

# SET2BII SET3BII SET4BII

Electronic Total Station

## OPERATOR'S MANUAL

Congratulations on your purchase of the SET BII Series!  
Before using the instrument, please read this operator's manual  
and verify that all equipment is included, refer to P. 192  
"STANDARD EQUIPMENT".

E version



- [English] CONTAIN NICKEL-CADMIUM BATTERY. MUST BE RECYCLED OR DISPOSED OF PROPERLY.
- [Deutsch] MIT NiCd AKKU. EFORDELT RECYCLING ODER FACHGERECHTE ENTSORGUNG.
- [Français] CONTIENT UNE BATTERIE AU CADMIUM NICKEL. DOIT ÊTRE RECYCLÉE OU DONNÉE A UN ORGANISME DE RETRAITEMENT.
- [Italiano] CONTIENE NiCd BATTERIA. DEVE QUINDI ESSERE RICICLATA O ELIMINATA IN MODO APPROPRIATO.
- [Nederlands] BEVAT EEN NiCd BATTERIJ. DIENT GERECYCLEERD TE WORDEN OF OP EEN CORRECTE MANIER VERNIETIGD TE WORDEN.
- [Español] CONTIENE UNA NiCd BATERÍA. DEBE RECICLARSE O ELIMINARSE ADECUADAMENTE.
- [Português] CONTEM BATERIA DE NÍQUEL CÁDMIO. DEVERÁ SER RECICLADA OU DEPARTADA CONVENIENTEMENTE.
- [Svensk] INNEHÅLLER NiCd BATTERI. BÖR ÅTERVINNAS ELLER FÖRSTÖRAS PÅ ETT SÄKERT SÄTT.
- [Suomi] SISÄLTÄÄ NIKKELI-KADMIUM AKUN. HÄVITETTÄESSÄ KÄSITELTÄVÄ ONGELMAJÄTTEENÄ.
- [Norsk] NiCd BATTERIER MÅ RESIRKULERES ELLER KASTES PÅ EN FORSVARLIG MÅTE.
- [Dansk] INDEHOLDER NiCd BATTERI. SKAL GENVINDES ELLER KASSERES PÅ FORSVARLIG MÅDE.
- [Ελληνικά] ΠΕΡΙΕΧΕΙ ΜΙΑΤΑΡΙΑ ΝΙΚΕΛΙΟΥ-ΚΑΔΜΙΟΥ. ΠΡΕΠΕΙ ΝΑ ΑΝΑΚΥΚΛΩΝΕΤΑΙ Η ΝΑ ΚΑΤΑΣΤΡΕΦΕΤΑΙ ΜΕ ΤΟΝ ΚΑΤΑΛΛΗΛΟ ΤΡΟΠΟ.

**For U.S.A. ATTENTION:**

The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal. Use the standard battery charger.

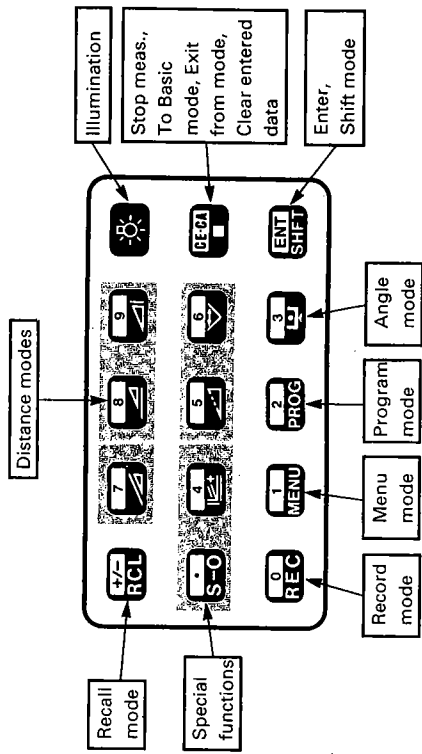
**Die Schweiz:** Nach Gebrauch der Verkaufsstelle zurückgeben.

**La Suisse:** Après usage à rapporter au point de vente.

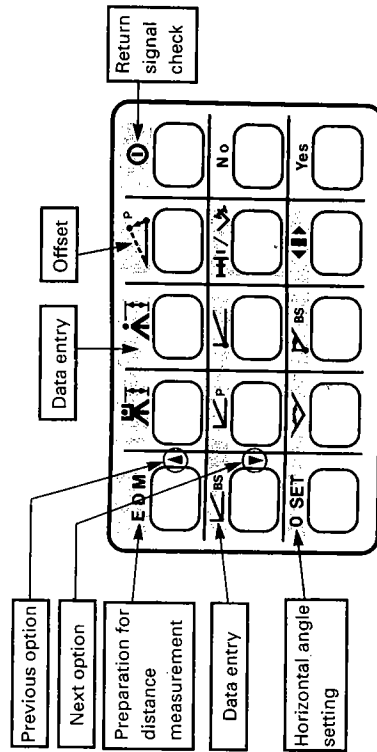
**Swizzera:** Ritornare la pila usate al negozio.

# 3. KEY FUNCTIONS

<Main functions>



<Shift functions>



EDM 7 RCL	8 P	9 ILLUMINATION	0 REC
4 S-O	5 BS	6 H/V	ENT SHIFT
1 MENU	2 PROG	3 ANGLE	

- Shift functions ←
- Numeric input ←
- Main functions ←
- Shift functions ←
- Numeric input ←
- Main functions ←
- Shift functions ←
- Numeric input ←
- Main functions ←

EDM



- < + > : Distance mode/Prism constant/ppm
- (Data input mode): Change the sign of the data input value (Parameter/Input mode): Move to previous option
- **Recall data from the memory**

BS



- < + > : Input Backsight station coordinates
- (Data input mode): Input "." (Decimal point) (Parameter/Input mode): Move to next option
- **Setting out measurement (+ mode key)**

O SET



- < + > : Set Horizontal angle to 0/  
In Missing line measurement, change the starting point
- (Data input mode): Input "0"
- **Output data to an External device**

KI



- < + > : Input Instrument height
- (Data input mode): Input "7"
- **Measure Slope distance**

L/P



- < + > : Input coordinates of point to be set out
- (Data input mode): Input "4"
- **Measure 3-Dimensional coordinates**

Δ



- < + > : Set horizontal angle to the required value
- (Data input mode): Input "1"
- **Menu mode: Configuration/Coordinate data settings**

Δ



- < + > : Input target height
- (Data input mode): Input "8"
- **Measure Horizontal distance**

Δ



- < + > : Input Instrument station coordinates
- (Data input mode): Input "5"
- **Measure remote elevation**

BS



- < + > : Set Azimuth angle from Instrument station and Backsight station coordinates
- (Data input mode): Input "2"
- **Program mode: Resection/Correction/ Set Instrument station coordinates and azimuth angle**

P



- < + > : Offset measurement
- (Data input mode): Input "9"
- **Measure Height difference**

H/L



- < + > : Input distance & horizontal angle setting out data
- (Data input mode): Input "6"
- **Missing line measurement**

||



- < + > : Select horizontal angle right or left
- (Data input mode): Input "3"
- **Transfer to Theodolite mode / Display tilt angle (when instrument is in Theodolite mode and: "Tilt correction" parameter is on)**

⓪



- < + > : Return signal check(stop: )
- **Display and Reticle illumination ON/OFF**

No



- Input "No"
- (Data Input mode): Clear input data
- **Stop measurement and transfer to Basic mode/ Exit from mode**

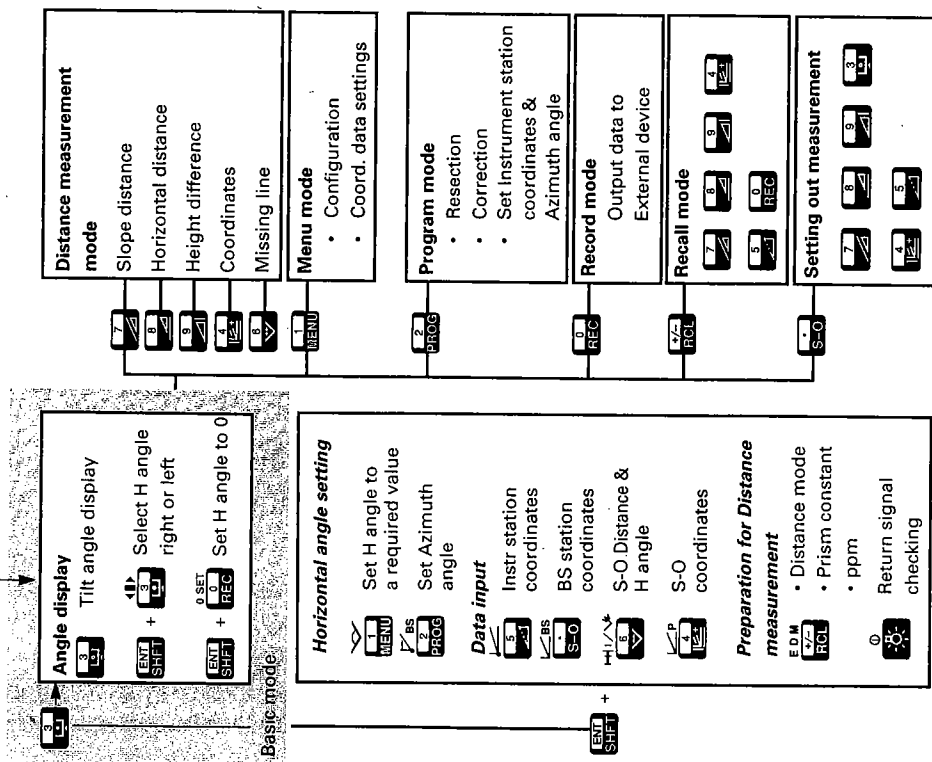
Yes



- Input "Yes"
- (Data input mode): Input data into memory
- **Select/Release Shift mode**

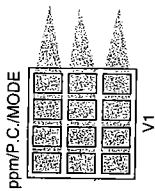
#### 4. MODE DIAGRAM

Switch on → H & V circle indexing



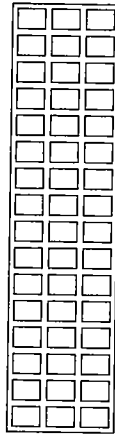
#### 5. DISPLAY SYMBOLS

<Sub display>



- ppm(Atmospheric correction value)
- P.C.(Prism constant correction value)
- ↓+ : Tilt angle compensation on
- SHFT : Shift
- SO : Setting-out measurement mode
- MENU : Menu mode
- PROG : Program mode
- REC : Record mode
- RCL : Recall mode
- Stn : Instrument station coordinates
- BS : Backsight station coordinates
- Pt : Coordinate setting-out data

<Main display>



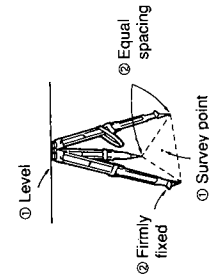
- ↕ : Select options
- ZA : Zenith angle (Z 0°)
- VA : Vertical angle (H 0°)
- HAR : Horizontal angle right (H 0°±90°)
- HAL : Horizontal angle left
- dHA : Horizontal angle from setting-out data
- X : Tilt angle in sighting direction
- Y : Tilt angle in horizontal axis direction
- S : Slope distance
- H : Horizontal distance
- V : Height difference
- Ht : REM value/Instrument height/Target height
- D : Distance setting-out data/Offset distance

## 7. SETTING UP THE INSTRUMENT

- Mount the battery in the instrument before performing this operation, because the instrument will tilt slightly if the battery is mounted after levelling.

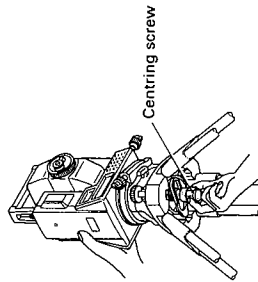
### 7.1 Centring

#### Set up the tripod



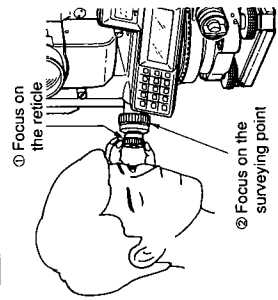
- 1) Make sure the legs are spaced at equal intervals and the head is approximately level.
- 2) Set the tripod so that the head is positioned over the surveying point.
- 3) Make sure the tripod shoes are firmly fixed in the ground.

#### Install the instrument



- 4) Place the instrument on the tripod head.
- 5) Supporting it with one hand, tighten the centring screw on the bottom of the unit to make sure it is secured to the tripod.

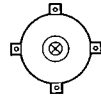
#### Focus on the surveying point



- 6) Looking through the optical plummet eyepiece, turn the optical plummet eyepiece to focus on the reticle.
- 7) Turn the optical plummet focusing ring to focus on the surveying point.

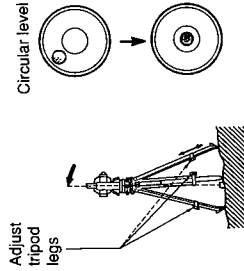
### 7.2 Levelling

#### Centre the surveying point in the reticle



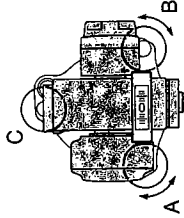
- 1) Adjust the levelling foot screws to centre the surveying point in the optical plummet reticle.

#### Centre the bubble in the circular level



- 2) Observe the off-centre direction of the bubble in the circular level, and shorten the nearest tripod leg, or extend the leg farthest from that direction to centre the bubble.
- 3) One more tripod leg must be adjusted to centre the bubble.

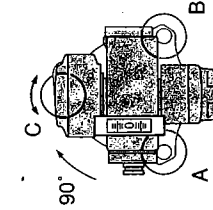
#### Centre the bubble in the plate level



- 4) Loosen the horizontal clamp to turn the upper part of the instrument until the plate level is parallel to a line between levelling screws A and B.
- 5) Centre the air bubble, using levelling screws A and B.

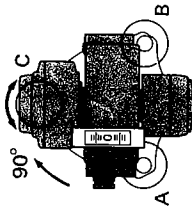
**Note:** The bubble moves towards a clockwise rotated foot screw.

#### Turn 90° and centre the bubble



- 6) Turn the upper part of the instrument through 90°. The plate level is now perpendicular to a line between levelling screws A and B.
- 7) Centre the air bubble, using levelling screw C.

### Turn another 90° and check bubble position



- 8) Turn the upper part of the instrument a further 90° and check to see if the bubble is in the centre of the plate level. If the bubble is off-centre, perform the following:
- ① Adjust levelling screws A and B in equal and opposite directions, to remove half of the bubble displacement.
  - ② Turn the upper part a further 90°, and use levelling screw C to remove half of the displacement in this direction.

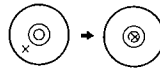
Or try the adjustment described on P.145, under "22.1 Plate level".

### Check to see if bubble is in same position in any direction

- 9) Turn the instrument and check to see if the air bubble is in the same position for any position of the upper part. If it is not, repeat the levelling procedure.

### Focus on the centre of the reticle again

- 10) Loosen the centring screw slightly.
- 11) Looking through the optical plummet eyepiece, slide the instrument over the tripod head until the surveying point is exactly centred in the reticle.
- 12) Retighten the centring screw securely.



### Check plate level bubble again

- 13) Check again to make sure the bubble in the plate level is centred. (If not, repeat the procedures starting from step 4).)

## 8. POWER ON

- When the power is turned on, a self-check is run to make sure the instrument is operating normally.

### Turn on the power



- 1) Turn on the power switch after completing sections 6 and 7.
- 2) The instrument name, instrument number, and software version are displayed for several seconds, an audio tone sounds, and the instrument performs self-diagnostic checks. On successful completion of the checks, "Self check ok" is displayed for 2 secs.

SET B model 2  
No. 88132  
Ver. 69-xx

Self check ok

or

Memory cleared

Battery level 3

- 0: less than 20%
- 1: less than 50%
- 2: less than 80%
- 3: less than 100%

Battery is low

**Note:** After power-off for more than 1 week, the previously stored data have been cleared from the short-term memory and "Memory cleared" is displayed.

- 3) The remaining battery power is then displayed for 3 seconds as a numeric value. (BDC25, Coarse meas. mode, Single meas., Temperature 25°C.)

If the battery is at the "low" level, the message "Battery is low" will be displayed, and an audio tone sounds. Turn the power off and charge the battery. If the battery power becomes low during surveying, the same message will be displayed.

