# NuEye®



# Getting Started

## PRC
Prentke Romich Company

# Acknowledgements

**Electronic Interference Information**

This device complies with Part 15 of the FCC Rules. Operation is subject to two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Warning!** Changes or modifications to this product which are not expressly approved by Prentke Romich Company could exceed FCC limits and negate your authority to use this product.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. You can determine whether this product is causing interference in your radio or television by turning this product off. If the interference stops, it was probably caused by this product or one of its accessories. You can attempt to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move this product to one side or the other of the television or radio.
- Move this product farther away from the television or radio.
- Plug this product into an outlet that is on a different circuit from the television or radio.
- If necessary, contact a Prentke Romich Company service technician for assistance.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respect toutes les exigences du Règlement sur le matériel brouiller du Canada.

**NuEye (RED-oem)**

The RED-oem (NuEye) fulfills the following regulatory directives and standards which are relevant for CE.

Directives: 2004/108/EEC; 2006/95/EEC; 93/68/EWG; and Standards: EN 61010-1:2002; EN 61000-3:2007; EN 62471:2009-03; EN 60825-1

⚠ **Warnings**

This system is not intended to be an emergency call device or sole communication aid.

When operating this system in a medical environment, do not use it with any product that is not medically approved. Follow all rules for appropriate cell phone and wireless device use.

Any mounts used should be fitted by a qualified person. Failure to install the mounting system according to the manufacturer's instructions may result in an injury to the user. Be certain that the user's view is not obstructed by the mounting.

**Implantable Medical Devices**

A minimum of six (6) inches should be maintained between a handheld wireless mobile device and an implantable medical device, such as a pacemaker, implantable cardioverter defibrillator, vagus nerve stimulator, shunt, or stent, to avoid potential magnetic interference with the device.

Persons who have such devices:

- Should ALWAYS keep the mobile device a minimum of six (6) inches from their implantable medical device;
- Should not carry the mobile device in a breast pocket;
- Should move the mobile device away from themselves immediately if there is any reason to suspect that it is interfering with the implantable medical device;
- Should read and follow the directions from the manufacturer of the implantable medical device. If you have any questions about using your wireless mobile device with an implantable medical device, *consult your health care provider*.

**Infrared (IR) Emissions**

Your NuEye system uses infrared technology. Certain medical devices are susceptible to disturbance by IR emissions. Do not use the NuEye system when in the vicinity of such susceptible medical devices. If you have questions about the susceptibility of a medical device, *consult the manufacturer of the medical device or your health care provider*.

**Infrared Sensitivity**

Some people may have epileptic seizures triggered by light flashes or patterns. This may occur while presented successive pictures or video material, even if they have never had a seizure before. Observe the individual using the system. Move the person away from the system immediately and consult a physician if the individual shows the following or similar symptoms: involuntary movements, disorientation, convulsions, loss of awareness, or altered vision.

# Contents

## For additional information:

Videos that show step-by-step how to get started
with NuEye are available from the following link:

https://www.youtube.com/user/PRCaccess

# Important Safety Guidelines

Please read the safety information below before installing and using your NuEye® system.

⚠ This device is not intended to be an emergency call device or sole communication aid.

⚠ Keep in mind that while installing the NuEye module, loose screws can be a choking hazard.

⚠ When operating this system in a medical environment, do not use it with any product that is not medically approved. Follow all rules for appropriate cell phone and wireless device use.

⚠ Any mounts used should be fitted by a qualified person. Failure to install the mounting system according to the manufacturer's instructions may result in an injury to the user. Be certain that the user's view is not obstructed by the mounting.

⚠ If you have an implantable medical device such as a pacemaker, implantable cardioverter defibrillator, vagus nerve stimulator, shunt, or stent, do the following to avoid potential magnetic interference with the medical device.

- *Always* keep the system a minimum of six (6) inches from your implantable medical device;

- Move the system away from yourself immediately if there is any reason to suspect that it is interfering with the implantable medical device;

- Read and follow the directions from the manufacturer of the implantable medical device. If you have any questions about using your system with an implantable medical device, *consult your health care provider*.

⚠ Some people may have epileptic seizures triggered by light flashes or patterns. This may occur while presented successive pictures or video material, even if they have never had a seizure before. Observe the individual using the system. Move the person away from the system immediately and consult a physician if the individual shows the following or similar symptoms: involuntary movements, disorientation, convulsions, loss of awareness, or altered vision.

⚠ If you have questions about the susceptibility of a medical device to the infrared technology that is part of your eyegaze system, *consult the manufacturer of the medical device or your health care provider*.

⚠ Do not use the system in an environment in which explosive or flammable gases could be present.

# Introduction: Mounting Your Device and NuEye Module

Mount your device (with the NuEye module attached) to a wheelchair mount or table stand. If you need to attach the NuEye module to your device, see the applicable appendix in the *NuEye Tracking System User's Guide*:

- Appendix A: Attaching NuEye to an Accent 1400

- Appendix B: Attaching NuEye to an Accent 1200

- Appendix C: Attaching NuEye to an Accent 1000

  *Important!* Appendix C of the *NuEye Tracking System User's Guide* only applies to Accent 1000 models with serial numbers between 499AC10 and 4999AC10.

Your device may look somewhat different from the pictures in the user's guide or the pictures below.

*Note:* **If you purchased NuEye with your Accent 1400, the NuEye module is already attached to the device.**

**If you purchased NuEye after you already had your Accent 1400, see Appendix A in the *NuEye Tracking System User's Guide*.**



**Accent 1400**



**Accent 1200**



**Accent 1000**

⚠️ **The mounts used should be fitted by a qualified person. Failure to install the mounting system according to the manufacturer's instructions may result in an injury to the user. Be certain that the user's view is not obstructed by the mounting.**

*Important!* If you are using your Accent for the *first time*, plug in the battery charger.

You are now ready to start NuEye, position the user, calibrate NuEye, and configure a selection method.

# Step 1: Start NuEye

*Note:* Typically, a communication partner helps during the setup process. While selecting menu options the communication partner can touch the keys with a finger.

1. Turn on the Accent device by pressing the power button on the top edge of the device.

2. Select the **Tools** key [icon] to the right of the text display area. The Tools menu will slide out from the left side of the screen.

3. Select the **Toolbox** key [icon] from the Tools menu. The Toolbox will open.
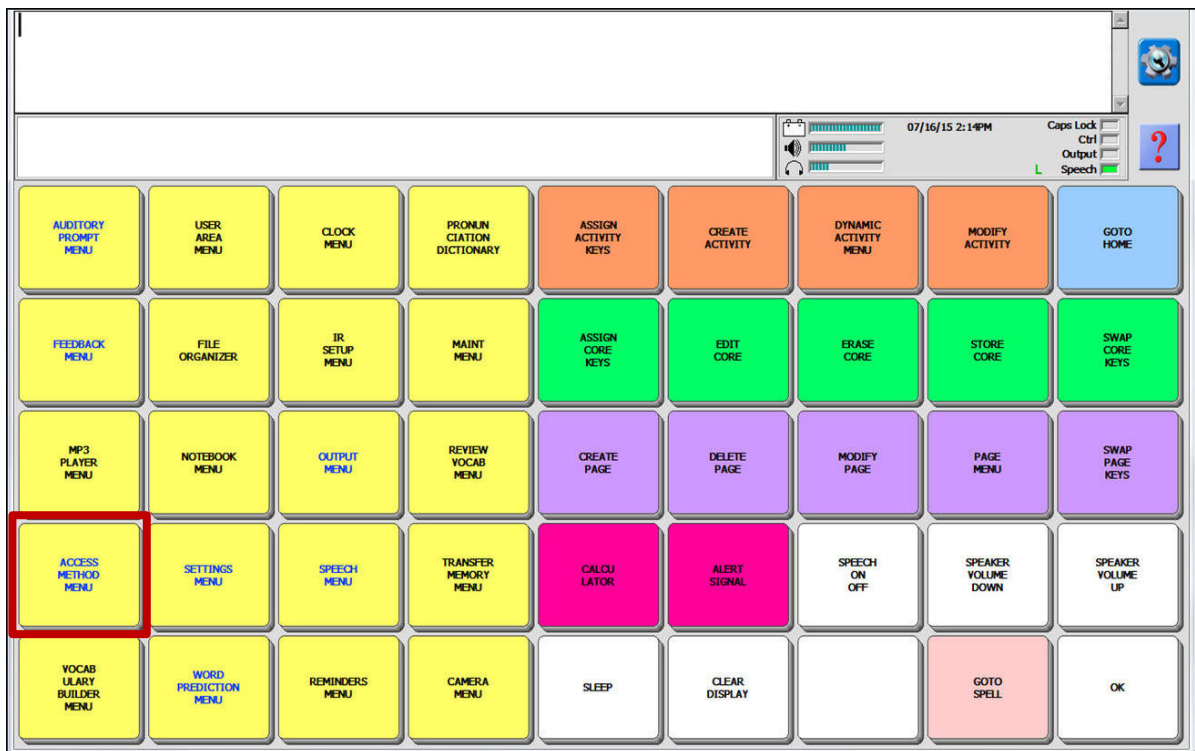


4. From the Toolbox select **Access Method Menu**. The Access Method Menu will open.

5. Select **Choose Different Access Method** and then **Eyegaze**.

"Current Access Method: Eyegaze" will be displayed to the right of the Choose Different Access Method key and the Track Status box will be displayed in the Status area.
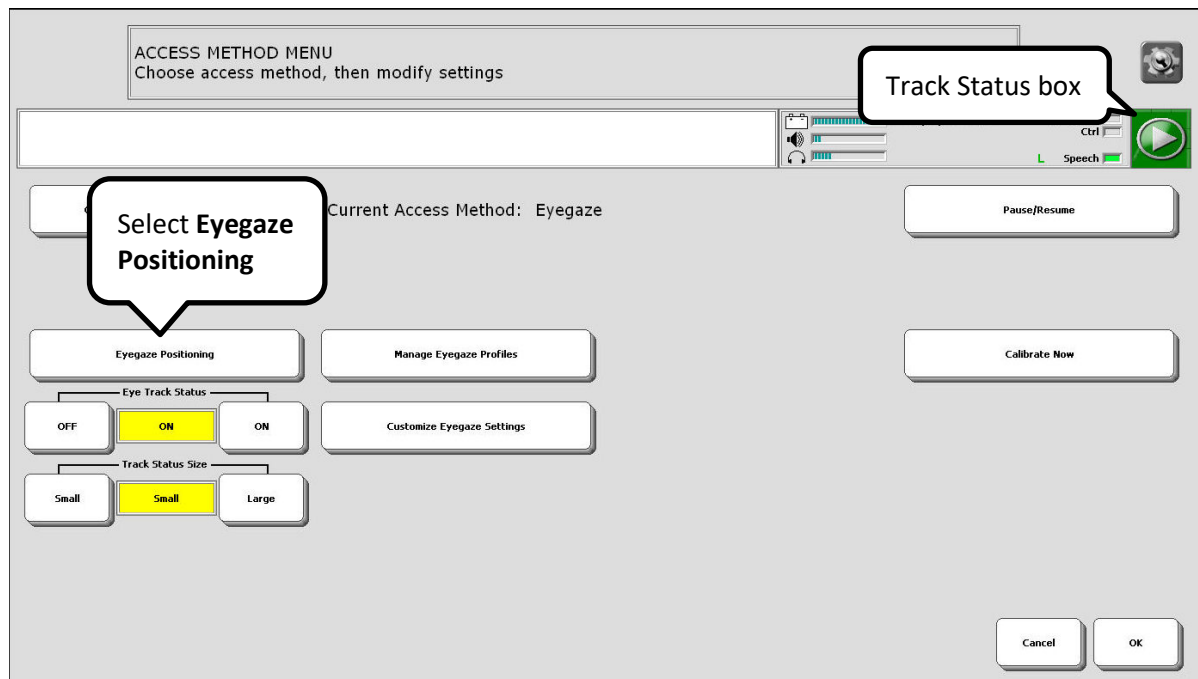


When the Track Status box is **green**, NuEye is active. When the Track Status box is **red**, NuEye is paused. To change the status, simply select the Track Status box to change the color.

*Note:* During setup, it is best to pause NuEye until you are ready to calibrate.

# Step 2: Position the User and NuEye

With NuEye paused, you are now ready to position the user and the NuEye module.

## Positioning Guidelines

The user should be approximately 20 to 24 inches from the Accent device's screen.



The user's nose should be aimed at the midpoint or upper two-thirds of the screen.
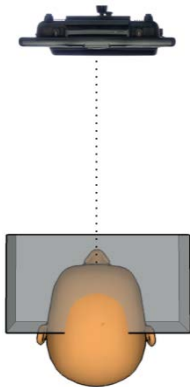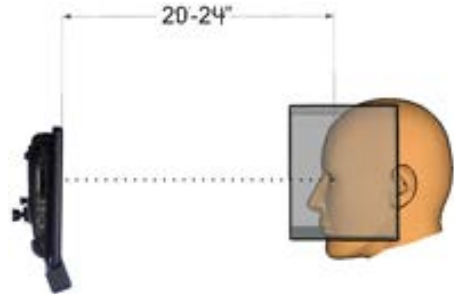


The user's face should be parallel to the screen. If the user is tilted due to positioning or posture, the Accent device should be tilted at a similar angle.

There should be no obstructions between the user's face and the Accent device and NuEye.

# Adjusting Positioning

1. From the Access Method Menu, select **Eyegaze Positioning**. The screen will show what NuEye sees.

   When eyegaze is active, the Track Status box to the right of the image is green. To pause eyegaze, touch the Track Status box. The box turns red. To resume using eyegaze, touch the box again.
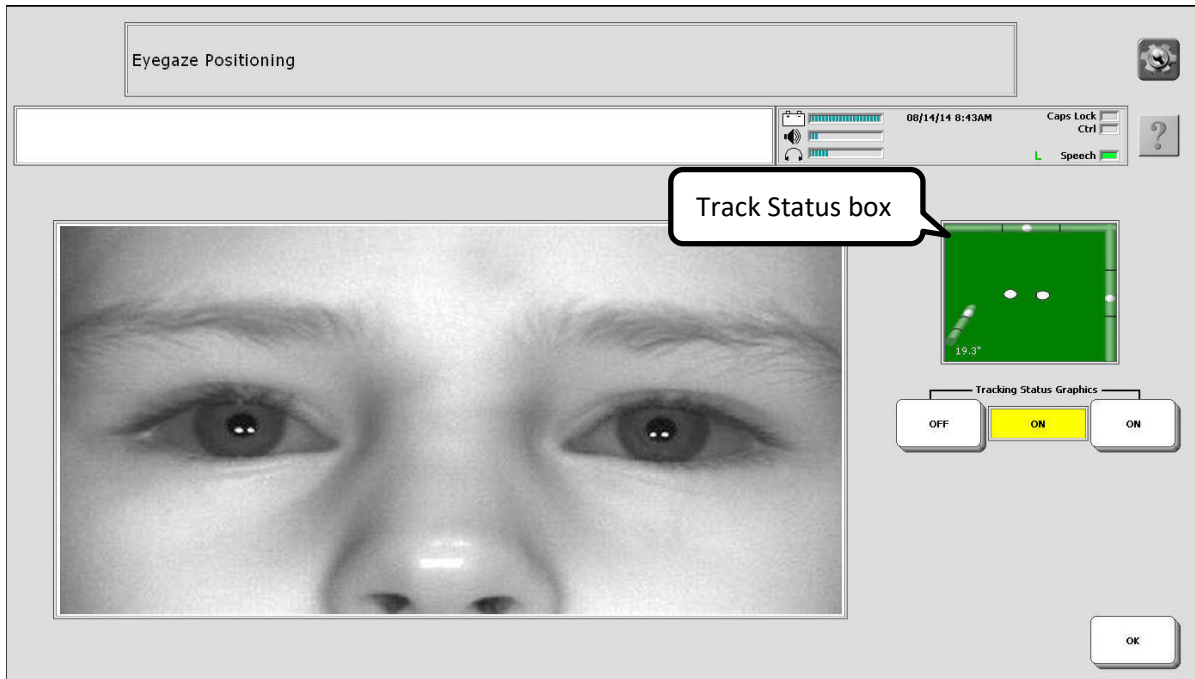


   When Tracking Status Graphics is turned on, two small white ovals show the positioning of the user's eyes and positioning dots appear on the outer edges of the Track Status box to indicate correct or incorrect positioning. These dots assist in correcting the positioning. When Tracking Status Graphics is turned off, only the two small ovals appear.

   For details on using the Track Status box, see "Using the Track Status Box" on page 11.

   In addition, three crosses appear over the user's eyes. These three crosses are reflections from the IR sensor of the NuEye module:

   - The white cross is the pupil center

   - The light gray cross is the left glint marker

   - The black cross is the right glint marker

2. When necessary, make adjustments by using either or both of the following methods:

- Loosen and tighten the screws on the device mount to alter the position of the NuEye module until you see two solid white ovals in the Track Status box.

- Reposition the user's head slightly until you see two solid white ovals in the Track Status box.

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**Goal**

The goal of making these adjustments is to see both white dots (pupil markers) stable and centered as much as possible in the Track Status box.

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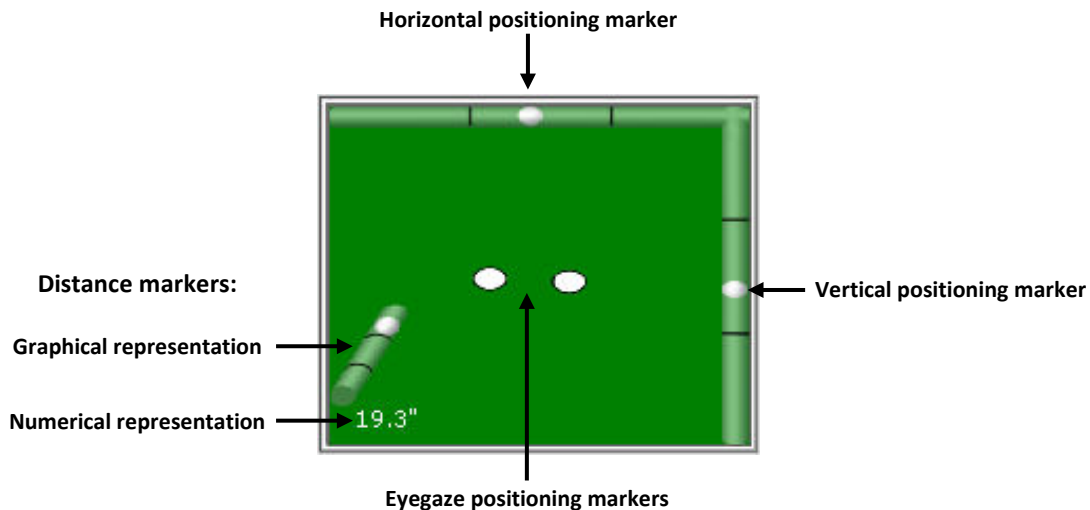3. When the positioning is correct, select the **OK** button in the bottom right of the display to exit the menu.

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**Hint**

When you want to pause NuEye but still be able to make menu selections, touch the Track Status box or select the **Pause/Resume** button on the Access Method Menu. Touch the box or select **Pause/Resume** again to resume using NuEye. Touch the display to make selections.

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# Using the Track Status Box

When Eye Track Status is set to **On** in the Eyegaze Access Method Menu, the Track Status box appears to the right of the status area. The Track Status box provides positioning feedback. The options below the box allow you to view more detailed feedback.

**Horizontal positioning marker**

**Distance markers:**

**Graphical representation**

**Numerical representation** → 19.3"

**Vertical positioning marker**

**Eyegaze positioning markers**

### Eyegaze Positioning Markers

The two white oval eyegaze markers track the user's basic position relative to the display. When positioning is correct, the eyes are level and both markers are white. The image to the left of the box will show most of the top of the nose to the tip and a normal amount of nostrils.

When one of the markers is white and the other is faded, the user's head is turned at an angle so that the eyes are not equidistant from the display. Reposition the user or device until both markers are white.

### Horizontal and Vertical Positioning Markers

*When Tracking Status Graphics is turned on:* Horizontal and vertical positioning are correct when the white dots are positioned in the center of the top and right sides of the box. When the positioning is off, reposition the user or device gradually until the markers are centered on their respective sides.

*When Tracking Status Graphics is turned off:* The horizontal and vertical positioning markers are not visible.

### Distance Markers

*When Tracking Status Graphics is turned on:* The Track Status box shows the distance the user's eyes are from the display. The distance is displayed in small numbers in the bottom left corner of the box and displayed graphically by a segmented bar. The distance must be between 18 and 30 inches. When the dot is positioned toward the top of the bar, the user is near the minimum distance. When the dot is positioned toward the bottom of the bar, the user is near the maximum distance. When the optimal distance is attained, the dot will be at or near the center of the bar.

*When Tracking Status Graphics is turned off:* The distance markers are not visible.

# Step 3: Calibrate NuEye

Calibration is the process by which NuEye adjusts to the eyes of the person using the system. It helps determine where the user is looking on the screen. The more precise the calibration, the smaller the target the user can look at and select.

## Setting Up the Initial Calibration

This section explains how to set up an initial calibration using the default calibration settings. The next section explains how to fine-tune the calibration if the user has a difficult time working with the default calibration settings.

1. With NuEye paused, display the Toolbox and select **Access Method Menu**.

2. From the Access Method Menu, set Track Status Size to **Large** to expand the size of the Track Status box. Verify that the positioning markers are in the center of the box and stable.

3. Set Track Status Size to **Small** again and select **Calibrate Now**. A solid colored screen will appear and the user will be shown a series of five stimulus points.

4. Have the user focus on the center of each stimulus point as it appears until the next point appears automatically.

5. When the calibration of all five points is complete, "Calibration complete" will appear in a yellow box.

6. Select **OK** to close the box and select **OK** to close the Access Method Menu and return to the Toolbox.

7. Select the **Go To Home** key in the Toolbox to go to your Core or Home page and have the user begin practicing with NuEye.

8. If you need to recalibrate, pause NuEye, return to the Access Method Menu, select **Customize Eyegaze Settings**, and then select **Calibration Settings**.

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### Recommendation

While the user is getting used to the NuEye system, take frequent breaks to rest the user's eyes and relax his or her concentration.

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# Adjusting Calibration Settings

If the user has a difficult time working with the default calibration settings, you can adjust the settings.

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**Recommendation**

When initially setting up NuEye, adjustments are commonly made to the stimulus type and number of calibration points. Children often need a more interesting picture and fewer calibration points. If visual attention is poor, try using a 0 or 1 point calibration. This is a quick and easy way to get children started and get them used to using their eyes for control.

It is best to adjust only one or two settings at a time. It may take several tries to obtain an accurate calibration. Be sure to take breaks to avoid fatiguing the user or losing his or her attention.

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1. From the Access Method Menu, select **Customize Eyegaze Settings** and then select **Calibration Settings**. The Calibration Settings Menu will open.
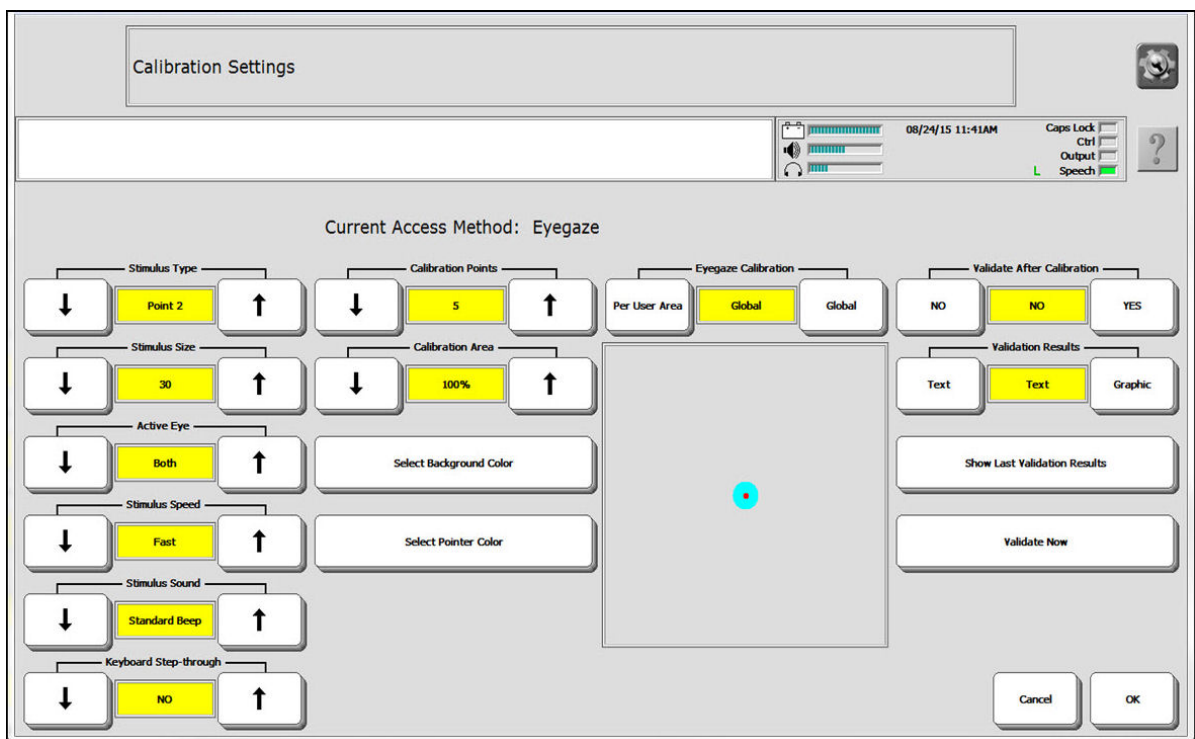


2. Adjust the settings to the user's needs. For an explanation of how to use each setting, see the next section, "Using Calibration Menu Settings".

3. When you finish adjusting settings, select **OK**.

4. Select **Calibrate Now**. When the calibration is complete, select **OK** to exit.

# Using Calibration Menu Settings

This section briefly explains how to use each Calibration Menu setting.

| Setting | How to Use It |
|---|---|
| Stimulus Type | A stimulus is the item the user's eyes focus on as it moves around the display during calibration. Select the stimulus you want to use:<br>• Point – a solid colored dot<br>• Point 2 – a solid colored dot with the inverted color in the center<br>• Cross – a small cross<br>• Image – a selectable image; use the Change Image key to select an image |
| Stimulus Size | Increase or decrease the size of the point, cross, or image. The default is 30. Available sizes range from 10 to 400. For the best calibration results you want the stimulus to be as small as the user's eyes can easily follow. The smaller the stimulus, the more accurate the calibration. |
| Active Eye | Select which of the user's eyes will be recognized during the calibration process.<br>• If both of the user's eyes work normally, select **Both**.<br>• If both of the user's pupils can be seen but one of the user's eyes is more controlled than the other, select **Both, Use Left** or **Both, Use Right**. Choose the side which is more controlled.<br>• If one eye is completely obstructed, select **Right Only** or **Left Only**. |
| Stimulus Speed | Change the speed at which the stimulus will move around the display during calibration. Fast is the default. Available speeds are Very Fast, Fast, Medium, Slow, and Very Slow. |
| Stimulus Sound | Select a sound to play when a calibration point is completed. Once a sound plays, the stimulus will move to the next location. Standard Beep is the default. You can also select other sounds that will be previewed when you select them. If you do not want a stimulus sound, select **No**. |
| Keyboard Step-through | If the user loses attention during the calibration process, Keyboard Step-through allows you to control when the stimulus advances to the next calibration point.<br>• If you select **Yes**, you can manually step through each calibration point. Plug in a USB keyboard and use the keyboard's **spacebar** to step through the calibration.<br>• If you select the default setting of **No**, calibration will proceed automatically through the calibration points. |
| Calibration Points | Calibration Points determines the number of stimulus points using during calibration. The available settings are 0, 1, 2, 5, and 9; the default is 5. The more points the user has to follow, the more accurate the calibration will be. |

| | |
|---|---|
| **Calibration Area** | Calibration Area determines the percentage of the screen used during calibration. The higher the percentage, the greater the precision of the calibration. |
| | At the default calibration area (100%), some if the calibration points will be at the very edges of the screen and may be difficult for the user to see or focus on. |
| | If you find this to be true for the user, decrease the calibration area. This will move the calibration points in from the edges. Select the down arrow key to decrease the area in increments of five (95%, 90%, etc.). Keep in mind that reducing the calibration area decreases precision. |
| **Select Background Color** | To change the calibration background color, you can create, preview, and save custom colors. Use a color that best matches the background color of your communication environment. |
| | For example, if you selected black as the background color in your vocabulary, you should choose a black background when you calibrate. |
| **Select Pointer Color** | Change the calibration stimulus color for point, point2, and cross. Options are available to create, preview, and save custom colors. |
| **Eyegaze Calibration** | If you want the calibration to apply to the current user area only, select **Per User Area**. If multiple users will use the same device, Per User Area will allow you to create a separate calibration for each user. |
| | If you want your calibration to be used in all six user areas, select **Global**. |
| **Validate After Calibration** | Validation is the process that verifies that the calibration obtained from the user is accurate. The validation process requires the user to look at four additional stimulus points on the screen. |
| | The process also assigns a value to the accuracy of validation. The lower the number, the more accurate the calibration. |
| | When Validate After Calibration is set to **Yes**, the validation process will occur immediately after calibration. |
| **Validation Results** | Select Text or Graphic to determine whether you view validation information in text or graphic format. |
| **Show Last Validation Results** | Displays the results of the most recent calibration. |
| **Validate Now** | Validate Now allows you to perform a validation at any time. |

# Step 4: Configure a Selection Method

Before the user starts using NuEye to communicate, you need to configure a selection type. To get started, select **Customize Eyegaze Settings** from the Eyegaze Access Method Menu. The Customize Eyegaze Settings Menu will open.
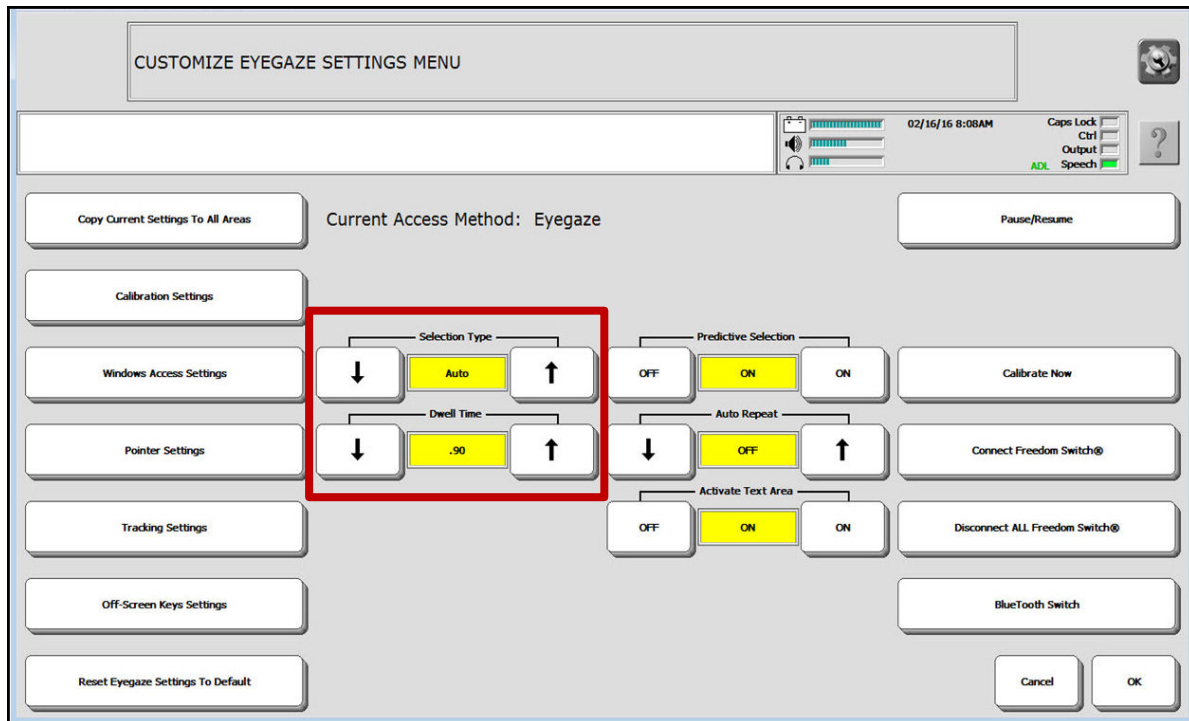


The Selection Type settings allow you to configure the selection method as Auto, Blink, or Switch. Use the Selection Type arrow keys to choose the selection method that will work best for the user.

## Selection Type: Auto

When **Auto** is selected, a key is selected automatically when the user looks at it. Auto is the default setting.
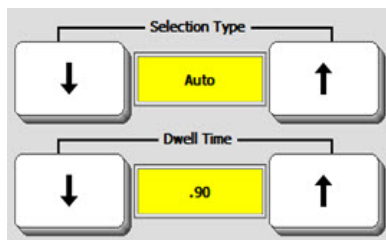


When you select **Auto**, Dwell Time is displayed as a supporting option. Use the Dwell Time arrow keys to adjust the setting to the user's needs.

**Dwell Time** is the amount of time the eyes must focus on a key for the system to recognize a selection The default dwell time is .90 seconds. At this setting, when the user focuses on a key for 0.9 seconds, the system selects that key automatically.

# Selection Type: Blink

When **Blink** is selected, the user can blink to make a selection.
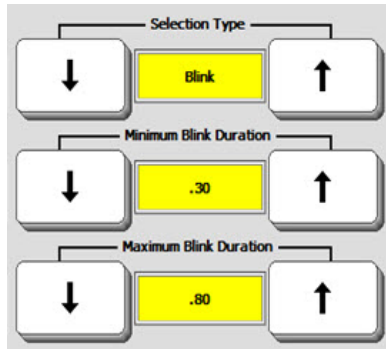
When you select **Blink**, Minimum Blink Duration and Maximum Blink Duration are displayed as supporting options. Use the Duration arrow keys to adjust the settings to the user's needs. The system will ignore blinks that are of shorter or longer duration than your settings.

**Minimum Blink Duration** is the minimum amount of time the user's eyes must be closed during a blink for the system to recognize a selection. The default minimum setting is .30.

We suggest you try using the default before changing the setting. If you need to change the setting, the minimum duration should be long enough that the user's normal blinks do not activate a key.

**Maximum Blink Duration** is the maximum amount of time the eyes must be closed during a blink for the system to recognize a selection. The default maximum setting is .80.

We suggest you try using the default before changing the setting. If you need to change the setting, the maximum duration should be long enough that the user finishes a blink before the maximum time has accumulated. You do not want to make your maximum duration time so long that if the user's head turns away from the screen and then back again, the system sees that as a selection.

# Selection Type: Switch

Switch allows you plug in and use a switch to make selections. The user uses his or her eyes to move the cursor and the switch to make selections. To use this method, the user must be able to maintain his or her focus on a target and activate a switch at the same time.
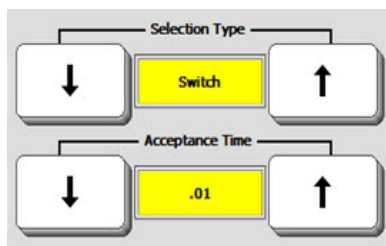
When you select **Switch**, Acceptance Time is displayed as a supporting option. Use the Acceptance Time arrow keys to adjust the setting to the user's needs.

Acceptance time is the amount of time the user must hold on the switch before the system recognizes a selection. The default setting is .01.

Because this method has no time requirement for focusing on the target, the user can look at the target for as long as he or she wants and activate the switch when ready to make a selection.

# Trying Out Your Settings

Once you choose a selection method and configure the supporting option(s), do the following:

1. Select **OK** to close the Customize Eyegaze Settings Menu.

2. Select **OK** again to return to the Toolbox.

3. Select **Go To Home** to go to your Core or Home page.

4. Have the user try out your settings.

5. If necessary, return to the Access Method Menu and fine-tune your settings.

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### Additional Sources of Information

The *NuEye Tracking System User's Guide* contains detailed instructions on mounting the NuEye module, positioning the device, calibration, customizing settings, managing eyegaze profiles, and cleaning the module. The manual came in the device shipping box.

Videos that show step-by-step how to get started with NuEye are available from the following link: https://www.youtube.com/user/PRCaccess

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