

Extensometers

Video-extensometer M Series

Rev. 02-2024-EN



Product information

The M-Series video extensometer developed by X-Sight, technical partner of Cermac, uses the most advanced technologies in Digital Image Correlation (DIC) to provide accurate strain measurements through a high-resolution optical sensor and dedicated software modules. Operation of the video extensometer is fully integrated with the Testing By Cermac software without the need for any external hardware interface.



Its ease of use and numerous software functions, which are constantly evolving, make the M-Series video extensometer an excellent choice for many applications in tensile testing of a wide range of materials and is applicable to all Cermac testing machines, from the smallest single column machines in the UTM-D series to the largest machines in both the electromechanical UTM-E series and the hydraulic UTM-H series.

The video extensometer is capable of measuring even the smallest strain (both axial and radial) of the specimen subjected to tensile testing without any need to place markings or targets on the specimen itself. It is suitable for measuring elongations of rebars and flat or round specimens up to failure.

It can be used on many types of materials, including those on which a traditional extensometer or strain gauge cannot be placed or bonded, e.g. FRP, FRCM, CRM, FRC, geotextiles, geogrids, fabrics and many others.

Also available is the HT series video extensometer, which is suitable for high-temperature measurements up to 1400°C.



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The video extensometer is generally installed in a fixed position to framing the specimen from a distance that is usually about 200 to 300 mm. The high-resolution C-MOS sensor is placed in a housing equipped with an automatically controlled LED illumination system. The video extensometer is connected to the PC via a high-speed USB 3.0 port and is operated using Alpha by X-Sight software. The Alpha strain analysis software is the user interface between the operator and the complex mathematical digital image correlation (DIC) operations that process the images acquired by the video extensometer. The Alpha software is interconnected with the Testing by Cermac software by TPC/IP protocol, allowing synchronization of acquired measurements that are centralized in the Cermac software.

The Alpha software is modular and provides many features that can also be enabled later by up-grading the user license. The main features are as follows:

- Presetting of different methods linked with a calibration
- Simultaneous measurement of multiple strains via multi-probe function
- Guided and easily managed device calibration procedure
- Digital image correlation (DIC)
- Unique functions:
 - Elongation measurement
 - Incline measurement
 - Torsion measurement
 - Transversal edge detection
 - Crack length measurement
 - Fragmenting surface measurement
 - High-sample rate real-time strain distribution

Machine Control System – Testing XE

The Testing Computerized Control System consists of a state-of-the-art datalogger (user/machine interface) equipped with an electronic module with TCP/IP network interface, analog and digital inputs and outputs of IN and OUT signals, firmware and software.

All signals related to the physical quantities coming from the machine's electronic sensors (load cell and displacement transducer), as well as those of electronic strain gauges (optional) applied to the sample or video extensometer for direct measurements of material deformation, are captured in real time by means of an analog/digital converter with resolution up to 24bit and sampling rate up to 1 kHz.



The Software Testing, in particular, allows the introduction of the necessary test parameters, through input masks adaptable to the specific needs of the operator, then proceed to the execution and display in real time of each test parameter.

The results are automatically captured and stored in a database so as to ensure easy traceability for subsequent processing.

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Thanks to the test modules fully customizable by the user, graphically accurate document and final printout are possible, which can be used both for certification and for any internal distribution.

The database can be shared over a network (intranet) and the software can be used simultaneously on different PCs allowing the visualization and processing of test data from different locations, with automatic and advanced functions of data loading and export of the results according to the requests related to the initiatives **Industry 4.0**.

Main reference standards

ASTM A615	Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Product
ASTM E4	Standard Practices for Force Verification of Testing Machines
ASTM E8	Standard Methods for Tension Testing of Metallic Materials
ASTM E9	Standard Methods of Compression Testing of Metallic Materials at Room Temperature
ASTM E2658	Standard Practices for Verification of Speed for Material Testing Machines
UNI EN ISO 6892	Test method for tensile test at room temperature
UNI EN ISO 7500-1	Calibration and verification of uniaxial static test machines
UNI EN 15630	Steel for reinforced concrete and prestressed concrete
UNI EN 10080	Concrete reinforcing steel - Weldable reinforcing steel

Technical Features

Video extensometer		
Model	M5	M9
Type of sensor	CMOS	
Resolution	5 Mpixels	9 Mpixels
Pixel dimension	0.00345 mm.	
Frame rate at maximum resolution	75 Hz	32 Hz
Digital interface	USB 3.0	
Working distance with 16 mm. lens focal length	Class 0.5: 213mm. Class 1: 459 mm. Class 2: 950 mm.	Class 0.5: 233 mm. Class 1: 494 mm. Class 2: 1017 mm.



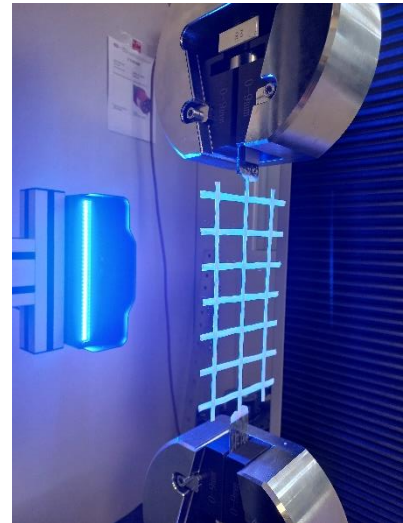
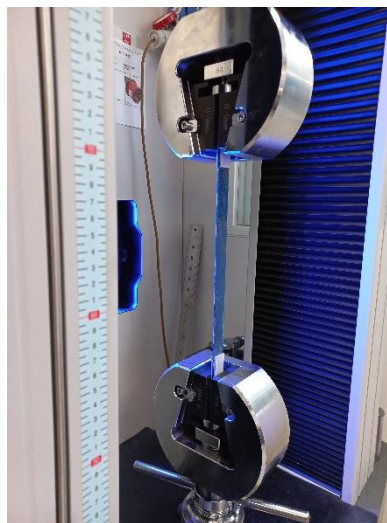
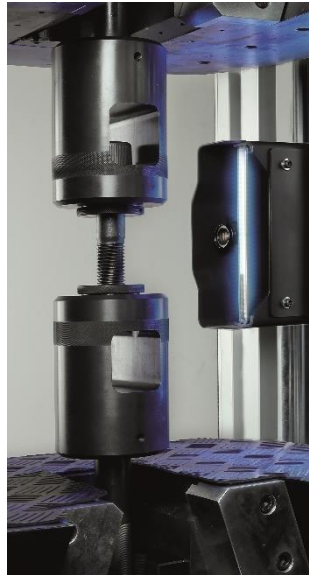
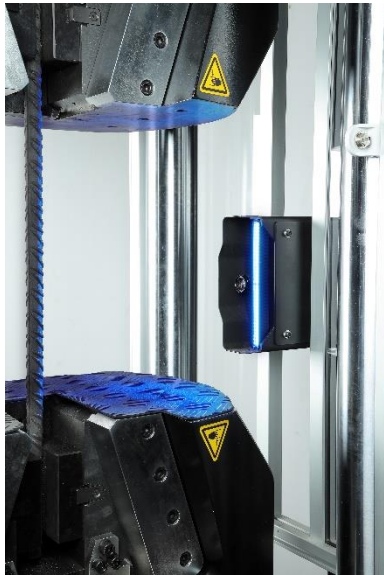
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Application examples



Models

P00590001 M5 Video extensometer

P00590002 M9 Video extensometer

P00560002 HT Video extensometer for high temperature tests

Learn more about X-Sight: www.x-sight.eu

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