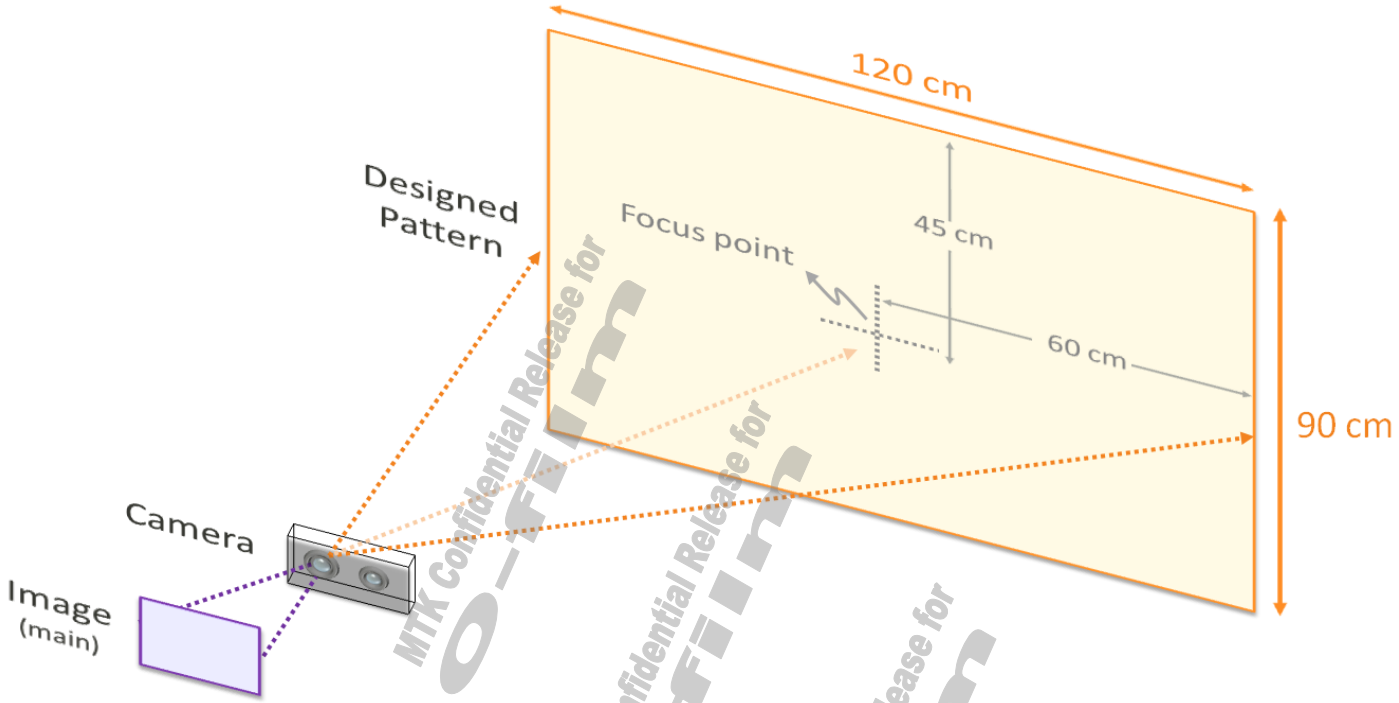
IQC Verification Tool

1. Environment setup

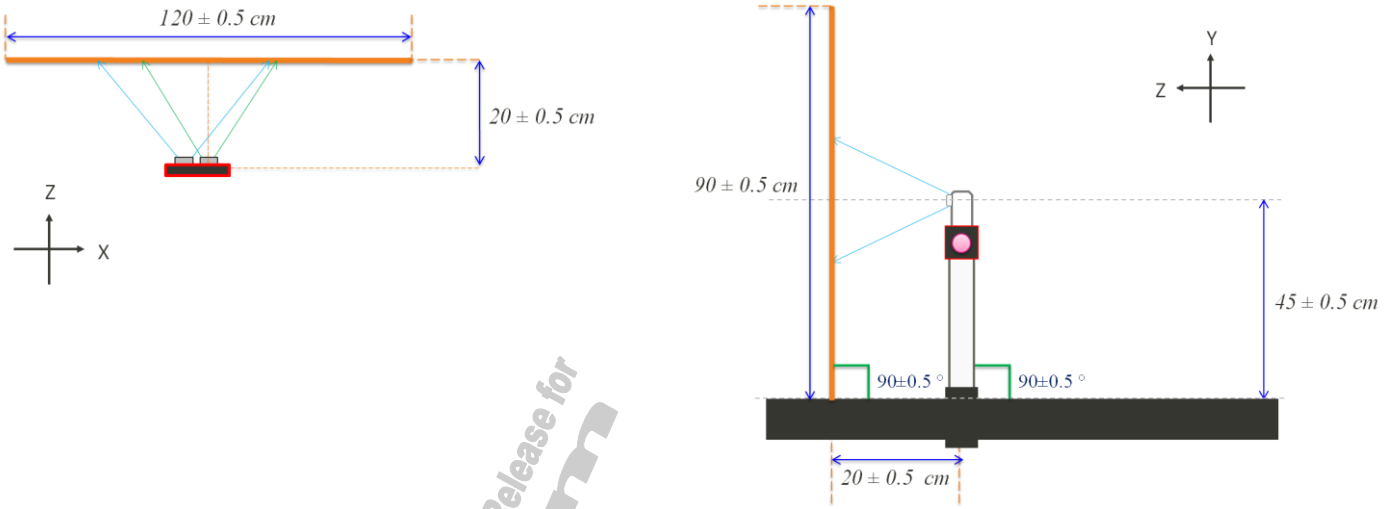
1.1 The relationship to the camera and designed pattern



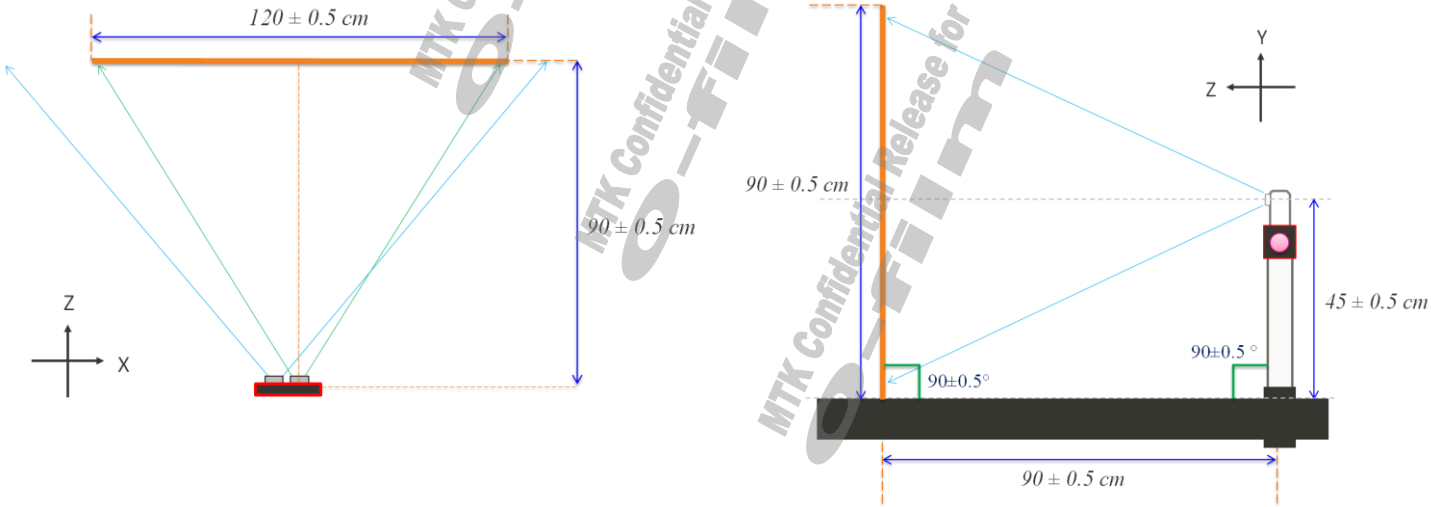
- The width and height of the image is aligned with the width and height of the designed pattern.
- The image center of the main camera needs to be aligned with the center of the designed pattern.
- The sensor plane needs to be parallel to the plane of the target pattern, i.e. the optical axis needs to be vertical to the plane of the target pattern - no perspective projection distortion in the image space.
- The captured image needs to avoid planner rotation of the designed pattern in the image space.
- The captured images from the two distances need to be parallel.
- The distance between the camera and target pattern indicates the distance from the front end of the lens module to the plane of target pattern in parallel direction.

1.2.1 Example#1 - moving the camera with the chart fixed

Adjust the focus settings to make the captured images focused on the designed pattern from 20 cm, and take the first stereo image.

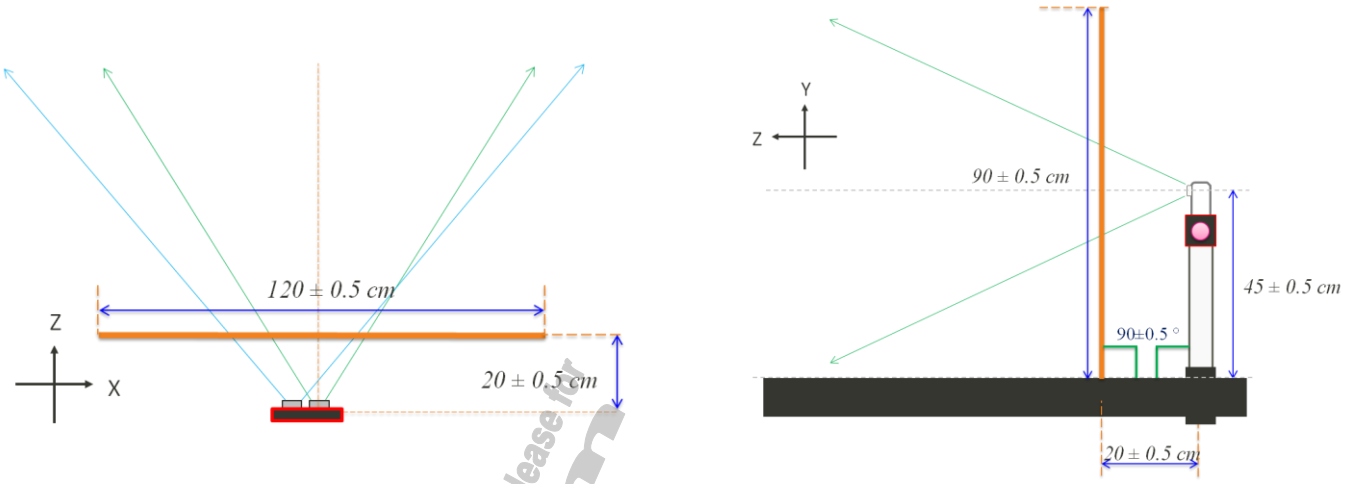


Adjust the focus settings to make the captured images focused on the designed pattern from 90 cm, and take the second stereo image.

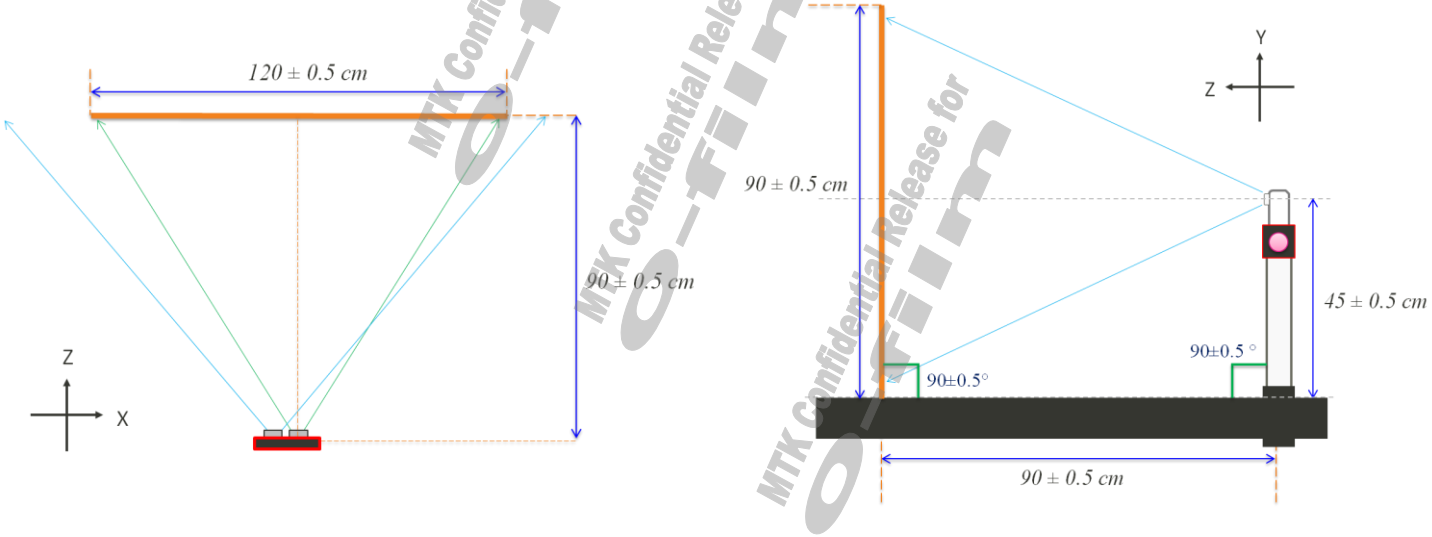


1.2.2 Example#2 - moving the chart with the camera fixed

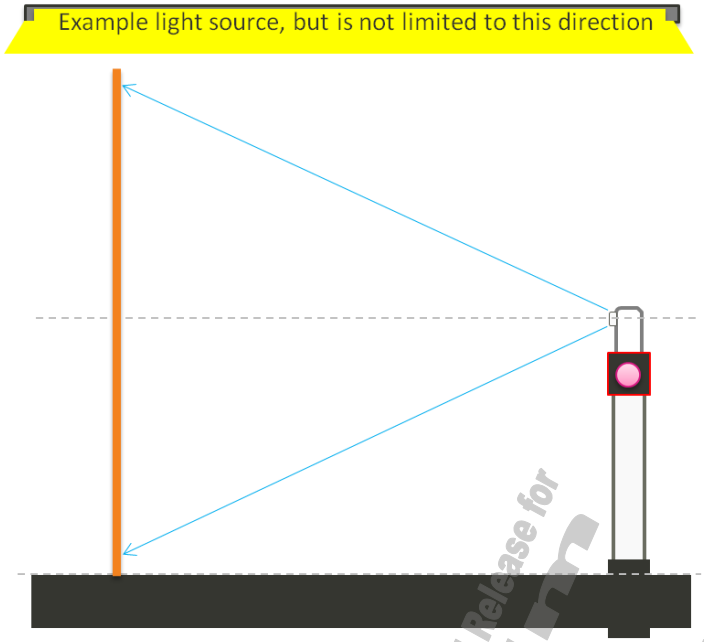
Adjust the focus settings to make the captured images focused on the designed pattern from 20 cm, and take the first stereo image.



Adjust the focus settings to make the captured images focused on the designed pattern from 90 cm, and take the second stereo image.



1.3 Lighting

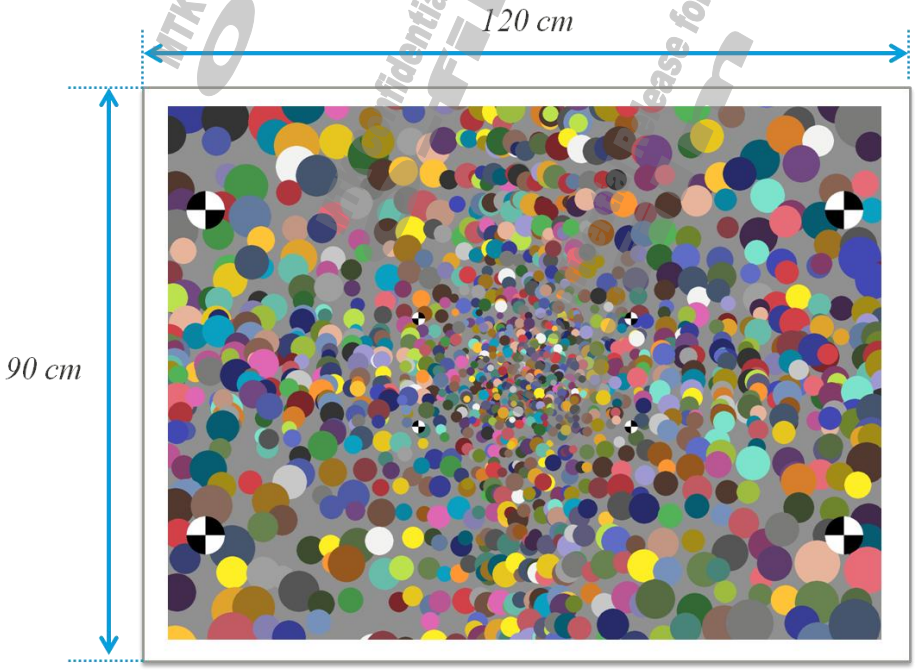


Principle
- Uniform, low reflectance

Lighting source
- Ambient Light
- Color temperature: 5.0K – 6.5K
- Luminance: 400-500 Lux

Test Chart
- Low reflectance material
- Uniformly lighted, ex. difference of luminance between center and corner less than 10% Lux

1.4 Designed Pattern.

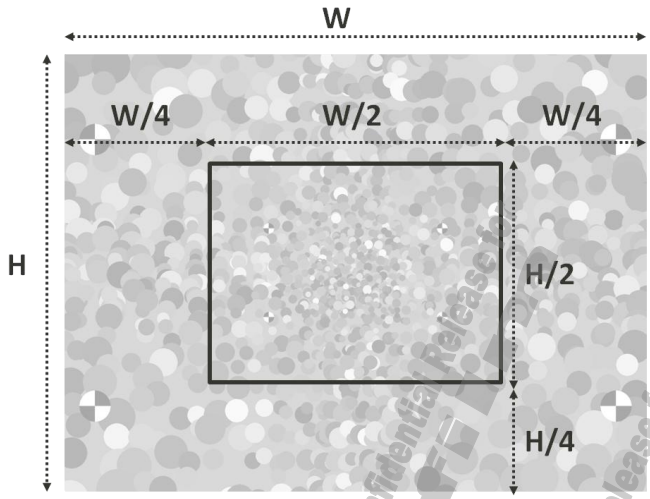


Make the designed chart as flat as possible.

1.5 Captured Image

- **Raw format**
  - Bit depth is 16.
  - If the bit depth is less than 16, please fill the zero bits with the most significant bits.
    Ex: (10 bits): 1111111111 → (16 bits) MSB 0000001111111111 LSB

- **Average image intensity**



  - The ROI (Region of Interest) is defined by the center of image, i.e. central (W/2, H/2) region, please see the above figure as the example.
  - Make the average intensity of ROI to be (100,150) under pixel range of 255, i.e. bit 8-bit value, or (400,600) under pixel value range of 1024, i.e. 10-bit value.
  - Set EV by adjusting shutter speed with fixed 1.0x sensor/digital gain to meet the criterion of the image intensity.