

Dynamic Test Stand – DTS

Test the performance and effectiveness of ADAS camera systems

The DTS uses contrast detection probability (CDP) and other methods to determine the capability of an automotive camera to differentiate and detect objects within its field of view.

The DTS has been developed to coincide with the objectives of the IEEE-P2020* working group.

Main Features

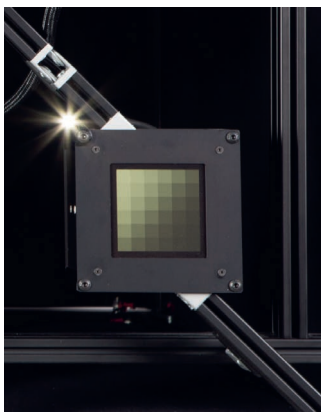
- * Contrast Detection Probability (CDP)
- * Color Separation Probability (CSP)
- * Modulated Light Mitigation Probability (MMP)
- * Motion Artifacts (Blurring)
- * Mounting for distortion compensation



Test key performance indicators (KPIs)

The DTS uses six white LED light sources and two iQ-LED powered CAL2 devices to simulate different lighting situations, including various flicker frequencies, in an automotive environment.

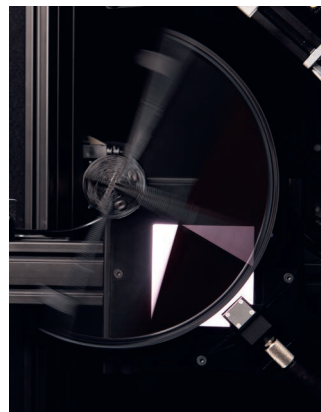
This device is capable of providing a flexible high dynamic scene to the device under test. HDR rendering can be tested and characterized.



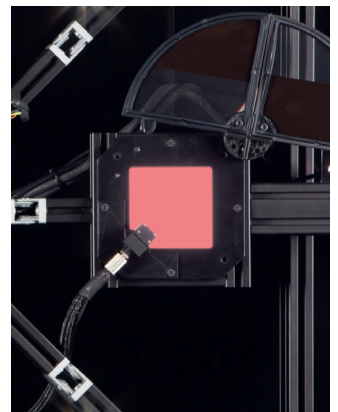
Contrast Detection



Modulated Light Mitigation
(Flicker)



Motion Artifacts



Color Separation

Hardware setup

The six CDP targets are each made up of 36 grey patches for a possible 216 different intensities for differentiating multiple objects in the field of view. The two integrated CAL2 iQ-LED devices produce different colors for analyzing the color separation capabilities of the camera under test.

Use the modulated light mitigation (flicker mode) to analyze the response time of a camera. Varying levels of flicker intensities can be generated using the middle box and the six CDP (performance similar to LG3) boxes. There are also four single LED lights for analyzing local flicker. In front of the LED light boxes, there are two rotating off-axis slanted edge targets that provide a way to measure a camera's response to various blurring and motion effects.

Software Features

- * DTS-Sequence Generator
 - ▶ Generate custom test sequence
- * DTS-Control
 - ▶ Control the hardware and manage sequences
- * DTS-Evaluation
 - ▶ Quickly analyze your test results



The DTS-Sequence Generator software

At a Glance	DTS
Principle	Versatile, dynamic test stand. Automated, sequence based measurement of multiple performance indicators.
Light Source	7 x high intensity LED light sources based on LG3 technology dimmable at 32 kHz, 2 x CAL2 based on iQ-LED technology
Flicker Frequency	10 - 500 Hz, 0.1 Hz steps (10 - 200 Hz), 0.2 Hz steps (200 - 500 Hz)
Flicker Duty Cycle	1 - 99% in 1% steps
Field of View	Variable mechanical distortion compensation 25° - 160° (depending on the distortion of the DUT)
Contrast Charts	216 Greyscale patches (6 x 36)
Dynamic Range	Approx. 120 dB
Metrics	Contrast Detection Probability Modulated Light Mitigation probability (Flicker) - planning stage Color Separation Probability - planning stage Motion Artifacts (Blurring) - planning stage
Motion	Motion artifacts measured on a rotating, translucent, slanted edge test chart
Software	Sequence based measurement divided into three steps: DTS-Sequence Generation, DTS-Control, DTS-Evaluation

*For more information on CDP and IEEE-P2020, please follow: <https://doi.org/10.2352/ISSN.2470-1173.2018.17.AVM-148>