

**DataScope<sup>®</sup>** *digital compass/rangefinder*

**KVH Industries, Inc.**

## **Congratulations!**

You have purchased one of the most advanced hand-held devices available. The KVH DataScope® integrates precision optics with modern electronics. By combining the world's most accurate fluxgate compass, a unique electronic rangefinder, a digital chronometer and the finest 5 x 30 monocular, the DataScope provides you with scores of information, all at your fingertips.

Should you have any questions, comments or suggestions:

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***WARNING! Do NOT expose the DataScope's eyepiece to direct sunlight for prolonged periods of time as magnification through the lens can create heat which may damage the display's polarizer.***

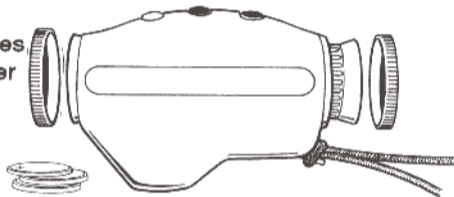
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## Out of the Box...

With your DataScope<sup>®</sup> you have received:

- 3 - 3V #2025 lithium batteries
- 1 - access cover screwdriver
- 2 - lens caps
- 1 - lens cloth
- 1 - lanyard (attached)
- 1 - Quick Reference card



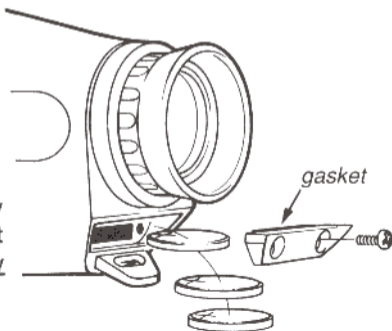
Before the DataScope will function, the batteries must be loaded. Please read the following section carefully, "Loading the Batteries" and follow the instructions thoroughly.

Furthermore, in order for you to get complete enjoyment out of your DataScope, and use it to its greatest capacity, we highly recommend that you read this manual thoroughly.

## Loading the Batteries

Near the lanyard hook on the DataScope, you will see the access cover to the battery compartment. Using the supplied screwdriver, unscrew the two screws and remove the cover. Make sure that the black gasket remains around the cover "tongue".

The 3 batteries stack into the battery cavity one on top of the other with (+) up. (+UP is noted on the access cover "tongue"). The third battery pushes against an internal spring. Place the third battery in against the spring (it will sit out from the cavity and gently push the cover back into the



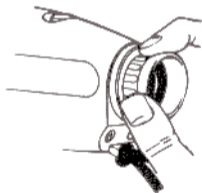
batteries stack  
" + " up

## FOCUSING THE EYEPIECE/"NO CAL" MESSAGE

cavity. The "tongue" will push the third battery into position. Replace the screws and tighten firmly, but do not overtighten.

Now that your DataScope is powered, place it up to your eye and you will see the message "No Cal" - warning that you have not calibrated your DataScope; a function very important to its accuracy. Pushing any button will put the DataScope into Bearing Mode. (If the DataScope did not power up, remove the batteries, wait 30 seconds and smoothly reinsert the batteries.)

At this stage, determine if you need to focus the DataScope. If so, grasp the rubber eyecup firmly and rotate it to the left or right until the display is in clear focus. The rubber eyecup folds down for use with glasses.



no CAL

### "No Cal" Message

Although your DataScope has been precisely calibrated at the

factory and has a "default" calibration in the software, every time batteries are installed into the DataScope it should be calibrated to ensure that it retains its  $\pm 0.5^\circ$  accuracy. (because all batteries are different magnetically). The "No Cal" message is warning you that you have placed new batteries in your DataScope and have not calibrated it for the new batteries. It is highly recommended to always recalibrate your DataScope each time you replace the batteries. But first, get yourself familiar with holding and using the DataScope and then go to pgs. 23-37 for detailed instructions on how to calibrate your DataScope.

## Holding the DataScope

The DataScope is ergonomically designed to fit comfortably in either hand. The buttons are positioned so that when holding the DataScope as in the illustration, your index finger lies on the green button, your middle finger on the black and your fourth



finger on the white button. In this position, when placed up to your eye, the DataScope should be relatively level. Although the DataScope is gimballed for tilt angles up to  $\pm 20^\circ$ , try to get into the habit of holding it as level as possible so that when tilt is inevitable (such as on a boat) you are maximizing its gimbaling capabilities. Position the DataScope in your hand and familiarize yourself with pushing the buttons. You may find your own method later, but for starts, this will do the job!

**One last note:** In this manual, "pushing" a button means pushing *and releasing* the button. Holding a button down and not releasing it will keep the button's push inactive and in some cases, will make the DataScope perform a different function altogether. So push and release, unless otherwise indicated!

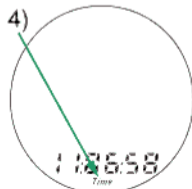
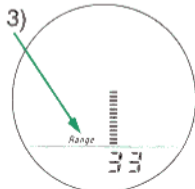
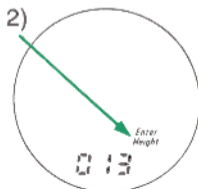
## DataScope Operations

Push any button to turn on the DataScope. It will turn off automatically if there is no button activity within 2 minutes. The **WHITE** button marked "mode" is a dedicated mode button and allows you to access the DataScope's various operating modes. These modes are:

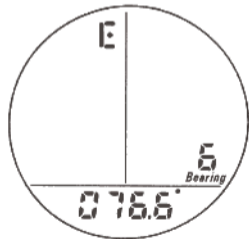
- 1) Bearing Mode
- 2) Enter Height Mode
- 3) Range Mode
- 4) Time Mode



*mode button  
rolls through modes*



Each time you push the **WHITE** button, you enter the next mode. For example, if you are in the Range Mode and press the **WHITE** button, you will enter into the Time Mode. Once you are in a particular mode, the **GREEN** and **BLACK** buttons perform functions associated with that particular mode. Pushing the **WHITE** (mode) button alone, always puts you into the next mode.



## Bearing Mode

Bearing mode is for obtaining accurate bearings to a target. While in **Bearing Mode**, you can get the following information:

- A) 9 Bearings recorded in Memory
- B) 9 "Time of Bearing" readings recorded in Memory
- C) Continuous Bearing for scanning and averaging
- D) Delta Bearing and Delta Time  
(Delta Time can also be used as a stopwatch)

When in the Bearing Mode, pushing and releasing the **GREEN** Button takes "bearings" and "times of bearings" and records them into the Bearing Memory. Holding the button down averages headings taken until the button is released. (Beneficial when in heavy seas.) Bearings are displayed in magnetic north unless variation (declination) is entered (*see pgs 23-5, 38-41*).

Taking Bearings:

1. Point to the desired target.
2. Press and hold the **GREEN** button down - "Bearing" will flash.
3. Release button when the bearing digits are steady or when desired. The heading is averaged until the **GREEN** button is released.

This bearing and time of bearing is automatically stored in the next available memory slot.



*Take Bearings/  
Stores Time*

## BEARING MODE



*Recalls Bearings  
(Hold down)  
flashes between  
"Time of Bearing" &  
"Bearing"*



*Continuous Bearing*

### Recalling Bearings:

When in Bearing Mode, the **BLACK** Button recalls previously stored bearings. Each time you push and release the **BLACK** button, the display backs up one bearing. If you hold the **BLACK** button down for 2-3 seconds the display will flash between **Bearing** and **Time of Bearing**.

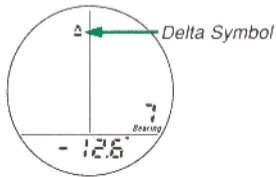
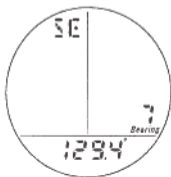
### Continuous Bearing:

In Bearing Mode, pushing the **GREEN** and **BLACK** buttons simultaneously will give you **continuous bearing**. This mode is intended for quick scans of several targets. Notice that once you are in this mode, you can release the buttons and continuous bearing will still be taken. The word, "**Bearing**" will continue to flash indicating that you are in this mode. To stop taking continuous bearing, press the **GREEN** or **BLACK** button.

**Delta Bearing/Delta Time:**

In Bearing Mode, pushing the **BLACK** and **WHITE** buttons simultaneously and holding them down will give you **Delta Bearing/ Delta Time**. The delta(difference) in bearing and time between the currently displayed bearing in memory and the bearing stored before it is displayed. The display alternates between flashing delta bearing and delta time on the display.

*For example: The DataScope display is reading "Bearing 7" & "129.4°". Simultaneously press/hold the black and white buttons to see the difference between Bearing 7 and Bearing 6. If "Bearing 6" was 142.0° then the display would read -12.6°. Delta Time between the two bearings would also be displayed.*

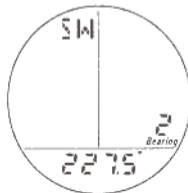


● then ●  
Stopwatch function

● (Hold down) ● mode  
Delta Time

### Stopwatch Function:

Delta Time can be used as a stopwatch function. Push and release the **GREEN** button to take a bearing to start the clock, and again to stop the clock. The **Delta Time** between these two bearings will be the time elapsed between the two bearings. (Displayed by simultaneously pushing and holding the black and white buttons down.) *For example: Press the green button to start timing and press it again to stop. Now press and hold both the black and white buttons down. The display flashes between Delta Bearing and Delta Time. Below, Delta Time is 1 minute, 26 seconds.*



## Enter Height Mode

Once you are familiar with the Bearing Mode, a push on the **WHITE** (mode) button will put you into the next mode - the **Enter Height Mode**.

This mode is used to enter the known height of an object to which you want to know the distance. Use whatever units (feet, inches, meters, boat lengths, etc.) you are comfortable with. The units won't be displayed, but whatever unit of measure that you enter will also be used in the **Range Mode**. For instance, if you enter the height of a lighthouse in meters, the distance to the lighthouse will also be displayed in meters.

When in **Enter Height Mode**, pushing and releasing the **GREEN** button rolls through the flashing digit in increments of one from 0-9. You will notice that the selected digit is flashing.



*Rolls through  
selected digit*

## ENTER HEIGHT MODE

There are 3 places for digits, so make sure you leave the first place at 0 if the height of the object in the selected unit of measure is less than 3 digits. *For example, if something is 40 feet high you would enter "040" for the height.*

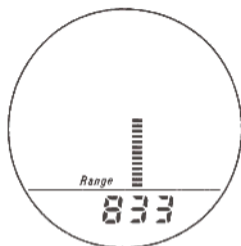


*Freezes digit  
and selects  
next digit place*

Once you have the correct number (0-9) in the first digit place, pressing the **BLACK** button freezes that digit and places the selection on the next digit place. You will see the second digit begin to flash. As with the first digit, use the **GREEN** button to roll through to the correct digit (0-9) for the second position and then push the **BLACK** button to freeze it in its place. Do this for all three places. When you have finished entering the last digit, push the **BLACK** button and it will make the first digit flash again. If your entered height is correct, disregard the flashing digit and push the **WHITE** button (mode) to get out of the Enter Height Mode. You will now be in the **Range Mode**.

## Range Mode

In the **Range Mode**, distance to an object is displayed based on the height entered in the **Enter Height Mode** combined with the amount of segments used to match the size of the object in the reticle. Place the display's horizontal line at the base of the object\* for which you entered the height and raise and lower the segments until they match the size of the object in view. Pushing and releasing the **GREEN** button lowers the segments in the range reticle one at a time. If you want the segments to decrease rapidly, hold the **GREEN** button down.



*Lowers segments  
in range reticle*

*\*See Note on page 18*



*Need MORE segments  
Use black button*



*Need LESS segments  
Use green button*



*Segments match height.  
Range displayed is distance to object.*

## RANGE MODE



*Raises segments  
in range reticle*

***Note:** Heights on marine charts are given in feet above mean high water. A 50' lighthouse may be 20' high and sitting on a 30' cliff. Place the horizontal line on the waterline below the object.*

The **BLACK** button raises the segments in the range reticle. Holding the black button down makes the segments increase rapidly.



As you raise or lower the segments in the range reticle, you will notice the distance displayed getting smaller or larger in relation to the amount of segments displayed on the reticle. Once you have matched the segments as close as possible to the size of the object in the reticle, the range displayed is the distance to that object in whatever unit of measure you used in the Enter Height Mode.

## A Note on the Rangefinder's Accuracy

The DataScope Rangefinder's accuracy is a function of the height of the object, the distance, and your ability to "match" the size of the object to the segments. In general, if most of the segments are being used to match the object, the accuracy of the rangefinder will be a very good estimate of the distance to the object. If there are very few segments matching the size of the object (1 to 3) and you are not able to perfectly match the object's size to the segments, then the distance displayed will be a rough estimate.



*Distance displayed will be very good estimate of distance.*



*Use distance displayed as rough estimate only.*

## Time Mode

The last mode in the regular menu for the DataScope is the **Time Mode**. If you were in the Range Mode, push the **WHITE** button (mode) and you will see the current time displayed.

Setting the time on your DataScope is similar to setting the time on a digital watch. The Time Mode has a sub-mode, "Set Time". To get into "Set Time", press and hold down the **BLACK** button until you see the "seconds" flashing, then release the button. Once the seconds are flashing, the buttons perform the following functions: the **BLACK** button steps through the groups of digits. Each time you press and release the button, the next digit group - seconds, minutes, hours - will flash. Once you are at the digit group that you want to change, the **GREEN** button increments through the flashing numbers (00-59 for seconds and minutes and 1-12/00-23 for hours).



*Hold down until  
seconds "flash"*



*Steps through  
digit groups*

When you reach the correct number, push the **BLACK** button and it will freeze the current digit group and go onto the next group of digits which will begin to flash. You will notice that when you get to the hour digits, the "hours" and an "A" or "P" will flash. These stand for AM or PM. Make sure you have the correct symbol displayed for the time you are setting. Step through the "hours" until the correct symbol appears (12hr clock only). As with the Range Mode, a push/release of the **GREEN** button increments the numbers one at a time, while holding the button down makes the changes go rapidly.

**Note:** There is a handy way to synchronize the DataScope to your watch. When the "seconds" are flashing, pushing the **GREEN** button will reset the time to the nearest minute (zeros out the seconds). To do this, simply put the DataScope in "Set Time" with the seconds flashing. When your watch goes to zero seconds, simultaneously push the **GREEN** button. The



*Increments the selected (flashing) digits*



*Freezes digits and selects next digit group*



*When seconds are flashing, resets to "00"*

seconds are now perfectly synchronized. You can change the minutes and hours as desired without worrying about the seconds.



*Exits "Set Time Mode"  
Back into Time Mode*

Once you have entered the correct time, push the **WHITE** button (mode) to exit "Set Time". You are now back in the Time Mode. The next press on the **WHITE** button will place you back to the beginning of the menu, in the Bearing Mode.

## Select Options Mode

The DataScope has a special internal mode - **Select Options Mode** in which you can perform various optional functions. This mode enables you to do one of the following:

- 1) Clear all bearings in memory.
- 2) Calibrate the DataScope for precise bearings.
- 3) Enter magnetic variation to display "True" rather than "Magnetic" bearing. *Note: This option is not displayed unless the DataScope has been calibrated.*
- 4) Select between "degrees" or "mils".
- 5) Select between a 12 or 24 hour clock.

To enter into the Select Options Mode, push and hold down all three buttons simultaneously. Wait about 2-3 seconds. When the message "Select" appears, you may release the buttons. If



## SELECT OPTIONS MODE

SELECT

option

"Select" does not appear within 2-3 seconds, then you probably did not push all three buttons simultaneously. If this is the case, try again. After "Select" appears, the words "Option" and then "Clear?" will be displayed. You are now in the "Select Options Mode".



*Displays functions*

Press/release the **WHITE** button (mode) until the desired function appears on the display. The functions are displayed in this order: "CLEAR?", "CAL?", "north?", "mILS?" and "24hr?"



The Select Option Mode's functions do not roll over, so once you reach "24hr?" you will go into the Bearing Mode. To get back into the Select Options Mode you must hold down all three buttons simultaneously again and wait for "Select" to appear.

*Note: The DataScope is preprogrammed in degrees and with a 12 hour clock. If you have set your DataScope with a 24 hour clock, or to mils, when you enter the Select Options Mode and are rolling through the functions you will see "dEGS?", and "12hr?" instead of "miLS?" and "24hr?" .*

When you want to perform a function, put the correct function in the field of view and do the following:

### Clear?

Pushing the GREEN button when "CLEAR?" is on the display erases all stored bearings, and places you in the Bearing Mode.

CLEAR?



*Clears all  
stored bearings*

CAL ?



*Puts you into  
Calibration Mode*

## Cal?

Pushing the **GREEN** button when "CAL?" appears on the display puts you into the calibration function for the DataScope's compass. Stored bearings are erased and the magnetic variation is set to zero. Your DataScope has been precisely calibrated at the factory and has a default calibration in the software, but to ensure that your DataScope always has  $\pm 0.5^\circ$  accuracy, you must calibrate it any time you change the batteries or operate the DataScope in a location where the magnetic field is widely different from where it was originally calibrated. Calibration should always be performed outdoors and away from iron and electrical interference such as power transformers. Also, when calibrating, make sure you are not wearing any jewelry or objects that could cause magnetic interference. *(If you will always have a metal object on your person while using the DataScope, calibrate with this object in place (knife on belt, etc.))*

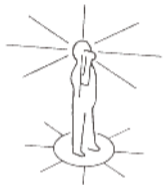
The DataScope requires 8 stable and level calibration bearings to perform its automatic calibration function. There are two methods for performing calibration: **Handheld** or **Remote**. We highly recommend the handheld method because it is faster, but if you try it at least twice (one practice and one for real) and find that you are not getting a "good" calibration (due to a shaky hand, etc.), then use the remote method, page 34. Remember that the DataScope is very picky in this mode because the result of the calibration will affect the accuracy of the compass. Don't worry about "ruining" the DataScope because of a bad calibration. The DataScope does a very thorough self-test on the results to make sure all is well and will tell you if you have not been successful in calibration. The DataScope will not use a "bad" calibration or put one into memory, but will continue to use the default calibration. The next time you turn on the DataScope, the display will continue to say "**No Cal**" and use the factory calibration.

Calibrating any position cannot take longer than 2 minutes. If it does, the DataScope will automatically turn off and you must try again. (If any of the 8 positions takes longer than 2 minutes, it means there was something causing interference that would prevent a good calibration). If this is the case, move to a "quieter" location and check your person for sources of interference. If you want to abort calibration mode for any reason, push any of the buttons and it will exit from the Calibration Function and use the last good calibration (or if none) the default factory calibration.

Read through the following section before beginning calibration, so that you have a good idea of what you need to do to calibrate your compass.

The handheld method of calibrating the compass requires your hand to be relatively steady, so prepare yourself for a few

minutes of concentrated steadiness! Standing in one central position, you will be turning in a circle to 8 positions, 45° apart.



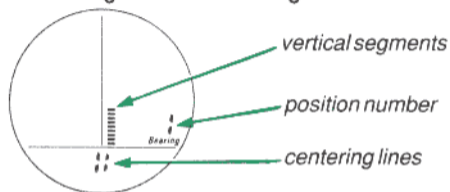
*Turn clockwise, staying in the same central position.*

*8 positions, 45° apart*

Remember this as you turn and it will cut down on the time needed to center out the display each time the display indicates a turn. To calibrate:

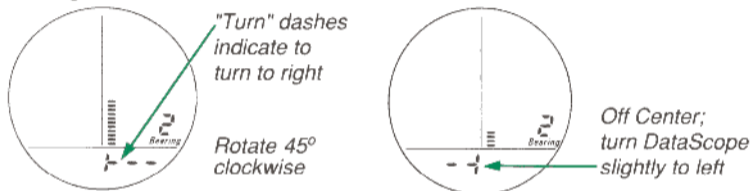
- 1) Get into the **Select Options Mode** with "CAL?" appearing on the DataScope display. Standing with feet apart in a comfortable stance, push and release the **GREEN** button.

Holding your hand steady you will see the display look something like the following illustration:



Two centering lines, vertical segments, and the position number that you are on (of the 8 needed for calibration), will be displayed. The two "centering" lines tell you that you are in the correct spot for the DataScope to take readings. The vertical segments give you an indication of your "steadiness" and the "noise" in the environment and roughly tell how much longer the DataScope needs to take readings at each of the eight bearings. When it goes down to 1 segment, you will see

indication "dashes" stemming off the centering lines telling you to turn 45° to the right. The vertical segments will also rise again.



- 2) Turn 45° or until you only have the two "centering" lines back. Hold the display steady until the dashes again indicate to turn 45°. Do this for all 8 positions. The position you are on (1-8) is recorded above the word "Bearing". If during any position you go off the "centering" lines to the left or right, the dashes stemming from the centering lines will indicate in which direction to turn to center the display. Turn

in the direction of the dashes to return to center. The DataScope discards bad readings and stays on a position until it has enough readings to continue on to the next one.

PAUSE

Good 6

Bad 3

- 3) After you have taken readings for the 8 positions, the word, "Pause" will appear on the display. The display will go blank for less than 10 seconds as the DataScope performs some calculations. Then the display will indicate whether you had a good or bad calibration with the words, "Good" or "Bad" on the display. The word will also be accompanied by a grade:

"Good 6 - Good 10" indicates a good calibration

"Bad 1 - Bad 5" indicates a bad calibration.

"Bad" grades are usually caused by the presence of iron on the user (keys, a knife, etc), iron around the DataScope or electrical interference nearby.

If the display goes **blank** (more than 10 seconds) before you have finished calibration, this indicates one of the following:

- 1) There is something in the area interfering with the operation of the DataScope. (electrical equipment, transformers, etc.)
- 2) Due to interference or a problem in holding the DataScope steady, it took longer than 2 minutes to calibrate a position and the DataScope automatically went into sleep mode.

If the display goes into Bearing Mode while you are calibrating, this indicates one of the following:

- 1) You accidentally pushed a button and aborted calibration.
- 2) You somehow missed the DataScope's calibration grade!  
The DataScope automatically enters Bearing Mode  
30 seconds after displaying the "Good" or "Bad" message.

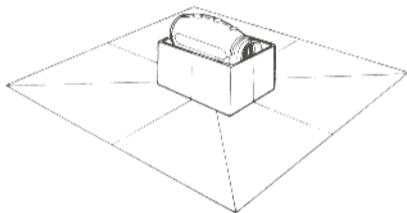
If you got a message other than "Good", correct the problem and re-enter the Select Options Mode to try again.

### **Alternate Calibration Method**

If you cannot get a good calibration using the handheld method, there is an alternative **Remote Method**. This method is to place the DataScope securely sitting upright in the shipping box or anything where it can be positioned upright, level and free from movement. It then involves rotating the DataScope (in the box) to 8 positions, 45° apart. Don't forget that you still need to perform calibration outdoors and away from iron or electrical interference. To calibrate:

- 1) Mark off 8 positions approximately 45° apart in a circle around the container. Put the DataScope into the "Select Options Mode" with the display reading "Cal?" (see page

23-26). Place the DataScope into the box pointing to the first position. Push the **GREEN** button, and **count 15 seconds** (1001, 1002, 1003...1015) to allow the DataScope to get a good stable reading.



*Move box clockwise, in 45° increments to 8 positions, keeping box on same central axis.*

- 2) Rotate the box to the next position **clockwise**, keeping the box on the same central axis. Again, wait 15 seconds, and repeat this until you have turned the box through all 8 positions. (don't forget to count the first position as a reading). **Immediately** remove the DataScope from the box

without pressing any buttons. Observe the display. You will see "Pause" and then the display will go blank for under 10 seconds while the DataScope calculates. The display will show your grade as noted on pgs. 32-33.

If the display is **blank** (for more than 10 seconds) or displays "!---", this indicates one of the following:

- 1) You didn't count long enough at each position
- 2) You did less than 8 readings
- 3) You took longer than 2 minutes to calibrate
- 4) The container wasn't rotated in 45° increments
- 5) There is something in the area interfering with the operation of the DataScope. (electrical equipment, transformers, etc.)

If the display is in the **Bearing Mode** when you pick it up, this indicates one of the following:

- 1) You accidentally pressed a button and aborted the calibration.
- 2) You did more than 8 readings or waited too long to pick up the DataScope and missed your grade! The DataScope automatically enters bearing mode 30 seconds after displaying the "Good" or "Bad" message.

If you got a message other than "Good", correct the problem, re-enter the "Select Options Mode" and try again.

Now that your DataScope is calibrated, you will no longer see the "No Cal" message when you first pick up your DataScope and push a button.

north?



Enters  
Easterly Deviation



Enters  
Westerly Deviation

▶ E ▶ W

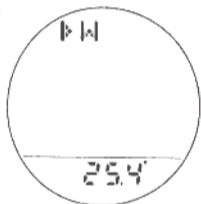
## north?

The "north?" function enters the magnetic variation. All stored bearings are erased. This function is not displayed if the DataScope has not been calibrated. Enter the local variation (declination) with the green and black buttons.

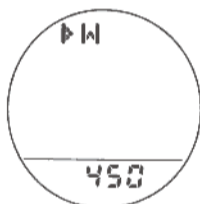
When "north?" is displayed, pushing and releasing the **GREEN** button makes magnetic variation more easterly by 0.1° increments, while the **BLACK** button makes magnetic variation more westerly by 0.1° increments. (If you need to decrease the variation/declination entry for either the easterly or westerly variation, use the opposite button - **GREEN/BLACK**). You will see a triangle symbol and an "E" or a "W" indicating in what direction you are entering the variation. Holding the button down makes the numbers increment rapidly. Once you have entered a magnetic variation (declination), every time you turn on the DataScope the first display will show the magnetic variation/declination entered for the DataScope.

*Note: If you have changed the compass from degrees to mils, then you will be entering variation/declination in mils. Mils are entered in 5 mil increments.*

Degrees



Mils



The "north?" function also has another option, the "Automatic Offset Mode". This mode can be useful if you want to define your own direction as north for relative measurements such as in land surveying or you know the physical direction of True North, such as the position of the North Star.

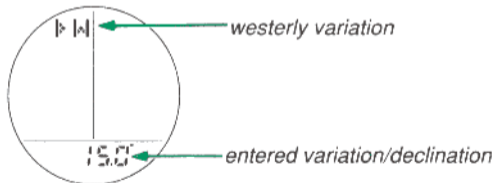
## SELECT OPTIONS MODE: AUTOMATIC OFFSET



Flashes last entered variation/declination

To operate this function:

- 1) Put the "north?" function on the DataScope Display. Push and release the **GREEN** button and you will see the last entered variation/declination flashing in the display and the triangle symbol with an "E" or a "W". For example, in the illustration below, the display is indicating that you have previously entered a westerly variation of  $15.0^\circ$ .



Puts DataScope into "Automatic Offset"

- 2) Simultaneously push and release the **GREEN** and **BLACK** buttons. The display will scroll the message, "Point true"

*north and press button*" . Do as it says, point to true north or your relative north and **push and HOLD down the GREEN button**. Keep the cross marks on your target and continue to hold the button down until the displayed magnetic bearing is stable for 2 or 3 seconds. The longer you hold the button down, the more accurate the reading will be. (Although, the DataScope will shut off if you try to do this longer than 2 minutes.)



- 3) Release the **GREEN** button and the new magnetic variation will be displayed. Pressing any button will put you in Bearing Mode. All stored bearings were cleared so the bearing mode will show "----" and "*Bearing 0*"

*Note: If you ever want to erase the entered variation, return to the "north?" function and set the variation to 0 using the green and black buttons.*

mils? 25°  
degs? 2



*Changes mils to degrees  
and vice versa*

### mils?/degs?

The "mils?" function displays bearings in mils instead of degrees which is used in military and various surveying applications (6400 mils in a circle). Stored bearings are erased and any magnetic variation will be set to zero when this function is performed. If "mils?" shows on the display, pushing and releasing the **GREEN** button will change the increments from degrees to mils. If "degs?" is displayed, mils will be changed to degrees.

24hr? 12hr?



*Changes clock from 12hr  
to 24hr and vice versa*

### 24hr?/12hr?

The 24 hr?/12hr? function enables you to select a 24 hour or a 12 hour clock. If the display shows "24hr?", push and release the **GREEN** button to place the 24 hour clock into the DataScope memory. If "12hr?" is displayed, the DataScope is presently in a 24 hour clock mode and pushing and releasing the

**GREEN** button will put it into a 12 hour clock mode. *Note: Changing the clock does **NOT** erase stored bearings/times.*

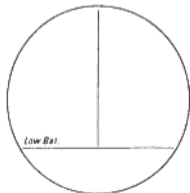
## Night Use of the DataScope

The DataScope has a night light for low light conditions. To turn the light on/off, **simultaneously push and release the GREEN and WHITE buttons.** *Note: Light is not visible in daylight.*



## "Low Bat."

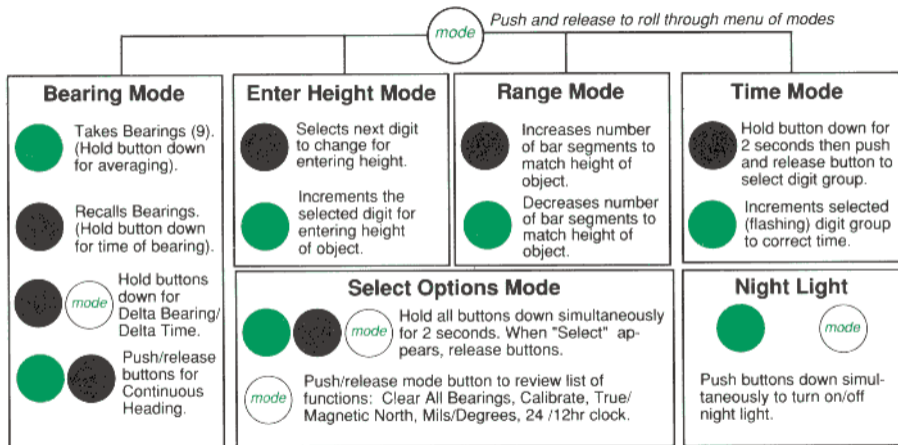
If you see "Low Bat." on the DataScope display, this means that the batteries are getting low, but readings taken are still accurate. When you see "Low Bat." **flashing**, this is telling you that the accuracy of readings taken could be in jeopardy. Remember that when you change the batteries, all your stored information is cleared.



**Technical Specifications**

Magnification/Lens	5x/30 mm.
Field of View	9° (472 feet at 1000 yards)
Gimballing	±20°
Compass Accuracy/Resolution	±0.5°/0.1° or ±10 mils/5 mils
True North Display	Yes (user enters variation)
Bearing Display	Instantaneous, averaged or continuous
Memories	9 recorded in conjunction with time
Compass Units	Degrees or Mils (user selectable)
Rangefinder Units	User determined (metric, english, or any other)
Time Readout	12 or 24 hour (user selectable)
Dimensions/Weight	Handheld - 4.5"(l) x 1.7"(w) x 2.4"(h)/11.7 ounces
Temperature Range	<i>Operating:</i> -20°C to +70°C <i>Storage:</i> -20°C to +70°C
Durability	Totally Waterproof, Fogproof, Shock Resistant
Power	3- 3 Volt #2025 lithium batteries
Battery Life	6 months to 1 year (depending on use)
Warranty	1 year

# DataScope Quick Reference Guide



The DataScope takes 3 - 3 Volt #2025 lithium batteries. Batteries insert (+) UP into battery compartment.