M505 (D)

Process calibrator

Operation manual

MEATEST

AUTO
20V
INP 13.986 V

99%
SUP 765.3 °C

ESC MENU

OK

ON
OFF LIGHT

MEMO	7 100mA	8 AUTO	9 HOLD
GRAPH	4 2V	5 20V	6 200V
LOGG	1 MAX	2 MIN	3 CLEAR
OUT	+/- NUM	0 RAMP	. STEP

Process Calibrator OC 505

Content

1   Introduction

- √ Current Calibrator 0/4 - 22mA, Source/Sink
- √ Voltage Calibrator 0-25V
- √ mV Outputs 0-27mV and 0-540 mV
- √ DIN Thermocouples J, K, N, R, S, T, B, E
- √ RTD Simulator Pt and Ni
- √ Resistance Simulation to 3kOhm
- √ Multimeter ±2V to ±200V DC and +100mA
- √ Calibrates and Measures Simultaneously
- √ Eight Memory slots for fast Transients
- √ Graphics of Measurements
- √ Steps, Ramps, direct value settings
- √ Datalogger Function in M505 D model

M505 is a Calibrator-Multimeter for generation of Currents 0-22mA Sink or Source und Voltages to 25VDC. External voltages ±2V, ±20V and ±200VDC (firm ranges or auto ranging) and Currents to ±100mA can be measured simultaneously and shown at the display.

Further Functions contain generation of calibration mV Signals, Thermo voltages of DIN Thermocouples and RTD Resistors and simulation of true resistors.

mV voltages of 0-27mV or 0-540mV are mainly used for calibration of Strain Gauges, Transmitters and small signal inputs with resolution of up to 0.001mV.

Thermocouples J, K, N, R, S, T, B, E are simulated. The temperature is entered with the keyboard and shown at the display. The cold junction is compensated to the ambient temperature. It can also be switched-off.

RTD Thermometers can be simulated within the DIN temperature range. The temperature is entered with the keyboard and shown at the display.

Ohm Source Resistance values up to 3kOhm are simulated. The resistance value is entered with the keyboard and shown at the display.

Graphics and Memorising of measured signals is a standard function. The signals are continuously stored and shown at the display as graphics. In apart of this eight memory slots for storing of fast signals -Transients- are available. They can individually be stored and selectively recalled at the display.

Datalogger is an Option. The calibrating signals and the multimeter input are shown at the display and stored as tables with date and time from internal RTC. They can be downloaded to the PC and edited under Windows and Excel. A software program is available for Windows.

2   Unpacking Instructions

Remove the Packing List and verify that you have received all equipment, including the following:
- Model M505 Handheld Calibrator.
- Operation Manual M505.

If you have any questions about the shipment, please call the Meatest Customer Service.

<table>
<tr><td align="center">NOTE

When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the Meatest customer service, Phone +420 543 250 886 or Fax +420 543 250 890 and to the shipping agent.
The carrier will not honour damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in event the reshipment is necessary.</td></tr>
</table>

Content of delivery
- Calibrator-Multimeter Model M505 (D)
- Charger 95-240VAC
- Two signal cables
- T/C plug K, U
- SoftManager for Windows
- Operation Manual and Calibration Certificate

3   Inputs, Outputs and keyboard

CALIBRATOR

Voltage and Current Outputs,

Resistance and RTD: **+ OUTPUT -**

Thermocouples: **Cu**   Terminals at the front

MULTIMETER

Voltage and Current Inputs: **+ INPUT -**
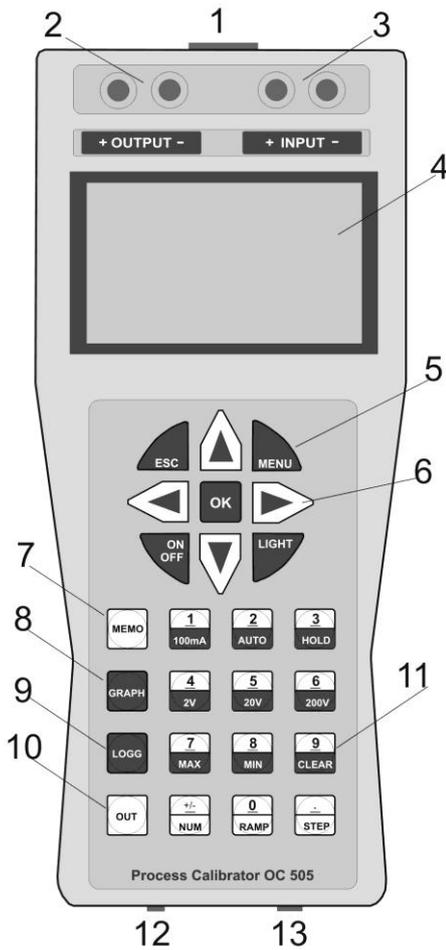
|	
1	Thermocouples Connector
2	Output Calibrator
3	Input Multimeter
4	LCD-Display
5	Main Keys
6	Cursor Keys
7	Memory Key
8	Recall Graphics
9	Datalogger
10	Selection of Calibrator Output Mode
11	Function Keys
12	Charger Jack
13	USB

CONTROLLER

The Functions of the Calibrator and the Multimeter are selected with the keyboard and supported by a microcontroller. The factory settings and the calibrated points are stored in a nopn-volatile memory and remain stored also when the instrument is switched off. The software calibration of all ranges is accessible in the calibration menu and protected with a password. All ranges can be recalibrated via the keyboard if required.

The graphic display is divided into two windows. The upper window is shows the multimeter functions, the lower window the calibrator. In programming mode the display shows the parameters. In graphics mode of operation the display shows the stored input signals.

The Multimeter is always active and can be used independently from the calibrator. The ranges can be selected with the keyboard. The current range is firm. The voltage ranges are firm 2V, 20V or 200VDC or can be set as automatic range.

Minus Terminals of the Calibrator and the Multimeter are common.

4   Graphics display

The LCD Display is divided into two parts. The upper part is for the multimeter functions, the lower part for the calibrator. The bargraph in the middle is the analogical representation of the measured input signals. The left side shows various symbols:
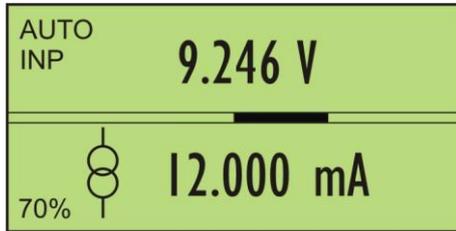
AUTO **INP** **9.246 V** ─────────────── 70% **12.000 mA**	**MULTIMETER** measured input voltage in automatic range. - **CALIBRATOR** generates 12.000mA. The Battery has 70% of capacity.

Symbols in the upper display part

AUTO	Automatic Voltage Range or firm measuring range
200V	Measure Ranges 2V, 20V, 200V, 100mA
INP	The display shows the input signal.

Symbols in the lower display part

RMP	Automatic Ramp of the calibrator signal
SUP	The battery is being charged
60%	Battery voltage in %. Do not run the instrument when the battery shows **0%**. Charge only with the enclosed original charger.

5   Datalogger (Software Option)

The generated signal and the measured signal are stored in a table format. The date and the time are added. The stored data can be downloaded via the USB to a PC. A Soft Manager supports the data transfer to a Windows PC. Two Set Points **LEVEL LOW** and **LEVEL HIGH** and two Intervals INTERVAL 1 and INTERVAL 2 will be selected. If the measured signal is between the both Set Points LEVEL LOW and LEVEL HIGH, the data will be stored with **INTERVAL 1**. The **INTERVAL 2** stores the date when the input signal is outside the Set Points. The both Intervals can be selected from 2 sec. to 24 hours.

With the key **LOGG** is the function Datalogger active. The key MENU and the two cursor keys permit the parameter selection. With OK the setting will be stored.

LOGGER LOGGER OFF	LOGGER LOGGER ON	LOGGER OFF Datalogger OFF LOGGER ON Data are stored MEMORY ERASE Erase the memory	LOGGER MEMORY ERASE
INTERVAL 1 < 2 SEC	INTERVAL 2 5 SEC	INTERVAL 1: < 2 Sek. … 24 Std. INTERVAL 2: < 2 Sek. … 24 Std.	
LEVEL LOW +100.000	LEVEL HIGH +200.000	LEVEL LOW: free settable LEVEL HIGH: free settable	

6   Function selection – calibrator

The calibrator function is selectable with the keys. The output values can be set in steps, ramps or free values.

The output function will be selected with **OUT**. Vertical cursor keys select the required function:

OUTPUT MODE / CURRENT SOURCE	Current Source 0 - 22mA
OUTPUT MODE / CURRENT SINK	Current Sink 0 - 22mA
OUTPUT MODE / VOLTAGE HIGH	Voltage Output 0 - 25V
OUTPUT MODE / VOLTAGE MEDIUM	Voltage Output 0 - 560mV
OUTPUT MODE / VOLTAGE LOW	Voltage Output 0 - 28mV
OUTPUT MODE / RESISTANCE	Resistance Output 45 - 3000 Ohm

OUTPUT MODE / PT-100, OUTPUT MODE / PT-200, OUTPUT MODE / PT-500, OUTPUT MODE / PT-1000, OUTPUT MODE / NI-1000

RTD Outputs Pt-100, Pt-200, Pt-500, Pt-1000, Ni 1000

OUTPUT MODE / TH-COUPLE B, OUTPUT MODE / TH-COUPLE E, OUTPUT MODE / TH-COUPLE J, OUTPUT MODE / TH-COUPLE K, OUTPUT MODE / TH-COUPLE N, OUTPUT MODE / TH-COUPLE R, OUTPUT MODE / TH-COUPLE S, OUTPUT MODE / TH-COUPLE T

Simulation of Thermocouples B, J, K, N, R, S, T

OK confirms the selection. The selected function remains memorised also when the power is switched-off.

DIRECT VALUE ENTRY
When the key **NUM** is pressed, the display shows the previous value with flashing digit. This digit can be set from the keyboard. The flashing digit will be positioned automatically. It can also be positioned with the horizontal cursors.

RAMPS
The key **RAMP** activates the Ramp generation. The values at the display increment in steps selected in the Menu. The display shows the symbol **RMP**.
By pressing the key RAMP again, the ramp generation will stop.

Ramp Steps selection in MENU
Press **MENU**. The step can be selected from firmly pre-programmed values with the vertical cursors. Confirm with OK.

RAMP SELECT	RAMP SELECT	RAMP SELECT	RAMP SELECT	RAMP SELECT	RAMP SELECT
DN STEP -0.5mA	DN STEP -0.1mA	UP STEP +0.1mA	UP STEP +0.5mA	STEP USER FN.1	STEP USER FN.2

Example: Current Output 0 - 22mA
DN STEP: Display decrementing
UP STEP: Display incrementing

RAMP SELECT	RAMP SELECT
STEP USER FN.1	STEP USER FN.2

Individual Ramp Step scan be selected und stored in FN.1 and FN.2.

RAMP STEPS
With keys **RAMP** or **STEP** the display will increment in steps selected in the MENU.

Selection of Steps in the MENU
Press the key **MENU**. Use the vertical cursors to select the Step from pre-programmed values. Confirm with OK.

STEP SELECT	STEP SELECT	STEP SELECT	STEP SELECT	STEP SELECT	STEP SELECT
DN STEP -0.5mA	DN STEP -0.1mA	UP STEP +0.1mA	UP STEP +0.5mA	STEP USER FN.1	STEP USER FN.2

Example: Current Output 0 - 22mA
DN STEP: Display decrementing
UP STEP: Display incrementing

Selection of individual Steps
The range and the steps can be set in two memory slots **FN.1** and **FN.2**.

Press MENU and select *RAMP SELECT*. With the key MENU and vertical cursors select the range and the steps.

RAMP SELECT	STEP USR I MIN	STEP USR I MAX	STEP USR I DIF
STEP USER FN.1	+5.0000	+020.000	+04.000

Confirm with OK.

7   Graphics

For fast diagnostics of external signals measured by the multimeter the graphics representation can be displayed. Two modes of operation are available:

- *GRAPHICS*   the running measurement is automatically stored in 128 points (FI-FO)
- *TRANSIENTS* Eight individual memory slots are assigned for fast signals – Transients.
                        The sampling time and the Trigger level are selectable.

The Memory module for the Graphics and the Transients are common. By recalling the *Transients*, the *Graphics* will be erased.

7.1   GRAPHICS

The key GRAPH opens the graphic presentation.

Graphics deactivated - GRAPH OFF. The graphics can be activated with vertical cursors - GRAPH ON.
The latest stored signal will be displayed when OK is pressed.

HISTORY GRAPH	HISTORY GRAPH	+5V ⟋‾⟍ -5V
GRAPH OFF	GRAPH ON	The graphics at the display
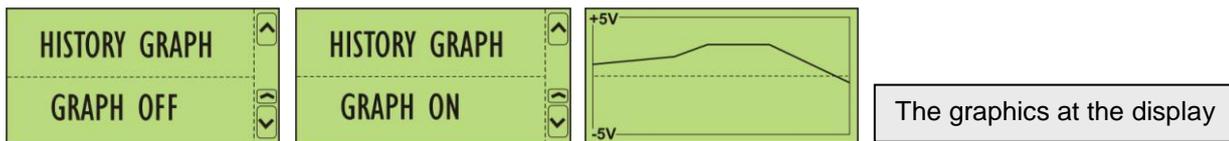
7.2   TRANSIENTS

Fast signals at the multimeter input can be stored. Eight individual memory slots TRANSIENT NO.1 … TRANSIENT NO.8 are available. The sampling rate is 1ms. Each transient contains 256 Point and can be time limited from 0.25 to 300 seconds. The Trigger level is programmable from <10% to >90%.

With the key **MENU** the Transients can be stored or recalled at the display. The selection is done with the vertical cursors.

TRANSIENT	+1V ⟋‾⟍ -1V	TRANSIENT	TRANSIENT
NO.1 SHOW		NO.1 START	NO.1 DELETE
Stored Transient 1 is shown at the display		Start of Transient 1 memorizing	Transient 1 deleted
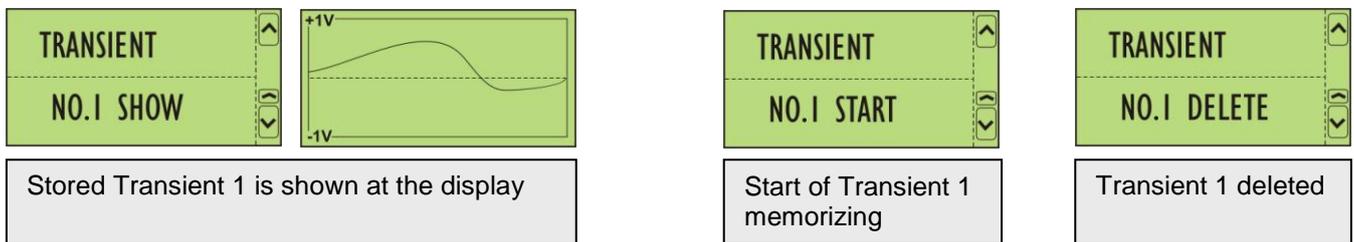
The parameters will be selected with the key **MENU**:

STORE TIME	0.25 … 300 sec.	THRESHOLD	<10% … >90%
0.25s		SIGNAL >10%	
The key MENU and vertical cursors select the time		The key MENU and vertical cursors select the Trigger level	
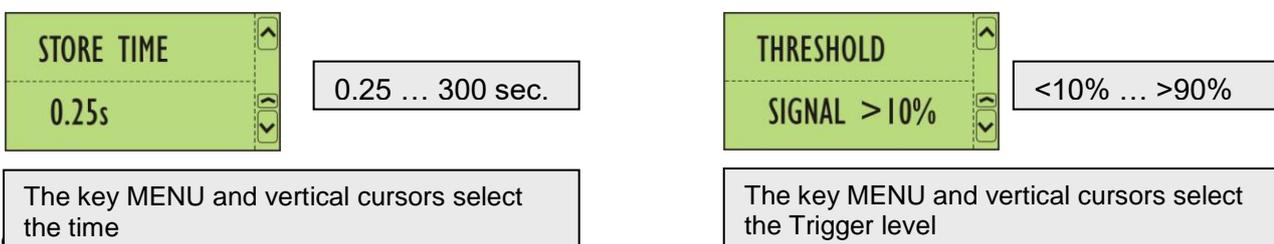
8   Menu steps

When the key MENU is used in the measuring mode, the display will change into program mode.

Display	Description
RAMP SELECT — UP STEP +0.5mA	Ramp and step selection
STEP SELECT — UP STEP +0.5mA	Step selection
STEP USR 1 MIN — +0.00000	Individual step, minimum value, User 1
STEP USR 1 MAX — +100.000	Individual step, maximum value, User 1
STEP USR 1 DIF — +5.00000	Individual step, differential value, User 1
STEP USR 2 MIN — +0.00000	Individual step, minimum value, User 2
STEP USR 2 MAX — +210.000	Individual step, maximum value, User 2
STEP USR 2 DIF — +7.00000	Individual step, differential value, User 2
COLD JUNCT. — COMPENS. OFF	Junction compensation ON - OFF
UNIT — USE °F	Temperature units °C or °F
TARE — TARE OFF	Tare of the Multimeter display ON - OFF
FILTER — OFF	Filter constant of the Multimeter display
DATE AND TIME — 12:10:33 19.03.11	Setting of the Time and the Date
UPGRADE — UPGRADE OFF	Software Upgrade OFF - ACTIVE

With **ESC** one return step in Menu is possible. By pressing **ESC** three times, the display returns into the measuring mode.

9   Additional functions in the multimeter mode

The key **MENU** opens the Functions *TARA* and *FILTER* for the Multimeter:

TARE	TARE
TARE OFF	TARE ON

The TARE can be activated
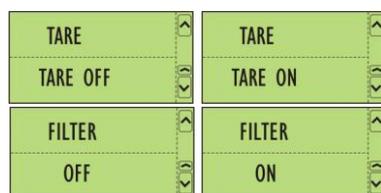
FILTER	FILTER
OFF	ON

The Filter can be set for the input signal.

ADDITIONAL FUNCTIONS
The numeric keyboard permits selection of following functions:

HOLD	Display Hold (with CLEAR return)
MAX	Maximum display reading of the Multimeter (with CLEAR return)
MIN	Minimum display reading of the Multimeter (with CLEAR return)
CLEAR	Cancel the above functions and switches into the measuring mode

10   Software – calibration

The voltage and the current ranges of the multimeter as well as the output signals of the calibrator can be calibrated from the keyboard. The calibration menu is password protected. The calibration menu opens with the key **OK** pressed for 10 seconds.

> ***Please ask the manufacturer for the Password.***

1	Out	4 .. 20mA	0 .. 24V
2	Input	i	0 .. 10mA
3	Input	u	0 .. 200V
4	Resists	r	390 Ohm
5	Hardware	6	Logo

Full calibration of all ranges or partial calibration of some selected ranges can be performed. A precision 5 digits multimeter with accuracy of 0.005% is required.

Point 1: Calibrator Outputs
Points 2-3:   Multimeter Inputs
Point 4: Calibration of the Resistor Simulator
Point 5: Hardware Configuration
Point 6: Selection of Logo for customized instrument

Quit the Menu with **ESC**.

10.1 CALIBRATION of CALIBRATOR OUTPUTS

Select the required range (1) or (4).
Currents, Voltage, Resistors and Thermocouples will be calibrated in the Range (1).
In the Range (2) the Resistors and the RTD will be calibrated.

10.1.1 Calibration of Currents

Connect a mA-Meter to the calibrator outputs. Required accuracy 0.01% @ 25mADC

OUT 4 mA SRC +11270	Set the value with the keyboard until the connected mA-Meter shows 4.000 mA. **SOURCE MODUS**.
OUT 20 mA SRC +53222	Set the value with the keyboard until the connected mA-Meter shows 20.000 mA. **SOURCE MODUS**.
OUT 4 mA SNK +11593	Set the value with the keyboard until the connected mA-Meter shows 4.000 mA. **SINK MODUS**.
OUT 20 mA SNK +554652	Set the value with the keyboard until the connected mA-Meter shows 20.000 mA. **SINK MODUS**.

10.1.2 Calibration of Voltages

Connect V-Meter to the calibrator outputs. Required accuracy 0.01% @ 25VDC

OUT 0.0 V +00771	Set the value with the keyboard until the connected V-Meter shows 0.000 V.
OUT 24.0 V +61316	Set the value with the keyboard until the connected V-Meter shows 24.000 V.
OUT 0.0 mV +00765	Set the value with the keyboard until the connected V-Meter shows 0.000 mV.
OUT 500.0 mV +56845	Set the value with the keyboard until the connected V-Meter shows 500.000 mV.
OUT 0.00 mV +00653	Set the value with the keyboard until the connected V-Meter shows 0.000 mV.
OUT 25.00 mV +57074	Set the value with the keyboard until the connected V-Meter shows 25.000 mV.

10.1.3 Calibration of Resistances

Connect Ohm-Meter to the calibrator outputs. The required accuracy is 0.05%.

RESIST 120 OHM +119.81	Set with the keyboard the resistance value which is being measured with the connected Ohm-Meter.
RESIST 150 OHM +149.74	Set with the keyboard the resistance value which is being measured with the connected Ohm-Meter.
RESIST 220 OHM +219.74	Set with the keyboard the resistance value which is being measured with the connected Ohm-Meter.
RESIST 390 OHM +389.83	Set with the keyboard the resistance value which is being measured with the connected Ohm-Meter.

10.2 CALIBRATION MULTIMETER

Select the required range (2) or (3).

The Range (2) is for calibration of the current, the Range (3) is for the voltage calibration.

I (0 - 0.1A) 0.0 A +00123	Supply from external current calibrator 0.000 mA and confirm with OK. The point 0.00A is calibrated.
I (0 - 0.1A) 0.1 A +58345	Supply from external current calibrator 100.000 mA and confirm with OK. The point 0.1A is calibrated.

U (0 - 2V) 0 V +00431	Supply from external voltage calibrator 0.000 V and confirm with OK. The point 0V is calibrated.
U (0 - 2V) 2 V +55443	Supply from external voltage calibrator 2.000 V and confirm with OK. The point 2V is calibrated
U (0 - 20V) 0 V +00421	Supply from external voltage calibrator 0.000 V and confirm with OK. The point 0V is calibrated.
U (0 - 20V) 20 V +56223	Supply from external voltage calibrator 20.000 V and confirm with OK. The point 20V is calibrated.
U (0 - 200V) 0 V +00431	Supply from external voltage calibrator 0.000 V and confirm with OK. The point 0V is calibrated.
U (0 - 200V) 200 V +58263	Supply from external voltage calibrator 200.000 V and confirm with OK. The point 200V is calibrated.

The key **ESC** terminates the calibration and the display returns into the measuring mode.

11   Datalogger (model M505D only)

When the function Datalogger is activated, the calibrator output and the multimeter input signals will be stored in the internal memory. This permits fast checking of transmitters and their calibration in the field.
Example: A T/C transmitter with mV input signal generates 0-10V at the output. Both signals are stored as a table with date and time added from internal RTC.
The Data can be downloaded to the PC and displayed as tables and graphics. They can be used for Excel and handled under Windows.

Set Points **LEVEL LOW** and **LEVEL HIGH** and Intervals **INTERVAL 1** and **INTERVAL 2** will be selected. If the measured signal is within the set points LEVEL LOW and LEVEL HIGH, the data will be stored with **INTERVAL 1**. Outside the set points the Data are stored with **INTERVAL 2**. The Intervals are programmable from 2 seconds to 24 hours.

DATA STORE
After LEVEL LOW and LEVEL HIGH and INTERVAL 1 and INTERVAL 2 are set, the data logging can be initiated with **LOGGER ON** and **OK**.
In the menu step **LOGGER OFF** is the logging terminated.

The key MENU and the vertical cursors permit the selection of the parameters. They will be stored with the key OK.

LOGGER		LOGGER			LOGGER	
---------------	-	---------------	-		---------------	-
LOGGER OFF		LOGGER ON			MEMORY ERASE	

LOGGER OFF   Data logging disabled
LOGGER ON   Data logging enabled
MEMORY ERASE   Stored data will be erased

INTERVAL 1		INTERVAL 2	
< 2 SEC		5 SEC	

INTERVAL 1:   < 2 sec … 24 h
INTERVAL 2:   < 2 sec … 24 h

LEVEL LOW		LEVEL HIGH	
+100.000		+200.000	

LEVEL LOW: free selectable
LEVEL HIGH: free selectable

RECAL of stored DATA
The stored data can be uploaded to the PC via USB terminal. Enclosed *Softmanager M505W* supports the communication.

Apart of the stored data, also the Transients cane be uploaded to the PC (see 5.2) and displayed as tables and graphics and handled under Windows and Excel.

12   Softmanager M505W

The Softmanager M505W permits an upload of the stored data and the transients to a PC, displaying the results in tables and graphics and handling under Windows and Excel.

M505 Calibrator will be connected via USB to a PC and switched-on.
The Softmanager M505W will be installed at the PC and opened. The window shows the selection:
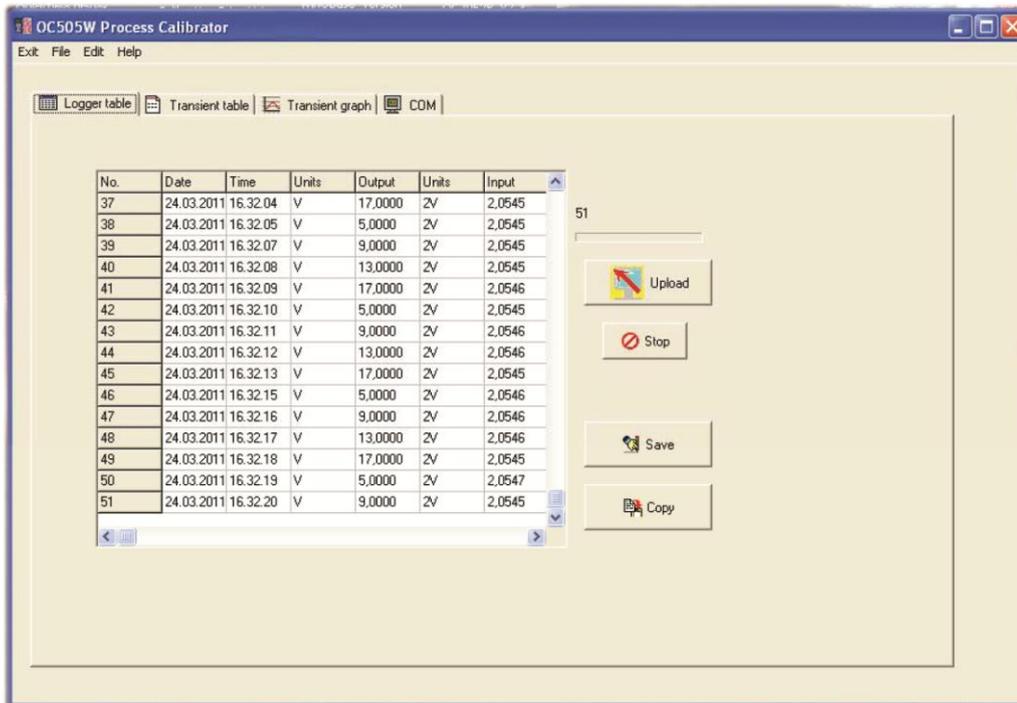

COM Selection

COM   The data port will be automatically found with *Find COM*.
   The Lamp changes the colour to green when the communication is running.
                            Assure the speed of the PC COM to run at high Baud Rate.
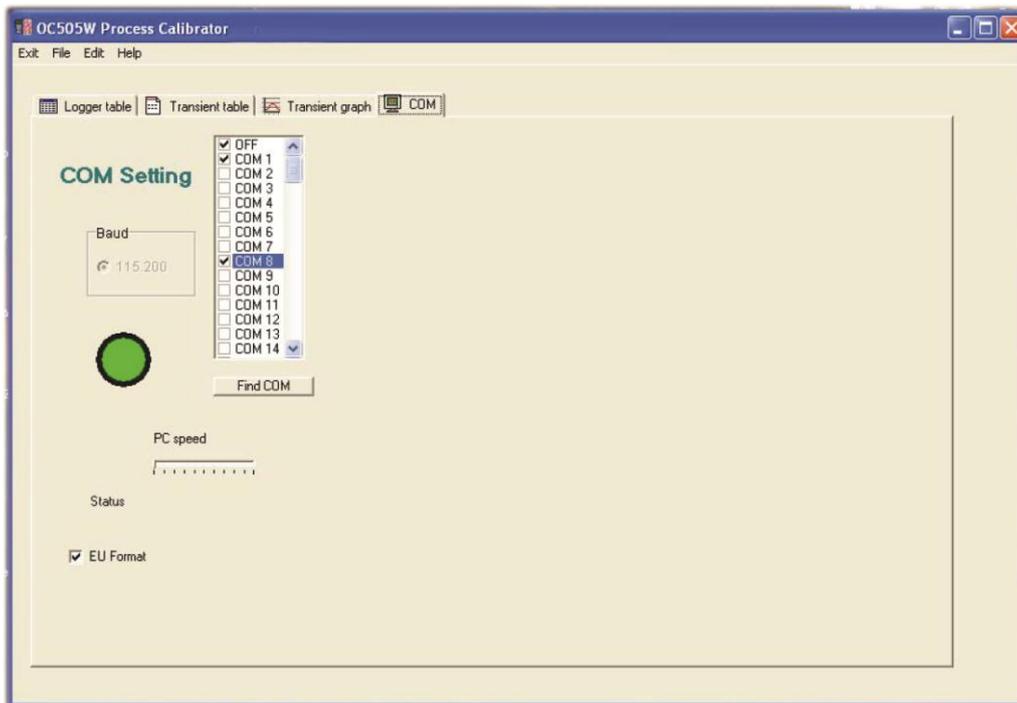
Logger Table	The stored data in M505 are transferred to the PC with *Upload*. They appear in selected units in a table format with date and time added from internal RTC. When the calibrator signal sent to the transmitter under test is e.g. 0-22mA and the transmitter output is a current, the transmitter signal has to be measured at the multimeter input 100mA.
Stop	Communication stops.
Save	The data are stored in a Text Format *.**txt** or Excel Format *.**xls**.
Copy	Copy the data.

Transient Data Table
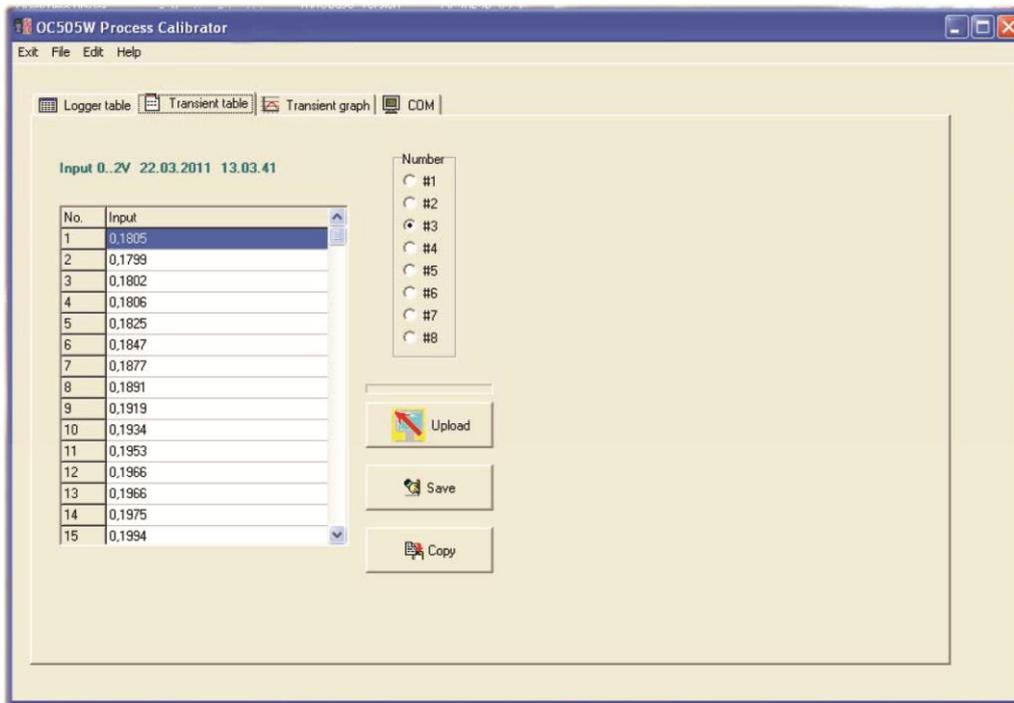
Number		
Number		Eight memory slots for fast signals at the multimeter input. Each Transient contains 256 samples, selectable Sampling Time and selectable Trigger Level (see 5.2).
Upload		The selected Transiente will be transferred to the PC with *Upload*.
Save		The data are stored in a Text Format *.**txt** or Excel Format *.**xls**.
Copy		Copy the data.

Transient Graphics
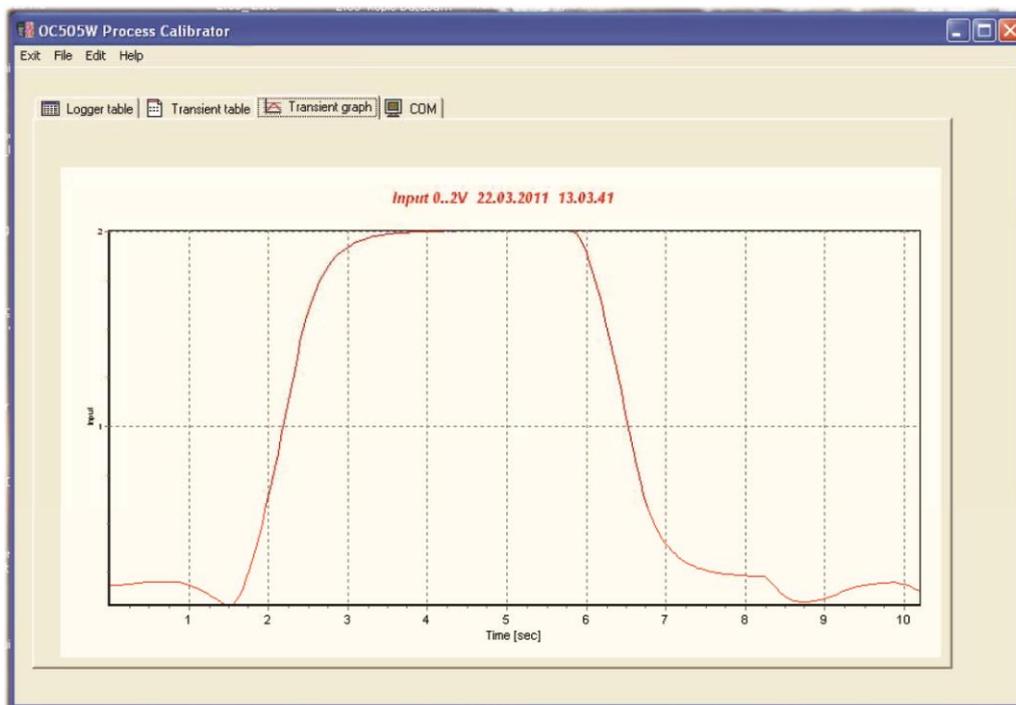
The selected Transient appears as Graphics, with Time Base, Scale, Date and Time.

13   Specification

13.1   CALIBRATOR

Voltage and Current: + OUTPUT –
Thermocouples: **Cu Connector**

Current Source Range		0 ... 22mA. Maximum external Shunt 750 Ohm
	Accuracy	± (0.05% from Value + 0.1% from Range)
	Resolution	0.001 mA

Current Sink	Range	0 ... 22mA at 24V maximum
	Accuracy	± (0.05% from Value + 0.1% from Range)
	Resolution	0.001 mA

Voltage Source Range		0 ... 25 V, 0 … 540mV, 0 … 27mV
	Accuracy	± (0.05% from Value + 0.1% from Range)
	Resolution:	0…25.000V, 0…560.00mV, 0…28.000mV

Thermocouples According to DIN:
J (1200 ºC), K (1370 ºC), N (1300 ºC), R (1760 ºC),
S (1760 ºC), T (400 ºC), B (1820 ºC), E (1000 ºC).
Accuracy   ± 0.5 - 2 ºC
Resolution   0.1ºC

RTD Thermometer	Pt-100, 200, 500	-140 ºC to 850 ºC, max. Load 0.1W.
	Pt-1000	-140 ºC to 550 ºC, max. Load 0.1W.
	Accuracy	± 0.1% from Value ± 1 ºC
	Pt-1000	550 ºC to 850 ºC, max. Load 0.1W.
	Accuracy	± 0.2% from Value ± 1 ºC
	Ni - 1000	-60 ºC to 170 ºC max. Load 0.1W
	Accuracy	± 0.1% from Value ± 0.5 ºC
	Resolution	0.5 ºC

Resistors   45 Ohms to 2000 Ohm, maximum load 0.1W
Accuracy   ± 0.1% from Value ± 0.5 Ohm
2000 Ohms to 3000 Ohm, maximum load 0.1W
Accuracy   ± 0.2% from Value ± 0.5 Ohm
Resolution   0.1 Ohm
Tempco   ± 25ppm/K

Temperature   Working: -10 ºC ... +35 ºC,   Storing: 0 ... 60 ºC
Reference: 23 ºC ± 5 ºC

Terminals   4mm plugs, gold plated, compensated Cu Terminals for thermocouples

Supply   Two rechargeable Li-Ion Batteries 3.7V-2000mAh.
Battery operation approx. 8 h with backlight switched-off

Charger   Mains Voltage100-240V, 48-60Hz / 12V-600mA DC.
Charging time 4 hours. The batteries are fully charged when the green LED
illuminates continuously.
Cabinet   Dimensions 200 x 90 x 40mm (L x W x D), weight 320 g

All specifications are valid after a warm-up time of 10 minutes at an ambient temperature of 23 ºC ± 5 ºC.

13.2 MULTIMETER

Terminals   + OUTPUT -

Voltage Input	Ranges ± 2V	(1.83 MΩ)
		± 20V (363 kΩ)
		± 200V (333 kΩ)
	Auto range	0 …. ± 200V DC
	Accuracy	± 0.1% from Range ± 1 Digit
Current Input	Range	+100mA DC (10Ω)
	Accuracy	± 0.1% from Range ± 1 Digit

Sampling	Two samples per second
Tare	The Tare can be activated in the Menu and relates to the input signal. When activated, the symbol TARE is displayed.
Filter	An averaging filter with steps 0 to 9 can be selected.
Tempco	± 25ppm/K
Terminals	4mm plugs, gold plated

All specifications are valid after a warm-up time of 10 minutes at an ambient temperature of 23 ℃ ± 5 ℃.

> **PLEASE NOTE**
> The instrument is supplied from internal rechargeable NiMH battery. Please make sure that the battery is correctly charged from the enclosed battery charger as soon as the **0%** sign at the display is illuminated. The time for the full charge is 4 hours.

We will be pleased to answer all your questions not only to this instrument but also to all our calibrators and measuring equipment. Please call our customer service or write to us

meatest@meatest.cz

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