eSee Digital Acuity Chart User Guide

Version 3.2.2

We've designed the eSee Digital Acuity chart to be easy and intuitive to use. We're confident you can be up and running in no time without any help. Even so, we understand that it's sometimes nice to have a little guidance. And even better, it's nice to know the secret tips and tricks that can help optimize your experience.

That's where this guide comes in. It goes in depth into how to use each function. Whether you have a question about how to navigate through a particular function or you are looking to become a power user, this guide can help! There is no need to read it front to back; just jump to the function you care about!

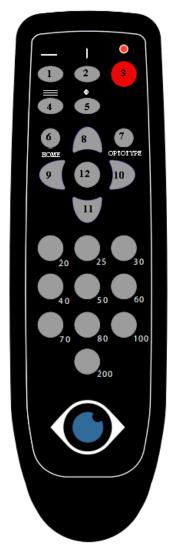# Table of Contents

Remote

This guide references the buttons on the remote by number. Please refer to the following image:

If a particular button is not listed under a function, that means it doesn't do anything for that function.

Functions

Function Support

Certain functions are not available on all models. Please refer to the chart below for function support on your model:

Feature	Lite	Full
Optotype Charts	✔	✔
Duochrome Chart	✔	✔
Contrast Sensitivity Testing	✘	✔

ETDRS Chart	✗	✓
Muscle Light	✓	✓
Education	✓	✓
● Custom images	✗	✓
Sundial	✓	✓
Worth 4 Dot	✓	✓
Disparity Chart	✗	✓
Animations	✗	✓
● Custom images	✗	✓
Colorful Shapes	✓	✓
Settings	✓	✓
Display Calibration[1]	✓	✓
Wireless	✓	✓
About	✓	✓
Slideshow	✗	✓
● Custom images	✗	✓

Optotype Charts

The Optotype Charts consist of five optotype sets, each containing three distinct charts[2]. The optotype sets are: Letters, numbers, pediatric shapes and pictures, HOTV, and tumbling Es. Of the three charts for each optotype set, one is considered the "default" chart. It is the one that displays upon first navigation to the optotype set.

The following table explains what will happen when you press a certain button when the chart is in a certain state:

When you press...	And the chart is displaying...	The chart will...
Horizontal Isolation (1)	The full chart	Isolate the smallest horizontal line currently displayed.
	An isolated horizontal line	Restore the full chart of optotypes with the previously isolated horizontal line at the bottom.
	A single optotype	Expand the single optotype to a full horizontal line, maintaining the acuity.

[1] Only relevant to units purchased without monitors, or "headless".
[2] Tip: Use them for OD, OS, and OU!

	Halved horizontal lines or horizontal lines of single optotypes	Expand the smallest optotype currently displayed into a full horizontal line and isolate that horizontal line.
	Three horizontal lines	Eliminate two of the horizontal lines, isolating the third.
Vertical Isolation (2)	The full chart	Eliminate half of the optotypes from each horizontal line (rapid refract).
	An isolated horizontal line	Restore the full chart of optotypes with the previously isolated horizontal line at the bottom, eliminating half of the optotypes from each horizontal line.
	A single optotype	Restore the full chart of optotypes with the horizontal line of the previously displayed optotype at the bottom, eliminating half of the optotypes from each horizontal line.
	Halved horizontal lines or horizontal lines of single optotypes	Eliminate all but a single optotype in each horizontal line when displaying halved horizontal lines and restore the full chart when displaying horizontal lines of single optotypes, maintaining the currently displayed acuities.
	Three horizontal lines	Restore the full chart of optotypes with the horizontal line of the previously isolated acuity at the bottom, eliminating half of the optotypes from each horizontal line.
Three Line (4)	The full chart	Display three horizontal lines of equal acuity, that of the smallest horizontal line currently displayed.
	An isolated horizontal line	Display three horizontal lines of equal acuity, that of the horizontal line currently displayed.
	A single optotype	Display three horizontal lines of equal acuity, that of the optotype currently displayed.
	Halved horizontal lines or horizontal lines of single optotypes	Display three horizontal lines of equal acuity, that of the smallest horizontal line currently displayed.
	Three horizontal lines	Restore the full chart of optotypes with the horizontal line of the previously isolated acuity at the bottom.[3]
Single Optotype (5)	The full chart	Isolate the leftmost optotype from the smallest horizontal line currently being displayed.
	An isolated horizontal line	Isolate the leftmost optotype from the horizontal line currently being displayed.

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[3] If you were on a chart other than the home chart before entering three line mode, you'll be restored to the home chart upon exiting three line mode. Yep, that's a bug.

	A single optotype	Restore the full chart of optotypes with the horizontal line of the previously displayed optotype at the bottom.[4]
	Halved horizontal lines or horizontal lines of single optotypes	Isolate the leftmost optotype from the smallest horizontal line currently being displayed.
	Three horizontal lines	Isolate the leftmost optotype from the bottom horizontal line currently being displayed.
Home (6)	Anything other than the displayed optotype set's full "default" chart	Restore the displayed optotype set's full "default" chart.
	The displayed optotype set's full "default" chart	Restore the full "default" letter chart.
Optotype (7)	Anything	Refreshes the currently displayed horizontal line(s) using a new set of optotypes, cycling through in the following order: letters, numbers, pediatric shapes and pictures, HOTV, tumbling Es
Up (8)	The full chart	Move to the next largest grouping of acuities. For example, if acuities 20-50 are showing, the chart will display acuities 25-60.
	An isolated horizontal line	Move to the next largest horizontal line by acuity.
	A single optotype	Move to a single optotype at the next largest acuity.
	Halved horizontal lines or horizontal lines of single optotypes	Move to the next largest grouping of acuities, maintaining the vertical halving or isolation.
	Three horizontal lines	Move to three horizontal lines of equal acuity at the next largest acuity.
Left (9)	The full chart	Move to the previous chart in the series of three, wrapping around to the third chart if currently on the first.
	An isolated horizontal line	Move to the horizontal line of equal acuity on the previous chart in the series of three, wrapping around to the third chart if currently on the first.
	A single optotype	If the horizontal line of the optotype's acuity contains more than one optotype, move to the previous one, wrapping around to the last optotype if currently on the first.
	Halved horizontal lines	Nothing.
	Horizontal lines of single optotypes	Move to the previous optotype in each line within the currently displayed chart.

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[4] If you were on a chart other than the home chart before entering single optotype mode, you'll be restored to the home chart upon exiting single optotype mode. Yep, that's a bug.

	Three horizontal lines	Nothing.
Right (10)	The full chart	Move to the next chart in the series of three, wrapping around to the first chart if currently on the third.
	An isolated horizontal line	Move to the horizontal line of equal acuity on the next chart in the series of three, wrapping around to the first chart if currently on the third.
	A single optotype	If the horizontal line of the optotype's acuity contains more than one optotype, move to the next one, wrapping around to the first optotype if currently on the last.
	Halved horizontal lines	Nothing.
	Horizontal lines of single optotypes	Move to the next optotype in each line within the currently displayed chart.
	Three horizontal lines	Nothing.
Down (11)	The full chart	Move to the next smallest grouping of acuities. For example, if acuities 20-50 are showing, the chart will display acuities 15-40.
	An isolated horizontal line	Move to the next smallest horizontal line by acuity.
	A single optotype	Move to a single optotype at the next smallest acuity.
	Halved horizontal lines or horizontal lines of single optotypes	Move to the next smallest grouping of acuities, maintaining the vertical halving or isolation.
	Three horizontal lines	Move to three horizontal lines of equal acuity at the next smallest acuity.
Acuity shortcut buttons	The full chart	Isolate the horizontal line of the chosen acuity.
	An isolated horizontal line	Isolate the horizontal line of the chosen acuity.
	A single optotype	Isolate the horizontal line of the chosen acuity.
	Halved horizontal lines or horizontal lines of single optotypes	Isolate the horizontal line of the chosen acuity.
	Three horizontal lines	Display three horizontal lines of the chosen acuity.
Enter (12)	Anything but the menu	Open the menu
	The menu	Open the highlighted function and closes the menu

Note: You can determine whether or not to display the 20/15 line within the [Settings](#) function.

Duochrome Chart

The Duochrome Chart behaves exactly the same as the Optotype Charts save for the fact that it only contains one chart within each optotype set. Therefore, the following buttons are disabled:

- Left (9)
- Right (10)

Also, due to the mirrored nature of the chart, a few additional buttons are disabled:

- Vertical Isolation (2)
- Three Line (4)
- Single Optotype (5)

Contrast Sensitivity Testing

Contrast sensitivity testing behaves exactly the same as the Optotype Charts with one exception: The Left (9) and Right (10) buttons increase and decrease contrast rather than cycling through the set of three charts. Contrast ranges from 10%-100% and moves in increments of 10%.

ETDRS Chart

From a remote standpoint, the ETDRS Chart behaves exactly the same as the Optotype Charts with one small exception. The main differences are in the chart's appearance.

First, the smallest row is 20/10 (or LogMAR -0.30).

Second, the left and right notations can be customized via the Settings menu. For the left notation, you can choose from Letter Size, 4/Meter, and 13/Foot notations. For the right notation, you can choose from LogMAR, Decimal, 6/Meter, and 20/Foot notations.

The small exception in remote behavior is with the acuity shortcut buttons. Because the ETDRS acuities do not line up exactly with the shortcut buttons, each button will jump to the acuity closest to the button. For example, the 60 button will jump to the 63 line. Note that the 70 button does nothing because no acuities are near enough.

Muscle Light

No buttons are active while displaying the Muscle Light.

Education

Most buttons are disabled when displaying Education images. The active buttons are:

- Left (9): Displays the next image.
- Right (10): Displays the previous image.

You can add custom images to augment the stock ones. To do so, create an "education" directory at the root of a USB drive[5]. Within that directory, add your custom images, named however you'd like. Unplug the system, insert the USB drive, and plug the system back in. The system will use up to 10 MB of images from this directory, and it will

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[5] This is case-sensitive, so please be sure the directory name is all lower-case!

load them in alphabetical order.[6]

Supported file types for custom images are: bmp, gif, jpg/jpeg, png, and tif/tiff. Non-animated images will be scaled to fill the screen as much as possible while maintaining scale. This includes shrinking images that are too large.

If you are using custom images, please read the [scaling images](#) section for tips on how to improve performance.

Sundial

No buttons are active while displaying the Sundial.

Worth 4 Dot

No buttons are active while displaying the Worth 4 Dot.

Disparity Chart

No buttons are active while displaying the Disparity Chart.

Animations

Most buttons are disabled when displaying Animations. The active buttons are:
- Left (9): Displays the next animation.
- Right (10): Displays the previous animation.
- Up (8): Pauses auto-advancement of animations.
- Down (11): Resumes auto-advancement of animations.

You can add custom animations to augment the stock ones. To do so, create a "pediatrics" directory at the root of a USB drive[7]. Within that directory, add your custom animations, named however you'd like. Unplug the system, insert the USB drive, and plug the system back in. The system will use up to 20 MB of images from this directory, and it will load them in alphabetical order.[8]

Supported file types for custom animations are: bmp, gif, jpg/jpeg, png, and tif/tiff. Of these, only gif supports animations, so that's probably the type you'll want to choose for this function. If you include any non-animated image, they will be scaled to fill the screen as much as possible while maintaining scale. This includes shrinking images that are too large.

If you are using custom images, please read the [scaling images](#) section for tips on how to improve performance.

Colorful Shapes

Most buttons are disabled when displaying Colorful Shapes. The active buttons are:
- Up (8): Speeds up the rate of shape change. Each press speeds up the rate by half of a second. The fastest rate of change is half of a second.
- Left (9): Forces the shapes to change.
- Right (10): Forces the shapes to change.

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[6] Hint: If you want tight control over the order, name them "00 - First Piece", "01 - Second Piece", etc. The leading digits will force your order. Also note that "2" comes after "10" alphabetically, so use leading zeroes: "02".

[7] This is case-sensitive, so please be sure the directory name is all lower-case!

[8] Hint: If you want tight control over the order, name them "00 - First Piece", "01 - Second Piece", etc. The leading digits will force your order. Also note that "2" comes after "10" alphabetically, so use leading zeroes: "02".

- Down (11): Slows the rate of shape change. Each press slows the rate by half a second. There is no limit to how slow you can set it.

Settings

The Settings page is used for configuring the system.

Use the Up (8) and Down (11) buttons to select the various settings and the Left (9) and Right (10) buttons to change them[9]. When done, use the Down (11) button to navigate to "Apply" and press the Enter (12) button. To discard any changes, navigate to "Cancel" and press the Enter (12) button. Note that "Cancel" will be disabled until the system has been through initial configuration.

Display Calibration

The Display Calibration screen is used to calibrate the display for a custom monitor. If your unit shipped with a monitor, it was pre-calibrated for you, so this screen will not be available.

With a ruler in hand, use the Left (9) and Right (10) buttons to adjust the displayed optotype to the size indicated on screen[10]. When done, use the Down (11) button to navigate to "Apply" and press the Enter (12) button. To discard any changes, navigate to "Cancel" and press the Enter (12) button. Note that "Cancel" will be disabled until the system has been calibrated.

Note: You can recalibrate the system at any time if you change monitors.

Wireless

Your system is able to connect to the Internet to check for updates. The Wireless screen allows you to configure a wireless connection, which is necessary to find and download updates. You can see your current connection status in the "Status" field.

To connect, use the Left (9) and Right (10) buttons to select your network[11]. When selected, use the Down (11) button to navigate to the "Password" field. Use the Enter (12) button to enter edit mode, the Right (10) and Left (9) buttons to add and remove characters[12], and the Up (8) and Down (11) buttons to change characters. When your password is complete, use the Enter (12) button to leave edit mode.

When you have selected your network and entered your password, use the Down (11) button to navigate to "Connect" and press the Enter (12) button[13]. Connecting can take up to 30 seconds. To discard any changes, navigate to "Cancel" and press the Enter (12) button.

If your system is currently connected, you can disconnect by navigating to "Disconnect" and pressing the Enter (12) button.

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[9] Tip: Use the acuity shortcut buttons to get close to your desired system distance and then use the Left (9) and Right (10) buttons to get it exact.

[10] Tip: Use the acuity shortcut buttons to get close to the correct size and then use the Left (9) and Right (10) buttons to get it exact.

[11] Note: Only networks protected by either WPA or WPA2 security are available.

[12] When the "Password" field is in edit mode, all but the last character are masked with an asterisk. When not in edit mode, all characters are masked.

[13] If "Connect" is disabled, please re-check your password. It must consist of a minimum of 8 characters.

About

The About screen displays information about your system. The only active buttons are Up (8), Down (11), Left (9), and Right (10). To leave the screen, navigate to "OK" and press Enter (12).

If an update is available, you'll see it in the "Update Available" field. You can apply the update by navigating to "Update" and pressing Enter (12). The system will restart one time to apply the update. Note that updates are completely optional (though recommended to get new functionality). The system will *never* apply an update on its own.

Slideshow

Because the Slideshow is a screen saving mechanism for while the chart is asleep, most buttons will cause the chart to awaken while it is displayed. The exceptions are:
- Left (9): Displays the next image.
- Right (10): Displays the previous image.

By default, the Slideshow functionality is disabled. To enable it, you have to provide one or more images to display when the system goes to sleep. To do so, create a "slides" directory at the root of a USB drive[14]. Within that directory, add your images. Unplug the system, insert the USB drive, and plug the system back in. The system will use up to 10 MB of images from this directory, and it will load them in alphabetical order.[15]

You'll now have the option to configure two separate timeouts: the timeout after which your slides will be displayed and the timeout after which the system will enter standby. For the slideshow to display, the latter timeout must be larger than the former.

Supported extensions for slideshow images are: bmp, gif, jpg/jpeg, png, and tif/tiff. Non-animated images will be scaled to fill the screen as much as possible while maintaining scale. This includes shrinking images that are too large.

If you are using custom images, please read the scaling images section for tips on how to improve performance.

Other Useful Tips

- Power (3) is always active and behaves the same regardless of function. If you press it when the chart is awake and have not configured a slideshow, it will put the chart to sleep. If you press it while the chart is asleep, it will wake the chart up (as will every other button). If you have configured a slideshow, the slideshow will be displayed upon the first button press, and pressing the button a second time will put the chart to sleep.
- Home (6) is always active and behaves the same on the vast majority of functions. It returns you to the letter optotype chart with the default horizontal lines displayed. There are a few exceptions:
  - If you are using the Optotype Charts, the button has some additional behavior. Please see the Optotype Charts for more details.
  - If you are using Settings, Display Calibration, Wireless, or About, the button behaves the same as the Enter (12) button.
- With a few exceptions, Enter (12) is always active and behaves the same regardless of function. If the menu is not displayed, it will be displayed. If the menu is displayed, it will select the currently highlighted function. The only exceptions are on the Settings, Display Calibration, Wireless, and About screens, where it is used to

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[14] This is case-sensitive, so please be sure the directory name is all lower-case!
[15] Hint: If you want tight control over the order, name them "00 - First Piece", "01 - Second Piece", etc. The leading digits will force your order. Also note that "2" comes after "10" alphabetically, so use leading zeroes: "02".

"press" the on-screen buttons.
- If your system seems to be taking multiple actions every time you press a button, try decreasing the button sensitivity on the Settings screen.
- Try pressing an acuity button while on the menu to save some button presses!
- The chart tries to always display five horizontal lines of acuity, but if your chart is a large distance away from the patient, it will automatically adjust to a lesser number of horizontal lines.
- The standard optotype charts support the following acuities: 15, 20, 25, 30, 40, 50, 60, 70, 80, 100, 150, 200 and 400.
- The ETDRS charts support the following acuities: 10, 12.5, 16, 20, 25, 32, 40, 50, 63, 80, 100, 125, and 160, and 200.
- The chart will never display more optotypes than can fit on the screen. Depending on your chart's distance setting, certain horizontal lines may not display the full set of optotypes.
- The chart will never display an optotype that is too big to fit on the screen. Depending on your chart's distance setting, certain horizontal lines at the largest acuities may not be available.

Scaling Images

Some functions support custom images loaded via a USB drive. When loading a custom image, the system will resize the image to fit the monitor.[16] Images that are too large for the monitor will be downsized, and images too small for the monitor will be upsized.

While the system is happy to do this work for you, scaling the images to fit the monitor increases the system boot time. To eliminate this penalty, you can resize the images yourself prior to putting them on the USB drive. Ideally, the dimensions of the image should exactly match your monitor's resolution.

To figure out proper sizing for your images, you can use this spreadsheet. Simply enter your monitor's resolution[17] as well as the image's original resolution, and it will tell you the proper scaled size for the image. Once you know that, you can use any number of online tools to do the actual resizing.

Feedback

Finally, if you ever have any questions or feedback, you can always reach out to us at comments@eseeacuity.com. We love hearing from our users!

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[16] The one exception is animated images, which are not resized.
[17] You can find the resolution of the monitor on the About screen.