

Dual Channel
Thermocouple Datalogger
BG 38TC

Professional temperature measuring instrument

Instruction manual

V1.3

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General Notes

This chapter provides important advice on using this documentation.

This document contains information that is required to use this product safely and effectively. Please read through the contents of this document carefully and be familiar with the operation of this product.

Button action

Short Press: Press the button and then raise it; you can hear a beep when pressing.

Press and hold: Press and hold the button for about 2s, raise it when hearing a beep.

When the corresponding function of the button is valid, there will be a beep. No sound means the current function is not available or the button sound is turned off.

Identification

Representation	Meaning	Comments
!!	Note	Provide important tips and information.
✓	Condition	The conditions that must be met before performing an operation.
➤, 1, 2...	Objective	Indicate the objective that is to be achieved via the steps described. The numbers are the order of the steps required to achieve this objective, which must always be followed.
BUTTON	Button	Press/Hold the button.
—	Supplement	Additional instructions for certain operations or projects.
●	List	List some details or examples related to the project.
◆	Result	The result of performing some operations.

1. Safety Advice

This chapter provides general rules that must be followed and adhered to if the product is to be used safely.

Avoid personal injury/equipment damage

- Do not use the measuring instrument and probes to measure on or near live parts (especially high-voltage electricity).
- Corrosive solvents can't be measured with the probe unless it is a designated anti-corrosion probe.

Product safety/warranty claims

- Operate the instrument only within the range specified in the specifications.
- Always use the instrument properly and for its intended purpose.
- Do not place handles and cables in environments above 80°C unless they are explicitly allowed to be used at elevated temperatures. Temperatures given on the probes are only related to the sensor's measuring range.
- The instrument can only be disassembled if it is explicitly stated in the documentation for maintenance and repair purposes. Perform only the maintenance and repair work described in this document. Follow the prescribed steps to perform maintenance and repair work. To be on the safe side, only the spare parts from the original factory can be used.

Ensure correct disposal

- Take faulty rechargeable batteries/spent batteries to the collection points provided for them.
- Send the product back to the original factory at the end of its useful life. We ensure that it will be disposed of in an environmentally friendly manner.

2. Intended Purpose

This chapter describes the areas of application for which the product is intended.

Use the product only for those applications for which it was designed. This instrument is a two channel high-precision measuring instrument with calibration for temperature measurement.

Accurate Measurement: Whether it is a low temperature cold storage or a high temperature boiler, flexible use multi-type probe will ensure accurate measurement over the whole range.

Safe and Reliable: Provide a safe and reliable measurement experience during the measurement process.

High Scalability: Use standard thermocouple socket to connect probe of any shape.

Excellent Performance: Super large backlight display; temperature over-limit alarm; maximum / minimum / average display ; Large dot matrix LCD display more information.

Practical Accessories: soft protective cover, waterproof and oil resistant, IP52 protection level can be achieved when connected to a temperature probe.

The product is designed for the following areas:

- Temperature standard instrument
- Scientific experiments
- Medical
- Food
- Chemical industry
- HVAC industry

The product should not be used in the following areas:

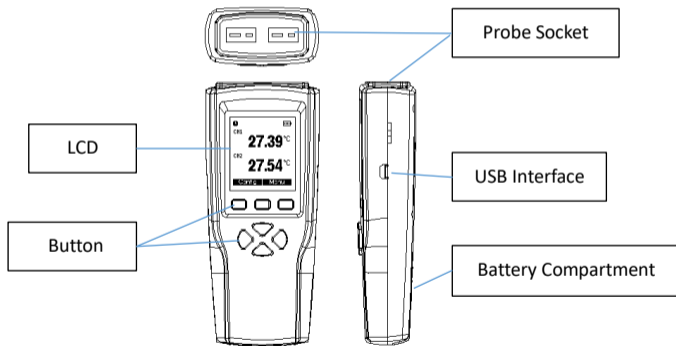
- Hazardous explosive areas
- High voltage areas
- Smelting industry

3. Products Description









This chapter provides an overview of components of the product and their functions.

3.1 Display and control components







Overview



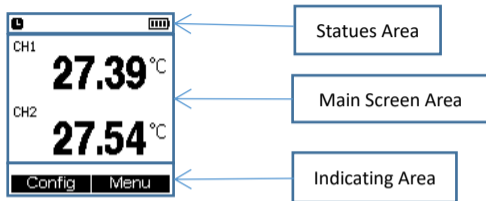
Button Functions

Button	Functions
	Multi-function button 1, the function will be displayed at the bottom left of the screen.
	Switch instrument on; Switch instrument off (hold the button).
	Switch display light on/off.
	Multi-function button 2, the function will be displayed at the bottom right of the screen.
	Switch type of probe.
	Keep reading.
	Display Max/Min/Avg value.
	Switch unit of reading.

Important displays

Displays	Meaning
	Alarm enable: Displayed when the alarm function is enabled, and the next icon is combined to indicate the enabled channel.
	Only channel 1 enable alarm, only channel 2 enable alarm, both channels enable alarms.
	High and low limit alarms: Display when the temperature exceeds the high or low limit.
	Auto shutdown: display when auto shutdown function is enabled.
	Battery capacity: display with battery power.
	Display when the instrument is connected to USB.

Display area division



Dividing the area is for quick positioning of the icons or readings you want to view.

3.2 Interface

- **Probe Interface**
 - A plug-in measuring probe can be connected to the measuring instrument via the probe socket.
- **USB Interface**
 - The instrument can be connected to a computer or other 5V USB powered device via a Micro USB cable.

3.3 Power supply

- The instrument is powered by three 1.5V AAA or 1.5V rechargeable batteries under normal conditions. USB interface can provide 5V voltage in emergencies. However, unstable USB power supply will result in inaccurate measurement, so USB power supply is not recommended.

4. Operation



This chapter describes the steps that have to be executed frequently when using the product.

4.1 Ready to work

- Remove the protective film from the display.
- Insert the battery/rechargeable battery into the battery compartment, observe the polarity of the battery.
- Insert the probe plug into the probe interface of the instrument.

4.2 Switching the instrument on/off

➤ Switching the instrument on / view the version number and serial number

1. Press  to turn on the instrument. The version number and serial number can be viewed on the screen by pressing the  before entering the measurement interface.

➤ Switching the instrument off

1. Press and hold . Raise the  button when you see “shut down”.

4.3 Backlight

➤ Switching the backlight on/off

- ✓ The instrument is switched on.
1. Press .





4.4 Multi-function button

- The instrument has two multi-function buttons: **F1** and **F2**. Their specific functions will be displayed in the function description area!

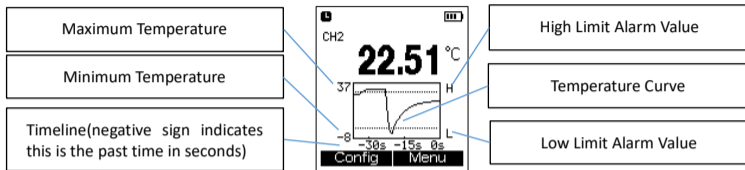
Commonly used function of F1 button		Commonly used function of F2 button	
Config	Enter the configuration interface.	Menu	Enter the menu interface.
Enter	Go to the next level option interface.	Exit	Enter configuration interface or menu Interface.
Set	Change the settings of the current option.		
Ok	Confirm changes to an option or value.	Back	Return to the previous interface or exit the Editing interface.
Yes	Perform an action.		
Edit	Edit a value.		
		No	Cancel an action.

4.5 Channel mode

- The instrument has two temperature measurement channels and four mode interfaces, which can be used flexibly to meet different measurement needs. Four mode interfaces are as shown in the following table:

Channel mode	Dual channel merge mode	Single channel one mode	Single channel two mode	Dual channel difference mode
Example				
Feature	Both channels are measured and displayed simultaneously.	Can view the temperature curve of channel 1 in the past 35 seconds.	Can view the temperature curve of channel 2 in the past 35 seconds.	Suitable for measuring items related to temperature differences.

- **Single channel trend chart**



- !! The maximum temperature of the trend graph is set to be 105% of the maximum measured temperature over the past 35 seconds. Therefore, the temperature values displayed on the screen may be outside the measurement range, but it does not mean that the instrument can measure temperatures outside this range. The same is true for the lowest temperature of the trend graph.

4.6 Instrument settings

- **To open configuration mode**

- ✓ The instrument is turned on and the function description area displays: **Config | Menu**.
- 1. Press **F1** (Config). Enter the configuration mode.
- !! The configuration interface is as shown on the right. You can press **▲** / **▼** to move the cursor.
- !! The settings related to instrument properties are located in the configuration interface.
- !! You can exit configuration mode at any time by press **F2** (Exit). The changed settings will be saved when you exit the configuration interface.



➤ **To set channel mode**

- ✓ Configuration mode is opened, move the cursor to “Channel Mode” and press **F1** (Enter).
- 1. Use **▲** / **▼** to select the desired mode, press **F1** (Ok) to confirm the selection or press **F2** (Back) to exit directly.

➤ **To set button sound**

- ✓ Configuration mode is opened, move the cursor to “Sound”.
- 1. Press **F1** (Set) to switch settings.

➤ **To set the automatic shut-down.**

- ✓ Configuration mode is opened, move the cursor to “Auto off”.
- !! When the automatic shutdown function is turn on, the instrument will automatically turn off if no button is pressed within 10 minutes.
- 1. Press **F1** (Set) to switch settings.

➤ **To restore the factory configuration**







- ✓ Configuration mode is opened, move the cursor to “Recovery” and press **F1** (Enter) to enter, waiting for 5 seconds.
- 1. Press **F1** (Yes) to reset to the factory settings. Press the **F2** (No) button to return to the configuration mode.

4.7 Data settings



➤ **To open menu interface**

- ✓ The instrument is turned on and the function description area displays: **Config | Menu**.
- 1. Press **F2** (Menu). Enter the menu interface.
- !! The menu interface will vary according to the channel mode, as shown in the table below.



Channel mode	Dual channel merge mode		Single channel one mode	Single channel two mode	Dual channel difference mode
Option one	High Limit-CH1	High Limit-CH2	High Limit-CH1	High Limit-CH2	Difference Limit
Option two	Low Limit-CH1	Low Limit-CH2	Low Limit-CH1	Low Limit-CH2	Diff-Alarm
Option three	Alarm-CH1	Alarm-CH2	Alarm-CH1	Alarm-CH2	Calibration
Option four	Calibration		Calibration	Calibration	

- !! You can press  /  to switch between different menu options. If there is a triangle icon  at the far right of the cursor, there is a sub-option. Press  /  to switch the sub-option.
- !! The options related to the measurement data are in the menu interface.
- !! You can exit menu mode at any time by pressing the  (Exit). The changed settings will be saved when you exit the menu.

➤ **To set the temperature alarm high limit**

- ✓ Open the instrument and enter the menu interface.
- 1. Move the cursor to “High Limit-CH1” or “High Limit-CH2” and press  (Edit) to set the temperature high limit alarm value of the channel. (In dual channel merge mode, the option for channel two is collapsed in the sub-option. You need to press the  button first.)

➤ **To set the temperature alarm low limit**

- ✓ Open the instrument and enter the menu interface.
- 1. Move the cursor to “Low Limit-CH1” or “Low Limit-CH2” and press  (Edit) to set the temperature low limit alarm value of the channel. (In dual channel merge mode, the option for channel two is collapsed in the sub-option. You need to press the  button first.)

➤ **To set temperature alarm switch**

- ✓ Open the instrument and enter the menu interface.
- !! The status of the alarm enable will be displayed directly on the option, and “Beep” means that the alarm way is sound by the buzzer.
- 1. Move the cursor to “Alarm-CH1” or “Alarm-CH2” and press **F1** (Set) to turn the channel’s temperature alarm on or off. (In dual channel merge mode, the option for channel two is collapsed in the sub-option. You need to press the **▶** button first.)

➤ **To set temperature difference alarm value**

- ✓ In dual channel difference mode, enter the menu interface.
- 1. Move the cursor to “Difference Limit”, Press **F1** (Edit) to set the temperature difference alarm value.

➤ **To set the temperature difference alarm switch**

- ✓ In dual channel difference mode, enter the menu interface.
- !! When the absolute value of the temperature difference between the two channels is greater than the temperature difference alarm value, the temperature difference alarm is triggered.
- 1. Move the cursor to “Diff-Alarm” and press **F1** (Set) to turn the temperature difference alarm on or off.

4.8 Calibration the instrument

➤ **To open the calibration mode**

- ✓ Open the instrument and enter the menu interface.
- !! This instrument supports three types probe K,T,J, and the three probes can be calibrated separately, and all probes calibration operation are the same. Each probe supports 10 calibration points. **Calibration will directly affect the measurement data, please ensure that the calibration value is the result of correct measurement by a high-precision instrument.**
- 1. Move the cursor to “Calibration” and press **F1** (Enter).

➤ **Start calibration/view total calibration points**

✓ Open the calibration mode and enter the “select probe type” interface.

!! In this interface, you can see the number of existing calibration points directly after the probe type. For example, if the K type probe has 2 calibration points, it will display “Type-K: 2 point”.

!! All probes calibration operation are the same, so the following operation takes the calibration of K type probe as an example .

1. Move the cursor to “Type-K” and press **F1** (Enter) to start calibrating the Type-K probe.

➤ **Delete all calibration points for a certain type of probe**

✓ Open the calibration mode and enter the “select probe type” interface.

!! All probes calibration operation are the same, so the following operation takes the calibration of K type probe as an example.

1. Move the cursor to “Type-K”, press the **▶** button, change the option to “Type-K:delete”, then press the **F1** (Yes) button to delete all K calibration points(the calibration points of other probe will not be delete).

➤ **Add a calibration point**

✓ Open the calibration mode and select the type of probe to calibrate on “Select probe type” interface to enter the “Edit point” interface.

!! After each calibration point, the temperature value before calibration is displayed, such as “Data 1:-100.00°C”, which means that the pre-calibration temperature value of the first calibration point is -100.00°C. Each time a calibration point is added, it is automatically sorted according to the temperature value before calibration.

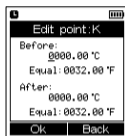
1. Move the cursor to “New data”, press **F1** (Add) to enter the calibration point editing mode. The calibration point editing interface is as shown in the figure below called “Calibration Point Editing Interface”.

2. Press **◀** / **▶** to move the cursor and press **▲** / **▼** to increase or decrease the number at the cursor position. Enter the temperature value before calibration in the “Before” filed and the

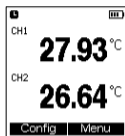
temperature value after calibration in the “After” filed.

3. Press **F1** (Save) to save the calibration point data, and press **F2** (Back) to return to the previous interface.

!! When the calibration is in effect, the affected channel number is displayed in reverse color. As shown in the figure below, “Before Calibration” and “After Calibration”.



Calibration Point Editing Interface



Before Calibration



After Calibration

➤ **Edit a calibration point**

- ✓ Open the calibration mode and select the type of probe to calibrate on the “Select probe type” interface, then enter into “Edit point” interface.
- 1. If the calibration point is entered incorrectly, for example, the second calibration point is wrong, you can move the cursor to second calibration point, then press **F1** (Yes) button enter into edit mode to modify the calibration data.

➤ **Remove a calibration point**

- ✓ Open the calibration mode and select the type of probe to calibrate on the “select probe type” interface to enter into “Edit point” interface.
- 1. If a calibration point is not needed, for example, the second calibration point, you can move the cursor to the second calibration point, then press **▶** to make the option change to “Remove data 2”, then press the **F1** (Yes) to remove the calibration data.

4.9 Data recording(with data logging function)

➤ Enter record mode

✓ Turn on the instrument and enter the menu interface.


!! This product supports 20000 data points.

1. Move the cursor to "Logging" and press **F1** (Enter).

➤ Start/Abandon recording

✓ Enter record mode and enter the Logging interface.

!! The internal storage will be cleared at the beginning of the recording, so the last record data will be cleared. Automatic shutdown function will be disabled.

!! During the recording process, (the recorded data points, the  icon will be displayed on the screen).

1. Move the cursor to "Start Logging" and press **F1** (Enter) to confirm. Then press **F1** (Start) to start recording, or press **F2** (Exit) to abandon recording.

➤ Stop recording/Saving results

!! The recorded data will be saved and generate file automatically after stop recording. And the files can be viewed on a computer.

1. The methods to stop recording:

- Press **F1** (Stop) to stop recording.
- Recording stops when battery power is insufficient.
- Recording stops when the battery is loose.
- Recording stops after turning off the device.

➤ View record information

✓ Enter record mode and enter the Logging interface.

1. Move the cursor to "View" and press **F1**, Press **▲** / **▼** to switch display contents.

- **Regenerate file**
- ✓ When the record file is corrupted, it can be used to recover the file. Set the file format before generating files in other formats. The old file will be cleared when generate a new file. Please make a backup.
1. Move the cursor to "Regenerate File" and press **F1** (Ok) to generate the file again.
- **Enter setting mode**
- ✓ Turn on record mode and enter the Logging interface.
1. Move the cursor to "Settings" and press **F1** "Set" to enter the setting interface.
- **Time setting**
- **Open the record mode and enter the Log Setting interface**
- !! Time must be reset before recording.
1. Move the cursor to "Set Time", and press **F1** "Set" to enter the time setting interface.
 2. Press **▲** / **▼** to select the option, press **◀** / **▶** to modify the value of the option, press **F1** (Ok) to confirm the setting.
- **Sampling rate setting**
- ✓ Enter the record mode and enter the Log Setting interface.
 - !! Sampling rate can be set from 1 second to 86399 seconds.
1. Move the cursor to "Set Sample Rate", and press **F1** "Set" to enter the interface of sampling rate setting.
 2. Press **▲** / **▼** to select the option, **◀** / **▶** to modify the value of the option, **F1** (Ok) to save the sampling rate.
- **Set file format**
- ✓ Enter the record mode and enter the Log Setting interface.
1. Move the cursor to "Set File Format", and press **F1** to enter the interface of file format setting.
 2. Press **▲** / **▼** to select the file format. Press **F1** (Ok) to save the file format.

5. Measuring

This chapter describes the steps that are required to perform measurement with the product.

- ✓ Turn on the instrument and enter the measurement interface. Insert the probe.
- **Perform measurements and view the current temperature readings on the screen**
 - When the alarm function is enabled, the instrument starts to alarm once the temperature is above the high limit or below the low limit.
 - The alarm stops when the reading goes below the upper or above the lower the shold again.
 - In order to save power, the alarm will stop after 10 minutes from the alarm going off.
- **Hold readings**
- **Press HOLD to hold reading on the screen. At the same time, the probe reading will continue to be displayed in small fonts above the frozen reading.**
- **View or reset the maximum, minimum, and average values**
- **a. In dual channel merge mode or dual channel difference mode**
 1. Press MAX/MIN/AVG to switch the display of various values. The current temperature value is updated in real time in a small font.
 - The Following values are displayed in turn: MAX; MIN; AVG; Current Reading.
 2. In the process of viewing the maximum, minimum and average values, press F1 (Reset) to clear the statistics.
 3. Press MAX/MIN/AVG again to exit the view mode.

b. In single channel one mode or single channel two mode

1. Press **MAX/MIN/AVG** to view the maximum, minimum and average values.
2. In the process of viewing the maximum, minimum and average values, press **F1** (Reset) to clear the statistics.
3. Press **MAX/MIN/AVG** again to exit the view mode.

➤ **Switch unit**

1. Press **°C/°F** to switch between Celsius and Fahrenheit.

➤ **Switch probe type**

1. In dual channel merge mode or dual channel difference mode. press **PROBE** to enter the switch probe type mode, and the status area will flash with the word PROBE. Press **F1** / **F2** to switch the probe type of corresponding channel. The current probe type will be displayed on the right of the channel number. In single channel mode, press **PROBE** to switch probe type directly. The current type will be displayed in the status area for 5 seconds.


6. Care and Maintenance

This chapter describes the steps that help to maintain the functionality of the product and extend its service life.

- **Cleaning the housing:**
 1. If the housing is dirty, clean the housing with a damp cloth. Do not use aggressive cleaners or solutions!
- **Replacing the battery/rechargeable battery:**
 - ✓ The instrument is switched off.
 - 1. Remove the battery cover in the direction of the arrow marked on the battery cover.
 - 2. Take out the spent battery/rechargeable battery and insert new battery/rechargeable batteries. And observe the battery polarity!
 - 3. Put the battery cover back and push it against the direction of the arrow.

7. Questions and Answers

This chapter gives answers to frequently asked questions.

Question	Possible Causes	Possible Solution
 is lit, or flash	<ul style="list-style-type: none">● Battery is almost spent	<ul style="list-style-type: none">● Replace instrument battery
The instrument automatically shut-down	<ul style="list-style-type: none">● Automatic shutdown function is turned on● Battery is almost spent● Operating temperature exceeds the specified value	<ul style="list-style-type: none">● Turn off the automatic shutdown function● Replace the battery● Transfer to a location that meets the requirements
Display "Error"	<ul style="list-style-type: none">● The probe line is broken● Measuring temperature exceeds the specified value	<ul style="list-style-type: none">● Connect the probe● Replace the probe with a wider measuring range
Normal function but no sound when pressing the button	<ul style="list-style-type: none">● Buzzer damage	<ul style="list-style-type: none">● Please send it back to the original factory for repairing
Inaccurate measurement data	<ul style="list-style-type: none">● The probe connection is not correct● Probe dose not meet the standard● Error setting of calibration point● Internal circuit damage of the instrument	<ul style="list-style-type: none">● Connect the probe correctly● Please use the specified probe● Delete all calibration point● Please send it back to the original factory for repairing

8. Specifications

Probe	TYPE-K probe	TYPE-T probe	TYPE-J probe
Parameters	Temperature(°C/°F)		
Measuring range	-200~+1370°C	-200~+400°C	-200~+1200°C
Resolution	0.01°C	0.01°C	0.01°C
Accuracy	$\pm(0.3\% t +0.40)^\circ\text{C}$	$\pm(0.3\% t +0.40)^\circ\text{C}$	$\pm(0.3\% t +0.40)^\circ\text{C}$
Measuring rate	2/s		
Operating Temperature	-10~+50°C		
Storage temperature	-20~+60°C (without battery)		
Power supply	3xAAA battery/1.2V rechargeable battery		
Battery life	About 190 hours(no backlight, battery capacity 1200mAh, environment temperature 25°C)		
Protection class	With protective sleeve(accessory part) and probe connected: IP52		
Standard/certification	CE/EMC, ROHS		
Warranty	One year		

The accuracy of the system is affected by the quality of the probe! The above is listed as the accuracy of the instrument.

Standard basis: JJF1170-2007 national standard "temperature calibration instrument calibration specification".

JJG(Machinery)94-1992 metrological verification procedure "Digital Temperature Measuring Instrument".

