980/M41h/M41d/M42d 6.10 Release

Updated: Jan 13 2021

Table of Contents

1. Overview

This document provides information on Release 6.10 of the firmware for the 980B/M41h/M41d/M42d and for the Advanced Test Platform (ATP) GUI Manager (PC based External Manager Software).

- This release contains the following components:
  - 32 bit and 64bit Debian package for 980 Version 6.10.
  - 64bit Debian package for M41h/M41d/M42dVersion 6.10.
  - hdcp2 sink playback files deb for compliance test.
  - hdmi sink playback files deb for compliance test.
  - hdr-lab images deb.
  - Dolby-audio deb
  - Windows GUI installation msi.

Item	FPGA Versions (Changes compared to previous release are in RED)	
	980/M41x	
	6.00	6.10
DP 1.2 980 Protocol Analyzer Rev D	4.17.85 Build Number: 1	4.17.85 Build Number: 1
DP 1.2 980 Protocol Analyzer Rev E	4.17.85 Build Number: 1	4.17.85 Build Number: 1
DP 1.2 980 Protocol Analyzer Rev E (410)	4.18.42 Build Number: 1	4.18.42 Build Number: 1
DP 1.2 980 Protocol Analyzer Rev F	Version: 4.18.62 Build Number: 1 (06/07/2018 14:14:18 CST) PCB: 6/G rev=6, DP Product Code=2982	Version: 4.18.62 Build Number: 1 (06/07/2018 14:14:18 CST) PCB: 6/G rev=6, DP Product Code=2982
DP 1.4 980 Protocol Analyzer	Version: 4.25.238 Build Number: 1 (12/17/2019 16:16:19 CST) PCB: 1/B rev=1, DP Product Code=2983	Version: 4.25.238 Build Number: 1 (12/17/2019 16:16:19 CST) PCB: 1/B rev=1, DP Product Code=2983
DP 1.4 USB-C 98 Protocol Analyzer (**980/M41d**)	Version: 4.26.94 Build Number: 1 (12/19/2019 15:15:19 CST) PCB: 1/B(980);2/C(M41d) rev=1, DP Product Code=2984	Version: 4.26.97 Build Number: 1 (11/20/2020 16:16:20 CST) PCB: 2/C rev=1, DP Product Code=2984
SDI Scope	4.33.7 Build Number: 32	4.33.7 Build Number: 32
HDMI 2.0 980 Video Generator Rev B	Version: 4.34.1 Build Number: 32 (06/19/2017 15:36:00) PCB: 594b rev. B	Version: 4.34.1 Build Number: 32 (06/19/2017 15:36:00) PCB: 594b rev. B
HDMI 2.0 980 Video Generator Rev C	Version: 5.102.1 Build Number: 39 (02/07/2020 15:36:00) PCB: 594b rev. C	Version: 5.102.1 Build Number: 39 (02/07/2020 15:36:00) PCB: 594b rev. C
HDMI 1.4 980 Protocol Analyzer	Version: 4.22.1 Build Number: 57 (05/22/2017) Gen: 3 PCB: 297b/D	Version: 4.22.1 Build Number: 57 (05/22/2017) Gen: 3 PCB: 297b/D
HDMI 2.0 980 Protocol Analyzer	4.22.7 Build Number: 43	4.22.7 Build Number: 43
HDMI 2.0 RX/TX	Version: 4.27.1 Build Number: 55 (07/12/2018) Gen: 5 PCB: 594d/A	Version: 4.27.1 Build Number: 55 (07/12/2018) Gen: 5 PCB: 594d/A
HDMI 2.1 RX/TX (**980/M41h**)	**Dual GW:** 1. Version: 5.30.1 Build Number: 168 (10/23/2020) Gen: 5 PCB: 1200a/C(980); 1200a/E(M41h) 2. Version: 5.30.1 Build Number: 118 (06/16/2020) Gen: 5 PCB: 1200b/C(980); 1200b/E(M41h)	**Dual GW:** 3. Version: 5.30.1 Build Number: 139 (12/09/2020) Gen: 5 PCB: 1200a/E 4. Version: 5.30.1 Build Number: 79 (12/04/2020) Gen: 5 PCB: 1200b/E
Phy and Protocol Aux Channel Analyzer	5.16.24 Build Number: 12	5.16.24 Build Number: 12
DP 2.0 USB-C (**M42d**)	Version: 4.26.253 Build Number: 1 (11/06/2020 00:00:20 CST) PCB: 2/C rev=1, DP Product Code=2985	Version: 4.27.25 Build Number: 1 (12/17/2020 15:15:20 CST) PCB: 2/C rev=1, DP Product Code=2985

Commented [CAB1]: This column should reflect 6.00 not 5.90.

Commented [SSR2R1]: Paul updates this section.

2. Installation

Important Note: When upgrading the 980/M41x/M42d system firmware, please be sure to disconnect any video cables that are connected to the 980/M41x Protocol Analyzer / Video Generator modules. Failure to do so may result in issues during upgrade.

Always begin by installing the Windows External Manager software:

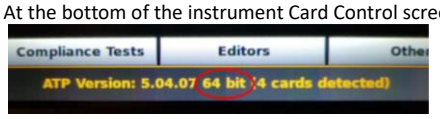
1. Download the Windows External Manager 6.10 file 980-mgr_6.10_Win32.msi.
2. Double-click or Run this file to install it.

Then install the Instrument Firmware Release.

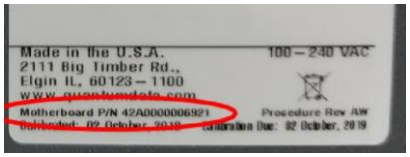
Important Note:
For the M41d/h/M42d series, there is only one Debian file beginning with M4xx. This debian is for all M41d/h/M42d series devices.

For the 980 series, two different versions of the Instrument Firmware are available, for 32-bit and for 64-bit operating systems. Please make one or both of the following checks to determine whether you need the 64-bit firmware:

3. At the bottom of the instrument Card Control screen, check for “64 bit” indication:



4. On the product label on the back (980B) or bottom (980R) of the instrument, check for Motherboard P/N 42A0000006921 or 42A0000009220:



If the ATP version shows 64 bit, or if the label shows either of the above part numbers, then download the “980-atp-64” firmware. Otherwise, you have a 32-bit system, so download the “980-atp-32” firmware.

1. Download the release “980-atp-xx” .deb firmware file as indicated above.
2. Launch the newly installed External Manager (980 Manager) and connect to the 980 via Ethernet TCP/IP.
   a. Note: you may see a warning about version mismatch. This is normal and indicates that you should continue with the version upgrade before using the instrument with the new version of the External Manager.
3. From the External 980 Manager program, pull down the Instrument menu and select Upgrade UI/Firmware/Gateware. Browse to and select the 980-atp-xx release file, select Open, and continue with the process. The 980 will power down at the end.

If the 980/ M41d/h/M42d is licensed for **HDR Lab** Images (License 45):

4. Download the HDR Lab Images .deb file.
5. From the External 980 Manager program, pull down the Instrument menu and select **Upgrade System Components**. Browse to and select the hdr-lab-images.deb file, select Open and continue with the process.

If the 980/ M41d/h/M42d is licensed for **HDMI HDCP CTS 2.3 Compliance Test for Sinks** (License 29):

6. Download the 980-hdcp2-sink-ct.deb file.
7. From the External 980 Manager program, pull down the **Instrument** menu and select **Upgrade CT Scripts**. Browse to and select the 980-hdcp2-sink-ct.deb file, select Open and continue with the process.

If the 980/ M41h is licensed for **HDMI CTS 1.4b Compliance Test for Sinks** (License 6) or HDMI CTS 2.0 Package 4 Sink Tests (License 27):

8. Download the 980-hdmi-sink-ct.deb file.
9. From the External 980 Manager program, pull down the **Instrument** menu and select **Upgrade CT Scripts**. Browse to and select the 980-hdcp2-sink-ct.deb file, select Open and continue with the process

If the 980/ M41h is licensed for **HDMI DSC Compliance Test of Sink, 980/M41h (License 79)**

10. Download **dsc-sink-test-images.deb** file.
11. From the External 980 Manager program, pull down the Instrument menu and select **Upgrade System Components**. Browse to and select the **dsc-sink-test-images.deb** file, select Open and continue with the process.

2.1. Special Notice for M41h, M41d and M42d users

6.10 release uses kernel 5.4.31 of the Linux system to allow proper communication with an HDCP 2.3 capable monitor. This is required for this release and all subsequent releases for the M41h, M41d and M42d. Once a unit is running the new kernel, it will no longer be able to use Debian files from previous releases using the 5.39 kernel.

To determine whether your device requires this update, view the information file on your instrument.
From the ATP manager Select Instrument>Information. Look for the line that begins with OS.

OS : [Linux M4XX-0689 5.4.31 #3 SMP Tue May 5 12:08:24 CDT 2020 x86_64 x86_64 x86_64 GNU/Linux]

If the version is anything less than 5.4.31, your instrument must be updated.

Applications Engineering has created a separate package that allows the user to reconfigure the M41d/h/M42d units with the new kernel using an ISO file that will install the new kernel and software while preserving the unit's licenses and identity.

To obtain this package please submit a tech service request to psgsupport@TeledyneLecroy.com using the title "Request M41x Kernel Upgrade" and one of our support engineers will provide the upgrade package and instructions and assist if there are any issues.

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3. Release Notes

3.1. Resolved Issues HDMI

This section describes the HDMI-related anomalies corrected in this release.

Ticket ID No.	Description
V980-4010	On the 980 48G HDMI 2.1 module and the M41h, the HF1-72 no longer requests VICs and colorimetry combinations that exceed 595 MHz Character Rate.
V980-4009	On the 980 48G HDMI 2.1 module and the M41h, the HDMI 1.4 compliance tests 7-33, 8-2 have been updated to provide correct results.
V980-3999	On the 980 48G HDMI 2.1 module and the M41h, test support for 4 block EDID cases from test 7-33 have been removed as they are not yet approved.
V980-3968	On the 980 48G HDMI 2.1 module and the M41h, for the HFR1-27 test, Iter #4, the test was modified to allow additional time for link training to complete.
V980-3946	The HDMI compliance test interface now enables users to add notes to the test results report when the application prompts for a Pass/Fail query.
V980-3946	On the 980 48G HDMI 2.1 module and the M41h, the Source CTs, now allow swapping of the HF-SCDB with an equivalent HF-VSDB.
V980-4002	The 980 18G HDMI 2.1 Video Generator module no longer halts when using VICs 106 or 107.
V980-3992	On the 980 48G HDMI 2.1 module and the M41h, the “Real Time” Receiver mode no longer halts and gives a "Get Video Failed" error notification.
V980-3831	On the 980 48G HDMI 2.1 module and the M41h, the HDCP1.4 Compliance Test ID 1b-03 test no longer fails when reading the BCAPS.
V980-3820	On the 980 HDMI 2.1 modules and the M41h, the Application Programming Interface (API) now supports Step 6 (Visual Check) for Test ID HF1-31.
V980-3976	On the 980 HDMI 2.1 modules and the M41h, the HFR1-34 test no longer improperly checks the AVI InfoFrame. Review AVI InfoFrame.
V980-3873	On the 980 HDMI module and the M41h, the ATP Manager application Capture Analysis function now enables users to select the number of frames to capture in addition to the percentage of the capture buffer.
V980-3792	On the 980 HDMI 2.1 modules and the M41h, the Application Programming Interface (API) the Test ID HF1-34 no longer halts during the test.
V980-3766	The M41h and the 980 48G HDMI 2.1 module now enables a user to force FRL Link settings and train independent of EDID.
V980-3812	The dynamic test images on the 980 48G HDMI 2.1 module and the M41h, now show the proper motion.

3.2. Resolved Issues DisplayPort

This section describes the DisplayPort-related anomalies corrected in this release.

Ticket ID No.	Description
V980-3960	On the M42d, the DP Source compliance Test ID 4.3.3.1 no longer halts during the test.
V980-3959	On the M42d, the DP Source compliance Test IDs 4.2.2.1, 4.3.2.1, 4.3.1.4, 4.3.1.10 no longer exhibits an improper failure condition.
V980-3965	On the M42d, the DPCD viewer no longer displays the “Command Execution Failure” error during a read operation through the ATP Manager.
V980-3946	The DIsplayPort compliance test interface now enables users to add notes to the test results report when the application prompts for a Pass/Fail query.
V980-3997	The 980 DP 1.4 Video Generator module no longer exhibits video noise when adjusting various video parameters.

3.3. Unresolved Issues

Functionality that is not working properly in this release:

Ticket ID No.	Description
V980-4053	On the M42d, the PD controller locks up when you create HPD of less than 4.8ms on USB-C RX port.
V980-3830	On the M41h and the 980 48G HDMI 2.1 module, the HDCP 1.4 compliance test 1B-01-1 fails with the message "DUT did not read KSVs from the KSV FIFO."
V980-3839	On the 980 48G HDMI 2.1 module, the Variable Refresh Rate (VRR) signal becomes unstable after about 10 minutes. This affects the Data Flow Metering as well and the Vsync as well.
V980-3884	On the M42d, when power down the unit, users should unplug the power line cord and wait to repower the unit for at least 15 seconds. In a future release, there will be a program that eliminate the need for this.
V980-3801	The 980 18G Video Generator supports the Test ID HF2-94 but cannot test VESA formats greater than 340MHz pixel rate.
V980-4032	On the M42d Passive Probing feature, the triggering modes are not functioning properly for the Capture feature. Only the Manual Trigger function properly.
V980-3940	On the 980 48G HDMI 2.1 module, the timing values when in Quick Media Switching (QMS) mode may show incorrect values.
V980-3937	On the 980 48G HDMI 2.1 module, the source TMDS compliance Test ID HF1-66 will exhibit inconsistent results and sometimes incorrectly indicate a failure.
V980-3794	The M41d does not detect Multi-Stream Transport (MST) topology correctly.

Note: There is a known issue(ticket #4053) PD controller locking up with HPD of only 4 ms to <5ms on M42D USB-C port when connected to another M42D only. Alpha build will be made available as soon as we have a fix.

3.4. New Display Port Features/Enhancements in 6.10

New Display Port Related features
M42d now supports the following: o DP2.0 Passive Probing M41d now supports the following: o DPCD register range 0x400 – 0x434

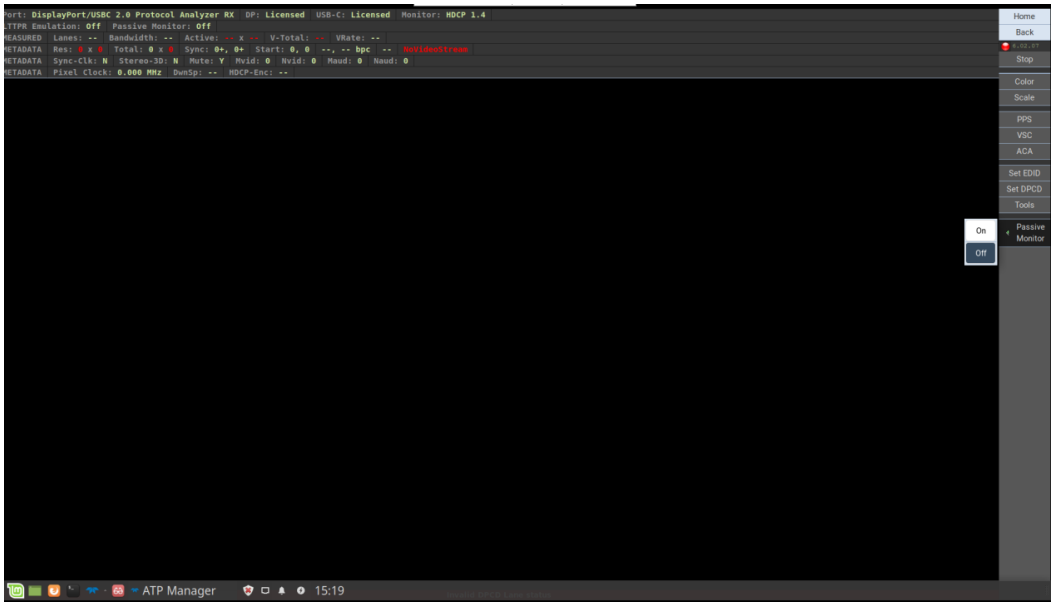
3.4.1.Passive Probing M42d

This release introduces passive probing on the M42d. It allows the user to place the M42d between a DP1.4/2.0 source and a DP1.4/2.0 Sink and monitor the video information passing through the unit as well as performing regular and ACA captures. Note that HDCP video content cannot be displayed or captured.

Connections can be made to the M42d via a standard DP cable, or short (one meter or less) high quality 8K DP USB-C cable Note that the cables shipped with the M42d are suitable for this purpose.

The following steps will provide for a stable connection:

1. On the receiver display of the M42d (not the ATP manager) Click on the Passive Monitoring button and insure it is **OFF**.
2. Connect your source to the M42d Rx port of choice with the appropriate cable to your Source.
3. Have your source generate your DP signal.
4. Make sure the cable connections are correct, the port status led will be green and you should see your video on the M42d display. Flip the USB-C cable at the M42d side only if the status LED is red.
5. Connect the M42d Tx port of choice with the appropriate cable to your Sink
6. Have the M42d generate a DP signal.
7. Make sure the cable connections are correct, the port status led will be green and you should see the generated video on your Sink. Flip the USB-C cable at the M42d side only if the status LED is red.
8. Once status LED's on the ports are green, you can turn **ON** the passive monitoring.



Once **ON** you should see your Source video on both the M42d display and on your Sink

The user will be able to perform the following functionality:

- Use the dashboard to view all the video data passing through in real time
- Use the ACA to perform capture of Aux data
- Perform regular data capture of the data passing through.

Please note the following restrictions:

1. In the case of both normal (Generator/Analyzer) and (Analyzer->Generator) passive-probing modes, a physical cable disconnect will be required for physical hot plug testing. In the passive-probing mode, where two cables are used, there is a very important caveat. It is **VERY IMPORTANT** that only the cable between Source DUT and TE (Analyzer) input port be disconnected and that the cable between TE (Generator) output port and Sink DUT remain connected.
2. Please note that as this is passive monitoring, the activation of HDCP will encrypt any video on the M42d display as it cannot process any data, just monitor it.

3.4.2.Accessing DPCD Register range 0x400-0x434 on the M41d

To use the DPCD register range of 400h - 434h in the M41d Analyzer Rx, you need to use both methods below (Part A and Part B) to write them to the actual DPCD registers.
They are split into two ranges 400h - 40Bh and 40Ch - 434h.

Part A

The Sink Device Specific registers (range of 40Ch to 434h) must be written for emulation using the auxw command from the command prompt. (see below) This is achieved through a DP or USB-C cable connected in loopback from the **M41d Tx to the M41d Rx**, because these writes are only performed across the DP or USB cable.
To access the command prompt Use one of the following methods:

Via the M41d USB Port

1. Using USB PC keyboard attached to M41d:
2. Press key combination Ctrl-Alt-F1
3. This will change the M41d screen to a command window.
4. login: qd
5. Password: qd
6. This will take you to the #dp14c-scope> prompt where you can enter commands.
7. to change the M41d screen back to the GUI Manager, press the key combination Ctrl-Alt-F7

Via Telnet session

1. Using a telnet or SSH client from a connected PC:
2. Run the telnet client (such as Putty) on the PC and connect to the M41d IP address.
3. login: qd
4. Password: qd
5. This will take you to the #dp14c-scope> prompt where you can enter commands.
6. This command prompt can remain open while you use the M41d graphical user interface.

The command syntax is as follows:
auxw [port] [starting address in hex] [byte values in hex 2 digits, bytes separated by a space]
port is always zero.

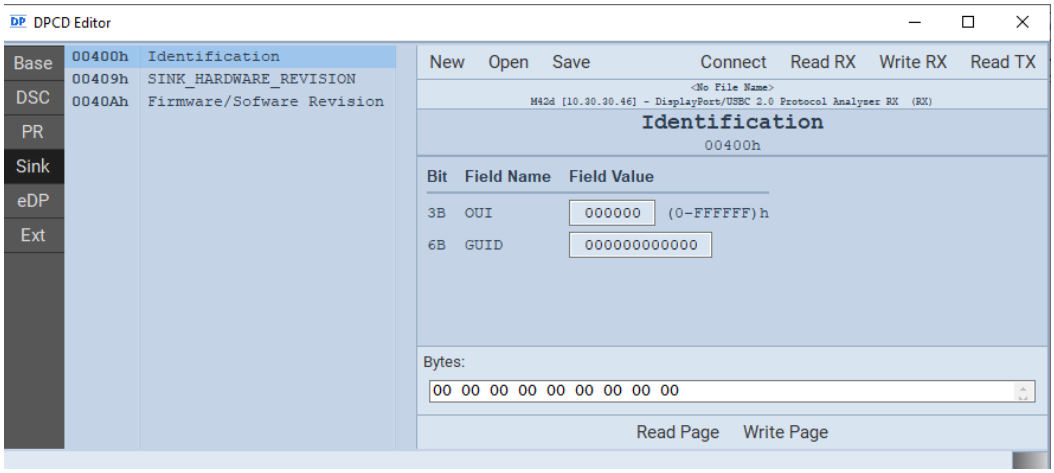
EXAMPLE: To write the hex values 01h 02h 03h 04h to the Sink Device Specific field 40Ch - 40Fh:
auxw 0 40c 01 02 03 04

After this command, these values will be emulated in the M41d Rx DPCD so that a connected source device will be able to read them from the range 40Ch - 40Fh.

Part B

The Identification and Revision fields 400h - 40Bh must be written via the DPCD Editor application.

1. Launch the DPCD Editor from the M41d Editors tab or the ATP manager.
2. In the far-left column choose the Sink button.
3. Note the 3 ranges of registers that must be written for emulation using the DPCD Editor:
   a. 400h - 408h Identification
   b. 409h Sink Hardware Revision
   c. 40Ah - 40Bh Firmware/Software Revision
3. Use the Open button to load the register settings for the range 400h - 40Bh if you have a pre-defined file, or click in the editor fields and manually enter the values into the range 400h - 40Bh.
4. When all registers in the range 400h - 40Bh are correct, click the "Write Rx" button. This will write the register values directly to the DPCD for the M41d Analyzer Rx.
5. After this procedure, these values will be emulated in the M41d Rx DPCD so that a connected source device will be able to read them from the range 400h - 40Bh.



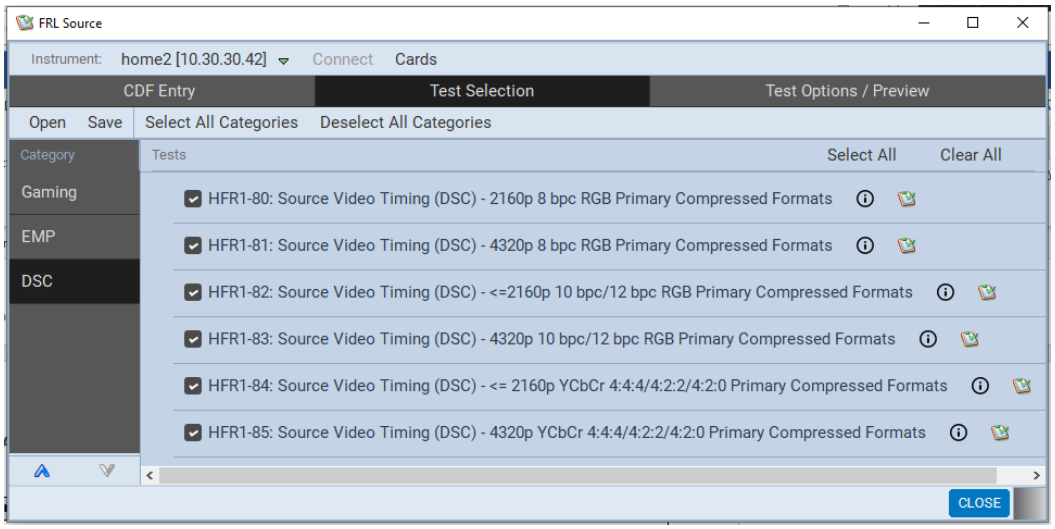
Please see the M41d User Guide for further information.

3.5. New HDMI Related Features/Enhancements in 6.10

Enhancements to the 980 48G HDMI 2.1 module & M41h
The 980 HDMI 2.1 module and M41h now support the following additional HDMI related function(s): • DSC Src CT – HFR1-80 through 85 • Newly added HFR1-65,HFR1-69 and HFR1-79

3.5.1. HDMI FRL DSC Source Compliance Tests

The following HDMI FRL Source compliance test have been added:



3.5.2. Compliance Tests Updates to match new gCTS wording

The following compliance tests have been updated:
Source 2.1e TMDS:

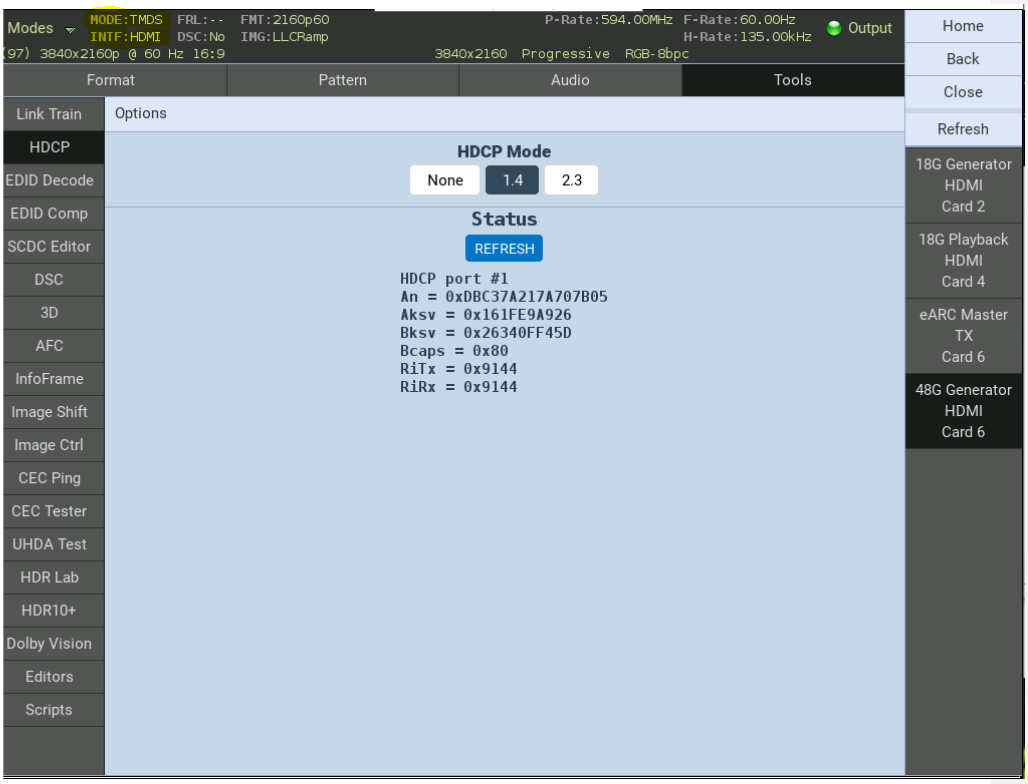
HF1-32, HF1-43, HF1-58, HF1-59, HF1-60, HF1-66

Source 2.1e FRL:
HFR1-30, HFR1-31, HFR1-33, HFR1-50, HFR1-51

Sink 2.1e TMDS:
HFR2-50

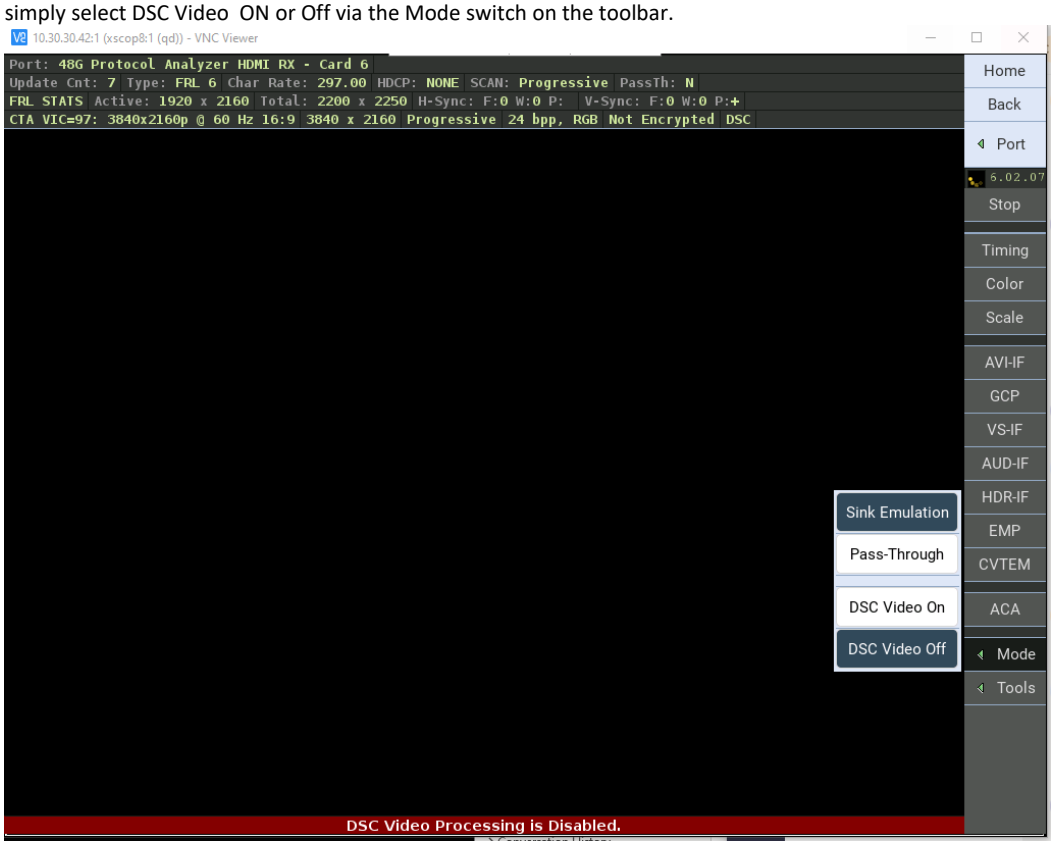
3.5.3. Supplemental - Enabling HDCP 1.4 on the 980 HDMI 2.1 TX and M41H

HDCP 1.4 capability has been added to the HDMI 2.1 generator. In order for this option to work properly, the 980 HDMI 2.1 or M41h must be in the TMDS mode. HDCP 1.4 is not supported in FRL mode per the HDMI 2.1 specification.
Note that the HDMI 2.1 module default HDCP state is none. Connect the generator to the sink to be tested and select 1.4 to activate HDCP 1.4 Note that the port authenticates after connection if the sink is compatible.



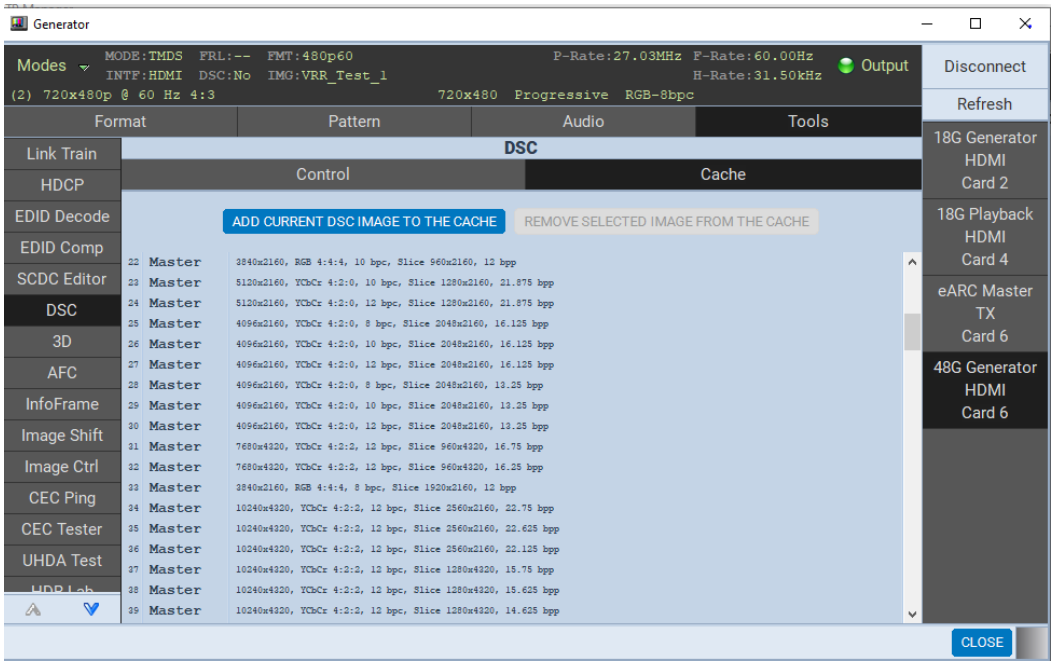
3.5.4. Supplemental - No DSC Video Snapshot Option on 980 HDMI 2.1 and M41H Rx

A new option has been added to the 48G Analayzer Snapshot view. This option allows the user to rapidly view the dashboard DSC video data without waiting for the DSC video image to be procesed first. The user needs to simply select DSC Video ON or Off via the Mode switch on the toolbar.



3.5.5.Supplemental – Cached Images for FRL DSC Sink Testing

To locate the image cache for the FRL DSC Sink testing once the appropriate .deb package has been installed, click on the Generator>Tools>DSC tab then on the Cache tab. As the complaince test runs, if the selected images are already cached, it will use these images rather then buildin a new image, thereby speeding up testing.



4. Support

For further information on the quantumdata 980/M41h/M41d/M42d products and the ATP Manager please see the Quick Start and Users guides available on our website at: https://www.quantumdata.com

For support on the quantumdata 980 or other Teledyne LeCroy PSG products, please send an email to: **psgsupport@teledynelecroy.com**

Please include your full contact information and a detailed description of the problem, including product model number, serial number, firmware version, software version, and any trace files pertaining to the issue.