



## LMT AND TECHNOTEAM: COMBINING THE BEST OF TWO WORLDS

In a strategic partnership, LMT and TechnoTeam combine the swiftness of digital imaging systems with the accuracy of traditional goniophotometers. This provides the automotive lighting industry with enhanced goniophotometric systems which significantly reduce measurement times required for LID generation.

Cornerstone of the partnership are methods of multi-sensor based goniophotometry enabling rapid acquisition of lighting distribution data, and which are protected under jointly owned patents in Europe, USA, China and Japan.

- 100 times faster than standard goniophotometry
- Fast pulse width modulation mode
- Sensor fusion
- More than 100 installations worldwide
- Patented technology

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RAPID CAMERA-BASED SCREEN  
GONIOPHOTOMETRY

# BEST OF TWO WORLDS



## HANDLING SYSTEMS & GONIOMETER FOR FRONT & REAR LIGHTING

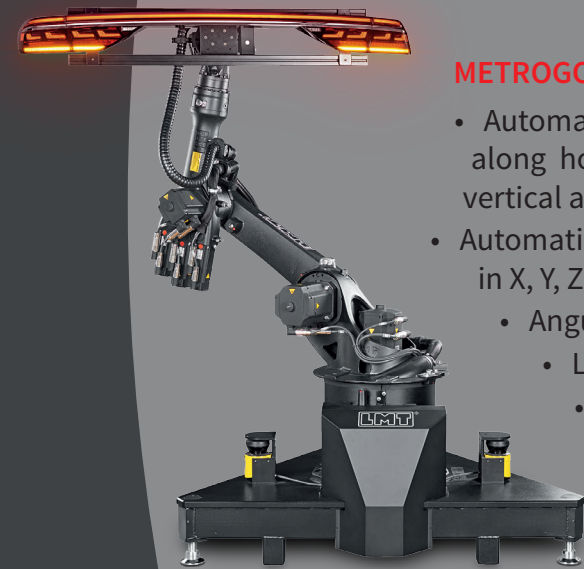
### TECHNOTEAM LID TABLE

- Automatic LID Stitching along a horizontal axis
- Manual alignment of DUT in X, Y, Z
- Angular accuracy horizontally  $0.01^\circ$
- Loads up to 50 kg
- Width 1000 mm



### METROGON® LMT GO-R 3000

- Automatic LID stitching along horizontal and vertical axes
- Automatic alignment of DUT in X, Y, Z
  - Angular accuracy  $0.01^\circ$
  - Loads up to 180 kg
  - Width 3000 mm



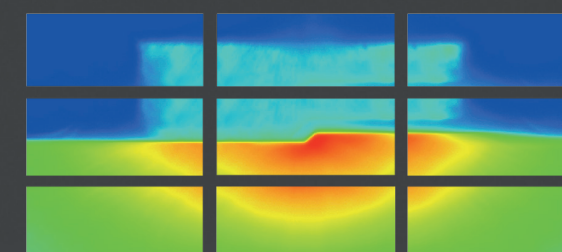
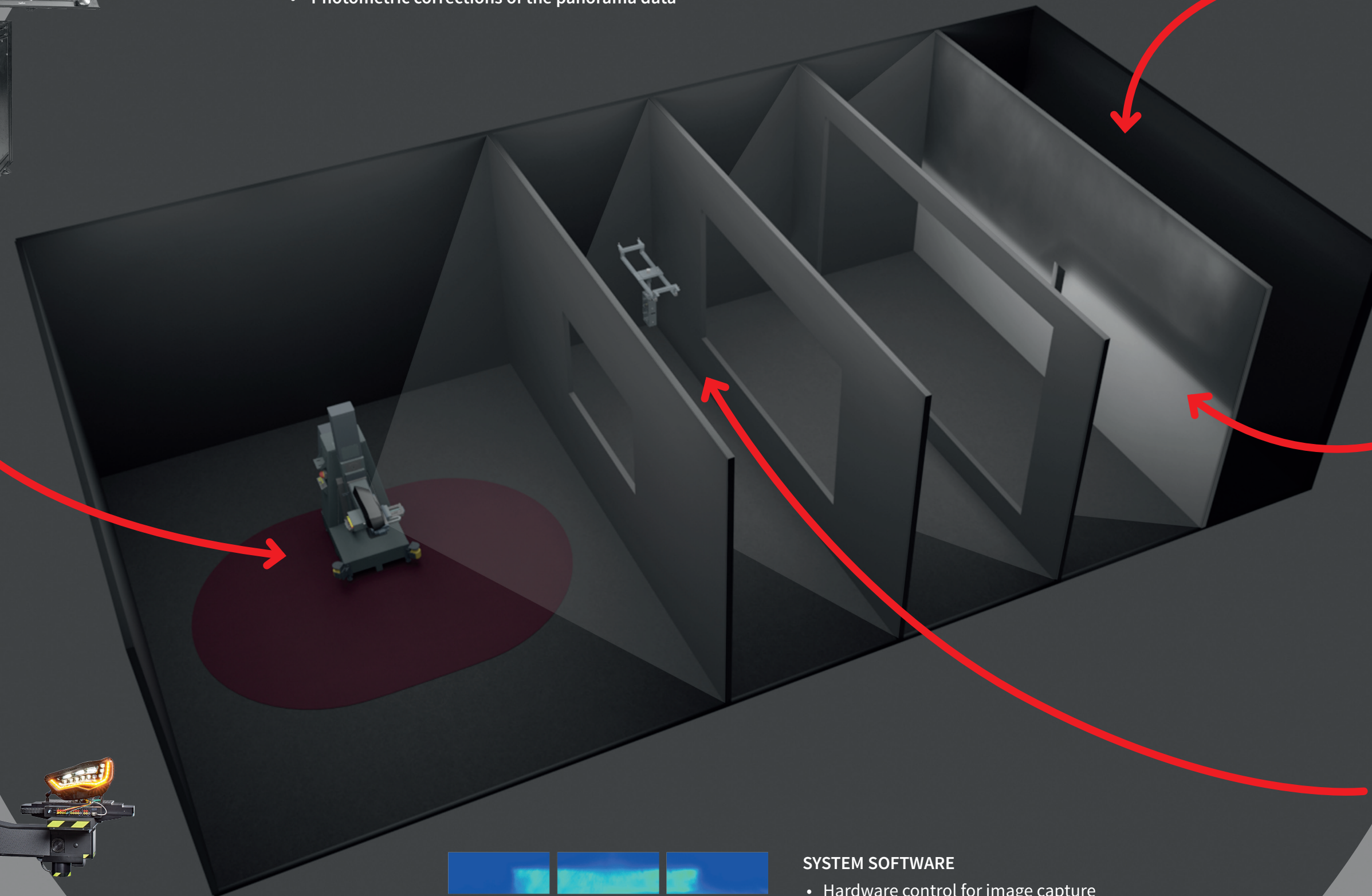
### GONIOMETER LMT GO-H 1660

- Automatic LID stitching along horizontal and vertical axes
- Automatic alignment of DUT in X, Y, Z
- Angular accuracy  $0.01^\circ$
- Loads up to 75 kg
- Width 1800 mm



## RAPID LUMINOUS INTENSITY DISTRIBUTION (LID) GENERATION BY STITCHING $V(\lambda)$ CORRECTED IMAGES

- Goniometric projection of the light distribution on the reflective screen
- Camera recording of images at successive angles of interest
- Software stitching of the images into complete distribution
- Photometric corrections of the panorama data



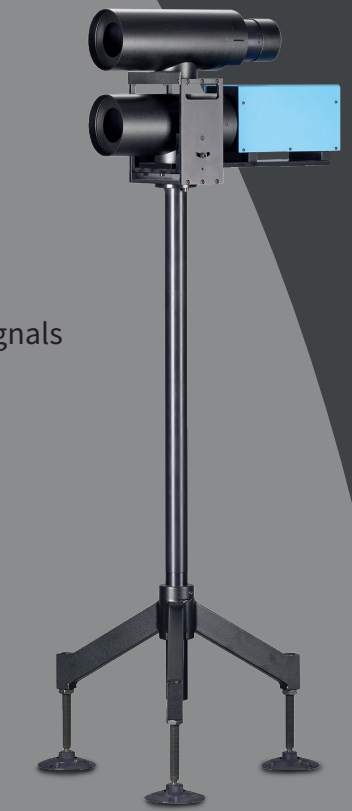
### SYSTEM SOFTWARE

- Hardware control for image capture
- Stitching of successive images
- Stray light and spectral mismatch correction
- Report generation and further analysis with respect to applicable automotive lighting standards

## SENSORS & ACCESSORIES

### PHOTOMETER LMT SP-30 AMR

- Very fine  $V(\lambda)$  correction  $f_1' < 1\%$
- Dynamic range 1:20.000
- Variable integration times for modulated and non-modulated signals
- Class L Photometer  $f_{\text{tot}} < 3.0\%$  as per DIN 5032



### STRAYLIGHT BAFFLES & CALIBRATED REFLECTIVE SCREEN

Measurement distance depending on DUT and customer request

- 10 m – 25 m for front lighting
- 3.16 m – 5 m for rear and signal lighting
- Size adapted to available space
- High-grade surface finishing and painting
- Laboratory layout and baffles customized to customers request



### TECHNOTEAM LMK CAMERA

- $100\ \mu\text{s} - 15\ \text{s} \rightarrow$  approx. 1 Mcd down to 0.1 cd
- Optical resolution down to  $0.005^\circ$
- Repeatability  $\Delta I$  [ $< 0.1\%$ ];  $\Delta x, y$  [ $< 0.0001$ ]
- Measuring accuracy  $\Delta I$  [ $< 3\%$ ];  $\Delta x, y$  [ $< 0.0020$ ]
- Uniformity  $\Delta I$  [ $< 3\%$ ]
- Measurable contrast common 1:1000 with measurement conditions according to CIE244:2021 characteristic value  $f_{25}$