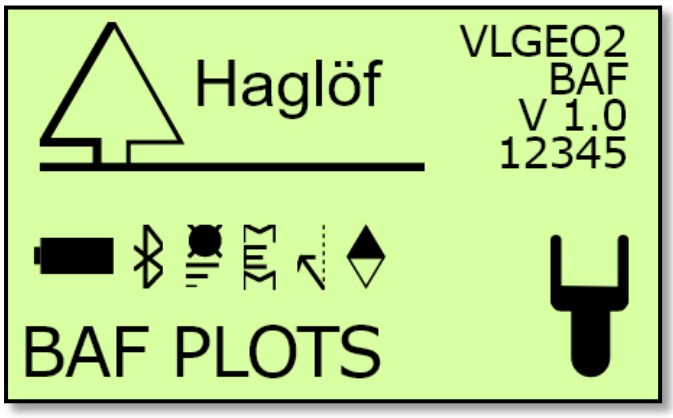
2025

BAF - software application

BAF USER MANUAL. GEO 2 SOFTWARE APPLICATION. ENG

2025-10-13

V 1.3



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2 OVERVIEW

2.1 THE BAF SOFTWARE APPLICATIONS

Please be advised that this manual exclusively covers **BAF** functions. All other features, including height measurement, are detailed in the **STD** manual and the **Geo 2** hardware manual.

Haglöf Sweden's Geo 2 instrument models are designed for field measurement operations in various situations, terrains, climates, and surroundings. The Geo 2 instruments provide long-range distance measuring with a high-precision laser and integrated tilt and compass sensors for accurate 3D measurements. Results are displayed in an integrated head-up display and on a large external graphic LCD display. The Vertex Laser Geo 2 model includes built-in ultrasonic distance technology, optimized for measurements in dense forest and circular sample plot work.

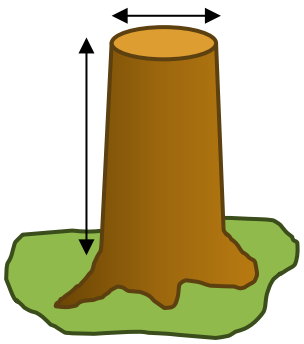
Without a software application, these instruments cannot function. Therefore, the Geo 2 instrument comes with a comprehensive software application **STD**, that includes all the features of the previous model, along with new features such as remote diameter measurement. This standard application, **STD**, is licensed to the Geo 2 hardware but is provided free of charge when purchasing a Geo 2 instrument.

The **BAF** software application has a variety of functions that cover most of the needs for measuring work in forests and other areas. This application allows for variable plot sampling (Point Sampling) to estimate basal area and volume.

2.2 BASAL AREA

Basal area is a commonly used term in forestry and plays an essential role in managing forest resources. It is an indicator of stand density and can be a good factor to use when estimating growth potential based on site conditions. Basal area refers to the cross-sectional area of trees measured at breast height (1.3m or 4.5ft above ground) and can be quantified at both tree and stand levels. Basal area provides an indication of the volume of standing timber and is usually given on a per hectare or per acre basis.

As a key factor in Timber and Wildlife Management, Basal Area values can be a tremendous tool for objectives such as native vegetation or native wildlife restoration, and historic Basal Area values can many times be replicated to assist in these restorative projects.



DBH - Diameter at Breast Height - the diameter of a tree measured at 1.3 m (4.5 feet) above ground.

Basal Area - The cross-sectional area of a tree trunk at DBH, measured in square meters (square feet). Used as a measure of stand density m^2/hectare (ft^2/acre) when the basal areas of all trees in a hectare (acre) are added together.

2.2.1 Upgrades and Customizations

Users can upgrade the STD and BAF software applications in the instruments whenever new versions are released. Ensure that you always have the latest version by visiting the Haglof Application Cloud and go under Download and select Geo 2.

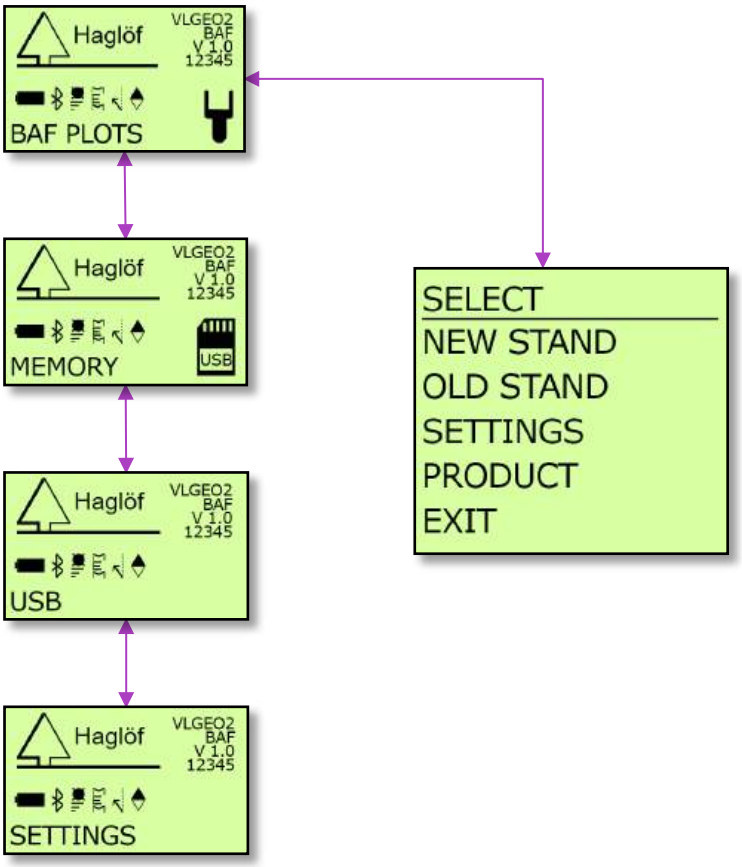
All installed applications in Geo 2 can be switched between at any time.

3 MENU SCHEME

The menu scheme in the BAF Application for Geo 2.

Note! More measuring functions can be activated or deactivated in Settings.

- Scroll through the menu with the ◁ **DME** and ▷ **SEND** arrow buttons.
- To select a function, press ⊙ **ON**.
- To cancel/exit or back out of a function press ◁ **DME** and ▷ **SEND** simultaneously.



4 BAF PLOTS

The BAF PLOTS function allows for variable plot sampling (Point Sampling) to estimate basal area and volume. Multiple plots can be measured and stored for each survey (Stand), with the total basal area and volume presented.

- Please ensure that BIOS version 3.3 or later is installed to use BAF PLOTS.
- The latest BIOS can be found on our software application site: http://haglof.app.

BAF PLOT Menu

Select	Description
NEW STAND	Start a new point sampling inventory
OLD STAND	Continue an already created inventory
SETTINGS	Settings for the measurement
PRODUCT	Set percentage of sawlog and pulpwood
EXIT	Exit the BAF PLOTS function

NOTE! Prior to measurement, review the SETTINGS for BAF PLOTS to confirm that the factor, form factor, sight intensity, sight type, GPS, and tree ID are appropriately set.

4.1 MEASURE

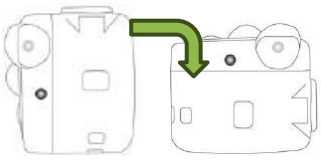
Start by going through the settings for the BAF PLOTS measurement; (Factor, Form factor, Sight intensity, Sight type, GPS and Tree ID). See BAF PLOT - SETTINGS

4.1.1 Measuring a new Stand

1. Select **BAF PLOTS** – **NEW STAND** and press ⊙ **ON**
2. Enter a 5-digit **ID** to create and store a new Stand or use an existing ID to access and continue with a previous Stand.
    a. Use ◁**DME** and ▷**SEND** to change the digit. Press ⊙ **ON** to move to the next digit. Long-press ⊙ **ON** to accept the value and continue.

4.1.2 Measuring a plot

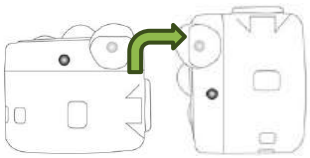
3. Go to the center of the plot.
    a. If GPS is selected in settings, begin by taking the plot center coordinate. Press ⊙ **ON** to start collecting coordinates and press ⊙ **ON** again to stop and save.
4. Rotate the GEO 2 instrument 90° to the side and look in the sight.
   The instrument sets the sighting gap according to the selected factor.
    a. Align the sighting gap at breast height (1.3 meters or 4.5 feet) with one tree at a time and press ⊙ **ON** to count all trees that are wider than the sighting gap. Rotate around the plot and record all trees that exceed the width of the sighting gap.



NOTE! The GEO 2 instrument also adjusts the sighting gap depending on the angle to the tree, which means that it can also be used on sloping terrain.

    b. By briefly pressing the ◁**DME**, it is possible to delete or reduce one tree at a time in cases where an incorrect tree has been registered.
    c. A long press at ◁**DME** allows you to switch type of sight. Select between dots, bars and line.
    d. A long press at ▷**SEND** allows you to change intensity of the sight. Select between weak and strong.

NOTE! When counting trees, a sample tree may be recorded by measuring its height and diameter. To register a sample tree, briefly press ▷**SEND**, return the instrument to its upright position, and proceed to measure the height. See SAMPLE TREE.



    e. When all trees on the plot have been counted, finish by pressing Escape (◁**DME** and ▷**SEND** simultaneously) to exit.
    f. The plot is prepared, and you will have the option to adjust or accept the default Form factor. Adjust by using ◁**DME** and ▷**SEND**, press ⊙ **ON** to step and accept.
5. You then have the option:
    a. **NEW PLOT:** Press ⊙ **ON** to start a new plot and repeat from point 3
    b. **VOLUME PLOT:** Press ⊙ **ON** to view Average height and volume for the current plot.
        i. If there are no sample trees, an average height must be entered. Enter the height, using ◁**DME** and ▷**SEND**, press ⊙ **ON** to step and accept.
    c. **VOLUME TOTAL:** Press ⊙ **ON** to view Average Basal area and Volume for all plots.
    d. **SAMPLE TREE:** Measure and register a sample tree's diameter and height. Multiple sample trees can be recorded.
        i. Press ⊙ **ON** to measure the sample tree. See section SAMPLE TREE how to measure.
    e. **DELETE TREE:** Remove sample trees individually, if there are multiple saved.
    f. **CONTINUE:** Continue the current plot.
    g. **FINISH:** End measurement in current stand.

4.1.3 VOLUME PLOT

The program determines the mean height based on measured sample trees present on the current plot. If there are no sample trees, users may input an average height, which will be stored.

The plot volume calculation uses the formula: Form Factor × Average Height × Total Basal Area (BA).

Values shown in the display

- **Average Height:** m or ft
- **Volume:** m^3/ha or ft^3/ac

4.1.4 VOLUME TOTAL

The total volume for all points.

- The program displays the average Basal Area and Total Volume for all plots on the Stand.
- The program also displays the amount of Sawlog and Pulpwood volume, using the percentage values set for the Products in BAF PLOT - PRODUCTS.
- Only plots with calculated volumes are included in the volume average.

Values shown in the display

- **Basal Area:** m^2/ha or ft^2/ac
- **Volume:** m^3/ha or ft^3/ac

Press ⊙ **ON** for next display.

Values shown in the display

- **Sawlog volume:** m^3/ha or ft^3/ac
- **Pulpwood volume:** m^3/ha or ft^3/ac

4.1.5 SAMPLE TREE

Measure sample trees on the current plot.

> **NOTE!** A sample tree can be registered at any point during the counting process by pressing ▷**SEND**, followed by measuring the sample tree according to the instructions provided below.

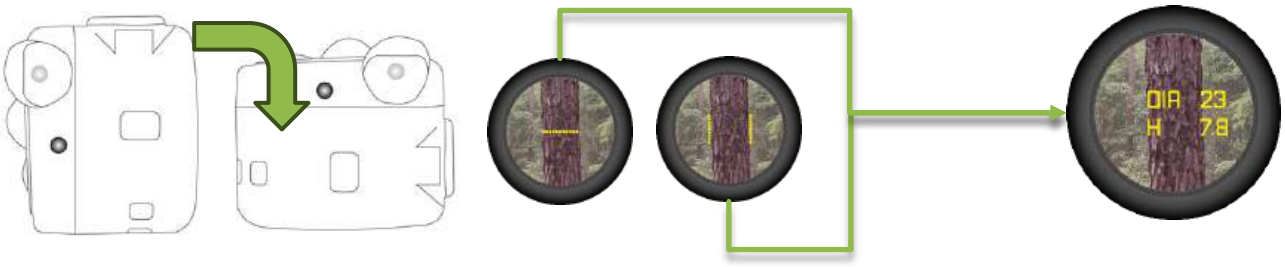
1. Enter a five-digit **ID** for the sample tree (optional; activate this feature in Settings). The ID can be used to identify species and quality codes.
   a. Use ◁**DME** and ▷**SEND** to change the digit. Press ⊙ **ON** to move to the next digit. Long-press ⊙ **ON** to accept the value and continue.
2. Use the sight to aim at a selected point on the stem, then briefly press ⊙ **ON** to measure the horizontal distance to the tree. Alternatively, hold down ⊙ **ON** to continuously scan the distance and release when the measurement is satisfactory.

> **Note!** Aim at the same point on the stem until a beep is heard.

3. Aim the sight at the root of the tree and hold ⊙ **ON** until you hear a beep.
4. Aim the sight at the top of the tree and hold ⊙ **ON** until you hear a beep. The height will appear on the display and Head-Up display.
5. Press ▷**SEND** or ⊙ **ON** to save the height value.

4.1.5.1 Measure a remote diameter:

Measure a remote diameter If diameter measurement is required.



1. Rotate the Geo 2 device 90° clockwise and align it with the target.
2. Use ◁**DME** and ▷**SEND** button to move the diameter sight until it matches the diameter. To move the sight continuously, press and hold the ◁**DME** or ▷**SEND** button.
3. Press ⊙ **ON** to calculate and see the diameter value in the display.
4. Press either ▷**SEND** or ⊙ **ON** to save the diameter measurement.

If GPS is selected, the software will then compute coordinates for the sample tree, using the plot center coordinate and measured distance and azimuth to the tree.

> **NOTE!** The program assumes that you are standing in the plot center when measuring the sample trees.

4.1.6 DELETE TREE

Delete a sample tree on current plot

1. Use ◁**DME** and ▷**SEND** buttons to scroll between the measured sample trees on the current plot.
2. Press ⊙ **ON** to select a sample tree.
3. Select OK and press ⊙ **ON** to delete the sample tree.
4. Select OK again and press ⊙ **ON** to confirm.

4.1.7 CONTINUE

Return to current plot and continue the inventory work.

4.1.8 Continue to measure on a Stand

1. Select **BAF PLOTS** – **OLD STAND** and press ⊙ **ON.**
2. Use ◁**DME** and ▷**SEND** buttons to select Stand from the list.
3. Press ⊙ **ON** to select a Stand.
4. Select if to continue latest created plot on the Stand or if to create a new plot.

4.2 SETTINGS – BAF PLOTS

Settings for the measurement. Before starting the measurement, go through the SETTINGS for measuring BAF PLOTS to ensure that the correct factor, shape factor, sight intensity, sight type, GPS and tree ID are set.

4.2.1 BAF PLOTS - SETTINGS menu

Options	Description
BAF FACTOR	xx. x m^2/ha or ft^2/ac. Used for the basal area calculation. The factor cannot be changed during measurement.
FORM FACTOR	0.10-0.95, default value is 0.45. Used for the volume calculation. The form factor can be set per plot when measure.
SIGHT INTENSITY	Weak or Strong.
SIGHT TYPE	Dots ○ ○, Bars | | or Line ___.
GPS COORDINATE	Activate if geographic coordinates should be collected for plots and sample trees
TREE ID	Extra ID field for the sample trees, five digits long. The ID can, for example, be used for species and quality code.

1. Select **BAF PLOTS - SETTINGS** and press the ⊙ **ON** button.
2. Use ◁**DME** and ▷**SEND** to change the digit. Press ⊙ **ON** to move to the next digit. Long-press ⊙ **ON** to accept the value and proceed to next settings.
    a. Set the **FACTOR** (Basal Area Factor) to calculate basal area. *It cannot be changed during measurement*.
    b. Set the **FORM FACTOR** used for the volume calculation.
    c. Set **SIGHT INTENSITY**: WEAK or STRONG.
    d. Set **SIGHT TYPE:** Dots ○ ○, Bars | | or Line ___.



    e. Set the **GPS COORDINATE** to activate when geographical position data is required for both the plot center and the sample trees.
    f. Set **USE TREE ID**: Yes or No.

4.3 SETTINGS - PRODUCTS

Use this menu to set the percentage of sawlog and pulpwood.

1. Enter the percentage value, 0-100%.
    a. Use ◁**DME** and ▷**SEND** to change the digit. Press ⊙ **ON** to move to the next digit. Long-press ⊙ **ON** to accept the value and continue.

5 DATA FILES

5.1 OUTPUT FILES

1. A CSV, KML and GEOJSON file are created when you finish the measurement and return to the main menu.
2. Attach the Geo 2 instrument to your computer using a USB cable.
3. Select the menu **USB** if the instrument doesn't go into USB mode.
4. Open a File Explorer on your computer. You will find the files in the DATA folder for the Geo 2 instrument

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