

3-349-564-03 12/1.18

- Universal calibrator, simulator and multimeter mA / mV ... V / °C (Pt100/1000, Ni100/1000, thermocouples: J, L, T, U, K, E, S, R, B, N) / 30 ... 2000  $\Omega$
- Dual mode simultaneous calibration and measurement (U/I)
- · Measuring and encoding in absolute terms and as percentage (scaled)
- Memory for measurement results: 16 MBit
- Frequency generator: 1 Hz to 2 kHz
- · Ramp and staircase functions
- Transmitter simulator (sink: 0 ... 24 mA)
- DAkkS calibration certificate included
- · Rugged, EMC compliant design
- Precision multimeter (V, A, Ω, F, Hz, °C/°F) 30,000 (60,000) digits and triple display
- TRMS AC measurement to 20 kHz
- Bidirectional IR data interface
- Free device driver for LabView® (National Instruments)
- Optional calibration software METRAwin<sup>®</sup>90-2
- Optional measurement data acquisition and analysis software METRAwin<sup>®</sup> 10/METRA##®











# **Applications**

Process engineers can use the **METRACAL MC** as a calibrator and a multimeter simultaneously, e.g. in order to simulate sensor conditions at the input of a transmitter while measuring and saving the output signal.

If the USB X-TRA plug-in infrared interface adapter (accessory) is attached to the instrument, measurement and calibration results can be uploaded to a PC, where they can be recorded and printed out as a calibration report. The multimeter can also be used as a data logger. METRAwin $^{\tiny (B)}$ 10/METRAH $\alpha^{\tiny (B)}$ PC software (accessory) allows for convenient evaluation and display of measurement data, and METRAwin $^{\tiny (B)}$ 90-2 (accessory) can be used to create ramp and interval sequences, to control the **METRACAL MC** online, as well as for the generation of calibration certificates.

### **Calibrator with Loop Current Measuring Instrument**

#### **Universal Calibration Standard**

Integrated electronics generate mV, V and mA signals. Beyond this, they're capable of simulating thermovoltages for various types of thermocouples for predefined temperatures (°C or °F), as well as for various Pt and Ni temperature sensors.

#### **Frequency Generator**

Continuous frequency signals can be transmitted by the **METRACAL MC** for testing SPCs, energy metering devices, flow rates and more. Amplitude and frequency are adjustable for the generated square-wave pulses, which are used to simulate sensor pulses.

#### **Calibration and Simulation**

Measuring transducers with a wide variety of input signals (voltage, thermovoltage, RTD and 2-wire resistance sensors etc.) can be directly connected and calibrated. If a multimeter is used (e.g. **METRAHIT XTRA**), respective values can be measured at the measuring transducer's output, transmitted to a PC via an adapter if desired, displayed with the help of METRAwin<sup>®</sup>90-2 software and compared with the appropriate calibration specifications. Setpoint values and actual values are displayed, or printed as a certificate. When operated in the "mA sink" mode, the **METRACAL MC** simulates a 2-wire transmitter and retrieves the selected current value from the measuring sequence.

#### Measurement Data Memory (16 MBit / 46,000 Measured Values)

The calibrator is connected to a PC with the attached USB X-TRA interface adapter (accessory). The software METRAwin  $^{\tiny (8)}$ 10/ METRA# $^{\tiny (3)}$ , which is available as an accessory, and the interface adapter USB X-TRA are used to transmit recorded measured values to a PC by means of the multimeter function for convenient subsequent visualization, evaluation and report generation.

# Read-Out Modes for Encoding and Sink Functions

Calibration signals can be read out either manually (numerically with key entries), or automatically by means of intervals with intermediate steps, or as a ramp in a stepless fashion.

The **METRACAL MC** can thus be used as a precision pulse generator for dynamic testing.

Depending upon individual needs, desired dynamic response can be derived from, for example, the full-scale value and the number of intermediate steps (intervals), or rise and dwell periods (ramp). This is especially helpful for long-term testing of laboratory and panel recorders, as well as measuring transducers, and for "one-man" control rooms.

#### **Numeric Read-Out**

Calibration values are set and read out manually with the help of the instrument's keypad immediately after the calibration function has been selected.

#### Interval

Calibration values are read out continuously in steps between the minimum and maximum values selected at the device to be calibrated in this read-out mode. The subsequent step can be triggered automatically (time per step: 1 sec. ... 60 min.) or manually.

#### Ramp

Calibration values are read out in a stepless fashion between the minimum and maximum values selected at the device to be calibrated in this read-out mode.

Ramp duration for rising and falling ramps, as well as dwell time at minimum and maximum values, can be set within a range of 1 second to 60 minutes.

### **Temperature Simulation**

The ten most common sensor types are available for the simulation of thermovoltages. Thermovoltages can be read out with reference to an internal (socket temperature) or an external reference junction.

Temperature for the external reference junction can be set at the calibrator or with a PC. This eliminates the need to connect the device to be calibrated with the calibrator via the respectively required compensating lead. A copper conductor between the calibrator and the device to be calibrated is sufficient in this case.

#### **Applicable Regulations and Standards**

IEC 61010-1/ DIN EN 61010-1/ VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
EN 60529 VDE 0470, part 1	Test instruments and test procedures – degrees of protection provided by enclosures (IP code)
DIN EN 61326-1 VDE 0843-20-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements

#### Guarantee

3 years material and workmanship

1 year for calibration

#### Characteristic Values

#### **Calibrator Section**

Calibration Function	Simulation Range	Resolution: 30,000 Digits (4¾ places)		Intrinsic Uncertainty	Overload
Direct Voltage Source		Minimum Load Resistance	±(% S + mV)	I <sub>max</sub>	
	0±60mV	1 μV		0.1 + 0.01	
	0±300mV	0.01 mV		0.05 + 0.02	
٧	0 3 V	0.1 mV	1 kΩ	0.05 + 0.2	18 mA
	010 V	1 mV		0.05 + 2	
	015 V	1 mV		0.05 + 2	
Pulse / Frequency Generator Duty cycle (pulse-no-pulse ratio): 50%, amplitude: 10 mV 15 V		Minimum Load Resistance	±(% S + Hz)	I <sub>max</sub>	
Hz	1 Hz2 kHz	0.11 Hz	1 kΩ	0.05 + 0.2	18 mA
Curre	nt Source		Max. load	±(% S + μA)	
	4 20 mA				
mA	0 20 mA	1 μΑ	16 V	0.05 + 2	
$\Box$	0 24 mA				
Curre	nt Sink			$\pm$ (% S + $\mu$ A)	U <sub>max</sub>
	4 20 mA				
mA	0 20 mA	1 μΑ	V <sub>in</sub> = 4 27 V	0.05 + 2	27 V
	0 24 mA				
Resis	tance Simulatio	n	Sensor Current [mA]	±(% S + Ω)	I <sub>max</sub>
ς	52000 Ω	0.1 Ω	0.05 <u>0.14</u> 5	0.05 + 0.2	5 mA

#### Simulator for Temperature Sensors (resolution: 0.1 K)

	Sensor Type	Simulation Range in °C	Simulation Range in °F	Intrinsic Uncertainty	Over- load			
	Resistance Thern	nometer per IEC 7	751	±(% S + K)	I <sub>max</sub>			
	Pt100	-200+850	-328+1562	0.1 + 0.5	5 mA			
	Pt1000	-200+300	-328+572	0.1 + 0.2	SIIIA			
	Resistance Therm	nometer per DIN	43760	±(% S + K)	I <sub>max</sub>			
	Ni100	−60+180	−76+356	0.1 + 0.5	5 mA			
	Ni1000	−60+180	−76 …+356	0.1 + 0.2	AIII C			
	RTD sensor current	0.05 <u>0.1 4</u>	5 mA					
J∘ / J∘	Thermocouples p	er DIN and IEC 58	34-1	ΔU in mV <sup>1</sup>	I <sub>max</sub>			
ပွဲ	K (NiCr/Ni)	<b>−</b> 250…+1372	-418+2501					
	J (Fe/CuNi)	-210+1200	-346+2192					
	T (Cu/CuNi)	<b>−</b> 270…+400	-454+ <b>7</b> 52					
	B (Pt30Rh/Pt6Rh)	+500+1820	+932+3308	L /O OF 0/				
	E (NiCr/CuNi)	-270+1000	-454+1832	±(0.05% r  Setting	18 mA			
	R (Pt13Rh/Pt)	<b>−</b> 50+1768	-58+3214	+	TOTTIA			
	N (NiCrSi-NiSi)	-270+1300	-454+2372	0.02)				
	S (Pt10Rh/Pt)	<b>−</b> 50+1768	-58+3214					
	J (Fe/CuNi)	-200+900	-328+1652					
		-200+600	-328+1112					

Without internal reference junction, relative to fixed external reference temperature and thermovoltage of the thermocouple, internal reference junction: intrinsic error of 2 K, external reference junction: entry of -30 ... 60 °C

#### Key

S = setting value

#### **Multimeter Section**

Meas. Func-	Measurin	g Range	Upper	ution at Range mit	Input im	Input impedance		Incertainty Resolution nce Conditions $\pm (\% \text{ rdq.} + \text{ d})$		rload acity <sup>3)</sup>
tion			30,000 <sup>1)</sup> (60,000)	3000 <sup>1)</sup>	DC	AC	±(% rdg. + d)	AC <sup>4) 10)</sup>	Value	Time
	60	mV <sup>2)</sup>	1 μV		> 20 MΩ	_	0.1 + 10	_		
	300	mV	10 μV		> 20 MΩ	5 MΩ // < 50 pF	0.08 + 10	0.5 + 30 (> 500 d)	300 V	
V	3	V	100 μV		11 MΩ	5 MΩ // < 50 pF	0.05 + 10	0.2 + 30 (> 100 d)	AC	Cont.
	30	V	1 mV		10 MΩ	5 MΩ // < 50 pF	0.05 + 10	0.2 + 30 (> 100 d)	TRMS sine	
	300	V	10 mV		10 MΩ	5 MΩ // < 50 pF	0.05 + 10	0.2 + 30 (> 100 d)	SILIE	
					Voltage drop at a	pprox. range limit				
					DC	AC	DC	AC 4) 10)		
	0.3	mA	10 nA		160 mV	160 mV	0.1 + 15	0.8 + 30 (> 100 d)		
A	3	mA	100 nA		160 mV	160 mV	0.05 + 15	0.5 + 30 (> 100 d)	0.36 A	Cont.
mA	30	mA	1 μΑ		180 mV	180 mV	0.05 + 15	0.5 + 30 (> 100 d)	0.36 A	COIII.
	300	mA	10 μΑ		380 mV	380 mV	0.05 + 15	0.5 + 30 (> 100 d)		
					Open-circuit voltage	Measuring current at range limit	±(% rc	lg. + d)		
	300	Ω	10 mΩ		0.6 V	250 μΑ	0.1 + 5			
	3	kΩ	0.1 Ω		0.6 V	150 μΑ	0.1 + 5	5		
_	30	kΩ	1 Ω		0.6 V	30 μΑ	0.1 + 5		300 V DC	5 minutes
ς	300	kΩ	10 Ω		0.6 V	3 μΑ	0.2 + 5		AC	3 IIIIIules
	3	$M\Omega$	100 Ω		0.6 V	360 nA	0.5 + 1		TRMS sine	
	30	$\Omega$ M	1 Ω		0.6 V	100 nA	2 + 10	10)	SILIC	
$\Omega$ $\square$	300	Ω		0.1 Ω	3.2 V	1 mA	2 + 5			Max. 10 s
->-⊦	6	V	1 mV		7 V	Approx. 1 mA	0.5 + 3		300 V	Max. 10 s
					Discharge resistance	U <sub>0 max</sub>	,	lg. + d)		
	30	nF		10 pF	1 ΜΩ	3 V	1 + 10	5) 10)	20011	
	300	nF		100 pF	100 kΩ	3 V	1 + 6 5)	10)	300 V DC	
F	3	μF		1 nF	12 kΩ	3 V	1 + 6 10		AC	5 minutes
	30	μF		10 nF	12 kΩ	3 V	1 + 6 10		TRMS sine	
	300	μF		100 nF	3 kΩ	3 V	5 + 6 <sup>10</sup>	0)	31110	
					f <sub>m</sub>	6) in	±(% rc	lg. + d)		
	300	Hz	0.01 Hz						300 V	
Hz	3	kHz	0.1 Hz		1 Hz		0.05 +	r 7) 10)	300 V	04
MZ	30	kHz	1 Hz		1		0.05 +	D · / · · · /	200 V	Cont.
	300	kHz	10 Hz		10 Hz				20 V	

Meas. Func-	Temperature	mperature Measuring Range		Intrinsic Uncertainty at highest Resolution	OL Ca- pacity <sup>3)</sup>	
tion			Resolution	under Ref. Conditions $\pm (\% \text{ rdg.} + \text{ d})^{8)}$	Value	Time
	Pt100	-200.0 −100.0 °C				
		−100.0 +100.0° C				
		+100.0 +850.0° C				
	Pt1000	−200.0 +100.0° C		0.3 + 10		
		+100.0 +850.0° C				
	Ni 100	−60.0 +180.0° C				
	Ni 1000	-60.0 +180.0 °C				
	K (NiCr-Ni)	−250.0 +1372.0° C			300	
	J (Fe-CuNi)	−210.0 +1200.0° C	~		V	5
°C/°F	T (Cu-CuNi)	-270.0 +400.0° C	0.1		DC RMS	min
	B (Pt30Rh/ Pt6Rh)	+500.0 +1820.0 °C			sine	
	E (NiCr/CuNi)	−270.0 +1000.0 °C		0.2 + 10 <sup>9)</sup>		
	R (Pt13Rh/Pt)	-50.0 +1768.0 °C				
	N (NiCrSi-NiSi)	-270.0 +1300.0 °C				
	S (Pt10Rh/Pt)	-50.0 +1768.0 °C				
	J (Fe/CuNi)	−200.0 +900.0 °C				
	U (Cu/CuNi)	-200.0 +600.0 °C	1			

- Display: 3% places for capacitance measurement; a different sampling rate can be selected in the rAtE menu for saving and transmitting measured values.

- selected in the rAtt Hieria for saving and transmissing.

  Only manually adjustable

  At 0° ... + 40° C

  20 ... 45 ... 65 Hz ... 1 kHz sine, for alternating voltage TRMS<sub>AC</sub>, measured values < 100 digits are suppressed,
- see page 4 for influences
  5) ZERO is displayed for active "zero balancing" function, maximum correction: 50% MR
- 6) Lowest measurable frequency for sinusoidal measuring signals symmetrical to the zero point
- 7) Range 300 mV~:  $U_E \ge 40\%$  of upper range limit 3/30/300 V~: U<sub>E</sub> ≥ 10% of upper range limit

- 8) Plus sensor deviation
  9) Without integrated reference junction; with internal reference temperature plus error of ±2 K 10) The limits only apply for battery operation

### Key

d = digit(s)

MR = measuring range

rdg. = reading (measured value)

# Influencing Quantities and Influence Error

Influencing Quantity	Sphere of Influence	Measured Quantity / Measuring Range <sup>1)</sup>	Influence Error ± ( % rdg. + d)/10 K
		V DC, °C (TC)	0.1 + 10
		V AC	0.5 + 10
		3/30 mA DC	0.1 + 10
		3/30 mA AC	0.5 + 10
		300 mA DC, AC	0.5 + 10
		$300\Omega/3/30/300~\mathrm{k}\Omega$ 2L	0.2 + 10
	0 +21 °C	$3~\mathrm{M}\Omega~2\mathrm{L}$	0.5 + 10
Temperature	and	30 MΩ 2L	1 + 10
lemperature	anu	$30/300 \text{ nF}/3/30/300 \mu\text{F}$	0.5 + 10
	+25+40° C	Hz	0.1 + 10
		°C (RTD)	0.2 + 10
		Simulator quantity	
		mV/V, °C (TC)	0.1 + 10
		Ω, °C (RTD)	0.2 + 10
		mA source	0.1 + 10
		mA sink	0.1 + 10

<sup>1)</sup> With zero balancing

Influencing Quantity	Frequency	Measured Qty. / Meas. Range	Influence Error $^{2)}$ $\pm$ ( % rdg. + d)
_	> 20 Hz 45 Hz	300.00 mV	2 + 30
Frequency V <sub>AC</sub>	> 65 Hz 1 kHz		2 + 30
VAC	> 1 kHz 20 kHz	300.0 V	3 + 30

Influencing Quantity	Frequency	Measured Qty. / Meas. Range	Influence Error <sup>2)</sup> ±( % rdg. + d)
_	> 20 Hz 45 Hz	0.3 mA	2 + 30
Frequency I <sub>AC</sub>	> 65 Hz 10 kHz	3 mA 30 mA 300 mA	3 + 30

Influencing Quantity		ere of ence	Measured Quantity / Measuring Range	Influence Error <sup>2)</sup>
	Crest	1 2		±1 % rdg.
	Factor	2 4	V AC, A AC	±5 % rdg.
	CF	4 5		±7 % rdg.
Measured Quantity Waveform			actor CF of the periodic quantity the displayed value:  Voltage and Current M	

<sup>2)</sup> Specified error valid as of display values of 10% of the measuring range

Influencing Quantity	Sphere of Influence	Measured Quantity / Measuring Range	Influence Error
	75%		
Relative Humidity	3 days	V, A, Ω F, Hz °C	1 x intrinsic uncertainty
	Instrument off	-	

Influencing Quantity	Sphere of Influence	Measuring Range	Attenuation ±dB
Common mode	Interference quantity max. 250 V $\sim$	V <del></del>	> 90 dB
interference voltage	Interference quantity max. 250 V ~ 50 Hz, 60 Hz sine	300 mV 30 V ∼	> 80 dB
voitage	50 Hz, 60 Hz sine	300 V ∼	> 70 dB
Series-mode interference voltage	Interference quantity V ∼ , respective nominal value of the measuring range max. 250 V ∼ , 50 Hz, 60 Hz, sine	V <del></del>	> 60 dB
voitage	Interference quantity max. 250 V —	V ~	> 60 dB

### **Real-Time Clock**

Time format DD.MM.YYYY hh:mm:ss,0

Resolution 0.1 s

 $\begin{array}{lll} \mbox{Accuracy} & \pm 1 \mbox{ min./month} \\ \mbox{Temp. Influence} & 50 \mbox{ ppm/K} \\ \end{array}$ 

# **Reference Conditions**

 $\begin{array}{ll} \text{Ambient temp.} & +23^{\circ}\,\text{C}\,\pm2\,\text{K} \\ \text{Relative humidity} & 40\,\dots\,60\% \end{array}$ 

Measured quantity frequency for AC

requency for AC 45 ... 65 Hz

Measured quantity waveform for AC

AC Sinusoidal, deviation between RMS and

rectified value < 0.1%

Battery Voltage 3.0 V ±0.1 V

# **Response Time (multimeter functions)**

Response Time (after manual range selection)

Measured Quantity / Measuring Range	Digital Display Response Time	Measured Quantity Jump Function
V DC, V AC A DC, A AC	1.5 s	From 0 to 80% of upper range limit value
300 Ω 3 MΩ	2 s	
30 MΩ	5 s	F
Continuity	< 50 ms	From ∞ to 50% of upper range limit value
→	1.5 s	or apportange inthe value
°C Pt100	Max. 3 s	
3 nF 30 μF	Max. 2 s	From 0 to 50%
> 10 Hz	Max. 1.5 s	of upper range limit value

### **Display**

LCD panel (65  $\times$  35 mm) with display of up to 3 measured values, unit of measure, type of current and various special functions.

Display / char. height 7-segment characters

Main display: 12 mm Auxiliary displays: 7 mm

Number of places 4¾ places 

⇒ 30,999 steps

Overflow display "OL" or "-OL" appears

Polarity display "-" sign is displayed if plus pole is

connected to "⊥"

LCD Test All display segments available during

operation of the **METRACAL MC** are activated after the instrument is switched on.

# **Electromagnetic Compatibility (EMC)**

Interference emission EN 61326-1:2013 class B

0 °C ... +40 °C

-25 °C ... +70 °C (without batteries)

40% ... 75%, no condensation allowed

Table Excerpt Regarding Significance of

Protection against the

penetration of water

Jet-water

IP XY

(2<sup>nd</sup> digit Y)

5

Approx. 430 g with batteries

-10 °C ... +50 °C

To 2000 meters

IP 65,

Protection against foreign

object entry

Dust-proof

IP Codes

Interference immunity EN 61326-1:2013 EN 61326-2-1:2013

**Ambient Conditions** 

Operating temp. range Storage temp. range

**Mechanical Design** 

Accuracy range

Relative humidity

Elevation

Protection

IP XY

(1st digit X)

6

Dimensions

Weight

# **Power Supply**

Battery 2 ea. 1.5 V mignon cell (AA),

alkaline manganese per IEC LR6 or equivalent rechargeable battery

Service life With alkaline manganese (2600 mAh)

Measuring Function	Current	Service Life
V, Hz, mA, Ω <sub>2</sub> , F, °C	31mA	70 h
Standby (MEM + clock)	350 μΑ	Approx. 1 year
Calibration Function		Service Life
mV, thermocouple	80 mA	25 h
15 V	200 mA	10 h
$\Omega$ , RTD	130 mA	15 h
Sink, 20 mA (25 V)	300 mA	5 h
Source, 20 mA max. load < 5V	230 mA	10 h

If voltage drops below 1.8 V, the

instrument is switched off automatically.

Battery test Battery capacity display with battery symbol in 4 segments: "Some ". Querying of

momentary battery voltage via menu

function.

Mains Power With NA X-TRA power pack

# Data Interface

Type Optical via infrared light through the housing Data transmission Serial, bidirectional (not IrDa compatible)

200 x 87 x 45 mm

Protocol Device specific Baud rate 38,400 baud

Functions DMM: read data and parameter DMM

Calibrator: set/query calibration functions

and parameters

The USB X-TRA plug-in interface adapter (see accessories) is used

for adaptation to the PC's USB port.

# **Power Saving Circuit**

The device is switched off automatically if the measured value remains unchanged for a long period of time, and if none of the controls are activated before a selected period of time in minutes elapses. In the case of the simulator, the output is switched off first, followed by the display one minute later, if no controls have been activated.

Automatic shutdown can be deactivated (APoFF = 0N).

# **Fuses**

Fuse links DMM (mA current measuring ranges):

F2: FF0.63A/400V, 5 mm x 20 mm Breaking capacity  $\geq$  10 kA at 400 V AC

(article number: Z109M) **Calibrator**:

F1: FF0.16A/400V, 5 mm x 20 mm Breaking capacity ≥ 10 kA at 400 V AC (article number: Z109N as from 06.2016)

# Multimeter Electrical Safety

Protection Class II per DIN EN 61010-1:2011/VDE 0411-1:2011

Measuring category II
Operating voltage 300 V
Pollution degree 2

Test Voltage 2.2 kV~ per DIN EN 61010-1:2011/

VDE 0411-1:2011

# Scope of Delivery

- 1 METRACAL MC calibrator with 2 batteries per IEC LR6
- 1 KS29 safety measurement cable set consisting of 3 measuring cables (1 black, 1 blue, 1 red) with 90° offset safety plugs, test probes and 3 safety caps for CAT IV, 1000 V CAT II 16 A / 600 V CAT IV 1 A
- 1 GH-XTRA rubber holster
- 1 DAkkS calibration certificate
- 1 Abbreviated instructions\*
- \* Detailed operating instructions are available for download on the Internet at www.gossenmetrawatt.com

#### **Accessories**

### HitBag Cordura Belt Pouch (Z115A)

for METRAHIT multimeters (with/without rubber holster)



#### HC20 hard case (Z113A)

for METRAHIT multimeters (with/without rubber holster) and accessories



#### F829 carrying pouch

For METRAHIT multimeters (with and without rubber holster) and accessories



#### HitBag L Cordura Belt Pouch (Z115B) (without contents)

For METRAHIT multimeters (with and without rubber holster) and accessories





Example Placement

#### Interface Adapter for USB Connection (Z216C)

The USB X-TRA bidirectional interface adapter includes the following functions:

- Configure the METRACAL MC from a PC.
- Transmit live measurement data to a PC.
- Read data out of memory from the METRACAL MC.

The adapter does not require a separate power supply. Its baud rate is 38,400 baud.

A CD ROM is included which contains current drivers for Windows operating systems.



## F836 ever-ready case (without contents)

For METRAHIT multimeters (with and without rubber holster) and accessories



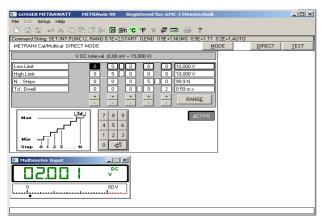


Example Placement

# Accessory Calibration Software METRAwin®90-2

The calibration software METRAwin<sup>®</sup> 90-2 is a multilingual Windows-based software program for the PC-aided control of various calibrators from our product range (**METRACAL MC**, METRAHIT CAL, METRAHIT 28C, METRAHIT 28C light and METRAHit 18C) as well as for the documentation of calibration results.

- Convenient and interactive control of the calibrator which is connected with the PC by direct data entry as individual value
- Straightforward and fast generation, testing and execution of calibration procedures
- Simple operation: even semi-skilled personnel is enabled to perform qualified calibration tasks
- Displaying of automatically created or user-defined operating instructions before performing a sequence step
- With connected multimeter: displaying and continuous updating of the measured value which is transmitted via interface
- High application flexibility due to tracking of the calibration signal (for analog measured value indicators, recorders, etc.), entry of a read-out measured value via keyboard or querying measured values via interface from a multimeter
- ISO-9000 compliant documentation of the calibration in the form of a standardized or user-definable protocol, including the required details on calibration object and system and schedule of the calibration values and their evaluation for each calibration point
- Dynamic data transfer to the report templates edited by the user in Microsoft<sup>®</sup>Excel™ or Microsoft<sup>®</sup>Word™ (e. g. with their own company logo)
- Safe storage of procedures and protocols on data carrier.



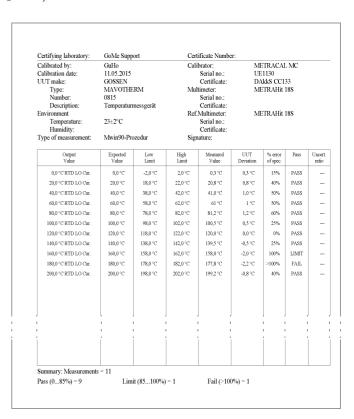
Direct entry of calibration values

The software performs the interactive (in operating mode DIRECT) or sequence-controlled (in operating mode TEST) adjustment of the calibrator by means of a PC via the IR interface (by using the interface adapter USB-XTRA), the automatic evaluation of the measured values which are either manually entered or transmitted from a multimeter via the interface as well as the documentation and storage of the calibration results in a calibration report.

Calibration procedures for the respective calibration objects can be easily created and tested with the software.

METRANS CAMMISCON TEST MODE	nand String	<u> </u>	шенст	. * = =				
Dutput   Par 1   Par 2   Par 3   Par 4   Par 5					STEP	BUN STO	P D	IRECT IE
Status	Percentag	e 85% CHANGE	Clear Uncerta	ainly				
Status	40	Outro	Pv 1	Pw 2	Pw 3	Pv 4	Pw 5	
				74.2	14.5	10.1	10.5	
Step								Measured
RTD P100 Manual   20.0 °C   Manual Pas								
PASS   Manual Input   200.0 °C   20.0 °C   18.0 °C   22.0 °C   2				10.2	10.5	1 0.4	10.5	
Step	tus:	Text	Mode	Range	Expected	Min	Max	Measured
	SS		Manual input	200,0 °C	20,0 °C	18,0 °C	22,0 °C	20,8 °C
Marcal   Mode   Plange   Expected   Min   Max				Par. 2	Par. 3	Par. 4	Par. 5	
PASS   Moroulineat   200.0 °C   40.0 °C   38.0 °C   42.0 °C   42.0 °C   44.0 °C   44								
Step		Text						Measured
A   RTD PH00 Manual   S0.0 °C								41,0 °C
Text				Par. 2	Par. 3	Par. 4	Par. 5	
More				D	Francisco	16-	Mani	Measured
Step		I ext						61 °C
5 /r         RTD Pr100 Manual         80.0 °C         Ronge         Expected         Mon         Max         Mo           PASS         Manual rout         200.0 °C         80.0 °C         78.0 °C         82.0 °C         8           Step         Output         Par. 1         Par. 2         Par. 3         Par. 4         Par. 5           18/bit         Text         Mode         Range         Expected         Mn         Max         Mr           ASS         Output         Manual rout         200.0 °C         100.0 °C         90.0 °C         102.0 °C         10           Step         Output         Par. 1         Par. 2         Par. 3         Par. 4         Par. 5         7         710 P1100 Manual         120.0 °C         Par. 2         Par. 3         Par. 4         Par. 5         7         72 Par. 3         Par. 4         Par. 5         7         8         72 Par. 3         Par. 4         Par. 5         7 <td></td> <td>Outred</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>61.0</td>		Outred						61.0
Total				1 0. 2	10.0	1	1 4.5	
Marsal Frost   Marsal Frost   200.0 °C   80.0 °C   78.0 °C   82.0 °C   85 °C	bus:			Bange	Expected	Min	Max	Measured
6         RTD P100 Monual         100.0°C         Range         Expected         Mn         Max         Ms         Ms           MASS         Model         Manual rput         200.0°C         100.0°C         90.0°C         102.0°C         10           Step         Output         Por.1         Por.2         Por.3         Por.4         Por.5           7         RTD P100 Manual         120.0°C         10         10         10         10	ss		Manual input			78.0 °C	82.0 °C	81,2 °C
Natural   Text	ep	Output	Par. 1	Par. 2	Par. 3	Par. 4	Par. 5	
PASS   Manual Input   200.0 °C   100.0 °C   98.0 °C   102.0 °C   105.0 °C   1		RTD Pt100 Manual						
Step		Text						Measured
7 RTD Pt100 Manual 120,0 °C								100,5 °C
				Par. 2	Par. 3	Par. 4	Par. 5	
		Text	Mode	Range	Expected	Min	Max	Measured 120.0 °C

Calibration procedure for measuring transducers (Function "TEST")



Print-out of a calibration report in accordance with ISO 9001, indicating traceability (4.11b), calibration method (4.11c), measuring uncertainty (4.11d), Pass/Fail (4.11g) as well as ambient conditions (4.11h).

# **Order Information**

Description	Туре	Article Number
Calibrator, see standard equipment for METRACAL MC	METRACAL MC	M245A
Hardware Accessories		
Power pack with broad range input: AC 90 253 V / DC 5 V, 600 V CAT IV	NA X-TRA	Z218G
Microprocessor-controlled fast charger for 1 to 4 NiMH or NiCd rechargeable batteries, model AA or AAA, including a 100 to 240 V AC mains adapter and a 10 15 V DC car adapter	Z206D	Z206D
Probe for voltage measurement in power installations to 1000 V	KS30	GTZ3204000R0001
Pt100 temperature sensor for surface and immersion measurements, $-40\ldots+600$ °C	Z3409	GTZ3409000R0001
Pt1000 temperature sensor for measurement in gases and liquids, –50 +220 °C	TF220	Z102A
Pt100 oven sensor, −50 +550 °C	TF550	GTZ3408000R0001
Imitation leather carrying pouch for METRAHIT	F829	GTZ3301000R0003
Cordura belt pouch for <b>METRAHIT</b> multimeters	HitBag	Z115A
Soft belt pouch large for one <b>METRAHIT</b> or METRAport Multimeter. Made of rugged and water repellent Cordura, three separate cases for leads, clips, manual, CD, etc.	HitBag L	Z115B
Imitation leather ever-ready case with cable compartment	F836	GTZ3302000R0001
Hard case for one <b>METRAHIT</b> and accessories	HC20	Z113A
Hard case for two METRAHIT instruments and accessories	HC30	Z113A
Fuse link for mA current measuring ranges	FF0,63A/400V	Z109M
Fuse link for calibrator (to 06.2016)	FF0,63A/400V	Z109M
Fuse link for calibrator (as from 06.2016)	FF0,16A/400V	Z109N
Software Accessories		
Bidirectional interface adapter, IR-USB	USB X-TRA	Z216C
Calibration software for controlling the METRACAL MC and for analysis of calibration results	METRAwin90-2	Z211A
Software METRAwin®10/METRAHa®	METRAwin10	GTZ3240000R0001

Description	Туре	Article Number		
Current Clamp Transformers and Sensors as Accessories 1)				
Current clamp transformer, 1 200 A 1000:1, <u>4865</u> 400 Hz	√~, WZ11A <sup>D)</sup>	Z208A		
WZ12A current clamp transformers and sensors D <sup>D)</sup> Frequency range: 4565500 Hz, clamp opening: max cable diameter of 15 mm				
Current clamp transformer 15 A 180 A, 1000:1	WZ12A	Z219A		
Current clamp sensor 10 mA 100 A; 100 mV/A	WZ12B	Z219B		
Switchable current clamp sensor, 1 mA 15 A; 1 mV/mA and 1 A 150 A; 1 mV/A	WZ12C	Z219C		
Current clamp transformer 30 mA 150 A, 1000:1	WZ12D	Z219D		

For additional information regarding accessories please refer to

- Measuring Instruments and Testers catalog
- www.gossenmetrawatt.com

Edited in Germany • Subject to change without notice • PDF version available from the Internet

D) Data sheet available

1) Refer to our Measuring Instruments and Testers catalog for more current clamp