

Keysight M8085A MIPI Receiver Test Solution Plugins

This document contains latest information on the Keysight MIPI D-PHY Editor Plugin, the D-PHY CTS Plugin, the C-PHY Editor Plugin, and the C-PHY CTS Plugin.

Related Documents

For detailed information, refer to the following documents for these applications:

- "Keysight M8085A D-PHY Editor User Guide.pdf"
- "Keysight M8085A D-PHY Receiver Test Software User Guide.pdf"
- "Keysight M8085A C-PHY Editor User Guide.pdf"
- "Keysight M8085A C-PHY Receiver Test Software User Guide.pdf"
- "Keysight M8085A Plugins Installation Guide.pdf"

The documents can be found at the following locations:

C:\Program Files\Keysight\M8070A\Plugins\MipiGeneratorPlugin\doc and

C:\Program Files\Keysight\M8070A\Plugins\Mipi\doc

The M8070A documents can be located by clicking *Start > All Programs > Keysight M8070A > Keysight M8070A Documentation*. Alternatively, you can also visit

www.keysight.com/find/m8070a to find the latest versions of M8070A documents.

Release V2.0.0.0

Released Date:	April 28, 2016
Operating System:	<ul style="list-style-type: none"> – Microsoft Windows 7 (64 bit) SP1 – Microsoft Windows 8 (64 bit) – Microsoft Windows 8.1 (64 bit)
Display resolution:	– Minimum requirement 1024 x 768
Software Pre-requisites:	<ul style="list-style-type: none"> – Keysight IO Library rev. 17.2 or above – AXIe Chassis Firmware (Embedded System Module (ESM) from Agilent Technologies) greater than or equal version 1.3.41
D-PHY Editor Plugin Requirements:	<ul style="list-style-type: none"> – Keysight M8070A System Software Version: 3.1.x.x or above with options M8070A-0TP or M8070A-0NP – Keysight M8085A -DT1 MIPI D-PHY Editor option for M819xA AWG – Keysight M8085A-DTA MIPI D-PHY calibration and test option for the M819xA AWG – Keysight M8190A Firmware Version: 5.3 or above with options 002, 12G, AMP and SEQ or alternatively Keysight M8195A, M8197A Firmware Version: 2.6.7.1 or above with options 004, 16G, AMP and SEQ
D-PHY CTS Plugin Requirements:	<ul style="list-style-type: none"> – Keysight M8070A System Software Version: 3.1.x.x or above with options M8070A-0TP or M8070A-0NP – Keysight D-PHY CTS license M8085A-DTA M8085A-DNA M8085A-DDA – Keysight M8085A-DTA MIPI D-PHY calibration and test option for the M819xA AWG – Keysight M8190A Firmware Version: 5.3 or above with options 002, 12G, AMP and SEQ or alternatively Keysight M8195A, M8197A Firmware Version: 2.6.7.1 or above with options 004, 16G, AMP and SEQ
C-PHY Editor Plugin Requirements:	<ul style="list-style-type: none"> – Keysight M8070A System Software Version: 3.1.x.x with options M8070A-0TP or M8070A-0NP – Keysight C-PHY Editor license M8085A-CT1, M8085A-CN1, or M8085A-CD1 – Keysight M8190A Firmware Version: 5.3 or above with options 002, 12G, AMP and SEQ – Keysight M8195A Firmware Version 2.6.7.1 or above with options 004, 16G, AMP and SEQ
C-PHY CTS Plugin Requirements:	<ul style="list-style-type: none"> – Keysight M8070A System Software Version: 3.1.x.x or above with options M8070A-0TP or M8070A-0NP – Keysight C-PHY CTS license M8085A-CTA M8085A-CNA M8085A-CDA – Keysight M8085A-CTA MIPI D-PHY calibration and test option for the M819xA AWG – Keysight M8190A Firmware Version 5.3 or above with options 002, 12G, AMP and SEQ or alternatively Keysight M8195A Firmware Version: 2.6.7.1 or above with options 004, 16G, AMP and SEQ
Executable File Name:	PlugInInstaller_MIPI_x.x.x.x.exe

Installation Steps

To install the MIPI M8085A MIPI D-PHY & C-PHY plugins, perform the following steps:

- If you have installed previous versions of the D-PHY or C-PHY plugins please uninstall them beforehand.

- Close the M8070A if it is running.
- Run the “PlugInInstaller_MIPI_x.x.x.x.exe”.
- Accept the disclaimer, and follow the steps of the installation wizard.
- Install the licenses above via the Keysight License Manager (if not done before).
- Start the M8070A software. To do so, go to *Start Menu > All Programs > Keysight M8070A* and click *Keysight M8085A* to start the M8070A software. You should now find the new plugins in the *Applications* menu of the M8070A software.

Getting Started

1. Start M8070A System Software
 - For D-PHY: Start the *MIPI D-PHY Editor Plugin* or the *MIPI D-PHY CTS Plugin* by selecting it on the *Application* menu of the menu bar;
 - For C-PHY: Start the *MIPI C-PHY Editor Plugin* or the *MIPI C-PHY CTS Plugin* by selecting it on the *Application* menu of the menu bar;
2. Start the controller software for the AWGs
3. After starting the application, you need to go through the configure steps and target hardware;
 - The real time oscilloscope (can be found in the *Keysight Connection Expert*)
 - The hislip connection numbers to the AWGs can be found via the controller software of the AWGs. The M8190A Firmware will show it on the main window, and the M8195A soft front panel is showing it in the *Help > About* screen. The IP address will be “localhost” or the IP address of the remote PC on which the controller software of the AWGs is running. The PC on which M8070A and the AWG controller software is running needs to be in the same network.

Features

MIPI D-PHY Editor Plugin Features

The MIPI D-PHY Editor Plugin supports the following features:

- Up to four data lanes on the M8195A AWG; single data lane on the M8190A.
- Different modes of operation, such as Burst mode, Burst mode with continuous clock, Frames, etc.;

- Load of complex easy to write sequences by using a text editor like notepad (see user manual);
- Configurable Intra/Inter pair skew, sinusoidal interference, ISI by s-parameter files, phy timings, sinusoidal jitter, random jitter, voltage levels and disturbances including eSpike generation;

MIPI D-PHY CTS Plugin Features

The MIPI D-PHY CTS Plugin supports the following features:

- Supports CTS tests for DPHY Specification Version 1.2 (complete test coverage)
- Same pattern and sequence capabilities then the D-PHY editor since it based on it
- Integration of a customer based interface to the DUT for controlling and reading the error information. It follows the definition of the IberReader interface in the CTS, and needs to be implemented in .Net (example code available)

Known Defects/Missing Features

- No parallel execution with the C-PHY CTS PlugIn

MIPI C-PHY Editor Plugin Features

- Support for M8195A.
- Support for up to three lanes of synchronous C-PHY physical layer receiver test by using a single M8197A and one to three M8195A. To support this multi-lane feature, the M8195A firmware version 3.0 is required.

Known Defects/Missing Features

- When doing a deskew calibration there is the chance of the Infiniium GUI hanging. This is generally caused by a problem in hardware and/or software setup leading the oscilloscope to not receive the signal required for measuring the channel skew. Restarting the Infiniium software or sending a "Device Clear" to it will resolve this issue.
- In certain cases, it is possible that when using the start/stop/restart/trigger or reset functionality of the Editor from SCPI that an error message "Operation is not possible for the current run status of the measurement." will be generated. This error message can generally be avoided by introducing a small delay between calling the above functionality or by querying the Run Status or Progress of the Editor.

MIPI C-PHY CTS Plugin Features

The MIPI C-PHY CTS Plugin supports the following features:

- Supports CTS tests for CPHY Specification Version 1.0 (complete test coverage)
- Supports single lane on M8195A and M8190A.

- Same pattern and sequence capabilities then the C-PHY editor since it based on it
- Integration of a customer based interface to the DUT for controlling and reading the error information. It follows the definition of the IBERReader interface in the CTS, and needs to be implemented in .Net (example code available)
- Compared to the previous version the Station Configurator is not required anymore. The setup of the instruments is now integrated in the user interface.

Known Defects/Missing Features

- No parallel execution with the D-PHY CTS PlugIn
- Previous versions need to be uninstalled

Release V1.5.0.0 (New Features and Defect Fix)

New Features

C-PHY Feature

- Sequence added for High Speed End and Low Power End.

Defect Fixes

C-PHY

448964 Glitch in triggered startup mode when trigger start state is set to LP000.

The C-PHY requirements, other features, and limitations are similar to release V1.4.2.2.

Release V1.4.7.10 (New Features and Defect Fix)

New Features

C-PHY Feature

- Restart sequence without re-computing the patterns.

D-PHY Feature

- Added a new trigger type “Triggered (HS only)” under AWG Setup functional block.

Defect Fixes

C-PHY

- 438153 M8085A-CT1/DT1: Issuing API STOP command causes error when already stopped.PLUG:CPHY:STAR 'name' generates error. Cannot start C-PHY traffic programmatically.
- 435649 Stop button doesn't stop data pattern. To stop data, we need to do STOP -> START (then wait few seconds) -> STOP.

The C-PHY/D-PHY requirements, other features, and limitations are similar to release V1.4.2.2.

Release V1.4.4.6 (Defect Fix)

This release only includes a defect fix. The C-PHY/D-PHY requirements, features, and limitations are similar to release V1.4.2.2.

Defect Fixes

- 438195 PLUG:CPHY:STAR 'name' generates error. Cannot start C-PHY traffic programmatically.

Release V1.4.2.2

Released Date:	September 17, 2015
Operating System:	Microsoft Windows 7 (64 bit) SP1, Microsoft Windows 8 (64 bit) Microsoft Windows 8.1 (64 bit)
Display resolution:	Minimum requirement 1024 x 768
Software Pre-requisites:	Keysight IO Library rev. 17.1 or above

	AXIe Chassis Firmware (Embedded System Module (ESM) from Agilent Technologies) greater than or equal version 1.3.41
C-PHY Plugin Requirements:	Keysight M8070A System Software Version: 2.5.x.x with options 0TP/0NP and CT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
D-PHY Plugin Requirements:	Keysight M8070A System Software Version: 2.5.x.x with options 0TP/0NP and DT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
File Name:	MipiGeneratorPlugin.m8kp

NOTE

Currently the M8085A MIPI plugin is only compatible with M8190A and not with its successor M8195A.

Features

C-PHY Features

- Allow parameterized eye closure with ISI scaling parameter.
- DCD support per line for High Speed symbol to achieve eye closure.
- Pulse width support per line for Low Power symbols to detect pulses with minimum required duration.
- Hysteresis support per line to add sinusoidal noise on low power symbols.
- S6P Files are supported to emulate ISI on individual lines.
- Triggered startup mode, to enable the C-PHY plugin to provide a static LP Stop signal.
- Separate LP amplitudes per line.
- De-Skew on complement outputs without re-cabling the normal outputs.
- Read-only skew calibration values.

D-PHY Features

- Parameter name HS Common-Mode Level and HS Differential Output Voltage under Signal Levels is replaced by Offset and Amplitude for Data and Clock lane. User guides are updated accordingly with better description.
- Data Rate and Sample rate can be set to a higher number of significant digits.
- Automatic clock pattern generation transitioning to LP stop state between HS bursts.

Important Notes

C-PHY

- Starting data generation when using a loop pattern type of PRBS $2^{18}-1$ takes approximately 10 minutes until run mode is initialized. In case ISI is additionally activated initial startup time will take around 30 minutes.
- Even if ISI is disabled in run mode unnecessary recalculation will occur when changing the S-Parameter file path.

Known Limitations

C-PHY

- Using different duty cycle distortion settings per line will introduce a skew between them.

C-PHY and D-PHY

- Using different rise/fall time settings per lane will introduce a skew between them.
- Before waveform playback starts AWG voltage level will be at its amplifier offset level. This level needs to correspond to the LP stop state level. Otherwise devices might see a wrong start value instead of the correct LP stop level depending on the output amplifier offset setting. As a workaround for this issue the amplifier offset setting in the MIPI plugin should be set to the desired LP stop state level.
- Context sensitive help is not working. As a workaround, all information related to C-PHY and D-PHY can be found at the following location:
C:\Program Files (x86)\Agilent\M8070A\Plugins\MipiGeneratorPlugin\doc

Defect Fixes

C-PHY

428335 A continuous loop pattern of LP-HS-LP-HS causes a glitch after sync word.

C-PHY/D-PHY

- 429089 Pressing stop button doesn't toggle the AWG outputs to OFF
- 428101 Floating licenses are checked out, even if not used.
- 438195 PLUG:CPHY:STAR 'name' generates error. Cannot start C-PHY traffic programmatically.

Release V1.3.0.0

Released Date:	April 02, 2015
Operating System:	Microsoft Windows 7 (64 bit) SP1, Microsoft Windows 8 (64 bit) Microsoft Windows 8.1 (64 bit)
Display resolution:	Minimum requirement 1024 x 768
Software Pre-requisites:	Keysight IO Library rev. 17.1 or above AXIe Chassis Firmware (Embedded System Module (ESM) from Agilent Technologies) greater than or equal version 1.3.41
C-PHY Plugin Requirements:	Keysight M8070A System Software Version: from 1.5.2.2 to 2.1.50.2 with options 0TP/0NP and CT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
D-PHY Plugin Requirements:	Keysight M8070A System Software Version: from 1.5.9.6 to 2.1.50.2 with options 0TP/0NP and CT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
File Name:	M8085A_MIPI_Setup.exe

NOTE

Currently the M8085A MIPI plugin is only compatible with M8190A and not with its successor M8195A.

D-PHY Features

- Automatic clock generation with single transition from LP to HS on clock lane and quadrature phase relationship to user pattern on data lane
- Speed mode transitions from LP to HS on clock lane and LP to HS and vice versa on data lane
- Support for single ended ISI adjustable per lane from S2P or S4P files where the S21 parameter is taken
- Support for adding e-Spike impairment to waveform adjustable per lane
- Restart of waveform playback without pattern recalculation and download. (Fast but can contain non-continuous patterns when changing parameters in run mode)
- Separate voltage level adjustability for LP and HS signals on normal and complement line

Release V1.2.8.4 (Beta)

Released Date:	February 26, 2015
Operating System:	Microsoft Windows 7 (64 bit) SP1, Microsoft Windows 8 (64 bit) Microsoft Windows 8.1 (64 bit)
Display resolution:	Minimum requirement 1024 x 768
Software Pre-requisites:	Keysight IO Library rev. 17.1 or above AXIe Chassis Firmware (Embedded System Module (ESM) from Agilent Technologies) greater than or equal version 1.3.41
C-PHY Plugin Requirements:	Keysight M8070A System Software Version: from 1.5.2.2 to 2.1.50.2 with options 0TP/0NP and CT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
D-PHY Plugin Requirements:	Keysight M8070A System Software Version: from 1.5.9.6 to 2.1.50.2 with options 0TP/0NP and CT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
File Name:	M8085A_MIPI_Setup.exe

NOTE

Currently the M8085A MIPI plugin is only compatible with M8190A and not with its successor M8195A.

D-PHY Features

- Support for one clock and one data lane

- Pattern generation for LP and HS pattern with separately definable patterns per lane
- Support of sequence playback with separately definable init pattern occurring once and loop pattern running indefinitely. It is also possible to change certain parameters on the fly without sequence restart.
- Adjustable HS and LP amplitudes per lane
- Adjustable transition times per link
- Adjustable sinusoidal jitter per lane
- Adjustable bounded uncorrelated jitter (RJ) per lane

Release V1.2.3.2 (Beta)

Released Date:	February 02, 2015
Operating System:	Microsoft Windows 7 (64 bit) SPI, Microsoft Windows 8 (64 bit) Microsoft Windows 8.1 (64 bit)
Display resolution:	Minimum requirement 1024 x 768
Software Pre-requisites:	Keysight IO Library rev. 17.1 or above AXIe Chassis Firmware (Embedded System Module (ESM) from Agilent Technologies) greater than or equal version 1.3.41
C-PHY Plugin Requirements:	Keysight M8070A System Software Version: from 1.5.2.2 to 2.1.50.2 with options 0TP/0NP and CT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
File Name:	M8085A_CPhy_Setup_V1.2.3.2_Beta.exe

NOTE

Currently the M8085A MIPI plugin is only compatible with M8190A and not with its successor M8195A.

C-PHY Features

- Use S-Parameters defined in Touchstone file format to add Intersymbol Interference distortion to the generated waveform

Release V1.1.6.0

Released Date:	November 24, 2014
Operating System:	Microsoft Windows 7 (64 bit) SP1, Microsoft Windows 8 (64 bit) Microsoft Windows 8.1 (64 bit)
Display resolution:	Minimum requirement 1024 x 768
Software Pre-requisites:	Keysight IO Library rev. 17.1 or above AXIe Chassis Firmware (Embedded System Module (ESM) from Agilent Technologies) greater than or equal version 1.3.41
C-PHY Plugin Requirements:	Keysight M8070A System Software Version: from 1.5.2.2 to 2.1.50.2 with options 0TP/0NP and CT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
File Name:	M8085A_CPhy_Setup_1.1.6.0.exe

NOTE

Currently the M8085A MIPI plugin is only compatible with M8190A and not with its successor M8195A.

C-PHY Features

- Support for changing parameters while signal generation is active (Ping Pong Mode)
- eSpike impairment for low power mode now available

Release V1.0.0.0

Released Date:	October 10, 2014
Operating System:	Microsoft Windows 7 (64 bit) SP1, Microsoft Windows 8 (64 bit) Microsoft Windows 8.1 (64 bit)
Display resolution:	Minimum requirement 1024 x 768
Software Pre-requisites:	Keysight IO Library rev. 17.1 or above AXIe Chassis Firmware (Embedded System Module (ESM) from Agilent Technologies) greater than or equal version 1.3.41
C-PHY Plugin Requirements:	Keysight M8070A System Software Version: from 1.5.2.2 to 2.1.50.2 with options 0TP/0NP and CT1 Keysight M8190A Firmware Version: 5.0 or above with options 002, 12G, AMP, SEQ, FSW (and 0G2 for full PRBS support)
File Name:	M8085A_CPhy_Setup_1.0.0.0.exe

NOTE

Currently the M8085A MIPI plugin is only compatible with M8190A and not with its successor M8195A.

C-PHY Features

- First release of C-PHY Plugin