ABT4610
Laser Offset Gauge
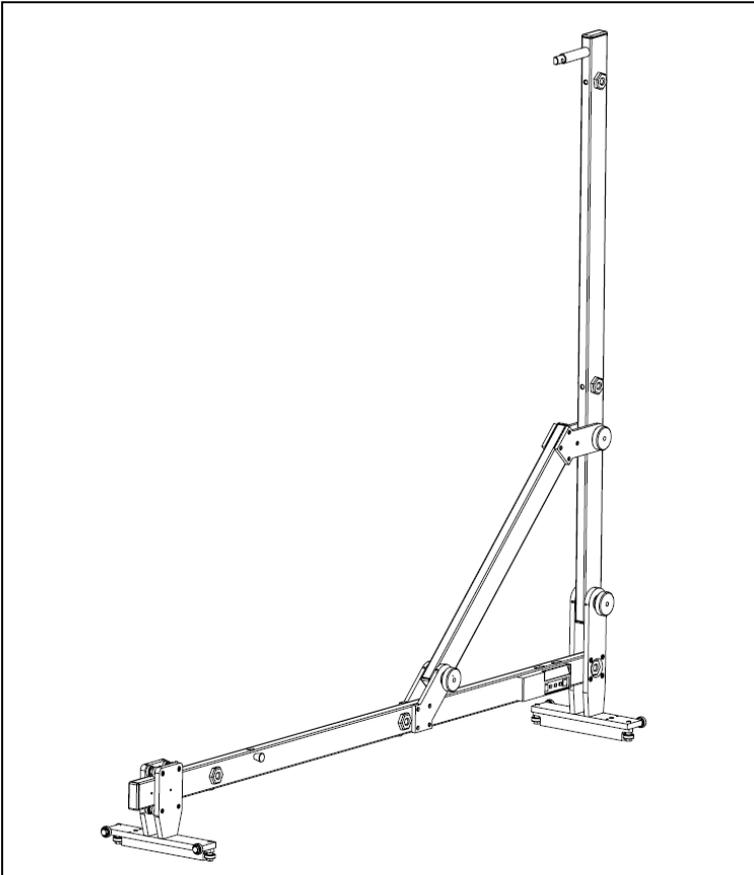
Instruction Manual

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2.0 Item List

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3.0 Specification

Features
1. Fully insulated
2. Expected Battery Life—1year (Inclinometer)
3. Back Light on laser display for Night/Tunnel work

4.0 Getting Started

4.1 Overview

The ABT 4610 is the latest edition to the Abtus data-logging range. The purpose of the product is to allow the user to take height and distance offset readings from the running rails to a desired object or position.

Height and Offset values are displayed on a PDA allowing the operator on track/site exactly what has been measured at that given position. These values are calculations of measurements taken from a laser and inclinometer fitted to the gauge. The technique used to calculate the height and offset values enables objects to be measured even if they are below rail level.

The tool is constructed from lightweight GRP and Nylon with a weight of just 8.0kg, ensuring that the gauge is insulated from the track circuit. Set up time is less than 30 seconds. The vertical and horizontal sections are unfolded then

clamped into position, the measurement laser is then attached.
The Datum Laser Gauge measures height and distance offsets by using the measurement laser. The laser has five location holes on the vertical and horizontal arms of the gauge, by measuring an object from at least two of these positions the PDA software is able to calculate the height and distance offset of the object/location to the running edge of the rail.
The horizontal arm of the gauge houses an inclinometer; the readings taken from this together with those from laser enable the software to calculate the super-elevation of the track which can be used for platform gauge working.
Once the data is input into the PDA it can be saved to file and then downloaded to a PC and kept as a permanent record of the survey.
For increased speed or for measuring bridge arches, a second laser can be used to locate the position of non-fixed points.

- Datum plate height & offset measurement
- Platform gauging (including cant measurement/allowance)
- Structure gauging
- Super-elevation
- OHL height and stagger position

Weight	-	8.0kg
Dimensions	-	1620mm x 1510mm x 265mm (in use) 1620mm x 315mm x 265mm (folded)
Distance Offset	-	Range: 0 – 100m Accuracy: ± 2mm Resolution: 0.1mm
Height Offset	-	Range: 0 – 100m Accuracy: ± 2.0mm Resolution: ± 0.1mm
Cant	-	Range: 0 - 45° Accuracy: ± 0.2° Resolution: 0.1°

4.2 Assembly

1. Unfold the Vertical Beam and locate the free end of the Diagonal Beam into the Locking Knob in the middle of the Vertical Beam. Ensure that the Locking Knob is located into the recess of the Locking Plate (as shown in figure 1).
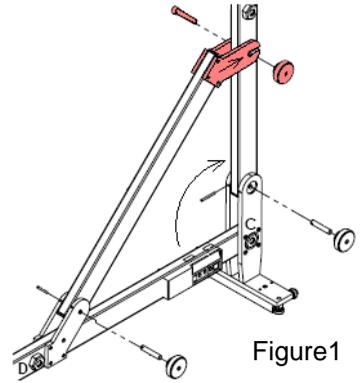

Figure1

2. Tighten all the knobs.

3. Place the Laser Range-finder into the Laser Carriage by extending the front, sprung plate (as shown in figure 2).

4. Carry the tool to the point on the rail opposite the measurement target.
   Place the Laser Carriage into an appropriate Pivot Socket and lock in the socket using the Locking knob attached (as shown in figure 2). Switch the Laser Rangefinder on to ensure that
   laser falls onto target.
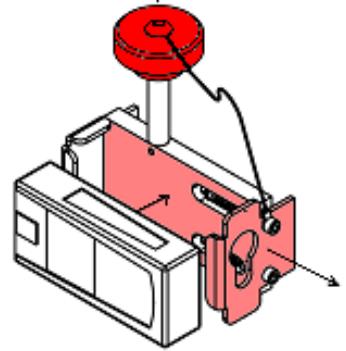
Figure 2

5. Switch on Inclinometer and Laser Rangefinder.

Removing the Offset Gauge from the track

6. Remove the equipment between locations. Fold down in reverse of assembly.

4.3 Measuring Super Elevation

The super elevation is displayed in degrees (°) on the inclinometer screen.

The arrow on either side of the display will determine weather the value is positive or negative, depending on which arrow is pointing upward. (Right arrow pointing up = negative value, left arrow pointing up = positive value).

There is a positive label directly above the left arrow and a negative label above the right arrow for clear indication (as shown in figure 3).

5.0 Operating the Gauge and Software

1. Turn on the Control Unit by pressing and holding the on button (please refer to manufacturers instructions as control units can vary).
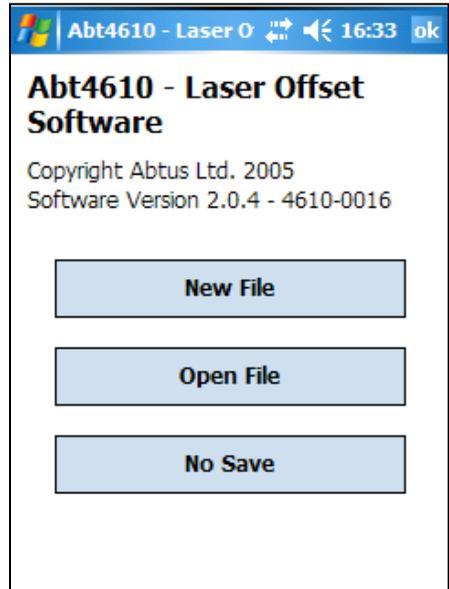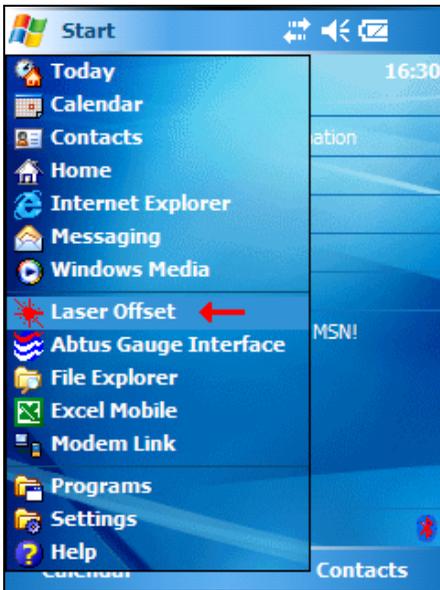
2. Select 1 of three options 'New File' (starts new file), 'Open File' (opens existing file) & 'No Save' (starts new file without option to save).

Enter a file name and then select appropriate button for type of measurement required 'Dat' (Datum), 'Plt' (Platform) & 'O/H' (Overhead).

Dat Calculates Datum using pivot sockets A, B & C.

Plt Calculates Platform using pivot sockets A, B & C.

O/H Calculates Overhead using pivot sockets A, D & E.

3. To obtain measurement values enter each laser reading taken from the specified pivot sockets (see above), and a 'Tilt' (Super Elevation) reading from the inclinometer into PDA and press calculate. (Indicated in image below)

4. To enter a reading into PDA tap once on each white box and use the keypad that appears.

5. If an error occurs (as image below) then one or more laser readings taken were not accurate and all three must be taken again.

Note: Using all three Pivot Sockets gives best accuracy. When necessary to use two only, then Pivot Sockets A+C is more accurate than A+B or B+C. Accuracy is dependent on distance and height of target.
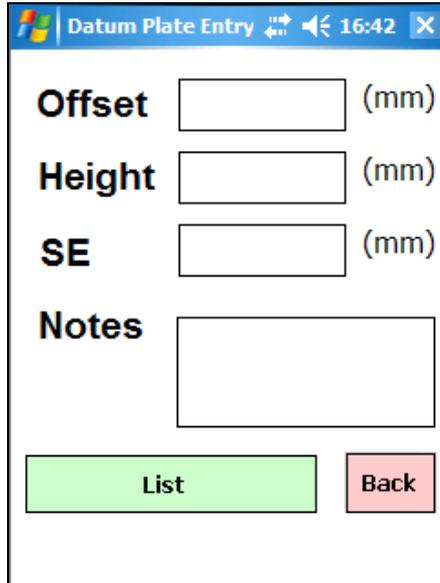
6.0 Maintenance

6.1   Before Each Use
1   Check that the bearing surfaces that are in contact with the rail are clean and can move freely
2   Ensure that the vertical beam locks firmly into place
3   Ensure all batteries are fully functioning

6.2   Every 3 Months
1   Visually check for damage

6.3   Annual
To ensure that the accuracy of your ABT4610 remains within specified limits, it should be returned to your local distributor for annual re-calibration.