TEMPERATURE
DATA LOGGER

PCE-T 394

User Manual

PCE-T 394 Temperature Data Logger

User manuals in various languages (français, italiano, español, português, nederlands, türk, polski, русский, 中文) can be found by using our

product search on: www.pce-instruments.com

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Contents

1   Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, …) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

2   Specifications

K-type thermocouple measurement range	-200 … 1370 °C (-328 … 2498 °F)
J-type thermocouple measurement range	-210 … 1100 °C (-346 … 2012 °F)
Accuracy	±(0.2 % of Rd+1 °C) above -100 °C ±(0.5 % of Rd +2 °C) below -100 °C
Resolution	0.1 °C/°F/K <1000, 1°C/°F/K >1000
Data update rate	500 ms
Auto power off	after 20 minutes of inactivity
Battery level indicator	⎓ flashes when the battery voltage is too low
Data logger	32,000 sets of measured values
Power supply	3.7 V Li-Ion battery
Operating conditions	-10 ... 50 °C / <80 % RH
Storage conditions	-20 ... 50 °C / <80 % RH
Dimensions	Meter: 162 x 88 x 32 mm (6.38 x 3.46 x 1.26 ") Sensor: 102 x 60 x 25 mm (4.01 x 2.36 x 0.98")
Weight	approx. 246 g (0.542 lbs)

* The probe provided with the instrument is a K-type thermocouple and the

applicable temperature range is -50～200℃.

* To avoid interference with the instrument and causing wrong readings, please do

*not shake the thermocouple probes during temperature measurement.*

3   Delivery scope
1 x temperature data logger PCE-T 394
1 x USB cable
1 x PC software
1 x service bag
1 x user manual

4   Device description

4.1   Key description

1. Thermocouple probes T1~T4
2. LC Display
3. Setup key
4. Enter (confirm) key
5. ON/OFF key
6. Temperature unit and arrow up key
7. Record key
8. MAX∕MIN key
9. Channel T1/2, T3/4 &
   differential value switching key
10. Data hold & arrow down key
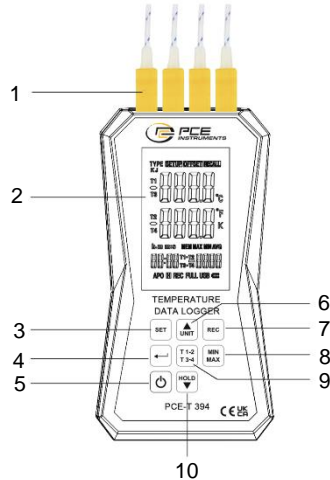
Note:
The micro-USB socket is located at the
bottom of the meter.

4.2   Display

1. Type of thermocouple (K or J)
2. Enter setup menu
3. Offset indicator
4. Reading data from memory
5. Channel T1/T3 indicator
6. Digital display for channel T1/T3
7. Channel T2/T4 indicator
8. Digital display for channel T2/T4
9. Time setting indication
10. Auto ranging indicator
11. Automatic power off
12. Freeze data
13. Data recording icon
14. Memory-full indicator
15. USB icon
16. Battery icon
17. Temperature unit
18. MAX, MIN & AVG indicator
19. T1/T2/T3/T4 reading
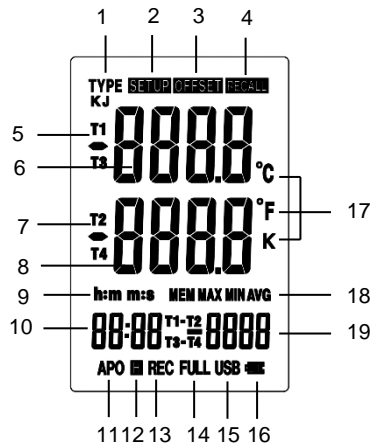
5   Operating instructions

5.1   Switch the meter on/off

Press and release the [⏻] key to turn on the temperature data logger and press and hold the same key for 3 seconds to turn it off.

5.2   Set the type of thermocouple

Set the type of thermocouple you want to use. As default, the K-type thermocouple is used.

1.   Press and hold the [SET] key for 3 s to enter setup mode, then the selection window for the thermocouple types (K or J) appears.

2.   Press the [←] key, the type of thermocouple icon will flash on LCD.

3.   Press the ▲ or ▼ key to select the correct type of thermocouple and press the [←] key to confirm.

5.3   Connect the probe to meter

Connect the correct thermocouple probe to the T1, T2, T3, T4 input jacks at the top of the temperature data logger.
The North American ANSI colour codes of the thermocouples are:

Type	K	J
Color	Yellow	Black

5.4   Measurement

The first reading will be displayed in about 1 second. It will display"----" if the thermocouple probe is not plugged into any one channel.
Leave the temperature data logger in the environment to be tested for some time to get stable readings.

Press and release the [▲ UNIT] key to select the temperature unit you prefer.

Press the [T1-2 / T3-4] key. The readings of the channels T3 & T4 will be displayed as the main reading and the DIF value (T3-T4) will be displayed as the sub-reading. When you press the [T1-2 / T3-4] key again, the readings of the channels T1 & T2 will be displayed as the main reading and the DIF value (T1-T2) will be displayed as the sub-reading.

5.5   MAX, MIN & AVG value

Press the [MIN MAX] key once to enter MAX/MIN/AVG mode. The maximum value, minimum value (MIN) and average value (AVG) of T1 will appear successively.

Press the [T1-2 / T3-4] key to switch the MAX/MIN/AVG value of T1-T2 and T3-T4 successively.

Press the [MIN MAX] key for 3 seconds until the MAX & MIN icon disappears to exit MAX/MIN mode.

Note:

The functions of the [HOLD ▼] key and Auto Power Off will be disabled when MAX/MIN mode is active.

5.6 Hold data

Press the [HOLD ▼] key. The digital reading is held and the HOLD icon appears on the LCD.

Press the [T 1-2 / T 3-4] key to switch between the readings of T1 & T2 or T3 & T4 at the main display and the values of T1-T2 or T3-T4 at the sub-display.

Press the [HOLD ▼] key again to return to normal operation.

5.7 Recording mode

The PCE-T 394 has a data logger function. It records max. 32000 groups of data. The recorded data can be read out via a PC.

1. Start the recording: As default, recording is started by pressing a key. You can change the start mode setting via the software. Please refer to the PCE software manual for details.
2. Set the interval: Before starting to record, set the sampling interval of the PCE-T 394 as described under 6.5 Setting the interval for data .
3. Press the [REC] key to start recording, press the key again for 3 seconds to stop recording.
4. When the set number of records is reached, a FULL icon will be displayed at the bottom of the LCD screen.
5. Data can be deleted automatically by re-setting the recording elements.
6. Read out the data: After recording, you can connect the data logger to a PC via the USB port and with the PCE software, you can read out and analyse the data accordingly. Please refer to the PCE software manual for details.

Note:
When the temperature data logger is at low battery, the recording function does not work and data cannot be deleted. If you need to record for a long time, fully charge the battery or use the AC/DC power adaptor for power supply.

Note:
When the instrument is in recording mode, unplug the probe and the LCD screen will display ERR.

5.8 Data recording and software installation

This temperature data logger is able to record data in its internal memory. Before you can record data, you need to install the PCE software on your PC. The latest version of this software and detailed instructions on how to install and use it can be found at https://www.pce-instruments.com. A CD with the software is included for your convenience but we recommend downloading the latest version at the PCE Instruments website.
To set up the meter for recording, connect it to a PC via the micro USB port.

5.9 Auto Power Off

The APO function is set to ON by default. To turn off the APO function, press the [⏻] key lightly. To extend the battery life, the temperature data logger will automatically turn off after about 10 minutes when not in use.
In recording mode or when the meter is connected via USB, the APO function is automatically disabled until the memory is full or the set number of records is reached.

6   Settings

With the SET key, you can set the time and date, select the type of thermocouple and change the recording interval and compensation.

6.1   Enter and exit setup

Press and hold the SET key for about 3 s to enter the setup menu. The SETUP icon will appear on the LCD. Press and hold the SET or ⏻ key for about 3 s to exit the setup menu. Under setup, the button functions are as below:
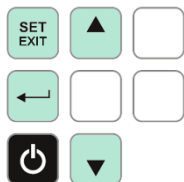
Press the ▲ or ▼ key to select the options and then press the ← key to confirm. The setup function is not available in MAX/MIN/AVG mode.

### 6.2   Set the type of thermocouple probe

Press and hold the SET key for 3 s to enter setup mode, then the selection window for the type of thermocouple (K or J) appears.

Press the ← key. The type of thermocouple icon will flash on LCD.

Press the ▲ or ▼ key to select the correct type of thermocouple and press ← to confirm.

6.3   Set the date

1.   Enter setup mode and press ▲ or ▼ until dAtE and YYYY are displayed.

2.   Press ← to set the year. "2018" will flash at the bottom, on the left.

3.   Press ▲ or ▼ until the year display is correct, then press ← to confirm.

4.   Press ▼ again. dAtE and ⁻⁻nn are shown on the main display. Press the ← key to select the month setting. The number will flash at the bottom, on the left.

5.   Press ▲ or ▼ to change the month, then press ← to confirm.

6.   Press the ▼ key again. dd will be shown on main display. Press ← to select the date setting. The number will flash at the bottom, on the left.

7.   Press ▲ or ▼ to change the date. Then press ← to confirm.

6.4   Set the time

1. Enter setup mode and press the ▲ or ▼ key to display ᴛ ɪᴎᴇ and ʜʜ.

2. Press the ↵ key to select the hour. The number will flash at the bottom, on the left.

3. Press ▲ or ▼ to change the hour and press ↵ to confirm.

4. Press ▼ again. ᴛ ɪᴎᴇ and ᴎᴎ are shown on the main display. Press the ↵ button to select the minute. The number will flash at the bottom, on the left.

5. Press ▲ or ▼ to change the minute and then press the ↵ key to confirm.

6. Press the ▼ key again, ꜱꜱ will be shown on the main display. Press the ↵ key to select second setting. The number will flash at the bottom, on the left.

7. Press ▲ or ▼ to change the second and then press ↵ to confirm.

6.5   Setting the interval for data logging

The interval for data logging is the interval time for saving data.
The following intervals are preset. You can select the most suitable interval for your application:
1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min, 30 min, 1 h, 2 h, 6 h, 12 h

1. Press ▲ or ▼ key until ɪᴎᴛᴜ is displayed on the LCD.

2. Press ↵ key. The interval selection window will appear on the LCD.

3. Press the ▲ or ▼ key until the correct interval you need is displayed. Then press ↵ to confirm.

6.6   Setting the compensation

You can adjust the reading of the PCE-T 394 to compensate for some deviation of the thermocouple. The value you can set as offset is limited to a maximum value. You can set individual compensation values for T1, T2, T3 and T4.

1. Enter setup mode and press the ▲ or ▼ key until OFFSET appears on the LCD.

2. Press the ↵ key to show the reading and compensation value (flashing). The compensated reading of T1 is displayed on the main display and the compensation value is displayed on the sub-display.

3. Press ▲ and ▼ to adjust the compensation value until the reading is correct and then press ↵ to confirm.

4. Repeat step 2-3 to change the setting of the compensation value of T2, T3 & T4.

5. Remember to set the compensation value into 0.0 again if there is no need of the compensation value.

Note:
The OFFSET icon will disappear if there is no compensation on T1, T2, T3 or T4.

7 Calibration

To ensure the accuracy of measurement of the temperature data logger, it is suggested to calibrate it regularly (usually once a year).

The calibration should be done by professionals, according to the procedure described in this manual.

Note:
The instrument has been calibrated before shipment.

7.1 Preparation for calibration

Before calibration, please prepare the test environment as below:
1. The required temperature of the shielded calibration room is +23 °C ±0.3 °C (+73.4 °F ±0.5 °F)
2. In order to achieve a stable reference room temperature point, the PCE-T 394 must be placed in the calibration room for more than one hour before the calibration.
3. In order to make a zero point calibration, two iron or copper thermocouple connectors are also required (short connect the positive and negative inputs).

7.2 Cold-junction compensation calibration

1. Enter setup mode and press the ▲ and ▼ keys until the CAL icon is displayed and at the same time, the inner NTC temperature value of the cold-junction compensation temperature is displayed.
2. Press the ← key to enter calibration mode.
3. Press ▲ and ▼ until the inner NTC temperature value is the same as the room temperature and then press the ← key to confirm.

7.3 AD value calibration (only to be carried out by PCE Instruments)

1. Plug the thermocouple connectors into the T1 and T3 connections so that the positive and negative poles are short circuited.
2. Press both the [SET] and the ← key at the same time. At this time, the $A:d$ and CAL icons (flash) on the LCD.
3. Press the ← key to calibrate the AD value. If you need to cancel, press and hold the [⏻] or [SET] key.

```
 SETUP
    131

    131

A:d      CAL
```
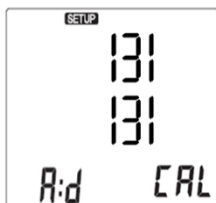
Warning:
This calibration must only be carried out by PCE Instruments.

8   Maintenance and cleaning

8.1   Cleaning and storage

1. The white plastic sensor dome should be cleaned with a damp, soft cloth, if necessary.
2. Store the temperature data logger in an area with moderate temperature and relative humidity.

8.2   Charging the battery

When the battery power is insufficient, the battery icon appears on the LCD and flashes. Use the DC 5V power adaptor to connect to the micro USB charging port at the bottom of the meter. The battery icon on the LCD indicates that the battery is charging and will disappear when the battery is fully charged.

9   Contact

If you have any questions, suggestions or technical problems, please do not hesitate to contact us. You will find the relevant contact information at the end of this user manual.

10   Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.

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