



User Guide

MS-TestPro

HCT - HDMI Cable Tester Module

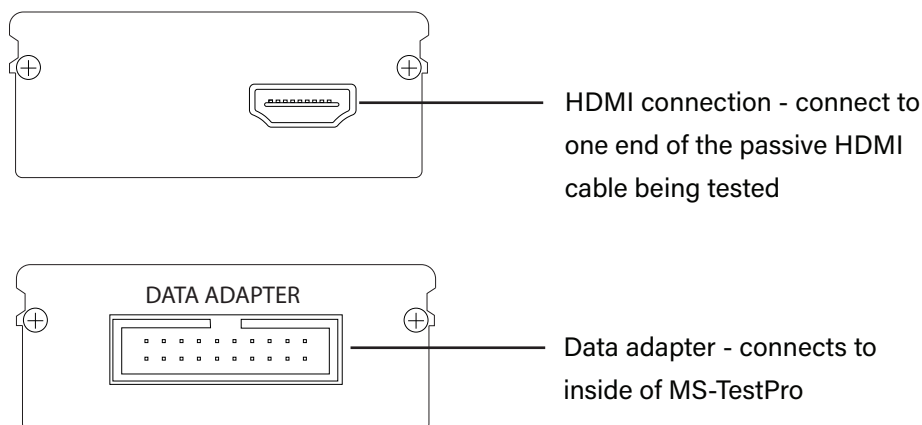


Introduction

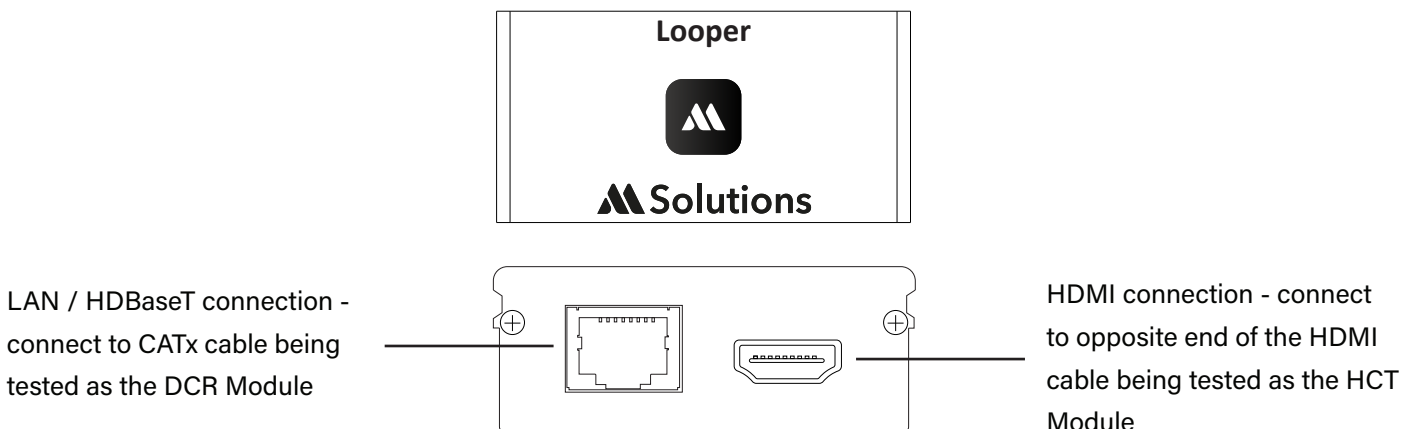
This User Guide has been written to assist in the use of the optional HCT module for the MS-104B - MS-TestPro. The HCT module is an optional purchase on top of the MS-TestPro for complete end-to-end testing or troubleshooting within a wider AV distribution system. The HCT allows for passive HDMI cables to be independently tested for data pass-through, highlighting the maximum bandwidth capabilities for resolution support up to 48Gbps by testing the physical layer and not a received image like other testers do in the market.

Please note: the MS-TestPro MS-104B will need to be on a firmware revision later than v4.0.3 to include support for the testing of 48Gbps passive HDMI cables. Please contact MSolutions for advice and access to the latest firmware for the MS-104B.

HCT Hardware



The Looper module is a remote-end module with RJ45 and HDMI ports that is used to create the loop at the other end for HCT testing (and DC Resistance when purchased with the optional DCR module). A Looper is supplied with any HCT or DCR module purchase.

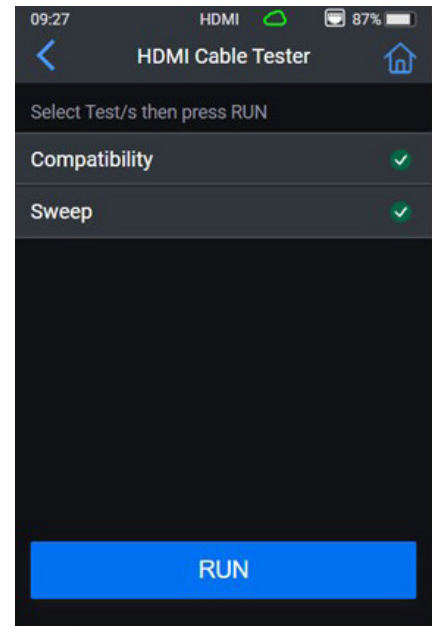


Testing Process

- Insert the main HCT module into the base of the MS-104B
- Switch on the power of the MS-104B unit once inserted and wait for the unit to boot
- Connect the passive HDMI cable between the HDMI port of the HCT module and the HDMI port on the Looper module.

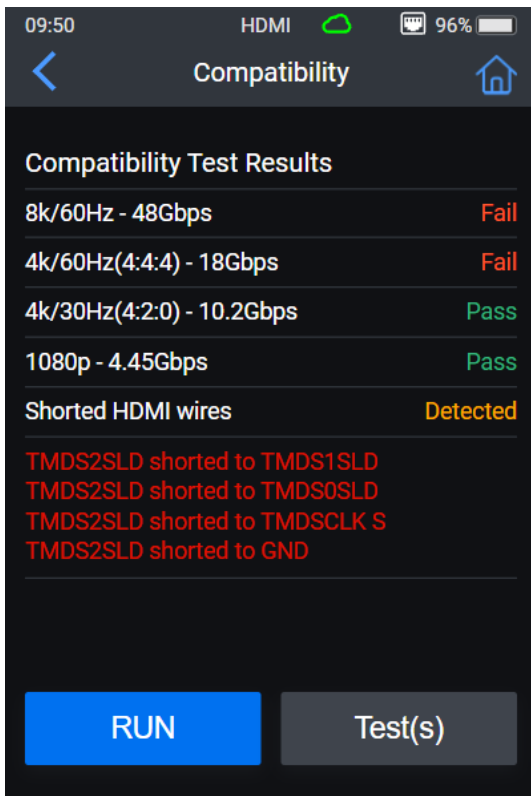
Please note: the HDMI Cable Test does not use the HDMI output port on the side of the MS-104B

- Once booted, select the option on the main menu for HCT. There will be two options for HDMI Cable Testing: Compatibility and Sweep
- A report can be generated and saved once both Sweep and Compatibility tests have been run simultaneously on the same cable



Compatibility:

The Compatibility test allows for a user to check the bandwidth capabilities of the HDMI cable. The HCT measures the resistance of the physical layer of the individual connections used on the high-speed data channels carrying video and audio data. The result is measured in 5 parts:



8K/60Hz - 48Gbps: testing the cable for its ability to carry 48Gbps to the Ultra High Speed classification for use with the HDMI2.1 chipset

4K/60Hz(4:4:4) - 18Gbps: testing the cable for its ability to carry 18Gbps for use with the HDMI2.0 chipset

4K/30Hz(4:2:0) - 10.2Gbps: testing the cable for its ability to carry 10.2Gbps to the High Speed classification for use with the HDMI1.4 chipset

1080p - 4.45Gbps: testing the cable for its ability to carry up to 1080p signals to the Standard classification for use with HDMI chipsets up to HDMI v1.3

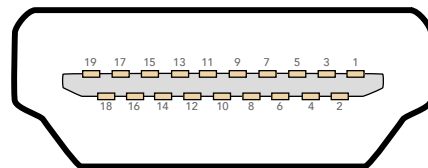
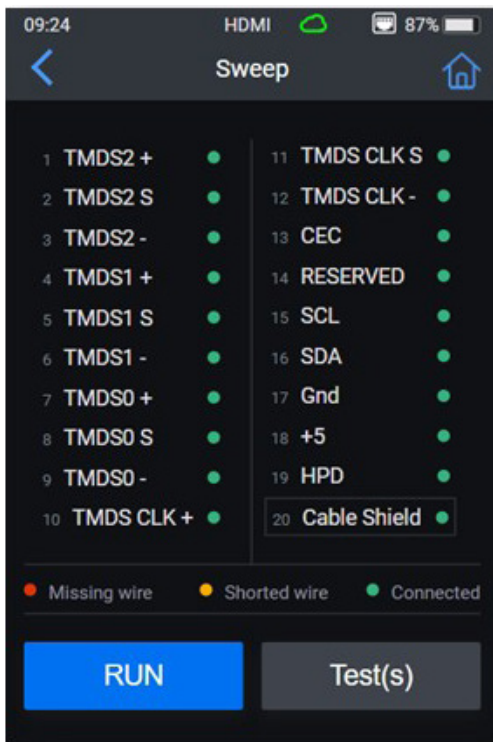
Shorted HDMI wires: outlines if any of the wires used in the cable may have been shorted during manufacturing, causing some functionality of the cables ability to carry all features of the HDMI signal.

Testing Process - continued...

The screenshot used on the previous page illustrates that the resistance put in front of the individual wires used for high-speed data transfer of the cable, are not suitable for sustained distribution of 18Gbps or 48Gbps signals. The cable may carry these 18/48Gbps signals for a period of time, however, the resultant signal will require additional correction from the HDMI chipset at the sink to rectify the errors. This could lead to failure of the link in the future, or after a prolonged period of time causing drop-outs of the image / sound.

Sweep:

The Sweep test allows for a user to check the individual connections of all 19-pins of the HDMI cable, outlining shorts or missing wires on the link. Certain features (i.e. CEC, or HEC) within the HDMI chipsets require individual connections on the HDMI cable to be functional where required.



The TMDS (Transition-Minimised Differential Signaling) channels are used for the transfer of video, audio and clock signals which are all required to carry high-speed data.

The remaining pins are low-speed data channels used for additional functionality and DDS (Display Data Channel) signals which are used for signals such as CEC, EDID and HDCP.

The screenshot used above shows that all individual pins on the HDMI cable are connected and functional showing that the cable is capable of passing the signals (to the maximum bandwidth of the Compatibility test) for successful HDMI data transfer.

Using the 'RUN' button on both Compatibility and Sweep screen, the user can swap HDMI cables and re-run the same tests through a batch prior to installation.



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