

# **BELDEN 10GXE01**

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## **Lightware Testing Lab**

### Cable Testing Method

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## Professional Cable Performance Analysis

We use Fluke DSX-5000 cable analyzers in the Lightware Testing Lab to measure the properties of the cable relevant to signal transmission. Measured data include the DC resistance of the cable, the loss of signal strength of a signal (attenuation) at one or more frequencies, measuring the isolation between pairs of multi-pair cable threads, cross talk and many more.

This phase of testing can outline the general performance of the cable itself, without the modifying effects of a connected HDBaseT™ device.

## Application Tests

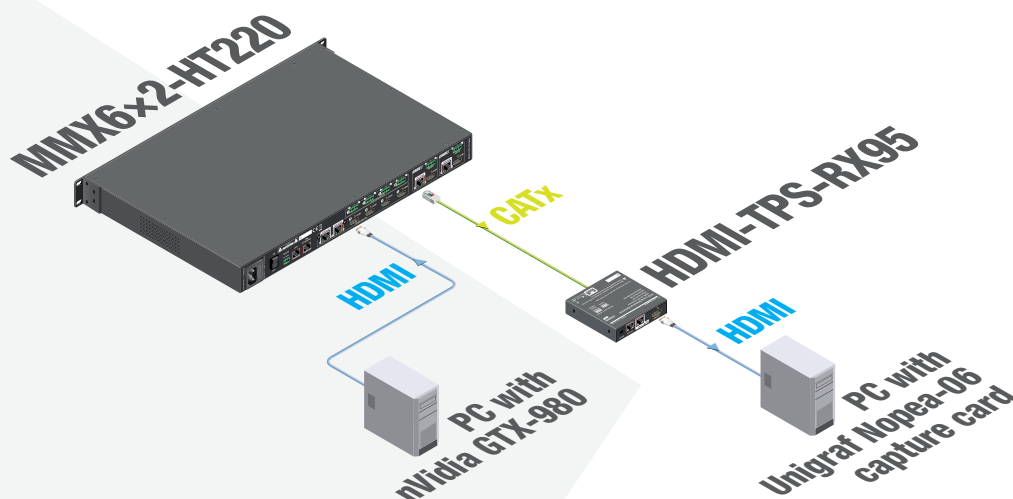
Measuring the performance of CAT cables is generally important, but it is even more useful to test the cables in a system containing HDBaseT™ transmitters and receivers.

These devices along with the used cable greatly affect the overall system performance. HDBaseT™ transmitters and receivers have HDMI input/output stage, reclocking features and other factors that can modify system performance.

We believe that in order to provide the most valuable information for integrators about the HDBaseT™ chain, it is best to test the cables together with HDBaseT™ compatible Lightware TPS products.

Therefore we always run cable performance tests in working applications as well.

Test criteria: Bit Error Rate is under  $10^{-9}$



	TX	RX	Test Pattern	Length (m)	Pixel errors over 200 sec			
					Red	Green	Blue	Total
Lightware Long Reach Mode	MMX6x2	HDMI-TPS-RX95 ENG-2068	1080p60 pseudorandom	150 m +2×0,3 m patch cable	0	0	0	0
HDBaseT™	MMX6x2	HDMI-TPS-RX95 ENG-2068	2160p30 pseudorandom	95 m +2×0,3 m patch cable	15	19	17	51

	Bit Error Rate				Tx Error Rate				Rx Error Rate			
	total_ber (tx side)	video_ber (rx side)	audio_ber (rx side)	control_ber (rx side)	A	B	C	D	A	B	C	D
Lightware Long Reach Mode	10 <sup>-9</sup>	10 <sup>-9</sup>	10 <sup>-9</sup>	10 <sup>-9</sup>	46.7	46.7	46.7	46.7	58.4	58.4	58.4	58.4
HDBaseT™	10 <sup>-9</sup>	1.01 <sup>-07</sup>	10 <sup>-9</sup>	10 <sup>-9</sup>	36.1	36.1	36.1	36.1	62.8	62.8	62.8	62.8



## Cable ID: 6 BELDEN 10GXE01

Date / Time: 2017-01-24 01:58:02 PM

Test Limit: Measure All

Cable Type: Cat 6A F/UTP

NVP: 74.0%

Software Version: V4.8 Build 1

Limits Version: V4.8

Calibration Date:

Main (Module): 2016-02-03

Remote (Module): 2016-02-03

## Test Summary: PASS

Model: DSX-5000

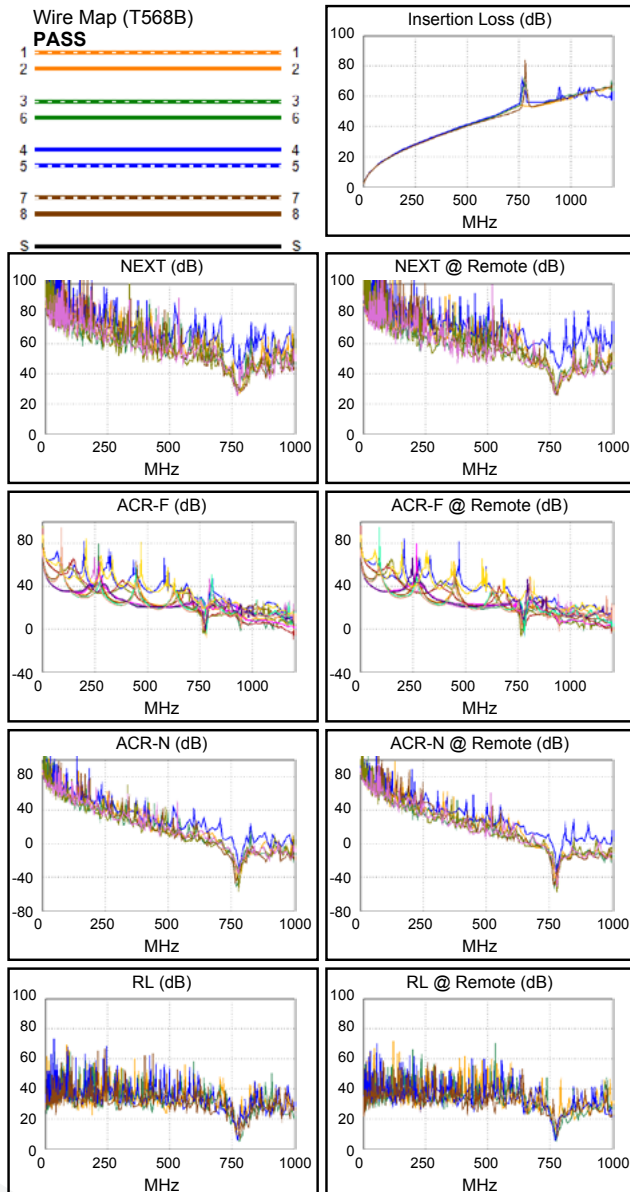
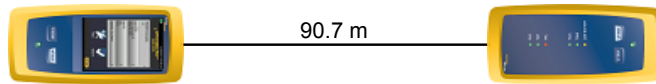
Main S/N: 2797178

Remote S/N: 2797197

Main Adapter: DSX-CHA004

Remote Adapter: DSX-CHA004

Length (m)	[Pair 78]	90.7
Prop. Delay (ns)	[Pair 12]	416
Delay Skew (ns)	[Pair 12]	7
Resistance (ohms)	[Pair 12]	13.90
Resist. Unbal. (ohms)	[Pair 36]	0.021
Resist. P2P Unbal. (ohms)	[Pair 12-78]	0.056
Impedance (ohms)	[Pair 78]	107
Insertion Loss Margin (dB)	[Pair 78]	
Frequency (MHz)	[Pair 78]	780.0
Limit (dB)	[Pair 78]	



Worst Case Margin Worst Case Value

N/A	MAIN	SR	MAIN	SR
Worst Pair	12-45	12-36		
<b>NEXT (dB)</b>	25.4	24.5		
Freq. (MHz)	775.0	778.0		
Limit (dB)				
Worst Pair	36	36		
<b>PS NEXT (dB)</b>	22.2	20.8		
Freq. (MHz)	783.0	778.0		
Limit (dB)				

N/A	MAIN	SR	MAIN	SR
Worst Pair	12-36	36-45		
<b>ACR-F (dB)</b>	-5.8	-7.5		
Freq. (MHz)	779.0	768.0		
Limit (dB)				
Worst Pair	36	45		
<b>PS ACR-F (dB)</b>	-8.5	-9.4		
Freq. (MHz)	779.0	768.0		
Limit (dB)				

N/A	MAIN	SR	MAIN	SR
Worst Pair	36-78	36-78		
<b>ACR-N (dB)</b>	-53.4	-54.7		
Freq. (MHz)	780.0	780.0		
Limit (dB)				
Worst Pair	45	78		
<b>PS ACR-N (dB)</b>	-55.4	-55.7		
Freq. (MHz)	768.0	780.0		
Limit (dB)				

N/A	MAIN	SR	MAIN	SR
Worst Pair	36	36		
<b>RL (dB)</b>	5.0	4.3		
Freq. (MHz)	783.0	777.0		
Limit (dB)				

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Main S/N: 2797178

Remote S/N: 2797197

Main Adapter: DSX-CHA004

Remote Adapter: DSX-CHA004

Worst Case Margin			Worst Case Value	
N/A	MAIN	SR	MAIN	SR
Worst Pair			78	36
<b>TCL (dB)</b>			23.0	20.7
Freq. (MHz)			799.0	787.0
Limit (dB)				
N/A	MAIN	SR	MAIN	SR
Worst Pair			78	78
<b>TCTL (dB)</b>			26.8	26.8
Freq. (MHz)			32.5	29.8
Limit (dB)				
N/A	MAIN	SR	MAIN	SR
Worst Pair			36-78	36-78
<b>CDNEXT (dB)</b>			17.2	15.0
Freq. (MHz)			832.0	834.0
Limit (dB)				
N/A	MAIN	SR	MAIN	SR
Worst Pair			45	45
<b>CMRL (dB)</b>			10.1	7.7
Freq. (MHz)			799.0	799.0
Limit (dB)				
N/A	MAIN	SR	MAIN	SR
Worst Pair			36	78
<b>ELTCTL (dB)</b>			-17.4	-20.0
Freq. (MHz)			779.0	780.0
Limit (dB)				

