

# User Guide

# Using the Dot Pad 320 with NVDA

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## Introduction

### Overview of Using NVDA with the Dot Pad 320

NVDA (NonVisual Desktop Access) is a free, open-source screen reader developed and distributed by NV Access for the Microsoft Windows operating system. Designed for individuals with visual impairments or low vision, NVDA provides voice and Braille output, allowing seamless navigation and management of Windows applications. Developed with contributions from NV Access and a global community, NVDA is a leading accessibility tool in the Windows environment.

Dot Inc. has developed and provides an NVDA Dot Pad 320 driver to ensure seamless integration with the NVDA screen reader and the Dot Pad 320, tactile graphic display. Install the Dot Pad 320 driver and experience digital information in a new and effective way with it. Utilize NVDA and the Dot Pad 320 to enhance information accessibility and increase work efficiency.

### Feature Overview

NVDA is a screen reader designed to assist visually impaired users in navigating and interacting with the Windows operating system and various applications. The NVDA Dot Pad 320 driver enhances NVDA by connecting it with the Dot Pad 320, offering a multi-line display that provides an experience beyond traditional Braille displays. The following features are available once the NVDA Dot Pad 320 driver is installed:

* Automatically detects and connects to the Dot Pad 320 when NVDA is started or running.
* Allows users to switch the connection to the Dot Pad 320 when connected to a different Braille display.
* Converts NVDA's output into Braille data and displays it on the Dot Pad 320.
* Displays screen content read by NVDA simultaneously in the 300-cell multi-line area and the 20-cell area of the Dot Pad 320.
* Displays different content simultaneously on the 300-cell multi-line area and the 20- cell area while independently controlling each.
* Outputs Microsoft Excel and PowerPoint chart data on the Dot Pad 320.
* Refreshes the display on the Dot Pad.
* Uses the Dot Pad 320 button keys to control NVDA's basic navigation functions and scroll through multi-line Braille and chart data on the Dot Pad 320.

### System Requirements

* **Operating System**: Windows 8.1 or higher

※ Windows 10 or higher recommended.

* **NVDA Version**: NVDA 2023.4 or higher

※ NVDA 2024.1 or higher recommended.

## Starting Guide for Using NVDA with the Dot Pad 320

### Installation and Setup

This section covers the installation and execution of NVDA and the NVDA Dot Pad 320 driver.

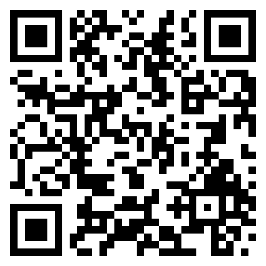
#### Installing NVDA

Before you can use NVDA with the Dot Pad 320, NVDA must be installed. NVDA can be downloaded from the ['Download'](https://www.nvaccess.org/download/) page on the NV Access website. For detailed information about downloading NVDA, initial setup, and running it, please refer to the ['NVDA User Manual](https://www.nvaccess.org/files/nvda/documentation/userGuide.html#NVDAQuickStartGuide).'

#### Installing the NVDA Dot Pad 320 Driver

To connect and use NVDA with the Dot Pad 320, the NVDA Dot Pad 320 driver must be installed. The following steps guide you through installing and running the NVDA Dot Pad 320 driver file:

1. Click the link to [‘Download NVDA Dot Pad 320 driver’,](https://www.dotincorp.com/guide/nvda_driver) or scan the QR code below to download the NVDA Dot Pad 320 driver installation file.



1. Download the NVDA Dot Pad 320 driver installation file to the laptop or computer you will execute it on.
2. Run the downloaded NVDA Dot Pad 320 driver installation file while NVDA version 2023.4 or higher is running.
3. If a notification popup asks, "Would you like to install the NVDA add-on?", select Yes (Y) to install the add-on.
4. If a notification popup asks, "Would you like to restart NVDA?", select Yes (Y) to restart NVDA and apply the changes from the add-on.
5. Once NVDA restarts, the NVDA Dot Pad 320 driver installation is successfully completed.

### Connecting the Dot Pad 320 to NVDA

The Dot Pad 320 can be connected to NVDA wirelessly using BLE (Bluetooth Low Energy).

※ Ensure the NVDA Dot Pad 320 driver is installed before attempting to connect the Dot Pad 320 to NVDA.

Users can automatically connect to any recognized Dot Pad 320 in the vicinity or manually specify and connect to a particular Dot Pad 320.

#### Automatic Connection

When NVDA is running, it detects any active Dot Pad 320 nearby and automatically attempts to connect with the device that has the strongest connection signal.

※ If another Braille display is already connected, the automatic connection feature of the Dot Pad 320 may not function.

1. Go to NVDA menu > Settings > NVDA Settings > Braille.
2. Set the Braille display to connect automatically.
3. In the checkbox for displays to automatically search, select Dot Pad 320.
4. Press the OK button, and the Dot Pad 320 with the strongest connection signal near the host device (PC) will be automatically selected and connected.

※ When the NVDA Dot Pad 320 driver is installed, Dot Pad 320 is typically pre-selected in the list of displays to automatically search.

#### Manual Connection

If NVDA is already connected to another Braille display or if automatic connection fails, users can manually select and connect to Dot Pad 320 through NVDA settings.

1. Navigate to NVDA menu > Settings > NVDA Settings > Braille.
2. Click the 'Change' button and select Dot Pad 320 from the list of Braille displays that appears.
3. Press the Tab key to select the Bluetooth name of the Dot Pad 320 you have from the port list.
4. Press the OK button, and a vibration will confirm the connection to the Dot Pad with the matching Bluetooth name, and Braille output will begin.
5. Once the selection is complete, press the Apply button followed by the OK button to finalize the connection.

### Learning Basic NVDA Shortcuts and Operations

Before using the Dot Pad 320 with NVDA, it is beneficial to familiarize yourself with NVDA's basic shortcuts and operations. This knowledge will allow you to effectively utilize the features of both NVDA and the Dot Pad 320. Refer to the NVDA User Guide to learn about the essential command keys and commonly used shortcuts.

* [Running NVDA](https://www.nvaccess.org/files/nvda/documentation/userGuide.html#RunningNVDA)
* [NVDA Basic Commands](https://www.nvaccess.org/files/nvda/documentation/userGuide.html#BasicNVDACommands)

## Navigating NVDA with the Dot Pad 320

NVDA uses two types of cursors: the system focus and the navigator object. The Dot Pad 320 features two display areas—multi-line and single-line—and with the NVDA Dot Pad 320 driver, each cursor can be appropriately utilized within these distinct display areas. The single-line Braille display corresponds to the system focus, while the multi-line area is aligned with the navigator object. Users can effectively manage both cursors simultaneously, allowing for easy access to information and an efficient, novel experience in accessing information.

### Navigating System Focus with the Dot Pad 320

The system focus in NVDA refers to the default cursor in Windows that can be moved using keyboard arrow keys or the Tab key. This focus allows for interaction with the spacebar or Enter key and encompasses all screen elements that can be focused using the Tab key. For example, users can navigate between controls by pressing the Tab key and Shift + Tab. And move to the menu bar with the Alt key, then use the arrow keys to navigate through the menus.

NVDA reads out changes when this system focus shifts. If the NVDA Dot Pad 320 driver is properly installed and running, the content of the system focus is simultaneously displayed in Braille on the Dot Pad 320's single-line display.

Some useful commands for navigating with the NVDA system focus include:

Table 1 Useful commands for navigating with the NVDA System focus

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Desktop Key | Laptop Key | Description |
| Report focus | NVDA+tab | NVDA+tab | Reports the current control which has focus. Pressing twice will spell the information. Pressing three times  will spell it using character description. |
| Window title | NVDA+t | NVDA+t | Reports the title of the currently active window.  Pressing twice will spell the information. Pressing three times will copy it to the clipboard |
| Read window | NVDA+b | NVDA+b | Reads the entire current window (useful for dialogs) |
| Read status bar | NVDA+end | NVDA+shift+end | Reports the Status Bar if NVDA finds one. Pressing twice will spell the information. Pressing three times  will copy it to the clipboard |

### Navigating the System Caret with the Dot Pad 320

Like other screen readers, NVDA uses the system caret within editable text areas or virtual cursors, including those in web browsers. The system caret is the method for navigating text within an editable text area or virtual cursor. Users can move character by character, word by word, or line by line using this navigation. Unless otherwise configured, when the NVDA system caret moves, the Braille cursor in both the single-line and multi-line areas of the Dot Pad synchronizes and moves accordingly.

Commands to move the system caret utilize standard Windows arrow key navigation. To navigate different text areas independently with the system caret and the NVDA review cursor, press NVDA + 6 to turn off "Follow the system caret." With this setting turned off, moving the system caret with arrow keys does not move the review cursor, so the Braille cursor in the Dot Pad's multi-line area does not move.

For more details, refer to section [<12.1.12.2. Follow System Caret>](https://www.nvaccess.org/files/nvda/documentation/userGuide.html#ReviewCursorFollowCaret) in the official NVDA User Guide.

### Navigating the Navigator Object with the Dot Pad 320

Typically, when using screen readers like NVDA, navigation is performed using the system focus and system caret. However, for navigating the screen in a hierarchical manner or in special cases such as with touch input displays, the NVDA navigator object is used. When navigating the screen using the navigator object, the content read by NVDA from this object is displayed in Braille on the Dot Pad 320 multi-line display. Additionally, the NVDA review cursor associated with the navigator object also appears on the Dot Pad 320 multi-line display.

For detailed information about the navigator object and review cursor, including shortcuts, please refer to the following sections in the NVDA User Guide:

* [5.4 Object Navigation](https://www.nvaccess.org/files/nvda/documentation/userGuide.html#ObjectNavigation)
* [5.5 Reviewing Text](https://www.nvaccess.org/files/nvda/documentation/userGuide.html#ReviewingText)
* [5.6 Review Mode](https://www.nvaccess.org/files/nvda/documentation/userGuide.html#ReviewModes)

Understanding the navigator object and review cursor is crucial for utilizing the dual Braille display functionality covered in later sections, so it is essential to become familiar with these features.

### Navigating NVDA Using the Dot Pad 320 Button Keys

Users can directly control NVDA and navigate the screen using the button keys on the Dot Pad. This includes many functions that are available on other braille displays, as well as unique capabilities of the Dot Pad 320, such as scrolling through multi-line Braille and reading chart data. The commands that can be utilized using the button keys on the Dot Pad 320 are as follows:

Table 2 Dot Pad 320 button keys usage

|  |  |  |
| --- | --- | --- |
| Name | Dot Pad Key | Description |
| Scroll to the previous line in  single-line braille | Left Pan (Triangular) | Scroll back through the braille text displayed in the 20-cell  braille area of the Dot Pad. |
| Scroll to the next line in  single-line braille | Right Pan (Triangular) | Scroll forward through the braille text displayed in the 20-  cell braille area of the Dot Pad. |
| Scroll back in multi-line braille | F1 Key | Scroll back in the multi-line braille area of the Dot Pad, where possible.  In the chart area, move to the previous chart data. |
| Scroll forward in multi-line braille | F4 Key | Scroll forward in the multi-line braille area of the Dot Pad.  In the chart area, move to the next chart data. |
| Move back | F2 Key | Move to the previous location in Windows Explorer.  This action is equivalent to pressing the Backspace key or Alt + Left Arrow key. |
| Activate the current navigator object | F3 Key | Execute the currently focused navigator object.  This is similar to pressing NVDA + Enter. f the system focus is synchronized with the navigator object, it is  equivalent to pressing the Enter key. |
| Move to the previous item | Left Pan + F1 Key | Move the system focus to the previous item from the current position.  This is similar to pressing the Up Arrow key on a PC or  Space + dot 1 on a standard Braille display. |
| Move to the Next item | Right Pan + F4 Key | Move the system focus to the next item from the current position.  This is equivalent to pressing the Down Arrow key on a PC  or Space + dot 4 on a standard braille display. |
| Move to the first item in the current window | F1 + F2 Key | Move the system focus to the first item in the current window.  In applications like text editors that use the system caret, this  moves the cursor to the very first character. |
| Move to the last item in the current window | F3 + F4 Key | Move the system focus to the last item in the current window.  n applications like text editors that use the system caret, this  moves the cursor to the very last character. |

## Using NVDA with the Dual Braille Display of the Dot Pad 320

When using the Dot Pad 320 with NVDA, it is possible to read two different screen contents simultaneously in Braille. For example, a user can display a webpage in the multi-line area while reading the content of a text editor in the single-line Braille display, allowing them to work efficiently. Alternatively, it is possible to read different sections of a document at the same time in Braille. This capability utilizes the fact that NVDA's system focus and navigator object can focus on separate screen areas. The detailed steps are as follows:

1. Focus on the content you want to reference in the multi-line Braille area.
2. Press NVDA + 7 to turn off "Follow Navigator Object System Focus."   
   It is also recommended to press NVDA + 6 to turn off "Follow System Caret" at the same time.
3. The navigator object remains fixed in the specified area and no longer follows the system focus. Only the content of the navigator object is displayed in Braille in the Dot Pad 320 multi-line area.
4. Navigate primarily in the working area, such as a text editor, using the system focus.
5. To navigate using the focus of the navigator object in the multi-line area, use the navigator object keyboard commands and review cursor keyboard commands.

Commands for the navigator object and review cursor that are useful when using the dual braille display with NVDA are as follows:

### NVDA Navigator Object Commands

Table 3 NVDA Navigator object commands

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Desktop Key | Laptop Key | Description |
| Report current object | NVDA+  numpad5 | NVDA+shift+o | Reports the current navigator object. Pressing twice spells the information, and pressing 3 times copies this  object's name and value to the clipboard. |
| Move to containing object | NVDA+ numpad8 | NVDA+shift+ upArrow | Moves to the object containing the current navigator  object |
| Move to previous object | NVDA+ numpad4 | NVDA+shift+ leftArrow | Moves to the object before the current navigator object |
| Move to next object | NVDA+ numpad6 | NVDA+shift+ rightArrow | Moves to the object after the current navigator object |
| Move to first contained object | NVDA+ numpad2 | NVDA+shift+ downArrow | Moves to the first object contained by the current navigator object. |
| Move to focus object | NVDA+ numpadMinus | NVDA+ backspace | Moves to the object that currently has the system focus,  and places the review cursor at the position of the System caret, if it is showing. |
| Move System focus or caret to current review position | NVDA+shift+ numpadMinus | NVDA+shift+ backspace | pressed once Moves the System focus to the current navigator object, pressed twice moves the system caret to the position of the review cursor |
| Activate current navigator object | NVDA+ numpadEnter | NVDA+enter | Activates the current navigator object (similar to clicking with the mouse or pressing space when it has the system focus) |
| Report review cursor location | NVDA+Shift+ numpadDelete | NVDA+Shift+ delete | Reports information about the location of the text or object at the review cursor. For example, this might include the percentage through the document, the distance from the edge of the page or the exact screen position. Pressing twice may provide further detail. |

### NVDA Review Cursor Commands

Table 4 NVDA Review cursor commands

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Desktop Key | Laptop Key | Description |
| Move to top line in review | shift+numpad7 | NVDA+control+  Home | Moves the review cursor to the top line of the text |
| Move to previous line in review | numpad7 | NVDA+upArrow | Moves the review cursor to the previous line of text |
| Report current line in review | numpad8 | NVDA+shift+. | Announces the current line of text where the review cursor is positioned. Pressing twice spells the line. Pressing three  times spells the line using character descriptions. |
| Move to next  line in review | numpad9 | NVDA+  downArrow | Move the review cursor to the next line of text |
| Move to bottom  line in review | shift+numpad9 | NVDA+control+  End | Moves the review cursor to the bottom line of text |
| Move to previous word in review | numpad4 | NVDA+control+ leftArrow | Moves the review cursor to the previous word in the text. |
| Report current word in review | numpad5 | NVDA+control+. | Announces the current word in the text where the review  cursor is positioned. Pressing twice spells the word. Pressing three times spells the word using character descriptions. |
| Move to next  word in review | numpad6 | NVDA+control+  rightArrow | Move the review cursor to the next word in the text |
| Move to start of  line in review | shift+numpad1 | NVDA+home | Moves the review cursor to the start of the current line in the  text |
| Move to previous character in  review | numpad1 | NVDA+leftArrow | Moves the review cursor to the previous character on the current line in the text |
| Report current character in review | numpad2 | NVDA+. | Announces the current character on the line of text where the review cursor is positioned. Pressing twice reports a description or example of that character. Pressing three times reports the numeric value of the character in decimal and  hexadecimal. |
| Move to next character in  review | numpad3 | NVDA+  rightArrow | Move the review cursor to the next character on the current line of text |
| Move to end of  line in review | shift+numpad3 | NVDA+end | Moves the review cursor to the end of the current line of text |
| Say all with  review | numpadPlus | NVDA+shift+a | Reads from the current position of the review cursor, moving  it as it goes |
| Select then Copy from review  Cursor | NVDA+f9 | NVDA+f9 | Starts the select then copy process from the current position of the review cursor. The actual action is not performed until  you tell NVDA where the end of the text range is |
| Select then Copy to review cursor | NVDA+f10 | NVDA+f10 | On the first press, text is selected from the position previously set as start marker up to and including the review cursor's current position. If the system caret can reach the text, it will be moved to the selected text. After pressing this key stroke a second time, the text will be copied to the  Windows clipboard |

## Converting Microsoft Excel Charts on the Dot Pad 320

When connected with NVDA, if you are using a spreadsheet document or PowerPoint that includes charts, you can read the content of the charts as text while verifying it as a bar graph. The bar graph is transformed and displayed in the multi-line area of the Dot Pad 320. Regardless of the chart type in the Microsoft document, it is converted into a bar graph when displayed on the Dot Pad 320. The detailed steps are as follows:

1. Open a Microsoft Excel spreadsheet or PowerPoint document that contains charts.
2. Press CTRL + Alt + 5 to navigate to the chart area.
3. Use the arrow keys to move the focus to the chart title.
4. The chart data appears as a bar graph on the Dot Pad 320 multi-line display.
5. If the chart data is too extensive to be displayed at once, you can scroll through the chart data in the same way you would scroll through multi-line text using the button keys on the Dot Pad 320.

## Guidelines for Configuring Dot Pad 320 in NVDA

### Adjusting Settings for the Dot Pad 320 in NVDA

#### Braille Tethering (Default Automatic)

Braille tethering is the setting that determines which cursor's content will be displayed in Braille when NVDA outputs content on screen. By default, it is set to automatic tethering. When set to automatic, the contents of both the navigator object/review cursor and the system focus are output in Braille whenever their contents change. Users can choose to set the Braille output to follow either the system focus or the review cursor's content.

When using the Dot Pad 320, it is recommended to set the Braille tethering to system focus. This configuration naturally separates the system focus to the single-line Braille display and the navigator object and review cursor contents to the multi-line display, preventing confusion. The shortcut key to switch Braille tethering is NVDA + CTRL + T.

### Setting Up the Dot Pad 320 Button Keys

Users can customize the button keys on the Dot Pad to perform different NVDA commands. The configuration process is similar to setting up standard keyboard commands. The detailed steps are as follows:

1. Go to NVDA menu > Preferences > Input Gestures.
2. Find the desired function in the feature category.
3. Press the Tab key to select the "Add" button.
4. Press the button key on the Dot Pad that you want to associate with this function. For example, pressing the F1 key in this mode will replace its existing function with scrolling back through the multi-line Braille.
5. A dialog box will open asking whether to apply the setting across all keyboard layouts, only in the desktop layout, or just in the laptop keyboard layout.
6. Use the arrow keys to focus on the desired keyboard layout and press Enter to select it.
7. The keyboard command is now registered.