

**UC RTD  
UC TC  
UC mAV**

## **On-site Pocket Calibrator**



**Measure and generation  
Protected for on-site use  
Perfect for control and tests**

**User friendly and robust. These tools have been designed to simplify temperature transmitters and probes maintenance and commissioning. They measure or generate TC, RTD and norm signals.**

**Well adapted for different process job procedures thanks to their ranges and specific functions such scaling, ramping,...**

**High accuracy in combination with very low temperature coefficient even in bad outside environmental conditions.**

**Its ergonomic design and its embedded software allow UC SERIES to be a high performance calibrator and very easy to use.**

## UC SERIES presentation

UC SERIES is a portable calibrator able to measure or to generate on 1 channel. It has a wide backlighted display with high contrast to be used for application in dark room. Full protected by the **sheath**, a keypad in lexan protects it from dirties. The knocked up keypad is usable even using protective gloves. It is able to measure or generate voltage, current, resistance signals as also resistive probes and thermo couple signals as also thermo couple probes and pressure for MC 75.

Process transmitters and other sensors are more and more reliable and accurate, therefore calibrators performances need to be at the same level. That is the reason why SIKA provides a very high accuracy also for these on-site instruments.



UC SERIES is delivered in standard with a arm strap and batteries.

## Main characteristics

Display via backlight display with contrast settings  
 USB Connection  
 ambient conditions -10 to 55°C with 10 to 80% relative humidity  
 Waterproof IP 54  
 standard batteries  
 Dimensions 160 x 85 x 45 mm  
 Weight 300g

## Functions

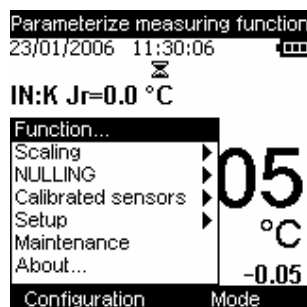
UC SERIES allows the following physical values to be measured and simulated:

- **Temperature by resistive probes RTD (UC RTD)**
- **Resistance  $\Omega$  (UC RTD)**
- **Temperature by and thermocouples TC (UC TC)**
- **Thermo couples signals  $\mu\text{V}$  (UC TC)**
- **Voltage mV, V (UC mAV)**
- **Current mA (UC mAV)**

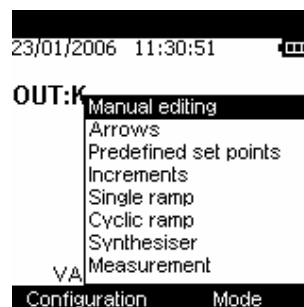
It is able to perform scaling of process signals and so to correct temperature probes. UC mAV is compatible with HART transmitters by inserting a 250  $\Omega$  resistance which doesn't disturb digital data transfer.

## Display

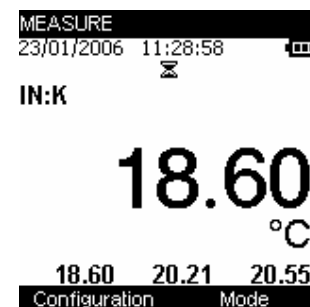
Calibrators of UC SERIES use a graphic display making easier programming and reading UC SERIES display indicates the measurement value or the emitted value, the gauge and the used functions. On the top date, time and also external temperature are also indicated. While for emission this part of screen displays all details of ramps, steps and constant value emission functions. Drop-down menus are used with the navigator.



Function menu



Operating menu



Reading display

## Display resolution

UC SERIES allows the digit number after the dot to be selected: This function is justified by the needs of users who want or not to display the best resolution for calibration or on the contrary limit it for simple verifications.

The resolution is programmable, by user for better reading, with up to 1m $\Omega$ , 1 $\mu\text{V}$  or 1  $\mu\text{A}$  and 1 mV.

## Functions and performances at 23 °C ± 5 °C and between 45% and 75% of relative humidity

### 1) UC RTD specifications

#### a) Resistance Measurement

Range	Resolution	Accuracy / 1yr	Remarks
400 Ω	1 mΩ	0.012% of rdg + 10 mΩ	Measurement current = 0.25 mA
3600 Ω	10 mΩ	0.012% of rdg + 100 mΩ	Measurement current = 0.25 mA

2, 3 or 4 wires resistance measurement :automatic recognition of number of connected wires, with indication on screen

#### b) Resistance Emission

Range	Resolution	Accuracy / 1yr	Remarks
400 Ω	1 mΩ	0.012% of rdg + 30 mΩ	lext from 0.1 to 1 mA
3500 Ω	10 mΩ	0.012% of rdg + 300 mΩ	lext from 0.1 to 1 mA

Temperature coefficient:<7ppm/°C from 0 to18°C and 28 to 50°C

Rising time in simulation<1ms

R internal <1Ω

Noise VLF<1mV (@ F<100Hz)

#### c) Resistive probes Measurement and emission

Probe type	Range	Resolution Measurement	Accuracy / 1year Measurement	Resolution Emission	Accuracy / 1year Emission
Pt 50(α = 3850)	- 220°C up to +1200°C	0,01°C	0,012 % R+ 0,06°C	0,03°C	0,012 % R+ 0,18°C
Pt 100 (α = 3850)	- 220°C up to +1 200°C	0,01°C	0,012 % R+ 0,05°C	0,02°C	0,012 % R+ 0,12°C
JPt 100 (α = 3916)	- 200°C up to +510°C	0,01°C	0,012 % R+ 0,05°C	0,02°C	0,012 % R+ 0,12°C
Pt 100 (α = 3926)	- 210°C up to +850°C	0,01°C	0,012 % R+ 0,05°C	0,02°C	0,012 % R+ 0,12°C
Pt 200 (α = 3851)	- 220°C up to +600°C	0,01°C	0,012 % R+ 0,12°C	0,10°C	0,012 % R+ 0,33°C
Pt 500 (α = 3851)	- 220°C up to +1200°C	0,01°C	0,012 % R+ 0,07°C	0,03°C	0,012 % R+ 0,18°C
Pt 1000 (α = 3851)	- 220°C up to +1 200°C	0,01°C	0,012 % R+ 0,05°C	0,02°C	0,012 % R+ 0,08°C
Ni 100 (α = 618)	- 60°C up to +180°C	0,01°C	0,012 % R+ 0,03°C	0,01°C	0,012 % R+ 0,08°C
Ni 120 (α = 672)	- 40°C up to +205°C	0,01°C	0,012 % R+ 0,03°C	0,01°C	0,012 % R+ 0,08°C
Ni 1 000 (α = 618)	- 60°C up to +180°C	0,01°C	0,012 % R+ 0,03°C	0,01°C	0,012 % R+ 0,08°C
Cu 10 (α = 427)	- 70°C up to +150°C	0,01°C	0,012 % R+ 0,18°C	0,01°C	0,012 % R+ 0,10°C
Cu 50 (α = 428)	- 50°C up to +150°C	0,01°C	0,012 % R+ 0,06°C	0,03°C	0,012 % + 0,15°C

Temperature Coefficient < 10 % of accuracy /°C.

For measurement, accuracy is given for a 4 wires connection. Sensor accuracy is not taken into account in this accuracy.

Automatic wires number detection

Measuring current 0.65 mA

Simulation current from 0,1 mA up to 1mA

Minimal Current pulse duration < 1 ms

## 2) UC TC specifications

### a) DC voltage Measurement

Range	Resolution	Accuracy / 1year	Remarks
±100mV	1 µV	0,020% of rdg + 3 µV	Rin > 10 MΩ

Rin: input resistance

### b) DC voltage Emission

Range	Resolution	Accuracy / 1yr	Remarks
80mV	1 µV	0,020% of rdg + 3 µV	Load 1KΩ

Temperature Coeff < 15 ppm / °C from 0 °C to 18 °C and 28 °C to 50 °C.

### c) Thermocouples Measurement and Emission

probe	Measurement			Emission		
	IN range	Resolution	Accuracy / 1 year	OUT range	Resolution	Accuracy / 1 year
<b>K</b>	- 250 to - 200 °C	0,20 °C	0,90 °C	- 240 to - 50 °C	0,20 °C	0,80 °C
	- 200 to - 120 °C	0,10 °C	0,3 °C	- 50 to + 120 °C	0,10 °C	0,30 °C
	- 120 to - 50 °C	0,05 °C	0,02 % r+ 0,12 °C	+ 120 to + 1 372 °C	0,05 °C	0,020 % r+ 0,11 °C
	- 50 to + 1 372 °C	0,05 °C	0,02 % r+ 0,11 °C			
<b>T</b>	- 250 to - 200 °C	0,2 °C	0,80 °C	- 240 to - 100 °C	0,20 °C	0,50 °C
	- 200 to - 50 °C	0,05 °C	0,25 °C	- 100 to - 40 °C	0,05 °C	0,25 °C
	- 50 to + 400 °C	0,05 °C	0,02 % r+ 0,09 °C	- 40 to + 400 °C	0,05 °C	0,020 % r+ 0,10 °C
<b>J</b>	- 210 to - 200 °C	0,05 °C	0,30 °C	- 210 to + 50 °C	0,05 °C	0,35 °C
	- 200 to - 120 °C	0,05 °C	0,25 °C	+ 50 to + 500 °C	0,05 °C	0,020 % r+ 0,11 °C
	- 120 to + 60 °C	0,05 °C	0,020 % r+ 0,11 °C	+ 500 to + 1 200 °C	0,05 °C	0,020 % r+ 0,09 °C
	+ 60 to + 1 200 °C	0,05 °C	0,020 % r+ 0,09 °C			
<b>E</b>	- 250 to - 200 °C	0,1 °C	0,55 °C	- 240 to - 100 °C	0,1 °C	0,55 °C
	- 200 to - 100 °C	0,05 °C	0,20 °C	- 100 to + 40 °C	0,1 °C	0,20 °C
	- 100 to + 450 °C	0,05 °C	0,020 % r+ 0,07 °C	+ 40 to + 1 000 °C	0,05 °C	0,020 % r+ 0,06 °C
	+ 450 to + 1 000 °C	0,05 °C	0,020 % r+ 0,05 °C			
<b>R</b>	- 50 to + 150 °C	0,50 °C	0,95 °C	- 50 to + 350 °C	0,50 °C	0,95 °C
	+ 150 to + 550 °C	0,20 °C	0,40 °C	+ 350 to + 900 °C	0,20 °C	0,5 °C
	+ 550 to + 1 768 °C	0,10 °C	0,020 % r+ 0,30 °C	+ 900 to + 1 768 °C	0,10 °C	0,020 % r+ 0,30 °C
<b>S</b>	- 50 to + 150 °C	0,5 °C	0,85 °C	- 50 to + 350 °C	0,50 °C	0,90 °C
	+ 150 to + 550 °C	0,2 °C	0,020 % r+ 0,4 °C	+ 350 to + 900 °C	0,20 °C	0,020 % r+ 0,40 °C
	+ 550 to + 1 768 °C	0,1 °C	0,020 % r+ 0,3 °C	+ 900 to + 1 768 °C	0,10 °C	0,020 % r+ 0,30 °C
<b>B</b>	+ 400 to + 900 °C	0,2 °C	0,95 °C	+ 400 to + 850 °C	0,20 °C	0,95 °C
	+ 900 to + 1 820 °C	0,1 °C	0,50 °C	+ 850 to + 1 820 °C	0,10 °C	0,50 °C
<b>U</b>	- 200 to - 100 °C	0,05 °C	0,35 °C	- 200 to - 70 °C	0,05 °C	0,35 °C
	- 100 to + 600 °C	0,05 °C	0,20 °C	- 70 to + 600 °C	0,05 °C	0,20 °C
<b>L</b>	- 200 to - 100 °C	0,05 °C	0,30 °C	- 200 to - 70 °C	0,05 °C	0,30 °C
	- 100 to + 900 °C	0,05 °C	0,20 °C	- 70 to + 900 °C	0,05 °C	0,25 °C
<b>C</b>	- 20 to + 900 °C	0,1 °C	0,30 °C	- 20 to + 900 °C	0,10 °C	0,35 °C
	+ 900 to + 2 310 °C	0,1 °C	0,020 % r+ 0,15 °C	+ 900 to + 2 310 °C	0,10 °C	0,020 % r+ 0,15 °C
<b>N</b>	- 240 to - 190 °C	0,2 °C	0,60 °C	- 240 to + 10 °C	0,20 °C	0,90 °C
	- 190 to - 110 °C	0,1 °C	0,25 °C	+ 10 to + 250 °C	0,10 °C	0,20 °C
	- 110 to - 0 °C	0,05 °C	0,15 °C	+ 250 to + 1 300 °C	0,05 °C	0,020 % r+ 0,09 °C
	+ 0 to + 1 300 °C	0,05 °C	0,020 % r+ 0,07 °C			
<b>Platine</b>	- 100 to + 1 400 °C	0,05 °C	0,3 °C	- 100 to + 1 400 °C	0,05 °C	0,35 °C
<b>Mo</b>	0 to + 1 375 °C	0,05 °C	0,020 % r+ 0,10 °C	+ 0 to + 1 375 °C	0,05 °C	0,25 °C
<b>NiMo/NiCo</b>	- 50 to + 1 410 °C	0,05 °C	0,020 % r+ 0,35 °C	- 50 to + 1 410 °C	0,05 °C	0,020 % r+ 0,35 °C

CJ accuracy ± 0,3 °C

Temperature Coefficient < 20 ppm / °C from 0 to 18 °C and 28 to 50 °C

### 3) UC mAV specifications

#### a) DC current Measurement

UC mAV is able to measure up to 20 mA, with or without power supply of loop (24V power supply)

Range	Resolution	Accuracy / 1year	Remarks
±25mA	1 µA	0,015% of rdg + 2 µA	Rin < 30 Ω

Temperature Coefficient <20ppm / °C from 0 to 18°C and from 28 to 50°C

Possibility of loop supply 24 V ±10 %

HART compatibility R = 250 Ω ± 5 %

Common rejection mode ≥120 dB at 50 / 60 Hz

For measurements of transmitters outputs, special ranges give a dual display using mA and % of full scale.

UC SERIES also allows to linearize linear or quadratic signal.

In current measurement Hart compatibility can selected to measure currents coming from Hart protocol transmitters.

#### b) DC current Emission

Range	Resolution	Accuracy / 1year
25mA	1 µA	0,015% of rdg + 2 µA

Emission with or without loop supply (24V)

Temperature coefficient <20 ppm / °C from 0 to 18°C and from 28 to 50°C

Rising time <500µs (0V to 20mA – on 20Ω load)

Noise VLF<1µA (at F<100Hz)

#### Preprogrammed steps

	0%	25%	50%	75%	100%
4-20mA linear	4	8	12	16	20
0-20mA quad	0	5	10	15	20
4-20mA linear	4	5	8	13	20
0-20Ma quad	0	1,25	5	11,25	20
4-20mA valves	3,8-4 -4,2		12		19,20,21

**c) DC voltage Measurement**

Range	Resolution	Accuracy / 1year	Remarks
0...10 V	1 mV	0,015% of rdg + 2 mV	Rin > 10 MΩ
25V	1 mV	0,015% of rdg + 2 mV	Rin = 1MΩ
50V	1 mV	0,015% of rdg + 4 mV	Rin = 1MΩ

Rin: input resistance

Temperature coefficient < 15 ppm / °C from 0°C to 18°C and from 28°C to 50 °C

Serial rejection mode ≥60 dB at 50 / 60 Hz

Common rejection mode ≥120 dB at 50 / 60 Hz.

**d) DC voltage Emission**

Range	Resolution	Accuracy / 1yr	Remarks
0...10V	1 mV	0,015% of rdg + 2 mV	Load 2KΩ
15V	1 mV	0,015% of rdg + 2 mV	Load 4KΩ

Temperature coefficient <15ppm / °C from 0 to 18°C and from 28 to 50°C

Rising time <1ms (0V to 15V on 1MΩ load)

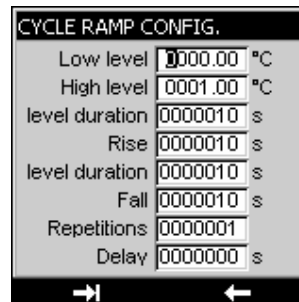
R internal <1Ω

Noise VLF<1mV (at F<100Hz)

### Simulation function:

#### Simple and cyclical ramps

Ramps can be generated by UC TC and UC RTD with setting of low and high dwell, rising and falling times, and stabilisation and delay times. Delay time (Programmable between 1 to 3600 seconds) allows a single user to launch ramp and go to the control panel.

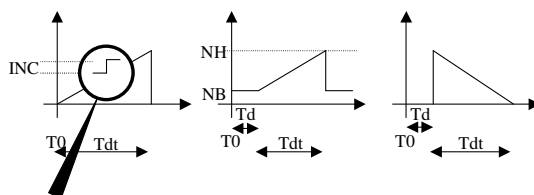


Cyclical  
ramps  
parameters

**Synthesizer mode:** This mode allows sending of predefined values with programmable frequency.

**Steps mode:** This mode allows sending of values with programmable amplitude and frequency

#### Steps mode parameters



To : Starting time  
Td : **Delay**  
Tdt : **Total time**  
NB : **Low level**  
NH : **High level**  
INC : **Steps** (Step value in °C or °F)

#### Scaling:

For UC TC and RTD this operation allows to correct probes errors. Scaling is performed using up to 10 segments, in order to fit with the real calibrated value.

For UC mA/V 2 scaling modes are available

0-100%FS scaling

Selecting a emission mode, 0-20mA or 4-20mA or 0-10V, a 0-100%FS display is proposed

Fully configurable scaling with units: User can also program a scaling in accordance with his sensor or transmitter with unit changing: 4-20mA output signal from a 0-100 bar transmitter will be measured by UC mA/V with bar display and reading between 0 and 100 bar.

### Measurement functions:

**Calibrated sensors for UC TC and RTD:** A database can be created to design curves for sensors after calibration in relation with the corrections showed on a calibration report.

**HART compatibility for UC mA:** Thanks to a non disturbing numerical transmission resistance, it is possible to measure current output of transmitter using HART protocol.

**Data recording:** Data are recorded either manually on event or automatically with programmed frequency. Data are dated and can be displayed as list or curves.

### Other functions:

**Interface language:** TC have 5 languages: French, English, German, Italian and Spanish.

**Display contrast :** When dark conditions, user can modify display contrast and switch on display back-light. Back-light timer programmable

**Display resolution:** User can select 3 resolutions (upto 3 decimal places): High, middle or low resolution.

**Date and time display:** These informations are permanently display on the screen

#### **Statistics:**

At the bottom of the screen, maximum, average and minimum values measured are displayed. Reset function allows re-calculating of the values.

**Hold:** To freeze the display.

**Filter:** A filter in seconds can be applied in order to avoid fluctuation of the value.

**Embedded software update:** According to the improvements for these calibrators, SIKA offers you the upgrade of the instrument using USB port free of charge

**Delay function:** When simulating steps or ramps, this function allows to delay the start.

### Power supply

In standard UC TC and UC RTD are delivered with 4 AA batteries. An optional rechargeable Batteries + charger allows to use instrument directly connected to the main or with the rechargeable batteries

#### Autonomy:

Mode	IN	OUT
Autonomy	40 hours	33 hours

### Supplied in standard:

Protection sheath, 4 AA batteries, instruction manual, transportation wrist-strap .  
Optional external Charger+batteries connectable to the main