



bcB Test Bench[®]

Powered by **bcB** Monitor 4.0[®]

Automatic Test Equipment for automotive Head&Rear lamps using climatic chamber, machine vision and CAN&LIN comms

The **bcB** Test Bench lighting system is a unique integrated machine-vision system to perform automatic test to assure the quality of the optic and electronic parts of the automotive head and rear lamps at different temperatures, humidity values and voltages.

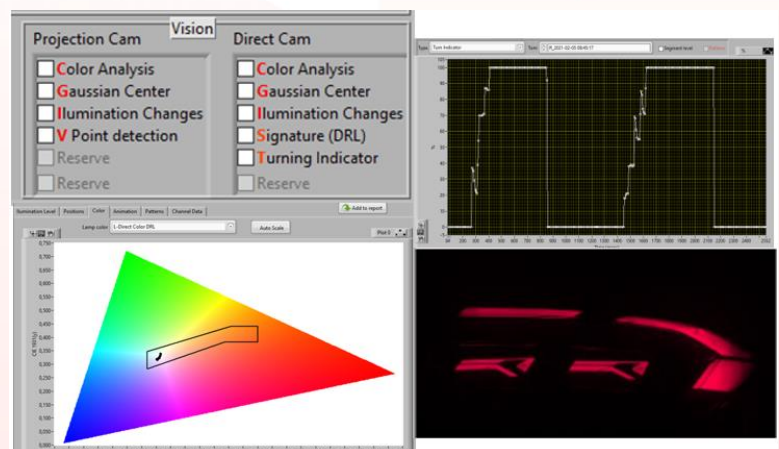
The goal is to perform an automatic test to determine if the right and left lamps comply or not (OK / NOK) with the quality requirements, related to changes in the behavior of the light patterns and colorimetry. The variations are produced due to the changes in the environment (temperature and humidity) and the variation of the car battery voltage. The data is saved to also perform analysis of the behavior over time.



The system is integrated by four cameras which are intended to measure two scenarios: the light direct from the lamp and the reflected light to the projection wall.

The system measures different temperatures and humidity values, simulated by a climate chamber, and different voltages values using a Power Supply Unit.

The climatic chamber is allocated inside a dark room where a projection wall is needed. Then, color and B&W cameras aim to the projection wall and to the lamps inside the climatic chamber to test both areas.

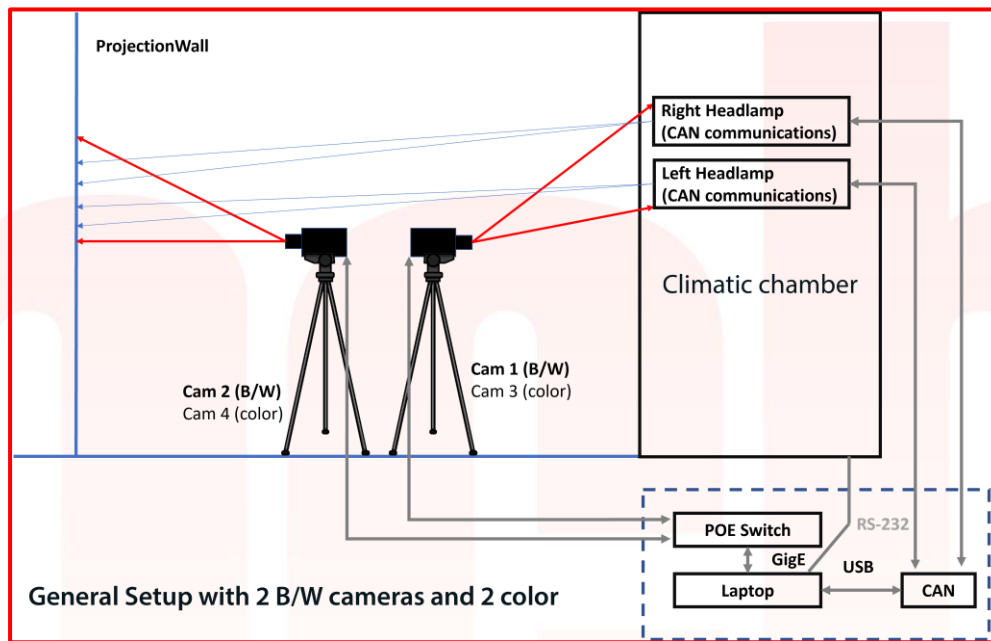


CIE-1931 color measures and blinking lights with running function.

Official dealer & integrator



APPLICATION NOTE



For executing the automatic test, it is necessary to define the following parameters:

- Lighting & signaling functions
- DTC reading & cleaning
- Program cycles
- Ramps of temperature & humidity
- Voltage and current (OVP & OCP)
- Images to acquire and store
- Machine vision results to store in data base
- Report generation

Related to machine vision, some of the system functionalities are:

- Color analysis (CIE-1931)
- Measurement of the gaussian center and V-point detection
- Illumination changes (due to PWM or derating) for studies with low and high beam (with matrix) or cornering lamps
- Analysis of signatures, DRL/PL patterns (with OLEDs) and turning indicator (TI), specially for running function
- Leveling motor tests

A color calibration, for direct and projected lamp colors (white, yellow and red), is also needed to avoid the influence of thick climatic chamber glasses.

It is possible to read analog values from the PSU (currents and voltages) but also in some cases through CAN commands, using the ADCs (analog-to-digital converter) existing in the state-of-the-art electronic of head lamps.

At the end of the tests, it is possible to query to the data base and generate graphs and tables with stored information and print the final report. Also, the system saves the images and the alphanumeric results into the database.

bcb

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