JT2005
Infrared Thermometer
Operation Manual

Overview

JT2005 is a professional non-contact infrared thermometer (hereinafter referred as thermometer) can determine surface temperature measuring the infrared energy radiated by the target surface. JT2005 can measure temperatures from -35 °C to 850°C. This 20:1 ratio meter can store up to 99 sets of data and perform scheduled measurement with a maximum interval of 96 hours between the two measurements. This thermometer is also IP65 rated and can withstand 3 meters drop.

Safety Instructions

⚠ Warning

To avoid eyes or personal injury, please read the following safety instructions before using the thermometer:

- Please do not aim at people or animals with the laser directly or indirectly.
- Please do not look at the laser directly or through other optical tools (telescope, microscope, etc.).
- If the battery symbol on the LCD display is flashing, replace the batteries immediately to avoid inaccurate measurements before using the thermometer.
- Inspect the case before using the thermometer. Do not use the thermometer if it is damaged. Look for cracks or missing plastic.
- Please refer to the emissivity information for the actual temperature. Reflective objects can cause the actual temperature value to be higher than the measured temperature value. When measuring these objects, please be aware of not to touch very hot surfaces.
- Do not use the thermometer in an explosive gas, steam or humid environment.
- To ensure measurement accuracy, place the thermometer in the test environment for more than 30 minutes before using it.
- Avoid keeping the thermometer near very hot objects for a long time.

Specifications

Functions	
Temperature Range	-35°C~850°C(-31°F~1562°F)
Accuracy 21°C ~25°C (70°F~77°F)	≥0°C: ±1.8°C or ±1.8% of reading, whichever is greater <0°C: ±(10% of reading + 1.8°C) ≥32°F: ±3.6°F or ±1.8% of reading, whichever is greater <32°F: ±(10% of reading + 3.6°F)
Temperature coefficient	0.1°C/°C (0.1°F/°F) or ±0.1% of reading per degree, whichever is greater
D:S Ratio	20:1 (calculated when energy is 90%)
Emissivity	0.1~1.0 adjustable
Response Time	250ms (95% of reading)
Spectral Response	8um~14um
Resolution	0.1°C (0.1°F)
Repeatability	0.8°C or 0.8% of reading, whichever is greater
Number of lasers	Dual Lasers
Laser type	CLASS II
Laser wavelength	630nm~670nm
Laser power	<1mW
Battery type	9V Battery (1604A)
Battery life	≥16H
Product size	189 x 118 x 55mm
Weight	292g
Operating temperature	0°C~50°C (32°F~140°F)
Storage temperature	-20°C~60°C (-4°F~140°F)
Operating humidity	<90% RH (non-condensing)
Operating altitude	2000m
Protection level	According to IEC60529, complies with IP65
Drop test	3m

Safety Standards

GE Certification: EN61326-1: 2013
Laser Safety Standard: EN60825-1: 2014

Reference Standards: JJG 856-2015

Product Features

Strong and Durable: Passed 3m drop test.
Dustproof and Waterproof: Passed IP65 level dustproof and waterproof tests.
Ergonomic Design: Comfortable handheld, simple and convenient operation.
MAX/AVG/DIF/MIN: Can quickly display the maximum, minimum, average and difference value (between maximum and minimum) during measurement.
Large Backlight Screen: Large screen, bold fonts, and uniform white backlight combined make it an attractive display.
Alarm Function: High and low temperature alarm is displayed with a flashing LED and symbol, in order to easily observe the exceeded measurement results when alarm is triggered.
Dual-wavelength rotatable Laser indication: Allows you to accurately and quickly determine the area to be measured.

Data Storage: Storages up to 99 groups of data for measurement analysis.
Scheduled Measurement: Sets a time point in which the thermometer will be automatically turned on and performs measurement once every interval is preset, the maximum interval is 96 hours.
Monitoring Measurement: Sets a time interval, after which the thermometer will be automatically turned on and then performs measurements.

Function Description

🔒	Temperature measurement lock trigger
▲	Laser on
HILO	High and low limit alarm
▭	Low battery
SCAN	Temperature measurement trigger
HOLD	Measurement data hold
°F°C	Unit
888.8	Measurement value on main display
88.88	Measurement value on secondary display
ε=0.88	Emissivity
LOG	Data storage mode
Auto	Scheduled measurement
Interval	Monitoring measurement
Protect	Auto shutdown protection
MAX MIN AVG DIF	Mode

Operations

Power On and Off

1. Gently pull the trigger to power on thermometer, LCD screen and the backlight will be turned on.
2. The thermometer will be powered off automatically without operation for 8s.

Manual Measurement

1. Pull and hold the trigger after aiming at the target. The SCAN icon will be flashing indicating that the target object temperature is being measured.
2. Releasing the trigger, the SCAN icon disappears and the HOLD icon appears, indicating that the measurement has stopped and the last measured value is kept.

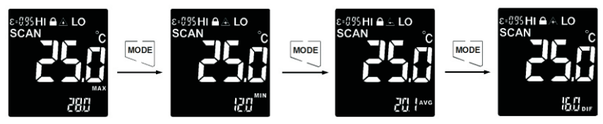
Lock Measurement

1. During lock measurement, pull the trigger to enable function. The 🔒 icon will appear on the thermometer screen and the SCAN icon will flash. Thermometer keeps continuously measuring the target temperature.
2. Pulling the trigger again, the 🔒 and SCAN icons will disappear, and the HOLD icon will appear. Thermometer stops measurement and keeps the last measured value.

Note: During measurement, the target must be larger than the light spot to ensure accuracy. Please refer to the D:S values.

MAX/MIN/AVG/DIF Value Reading

Short press MODE button to change MAX/MIN/AVG/DIF modes respectively, the temperature value of the corresponding modes are shown in the secondary display area (as shown below).



HIGH Alarm ON/OFF

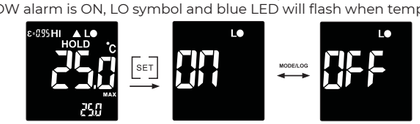
Short press SET button to switch to HIGH alarm ON/OFF setup (as shown below), press LOG or MODE button to switch between ON/OFF.
Thermometer will exit the setup after 5 seconds without any operation.
When HIGH alarm is ON, HI symbol and red LED will flash when temperature exceeds the high alarm limit.

HIGH Alarm Limit Setup

Short press SET button to switch to HIGH alarm limit setup (as shown below), use functional buttons to set values.
Short press LOG or MODE button to add or subtract 1 every time. Long press LOG or MODE button to add or subtract 10 every second.
Thermometer will exit the limit setup after 5 seconds without any operation.

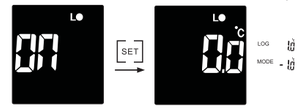
LOW Alarm ON/OFF

Short press SET button to switch to LOW alarm ON/OFF setup (as shown below), press LOG or MODE button to switch between ON/OFF. Thermometer will exit the setup after 5 seconds without any operation.
When LOW alarm is ON, LO symbol and blue LED will flash when temperature is lower than the low alarm limit.



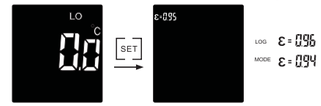
LOW Alarm Limit Setup

Short press SET button to switch to LOW alarm limit setup (as shown below), press the functional buttons to set values.
Short press LOG or MODE button to add or subtract 1 every time. Long press LOG or MODE button to add or subtract 10 every second. Thermometer will exit the limit setup after 5 seconds without any operation.



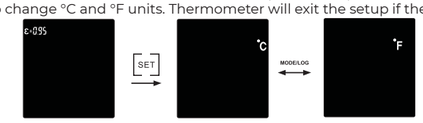
Emissivity Setup

Emissivity can be adjusted from 0.1 to 1.0. Short press SET button to enter the emissivity setup interface (as shown below). Press LOG or MODE button to set the values. Short press LOG or MODE button to add or subtract 0.01 every time, long press LOG or MODE button to add or subtract 0.1 every second. Thermometer will exit the setup after 5 seconds without any operation.



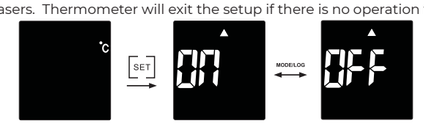
Unit Setup

Short press SET button to switch to the unit setup interface (as shown in the following figure), press LOG or MODE button to change °C and °F units. Thermometer will exit the setup if there is no operation for 5 seconds.



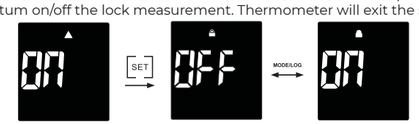
Laser ON/OFF

Short press SET button to turn the laser on or off setup interface (as shown below), press LOG or MODE button to tum on or off lasers. Thermometer will exit the setup if there is no operation for 5 seconds.



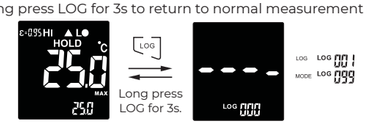
Lock Measurement ON/OFF

Short press SET button to switch to lock measurement ON/OFF setup interface (as shown below), press LOG or MODE button to tum on/off the lock measurement. Thermometer will exit the setup if there is no operation for 5 seconds.



Enter/Exit Data Storage Mode

In the HOLD state of normal measurement mode, short press LOG button to enter the data storage mode, then press LOG/MODE to select the data group to be viewed (up to 99 groups). '- - - -' indicates that no data has been saved in the group. Long press LOG for 3s to return to normal measurement mode.



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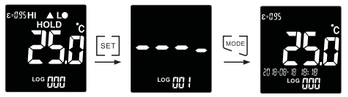
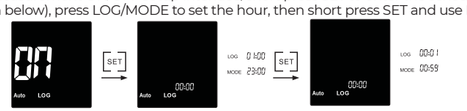
Data Storage
In data storage mode (with new data in HOLD state), press SET, data flashes 3 times and is saved in current data group, then the screen will display the data of next group. If no data has been saved in the group, '- - - -' appears. You can short press MODE to return to view the previous stored data.



Delete Data
In data storage mode, long press SET for 5s to delete all data (99 groups).

Scheduled Measurement
Enable this function to measure at a preset time (in 24 hours format). The thermometer will turn on automatically to perform the measurement and save the record at preset time.
General measurement mode: Long press MODE for 3s to enter the scheduled measurement ON/OFF setup interface (as shown below), use LOG or MODE button to switch between ON/OFF. Thermometer will exit the setup after 5 seconds of no operation.

Scheduled Measurement Time Setup
In the scheduled measurement ON/OFF setup interface, short press SET to enter the scheduled measurement time setup interface (as shown below), press LOG/MODE to set the hour, then short press SET and use LOG/MODE to set the minutes.



Monitoring Measurement
Enable this function to setup the monitoring measurement at a preset interval (1 min-24h). The Thermometer will automatically turn on to measure and record a measurement at every interval.
In the scheduled measurement time setup interface, short press SET to enter the monitoring measurement setup interface (as shown below), press LOG or MODE button to switch between ON/OFF. Thermometer will exit the setup after 5 seconds without any operation.

Monitoring Measurement Time Setup
In the monitoring measurement ON/OFF setup interface, short press SET to enter the monitoring measurement time setup interface (as shown below), press LOG/MODE to set the hour, then short press SET and press LOG/MODE to set the minutes.

Protection Function
Without protection function, the thermometer will always be on during locked measurement mode, even when trigger is enabled by accident. When protection function is enabled, the thermometer will stop the measurement and shut down when there is no button operation for 10 minutes.
In the monitoring measurement lime setup interface, short press SET to enter the protection mode ON/OFF setup interface (as shown below), use LOG or MODE button to switch between ON/OFF. Thermometer will exit the setup after 5 seconds without any operation.

System Time Setup
Please set the system time before the scheduled measurement and monitoring measurement. This thermometer clock is displayed in 24-hour time format.
In the protection mode ON/OFF setup interface, short press SET to enter the system time setup interface (as shown below), press LOG/MODE to increase/decrease the relevant value, and short press SET to set the year-month-date-hour-minute accordingly.
Thermometer will exit the setup after 5 seconds of no operation.

Notes:

1. The records will be saved from the 000 position when they are stored in memory. After all 99 positions are occupied, the recording will return to 000 again and overwrite the original data.
2. When this function is turned on and the thermometer is in the SCAN or HOLD states, "Auto" or "Interval" will be displayed.
3. When the thermometer restarts, the system time and the measurement settings will be restored to the default values (it needs to be reset), but the recording memory will be still saved.
4. It is not recommended to enable the scheduled measurement and monitoring measurement at the same time, as their measurement records all start from 000, and will overwrite the measurement data of each other.

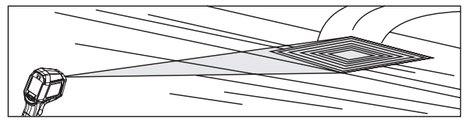
Enter the scheduled measurement/monitoring measurement/protection function/system time setting modes

In the HOLD state, press **MODE** button for more than 3s to enter the scheduled measurement mode; then press SET to enter the following setting interface:

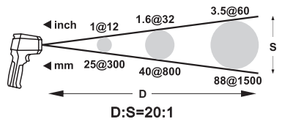
- In HOLD state, press MODE (>3s)
- Scheduled measurement on/off ("Auto" and "LOG" blue characters appear)
- Set the hour of scheduled measurement (hour characters flash)
- Set the minutes of scheduled measurement (minute characters flash)
- Monitoring measurement on/off ("Interval" and "LOG" blue characters appear)
- Set the hour of the interval in monitoring measurement (hour characters flash)
- Set the minutes of the interval in monitoring measurement (minute characters flash)
- Protection function on/off ("Protect" blue characters appear)
- Set the year of the system date (year characters flash)
- Set the month of the system date (month characters flash)
- Set the date of the system date (date characters flash)
- Set the hour of the system time (hour characters flash)
- Set the minutes of the system time (minute characters flash)
- Save and exit the setup mode

Press SET

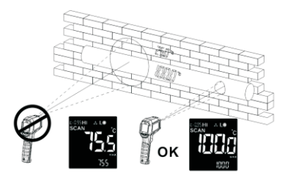
Finding Hot Point and Cold Point
Aim at target area with thermometer, then move up and down slowly to sweep the whole area until the hot point and cold point are found.



D:S Ratio (Distance to spot ratio)
S increases as D increases (S represents 90% of energy in the circle). The maximum D:S can be obtained when D=800mm (32") and S=40mm (1.6").



Field of View
Ensure that the target is larger than S. The smaller the target is, the closer the measurement distance should be. Optimum result is obtained when diameter of the target is more than 2.0 times of S. The spot diameter is approximately equal to the distance between the two laser points.



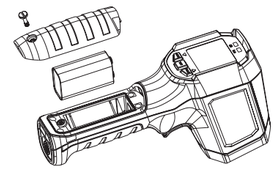
Emissivity
Emissivity characterization reflects the radiated energy by the material. Emissivity for most organic materials, paints or oxidized surfaces are about 0.95. Total emissivity of selected metals and non-metals are listed in the following table.

Measured Surfaces	Emissivity
Metal	
Aluminum	
Oxidization	0.2 - 0.4
A3003 Alloy	
Oxidization	0.3
Rough	0.1 - 0.3
Brass	
Burnishing	0.3
Oxidization	0.5
Copper	
Oxidization	0.4 - 0.8
Electric Terminal Board	0.6
Hastelloy	
Alloy	0.3 - 0.8
Inconel	
Oxidization	0.7 - 0.95
Sand-Blasting	0.3 - 0.6
Electro Burnishing	0.15
Iron	
Oxidization	0.5 - 0.9
Rusting	0.5 - 0.7
Iron (Casting)	
Oxidization	0.6 - 0.95
Non-Oxidization	0.2
Casting	0.2 - 0.3
Iron (Forging)	
Passivation	0.9
Lead	
Rough	0.4
Oxidization	0.2 - 0.6
Molybdenum	
Oxidization	0.2 - 0.6
Nickel	
Oxidization	0.2 - 0.5
Platinum	
Black	0.9
Steel	
Cold Rolling	0.7 - 0.9
Steel Plate Rubbing	0.4 - 0.6
Steel Plate Burnishing	0.1
Zinc	
Oxidization	0.1
Non-Metal	
Asbestos	0.95
Asphalt	0.95
Basalt	0.7
Ceramic	0.95
Clay	0.95
Concrete	0.95
Cloth	0.9
Glass	
Convex Glass	0.76 - 0.8
Smooth Glass	0.92 - 0.94
Lead-Boron Glass	0.78 - 0.82
Plates	0.96
Plaster	0.8 - 0.95
Ice	0.98
Limestone	0.98
Paper	0.95
Plastics	0.95
Water	0.93
Soil	0.9 - 0.98
Wood	0.9 - 0.95

Maintenance

Clean
Use clean compressed air to blow away falling particles.
Use a wet cotton swab to carefully wipe lens surface.
Use a wet sponge or a soft cloth to clean product exterior.

Battery Replacement
Install or replace 1604A 9V battery according to the picture on the right.



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