	M	V	0	
	2	+z	4	0	M	V	
	4	-z	5	V	M	0	
	3	+x	0	V	0	M	
	1	-z	5	V	M	0	
	3	+x	0	V	0	M	
	0	+y	2	M	V	0	
2) 2674	0	+z	4	0	M	V	
	1	-y	3	M	0	V	
	3	+z	4	0	M	V	
	1	-y	3	M	0	V	
	2	-z	5	V	M	0	
	1	+y	2	M	V	0	
	2	+z	4	0	M	V	
	0	+y	2	M	V	0	
3) B948	4	-z	5	V	M	0	
	0	-y	3	M	0	V	
	2	-z	5	V	M	0	
	4	+z	4	0	M	V	
	0	+y	2	M	V	0	
	1	-x	1	0	V	M	
	1	+z	4	0	M	V	
	0	+y	2	M	V	0	
4) F3C5	1	-y	3	M	0	V	
	1	+x	0	V	0	M	
	0	+z	4	0	M	V	
	4	-z	5	V	M	0	
	3	+x	0	V	0	M	
	4	-x	1	0	V	M	
	3	+y	2	M	V	0	
	0	+y	2	M	V	0	
5) A8D9	1	-x	1	0	V	M	
	0	+y	2	M	V	0	

The encoder log is created when:

- The signal mode is either HS or LP\_HS mode.
- The base pattern is any of the PRBS patterns.
- The base pattern 'Text file' is selected.

# Creating a signal

## Selecting signal mode

By default the High Speed (HS) signal mode is selected.

### High Speed (HS)

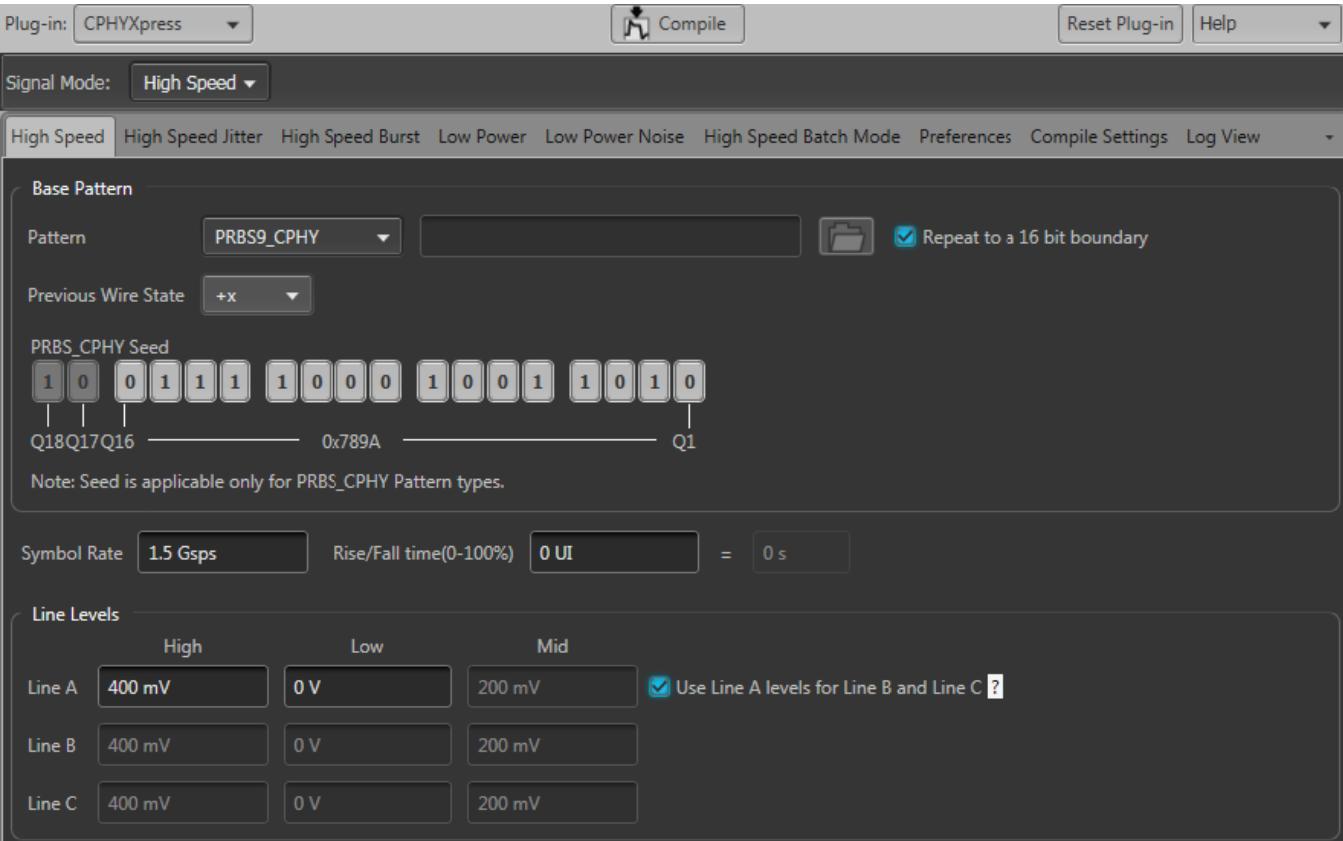
High Speed (HS) signal mode allows you to create a high speed signal using a set of patterns.

The screenshot shows the CPHYXpress software interface. At the top, there is a 'Plug-in:' dropdown set to 'CPHYXpress', a 'Compile' button, and 'Reset Plug-in' and 'Help' buttons. Below this, the 'Signal Mode:' dropdown is set to 'High Speed'. A tabbed interface shows 'High Speed' as the active tab, with other tabs including 'High Speed Jitter', 'High Speed Burst', 'Low Power', 'Low Power Noise', 'High Speed Batch Mode', 'Preferences', 'Compile Settings', and 'Log View'. The 'Base Pattern' section contains a 'Pattern' dropdown set to 'PRBS9\_CPHY', a text field, a folder icon, and a checked checkbox 'Repeat to a 16 bit boundary'. Below this is a 'Previous Wire State' dropdown set to '+x'. The 'PRBS\_CPHY Seed' section shows a sequence of 16 bits: 1, 0, 0, 1, 1, 1, 1, 0, 0, 0, 1, 0, 0, 1, 1, 0, 1, 0. Below the bits are labels 'Q18Q17Q16' and 'Q1', and the hexadecimal value '0x789A'. A note states: 'Note: Seed is applicable only for PRBS\_CPHY Pattern types.' The 'Symbol Rate' is set to '1.5 Gsps', and 'Rise/Fall time(0-100%)' is set to '0 UI', with an equals sign and '0 s'. The 'Line Levels' section has three columns: 'High', 'Low', and 'Mid'. For 'Line A', the values are '400 mV', '0 V', and '200 mV'. For 'Line B', the values are '400 mV', '0 V', and '200 mV'. For 'Line C', the values are '400 mV', '0 V', and '200 mV'. A checked checkbox 'Use Line A levels for Line B and Line C' is present.

The parameters to create high speed signal are configured using these tabs:

- *High speed*
- *High speed jitter*
- *High speed burst*
- *High speed batch*

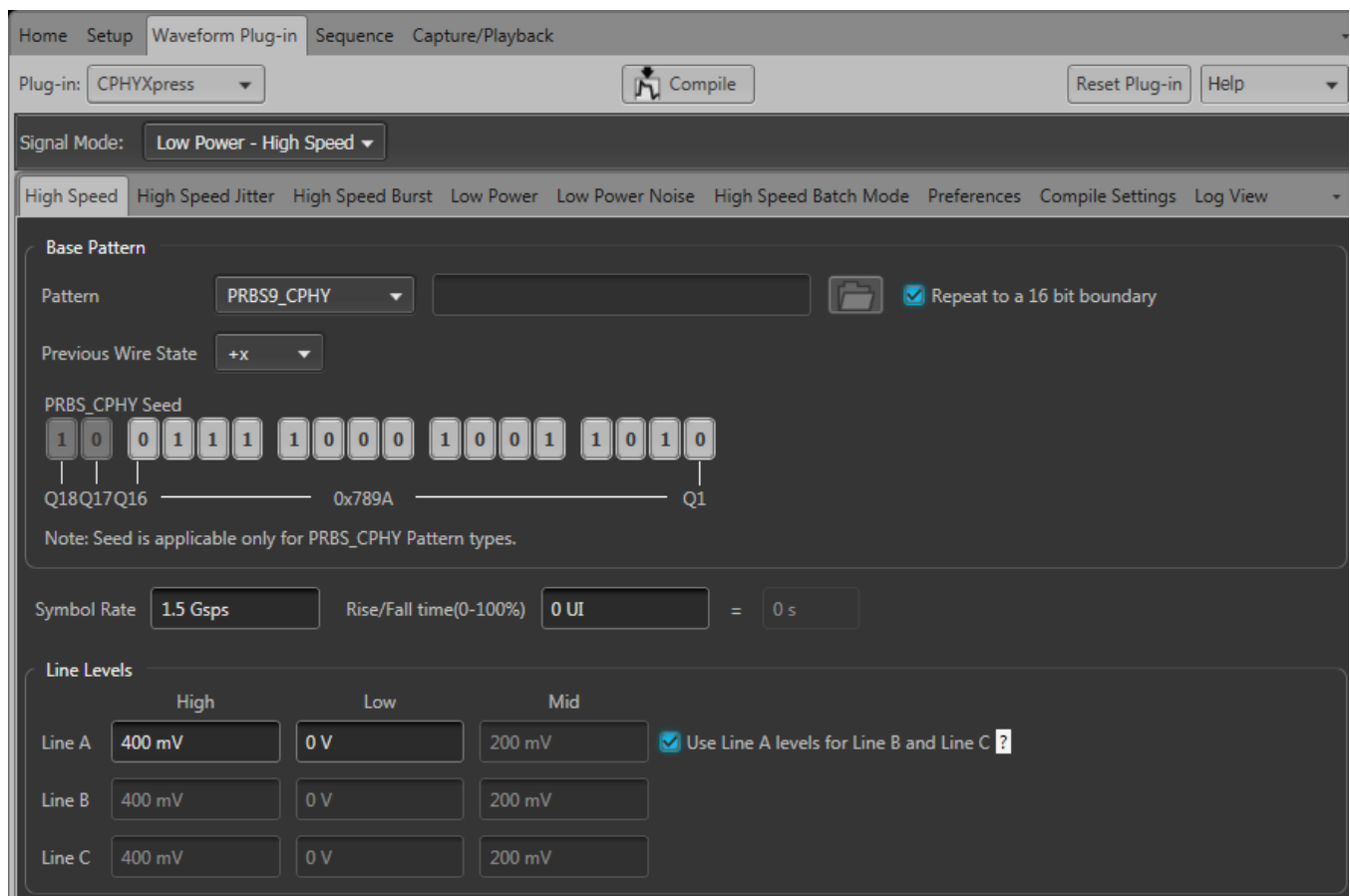
**Low Power (LP)**    Low Power (LP) signal mode allows you to create a low power signal.



The parameters to create low power signal are configured in these tabs:

- *Low power*
- *Low power noise*

**Low Power - High Speed (LP-HS)**    Low Power-High Speed signal mode allows you to create a complete low-power, high-speed CPHY Burst waveform.



The parameters to create low power - high speed signal are configured in these tabs:


- *High speed*
- *High speed jitter*
- *High speed burst*
- *High Speed Batch*
- *Preferences*
- *Low Power Noise*
- *Low power*

## CPHY signal parameters

**High speed**    Use this tab to configure the basic parameters of the High Speed signal.  
You can select a set of patterns and compile waveforms using these patterns.

High Speed   High Speed Jitter   High Speed Burst   Low Power   Low Power Noise   High Speed Batch Mode   Preferences   Compile Settings   Log View

Base Pattern

Pattern   PRBS9\_CPHY         ☒ Repeat to a 16 bit boundary

Previous Wire State   +x   ▾

PRBS\_CPHY Seed

1   0   0   1   1   1   1   0   0   0   1   0   0   1   1   0   1   0

Q18Q17Q16   0x789A   Q1

Note: Seed is applicable only for PRBS\_CPHY Pattern types.

Symbol Rate   1.5 Gsps   Rise/Fall time(0-100%)   0 UI   =   0 s

Line Levels

	High	Low	Mid	
Line A	400 mV	0 V	200 mV	<input checked="" type="checkbox"/> Use Line A levels for Line B and Line C ?
Line B	400 mV	0 V	200 mV	
Line C	400 mV	0 V	200 mV	

The following table describes High speed signal parameters:

Parameter	Description	Range	Default value
<b>Base Pattern</b>	Select the base pattern file from the list.		
Pattern	Select the input Base Pattern / Bit Pattern for waveform generation.	PRBS7 PRBS9_CPHY PRBS11_CPHY PRBS18_CPHY Text file Symbol file Wire state file	PRBS9_CPHY
Repeat to a 16 bit boundary	Sets option to repeat to 16 bit boundary.	NA	Selected
Previous Wire State	Select the previous wire state	+x -x +y -y +z -z	+x
PRBS Seed	Specify the 16-bit seed value for all the PRBS CPHY patterns.	0x0000 to 0xFFFF	0x789A
<b>Symbol</b> Symbol Rate	Specify the signal rate of the signal.	50 MS/s to 5 GS/s	1.5 GS/s
<b>Rise / Fall:</b> Rise / Fall Time	Specify the rise/fall times of the signal.	0 to 0.5 UI	0 UI
<b>Line Levels</b>			
Line Levels-High	Specify the high-level voltage of the waveform for lines A, B, and C.	0 to 600 mV	400 mV
	<b>NOTE.</b> High line value or level should be more than or equal to the sum of Low line value or level and 20 mV.		
Line Levels-Low	Specify the low-level voltage of the waveform for the lines A, B, and C.	-100 to 400 mV. This value depends on the value of high line level.	0
	<b>NOTE.</b> High line value or level should be more than or equal to the sum of Low line value or level and 20 mV.		

Parameter	Description	Range	Default value
Use Line A levels for Line B and Line C	When selected, considers the voltage levels of line A for line B and line C.	NA	Selected

---

**NOTE.**

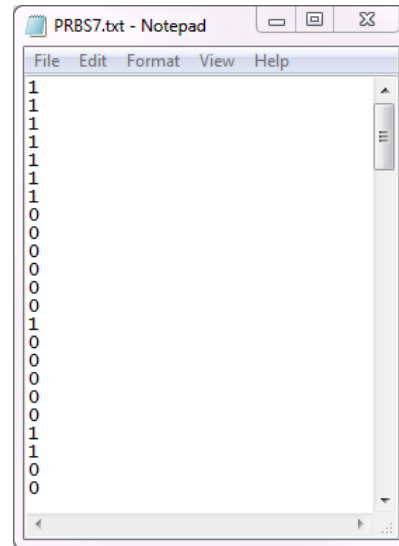
- 1. Maximum and minimum values are displayed when you right click a field.*
  - 2. Mid level is computed as the average of High and Low levels.*
  - 3. The high line value/level should be more than or equal to the sum of the Low line value/level plus 20 mV.*
-



**Selecting file types.** Supported Base Pattern file types for upload are:

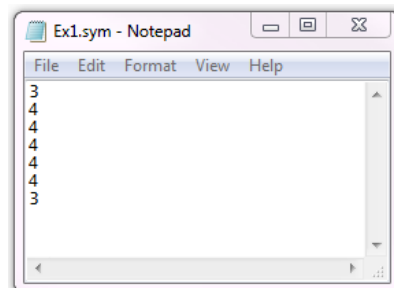
- Text file
- Symbol file
- Wire State file

**Text file.** The Text files use the \*.txt extension. The range of elements for a text file is [0, 1].



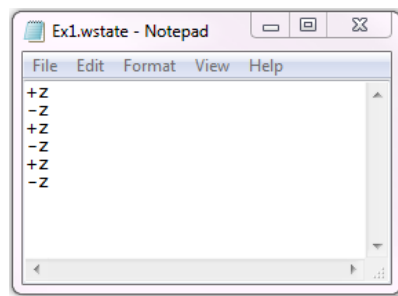
**Figure 5: Example of Text file**

**Symbol file.** HS files use the \*.sym extension. The range of elements for a symbol file is [0, 1, 2, 3, 4].



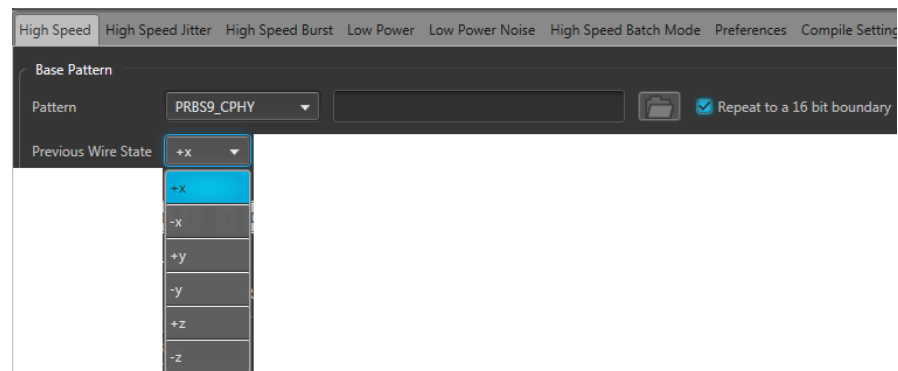
**Figure 6: Example of Symbol file**

**Wire State file.** Wire State files uses \*.wstate extension. The range of elements for a wire state file is [+z, -z, +y, -y, +x, -x].



**Figure 7: Example of Wire State file**

**Selecting previous wire state file.** Select Previous Wire State from the drop-down.



Example:

The initial symbol is 1 and the previous Wire State is +z. The current wire state is defined to be -y as shown below.

Symbol Input Value	Previous Wire State, interval N-1						What Happens
	+x	-x	+y	-y	+z	-z	
000	+z	-z	+x	-x	+y	-y	Rotate CCW, polarity is Same
001	-z	+z	-x	+x	-y	+y	Rotate CCW, polarity is Opposite
010	+y	-y	+z	-z	+x	-x	Rotate CCW, polarity is Same
011	-y	+y	-z	+z	-x	+x	Rotate CCW, polarity is Opposite
1xx	-x	+x	-y	+y	-z	+z	Same phase, polarity is Opposite

With the Wire State set to -y, the line-levels should be middle for Line A, low for Line B and high for Line C as shown in the table below.

Table 5: Definition of Wire State

Wire State Name	High-Speed State Code Name	Line Signal Levels		
		A	B	C
+x	HS_+x	High	Low	Middle
-x	HS_-x	Low	High	Middle
+y	HS_+y	Middle	High	Low
-y	HS_-y	Middle	Low	High
+z	HS_+z	Low	Middle	High
-z	HS_-z	High	Middle	Low

High speed jitter

This tab allows you to configure jitter and noise parameters for the high speed signal.

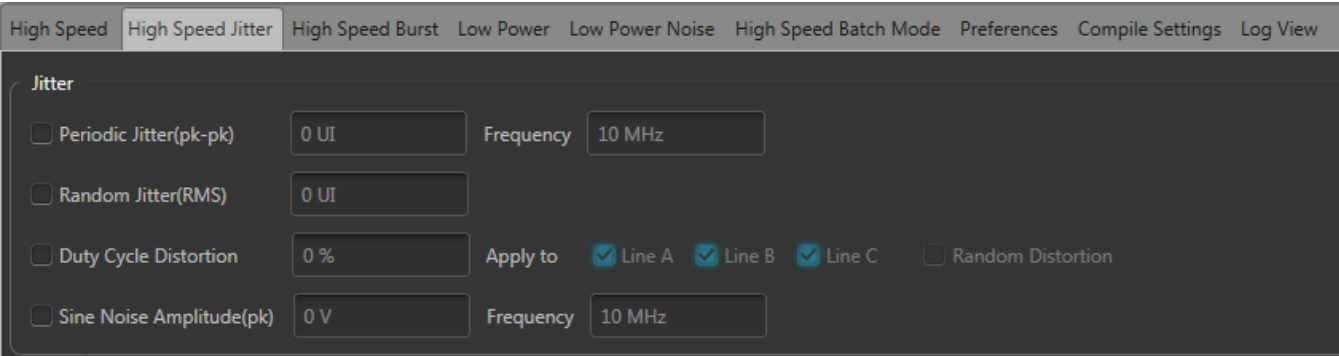


Figure 8: High speed jitter

You can select a set of patterns and compile waveforms using these patterns.

The following table describes the High speed jitter parameters:

Table 6: High speed jitter tab settings

Controls	Description	Range	Default Value
<b>Jitter</b>			
Periodic Jitter (pk-pk)	Select to set the magnitude of periodic jitter (pk-pk).	Min: 0 UI Max: 1 UI	0 UI
Frequency	Enter the amplitude in volts to generate desired sine noise.	Min: 100 kHz Max: 300 MHz	10 MHz
Random Jitter (RMS)	Select to set the magnitude of random jitter (in UI).	Min: 0 UI Max: 0.3 UI	0 UI

Controls	Description	Range	Default Value
Duty Cycle Distortion (DCD)	Enter the required value for DCD <b>Line A:</b> Select to apply DCD to Line A. <b>Line B:</b> Select to apply DCD to Line B. <b>Line C:</b> Select to apply DCD to Line C.	Min: 0 Max: 40	0 %
Apply to	All lines are enabled when Duty Cycle Distortion is selected.		
Line A	Enables the Duty Cycle Distortion for line A.	NA	Selected
Line B	Enables the Duty Cycle Distortion for line B.	NA	Selected
Line C	Enables the Duty Cycle Distortion for line C.	NA	Selected
Random Distortion	Select to generate varied distortion randomly, for each symbol interval.  <i><b>NOTE.</b> When the check box is deselected the distortion is fixed over time.</i>	NA	Not selected
Sine Noise Amplitude (pk)	Select to generate noise in the waveform. When selected, activates Frequency. Specify the amplitude in volts to generate the desired sine noise.	Min: 0 V Max: 50 mV	0 V
Frequency	Enter the frequency in Hz to generate the desired sine noise.	Min: 100 kHz Max: 2* Symbol Rate GHz  <i><b>NOTE.</b> Frequency value depends on the value of Symbol rate in the High speed tab.</i>	Min 10 MHz

**NOTE.** All the parameters have a checkbox, allowing you to select or clear the stress.

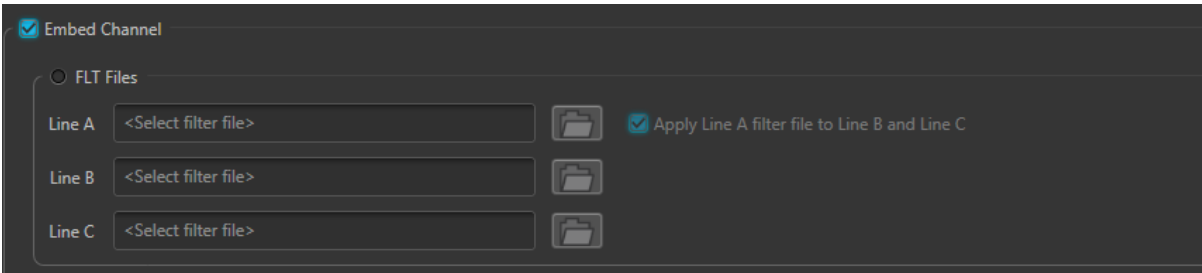


Figure 9: High speed jitter - Embed Channel - FLT file

Table 7: High speed jitter tab settings - Embed Channel - FLT files

Controls	Description	Range	Default Value
Embed Channel	Enables you to embed or emulate the channel effect either by using FLT files or S-parameter files.		
FLT Files	It refers to line A, line B, and line C.	NA	Selected, when Embed Channel is selected.
Line A	Enter the location of the saved line A FLT files or browse to the location.	NA	NA
Line B	Enter the location of the saved line B signal FLT files or browse to the location.	NA	NA
Line C	Enter the location of the saved line C signal FLT files or browse to the location.	NA	NA
Apply Line A filter file to Line B and Line C	Select to apply the filter file of Line A to Line B and Line C.	NA	Selected, when Embed Channel is selected.

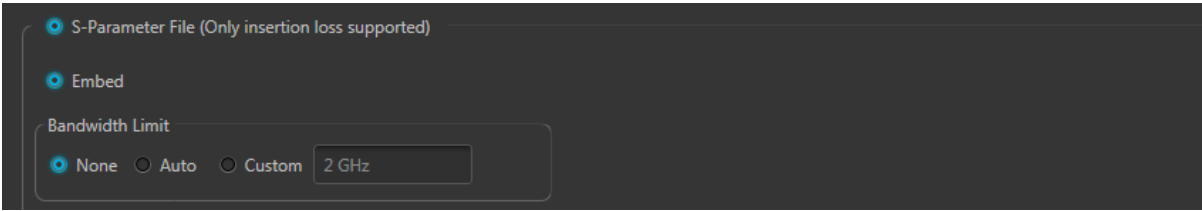


Figure 10: High speed jitter - Embed Channel - S-Parameter file

Table 8: High speed jitter tab settings - Embed Channel - S-Parameter file

Controls	Description	Range	Default Value
S-Parameter File	Emulate channel using various S-Parameter files.		
Embed	Select to embed the S-Parameter file.	NA	Selected by default.

Controls	Description	Range	Default Value
<b>Bandwidth Limit</b>	Enables the bandwidth of computed channel filter.		
None	If you select None, the cutoff frequency of the filter is $F_s/2$ (where $F_s$ is the sampling frequency).	NA	Selected by default
Auto	If you select Auto, the cutoff frequency is – 14 dB of the channel response.	NA	NA
Custom	If you select Custom, the cutoff frequency is the frequency that you specify.	Min: Sample rate/100 Max: Sample rate/2.5	9.6 GHz

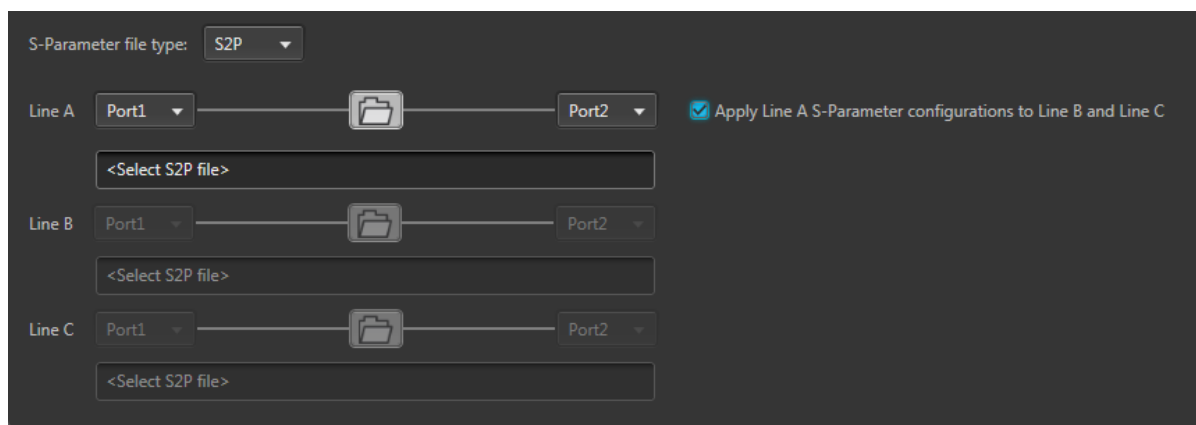


Figure 11: High speed jitter - Embed Channel - S-Parameter file type - S2P

Table 9: High speed tab settings - Embed Channel - S-Parameter file type -S2P

Controls	Description	Default Value
<b>S2P File type</b>	Select the S-Parameter file type from the drop-down.	S2P
<b>S2P</b>	Two port S parameter file.	
Line A	Selects the two ports for Line A. Port selection will not be the same.	NA
Port 1	Select to define the port.	NA
Port 2	Select to define the port.	NA
Browse	Browse to select the S2P file for Line A.	
Line B	Selects the two ports for Line B. Port selection will not be the same.	NA
Port 1	Select to define the port.	NA

Controls	Description	Default Value
Port 2	Select to define the port.	NA
Browse	Browse to select the S2P file for Line B.	
Line C	Selects the two ports for Line C. Port selection will not be the same.	NA
Port 1	Select to define the port.	NA
Port 2	Select to define the port.	NA
Browse	Browse to select the S2P file for Line C.	
Apply Line A S-Parameter file to Line B and Line C	When selected, uses the S-Parameter file of Line A to Line B and Line C.	Selected



S-Parameter file type: **S4P Single Ended**

**Line A Line B**

☒ Apply LineAB S-Parameter configurations to LineBC and LineCA

<Select S4P file>

**Line B Line C**

<Select S4P file>

**Line C Line A**

<Select S4P file>

Figure 12: High speed jitter - Embed Channel - S-Parameter file type - S4P - Single Ended

Table 10: High speed jitter tab settings - Embed Channel - S-Parameter file type - S4P Single Ended

Controls	Description	Default Value
<b>S4P Single Ended</b>	Four port single ended S parameter file.	
Line A Line B	Selects the four ports for Line A Line B.	
Port1	Select to define the port.	NA
Port2	Select to define the port.	NA
Port3	Select to define the port.	NA
Port4	Select to define the port.	NA
Browse	Browse to select the S4P Single Ended file.	

Controls	Description	Default Value
Line B Line C	Selects the four ports for Line B Line C.	
Port1	Select to define the port.	NA
Port2	Select to define the port.	NA
Port3	Select to define the port.	NA
Port4	Select to define the port.	NA
Browse	Browse to select the S4P Single Ended file.	
Line C Line A	Selects the four ports for Line C Line A.	
Port1	Select to define the port.	NA
Port2	Select to define the port.	NA
Port3	Select to define the port.	NA
Port4	Select to define the port.	NA
Browse	Browse to select the S4P Single Ended file.	
Apply LineAB S-Parameter file to LineBC and LineCA	When selected, uses the S-Parameter file of Line AB to Line BC and Line CA.	Selected

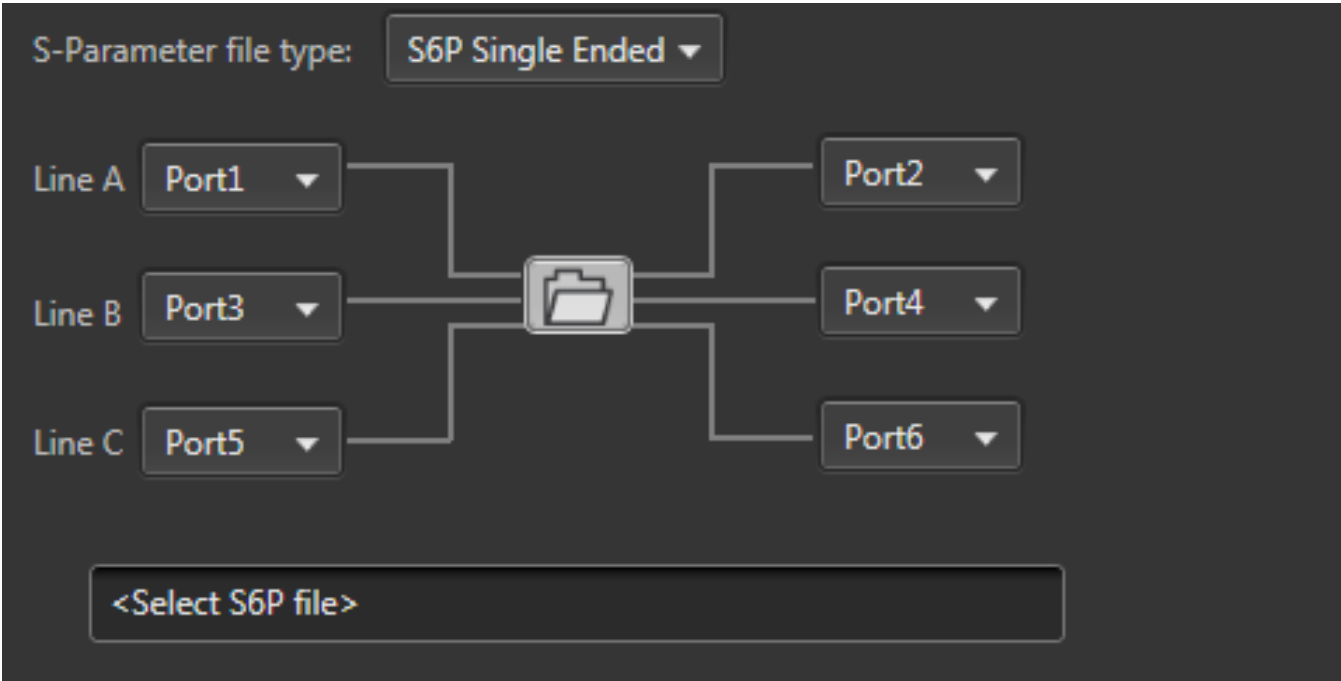


Figure 13: High speed jitter - Embed Channel - S-Parameter file type - S6P Single Ended

Table 11: High Speed tab settings - Embed Channel - S-Parameter file type - S6P Single Ended

Controls	Description	Default Value
S6P Single Ended	Six port single ended S parameter file.	
Port1	Select to define the port.	NA

Controls	Description	Default Value
Port2	Select to define the port.	NA
Port3	Select to define the port.	NA
Port4	Select to define the port.	NA
Port5	Select to define the port.	NA
Port6	Select to define the port.	NA
Browse	Browse to select the S6P Single Ended file.	

### High speed burst

This tab allows you to configure the protocol data - Preamble, Sync, and Post Pattern. When selected, this check box inserts the protocol data into the waveform along with the payload specified in HS tab.

High Speed High Speed Jitter **High Speed Burst** Low Power Low Power Noise High Speed Batch Mode Preferences Compile Settings Log View

☒ Create Burst

☒ Include High Speed Base Pattern Previous Wire State +x

**Preamble Pattern**

☒ PreBegin ☒ ProgSeq ☒ PreEnd

Pattern

Repeat  x 7  x 14  x 7

Preamble Length  Symbols

Note: Preamble length = [(PreBegin Repeat \* 7) + (ProgSeq Repeat \* 14) + (PreEnd Repeat \* 7)]

☒ Sync Word

Sync Word Repeat  x 7 =  Symbols

☒ Post Pattern

Post Pattern Repeat  x 7 =  Symbols

Note:  
Preamble, sync and post patterns are each specified by 7 symbols.  
A symbol is defined by a value in the range: {0,1,2,3,4}

You can select a set of patterns and compile waveforms using these patterns.

The table below describes the High speed burst parameters:

**Table 12: High speed burst**


Parameter	Description	Range	Default value
<b>Create Burst</b>	Enable this option to additional insert the burst constituents to the waveform along with the payload specified in HS tab.		Not selected
Include High Speed Base Pattern	Enable this option to include High Speed Base pattern.		
Previous Wire State	Select the wire state.	+x -x +y -y +z -z	+x
<b>Preamble Pattern</b>	Specify the preamble with 7 symbols.		
PreBegin	Select to include PreBegin.		
Preamble PreBegin Pattern	Specify the preamble PreBegin pattern, with 7 symbols.	0,1,2,3,4 symbols	3333333
Preamble PreBegin Repeat	Specify the number of times to repeat the preamble PreBegin pattern. Specify the preamble with 7 symbols.	0 to 2000 symbols	63
ProgSeq	Select to include ProgSeq.		
ProgSeq Pattern	Specify the ProgSeq pattern, with 7 symbols. Disabled by default.	0,1,2,3,4 symbols	3333333333333
ProgSeq Repeat Pattern	Specify the number of times to repeat the ProgSeq pattern.	0 to 16 symbols	1
PreEnd	Select to include PreEnd.		
Preamble PreEnd Pattern	Specify the preamble PreEnd pattern, with 7 symbols. Specify the 7 symbols.	0,1,2,3,4 symbols	3333333
Preamble PreEnd Repeat Pattern	Specify the number of times to repeat the preamble PreEnd pattern.	0 to 10 Symbols	1
Preamble Length	Specify the preamble length. Preamble length is the sum of PreBegin Repeat, ProgSeq Repeat and PreEnd Repeat.	Preamble length = [(PreBegin Repeat*7) + (ProgSeq Repeat * 14) + (PreEnd Repeat * 7)]	By default preamble length shows 448 symbols

Parameter	Description	Range	Default value
Sync Word	Select this option to include the 7 symbols.	0,1,2,3,4 symbols	3444443
Sync Word Repeat	Specify the number of times to repeat sync word.	0 to 10	1 repeat that is 7 Symbols
Post Pattern	Select this option to include the 7 Post Pattern symbols.	0,1,2,3,4 symbols	4444444
Post Pattern Repeat	Specify the number of times to repeat the Post Pattern.	0 to 2000	32 repeat that is 224 Symbols.

**Low power** This tab allows you to configure the basic parameters of the Low Power signal.

High Speed High Speed Jitter High Speed Burst **Low Power** Low Power Noise High Speed Batch Mode Preferences Compile Settings Log View

**Base pattern**

Pattern **ULPS**  

☐ Include LP content in Low Power - High Speed (LP-HS) Signal Mode

**Symbol**

Symbol rate **20 MHz** TLPX **50 ns**

**Rise/Fall**

Rise/Fall time (15%-85%) **0.1 UI** = **5 ns**

**Line levels (High impedance)**

High Low

Line A **1 V** **50 mV** ☒ Use Line A levels for Line B and Line C ?

Line B **1 V** **50 mV**

Line C **1 V** **50 mV**

**LP-HS Entry/Exit timing (Applicable in LP-HS Signal mode)**

Start LP-111 duration **2** LP symbols = **100 ns**

LP-000 duration(t3\_PREPARE) **1** LP symbols = **50 ns**

☐ Enable THS\_Exit

End LP-111 duration **2** LP symbols = **100 ns**

You can select a set of patterns and compile waveforms using these patterns.  
The table below describes the parameters:

Table 13: Low power

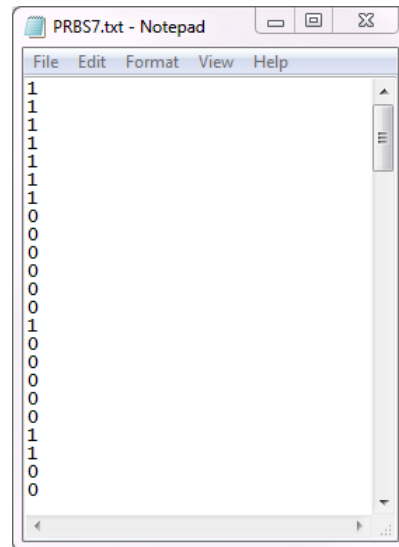
Parameter	Description	Range	Default value
<b>Base Pattern</b>	Select the base pattern file from the list.		
Pattern	Select the input Base Pattern / Bit Pattern for waveform generation.  <i><b>NOTE.</b> The Low Power state file allows to browse a LP file, Test file allows to browse to .txt file.</i>	ULPS Low power state file Text file	ULPS
Include LP content in Low Power - High Speed (LP-HS) Signal Mode	This is applicable only when the signal mode is Low Power-High Speed (LP-HS). When selected the LP content specified by the Base Pattern will be included in the LP-HS signal.	NA	Disabled
<b>Symbol</b>			
Symbol Rate	Specify the symbol rate of the LP signal.	10 to 100 MHz	20 MHz
TLPX	Displays the value based on the symbol rate entered.	Value depends on the value of the symbol rate.	50 ns
<b>Rise/Fall</b>	Specifies the rise / fall time of the signal.		
Rise/Fall time (15%-85%)	Specifies the rise/fall time of the LP signal.	0.01 to 0.5 UI	0.1 UI
<b>Line Levels (High Impedance)</b>	Specify the LP line voltages for the receiver at high impedance.		
High	Specify the high-level voltage (high impedance) for LP signals for lines A, B, and C. High line levels = Low line levels + 200 mV.	500 mV to 1.3 V	1 V
Low	Specify the low-level voltage (low impedance) for lines A, B and C.	-100 mV to 700 mV	50 mV
Use Line A levels for Line B and Line C	When selected considers the voltage levels of line A for line B and line C.		
<b>LP-HS Entry/Exit Timing</b>	Specify the LP-HS entry/exit timing. This is applicable only when the signal mode is Low Power-High Speed (LP-HS).		

Parameter	Description	Range	Default value
Start LP-111 duration	Specify the start of LP-111 duration.	1 to 100 Symbols	2 Symbols
LP-000 Duration (t3_PREPARE):	Specify the LP-000 duration.	0.5 to 100 Symbols	1 Symbol
Enable THS_Exit	Enables the End LP_111 duration.		
End LP_111 duration	Specifies the end of LP-111 duration.	1 to 100 Symbols	2 Symbols
<b>NOTE.</b> Displays only if Enable THS_Exit is enabled.			

**Selecting file types.** Supported Base Pattern file types to browse are:

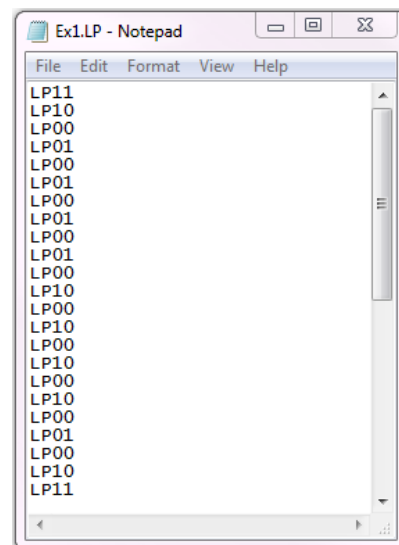
- Bit file
- LP file

**Bit file.** The Bit files use the .txt extension. The range of elements for a bit file is [0,1].



**Figure 14: Example of Bit file**

**LP file.** The extension for LP file is .LP. The range of elements for a LP file is [LP00, LP01, LP10, LP11].



**Figure 15: Example of LP file**



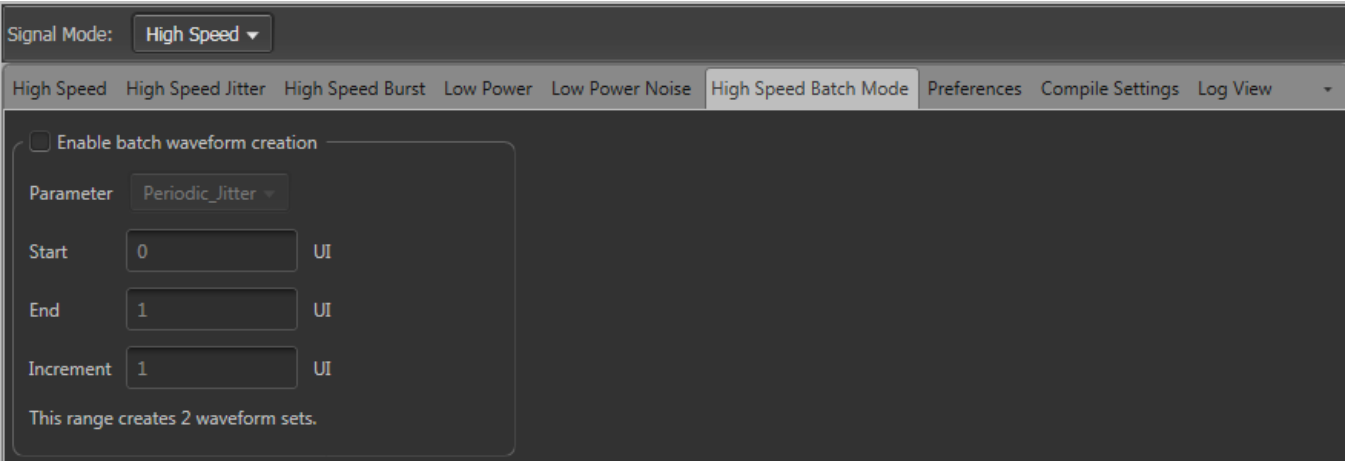
**Low power noise**

This tab allows you to configure the basic parameters of the Low power noise signal.

Parameter	Description	Range	Default value
<b>Impairments (Applicable in LP signal mode)</b>			
<b>Sine Noise</b>	Select to generate noise in the waveform. Selecting this check box, activates Amplitude (Peak) and Frequency controls.		
Amplitude (Peak)	Specify the amplitude in volts to generate the desired sine noise.	Min: 0 V Max: 300 mV	0 V
Frequency	Enter the frequency in Hz to generate the desired sine noise.	Min: 100 kHz Max: 5 GHz  <i><b>NOTE.</b> The maximum value depends on the symbol rate in the LP tab.</i>	1 MHz
Apply to	All lines are enabled when Sine Noise is enabled.		
Line A	Enables the sine noise frequency for Line A.	NA	Selected
Line B	Enables the sine noise frequency for Line B.	NA	Selected
Line C	Enables the sine noise frequency for Line C.	NA	Selected
<b>eSpike</b>	Select to add Spike to the waveform.		
Area	Specify the area of the eSpike.	100 to 400 Vps	200 Vps
Duration	Specify the duration of the eSpike.	1 to 5 ns	2 ns
Apply to	Select to add eSpike to all the lines.		

Parameter	Description	Range	Default value
Line A	Enables the eSpike area and duration for Line A.	NA	Selected
Line B	Enables the eSpike area and duration for Line B.	NA	Selected
Line C	Enables the eSpike area and duration for Line C.	NA	Selected
TMin	Minimum width of the Low power pulse.	10 ns to 100 ns <i>NOTE. Max value depends on the symbol rate of the LP signal.</i>	20 ns

**High speed batch mode**      Use this tab to configure the parameters of the High Speed Batch mode.



Parameter	Description	Default value
Enable batch waveform creation	Enables the batch waveform creation.	Disabled
Parameter	Select the parameter to configure the waveform.	Periodic_Jitter

Listed is the default range of increment values for all the parameters:

Parameter	Units	Range		
		Start	End	Increment
Periodic Jitter	UI	Min: 0 Max: 0.99	Min: 0.01 Max: 1	Min: 0.01 Max: 1
Periodic_Jitter_Frequency	MHz	Min: 1 Max: 299	Min: 2 Max: 300	Min: 1 Max: 299
Random_Jitter	UI	Min: 0 Max: 0.29	Min: 0.01 Max: 0.3	Min: 0.01 Max: 0.3
Duty_Cycle_Distortion	%	Min: 0 Max: 39	Min: 1 Max: 40	Min: 1 Max: 40
PreBegin_Repeat	Words	Min: 0 Max: 999	Min: 1 Max: 1000	Min: 1 Max: 1000
Post_Repeat	Words	Min: 0 Max: 63	Min: 1 Max: 64	Min: 1 Max: 64

---

**NOTE.**

- *Increment value is depends on Start and the End value.*
  - *End and increment value depends on the Start value.*
-

**Preferences** This tab allows you to define the preferences for the compiled waveform.

High Speed High Speed Jitter High Speed Burst Low Power Low Power Noise High Speed Batch Mode Preferences Compile Settings Log View

Sample rate

Auto

Manual

Samples per UI 16 Sample rate 24GHz

AWG Amplitude and Offset control

Auto (Recommended)

Manual

Offset 400 mV

Amplitude 400 mV

Apply Correction File

Master Ch1

<Select correction file>

Apply Master Ch1 correction file to all channels

Master Ch2

<Select correction file>

Apply Gaussian Filter

Slave Ch1

<Select correction file>

Bandwidth

12 GHz

Slave Ch2

<Select correction file>

Remove corrections for Sin(x)/x distortions from correction file

Startup Signal

Line A

LP-High

Line B

LP-High

Line C

LP-High

Skew

Line A to Line B

0 s

Line A to Line C

0 s

You can select a set of parameter preferences for the waveforms.  
The table below describes these parameters:

**Table 14: Preferences tab**

Parameter	Description	Range	Default value
<b>Sample Rate</b>	Specifies the sample rate of the waveform.		
Auto	Select to allow the application to choose an optimal sample rate for the waveform.	NA	Default
Manual	Select to specify the sample rate for the signal by setting the Samples per UI (SPUI).		Not selected

Parameter	Description	Range	Default value
Samples per UI	Specify the samples per UI (SPUI), which dictates the sample rate for the waveform to be created. This is applicable when the Sample rate selection is 'Manual'. The range of values of this depends on the HS symbol rate.	Signal mode: High Speed, 4 to 500 Signal mode: Low Power, 4 to 2500	Signal mode: High Speed <ul style="list-style-type: none"> <li>Auto mode: 16</li> <li>Manual mode: 16</li> </ul> Signal mode: Low Power <ul style="list-style-type: none"> <li>Auto mode: 100</li> <li>Manual mode: 100</li> </ul>
Sample rate	The value of the resulting sample rate is displayed for users information.	Signal mode: High Speed, 6 GHz to 24 GHz Signal mode: Low Power, 0.08 GHz to 25 GHz	Signal mode: High Speed <ul style="list-style-type: none"> <li>Auto/Manual mode: 24 GHz</li> </ul> Signal mode: Low Power <ul style="list-style-type: none"> <li>Auto/Manual mode: 2 GHz</li> </ul> <p><b>NOTE.</b> Sample Rate = (Symbol Rate) x (Samples Per UI)</p>
<b>AWG Amplitude and Offset control</b>	Enable this option to include AWG Amplitude and Offset control for the waveform.		
Auto (Recommended)	Automatically sets the AWG amplitude and offset values.	NA	Selected
Manual	Enables AWG amplitude and offset.	NA	Not selected
Offset	Specify the offset value manually.	-400 to 800 mV	400 mV
Amplitude	Specify the AWG amplitude value manually.	31 mV to 1.2 V	400 mV
<b>Apply Correction File</b>	Enables the application of correction file.		Not Selected
Master Ch1	Select to apply the correction file on Master Ch1 waveform.	NA	Not Selected. Enables when Apply Correction File is selected.
Master Ch2	Select to apply the correction file on Master Ch2 waveform.	NA	Not Selected

Parameter	Description	Range	Default value
Slave Ch1	Select to apply the correction file on Slave Ch1 waveform.	NA	Not selected. Enables when the slave is connected
Slave Ch2	Select to apply the correction file on Slave Ch2 waveform.	NA	Not selected. Enables when the slave is connected
Use Master Ch1 connection file to all the channels	Select to apply the correction file of the Master ch1 to all channels.	NA	Not Selected. Enables when Apply Correction File is selected.
Apply Gaussian filter	Select to apply the Gaussian filter to correct the signal.	NA	Not Selected
Bandwidth	Enter the bandwidth of the signal. The available bandwidth setting depends on the AWG sample rate and the frequency resolution setting.	Sample rate/100 to sample rate/2	12 GHz
Remove correction for Sin(x)/x distortions from correction file	Enables removal of correction for Sin(x)/x distortions from correction file.	NA	Not Selected
<b>Startup Signal</b>	Select to include the start up signal.  <b>NOTE.</b> Applicable only for Auto mode of AWG and Amplitude offset control in LP and LP-HS signal mode.		
Line A, B, and C	Select the LP-High or LP-Low signal for line A, B, and C.		
<b>Skew</b>	Specify the skew (of the output waveform).		
Line A to Line B	Specify the skew to be introduced between line A and B signals.	2 ns to -2 ns	0 sec
Line A to Line C	Specify the skew to be introduced between the line A and C signals.	2 ns to -2 ns	0 sec

### Correction file

When testing a Device under test, make sure that the test equipment generating the signal is of better quality than the Device under Test. Signal Generators and AWG's require a flat amplitude and linear phase response in the band of interest to generate high-quality waveforms. The influence of the AWGs and the cables on the signals which could distort the signals should be de-embedded from the signals before sending it to the DUT.

For a detailed procedure to create a correction file, please refer to *Generic Precompensation Plug-in Application* manual.

### Applying the correction to the test signal

Correction files can be applied to any waveform in the AWG waveform list. By default, the correction file feature is disabled. To apply corrections, enable “**Apply correction file**” in the **Compile Settings** tab. The slave correction file controls will be enabled only if the slave is connected. You can select a correction file for each channel using the Browse button. The correction file will be applied only for the channels that are enabled in the application.

**Compile settings** This tab allows you to define the settings for the compiled waveform.

The screenshot shows the 'Compile Settings' tab in a software application. At the top, there is a 'Signal Mode' dropdown set to 'High Speed'. Below this is a horizontal menu with tabs: 'High Speed', 'High Speed Jitter', 'High Speed Burst', 'Low Power', 'Low Power Noise', 'High Speed Batch Mode', 'Preferences', 'Compile Settings' (selected), and 'Log View'. The main content area is divided into sections. The 'Waveform' section has 'Sequence Name' (CPhySequence) and 'Name' (CPHY\_Example) text boxes, with an 'Override existing waveform name' checkbox. The 'Compile/Assign waveforms' section has radio buttons for 'Compile' (selected) and 'Compile and assign to', and a checkbox for 'Append to the waveform sequence in AWG'. There is also a checked checkbox for 'Switch to Log View during Compile'. The 'Master' section has two channel dropdowns (CH1: VA, CH2: VB). The 'Enable Slave' section has an unchecked checkbox, an 'IP Address' field with four '0' digits, a 'Connect' button, and two channel dropdowns (CH1: VC, CH2: VC).

**Table 15: Compile settings tab**

Parameter	Description	Range	Default value
<b>Waveform</b>			
Sequence Name	Specify the name of the sequence.		CPhySequence

Parameter	Description	Range	Default value
Name	Specify the name for the compiled waveform. The name will be automatically incremented. This helps you to create multiple waveforms without the need to change the name.	Alphanumeric without spaces.	CPHY_Example
Override existing waveform	Select to replace the waveform if the waveform name is the same. If the waveform name is not the same, then the created waveform will be listed along with the new name in the waveform list.		
Compile/Assign waveforms			
Compile	Compiles the waveform only.		Default
Compile and assign to	Compiles and loads the waveform to the specified channel.		
Append to the waveform sequence in AWG	Select, to append the waveform to the old sequence. Clear to create a new sequence of waveform.		
Master	Select the Master AWG.		
	NOTE. Activates only when Compile and assign to is enabled.		
CH1	Specify the waveform line to be loaded on Ch1, if <b>Compile and assign to</b> is selected.	VA VB	VA
CH2	Select the waveform line to be loaded on Ch2.	VA VB	VB
Enable Slave	Enables slave AWG specific controls.		Not selected
IP Address	Specify the slave IP address.	NA	Dimmed
Connect	Connects to the Slave.	NA	Dimmed
CH1	Specify the waveform line to be loaded on Ch1 on the AWG, if <b>Compile and assign to</b> is selected.	VA VB VC	VC
CH2	Select the waveform line to be loaded on Ch2 on the AWG.	VA VB VC	VC



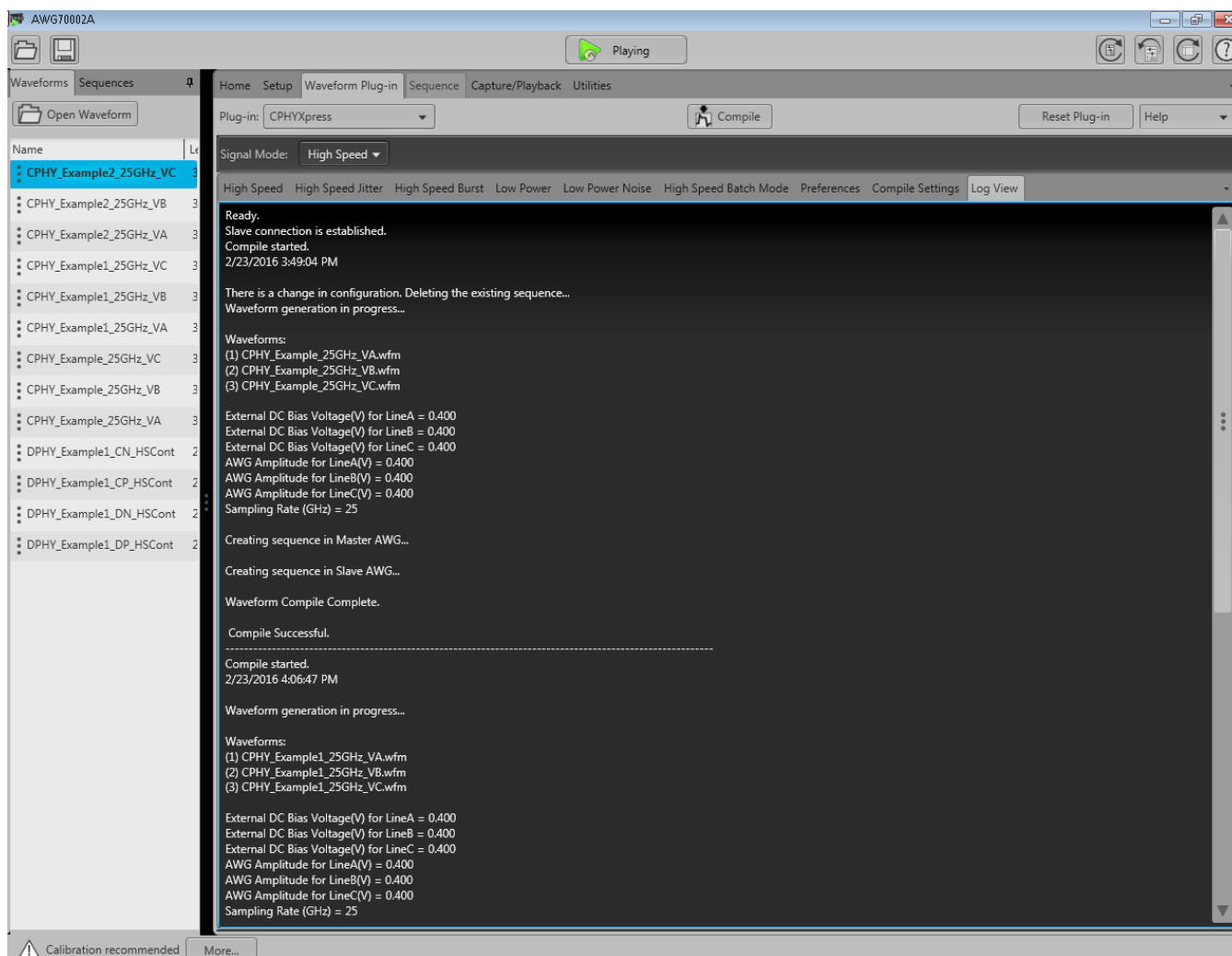
## Compile and transfer signal

To compile and transfer the waveform:

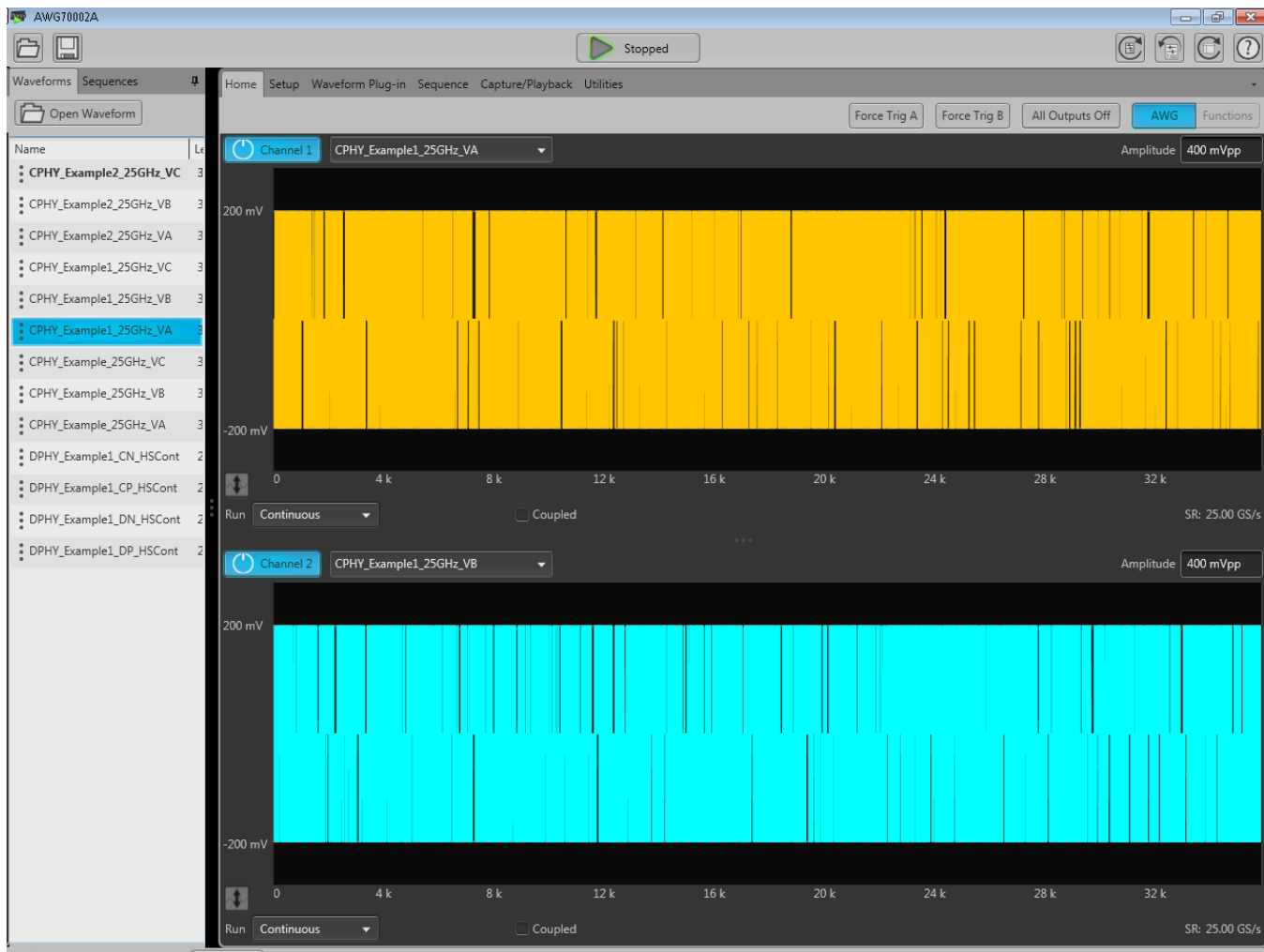
1. Click **Compile** in the toolbar.

You can view the details of the waveform in the **Log View**.

The compiled waveform is displayed in the waveform list. The waveform name is same as the pattern selected.



2. Select the **Home** menu from the AWG.
3. To load the waveform into the oscilloscope, drag and drop the waveform from Waveform list to the AWG channel (Ch1/Ch2).



You can view the waveform in the AWG.

4. Click **Channel 1** and **Channel 2** to turn on the AWG channels.

---

### NOTE.

*You do not need to assign a channel if **Compile and assign to** is selected in **Preferences** tab.*

*You need to manually drag the waveform to AWG channels if 'Compile' is selected in **Compile Setting** tab.*

---

5. Click **Play**.

The waveform is transferred to the oscilloscope: You can view the waveform in the oscilloscope.





# Reference

## Error messages

The following table lists the error codes for the application.

**Table 16: Error messages for CPHYXpress**

Error code	Error Type	Error messages
8800	Channel Filter File Error	High Speed: Channel Filter file not found or has invalid content.
8801	Base Pattern File Error	High Speed: Text file not found or has invalid content.
8802	Base Pattern File Error	Low Power: Text file not found or has invalid content.
8803	PRBS Error	High Speed: All zero PRBS seed value is invalid.
8804	Compile Error	Waveform compilation failed.
8805	eSpike Error	Low Power: eSpike Synthesis Failed - Increase the Samples per UI (SPUI), or change eSpike Area or Duration.
8806	Channel Filter File Error	High Speed: Embed Channel - Filter file data may be invalid. The sample rate of filter file does not match the sample rate of the waveform.
8807	VISA Communication Error	Visa communication failed. For more details refer to <a href="#">Troubleshooting</a> section of the OLH.
8808	Slave AWG Connection Error	Slave AWG configuration is incorrect. For more details refer to the <a href="#">Troubleshooting</a> section of OLH.
8809	S-Parameter file Error	S-Parameter file not found.
8810	Correction file Error	Invalid Correction file.
8811	Custom Base Pattern file Error	High Speed: Invalid Custom base pattern file.
8812	Custom Base Pattern file Error	Low Power: Invalid Custom base pattern file.
8813	S-Parameter file Error	Invalid S-Parameter file.

Error code	Error Type	Error messages
8814	HS Pattern Error	HS pattern length is zero. At least one portion of the pattern needs to be enabled and configured.
8815	Base Pattern file Error	Low Power - High Speed: Text file not found or has invalid content.
8816	Embed Channel filter file Error	Invalid filter file.
8817	Amplitude and Offset Error	Waveform with specified amplitude and offset values for the voltage levels cannot be achieved. Try with amplitude and offset control set to Auto.
8818	Base Pattern file Error	High Speed: Symbol file not found or has invalid content.
8819	Base Pattern file Error	High Speed: Wire state file not found or has invalid content.
8820	Base Pattern file Error	Low Power: Low power state file not found or has invalid content.
8821	Base Pattern file Error	Low Power - High Speed: Symbol file not found or has invalid content.
8822	Base Pattern file Error	Low Power - High Speed: Wire state file not found or has invalid content.
8823	Base Pattern file Error	Low Power - High Speed: Low power state file not found or has invalid content.
8824	Compile Error	A trigger waveform cannot be created for cases when LP voltage swing is less than HS voltage swing.
8825	Correction file Error	Correction file not found or has invalid content.
8826	Startup Signal Error	Startup signal is not applicable in High Speed mode.
8827	Correction Configuration Error	Channel waveform types are same and correction files are different.
8829	Correction Configuration Error	Correction is not enabled on the channel.
1613	MDC4500 error	Lost connection to MDC4500 (-100); Check the USB connection between AWG and MDC.

## How to

### Enable PC to use the software

You need to configure the Master AWG from the SourceXpress installed in the PC and configure the Slave using Remote Desktop Connection to create the waveforms and assign it to the Master and Slave AWG.

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**NOTE.** *Enable Slave AWG configuration before configuring the Master AWG.*

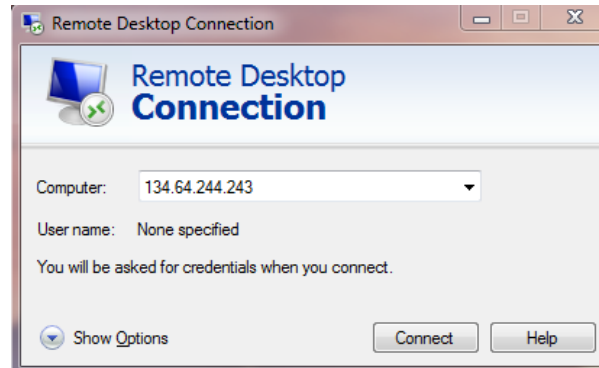
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Steps to compile waveforms on the master AWG and transfer the waveform to the slave AWG:

1. Configure Slave AWG.
2. Configure Master AWG.
3. Compile waveforms from PC.
4. Run the waveforms.

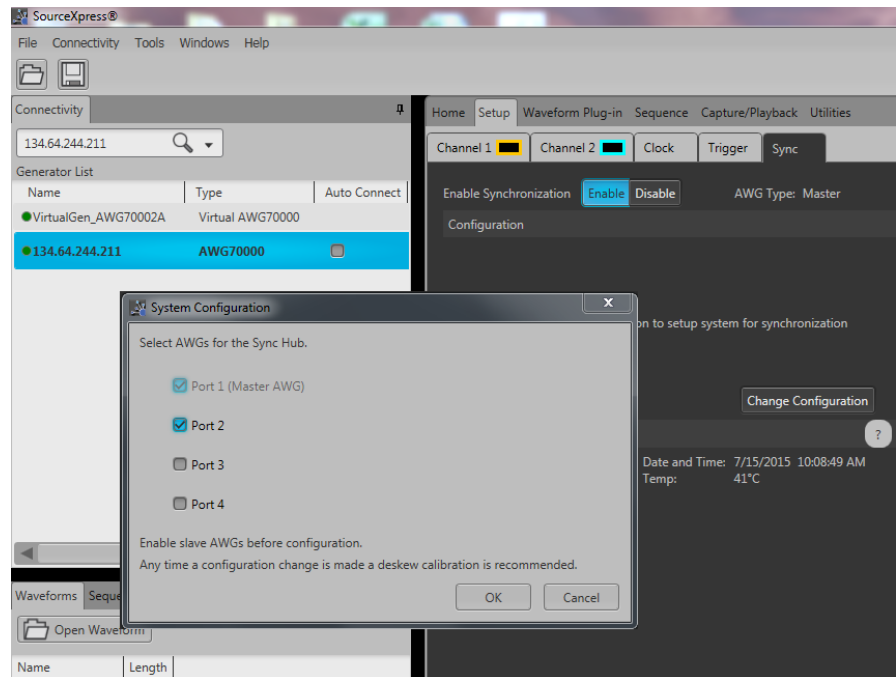
### 1. Configure Slave AWG (Enable Sync in Slave)

- Using Remote Desktop Connection or VNC Viewer, connect to the Slave AWG using the IP address.

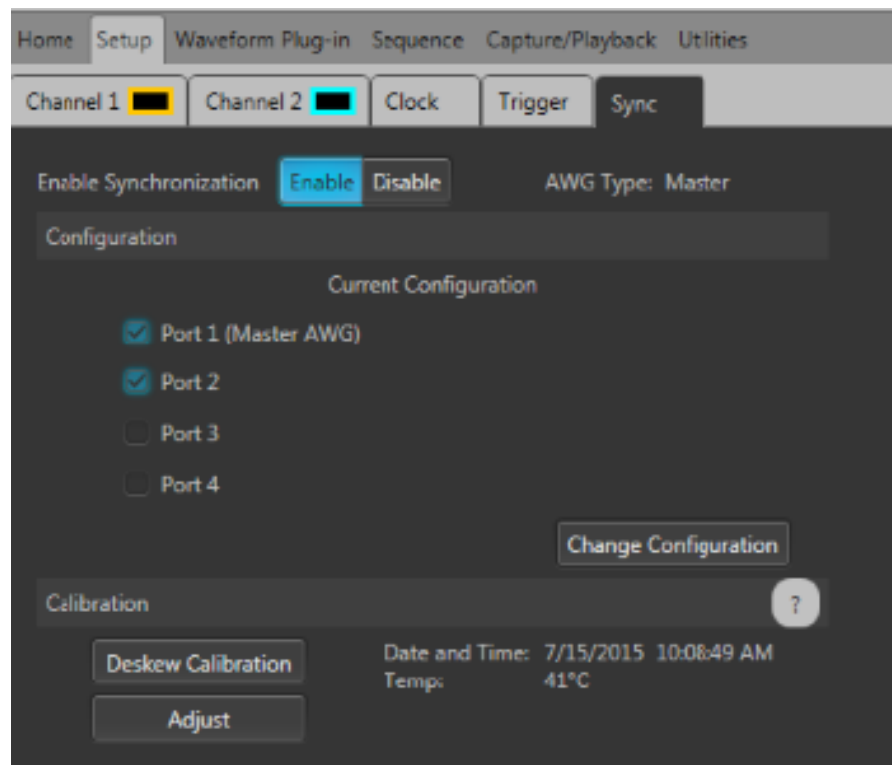




- Select **Setup** tab, and click **Sync**.
- Select **Enable**.
- Click **OK**.



The Slave AWG is configured.



## 2. Configure Master AWG

- Select the **Connectivity** tab.
- Enter the IP address of the Master AWG. A popup appears displaying that a connection is in progress.

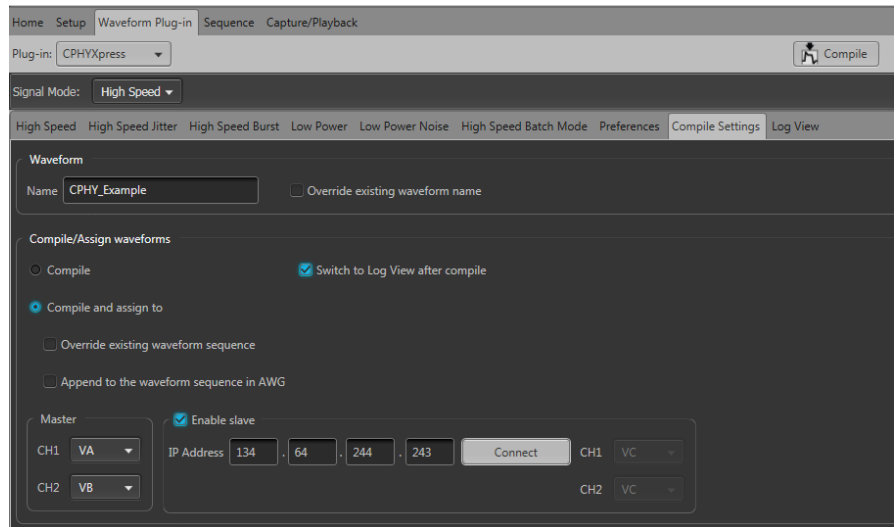
Displays the IP address of the configured Master AWG in the **Generator list**.

- Select the **Setup** tab, and click **Sync**.
- Select **Enable**.
- Click on change configuration and select the port where the slave is connected (Port 2, 3 or 4).
- Click **OK**.

## 3. Compile Waveform from PC

- Select **Waveform Plug-in -> CPHYXpress -> Compile settings**.
- Select **Compile and assign to**.
- Assign the waveforms to the **Master channels CH1 or CH2**.
- Enable Slave.
- Enter the slave IP Address.
- Click **Connect**. The slave AWG is connected. Assign the waveforms to the Slave channels CH1 or CH2.

- Click **Compile** to compile the waveform.



- The waveform is generated and it is displayed in the Waveform tab.

#### 4. Run the Waveforms

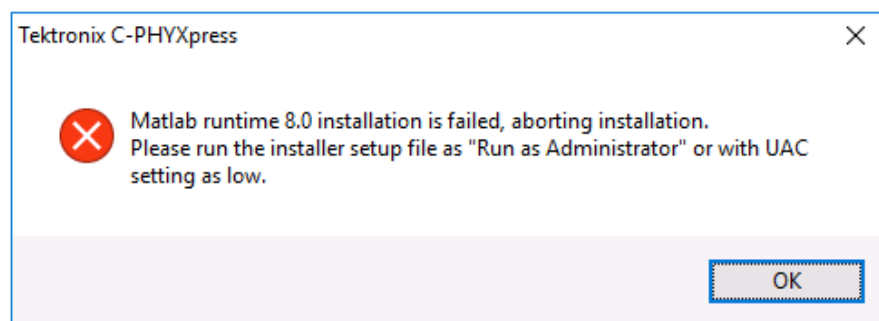
**NOTE.** Connect Master and Slave AWG channels to the Scope channels.

#### Check MCR is installed.

To check whether MCR is installed, click **Start > Control Panel > Programs** > click **Uninstall a program**. List of programs installed are populated in a window. If MCR is installed, then it appears in the list.

#### Check if MCR installation fails.

If MCR installation fails, change the UAC (User Account Control) setting as low, in the control panel or run the application as Administrator.



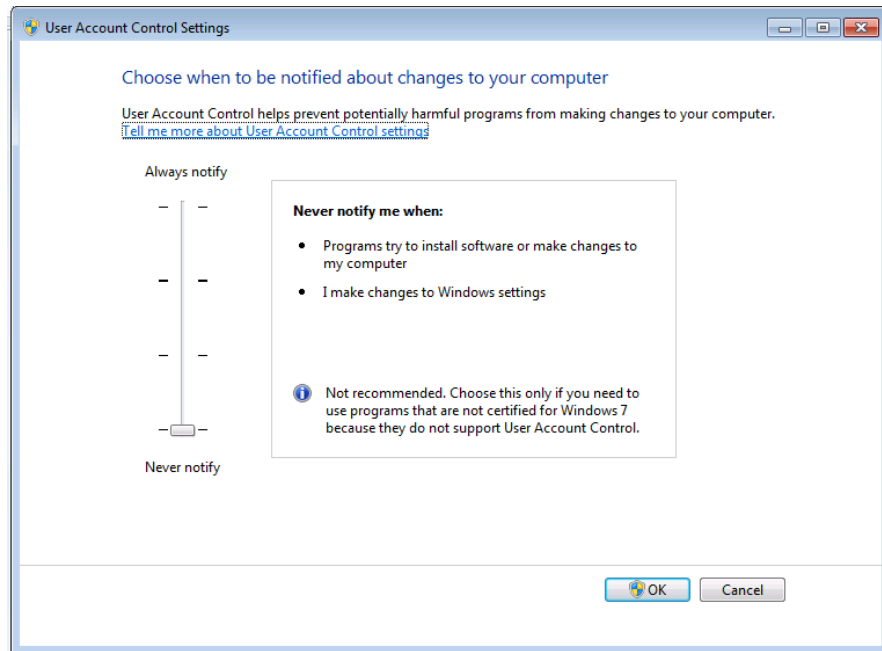



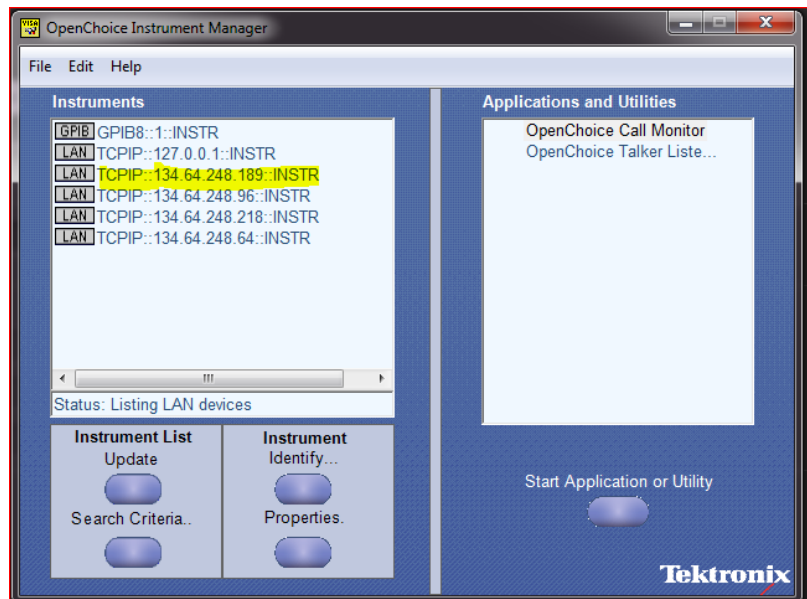
Figure 16: User Account Control Settings

## Troubleshooting

Listed below are the frequently reported issues and the ways to troubleshoot them.

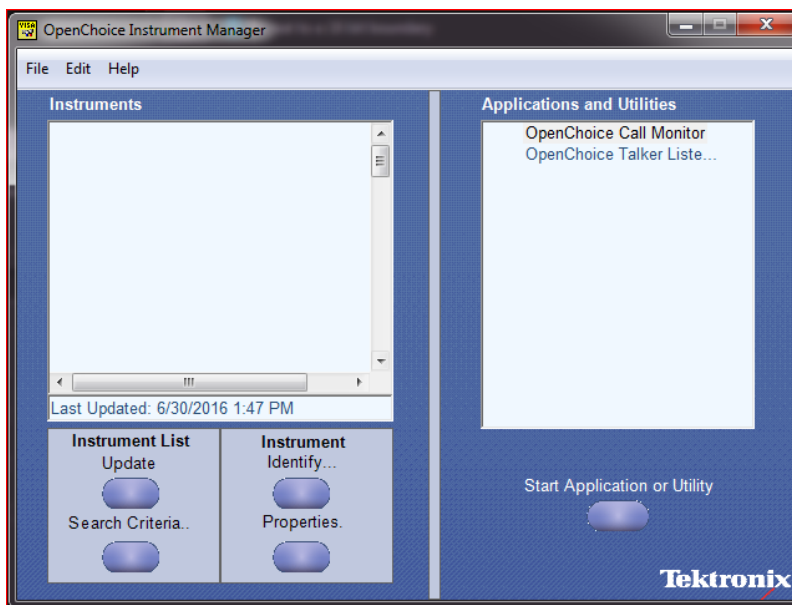
**Slave AWG Connection Error and VISA Communication Error:** This error occurs because of one among the following reasons:

- Invalid slave IP or slave is offline or AWG software is not launched in slave or slave AWG model is not supported.
- TekVisa LAN server has stopped. Follow the below steps on Master and Slave AWG to fix this issue.
  1. Run ServerControl.exe from C:\Program Files (x86)\IVI Foundation\Visa\WinNT\TekVISA\Bin\.
  2. A tray icon  appears on the task bar.
  3. Right click the icon and select Start VX-11 Server if it is not started.
- Check whether the slave IP address is listed in Open Choice Instrument Manager. If the slave IP address is not listed, then use the following steps to check and add the instrument.
  1. Run TekInstrMgr.exe from C:\Program Files (x86)\IVI Foundation\Visa\WinNT\TekVISA\Bin.
  2. Check whether the slave IP address is listed as in the below screen.



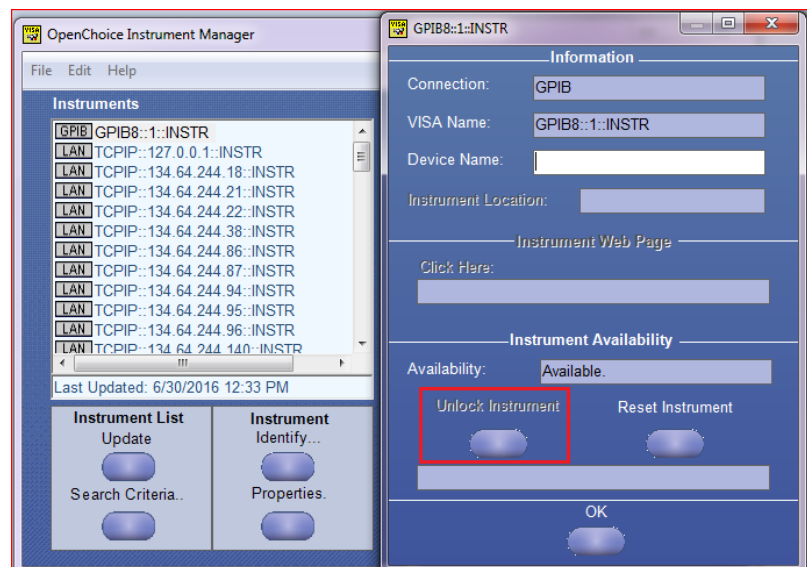
3. If the slave address is not listed, use the steps below:
  - a. Ensure GPIB, LAN and VXI LEDs are ON.
  - b. Under LAN, select **Auto Discovery**.
  - c. Enter the slave IP for Hostname, click the down arrow button, and click **Done**.
  - d. Click **Update** and wait for some time to view the Slave IP in the list.

- The Instrument Manager is unable to recognize Virtual GPIB. The Instrument list appears to be blank as below even after updating in OpenChoice Instrument Manager. TekVisa needs to be re-installed to fix this issue.



- This could be either because of slave configuration or improper installation of TekVisa.
- The instrument might have got locked. Follow the steps below to unlock it.
  1. Run TekInstrMgr.exe from C:\Program Files (x86)\IVI Foundation\VISA\WinNT\TekVISA\Bin.
  2. On Master/ SourceXpress, select GPIB::1::INSTR in the list and click **Properties**.

3. Click **Unlock Instrument** button if it is locked.



### No waveforms assign to channel

To assign waveforms to a channel:

- Select **Window > Waveform List** to view the waveforms are assigned to channel. If the waveforms are not assigned to channels, you need to assign the channels to the waveform.
- Select **Compile Settings > select Compile and assign to** and select the Channels.

### Slave configuration

To configure the slave, select **Compile and assign to** in **Preferences** tab.

1. Select **Enable slave** to enable slave specific controls.
2. Provide the IP Address of the slave.
3. Click **Connect**.

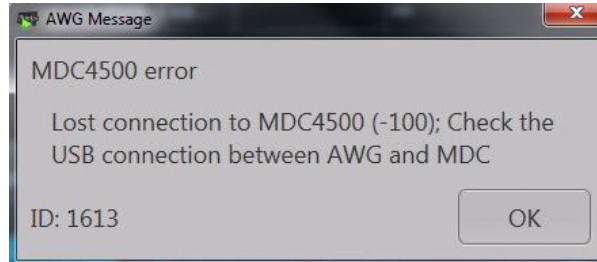
#### NOTE.

- Enter only the valid Slave IP Address.
- Slave should be online.
- The control channel is enabled.

4. Select the waveforms to be assigned to the respective channels.

**MDC error** The MDC error pop-up is displayed in either of the context:

- The MDC USB cable from AWG Master/Slave is removed or when there is a loose connection of the cable.
- In the process of compiling and transferring the signals to the oscilloscope.



## Parameter definitions

Definitions of the jitter and time related parameters are given in the following table:

**Table 17: Jitter/Time parameters and their description**

Parameters	Description
<b>Jitter</b>	
RJ	Random Jitter is jitter that does not exhibit deterministic behavior and is not bounded.
PJ	Periodic Jitter is the portion of the deterministic jitter that is periodic, but for which the period is not correlated with any data in the waveform. It is measured by peak-to-peak variation and frequency.
DCD	Duty Cycle Distortion is the portion of the deterministic jitter directly correlated with waveform polarity (the difference in the positive edges and negative edges).
Noise	This is a type of additive noise that modifies the vertical amplitude of the serial data and contributes to the jitter.
<b>Time</b>	
Rise Time	Elapsed time between the low reference level crossing and the high reference level crossing on the rising edge of the waveform. It is measured in time units between the 10% and 90% levels or between the 20% and 80% levels.
Fall Time	Elapsed time between the high reference level crossing and the low reference level crossing on the falling edge of the waveform. It is measured in time units between the 10% and 90% levels or between the 20% and 80% levels.



# Commands group

## High speed group commands

Command	Description
<i>CPHY:HSPEed:PATtern</i>	Sets or returns the High Speed base pattern type.
<i>CPHY:HSPEed:CUSTom:FILE</i>	Sets or returns the custom base pattern file path.
<i>CPHY:HSPEed:SRATe</i>	Sets or returns the symbol rate for High Speed base pattern.
<i>CPHY:HSPEed:RTFT:VALUe</i>	Sets or returns the rise and fall time of the signal for High Speed base pattern.
<i>CPHY:HSPEed:RTFT:SECOnds (Query only)</i>	Sets the rise/fall times of the signal in seconds.
<i>CPHY:HSPEed:PRBS:SEED</i>	Sets or returns the PRBS seed value.
<i>CPHY:HSPEed:LINEA:HIGh</i>	Sets or returns the high-level voltage of line A waveform.
<i>CPHY:HSPEed:LINEA:LOW</i>	Sets or returns the low level voltage of the waveform for line A.
<i>CPHY:HSPEed:LINEA:MID (Query only)</i>	Returns the mid level voltage of Line A waveform.
<i>CPHY:HSPEed:LINEB:HIGh</i>	Sets or returns the high level voltage of line B waveform.
<i>CPHY:HSPEed:LINEB:LOW</i>	Sets or returns the low level voltage for the waveform for Line B.
<i>CPHY:HSPEed:LINEB:MID (Query only)</i>	Returns the mid level voltage of Line B waveform.
<i>CPHY:HSPEed:LINEC:HIGh</i>	Sets or returns the high level voltage of Line C waveform.
<i>CPHY:HSPEed:LINEC:LOW</i>	Sets or returns the low level voltage of line C waveform.
<i>CPHY:HSPEed:LINEC:MID? (Query only)</i>	returns the mid level voltage of Line C waveform.
<i>CPHY:HSPEed:USELevels</i>	Sets or returns the state of 'use line A levels for line B and line C.
<i>CPHY:HSPEed:REPEat16bit?</i>	Sets or returns the status of the option to repeat the input base pattern to a 16-bit boundary or not.
<i>CPHY:HSPEed:WIREstate</i>	Sets or returns the wire state type.

## High speed jitter group commands

Command	Description
<a href="#">CPHY:HSPEed:JITTer:PJ:ENABle</a>	Enables or disables the periodic jitter.
<a href="#">CPHY:HSPEed:JITTer:PJ:VALUe</a>	Sets or returns periodic jitter value.
<a href="#">CPHY:HSPEed:JITTer:PJ:FREQuency:VALUe</a>	Sets or returns the periodic jitter frequency value.
<a href="#">CPHY:HSPEed:JITTer:RJ:ENABle</a>	Sets or returns the random jitter.
<a href="#">CPHY:HSPEed:JITTer:RJ:VALUe</a>	Sets or returns the random jitter value of high speed jitter waveform.
<a href="#">CPHY:HSPEed:JITTer:DCD:ENABle</a>	Sets or returns the duty cycle distortion.
<a href="#">CPHY:HSPEed:JITTer:DCD:VALUe</a>	Sets or returns the value of duty cycle distortion.
<a href="#">CPHY:HSPEed:JITTer:DCD:LINEA:ENABle</a>	Sets or returns the duty cycle distortion for line A.
<a href="#">CPHY:HSPEed:JITTer:DCD:LINEB:ENABle</a>	Sets or returns the duty cycle distortion to line B.
<a href="#">CPHY:HSPEed:JITTer:DCD:LINEC:ENABle</a>	Sets or returns the duty cycle distortion for line C.
<a href="#">CPHY:HSPEed:JITTer:DCD:RANDomdistortion:ENABle</a>	Sets or returns the random distortion.
<a href="#">CPHY:HSPEed:JITTer:SINE:ENABle</a>	Enables or disables the sine noise.
<a href="#">CPHY:HSPEed:JITTer:SINE:AMPLitude</a>	Sets or returns the sine noise amplitude value.
<a href="#">CPHY:HSPEed:JITTer:SINE:FREQuency</a>	Sets or returns the sine noise frequency value.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:ENABle</a>	Enables or disables channel embedding.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:TYPE</a>	Sets or returns the type of channel embedding.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEA</a>	Sets or returns line A channel filter file path.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEB</a>	Sets or returns line B channel filter file path.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEC</a>	Sets or returns line C filter file path.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:FILTer:APPLYbc</a>	Enables or disables the use of line A channel filter file for line B and line C.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARameter:M ODE</a>	Sets or returns the S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARameter:BA NDwidth:CUST</a>	Sets or returns the S-Parameter bandwidth mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARameter:PO RT</a>	Sets or returns the S-Parameter file type.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARameter:ST WO:LINEA:INPUt</a>	Sets or returns the line A input port in 2 port S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARameter:ST WO:LINEA:OUTPut</a>	Sets or returns the line A output port in 2 port S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARameter:ST WO:LINEB:INPUt</a>	Sets or returns the line B input port in 2 port S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARameter:ST WO:LINEB:OUTPut</a>	Sets or returns the line B output port in 2 port S-Parameter mode.

Command	Description
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:INPut</i>	Sets or returns the line C input port in 2 port S-Parameter mode
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:OUTPut</i>	Sets or returns the line C output port in 2 port S-Parameter mode.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:FILE</i>	Sets or returns line A S2P file path.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:FILE</i>	Sets or returns line B S2P file path.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:FILE</i>	Sets or returns line C S2P file path.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:APPLYlinebc</i>	Sets or returns the use of line A S-Parameter file for line B and line C.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:AB:INPut:ONE</i>	Sets or returns the line AB input one type.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:AB:INPut:TWO</i>	Sets or returns the input two type of line AB.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:AB:INPut:FILE</i>	Sets or returns the line AB S-Parameter file path.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:AB:OUTPut:ONE</i>	Sets or returns the output one type of Line AB.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:AB:OUTPut:TWO</i>	Sets or returns the output two type of line AB.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:BC:INPut:ONE</i>	Sets or returns the input one type of line BC.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:BC:INPut:TWO</i>	Sets or returns input two type of line BC.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:BC:INPut:FILE</i>	Sets or returns the line BC input file path.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:BC:OUTPut:ONE</i>	Sets or returns output one type of line BC.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:BC:OUTPut:TWO</i>	Sets or returns output two type of line BC.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:CA:INPut:ONE</i>	Sets or returns the input one type of line CA.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:CA:INPut:TWO</i>	Sets or returns the input two type of line CA.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:CA:INPut:FILE</i>	Sets or returns line CA input file path.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:CA:OUTPut:ONE</i>	Sets or returns output one type of line CA.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSIZE:CA:OUTPut:TWO</i>	Sets or returns output two type of line CA.
<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:INPut</i>	Sets or returns the line A input of 6-port S-Parameter mode.

Command	Description
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEA:OUTPut</a>	Sets or returns the line A output of 6-port S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:INPUt</a>	Sets or returns the line B input of 6-port S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:OUTPut</a>	Sets or returns the line B output of 6-port S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEC:INPUt</a>	Sets or returns the line C input of 6-port S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEC:OUTPut</a>	Sets or returns the line C output of 6-port S-Parameter mode.
<a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:FILE</a>	Sets or returns the S6P S-Parameter file path.

## High speed burst group commands

Command	Description
<a href="#">CPHY:HSPEed:BURSt:ENABle</a>	Enables or disables batch waveform creation.
<a href="#">CPHY:HSPEed:BURSt:HSDATA:INCLude</a>	Sets or returns to include High Speed data with burst mode.
<a href="#">CPHY:HSPEed:BURSt:PREBegin:ENABle</a>	Enables or disables Prebegin with burst mode.
<a href="#">CPHY:HSPEed:BURSt:PREBegin:PATT</a>	Sets or returns the PreBegin pattern.
<a href="#">CPHY:HSPEed:BURSt:PREBegin:REPEat</a>	Sets or returns the repeat count for PreBegin.
<a href="#">CPHY:HSPEed:BURSt:PREAmble:LENGth (Query only)</a>	Returns the preamble length in terms of number of symbols.
<a href="#">CPHY:HSPEed:BURSt:PROGseq:ENABle</a>	Enables or disables programmable sequence.
<a href="#">CPHY:HSPEed:BURSt:PROGseq:PATTern</a>	Sets or returns the for programmable sequence pattern.
<a href="#">CPHY:HSPEed:BURSt:PROGseq:REPEat</a>	Sets or returns the repeat count for programmable sequence pattern.
<a href="#">CPHY:HSPEed:BURSt:PREEnd:ENABle</a>	Enables or disables PreEnd with burst mode.
<a href="#">CPHY:HSPEed:BURSt:PREEnd:PATTern</a>	Sets or returns the PreEnd pattern.
<a href="#">CPHY:HSPEed:BURSt:PREEnd:REPEat</a>	Sets or returns the repeat count for PreEnd pattern.
<a href="#">CPHY:HSPEed:BURSt:SYNC:ENABle</a>	Enables or disables sync with high speed burst mode.
<a href="#">CPHY:HSPEed:BURSt:SYNC:WORD</a>	Sets or returns the sync word.
<a href="#">CPHY:HSPEed:BURSt:SYNC:REPEat</a>	Sets or returns the repeat count of sync word.
<a href="#">CPHY:HSPEed:BURSt:SYNC:SYMBols (Query only)</a>	Returns the number of symbols for sync word.
<a href="#">CPHY:HSPEed:BURSt:POST:ENABle</a>	Enables or disables the post pattern in high speed burst mode.

Command	Description
<a href="#"><i>CPHY:HSPEed:BURSt:POST:PATtern</i></a>	Sets or returns the post pattern.
<a href="#"><i>CPHY:HSPEed:BURSt:POST:REPEat</i></a>	Sets or returns the repeat count of post pattern.
<a href="#"><i>CPHY:HSPEed:BURSt:POST:SYMBols (Query only)</i></a>	Returns the number of symbols of post pattern.

## Low power group commands

Commands	Description
<a href="#"><i>CPHY:LPOWer:PATtern</i></a>	Sets or returns the low power base pattern.
<a href="#"><i>CPHY:LPOWer:CUSTom:FILE</i></a>	Sets or returns custom base pattern file for low power.
<a href="#"><i>CPHY:LPOWer:CONTent:ENABle</i></a>	Enables or disables the option to include LP base pattern content in the LP-HS signal.
<a href="#"><i>CPHY:LPOWer:SRATe</i></a>	Sets or returns the low power symbol rate.
<a href="#"><i>CPHY:LPOWer:TLPX (Query only)</i></a>	Returns the Low Power TLPX value.
<a href="#"><i>CPHY:LPOWer:RTFT:VALUe</i></a>	Sets or returns the rise/fall time in UI.
<a href="#"><i>CPHY:LPOWer:RTFT:SECOnds (Query only)</i></a>	Returns the rise/fall time in seconds.
<a href="#"><i>CPHY:LPOWer:LINEA:HIGH</i></a>	Sets or returns the high level voltage for line A.
<a href="#"><i>CPHY:LPOWer:LINEA:LOW</i></a>	Sets or returns the low level voltage for line A.
<a href="#"><i>CPHY:LPOWer:LINEB:HIGH</i></a>	Sets or returns the high level voltage for line B.
<a href="#"><i>CPHY:LPOWer:LINEB:LOW</i></a>	Sets or returns the low level voltage for line B.
<a href="#"><i>CPHY:LPOWer:LINEC:HIGH</i></a>	Sets or returns the high level voltage for line C.
<a href="#"><i>CPHY:LPOWer:LINEC:LOW</i></a>	Sets or returns the low level voltage for line C.
<a href="#"><i>CPHY:LPOWer:USELINEA</i></a>	Enables or disables the use line level of A to line B and line C.
<a href="#"><i>CPHY:LPOWer:START:DURAtion:VALUe</i></a>	Sets or returns the start timing for LP-HS mode.
<a href="#"><i>CPHY:LPOWer:START:DURAtion:SYMBols (Query only)</i></a>	Returns the start LP-111 duration of the LP-HS mode in seconds.
<a href="#"><i>CPHY:LPOWer:TPREpare:VALUe</i></a>	Sets or returns the LP-000 duration in LP symbols.
<a href="#"><i>CPHY:LPOWer:TPREpare:SYMBols? (Query only)</i></a>	Returns the LP-000 duration in seconds.
<a href="#"><i>CPHY:LPOWer:THSExit:ENABle</i></a>	Enables or disables the option to include THS Exit in the LP-HS waveform.
<a href="#"><i>CPHY:LPOWer:END:DURAtion:VALUe</i></a>	Sets or returns the end duration value in LP symbols.
<a href="#"><i>CPHY:LPOWer:END:DURAtion:SYMBols? (Query only)</i></a>	Returns the end duration value in symbols.

## Low power noise group commands

Commands	Description
<i>CPHY:LPOWer:NOISe:SINE:ENABle</i>	Enables or disables the low power sine noise.
<i>CPHY:LPOWer:NOISe:SINE:AMPLitude</i>	Sets or returns the low power sine noise amplitude.
<i>CPHY:LPOWer:NOISe:SINE:FREQuency</i>	Sets or returns the sine noise frequency.
<i>CPHY:LPOWer:NOISe:ESPIke:ENABle</i>	Enables or disables the low noise eSpike.
<i>CPHY:LPOWer:NOISe:ESPIkeAREA</i>	Sets or returns the eSpike area.
<i>CPHY:LPOWer:NOISe:ESPIke:DURAtion</i>	Sets or returns the low power noise eSpike duration.
<i>CPHY:LPOWer:NOISe:SINE:LINEA</i>	Enables or disables the low power noise for line A.
<i>CPHY:LPOWer:NOISe:SINE:LINEB</i>	Enables or disables the low power noise for line B.
<i>CPHY:LPOWer:NOISe:SINE:LINEC</i>	Enables or disables the low power noise for line C.
<i>CPHY:LPOWer:NOISe:ESPIke:LINEA</i>	Sets or returns the low power eSpike for line A.
<i>CPHY:LPOWer:NOISe:ESPIke:LINEB</i>	Sets or returns the low power eSpike for line B.
<i>CPHY:LPOWer:NOISe:ESPIke:LINEC</i>	Sets or returns the low power eSpike for line C.
<i>CPHY:LPOWer:NOISe:TMIN:ENABle</i>	Enables or disables the noise TMin.
<i>CPHY:LPOWer:NOISe:TMIN:VALUe</i>	Enables or disables the low power noise TMin value.

## High speed batch mode group commands

Commands	Description
<i>CPHY:HSPEed:BATCh:ENABle</i>	Enables or disables the batch waveform creation.
<i>CPHY:HSPEed:BATCh:PARAMeter</i>	Sets or returns the batch parameter type.
<i>CPHY:HSPEed:BATCh:STARt</i>	Sets or returns the start value of the selected batch mode parameter type.
<i>CPHY:HSPEed:BATCh:END</i>	Sets or returns the end value of the selected batch mode parameter type.
<i>CPHY:HSPEed:BATCh:INCRement</i>	Sets or returns the increment value of the selected batch mode parameter type.
<i>CPHY:HSPEed:BATCh:WAVEformNo? (Query only)</i>	Returns the total number of waveforms that will be generated in the batch mode.

## Preferences group commands

Commands	Description
<i>CPHY:PREFerece:SRATe:MODE</i>	Sets or returns the sample rate mode.
<i>CPHY:PREFerece:SAMPlesperui</i>	Sets or returns the value of the Samples Per Unit Interval (SPUI).
<i>CPHY:PREFerece:SRATe:VALUe? (Query only)</i>	Returns the sample rate for High Speed and Low Power.
<i>CPHY:PREFerece:SAMPlesperui:HIGH</i>	Sets or returns the samples per unit interval of High speed signal.
<i>CPHY:PREFerece:SAMPlesperui:LOW</i>	Sets or returns the samples per unit interval of Low power signal.
<i>CPHY:PREFerece:SRATe:HIGH:VALUe? (Query only)</i>	Returns the sample rate of High speed signal.
<i>CPHY:PREFerece:SRATe:LOW:VALUe? (Query only)</i>	Returns the sample rate of Low power signal
<i>CPHY:PREFerece:SKEW:ACLIne</i>	Sets or returns the skew value of Line A to Line C.
<i>CPHY:PREFerece:SKEW:ABLIne</i>	Sets or returns the skew value of Line A to Line B.
<i>CPHY:PREFerece:AWGAmplitude:MODE</i>	Sets or returns the amplitude and offset control mode.
<i>CPHY:PREFerece:AWGAmplitude:OFFSet:VALUe</i>	Sets or returns the offset value.
<i>CPHY:PREFerece:AWGAmplitude:AMPLitude:VALUe</i>	Sets or returns the amplitude value.
<i>CPHY:PREFerece:STARtupsignal:ENABle</i>	Enables or disables the startup signal.
<i>CPHY:PREFerece:STARtupsignal:LINEA</i>	Sets or returns the startup signal for line A.

Commands	Description
<a href="#"><i>CPHY:PREFERENCE:STARTupsignal:LINEB</i></a>	Sets or returns the startup signal for line B.
<a href="#"><i>CPHY:PREFERENCE:STARTupsignal:LINEC</i></a>	Sets or returns the startup signal for line C.

## Compile settings group commands

Commands	Description
<a href="#"><i>CPHY:CSETtings:WAVEform:SEQUence</i></a>	Sets or returns the name of the sequence.
<a href="#"><i>CPHY:CSETtings:WAVEform:NAME</i></a>	Sets or returns the name of the waveform.
<a href="#"><i>CPHY:CSETtings:WAVEform:OVERwrite</i></a>	Enables or disables waveform overwrite.
<a href="#"><i>CPHY:CSETtings:COMPILE</i></a>	Sets or returns the type of compile option.
<a href="#"><i>CPHY:CSETtings:SWITChlogview</i></a>	Enables or disables switch log view.
<a href="#"><i>CPHY:CSETtings:MASTer:CHONe</i></a>	Sets or returns the line waveform of master channel one.
<a href="#"><i>CPHY:CSETtings:MASTer:CHTWo</i></a>	Sets or returns the line waveform of master channel two.
<a href="#"><i>CPHY:CSETtings:SLAVe:ENABLE</i></a>	Enables or disables the value to enable or disable the slave.
<a href="#"><i>CPHY:CSETtings:SLAVe:IPADDRESS</i></a>	Sets or returns the slave IP address.
<a href="#"><i>CPHY:CSETtings:SLAVe:CHONe</i></a>	Sets or returns the line waveform of slave channel one.
<a href="#"><i>CPHY:CSETtings:SLAVe:CHTWo</i></a>	Sets or returns the line waveform of Slave channel two.
<a href="#"><i>CPHY:CSETtings:SLAVe:ISConnected</i></a>	Sets or returns the value to connect/disconnect the slave.
<a href="#"><i>CPHY:CSETtings:WAVEform:APPEND</i></a>	Enables or disables the option to append the waveform sequence in AWG.
<a href="#"><i>CPHY:PREFERENCE:CORRection:ENABLE</i></a>	Enables or disables the application of correction file.
<a href="#"><i>CPHY:PREFERENCE:CORRection:MASTer:CHONe:ENABLE</i></a>	Enables or disables the application of correction file on master channel one.
<a href="#"><i>CPHY:PREFERENCE:CORRection:MASTer:CHTWo:ENABLE</i></a>	Enables or disables the application of correction file on master channel two.
<a href="#"><i>CPHY:PREFERENCE:CORRection:MASTer:CHONe:FILE</i></a>	Sets or returns the correction file path of master channel one.
<a href="#"><i>CPHY:PREFERENCE:CORRection:MASTer:CHTWo:FILE</i></a>	Sets or returns the correction file path of master channel two.
<a href="#"><i>CPHY:PREFERENCE:CORRection:SLAVe:CHONe:ENABLE</i></a>	Sets or returns the correction file path of slave channel one.
<a href="#"><i>CPHY:PREFERENCE:CORRection:SLAVe:CHTWo:ENABLE</i></a>	Enables or disables the application of correction file on Master channel two.



Commands	Description
<i>CPHY:PREFERENCE:CORRection:SLAVe:CHOn e:FILE</i>	Sets or returns the correction file path of slave channel one.
<i>CPHY:PREFERENCE:CORRection:SLAVe:CHTw o:FILE</i>	Sets or returns the correction file path of slave channel two.
<i>CPHY:PREFERENCE:CORRection:REMOVe</i>	Enables or disables the removal of Sin(x)/x distortions from correction file.
<i>CPHY:PREFERENCE:CORRection:GAUSSian</i>	Enables or disables application of Gaussian filter.
<i>CPHY:PREFERENCE:CORRection:GAUSSian:BA NDwidth</i>	Sets and returns the Gaussian bandwidth.
<i>CPHY:PREFERENCE:CORRection:AALL</i>	Enables or disables the application of correction file of Master channel one to all channels.
<i>CPHY:LOGView?</i>	Returns the log view contents.

## Miscellaneous group commands

Commands	Description
<i>CPHY:SIGNal</i>	Sets or returns the signal mode.
<i>CPHY:VERSiOn? (Query only)</i>	Sets or returns CPHYXpress version number.
<i>CPHY:COMPIle (No Query form)</i>	Initiates to compile the waveform.
<i>CPHY:COMPIle:CANCel (no Query form)</i>	Cancels compilation.
<i>CPHY:RESEt (No Query only)</i>	Resets the plugin settings to default settings.
<i>WMODUle:ACTive (No Query form)</i>	Sets or returns the active waveform plugin. Enables to launch the application.



---

# Command description

## CPHY:HSPEed:PATtern

This command sets or returns the High Speed base pattern type.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:PATtern {PRBS7|PRBS9\_CPHY|PRBS11\_CPHY|  
PRBS18\_CPHY|TEXT|SYM|WSTATE}  
CPHY:HSPEed:PATtern?

**Related commands** [\*CPHY:HSPEed:CUSTom:FILE\*](#)

**Returns** PRBS7  
PRBS9\_CPHY  
PRBS11\_CPHY  
PRBS18\_CPHY  
TEXT  
SYM  
WSTATE

**Arguments** {PRBS7|PRBS9\_CPHY|PRBS11\_CPHY|PRBS18\_CPHY|TEXT|SYM|WSTATE}.

**Example** CPHY:HSPEed:PATtern PRBS7 sets the base pattern as PRBS7 for waveform generation.  
CPHY:HSPEed:PATtern? returns the base pattern type as PRBS7 for the waveform generation.

## CPHY:HSPEed:CUSTom:FILE

This command sets or returns the custom base pattern file path.

**Condition** The custom base pattern file should be available.  
The custom base pattern file should be in one of the format.

- Bit File (.txt)
- Symbol File (.sym)
- Wire state file (.wstate)

**Group** High Speed

**Syntax** CPHY:HSPEed:CUSTom:FILE <path>  
CPHY:HSPEed:CUSTom:FILE?

**Related commands** *CPHY:HSPEed:PATtern*

**Arguments** <path of the file>

**Returns** <path of the file>

**Example** CPHY:HSPEed:CUSTom:FILE "C:\Users\Public\Tektronix\CPHYXpress  
\DataFiles\Custom.txt" sets the custom pattern file path.  
CPHY:HSPEed:CUSTom:FILE? returns the custom pattern file path.

## CPHY:HSPEed:SRATe

This command sets or returns the symbol rate for High Speed Base Pattern.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:SRATe <NR2>  
CPHY:HSPEed:SRATe?

**Arguments** A single <NR2> value.  
Range: {0.05 to 5 GS/s}.

**Returns** A single <NR2> value, {0.05 to 5 GS/s}.

**Related commands** [\*CPHY:HSPEed:RTFT:VALUe\*](#)

**Example** CPHY:HSPEed:SRATe 2.5E+9 sets the high speed symbol rate to 2.5 Gbps.  
CPHY:HSPEed:SRATe? returns 2.5 Gbps as high speed symbol rate.

## CPHY:HSPEed:RTFT:VALUe

This command sets or returns the rise and fall time of the signal for High Speed base pattern.

<b>Condition</b>	Signal mode should be High Speed.
<b>Group</b>	High Speed
<b>Syntax</b>	CPHY:HSPEed:RTFT:VALUe <NR2> CPHY:HSPEed:RTFT:VALUe?
<b>Arguments</b>	A single <NR2> value. Range: 0 to 0.5
<b>Returns</b>	A single <NR2> value, {0 to 0.5}
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:RTFT:SECOnds</i></a>
<b>Example</b>	CPHY:HSPEed:RTFT:VALUe 0.5 sets the rise and fall time of the signal to 0.5 UI. CPHY:HSPEed:RTFT:VALUe? returns 0.5 as rise and fall time of the signal.

## CPHY:HSPEed:RTFT:SECOnds? (Query only)

This command gets the rise/fall time of the signal in seconds.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:RTFT:SECOnds?

**Returns** A single <NRf> value.

**Related commands** [\*CPHY:HSPEed:RTFT:VALUe\*](#)

**Example** CPHY:HSPEed:RTFT:SECOnds? returns the rise/fall time of the signal in seconds.

## CPHY:HSPEed:PRBS:SEED

This command sets or returns the PRBS seed value.

**Condition** Applicable only for PRBS9\_CPHY, PRBS11\_CPHY, PRBS18\_CPHY.  
A seed value set as "0000" is invalid.

**Group** High Speed

**Syntax** CPHY:HSPEed:PRBS:SEED <seed>  
CPHY:HSPEed:PRBS:SEED?

**Arguments** <seed>::= <string>  
{ "0000" to "FFFF" }

**Returns** A string value indicating the seed value.  
Returns a seed value between { "0000" to "FFFF" } as a hexadecimal string.

**Related commands** *CPHY:HSPEed:PATtern*

**Example** CPHY:HSPEed:PRBS:SEED "F27A" sets the PRBS value to 0xF27A.  
CPHY:HSPEed:PRBS:SEED? returns the PRBS value.

## CPHY:HSPEed:LINEA:HIGH

This command sets or returns the high-level voltage of line A waveform.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:LINEA:HIGH <NR1>  
CPHY:HSPEed:LINEA:HIGH?



**Arguments** A single <NR1> value.  
Range: {0 to 600 mV}.  
Range depends on the Low value of line A.

**Returns** A single <NR1> value.

**Related commands** [\*CPHY:HSPEed:LINEA:LOW\*](#)

**Example** CPHY:HSPEed:LINEA:HIGH 400E-3 sets the line A high level voltage for the waveform to 400 mV.  
CPHY:HSPEed:LINEA:HIGH? returns 400 mV as the line A high level voltage for the waveform.

## CPHY:HSPEed:LINEA:LOW

This command sets or returns the low level voltage of the waveform for line A.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:LINEA:LOW <NR1>  
CPHY:HSPEed:LINEA:LOW?

**Arguments** A single <NR1> value.  
Range: {-100 to 400 mV (Range depends on the High value of line A)}.

**Returns** A single <NR1> value.  
{-100 to 400 (Range depends on the High value of line A)}.

**Related commands** *CPHY:HSPEed:LINEA:HIGH*

**Example** CPHY:HSPEed:LINEA:LOW -100E-3 sets the low level voltage for line A waveform to -100 mV.  
CPHY:HSPEed:LINEA:LOW? returns -100 mV as the low level voltage for line A waveform.

## CPHY:HSPEed:LINEA:MID? (Query only)

This command returns the mid level voltage of line A waveform .

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:LINEA:MID?

**Arguments** A single <NR1> value.  
Range: {-50 to 500 mV}.  
Range depends on the High and Low voltage value of line A.

**Returns** A single <NR2> value, {-50 to 500 mV}.

**Related commands**    *CPHY:HSPEed:LINEA:HIGH*  
*CPHY:HSPEed:LINEA:LOW*

**Example**    CPHY:HSPEed:LINEA:MID? returns the mid level voltage of line A waveform.

## CPHY:HSPEed:LINEB:HIGH

This command sets or returns the high level voltage of line B waveform.

**Condition**    Signal mode should be High Speed.

**Group**    High Speed

**Syntax**    CPHY:HSPEed:LINEB:HIGH?  
CPHY:HSPEed:LINEB:HIGH <NR1>

**Arguments**    A single <NR1> value.  
Range: {0 to 600 mV}.

**Returns**    A single <NR1> value, {0 to 600 mV}.

**Related commands**    *CPHY:HSPEed:LINEB:LOW*

**Example**    CPHY:HSPEed:LINEB:HIGH 600E-3 sets the high level voltage of line B waveform to 600 mV.  
CPHY:HSPEed:LINEB:HIGH? returns 600 as the high level voltage of line B waveform.

## CPHY:HSPEed:LINEB:LOW

This command sets or returns the low level voltage of line B waveform.

<b>Condition</b>	Signal mode should be High Speed.
<b>Group</b>	High Speed
<b>Syntax</b>	CPHY:HSPEed:LINEB:LOW <NR1> CPHY:HSPEed:LINEB:LOW?
<b>Arguments</b>	A single <NR1> value. Range: {-100 to 400 mV}. Range depends on High value of line B.
<b>Returns</b>	A single <NR1> value, {-100 to 400 mV (Range depends on High value of line B)}.
<b>Related commands</b>	<i>CPHY:HSPEed:LINEB:HIG</i>
<b>Example</b>	CPHY:HSPEed:LINEB:LOW - 100E-3 sets the low level voltage of line B waveform to -100 mV. CPHY:HSPEed:LINEB:LOW? returns -100 as the low level voltage for line B waveform.

## CPHY:HSPEed:LINEB:MID? (Query only)

This command returns the mid level voltage of line B waveform.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:LINEB:MID?

**Returns** A single <NR1> value.

**Related commands** [\*CPHY:HSPEed:LINEB:HIGH\*](#)

**Example** CPHY:HSPEed:LINEB:MID? returns the mid level voltage for the line B waveform.

## CPHY:HSPEed:LINEC:HIG

This command sets or returns the high level voltage of line C waveform.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:LINEC:HIGH <NR1>  
CPHY:HSPEed:LINEC:HIGH?

**Arguments** A single <NR1> value.  
Range: {0 to 600 mV}.

**Returns** A single <NR1> value, {0 to 600 mV (High level voltage is dependent on Low level voltage)}.

**Related commands** [\*CPHY:HSPEed:LINEC:LOW\*](#)

**Example** CPHY:HSPEed:LINEC:HIGH 600E-3 sets the high level voltage of line C waveform to 600 mV.  
CPHY:HSPEed:LINEC:HIGH? returns 600 as the high level voltage of line C waveform.

## CPHY:HSPEed:LINEC:LOW

This command sets or returns the low level voltage of line C waveform.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:LINEC:LOW <NR1>  
CPHY:HSPEed:LINEC:LOW?

**Arguments** A single <NR1> value.  
Range: (-100 to 400 mV).  
Range depends on the High level voltage of line C.

**Returns** A single <NR1> value, {-100 to 400 mV}

**Related commands** [\*CPHY:HSPEed:LINEC:HIGH\*](#)

**Example** CPHY:HSPEed:LINEC:LOW -100E-3 sets the low level voltage of line C waveform to -100 mV.  
CPHY:HSPEed:LINEC:LOW? returns -100 as the low level voltage of line C waveform.

## CPHY:HSPEed:LINEC:MID? (Query only)

This command returns the mid level voltage of line C waveform.

**Condition** Signal mode should be High Speed.

**Group** High Speed

**Syntax** CPHY:HSPEed:LINEC:MID?

**Returns** A single <NR1> value.

**Related commands**     [\*CPHY:HSPEed:LINEC:HIGH\*](#)

**Example**     CPHY:HSPEed:LINEC:MID? returns the mid level voltage of line C waveform.

## CPHY:HSPEed:USELevels

This command sets or returns the state of use line A levels for line B and line C.

**Group**     High Speed

**Syntax**     CPHY:HSPEed:USELevels {0|1}  
CPHY:HSPEed:USELevels?

**Arguments**     {0|1}  
1 enables the use of line A level for both line B and line C.  
0 disables the use of line A level for line B and line C.

**Returns**     A single <Boolean> value, {0|1}.

**Related commands**     [\*CPHY:HSPEed:LINEA:HIGH\*](#)

**Example**     CPHY:HSPEed:USELevels 1 sets the use line A level to line B and line C.  
CPHY:HSPEed:USELevels? returns 1 indicating "Use Line A levels for Line B and Line C" is enabled.



## CPHY:HSPEed:REPEat16bit

This command enables or disables the option to repeat the input base pattern to a 16-bit boundary.

**Group** High Speed

**Syntax** CPHY:HSPEed:REPEat16bit {0|1}  
CPHY:HSPEed:REPEat16bit?

**Arguments** {0|1}  
1 repeats the base pattern to a 16 bit boundary.  
0 base pattern is not repeated.

**Returns** A single <Boolean> value, {0 or 1}.

**Related commands** [\*CPHY:HSPEed:PRBS:SEED\*](#)

**Example** CPHY:HSPEed:REPEat16bit 1 enables the option "Repeat to a 16-bit boundary".  
CPHY:HSPEed:REPEat16bit? returns 1 indicating "Repeat to a 16-bit boundary" is enabled.

## CPHY:HSPEed:WIREstate

This command sets or returns the wire state type.

<b>Condition</b>	Signal mode should be High Speed.
<b>Group</b>	High Speed
<b>Syntax</b>	CPHY:HSPEed:WIREstate {PLUSX MINUSX PLUSY MINUSY PLUSZ MINUSZ} CPHY:HSPEed:WIREstate?
<b>Related commands</b>	<i>CPHY:HSPEed:CUSTom:FILE</i>
<b>Returns</b>	PLUSX MINUSX PLUSY MINUSY PLUSZ MINUSZ
<b>Arguments</b>	{PLUSX MINUSX PLUSY MINUSY PLUSZ MINUSZ}
<b>Example</b>	CPHY:HSPEed:WIREstate PLUSX sets the wire state as PLUSX. CPHY:HSPEed:WIREstate? returns the wire state as PLUSX.

## CPHY:HSPEed:JITTer:PJ:ENABle

This command enables or disables the periodic jitter.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:PJ:ENABle {0|1}  
CPHY:HSPEed:JITTer:PJ:ENABle?

**Related commands** [\*CPHY:HSPEed:JITTer:PJ:VALUe\*](#)

**Arguments** {0|1}  
0 disables the periodic jitter.  
1 enables the periodic jitter.

**Returns** A single <Boolean> value, {0|1}

**Example** CPHY:HSPEed:JITTer:PJ:ENABle 1 enables the periodic jitter.  
CPHY:HSPEed:JITTer:PJ:ENABle? returns 1 indicating periodic jitter is enabled.

## CPHY:HSPEed:JITTer:PJ:VALUe

This command sets or returns periodic jitter value.

<b>Condition</b>	Periodic Jitter should be enabled.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:PJ:VALUe? CPHY:HSPEed:JITTer:PJ:VALUe <NR2>
<b>Arguments</b>	A single <NR2> value Range: {0 to 1}
<b>Returns</b>	A single <NR2> value, {0 to 1}
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:JITTer:PJ:ENABle</i></a>
<b>Example</b>	CPHY:HSPEed:JITTer:PJ:VALUe 1 sets the periodic jitter value to 1 UI. CPHY:HSPEed:JITTer:PJ:VALUe? returns 1 as periodic jitter value.

## CPHY:HSPEed:JITTer:PJ:FREQuency:VALUe

This command sets or returns the periodic jitter frequency value.

**Condition** Periodic Jitter should be selected.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:PJ:FREQuency:VALUe <NRf>  
CPHY:HSPEed:JITTer:PJ:FREQuency:VALUe?

**Related commands** [\*CPHY:HSPEed:JITTer:PJ:ENABLE\*](#)  
[\*CPHY:HSPEed:JITTer:PJ:VALUe\*](#)

**Arguments** A single <NRf> value.  
Range: {100E3 to 300E6}

**Returns** A single <NRf> value, {100E3 to 300E6}.

**Example** CPHY:HSPEed:JITTer:PJ:FREQuency:VALUe 100E3 sets the periodic jitter frequency value to 100 kHz.  
CPHY:HSPEed:JITTer:PJ:FREQuency:VALUe? returns 100E3 as periodic jitter frequency value.

## CPHY:HSPEed:JITTer:RJ:ENABle

This command sets or returns random jitter.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:RJ:ENABle?  
CPHY:HSPEed:JITTer:RJ:ENABle {0|1}

**Related commands** [\*CPHY:HSPEed:JITTer:RJ:VALUe\*](#)

**Arguments** {0|1}  
0 disables the use of random jitter.  
1 enables the use of random jitter.

**Returns** A single <Boolean> value, {0|1}

**Example** CPHY:HSPEed:JITTer:RJ:ENABle 1 sets the random jitter to 1.  
CPHY:HSPEed:JITTer:RJ:ENABle? returns 1 indicating random jitter is enabled.

## CPHY:HSPEed:JITTer:RJ:VALUe

This command sets or returns the random jitter value of high speed jitter waveform.

**Condition** Periodic Jitter should be enabled.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:RJ:VALUe?  
CPHY:HSPEed:JITTer:RJ:VALUe <NR2>

**Related commands** [\*CPHY:HSPEed:JITTer:RJ:ENABLe\*](#)

**Arguments** A single <NR2> value.  
Range: {0 to 0.3}.  
Resolution of 1E-3.

**Returns** A single <NR2> value, {0 to 0.3}.  
Resolution of 1E-3.

**Example** CPHY:HSPEed:JITTer:RJ:VALUe sets the random jitter value to 0.2 UI.  
CPHY:HSPEed:JITTer:RJ:VALUe? returns 200E-03 as random jitter value.

## CPHY:HSPEed:JITTer:DCD:ENABle

This command enables or disables the duty cycle distortion.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:DCD:ENABLE {0|1}  
CPHY:HSPEed:JITTer:DCD:ENABle?

**Related commands** [\*CPHY:HSPEed:JITTer:DCD:VALUe\*](#)

**Arguments** {0|1}  
0 disables duty cycle distortion.  
1 enables duty cycle distortion.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:HSPEed:JITTer:DCD:ENABLE 1 enables duty cycle distortion.  
CPHY:HSPEed:JITTer:DCD:ENABle? returns 1 indicating duty cycle distortion is enabled.



## CPHY:HSPEed:JITTer:DCD:VALUe

This command sets or returns the value of duty cycle distortion.

**Condition** DCD should be enabled.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:DCD:VALUe?  
CPHY:HSPEed:JITTer:DCD:VALUe <NR1>

**Related commands** [\*CPHY:HSPEed:JITTer:DCD:ENABle\*](#)

**Arguments** A single <NR1> value.  
Range: {0 % to 40 %}.

**Returns** A single <NR1> value, {0 to 40}.

**Example** CPHY:HSPEed:JITTer:DCD:VALUe 30 sets the value of duty cycle distortion to 30 %.  
CPHY:HSPEed:JITTer:DCD:VALUe? returns 40 % as duty cycle distortion value.

## CPHY:HSPEed:JITTer:DCD:LINEA:ENABLE

This command sets or returns the duty cycle distortion for line A.

<b>Condition</b>	DCD should be selected.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:DCD:LINEA:ENABle? CPHY:HSPEed:JITTer:DCD:LINEA:ENABle {0 1}
<b>Arguments</b>	{0 1} 0 disables the use of duty cycle distortion for line A. 1 enables the use of the duty cycle distortion for line A.
<b>Returns</b>	A single <Boolean> value, {0 1}
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:DCD:LINEB:ENABle</i> <i>CPHY:HSPEed:JITTer:DCD:LINEC:ENABle</i>
<b>Example</b>	CPHY:HSPEed:JITTer:DCD:LINEA:ENABle 1 sets the duty cycle distortion for line A. CPHY:HSPEed:JITTer:DCD:LINEA:ENABle? returns 1 as the duty cycle distortion for line A.

## CPHY:HSPEed:JITTer:DCD:LINEB:ENABLE

This command sets or returns duty cycle distortion for line B.

**Condition** DCD should be enabled.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:DCD:LINEB:ENABLE {0|1}  
CPHY:HSPEed:JITTer:DCD:LINEB:ENABLE?

**Arguments** {0|1}  
0 disables the use of duty cycle distortion for line B.  
1 enables the use of duty cycle distortion for line B.

**Returns** A single <Boolean> value, {0|1}.

**Related commands** [\*CPHY:HSPEed:JITTer:DCD:LINEA:ENABLE\*](#)  
[\*CPHY:HSPEed:JITTer:DCD:LINEC:ENABLE\*](#)

**Example** CPHY:HSPEed:JITTer:DCD:LINEB:ENABLE 1 sets the duty cycle distortion for line B.  
CPHY:HSPEed:JITTer:DCD:LINEB:ENABLE? returns 1 indicating duty cycle distortion is enabled for line B.

## CPHY:HSPEed:JITTer:DCD:LINEC:ENABLE

This command sets or returns the duty cycle distortion for line C.

<b>Condition</b>	DCD should be selected.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:DCD:LINEC:ENABle {0 1} CPHY:HSPEed:JITTer:DCD:LINEC:ENABle?
<b>Arguments</b>	{0 1} 0 disables the use of duty cycle distortion for line C. 1 enables the use of duty cycle distortion for line C.
<b>Returns</b>	A single <boolean> value, {0 1}.
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:DCD:LINEB:ENABle</i> <i>CPHY:HSPEed:JITTer:DCD:LINEA:ENABle</i>
<b>Example</b>	CPHY:HSPEed:JITTer:DCD:LINEC:ENABle 1 sets the duty cycle distortion for line C. CPHY:HSPEed:JITTer:DCD:LINEC:ENABle? returns 1 as indicating duty cycle distortion is enabled for line C.

## CPHY:HSPEed:JITTer:DCD:RANDomdistortion:ENABLE

This command sets or returns the random distortion.

**Condition** DCD should be selected.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:DCD:RANDomdistortion:ENABLE {0|1}  
CPHY:HSPEed:JITTer:DCD:RANDomdistortion:ENABLE?

**Arguments** {0|1}  
0 disables the creation of random distortion.  
1 enables the creation of random distortion.

**Returns** A single <Boolean> value, {0|1}.

**Related commands** [\*CPHY:HSPEed:JITTer:DCD:ENABLE\*](#)

**Example** CPHY:HSPEed:JITTer:DCD:RANDomdistortion:ENABLE 1 sets the random distortion.  
CPHY:HSPEed:JITTer:DCD:RANDomdistortion:ENABLE? returns 1 indicating that random distortion is enabled.

## CPHY:HSPEed:JITTer:SINE:ENABLE

This command enables or disables the sine noise.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:SINE:ENABLE {0|1}  
CPHY:HSPEed:JITTer:SINE:ENABLE?

**Related commands** [\*CPHY:HSPEed:JITTer:SINE:AMPLitude\*](#)  
[\*CPHY:HSPEed:JITTer:SINE:FREQuency\*](#)

**Arguments** {0|1}  
0 disables the sine noise.  
1 enables the sine noise.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:HSPEed:JITTer:SINE:ENABLE 1 enables the sine noise.  
CPHY:HSPEed:JITTer:SINE:ENABLE? returns 1 indicating sine noise is enabled.

## CPHY:HSPEed:JITTer:SINE:AMPLitude

This command sets or returns the sine noise amplitude value.

**Condition** Sine Noise should be selected.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:SINE:AMPLitude <NRf>  
CPHY:HSPEed:JITTer:SINE:AMPLitude?

**Related commands** [\*CPHY:HSPEed:JITTer:SINE:ENABLE\*](#)

**Arguments** A single <NRf> value.  
Range: (0 to 50E-3).  
Resolution of 1E-3.

**Returns** A single <NRf> value, (0 to 50E-3), resolution of 1E-3.

**Example** CPHY:HSPEed:JITTer:SINE:AMPLitude 50E-3 sets the sine amplitude value to 50 mV.  
CPHY:HSPEed:JITTer:SINE:AMPLitude? returns 50E-03 as sine noise amplitude value.

## CPHY:HSPEed:JITTer:SINE:FREQuency

This command sets or returns the sine noise frequency value.

<b>Condition</b>	Sine Noise should be selected.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:SINE:FREQuency <NRf> CPHY:HSPEed:JITTer:SINE:FREQuency?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:SINE:ENABle</i>
<b>Arguments</b>	A single <NRf> value. Range: {100E+3 to 1.5E+9}.
<b>Returns</b>	A single <NRf> value, {100E+3 to 1.5E+9}.
<b>Example</b>	CPHY:HSPEed:JITTer:SINE:FREQuency 100E+3 sets the sine frequency value to 100 KHz. CPHY:HSPEed:JITTer:SINE:FREQuency? returns 100E+3 as sine frequency value.



## CPHY:HSPEed:JITTer:EMBEd:ENABle

This command enables or disables channel embedding.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:ENABle {0|1}  
CPHY:HSPEed:JITTer:EMBEd:ENABle?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:TYPE\*](#)

**Arguments** {0|1}  
0 disables channel embedding.  
1 enables channel embedding.

**Returns** A single <NR1> value, {0|1}

**Example** CPHY:HSPEed:JITTer:EMBEd:ENABle 1 enables channel embedding.  
CPHY:HSPEed:JITTer:EMBEd:ENABle? returns 1 indicating channel embedding is enabled.

## CPHY:HSPEed:JITTer:EMBEd:TYPE

This command sets or returns the type of channel embedding.

<b>Condition</b>	Embed Channel should be selected.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:TYPE {FLT SPRM} CPHY:HSPEed:JITTer:EMBEd:TYPE?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd: ENABLE</i>
<b>Arguments</b>	FLT sets channel embed type to Filter. SPRM sets channel embed type to S-Parameter.
<b>Returns</b>	FLT SPRM
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:TYPE FLT sets the channel embed type to Filter. CPHY:HSPEed:JITTer:EMBEd:TYPE? returns FLT as channel embed type.

## CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEA

This command sets or returns line A channel filter file path.

**Condition** Embed Channel and Filter Files should be selected.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEA <file\_name>  
CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEA?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:TYPE\*](#)

**Arguments** File path

**Returns** File path.

**Example** CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEA "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\ ChannelFilter\_A.flr" sets the line A channel filter file.  
CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEA? returns "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\ChannelFilter\_A.flr". as line A channel filter file.

## CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEB

This command sets or returns line B channel filter file path.

<b>Condition</b>	Embed Channel and Filter Files should be selected.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEB <file_name> CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEB?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:TYPE</i>
<b>Arguments</b>	File path.
<b>Returns</b>	File path.
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEB "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\ChannelFilter_B.flr" sets the line B channel filter file. CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEB? returns "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\ChannelFilter_B.flr" as line B channel filter file path.

## CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEC

This command sets or returns line C filter file path.

**Condition** Embed Channel and Filter Files should be selected.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEC <file\_name>  
CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEC?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:TYPE\*](#)

**Arguments** File path.

**Returns** File path.

**Example** CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEC "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\ ChannelFilter\_C.flr" sets the line C channel filter file.  
CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEC? returns "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\ChannelFilter\_C.flr" as line C channel filter file.

## CPHY:HSPEed:JITTer:EMBEd:FILTer:APPLybc

This command enables or disables the use of line A channel filter file for line B and line C.

<b>Condition</b>	Embed Channel and Filter Files should be enabled.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:FILTer:APPLybc {0 1} CPHY:HSPEed:JITTer:EMBEd:FILTer:APPLybc?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:FILTer:LINEA</i>
<b>Arguments</b>	{0 1} 1 enables the use of Line A filter file for line B and line C. 0 disables the use of Line A filter file for line B and line C.
<b>Returns</b>	A single <Boolean> value, {0 1}.
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:FILTer:APPLybc 1 enables the use of line A filter file for line B and line C. CPHY:HSPEed:JITTer:EMBEd:FILTer:APPLybc? returns 1 indicating 'Apply Line A filter file for Line B and Line C' is enabled.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:MODE

This command sets or returns the S-parameter type.

**Condition**     Embed channel and S-Parameter File should be selected.

**Group**        High Speed Jitter

**Syntax**       CPHY:HSPEed:JITTer:EMBEd:SPARameter:MODE {EMBD or embd}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:MODE?

**Related commands**     *CPHY:HSPEed:JITTer:EMBEd: ENABLE*

**Arguments**     EMBD or embd.

**Returns**        EMBD.

**Example**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:MODE EMBD sets S-Parameter type to Embed.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:MODE? returns EMBD as S-Parameter type.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:MODE

This command sets or returns the S-Parameter bandwidth mode.

<b>Condition</b>	Embed Channel and S-Parameter File should be selected.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:MODE {NONE  AUTO CUST} CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:MODE?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:MODE</i>
<b>Arguments</b>	NONE sets S Parameter bandwidth type to None. AUTO sets S Parameter bandwidth type to Auto. CUST sets S Parameter bandwidth type to Custom.
<b>Returns</b>	NONE AUTO CUST
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:MODE CUST sets the S-Parameter bandwidth type to Custom. CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:MODE? returns Cust as S-Parameter bandwidth type.



## CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:CUST

This command sets or returns the custom value for S-Parameter bandwidth.

**Condition**     Embed Channel and FLT Files should be selected.

**Group**        High Speed Jitter

**Syntax**       CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:CUST <NRf>  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:CUST?

**Related commands**     [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:MODE\*](#)

**Arguments**     A single <NRf> value.  
Range is dependent on Sample Rate.

**Returns**        A single <NRf> value.

**Example**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:CUST sets the custom value for S-Parameter bandwidth.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:BANDwidth:CUST? returns the custom value for S-Parameter bandwidth.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:PORT

This command sets or returns the S-Parameter file type.

<b>Condition</b>	Embed Channel and S-Parameter file should be selected.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:PORT {S2P S4SE S6P} CPHY:HSPEed:JITTer:EMBEd:SPARameter:PORT?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:MODE</i>
<b>Arguments</b>	S2P sets S-parameter file type to 2 port S-Parameter file type. S4SE sets S-parameter file type to 4 port Single Ended S-Parameter file type. S6P sets S-parameter file type to 6 port S-parameter file type.
<b>Returns</b>	S2P S4SE S6P
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:PORT S2P sets S-Parameter file type to S2P. CPHY:HSPEed:JITTer:EMBEd:SPARameter:PORT? returns S2P as S-Parameter file type.

## CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEA:INPUt

This command sets or returns the line A input port in 2 port S-Parameter mode.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEA:INPUt {P1|P2}  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEA:INPUt?

**Related commands** [\*CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEA:OUTPUt\*](#)

**Arguments** P1 sets the Line A input port to Port1 in S2P mode.  
P2 sets the Line A input port to Port2 in S2P mode.

**Returns** P1  
P2

**Example** CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEA:INPUt P1 sets the line A input port to Port1 in S2P mode.  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEA:INPUt? returns P1 as line A input port in S2P mode.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:OUTPut

This command sets or returns the line A output port in 2 port S-Parameter mode.

<b>Condition</b>	Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:OUTPut {P1 P2} CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:OUTPut?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:INPUt</i>
<b>Arguments</b>	P1 sets the line A output port to Port1 in S2P mode. P2 sets the line A output port to Port2 in S2P mode.
<b>Returns</b>	P1 P2
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:OUTPut P1 sets the line A output port to Port1 in S2P mode. CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:OUTPut? returns P1 as line A output port in S2P mode.

## CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEB:INPUt

This command sets or returns the line B input port in 2 port S-Parameter mode.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEB:INPUt {P1|P2}  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEB:INPUt?

**Related commands** [\*CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEB:OUTPUt\*](#)

**Arguments** P1 sets the line B input port to Port1 in S2P mode.  
P2 sets the line B input port to Port2 in S2P mode.

**Returns** P1  
P2

**Example** CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEB:INPUt P1 sets the line B input port to Port1 in S2P mode.  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEB:INPUt? returns P1 as line B input port.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:OUTPut

This command sets or returns the line B output port in 2 port S-Parameter mode.

<b>Condition</b>	Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:OUTPut {P1 P2} CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:OUTPut?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:INPUt</i>
<b>Arguments</b>	P1 sets the line B output port to Port1 in S2P mode. P2 sets the line B output port to Port2 in S2P mode.
<b>Returns</b>	P1 P2
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:OUTPut P1 sets the line B output port to Port1 in S2P mode. CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:OUTPut? returns P1 as line B output port.

## CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEC:INPut

This command sets or returns the line C input port in 2 port S-Parameter mode.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEC:INPut {P1|P2}  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEC:INPut?

**Related commands** [\*CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEC:OUTPut\*](#)

**Arguments** P1 sets the line C input port to Port1 in S2P mode.  
P2 sets the line C input port to Port2 in S2P mode.

**Returns** P1  
P2

**Example** CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEC:INPut P1 sets the line C input port to Port1 in S2P mode.  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:STWO:LINEC:INPut? returns P1 as line C input port.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:OUTPut

This command sets or returns the line C output port in 2 port S-Parameter mode.

<b>Condition</b>	Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:OUTPut {P1 P2} CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:OUTPut?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:INPut</i>
<b>Arguments</b>	P1 sets the line C output port to Port1 in S2P mode. P2 sets the line C output port to Port2 in S2P mode.
<b>Returns</b>	P1 P2
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:OUTPut P1 sets the line C output port to Port1 in S2P mode. CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:OUTPut? returns P1 as line C output port.



## CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:FILE

This command sets or returns line A S2P file path.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:FILE <file\_name>  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:FILE?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:INPUt\*](#)  
[\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:OUTPut\*](#)

**Arguments** File path

**Returns** File path.

**Example** CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:FILE "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\S2P\_A.flr" sets the file path of Line A in S2P.

CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEA:FILE? returns "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\S2P\_A.flr" as line A S2P file path.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:FILE

This command sets or returns line B S2P file path.

<b>Condition</b>	Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:FILE<file_name> CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:FILE?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:INPUt?</i> <i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:OUTPut</i>
<b>Arguments</b>	File path
<b>Returns</b>	File path.
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:FILE "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\S2P_B.flc" sets the file path of line B S2P.  CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEB:FILE? returns "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\S2P_B.flc" as line B S2P file path.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:FILE

This command sets or returns line C S2P file path.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S2P.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:FILE <file\_name>  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:FILE?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:INPut\*](#)  
[\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:OUTPut\*](#)

**Arguments** File path.

**Returns** File path.

**Example** CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:FILE "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\S2P\_C.s2p" sets the file path of line B in S2P.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWO:LINEC:FILE? returns "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\S2P\_C.s2p" as line C S2P file path.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWOp:APPLYlinebc

This command sets or returns the use of line A S-Parameter file for line B and line C.

<b>Condition</b>	Embed Channel and S-Parameter Files should be selected.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWOp:APPLYlinebc {0 1} CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWOp:APPLYlinebc?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWOp:APPLYlinebc</i>
<b>Arguments</b>	{0 1} 1 enables the use of line A S-Parameter file for line B and line C. 0 disables the use of line A S-Parameter file for line B and line C.
<b>Returns</b>	A single <Boolean> value, {0 1}.
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWOp:APPLYlinebc 1 enables the use of line A S-Parameter file for line B and line C. CPHY:HSPEed:JITTer:EMBEd:SPARameter:STWOp:APPLYlinebc? returns 1 indicating 'Apply Line A S-Parameter file to Line B and Line C' is enabled.

## CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:ONE

This command sets or returns the line AB input one type.

**Condition**     Embed channel and S-Parameter should be selected.  
S-Parameter file type should be S4P Single Ended.

**Group**        High Speed Jitter

**Syntax**        CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:ONE {P1|P2|P3|P4}  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:ONE?

**Related commands**     [\*CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:TWO\*](#)

**Arguments**     {P1|P2|P3|P4}

**Returns**        {P1|P2|P3|P4}

**Example**        CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:ONE sets the line AB input one type to Port 1.  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:ONE returns P1 as the input one type of line AB.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:TWO

This command sets or returns the input two type for line AB.

<b>Condition</b>	Embed Channel and S-Parameter should be selected. S-Parameter file type should be S4P Single Ended.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:TWO {P1 P2 P3 P4} CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:TWO?
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:ONE</i></a>
<b>Arguments</b>	{P1 P2 P3 P4}
<b>Returns</b>	{P1 P2 P3 P4}
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:TWO P2 sets the line AB input two type to port 2. CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:TWO? returns P1 as line AB input two type.

## CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:FILE

This command sets or returns the line AB S-Parameter file path.

**Condition**     Embed Channel and S-Parameter should be selected.  
S-Parameter file type should be S4P Single Ended.

**Group**        High Speed Jitter

**Syntax**        CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:FILE <"file  
path">  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:FILE?

**Related commands**     *CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:ONE*

**Arguments**     "file path".

**Returns**        "file path".

**Example**        CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:FILE "C:\\1.s4p"  
sets the Line AB S-Parameter file path to "c:\\1.s4p".  
CPHY:HSPEEd:JITTer:EMBEd:SPARAmeter:SFSE:AB:INPUt:FILE? returns  
"C:\\1.s4p" as line AB S-Parameter file path.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:ONE

This command sets or returns the output one type of Line AB.

<b>Condition</b>	Embed Channel and S-Parameter should be selected. S-Parameter file type should be S4P Single Ended.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:ONE {P1 P2 P3 P4} CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:ONE?
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:TWO</i></a>
<b>Arguments</b>	{P1 P2 P3 P4}
<b>Returns</b>	{P1 P2 P3 P4}
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:ONE sets p1 as output one type of line AB. CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:ONE? returns P1 as line AB output one type.



## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:TWO

This command sets or returns the output two type of line AB.

**Condition**     Embed Channel and S-Parameter should be selected.  
S-Parameter file type should be S4P Single Ended.

**Group**        High Speed Jitter

**Syntax**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:TWO {P1|P2|P3|P4}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:TWO?

**Related commands**     [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:TWO\*](#)

**Arguments**     {P1|P2|P3|P4}.

**Returns**        {P1|P2|P3|P4}.

**Example**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:TWO P2 sets the line AB as output two type to Port2.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:TWO? returns P2 as line AB output two type.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:ONE

This command sets or returns the input one type of line BC.

<b>Condition</b>	Embed Channel and S-Parameter should be selected. S-Parameter file type should be S4P Single Ended.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:ONE {P1 P2 P3 P4} CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:ONE?
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:ONE</i></a>
<b>Arguments</b>	{P1 P2 P3 P4}.
<b>Returns</b>	{P1 P2 P3 P4}.
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:ONE P3 sets the input one type of line BC to Port 3. CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:ONE? returns P3 as line BC input one type.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:TWO

This command sets or returns input two type of line BC.

**Condition** Embed Channel and S-Parameter should be selected.  
S-Parameter file type should be S4P Single Ended.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:TWO {P1|P2|P3|P4}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:TWO?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:TWO\*](#)

**Arguments** {P1|P2|P3|P4}.

**Returns** {P1|P2|P3|P4}.

**Example** CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:TWO P1 sets line BC input two type to Port1.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:TWO? returns P1 as line BC input two type.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:FILE

This command sets or returns the line BC input file path.

<b>Condition</b>	Embed Channel and S-Parameter should be selected. S-Parameter file type should be S4P Single Ended.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:FILE <file path> CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:FILE?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:FILE</i>
<b>Arguments</b>	"file path".
<b>Returns</b>	"file path".
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:FILE "C:\\1.s4p" sets the line BC input file path to C:\\1.s4p.  CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:INPUt:FILE? returns "C:\\1.s4p" as the line BC input file path.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:ONE

This command sets or returns output one type of line BC.

**Condition**     Embed Channel and S-Parameter should be selected.  
S-Parameter file type should be S4P Single Ended.

**Group**        High Speed Jitter

**Syntax**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:ONE {P1|P2|P3|P4}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:ONE?

**Related commands**     [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:ONE\*](#)

**Arguments**     {P1|P2|P3|P4}.

**Returns**        {P1|P2|P3|P4}.

**Example**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:ONE P2 sets the output one type of line BC to Port2.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:ONE? returns P2 as line BC output one type.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:TWO

This command sets or returns output two type of line BC.

<b>Condition</b>	Embed Channel and S-Parameter should be selected. S-Parameter file type should be S4P Single Ended.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:TWO {P1 P2 P3 P4} CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:TWO?
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:TWO?</i></a>
<b>Arguments</b>	{P1 P2 P3 P4}.
<b>Returns</b>	{P1 P2 P3 P4}.
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:TWO P1 sets the line BC output two type to Port1. CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:BC:OUTPut:TWO? returns P1 as line BC output two type.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:ONE

This command sets or returns the input one type of line CA.

**Condition**     Embed Channel and S-Parameter should be selected.  
S-Parameter file type should be S4P Single Ended.

**Group**        High Speed Jitter

**Syntax**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:ONE {P1|P2|P3|P4}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:ONE?

**Related commands**     [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:ONE\*](#)

**Arguments**     {P1|P2|P3|P4}.

**Returns**        {P1|P2|P3|P4}.

**Example**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:ONE P2 sets the input one type of line CA to port2.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:ONE? returns P2 as input one type of line CA.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:TWO

This command sets or returns the input two type of line CA.

<b>Condition</b>	Embed Channel and S-Parameter should be enabled. S-Parameter file type should be S4P Single Ended.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:TWO {P1 P2 P3 P4} CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:TWO?
<b>Related commands</b>	<i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:TWO</i>
<b>Arguments</b>	{P1 P2 P3 P4}.
<b>Returns</b>	{P1 P2 P3 P4}.
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:TWO P3 sets the input two type of line CA to port3. CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:TWO? returns P3 as line CA input two type.



## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:FILE

This command sets or returns line CA input file path.

**Condition**     Embed Channel and S-Parameter should be selected.  
S-Parameter file type should be S4P Single Ended.

**Group**        High Speed Jitter

**Syntax**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:FILE <file path>  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:FILE?

**Related commands**     [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:INPUt:FILE\*](#)

**Arguments**     "file path".

**Returns**        "file path".

**Example**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:FILE "C:\\1.s4p"  
sets the line CA input file path to "C:\\1.s4p".  
  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:INPUt:FILE? returns  
"C:\\1.s4p" as line CA input file path.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:ONE

This command sets or returns output one type of line CA.

<b>Condition</b>	Embed Channel and S-Parameter should be selected. S-Parameter file type should be S4P Single Ended.
<b>Group</b>	High Speed Jitter
<b>Syntax</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:ONE {P1 P2 P3 P4} CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:ONE?
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:ONE</i></a>
<b>Arguments</b>	{P1 P2 P3 P4}
<b>Returns</b>	{P1 P2 P3 P4}
<b>Example</b>	CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:ONE P1 sets line CA output one type to Port 1. CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:ONE? returns P1 as line CA output one type.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:TWO

This command sets or returns output two type of line CA.

**Condition**     Embed channel and S-Parameter should be selected.  
S-Parameter file type should be S4P Single Ended.

**Group**        High Speed Jitter

**Syntax**       CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:TWO {P1|P2|  
P3|P4}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:TWO?

**Related commands**     [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:AB:OUTPut:TWO\*](#)

**Arguments**       {P1|P2|P3|P4}.

**Returns**        {P1|P2|P3|P4}.

**Example**        CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:TWO P1 sets  
the output two type of line CA to Port1.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SFSE:CA:OUTPut:TWO? returns  
P1 as line CA output two type.

# CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:INPUt

This command sets or returns the line A input of 6-port S-Parameter mode.

**Condition**      Embed Channel and S-Parameter file should be enabled. S-Parameter file type should be S6P Single Ended.

**Group**            High Speed Jitter

**Syntax**           CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:INPUt {P1|P2|P3|P4|P5|P6}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:INPUt?

**Related commands**    *CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:OUTPut*

**Arguments**        P1 sets the Line A input of 6-port S-Parameter mode to Port1.  
P2 sets the Line A input of 6-port S-Parameter mode to Port2.  
P3 sets the Line A input of 6-port S-Parameter mode to Port3.  
P4 sets the Line A input of 6-port S-Parameter mode to Port4.  
P5 sets the Line A input of 6-port S-Parameter mode to Port5.  
P6 sets the Line A input of 6-port S-Parameter mode to Port6.

**Returns**           P1  
P2  
P3  
P4  
P5  
P6

**Example** CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:INPUt P1 sets the line A input of 6-port S-Parameter mode to Port1.  
 CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:INPUt? returns P1 as line A input type of 6port S-Parameter.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:OUTPut

This command sets or returns the line A output of 6-port S-Parameter mode.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S6P Single Ended.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:OUTPut {P1|P2|P3|P4|P5|P6}  
 CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:OUTPut?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:INPUt\*](#)

**Arguments** P1 sets the line A output of 6-port S-Parameter mode to Port1.  
 P2 sets the line A output of 6-port S-Parameter mode to Port2.  
 P3 sets the line A output of 6-port S-Parameter mode to Port3.  
 P4 sets the line A output of 6-port S-Parameter mode to Port4.  
 P5 sets the line A output of 6-port S-Parameter mode to Port5.  
 P6 sets the line A output of 6-port S-Parameter mode to Port6.

**Returns**    P1  
                 P2  
                 P3  
                 P4  
                 P5  
                 P6

**Example**    CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:OUTPutP1 sets the line A output of 6-port S-Parameter mode to Port1.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:OUTPut? returns P1 as line A output of 6-port S-Parameter.

**CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEB:INPUT**

This command sets or returns the line B input of 6-port S-Parameter mode.

**Condition**    Embed Channel and S-Parameter File should be enabled. S-Parameter file type should be S6P Single Ended.

**Group**        High Speed Jitter

**Syntax**       CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEB:INPUt {P1|P2|P3|P4|P5|P6}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEB:INPUt?

**Related commands**    *CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEB:OUTPut*

**Arguments** P1 sets the line B input of 6-port S-Parameter mode to Port1.  
P2 sets the line B input of 6-port S-Parameter mode to Port2.  
P3 sets the line B input of 6-port S-Parameter mode to Port3.  
P4 sets the line B input of 6-port S-Parameter mode to Port4.  
P5 sets the line B input of 6-port S-Parameter mode to Port5.  
P6 sets the line B input of 6-port S-Parameter mode to Port6.

**Returns** P1  
P2  
P3  
P4  
P5  
P6

**Example** CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:INPUt P1 sets the line B input of 6-port S-Parameter mode to Port1.  
CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:INPUt? returns P1 as line B of 6-port S-Parameter.

## CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:OUTPUt

This command sets or returns the line B output of 6-port S-Parameter mode.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S6P Single Ended.

<b>Group</b>	High Speed Jitter
<b>Syntax</b>	<code>CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:OUTPut {P1 P2 P3 P4 P5 P6}</code> <code>CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:OUTPut?</code>
<b>Related commands</b>	<i><a href="#">CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:INPUt</a></i>
<b>Arguments</b>	<p>P1 sets the line B input of 6-port S-Parameter mode to Port1.</p> <p>P2 sets the line B input of 6-port S-Parameter mode to Port2.</p> <p>P3 sets the line B input of 6-port S-Parameter mode to Port3.</p> <p>P4 sets the line B input of 6-port S-Parameter mode to Port4.</p> <p>P5 sets the line B input of 6-port S-Parameter mode to Port5.</p> <p>P6 sets the line B input of 6-port S-Parameter mode to Port6.</p>
<b>Returns</b>	<p>P1</p> <p>P2</p> <p>P3</p> <p>P4</p> <p>P5</p> <p>P6</p>
<b>Example</b>	<p><code>CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:OUTPut P1</code> sets the line B output of 6-port S-Parameter mode to Port1.</p> <p><code>CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEB:OUTPut?</code> returns P1 as line B output of 6-port S-Parameter.</p>



## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEC:INPUT

This command sets or returns the line C input of 6-port S-Parameter mode.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S6P Single Ended.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEC:INPUT {P1|P2|P3|P4|P5|P6}  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEC:INPUT?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEC:OUTPut\*](#)

**Arguments** P1 sets the line C input of 6-port S-Parameter mode to Port1.  
P2 sets the line C input of 6-port S-Parameter mode to Port2.  
P3 sets the line C input of 6-port S-Parameter mode to Port3.  
P4 sets the line C input of 6-port S-Parameter mode to Port4.  
P5 sets the line C input of 6-port S-Parameter mode to Port5.  
P6 sets the line C input of 6-port S-Parameter mode to Port6.

**Returns** P1  
P2  
P3  
P4  
P5  
P6

**Example** CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEC:INPUtP1 sets the line C input of 6-port S-Parameter mode to Port1.  
CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEC:INPUt? returns P1 as line C input of 6-port S-Parameter.

## CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEC:OUTPut

This command sets or returns the line C output of 6-port S-Parameter mode.

**Condition** Embed Channel and S-Parameter File should be selected. S-Parameter file type should be S6P Single Ended.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEC:OUTPut {P1|P2|P3|P4|P5|P6}  
CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEC:OUTPut?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:LINEC:INPUt\*](#)

**Arguments** P1 sets the line C output of 6-port S-Parameter mode to Port1.  
P2 sets the line C output of 6-port S-Parameter mode to Port2.  
P3 sets the line C output of 6-port S-Parameter mode to Port3.  
P4 sets the line C output of 6-port S-Parameter mode to Port4.  
P5 sets the line C output of 6-port S-Parameter mode to Port5.  
P6 sets the line C output of 6-port S-Parameter mode to Port6.

**Returns** P1  
P2  
P3  
P4  
P5  
P6

**Example** CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEC:OUTPut P1 sets the line C output of 6-port S-Parameter mode to Port1.  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEC:OUTPut? returns P1 as line C output of 6-port S-Parameter.

## CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:FILE

This command sets or returns the S6P S-Parameter file path.

**Condition** Embed Channel and S-Parameter file should be selected. S-Parameter file type should be S6P Single Ended.

**Group** High Speed Jitter

**Syntax** CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:FILE <file\_name>  
CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:FILE?

**Related commands** [\*CPHY:HSPEed:JITTer:EMBEd:SPARameter:SSIX:LINEA:INPUt\*](#)

**Arguments** File path.

**Returns** File name with full path of 6 port S-Parameter mode.

**Example** CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:FILE "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\S6P\_file.s6p" sets the file path of 6 port S-Parameter mode.  
CPHY:HSPEed:JITTer:EMBEd:SPARAmeter:SSIX:FILE? returns "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\S6P\_file.s6p" as S6P S-Parameter file path.

## CPHY:HSPEed:BURSt:ENABLE

This command enables or disables batch waveform creation.

**Condition** Signal mode should be either High Speed or Low power - High Speed.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:ENABle {0|1}  
CPHY:HSPEed:BURSt:ENABle?

**Related commands** *CPHY:HSPEed:BURSt:HSDATA:INCLude*

**Arguments** {0|1}  
0 disables the burst waveform creation for High Speed.  
1 enables the burst waveform creation for High Speed.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:HSPEed:BURSt:ENABle 1 enables burst waveform creation.  
CPHY:HSPEed:BURSt:ENABle? returns 1 indicating the burst waveform creation is enabled.

## CPHY:HSPEed:BURSt:HSDATA:INCLude

This command sets or returns to include High Speed data with burst mode.

**Condition** Create Burst should be selected.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:HSDATA:INCLude <bool>  
CPHY:HSPEed:BURSt:HSDATA:INCLude?

**Related commands** [\*CPHY:HSPEed:BURSt:PREBegin:ENABle\*](#)

**Arguments** A single Boolean value {0|1}.

**Returns** A single Boolean value {0|1}.

**Example** CPHY:HSPEed:BURSt:HSDATA:INCLude 1 enables include High speed data with burst mode.  
CPHY:HSPEed:BURSt:HSDATA:INCLude? returns 1 indicating high speed data is included with burst mode.

## CPHY:HSPEed:BURSt:PREBegin:ENABle

This command enables or disables Prebegin with burst mode.

<b>Condition</b>	Create Burst should be selected.
<b>Group</b>	High Speed Burst
<b>Syntax</b>	CPHY:HSPEed:BURSt:PREBegin:ENABle <bool> CPHY:HSPEed:BURSt:PREBegin:ENABle?
<b>Related commands</b>	<i>CPHY:HSPEed:BURSt:PREEnd:ENABle</i>
<b>Arguments</b>	A single Boolean value {0 1}.
<b>Returns</b>	A single Boolean value {0 1}.
<b>Example</b>	CPHY:HSPEed:BURSt:PREBegin:ENABle 1 enables prebegin with high speed burst mode. CPHY:HSPEed:BURSt:PREBegin:ENABle? returns 1 indicating prebegin is enabled in high speed burst mode.

## CPHY:HSPEed:BURSt:PREBegin:PATtern

This command sets or returns the PreBegin pattern.

**Condition** Create Burst should be selected.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:PREBegin:PATtern <string>  
CPHY:HSPEed:BURSt:PREBegin:PATtern?

**Related commands** *CPHY:HSPEed:BURSt:PREBegin:REPEat*

**Arguments** <value>::= <string>  
{ "0000000" to "4444444" }  
It should contain 7 symbols and each symbol value should be between 0 to 4.

**Returns** The value is returned in a string format.  
{ "0000000" to "4444444" }.

**Example** CPHY:HSPEed:BURSt:PREBegin:PATtern "0123400" sets the PreBegin pattern to 0123400.  
CPHY:HSPEed:BURSt:PREBegin:PATtern? returns "0123400" as PreBegin pattern.

## CPHY:HSPEed:BURSt:PREBegin:REPEat

This command sets or returns the repeat count for PreBegin.

<b>Condition</b>	Create Burst should be selected.
<b>Group</b>	High Speed Burst
<b>Syntax</b>	CPHY:HSPEed:BURSt:PREBegin:REPEat <NR1> CPHY:HSPEed:BURSt:PREBegin:REPEat?
<b>Related commands</b>	<i>CPHY:HSPEed:BURSt:PREBegin:PATtern</i>
<b>Arguments</b>	A single <NR1> value, {0 to 2000}.
<b>Returns</b>	A single <NR1> value, {0 to 2000}.
<b>Example</b>	CPHY:HSPEed:BURSt:PREBegin:REPEat 1000 sets the PreBegin repeat count to 1000. CPHY:HSPEed:BURSt:PREBegin:REPEat? returns 1000 as PreBegin repeat count.



**CPHY:HSPEed:BURSt:PREAmble:LENGth? (Query only)**

This command returns the preamble length in terms of number of symbols.

**Condition** Create Burst should be selected.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:PREAmble:LENGth?

**Related commands** [\*CPHY:HSPEed:BURSt:PREBegin:REPEat\*](#)  
[\*CPHY:HSPEed:BURSt:PREBegin:PATtern\*](#)

**Returns** A single <NR1> value.

**Example** CPHY:HSPEed:BURSt:PREAmble:LENGth? returns the preamble length.

**CPHY:HSPEed:BURSt:PROGseq:ENABle**

This command enables or disables programmable sequence.

**Condition** Create Burst should be selected.

**Group** High Speed Burst

<b>Syntax</b>	CPHY:HSPEed:BURSt:PROGseq:ENABle {0 1} CPHY:HSPEed:BURSt:PROGseq:ENABle?
<b>Related commands</b>	<i>CPHY:HSPEed:BURSt:PROGseq:PATtern</i> <i>CPHY:HSPEed:BURSt:PROGseq:REPEat</i>
<b>Arguments</b>	{0 1} 1 enables the programmable sequence. 0 disables the programmable sequence.
<b>Returns</b>	A single <Boolean> value, {0 1}.
<b>Example</b>	CPHY:HSPEed:BURSt:PROGseq:ENABle 1 enables the programmable sequence. CPHY:HSPEed:BURSt:PROGseq:ENABle? returns 1 indicating programmable sequence is enabled.

## CPHY:HSPEed:BURSt:PROGseq:PATtern

This command sets or returns the programmable sequence pattern.

<b>Condition</b>	Create Burst and Programmable Sequence should be selected.
<b>Group</b>	High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:PROGseq:PATtern <string>  
CPHY:HSPEed:BURSt:PROGseq:PATtern?

**Related commands** *CPHY:HSPEed:BURSt:PREBegin:PATtern*

**Arguments** <value>::= <string>  
{ "0000000000000000" to "4444444444444444" }.  
It should contain 14 symbols and each symbol value should be between 0 to 4.

**Returns** The value is returned in a string format.  
{ "0000000000000000" to "4444444444444444" }.

**Example** CPHY:HSPEed:BURSt:PROGseq:PATtern "4444444444444444" sets the pattern for programmable sequence.  
CPHY:HSPEed:BURSt:PROGseq:PATtern? returns "4444444444444444" as programmable sequence pattern.

## CPHY:HSPEed:BURSt:PROGseq:REPEat

This command sets or returns the repeat count for programmable sequence.

**Condition** Create Burst and Programmable Sequence should be selected.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:PROGseq:REPEat <NR1>  
CPHY:HSPEed:BURSt:PROGseq:REPEat?

**Related commands** *CPHY:HSPEed:BURSt:PROGseq:PATtern*

**Arguments** A single <NR1> value.  
Range: {0 to 16}.

**Returns** A single <NR1> value, {0 to 16}.

**Example** CPHY:HSPEed:BURSt:PROGseq:REPEat 16 sets the repeat count for programmable sequence to 16.  
CPHY:HSPEed:BURSt:PROGseq:REPEat? returns 16 as the repeat count for programmable sequence.

## CPHY:HSPEed:BURSt:PREEnd:ENABLE

This command enables or disables PreEnd with burst mode.

**Condition** Create Burst should be selected.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:PREEnd:ENABLE  
CPHY:HSPEed:BURSt:PREEnd:ENABLE?

**Related commands**     *CPHY:HSPEed:BURSt:SYNC:ENABLE*

**Arguments**     A single <Boolean> value, {0|1}.

**Returns**     A single <Boolean> value, {0|1}.

**Example**     CPHY:HSPEed:BURSt:PREEnd:ENABLE 1 enables PreEnd with high speed burst mode.  
CPHY:HSPEed:BURSt:PREEnd:ENABLE? returns 1 indicating PreEnd is enabled with high speed burst mode.

## CPHY:HSPEed:BURSt:PREEnd:PATtern

This command sets or returns the PreEnd pattern.

**Condition**     Create Burst should be selected.

**Group**     High Speed Burst

**Syntax**     CPHY:HSPEed:BURSt:PREEnd:PATtern <string>  
CPHY:HSPEed:BURSt:PREEnd:PATtern?

**Related commands**     *CPHY:HSPEed:BURSt:PREEnd:REPeat*

**Arguments**     <value>::= <string>  
{"0000000" to "4444444"}  
It should contain 7 symbols and each symbol value should be between 0 to 4.

**Returns** The value is returned in a string format.  
{ "0000000" to "4444444" }.

**Example** CPHY:HSPEed:BURSt:PREEnd:PATtern "4444444" sets PreEnd pattern.  
CPHY:HSPEed:BURSt:PREEnd:PATtern? returns "4444444" as the PreEnd pattern.

## CPHY:HSPEed:BURSt:PREEnd:REPeat

This command sets or returns the repeat count for PreEnd pattern.

**Condition** Create Burst should be selected.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:PREEnd:REPeat <NR1>  
CPHY:HSPEed:BURSt:PREEnd:REPeat?

**Related commands** *CPHY:HSPEed:BURSt:PREEnd:PATtern*

**Arguments** A single <NR1> value.  
Range: {0 to 10}.

**Returns** A single <NR1> value, {0 to 10}.

**Example** CPHY:HSPEed:BURSt:PREEnd:REPeat 10 sets the PreEnd repeat count to 10.  
CPHY:HSPEed:BURSt:PREEnd:REPeat? returns 10 as the PreEnd repeat count.

## CPHY:HSPEed:BURSt:SYNC:ENABLE

This command enables or disables sync with high speed burst mode.

**Condition** Create Burst should be enabled.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:SYNC:ENABLE <bool>  
CPHY:HSPEed:BURSt:SYNC:ENABLE?

**Related commands** [\*CPHY:HSPEed:BURSt:SYNC:WORD\*](#)

**Arguments** A single <Boolean> value, {0|1}.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:HSPEed:BURSt:SYNC:ENABLE 1 enables sync with high speed burst mode.  
CPHY:HSPEed:BURSt:SYNC:ENABLE? returns 1 indicating sync is enabled with burst mode.

## CPHY:HSPEed:BURSt:SYNC:WORD

This command sets or returns the sync word.

<b>Condition</b>	Create Burst should be selected.
<b>Group</b>	High Speed Burst
<b>Syntax</b>	CPHY:HSPEed:BURSt:SYNC:WORD <string> CPHY:HSPEed:BURSt:SYNC:WORD?
<b>Related commands</b>	<i>CPHY:HSPEed:BURSt:PREBegin:PATT</i> <i>CPHY:HSPEed:BURSt:PROGseq:PATT</i>
<b>Arguments</b>	<value>::= <string> { "0000000" to "4444444" } It should contain 7 symbols and each symbol value should be between 0 to 4.
<b>Returns</b>	A string value indication of sync word. The value is returned in a string format. { "0000000" to "4444444" }
<b>Example</b>	CPHY:HSPEed:BURSt:SYNC:WORD "4444444" sets the sync word. CPHY:HSPEed:BURSt:SYNC:WORD? returns "4444444" as the sync word.



## CPHY:HSPEed:BURSt:SYNC:REPEat

This command sets or returns the repeat count of sync word.

**Condition** Create Burst should be selected.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:SYNC:REPEat <NR1>  
CPHY:HSPEed:BURSt:SYNC:REPEat?

**Related commands** [\*CPHY:HSPEed:BURSt:PREBegin:REPEat\*](#)

**Arguments** A single <NR1> value.  
Range: {0 to 10}.

**Returns** A single <NR1> value, {0 to 10}.

**Example** CPHY:HSPEed:BURSt:SYNC:REPEat 10 sets the sync word to 10.  
CPHY:HSPEed:BURSt:SYNC:REPEat? returns 10 of the sync word.

## CPHY:HSPEed:BURST:SYNC:SYMBols? (Query only)

This command returns the number of symbols for sync word.

<b>Condition</b>	Create Burst should be selected.
<b>Group</b>	High Speed Burst
<b>Syntax</b>	CPHY:HSPEed:BURST:SYNC:SYMBols?
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:BURSt:SYNC:WORD</i></a> <a href="#"><i>CPHY:HSPEed:BURSt:SYNC:REPEat</i></a>
<b>Returns</b>	A single <NR1> value.
<b>Example</b>	CPHY:HSPEed:BURST:SYNC:SYMBols? returns sync word in symbols.

## CPHY:HSPEed:BURSt:POST:ENABLE

This command enables or disables the post pattern in high speed burst mode.

<b>Condition</b>	Create Burst should be selected.
<b>Group</b>	High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:POST:ENABle <bool>  
CPHY:HSPEed:BURSt:POST:ENABle?

**Related commands** [\*CPHY:HSPEed:BURSt:POST:PATtern\*](#)

**Arguments** A single <Boolean> value, {0|1}.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:HSPEed:BURSt:POST:ENABle 1 enables the post pattern for burst.  
CPHY:HSPEed:BURSt:POST:ENABle? returns 1 as post pattern for burst.

## CPHY:HSPEed:BURSt:POST:PATtern

This command sets or returns the post pattern.

**Condition** Create Burst should be selected.

**Group** High Speed Burst

**Syntax** CPHY:HSPEed:BURSt:POST:PATtern <value>  
CPHY:HSPEed:BURSt:POST:PATtern?

**Related commands** [\*CPHY:HSPEed:BURSt:POST:REPEat\*](#)  
[\*CPHY:HSPEed:BURSt:POST:SYMBols?\*](#)

<b>Arguments</b>	<code>&lt;value&gt;::= &lt;string&gt;</code> <code>{"0000000" to "4444444"}</code> It should contain 7 symbols and each symbol value should be between 0 to 4.
<b>Returns</b>	The value is returned in a string format. <code>{"0000000" to "4444444"}</code> .
<b>Example</b>	<code>CPHY:HSPEed:BURSt:POST:PATtern "4444444"</code> sets the post pattern. <code>CPHY:HSPEed:BURSt:POST:PATtern?</code> returns "4444444" as the post pattern.

## CPHY:HSPEed:BURSt:POST:REPEat

This command sets or returns the repeat count of post pattern.

<b>Condition</b>	Create Burst should be selected.
<b>Group</b>	High Speed Burst
<b>Syntax</b>	<code>CPHY:HSPEed:BURSt:POST:REPEat &lt;NR1&gt;</code> <code>CPHY:HSPEed:BURSt:POST:REPEat?</code>
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:BURSt:POST:SYMBols?</i></a> <a href="#"><i>CPHY:HSPEed:BURSt:POST:PATT</i></a>

<b>Arguments</b>	A single <NR1> value. Range: {0 to 2000}.
<b>Returns</b>	A single <NR1> value, {0 to 2000}.
<b>Example</b>	CPHY:HSPEed:BURSt:POST:REPEat 64 sets the post pattern repeat count to 64. CPHY:HSPEed:BURSt:POST:REPEat? returns 64 as post pattern repeat count.

## CPHY:HSPEed:BURSt:POST:SYMBols? (Query only)

This command returns the number of symbols of post pattern.

<b>Condition</b>	Create Burst should be selected.
<b>Group</b>	High Speed Burst
<b>Syntax</b>	CPHY:HSPEed:BURSt:POST:SYMBols?
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:BURSt:POST:REPEat?</i></a>
<b>Returns</b>	A single <NR1> value.
<b>Example</b>	CPHY:HSPEed:BURSt:POST:SYMBols? returns the number of symbols for post pattern.

# CPHY:HSPEed:WIREstate

This command sets or returns the wire state.

Group	High Speed
Syntax	CPHY:HSPEed:WIREstate {PLUSX MINUSX PLUSY MINUSY PLUSZ MINUSZ} CPHY:HSPEed:WIREstate?
Related commands	<a href="#">CPHY:HSPEed:CUSTom:FILE</a>
Arguments	{PLUSX MINUSX PLUSY MINUSY PLUSZ MINUSZ}
Returns	PLUSX MINUSX PLUSY MINUSY PLUSZ MINUS
Example	CPHY:HSPEed:WIREstate PLUSX sets the initial wire state as +x for waveform generation. CPHY:HSPEed:WIREstate? returns PLUSX initial wire state for waveform generation.

## CPHY:LPOWer:PATtern

This command sets or returns the low power base pattern.

**Condition**     Applicable for LP and LPHS signal mode.

**Group**        Low Power

**Syntax**       CPHY:LPOWer:PATtern {ULPS|LP|TEXT}  
CPHY:LPOWer:PATtern?

**Related commands**     *CPHY:LPOWer:CUSTom:FILE*

**Arguments**     {ULPS|LP|TEXT}.

**Returns**        ULPS  
LP  
TEXT

**Example**        CPHY:LPOWer:PATtern ULPS sets ULPS as the low power pattern.  
CPHY:LPOWer:PATtern? returns ULPS as the low power pattern.

## CPHY:LPOWer:CUSTom:FILE

This command sets or returns custom base pattern file for low power.

<b>Condition</b>	This is applicable when the Base Pattern is set to Custom . Refer <a href="#"><i>CPHY:LPOWer:PATtern</i></a> . The file can be of three types: ULPS, Low power state file or Text file.
<b>Group</b>	Low Power
<b>Syntax</b>	CPHY:LPOWer:CUSTom:FILE <path> CPHY:LPOWer:CUSTom:FILE?
<b>Related commands</b>	<a href="#"><i>CPHY:LPOWer:PATtern</i></a>
<b>Arguments</b>	<path of the file>.
<b>Returns</b>	<path of the file>.
<b>Example</b>	CPHY:LPOWer:CUSTom:FILE "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\Custom.txt" sets the custom base pattern file. CPHY:LPOWer:CUSTom:FILE? returns "C:\Users\Public\Tektronix\CPHYXpress\DataFiles\Custom.txt" as custom base pattern file path.



## CPHY:LPOWer:CONTent:ENABLE

This command enables or disables the option to include LP base pattern content in the LP-HS signal.

**Condition** This is applicable in LP-HS signal mode. Refer [CPHY:SIGNal](#).

**Group** Low Power

**Syntax** CPHY:LPOWer:CONTent:ENABLE {0|1}  
CPHY:LPOWer:CONTent:ENABLE?

**Related commands** [CPHY:LPOWer:CUSTom:FILE](#)

**Arguments** {0|1}  
0 disables include LP base pattern content.  
1 enables include LP base pattern content.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:LPOWer:CONTent:ENABLE 1 enables the low power content to be included in the waveforms in LP-HS signal mode.  
CPHY:LPOWer:CONTent:ENABLE? returns 1 indicating low power content is included in LP-HS signal mode.

## CPHY:LPOWer:SRATe

This command sets or returns the low power symbol rate.

<b>Condition</b>	Signal mode should be Low Power or Low Power-High Speed.
<b>Group</b>	Low Power
<b>Syntax</b>	CPHY:LPOWer:SRATe <NRf> CPHY:LPOWer:SRATe?
<b>Related commands</b>	<i>CPHY:LPOWer:TLPX</i>
<b>Arguments</b>	A single <NRf> value. Range: {10E+6 to 100E+6} Hz. Resolution: 1 Hz.
<b>Returns</b>	A single <NRf> value, {10E+6 to 100E+6}.
<b>Example</b>	CPHY:LPOWer:SRATe 100E+6 sets the symbol rate for low power to 100 MHz. CPHY:LPOWer:SRATe? returns 100E+6 as low power symbol rate.

## CPHY:LPOWer:TLPX? (Query only)

This command returns the low power TLPX value.

**Condition** Signal mode should be Low Power or Low Power-High Speed.

**Group** Low Power

**Syntax** CPHY:LPOWer:TLPX?

**Related commands** [\*CPHY:LPOWer:SRATe\*](#)

**Returns** A single <NRf> value.

**Example** CPHY:LPOWer:TLPX? returns the TLPX value.

## CPHY:LPOWer:RTFT:VALUe

This command sets or returns the rise/fall time in UI.

**Condition** Signal mode should be Low Power or Low Power-High Speed.

**Group** Low Power

**Syntax** CPHY:LPOWer:RTFT:VALUe <NRf>  
CPHY:LPOWer:RTFT:VALUe?

**Related commands** *CPHY:LPOWer:RTFT:SECOnds*

**Arguments** A single <NRf> value.  
Range: {0.01 to 0.5}.

**Returns** A single <NRf> value.  
Range: {0.01 to 0.5}.

**Example** CPHY:LPOWer:RTFT:VALUe 0.5 sets the rise/fall time to 0.5 UI.  
CPHY:LPOWer:RTFT:VALUe? returns 500E-3 as rise/fall time value.

## CPHY:LPOWer:RTFT:SECOnds (Query only)

This command returns the rise/fall time in seconds.

**Condition** Signal mode should be Low Power or Low Power-High Speed.

**Group** Low Power

**Syntax** CPHY:LPOWer:RTFT:SECOnds?

**Related commands**    [\*CPHY:LPOWer:RTFT:VALUe\*](#)

**Returns**    A single <NRf> value.

**Example**    CPHY:LPOWer:RTFT:SECOnds? returns the rise/fall time in seconds.

## CPHY:LPOWer:LINEA:HIGH

This command sets or returns the high level voltage for line A.

**Group**    Low Power

**Syntax**    CPHY:LPOWer:LINEA:HIGH <NRf>  
CPHY:LPOWer:LINEA:HIGH?

**Related commands**    [\*CPHY:LPOWer:LINEA:LOW\*](#)

**Arguments**    A single <NRf> value.  
Range: {500E-03 to 1.3 (dependent on Line A Low value)}.

**Returns**    A single <NRf> value, {500E-03 to 1.3}

**Example**    CPHY:LPOWer:LINEA:HIGH 500E-03 sets the high level voltage for line A to 500 mV.  
CPHY:LPOWer:LINEA:HIGH? returns 500E-03 as high level voltage for line A.

## CPHY:LPOWer:LINEA:LOW

This command sets or returns the low level voltage for line A.

**Group** Low Power

**Syntax** CPHY:LPOWer:LINEA:LOW <NRf>  
CPHY:LPOWer:LINEA:LOW ?

**Related commands** *PHY:LPOWer:LINEA:HIGH*

**Arguments** A single <NRf> value  
Range: {-100E-03 to 700E-03 (dependent on Line A High value)}.

**Returns** A single <NRf> value, {500E-03 to 1.3}.

**Example** CPHY:LPOWer:LINEA:LOW 100E-03 sets the low level voltage for line A to 100 mV.  
CPHY:LPOWer:LINEA:LOW ? returns 100E-03 as low level voltage value for line A.

## CPHY:LPOWer:LINEB:HIGH

This command sets or returns the high level voltage for line B.

**Group** Low Power

**Syntax** CPHY:LPOWer:LINEB:HIGH <NRf>  
CPHY:LPOWer:LINEB:HIGH?

**Related commands** [\*CPHY:LPOWer:LINEB:LOW\*](#)

**Arguments** A single <NRf> value.  
Range: {500E-03 to 1.3 (dependent on Line B Low value)}.

**Returns** A single <NRf> value, {500E-03 to 1.3}.

**Example** CPHY:LPOWer:LINEB:HIGH 500E-03 sets the high level voltage for line B to 500 mV.  
CPHY:LPOWer:LINEB:HIGH? return 500E-03 as high level voltage for line B.

## CPHY:LPOWer:LINEB:LOW

This command sets or returns the low level voltage for line B.

**Group** Low Power

**Syntax** CPHY:LPOWer:LINEB:LOW <NRf>  
CPHY:LPOWer:LINEB:LOW?

**Related commands** [\*CPHY:LPOWer:LINEB:HIG\*](#)

**Arguments** A single <NRf> value.  
Range: {-100E-03 to 700E-03 (dependent on Line B High Value)}.

**Returns** A single <NRf> value, {500E-03 to 1.3}.

**Example** CPHY:LPOWer:LINEB:LOW 100E-03 sets the low level voltage for line B.  
CPHY:LPOWer:LINEB:LOW ? returns 100E-03 as the low level voltage for line B.



## CPHY:LPOWer:LINEC:HIGH

This command sets or returns the high level voltage for line C.

**Group** Low Power

**Syntax** CPHY:LPOWer:LINEC:HIGH <NRf>  
CPHY:LPOWer:LINEC:HIGH?

**Related commands** [\*CPHY:LPOWer:LINEC:LOW\*](#)

**Arguments** A single <NRf> value.  
Range: {500E-03 to 1.3 (dependent on line C Low value)}.

**Returns** A single <NRf> value, {500E-03 to 1.3}.

**Example** CPHY:LPOWer:LINEC:HIGH 500E-03 sets the high level voltage for line C.  
CPHY:LPOWer:LINEC:HIGH? returns 500E-03 as high level voltage for line C.

## CPHY:LPOWer:LINEC:LOW

This command sets or returns the low level voltage for line C.

**Group** Low Power

**Syntax** CPHY:LPOWer:LINEC:LOW <NRf>  
CPHY:LPOWer:LINEC:LOW?

**Related commands** [\*CPHY:LPOWer:LINEC:HIGH\*](#)

**Arguments** A single <NRf> value.  
Range: {-100E-03 to 700E-03 (dependent on line C High value)}.

**Returns** A single <NRf> value, {500E-03 to 1.3}.

**Example** CPHY:LPOWer:LINEC:LOW 100E-03 sets the low level voltage for line C.  
CPHY:LPOWer:LINEC:LOW ? returns 100E-03 as low level voltage for line C.

## CPHY:LPOWer:USELINEA

This command enables or disables the use line level of A to line B and line C.

**Group** Low Power

**Syntax** CPHY:LPOWer:USELINEA {0|1}  
CPHY:LPOWer:USELINEA?

**Related commands** [\*CPHY:LPOWer:LINEC:HIGH\*](#)  
[\*CPHY:LPOWer:LINEB:LOW\*](#)

**Arguments** {0|1}.

0 disables the use of using line level of line A to line B and C.

1 enables the use of line A to line B and line C.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:LPOWer:USELINEA 1 enables the use of line level of line A to line B and line C.

CPHY:LPOWer:USELINEA? returns 1 indicating 'Use of Line A levels for Line B and Line C' is enabled .

## CPHY:LPOWer:STARt:DURAtion:VALUe

This command sets or returns the start timing for LP-HS mode.

<b>Condition</b>	Signal mode should be Low Power or Low Power-High Speed.
<b>Group</b>	Low Power
<b>Syntax</b>	CPHY:LPOWer:STARt:DURAtion:VALUe <NR1> CPHY:LPOWer:STARt:DURAtion:VALUe?
<b>Related commands</b>	<i>CPHY:LPOWer:STARt:DURAtion:SYMBols</i>
<b>Arguments</b>	A single <NR1> value. Range: {1 to 100} LP symbols.
<b>Returns</b>	A single <NR1> value, {1 to 100}.
<b>Example</b>	CPHY:LPOWer:STARt:DURAtion:VALUe 100 sets the start LP-111 duration of LP-HS mode to 100 LP symbols. CPHY:LPOWer:STARt:DURAtion:VALUe? returns 100 as start LP-111 duration value.

## CPHY:LPOWer:STARt:DURAtion:SYMBols? (Query only)

This command returns the start LP-111 duration of the LP-HS mode in seconds.

**Condition** This is applicable in LP-HS signal mode.

**Group** Low Power

**Syntax** CPHY:LPOWer:STARt:DURAtion:SYMBols?

**Related commands** [\*CPHY:LPOWer:STARt:DURAtion:VALUe\*](#)

**Returns** A single <NR2> value.

**Example** CPHY:LPOWer:STARt:DURAtion:SYMBols? returns the start LP-111 in seconds.

## CPHY:LPOWer:TPREpare:VALUe

This command sets or returns the LP-000 duration in LP symbols.

**Condition** Signal mode should be Low Power or Low Power-High Speed.

**Group** Low Power

<b>Syntax</b>	CPHY:LPOWer:TPREpare:VALUe <NR2> CPHY:LPOWer:TPREpare:VALUe?
<b>Related commands</b>	<i>CPHY:LPOWer:TPREpare:SYMBols</i>
<b>Arguments</b>	A single <NR2> value. Range: {0.5 to 100} LP symbols.
<b>Returns</b>	A single <NR2> value, {0.5 to 100}.
<b>Example</b>	CPHY:LPOWer:TPREpare:VALUe 100 sets the LP-000 duration to 100 LP symbols. CPHY:LPOWer:TPREpare:VALUe? returns 100 as LP-000 duration value.

## CPHY:LPOWer:TPREpare:SYMBols? (Query only)

This command returns the LP-000 duration in seconds.

<b>Condition</b>	Signal mode should be Low Power or Low Power-High Speed.
<b>Group</b>	Low Power
<b>Syntax</b>	CPHY:LPOWer:TPREpare:SYMBols?
<b>Related commands</b>	<i>CPHY:LPOWer:TPREpare:VALUe</i>

**Returns** A single <NRf> value.

**Example** CPHY:LPOWer:TPREpare:SYMB? returns LP-000 duration in seconds.

## CPHY:LPOWer:THSExit:ENABLE

This command enables or disables the option to include THS Exit in the LP-HS waveform.

**Condition** Signal mode should be Low Power or Low Power-High Speed.

**Group** Low Power

**Syntax** CPHY:LPOWer:THSExit:ENABLE {0|1}  
CPHY:LPOWer:THSExit:ENABLE?

**Related commands** [\*CPHY:LPOWer:END:DURAtion:VALUe\*](#)

**Arguments** {0|1}  
0 does not include THS\_Exit in the waveform.  
1 includes THS\_Exit in the waveform.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:LPOWer:THSExit:ENABLE 1 enables THS\_Exit to be included in the waveform.  
CPHY:LPOWer:THSExit:ENABLE? returns 1 indicating THS\_Exit is included in LP-HS waveform.

## CPHY:LPOWer:END:DURAtion:VALUe

This command sets or returns the end duration value in LP symbols.

<b>Condition</b>	This is applicable when 'THS_Exit' is selected.
<b>Group</b>	Low Power
<b>Syntax</b>	CPHY:LPOWer:END:DURAtion:VALUe <NR2> CPHY:LPOWer:END:DURAtion:VALUe?
<b>Related commands</b>	<i>CPHY:LPOWer:THSExit:ENABLE</i>
<b>Arguments</b>	A single <NR2> value. Range: {1-100} LP symbols.
<b>Returns</b>	A single <NR2> value, {1-100}.
<b>Example</b>	CPHY:LPOWer:END:DURAtion:VALUe 100 sets the end duration value as 100 LP symbols. CPHY:LPOWer:END:DURAtion:VALUe? returns 100 as end duration value.



## CPHY:LPOWer:END:DURAtion:SYMBols? (Query only)

This command returns the end duration value in symbols.

**Condition** Applicable for LP and LPHS signal mode.

**Group** Low Power

**Syntax** CPHY:LPOWer:END:DURAtion:SYMBols?

**Related commands** [\*CPHY:LPOWer:END:DURAtion:VALUe\*](#)

**Returns** A single <NR1> value.

**Example** CPHY:LPOWer:END:DURAtion:SYMBols? returns the end duration value in seconds.

## CPHY:LPOWer:NOISe:SINE:ENABLE

This command enables or disables the low power sine noise.

**Condition** Sine Noise should be selected.

**Group** Low Power Noise

**Syntax** CPHY:LPOWer:NOISe:SINE:ENABle {0|1}  
CPHY:LPOWer:NOISe:SINE:ENABle?

**Related commands** *CPHY:LPOWer:NOISe:SINE:AMPLitude*

**Arguments** {0|1}  
0 disables the low power sine noise.  
1 enables the low power sine noise.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:LPOWer:NOISe:SINE:ENABle 1 enables the low power sine noise.  
CPHY:LPOWer:NOISe:SINE:ENABle? returns 1 indicating low power sine noise is enabled.

## CPHY:LPOWer:NOISe:SINE:AMPLitude

This command sets or returns the low power sine noise amplitude.

**Condition** Sine Noise should be enabled.

**Group** Low Power Noise

**Syntax** CPHY:LPOWer:NOISe:SINE:AMPLitude <NRf>  
CPHY:LPOWer:NOISe:SINE:AMPLitude?

**Related commands**     *CPHY:LPOWer:NOISe:SINE:FREQuency*

**Arguments**     A single <NRf> value  
Range: {0 to 300E-3}

**Returns**     A single <NRf> value, {0 to 300E-3}

**Example**     CPHY:LPOWer:NOISe:SINE:AMPLitude 300 sets the low power sine noise amplitude to 300 mV.  
CPHY:LPOWer:NOISe:SINE:AMPLitude? returns 300 E-03 as the low power sine noise amplitude.

## CPHY:LPOWer:NOISe:SINE:FREQuency

This command sets or returns the sine noise frequency.

**Condition**     Sine Noise should be enabled.

**Group**     Low Power Noise

**Syntax**     CPHY:LPOWer:NOISe:SINE:FREQuency <NRf>  
CPHY:LPOWer:NOISe:SINE:FREQuency?

**Related commands**     *CPHY:LPOWer:NOISe:SINE:AMPLitude*

<b>Arguments</b>	A single <NRf> value. Range: {100E+3 to 100E+6}.
<b>Returns</b>	A single <NRf> value, {100E+3 to 100E+6}.
<b>Example</b>	CPHY:LPOWer:NOISe:SINE:FREQuency 100E+6 sets the low power sine noise frequency to 100 MHz. CPHY:LPOWer:NOISe:SINE:FREQuency? returns 100E+6 as the low power sine noise frequency.

## CPHY:LPOWer:NOISe:ESPIke:ENABLE

This command enables or disables the low power noise eSpike.

<b>Condition</b>	Signal mode should be Low Power or LP-HS.
<b>Group</b>	Low Power Noise
<b>Syntax</b>	CPHY:LPOWer:NOISe:ESPIke:ENABLE <bool> CPHY:LPOWer:NOISe:ESPIke:ENABLE?
<b>Related commands</b>	<a href="#"><i>CPHY:LPOWer:NOISe:ESPIkeAREA</i></a>
<b>Arguments</b>	0 disables low noise eSpike. 1 enables the low noise eSpike.

**Returns** A single <Boolean> value, {0 or 1}.

**Example** CPHY:LPOWer:NOISe:ESPIke:ENABle 1 enables the low power noise eSpike.  
CPHY:LPOWer:NOISe:ESPIke:ENABle? returns 1 indicating eSpike is enabled for low power noise.

## CPHY:LPOWer:NOISe:ESPIke:AREA

This command sets or returns the eSpike area.

**Condition** eSpike should be enabled.

**Group** Low Power Noise

**Syntax** CPHY:LPOWer:NOISe:ESPIke:AREA <NR1>  
CPHY:LPOWer:NOISe:ESPIke:AREA?

**Related commands** [\*CPHY:LPOWer:NOISe:ESPIke:DURAtion\*](#)

**Arguments** A single <NR1>.  
Range: {100 to 400}.

**Returns** A single <NR1> value, {100 to 400}.

**Example** CPHY:LPOWer:NOISe:ESPIke:AREA 400 sets the low power noise eSpike area to 400 Vps.  
CPHY:LPOWer:NOISe:ESPIke:AREA? returns 400 as the low power noise eSpike area.

## CPHY:LPOWer:NOISe:ESPIke:DURAtion

This command sets or returns the low power noise eSpike duration.

<b>Condition</b>	eSpike should be enabled.
<b>Group</b>	Low Power Noise
<b>Syntax</b>	CPHY:LPOWer:NOISe:ESPIke:DURAtion <NRf> CPHY:LPOWer:NOISe:ESPIke:DURAtion?
<b>Related commands</b>	<i>CPHY:LPOWer:NOISe:ESPIkeAREA</i>
<b>Arguments</b>	A single <NRf> value. Range: {1E-9 to 5E-9}.
<b>Returns</b>	A single <NRf> value, {1E-9 to 5E-9}.
<b>Example</b>	CPHY:LPOWer:NOISe:ESPIke:DURAtion 5E-9 sets the low power noise eSpike duration to 5 ns. CPHY:LPOWer:NOISe:ESPIke:DURAtion? returns 5E-9 as the low power noise eSpike duration.

## CPHY:LPOWer:NOISe:SINE:LINEA

This command enables or disables the sine noise for line A.

**Condition** Sine noise should be selected

**Group** Low Power Noise

**Syntax** CPHY:LPOWer:NOISe:SINE:LINEA {0|1}  
CPHY:LPOWer:NOISe:SINE:LINEA?

**Related commands** [\*CPHY:LPOWer:NOISe:SINE:LINEB\*](#)  
[\*CPHY:LPOWer:NOISe:SINE:LINEC\*](#)

**Arguments** {0|1}.  
1 enables the use of Sine Noise for line A.  
0 disables the use of Sine Noise for line A.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:LPOWer:NOISe:SINE:LINEA 1 enables the use of sine noise for line A.  
CPHY:LPOWer:NOISe:SINE:LINEA? returns 1 indicating sine noise is enabled for line A.

## CPHY:LPOWer:NOISe:SINE:LINEB

This command enables/disables the sine noise for Line B.

<b>Condition</b>	Sine noise should be selected
<b>Group</b>	Low Power Noise
<b>Syntax</b>	CPHY:LPOWer:NOISe:SINE:LINEB {0 1} CPHY:LPOWer:NOISe:SINE:LINEB?
<b>Related commands</b>	<i>CPHY:LPOWer:NOISe:SINE:LINEC</i>
<b>Arguments</b>	{0 1} 1 enables the use of Sine Noise for line B. 0 disables the use of Sine Noise for line B.
<b>Returns</b>	A single <Boolean> value, {0 1}.
<b>Example</b>	CPHY:LPOWer:NOISe:SINE:LINEB 1 enables the use of sine noise for line B. CPHY:LPOWer:NOISe:SINE:LINEB? returns 1 indicating sine noise is enabled for line B.



## CPHY:LPOWer:NOISe:SINE:LINEC

This command enables or disables the sine noise for line C.

**Condition** Sine noise should be selected.

**Group** Low Power Noise

**Syntax** CPHY:LPOWer:NOISe:SINE:LINEC {0|1}  
CPHY:LPOWer:NOISe:SINE:LINEC?

**Related commands** [\*CPHY:LPOWer:NOISe:SINE:LINEB\*](#)

**Arguments** {0|1}.  
1 enables the use of Sine Noise for line C.  
0 disables the use of Sine Noise for line C.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:LPOWer:NOISe:SINE:LINEC 1 enables the use of sine noise for line C.  
CPHY:LPOWer:NOISe:SINE:LINEC? returns 1 indicating sine noise is enabled for line C.

## CPHY:LPOWer:NOISe:ESPIke:LINEA

This command enables or disables the eSpike for line A.

<b>Condition</b>	eSpike should be selected.
<b>Group</b>	Low Power Noise
<b>Syntax</b>	CPHY:LPOWer:NOISe:ESPIke:LINEA {0 1} CPHY:LPOWer:NOISe:ESPIke:LINEA?
<b>Related commands</b>	<i>CPHY:LPOWer:NOISe:SINE:LINEB</i>
<b>Arguments</b>	1 enables the use of eSpike for line A. 0 disables the use of eSpike for line A.
<b>Returns</b>	A single <Boolean> value, {0 1}.
<b>Example</b>	CPHY:LPOWer:NOISe:ESPIke:LINEA 1 enables the use of eSpike for line A. CPHY:LPOWer:NOISe:ESPIke:LINEA? returns 1 indicating eSpike is enabled for line A.

## CPHY:LPOWer:NOISe:ESPIke:LINEB

This command enables or disables eSpike for line B.

**Condition** eSpike should be enabled.

**Group** Low Power Noise

**Syntax** CPHY:LPOWer:NOISe:ESPIke:LINEB {0|1}  
CPHY:LPOWer:NOISe:ESPIke:LINEB?

**Related commands** [\*CPHY:LPOWer:NOISe:SINE:LINEB\*](#)  
[\*CPHY:LPOWer:NOISe:SINE:LINEC\*](#)

**Arguments** {0|1}.  
1 enables the use of eSpike for line B.  
0 disables the use of eSpike for line B.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:LPOWer:NOISe:ESPIke:LINEB 1 enables the use of eSpike for line B.  
CPHY:LPOWer:NOISe:ESPIke:LINEB? returns 1 indicating eSpike is enabled for line B.

## CPHY:LPOWer:NOISe:ESPIke:LINEC

This command enables or disables the eSpike for Line C.

<b>Condition</b>	eSpike should be selected.
<b>Group</b>	Low Power Noise
<b>Syntax</b>	CPHY:LPOWer:NOISe:ESPIke:LINEC {0 1} CPHY:LPOWer:NOISe:ESPIke:LINEC?
<b>Related commands</b>	<i>CPHY:LPOWer:NOISe:SINE:LINEB</i>
<b>Arguments</b>	{0 1}. 1 enables the use of eSpike for line C. 0 disables the use of eSpike for line C.
<b>Returns</b>	A single <Boolean> value, {0 1}.
<b>Example</b>	CPHY:LPOWer:NOISe:ESPIke:LINEC 1 enables the use of eSpike for line C. CPHY:LPOWer:NOISe:ESPIke:LINEC? returns 1 indicating eSpike is enabled for line C.

## CPHY:LPOWer:NOISe:TMIN:ENABle

This command enables or disables the noise TMin.

**Condition** Low Power Noise

**Group** Low Power Noise

**Syntax** CPHY:LPOWer:NOISe:TMIN:ENABle {0|1}  
CPHY:LPOWer:NOISe:TMIN:ENABle?

**Related commands** [\*CPHY:LPOWer:NOISe:TMIN:VALUe\*](#)

**Arguments** {0|1}  
1 enables the low power noise TMin.  
0 disables the low power noise TMin.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:LPOWer:NOISe:TMIN:ENABle 1 enables low power noise TMin.  
CPHY:LPOWer:NOISe:TMIN:ENABle? returns 1 indicating TMin is enabled.

## CPHY:LPOWer:NOISe:TMIN:VALUe

This command enables or disables the low power noise TMin value.

<b>Condition</b>	In Low Power Noise TMin should be selected.
<b>Group</b>	Low Power Noise
<b>Syntax</b>	CPHY:LPOWer:NOISe:TMIN:ENABle <NR2> CPHY:LPOWer:NOISe:TMIN:ENABle?
<b>Related commands</b>	<i>CPHY:LPOWer:NOISe:TMIN:ENABle</i>
<b>Arguments</b>	A single <NR2> value Range: {0 to 50}.
<b>Returns</b>	A single <NR2> value. Range: {0 to 50}.
<b>Example</b>	CPHY:LPOWer:NOISe:TMIN:ENABle 10E-9 sets the low power noise TMin value to 10 ns. CPHY:LPOWer:NOISe:TMIN:ENABle? returns 10E-9 as TMin.

## CPHY:HSPEed:BATCh:ENABle

This command enables or disables the batch waveform creation.

**Condition** Signal mode should be Low Power or Low Power-High Speed.

**Group** High Speed Batch

**Syntax** CPHY:HSPEed:BATCh:ENABle {0|1}  
CPHY:HSPEed:BATCh:ENABle?

**Related commands** [\*CPHY:HSPEed:BATCh:PARAmeter\*](#)

**Arguments** {0|1}  
0 disables the batch waveform creation.  
1 enables the batch waveform creation.

**Returns** A single <Boolean> value, {0|1}.

**Example** CPHY:HSPEed:BATCh:ENABle 1 enables the batch waveform creation.  
CPHY:HSPEed:BATCh:ENABle? returns 1 indicating overwrite existing sequence is enabled.

# CPHY:HSPEed:BATCh:PARAMeter

This command sets or returns the batch parameter type.

**Condition**     Batch waveform creation should be selected.

**Group**        High Speed Batch

**Syntax**       CPHY:HSPEed:BATCh:PARAMeter {PJ|PJF|RJ|DCD|PRE|POST}  
CPHY:HSPEed:BATCh:PARAMeter?

**Related commands**     *CPHY:HSPEed:BATCh:ENABle*

**Arguments**        {PJ|PJF|RJ|DCD|PRE|POST}

**Returns**        PJ  
PJF  
RJ  
DCD  
PRE  
POST

**Example**        CPHY:HSPEed:BATCh:PARAMeter PJ sets the batch parameter to PJ.  
CPHY:HSPEed:BATCh:PARAMeter? returns PJ as the batch parameter.



## CPHY:HSPEed:BATCh:STARt

This command sets or returns the start value of the selected batch mode parameter type.

**Condition** Batch waveform creation should be enabled.

**Group** High Speed Batch

**Syntax** CPHY:HSPEed:BATCh:STARt <NR2>  
CPHY:HSPEed:BATCh:STARt?

**Related commands** [\*CPHY:HSPEed:BATCh:END\*](#)

**Arguments** A single <NR2> value.

**Returns** A single <NR2> value.

**Example** CPHY:HSPEed:BATCh:STARt 0.99 sets the start value of selected batch mode.  
CPHY:HSPEed:BATCh:STARt? returns 0.99 as the start value of selected batch mode.

The table below shows the default range value for all the parameters:

Parameter	Units	Range	
		Min	Max
Periodic Jitter	UI	0	0.99
Periodic_Jitter_Frequency	MHz	1	299
Random Jitter	UI	0	0.29
Duty_Cycle_Distortion	%	0	39
PreBegin_Repeat	Words	0	990
Post_Repeat	Words	0	63

## CPHY:HSPEed:BATCh:END

This command sets or returns the end value of the selected batch mode parameter type.

**Condition** End value depends on the start value of corresponding parameter type. Batch waveform creation should be selected.

**Group** High Speed Batch

**Syntax** CPHY:HSPEed:BATCh:END <NR2>  
CPHY:HSPEed:BATCh:END?

**Related commands** [\*CPHY:HSPEed:BATCh:STARt\*](#)

**Arguments** A single <NR2> value.

**Returns** A single <NR2> value.

**Example** CPHY:HSPEed:BATCh:END 1 sets the end value of the selected batch mode parameter type to 1.

CPHY:HSPEed:BATCh:END? returns 1 as the end value of the selected batch mode parameter type.

Range varies depending upon the parameters selected. The table below shows the range of end value for all the parameters:

Parameter	Units	Range	
		Start	End
Periodic Jitter	UI	0.01	1
Periodic_Jitter_Frequency	MHz	2	300
Random_Jitter	UI	0.01	0.3
Duty_Cycle_Distortion	%	1	40
PreBegin_Repeat	Words	10	1000
Post_Repeat	Words	1	64

## CPHY:HSPEed:BATCh:INCRement

This command sets or returns the increment value of the selected batch mode parameter type.

**Condition** Increment value depends on the End value of corresponding parameter type. Batch waveform creation should be selected.

**Group** High Speed Batch

**Syntax** CPHY:HSPEed:BATCh:INCRement <NRf>  
CPHY:HSPEed:BATCh:INCRement?

**Related commands** [\*CPHY:HSPEed:BATCh:ENABLE\*](#)

**Arguments** A single <NRf> value.

**Returns** A single <NRf> value.

**Example** CPHY:HSPEed:BATCh:INCRement sets the increment value of the selected batch mode parameter type  
CPHY:HSPEed:BATCh:INCRement? returns the increment value of the selected batch mode parameter type

The table below shows the default range of increment values for all the parameters:

Parameter	Units	Range	
		Start	End
Periodic Jitter	UI	0.01	1
Periodic_Jitter_Frequency	MHz	1	299
Random_Jitter	UI	0.01	0.3
Duty_Cycle_Distortion	%	1	40
PreBegin_Repeat	Words	10	1000
Post_Repeat	Words	1	64

## CPHY:HSPEed:BATCh:WAVEformNo? (Query only)

This command returns the total number of waveforms that will be generated in the batch mode.

<b>Condition</b>	Batch waveform creation should be selected.
<b>Group</b>	High Speed Batch
<b>Syntax</b>	CPHY:HSPEed:BATCh:WAVEformNo?
<b>Related commands</b>	<a href="#"><i>CPHY:HSPEed:BATCh:ENABle</i></a>
<b>Returns</b>	A single <NR1> value.
<b>Example</b>	CPHY:HSPEed:BATCh:WAVEformNo? returns the total number of waveforms that is generated in the batch mode.

## CPHY:PREFERENCE:SRATe:MODE

This command sets or returns the sample rate mode.

<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFERENCE:SRATe:MODE <value> CPHY:PREFERENCE:SRATe:MODE?

<b>Related commands</b>	<a href="#"><i>CPHY:PREFERENCE:SAMPLESperui</i></a>
<b>Arguments</b>	{AUTO MANUal}
<b>Returns</b>	AUTO MANUal
<b>Example</b>	CPHY:PREFERENCE:SRATE:MODE AUTO sets the sample rate mode to Auto. CPHY:PREFERENCE:SRATE:MODE? returns indicating AUTO as the sample rate mode.

## CPHY:PREFERENCE:SAMPLESperui

This command sets or returns the value of samples per unit interval.

<b>Condition</b>	Signal Mode should be High Speed to get Samples per UI for High Speed. Signal Mode should be Low Power to get Samples per UI for Low Power.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFERENCE:SAMPLESperui<NR1> CPHY:PREFERENCE:SAMPLESperui?
<b>Related commands</b>	<a href="#"><i>CPHY:PREFERENCE:SRATE:MODE</i></a>

<b>Arguments</b>	A single <NR1> value. Range: {4 to 500 for High Speed, 4 to 2500 for Low Power}.
<b>Returns</b>	A single <NR1> value, {4 to 500 for High Speed, 4 to 2500 for Low Power}.
<b>Example</b>	CPHY:PREference:SAMPlesperui 4 sets the samples per UI to 4. CPHY:PREference:SAMPlesperui? returns 4 as the sample per UI.

## CPHY:PREference:SRATe:VALUe? (Query only)

This command returns the sample rate for High Speed and Low Power.

<b>Condition</b>	Signal Mode should be High Speed to get Sample rate for High Speed. Signal Mode should be Low Power to get Sample rate for Low Power.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREference:SRATe:VALUe?
<b>Related commands</b>	<i>CPHY:PREference:SAMPlesperui</i>
<b>Returns</b>	A single <NR1> value.
<b>Example</b>	CPHY:PREference:SRATe:VALUe? returns the value of sample rate.

## CPHY:PREFerence:SAMPlesperui:HIGH

This command sets or returns the samples per unit interval of High speed signal.

**Condition** Signal Mode should be High speed.

**Group** Preferences

**Syntax** CPHY:PREFerence:SAMPlesperui:HIGH <NR1>  
CPHY:PREFerence:SAMPlesperui:HIGH?

**Related commands** [\*CPHY:PREFerence:SRATe:MODE\*](#)

**Arguments** A single <NR1> value  
Range: {4 to 500}

**Returns** A single <NR1> value  
Range: {4 to 500}

**Example** CPHY:PREFerence:SAMPlesperui:HIGH 4 sets the samples per UI to 4.  
CPHY:PREFerence:SAMPlesperui:HIGH? returns 4 as the sample per UI.

## CPHY:PREFerence:SAMPlesperui:LOW

This command sets or returns the samples per unit interval of Low power signal.

<b>Condition</b>	Signal Mode should be Low power.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFerence:SAMPlesperui:LOW <NR1> CPHY:PREFerence:SAMPlesperui:LOW?
<b>Related commands</b>	<i>CPHY:PREFerence:SRATe:MODE</i>
<b>Arguments</b>	A single <NR1> value Range: {4 to 2500}
<b>Returns</b>	A single <NR1> value Range: {4 to 2500}
<b>Example</b>	CPHY:PREFerence:SAMPlesperui:LOW 4 sets the samples per UI to 4. CPHY:PREFerence:SAMPlesperui:LOW? returns 4 as the sample per UI.



## CPHY:PREFereNce:SRATe:HIGH:VALUe?(Query only)

This command returns the sample rate of High speed signal.

**Group** Preferences

**Syntax** CPHY:PREFereNce:SRATe:HIGH:VALUe?

**Related commands** [\*CPHY:PREFereNce:SRATe:MODE\*](#)

**Returns** A single <NRf> value.

**Example** CPHY:PREFereNce:SRATe:HIGH:VALUe? returns the sample rate of High speed signal.

## CPHY:PREFereNce:SRATe:LOW:VALUe (Query only)

This command returns the sample rate of Low power signal.

**Group** Preferences

**Syntax** CPHY:PREFereNce:SRATe:LOW:VALUe?

**Related commands** [\*CPHY:PREFereNce:SRATe:MODE\*](#)

**Returns** A single <NRf> value

**Example** CPHY:PREFERENCE:SRATE:LOW:VALUE? returns the sample rate of Low power signal.

## CPHY:PREFERENCE:SKEW:ACLIne

This command sets or returns the skew value of line A to line C.

**Group** Preferences

**Syntax** CPHY:PREFERENCE:SKEW:ACLIne <NRf>  
CPHY:PREFERENCE:SKEW:ACLIne?

**Related commands** [\*CPHY:PREFERENCE:SKEW:ABLine\*](#)

**Arguments** A single <NRf> value.  
Range: {-2E-9 to 2E-9}.

**Returns** A single <NRf> value, {-2E-9 to 2E-9}.

**Example** CPHY:PREFERENCE:SKEW:ACLIne 1.96E09 sets the skew value as 1.96 ns for line A to line C.  
CPHY:PREFERENCE:SKEW:ACLIne? returns 1.96E09 as the skew value for line A to line C.

## CPHY:PREFERENCE:SKEW:ABLine

This command sets or returns the skew value of line A to line B.

**Group** Preferences

**Syntax** CPHY:PREFERENCE:SKEW:ABLine <NRf>  
CPHY:PREFERENCE:SKEW:ABLine?

**Related commands** [\*CPHY:PREFERENCE:SKEW:ACLine\*](#)

**Arguments** A single <NRf> value.  
Range: {-2E-9 to 2E-9}.

**Returns** A single <NRf> value, {-2E-9 to 2E-9}.

**Example** CPHY:PREFERENCE:SKEW:ABLine 1.96E09 sets the skew value as 1.96 ns for line A to line B.  
CPHY:PREFERENCE:SKEW:ABLine? returns 1.96E09 as the skew value for line A to line B.

## CPHY:PREFerence:AWGAmplitude:MODE

This command sets or returns the amplitude and offset control mode.

**Group**      Preferences

**Syntax**      CPHY:PREFerence:AWGAmplitude:MODE <value>  
CPHY:PREFerence:AWGAmplitude:MODE?

**Related commands**      *CPHY:PREFerence:AWGAmplitude:OFFSet:VALUe*

**Arguments**      {AUTO|MANUal}

**Returns**      AUTO  
MANUal

**Example**      CPHY:PREFerence:AWGAmplitude:MODE AUTO sets the amplitude value to Auto.  
CPHY:PREFerence:AWGAmplitude:MODE? returns AUTO as the amplitude mode.

## CPHY:PREFERENCE:AWGAmplitude:OFFSet:VALUe

This command sets or returns the offset.

**Group** Preferences

**Syntax** CPHY:PREFERENCE:AWGAmplitude:OFFSet:VALUe <NRf>  
CPHY:PREFERENCE:AWGAmplitude:OFFSet:VALUe?

**Related commands** [\*CPHY:PREFERENCE:AWGAmplitude:AMPLitude:VALUe\*](#)

**Arguments** A single <NRf> value.  
Range: {-400E-03 to 800E03}

**Returns** A single <NRf> value, {-400E-03 to 800E03}

**Example** CPHY:PREFERENCE:AWGAmplitude:OFFSet:VALUe 500E-03 sets the offset to 500 mV.  
CPHY:PREFERENCE:AWGAmplitude:OFFSet:VALUe? returns 500E-03 as the offset value.

## CPHY:PREFerence:AWGAmplitude:AMPLitude:VALUe

This command sets or returns the AWG amplitude.

<b>Condition</b>	AWG amplitude mode should be Manual.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFerence:AWGAmplitude:AMPLitude:VALUe? <NRf> CPHY:PREFerence:AWGAmplitude:AMPLitude:VALUe
<b>Related commands</b>	<i>CPHY:PREFerence:AWGAmplitude:OFFSet:VALUe</i>
<b>Arguments</b>	A single <NRf> value. Range: {31E-03 to 1.2}.
<b>Returns</b>	A single <NRf> value, {31E-03 to 1.2}.
<b>Example</b>	CPHY:PREFerence:AWGAmplitude:AMPLitude:VALUe 32E-03 sets the AWG amplitude to 32 mV. CPHY:PREFerence:AWGAmplitude:AMPLitude:VALUe? returns 32E-03 as the AWG amplitude.

## CPHY:PREFERENCE:STARtupsignal:ENABLE

This command enables or disables the startup signal.

**Group** Preferences

**Syntax** CPHY:PREFERENCE:STARtupsignal:ENABle {0|1}  
CPHY:PREFERENCE:STARtupsignal:ENABle?

**Related commands** [\*CPHY:PREFERENCE:STARtupsignal:LINEB\*](#)  
[\*CPHY:PREFERENCE:STARtupsignal:LINEC\*](#)

**Arguments** {0|1}  
0 disables startup signal.  
1 enables startup signal.

**Returns** A single <Boolean> value, {0|1}

**Example** CPHY:PREFERENCE:STARtupsignal:ENABle 1 enables the startup signal to be included in the waveform.  
CPHY:PREFERENCE:STARtupsignal:ENABle? returns 1 indicating startup signal is enabled.

## CPHY:PREFeRence:STARtupsignal:LINEA

This command sets or returns the startup signal for line A.

**Group**      Preferences

**Syntax**      CPHY:PREFeRence:STARtupsignal:LINEA {LPHIGH|LPLOW}  
CPHY:PREFeRence:STARtupsignal:LINEA?

**Related commands**      *CPHY:PREFeRence:STARtupsignal:LINEB*

**Arguments**      {LPHIGH|LPLOW}

**Returns**      LPHIGH  
LPLOW

**Example**      CPHY:PREFeRence:STARtupsignal:LINEA LPHIGH offsets the startup signal of line A to LPHIGH.  
CPHY:PREFeRence:STARtupsignal:LINEA? returns LPHIGH as the value of startup signal for line A.



## CPHY:PREFerence:STARtupsignal:LINEB

This command sets or returns the startup signal for line B.

**Group**     Preferences

**Syntax**     CPHY:PREFerence:STARtupsignal:LINEB {LPHIGH|LPLOW}  
CPHY:PREFerence:STARtupsignal:LINEB?

**Related commands**     [\*CPHY:PREFerence:STARtupsignal:LINEC\*](#)

**Arguments**     {LPHIGH|LPLOW}

**Returns**     LPHIGH  
LPLOW

**Example**     CPHY:PREFerence:STARtupsignal:LINEB LPHIGH offsets the startup signal of line B to LPHIGH.  
CPHY:PREFerence:STARtupsignal:LINEB? returns LPHIGH as the value of startup signal for line B.

## CPHY:PREFeRence:STARtupsignal:LINEC

This command sets or returns the startup signal for line C.

**Group**      Preferences

**Syntax**      CPHY:PREFeRence:STARtupsignal:LINEC {LPHIGH|LPLOW}  
CPHY:PREFeRence:STARtupsignal:LINEC?

**Related commands**      *CPHY:PREFeRence:STARtupsignal:LINEB*

**Arguments**      {LPHIGH|LPLOW}

**Returns**      LPHIGH  
LPLOW

**Example**      CPHY:PREFeRence:STARtupsignal:LINEC LPHIGH offsets the startup signal for line C to LPHIGH.  
CPHY:PREFeRence:STARtupsignal:LINEC? returns LPHIGH as the value of startup signal for line C.

## CPHY:CSETtings:WAVEform:SEQUence

This command sets or returns the name of the sequence.

**Condition**     Compile and assign to option should be selected.

**Group**         Compile Settings

**Syntax**        CPHY:CSETtings:WAVEform:SEQUence "string"  
CPHY:CSETtings:WAVEform:SEQUence?

**Related commands**     [\*CPHY:CSETtings:COMPILE\*](#)

**Arguments**     <String> ::= <Sequence name entered by user>  
                    <Sequence name>

**Returns**        <Sequence name>

**Example**        CPHY:CSETtings:WAVEform:SEQUence "CPhySequence" sets the waveform sequence as CPhySequence.  
CPHY:CSETtings:WAVEform:SEQUence? returns "CPhySequence" as the waveform sequence.

## CPHY:CSETtings:WAVEform:NAME

This command sets or returns the name of the waveform.

**Group**      Compile Settings

**Syntax**      CPHY:CSETtings:WAVEform:NAME <string>  
CPHY:CSETtings:WAVEform:NAME?

**Related commands**      *CPHY:CSETtings:WAVEform:OVERwrite*

**Arguments**      <String>::= <Waveform name entered by user>  
                     <Waveform name>

**Returns**      <Waveform name>

**Example**      CPHY:CSETtings:WAVEform:NAME "CPHY-Example" sets the waveform name as CPHY-Example.  
CPHY:CSETtings:WAVEform:NAME? returns "CPHY-Example" as the waveform name.

## CPHY:SIGNal

This command sets or returns the signal mode.

<b>Group</b>	Miscellaneous
<b>Syntax</b>	CPHY:SIGNal {LP HS LPHS} CPHY:SIGNal?
<b>Arguments</b>	{LP HS LPHS}
<b>Returns</b>	LP HS LPHS
<b>Example</b>	CPHY:SIGNal LP sets the signal mode to LP. CPHY:SIGNal? returns LP as the signal mode.

## CPHY:RESEt (No Query form)

This command resets the plugin settings to default settings.

<b>Group</b>	Miscellaneous
<b>Syntax</b>	CPHY:RESEt

**Example** CPHY:RESEt reset plugin.

## CPHY:VERSion? (Query only)

This command sets or returns CPHYXPRESS version.

**Condition** Active waveform plug-in should be CPHYXpress.

**Group** Miscellaneous

**Syntax** CPHY:VERSion?

**Returns** String value

**Example** CPHY:VERSion? returns the CPHYXPRESS version.

## WPLUgin:ACTIve (No Query form)

This command sets or returns the active waveform plugin. Enables to launch the application.

**Condition** Plug-in should be installed.

**Group** Miscellaneous

<b>Syntax</b>	WPLUgin:ACTive "Plugin name"
<b>Arguments</b>	String value - It should be a plugin name.
<b>Returns</b>	Returns a string value which is a plugin name.
<b>Example</b>	WPLUgin:ACTive "CPHYXpress" sets the active plug-in to CPHYXpress. WPLUgin:ACTive? returns "CPHYXpress" as the active plug-in.

## CPHY:COMPile (No Query form)

This command initiates to compile the waveform.

<b>Condition</b>	Active waveform plug-in should be CPHYXpress.
<b>Group</b>	Miscellaneous
<b>Syntax</b>	CPHY:COMPile
<b>Example</b>	CPHY:COMPile compiles waveform.

## CPHY:COMPile:STATus?

This command initiates to compile status.

<b>Condition</b>	Active waveform plug-in should be CPHYXpress.
<b>Group</b>	Miscellaneous
<b>Syntax</b>	CPHY:COMPile:STATus {0/NONE 1}
<b>Returns</b>	A single <Boolean> value, {0/NONE 1}. 0 or NONE value returns when waveform compilation is in progress. 1 returns when waveform compilation is completed.
<b>Example</b>	CPHY:COMPile:STATus? may return 0 as the compile status.

## CPHY:COMPile:CANCel (No Query form)

This command cancels compilation.

<b>Group</b>	Miscellaneous
<b>Syntax</b>	CPHY:COMPile:CANCel
<b>Example</b>	CPHY:COMPile:CANCel cancels compilation.



## CPHY:CSETtings:WAVEform:OVERwrite

This command enables or disables waveform overwrite.

**Condition** There should be an existing waveform with the same waveform name.

**Group** Compile Settings

**Syntax** CPHY:CSETtings:WAVEform:OVERwrite {0|1}  
CPHY:CSETtings:WAVEform:OVERwrite?

**Related commands** [\*CPHY:CSETtings:WAVEform:NAME\*](#)

**Arguments** {0|1}  
0 disables overwrite waveform.  
1 enables overwrite waveform.

**Returns** A single <Boolean> value {0|1}.

**Example** CPHY:CSETtings:WAVEform:OVERwrite 1 enables overwrite existing waveform.  
CPHY:CSETtings:WAVEform:OVERwrite? returns 1 indicating overwrite existing waveform is enabled.

# CPHY:CSETtings:COMPile

This command sets or returns the type of compile option.

Group	Compile Settings
Syntax	CPHY:CSETtings:COMPile <value> CPHY:CSETtings:COMPile?
Related commands	<i>CPHY:CSETtings:SLAVe:ENABle</i>
Arguments	{COMP, CSENd}.
Returns	COMP CSENd
Example	CPHY:CSETtings:COMPile COMP sets the compile option to compile. CPHY:CSETtings:COMPile? returns COMP as the compile option.

## CPHY:CSETtings:SWITChlogview

This command enables/disables switch log view.

**Group**     Compile Settings

**Syntax**     CPHY:CSETtings:SWITChlogview <value>  
CPHY:CSETtings:SWITChlogview?

**Related commands**     [\*CPHY:CSETtings:SLAVe:ENABLE\*](#)

**Arguments**     {0|1}  
0 disables switch log view  
1 enables switch log view

**Returns**     A single <Boolean> value, {0|1}.

**Example**     CPHY:CSETtings:SWITChlogview 1 enables switch log view.  
CPHY:CSETtings:SWITChlogview? returns 1 indicating switch log view is enabled.

# CPHY:CSETtings:MASTer:CHONe

This command sets or returns the line waveform of Master channel one.

Condition	Compile and assign to option should be selected. Master should be enabled and connected.
Group	Compile Settings
Syntax	CPHY:CSETtings:MASTer:CHONe <value> CPHY:CSETtings:MASTer:CHONe?
Related commands	<i>CPHY:CSETtings:MASTer:CHTWo</i>
Arguments	{VA VB VC}
Returns	VA VB VC
Example	CPHY:CSETtings:MASTer:CHONe VA sets the master channel one to line waveform VA. CPHY:CSETtings:MASTer:CHONe? returns VA as the line waveform of master channel one.

## CPHY:CSETtings:MASTer:CHTWo

This command sets or returns the line waveform of Master channel two.

**Condition** Compile and assign to option should be selected. Master should be enabled and connected.

**Group** Compile Settings

**Syntax** CPHY:CSETtings:MASTer:CHTWo <value>  
CPHY:CSETtings:MASTer:CHTWo?

**Related commands** [\*CPHY:CSETtings:MASTer:CHONe\*](#)

**Arguments** {VA|VB|VC}

**Returns** VA  
VB  
VC

**Example** CPHY:CSETtings:MASTer:CHTWo VA sets the master channel two to line waveform VA.  
CPHY:CSETtings:MASTer:CHTWo? returns VA as the line waveform of master channel two.

# CPHY:CSETtings:SLAVe:ENABLE

This command enables or disables the value to enable or disable the slave.

Condition	This option will be enabled only when compile and assign to option is selected.
Group	Compile setting
Syntax	CPHY:CSETtings:SLAVe:ENABLE {0 1} CPHY:CSETtings:SLAVe:ENABLE?
Arguments	{0 1} 0 disables the slave. 1 enables the slave.
Returns	A single <boolean> value, {0 1}.
Example	CPHY:CSETtings:SLAVe:ENABLE 1 enables the slave. CPHY:CSETtings:SLAVe:ENABLE returns 1 indicating slave is enabled.

## CPHY:CSETtings:SLAVe:IPADdress

This command sets or returns the slave IP address.

**Condition** This option will be enabled only when slave is selected.

**Group** Compile Settings

**Syntax** CPHY:CSETtings:SLAVe:IPADdresss <Slave IP address>  
CPHY:CSETtings:SLAVe:IPADdress?

**Related commands** [\*CPHY:CSETtings:SLAVe:ENABle\*](#)

**Arguments** A single <"string"> value, should be a valid IPV6/IPV4.

**Returns** A single <"string"> value.

**Example** CPHY:CSETtings:SLAVe:IPADdress 134.64.220.21 sets the slave IP address to 134.64.220.21.

CPHY:CSETtings:SLAVe:IPADdress? returns 134.64.220.21 as slave IP address.

# CPHY:CSETtings:SLAVe:CHONe

This command sets or returns the line waveform of Slave channel one.

**Condition**      Compile and assign to option should be selected. Slave should be enabled and connected.

**Group**            Compile Settings

**Syntax**           CPHY:CSETtings:SLAVe:CHONe <value>  
CPHY:CSETtings:SLAVe:CHONe?

**Related commands**    *CPHY:CSETtings:SLAVe:CHTWo*

**Arguments**        {VA|VB|VC}

**Returns**           VA  
VB  
VC

**Example**           CPHY:CSETtings:SLAVe:CHONe VA sets the slave channel one to line waveform VA.  
CPHY:CSETtings:SLAVe:CHONe? returns VA as the line waveform of slave channel one.



## CPHY:CSETtings:SLAVe:CHTWo

This command sets or returns the line waveform of Slave channel two.

**Condition** Compile and assign to option should be selected. Slave should be enabled and connected.

**Group** Compile Settings

**Syntax** CPHY:CSETtings:SLAVe:CHTWo <value>  
CPHY:CSETtings:SLAVe:CHTWo?

**Related commands** [\*CPHY:CSETtings:SLAVe:CHONe\*](#)

**Arguments** {VA|VB|VC}

**Returns** VA  
VB  
VC

**Example** CPHY:CSETtings:SLAVe:CHTWo VA sets the slave channel two to line waveform VA.  
CPHY:CSETtings:SLAVe:CHTWo? returns VA as the line waveform of slave channel two.

# CPHY:CSETtings:SLAVe:ISConected

This command sets or returns the value to connect or disconnect the slave.

Condition	Compile and assign to option should be selected. Slave should be enabled and connected with a valid IP address.
Group	Compile Settings
Syntax	CPHY:CSETtings:SLAVe:ISConected {0 1} CPHY:CSETtings:SLAVe:ISConected?
Related commands	<i>CPHY:CSETtings:SLAVe:ENABLE</i>
Arguments	{0 1} 0 disconnects the slave connection. 1 establishes slave connection.
Returns	A single <NR1> value, {0 1}.
Example	CPHY:CSETtings:SLAVe:ISConected 1 establishes slave connection. CPHY:CSETtings:SLAVe:ISConected? returns 1 indicating the slave is connected.

## CPHY:CSETtings:WAVEform:APPEND

This command enables or disables the option to append the waveform sequence in AWG.

**Condition** Compile and assign to option should be selected.

**Group** Compile Settings

**Syntax** CPHY:CSETtings:WAVEform:APPEND {0|1}  
CPHY:CSETtings:WAVEform:APPEND?

**Related commands** [\*CPHY:CSETtings:SEQUence:OVERwrite\*](#)

**Arguments** {0|1}  
0 disables append waveform to sequence.  
1 enables append waveform to sequence.

**Returns** A single <Boolean> value, {0|1}

**Example** CPHY:CSETtings:WAVEform:APPEND 1 enables append waveform to sequence.  
CPHY:CSETtings:WAVEform:APPEND? returns 1 indicating append waveform to sequence is enabled.

## CPHY:PREFeRence:CORRection:ENABLE

This command enables or disables the application of correction file.

<b>Condition</b>	Correction file on any of the channels of master and slave should be selected. A valid correction file must be given.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFeRence:CORRection:ENABLE <bool> CPHY:PREFeRence:CORRection:ENABLE?
<b>Related commands</b>	<i>CPHY:PREFeRence:CORRection:GAUSSian</i>
<b>Arguments</b>	A single <Boolean> value, {0 1}. 0 disables the application of correction file. 1 enables the application of correction file.
<b>Returns</b>	A single <Boolean> value, {0 1}
<b>Example</b>	CPHY:PREFeRence:CORRection:ENABLE 1 enables the application of correction file. CPHY:PREFeRence:CORRection:ENABLE? returns 1 indicating application of correction file is enabled.

## CPHY:PREFerence:CORRection:MASTer:CHOne:ENABLE

This command enables or disables the application of correction file on Master channel one.

**Condition** Apply Correction File should be selected.

**Group** Preferences

**Syntax** CPHY:PREFerence:CORRection:MASTer:CHOne:ENABLE <bool>  
CPHY:PREFerence:CORRection:MASTer:CHOne:ENABLE?

**Related Commands** [\*CPHY:PREFerence:CORRection:MASTer:CHTwo:ENABLE\*](#)

**Arguments** A single <Boolean> value, {0|1}.

0 disables the application of correction file on Master channel one.

1 enables the application of correction file on Master channel one.

**Returns** A single < Boolean> value, {0|1}.

**Example** CPHY:PREFerence:CORRection:MASTer:CHOne:ENABLE1 applies correction file on master channel one.

CPHY:PREFerence:CORRection:MASTer:CHOne:ENABLE? returns 1 indicating correction file will be applied on master channel one.

## CPHY:PREFeRence:CORRection:MASTer:CHTwo:ENABLE

This command enables or disables the application of correction file on Master channel two.

<b>Condition</b>	Apply Correction File should be selected.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFeRence:CORRection:MASTer:CHTwo:ENABLE {0 1} CPHY:PREFeRence:CORRection:MASTer:CHTwo:ENABLE?
<b>Related commands</b>	<i>CPHY:PREFeRence:CORRection:MASTer:CHOne:ENABLE</i>
<b>Arguments</b>	A single boolean value, {0 1}. 0 disables the application of correction file on Master channel two. 1 enables the application of correction file on Master channel two.
<b>Returns</b>	A single boolean value, {0 1}.
<b>Example</b>	CPHY:PREFeRence:CORRection:MASTer:CHTwo:ENABLE1 applies correction file on master channel two. CPHY:PREFeRence:CORRection:MASTer:CHTwo:ENABLE? returns 1 indicating correction file will be applied on master channel two.

## CPHY:PREFereNce:CORRection:MASTer:CHOne:FILE

This command sets or returns the correction file path of Master channel one.

**Condition** Apply Correction File and Master Channel one should be selected.

**Group** Preferences

**Syntax** CPHY:PREFereNce:CORRection:MASTer:CHOne:FILE <"file path">  
CPHY:PREFereNce:CORRection:MASTer:CHOne:FILE?

**Related Commands** [\*CPHY:PREFereNce:CORRection:MASTer:CHTwo:FILE\*](#)

**Arguments** <"file path">

**Returns** <"file path">

**Example** CPHY:PREFereNce:CORRection:MASTer:CHOne:FILE "C:\\sample.corr" sets the master channel one correction file path to C:\\sample.corr.

CPHY:PREFereNce:CORRection:MASTer:CHOne:FILE? returns C:\\sample.corr as the correction file path of master channel one.

## CPHY:PREFeRence:CORRection:MASTer:CHTwo:FILE

This command sets or returns the correction file path of Master channel two.

<b>Condition</b>	Apply Correction File and Master Channel one should be selected.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFeRence:CORRection:MASTer:CHTwo:FILE "file path" CPHY:PREFeRence:CORRection:MASTer:CHTwo:FILE?
<b>Related Commands</b>	<i>CPHY:PREFeRence:CORRection:MASTer:CHOne:FILE</i>
<b>Arguments</b>	"file path"
<b>Returns</b>	"file path"
<b>Example</b>	CPHY:PREFeRence:CORRection:MASTer:CHTwo:FILE "C:\\sample.corr" sets correction file path of master channel two. CPHY:PREFeRence:CORRection:MASTer:CHTwo:FILE returns "c:\\sample.corr" as the correction file path of master channel two.



## CPHY:PREFERENCE:CORREction:SLAVe:CHOne:ENABle

This command enables or disables the application of correction file on Slave channel one.

**Condition** Apply Correction File should be selected.

**Group** Preferences

**Syntax** CPHY:PREFERENCE:CORREction:SLAVe:CHOne:ENABle <bool>  
CPHY:PREFERENCE:CORREction:SLAVe:CHOne:ENABle?

**Related Commands** [\*CPHY:PREFERENCE:CORREction:SLAVe:CHTwo:ENABle\*](#)

**Arguments** A single <Boolean> value, {0|1}.

0 disables the application of correction file on Slave channel one.

1 enables the application of correction file on Slave channel one.

**Returns** A single < Boolean> value, {0|1}.

**Example** CPHY:PREFERENCE:CORREction:SLAVe:CHOne:ENABle 1 applies correction file on slave channel one.

CPHY:PREFERENCE:CORREction:SLAVe:CHOne:ENABle? returns 1 indicating correction file will be applied on slave channel one.

## CPHY:PREFeRence:CORRection:SLAVe:CHTWo:ENABle

This command enables or disables the application of correction file on Master channel two.

<b>Condition</b>	Apply Correction File should be selected.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFeRence:CORRection:SLAVe:CHTWo:ENABle {0 1} CPHY:PREFeRence:CORRection:SLAVe:CHTWo:ENABle?
<b>Related commands</b>	<i>CPHY:PREFeRence:CORRection:SLAVe:CHOne:ENABle</i>
<b>Arguments</b>	A single boolean value, {0 1}. 0 disables the application of correction file on Slave channel two. 1 enables the application of correction file on Slave channel two.
<b>Returns</b>	A single boolean value, {0 1}.
<b>Example</b>	CPHY:PREFeRence:CORRection:SLAVe:CHTWo:ENABle 1 applies correction file on slave channel two. CPHY:PREFeRence:CORRection:SLAVe:CHTWo:ENABle? returns 1 indicating correction file will be applied on slave channel two.

## CPHY:PREFereNce:CORRection:SLAVe:CHOne:FILE

This command sets or returns the correction file path of slave channel one.

**Condition**     Apply Correction File and Slave Channel one should be selected.

**Group**         Preferences

**Syntax**        CPHY:PREFereNce:CORRection:SLAVe:CHOne:FILE <"file path">  
CPHY:PREFereNce:CORRection:SLAVe:CHOne:FILE?

**Related Commands**     *CPHY:PREFereNce:CORRection:SLAVe:CHTwo:FILE*

**Arguments**     <"file path">

**Returns**        <"file path">

**Example**        CPHY:PREFereNce:CORRection:SLAVe:CHOne:FILE "C:\\sample.corr" sets the slave channel one correction file path to C:\\sample.corr.  
CPHY:PREFereNce:CORRection:SLAVe:CHOne:FILE? returns C:\\sample.corr as the correction file path of slave channel one.

## CPHY:PREFeRence:CORRection:SLAVe:CHTwo:FILE

This command sets or returns the correction file path of slave channel two.

<b>Condition</b>	Apply Correction File and Slave Channel two should be selected.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFeRence:CORRection:SLAVe:CHTwo:FILE <"file path"> CPHY:PREFeRence:CORRection:SLAVe:CHTwo:FILE?
<b>Related Commands</b>	<i>CPHY:PREFeRence:CORRection:SLAVe:CHOne:FILE</i>
<b>Arguments</b>	<"file path">
<b>Returns</b>	<"file path">
<b>Example</b>	CPHY:PREFeRence:CORRection:SLAVe:CHTwo:FILE "C:\\sample.corr" sets the slave channel two correction file path to C:\\sample.corr. CPHY:PREFeRence:CORRection:SLAVe:CHTwo:FILE? returns C:\\sample.corr as the correction file path of slave channel two.

## CPHY:PREFERENCE:CORREction:REMOve

This command enables or disables the removal of Sin(x)/x distortions from correction file.

**Condition**     Apply Correction File and Master Channel one should be selected.

**Group**        Preferences

**Syntax**       CPHY:PREFERENCE:CORREction:REMOve <bool>  
CPHY:PREFERENCE:CORREction:REMOve?

**Related Commands**     [\*CPHY:PREFERENCE:CORREction:GAUSSian\*](#)

**Arguments**     A single <Boolean> value, {0|1}.

0-disables the removal of Sin(x)/x distortions from correction file.

1-enables the removal of Sin(x)/x distortions from correction file.

**Returns**        A single <Boolean> value, {0|1}

**Example**        CPHY:PREFERENCE:CORREction:REMOve enables the removal of Sin(x)/x distortions from correction file.

CPHY:PREFERENCE:CORREction:REMOve? returns 1 indicating removal of Sin(x)/x distortions from correction file is enabled.

## CPHY:PREFeRence:CORRection:GAUSSian

This command enables or disables application of Gaussian filter.

<b>Condition</b>	Apply Correction File should be selected.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFeRence:CORRection:GAUSSian <bool> CPHY:PREFeRence:CORRection:GAUSSian?
<b>Related Commands</b>	<i>CPHY:PREFeRence:CORRection:GAUSSian:BANDwidth</i>
<b>Arguments</b>	A single <Boolean> value, {0 1}. 0-disables the application of Gaussian filter. 1-enables the application of Gaussian filter.
<b>Returns</b>	A single <Boolean> value, {0 1}.
<b>Example</b>	CPHY:PREFeRence:CORRection:GAUSSian 1 enables the application of Gaussian filter. CPHY:PREFeRence:CORRection:GAUSSian? returns 1 indicating Gaussian filter is enabled.

## CPHY:PREFERENCE:CORREction:GAUSSian:BANDwidth

This command sets and returns the Gaussian bandwidth.

**Condition**     Apply Correction File should be selected.

**Group**        Preferences

**Syntax**       CPHY:PREFERENCE:CORREction:GAUSSian:BANDwidth <NRF>  
CPHY:PREFERENCE:CORREction:GAUSSian:BANDwidth?

**Related Commands**     *CPHY:PREFERENCE:CORREction:GAUSSian*

**Arguments**     A single <NRF> value.  
Range: Sample rate /100 to sample rate/2.

**Returns**        A single <NRF> value.  
Range: Sample rate /100 to sample rate/2.

**Example**        CPHY:PREFERENCE:CORREction:GAUSSian:BANDwidth 340E6 sets the bandwidth to 340 MHz.  
CPHY:PREFERENCE:CORREction:GAUSSian:BANDwidth? returns 340E6 as bandwidth value.

## CPHY:PREFeRence:CORRection:AALL

This command enables or disables the application of correction file of Master channel one to all channels.

<b>Condition</b>	Apply Correction File should be selected.
<b>Group</b>	Preferences
<b>Syntax</b>	CPHY:PREFeRence:CORRection:AALL <bool> CPHY:PREFeRence:CORRection:AALL
<b>Related Commands</b>	<i>CPHY:PREFeRence:CORRection:MASTer:CHTwo:FILE</i>
<b>Arguments</b>	A single Boolean value, {0 1}.
<b>Returns</b>	A single Boolean value, {0 1}.
<b>Example</b>	CPHY:PREFeRence:CORRection:AALL 1 applies correction file of master channel one to all the channels.  CPHY:PREFeRence:CORRection:AALL returns 1 indicating correction file used in master channel one will be applied to all channels.



## CPHY:LOGView? (Query only)

This command returns the logview contents.

**Condition**    There is a limitation on number of characters (256 characters)

**Syntax**      CPHY:LOGView?

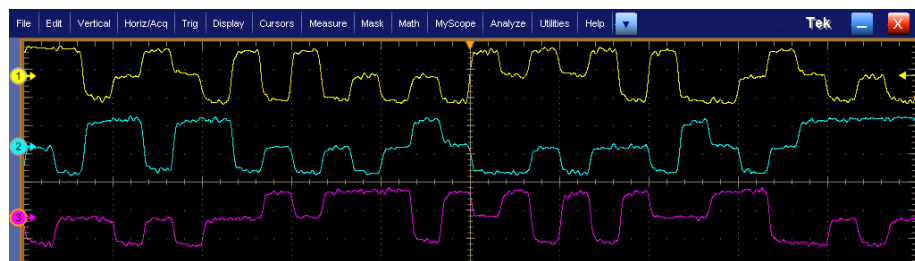
**Returns**      A string value.

**Example**      CPHY:PREF:OUTPut? returns the logview contents.

## Example code to use PI parameter

**Example of PI command to create a waveform and assign them to AWG channels :**

Task	PI Command
Set Plug-in Module CPHYXpress	WPLUgin:ACTIve "CPHYXpress" (This is AWG PI Command)
Reset Module	CPHY:RESEt
Set the Signal Mode	CPHY:SIGNal LPHS
Set the HS Base Pattern	CPHY:HSPEed:PATtern PRBS7
Set HS Symbol rate	CPHY:HSPEed:SRATe 2
Enable 'Use Line A levels for B and C'	CPHY:HSPEed:USELevels 1
Set LineA voltage Levels	CPHY:HSPEed:LINEA:HIGH 300E-3 CPHY:HSPEed:LINEA:LOW -100E-3
LP Pattern	CPHY:LPOWer:PATtern ULPS
LP Symbol rate	CPHY:LPOWer:SRATe 50E6
LP line levels	CPHY:LPOWer:LINEA:HIGH 800E-3 CPHY:LPOWer:LINEA:LOW 0 CPHY:LPOWer:USELINEA 1
Set a waveform name	CPHY:CSETtings:WAVEform:Name "NameOfWfm"
Switch to 'Compile and Assign to' Assign waveforms to channels	CPHY:CSETtings:COMPIle CSEnd CPHY:CSETtings:MASTer:CHONe VA CPHY:CSETtings:MASTer:CHTWo VB
Enable Slave and configure IP address	CPHY:CSETtings:SLAVe:ENABLE 1 CPHY:CSETtings:SLAVe:IPADDress "134.64.220.21" e.g. Here IP: 134.64.220.21
Connect Slave	CPHY:CSETtings:SLAVe:ISConected 1
Assign signal to slave Channels	CPHY:CSETtings:SLAVe:CHONe VC CPHY:CSETtings:SLAVe:CHTWo VA
AWG Channel turn on (Separate for Master & Slave)	OUTPut1:STATE ON OUTPut2:STATE ON (AWG PI Command)
Compile	CPHY:COMPIle



**Figure 17: Expected wfm file**

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