ComNavTech

TS-C200

Total Station User Guide

2026

Foreword

Thank for very much for purchasing C200 series total station!

Scope of use of this manual: applicable to C200 series total station.

Note: the manufacturer reserves the right to change the technical parameters without prior notice!

Features: rich functions

The total station C200 has rich measurement programs, as well as data storage and parameter setting functions,Powerful, applicable to various professional and engineering surveys.

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- Absolute digital dial

The absolute digital dial is pre-installed, and the instrument can be directly measured when it is turned on. Even if the power is reset midway, the azimuth information will not be lost.

- SD card function

With functions such as high memory capacity, fast data transfer, great mobility flexibility, and good security , various data can be easily saved to SD during operations The SD card can be easily read on the computer through the laptop slot or card reader data on the card. The SD card cannot be pulled out during the file operation in the SD card, otherwise it will lead to result in loss or corruption of data.

1 megabyte (MB) of memory on the SD card can store 8500 sets of measurement data and the number of coordinates (converted from the measurement data) data, or 22000 coordinate data.

- Powerful memory management

Large-capacity memory, and can easily manage the file system to achieve data addition, deletion, modification, transmission , etc.

- Prism-free ranging

C200 series total station with laser ranging can directly measure objects of various materials and colors (such as walls of buildings, telephone poles, wires, cliff walls, mountains, soil, wood, etc.) Pile, etc.) for long-distance, high-precision measurement. For those targets that are difficult to reach or

cannot be reached at all, the application of the prism-free ranging function can complete the measurement task very well.

- Special measurement procedures

In addition to the common basic measurement functions, this series of total stations also have special measurement procedures, which can perform suspension height measurement, eccentric measurement, side-to-side measurement, stakeout, resection, area calculation, road design and stakeout, etc. It can meet the needs of professional surveying and engineering surveying.

Precautions:

1. Avoid directing the objective lens to the sun when measuring in sunlight. A sun filter is recommended to reduce this effect.

2. Avoid storing the instrument at high and low temperatures, and avoid sudden temperature changes (except for temperature changes during use) .

3. When the instrument is notin use, it should be putinto a box, placed in a dry place, and should be protected from shock, dust and moisture.

4. If the temperature difference between the working place of the instrument and the temperature of the storage place is too large, the instrument should be left in the box and used until it adapts to the ambient temperature.

5. If the instrument is not used for a long time, the battery should be removed and stored separately. And the battery should be charged once a month.

6. When transporting the instrument, it should be packed in a box. Be careful during transportation to avoid extrusion, collision and violent vibration. It is best to use upholstery around the box for long-distance transport.

7. When erecting the instrument, use a wooden stand as much as possible. Because the use of metal tripods may cause vibration and affect the measurement accuracy.

8. When the exposed optical device needs to be cleaned, it should be gently wiped with absorbent cotton or lens paper, and must not be wiped with other items.

9. After the instrument is used, use a flannel or a brush to remove the dust on the surface of the instrument. After the instrument is wet by rain, do not turn it on, dry it with a clean soft cloth and store it in a ventilated place for a period of time.

10. Before the operation, the instrument should be carefully and comprehensively inspected, and the operation should be carried out only when all the indicators, functions, power supply, initial settings and correction parameters of the instrument meet the requirements.

11. If the instrument is found to function abnormally, non-professional maintenance personnel should not disassemble the instrument without authorization to avoid unnecessary damage .

12 .The prism-free C200 series total station emits laser light, which should not be aimed at the eyes.

Safety Guidelines

Warn:

Total stations equipped with laser class 3R/ IIIa rangefinders are identified by the following designations :

A warning label is attached above the vertical micro-movement of the front mirror of the instrument: "Class 3A Laser Product " , and there is a similar label on the opposite side.This product is a Class 3R laser product according to the following standards.

IEC 60825-1 : 2001 " Radiation Safety of Laser Products ".

Class 3R / IIIa laser product: continuous observation of the laser beam is harmful, avoid direct laser eyes. in wavelength 400nm-700nmcan reach the emission limit within five times of Class 2/ II .

warn:

Continuously looking directly into the laser beam is harmful.

Prevention:

Do not stare into the laser beam with your eyes, and do not point the laser beam at others. The reflected beam is valid for the instrument Measurement.

warn:

When the laser beam strikes eg prisms, flat mirrors, metal surfaces, windows, direct viewing of the reflected light with the eye can be dangerous.

Prevention:

Do not stare at where the laser is reflected. When the laser switch is on (ranging mode), do not look next to the laser beam path or prism. The collimating prism can only be viewed through the telescope of the total station.

warn:

Incorrect use of Class 3R laser equipment is dangerous.

Prevention:

In order to avoid injury and make every user take effective safety precautions, it is necessary to Control it from the inside (according to the standard IEC60825-1:2001).

Below is an explanation of the main parts of the standard:

Class 3R laser products for outdoor and construction site use (measurement, alignment, leveling).

a. Only persons with relevant training and certification can install, commission and operate such laser equipment.

b. Set up corresponding laser warning signs within the area of use.

c. To prevent anyone from looking directly at the laser beam or using optical instruments to view the laser beam.

d. In order to prevent the damage of the laser to people, the laser beam should be blocked at the end of the working route, and the laser beam must be terminated when the laser beam passes through the restricted area (harmful distance *)and there are people moving.

e. The passing route of the laser beam must be set above or below the line of sight of the person.

f. When the laser products are not in use,they should be properly kept and stored, and uncertified persons should not use them.

g. Topreventthelaserbeamfrominadvertentlyirradiatingsuchas flat mirrors, metal surfaces, windows, etc., pay special attention to surfaces such as flat mirrors and concave mirrors .

* Harmful distance refers to the maximum distance from the starting point of the laser beam to the point where the laser beam is weakened so that it will not cause harm to people.

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1. Names and Functions of Instrument Components

1.1 Instrument



1.2 Keyboard Functions and Information Display



Keyboard Symbols:

Key	Name	Function
ANG	Angle Measurement Key	Enters the angle measurement mode (backspace to delete when inputting)
DIST	Distance Measurement Key	Enters the distance measurement mode

Key	Name	Function
		(switches between number/letter input)
CORD	Coordinate Measurement Key	Enters the coordinate measurement mode
MENU	Menu Key	Enters the menu mode
ENT	Enter Key	Confirms data input or saves the data of the current line and wraps to the next line
ESC	Exit Key	Cancels the previous operation and returns to the previous display screen or mode
⏻	Power Control Key	Controls the power on/off
F1~F4	Soft Keys	Functions refer to the displayed information
0~9	Numeric Keys	Inputs numbers and letters or selects menu items
·~ -	Symbol Input Key	Inputs symbols, decimal points, positive/negative signs
★	Common Function Key	Used for operations of several common functions of the instrument

Display Symbols:

Display	Symbol Content
V%	Vertical Angle (Slope Display)
HR	Horizontal Angle (Right Angle)
HL	Horizontal Angle (Left Angle)
HD	Horizontal Distance
VD	Height Difference
SD	Slant Distance
N	North Coordinate
E	East Coordinate
Z	Elevation
m	Unit: Meter
ft	Unit: Foot
fi	Unit: Foot + Inch

1.3 Function Keys

Angle Measurement Mode (Three Interface Menus)



Page	Soft Key	Display Symbol	Function
Page 1 (P1)	F1	Measure & Save	Starts angle measurement and records the measurement data to the corresponding file (the measurement file and coordinate file are selected in the data collection function).
	F2	Zero Set	Sets the horizontal angle to zero

Page	Soft Key	Display Symbol	Function
	F3	Scale Set	Sets a horizontal angle through keyboard input
	F4	P1	Displays the soft key functions of Page 2
Page 2 (P2)	F1	Lock	Locks the horizontal angle reading
	F2	Repeat	Repeats horizontal angle measurement
	F3	Slope	Switches between vertical angle/percentage slope
	F4	P2	Displays the soft key functions of Page 3
Page 3 (P3)	F1	H Beep	Sets whether the instrument beeps when rotating to horizontal angles of 0°, 90°, 180°, 270°
	F2	Right/Left	Switches between horizontal angle right angle/left angle
	F3	Vertical Angle	Switches the vertical angle display format (altitude angle/zenith distance)
	F4	P3	Displays the soft key functions of Page 1

Distance Measurement Mode (Two Interface Menus)



Page	Soft Key	Display Symbol	Function
Page 1 (P1)	F1	Measure & Save	Starts distance measurement and records the measurement data to the corresponding file (the measurement file and coordinate file are selected in the data collection function).
	F2	Measure	Starts distance measurement
	F3	Mode	Sets the switching of ranging modes (single precision measurement/N times precision measurement/repeat precision measurement/tracking), and can also set the reflector type, prism constant, and meteorological correction value.
	F4	P1	Displays the soft key functions of Page 2
Page 2 (P2)	F1	Offset	Enters the offset measurement mode
	F2	Stake Out	Enters the distance stake out mode
	F3	m/f/i	Sets the distance unit (meter/foot/foot·inch)
	F4	P2	Displays the soft key functions of Page 1

Coordinate Measurement Mode (Three Interface Menus)



Page	Soft Key	Display Symbol	Function
Page 1 (P1)	F1	Measure & Save	Starts coordinate measurement and records the measurement data to the corresponding file (the measurement file and coordinate file are selected in the data collection function).
	F2	Measure	Starts coordinate measurement
	F3	Mode	Sets the switching of ranging modes (single precision measurement/N times precision measurement/repeat precision measurement/tracking), and can also set the reflector type and prism constant.
	F4	P1	Displays the soft key functions of Page 2
Page 2 (P2)	F1	Setting	Sets the target height and instrument height
	F2	Back Sight	Sets the coordinates of the back sight point
	F3	Station	Sets the coordinates of the station point
	F4	P2	Displays the soft key functions of Page 3
Page 3 (P3)	F1	Offset	Enters the offset measurement mode
	F2	Stake Out	Enters the coordinate stake out mode
	F3	m/f/i	Sets the distance unit (meter/foot/foot·inch)
	F4	P3	Displays the soft key functions of Page 1

1.4 Star (★) Key Mode

After pressing the (★) key, the screen displays as follows:



- Cross Hair: Adjust the brightness of the cross hair reticle in the objective lens by pressing the [◄] or [►] key.

- Laser Plummet: Change the intensity of the laser plummet by pressing the [◄] or [►] key.
- Backlight Brightness: Change the backlight brightness of the display screen by pressing the [◄] or [►] key.
- Battery Level: Displays the remaining battery power.
- Pointing: Press [F1] to switch the laser pointing on/off.
- Compensation: Press [F2] to select "Compensation" to enter the compensator interface and make settings.
- EDM: Press [F3] to enter the rangefinder head settings, where you can set meteorology, grid, and constants, and check the signal strength.

2. Initial Settings

2.1 Power On/Off

Operation Key	Operation Process	Display
Press [POWER]	Turning on the power	
	If an SD card is inserted, the instrument performs SD card detection.	
	After detection is completed, it automatically enters the measurement mode.	

2.2 Setting Tilt Correction for Vertical Angle and Horizontal Angle

When the tilt sensor is activated, it will display the correction values that need to be automatically applied to the vertical angle and horizontal angle due to the instrument not being strictly level. To ensure the accuracy of angle measurement, the tilt sensor must be selected (single-axis/dual-axis), and its display can be used to better level the instrument. If "Compensation Overrun" appears, it indicates that the instrument exceeds the automatic compensation range and must be manually leveled.

- The total station can compensate and correct the errors of vertical angle and horizontal angle readings caused by the tilt of the instrument's vertical axis in the X and Y directions.
- The compensation settings of the total station include three options: Compensation Off, Single-Axis Compensation, and Dual-Axis Compensation.
  (1) Dual-Axis Compensation: Corrects the vertical angle index error and the error of the horizontal angle caused by the tilt of the vertical axis. When any item exceeds the limit, the system will prompt "Compensation Overrun", and the user must level the instrument first.

(2) Single-Axis Compensation: Corrects the vertical angle index error. The prompt is only given when the vertical angle compensation exceeds the limit.

(3) Compensation Off: The compensator is turned off.

- When the instrument is in an unstable state or in windy weather, the vertical angle display will be unstable. In this case, the compensator should be turned off. This can avoid the compensator exceeding the working range due to jitter, and the instrument prompting an error message to interrupt the measurement.

[Example] Setting Tilt Correction with Software

Operation Process	Operation Key	Display
① Enter the star (★) key mode.	[★]	
② Press [F2] to enter the compensation setting function.	[F2]	
③ If the instrument tilt exceeds the correction range, manually level the instrument. Use the method introduced in "3.2 Instrument Setup" to center the black dot. Single-Axis: Only compensates the vertical angle. Dual-Axis: Compensates the vertical angle and horizontal angle.		
④ Press [F2] (Setting) key, and in the compensation settings, select Single-Axis/Dual-Axis/Compensation Off by pressing [◄ or ►] key.	[F2] [ESC]	

2.3 Setting Ranging Type

The C200 total station can be set to red laser ranging and invisible infrared ranging. The available reflectors include prisms, prism-free, and reflective sheets. Users can set it according to operational needs.

Operation Process	Operation Key	Display
① Enter the star (★) key mode.	[★]	
② Press [F3] to enter EDM settings. Press [↑ or ↓] to select the reflector, then press [◄ or ►] to switch the reflector type between prism/ prism-free/ reflective sheet. Press [F3] to save.	[F3]	

2.4 Setting Reflector Prism Constant

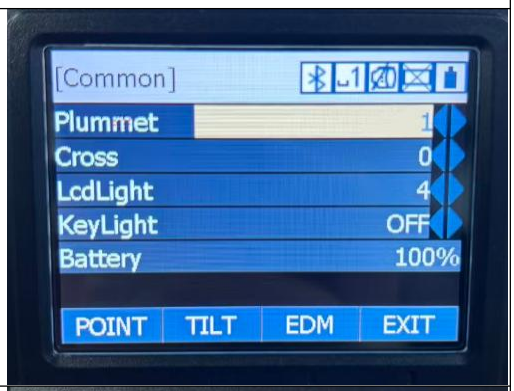
When using a prism as the reflector, the prism constant must be set before measurement. Once the prism constant is set, it will be saved even after the power is turned off.

Step	Operation Key	Operation Process	Display
Step 1	[★][F3]	Enter the star key (★) mode and press [F3].	

Step	Operation Key	Operation Process	Display
Step 2	[↓]	Press [↓] to move down to the prism constant parameter column, and adjust to prism mode, then set the prism constant by pressing [◄ or►].	
Step 3	[F3]	Enter the prism constant correction value, press [F3] (Set), and press [ESC] to return to the star key mode.※1)	
※1) Input range: -99.9mm to +99.9mm, step 0.1mm.			

2.5 Return Light Signal

The return light signal function displays the return light signal strength of the EDM (rangefinder). It can achieve the best aiming effect under harsh conditions.
Once the reflected light from the prism is received, the instrument will emit a beep. When the target is difficult to find, this function can easily aim at the target.

Step	Operation Key	Operation Process	Display
Step 1	[★]	Enter the star mode.	
Step 2	[F3][F4]	Press [F3] (EDM) to enter EDM settings.	

Step	Operation Key	Operation Process	Display
Step 3	[F1]	Press [F1] (Signal) to display the intensity (signal) of the reflected light. The intensity of the light received by the instrument is displayed on the screen in the form of a bar graph.※1)	
※1) Press [ESC] to return to the star key mode.			

2.6 Setting Atmospheric Correction

During distance measurement, the distance value will be affected by the atmospheric conditions at the time of measurement.To take into account the impact of atmospheric conditions, meteorological correction parameters must be used for correction during distance measurement.

Temperature: Air temperature around the instrument

Atmospheric Pressure: Atmospheric pressure around the instrument

PPM Value: Calculated and predicted meteorological correction

● Standard meteorological conditions for total stations (i.e., meteorological correction value of the instrument is 0):

Atmospheric Pressure: 1013hPa

Temperature: 20°C

● Calculation of Atmospheric Correction:

$\Delta S=278.44-0.294922\ P\ /\ (\mathbf{1}+\mathbf{0.003661}T)$ (ppm)

where:

ΔS: Correction coefficient (unit: ppm)

P: Atmospheric pressure (unit: hPa)

If the atmospheric pressure unit used is mmHg, convert it according to: 1hPa=0.75mmHg.

T: Temperature (unit: °C)

2.6.1 Directly Reading Temperature, Atmospheric Pressure, and Atmospheric Correction Value

The temperature and atmospheric pressure are measured by sensors, and then the instrument calculates the atmospheric correction value (PPM) according to the correction formula.

Step	Operation Key	Operation Process	Display

Step	Operation Key	Operation Process	Display
Step 1	[★][F3]	Enter the star key mode and press [F3] (EDM) key.	
Step 2	[F1]	Press [F3] (EDM) to enter EDM settings.	
Step 3	[F2] [◄ or ►] [F3]	Press [F2] (Sensor) to enter the sensor setting. In the sensor, select the sensor to be turned on by pressing [◄ or ►], then press [F3] (Read), and the screen displays the real-time temperature and atmospheric pressure values.	
Step 4	[F4]	Press [F4] (Set), the screen returns to the meteorological data interface, and the instrument will automatically calculate the PPM value internally.※1)	

※1) When the sensor is on, the [F3] position on the meteorological data interface displays "Read". Press [F3] on this interface to automatically obtain the current ambient temperature, atmospheric pressure, and meteorological correction value.

2.6.2 Calculating Atmospheric Correction from Temperature and Atmospheric Pressure

Measure the temperature and atmospheric pressure around the station in advance.

Example: Temperature +25℃, Atmospheric Pressure 1017.5hPa

Step	Operation Key	Operation Process	Display

Step	Operation Key	Operation Process	Display
Step 1	[★]	Enter the star key mode	
Step 2	[F3]	Press [F3] (EDM) to enter EDM settings.	
Step 3	[F1] [F4]	Press [F1] (Meteorology) key to enter meteorological data. Input the temperature and atmospheric pressure. The system calculates the PPM value based on the input temperature and atmospheric pressure.※1) After setting, press ENT, then press [F4] (Set) key, and the screen returns to EDM setting.	
The PPM value can only be calculated by manually inputting temperature and atmospheric pressure when the sensor is off. For the input method, refer to "3.7 Alphanumeric Input Method". Temperature input range: -99.9°~+99.9℃ (step 0.1℃) or -99.9~+99.9℉ (step 0.1℉) Atmospheric pressure input range: 0~1066hPa (step 0.1hPa), 0~1066mmHg (step 0.1mmHg), or 0~1066inHg (step 0.1inHg) If the atmospheric correction value calculated from the input temperature and atmospheric pressure exceeds the range of ±999.9ppm, the operation process returns to Step 2 to re-enter the data.			

2.7 Atmospheric Refraction and Earth Curvature Correction

The instrument can automatically correct the influence of atmospheric refraction and earth curvature during horizontal distance measurement and height difference measurement.The corrections for atmospheric refraction and earth curvature are calculated according to the following formulas:

Corrected horizontal distance:

$D=S\times[\cos\alpha+\sin\alpha\times S\times\cos\alpha(K-2)/2Re]$

Corrected height difference:

$H=S\times[\sin\alpha+\cos\alpha\times S\times\cos\alpha(1-K)/2Re]$

If no correction for atmospheric refraction and earth curvature is performed, the formulas for calculating horizontal distance and height difference are:

$D=S\cdot\cos\alpha$

$H=S\cdot\sin\alpha$

Where:

K = 0.14 ..... Atmospheric refraction coefficient

Re = 6370 km ..... Earth curvature radius

α (or β) ..... Vertical angle (from the horizontal plane)

S ..... Slant distance

Step	Operation Key	Operation Process	Display
Step 1	[★]	Enter the star key mode	
Step 2	[F3]	Press [F3] (EDM) to enter EDM settings.	
Step 3	[F1] [F4]	Press [F1] (Meteorology) key to enter meteorological data and input the refraction coefficient.※1) After setting, press ENT, then press [F4] (Set) key, and the screen returns to EDM setting.	

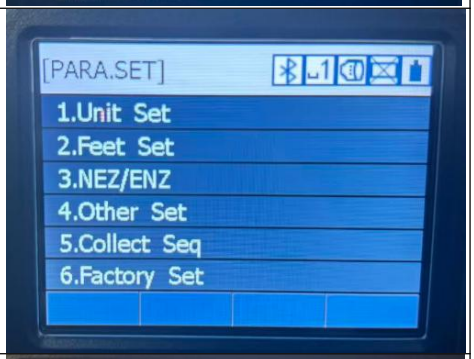
※1) For the input method, refer to "3.7 Alphanumeric Input Method".
The atmospheric refraction coefficient of this instrument is set to K=0.14 at the factory. The K value can be selected from 0.0 to 0.2.

2.8 Setting the Minimum Reading for Angle/Distance

The minimum reading setting allows selecting the display unit for angle/distance measurement.

Instrument Type	Angle	Distance
C200	1″ /5″ /10″ /0.1″	1mm / 0.1mm

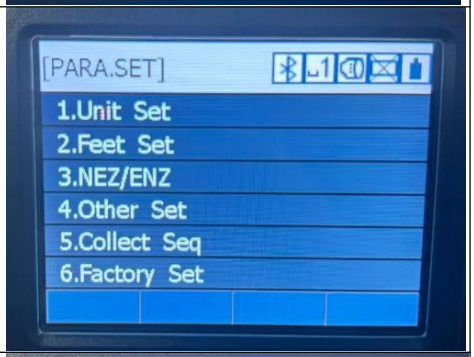
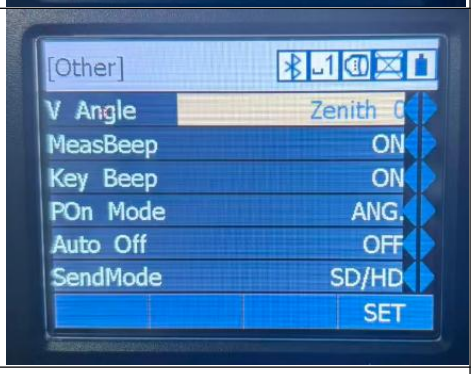
[Example] Minimum angle reading: 0.1″

Operation Process	Operation Key	Display
① Press [MENU] key to enter the main menu, then press numeric key [5] (System Setting).	[MENU] [5]	
② Press [1] key (Unit Setting).	[1]	
③ Press [↑ or ↓] key to select the angle precision setting option. Adjust by pressing [◄ or ►] key, then press [F4] (Set).	[F4]	
④ The screen returns to the system setting menu.		

2.9 Setting Automatic Power Off

If there is no key operation or ongoing measurement for the set minutes, the instrument will automatically power off.

Operation Process	Operation Key	Display
① Press [MENU] key to enter the main menu, then press numeric key [5] (System Setting).	[MENU] [5]	

Operation Process	Operation Key	Display
		
② Press [4] key (Other Setting).	[F4]	
③ Press [◂ or ▸] key to set Auto Power Off. Options include 10 minutes/20 minutes/30 minutes/Off. Then press [F4] (Set) key.	[F4]	
④ The screen returns to the Other Setting menu.		

2.10 Setting Instrument Constant

The method for setting the instrument constant is as follows:

Operation Process	Operation Key	Display
① Enter the star (★) key mode.Press [F3] (EDM) key to enter the EDM setting function.	[★] [F3]	

Operation Process	Operation Key	Display
② After entering the [EDM] settings interface, press the [F4] (P1) key, then you can see the [Constant] option. Press the [F2] (Constant) key.	[P1] [F2]	
③ After entering the [Constant Settings] interface, you can set the [Add Constant] and [Multiply Constant]. Once the settings are complete, press the [F4] Set key to return to the [EDM] settings interface.	[F4]	
Press the [ESC] key to cancel the settings.		

Notes:

The instrument constant is strictly measured and set at the factory. Users generally do not need to make this setting. If the user needs to change the original setting after strict measurement (such as measurement by a professional testing unit in a standard baseline field), this setting can be made.

2.11 Selecting Coded Data File

Operation Process	Operation Key	Display
① Press [MENU] key to enter the main menu, press [F4] (P1) key to display the main menu P2, then press numeric key [1] to enter.	[MENU] [F4] [1]	

Operation Process	Operation Key	Display
② After entering the Select Coded Data File display interface, directly input the file name of the code to be called.※1)		
③ Alternatively, press [F1] (Call) key to display the list of currently selected coded files.	[F1]	
④ Press [↑ or ↓] key to scroll the file list up or down, and select a coded data file. Press [◄ or ►] to turn pages.	[↑ or ↓]	
⑤ Press [ENT] (Enter) key, the file is successfully called, and the screen returns to the main menu.	[ENT]	
※1) For the input method, refer to "3.7 Alphanumeric Input Method".		

3. Measurement Preparation

3.1 Instrument Unpacking and Storage

Unpacking

Place the case gently with the lid facing up, open the case latches, lift the lid, and take out the instrument.

Storage

Cover the telescope objective cap, place the instrument horizontally (with the telescope objective end facing down) in the case with the vertical clamp screw of the alidade and the level of the base facing up. Tighten the vertical clamp screw gently, close the case lid, and fasten the latches.

3.2 Instrument Setup

Install the instrument on a tripod, and perform precise leveling and centering to ensure the accuracy of measurement results (a tripod with a dedicated central connecting screw should be used).

Operation Reference:

Install the instrument on a tripod, and perform precise leveling and centering to ensure

the accuracy of measurement results.

1. Centering and Leveling with Plumb Bob

1）Set up the tripod.

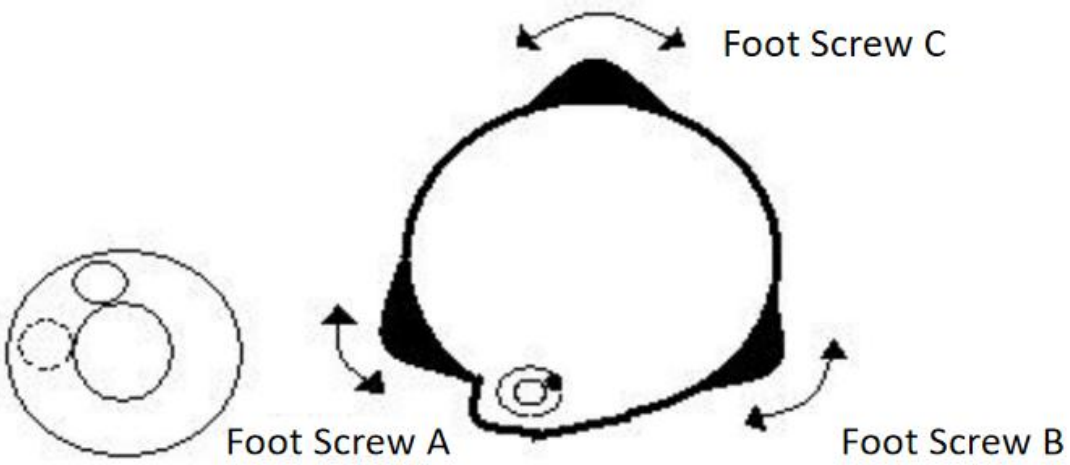
- First, open the tripod so that the three legs are approximately equidistant, the top surface is approximately horizontal, and tighten the three fixing screws.
- Align the center of the tripod with the measuring point approximately on the same vertical line.
- Step on the tripod firmly to support it stably on the ground.

2）Mount the instrument carefully on the tripod top.

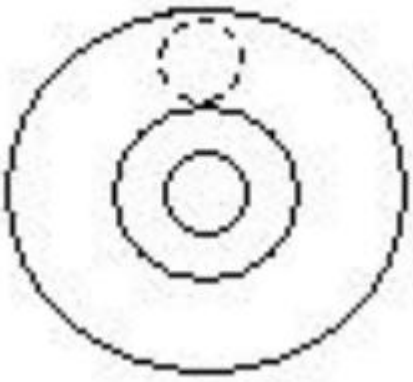
- Hold the instrument with one hand and loosen the central connecting screw with the other hand. Move the instrument slightly on the tripod head until the plumb bob is aligned with the center of the measuring point mark, then tighten the connecting screw gently.

3）Roughly Level the Instrument with Circular Level

- Rotate the two foot screws A and B to move the circular level bubble to the line perpendicular to the line connecting the two foot screws.

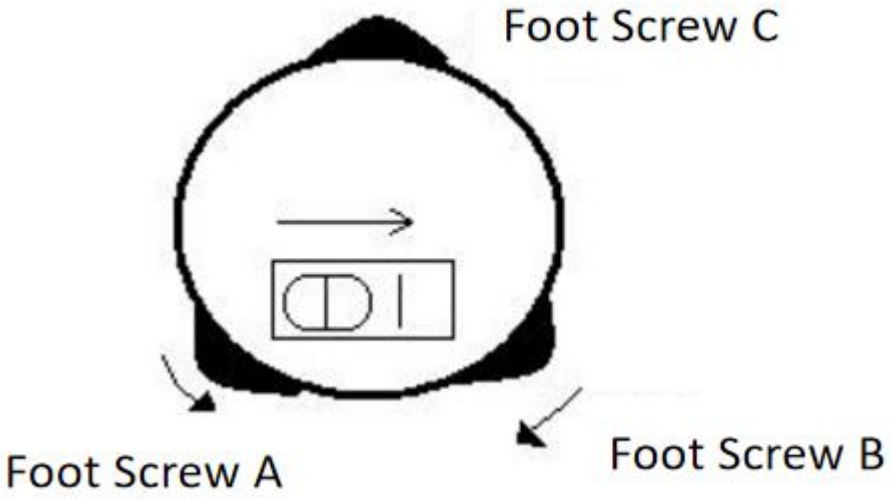


- Rotate the foot screw C to center the circular level bubble.

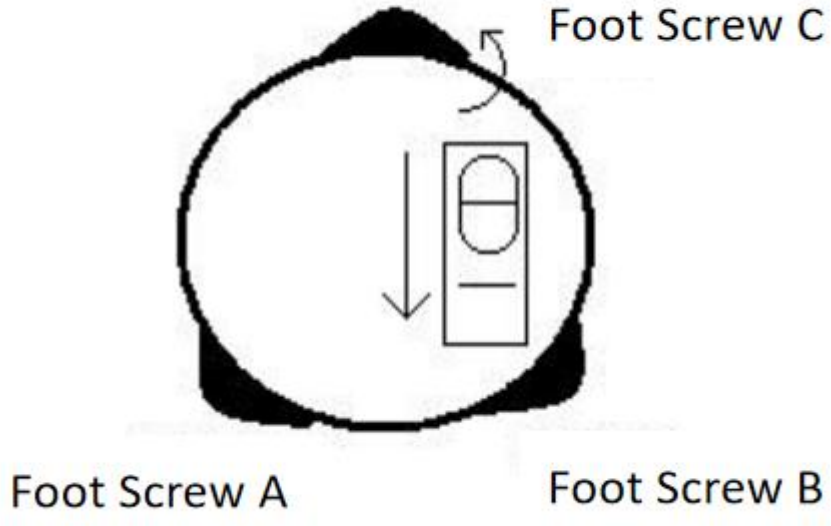


4）Precisely Level the Instrument with Tubular Level

- Loosen the horizontal clamp screw, rotate the instrument to make the tubular level parallel to the line connecting a pair of foot screws A and B, then rotate the foot screws A and B to center the tubular level bubble.



- Rotate the instrument 90° around the vertical axis, then rotate the other foot screw C to center the tubular level bubble.



- Rotate the instrument 90° again, repeat steps until the bubble is centered at four positions.

2. Centering with Optical Plummet

1）Set up the tripod.

- Extend the tripod to an appropriate height, ensure the three legs are of equal length, open, and the tripod top is approximately horizontal and directly above the measuring point. Support the tripod legs on the ground and fix one of the legs.

2）Install the instrument and align the target.

- Mount the instrument carefully on the tripod, tighten the central connecting screw, adjust the optical plummet to make the cross hair image clear. Hold the other two unfixed tripod legs with both hands, and adjust the position of these two legs by observing the optical plummet. When the optical plummet is roughly aligned with the measuring point, fix all three tripod legs on the ground. Adjust the three foot screws of the total station to make the optical plummet precisely aligned with the measuring point.

3）Roughly Level the Instrument with Circular Level

- Adjust the length of the three tripod legs to center the circular level bubble of the total station.

4）Precisely Level the Instrument with Tubular Level

- Loosen the horizontal clamp screw, rotate the instrument to make the tubular level parallel to the line connecting a pair of foot screws A and B. Rotate the foot screws A and B to center the tubular level bubble.
- Rotate the instrument 90℃ to make it perpendicular to the line connecting the foot screws A and B. Rotate the foot screw C to center the tubular level bubble.

5）Precise Centering and Leveling

- Through observing the optical plummet, slightly loosen the central connecting screw, translate the instrument (do not rotate the instrument) to make the instrument precisely aligned with the measuring point. Tighten the central connecting screw again and re-level the instrument precisely.
- Repeat this operation until the instrument is precisely aligned with the measuring point.

3.3 Battery Installation/Removal, Information, and Charging

Battery Information



Full Display——Sufficient battery power, ready for operation.

Half Display——When this message first appears, the battery can still be used for about 4 hours; if the usage time is unknown, prepare a spare battery or recharge it before use.

Low Display——Battery power is low, finish the operation as soon as possible, replace the battery and recharge it.

Flashing until Disappearance——It can last for about a few minutes from flashing to power-off due to low battery. The battery is dead, so replace and recharge it immediately.

Notes:

① The working time of the battery depends on environmental conditions, such as ambient temperature, charging time, and number of charges. For safety, it is recommended to recharge in advance or prepare some fully charged spare batteries.

② The display level of remaining battery capacity is related to the current measurement mode. Sufficient remaining battery capacity in the angle measurement mode does not guarantee that the battery can be used in the distance measurement mode. Because the power consumption of the distance measurement mode is higher than that of the angle measurement mode, when switching from the angle mode to the distance mode, ranging may be interrupted due to insufficient battery capacity.

Precautions for Removing the Onboard Battery Pack:

▲Before removing the battery pack each time, the instrument power must be turned off; otherwise, the instrument may be damaged.

Battery Charging

To install the battery pack: Insert the battery pack into the slot at the bottom of the instrument, press the button on the side of the battery pack to lock it into place.

A dedicated charger should be used for battery charging; this instrument is equipped with the SD841201 charger.

When charging: First, connect the charger to a power supply between 85V and 265V. Remove the battery pack from the instrument, insert the charger plug into the charging socket of the battery pack. The indicator light on the charger turns red when charging is in progress, and green when charging is completed. Pull out the plug.

Charging Precautions:

▲ Although the charger has an overcharge protection circuit, the plug should still be pulled out from the socket after charging is completed.

▲ Charge within the temperature range of 0°~+45°C; charging may be abnormal beyond this range.

▲ If the indicator light does not turn on when the charger is connected to the battery, the charger or battery may be damaged and should be repaired.

Storage Precautions:

▲ Rechargeable batteries can be recharged 300-500 times. Complete discharge of the battery will shorten its service life.

▲ To obtain the longest service life of the battery, please charge it once a month.

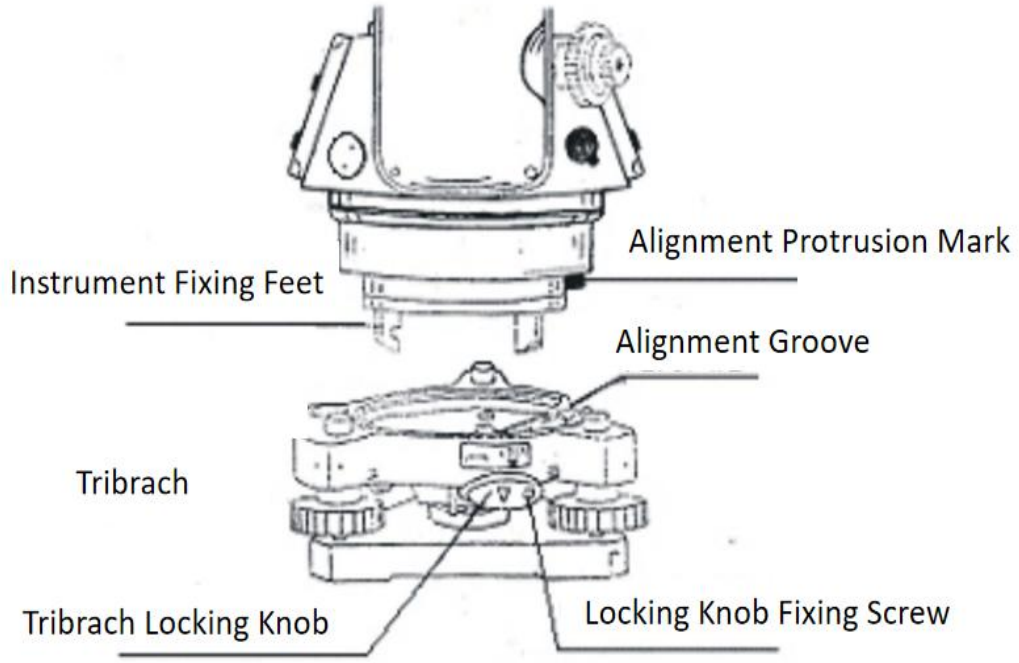
3.4 Reflective Prism

When the total station performs operations such as distance measurement using infrared light, a reflective prism must be placed at the target. The reflective prism has a single (triple) prism group, which can be connected to the base through a base connector and installed on a tripod, or directly installed on a centering rod. The prism group is configured by the user according to operational needs.

3.5 Base Installation/Removal

Removal

If necessary, the triangular base can be removed from the instrument (including the reflective prism base connector adopting the same base). First, loosen the fixing screw of the base locking knob with a screwdriver, then rotate the locking knob counterclockwise by approximately 180° to separate the instrument from the base.



Installation

Align the alignment protrusion mark of the instrument with the alignment groove of the base, place the three fixing feet of the instrument into the holes of the base correspondingly, mount the instrument on the triangular base, rotate the locking knob clockwise by 180° to lock the instrument with the base, then tighten the locking knob fixing screw with a screwdriver.

3.6 Telescope Eyepiece Adjustment and Target Aiming

Method for Aiming at Target (for Reference)

① Point the telescope at a bright sky, rotate the eyepiece tube to focus and clearly see the cross hair (first rotate the eyepiece tube towards yourself, then slowly screw it in to focus the cross hair clearly);

② Aim at the target point using the tip of the triangular mark in the collimator. Keep a certain distance between the eye and the collimator when aiming;

③ Use the telescope focusing screw to make the target image clear.

If parallax is found when moving the eye up and down or left and right at the eyepiece end, it indicates that the focusing or eyepiece diopter is not adjusted properly, which will affect the observation accuracy. The focusing and eyepiece tube should be carefully adjusted to eliminate parallax.

3.7 Alphanumeric Input Method

C200 series total station keyboard is equipped with alphanumeric keys, so users can directly input numbers and characters.

Inputting Numbers

[Example 1] Selecting the Station Instrument Height in Data Collection Mode

1. The arrow indicates the item to be input. Press the [↑][↓] keys to move the arrow up and down.



2. Press the [↓] key to move the cursor to the Instrument Height item.



3. Directly input using the numeric keys: press [1] to input "1", press [.] to input ".", press [5] to input "5". After inputting, press [ENT] to confirm. At this time, the

instrument height is 1.5m, and the input instrument height is 1.5000m. After inputting, press ENT to save.



Inputting Angles

[Example 2] For example, input the angle 90°10′ 20″ when setting the horizontal angle in basic measurement.



Press [9] to input "9"; press [0] to input "0"; press [.] to input degree "°"; press [1] to input "1"; press [0] to input "0"; press [.] to input minute "′ "; press [2] to input "2"; press [0] to input "0"; press [F4] to set. At this time, the horizontal angle is 90°10′ 20″ .

Inputting Characters

[Example 3] Inputting the station code in data collection mode.

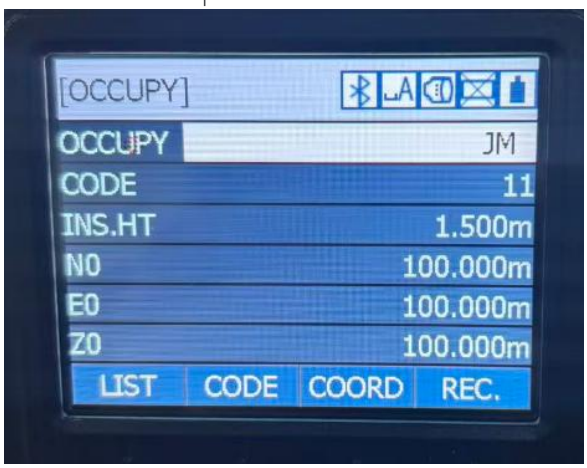
1. Press the [F4] key to enter the data collection interface



2. After entering the data collection interface, press numeric key [1] to enter the station setting



3. Press the [DIST] key to switch to the letter input mode. Each press of [DIST] switches the input mode between numbers and letters.



Note:

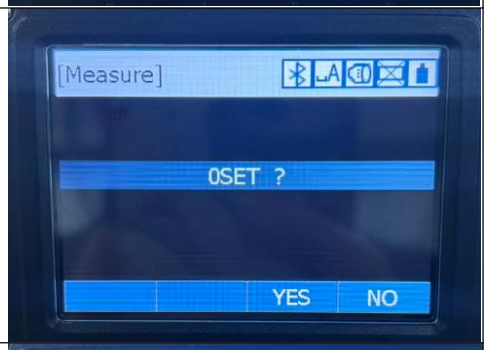
- When "Letter" is displayed in the menu, numbers can be input; when "Number" is displayed, letters can be input.
- Press the [ANG] (backspace) key to delete the input character.
- When there are two consecutive letters on the same key in the input letters, the cursor automatically moves to the next position when inputting the second letter.

Press the [STU] key to display "S"; press the [MNO] key three times continuously to display "O"; press the [STU] key three times to display "U"; press the [STU] key twice continuously to display "T"; press the [GHI] key twice continuously to display "H"; the cursor automatically moves to the next position, then press the [STU] key four times to display the number "1". After inputting, press [F4] to record.

4. Angle Measurement Mode

4.1 Horizontal Angle and Vertical Angle Measurement

Measurement of horizontal angle (right angle) and vertical angle.
Ensure the instrument is in angle measurement mode.

Operation Process	Operation Key	Display
① Aim at the first target A.	Aim at Target A	
② Press [F2] (Zero Set) key and [F3] (Yes) key to set the horizontal angle of target A to 0°00′ 00″.	[F2] [F3]	
③ Aim at the second target B, and the vertical angle and horizontal angle of target B will be displayed.	Aim at Target B	

Method for Aiming at Target (for Reference)
① Point the telescope at a bright sky, rotate the eyepiece tube to focus and clearly see the cross hair (first rotate the eyepiece tube towards yourself, then slowly screw it in to focus the cross hair clearly);

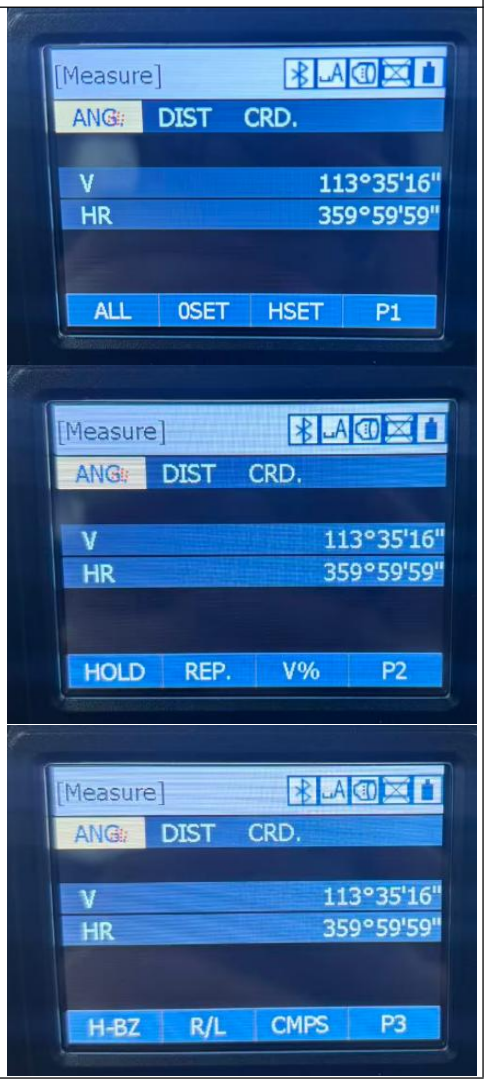
② Aim at the target point using the tip of the triangular mark in the collimator. Keep a certain distance between the eye and the collimator when aiming;

③ Use the telescope focusing screw to make the target image clear.

※ If parallax is found when moving the eye up and down or left and right at the eyepiece end, it indicates that the focusing or eyepiece diopter is not adjusted properly, which will affect the observation accuracy. The focusing and eyepiece tube should be carefully adjusted to eliminate parallax.

4.2 Switching Horizontal Angle (Right Angle/Left Angle)

Ensure the instrument is in angle measurement mode.

Operation Process	Operation Key	Display
① Press the [F4] (P1) key twice to flip to [P3], and the [Left/Right] function keys will appear at the bottom.	[P1] Twice	

Operation Process	Operation Key	Display
② Press the [F2] and [Left/Right] keys to switch from left angle mode (HR) to right angle mode (HR).	[F2]	
③ Press the [F2] key again to display in right angle mode. ※1)		
※1) Each time you press the [F2] (Left/Right) key, it alternates between the HR and I modes.		

4.3 Setting Horizontal Angle

4.3.1 Setting via [Lock] Key

Ensure the instrument is in angle measurement mode.

Operation Process	Operation Key	Display
① Rotate the horizontal fine adjustment screw to the desired horizontal angle. Press the [P1] key to enter the [P2] page.	Display the angle.	
②Enter the [P2] page, and the [Lock] function key will be located at the bottom right corner.		

Operation Process	Operation Key	Display
③ Press the [F1] (Lock) key.	[F1]	
④ Aim at the target point.	Aim at the target.	
⑤ Press the [F3] (OK) key to complete the horizontal angle setting. The screen will return to the angle measurement mode, displaying as shown in the right figure. ※1)	[F4]	
※1) To return to the previous mode, press the [F4] (Cancel) key.		

4.3.2 Setting via Keyboard Input

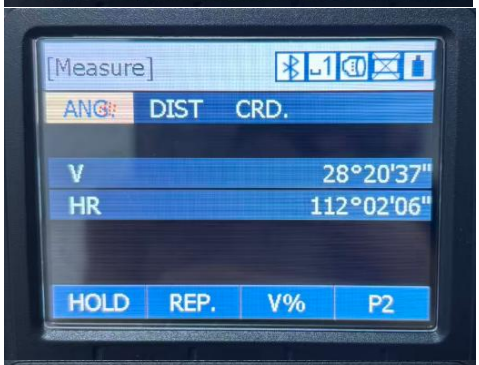
Ensure the instrument is in angle measurement mode.

Operation Process	Operation Key	Display
① Aim at the target point and press the [F3] (Set Horizontal Angle) key.	Aim at the target, [F3]	
② Enter the required horizontal angle reading via the keyboard and press the [F4] (Confirm) key. ※1) For example: 150°10′ 20″ .	[F4]	

Operation Process	Operation Key	Display
③ The horizontal angle is set, and normal measurement can be performed starting from the required horizontal angle.	[F1]	

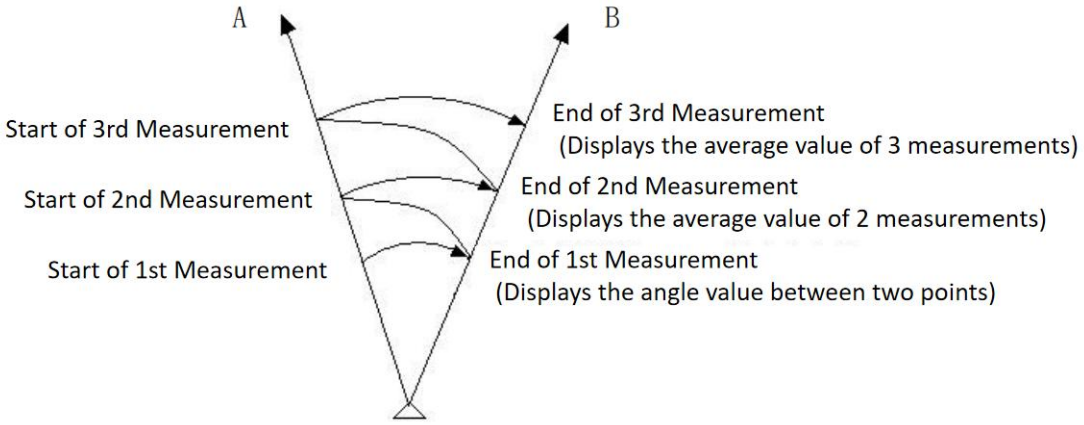
4.4 Conversion between Vertical Angle and Slope (%)

Ensure the instrument is in the angle measurement mode.

Operation Process	Operation Key	Display
① Press the [F4] [P1] key to switch to the [P2] function menu.	[F4]	  
② Press the [F3] (Slope) key.※1)	[F3]	
※1) Each press of the [F3] (Slope) key toggles the display mode alternately. When the height is close to 90° (infinite), the display will prompt "Out of Range".		

4.5 Angle Repetition Measurement

Angle repetition measurement can be performed in the horizontal angle (right angle) measurement mode. Ensure the instrument is in the horizontal angle (right angle) measurement mode.



Operation Process	Operation Key	Display
① Press the [F4] key to switch to the [P2] function menu.	[F4]	
②Press the [F2] (Repeat Measurement) key to enter the angle repetition measurement mode.	[F2]	
③ Aim at target A and press the [F1] (Reset) key.	Aim at target A, [F1]	

Operation Process	Operation Key	Display
④ Press the [F3] (Yes) key to enter the repetition measurement function interface.	[F3]	
⑤ Use the horizontal clamp and tangent screws to aim at target B, then press the [F4] (Lock) key.	Aim at target B, [F4]	
⑥ Use the horizontal clamp and tangent screws to aim at target A again, then press the [F4] (Unlock) key.	Aim at target A, [F4]	
⑦ Use the horizontal clamp and tangent screws to re-align target B, then press the [F4] (Lock) key.	Aim at target B, [F4]	
⑧ Repeat steps ⑥~⑦ to complete the required number of measurements. Example: Repeat 6 times. ※1) ※2)		
⑨ To exit angle repetition measurement, press the [F2] (Exit) key and then the [F3] (Yes) key. The screen returns to the normal angle measurement mode.	[F2] [F3]	

※1) The horizontal angle can be accumulated up to (3600°00′ 00″ - minimum reading) in the horizontal angle (right angle) mode.
For example, when the minimum reading is 5 seconds, the horizontal angle can be accumulated up to ±3599°59′ 55″.
※2) If the angle observation result differs from the initial observation value by more than

Operation Process	Operation Key	Display
±30", an error message will be displayed.		

4.6 Horizontal Angle 90°Interval Beep

If the horizontal angle falls within the range of 0° (90°, 180°, or 270°) ±4°30′ , a beep will sound; the beep will stop when approaching ±15″ . This setting is not retained after power-off. Ensure the instrument is in the angle measurement mode.

Operation Process	Operation Key	Display
① Press the [F4] (P1) key twice to switch to the [P3] function menu.	[F4] Twice	
② Press the [F1] (H Beep) key to display the last setting status.	[F1]	
③ Press the [◄ or ►] key to select the beep on/off status. After setting, press [Confirm] to return to the basic measurement interface.	[◄ or►]	
④ After the settings are completed, press [Set] to return to the basic measurement interface.	[F4]	

4.7 Conversion between Zenith Distance and Altitude Angle

Operation Process	Operation Key	Display
① Press the [F4] key twice to switch to the [P3] function menu.	[F4] Twice	
② Press the [F3] (Vertical Angle) .※1)	[F1]	
※1)Press the [F3] (Vertical Angle) key to toggle the display between zenith distance and altitude angle.		

5. Distance Measurement Mode

C200 total station during measurement, avoid distance measurement targeting strong reflective objects (such as traffic lights) in infrared ranging mode and laser ranging mode, as the measured distance may be incorrect or inaccurate.

When the measurement key is pressed, the instrument will measure the distance to the target in the optical path.

During ranging, if pedestrians, vehicles, animals, swinging branches, etc., pass through the ranging optical path, part of the light beam will be reflected back to the instrument, resulting in inaccurate distance results.

In non-prism measurement mode and reflector sheet measurement mode, avoid blocking or interfering with the light beam during measurement.

Non-Prism Ranging

- Ensure the laser beam is not reflected by any high-reflectivity objects close to the optical path.
- When distance measurement is started, the EDM (Electronic Distance Meter) will measure the distance to objects in the optical path. If there are temporary obstacles (such as passing cars, heavy rain, snow, or fog) in the optical path at this time, the distance measured by the EDM is the distance to the nearest obstacle.
- For long-distance measurement, the deviation of the laser beam from the line of

sight will affect measurement accuracy. This is because the reflection point of the divergent laser beam may not coincide with the point aimed at by the crosshairs. Therefore, it is recommended that the user make precise adjustments to ensure the laser beam is aligned with the line of sight (refer to "12.11 Non-Prism Ranging").

- Do not use two instruments to measure the same target simultaneously.

Precision Ranging with Prism

Standard mode (prism mode) should be adopted for precision ranging with a prism.

Ranging with Red Laser and Reflector Sheet

Laser can also be used for ranging with reflector sheets. Similarly, to ensure measurement accuracy, the laser beam must be perpendicular to the reflector sheet and undergo precise adjustment (refer to "12.11 Non-Prism Ranging").

Ensure the correct additional constants for different reflecting prisms.

Before distance measurement, it is usually necessary to confirm the settings of atmospheric correction and prism constant, then perform distance measurement. For the settings of atmospheric correction and prism constant, refer to "Chapter 2 Initial Settings".

5.1 Distance Measurement

Operation Process	Operation Key	Display
① Press the [DIST] key to enter the distance measurement interface, and distance measurement starts. ※1)	[DIST]	
② Click [F2] (Measure) to start ranging.	[F2]	

Operation Process	Operation Key	Display
③ After measurement is completed, the measured distance is displayed. The right figure shows the interface during measurement. ※2) ※3)		
④ Press [F1] (Measure and Save) to enter the editing interface. After editing, press [F4] (Measure) to start the measurement. Once the measurement is successful, a prompt will appear. Press [F4] (Confirm), and the screen will return to the distance measurement mode (if the point name is duplicated, the system will prompt whether to overwrite). After completing the measurement of one point, the program will automatically increment the point name by +1. Simply repeat the previous steps to begin a new.※4)	[F1] [F4]	 
※1) When the EDM is working, the measurement interface is entered. The [F4] [Stop] key can be pressed to exit the measurement interface. ※2) The distance unit is displayed as "m" (meter), "ft" (foot), or "fi" (foot-inch), and a beep sounds each time the distance data is updated. ※3) If the measurement result is affected by atmospheric turbulence, the instrument can automatically repeat the measurement. ※4) For the recording method, refer to "7.6 Data Collection Parameter Settings".		

5.2 Setting Measurement Mode

The C200 total station provides seven measurement modes: Single Precision Measurement, 2 Times Precision Measurement, 3 Times Precision Measurement, 4 Times Precision Measurement, 5 Times Precision Measurement, Continuous Precision Measurement, and Tracking Measurement. Users can select according to needs.

Operation Process	Operation Key	Display

Operation Process	Operation Key	Display
① Press the [DIST] key to enter the distance measurement interface, and distance measurement starts.	[DIST]	
② To change the measurement mode, press the [F3] (Mode) key to enter the EDM settings interface, then press the [◂ or ▸] key to select one of the seven measurement modes (Single/2 Times/3 Times/4 Times/5 Times/Continuous Precision Measurement, Tracking Measurement). After setting, press the [F3] (Confirm) key to return to the measurement interface.	[F3]	

5.3 Selecting Distance Unit (Meter/Foot/Foot-Inch) via Soft Keys

The distance unit can be changed via soft keys.

Operation Process	Operation Key	Display
① Press the [F4] (P1) key to switch to the [P2] function interface.	[F4]	

Operation Process	Operation Key	Display
② Press the [F3] (m/f/i) key to change the displayed unit. Each press of the [F3] (m/f/i) key toggles the unit mode in the order of m/ft/fi.	[F3]	

5.4 Staking

This function displays the difference between the measured distance and the entered staking distance.
Measured Distance - Staking Distance = Display Value
During staking, any of the three staking modes can be selected: Horizontal Distance (HD), Height Difference (VD), and Slope Distance (SD).

Operation Process	Operation Key	Display
① In the distance measurement mode, press the [F4] (P1) key to enter the [P2] function interface.	[F4]	
② Press the [F2] (Staking) key.	[F2]	

Operation Process	Operation Key	Display
③ Press the [F2] (Set) key to set the staking measurement mode. Press the left/right keys to select Horizontal Distance Staking, Height Difference Staking, or Slope Distance Staking. Press the down key to set the corresponding staking value. ※1) After completion, press the [F4] (Confirm) key to save. For example, set to Horizontal Distance Staking mode as shown in the right figure.	[F2] [◄ or►] [F4]	
④ Return to the distance staking interface.		
⑤ Aim at the target (prism) and press the [F1] (Measure) key to start measurement. The difference between the measured distance and the staking distance is displayed. A positive value indicates the measured distance is greater than the staking distance, and a negative value indicates the measured distance is less than the staking distance.	Aim at target P	
⑥ Move the target prism until the horizontal distance display equals 0m.		
※1) Refer to "3.7 Alphanumeric Input Method" for input operation.		

5.5 Eccentric Measurement

There are four eccentric measurement modes:
1. Angle Eccentric Measurement
2. Distance Eccentric Measurement
3. Plane Eccentric Measurement

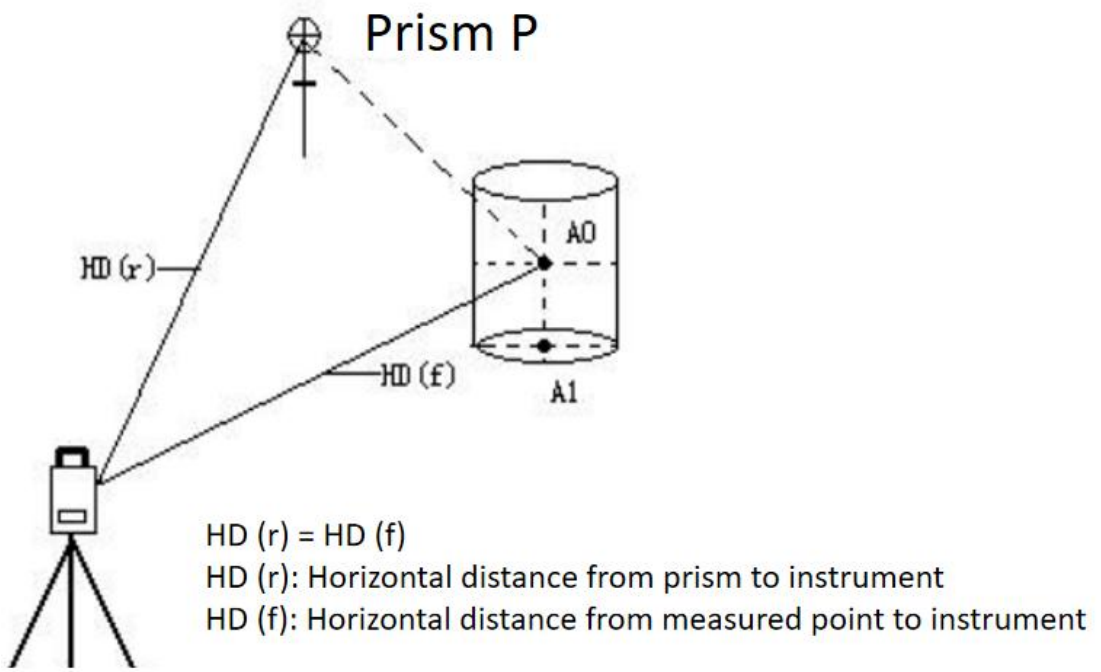
4. Cylinder Eccentric Measurement

5.5.1 Angle Eccentric Measurement

This mode is very useful when it is difficult to directly set up a prism, such as at the center of a tree. As long as the prism is placed at point P with the same horizontal distance from the instrument as the measured object, and eccentric measurement is performed after setting the instrument height/target height, the coordinates of the center position of the measured object can be obtained.

When measuring the coordinates of ground point A1 (the projection of A0 on the ground), set the instrument height/target height.

When measuring the coordinates of point A0, only set the instrument height (set the target height to 0).



Before eccentric measurement, the instrument height/target height should be set. For setting the coordinates of the instrument station, refer to "6.2 Setting Instrument Station Coordinates".

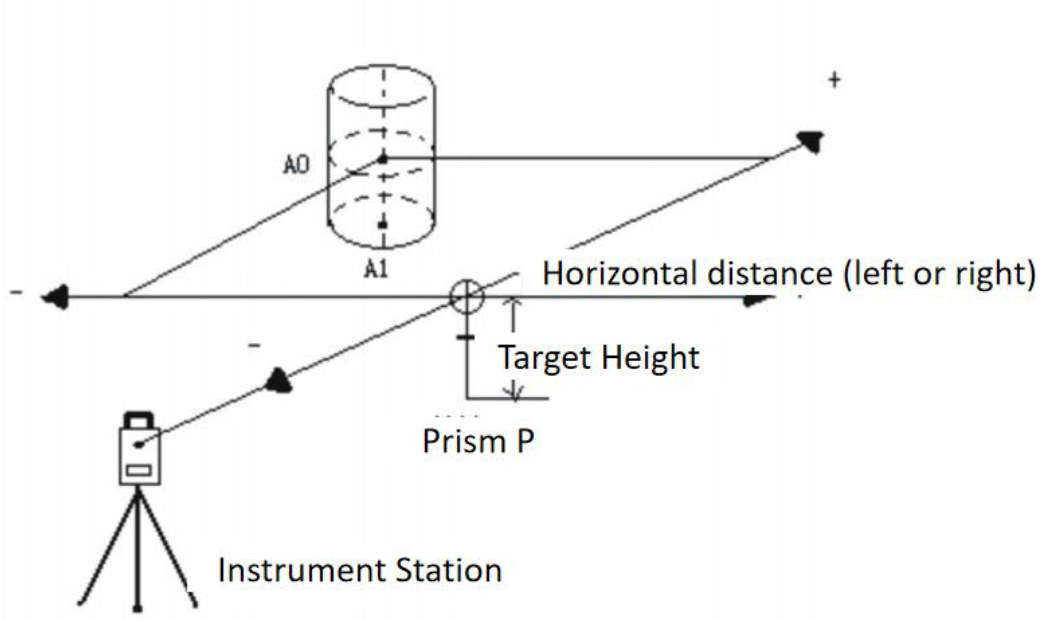
Operation Process	Operation Key	Display
① In the distance measurement mode, press the [F4] (P1) key to enter the [P2] function interface.	[F4]	

Operation Process	Operation Key	Display
② Press the [F1] (Eccentric) key to enter the eccentric measurement interface.	[F1]	
③ Press the numeric key [1] (Angle Eccentric) to enter angle eccentric measurement.	[1]	
④ Aim at prism P and press the [F4] (Measure) key. If the repeated precision measurement mode is adopted, press the [F4] (Stop) key to end the measurement of the distance between the instrument and the prism. ※1)	Aim at target P [F4]	
⑤ Rotate the horizontal clamp and tangent screws to aim at the target point A0.	Aim at A0	
⑥ To display the coordinates of point A0 or A1, press the [Coordinate] key. ※2)	[Coordinate]	
※1) Press the [F1] (Next Point) key to return to operation step ④. ※2) Press the [ESC] key to return to the eccentric measurement interface.		

5.5.2 Distance Eccentric Measurement

If the radius of a tree or pond is known and it is necessary to determine the distance and coordinates of its center, to measure the distance or coordinates of point P0, enter the

eccentric distance oHD as shown in the figure, measure point P1 in the distance eccentric measurement mode, and the distance and coordinates of point P0 will be displayed on the screen.



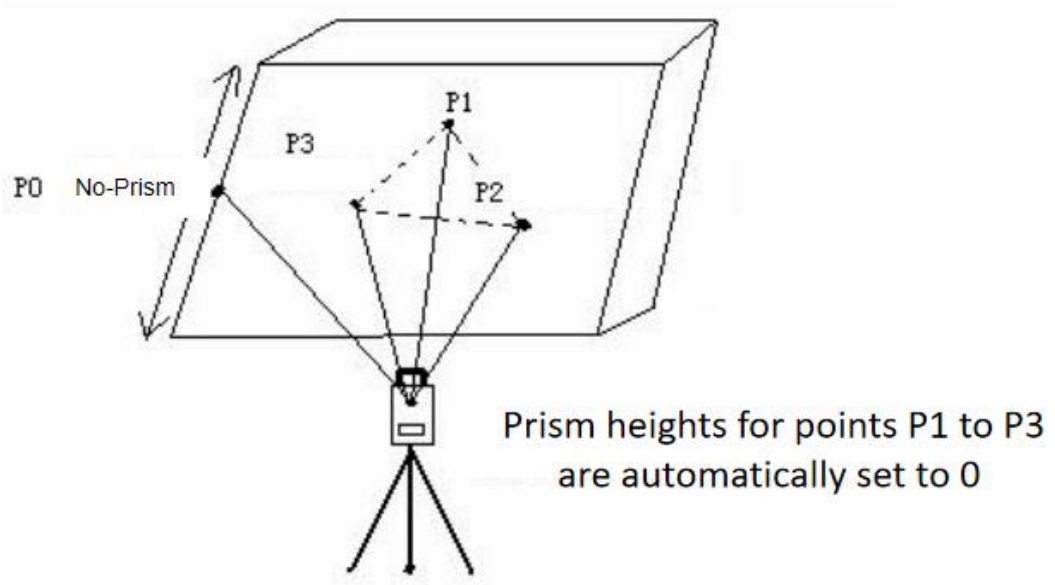
Operation Process	Operation Key	Display
① In the distance measurement mode, press the [F4] (P1) key to enter the [P2] function interface.	[F4]	
② Press the [F1] (Eccentric) key to enter the eccentric measurement interface.	[F1]	

Operation Process	Operation Key	Display
③ Press the numeric key [2] (Distance Eccentric) to enter distance eccentric measurement.	[2]	
④ Use the numeric keys to enter the front/back eccentricity or left/right eccentricity, then press the [F4] (Confirm) key.	Enter eccentricity, [F4]	
⑤ Aim at prism P1 and press the [F4] (Measure) key to start measurement. If the repeated precision measurement mode is adopted, press the [F4] (Stop) key to end the measurement. The measurement result after correcting the eccentric distance will be displayed after ranging.	Aim at P1 [F4]	
⑥ Press the [Coordinate] key to display the coordinates of point P0.	[Coordinate]	
※1) Press the [ESC] key to return to the eccentric measurement interface.		

5.5.3 Plane Eccentric Measurement

This function is used to measure points that cannot be directly measured, such as the distance or coordinates of the edge of a plane.

At this time, first measure any three points (P1, P2, P3) on the plane in this mode to determine the measured plane, aim at the measured point P0, and the instrument will calculate and display the distance and coordinates of the intersection point between the line of sight and the plane.



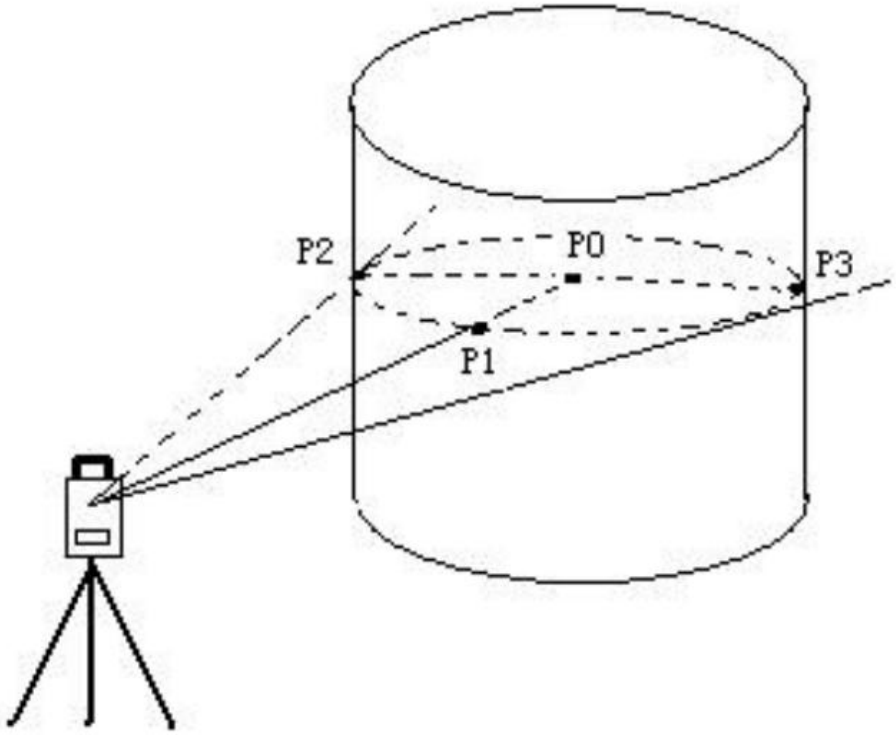
Operation Process	Operation Key	Display
① In the distance measurement mode, press the [F4] (P1) key to enter the [P2] function interface.	[F4]	
② Press the [F1] (Eccentric) key to enter the eccentric measurement interface.	[F1]	
③ Press the numeric key [3] (Plane Eccentric) to enter plane eccentric measurement.	[3]	

Operation Process	Operation Key	Display
④ Aim at prism P1 and press the [F1] (Measure) key. If the repeated precision measurement mode is adopted, press the [F4] (Stop) key to end the measurement. The display prompts to measure the second point after the measurement is completed.	Aim at P1 [F1]	
⑤ Measure the second and third points in the same way.	Aim at P2 [F1] Aim at P3 [F1]	
⑥ The instrument calculates and displays the coordinates and distance value of the intersection point between the line of sight and the plane.		
⑦ After obtaining point P3, press the [Confirm] key and aim at the edge of the plane (P0).	Aim at P0	
⑧ Press the [Coordinate] key to display the coordinates of the point P0.	[Coordinate]	
※1) Press the [ESC] key to return to the eccentric measurement interface. During the measurement process, press the [Reset] key to return to step ④ and restart the measurement.		

5.5.4 Cylinder Eccentric Measurement

First, directly measure the distance of point (P1) on the cylindrical surface, then measure the direction angles of points (P2) and (P3) on the cylindrical surface to calculate the distance, direction angle, and coordinates of the cylinder center.

The direction angle of the cylinder center is equal to the average of the direction angles of points (P2) and (P3) on the cylindrical surface.



For setting the coordinates of the instrument station, refer to "6.2 Setting Instrument Station Coordinates".

Operation Process	Operation Key	Display
① In the distance measurement mode, press the [F4] (P1) key to enter the [P2] function interface.	[F4]	
② Press the [F1] (Eccentric) key to enter the eccentric measurement interface.	[F1]	

Operation Process	Operation Key	Display
③ Press the numeric key [4] (Plane Eccentric) to enter plane eccentric measurement.	[4]	
④ Aim at the center of the cylindrical surface (P1) and press the [F1] (Measure) key to start measurement. After the measurement is completed, press the [Confirm] key. The display prompts to observe the angle of the left tangent (P2) of the cylinder.	Aim at P1 [F1]	
⑤ Aim at the left tangent (P2) of the cylinder and press the [F4] (Confirm) key. The system will prompt to sight the right tangent of the cylinder (P3).	Aim at P2 [F4]	
⑥ Aim at the right point (P3) of the cylindrical surface and press the [F4] (Confirm) key. After the measurement is completed, the distance between the instrument and the cylinder center (P0) is calculated.	Aim at P3 [F4]	
⑦ To display the coordinates of point P0, press the [Coordinate] key. ※1)	[Coordinate]	
※1) Press the [ESC] key to return to the eccentric measurement interface. During the measurement process, press the [Reset] key to return to step ④ and restart the measurement.		

6. Coordinate Measurement Mode

6.1 Steps for Coordinate Measurement

Coordinate measurement allows direct determination of unknown point coordinates by inputting the instrument height and target height.

- To set the instrument station coordinates, refer to "6.2 Setting Instrument Station Coordinates".
- To set the instrument height and target height, refer to "6.3 Setting Instrument Height" and "6.4 Setting Target Height".

- To set the backsight and determine the azimuth angle via measurement before performing coordinate measurement.

The coordinates of the unknown point are calculated and displayed using the following formulas:

Instrument station coordinates: (N0, E0, Z0)

Target center coordinates relative to the instrument center: (n, e, z)

Instrument height: Inst. Ht.

Unknown point coordinates: (N1, E1, Z1)

Target height: Tgt. Ht.

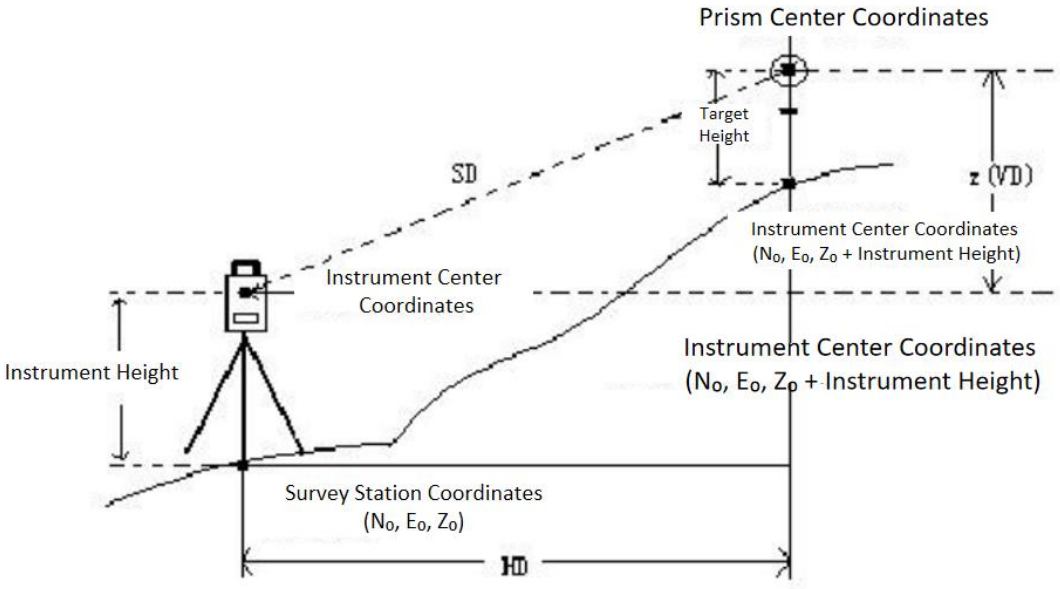
Height difference: Z (VD)

N1 =N0 +n

E1 =E0 +e

Z1 =Z0 +Inst. Ht.+Z−Tgt. Ht.

Instrument center coordinates (N0, E0, Z0 + Inst. Ht.)



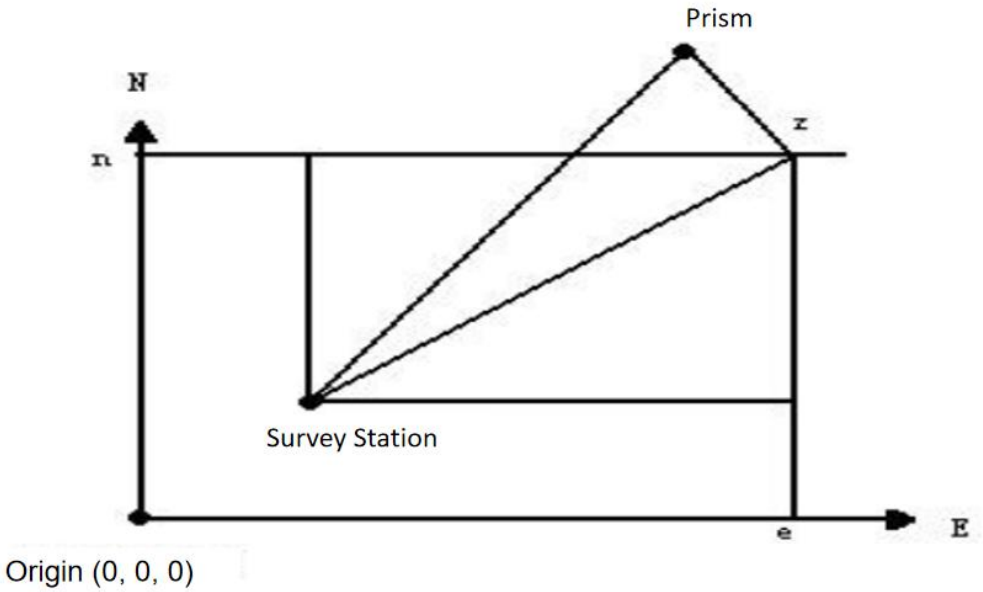
For coordinate measurement, note: Set the instrument station coordinates, instrument height, target height, and backsight azimuth angle first.

Operation Process	Operation Key	Display
①Aim at target A, press the [F2] (Measure) key for coordinate measurement, or [F1] (Store/Measure) to measure and store coordinates. After measuring one point, the program automatically increments the point name by 1. You can also encode the stored point and repeat the steps to restart measurement.	Aim at the prism [F2] or [F1]	

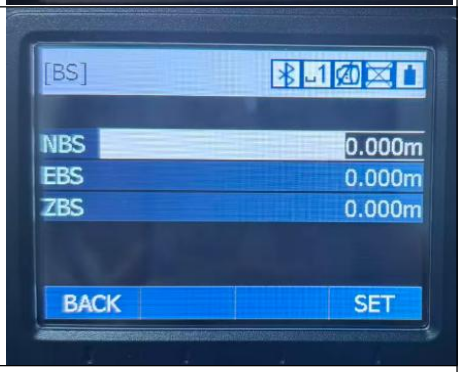
Operation Process	Operation Key	Display
		
② The measured coordinates are displayed as shown in the right figure.	[F1]	

6.2 Setting Instrument Station Coordinates

Set the coordinates of the instrument (instrument station) relative to the coordinate origin. The instrument can automatically convert and display the coordinates of unknown points (target points) in this coordinate system.



Operation Process	Operation Key	Display

Operation Process	Operation Key	Display
① In the coordinate measurement mode, press the [F4] (P1) key to enter the [P2] function interface.	[F4]	
② Press the [F3] (Instrument Station) key to enter the instrument station setting interface.	[F3]	
③ Use the numeric keys to input the N/E/Z coordinates and press the [ENT] (Enter) key to confirm. ※1)	Input data	
④ After input, press the [F4] (Confirm) key. The screen returns to the coordinate measurement mode.		
※1) For input method, refer to "3.7 Alphanumeric Input Method". Input range: -99999999.9999 ≤ N, E, Z ≤ +99999999.9999 m; -99999999.9999 ≤ N, E, Z ≤ +99999999.9999 ft; -99999999.11.7 ≤ N, E, Z ≤ +99999999.11.7 ft+inch.		

6.3 Setting Instrument Height

Note: The instrument height is retained after power-off.

Operation Process	Operation Key	Display
① In the coordinate measurement mode, press the [F4] (P2) key to enter the [P2] function interface.	[F4]	

Operation Process	Operation Key	Display
② Press the [F1] (Set) key to enter the height setting interface.	[F1]	
③ Use the numeric keys to input the instrument height and press the [F4] (Confirm) key to save. ※1)	Input instrument height [F4]	
※1) For input method, refer to "3.7 Alphanumeric Input Method". Input range: -9999.9999 ≤ Instrument Height ≤ +9999.9999 m; -9999.9999 ≤ Instrument Height ≤ +9999.9999 ft; -9999.11.7 ≤ Instrument Height ≤ +9999.11.7 ft+inch.		

6.4 Setting Target Height

This function is used to obtain the Z coordinate. The target height is retained after power-off.

Operation Process	Operation Key	Display
① In the coordinate measurement mode, press the [F4] (P2) key to enter the [P2] function interface.	[F4]	
② Press the [F1] (Set) key to display the current instrument height and target height. Press the [▼] key to move the cursor to the target height.	[F1]	
③ Input the target height and press the [F4] (Confirm) key to complete the setting. ※1)	Input target height [F4]	
※1) For input method, refer to "3.7 Alphanumeric Input Method".		

Operation Process	Operation Key	Display
Input range: -9999.9999 ≤ Target Height ≤ +9999.9999 m; -9999.9999 ≤ Target Height ≤ +9999.9999 ft; -9999.11.7 ≤ Target Height ≤ +9999.11.7 ft+inch.		

7. Data Collection

7.1 Operation Steps

1、Select a data collection file to store the collected data.
2、Select a coordinate storage file to store the coordinate data converted from raw data.
3、Select a coordinate data file for calling (optional, skipped if no known point coordinate data needs to be called).
4、Set the instrument station, including instrument height, station number, and coordinates.
5、Set the backsight point, determine the azimuth angle through orientation by measuring the backsight point.
6、Set the target height of the point to be measured, then start collecting and storing data.

7.2 Preparation

7.2.1 Selection of Data Collection File

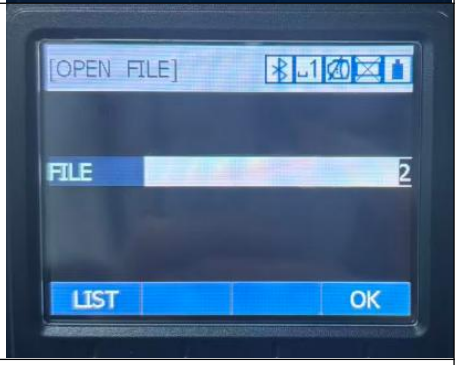
A data collection file must be selected first. The file selection screen will appear before starting the data collection mode, allowing you to select a file. File selection can also be performed in the data collection menu under this mode.

Operation Process	Operation Key	Display
① Press the [MENU] key to enter the first page of the main menu, then press the numeric key [1] (Data Collection).	[MENU] [1]	
② Press the [F1] (Call) key. ※1)	[F1]	

Operation Process	Operation Key	Display
③ The list of currently selected files is displayed. ※2)		
④ Press the [▲ or ▼] key to scroll the file list up or down and select a file. ※3)	[▲ or ▼]	
⑤ Press the [ENT] (Enter) key. The file is successfully called, and the screen returns to the data collection menu.	[ENT]	
※1) For disk description and operation, refer to "11.1.1 Check Memory Status and Format Disk". ※2) To create a new file, directly enter the file name in the measurement and coordinate file selection interface. ※3) Press the [F2] (Search) key to directly enter the file name for search.		

7.2.2 Selection of Coordinate File for Calling

If coordinates from a coordinate data file need to be used as the instrument station or backsight point coordinates, a coordinate file must first be selected from the data collection menu 2/2.

Operation Process	Operation Key	Display
① In the data collection menu, press the numeric key [4] (Select File).	[F4]	
② The file selection interface (for calling coordinate files) is displayed.	[F1]	
③ Select a coordinate file following		

Operation Process	Operation Key	Display
the method described in "7.2.1 Selection of Data Collection File".		

7.3 Instrument Station and Backsight Point

The instrument station and orientation angle are shared between the data collection mode and the normal coordinate measurement mode. The values of the instrument station and orientation angle can be input or modified in the data collection mode.

Methods for Setting Instrument Station Coordinates

1. Using coordinate data stored in the memory.
2. Direct input via the keyboard.

Methods for Setting Backsight Azimuth Angle

1. Using coordinate data stored in the memory.
2. Direct input of backsight point coordinates.
3. Direct input of the set orientation angle.

※ The azimuth angle must be determined through measurement.

7.3.1 Example of Setting the Instrument Station

There are two methods to set the instrument station:

1. Using coordinates stored in the memory.
2. Directly inputting coordinates via the keyboard.

Example: Setting the instrument station using a coordinate data file stored in the memory.

Operation Process	Operation Key	Display
① From the data collection menu, press the numeric key [1] (Set Instrument Station) to display existing data.	[1]	
② Press the [F3] (Coordinate) key.	[F3]	

Operation Process	Operation Key	Display
③ If the point does not exist, press the [F4] (Add) key to create a new point. Enter the coordinates and press the [F4] (Add) key to save the new point.	[F1] [F4] [ENT]	  
④ Select an existing coordinate point name using the up/down keys or the [F2] (Search) key, press the [ENT] (Confirm) key to select the instrument station ※1), and set the instrument height in this interface.	[F4]	
⑤ Press the [F4] (Record) key to complete the instrument station setup and return to the data collection interface.	[F4]	
※1) For the input method, refer to "3.7 Alphanumeric Input Method". ※2) If the specified point name is not found in the memory, the system will display "Point Name Does Not Exist" at the bottom of the screen. ※3) Code: When entering a numeric code, if the number corresponds to a code in the code library, the system will call the corresponding code; if no matching code exists, the code column will display the entered numeric code. Press the [F2] (Search) key in step ⑥		

Operation Process	Operation Key	Display
to call data from the code library. ※4) Press the [F4] (Station) key to return to step ④. ※5) Data stored during data collection includes the point number, code, and target height.		

7.3.2 Example of Setting the Azimuth Angle

The azimuth angle must be determined through measurement.

The following example stores the backsight orientation angle data in the instrument by inputting the point number to set the backsight point.

Operation Process	Operation Key	Display
① From the data collection menu, press the numeric key [2] (Set Backsight Point).	[2]	
② Press the [F3] (Coordinate) key.	[F3]	
③ If the point does not exist, press the [F4] (Add) key to create a new point. Enter the coordinates and press the [F4] (Add) key to save the new point.	[F1] [F4] [ENT]	

Operation Process	Operation Key	Display
		 
④ Select an existing coordinate point name using the up/down keys or the [F2] (Search) key, press the [ENT] (Confirm) key to select the backsight point ※1).	[F2] [F4]	
⑤ Aim at the backsight point, press the [F4] (Measure) key, then select a measurement mode by pressing [F1] (Angle), [F2] (Distance), or [F3] (Coordinate). Perform the measurement, set the horizontal dial reading based on the calculation result, and press the [F4] (Confirm) key as shown in the right figure. The measurement result is stored, and the screen returns to the data collection menu.	Aim at the backsight point [F4] [F3]	
※1) Each press of the [F3] key switches the input method between coordinate value, set		

Operation Process	Operation Key	Display
angle, and coordinate point. ※2) For the input method, refer to "3.7 Alphanumeric Input Method". Press the [F2] (Call) key in step ④ to call data from the code library. ※3) If the specified point name is not found in the memory, the system will display "Point Name Does Not Exist" at the bottom of the screen. ※4) Code: When entering a numeric code, if the number corresponds to a code in the code library, the system will call the corresponding code; if no matching code exists, the code column will display "Code Does Not Exist". ※5) The data collection order can be set to [Edit First, Collect Later] or [Collect First, Edit Later]. For detailed explanations, refer to "7.6 Data Collection Parameter Settings".		

7.4 Measuring Points to Be Measured

Operation Process	Operation Key	Display
① From the data collection menu, press the numeric key [3] to enter the measurement of points to be measured.	[3]	
② In the 【Measure Points】 interface, input the point name, code, and instrument height of the measurement point. In the [Mode] column, select the measurement mode to measure the direction angle, distance, or coordinates of the target point. For example, select the distance measurement mode as shown in the right figure.		
③ Aim at the target point, press the [F4] (Measure) key to enter the distance measurement interface.	[F4]	

Operation Process	Operation Key	Display
④ After the measurement is completed, press the [F4] (Save) key to store the data.	[F4]	
⑤ The system automatically increments the point name by 1 to start measuring the next point. Input the target point name and aim at the point. Press the [F4] (Same as Previous) key to measure using the same method as the previous point, or press the [F3] (Measure) key to select a measurement mode.	[F4]	
⑥ After the measurement is completed, the data is stored.		
※1) For the input method, refer to "3.7 Alphanumeric Input Method". ※2) Code: When entering a numeric code, if the number corresponds to a code in the code library, the system will call the corresponding code; if no matching code exists, the code column will display "Code Does Not Exist".		

7.4.1 Finding Recorded Data

You can browse recorded data while running the data collection mode.

Operation Process	Operation Key	Display
① Press the [F1] (Browse) key during data collection mode to view recorded data.	[F1]	

Operation Process	Operation Key	Display
② The code library data is displayed on the screen. Press the [▼] key to select a file.	[▼]	
③ Aim at the target point, press the [F4] (Measure) key to enter the distance measurement interface.	[F1]	

7.4.2 Inputting Codes

You can directly input codes while running the data collection mode.

Operation Process	Operation Key	Display
① In the measurement point mode, press the [▼] key to move the cursor to the code column and input the code.	[▼]	

7.5 Data Collection Parameter Settings

The following parameter settings for the data collection mode can be configured here: 【Basic Measurement】→【Menu】→【System Settings】→【Data Collection Settings】.

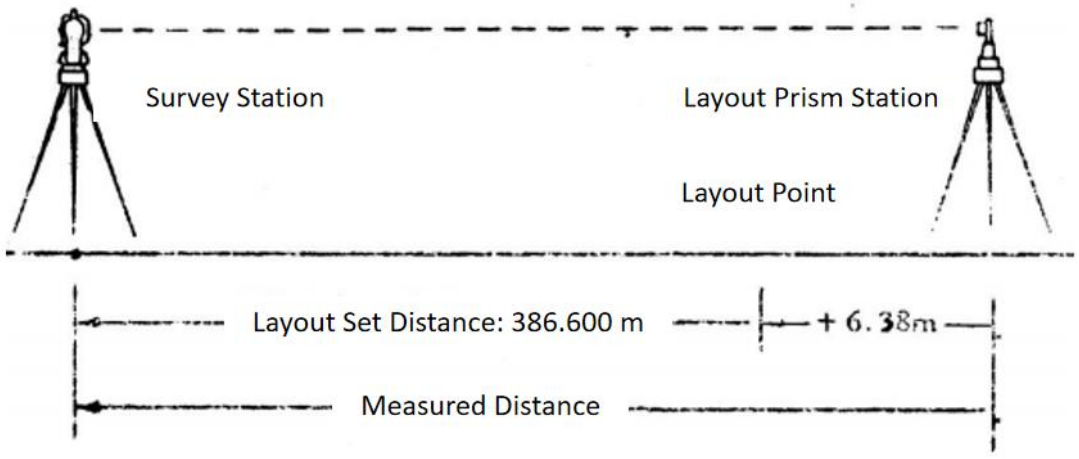
Menu	Options	Function Description
① Data Collection Order	1. Edit First, Collect Later 2. Collect First, Edit Later	Set the order of data editing and collection. Edit First, Collect Later: Configure the point name, code, and target height before data collection. Collect First, Edit Later: Allow editing of the collected point name, code, and target height

Menu	Options	Function Description
		after data collection.
② Data Collection Confirmation	1. On 2. Off	Set the recording prompt switch after data collection. On: Prompt whether to record the data.

● If these settings need to be modified during data collection, configure the parameters first.

8. Staking

The staking mode has two functions: determining staking points and setting new points using known coordinate data stored in the memory. The coordinate data for staking can be points in the memory or coordinates input via the keyboard. Coordinate data can also be loaded into the instrument memory from a computer via a transmission cable.
The memory of the C200 series total station is divided into measurement data and coordinate data for staking. Coordinate data is stored in coordinate data files. For details about memory, refer to "Chapter 11 Storage Management Mode".



8.1 Staking Steps

The staking process involves the following steps:
1. Select a staking file to call instrument station coordinate data, backsight coordinate data, and
2. Set the instrument station.
3. Set the backsight point to determine the azimuth angle.
4. Input the required staking coordinates and start staking.

8.2 Preparation

8.2.1 Setting the Coordinate Grid Factor

Elevation Factor

Elevation Factor = R/(R + Elevation)

Where: R = Average Earth curvature radius; Elevation = Elevation above the mean sea level.

Scale Factor

Scale Factor: Scale factor at the instrument station.

Grid Factor

Grid Factor=Elevation Factor×Scale Factor

Distance Calculation

Coordinate Grid Distance

HDg=HD×Coordinate Grid Factor

Where: HDg = Coordinate grid distance; HD = Distance on the ground.

Distance on the Ground

HD=HDg/Coordinate Grid Factor

How to Set the Coordinate Grid Factor

Operation Process	Operation Key	Display
① Press the [★] key to enter 【Common Settings】, then press [F3] (EDM) to enter the EDM settings interface.	[★] [F3]	 
② Press [F2] (Grid) to enter the grid factor settings.	[F2]	
※1) For the input method, refer to "3.7 Alphanumeric Input Method".		

Operation Process	Operation Key	Display
Input range: Elevation: -9999 to +9999m (-32805 to +32805ft); Scale Factor: 0.990000 to 1.010000.		

8.2.2 Selection of Staking File

To run the staking mode, first select a coordinate data file. New point measurement data can also be stored in the selected coordinate data file. When the staking mode is already running, files can be selected in the same way.

Operation Process	Operation Key	Display
① From the first page of the 【Menu】, press the numeric key [2] (Staking).	[2]	
② Press the [F1] (Call) key. ※1)	[F1]	
③ The file list is displayed. ※2)		

Operation Process	Operation Key	Display
④ Press the [▲ or ▼] key to scroll the file list up or down and select a file.	[▲ or ▼]	
⑤ Press the [ENT] (Enter) key. The file is selected, and the screen returns to the staking menu.	[ENT]	
※1) Directly input the file name and press [F4] (Confirm) to select. ※2) For disk description and operation, refer to "11.1.1 Check Memory Status and Format Disk".		

8.2.3 Setting the Instrument Station

There are two methods to set the instrument station:

1. Using coordinates stored in the memory.
2. Directly inputting coordinates via the keyboard.

Operation Process	Operation Key	Display
① From the data collection menu, press the numeric key [1] (Set Instrument Station) to enter the 【Staking Instrument Station】 settings.	[1]	

Operation Process	Operation Key	Display
		
② Directly input the instrument station coordinates ※1) or press [F3] (Coordinate) to call existing coordinates. Input the instrument height and press [F4] (Confirm) to complete the instrument station setup.	[F3] [F4]	 
※1) For the input method, refer to "3.7 Alphanumeric Input Method".		

8.2.4 Setting the Backsight Point

Three methods are available for setting the backsight point:

1. Using coordinate data stored in the memory.
2. Directly inputting coordinate data.
3. Directly inputting the set angle.

Example: Setting the backsight point using coordinate data stored in the memory.

Operation Process	Operation Key	Display

Operation Process	Operation Key	Display
① From the staking menu, press the numeric key [2] (Set Backsight Point).	[2]	 
② Press [F3] (Coordinate) to call existing coordinates, input the target height, and press [F4] (Confirm) to set the backsight point.	[F3], Input target height, [F4]	 

Operation Process	Operation Key	Display
		
③ Aim at the backsight point and press [F4] (Confirm) to complete the backsight point setup.	Aim at the backsight point, [F4]	

8.3 Implementing Staking

Two methods are available for implementing staking:
1. Calling coordinate values from files via point numbers.
2. Directly inputting coordinate values.
Example 1: Calling Coordinate Values from Files

Operation Process	Operation Key	Display
① From the staking menu, press [3]	[3]	
② Press [1] to select the coordinate file for staking out, and enter the [File Staking] interface.	[1]	
③ Input the target height in this interface. Coordinate data stored in the file can be used for staking. Press [F3] (Coordinate) to select the required staking coordinate	Input target height, [F3] or [Up/Down] keys	

Operation Process	Operation Key	Display
point, or directly use the [Up/Down] keys on the keyboard to select.		
④ After locating the layout point, press the [F4] (Set) key. The instrument will calculate the layout elements. HR: Calculated horizontal angle of the layout point HD: Calculated horizontal distance from the instrument to the layout point	[F4]	
⑤ Press [F1] (Distance) to select the Distance Layout mode, or press [F2] (Coordinate) to select the Coordinate Layout mode. Place the prism at the approximate position of the desired layout point, aim the instrument at the prism center, then press [F1] (Measure) to obtain the position difference between the prism and the layout point. For Distance Layout: Adjust the prism left/right until dHR = 0°00′ 00″ — this indicates the direction to the layout point is found. Adjust the prism forward/backward until dHD = 0. Finally, adjust the prism height up/down until dZ = 0.The prism position now matches the layout point. For Coordinate Layout: Adjust the prism left/right until dHR = 0°00′ 00″. Adjust the prism forward/backward	[F1] or [F4] Input Target Height [F4] [F1]	 

Operation Process	Operation Key	Display
until dE = dN = 0. Finally, adjust the prism height up/down until dZ = 0.The prism position now matches the layout point.		
⑥ From the [Layout Value] screen, press [F3] (Guide) to enter Guided Layout mode. Aim the instrument at the prism, then press [F1] (Measure). The system will automatically calculate the deviation between the prism position and the layout point, and intuitively indicate the adjustment method for easier layout. First, adjust the prism left/right until the dHR value is close to zero. Then, adjust the prism left/right, forward/backward, and up/down according to the respective deviation values until all values reach zero.The prism position now matches the layout point. Positive values indicate the prism needs to move right/forward. Negative values indicate the prism needs to move left/backward.	[F3] Aim at [F1]	
⑦ After completing the layout of a point, press [F3] (Next Point) to proceed with the layout of the next point's coordinates in the file.	[F3]	

Example 2: Directly Inputting Coordinate Values

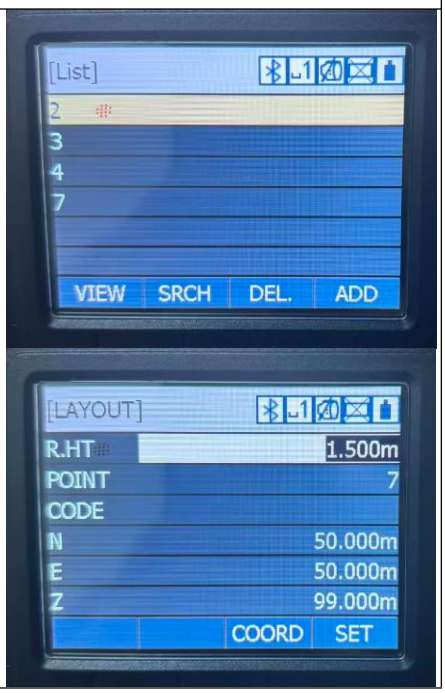
Operation Process	Operation Key	Display
① From the staking menu, press [3]	[3]	

Operation Process	Operation Key	Display
② Press [2] to select manual input staking and enter the 【Manual Staking】 interface. Input the required staking point coordinates and press [F4] (Confirm). The subsequent steps are the same as file staking.	[2] Input Coordinate [4]	  
③ After staking one point, press [F3] (Next Point) to stake the next coordinate point.	[F3]	

Browsing Point Numbers

In the staking mode, you can also view the point number list and call data as the staking point number.

Operation Process	Operation Key	Display
① In the file staking mode, press [F3] (Coordinate) to display the point number list in the memory. Select the required staking point number and press [ENT] to perform coordinate staking.	[F3] [ENT]	

Operation Process	Operation Key	Display
		

8.4 Setting New Points

New points need to be set when there is no line of sight between existing control points and staking points.

8.4.1 Polar Coordinate Method

Install the instrument at a known point and determine the coordinates of the new point using the lateral view method (polar coordinate method).

Operation Process	Operation Key	Display
① Enter the staking menu, set the instrument station and backsight, then press [4] (Polar Coordinate).	[4]	

<table>
<tr><th>Operation Process</th><th>Operation Key</th><th>Display</th></tr>
<tr><td>② Select the coordinate file for storing the new point ※1).</td><td>Select file</td><td>

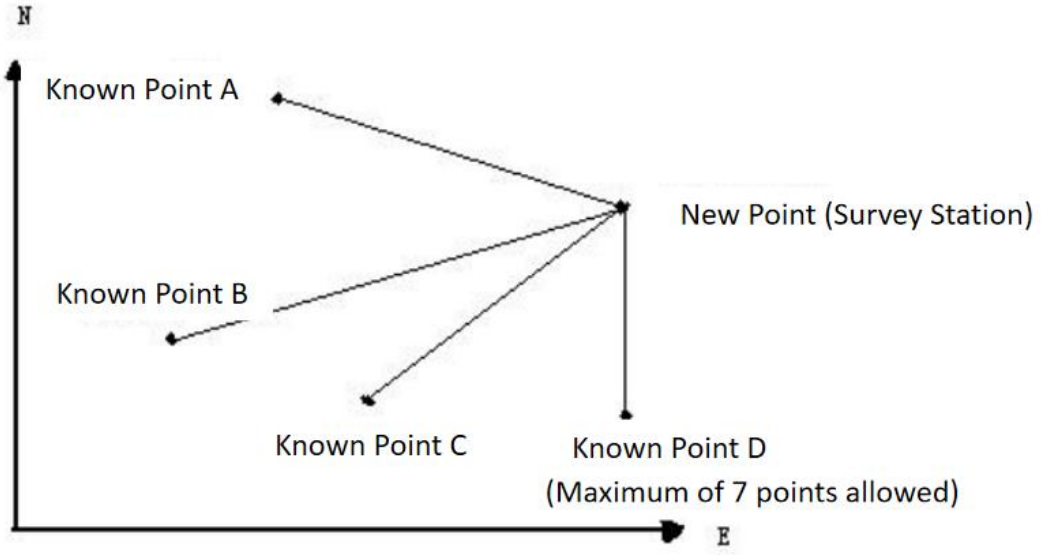

</td></tr>
<tr><td>③ Input the new point name, code, and target height.</td><td></td><td>
</td></tr>
<tr><td>④ Aim at the new point and press [F1] (Measure) to start measurement. After measurement, press [F4] (Record) to store the data. The point name is automatically incremented by 1 after recording.</td><td>Aim at the new point
[F1]
[F4]</td><td>
</td></tr>
<tr><td colspan="3">※1) Directly input the file name and press [F4] (Confirm) to select; or press [F1] (Disk) to select the disk and [F2] (Call) to select the file.</td></tr>
</table>

8.4.2 Resection Method

Install the instrument at a new station and calculate the new coordinates using the coordinates of up to 7 known points and their measurement data. The observations for resection are as follows:

1. Distance measurement resection: Measure 2 or more known points.

2. Angle measurement resection: Measure 3 or more known points.
The instrument station coordinates are solved by the least squares method (when only angle measurement is used for resection and only 3 known points are observed, the least squares method is not required).



Operation Process	Operation Key	Display
① From the staking menu, press [5] (Resection).	[5]	
② Input the instrument station name, code, and instrument height, then press [F4] (Confirm). You can also press [F3] (Skip) to skip inputting the instrument station name; in this case, the instrument station will not be saved after backsight measurement.	Input point name [F4] or [F3]	

Operation Process	Operation Key	Display
		
③ Input the coordinates of the first known point, or press [F1] (Coordinate) to call known coordinates. After inputting the known point coordinates, press [F4] (Confirm) to confirm.	Input coordinates [F1], [F4]	
④ Aim at the first known point and press [F3] (Angle) or [F4] (Distance). For example, press [F4] (Distance) to start the known point distance measurement. Press [F1] (Next Point) to measure other known points (up to 7 points). The staking point coordinates are calculated after measuring the second point.	Aim at the new point [F1] [F4]	 
⑤ The standard deviation of the coordinate values is displayed. Unit: (mm).		

Operation Process	Operation Key	Display
⑥ Press [F4] (Calculate) to calculate the instrument station coordinates. Press [F4] (Confirm) and [F3] (Yes) to store the instrument station coordinates.	[F4]	
※1) Residual: dHD (horizontal distance between two known points) = Measured value – Calculated value. dZ (new point Z coordinate calculated from known point A) - (new point Z coordinate calculated from known point B). ※5) If [F3] (Skip) is pressed in step ②, the new point data is not stored in the coordinate data file, and only the new point calculation value is replaced with the instrument station coordinates.		

9. Parameter Settings

Parameter settings allow configuration of units, measurement modes, etc. On the main menu interface, press the number key [5] to enter parameter settings.



1. Unit Settings

Menu	Options	Content
Angle Unit	1. Degrees (360°) 2. Gons (400G) 3. Mils (6400M)	Select the angle measurement unit: DEG/GON/MIL (Degrees/Gons/Mils)
Distance Unit	1. Meters 2. Feet 3. Feet-Inches	Select the distance measurement unit: m / ft / ft+in (Meters/Feet/Feet-Inches)
Temperature	1. Temperature: °C / °F	Select temperature unit: °C / °F;

and Pressure Units	2. Pressure: hPa / mmHg / inHg	Select pressure unit: hPa / mmHg / inHg

2. Feet Settings

Menu	Options	Content
Feet Type	1. International Feet 2. US Feet	Select the feet conversion factor. International Feet: 1m = 3.280839895013123ft; US Feet: 1m = 3.2803333333333ft

3. Coordinate Settings

Menu	Options	Content
Coordinate Display Order	1. NEZ 2. ENZ	The coordinate display order is N/E/Z or E/N/Z.

4. Other Settings

Menu	Options	Content
Vertical Angle Mode	1. Zenith Zero 2. Horizontal Zero	Select whether the vertical angle reading is counted from the zenith direction as the zero reference or the horizontal direction as the zero reference.
Distance Measurement Beep	1. Off 2. On	Whether to beep when a return light signal is received.
Key Press Beep	1. Off 2. On	Toggle the key press beep function.
Power-On Mode	1. Angle Measurement 2. Distance Measurement 3.Coordinate Measurement	Select the mode to enter after power-on: Angle Measurement Mode, Distance Measurement Mode, or Coordinate Measurement Mode.
Auto Power-Off	1. Off 2. On	Set auto power-off. On: If there is no keyboard operation or ongoing measurement within the set time, the instrument will automatically power off.

5. Data Collection Settings

Menu	Options	Content
Collection Order	1. Edit First, Then Collect 2. Collect First, Then Edit	Set the order of data collection and editing. Edit First, Then Collect: Set the point name, code, and target height first before data collection. Collect First, Then Edit: After data collection, users can edit the collected point name, code, and target height.

Storage Prompt	1. Off 2. On	Set whether to prompt for saving data when storing data. On: Prompt to confirm saving.

6. System Settings

Select whether to restore factory settings.

10. Storage Management Mode

In this mode, the following memory functions are available:
1. File Maintenance: Rename files, search for data in files, delete, create new, and edit files.
2. Data Transmission: Send measurement data/coordinate data, or code library data; receive coordinate data, code library data, or horizontal/vertical alignment data, and set communication parameters.
3. File Import: Transfer files from the SD card to the local disk or another SD card.
4. File Export: Transfer files from the local disk or SD card to the SD card.
Storage Management Menu List:

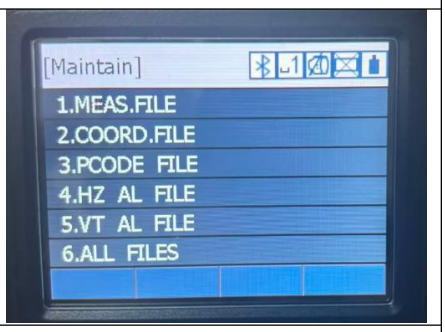
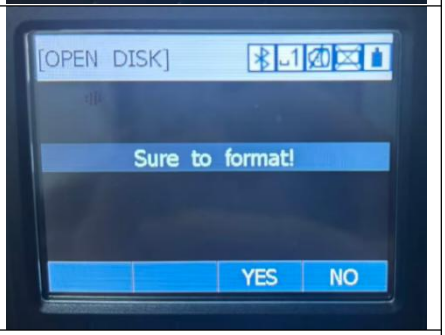


10.1 File Maintenance

This mode can be used to check the memory status of the disk, format the disk, rename files, search for data in files, delete, create new, and edit files.

10.1.1 Check Memory Status and Format Disk

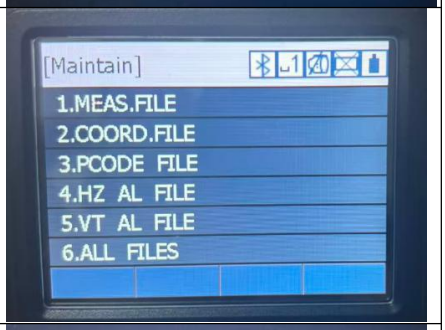
Operation Process	Operation Key	Display
① Press the [MENU] key to enter the 【Menu】 interface, press the [3] (Storage Management) key to display the storage management menu.	[MENU] [3]	

Operation Process	Operation Key	Display
② Press the [1] (File Maintenance) key, the screen displays different file types. Press keys [1] to [6] to select a file type. Example: Press [2] for coordinate files.	[1] [2]	
③ Enter the disk list. ※1) Disk:A indicates the local disk; Disk:B indicates the removable disk of the inserted SD card (if the disk has enough space for partitioning, disks C/D... will be displayed; Chinese file names and directories are not supported). Switch between Disk:A and Disk:B using the [◄] or [►] key.	[◄] or [►]	
④ Press the [F1] (Properties) key to view the space status and disk description of the selected disk.	[F1]	
⑤ Press the [F2] (Format) key to delete all data in the selected disk. Confirm formatting by pressing the [F3] key. After formatting is completed, the screen displays "Format Completed!" and returns to the disk list after pressing the confirm key. ※2)	[F2] [F3]	
※1) Press the [F4] (Confirm) or [ENT] (Enter) key to open the selected disk and enter the file list.Note: Do not remove the SD card during file operations on the SD card, otherwise data loss or damage may occur. ※2) Press the [F1] (Cancel) key to return to the disk list.		

10.1.2 Create New Files

Create a new file in the memory.

Operation Process	Operation Key	Display
① Press the [MENU] key to enter the 【Menu】 interface, press the [3] (Storage Management) key to	[MENU] [3]	

Operation Process	Operation Key	Display
display the storage management menu.		
② Press the [1] (File Maintenance) key, the screen displays different file types. Press keys [1] to [6] to select a file type. Example: Press [2] for coordinate files. Press the confirm key to enter the file selection interface.	[1] [2]	
③ From the file list, press the [F4] (P1) key to display the second page of functions.	[F4]	
④ Press the [F1] (Create) key.	[F1]	
⑤ Enter the 【Create New File】 interface. Use the [◄] or [►] key to set the file type (measurement file/coordinate file/code file/horizontal alignment/vertical alignment/text file). Then use the on-screen keyboard to enter the file name, and press the [F4] key to confirm after selection.	[◄] or [►] [F4]	
※1) For input methods, refer to "3.7 Alphanumeric Input Method". ※2) Do not use existing file names.		

Operation Process	Operation Key	Display
※3) Press the [ESC] key to return to the file list.		

10.1.3 Rename Files

Edit the name of a working file in the memory.

Operation Process	Operation Key
① Follow steps ①-② in 11.1.2 to enter the file list.	
② Select the file to be renamed, press the [F2] (Rename) key.	[F2]
③ Enter the new file name and press the [F4] (Confirm) key to successfully rename the file. ※1)~※3)	[F4]

10.1.4 Delete Files

Delete one file in the memory; only one file can be deleted at a time.

Operation Process	Operation Key
① Follow steps ①-② in 11.1.2 to enter the file list.	
② Select the file to be deleted, press the [F3] (Delete) key.	[F3]
③ Press the [F3] (Yes) key to confirm deletion; the file is deleted successfully.	[F3]

10.1.5 Edit Data in File Browsing Mode

In this mode, the point name, identifier, code, instrument height, and target height of the measurement data can be modified, but the observed values cannot be modified.

Operation Process	Operation Key
① Press the [MENU] key to enter the main menu 1/2 mode, press the [3] (Storage Management) key to display the storage management menu.	[MENU] [3]
② Press the [1] (File Maintenance) key, the screen displays different file types. Press keys [1] to [6] to select a file type. Example: Press [2] for coordinate files.	[1] [2]
③ Enter the disk list. ※1) Use the [◄] or [►] key to switch disks, press the [F4] (Confirm) key to open the selected disk.	[◄] or [►] [F4]
④ Use the [▲] or [▼] key to select the coordinate file to be edited, then press the [ENT] (Enter) key.	[ENT]
⑤ Use the same method to select the coordinate data to be edited, and press the [F1] (Browse) key. ※1)	[F1]
⑥ The screen displays the selected coordinate data, press the [F1] (Edit) key.	[F1]
⑦ Enter the new point name, code, and coordinates to be edited. Press the [F2] (Call) key to call the code in the memory. After input, press the [F4] (Save) key to complete the editing. ※3)	[F4]

10.2 File Import

Files in the local disk cannot be operated with each other in this mode.

Operation Process	Operation Key
① Follow step ① in 10.1.1 to enter the storage management menu.	

Operation Process	Operation Key
② Press the [3] (File Import) key to display the import file types. Example: Press the [1] key (Coordinate File Import).	[3] [1]
③ Enter the import file name and press the [F4] (Confirm) key. Or press the [F2] (Call) key to call an import file name.	Enter import file name [F4]
④ Press [1] to [3] to select the receiving format. Example: Press the [1] key (300 Format).	[1]
⑤ Display the selected coordinate data file. Enter the file name directly or press [F2] to call the coordinate file in the memory, then press the [F4] (Confirm) key. ※1)	[F4]
⑥ The screen displays the ongoing file import information. After all data is imported, the display automatically returns to the file import menu. ※2)	

10.2.1 Custom Receive/Send Format

This setting can only be operated in the coordinate data transmission and reception mode. It sets the order of the point name, coordinates, or code of the received/sent coordinate data content. Therefore, two option columns cannot be set to the same data content.

Operation Process	Operation Key
① In step ④ of "11.2 File Import", press the [4] (Custom) key to customize the receiving format of coordinate data.	[4]
② Display the receive coordinate order menu. Press the [▲] or [▼] key or the corresponding number keys [1] to [5] to select the option column to be set. Then press the [◂] or [▸] key; the receive coordinate order will switch between point name/N/E/Z/code.	[▲] or [▼] [◂] or [▸]
③ Use the same method to set other options. After setting is completed, press the [F4] (Confirm) key.	[F4]
④ Return to the receive format menu, press the [3] (Custom) key to operate file import according to the set receive coordinate data display order.	

10.3 File Export

Operation Process	Operation Key
① Press the [MENU] key to enter the menu interface, press the [3] (Storage Management) key to enter the 【Storage Management】 interface.	[3]
② Press the [4] (File Export) key to display the export file types. Example: Press the [2] key (Coordinate File Export).	[4] [2]
③ Directly enter the coordinate data file to be selected via the keyboard or press the [F2] key to call the coordinate data file to be exported in the memory, then press the [F4] (Confirm) key.	[F4]
④ Press [1] to [3] to select the sending format. ※1) Example: Press the [2] key (660 Format).	[2]
⑤ Enter the export file name and press the [F4] (Confirm) key.	[F4]

Operation Process	Operation Key
⑥ The screen displays the ongoing file export information. After all data is exported, the display automatically returns to the file export menu. ※2), ※3), ※4)	

10.4 Data Communication

You can directly transfer data files in the memory to a computer, or directly load coordinate data files, code library data, and horizontal/vertical alignment data for road design from the computer into the instrument memory. For the detailed format of horizontal and vertical alignment data, refer to Appendix A.
The C200 total station supports data transmission in three formats: NTS300 format, NTS660 format, and custom format. Users can choose according to their needs. For detailed information about these data formats, refer to Appendix A.
Data Transmission Menu:【Data Transmission】

Note: During data communication, first check whether the communication cable connection is correct and whether the communication parameter settings of the computer and total station are consistent. In addition, after each field work, remember to transfer data to the computer in a timely manner to ensure sufficient memory of the instrument and reduce the possibility of data loss.

10.4.1 Setting of Communication Parameters

Example: Set the baud rate to 4800 in RS232 transmission mode.

Operation Process	Operation Key
① In the storage management menu, press the [2] (Data Transmission) key.	[2]
② Press the [1] (RS232 Transmission Mode) key.	[1]
③ Press the [3] (Communication Parameters) key.	[3]
④ Press the [▼] key to move the cursor down to the baud rate option column. Then press the [◄] or [►] key to select the required parameter, and press the [F4] (Set) key. ※1), ※2)	[▼] [◄] or [►] [F4]
⑤ The screen returns to the RS232 transmission mode menu.	[F4]

10.4.2 Send Data (RS232 Transmission Mode)

Operation Process	Operation Key
① In the storage management menu, press the [2] (Data Transmission) key.	[2]
② Display the three data transmission modes: RS232 Transmission Mode, USB Transmission Mode, and Storage Mode. Example: Press the [1] key to select (RS232 Transmission Mode).	[1]
③ Press the [1] key to select (Send Data), the screen enters the send data type. Example: Press the [2] key (Send Coordinate Data).	[1] [2]
④ Enter the name of the file to be sent and press the [F4] (Confirm) key. Or press [F2] to call the file from the memory. ※1)	Enter file name [F4]
⑤ The data transmission format includes NTS300 format,	[2]

Operation Process	Operation Key
NTS660 format, and custom format; users can choose freely. Example: Press the [2] key (660 Format) ※2)	
⑥ When the data sending is completed, the screen displays "Data Send Completed!" and returns to the send data menu. ※3)	

10.4.3 Receive Data

Coordinate data files and code data can be loaded into the instrument memory from a computer. Example: Receive coordinate data files in USB transmission mode.

Operation Process	Operation Key
① In the storage management menu, press the [2] (Data Transmission) key.	[2]
② Display the data transmission mode menu, press the [1] (RS232 Transmission Mode) key.	[1]
③ Press the [2] key to receive data and select the type of data to be received. Example: Press the [1] key (Receive Coordinate Data).	[2] [1]
④ Enter the name of the new file to be received and press the [F4] (Confirm) key. Or press [F2] (Call) to call the coordinate data in the memory. ※1)	Enter file name [F4]
⑤ The data transmission format includes NTS300 format, NTS660 format, and custom format; users can choose freely. Press the [3] key (Example: Custom) ※2)	[3]
⑥ When the data reception is completed, the screen displays "Data Receive Completed!" and returns to the receive data menu. ※3)	