

ViewPoint™ Application Note

Title: Curved Display Measurement

Abstract: This bulletin explains how to use the new curved display features of Westar's ViewPoint™ software

Date: 24 September 2014

1. Curved Display Overview

Curved display features have been added to ViewPoint™ software starting with version 4.30.4. These features allow the user to easily measure curved display surfaces while maintaining viewing angle and working distance.

The following illustrations will use a uniformity measurement as an example.

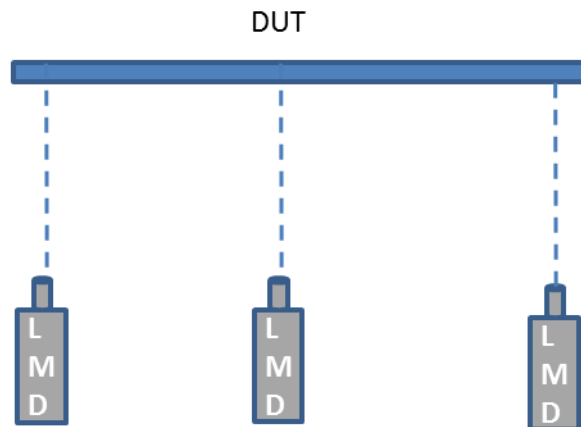


Figure 1 – Typical Uniformity Measurement of a Flat Display

Figure 1 shows an example of a horizontal uniformity measurement of a flat display, viewed from top down, with the viewing angle set to 0 degrees. The Light Measuring Device (LMD) is moved horizontally to discrete points along the display surface.

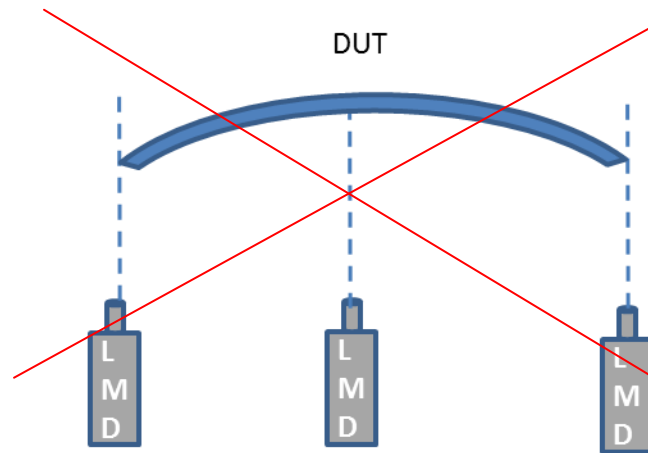


Figure 2 – Uniformity Measurement of a Curved Display Prior to ViewPoint™ version 4.30.4

Figure 2 shows an example of the same uniformity measurement made on a curved display prior to the curved display features added to ViewPoint™. There are several errors:

- The viewing angle changes as the LMD moves away from the center of the display.
- The working distance decreases as the LMD moves from the center of the display.
- The measurement spot locations are shifted on the display surface

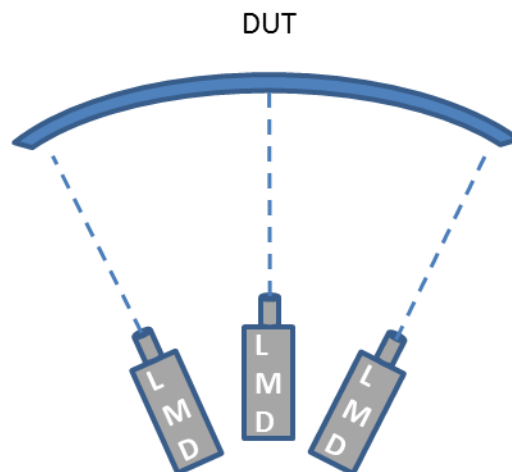


Figure 3 – Uniformity Measurement of a Curved Display after ViewPoint™ version 4.30.4

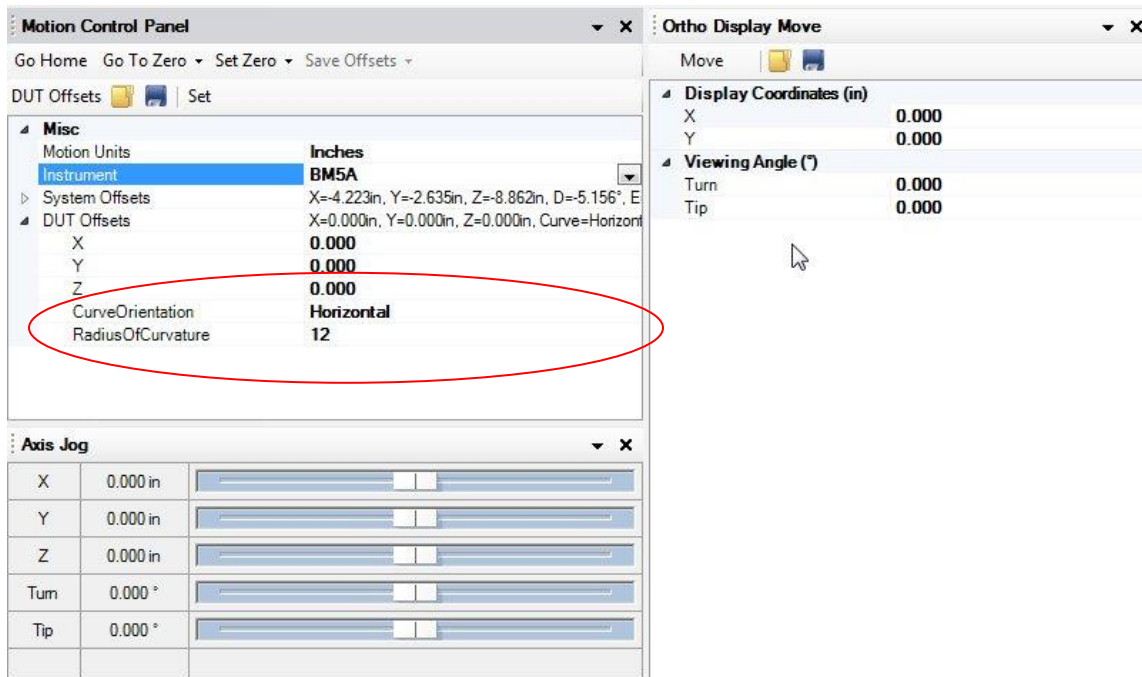
Figure 3 shows an example of a uniformity measurement made on a curved display using the curved display features of ViewPoint™. The software automatically maintains the user specified 0 degree viewing angle and maintains a constant working distance. The measurement spot locations now take into consideration the curvature of the display.

2. ViewPoint™ Manual Control Interface Changes

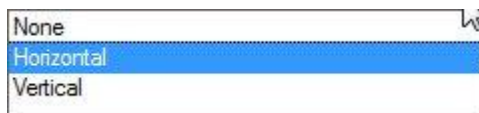
The changes to the ViewPoint™ Manual Control Interface (MCI) are minor. In the Motion Control Window two new fields are added under DUT Offsets.

They are:

- Curve Orientation
- Radius of Curvature



The curve orientation selections are horizontal, vertical, or none.



These settings only affect the display relative moves: Ortho Display Move, Polar Display Move and Design Eye-Point (DEP) Move. Axis Jog and Axis Move are unaffected by the curved display settings.

3. ViewPoint™ TestObject Changes

The changes to the ViewPoint™ test objects for automated test sequences are located in the WDT.Measurement.ViewPoint.Motion._TestObjectsEx root class. The OrthoDisplayMove and PolarDisplayMove now include parameters for Curve Orientation and Radius of Curvature.

WDT.Measurement.ViewPoint.Motion._TestObjects root class contains the old OrthoDisplayMove and PolarDisplayMove test objects for backward compatibility with existing test sequences.

Parameter Name	Type	In/Out	Log	Dispose	Default	Value
OrthoDisplayMove						
Units	Enum (WDT.Measurement.ViewPoi...	in	<input type="checkbox"/>			cm
DisplayX	Number (Double)	in	<input type="checkbox"/>			Locals.Xpos[Locals.Point]
DisplayY	Number (Double)	in	<input type="checkbox"/>			Locals.Ypos[Locals.Point]
DisplayTip	Number (Double)	in	<input type="checkbox"/>			0
DisplayTurn	Number (Double)	in	<input type="checkbox"/>			0
Instrument	String (System.String)	in	<input type="checkbox"/>			FileGlobals.Instrument
WorkingDistance	Number (Double)	in	<input type="checkbox"/>			FileGlobals.WorkingDistance
DUTOffsetX	Number (Double)	in	<input type="checkbox"/>			FileGlobals.OOX
DUTOffsetY	Number (Double)	in	<input type="checkbox"/>			FileGlobals.OOY
DUTOffsetZ	Number (Double)	in	<input type="checkbox"/>			FileGlobals.OOZ
Curve	Enum (WDT.Measurement.ViewPoi...	in	<input type="checkbox"/>			FileGlobals.CurveOrientation
CurveR	Number (Double)	in	<input type="checkbox"/>			FileGlobals.CurveRadius

Ortho Display Move Parameters

Parameter Name	Type	In/Out	Log	Dispose	Default	Value
PolarDisplayMove						
Units	Enum (WDT.Measurement.ViewPoi...)	in	<input type="checkbox"/>			cm
DisplayX	Number (Double)	in	<input type="checkbox"/>			Locals.Xpos[Locals.Point]
DisplayY	Number (Double)	in	<input type="checkbox"/>			Locals.Ypos[Locals.Point]
DisplayAzimuth	Number (Double)	in	<input type="checkbox"/>			0
DisplayInclination	Number (Double)	in	<input type="checkbox"/>			0
Instrument	String (System.String)	in	<input type="checkbox"/>			FileGlobals.Instrument
WorkingDistance	Number (Double)	in	<input type="checkbox"/>			FileGlobals.WorkingDistance
DUTOffsetX	Number (Double)	in	<input type="checkbox"/>			FileGlobals.OOX
DUTOffsetY	Number (Double)	in	<input type="checkbox"/>			FileGlobals.OOY
DUTOffsetZ	Number (Double)	in	<input type="checkbox"/>			FileGlobals.OOZ
Curve	Enum (WDT.Measurement.ViewPoi...)	in	<input type="checkbox"/>		<input type="checkbox"/>	FileGlobals.CurveOrientation
CurveR	Number (Double)	in	<input type="checkbox"/>		<input type="checkbox"/>	FileGlobals.CurveRadius

Polar Display Move Parameters

4. Summary

The curved display additions to ViewPoint™ are easy to use and simplify the measurement of curved displays while maintaining the spot tracking accuracy of Westar's FPM systems.

In the display relative motion spaces (Ortho, Polar and Design-Eye Point) all spot positions and viewing angles are relative to the surface of the display under test, whether that surface is flat or curved.