

ABT 8100 - Laser Height & Stagger



Overhead Line
Height and Stagger
measurements to
overhead catenary wire.

Instruction Manual

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2.0 Item List

- Height & Stagger Gauge
- REFOS Bracket
- HILTI PD-E Laser + HILTI Documentation
- Brake Assembly
- User Manual



3.0 Technical Specification

Abtus No.	Physical Weight & Dimensions	Cant/ Super-Elevation	Cable Stagger	Cable Height	REFOS
ABT 8100 – 56.5"	Length – 61 ⁷ / ₁₆ in Height – 56 ³ / ₄ in Width – 10 ⁵ / ₁₆ in Weight – 22lb	Range ± 7 ¹ / ₂ in Accuracy ± ¹ / ₁₆ in Resolution ¹ / ₁₆ in	Range ± 20 ¹ / ₂ in Accuracy ± ³ / ₈ in Resolution ¹ / ₁₆ in	Range 6.5ft to 328ft Accuracy ± ¹ / ₈ in @ 16ft Resolution ¹ / ₁₆ in	Range 6.5ft to 328ft Accuracy ± ¹ / ₈ in Resolution ¹ / ₁₆ in
ABT 8100 – 1435g	Length 1560mm Height 1442mm Width 262mm Weight 10kg	Range ±200mm Accuracy ±1.0mm Resolution 1mm	Range ±530mm Accuracy ±10mm Resolution 1mm	Range 2m to 100m Accuracy ±3.0mm@5m Resolution 1mm	Range 2m to 100m Accuracy ±3.0mm Resolution 1mm
ABT 8100 - 1600g	Length 1770mm Height 1440mm Width 265mm Weight 11kg	Range ±200mm Accuracy ±1.0mm Resolution 1mm	Range ±530mm Accuracy ±10mm Resolution 1mm	Range ±2m to 100m Accuracy ±3.0mm@5m Resolution 1mm	Range ±2m to 100m Accuracy ±3.0mm Resolution 1mm
ABT 8100 - 1676g	Length 1845mm Height 1440mm Width 265mm Weight 11.5kg	Range ±200mm Accuracy ±1.0mm Resolution 1mm	Range ±530mm Accuracy ±10mm Resolution 1mm	Range ±2m to 100m Accuracy ±3.0mm@5m Resolution 1mm	Range ±2m to 100m Accuracy ±3.0mm Resolution 1mm

Features:

- Fully insulated
- Expected battery life – 1 year
- Carry / Storage Bag
- Back light on laser display for night/ tunnel work

4.0 Getting Started

4.1 Overview

The ABT 8100 is a light-weight gauge that allows the user to safely take Height and Stagger measurements of the OHL (Over Head Line) using laser technology. Super-Elevation (SE) and Rail Edge to Face of Structure (REFOS) can also be measured

The laser unit is positioned at eye-level and features a 90° viewfinder, enabling the operator to easily set the laser location marker onto the OHL in all weather conditions including bright sunshine. The Height reading is displayed on an illuminated LCD screen on the laser. Stagger position is indicated on a reflective scale for ease of use at night as well as day.

SE is displayed on an illuminated LCD screen and REFOS is measured by transferring the laser unit to a separate bracket.

The vertical beam folds down flat to the horizontal beam for storage and transport.



4.2 Assembly

1. To release the vertical beam, pull the lever towards you (See Figure 1). Lift the vertical beam until it rests against the stop. Turn the locking handle away from the beam to lock it vertically in place (shown in Figure 2).



Figure 1

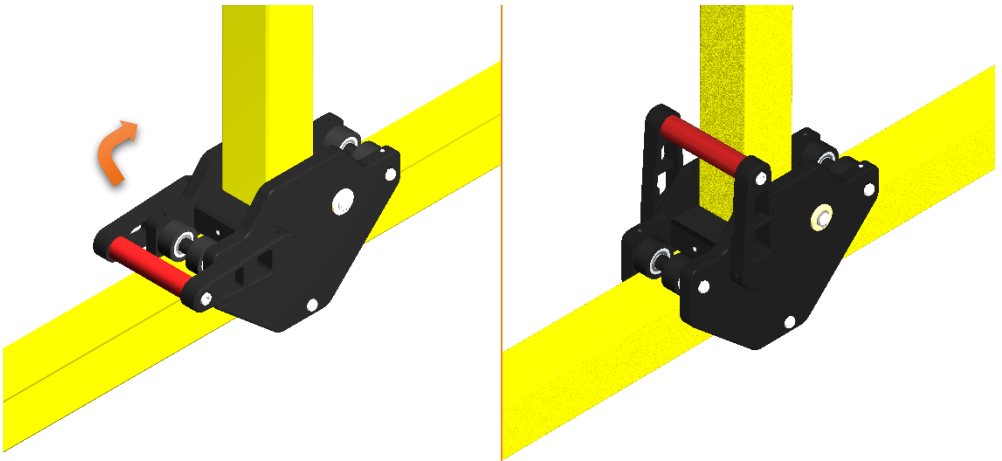


Figure 2 (Left – Unlocked vertical beam, Right – Locked vertical beam)

2. Place the laser unit into the holder at the top of the vertical beam and fix in place by turning the locking knob (See Figure 3).

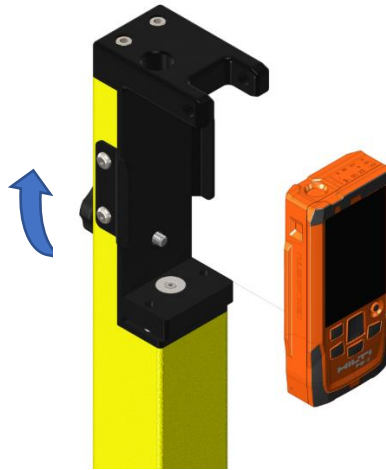



Figure 3

3. Screw the REFOS bracket to the rail foot of the gauge. The REFOS bracket may be fitted to either side of the gauge as required (see Figure 4).



Figure 4


4.3 Operating the Laser

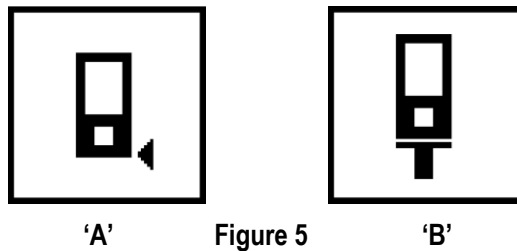
1. Switch on the laser by pressing the  situated on the right hand side of the unit.
 - a. If the laser unit is mounted on the top holder, the following screen will appear.




- b. If the laser unit is mounted on the REFOS bracket, the following screen will appear.



2. Press the  button to go to the next screen if the laser is mounted on the top holder.
3. One of two icons (shown in Figure 5) will be displayed in the top left of the screen which represents the point from which the laser measurements will be taken. Icon 'A' should be shown when the laser unit is mounted on the REFOS bracket and Icon 'B' should be shown when placed in the top holder.



4. Press the  button to reveal the laser location marker (visible red laser beam).
5. Press the same button to take the measurement, which will appear in the bottom right corner of the screen.

4.4 Measuring Height & Stagger

1. Ensure vertical beam is in the operating position and that the laser is secured (as described in section 4.2).
2. With the laser location marker activated, look through the viewfinder of the laser unit (shown in Figure 6). This will allow you to see when the laser is in line with the OHL.

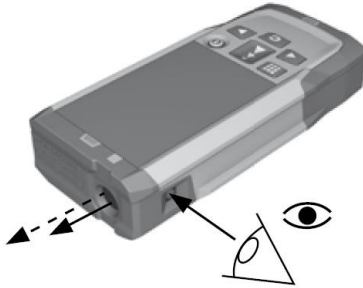


Figure 6

3. The vertical beam can be moved from side to side by turning the stagger adjustment wheel located in the centre of the vertical beam (shown in figure 7). When the over-head cable is in line with the laser the amount of cable stagger can be read from the scale on the upper side of the horizontal beam.

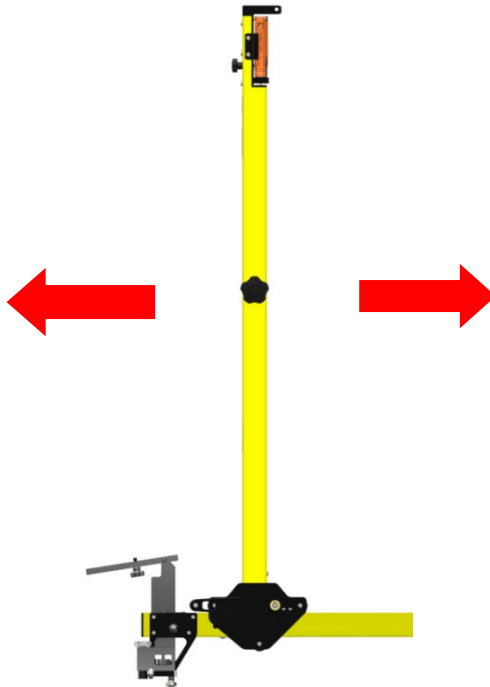


Figure 7

4.5 Measuring Cant/ Super Elevation

1. To measure cant / super elevation press the black button at the left end of the gauge (Figure 8). This will turn on the display directly above the button and will show the SE readings.

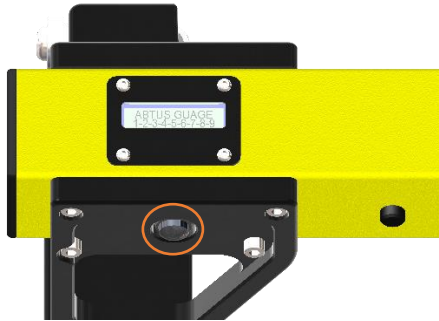


Figure 8

2. After pressing the white button, the sensor requires approximately 10 seconds to stabilise and display an accurate SE reading on the screen. In order to save battery power, the screen will automatically switch off after 15 seconds.
3. A positive SE reading is when the right rail is higher than the left.

4.6 Measuring REFOS

1. Secure laser unit to REFOS bracket (see Figure 4).
2. Use the spirit level on the laser unit to ensure it is level before taking the measurement

5.0 Maintenance

5.1 User Advice

- Check that the bearing surfaces that are in contact with the rail are clean and can move freely
- Ensure that the vertical beam locks firmly into place and there is no slack.
- Ensure the laser window on the vertical beam and the REFOS laser unit are clear.

5.2 Every 3 Months

- Visually check for damage
- Ensure the vertical beam moves smoothly across the cross beam using the stagger adjustment wheel.

5.3 Annual

- To ensure the ongoing accuracy of your ABT8100, the gauge should be calibrated every 12 months. For UK users this means returning to Abtus for re-calibration and for overseas users this means returning to your local Abtus Representative, a list of which can be found on www.abtus.com.

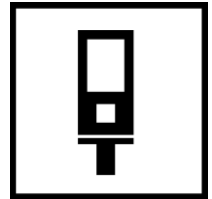
6.0 Trouble Shooter

6.1 Cant is not showing or is incorrect

Try replacing the battery (9V PP3). Remove the battery cover on the underside of the horizontal beam and carefully unplug the existing battery.

6.2 Incorrect icon is displayed on the laser unit

The laser unit senses a magnetic field to select the correct icon – check that a magnet is present in the base of the top holder. If the symbol below does not show, try removing the unit and re-attaching to the laser bracket.



6.3 Hilti PD-E Laser Variation

Each Abtus ABT8100 Laser Height and Stagger has its own Hilti PD-E laser. The laser beam comes out of each laser at a slightly different angle. Hilti claims this angle varies by around $\pm 1^\circ$. Over 4 meters this equates $\pm 7\text{mm}$. To compensate for this, each ABT8100 is calibrated to correct for the variation in this laser angle. Swapping the laser for a different PD-E laser means the gauge is no longer accurately calibrated. The accuracy of a PD-E laser in place for another laser was tested at Abtus and in the worst case, an error of 14mm in stagger measurement was found.

ABT8100 users are advised to return PD-E lasers with their Height and Stagger gauge so that the calibration is performed with the correct laser. Users are also advised to keep the same laser with the gauge at all times, until it is returned for the next calibration.