



*PROPRIETARY
INFORMATION*

ORBIT WRITER

User Guide

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1 Introduction



The Orbit Writer is a compact and portable Perkins-style braille keypad with the following features.

- Works with all smartphones and computers out of the box
- Seamless, instant connection
- Ultra-compact design easily fits in the pocket or purse
- Ergonomic Perkins-style braille keyboard
- High-quality scissors keys for smooth and quiet operation with positive tactile feedback
- Navigation keys to control your smartphone or computer with intuitive key combinations. No need to use touch gestures
- Works with iOS, Android, Windows, Mac OS, Fire OS, Chrome OS, and Linux devices
 - Read and send messages and emails
 - Browse the internet and social media
 - Control your smartphone or computer
- Simultaneous connection to 5 devices over Bluetooth and one over USB, switch with hotkey combinations
- Support for all languages available on phones and computers
- Fast-charging long-life battery
 - Over 3 days of operation
 - Charge in under 2 hours
 - Can be charged with any USB compliant charger

- Lightweight but rugged construction
 - 3.2 oz, 6.3 x 2.6 x 0.3 inches
 - 90 grams, 16.0 x 6.5 x 0.8 cm
- Haptic (vibration) feedback for actions and settings
- Attachment points for a strap or lanyard
- Comes with a USB charging cable

2 Documentation Conventions

For consistency and clarity, this documentation uses the following conventions.

Braille keys are indicated by a number. For example, if the documentation indicates Dot 1, it shows Dot 1.

If multiple braille keys are required, the documentation indicates those keys by showing the numbers separated by a space like this: Dots 1 4.

When modifier keys are used, the documentation separates the modifiers from the rest of the keys with a plus (+) sign like this: Space + Dot 1. Recall that modifiers, like the Shift key on a regular QWERTY keyboard, are keys you hold down while pressing another key. This modifies the effect of the pressed key. On a braille keyboard, Space is often used as a modifier to alter the effect of the input keys.

Key mnemonics are written in capital letters for emphasis but are typed in braille lowercase (unless otherwise stated). When one key follows another, the two keys are shown with a comma between them. For example, the command Select, M means to press and release the Select key, then press and release M (Dots 1 3 4) simultaneously.

The Up, Down, Right, and Left directional buttons on the navigation pad are interchangeably referred to as arrows, buttons, arrow buttons, and arrow keys.

3 In the Box

In addition to the basic package that includes Orbit Writer and the printed quick-start guide, the following accessories are available for sale:

- Orbit Writer device
- Standard-A to Micro-B USB cable
- Printed Quick-Start Guide

Check that all purchased items are in the box that you have received.

4 Features

These are a few of the features the Orbit Writer has to offer

- Perkins-Style Braille keypad
- Eight Braille Input keys and Space bar
- Navigation pad with four directional buttons (Up, Down, Left, Right) and the Select button
- Supports up to five Bluetooth and one USB connection
- Micro-B USB charging port
- Can be charged with any USB compliant charger
- Bluetooth 5.0® wireless technology
- Rechargeable and non-replaceable batteries

5 Orientation

Orientation to the positioning of keys is important for understanding how the device operates and how you input and receive information on the device.

To begin the exploration of the Orbit Writer, place the device on a flat surface in front of you with the wide key closest to you. This is the proper operational orientation.



On the left side of the device, going from front to back, there is a Micro-B USB port.



5.1 Key Placements

Moving toward the top and away from you, find a row of three keys, with a wider one - in the middle. The wide key is the Space bar. The Dot 7 input key is to the left of the Space Bar, and the Dot 8 input key is to the right of the Space Bar.

As you continue toward the top of the face of the device, there is a navigation pad in the middle, between the Braille Input keys and Space bar.

The navigation pad contains the four directional arrow buttons (Up, Down, Left, Right) and the Select button.

The six traditional braille input keys are aligned horizontally along the top edge of the face of the device, Dots 3 2 1 on the left and Dots 4 5 6 on the right.

when using the device with a screen reader on a host device, such as an iPhone, the Braille Input keys can be used to input text or control functionality of applications.

6 Getting Started

This section explains how to charge, turn the Orbit Writer on and off and quick steps for connecting with iOS device.

6.1 Charging the Device

When you receive the Orbit Writer, it may already have a charge; however, we recommend charging it fully before or during first use. You can use the device and charge it at the same time.

The Orbit Writer can be charged with any kind of USB compliant charger. If you have the Orbit Reader 20 display then it can be also charged with the charger supplied with the Orbit Reader 20

When the battery in the Orbit Writer gets to 20%, it gives three small haptic pulses at every 3 minutes. This behavior is normal, indicating that the battery is low.

To charge the device, use the provided Standard-A to Micro-B USB. Insert the small end of the cable into the Orbit Writer's USB port with the bumps facing up. It should slide in without resistance; do not force it. Then insert the large end of

the cable into a computer USB connector or the AC adapter. Plug the adapter into an AC wall connector.

When you plug in the charger it gives a single short haptic pulse and when you unplug the charger, it gives battery indication. The charger plug and unplug event indications are also provided when the unit is off.

We recommend to charge the device for at least 2 hours always. Usually the Orbit Writer indicates battery full (Level 5) after 1.5 hours of continuous charging but we recommend to charge it for more 30 minutes.

If you have charged the device for 4 or more hours, and it does not power on, contact Customer Service at techsupport@orbitresearch.com

6.2 Powering On and Off

The navigation pad is found between the Braille Input keys and Space bar. See the [Orientation](#) section for more information.

To power the device on, press and hold the Up Arrow and Down Arrow keys together until you feel a short haptic pulse. To power the device off, press and hold the same key combination until you feel a long haptic pulse. This is how the Orbit Writer lets you know it is coming on or shutting down.

When you turn the Orbit Writer on, it resumes using the last-used channel. If this is the first time you are using this device, the first Bluetooth channel (Channel 1) is selected by default

If the Orbit Writer was turned off with any of the five Bluetooth channels active, the same channel is activated when the unit is turned back on

After being idle for as long as the automatic power off time limit has been set the Orbit Writer automatically turns off to conserve power. See the [Automatic turn off](#) section for more information.

6.3 Quick steps to pair with an iOS device

The Orbit Writer can connect to computers and mobile devices to access all of their functions and features. The following is a simple description of the steps for connecting

Step 1. Turn on the Orbit Writer by pressing Up + Down Arrow keys. It responds with a short vibration pulse.

Step 2. You can connect the Orbit Writer to multiple devices. Each connection is called a channel. Channel 1, the default channel, is already set. Enable pairing on channel 1 by pressing and holding Space + Left Arrow + Dot 1 until you feel a short vibration pulse. To read about using other channels, please refer to the section [Selecting the channel of communication](#).

Step 3. For iOS devices, go to Settings > Accessibility > VoiceOver, and turn VoiceOver on. Then go to the Braille item and select it. Look in the list of

available braille displays for “Orbit Reader 20” followed by the last four digits of your Orbit Writer’s serial number and select this.

The Orbit Writer responds with three short vibration pulses. The first short pulse indicates it has successfully paired and the other two indicate it has successfully connected with the iOS device. Once it has paired and connected, it is important to first lock and unlock the iOS device before using the Orbit Writer with it. When you lock or unlock your iOS device, the Orbit Writer gives two short vibration pulses to indicate connection or disconnection with Voiceover.

Notes:

1. If the connection fails, delete the pairing record from your device, and try the steps above again.
2. Up to five devices can be simultaneously paired over Bluetooth to the Orbit Writer. To use a channel other than channel 1, please refer to the section [Selecting the channel of communication](#).
3. If the Orbit Writer is already on and the smartphone is woken up (due to a notification or button press), it will reconnect immediately.
4. If the iOS device is already awake and the Orbit Writer is turned on, it will reconnect with the last used device automatically. It may take up to 10 seconds to be reconnected.

7 General system commands and indications

This section describes the key commands and haptic indications for various events and actions. Also, details can be found in the form of a table, go to [Appendix A - System Commands and Indications](#) at the end of this document.

7.1 Turning on the Orbit Writer

The Orbit Writer can be turned on by pressing Up Arrow + Down Arrow keys together for three seconds. It responds with a single short pulse.

7.2 Turning off the Orbit Writer

The Orbit Writer can be turned off by pressing Up Arrow + Down Arrow keys together for three seconds. It responds with a single long pulse.

7.3 Entering Firmware upgrade mode

For upgrading the Orbit Writer from PC, Connect the Orbit Writer to the PC using the USB cable. Press and hold down the Up Arrow + Dot 5, then press Dot 8. Release Dot 8 first, then release the Up Arrow + Dot 5.

7.4 Entering DFU/Boot mode

For upgrading the Bootloader of the Orbit Writer from PC, Connect the Orbit Writer to the PC using the USB cable. Press and hold down the Up Arrow + Dot 6, then press Dot 8. Release Dot 8 first, then release the Up Arrow + Dot 6.

7.5 System reset

Press Up Arrow + Dot 8 keys together to reset the Orbit Writer.

7.6 Inserting and removing the charger

When you receive the Orbit Writer, you should bring the battery to a full charge. This is achieved by connecting the Orbit Writer to the charging cable, connecting the other end of the cable to a USB charger, and plugging the charger into an outlet. If these steps are accomplished, the Orbit Writer will produce a short vibration, alerting you that it is now receiving power. If you then remove the charging cable from the Orbit Writer, the Orbit Writer produces a vibration pulse to indicate the battery charge level. To read about the battery level indication refer to the section [Check battery level](#).

7.7 Connecting and disconnecting from Screen reader

The Orbit Writer gives two short pulses when it connects to and disconnects from any screen reader application.

7.8 Automatic turn off

The Orbit Writer turns itself off after being idle for the selected automatic power-off timeout. It generates a long pulse when turning itself off. The power-off timeout can be set to four different values by pressing Space + Left Arrow for three seconds. Press and release Space + Left Arrow to check the currently selected value of the power-off timeout. The Orbit Writer responds with the haptic indication which matches the current level of the timeout. The following table shows the various power-off timeout settings along with their vibration patterns.

Level	Power off time	Haptic Indication
1	5 Minutes	One short pulse
2	10 Minutes (Default)	Two short pulses
3	20 Minutes	Three short pulses
4	30 Minutes	Four short pulses

7.9 Selecting the Vibration intensity level

The vibration intensity level can be toggle among 3 options by pressing Space + Right Arrow for three seconds. Press and release Space + Right Arrow to check the currently selected level. The Orbit Writer responds with the haptic indication according to the current level of the intensity. The following table captures the available options. By default, level 2 (Medium intensity) is selected.

Level	Vibration intensity	Haptic Indication
1	Low	One short pulse
2	Medium (Default)	Two short pulses
3	High	Three short pulses

7.10 Check battery level

Press and hold Space + Up Arrow for one three to check the battery level. The Orbit Writer responds with several short pulses as per the battery level.

- Level 1. Single short pulse if the battery capacity is less than 20%.

- Level 2. Two short pulses: if the battery capacity is between 20% and 40%.
- Level 3. Three short pulses: if the battery capacity is between 40% and 60%.
- Level 4. Four short pulses: if the battery capacity is between 60% and 80%.
- Level 5. One long pulse: if the battery capacity is greater than 80%.

7.11 Low battery indications

The Orbit Writer gives three short pulses every 3 minutes if it detects the battery capacity low in the range between 1% and 20%.

7.12 Low battery lockout

The Orbit Writer gives a short pulse at power on if it detects the battery capacity critically low 0% and immediately turns itself off automatically.

8 Built-in self-test

Once the Orbit Writer is turned on press and hold Select + Space keys together for three seconds to enter in built-in self-test (BIST). It responds with a long pulse. Under this test, all keys can be tested. To test the key, press that key, and the Orbit Writer responds with a single short pulse for each keypress event.

The Orbit Writer can be exited from a built-in self-test by pressing and holding Select + Space keys together for one seconds. It responds with a long pulse.

9 Selecting the channel of communication

The Orbit Writer supports up to five Bluetooth channels and one USB channel. This means that you can use the Orbit Writer over USB with your desktop computer and also set up Bluetooth connections to your phone and tablet. The user can select one active channel at a time while the other channels remain in standby mode. The Orbit Writer sends keypad events to the device connected to the active channel.

The Orbit Writer supports 5 Bluetooth communication channels and 1 USB channel. For each Bluetooth channel (channels 1-5), two communication protocols are possible:

- Screen Reader Profile (SRP)—used to communicate as a braille device to screen reading software
- Keyboard-HID—used if the Orbit Writer is to emulate a QWERTY keyboard.

For the USB channel (channel 6), the possible protocols are Orbit-HID (supported by screen reading software such as JAWS or NVDA) and Braille-HID. For most situations, the default protocols for Bluetooth and USB channels will not need to be changed. The following table summarizes the commands to activate each channel.

#	Channel	Command to activate the channel
1	Bluetooth	Space + Left Arrow + Dot 1
2	Bluetooth	Space + Left Arrow + Dot 2
3	Bluetooth	Space + Left Arrow + Dot 3
4	Bluetooth	Space + Right Arrow + Dot 4
5	Bluetooth	Space + Right Arrow + Dot 5
6	USB	Space + Right Arrow + Dot 6

You can switch to any channel by pressing the corresponding activation command.

When you switch to any channel, the channel status is indicated by a unique vibration pattern.

1. No Bluetooth device is paired with the channel – Three short vibration pulses.
2. A Bluetooth device is paired but not actively connected – Two short vibration pulses
3. A Bluetooth device is paired and connected – A single short vibration pulse.

10 Selecting the communication protocol

The following table captures the key commands to select the desired communication protocol for a channel,

Channel Number	Channel	Communication Protocol	Commands
1	Bluetooth	SRP (Default)	Select + Dots 2 3 4 7
		Keyboard-HID	Select + Dots 1 3 7
2	Bluetooth	SRP (Default)	Select + Dots 2 3 4 7
		Keyboard-HID	Select + Dots 1 3 7
3	Bluetooth	SRP (Default)	Select + Dots 2 3 4 7
		Keyboard-HID	Select + Dots 1 3 7
4	Bluetooth	SRP (Default)	Select + Dots 2 3 4 7
		Keyboard-HID	Select + Dots 1 3 7
5	Bluetooth	SRP (Default)	Select + Dots 2 3 4 7
		Keyboard-HID	Select + Dots 1 3 7
6	USB	Orbit-HID (Default)	Select + Dots 1 3 5 7
		Braille-HID	Select + Dots 1 2 7

While you are using the Orbit Writer for the first time, it starts with the default channel, which is channel 1 and the default protocol which is SRP (Screen Reader Profile).

By default, each Bluetooth channel is configured to connect over SRP protocol. If you wish to connect over the Keyboard-HID protocol, you can switch.

By default, the USB channel is configured to connect over the Orbit-HID protocol. If you wish to connect over Braille-HID protocol, you can switch.

Note - After activating the Keyboard-HID protocol on any desired Bluetooth channel turn off the Bluetooth of previously paired iOS/Mac devices on other channels before enabling pairing on the desired channel.

10.1 Screen Reader Profile (SRP) Bluetooth protocol

The SRP Bluetooth protocol must be active on the desired Bluetooth channel before activating Bluetooth pairing on the same channel. Fortunately, SRP is the default protocol active by default on all five Bluetooth channels. VoiceOver (iOS), VoiceOver (Macbook), Brailleback (Android), BRLTTY (Android), VoiceView (Amazon Fire tablet), NVDA (Windows), JAWS (Windows), and ChromeVox (Chromebook) are screen reading programs which support SRP. Braille devices connected to screen reading software using SRP send commands directly to the screen reader, and what the commands do depends on the screen reader's interpretation of the command. For example, both screen reading programs— BrailleBack (Android) and NVDA (Windows PC)— support the SRP protocol. When the Orbit Writer or any other Braille device connects to Brailleback using SRP, one needs to enter Space + Dot 7 to erase the previous character while editing a document. If, however, in the same situation, if NVDA is the screen reader, one needs to enter Dot 7 to erase the previous character while editing a document. A screen reader can also translate the key inputs from the Orbit Writer to the desired language. So, when the Orbit Writer connects to any screen reader using the SRP protocol, the user enters the key commands that are supported by the screen reader itself.

10.2 Keyboard-HID protocol

The Keyboard-HID Bluetooth protocol has to be selected on the desired Bluetooth channel before activating the pairing on the same channel. When this protocol is activated the Orbit Writer directly talks with the OS running on the host like any other Bluetooth keyboard available in the market and doesn't directly connect with any Screen reader. The host OS converts the key commands from the Orbit Writer and executes the function defined by the OS itself. The Orbit Writer activates the keymap given in [Appendix B - Keyboard-HID protocol key commands](#) under this protocol. So, when the Orbit Writer connects to any host under this protocol user has to follow these key commands. As the screen reader doesn't connect to the Orbit Writer under this protocol user cannot use the translation feature provided by the screen reader.

10.3 Orbit-HID protocol

The Orbit-HID is a USB protocol and it has to be activated on the USB channel before connecting to PC/laptop. By default, the USB channel 6 is configured to

connect over this protocol. Almost all screen reader uses this USB protocol to connect with any Braille device over the USB. When this protocol is activated the Orbit Writer and any other similar Braille device directly talks with the Screen reader like SRP protocol. The behavior of this protocol is similar to the SRP protocol but only the physical connection is different from the SRP protocol. SRP protocol works over wireless Bluetooth while the Orbit-HID is for USB. This protocol can be used when working with few popular screen readers which also support Orbit-HID protocol. These screen readers are NVDA (Windows), JAWS (Windows), Narrator (Windows), BRLTTY (Android), VoiceOver (Macbook), and ChromeVox (Chromebook).

10.4 Braille-HID protocol

The Braille-HID is a USB protocol and it has to be activated on the USB channel before connecting to PC/laptop. Only VoiceOver (Macbook) supports this protocol. So, this can be used when you want to connect and use the Orbit Writer with VoiceOver (Macbook) over the USB channel.

11 Pair and forget

To use the Orbit Writer wirelessly over Bluetooth, the user must first configure a Bluetooth partnership between the Orbit Writer and the smartphone or tablet. If no host is paired over the currently-activated channel, you can pair/connect a host over the channel.

Activate the desired Bluetooth channel and the communication protocol with the appropriate key command, bearing in mind that SRP is the default protocol for all Bluetooth channels (1-5).

Channel 1: Space + Left Arrow + Dot 1

Channel 2: Space + Left Arrow + Dot 2

Channel 3: Space + Left Arrow + Dot 3

Channel 4: Space + Right Arrow + Dot 4

Channel 5: Space + Right Arrow + Dot 5

Channel 6: Space + Right Arrow + Dot 6

After activation of the desired Bluetooth channel, press and hold the same keys used for the channel activation for three seconds to enable the pairing for the just-activated channel. Once pairing has been enabled, the Orbit Writer forgets any device that might have already been paired previously on that channel.

Initiate a Bluetooth scan on the smartphone or tablet and find the Bluetooth name "Orbit Reader 20 XXXX" where XXXX is the last four digits of the Orbit Writer's serial number printed on the backside of the unit. Tap on the device name to initiate pairing with the Orbit Writer.

Once paired, the Orbit Writer responds with a single short pulse and disables pairing for the current Bluetooth channel. If the Orbit Writer doesn't receive any

pairing request from the smartphone or tablet within 3 minutes, it automatically disables pairing.

The Orbit Writer responds with a single short pulse if a successful pairing occurs. Otherwise, it responds with two long pulses.

For iOS devices, the Orbit Writer responds with three short vibration pulses. The first short pulse indicates it has successfully paired and the other two indicate it has successfully connected with the iOS device. Once it has paired and connected, it is important to first lock and unlock the iOS device before using the Orbit Writer with it

11.1 Forget all the devices from the Orbit Writer

Press and hold Space + Down Arrow keys together for three seconds to forget all the devices from the Orbit Writer from all five available Bluetooth channels. It also restores the protocol selection for each channel to default SRP.

The Orbit Writer responds with a single short pulse if it succeeds otherwise it responds with two long pulses.

Note: If the Orbit Writer is not connecting on the active communication channel, unlock your device so it will detect the Orbit Writer and activate the channel.

12 Reconnecting with last connected device

The Orbit Writer preserves the required information about the device connected on the last active communication channel as well as protocol and re-connects to that device on the same channel with the same protocol at power on.

13 Connecting the Orbit Writer with Screen readers

The Orbit Writer connects with host devices (i.e., computers, phones, tablets) to provide braille input to that device. The host device must be running software that supports braille.

Host Device	Screen Reader
Windows PCs	JAWS®, System Access, NVDA, SuperNova, Windows Narrator
Mac® computers and iOS® devices	VoiceOver
Android devices	BrailleBack, BRLTTY, Amazon VoiceView, Our Braille
Chromebook	ChromeVox

When you use Orbit Writer as a keypad for other hosts, the screen reader on that host device provides the translation and other braille settings. Consult the documentation for your screen reader.

13.1 Before you Connect

Newer versions of screen readers recognize the Orbit Writer as the Orbit Reader 20. The table below shows the first version of the screen reader to directly support the orbit Writer as Orbit Reader 20.

Screen Reader	Version
VoiceOver on iOS	10.2
VoiceOver on Mac	10.11
NVDA	2017.1
ChromeVox	61.0.3163.120
System Access	3.7.85
SuperNova	16.05

13.2 Using the Bluetooth Connection

Bluetooth is a technology that wirelessly connects devices, such as the Orbit Writer, to host devices, such as phones, tablets, and computers. For example, when using an iPhone with VoiceOver, you can control the iPhone with the keys and buttons on the Orbit Writer.

If the Orbit Writer is on, when you wake up or turn on the host device, it connects automatically. When the host device enters sleep mode or is turned off, Orbit Writer disconnects and waits for the host to wake and open the connection again.

For the SRP protocol, it is currently not possible to wake up the host from the braille keyboard on the Orbit Writer, but for the Keyboard-HID protocol, you can wake the host as you can with Bluetooth keyboard.

For the SRP protocol, there are only two ways to wake up a host:

- Pressing the Power button
- Receiving notification

To pair and connect the Orbit Writer to a host device, see the Bluetooth section for the device type.

Connecting iOS with Bluetooth
Connecting Mac with Bluetooth
Connecting Android with Bluetooth
Connecting Windows with Bluetooth
Connecting ChromeBook with Bluetooth

13.3 iOS Devices

You can only connect iOS using Bluetooth. The iOS devices support SRP and Keyboard-HID protocol for the Bluetooth channels. The desired protocol can be selected on the Orbit Writer.

13.3.1 Connecting iOS with Bluetooth

Connecting Orbit Writer to an iOS device provides the ability to type and control the iOS device with the Orbit Writer keyboard and directional buttons.

Follow these steps to pair and connect with the iOS device over Bluetooth when SRP protocol is selected:

1. On the iOS device, go to Settings > Accessibility > VoiceOver, and turn the VoiceOver on.
2. On the Orbit Writer, activate the desired Bluetooth channel. E.g. To activate the Bluetooth channel 1 press and release Space + Left Arrow + Dot 1. The Orbit writer responds with a unique vibration pattern according to the status of the channel as mentioned in [Selecting the channel of communication](#).
3. If SRP protocol is not already activated then activate it on the channel by pressing Select + Dots 2 3 4 7.
4. Activate the pairing on the desired Bluetooth channel. E.g. To enable pairing on Bluetooth channel 1 press and hold Space + Left Arrow + Dot 1 for three seconds. The Orbit writer responds with a single short pulse.
5. On the iOS device, go to Settings > Accessibility > VoiceOver > Braille
6. Look for the name of the unit in the list of possible braille devices. It shows up as Orbit Reader 20 plus the last four digits of the serial number.
7. Activate the Orbit Reader 20 device in the list to pair.
8. The Orbit Writer responds with a single short haptic pulse when pairing is completed.
9. The Orbit Writer gives two short haptic pulses when it connects or disconnects with the Voiceover.

Follow these steps to pair and connect with the iOS device over Bluetooth when Keyboard-HID protocol is selected:

1. Activate the desired Bluetooth channel. E.g. To activate the Bluetooth channel 1 press and release Space + Left Arrow + Dot 1.
2. If the Keyboard-HID protocol is not already activated then activate it on the channel by pressing Select + Dots 1 3 7.
3. Activate the pairing on the desired Bluetooth channel. E.g. To enable pairing on Bluetooth channel 1 press and hold Space + Left Arrow + Dot 1 for three seconds. The Orbit writer responds with a single short pulse.
4. On the iOS device, go to Settings > Bluetooth.
5. Look for the name of the unit in the list of possible braille devices. It shows up as Orbit Reader 20 plus the last four digits of the serial number.
6. Activate the Orbit Reader 20 device in the list to pair.
7. The Orbit Writer responds with a single short haptic pulse when pairing is completed.
8. The Orbit Writer gives two short haptic pulses when it connects or disconnects with the iOS device.

Note – Here, in case of Keyboard-HID protocol the Orbit Writer doesn't connect with the VoiceOver, but it connects directly with the iOS.

Once you pair and connect the unit, you can use the Orbit Writer input and navigation keys to control your iOS device.

For more information about iOS and braille devices, see [Braille Displays for iOS](#) on the Apple® Accessibility website.

13.3.2 iOS Resources

- [Apple Blind and Visually Impaired User Community](#)
- [Andrea's Head Wiki](#)
- [TechVision Tutorials](#)
- [Youtube Videos on iPad/iPhone and Braille](#)
- [Braille Displays for iOS](#)

13.3.3 iOS Commands

The VoiceOver has assigned Braille key commands for various iOS functions and a few functions require the user to assign the key command as per their convenience. The VoiceOver provides flexibility to define a desired key command against every feature available. Here is the list of all the functions and default key commands defined by the iOS, for a few function which doesn't have any default key command assigned have been highlighted by "No Assigned Braille Keys". This list of commands is also accessible on the iOS device once the Orbit Writer connects with the VoiceOver. Settings > Accessibility > VoiceOver > Commands > Orbit Reader 20. Note – This table is applicable for the iOS device v13.6 The default key commands for your device may have a different table. For more commands please refer this link [Common braille commands for VoiceOver navigation using iPhone, iPad, and iPod® touch](#)

Braille Commands	
Function	Keys
Next Input Mode	Space + Dots 2 3 6
Next Output Mode	Space + Dots 1 2 4 5
Pan Left	Left Arrow or Space + Dot 2
Pan Right	Right Arrow Or Space + Dot 5
Toggle 8-Dot Braille	No Assigned Braille Keys
Toggle Announcement History	Space + Dots 1 3 4 5
Toggle Contractions	No Assigned Braille Keys
Toggle Word Wrap	No Assigned Braille Keys
Translate	Space + Dots 4 5
Translate Braille to Clipboard	No Assigned Braille Keys

Device Commands	
Function	Keys
Control Centre	Space + Dot 2 5
Home	Space + Dot 1 2 5
Notification	Space + Dot 4 6
Open Next App	No Assigned Braille Keys
Open Previous App	No Assigned Braille Keys
Rotate Device Left	No Assigned Braille Keys
Rotate Device Right	No Assigned Braille Keys
Show App Switcher	Space + Dots 1 2 5 (Twice)
Show/Hide Keyboard	Space + Dot 1 4 6
Siri	No Assigned Braille Keys
Speak Screen	No Assigned Braille Keys
Toggle Orientation Lock	No Assigned Braille Keys
Volume Down	Space + Dot 1 2 6
Volume Up	Space + Dot 3 4 5

Interaction Commands	
Function	Keys
3D Touch Selected Item	Space + Dots 3 5 6
Double Tap	Space + Dots 3 6 (Twice)
Escape Current Context	Space + Dots 1 2
Label Selected Item	Space + Dots 1 2 3 4 6
Long Press	Space + Dots 3 6 7 8
Scroll Down	Space + Dots 1 4 5 6 or Space + Dots 1 4 5 6 8
Scroll Left	Space + Dots 2 4 6
Scroll Right	Space + Dots 1 3 5
Scroll Up	Space + Dots 3 4 5 6 or Space + Dots 3 4 5 6 8
Speak Item Summary	Space + Dots 3 4
Start or Stop Current Action / Answer a call	Space + Dots 1 5 6
Tap	Select or Space + Dots 3 6
Toggle Item Watching	No Assigned Braille Keys

Keyboard Commands	
Function	Keys
Bottom of Document	No Assigned Braille Keys
Command	Space + Dots 1 7
Control	Space + Dots 3 7
Copy	Space + Dots 1 4
Cut	Space + Dots 1 3 4 6
Delete	Dot 7 or Space + Dot 7 or Space + Dots 1 4 5

Down Arrow	No Assigned Braille Keys
First Word	No Assigned Braille Keys
FN	Space + Dots 5 7
Last Word	No Assigned Braille Keys
Left Arrow	No Assigned Braille Keys
Next Keyboard	No Assigned Braille Keys
Option	Space + Dots 2 7
Paste	Space + Dots 1 2 3 6
Redo	Space + Dots 2 3 4 6
Return	Dot 8 or Space + Dots 1 5 or Space + Dot 8
Right Arrow	No Assigned Braille Keys
Select All	Space + Dots 2 3 5 6
Select Left	Space + Dots 2 3 5
Select Right	Space + Dots 2 5 6
Shift	Space + Dots 4 7
Shift-Tab	Space + Dots 1 2 5 6
Speak Link Address	No Assigned Braille Keys
Speak Number Of Lines	No Assigned Braille Keys
Speak Selected Text	No Assigned Braille Keys
Speak Text Style	Space + Dots 2 3 4 5 6
Tab	Space + Dots 2 3 4 5
Toggle Command	Space + Dots 1 8
Toggle Control	Space + Dots 3 8
Toggle FN	Space + Dots 5 8
Toggle Option	Space + Dots 2 8
Toggle Shift	Space + Dots 4 8
Top of Document	No Assigned Braille Keys
Undo	Space + Dots 1 3 5 6
Up Arrow	No Assigned Braille Keys

Navigation Commands	
Function	Keys
First Item	Space + Dots 1 2 3
Last Item	Space + Dots 4 5 6
Move to Bottom of Container	No Assigned Braille Keys
Move To Status Bar	Space + Dots 2 3 4
Move to Top of Container	No Assigned Braille Keys
Next to Blockquote	No Assigned Braille Keys
Next Bold Text	No Assigned Braille Keys
Next Character	No Assigned Braille Keys
Next Colour Change	No Assigned Braille Keys
Next Container	No Assigned Braille Keys
Next Different item	No Assigned Braille Keys
Next Font Change	No Assigned Braille Keys

Next Form Item	No Assigned Braille Keys
Next Heading	No Assigned Braille Keys
Next Image	No Assigned Braille Keys
Next Italic Text	No Assigned Braille Keys
Next Item	Right Arrow Or Space + Dot 4
Next Item Of Same Type	No Assigned Braille Keys
Next Line	No Assigned Braille Keys
Next Link	No Assigned Braille Keys
Next List	No Assigned Braille Keys
Next Misspelt Word	No Assigned Braille Keys
Next Paragraph	No Assigned Braille Keys
Next Plain Text	No Assigned Braille Keys
Next Same Blockquote	No Assigned Braille Keys
Next Same Heading Level	No Assigned Braille Keys
Next Sentence	No Assigned Braille Keys
Next Style Change	No Assigned Braille Keys
Next Table	No Assigned Braille Keys
Next Textphone Message	No Assigned Braille Keys
Next Underline Text	No Assigned Braille Keys
Next Visited Link	No Assigned Braille Keys
Previous Blockquote	No Assigned Braille Keys
Previous Bold Text	No Assigned Braille Keys
Previous Character	No Assigned Braille Keys
Previous Colour Change	No Assigned Braille Keys
Previous Container	No Assigned Braille Keys
Previous Different Item	No Assigned Braille Keys
Previous Font Change	No Assigned Braille Keys
Previous Form Item	No Assigned Braille Keys
Previous Heading	No Assigned Braille Keys
Previous Image	No Assigned Braille Keys
Previous Italic Text	No Assigned Braille Keys
Previous Item	Left Arrow Or Space + Dot 1
Previous Item Of Same Type	No Assigned Braille Keys
Previous Line	No Assigned Braille Keys
Previous Link	No Assigned Braille Keys
Previous List	No Assigned Braille Keys
Previous Misspelt Word	No Assigned Braille Keys
Previous Paragraph	No Assigned Braille Keys
Previous Plain Text	No Assigned Braille Keys
Previous Same Blockquote	No Assigned Braille Keys
Previous Same Heading Level	No Assigned Braille Keys
Previous Sentence	No Assigned Braille Keys
Previous Style Change	No Assigned Braille Keys
Previous Table	No Assigned Braille Keys
Previous Textphone Message	No Assigned Braille Keys

Previous Underline Text	No Assigned Braille Keys
Previous Visited Link	No Assigned Braille Keys

Rotor Commands	
Function	Keys
Next Rotor Option	Space + Dots 5 6
Previous Rotor Option	Space + Dots 2 3
Rotor Down	Down Arrow Or Space + Dot 6
Rotor Up	Up Arrow or Space + Dots 3
Speak Current Rotor Item	No Assigned Braille Keys

VoiceOver Commands	
Function	Keys
Copy Speech	No Assigned Braille Keys
Item Chooser	Space + Dots 2 4
Next Search Result	No Assigned Braille Keys
Open VoiceOver Settings	No Assigned Braille Keys
Pause or Continue Speech	Space + Dots 1 2 3 4
Previous Search Results	No Assigned Braille Keys
Read All	Space + Dots 1 2 3 5
Read From Top	Space + Dots 2 4 5 6
Related Content	No Assigned Braille Keys
Single Letter Search	No Assigned Braille Keys
Speak Hint	No Assigned Braille Keys
Text Search	Space + Dots 1 2 4
Toggle Mute	Space + Dots 1 3 4 7 Or Space + Dots 1 3 4
Toggle Quick Nav	Space + Dots 1 2 3 4 5
Toggle Screen Curtains	Space + Dots 1 2 3 4 5 6
Toggle Single Letter Quick Nav	Space + Dots 1 2 3 4 5 7
VoiceOver Help	Space + Dots 1 3 Or Space + Dots 1 3 7

13.3.4 Assign the key command on the iOS device

You can assign a key command to those which are listed above as "No Assigned Braille Keys". To do so, perform the following steps.

Follow these to assign the desired key command,

1. Pair the Orbit Writer with your iOS device.
2. On iOS device go to Settings > Accessibility > VoiceOver > Comands > Orbit Reader 20.
3. Go to the desired command.
4. Tap on "Assign New Braille Keys"
5. On the Orbit Writer press the braille key combination you want to set.

Note that you must press the key command that you desire quickly. If you find that pressing the desired key command does not return you to the previous menu, go back and select “Assign New Braille Keys” again. It is also possible to re-assign existing key commands to new functions. If the key command is already in use by another function, iOS will inform you of this. You can then either cancel the new key command assignment or change it.

13.4 Mac Computers

When connecting Orbit Writer to a Mac, there are two possible methods. One is to connect using the USB cable that came in the box. The second is to use Bluetooth for a wireless connection. To connect the Orbit Writer with Mac over USB you have to activate the USB channel first and after that activate the desired USB protocol from Orbit-HID and Braille-HID. To connect the Orbit Writer with Mac over Bluetooth you have to activate any Bluetooth channel first and after that activate the desired USB protocol from SRP and Keyboard-HID.

13.4.1 Connecting Mac with USB

The simplest way to connect the Orbit Writer to a Mac is to connect using a USB Standard-A to Micro-B cable. First, activate the USB channel on the Orbit Writer by Space + Right Arrow + Dot 6 and after that switch, the Orbit Writer to the desired HID protocol. The Orbit-HID protocol can be selected by pressing Select + Dots 1 3 5 7 and the Braille-HID protocol can be selected by pressing Select + Dots 1 2 7. Next, run VoiceOver by pressing the Apple CMD key + F5. Then, attach the small end of the USB cable to Orbit Writer with the bumps facing up and the big end to Mac. VoiceOver automatically recognizes and starts using the device.

13.4.2 Connecting Mac with Bluetooth

Follow these steps to pair and connect with Bluetooth when the SRP protocol is selected:

1. Activate the desired Bluetooth channel. E.g. To activate the Bluetooth channel 1 press and release Space + Left Arrow + Dot 1. The Orbit writer responds with a single short pulse.
2. If SRP protocol is not already activated then activate the SRP protocol on the channel by pressing Select + Dots 2 3 4 7.
3. Activate the pairing on the desired Bluetooth channel. E.g. To enable pairing on Bluetooth channel 1 press and hold Space + Left Arrow + Dot 1 for three seconds. The Orbit writer responds with a single short pulse.
4. When VoiceOver is on, open VoiceOver Utility by pressing VO-F8
5. Click the Braille category, click Displays, and then click the Add (+) button
6. Select Orbit Reader 20 on the list. VoiceOver filters the devices it detects to list only the Bluetooth braille displays that are within range of your computer and that appear to match a VoiceOver braille display driver.
7. Activate the Orbit Reader 20 device in the list to pair.

8. The Orbit Writer responds with a single short haptic pulse when pairing is completed.
9. The Orbit Writer gives two short haptic pulses when it connects or disconnects with the Voiceover.

Follow these steps to pair with Bluetooth when Keyboard-HID protocol is selected:

1. Activate the desired Bluetooth channel. E.g. To activate the Bluetooth channel 1 press and release Space + Left Arrow + Dot 1.
2. If the Keyboard-HID protocol is not already activated then activate the Keyboard-HID protocol on the channel by pressing Select + Dots 1 3 7.
3. Activate the pairing on the desired Bluetooth channel. E.g. To enable pairing on Bluetooth channel 1 press and hold Space + Left Arrow + Dot 1 for three seconds. The Orbit writer responds with a single short pulse.
4. On the Mac device, go to Bluetooth Preferences.
5. Look for the name of the unit in the list of possible braille devices. It shows up as Orbit Reader 20 plus the last four digits of the serial number.
6. Activate the Orbit Reader 20 device in the list to pair.
7. The Orbit Writer responds with a single short haptic pulse when pairing is completed.
8. The Orbit Writer gives two short haptic pulses when it connects or disconnects with the Mac.

Note – Here, in case of Keyboard-HID protocol the Orbit Writer doesn't connect with the VoiceOver, but it connects directly with the Mac.

13.5 Android Devices

You can connect Android devices using Bluetooth and USB both. BrailleBack and Our Braille support only Bluetooth connection but the BRLTTY screen reader supports both Bluetooth and USB. You can download and install BRLTTY from <http://mielke.cc/brlty/download.html>. You can download Our Braille and BrailleBack from the Playstore.

There are pros and cons to each of these screenreader applications and the correct choice may depend on your needs. The table below captures a summary of key differences between these applications to help you make the choice.

#	Feature	Our Braille	BrailleBack	BRLTTY
1	Connection	Bluetooth	Bluetooth	Bluetooth, USB
2	Word Wrapping	YES	YES	NO
3	Speech Support (without TalkBack)	NO	NO	YES

4	Navigation Mode	NO	NO	YES
5	Indian Language Support	Hindi	Hindi	Hindi & many more
6	Basic Global Commands	YES	YES	NO
7	Navigation Commands	YES	NO	YES
8	Form Navigation Commands	YES	NO	NO
9	Help Menu	YES	YES	NO

13.5.1 Connecting BrailleBack or Our Braille with Bluetooth

Follow these steps to pair and connect with Bluetooth when the SRP protocol is selected:

1. Power on the Android device and turn the Bluetooth on.
2. Activate the desired Bluetooth channel. E.g. To activate the Bluetooth channel 2 press and release Space + Left Arrow + Dot 2.
3. If SRP protocol is not already activated then activate the SRP protocol on the channel by pressing Select + Dots 2 3 4 7.
4. Activate pairing on the desired Bluetooth channel. E.g. To enable pairing on Bluetooth channel 2 press and hold Space + Left Arrow + Dot 2 for three seconds. The Orbit writer responds with a single short pulse.
5. Scan for the Orbit Writer from the Android phone and look for “Orbit Reader 20 XXXX” where XXXX is the last four digits of serial number printed on the backside of the device.
6. Pair the Orbit Writer with the Android device. Upon successful pairing, the Orbit Writer will respond with a single short pulse
7. Go to settings/system/Accessibility/ (Note, depending on phone manufacturer, the accessibility menu might be under a different path. Please locate the accessibility menu of your phone settings)
8. Go to BrailleBack or Our Braille and turn it on.
9. Go to Settings/Language & inputs/Current Keyboard and select “Braille hardware keyboard” for BrailleBack and “Our Braille hardware keyboard” for Our Braille.
10. Set up an Android device.
To set up your Android device, follow the Install and enable BrailleBack instructions found on the Google™ Android Accessibility Help webpage.

13.5.2 Input Text With BrailleBack

To input text with your braille keyboard first, enable the keyboard in your Android settings under Language and Input. If you try to use the keyboard before completing this step, you receive a prompt to change your settings.

To edit a text field focus, and activate the text field. You can then use the Up Arrow and Down Arrow keys to move in the text field and braille keys to edit the text fields.

13.5.3 BrailleBack Commands

Function	Keys
Back	Space + Dots 1 2 (b)
Home	Space + Dots 1 2 5 (h)
BrailleBack help	Space + Dots 1 2 3
Notifications	Space + Dots 1 3 4 5 (n)
Recent Apps	Space + Dots 1 2 3 5 (r)
Enter (in Edit field)	Space + Dot 8
Backspace (in Edit field)	Space + Dot 7
Next item	Right Arrow
Activate current focused element	Select button
First item on page	Dot 4 + Up
Last item on page	Dot 4 + Down
To previous heading, landmark, table, focusable item, etc.	Left Arrow
Select and deselect Checkbox	Select
Open combo box	Select
Browse/select options of combo boxes	Select
Select multiple options from combo boxes	Select
Toggle selection of radio button	Select
Switch between literary and computer braille	Space + Dots 1 2 4 5 (g)
Enter/exit on-screen search	Space + Dots 3 4

13.5.4 Our Braille Commands

Function	Keys
Back	Space + Dots 1 2 (b)
Home screen	Space + Dots 1 2 5 (h)
Our Braille help	Space + Dots 1 2 3
Notifications	Space + Dots 4 6

Recent apps	Space + Dots 1 2 3 5 (r)
Enter (in Edit field)	Space + Dot 8
Backspace (in Edit field)	Space + Dot 7
Next item	Right Arrow
Activate current focused element	Select button
First item on page	Dot 7 + Up
Last item on page	Dot 7 + Down
To previous heading, landmark, table, focusable item, etc.	Left Arrow
Select and deselect Checkbox	Select
Open combo box	Select
Browse/select options of combo boxes	Select
Select multiple options from combo boxes	Select
Toggle selection of radio button	Select
Switch between literary and computer braille	Space + Dots 1 2 4 5 (g)
Enter/exit on-screen search	Space + Dots 3 4

13.5.5 Connecting the Orbit Writer to BRLTTY over Bluetooth

Follow these steps to pair and connect with Bluetooth when the SRP protocol is selected:

1. Power on the Android device and turn the Bluetooth on.
2. Activate the desired Bluetooth channel. E.g. To activate the Bluetooth channel 2 press and release Space + Left Arrow + Dot 2.
3. If SRP protocol is not already activated then activate the SRP protocol on the channel by pressing Select + Dots 2 3 4 7.
4. Activate pairing on the desired Bluetooth channel. E.g. To enable pairing on Bluetooth channel 2 press and hold Space + Left Arrow + Dot 2 for three seconds. The Orbit writer responds with a single short pulse.
5. Scan for the Orbit Writer from the Android phone and look for “Orbit Reader 20 XXXX” where XXXX is the last four digits of serial number printed on the backside of the device.
6. Pair the Orbit Writer with the Android device. Upon successful pairing, the Orbit Writer will respond with a single short pulse.
7. Go to settings/system/Accessibility/ (Note, depending on phone manufacturer, the accessibility menu might be under a different path. Please locate the accessibility menu of your phone settings)
8. Go to BRLTTY and turn it on.
9. Go to Settings/Language & inputs/Current Keyboard and select “BRLTTY Input Service”

10. Now you can type on and operate your phone through the Orbit Writer using the BRLTTY commands.

13.5.6 Connecting the Orbit Writer to BRLTTY with USB

Follow these steps to connect Orbit Writer to BRLTTY with USB when Orbit-HID protocol is selected:

1. Activate USB channel by pressing Space + Right Arrow + Dot 6.
2. If Orbit-HID protocol is not already activated then activate the Orbit-HID protocol on the channel by pressing Select + Dots 1 3 5 7.
3. Connect Orbit Writer with Android device using USB cable, the Orbit Writer will respond with a single short pulse.
4. Go to settings/system/Accessibility/ (Note, depending on phone manufacturer, the accessibility menu might be under a different path. Please locate the accessibility menu of your phone settings)
5. Go to BRLTTY settings, go to Manage Devices, go to Add Device and select Communication Method as USB, after that select Done.
6. Go back to Manage Devices again and tap on Selected Device options, choose 'autodetect USB Orbit Research, Orbit Writer, SB xxxxxx'.
i.e.xxxxxx is device serial number.
7. Go to BRLTTY and turn it on.
8. Go to Settings/Language & inputs/Current Keyboard and select "BRLTTY Input Service"
9. Now you can type on and operate your phone through the Orbit Writer using the BRLTTY commands.

13.5.7 BRLTTY commands

Phone Navigation	
Function	Keys
Next icon down	Dot 1 + Down Arrow
Previous icon up	Dot 1 + Up Arrow
Next icon right	Dot 1 + Right Arrow
Previous icon left	Dot 1 + Left Arrow

Document Review	
Function	Keys
Move Cursor Right	Dot 1 + Right Arrow
Move Cursor Left	Dot 1 + Left Arrow
Home	Space + Dot 2
End	Space + Dot 5

Delete/backspace	Dot 7 OR Space + Left Arrow
Previous line	Dot 1 + Up Arrow
Next line	Dot 1 + Down Arrow

13.6 Chromebooks

Currently, you can use USB and Bluetooth to connect to the Orbit Writer from a Chromebook™ notebook computer. The Chromebook supports the Orbit-HID protocol for the USB channel and SRP protocol for the Bluetooth channels.

13.6.1 Connecting Chromebook with USB

To connect to Chromebook with USB, follow these steps:

1. Press Space + Right Arrow + Dot 6 to activate the USB channel on the Orbit Writer.
2. Press Select + Dots 1 3 5 7 to activate the Orbit-HID protocol on the USB channel.
3. Plug the Orbit Writer into the Chromebook USB port. After a few seconds, the Chromebook detects the device and turns on ChromeVox.

13.6.2 Connecting Chromebook with Bluetooth

To connect to Chromebook with Bluetooth, follow these steps:

1. Activate the desired Bluetooth channel. E.g. To activate the Bluetooth channel 2 press and release Space + Left Arrow + Dot 3
2. If SRP protocol is not already activated then activate the SRP protocol on the channel by pressing Select + Dots 2 3 4 7.
3. Activate pairing on the desired Bluetooth channel. E.g. To enable pairing on Bluetooth channel 3 press and hold Space + Left Arrow + Dot 3 for three seconds. The Orbit writer responds with a single short pulse.
4. Scan for the Orbit Writer from the Chromebook Bluetooth settings and look for “Orbit Reader 20 XXXX” where XXXX is the last four digits of serial number printed on the backside of the device.
5. Pair the Orbit Writer with the Chromebook. Upon successful pairing, the Orbit Writer will respond with a single short pulse.
6. On the Chromebook turn the ChromeVox by pressing “Ctrl + Alt + z”.

13.6.3 ChromeVox Settings/Commands

To adjust ChromeVox settings or learn commands, go to ['Use a braille device with your Chromebook'](#).

13.7 Fire Tablets

To pair the Orbit Writer with VoiceView on your Fire Tablet, follow these steps

1. Swipe down from the top of the screen with two fingers and double tap on Settings.
2. Find the Accessibility settings and double-tap. Then double-tap on VoiceView Screen Reader.
3. Navigate to Braille and double-tap. Then double-tap Pair Bluetooth Braille Display.
4. Make sure your Orbit Writer's is on and pairing is turned on, then double-tap on Scan.

You should see Orbit Reader 20 followed by the serial number. Double-tap on it to pair.

For additional information, go to the "Use a Braille Display with Your FireTablet": (<https://www.amazon.com/gp/help/customer/display.html?nodeId=201829370>) webpage on the Amazon Help and Customer Service site.

13.8 Windows PCs

Before connecting Orbit Writer with a PC, you must first decide how you wish to connect: Bluetooth or USB. This is a personal preference. USB charges the device as you use it, so it is a good choice when your battery is low. Bluetooth does not use wires, so it is a good choice when you are on the go.

13.8.1 Connecting Windows with USB

If your screen reader does not support the Orbit-HID protocol, switch to the Braille-HID protocol on the Orbit Writer with the hotkey.

13.8.2 Connecting Windows with Bluetooth

When connecting the Orbit Writer with Bluetooth, you must first activate the desired Bluetooth channel and the protocol.

Once done enable the pairing on the desired channel by pressing hotkeys and pair it to the PC.

Next, check the Ports list in the Windows Device Manager to find the COM port number assigned to the outgoing Bluetooth serial port. Make a note of this number.

In your screen reader on the PC, set the active Braille device COM port to use as the relevant Bluetooth serial port COM number.

13.8.3 Non-Visual Desktop Access (NVDA)

If you have NVDA (version 2017.1 or later) installed on your PC, it automatically recognizes the Orbit Writer as Orbit Reader 20. If NVDA is not recognizing the device, go to the NVDA Preferences menu and select Braille Settings from the

list. From the braille device drop-down menu, select "Baum/Humanware/APH/Orbit Displays" and click OK.

Note: NVDA works in Orbit-HID only.

If Orbit Writer is not one of the devices shown in the Braille Display list, upgrade NVDA to the newest version and repeat the process.

NVDA turns 'On' braille output when it is configured for the display. To turn 'Off' braille support, select "No Braille" from the Braille Display options in the Braille Settings menu.

- NVDA Commands

Function	Key
Move up one line	Up Arrow
Move down one line	Down Arrow
Move left one character	Left Arrow
Move right one character	Right Arrow
Enter	Select

13.8.4 Job Access with Speech (JAWS)

For JAWS version 2018.1803.24 and later no driver installation required. If you are using older versions, you will need to install a driver. The [JAWS driver download and instructions](#) are available on the Orbit Research Support webpage.

When connecting Orbit Writer to JAWS by USB, it must be set to use the Orbit-HID protocol by pressing Select + Dots 1 3 5 7.

To connect Orbit Writer by USB, follow these steps:

1. Start or restart JAWS.
2. Insert + J to bring up the JAWS menu.
3. Press Enter on Options.
4. Down Arrow to Braille and press Enter.
5. Tab to Add Braille Display and press Enter.
6. Arrow Up or Down to Orbit Reader 20 and press Space to check the box and select it.
7. Tab to the Next button and press Enter.
8. Select USB.
9. Tab to the Next button and press Enter.
10. Select Orbit Reader 20 as a primary device.
11. Tab to the Finish button and press Enter.
12. Restart JAWS.

Alternate Steps for Bluetooth Connection:

1. Activate the desired Bluetooth channel. E.g. To activate channel 2 press Space + Left + Dot 2, the Orbit Writer responds with three short buzzes.

2. Activate the JAWS mode on the selected channel by pressing Select + dots 2 4 5 7, the Orbit Writer responds with a short buzz.
3. On the PC look for the “Refreshbraille ” followed by the last four digits of your Orbit Writer’s serial number and initiate the pairing.
4. On the JAWS select ‘APH Refreshbraille 18’ as a braille display and select appropriate com port.
5. Select the COM port where the Orbit Writer is connected (check device manager for COM port or use COM port you saved from previous steps).

To turn off braille support, follow these steps:

1. Insert + J to bring up the JAWS menu.
2. Press Enter on Options.
3. Down Arrow to Braille and press Enter.
4. Up Arrow to No Braille Display.
5. Tab to Ok and press Enter.
6. Restart JAWS.

Note: For a longer description of any of the following commands, turn JAWS keyboard Help ‘on’ by pressing Insert + 1 and type the command. Quickly type the command twice to get an even longer description. Press Insert + 1 again to exit the JAWS keyboard Help mode.

- Jaws Commands

Jaws Reading Commands	
Function	Key(s)
Move display to the left	Left Arrow
Move display to the right	Right Arrow
Move display up one line	Up Arrow
Move display down one line	Down Arrow
Top of active window	Select + Dots 1 2 3
Bottom of active window	Select + Dots 4 5 6
Route braille to active cursor	Select + R
Say current line	Space + Dots 1 4
Say current word	Space + Dots 2 5
Say current character	Space + Dots 3 6

Jaws Navigation Commands	
Function	Keys
Previous document window	Space + Dots 1 3
Next document window	Space + Dots 4 6
Beginning of file	Space + Dots 1 2 3
End of file	Space + Dots 4 5 6
Page Up	Space + Dots 1 2 3 4 5

Page Down	Space + Dots 1 2 4 5 6
Home	Space + Dots 1 2 3 4
End	Space + Dots 1 4 5 6
Up Arrow	Space + Dot 1
Down Arrow	Space + Dot 4
Previous word	Space + Dot 2
Next word	Space + Dot 5
Previous character	Space + Dot 3
Next character	Space + Dot 6

Jaws Editing Commands	
Function	Keys
Backspace (acts as shift key when typing braille characters)	Space + Dot 7
Enter	Space + Dot 8
Tab	Space + Dots 4 5
Shift + Tab	Space + Dots 1 2
Delete current character	Space + D
Select all	Space + Dots 1 8
Select to top of document	Space + Dots 1 2 3 7 8
Select to bottom of document	Space + Dots 4 5 6 7 8
Select previous page	Space + Dots 1 2 3 4 5 7 8
Select next page	Space + Dots 1 2 4 5 6 7 8
Select to beginning of line	Space + Dots 1 2 3 4 7 8
Select to end of line	Space + Dots 1 4 5 6 7 8
Select previous line	Space + Dots 1 7 8
Select next line	Space + Dots 4 7 8
Select previous word	Space + Dots 2 7 8
Select next word	Space + Dots 5 7 8
Select previous character	Space + Dots 3 7 8
Select next character	Space + Dots 6 7 8
Copy to clipboard	Space + Dots 1 4 8
Cut to clipboard	Space + Dots 1 3 4 6 8
Paste clipboard	Space + Dots 1 2 3 6 8
Undo	Space + Dots 1 3 5 6 8

Jaws Windows Commands	
Function	Keys
Start menu	Space + Dots 1 3 4 7 8
Toggle menu bar	Space + M
Escape	Space + Dots 1 3 5 6

Alt Tab	Space + T
Minimize all applications	Space + Dots 1 4 5 7 8

Jaws General Commands	
Function	Keys
Toggle keyboard help	Space + Dots 1 4 5 6
Enable / disable braille 6 key input from braille display	Space + Dots 1 2 3 4 5 6
JAWS cursor	Select + J
PC cursor	Select + P
Route JAWS cursor to PC cursor	Select + Dots 1 4
Say all to bottom	Space + Dots 1 2 3 4 5 6 7 8
Toggle grade 2 translation	Space + G (Dots 1 2 4 5)
Toggle grade 2 translation of current word	Select + W (Dots 2 4 5 6)
Display last flash message	Select + F
JAWS find	Space + F
JAWS find next	Space + Dots 2 5 7 8
JAWS find previous	Space + Dots 2 5 7 8
Toggle active cursor follows braille	Select + Dot 1
Toggle braille follows active cursor	Select + Dot 4
Cycle through braille modes	Select + M
Display six-dot braille	Select + Dots 2 3 5
Display eight-dot braille	Select + Dots 2 3 6
Toggle cursor shape	Select + Dots 1 4 6
Restrict braille cursor	Select + R
Toggle characters and attributes	Select + Dots 1 6
Braille color marking	Select + Dots 1 4
Select attributes to be displayed	Select + Dots 1 3
Set 8 characters per space	Space + Dots 2 3 6
Set unlimited characters per space	Space + Dots 1 3 6
Toggle 8/unlimited characters per space	Select + Dots 1 3 4 6
Cycle table reading options	Select + T
Cycle table header options	Select + H
Graphics labeler	Select + G
Adjust JAWS options	Select + Dots 1 2 3 6
JAWS window	Space + J
Announce time	t + Dots 7 and 8
Show script file name	Select + Dots 1 2 3 4 5
Run JAWS manager	Space + 2 3 7 8

13.8.5 System Access

To connect Orbit Writer to System Access, the device must be connected by a Standard-A to Micro-B USB cable and set in USB channels 6 and Orbit-HID protocol.

1. Press Space + Right Arrow + Dot 6 to activate the USB channel on the Orbit Writer.
2. Press Select + Dots 1 3 5 7 to activate the Orbit-HID protocol on the USB channel.

After running System Access in Orbit-HID mode, connect the USB cable and wait up to 30 seconds. System Access announces when Orbit Reader 20 is connected.

13.8.6 SuperNova

To connect Orbit Writer to SuperNova ScreenReader, the device must be connected by a Standard-A to Micro-B USB cable and set in Orbit-HID protocol mode.

1. Press Space + Right Arrow + Dot 6 to activate the USB channel on the Orbit Writer
2. Press Select + Dots 1 3 5 7 to activate the Orbit-HID protocol on the USB channel.

SuperNova automatically detects Orbit Writer.

13.8.7 Narrator

Narrator braille support is in beta. To opt-in to the beta, please follow the instructions found in "Chapter 7: Using Narrator with braille":<https://support.microsoft.com/en-us/help/4004263/windows-10-narrator-using-with-braille> from Microsoft Support.

Narrator support for the Orbit Writer as Orbit Reader 20 has been enabled for the release 1903 and onwards. If users are experiencing issues connecting with version 1903, follow these steps to fix the issue.

- Uninstall Narrator:
 - Press the Windows logo key + I to open Settings.
 - Select Apps, choose Apps & features, and then select Optional features.
 - Select Accessibility – Braille support, and then choose Uninstall.
- Reinstall Narrator:
 - Press the Windows logo key + Ctrl + N to open Narrator settings.

- Under Use braille, select Download, and install braille. (This takes some time. Windows also ask if you're sure that you want to allow Windows to make changes to your PC.)
- When download and installation are complete, select Enable braille.

Note: The narrator assigns "libusb" as the driver to the Orbit Writer. For the present, for firmware upgrades and to work with screen reader applications other than HID, you must go to the Narrator settings and choose the "Change your braille display driver" setting to HID.

14 Reboot the Device

If the Orbit Writer suddenly no longer responds to button presses, and you know the battery is not fully discharged, then you may try rebooting the device by pressing the Up Arrow + Dot 8. There is no indication of the reset event. The unit is in power-off condition after reset and needs to be powered on before it can be used.

15 Device Upgrade Procedure

New versions of the firmware for the Orbit Writer are released from time to time, containing improvements, bug fixes, and new features. This section describes the procedure for updating the Orbit Writer firmware.

The Orbit Writer can be upgraded using a Windows PC and a USB cable. The USB upgrade method requires a Windows PC, but the upgrade process is simple and quick.

There are two parts to either upgrade procedure:

1. Download the firmware package
2. Upgrade the Orbit Writer

15.1 Download firmware package

To download a Firmware Upgrade Package for the Orbit Writer:

1. Go to the Orbit Research Support webpage (<http://www.orbitresearch.com/support/orbit-writer-support/>)
2. For the most current version, select Download Most Recent Firmware. (<http://www.orbitresearch.com/support/orbit-writer-support/orbit-writer-firmware-download/>). Alternatively, to download an older firmware version, select Download previous firmware release versions, and select the Upgrade Package of your choice. (<http://www.orbitresearch.com/old-software-releases-archive/>)
3. Select Orbit Writer - Bluetooth - Firmware Upgrade Package vB0.00.00.XXrYY.
4. Save the zip file to your PC.

When the download is complete, follow these steps:

1. Open the folder on your computer where the firmware file was downloaded. This is usually your Downloads folder.
2. Right-click on the file and choose "Extract all" *OR* select the file by arrowing to it, press the application key and choose "Extract all" from the Context menu.
3. Follow the dialog steps to extract it to a folder of your choice.

When finished, your chosen folder should contain a folder named after the version of the release, for example, OrbitWriter_XX.XX.XX. Make a note of the location of this folder for use in the next section of this document.

For information about bugs, fixes, and additions to the software, see the latest version's Release Notes on the Orbit Writer Firmware. Download the webpage at <http://www.orbitresearch.com/support/orbit-writer-support/orbit-writer-firmware-download/>

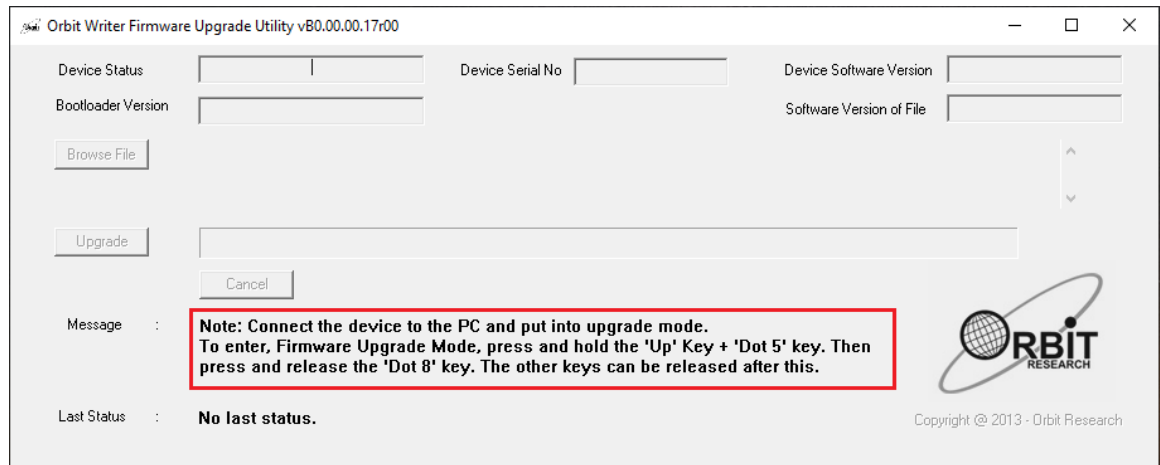
15.2 Using the Windows PC Upgrade Utility

The following is required to perform the upgrade to the Orbit Writer with a PC:

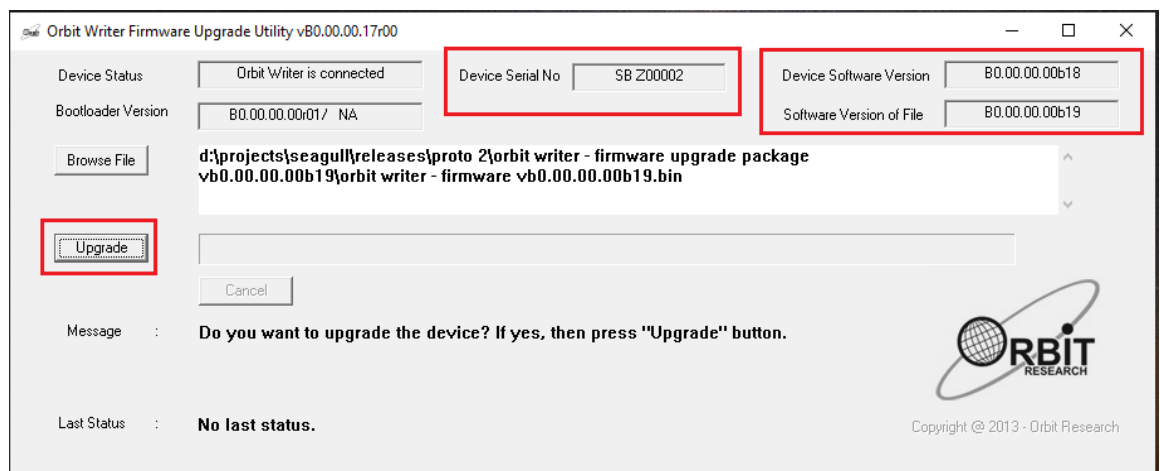
1. Orbit Writer unit
2. Standard-A to Micro-B USB cable
3. A PC running Windows XP or later
4. The Orbit Writer Upgrade Utility file found in the Orbit Writer folder (see Download firmware package).
5. Orbit Writer Release Bin file found in the Orbit Writer folder (see Download firmware package).

To upgrade the firmware, follow these steps:

1. Make sure the Orbit Writer is turned off.
2. Connect the Orbit Writer to the PC using the USB cable.
3. In the Release folder on your PC, run the Orbit Writer Firmware Upgrade Utility. If you receive an error message, see [Troubleshooting](#) section. Assuming no errors, the program displays the message, "Note: Connect the device to the PC and put into upgrade mode. To enter, Firmware Upgrade Mode, press and hold 'Up' key + 'Dot 5' key. Then press and release the 'Dot 8' key. The other keys can be released after this" in the message field.

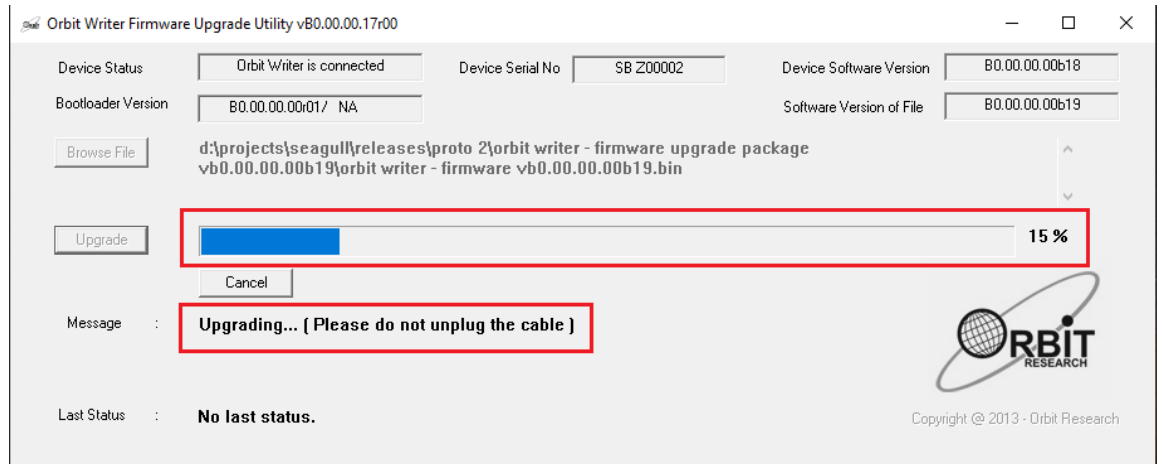


4. Press and hold down the Up Arrow + Dot 5, then press Dot 8. The utility shows the message “Orbit Writer is connected” in the Device status field. It shows the message “Do you want to upgrade the device?” in the message field at the bottom of the dialog.
5. Release Dot 8 first, then release the Up Arrow and Dot 5. This switches the Orbit Writer Upgrade mode. You should hear a tone on your PC.
6. The utility shows the device serial number and the software version of the device at the top right corner of the window. If the serial number is blank, repeat steps 4 and 5.
7. Activate the Browse button found in the dialog.
8. Browse and select the firmware bin file from your PC. The file is in the folder you unzipped previously.
9. Once the file is selected, the dialog shows the software version of the selected file.

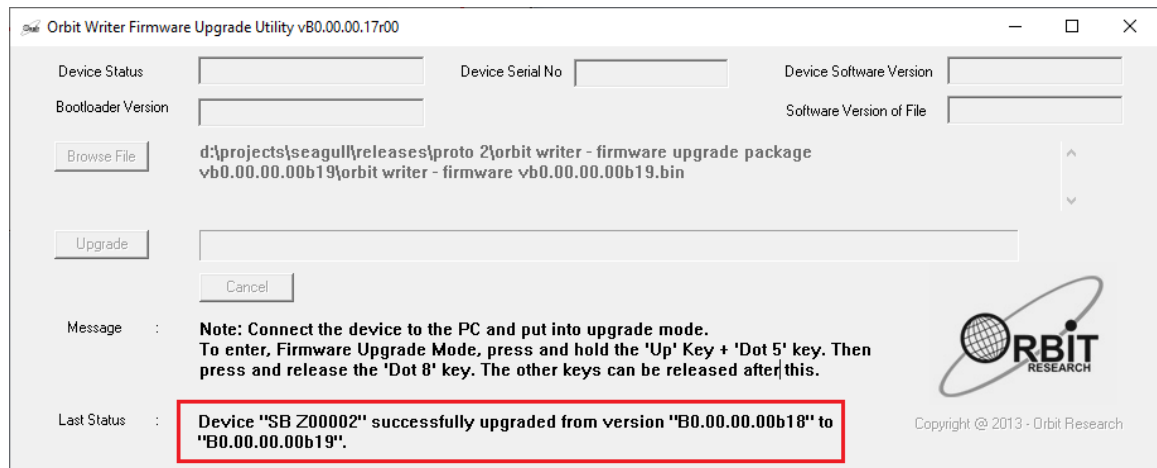


10. Activate the Upgrade button.

11. The utility starts upgrading the device.



12. Do not unplug the cable. Wait for the message “Device upgrade has been completed” on the upgrade utility or until the Orbit Writer reboots and shuts down.



13. The Orbit Writer is upgraded. Turn on the Orbit Writer to start using the device.

16 Troubleshooting

If the Orbit Writer does not power on or seems to freeze, try these options in the following order:

Option 1: Plug-in device

1. Plugin the unit with the supplied AC wall connector and cable to ensure the battery is charged. This is the most reliable power source.

2. Let the unit charge for at least an hour or more.
3. Hold the Up Arrow and Down Arrow keys for at least three seconds. If the unit is on, it should turn off. If it is off, it should come on.

Option 2: Unplug device

1. If the unit is plugged in, unplug the power cord.
2. Hold the Up Arrow and Down Arrow keys for at least three seconds.

Option 3: Reset device

1. Press the Reset command (Up Arrow + Dot 8 key). **Note:** On reset, the unit is unresponsive.
2. Hold the Up Arrow and Down Arrow keys for at least three seconds.

If none of the options work and the device does not come on, contact Customer Service at techsupport@orbitresearch.com.

17 Battery Use and Replacement

Orbit Writer includes a rechargeable Lithium-ion battery. It fully charges in about two hours under optimal conditions. A full battery charge lasts approximately three days of typical use. You can check the Battery status by pressing Space + Up Arrow keys.

When the battery in the Orbit Writer gets to 20%, It provides three short haptic pulses at every 3 minutes. This behavior is normal, indicating that the battery is low.

The battery in Orbit Write should last several years. Gradually, the battery begins holding its charge for less and less time. When the amount of time the battery holds a charge becomes inconvenient, it is time for a replacement.

To dispose of batteries properly, call the recycling center at 1-800-822-8837

18 Accessories Information

Orbit Writer has one hole on the front-middle side of the device. The cavity is there to provide a means to attach a lanyard to the device.



19 General Specifications

Dimensions (WxHxD)	6.3 x 2.6 x 0.3 inch (160 x 65 x 8 mm)
Weight	0.198 lbs (90 grams)
Braille Input Keys	8-key Perkins style keypad, with the space bar High-quality scissor-type keys
Additional Keys	4-way cursor keys and select key
OS Support	Windows: NVDA, JAWS, Narrator, System Access, SuperNova Mac OS: Voiceover iOS: Voiceover Android: Brailleback, BRLTTY Chromebook: ChromeVox Amazon Fire OS: Voice View
Interfaces and Ports	1x Micro-B USB port, USB 2.0, for host interface, firmware upgrade, and battery charging Bluetooth v5.0, Class 2
Battery	Non-replaceable, rechargeable Lithium-Ion battery;
Battery Life	3 days of typical use
Charging Method	PC charger: Charge over USB Port – 5V, 500 mA Max Wall charger: Charge over USB Port – 5V, 1000 mA Max; USB BC1.2 compliant charger required
Environmental Conditions	Operational Temperature: 5 °C to 45 °C Humidity: 10% - 70% relative humidity Storage Temperature: -15 °C to 70 °C Humidity: 5% - 90% relative humidity

20 Appendices

20.1 Appendix A – System Commands and Indications

#	Action	Key commands	Tap	Haptic Indication
1	Power On	Up Arrow + Down Arrow	Long	Single Short pulse
2	Power Off	Up Arrow + Down Arrow	Long	Single Long Pulse
3	Enter/Exit BIST	Select + Space	Long	Single Long Pulse
4	System Reset	Up Arrow + Dot 8	Short	N/A
5	Charger insert/remove	N/A	N/A	Single Short Pulse
6	Charger remove	N/A	N/A	Pulses as per battery level
7	Connects/disconnects to/from screen reader	N/A	N/A	Two short Pulses
8	Check automatic turn off timeout level	Space + Left Arrow	Short	L1 - 5 Minutes - Single Short Pulse L2 - 10 Minutes - Two Short Pulse (Default) L3 - 20 Minutes - Three Short Pulse L4 - 30 Minutes - Four Short Pulse
9	Change automatic turn off timeout level	Space + Left Arrow	Long	L1 - 5 Minutes - Single Short Pulse L2 - 10 Minutes - Two Short Pulse (Default) L3 - 20 Minutes - Three Short Pulse L4 - 30 Minutes - Four Short Pulse
10	Check Vibration intensity level	Space + Right Arrow	Short	L1 - LOW - Single Short Pulse L2 - MID - Two Short Pulse (Default) L3 - HIGH - Three Short Pulse
11	Change Vibration intensity level	Space + Right Arrow	Long	L1 - LOW - Single Short Pulse L2 - MID - Two Short Pulse (Default) L3 - HIGH - Three Short Pulse

1 2	Activate Bluetooth Channel 1	Space + Left Arrow + Dot 1	Short	Single/Two/Three Short Pulses
1 3	Forget device on channel 1 and enable pairing	Space + Left Arrow + Dot 1	Long	Single Short Pulse
1 4	Activate Bluetooth Channel 2	Space + Left Arrow + Dot 2	Short	Single/Two/Three Short Pulses
1 5	Forget device on channel 2 and enable pairing	Space + Left Arrow + Dot 2	Long	Single Short Pulse
1 6	Activate Bluetooth Channel 3	Space + Left Arrow + Dot 3	Short	Single/Two/Three Short Pulses
1 7	Forget device on channel 3 and enable pairing	Space + Left Arrow + Dot 3	Long	Single Short Pulse
1 8	Activate Bluetooth Channel 4	Space + Right Arrow + Dot 4	Short	Single/Two/Three Short Pulses
1 9	Forget device on channel 4 and enable pairing	Space + Right Arrow + Dot 4	Long	Single Short Pulse
2 0	Activate Bluetooth Channel 5	Space + Right Arrow + Dot 5	Short	Single/Two/Three Short Pulses
2 1	Forget device on channel 5 and enable pairing	Space + Right Arrow + Dot 5	Long	Single Short Pulse
2 2	Activate USB Channel 6	Space + Right Arrow + Dot 6	Short	Single/Two Short Pulses
2 3	Activate Orbit-HID protocol	Select + Dots 1 3 5 7	Short	Single Short Pulse
2 4	Activate Braille-HID protocol	Select + Dots 1 2 7	Short	Single Short Pulse
2 5	Activate SRP protocol	Select + Dots 2 3 4 7	Short	Single Short Pulse
2 6	Activate Keyboard-HID protocol for any Bluetooth channel from 1 to 5	Select + Dots 1 3 7	Short	Single Short Pulse
2 7	Forget all the Bluetooth devices	Space + Down Arrow	Long	Single Short Pulse
2 8	Enter firmware upgrade mode	Press and hold Up Arrow + Dot 5, Press and release Dot 8	Short	N/A
2 9	Enter DFU/Boot mode	Press and hold Up Arrow + Dot 6, Press and release Dot 8	Short	N/A

30	Check Battery level	Space + Up Arrow	Long	<p>Single short pulse: If the battery capacity is at less than 20%.</p> <p>Two short pulses: if the battery capacity is between 20% and 40%.</p> <p>Three short pulses: If the battery is between 40% and 60%.</p> <p>Four short pulses: If the battery is between 60% and 80%.</p> <p>One long pulse: If the battery is greater than 80%.</p>
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20.2 Appendix B - Haptic indications for various events

#	Events	Haptic Indication
1	Low battery (If Battery capacity < 20%)	Three short pulses at every 3 minutes
2	Automatic turn-off	Single Long Pulse
3	Any new device pairs with the Orbit Writer	Single Short Pulse
4	When Screen reader or host connects or disconnects with the Orbit Writer over activated channel under the activated protocol.	Two short pulses

20.3 Appendix C – Keyboard-HID protocol key commands

Lower Case		
#	Symbol	Key Command
1	a	1
2	b	12
3	c	14
4	d	145
5	e	15
6	f	124
7	g	1245
8	h	125
9	i	24
10	j	245

11	k	13
12	l	123
13	m	134
14	n	1345
15	o	135
16	p	1234
17	q	12345
18	r	1235
19	s	234
20	t	2345
21	u	136
22	v	1236
23	w	2456
24	x	1346
25	y	13456
26	z	1356

Upper Case		
#	Symbol	Key Command
1	A	17
2	B	127
3	C	147
4	D	1457
5	E	157
6	F	1247
7	G	12457
8	H	1257
9	I	247
10	J	2457
11	K	137
12	L	1237
13	M	1347
14	N	13457
15	O	1357
16	P	12347
17	Q	123457
18	R	12357
19	S	2347
20	T	23457
21	U	1367

22	V	12367
23	W	24567
24	X	13467
25	Y	134567
26	Z	13567

Numbers		
#	Symbol	Key Command
1	0	356
2	1	2
3	2	23
4	3	25
5	4	256
6	5	26
7	6	235
8	7	2356
9	8	236
10	9	35

Other Symbols (Computer 8 dot Braille)			
#	Symbol	Name	Key Command
1	!	Exclamation mark	2346
2	"	Quotation	5
3	#	Hash	3456
4	\$	Dollar sign	1246
5	%	Percent sign	146
6	&	Ampersand	12346
7	'	Apostrophe	3
8	(Left parenthesis	12356
9)	Right parenthesis	23456
10	*	Asterisk	16
11	+	Plus	346
12	,	Comma	6
13	-	Minus	36
14	.	Dot	46
15	/	Forward Slash	34
16	:	Colon	156

17	;	Semi Colon	56
18	<	Less than sign	126
19	'='	Equal	123456
20	>	Greater than sign	345
21	?	Question mark	1456
22	'@'	At sign	47
23	[Left square brace	2467
24	\	Back slash	12567
25]	Right square brace	124567
26	^	Caret	457
27	_	Underscore	456
28	`	Grave accent	4
29	{	Left curley brace	246
30		Vertical bar	1256
31	}	Right curley brace	12456
32	~	Tilde	45

Special Functions		
#	Functions	Key Command
1	Shift	Dot 7
2	Ctrl	Dot 8
3	Enter	Select
4	Up	Up Arrow
5	Down	Down Arrow
6	Right	Right Arrow
7	Left	Left Arrow
8	Caps Lock	Space + Dot 1
9	Alt	Space + Dot 2
10	Esc	Space + Dot 3
11	BackSpace	Space + Dot 4
12	Delete	Space + Dot 5
13	Insert	Space + Dot 6
14	Tab	Space + Dot 8
15	Page Up	Space + Up Arrow

16	Page Down	Space + Down Arrow
17	Home	Space + Left Arrow
18	End	Space + Right Arrow
19	F1	Select + Dot 1
20	F2	Select + Dot 2
21	F3	Select + Dot 3
22	F4	Select + Dot 4
23	F5	Select + Dot 5
24	F6	Select + Dot 6
25	F7	Select + Dot 7
26	F8	Select + Dot 8
27	F9	Select + Up Arrow
28	F10	Select + Down Arrow
29	F11	Select + Right Arrow
30	F12	Select + Left Arrow

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Warranty obligations for the Orbit Writer are limited to the terms set forth below:

Orbit Research warrants this hardware product against defects in materials and workmanship under normal use for a period of ONE (1) YEAR from the purchase by the original purchaser ("Warranty Period"). If a hardware defect arises and a valid claim is received by the Orbit Research LLC within the Warranty Period, at its option and to the extent permitted by law, Orbit Research will either:

Repair the product free of charge (or) replace it with a product that is manufactured from new or serviceable used parts and is at least functionally equivalent to the original product.

A replacement product or part assumes the remaining warranty of the original product or thirty (30) days from the date of replacement or repair, whichever provides longer coverage. Parts provided in fulfillment of its warranty obligation must be used in products for which warranty service is claimed.

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This Limited Warranty applies only to the hardware product manufactured by Orbit Research LLC that can be identified by the "Orbit Research" trademark, trade name, or logo affixed to it. Orbit Research is not responsible for damage arising from failure to follow instructions relating to the product's use.

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3. Damage caused by service (including upgrades and expansions) performed by anyone who is not a representative of Orbit Research
4. A product or part that has been modified to alter functionality or capability without the written permission of Orbit Research
5. The serial number has been removed or defaced

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OBTAINING WARRANTY SERVICE

Please access and review the online help resources referred to in the documentation accompanying this hardware product before seeking warranty service. If the product is still not functioning properly after making use of these resources, please send an e-mail to: techsupport@orbitresearch.com, for instructions on how to obtain warranty service. You must follow ORBIT RESEARCH warranty procedures.

ORBIT RESEARCH will maintain and use customer information in accordance with its Customer Privacy Policy.

If your product is capable of storing software programs, data, and other information, you should make periodic backup copies of the information contained on the product's hard drive or other storage media to protect the contents and as a precaution against possible operational failures. Before you deliver your product for warranty service, it is your responsibility to keep a separate backup copy of the contents and disable any security passwords. IT IS POSSIBLE THAT THE CONTENTS ON THE DEVICE BEING SERVICED WILL BE LOST OR REFORMATTED IN THE COURSE OF WARRANTY SERVICE, AND ORBIT RESEARCH IS NOT RESPONSIBLE FOR ANY DAMAGE TO OR LOSS OF PROGRAMS, DATA, OR OTHER INFORMATION CONTAINED ON THE MEDIA OR ANY PART OF THE PRODUCT SERVICED.

Your product will be returned to you configured as originally purchased, subject to applicable updates. You will be responsible for reinstalling all other software programs, data, and passwords. Recovery and reinstallation of software programs and user data are not covered under this Limited Warranty.

20.5 Appendix C - FCC Information

FCC Notice

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. If this

equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following 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.

FCC Caution

To ensure continued compliance follow the installation instructions and this device must be installed with a computer or peripheral device certified to comply with Part 15 of the FCC rules for the Class B limits. Use shielded interface cables only. Use the power adapter that is supplied with the device to charge its internal battery pack.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

21 Further Information

For the latest information, specifications, troubleshooting tips, software upgrade instructions, care and use information, warranty information, and more detailed instructions, visit the Orbit Writer website at www.orbitresearch.com/orbit-writer.

For further questions or concerns not covered in this User Guide, please contact the distributor from where you purchased your Orbit Writer.