



# AMEE 3D

Flexible **Non-Contact** Measurement System for Complex Analysis of Deformation and Displacement of Static and Dynamic Events









## OPTICAL STRAIN AND DEFORMATION MEASUREMENT SYSTEM

Mercury MS, s.r.o., a software company based in the Czech Republic, is bringing you the best solution for non-contact material measurement. Our masterpiece is called AMEE 3D.

AMEE 3D is an optical strain and deformation measurement system that uses multiple cameras in stereo pairs. The system includes hardware components and uses software to analyze digital images using the Digital Image Correlation (DIC) method to determine strain and deformation in real time or by post-processing images.

AMEE 3D is suitable for measuring samples with complex shapes, spatial deformations and movements of solids in the direction of the camera, where the use of a 2D system does not provide sufficient results.

### The Basic AMEE 3D system consists of the following components:

-  Mercury RT 3D Software module + extensions based on testing purposes
-  Tripod with head
-  **TWO** LED Lights
-  **TWO** Magic arms for camera or light mounting
-  Cameras and Lenses
-  Stereo Bar
-  Measuring grid for calibration
-  HW HASP key

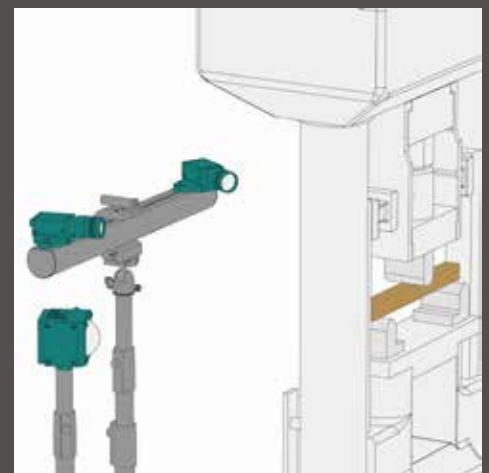
## PARAMETERS:

Parameters	Range *	Typical System
Classification to ISO 9513	Class 0.2, 0.5, 1, 2 -	Class 1
Classification to ASTM E 83	Class A, B-1, B-2, C, D, E, -	Class B-1
Field of View (FOV)	2-2000** mm	200 mm
Gauge Range	0.01 - 800 %	0.01-10 %
Resolution	0.1 - 50** μm	1 μm
Analog Output	10-16 Bit	4V/14 Bit
Digital Output	RS232/422/485. TCP/IP	TCP/IP
Test Rig Connectivity	DOLI DoPE. custom	DOLI DoPE
Camera Resolution	0.3-29 MPx	5 MPx
Data Rate	0.1-10 000 Hz	Up to 165 Hz

\* The range depends on the configuration

\*\* Could be increased by a different optical system

## HARDWARE SETUP



3D Stereo Setup - tripod with cameras

## SOFTWARE MODULES



The license for Mercury RT® software can be provided either online (software license) or through a HASP key (hardware license) with easy upgradability of modules and extensions.

## Mercury RT® - 3D

The 3D module extends the functionality of the 2D module by adding the ability to measure 3D space by combining cameras into stereo camera pairs to measure surface deformations and displacements in three axes.

The ability to measure 3D displacements and deformations is based on a precise measurement of the 3D shape of the area under inspection. The results can even be used to validate FEM (Finite Element Method) calculations. Understanding of the measured data is also facilitated by its representation in the included 3D graph. A typical application of this module is the measurement of the previously unknown direction of deformation.



## ENGINEERING SERVICES

In the field of optical measuring systems, we provide services for the processing of measured data and their interpretation, comparison, and subsequent implementation into simulations and calculation programs. The delivery of systems and services also include **the calibration** of the measuring systems with **a production certificate** or calibration of a measuring system with a certificate from an accredited calibration laboratory.



## MATERIAL TESTING

- 2D/3D Video extensometer (VEX).
- Extension and contraction measurement.
- Chain probe tool for rebar measurement.
- Neck gauge detection tool.
- Virtual strain gauge tool.



## RESEARCH & DEVELOPMENT

In addition to supplying standard measurement systems, our company can deliver **customized solutions to meet your requirements**. We have extensive experience with process automation of measuring systems, integration of measuring systems into a production line, miniaturisation of the measuring systems, modification of the systems for use in non-standard environments (e.g. design for outdoor applications).



## COMPONENT TESTING

- Static, quasistatic, dynamic measurement.
- Full-field strain distribution measurement.
- Integrated high-speed cameras.
- Point and area measurement of motion.
- Sampling synchronisation with the dynamic and periodic events.

## KEY FEATURES

- Both online (real-time) and offline analysis, where the computed values can be transferred as analog or digital outputs.
- Joint resolution of the standard system is within 500 nm and 5 µm, strain resolution can be up to 10 microstrains.
- Unlimited number of virtual measuring tools such as Line probe (extensometer), Point probe (motion sensor), Rigid Plane Probe, Chain Probe, Polyline Probe and Force gauge.
- Flow/motion field measurement applies to motion measurements with changing patterns and shapes, measurement of in-plane particle movement allows measuring displacement, velocity and acceleration, differential motion tracking and vector direction visualization.
- Ability to perform measurements using a natural speckle pattern.
- Camera integration - Mercury RT® supports a wide range of regular cameras, thermal cameras and High speed cameras. New camera brands can be integrated into the Mercury RT® upon customer request.

**TESS (Technical Support & Services)** includes

- a customer portal that facilitates communication between the technical team and the customer
- customer training on new features, new modules explanation
- rapid technical support & quick bug fixes
- a free update to the new version

## Why are we unique?

Mercury RT® Software was developed in collaboration with our customers, who inspire us to continually make it better and we understand their needs.

Our Technical team provides up to date measuring system with continuous software updates and features. In addition to providing measurement systems, we can deliver customizations according to your requirements. Mercury RT® supports various types of cameras manufacturers.

Local Distributor:

HEAD QUARTERS

<https://www.mercury-dic.com>



Developed in the Czech Republic

Feb 2024

