polyga

Title	**HDI Advance Configuration Guide**
Revision	**1.0**

Purpose

This application note will help you choose the right combination of lens focal length, lens slot position, and projector zoom setting based on various object sizes to get the best results from the scanner's imager. It also provides basic information on the system's stereo vision geometry.

Equipment HDI Advance system

HDI Advance system

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Introduction

This application note will help you to configure your HDI Advance system to ensure that you get the best results from the scanner's imager. It also provides basic information on the system's stereo vision geometry.

Stereo Vision

The HDI Advance uses two cameras. The cameras are mounted to each side of a projector that emits a light pattern.

Figure 1: HDI Advance

The cameras are mounted in one of three "slot" positions: inner, middle, or outer. Both cameras should be mounted to the same position. The distance between the cameras is determined by the slot positions.

Figure 2: Right camera in middle slot position

HDI Advance systems include three pairs of lenses: 12mm, 16mm, and 25mm. These values indicate the focal length of the lens. Using the 12 mm focal length lenses produces the widest field of view (FOV). Using the 16mm lenses produces a smaller FOV, and using the 25mm lenses produces the smallest FOV.
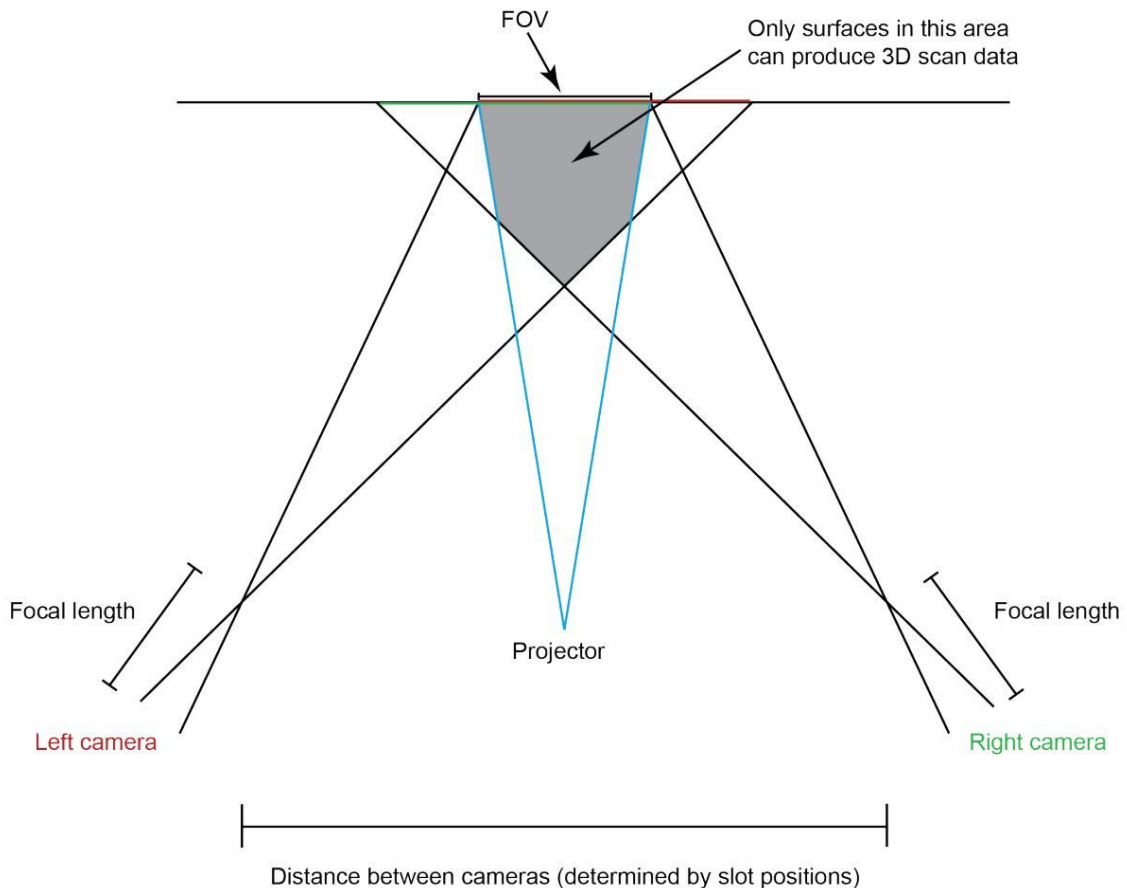

Figure 3 - Stereo Vision

To get the most out of the scanner's imager, you must match the camera FOV with the projector FOV by choosing the right combination of object size, lens focal length and slot positions, and projector zoom. Also, you must make sure that the object you want to scan falls within the area covered by both cameras and that both cameras can "see" the object, in order to produce 3D data

Choosing the Right Combination

The following table lists the combinations of object size, lens focal length and slot positions (which determine the camera FOV), projector zoom, and standoff that work best with an HDI Advance system:

Max Object Size	Lens Focal Length	Lens Slot Positions	Camera FOV	Projector Zoom	Standoff
14" x 14"	12 mm	Outer	700 mm	Maximum	1010 mm
11" x 11"	12 mm	Middle	450 mm	Maximum	710 mm
6" x 6"	12 mm	Inner	250 mm	Minimum	390 mm
4" x 4"	16 mm	Inner	170 mm	Minimum	390 mm
2" x 2"	25 mm	Inner	120 mm	Minimum	390 mm

Table 1 : Supported Combinations

You can use combinations and lens focal lengths not listed in Table 1, but we do not officially support this.

Note that the maximum object size in the table corresponds to roughly 80% coverage of the FOV. This reduced coverage is recommended because scan data around the edge of the FOV isn't as good as data toward the center.
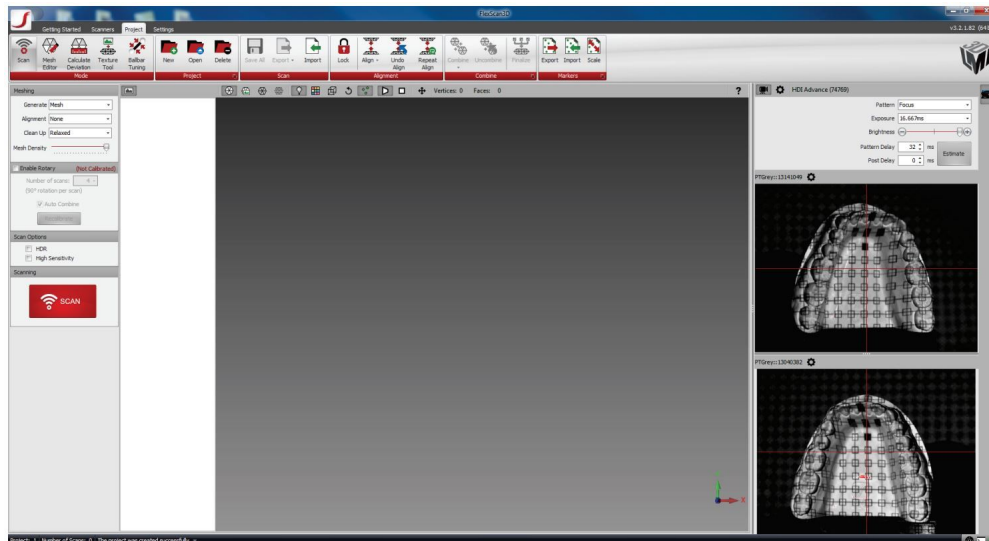

Figure 4: Object filling only 80% of FOV

Choosing the Right Combination

If you need to scan objects larger than those listed in Table 1, see:

http://www.polyga.com/FS3DHelp/Manual/Default.htm#CapturingScanData/ScanningALargeObject.htm

Tilting or Moving the Scanner

Tilting the scanner does not affect the scanner volume. It only tilts the volume. You can also tilt or move the scanner during calibration as long as you don't change the slot positions of the cameras.

Setting Focus and Aperture

For procedures describing how to set the camera and projector focus and aperture, see:

http://www.polyga.com/FS3DHelp/Manual/Default.htm#SettingUpTheScanner_HDIAdvance/AdjustingYourEquipment_HDIAdvance.htm

Setting Up a Good Calibration

For procedures describing how to set up a good calibration, see:

http://www.polyga.com/FS3DHelp/Manual/Default.htm#SettingUpTheScanner_HDIAdvance/CapturingCalibrationImages.htm