Force Measuring System Model CMS

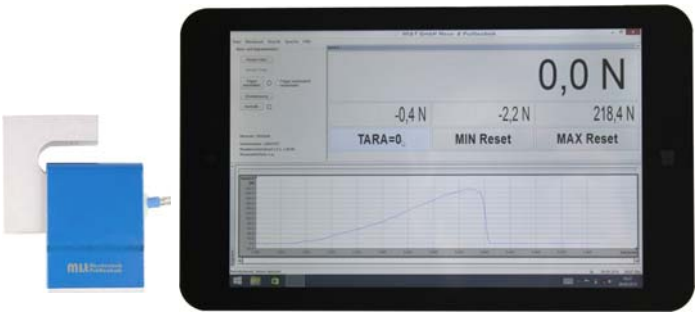
for precise tensile & compressive force measurements

MI&T GmbH Berlin
Mess- & Prüftechnik
Measuring Instruments & Testers

General Information:

- Digital high-precision force measuring system for measurements of tensile and compressive forces.
- Force measuring system consisting of high-precision remote load cell with sensor interface CMS (A/D converter and USB interface) integrated in the connection cable of the load cell and CMS configuration and evaluation software. Optional the force measuring system can be supplied with a tablet display, tablet computer or laptop, each with installed and fully configured software.
- Configuration and evaluation software for analysis and graphical presentation.
- High measuring accuracy, resolution and repeatability.
- Easy operation.
- Rapid internal update rate consistently captures even critical force readings
- Tracking Mode with indication of current force values.
- Minimum and maximum value memory (resettable).
- Variable average determination.
- Tare compensation.
- User settable upper and lower limit (OK/NOK evaluation).
- Graphical presentation of measured values (force/time).
- Manual or automatic storage in a CSV- ad BMP-file.
- Scaling function of the input variable to any display value with unit.
- Configuration menu for general parameter setting.
- Load cells with different capacities can be used and operated alternately. After factory parameterization of the CMS interface of the respective load cell, the CMS software recognizes each load cell automatically. Thus, measurement can be started immediately after connection of the load cell through the USB-connector of the interface.
- Ideally suitable for calibration of MI&T test stations and testers.

Tablet display with presentation of measured values



Measured valued display with force/time graph

Technical Specifications:

Model Designation:	**CMS**
Indication Ranges:	depending on load cell model, see e. g. SM load cells.
Resolution:	depending on rated output of load cell per ±1 mV/V = ±10000 digits
Accuracy error:	≤ ±0.1% F.S. ± LSD.
Load Cells:	see specifications of SM load cells
Sensor Interface:	
Interface:	USB
Power Supply:	from USB, 4 V, ≤ 20 mA
Measured Values:	±3 mV/V = ±30000 digits
Resolution:	1 mV/V = 10000 digits
Zero Point:	0 Digits
Output Format:	16 Bit Signed Int.
Internal update rate:	adjustable, max. 5000 Hz
Accuracy:	± 32 Bit
Cable lengths:	sensor cable 1m USB cable 0.5 m (max. 2 m) with USB-A connector
Dimensions:	25x115 mm (Ø x L), weight: 250 g.
Miscellaneous:	Temperature drift: 4 Bit/K Nominal temperature range: +10…+40 ºC Service temperature range: +10…+40 ºC Storage temperature range: +10…+70 ºC Protection class: IP67

Configuration & Evaluation Software:

Indication of current measuring value (tracking mode), single measurement, graphical presentation of measured values (force/time, automatic scaling of Y-axis), resettable maximum value (peak value) memory, resettable minimum value memory, tare compensation, variable average determination (adjustable), adjustable lower and upper limit for OK/NOK evaluation, automatic and manual storage in a CSV- and BMP-file, operating languages: German, English, French (selectable).

System requirements:
Windows ’00 / ’03 / ’08 / XP /Vista / 7 32/64 / 8
Single Core ex 2.0 GHz (without diagram)
Dual Core ex 1.8 GHz (with diagram)

Optional Accessories:

- Tablet display with installed and fully configured CMS software.
- Tablet computer with installed and fully configured CMS software.
- Laptop with installed and fully configured CMS software.
- Installation service: upon customer’s request MI&T can install and configure the MSC software on a provided, customer-owned computer.
- External control signal excitation in the load cell in order to check the adjustment of the load cell at any time.

Load Cells Model SM

High-precision Force Transducers for tension & compression

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General Information:

- The load cells of the model series SM can be used in all fields of application of tensile and compressive force measurements.
- Separate load cells, to be connected by a detachable cable to the force gauge or force measuring system.
- In combination with a CMS force measuring system an efficient measuring system is provided for precise force measurements.
- The aluminium base body of the load cells is characterized by high stability and stiffness.
- If loaded the DMS load cells of S beam type generate a rated output signal, which is exact proportional to the applied load.
- Under load the resulting deflection of the base body is measured by strain gages, which are mounted on the S beam base body. The force measuring gauge/system evaluates whose rated output.
- The precise manufactured internal construction ensures that the applied forces are concentrated into defined areas whereas inaccuracies caused by side forces or bend moments are minimized.
- To obtain measurements with highest possible accuracy it is necessary to ensure that the load path must be through the load axis of the load cell. Loads not being perfectly aligned should be avoided.
- At top and bottom of the load cells there is each one threaded hole to mount in either tension or compression applications.
- During the use and assembly of load cells a suitable overload protection must be installed, especially in case of load cells with small capacities.

Load cell SM 1000 N

Load cell SM 5000 N

SM with Force Measuring System CMS:

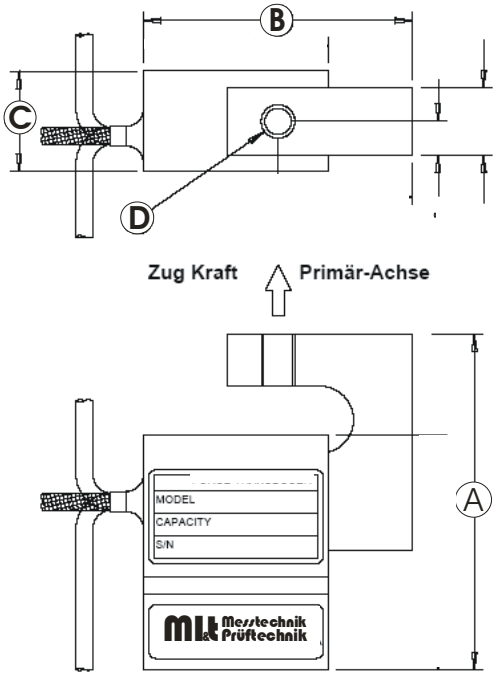
Type	Indication Range [N]	Resolution* [N]
50	0- 50	0.005
100	0- 100	0.01
200	0- 200	0.01
250	0- 250	0.01
500	0- 500	0.05
1000	0- 1000	0.1
2000	0- 2000	0.1
5000	0- 5000	0,5
10000	0- 10000	1

*** recommended setting for the resolution in CMS**

Technical Specifications:

Model Designation:	**SM**
Capacity [N]:	accord. to below-mentioned table
Rated Output:	2-3 mV/V
Input Resistance:	350 ± 3,5 Ω
Output Resistance:	350 ± 3,5 Ω
Excitation Voltage:	15 V DC max.
Deflection:	0.076-0.127 mm (according to type)
Weight:	ca. 190-300 g (depend. on model)
Cable:	4-wire cable with shield, 1 m length
Nonlinearity:	±0.03-0.06% FS
Zero Balance:	±1% RO
Insulation Resistance:	5 GΩ (Bridge/Housing)
Safe Overload:	±150% of capacity
Breaking Load:	±500% of capacity

Capacities and dimensions:



Model	Capacity [N]	A [mm]	B [mm]	C [mm]	D
SM 50 N	50	64	51	19	M6
SM 100 N	100	64	51	19	M6
SM 200 N	200	64	51	19	M6
SMT 250 N	250	64	59	17	M6
SM 500 N	500	64	51	19	M6
SM 1000 N	1000	64	51	19	M6
SM 2000 N	2000	76	51	19	M12
SM 5000 N	5000	76	51	19	M12
SSM 10000 N	10000	76	51	25	M12

Further load cell models with other force ranges available on request