THERMOPORT 20

E+E ELEKTRONIK®

CE

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1. Prior to operation

- Prior to using the instrument (commissioning / assembly) the user is requested to thoroughly read the instruction manual and comply with it in all points.
- Never take measurements on live parts.
- Please observe the measuring ranges of the different sensors (Overheating may cause irrversible damage).
- Take care of storage and transport conditions (No direct exposure to solar radiation).
- Temperature adjustments may only be carried out with proper reference material.
- In case of use in changing locations with different climatical conditions the instrument requires a recovery period of several minutes.

- Technical data, storage and transport conditions can be found on the technical data sheet.

Proper use:

- The instrument may only be used under the conditions defined in the technical data sheet.
- The measuring instrument may only be used under those conditions and for those purposes for which it was built.
- Operational safety can no longer be ensured when the instrument is opened or modified.

THERMOPORT 20
PT100 Probe

THERMOPORT 20
Thermocouple Probe

2. THERMOPORT 20

The new hand held device series for measuring temperature stands out due to:

- big display with backlight
- easy thumb wheel operation
- resistant and elegant housing
- high accuracy and resolution (0,01°C for PT100)

	Channels	PT100	TC
THERMOPORT 20	2	•	•

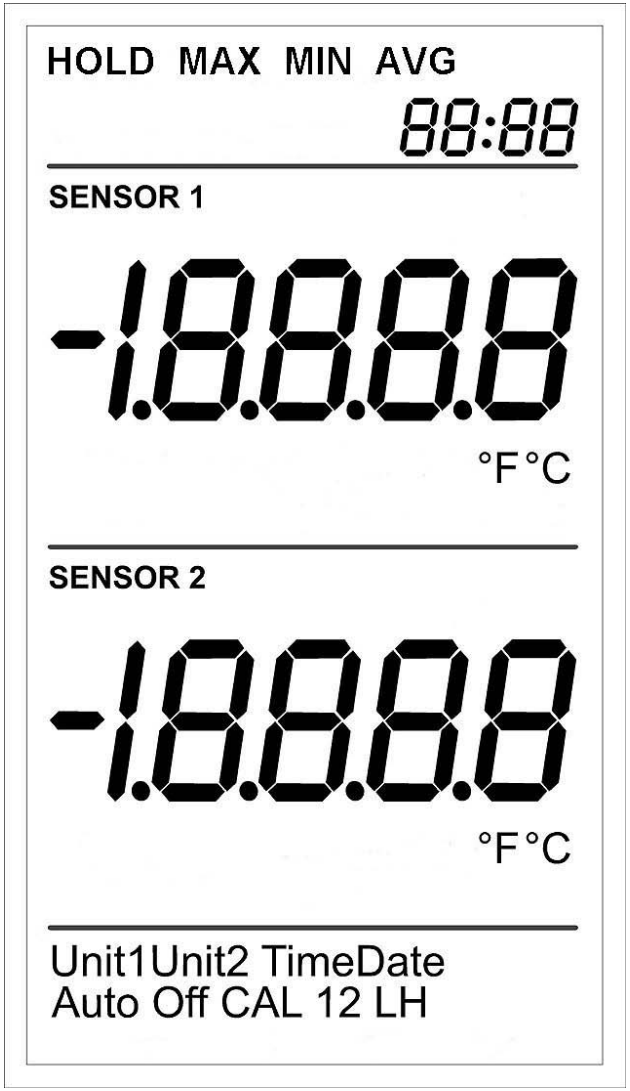
Table: No. of channels and configuration of the entries

TECHNICAL DATA:

	Channel 1	Channel 2
Measuring range:	-200...500°C	-200...1200°C
Accuracy:	±0.1°C (-100...200°C) otherwise ±0.2°C	± (0.5°C ± 0.2% of m.v.)
Resolution:	0.01°C (-100...200°C) otherwise ±0.1°C	0.1°C

Working temperature range: 0...50°C

3. The Display



◀ Upper menu with date and time

◀ Probe 1 value (temperature 1)

◀ Probe 1 units (°C, °F)

◀ Probe 2 value (temperature 2)

◀ Probe 2 units (°F,°C)

◀ Lower menu for configuration and adjustment

4. Operating the instrument

THUMB-WHEEL

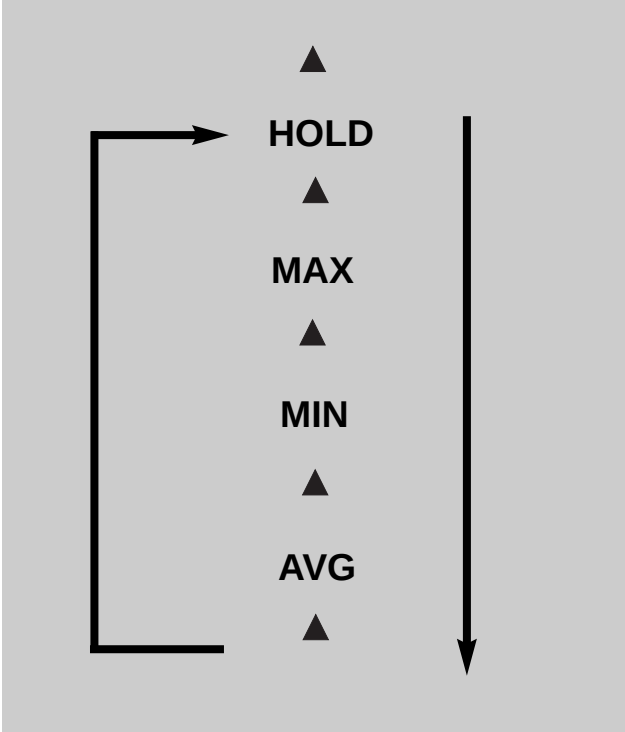
In contrast to most traditional hand held instruments, the THERMOPORT 20 do not have a key field but a **“THUMB-WHEEL”** on their left side.
The wheel permits a 15º turn up and downwards and can additionally be pressed in the central position.
A turn upwards selects the upper menu whereas the lower menu for configuration and adjustment is selected by turning the wheel downwards.

For switching the instrument on and off or confirm the selection of values the thumb wheel has to be pressed in the central position.

The 3 positions of the **THUMB-WHEEL:**

Symbol used in manual		
▶		Switch on: press shortly Switch on with light: press for approx. 2 seconds Switch off: press for approx. 2 seconds (no menu activated)
Symbol used in manual		
▲		Activate upper menu with HOLD MAX MIN AVG Selection with ▲ confirm with ▶, cancel with ▼ or leave the wheel unpressed during 20 seconds
Symbol used in manual		
▼		Activate lower menu for configuration and adjustment Select with ▼, confirm with ▶ cancel with ▲ or leave the wheel unused for 20 seconds

5. The upper menu

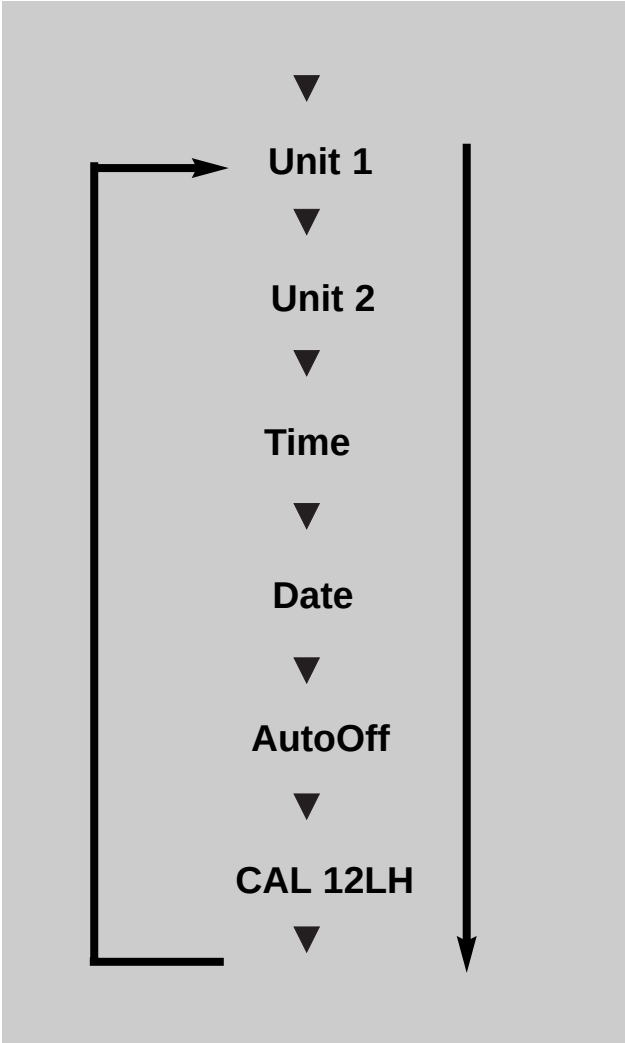


The upper menu contains the standard functions, which are:

HOLD MAX MIN AVG

Select with ▲ , the selected function flashes and can be confirmed with ▶ . When a function has been confirmed it remains continuously on the display. The menu can be cancelled with ▼ or by leaving the wheel unused for 20 seconds.

Hold: Hold "freezes" the value.
MAX: MAX displays the maximum value in the active time interval.
MIN: MIN displays the minimum value in the active time interval.
AVG: AVG displays the arithmetical average value in the active time interval.



6. The lower menu

The following functions can be selected in the lower menu for configuration and adjustment:

Unit1 Unit2 Time Date AutoOff CAL 12LH

Select with ▼, the selected function flashes and can be confirmed with ►. The menu can be cancelled with ▲ or by leaving the wheel unused for 20 seconds.

In the THERMOPORT 20 the additional menu (V) defines the thermocouple type. Types K, J, N, E, R, S, T can be connected.
Due to the limitated possibilities of the screen the following settings are used:

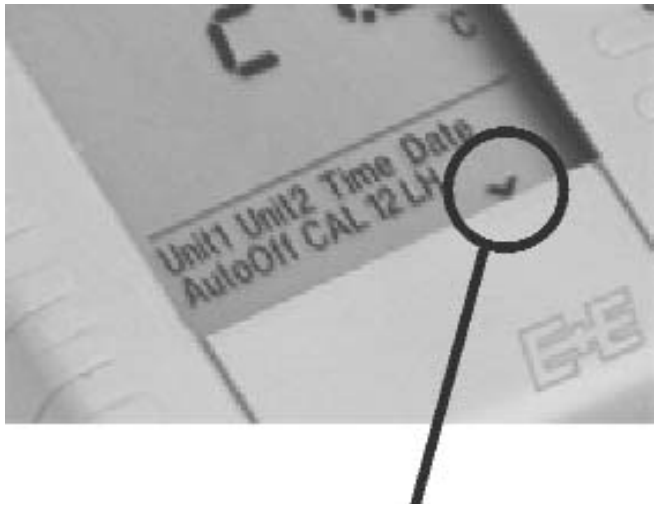


Fig.: Thermocouple Selection

Thermocouple	Display
K	H
J	J
E	E
N	n
R	r
S	S
T	t

Select with ▲ and ▼; confirm with ►.

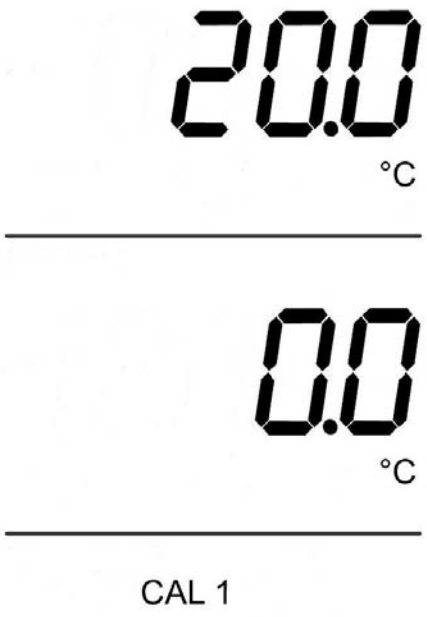
Unit1: Unit1 selects the unit of temperature 1 which is either °C or °F. Select with ▲ and ▼ ; confirm with ►.

Unit2: Unit2 selects the unit of temperature 2 which is either ºC or ºF. Select with ▲ and ▼ ; confirm with ► .

Time: Set time. Hours and minutes are set one after the other. Select with ▲ and ▼ ; confirm with ► .

Date: Set Date. Day, month and year are set one after the other. Select with▲ and ▼ ; confirm with ► .

AutoOff: AutoOff is used to define an interval in minutes after which the instrument switches off automatically. The setting OFF (<1) deactivates the automatic switch off. Select with ▲ and ▼ ; confirm with ► .



One point temperature calibration

CAL1: CAL1 (one point calibration) gives the user the possibility to define an offset for temperature 1. The offset is displayed in the lower part of the screen. Maximum offsets are:
PT100 channel: +/- 2.5°C/°F in 0.01°C/°F steps
TC channel: +/- 10°C/°F in 0.1°C/°F steps.
The offset will be valid over the complete measuring range.
Factory calibration can be obtained by setting the offset to 0.0.

Important: Calibrations only make sense if they are carried out by specially skilled persons using appropriate calibration equipment.

CAL2: CAL2 (one point calibration) gives the user the possibility to set an offset for temperature 2. The offset is displayed on the upper part of the screen.

The maximum offset on the TC channel is +/- 10°C/°F in 0,1°C/°F step.

The offset is valid over the complete measuring range.

Factory calibration can be obtained by setting the offset to 0.0.

Important: the determination of the coefficients A,B,C and R0 must only be carried out by accredited laboratories.

Calibration of the PT100 channel by means of coefficients

CAL1 LH: Every characteristic curve of a PT100 sensor can be defined by a polynomial. Polynomials are used for minimizing errors and non-linear behaviour of a sensor element.

For temperatures -200°C...0°C (-328...32°F) the characteristic of a PT100 corresponds to the following polynomial:

$$\mathbf{Rt = R0\ [1 + At + Bt^2 + C(t-100°C)\ t^3]}$$

For temperatures > 0°C the polynomial is:

$$\mathbf{Rt = R0\ [1 + At + Bt^2]}$$

Rt is the resistance at temperature t, R0 resistance at temperature 0°C. A,B and C are coefficients of the polynomial equation.

In menu **CAL1 LH** these coefficients as well as the value R0 can be set.

The following table contains the factory settings for the values A, B, C and R0.

Coefficient	Default Value
A	**+ 3,9083 x 10-3**
B	**- 5,775 x 10-7**
C	**- 4,183 x 10-12**
R0	**100.0000**

Select your coefficient first, using ▲ and ▼; then confirm with ►.

Due to display limitations the following settings are used:

Coefficient	Display
A	A
B	b
C	C
R0	r0

Changing coefficient **A**

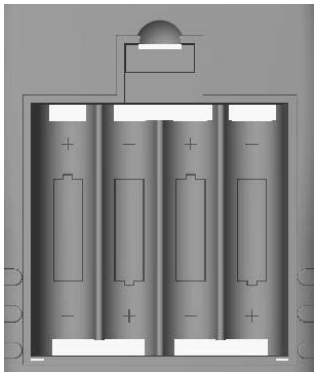
1. Select sign with: ▲ and ▼ ; confirm with ►.

2. Change number by number with ▲ and ▲ , confirm with ►.

For cancelling the menu, leave the wheel unused for 20 seconds.

Coefficients B,C and R0 can be entered correspondingly.

7. Changing the battery



open battery case

The letters "BAT" on the display indicate a remaining operating time of a few hours. Open the battery case on the back of the instrument. Remove the empty batteries and insert new ones.

Please use only batteries type IEC LR6 AA.
Do not use rechargeable batteries!

Reverse polarity may destroy the instrument. Make sure to place the batteries in the correct position and to use high quality batteries only.

8. Maintenance and adjustment

For use in climatological purposes we recommend a yearly maintenance.
Before checking or adjusting the instrument it should be left in an environment of 20ºC to 25ºC (68°F to 77°F) temperature for about 12 hours.
Recalibrations should recommendably be carried out only by skilled persons or even better by accredited laboratories.

For cleansing the instrument use humid cloth. Do not use any detergents but only clear water.