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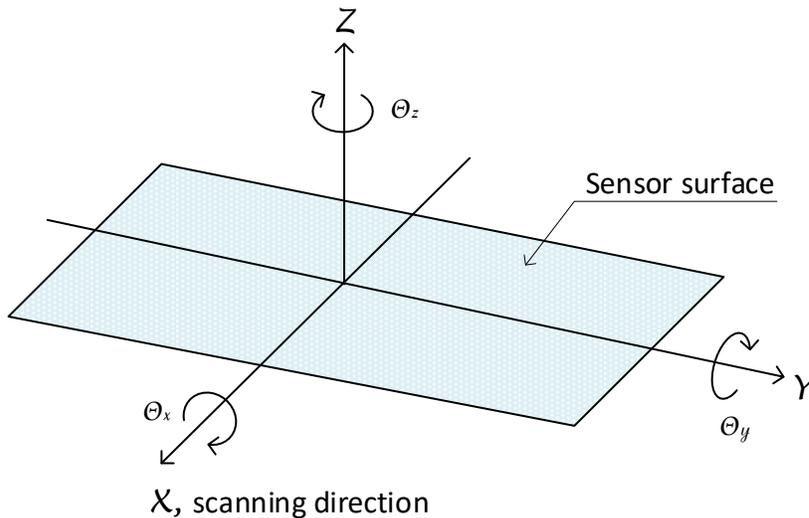
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Application Guideline for TDI Cameras

Due to the nature of the sensor structure, the TDI linescan camera has relatively strict requirements for installation (mounting), relative motion of object and camera, and trigger pulse compared to the non-TDI camera.

By reducing various mechanical (mounting, vibration, etc.) and electrical (trigger signal, etc.) errors, ultimately, the mismatch rate between the object and pixels must be controlled within 10%.

The following figure shows the camera (sensor) mounting errors.



The following table lists recommended specifications of the camera mounting, object moving, and trigger errors.

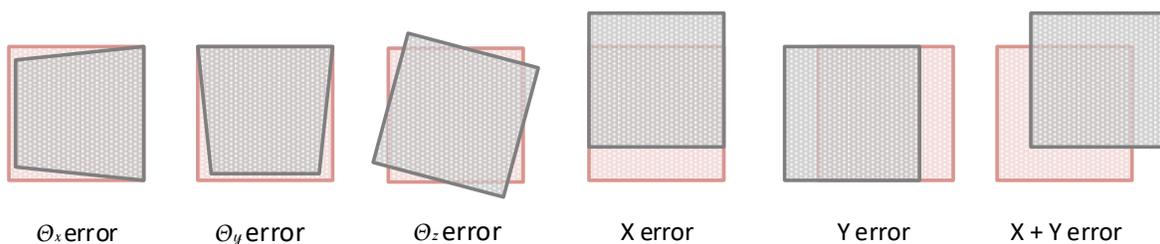
Error Item	Max Error	Remark
θ_x	0.25°	
θ_y	0.5°	

θ_z	0.25°	
X	5%	Trigger jitter (vibration, electrical error)
y	10% of resolution	Transverse error (vibration, mechanical error)
Z	0.1mm	Working distance error (vibration)
Square image ratio	0.2%	Width : height (e.g. 1000 pixel : 1002 pixel)

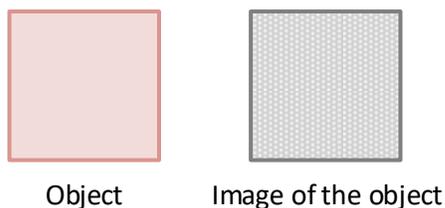
Note:

1. The above errors are presented based on the sensor surface. In fact, when mounting a camera, the camera's front plate is often referred to, so in this case, the error between the sensor surface and front plate surface must be taken into account. The specification for the sensor surface and front plate can be found from the camera manual.
2. When the inspection defect size is smaller than the pixel size, it is recommended to use the sensor surface plane as the camera mounting reference plane.
3. Compared to single channel TDI, when using multi-channel TDI, the above specifications should be considered more tightly.

The above errors may cause the following results to the image.



Note:



The area mode, if applicable, is helpful in the initial stage of mounting.

Scanning two distant marks on the same line that coincides with the scan direction can also help verify camera alignment.

Focusing

When using TDI, it may be difficult to focus lens. This is because image blur can be affected by a number of factors other than focusing, such as incorrect camera mounting, imperfect synchronization, trigger jitter, and system vibrations, etc. As a result, poorly focused images greatly affects the MTF.

The best way to check focus is to use area mode (When using area mode in CamExpert, you need to switch the framegrabber to the area mode).

Note:

If you have adjusted the lens even a little, you must redo the square image acquisition processing.

Further Supports

Should you have any questions, please feel free to contact your local TCS (Technical Customer Support) teams.