



Users Guide Vertex IV and Transponder T3

Users Guide

Vertex IV and Transponder T3

2007-02-02/rev. 2007-09-01

Haglöf Sweden AB

Box 28 • 88221 Långsele • Sweden

Phone: +46 620-255 80 • Fax: +46 620-205 81 • Mail: info@haglofsweden.com

Web: www.haglofsweden.com



VERTEX IV	6
FUNCTIONS AND CONSTRUCTION	6
DESCRIPTION	7
KEYS	7
FUNCTION OF THE ARROW KEYS	7
THE ON KEY FUNCTION	8
RED CROSS AIM	8
LOUD SPEAKERS	8
BATTERY	8
MENU OVERVIEW	9
IMPORTANT FACTS ON YOUR VERTEX IV INSTRUMENT	10
SETTINGS	11
SETUP	11
METRIC/FEET	11
DEG/GRAD/%	11
P.OFFSET (PIVOT OFFSET)	11
T.HEIGHT (TRANSPONDER HEIGHT)	12
M.DIST (MANUAL DISTANCE).....	12
BAF BASAL AREA FACTOR	12
CALIBRATE	13
DISPLAY	13
CONTRAST	13
CROSS HAIR SIGHT	13
HOW TO USE THE VERTEX IV.....	14
HEIGHT	14
HEIGHT MEASURING WITH TRANSPONDER	14
HEIGHT MEASURING WITHOUT THE TRANSPONDER	14
HEIGHT MEASURING FROM HORIZONTAL LINE	15
INCLINATION (ANGLE)	15
DISTANCE MEASURING (DME).....	16

DISTANCE MEASURING WITH THE ADAPTER FOR 360 DEGREES.....	16
HORIZONTAL DISTANCE MEASURING (DME)	16
BAF – SMALLEST DIAMETER	17
DIAMETERS IN LEANING TERRAIN	17
TRANSPONDER T3	18
HOW TO USE THE T3 TRANSPONDER.....	18
BLUETOOTH.....	19
BLUETOOTH PORTS IN COMMON COMPUTER DEVICES	19
<i>The Allegro</i>	19
<i>The Recon</i>	19
DATA FORMAT	20
<i>Height Measuring</i>	20
<i>Distance Measuring</i>	20
SIGN FORMAT BLUETOOTH	20
EXAMPLE OF CONNECTION TO PC	21
IR.....	22
SIGN FORMAT IR	22
TECHNICAL SPECIFICATION	23
FAULT DETECTION	24
QUICK START GUIDE	25
HEIGHT MEASURING WHEN USING THE TRANSPONDER.....	25
HEIGHT MEASURING WITHOUT USING THE TRANSPONDER	25
HEIGHT MEASURING HORIZONTALLY.....	25
ANGLE MEASURING.....	25
DISTANCE MEASURING (DME).....	25
TURN ON AND TURN OFF THE TRANSPONDER T3.....	25
DECLARATION OF CONFORMITY	26
WARRANTY AND SERVICE INFORMATION	26
SOFTWARE	27

VERTEX IV

FUNCTIONS AND CONSTRUCTION

Congratulations to your choice of height measurer! The Vertex IV is the market's most modern instrument, carefully tested and approved to be your reliable companion for years to come.

The Vertex IV is primarily designed to measure the height of standing objects, and most often trees. The instrument can also be used to measure distance, horizontal distance, angle and inclination. The Vertex instrument has with its ultrasonic measuring technique proved to be especially useful in dense terrains with thick undergrowth, where conventional methods such as measuring tapes, laser instruments and mechanical height measurers are difficult to use.

To define a reference point in a secure and reliable way, the Vertex IV works with the transponder T3. The Vertex IV communicates with the transponder. This communication eliminates in an efficient way any mix-ups of signals from other instruments or places (echoes). A measuring operation will not in any significant way be disturbed by objects in between the Vertex IV and the Transponder T3. The reference point, i.e. the T3, is used as a sight mark for height measuring and can be placed at optional height, where visibility is the best in for example thick vegetation. The reference point height is set in a special menu in the Vertex instrument and automatically added to the measured height.

The Vertex IV uses ultrasound to measure distances. Unlike for example measuring tapes and laser instruments, ultrasound can be used also when there is no free aim to the reference point. The ultrasound will not pass through an obstacle, but looks for the shortest way around it.

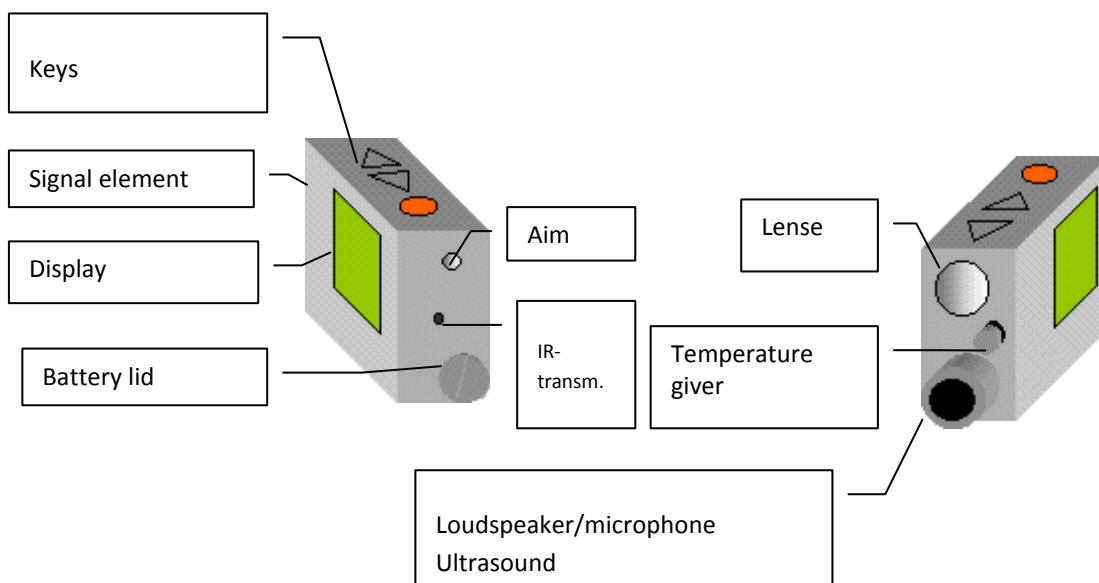
Heights are calculated trigonometrically using the variables contained when measuring angle and distance. The Vertex IV automatically assumes that the measuring object is perpendicularly positioned to the ground.

With the Vertex IV, an unlimited number of heights per object can be measured. The instrument display can show the 4 lastly measured heights per object at a time.

When using a relaskopic method to measure, an in-built BAF function (Basal Area Factor) can be used for the Vertex IV instrument to control the minimum diameter for trees. The function is useful when some trees in an area are covered by other, making the decision whether to include the tree or to exclude it from the area difficult. By simply measuring the distance between the tree and the plot centre, the Vertex IV can calculate the minimum diameter the tree should have in order to be included into the counting.

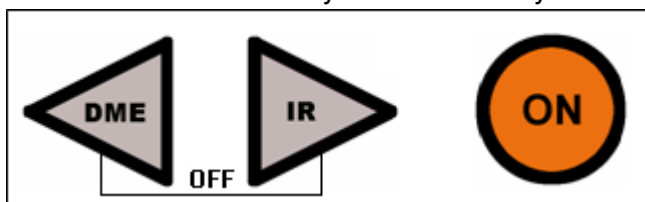
Data can be sent through IR or Bluetooth and results can be stored and processed in for example the Digitech Professional caliper, other PC or handheld computer.

DESCRIPTION



KEYS

The Vertex IV has three keys: Two arrow keys and one ON key.



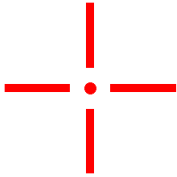
FUNCTION OF THE ARROW KEYS

Use the arrow keys primarily to scroll through the menu and to change the settings in the SETUP menu. By pressing down both arrow keys at the same time, the Vertex IV is turned off. Automatic turnoff time is set to approximately 25 sec. When the Vertex IV is turned off, the DME position can be activated with left arrow key. The Vertex IV turns into a distance measurer. Right arrow key (IR) is used to transmit data through IR (Infrared light) or Bluetooth® (Vertex IV BT model). Data can only be sent after having made a measuring. Note that the Bluetooth function is available only on Vertex IV units ordered and pre-fabricated with Bluetooth.

THE ON KEY FUNCTION

The ON key is used to start the Vertex IV, to confirm a value and as a trigger when measuring heights and angles.

RED CROSS AIM



The red dot cross hair sight simplifies spotting the target and holding the instrument straight when measuring heights, for best possible accuracy.

For best possible visibility, the light can be adjusted with the left arrow key when aiming.

LOUD SPEAKERS

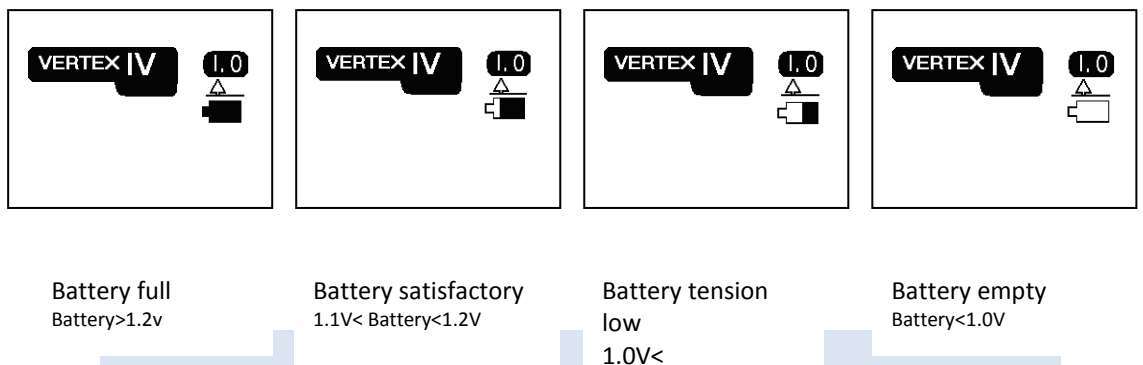
The Vertex IV is equipped with a built-in signal that will beep when an angle or a height has been registered.

BATTERY

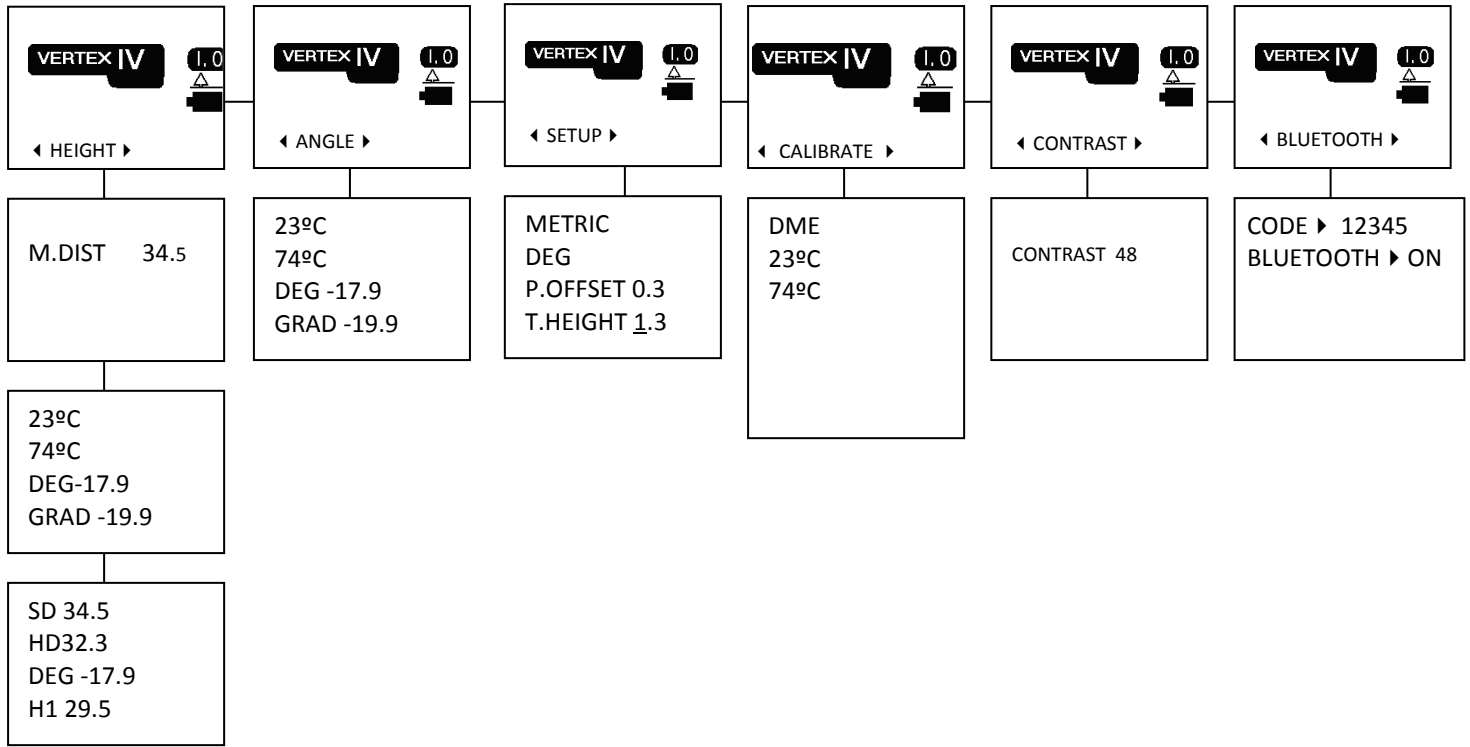
The Vertex IV uses an alkaline or a rechargeable battery of 1,5 V AA. The battery is placed under the battery cap, plus pole + down.

The remaining battery tension is featured as an icon in the display of the Vertex IV.

A battery will in normal cases last for weeks or even months. When frequently operating the Bluetooth function (model Vertex IV BT) the battery capacity is reduced and will last for less time (days in stead of weeks).



MENU OVERVIEW



IMPORTANT FACTS ON YOUR VERTEX IV INSTRUMENT

The Vertex IV uses ultra sonic signals to determine distances. Humidity, air pressure, surrounding noise and, above all, the temperature can affect the range and extension of the ultra sonic signals. The Vertex IV has a built-in temperature sensor that automatically compensates for the divergence caused by variations in temperature.

In some cases, distances of 50 meters/yds and greater can be measured without problems, and in other cases, the maximum distance can be shorter than 30 meters/yds.

To increase and optimize the measuring accuracy, the instrument should be calibrated on a regular basis. When calibrating, it is of utmost importance that the instrument has been given enough time to stabilize at ambient temperature.

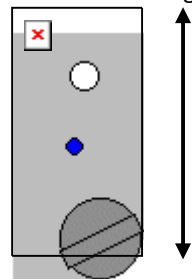
If, for example, the instrument is carried in an inner pocket, it can take up to 10 minutes before it has adjusted to current outdoor temperature. The measurement inaccuracy pending on temperature is app. 2 cm/C°.

An example: Your inner pocket holds +15 C°/59F. Outdoor air temperature is -5 C°/23F. The measurement result will show 10,40 m/34 ft and not the correct 10,00 m/32.8 ft.

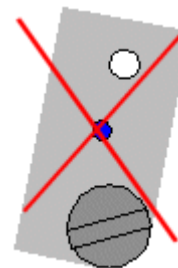
The measuring fault can be made permanent if the instrument is calibrated before reaching the correct current temperature.

- Check your instrument daily and recalibrate if necessary
- Do not touch the temperature sensor at the front of the instrument (the metal knob between the sight and the loudspeaker)
- Never calibrate the instrument before it has reached ambient temperature

When measuring heights, it is important to hold the instrument as straight as possible.



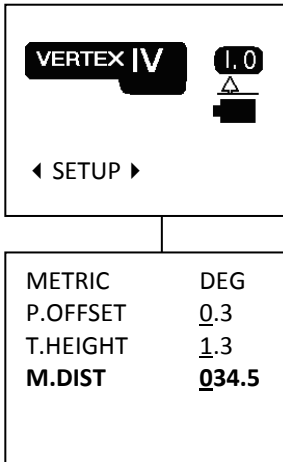
Correct



Wrong

The trigonometric functions calculate the height based on two (2) angles and one (1) distance. The distance can be measured manually with a tape, or automatically by using the T3 transponder. If using a tape, the distance has to be input in the Vertex before starting (angle-) and height measuring.

SETTINGS



SETUP

All settings to measure heights, distances and angles and BAF Factors are made in the SETUP menu. Choose between metric or feet, degrees or percentage, pivot offset, transponder height and manual distance.

Start the Vertex IV by pressing ON. Press any of the arrow keys and ON to go to settings. Step to the parameter using ON and change values with the arrow keys.

METRIC/FEET

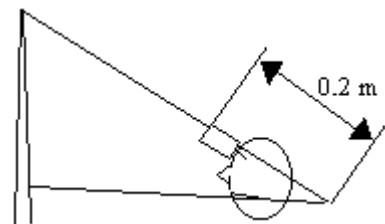
Choose if height and distance values should be featured in **METRIC or FEET**. Shift with the arrow keys and confirm your choice with ON.

DEG/GRAD/%

Select Angle unit as Deg (degrees 0.360), GRAD (gradients 0..400) or % (percentage) by pressing the arrow keys. Confirm by pressing ON.

P.OFFSET (PIVOT OFFSET)

Change the value with the arrow keys and confirm your choice with ON. The value is shown in Metric/Feet.



The "Pivot offset" is equal to the distance between the front side of the instrument to the aimed point where the prolonging of the sight line from the transponder and the top of the tree coincide.

The imagined point is located somewhere behind your neck and the value should in normal cases be set to 0,3 m (1.0 feet).

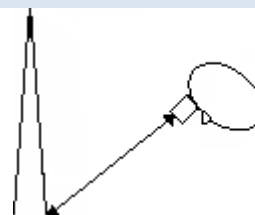
Since the Vertex IV will presume that the transponder T3 is placed directly under the aimed height of the measuring object (when the object is equal to a tree), a half of the objects diameter should be added to the Pivot Offset. This compensates for the diminishment of the tree top. When measuring tree heights, it is recommended to add half the average diameter in the area, for improved accuracy.

T.HEIGHT (TRANSPONDER HEIGHT)

Change the value with the arrow keys and confirm with ON. The value is set in metric/feet. **T.HEIGHT** is the height where the transponder is set, the reference height for the measuring unit. The Vertex IV adds the preset T HEIGHT to the measured height. Normal breast height value is set to 1,3 m (4.5 ft).

M.DIST (MANUAL DISTANCE)

This function is useful when measuring without the transponder. Change value with the arrow keys and confirm with the ON key. The value is shown in metric or feet. **M. DIST** is the manual distance to the reference point on the object where the height is measured. Make sure that the **T.HEIGHT** is correctly set, i.e. the height to the chosen reference point.



DME DIAMETER
MEASURING
BAF 5

BAF BASAL AREA FACTOR

Working with relaskopes or prism can sometimes offer difficulties when in the forest some trees cover others. The poor sighting can prevent a correct diameter measuring. With the Vertex built in BAF function, the minimum tree diameter for trees to be included can be featured.

By measuring the distance from the tree to the plot centre with the Vertex IV the instrument can calculate the minimum diameter for a tree to be included in the plot.

These BAF factors are available in the Vertex IV:

0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9 (m²/ha)

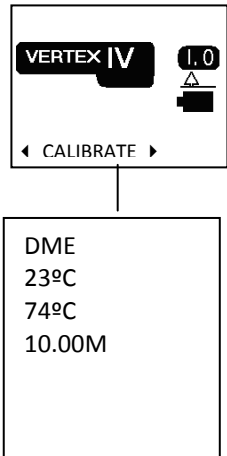
or

5, 10, 15, 20, 25, 30, 35, 40, 45, 50 (ft²/acre)

The Vertex IV can compensate for an inclination in the terrain when calculating the minimum diameter, see next chapter.

CALIBRATE

Use a measuring tape to measure the exact distance of 10.0 m (32,8 feet) between the transponder and the Vertex front.

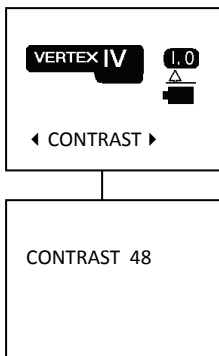


Press ON to start the Vertex instrument. Step in the menu to **CALIBRATE** and press ON. The instrument will calibrate to 10 m and automatically turn off when ready.

It is important to give the instrument approximately 10 minutes to set to the correct temperature before calibrating.

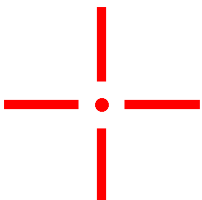
DISPLAY

Set the display contrast for best possible visibility using the arrow keys.



CONTRAST

Start the instrument with ON. Step to **CONTRAST** and press ON. Change the contrast with the arrow keys for best possible visibility.



CROSS HAIR SIGHT

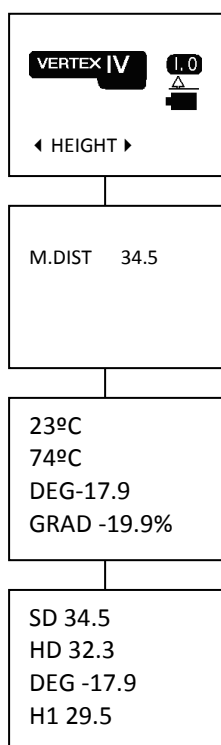
Change the light in the cross sight by looking into the sight when measuring and using arrow keys to increase or decrease the light intensity.

If the sun (back-light) makes it difficult to see, use both eyes when aiming, and put a finger in front of the sight.

HOW TO USE THE VERTEX IV

HEIGHT

Height measuring can be performed in different ways depending on type of surroundings and operation. Heights, distance and angles can be transferred to for example the Digitech Professional Caliper or other computer device for storage/processing with IR or Bluetooth (Vertex IV BT model only) by pressing right arrow key. For height measuring, the 3 last measured heights with angle and distance can be transferred.



HEIGHT MEASURING WITH TRANSPONDER

Start the transponder T3 and place it on/towards the object to measure. *Note that the transponder should be placed at the T.HEIGHT (transponder height) that has been set in the SETUP menu.* Walk a suitable distance from the object – for optimal result accuracy, a distance equal to the approximate height.

1. Press ON to start the Vertex and aim at the transponder. Keep pressing ON until the cross hair sight goes out momentarily. Now release ON. The Vertex has measured the distance, the angle and the horizontal distance to the transponder.
2. Aim at the height to measure with the sight cross blinking. Press ON until the cross hair disappears. The first height is locked and displayed. Repeat until all heights on the object are measured.

HEIGHT MEASURING WITHOUT THE TRANSPONDER

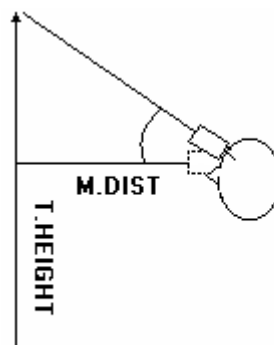
Height measuring without the transponder can be performed in two ways, both using manual distance (M.DIST). *Note that aiming must be made on the same height as the preset T.HEIGHT.*

1. Press ON to start the Vertex IV and **HEIGHT** is displayed.
2. A quick press on ON and **M.DIST** is featured. Change this value in the SETUP menu if incorrect. Press ON when the value is set and the angle window is featured.
3. Aim at the height that T.HEIGHT is set to and press ON until sight cross disappears. Release ON. The Vertex displays the angle and the horizontal distance to T.HEIGHT.
4. Aim at the height you wish to measure with the cross hair blinking. Keep pressing ON until the cross disappears. The first height is displayed. Repeat until all heights on the object are measured (see above).

HEIGHT MEASURING FROM HORIZONTAL LINE

Height measuring from a fixed distance and 0-set reference angle is a useful function to measure for example power line heights.

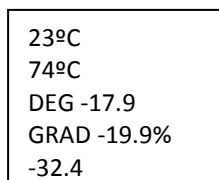
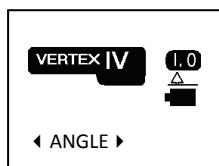
1. Press ON to start the Vertex and **HEIGHT** is displayed.
2. Press ON and **M.DIST** is featured. Change this value with the arrow keys and press ON when the correct distance is reached. Press right arrow key and ON at the same time to zero-set the angle.
3. Aim at the height of the object, with the cross hair sight blinking. Push and press ON until the cross disappears. The first height is locked and displayed. Repeat for more heights (see above). Note that the T.HEIGHT is added to the measured height over the horizontal line. The T.HEIGHT can, for example, be set at the operator's eye height.



INCLINATION (ANGLE)

The Vertex IV is an excellent instrument to measure inclination and angles in the terrain.

1. Start the Vertex IV with the ON key and step with the arrow keys in the menu to **ANGLE**. Press the ON key.
2. The ANGLE window is displayed. Aim where you need to measure the angle. Press and keep ON pressed until the red aim cross goes out. Read the measured value in the display.



The angle is presented in DEG (degrees 0.360), GRAD (degrees 0..400) and percentage.

Note that the angle should be measured with the cross hair sight. This implies that it is not possible to use the outside of the Vertex IV to measure an angle of, for example a flat table surface.

DISTANCE MEASURING (DME)



DME
23°C
74°F
10.00M

To measure a distance, press the DME key (left arrow key) when the Vertex IV is turned off. The result, the distance between the Vertex IV and the transponder T3, is presented in the Vertex display. Data can be transmitted through IR (or Bluetooth for the Vertex IV BT model) by pressing the IR key.

DISTANCE MEASURING WITH THE ADAPTER FOR 360 DEGREES

With the adapter, the ultrasound is spread and it is possible to measure from any direction. This is particularly useful when working in circular sample plots, where the distance from the plot centre to objects within a defined circle should be measured.

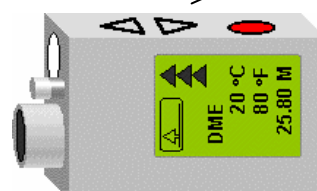
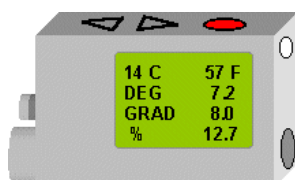
Note that the ultrasound has to travel approximately 1 inch (2,5cm) extra in these cases and that the distance reading should be made from the upper part of the display frame on the Vertex IV instrument when Vertex is calibrated as in page 13.

HORIZONTAL DISTANCE MEASURING (DME)



The Vertex can be used as a horizontal distance measurer (DME). The display text will rotate 90° to simplify reading the results when measuring horizontal distances.

1. Press ON to start the Vertex and go with the arrow keys to **ANGLE** and push ON.
2. Aim at the point where you need to know the angle. Push and press the ON until the red cross goes out.
3. To measure a distance, now push the left arrow key. The Vertex IV presents the horizontal distance in the display.



DME arrow key – trigger for distance

DME
23°C
74°C
23.5
15.54M

BAF – SMALLEST DIAMETER

Working in dense forest with relaskopes or prism can sometimes offer difficulties and accurate diameter estimation hard to make.

When using a relaskopic method to measure, an in-built BAF function can be used for the Vertex IV instrument to control the minimum diameter for trees. The function is useful when some trees in an area are covered by other, making the decision whether to include the tree or to exclude it from the area difficult.

By simply measuring the distance between the tree and the plot centre, the Vertex IV can calculate the minimum diameter the tree should have in order to be included into the counting.

Basal Area Factors: 0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9 (m²/ha)

or: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 (ft²/acre)

BAF factors are changed and set in the SETUP menu.

DIAMETERS IN LEANING TERRAIN

The Vertex IV can compensate the calculated minimum diameter also when the terrain is leaning. Measure the angle from the tree to the plot centre. Activate the distance measuring function by pressing the DME key (left arrow key).

The horizontal distance and the calculated minimum diameter is presented in the display.

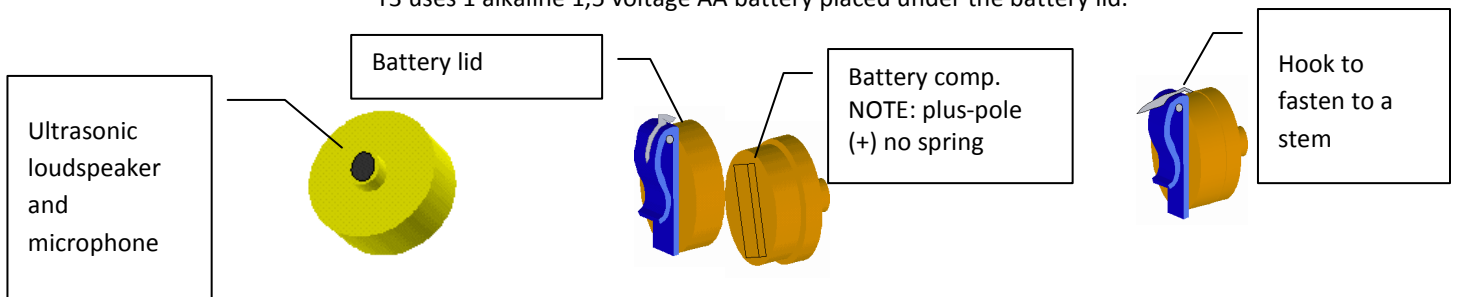
TRANSPONDER T3

The T3 transponder is an ultrasonic transmitter/receiver that communicates with the Vertex IV instrument. The T3 transponder can be used both for direct measuring (60°), and in 360° when used with the “360 adapter” – for example when working in circular sample plots.

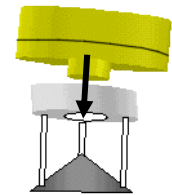
The T3 is equipped with an audible signal that tells if the transponder is activated or not.

The T3 has no switch and the Vertex and/or DME is used as a remote control to turn off and on. When turned on, the T3 Transponder stays activated for app. 20 minutes.

T3 uses 1 alkaline 1,5 voltage AA battery placed under the battery lid.

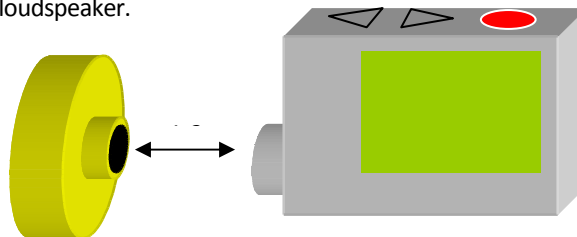


To measure in a 360° circle with the transponder, the T3 is attached to the adapter. The adapter spreads and receives the ultrasound in a full circle. The adapter can be mounted onto the custom plot center staff.



HOW TO USE THE T3 TRANSPONDER

To perform any of the operations described below, keep the measuring unit loudspeaker towards the T3 loudspeaker.

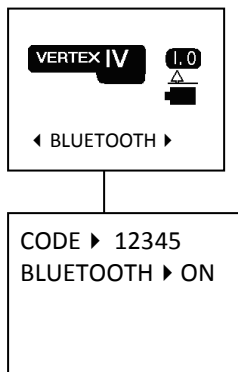


Function	
Turn on	Press meas.unit DME ◁ trigger until 2 signals beep
Turn off	Press meas.unit DME ◁ trigger until 4 signals beep (transponder)

BLUETOOTH

Read the following pages if you have the Vertex IV BT model:

The Vertex IV can as an option be equipped with Bluetooth, as the model Vertex IV BT. The Vertex IV BT can send data wireless to handheld computers or PC, using Bluetooth. The setup is made with the Vertex IV instrument in slave mode. Certain computer devices will ask to activate a pin code before making the connection. The pin code should be activated in the BLUETOOTH menu. The Vertex IV uses default code **12345**. Use this code if pin code has been activated.



Activate the Bluetooth function in the Vertex IV by selecting the BLUETOOTH menu. Activate pin code (if asked to according to above instructions) and switch '—' to 'ON' with the arrow keys. It is now possible for other, external device to connect to the Vertex IV.

Data is sent by pressing the centre key (IR) on the Vertex IV after having measured a height, angle or distance.

The Vertex IV will not disconnect the Bluetooth connection even when the unit is switched off. This implies that the Vertex IV can transfer data with Bluetooth after having been switched off and turned on again, without having to reconnect the Bluetooth.

Note that the Vertex IV consumes more battery when the Bluetooth function is activated. Do not forget to turn the function off when not in use, for example when moving between sample plots. To turn off the Bluetooth function, simply change the 'ON' to '—' in the BLUETOOTH menu.

If the Bluetooth function has been activated and the Vertex IV is switched off, the Bluetooth symbol is shown in the Vertex display as a reminder that the Bluetooth function is up and running.

The distance between the connected, receiving computer device and the Vertex IV should not be longer than 10 m or 32 ft. This is the maximum distance to transfer data with Bluetooth.

BLUETOOTH PORTS IN COMMON COMPUTER DEVICES

The documentation on ports dedicated to the Bluetooth function is often incomplete. These are the ports in the most common handheld computers:

THE ALLEGRO

COM6 is usually the internal Bluetooth port.

THE RECON

COM4 is usually the internal Bluetooth port.

DATA FORMAT

Data from the Vertex IV is sent serially as text acc. to below:

The data packet contains a total of 40 signs.

1 0000 [LF][EOL]

2 0000 [LF][EOL]

3 0000 [LF][EOL]

4 0000 [LF][EOL]

5 +000 [LF][EOL] (Negative angle replaces '+' with '-')

LF=Linefeed (ASCII 13)

EOL=End of line (ASCII 10)

HEIGHT MEASURING

Line 1: 1st height (dm alt. feet X 10)

Line 2: 2nd height (dm alt. feet X 10)

Line 3: 3rd height (dm alt. feet X 10)

Line 4: Horizontal distance to the object (dm x 10 alt. ft X10)

Line 5: Angle to the object (centesimal gradients X10)

DISTANCE MEASURING

Line 1: Distance to transponder (cm alt feet X 10)

Line 2: 0000

Line 3: 0000

Line 4: 0000

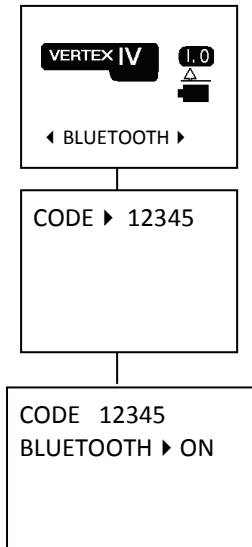
Line 5: Angle to the object (centesimal degree X10)

*If the angle (line 5) has a larger or smaller value than zero (0) the distance will be the calculated horizontal distance.

SIGN FORMAT BLUETOOTH

Transfer speed (Baud Rate) and number of stop bits are automatically set by the receiver. Number of bits per sign is 8 data bits and no parity.

EXAMPLE OF CONNECTION TO PC



1. Start the Vertex IV by pressing ON.
2. Select the BLUETOOTH menu with the arrow keys. Press the ON- key.
3. Select to use Pin code by pressing any of the arrow keys. The code 12345 should be shown in the display. Press the ON-key.
4. Activate Bluetooth by pressing any of the arrow keys. ON should be shown in the display. Press the ON-key.
5. Activate your Bluetooth settings in the PC.
6. Select to add a new device.
7. The PC is searching for new devices. Select 'VertexIV xxxxx' in the list of found Bluetooth devices.
8. Note the COM-port number given to the Vertex IV. This is the port that should be used.
9. Start a communication program, for ex. Hyperterminal in Windows (see Accessories in Windows). Start a new session and select to open the port that you have noted (point 8 above).
10. Measure a height or distance. Send data by pressing the IR key on the Vertex IV BT instrument.

IR

Heights can be sent through IR to the Digitech Professional caliper or to a special made IR receiver that can be placed in a serial port (RS232). The format is the same as for Bluetooth (see previous pages) Sign format and baud rate are according to the below description.

Note that the Vertex IV has to be positioned within 10 cm/4" to the receiving device for a transmission to be successful.



SIGN FORMAT IR

When sending data through IR every sign is transmitted with a parity bit added, if the number of bits in the sign is uneven. The parity bit is used to control that the sign has been received correctly, and has to be removed. When transmitting data with IR, baud 1200bps, 7 data bits and even parity and 1 stop bit are used. A special made receiver for handheld computers and PC can be ordered separately.

Ex. Sending data to the Digitech Professional

TECHNICAL SPECIFICATION

Vertex IV	
Size	80 x 50 x 30 mm
Weight	180 g (incl. battery)
Battery	1 x 1,5 AA alkaline
Temperature	-15° - 45° C
Ultra sonic frequency	25 kHz
Height	0-999 m
Resolution height	0,1 m
Angles	-55° .. 85° degrees
Resolution Angle	0,1
Distance with aimed transponder	30 m or better
Distance with 360° adapter	20 m or better
Resolution distance	0.01 m
Accuracy distance	1% or better
Bluetooth	Model –BT SPP Slave serial profile
T3 Transponder	
Size:	Diameter 70 mm
Weight:	85 g (Incl. battery)
Battery:	1,5V AA alkaline
Current:	1.0 mA

FAULT DETECTION		
Problem	Cause	What to do
No distance shown in display	Transponder turned off Poor battery in transponder Disturbing noise in surroundings	Start the transponder Change battery Measure from other spot or manually
Unstable distance value	Disturbing noise in surroundings	Measure from other spot or manually
Incorrect distance value	Poor calibration Disturbing noise in surroundings	Calibrate Measure from other spot or manually
Cross hair will not go out	Transponder turned off Poor battery in transponder Disturbing noise in surroundings Too large angle towards measuring object	Start the transponder Change battery Measure from other spot or manually Increase distance to measuring object
Measuring unit will not start	Poor batteries Batteries put in incorrectly	Change batteries Turn batteries to right position
Transponder will not start	Poor batteries	Change battery
No measuring values are presented	Transponder turned off Poor battery in transponder Disturbing noise in surroundings Too large angle towards measuring object. Instrument not held steady No horizontal reference	Start the transponder Change battery Measure from other spot or manually Increase distance to measuring object Attempt to hold unit steady Shake the measuring unit cautiously
Incorrect/unrealistic values	Disturbing noise in surroundings Measuring unit held unsteady	Measure from other spot or manually Attempt to hold unit steady

QUICK START GUIDE

HEIGHT MEASURING WHEN USING THE TRANSPONDER

Start the transponder and place it on the object to measure.
Press ON. Aim towards the transponder and press ON until the cross hair sight goes out.
Aim towards the height to measure. Press ON until the cross hair sight goes out.
Repeat for taking another height.

HEIGHT MEASURING WITHOUT USING THE TRANSPONDER

Press ON. **HEIGHT** is displayed. Press ON and **M.DIST** is displayed. Change **M.DIST** in SETUP or use the current value if accurate.
Aim towards the height measuring point (T.HEIGHT). Press ON until the cross hair sight goes out.
Aim towards the height to measure. Press ON until the cross hair sight goes out.
Repeat for taking another height.

HEIGHT MEASURING HORIZONTALLY

Press ON. **HEIGHT** is displayed. Press ON and **M.DIST** is displayed. Change **M.DIST** in SETUP or use the current value if accurate and press ON.
The angle window is displayed. Press left arrow and ON. Height measuring position is featured.
Aim towards the height to measure. Press ON until the cross hair sight goes out.
Repeat for taking another height.

ANGLE MEASURING

Start the Vertex with ON and use the arrow keys to reach **ANGLE**. Press ON.
Sight towards the point where the angle to measure is located. Press ON until the cross hair sight goes out.

DISTANCE MEASURING (DME)

Start the transponder and place it on the object to where the required distance to be measured is.
Press left arrow key and read the value measured.

TURN ON AND TURN OFF THE TRANSPONDER T3

On

Keep the Vertex loudspeaker towards the transponder.
Press left arrow key until two short signals are heard from the transponder.

Off

Keep the Vertex loudspeaker towards the transponder.
Press the left arrow key until 4 short signals goes off from the transponder.

DECLARATION OF CONFORMITY

According to the EMC Directive with amendment 89/336/EEG & the Low Voltage Directive 73/23/EEG and 93/68/EEG including amendments by the CE Marking Directive 93/68/EEG

Type of equipment Distance and angle meter

Brand name or trade mark Vertex

Manufacturer's name, address, telephone & fax no

Haglöf Sweden AB, Klockargatan 8, SE-882 21 Långsele, Sweden

Tel: +46 620-25585, **Fax:** +46 620-20581, info@haglofsweden.com;

www.haglofsweden.com

The following standards and/or technical specifications, which comply with good engineering practice in safety matters in force within the EEA, have been applied:

Test report/ technical construction file/ normative document

Ref.no 99250/Issued by Forestor AB, Standards EN50081-1, EN 55011

Class B, EN50082-2, EN61000-4-2, -3, Level 3

The Vertex was CE marked 1999

As manufacturer established within EEA, we declare under our sole responsibility that the equipment follows the provisions of the Directives stated above.

WARRANTY AND SERVICE INFORMATION

Haglöf Sweden AB warrants that this product shall be free from defects in materials and workmanship, under normal intended use, for a period of 12 months after date of shipment. The warranty excludes the batteries, the accessories and any written materials. The warranty does not apply if the product has been improperly installed, improperly calibrated or operated in a manner not in accordance with the user's guide. Warranty is also automatically expired if the product has been opposed to external force and warranty is not applicable for cosmetic defects. The one-year limited warranty time covers obvious fabrication defects. Defects in the electronic components that are impossible for the manufacturer to detect prior to assembling and shipping of the product may occur. Haglöf Sweden AB can in no case be responsible for problems of this nature and has no liability for any loss of business, profits, savings, consequential damages or other damages resulting from use of the products described. Signs of misuse, cosmetic damage, accidents or equal automatically withdraw the warranty. The warranty is valid in the country where your Haglöf product has been purchased. A product covered by warranty will be object to exchange, service, and repair or according to special agreement between seller and buyer, within the frames of the limited warranty. Haglöf Sweden reserves the right to determine which option will be most suitable for each separate case after having examined and evaluated the product.

IMPORTANT ISSUES:

- For a valid warranty, a copy of invoice or dated receipt of your purchase must be presented. The serial number of the returned product has to be clearly stated upon return. Go to <http://www.haglofsweden.com/PDF/HaglofRMA.pdf> for return form/turn to your supplier for assistance.
- The return freight to us is on buyer's expense. After warranty repair or exchange, the return freight to you is on our expense. If warranty has expired or is null and void, all freights are on buyer's expense.
- If no original invoice can be presented upon shipment, or if two years or more have passed from date of purchase, a customs fee will be added by the applicable customs authorities and possibly in receiving country as well. These fees are on buyers account.
- We perform repair and service of products where warranty has expired when possible. Cost estimation will be sent to you after evaluating the returned product for cost approval. Please also see above paragraph on customs fees.
- Please do not hesitate to contact us or any Haglöf Sweden AB representative for questions or comments!

Any signs of misuse or negligence automatically withdraw our warranty commitments

SOFTWARE

© Copyrights of Haglöf Sweden AB Software belong to Haglöf Sweden AB. Unauthorized duplication is prohibited. Haglöf Sweden AB is registered trademark and VERTEX is a recognized trademark of Haglöf Sweden AB. Production is made in Sweden.

Haglöf Sweden and its suppliers cannot warrant the performance or results when using the firmware, software or hardware, nor the documentation. No warranties or conditions are made; neither expressed nor implied, of merchantability, suitability or special fitness for any particular purpose. If software problems appear, please contact your programmer for support. Haglöf Sweden takes no responsibility for loss of income, time, or problems and delays due to problems in soft- or hardware of products. ***Copyrights of all software & firmware made by Haglöf Sweden belong to Haglöf Sweden*** Any lists and/or information of software for any Haglöf Sweden AB products should be considered as brief descriptions and not as a complete guide to what may and may not be available. For further details, please see ORGALIME SW01, General Conditions for Computer Software, and Supplement to ORGALIME S 2000 or ORGALIME SE 94.

