Leica Builder
Quickguide

Version 1.0
English

- when it has to be **right**

Leica
Geosystems

In this manual

☞ To use the product in a permitted manner, please refer to the detailed safety instructions in the User Manual.

1   SETUP: Establish Control Line - Over 1st Point

Description

The Setup method **Control Line - Over 1st Point** is used to set the station coordinates to E_0= 0.000, N_0=0.000, H_0=0.000 and the orientation to 0.000. All further measuring points and points to be staked are in relation to the control line.

Diagram

Hz = 0.000

P1

P0
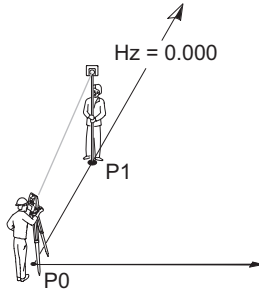
P0	Station
P1	Target point

Setup method Establish Control Line - Over 1st Point step-by-step

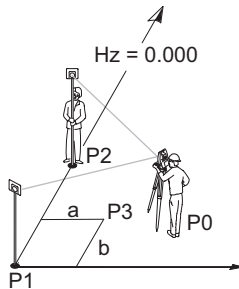| Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **SETUP**.
2.	CONFIG)THEO)PROG)DATA Control Line... Coordinates... Height... OK	Press ◯ to highlight Setup option **Control Line** and accept with **OK**.
3.	CONFIG)THEO)PROG)DATA ESTABLISH CONTROL LINE Over 1st Point... Anywhere... OK	Press ◯ to highlight Setup option **Over 1st Point** and accept with **OK**.
4.		Aim at target point and accept with **OK**.
☞		Station and Orientation will be set after pressing **YES**.
☞		Previous Station and Orientation parameters will be replaced by the new calculated ones.

2 SETUP: Establish Control Line - Anywhere

Description

The Setup method **Establish Control Line - Anywhere** is used to set up the instrument along a control line. The coordinates of line start point are set to E_0= 0.000, N_0=0.000 and H_0=0.000. The orientation is set to 0.000 in the direction of the second line point. Additionally line startpoint can be shifted by entering or measuring line and offset values. All further measuring points and points to be staked are in relation to the control line.

☞ The height of line start point is used as the reference height for all further measurements.

Diagram

Hz = 0.000

P0	Station
P1	Line start point
P2	Second line point
P3	Shifted line start point
a	Line value for shift
b	Offset value for shift

Setup method Estalish Control Line - Anywhere step-by-step

Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **SETUP**.
2.		Press ◯ to highlight Setup option **Control Line** and accept with **OK**.
3.		Press ◯ to highlight Setup option **Anywhere** and accept with **OK**.
4.		Aim at line start point.
5.		Measure and record line start point.
6.		Aim at second line point.
7.		Measure and record second line point.

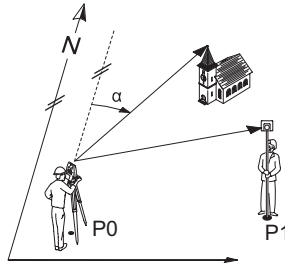| Step	Screen	Description
☞		Station and Orientation will be set after pressing **YES**.
☞		Previous Station and Orientation parameters will be replaced by the new calculated ones.

3 SETUP: Establish Coordinates - Over Known Point

Description

The Setup method **Establish Coordinates - Over Known Point** is used to set up the instrument on a known point and orient to a known azimuth or to a known backsight point. All further measuring points and points to be staked are in relation to the used coordinate system.
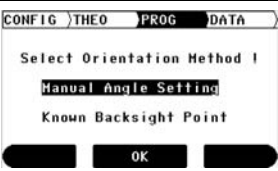
Diagram

P0	Known Station
P1	Known backsight point
α	Known azimuth

Setup method Establish Coordinates - Over Known Point step-by-step

Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **SETUP**.
2.		Press ⬤ to highlight Setup option **Coordinates** and accept with **OK**.
3.		Press ⬤ to highlight Setup option **Known Point** and accept with **OK**.
4.		Enter instrument height and reflector height and accept with **OK**.
5.		Select point from the memory or enter new point or coordinates of known station point and accept with **OK**.

Step	Screen	Description
6.	CONFIG)THEO)PROG)DATA Select Orientation Method ! **Manual Angle Setting** Known Backsight Point OK	Press ⬦ to select orientation method and accept with **OK**.
☞		For orientation method **Manual Angle Setting** continue with step 7. For orientation method **Known Backsight Point** continue with step 9.
7.	CONFIG)THEO)PROG)DATA Enter Bearing ! Brg : 100.0000 g Brg=0 OK	For orientation method **Manual Angle Setting** enter bearing and accept with **OK**.
8.		Aim at target point and accept with **OK**.
☞		Station and Orientation will be set after pressing **YES**.
☞		Previous Station and Orientation parameters will be replaced by the new calculated ones.
9.		For orientation method **Known Backsight Point** select point from the memory or enter new point or coordinates of known backsight point and accept with **OK**.
10.		Aim at target point and accept with **OK**.
☞		Station and Orientation will be set after pressing **YES**.
☞		Previous Station and Orientation parameters will be replaced by the new calculated ones.

4 SETUP: Establish Coordinates - Anywhere

Description

The Setup method **Establish Coordinates - Anywhere** is used to set up the instrument on an unknown point and set the orientation by measuring angles and distances to two known target points. All further measuring points and points to be staked are in relation to the used coordinate system.

Diagram
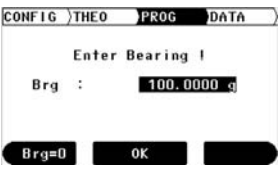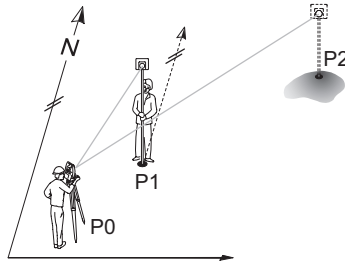

P0	Station
P1	First known point
P2	Second known point

Setup method Establish Coordinates - Anywhere step-by-step

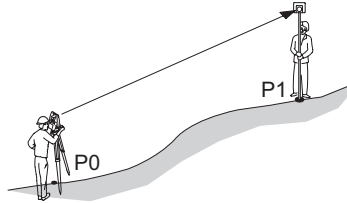| Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **SETUP**.
2.		Press ⬤ to highlight Setup option **Coordinates** and accept with **OK**.
3.		Press ⬤ to highlight Setup option **Anywhere** and accept with **OK**.
4.		Enter instrument height and reflector height and accept with **OK**.
5.		Select first point from the memory or enter new point or coordinates and accept with **OK**.
6.		Aim at first point.
7.		Measure and record first point.

Step	Screen	Description
8.	CONFIG)THEO)PROG)DATA Select Second Point ! Pt : P†0002() E : 100.000 m N : 200.000 m H : 100.000 m OK NEW PT	Select second point from the memory or enter new point or coordinates and accept with **OK**.
9.		Aim at second point.
10.		Measure and record second point.
☞		Compare the calculated line length and the measured line length.
11.	CONFIG)THEO)PROG)DATA Plausibility Check Line Length Calc.: 100.000 m Line Length Meas.: 100.010 m Difference : -0.010 m NO YES	If the difference is within the limit accept with **YES**.
☞		Station and Orientation will be set after pressing **YES**.
☞		Previous Station and Orientation parameters will be replaced by the new calculated ones.

5   SETUP: Establish Height

Description

The Setup Option **Establish Height** is used to enter the station height, instrument height and reflector height. If the station height is unknown a **Height Transfer** can be performed to determine the height of the position of the instrument from a measurement to a target point with known height. All further measuring points and points to be staked are in relation to the entered values.

Diagram Height Transfer

P0	Station
P1	Point with known height

Setup method Establish Height step-by-step

Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **SETUP**.
2.	CONFIG)THEO)PROG)DATA Control Line... Coordinates... **Height...** OK	Press 🟡 to highlight Setup option **Height** and accept with **OK**.
3.	CONFIG)THEO)PROG)DATA ESTABLISH HEIGHT Station H: 0.000 m hi : 1.600 m hr : 1.300 m OK HTRANS	Enter station height, instrument height and reflector height and accept with **OK**.
☞		If the station height is unknown press **HTRANS** to access setup method **Height Transfer**.
4.	CONFIG)THEO)PROG)DATA Select Height Point ! Pt : Pt0003 ‹› E : ---------.--- m N : ---------.--- m H : 200.000 m OK NEW PT	Select known height point from the memory or enter new point or height and accept with **OK**.
5.		Aim at height point.
6.		Measure height point.
☞		New station height will be set after pressing **YES**.

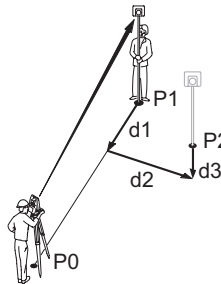| Step	Screen	Description
☞		Previous station height will be replaced by the new calculated ones.

6 APPLICATION PROGRAM - Layout

Description

The application program **Layout** is used to place markers in the field at prede-termined points. These predetermined points are the points to be staked. The points to be staked are defined by entering line and offset or easting, northing and height depending on the used setup method. For **BUILDER RM** the points can also be selected from the memory. The program calculates and displays the difference between the measured point and the point to be staked.
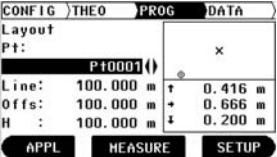
Diagram

P0	Station
P1	Current position
P2	Point to be staked
d1	<↑:> go forward or <↓:> go back
d2	<→:> go right or <←:> left
d3	<↑:> fill or <↓:> cut

Application program Layout step-by-step

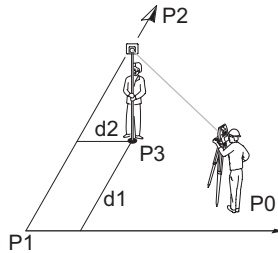| Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **APPL**.
2.		Press ◯ to highlight application program **Layout** and accept with **OK**.
3.		If a Setup method with **Control line** was used enter line, offset and height values for the point to be staked relative to the control line. If a Setup method with **Coordinates** was used enter east, north and height coordinates of the point to be staked. For **BUILDER RM** press ◁◯▷ to select points from the memory, if available.
4.		Turn telescope until horizontal angle shows nearly 0.000.

Step	Screen	Description
☞		Press **MEASURE** for at least 5 seconds to turn on/off **Tracking Mode**. If **Tracking Mode** is activated the stake out differences are displayed continuously.
5.		Press **MEASURE** to measure point.
☞		The stake out differences Δline, Δoffset and Δheight are calculated and displayed. The graphic shows the position of the prism relative to the point to be staked.
6.		Move prism until stake out differences show nearly 0.000m.

7 APPLICATION PROGRAM - As Built

Description

The application program **As built** is used for measuring an unlimited number of points. The program shows line and offset values or easting, northing and height depending on the used Setup method.

Diagram

P2

d2

P3

d1

P1

P0

P0	Station
P1	Line start point
P2	Second line point
P3	Measured point
d1	Line
d2	Offset

Application program As Built step-by-step

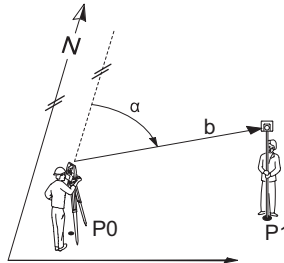| Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **APPL**.
2.	CONFIG THEO PROG DATA Layout... As Built... Angle & Distance... Tie Distance... Area... OK	Press ⬤ to highlight application program **As Built** and accept with **OK**.
3.		Aim at target point.
☞		Press **MEASURE** for at least 5 seconds to turn on/off **Laser-pointer**.
4.	CONFIG THEO PROG DATA As Built Pt: P10008 Line: 201.169 m Offs: 45.086 m H : -0.200 m APPL MEASURE SETUP	Measure and record point.
☞		If a Setup method with **Control line** was used, the values line, offset and height are displayed.
☞		If a Setup method with **Coordinates** was used, the easting, northing and height are displayed.
☞		The graphic shows the position of the station, the reflector and the measured points.

8   APPLICATION PROGRAM - Angle & Distance

Description

The application program **Angle & Distance** is used for measuring an unlimited number of points. The program shows horizontal angle, horizontal distance and height.

Diagram

P0   Known Station
P1   Measured point
α   Measued horizontal angle
b   Horizontal distance

Application program Angle&Distance step-by-step

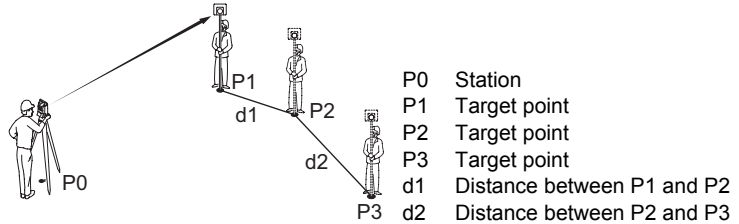| Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **APPL**.
2.		Press ⬤ to highlight application program **Angle & Distance** and accept with **OK**.
3.		Aim at target point.
☞		Press **MEASURE** for at least 5 seconds to turn on/off **Laser-pointer**.
4.		Measure and record point.
☞		The measured horizontal angle, horizontal distance and height difference are displayed.
☞		The graphic shows the position of the station, the reflector and the measured points.

9 APPLICATION PROGRAM - Tie Distance

Description

The application program **Tie Distance** is used to compute horizontal distance, height difference grade and slope distance between two target points. The target points have to be measured.
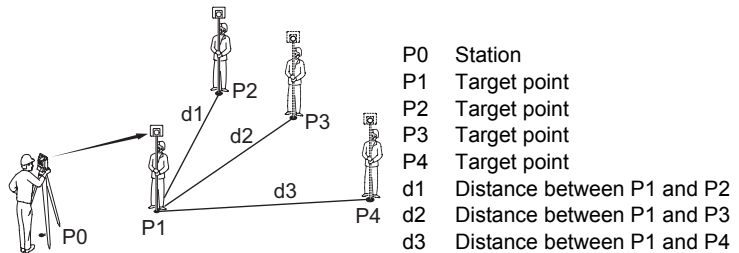
The user can choose between two different methods:

- Polygonal (P1-P2, P2-P3);
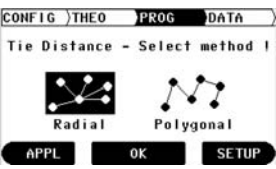
- Radial (P1-P2, P1-P3);

Diagram Polygonal (P1-P2, P2-P3)

P0	Station
P1	Target point
P2	Target point
P3	Target point
d1	Distance between P1 and P2
d2	Distance between P2 and P3
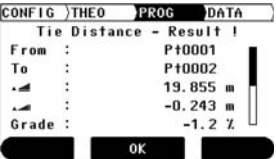
Diagram Radial (P1-P2, P1-P3)

P0	Station
P1	Target point
P2	Target point
P3	Target point
P4	Target point
d1	Distance between P1 and P2
d2	Distance between P1 and P3
d3	Distance between P1 and P4

Application program Tie Distance step-by-step

Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **APPL**.
2.	CONFIG THEO PROG DATA Layout... As Built... Angle & Distance... **Tie Distance...** Area... OK	Press ⬤ to highlight application program **Tie Distance** and accept with **OK**.

Step	Screen	Description
3.	CONFIG)THEO)PROG)DATA Tie Distance - Select method ! Radial Polygonal APPL OK SETUP	Press ◁◯▷ to select method and accept with **OK**.
☞		Press **MEASURE** for at least 5 seconds to turn on/off **Laser-pointer**.
4.		Aim at first point.
5.		Measure and record first point.
6.		Aim at second point.
7.		Measure and record second point.
☞	CONFIG)THEO)PROG)DATA Tie Distance - Result ! From : Pt0001 To : Pt0002 ∠ : 19.855 m ∠ : -0.243 m Grade : -1.2 % OK	Once two points have been measured and recorded the calculated horizontal distance, height difference, grade and slope distance between the measured points are displayed.
8.		Press **OK** to measure more points.

10 APPLICATION PROGRAM - Area

Description

The application program **Area** is used to compute online areas from an unlimited number of points connected by straights. The target points have to be measured. Additionally a block volume can be calculated.

Diagram
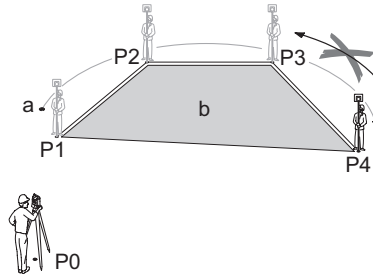
P0	Station
P1	Start point
P2	Target point
P3	Target point
P4	Target point
a	Perimeter
b	Calculated area, always closed to the start point P1

Application program Area step-by-step

Step	Screen	Description
☞		Make sure that **PROG** Mode is active.
1.		Press **APPL**.
2.		Press ◯ to highlight application program **Area** and accept with **OK**.
☞		Press **MEASURE** for at least 5 seconds to turn on/off **Laser-pointer**.
3.		Aim at first point.
4.		Measure and record first point.
5.		Aim at second point.
6.		Measure and record second point.
7.		Aim at third point.
8.		Measure and record third point.
☞		Once three points have been measured and recorded the calculated area, perimeter and number of points are displayed.
9.		Press **OK** to measure more points.

Step	Screen	Description
10.		Or press **VOLUME** to calculate a block volume.

Total Quality Management: Our commitment to total customer satisfaction.

TQM
ISO 9001 / ISO 14001

Leica Geosystems AG, Heerbrugg, Switzerland, has been certified as being equipped with a quality system which meets the International Standards of Quality Management and Quality Systems (ISO standard 9001) and Environmental Management Systems (ISO standard 14001).

Ask your local Leica dealer for more information about our TQM program.

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