Radiant Vision Systems TrueTest™ Software provides a comprehensive set of tests for image analysis within a flexible framework that enables evaluation using a single test, or multiple tests in sequence. Test sequencing and pass/fail reporting functionality make TrueTest the ideal software package for production environments. TrueTest Software can be combined with any Radiant ProMetric® Imaging Colorimeter or Photometer to create a complete testing system for light and color measurement or machine vision inspection.

The TT-HUD™ module for TrueTest Software provides a test suite to efficiently perform light, color, and dimensional measurements used to evaluate the quality of virtual images and projections, such as those emitted by head-up display (HUD) systems.

The TT-HUD module includes:

- **Light Measurement**: Characterize luminance and chromaticity, and evaluate other photometric qualities including contrast and uniformity.
- **Image Quality Analysis**: Evaluate projected image distortion, warping, ghosting, eyebox accuracy, and MTF (image clarity based on line pair algorithms).
- **Virtual Image Distance Calculation**: Use software to auto-adjust camera lens focus for the virtual image and calculate virtual image distance (e.g., in meters).

Applications

- Evaluate virtual images and projections generated by head-up display (HUD) systems
- Use with a Radiant ProMetric® Imaging Colorimeter (16 or 29MP) or Photometer (16, 29, or 43MP) with 200 mm lens
- Measure absolute luminance and chromaticity in projected images
- Test image clarity, distance, and position; characterize image distortion and other effects

Benefits

- Single test suite captures luminance, chromaticity, and dimensional measurement data for analysis
- Quickly apply pre-defined tests for advanced HUD measurement
- Software test sequencing and API device integration to control display test images in conjunction with software analyses, enabling automated production-level testing
- Apply tolerances and obtain pass/fail data to enable in-line quality control
- Supports Society of Automotive Engineers standard requirements for HUD measurement (SAE J1757-1) and methodology (SAE J1757-2), as well as standard requirements for HUD visibility from the International Organization for Standardization (ISO/TC 22/SC 35/WG 3, Visibility).
TT-HUD™ System Requirements

- ProMetric® Imaging Photometer (16, 29, 43MP) or Colorimeter (16 or 29MP)
- 200 mm lens
- Windows® 10, 64 bit
- 16-32 GB RAM
- Additional system requirements vary by camera. See hardware specification sheet for more information.

Examples of TT-HUD analyses:

Use Modulation Transfer Function (MTF) line pair algorithms to calculate contrast at different spatial frequencies to determine image clarity. Testing uses horizontal and vertical pairs of black and white lines.

Test distortion of the virtual image using Distortion Dot Grid to measure the spatial offset between dots of the primary image and a test pattern. Distortion can also be tested using Distortion Line Grid Analysis.

MeasureSpecments:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>ProMetric I16</th>
<th>ProMetric I29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focal Distance</td>
<td>200 mm</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Electronically controlled focus and aperture</td>
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</tr>
<tr>
<td>Field of View</td>
<td>8° x 5&quot;</td>
<td>11° x 7&quot;</td>
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</tbody>
</table>

Specifications subject to change without notice.