Leica Builder Series
How to Guide

Version 1.0
English

- when it has to be right
To use the product in a permitted manner, please refer to the detailed safety instructions in the User Manual.

Table of Contents

<table>
<thead>
<tr>
<th>In this manual</th>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>How to Getting Started</strong></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Description of the User Interface</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Explanation of the Screen</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Explanation of the Displayed Data</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>How to Set Up Builder Anywhere or over a Ground Point</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>How to Level Up Builder</td>
<td>14</td>
</tr>
<tr>
<td>1</td>
<td><strong>How to Set Up Builder to Gain a Known Station</strong></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>1.1 Set Up Anywhere Based on Given Control Line</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>1.2 Set Up over Control Line</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>1.3 Set Up Anywhere with Given Coordinates</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>1.4 Set Up over One Known Point with Second Known Point</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>1.5 Set Up Using Nails from Profile Boards</td>
<td>28</td>
</tr>
</tbody>
</table>
## How to Set Up Builder with Height

2.1 Transfer Elevation to Builder Placed over Height Benchmark 32
2.2 Transfer Height from Benchmark to Builder 34

## How to Measure

3.1 Measure a Site Surface 38
3.2 Make a Site Survey with Point Descriptions 40
3.3 Measure the Centre of Trees or Columns 42
3.4 Measure the Angle between Inlet and Outlet of a Planned Concrete Manhole 46

## How to Layout

4.1 Layout Points from Memory 48
4.2 Layout Points from Plan with Line & Offset 50
4.3 Layout Nails on Profile Boards from Control Line 54
4.4 Layout Nails on Profile Boards from Coordinates 56
4.5 Layout Pins with Offset for Rounded Curbs 60

## How to Measure Heights

5.1 Measure the Height of Inaccessible Points 64
5.2 Measure the Height Difference between Two Inaccessible Points 68
5.3 Place a Datum Line 70
5.4 Determine the Height of the Bottom of a Manhole 74
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td><strong>How to Measure Areas &amp; Volumes</strong></td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>6.1 Measure and Calculate a Plane Area</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>6.2 Measure and Calculate a Tilted Area</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>6.3 Measure and Calculate Volumes</td>
<td>86</td>
</tr>
<tr>
<td>7</td>
<td><strong>How to Check Verticality</strong></td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>7.1 Check the Verticality of a Wall</td>
<td>90</td>
</tr>
<tr>
<td>8</td>
<td><strong>How to Check Plane or Tilted Surfaces</strong></td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>8.1 Check a Plane Surface</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>8.2 Check a Tilted Surface</td>
<td>96</td>
</tr>
</tbody>
</table>
How to Getting Started

Depending on the Builder model some functions might not be available.

Description of the User Interface

Keyboard | Builder 100, 200 and 300 | Builder 400 and 500

- **a**) Page key
- **b**) Navigation keys
- **c**) ESC
- **d**) Light
- **e**) Function keys
- **f**) 10-digit keypad
- **g**) EDM key
- **h**) LED
### Keys for all Builder models:

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Key" /></td>
<td>Changes tab in the tab bar. Press to switch between the <strong>CONFIG</strong>, <strong>THEO</strong>, <strong>PROG</strong> and <strong>DATA</strong> tab pages.</td>
</tr>
</tbody>
</table>
| ![Key](image) | • Move the focus on the screen.  
• Start the edit mode for edit fields.  
• Control the input bar in edit and input mode. |
| ![Key](image) | • Leaves the current menu or dialog without storing changes made.  
• If **THEO** mode is active: press for approximately 5 seconds to access **System Info**. |
| ![Key](image) | Turns the display light including reticle illumination on and off. |
| ![Key](image) | Correspond to the three softkeys that appear on the bottom of the screen when the screen is activated. |
Keys only for Builder 400 and 500:

<table>
<thead>
<tr>
<th>Key/LED</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![Button Image] | • Press button short: to access the EDM settings.  
• Press button long: to toggle between red dot and prism. |
| ![Alphanumeric Keys Image] | Alphanumeric keys |
| ![LED Image] | • LED white: EDM type is prism.  
• LED red: EDM type is red dot.  
• LED flashes once if the EDM setting has changed by toggling or when a measurement is taken.  
• LED blinks if EDM measures in tracking mode. |
Sidecover keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![On/Off key]</td>
<td>On / Off key. Switches the instrument on or off.</td>
</tr>
<tr>
<td>![Switch key]</td>
<td>Switch key. The top end of the Switch key is Switch Key 1, the lower end is Switch Key 2.</td>
</tr>
</tbody>
</table>

Switch key functionality

<table>
<thead>
<tr>
<th>Builder model</th>
<th>Switch key 1</th>
<th>Switch key 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 series</td>
<td>Sector beep on/off</td>
<td>-</td>
</tr>
<tr>
<td>200 series</td>
<td>Laser pointer on/off</td>
<td>-</td>
</tr>
<tr>
<td>300 series</td>
<td>Laser pointer on/off</td>
<td>-</td>
</tr>
<tr>
<td>400 series</td>
<td>EDM tracking on/off</td>
<td>Switch between <strong>Measure/Record</strong>, <strong>All in 1</strong> and <strong>Measure</strong></td>
</tr>
<tr>
<td>500 series</td>
<td>Laser pointer on/off</td>
<td>Switch between <strong>Measure/Record</strong>, <strong>All in 1</strong> and <strong>Measure</strong></td>
</tr>
</tbody>
</table>

 vazgeçנה These settings or modes can also be changed in the **CONFIG** tab page.
Explanation of the Screen

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tab bar</td>
<td>The current active tab is shown in black.</td>
</tr>
<tr>
<td>Time</td>
<td>Shows the current time provided that the setting is made in the configurations.</td>
</tr>
<tr>
<td>Icons</td>
<td>Shows the current status information of the instrument.</td>
</tr>
<tr>
<td>Screen area</td>
<td>The working area of the screen.</td>
</tr>
<tr>
<td>Softkeys</td>
<td>Commands can be executed using the Softkeys. The commands assigned to the softkeys are screen dependent.</td>
</tr>
</tbody>
</table>
Explanation of the Displayed Data

Overview

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Symbol" /></td>
<td>Indicated meteorological corrected slope distance between instrument tilting axis and centre of prism/laser dot.</td>
</tr>
<tr>
<td><img src="image2" alt="Symbol" /></td>
<td>Indicated meteorological corrected horizontal distance.</td>
</tr>
<tr>
<td><img src="image3" alt="Symbol" /></td>
<td>Height difference between station and target point.</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>hr</td>
<td>Reflector height above ground.</td>
</tr>
<tr>
<td>hi</td>
<td>Instrument height above ground.</td>
</tr>
<tr>
<td>E₀</td>
<td>Easting of Station.</td>
</tr>
<tr>
<td>N₀</td>
<td>Northing of Station.</td>
</tr>
<tr>
<td>H₀</td>
<td>Height of Station.</td>
</tr>
<tr>
<td>E</td>
<td>Easting of target point.</td>
</tr>
<tr>
<td>N</td>
<td>Northing of target point.</td>
</tr>
<tr>
<td>H</td>
<td>Height of target point.</td>
</tr>
</tbody>
</table>
**How to Set Up Builder Anywhere or over a Ground Point**

Setup step-by-step

1. Extend the tripod legs to allow for a comfortable working posture (a).
2. **Over a ground point:** Position the tripod over the marked ground point, centring it as good as possible (b).
3. Fasten the tribrach and instrument onto the tripod (c).
4. Turn on the instrument by pressing the key (d).

   The electronic level and laser plummet are activated automatically after switching on the instrument, if compensator is set to on.
5. **Over a ground point:** Move the tripod legs (a) and use the tribrach footscrews (e) to centre the plummet over the ground point (f).

6. Adjust the tripod legs (g) to level the circular level (h).

7. By using the electronic level turn the tribrach footscrews (e) to precisely level the instrument.
   Refer to "How to Level Up Builder" for more information.

8. **Over a ground point:** Centre the instrument precisely over the ground point (f) by shifting the tribrach on the tripod plate (c).

9. Repeat steps 7. (and 8.) until the required accuracy is achieved.
How to Level Up Builder

Levelling up with the electronic level step-by-step

The electronic level can be used to precisely level the instrument using the footscrews of the tribrach.

1. Turn on the instrument by pressing the key.

   The electronic level and laser plummet are activated automatically after switching on the instrument, if compensator is set to on.

2. Centre the circular level roughly by turning the footscrews of the tribrach.

   The bubble of the electronic level and the arrows for the rotating direction of the footscrews only appear if the instrument tilt is inside a certain levelling range.

3. Rotate the instrument until it is parallel to two of the footscrews of the tribrach.

4. Centre the electronic level of this axis by turning the two footscrews. Arrows show the direction for rotating the footscrews. When the electronic level is centred the arrows are replaced by checkmarks.
5. Centre the electronic level for the second axis by turning the last footscrew. An arrow shows the direction for rotating the footscrew. When the electronic level is centred, the arrow is replaced by a checkmark.

When the electronic level is centred and three checkmarks are shown, the instrument has been perfectly leveled up.

6. Accept with **OK**.
1 How to Set Up Builder to Gain a Known Station

1.1 Set Up Anywhere Based on Given Control Line

Given:
- Start point of control line and one direction point.
- Builder is set up anywhere on site and levelled.
1

In the **PROG** Tab page, press **SETUP**. Select **Control Line...** and press **OK**. Select **Anywhere...** and press **OK**.

> After selecting a programme or setup, you always have to press **OK**. This will from now on no longer be stated but implied.

2

Sight start point of control line [2a] with the telescope and press **M & R**. Sight direction point [2b] and press **M & R**. Confirm new Station and Orientation with **YES**.
1.2 Set Up over Control Line

Given:
- Start point of control line and one direction point.
- Builder is set up over start point of control line.
1. In the **PROG** Tab page, press **SETUP**. Select **Control Line**... and **Over 1st point**...

2. Sight direction point and press **OK**. Confirm new Station and Orientation with **YES**.

---

**Builder, How to Set Up Builder to Gain a Known Station**
1.3 Set Up Anywhere with Given Coordinates

Given:
- Two or more points with coordinates have been stored in Builder’s memory.
- Builder is set up anywhere on site and levelled.
1. In the **PROG** Tab page, press **SETUP**. Select **Coordinates...** and **Anywhere...**.

2. Enter instrument height (hi) and reflector height (hr).

   ![Interacting with Builder interface](image)

   - **hi** : 1.500 m
   - **hr** : 2.000 m

   - It is not required to enter a value for hi. It is only needed if you want to know the height of the ground point. If you enter 0.000 m, the telescope height will be shown.
3 Select the first point and sight it. Press M & R.

4 Select the second point and sight it. Press M & R.
Check the results. If they are within the correct deviation, press **YES**. You can measure additional points by pressing **NEXT PT**. Confirm new Station and Orientation with **YES**.

If the results are not within the correct deviation, press **NO** and restart at step 1.
1.4 Set Up over One Known Point with Second Known Point

Given:
- Two known points with coordinates.
- Builder is set up over one known point and levelled.
In the PROG Tab page, press SETUP. Select Coordinates... and Over Known Station.

1. Enter instrument height (hi) and reflector height (hr). Select Station Number (Pt). Select Known Backsight Point.

The known backsight point is the second known point.
Select number of backsight point (Pt). Sight backsight point and press OK. Confirm new Station and Orientation with YES.

Only the angle will be measured for the backsight point, not the distance. Therefore it is not necessary to use a target on the point.
1.5 Set Up Using Nails from Profile Boards

Given:
- Profile boards with nails and plan.
- Builder is set up anywhere on site and levelled.

P0 Station (sought)
P1... Known point
a Control line
1. In the PROG Tab page, press SETUP. Select Control Line... and Anywhere....

2. Sight one nail of a line as start point and press M & R [2a]. Sight the other nail of the line as second point and press M & R [2b].
3. Press **SHIFT** to move control line in line direction. Press **MEASURE**. Now sight third nail, measure it and press **RECORD**.

4. Select **Offset** and press **Set=0**. Press **OK** to confirm it. Confirm new Station and Orientation with **YES**.
Afterwards, store three or more permanent points outside of the construction site as described in "3.1 Measure a Site Surface" on page 38. In case the profile boards are no longer available, use these points to set up Builder according to "1.3 Set Up Anywhere with Given Coordinates".
Given:
Builder is placed over benchmark with given elevation and levelled.
1. In the **PROG** Tab page, press **SETUP**. Select **Height**.

2. Enter elevation of benchmark (**Station H**), height from benchmark to telescope (**hi**) and reflector height (**hr**). Press **OK** to confirm.
2.2 Transfer Height from Benchmark to Builder

**Given:**
- One benchmark with known elevation.
- Builder is placed anywhere on site and levelled.
In the **PROG** Tab page, press **SETUP**. Select **Height**.

1. **Station H** shows the previous station height. Enter instrument height (**hi**) and reflector height (**hr**). Press **HTRANS** for height transfer.

   It is not required to enter a value for **hi**. It is only needed if you want to know the height of the ground point. If you enter **0.000 m**, the telescope height will be shown.
3 Select benchmark from list (Pt) or enter new point. For new point enter elevation of benchmark and press OK as shown in centre and right screen.

4 Measure benchmark. Confirm new Station Height with YES.
3 How to Measure

3.1 Measure a Site Surface

Given:
Builder is set up with known station and height.

- You can also do this with application Measure & Descriptor or Angle & Distance.
- This procedure can also be used, for example, by architects and civil engineers for quantity surveying or by carpenters for receiving exact dimensions for the roof framework.
1 In the **PROG** Tab page, press **APPL**. Select **As Built**...

2 Enter ID of starting point (**Pt**), sight target and press **MEASURE**. After measuring, press **RECORD** to store the point. Measure and record as many points as needed.

- For storing points automatically after measuring, switch to measurement mode **All in 1** by pressing Switch key 2.
- Recorded points can be downloaded to a computer using the CDM software.
This procedure can also be used, for example, by architects and civil engineers for quantity surveying or by carpenters for receiving exact dimensions for the roof framework.

**Given:**
Builder is set up with known station and height.
In the PROG Tab page, press APPL. Select Measure & Descriptor....

Enter ID of starting point (Pt), enter a description (Desc.) and press OK. Sight target and press MEASURE. After measuring, press RECORD to store the point. Describe, measure and record as many points as needed.

For storing points automatically after measuring, switch to measurement mode All in 1 by pressing Switch key 2.
3.3 Measure the Centre of Trees or Columns

Given:
- Builder is set up with known station.
- Measure and Record mode is set to Measure/Record. Refer to "Sidecover keys" on page 8 on how to switch modes.
1. In the PROG Tab page, press APPL. Select As Built....

2. Place prism next to tree or column in the same distance as the centre. Enter point ID and sight prism. Press MEASURE.
Before storing the point, turn instrument and sight the centre of the tree or column. Now press **RECORD** to store the point with the new angle.

This method of turning the instrument before storing a point works in most of the applications.
3.4 Measure the Angle between Inlet and Outlet of a Planned Concrete Manhole

This procedure can also be used, for example, to check a right angle or to determine the angle for an elbow in power line constructions.

**Given:**
- Builder is placed over a planned manhole position and levelled.
- The position of the other two manholes is known.
1. In the **THEO** Tab page, press $Hz = 0$. Sight the first manhole and confirm new Orientation with **OK**.

2. Sight the second manhole and notice the shown angle ($Hz$).
Given:

- Builder is set up with known station. Setup with height is optional.
- List with layout points and coordinates have been stored in Builder’s memory.

This procedure can also be used for all other points you want to layout.
In the **PROG** Tab page, press **APPL**. Select **Layout**.

1. Enter ID of point to layout (**Pt**) Turn Builder in the shown direction. Measure until results are within the correct deviation.
This procedure can also be used for all other points you want to layout.

**Given:**
- Builder is set up with known station. Setup with height is optional.
- Plan with dimensioning.
1 In the **PROG** Tab page, press **APPL**. Select **Layout**.

2 Use Navigation keys to navigate to **Line**. Enter given value and press **OK**. Repeat this for offset (**Offs**) and height (**H**).
Turn Builder in the shown direction. Measure until results are within the correct deviation.
4.3 Layout Nails on Profile Boards from Control Line

Enable **EDM tracking** and **Laser pointer** while sighting the profile board for a faster workflow. For improved accuracy or for final layout also use a reflector target.

**Given:**
- Builder is set up with known station. Setup with height is optional.
- Plan with dimensioning.
In the **PROG** Tab page, press **APPL**. Select **As Built**.

1. Sight target on profile board and press **MEASURE**. Verify offset value (**Offs**). Note that this value is an absolute value to the control line. Move target to designated offset dimension [2a]. Measure target again until results are within the correct deviation and mark the point on the profile board [2b]. Press **RECORD** to store the point.

2. If there are vertical lines to layout, verify Line value.

For faster workflow use measurement mode **Measure**. To store the point, switch to **All in 1** or **Measure/Record** by pressing Switch key 2.
4.4 Layout Nails on Profile Boards from Coordinates

Given:
- Builder is set up with known station. Setup with height is optional.
- List with layout points and coordinates have been stored in Builder’s memory.

Enable **EDM tracking** and **Laser pointer** while sighting the profile board for a faster workflow. For improved accuracy or for final layout also use a reflector target.
In the PROG Tab page, press APPL. Select Layout Line/Arc/Spiral... and Basic....

1

Select Line. Enter ID of start point (Start Pt) and of end point (End Pt) and press OK. Then press Check.
Sight target on profile board and press **MEASURE**. Verify line (**Line**) and offset (**offs**) values. Note that these values are absolute values to the control line. Move target along board until offset value is **0.000** [2a]. Measure and record target to verify results. Mark the point on the profile board [2b].
4.5 Layout Pins with Offset for Rounded Curbs

This procedure can also be used, for example, for building up any round formworks.

**Given:**
- Builder is set up with known station. Setup with height is optional.
- Constructional drawing with dimensioning. The points have been stored in Builder’s memory.
1. In the PROG Tab page, press **APPL**. Select **Layout Line/Arc/Spiral...** and **Basic...**.

2. Select **Arc**. Select the method of how to define the arc, for example **Start Point & End Point & Radius**, enter or change the other values and press **OK**.

Refer to the Builder Series User Manual for more details about the different methods.
Press **LAYOUT**. Enter values for chainage of the arc (**Arc**) and Offset (**Offs**) and begin with layouting.
5 How to Measure Heights

5.1 Measure the Height of Inaccessible Points

This procedure can be used to measure, for example, the height of buildings, power lines, cranes, ridges, overhead clearances and trees.

**Given:**
- Builder is set up with height, known station is not necessary.
- Lower point and upper point are nearly in a vertical line.
- Target is measurable reflectorless.
1. In the **PROG** Tab page, press **SETUP**. Select **Height**.

![Diagram showing how to select Height](image1)

2. Enter **0.000 m** for both instrument height (**hi**) and reflector height (**hr**) and press **HTRANS** for height transfer. Press **NEW PT**. Enter a point ID (**Pt**) and press **OK**.

![Diagram showing how to enter point coordinates](image2)
3. Press **ENH=0** to set coordinates to 0.000 then press **OK** to store the point. Sight lower point and press **M & R**. Confirm new Station Height with **YES**.

4. Press **APPL**. Select **Angle & Distance**...
Press **MEASURE** to measure the point again. \( H \) should still be **0.000**. If this is not the case, restart from step 1.

Sight upper point. Now, \( H \) shows the height of the upper point.
5.2 Measure the Height Difference between Two Inaccessible Points

This procedure can be used to measure, for example, the height of buildings, power lines, cranes, ridges, overhead clearances and trees.

Given:
• Builder is set up with height, known station is not necessary.
• Target is measurable reflectorless.
In the PROG Tab page, press APPL. Select Tie Distance.... Select the method most suitable to your workflow.

Radial always shows the height difference to the first measured point while Polygonal always shows the height difference to the last measured point.

Sight start point and press M & R. Sight target point and press M & R. \( \Delta \) shows the height difference between the points.
5.3 Place a Datum Line

You can also use elevations above sea level for this procedure.

**Given:**
- Builder is levelled.
- Target is measurable reflectorless.
1. In the PROG Tab page, press SETUP. Select Height.... Enter 0.000 m for both instrument height (hi) and reflector height (hr) and press HTRANS for height transfer.

2. Press NEW PT to enter a new point. Enter a Point ID (Pt) and press OK. Press ENH=0 to set coordinates to 0.000. Press OK to store the point.
Sight a point at the bottom of the wall or a point of a reference height and press M & R. New Station Height shows the height difference between point and telescope height. Confirm new Station Height with YES.

Press APPL. Select Angle & Distance. Measure point again.
Press the button to open the EDM Settings. Select On for both Laser Pointer and Tracking and press OK. Sight wall for the datum line. Move telescope vertically until H shows correct value. Make mark at red dot on wall.
5.4 Determine the Height of the Bottom of a Manhole

This procedure can be used for every point which cannot be measured directly, for example points behind corners and trees, in chambers and in building pits.

**Given:**
- Builder is set up with known station and height.
- Rod, folding rod or level staff.
1. In the **PROG** Tab page, press **APPL**. Select **Hidden Point**.

2. Select **Rod** and press **OK**. Enter the Rod’s length and press **OK**.
Sight upper point on rod and press **MEASURE**. Sight lower point and press **MEASURE**. \( H \) shows the height of the bottom of the manhole. Press **RECORD** to store the point.
6 How to Measure Areas & Volumes

6.1 Measure and Calculate a Plane Area

**Given:**
Builder is set up anywhere.

- To use the measurement afterwards, Builder must be set up with known station and height.
1. In the PROG Tab page, press **APPL**. Select **Area & Volumes**... and **Area plane**.

2. Sight, measure and store the corner points either in clockwise or counter-clockwise direction.
After the third point has been measured and stored, a result screen will pop up with an overview about the measured points, the covered area and perimeters. To add more points, press **OK** and sight, measure and store as many points as needed. To leave the application, press **ESC**.
6.2 Measure and Calculate a Tilted Area

**Given:**
Builder is set up anywhere.

To use the measurement afterwards, Builder must be set up with known station and height.
In the **PROG** Tab page, press **APPL**. Select **Area & Volumes**.... and **Area tilt**.

1. Sight, measure and store the corner points either in clockwise or counter-clockwise direction.
After the third point has been measured and stored, a result screen will pop up with an overview about the measured points, the covered area and perimeters. To add more points, press **OK** and sight, measure and store as many points as needed. To leave the application, press **ESC**.
6.3 Measure and Calculate Volumes

**Given:**
Builder is set up anywhere.

- To use the measurement afterwards, Builder must be set up with known station and height.
1. In the **PROG** Tab page, press **APPL**. Select **Area & Volumes** and **Volumes**.

2. Sight first point of boundary and press **MEASURE**. Press **RECORD** to store the point. Proceed in the same way for the second point and the third point.

All points need to be measured consistently either in clockwise or in counter-clockwise direction.
After the third point has been measured and stored, a result screen will pop up with an overview about the measured points, the covered area and perimeters. To add more points of the boundary, press OK and sight, measure and store as many points as needed.

After measuring all points of the boundary, the points of the breakline have to be measured. Press BREAKL. Sight, measure and store points of the breakline in the same way as points of the boundary.
After the first point of the breakline has been measured and stored, a result screen will pop up with additional volume information. To add more points of the breakline, press **OK** and sight, measure and store as many points as needed. To leave the application, press **ESC**.
This procedure can also be used to build up and check the verticality of formworks.

**Given:**
- Builder is set up as described in chapter "1.1 Set Up Anywhere Based on Given Control Line" centrally in front of the wall using the lower left and lower right corner of the wall as the two points of control line.
In the PROG Tab page, press APPL. Select As built.

Enter ID of start point (Pt). Press to open the EDM Settings. For EDM Type select red dot and for Tracking select On and press OK. Builder will automatically switch back to application As Built.
3 Press **MEASURE** and start moving the telescope up and down. Builder will constantly measure the distance and update line and offset values without storing points. Check **Offs** to monitor the wall’s deviation from verticality.

To store the last measured point, press **RECORD**. To stop EDM Tracking, press **ESC**.

<table>
<thead>
<tr>
<th>CONFIG</th>
<th>THEO</th>
<th>PROG</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>As Built</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt:</td>
<td>PT0004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line: 24.754 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offs: 0.044 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H : 4.793 m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONFIG</th>
<th>THEO</th>
<th>PROG</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>As Built</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt: c.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line: 24.754 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offs: 0.044 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H : 4.793 m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8 How to Check Plane or Tilted Surfaces

8.1 Check a Plane Surface

Given:
Builder is set up anywhere.
In the PROG Tab page, press APPL. Select Tie Distance... and Radial.

1. Sight start point and press MEASURE. Sight target point and press MEASURE. The result screen shows the deviations for height ($\Delta h$) and Grade. For a plane surface both values should show 0.
8.2 Check a Tilted Surface

Given:
Builder is set up anywhere.
1. In the PROG Tab page, press the APPL button. Select Tie Distance.... Select the method most suitable to your workflow.

- Radial always shows the height difference to the first measured point while Polygonal always shows the height difference to the last measured point.

2. Sight start point and press MEASURE. Sight target point and press MEASURE. The result screen shows the deviations for height (Δ) and Grade.
Total Quality Management: Our commitment to total customer satisfaction.

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.