

### » Precise Non-Contact Measurement

No mechanical influence of the specimen due to the non-contacting camera system.

### » High Resolution and Accuracy

Different lenses are available for different FOV, resolution and accuracy. System calibration provide measures in mm.

### » Longitudinal Measurement

Measurement of longitudinal strain.

### » Templates For Easy Test SetUp

For quick and easy measurement, a series of templates are available for different test setups and applications.

### » Benefits over Traditional Contact Extensometers

- No influence of the weight or operating-force on the test specimen
- No problems with knife-edge slip or damage to the specimen
- No errors due to inertia of moving parts
- No moving parts eliminate errors due to wear
- No possibility of damage due to energy release at failure
- Non-Ambient testing conditions



The VE1 video extensometer is a high precision instrument that uses a non-contacting optical measurement system based on a digital camera and real time image processing to measure the longitudinal and transversal strain during a tensile test. The system measures longitudinal strain between two applied lines at a rate of up to 100 Hz. The strain data is synchronized and transferred to NEXYGEN*Plus* 3 software (Series Plus & LS machine). An optional analog signal can be used for older machines.

### Applications

The VE1 is ideal for determining material properties in tensile tests. Sample deformation is measured without contact with the specimen to determine measurements such as stress-strain curves, e-modulus, investigation of strain behaviour on high speed tests and true strain controlled tensile tests.

The VE1 has a large application area and can test a wide range of material including metals, rigid plastics, composites, ceramics, thick films etc. in both ambient and non ambient temperature conditions.

### Wide Range of Measurements

- Longitudinal strain from 2 line markers
- Distance (mm) of the line markers

### Wide Range of Strain Measurements

The VE1 video extensometer has a wide range of strain measurements. Strains from 20 µm/m up to more than 1000% can be measured. System calibration provides measurements from a few mm to multiple m. The VE1 is saving images during the tensile test and can be used until sample break.

### Simple Preparation

The VE1 measures strain by tracking contrasting gauge marks placed on the specimen. The marks can be made with a black or white pen, adhesive or paint. For quick and easy measurement, a series of templates are available for different test setups and applications.

### Non-contact Measurement

A high performance digital camera with an IEEE 1394 (Firewire) digital interface provides high resolution measurements. The VE1 video extensometer provide real time calculation of strain from the camera.

### Gauge Length and Field of View

To define the field of view, you have to know:

- The initial length of your specimen (L0)
- The maximum elongation in % or in mm

This table will give you the maximum field that must be covered and analyze the camera.

### Applications Designed to You

The table below shows various options for a specific application. Contact your sales office for applications designed for your needs.

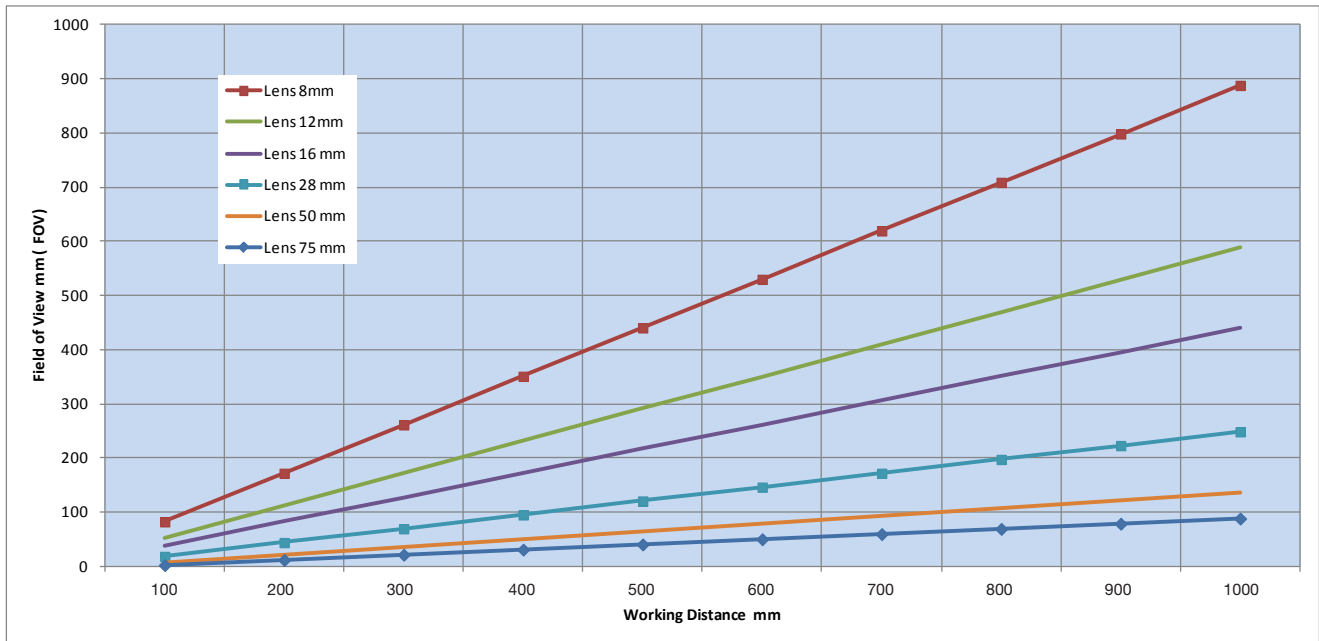
Working Distance mm		500 mm	
Gauge Length (L0)	Max Elongation	Optical Lens	Field of View (FOV)
10 mm	100%	50 mm	60 mm
20 mm	30%	50 mm	120 mm
20 mm	100%	28 mm	120 mm
20 mm	400%	16 mm	210 mm
20 mm	800%	8 mm	440 mm
25 mm	100%	28 mm	120 mm
25 mm	600%	8 mm	440 mm
50 mm	25%	28 mm	120 mm
50 mm	100%	16 mm	210 mm
50 mm	300%	8 mm	440 mm
80 mm	30%	16 mm	210 mm
80 mm	100%	8 mm	440 mm
100 mm	10%	16 mm	210 mm
100 mm	100%	8 mm	440 mm

\* Generally, FOV requires 2 x (L0+Max elongation)

### Optional Lens

Available standard lenses with focal length (mm):

- 8, 12, 16, 28, 50, 75
- Zoom: 24-85
- Larger focal length on request



## Accessory Kits

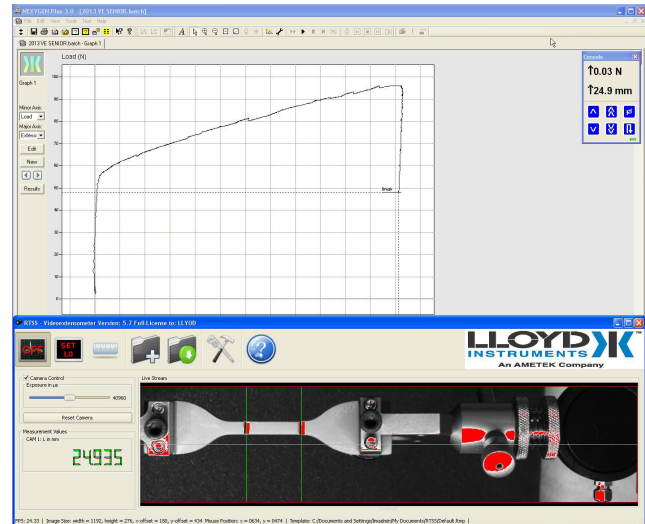
The VE1 is composed and supplied with:

- CCD Camera 2 Mp
- One lens
- Black and white specimen marker pens
- Calibration plate
- Gauge mark template
- 300 mm LED vertical light
- Stand

The camera can be used with different lenses to have up to six Field of View (FOV).

## Integration with Tensile Testing Machines

The VE1 video extensometer can be used with any current Lloyd Instruments test machine. Full control of the VE1 and analysis is possible with Lloyd Instruments accredited NEXYGEN<sup>Plus</sup> 3 materials testing software.



## Easy Operation with Intuitive User Interface

The VE1 video extensometer features a modern, configurable and intuitive user interface using OpenGL technology for easy operation.

## Low Processor Load

The multi-thread analysis kernel supports multi-core processors to achieve a low processor load.

## PC Requirements

The VE1 runs on the same PC as the testing machine software. The minimum specification for the PC is:

- i3 (faster than 2.8GHz, with FireWire-interface)
- Windows XP or 7 operating system
- Available PCI slot
- An actual graphics card
- Installed driver that supports at least OpenGL 2.0

Options for mounting on to various frames and temperature chambers are available.

## A Multitude of Configurations

The table below shows the standard configurations of the VE1. Other configurations are available on request.



## Technical Specification

Configuration Reference	VE-50-500	VE-28-500	VE-16-500	VE-8-500	VE-Z-500	VE-8-1000	
Working Distance mm	500	500	500	500	500	1000	
Focal Length mm	50	28	16	8	ZOOM 24-85	8	
FOV mm	60	120	210	440	35-140	890	
Minimal Resolution $\mu$ m	0,3	0,6	1,05	2,2		4,4	
Lines thickness mm	1	1	2	4	1 à 3	5	
Dots $\emptyset$ mm	2	4	4	4	2 à 4	4	
Data Rate*	De 100 Hz à 10 Hz						
Accuracy	$\pm 2 \mu$ m or $\pm 0,5\%$ of the reading	$\pm 4 \mu$ m or $\pm 0,5\%$ of the reading	$\pm 6 \mu$ m or $\pm 0,5\%$ of the reading	$\pm 16 \mu$ m or $\pm 1\%$ of the reading	$\pm 2 \mu$ m or $\pm 0,5\%$ of the reading	$\pm 4 \mu$ m or $\pm 0,5\%$ of the reading	$\pm 100 \mu$ m or $\pm 1\%$ of the reading

\* The data sampling frequency may be less than values indicated in the specifications, due to the PC performance and load.

## Lens Sizes

Working Distance mm	Lens 8 mm	Lens 16 mm	Lens 28 mm	Lens 50 mm	Lens 75 mm
100	82	38	18	7	2
200	172	82	44	21	12
300	261	127	70	36	21
400	351	172	95	50	31
500	440	217	121	64	41
600	530	261	146	79	50
700	619	306	172	93	60
800	709	351	197	107	69
900	798	396	223	122	79
1000	888	440	249	136	88

## Ordering Information

Order number	Description
01/3892	VE1 Non-contacting video extensometer
<b>Optional Accessories</b>	
01/3894	Zoom or fixed focus lens
01/3895	Tripod
01/3896	3D-gear head
01/3897	300 mm LED line light
01/4474	600 mm LED line light
01/4468	Video Extensometer Stand. Common parts. All machines.
01/4469	Video Extensometer Stand 600 mm Beam
01/4470	Video Extensometer Stand LS Machine Adaptor
01/3899	Robust system case for camera and accessories
01/4473	NI DAQ Interface for Video Extensometer (BNC Output) includes 6.35 mm male jack plug cable.



### AMETEK Test & Calibration Instruments

A business unit of AMETEK Measurement & Calibration Technologies offering the following industry leading brands for test and calibration instrumentation.

### LLOYD Materials Testing

#### Materials Testing Solutions

Materials testing machines and software from Lloyd Instruments guarantee the highest level of performance and capability for production testing, quality control, laboratory testing, research and education to provide expert materials testing solutions.

#### Davenport Polymer Test Equipment

Allows critical polymer parameters to be determined, including melt flow index and melt flow rate, intrinsic viscosity (IV) measurement of moisture-sensitive PET polymers and polymer density measurement.

#### Texture Analysers

The comprehensive program provides the platform to perform rapid, general food testing and detailed texture analysis on a diverse range of foods.

### Chatillon Force Measurement

Chatillon has been a hallmark in the industry since 1835. The hand held gauges and motorized testers have earned their reputation for quality, reliability and accuracy and they represent the de facto standard for force measurement.

### Newage Testing Instruments

Newage offers a comprehensive range of hardness testers, durometers, optical systems and software for measurement, data acquisition and analysis.

### JOFRA Calibration

The inventor of the portable high precision dry-block temperature calibrators. The calibration instruments program also covers precision thermometers and temperature baths, temperature sensors handheld instruments for pressure calibration and process signal calibrators for easy control loop calibration, measurements and simulation.

### M&G Pressure Testers & Pumps

Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading.



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