User Manual
Dot Pad X

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1. About Dot Pad X

1.1 Introduction

Welcome to the Dot Family! We are delighted that you have chosen Dot Pad X. Dot Pad X is designed to provide rich tactile graphics and multi-line braille experience, enhancing the accessibility of visual information and boosting productivity for visually impaired users. Dot Pad X represents a significant advancement in assistive technology, bringing tactile graphics and braille text together in one innovative device.

1.2 What is Dot Pad X

Dot Pad X is a tactile information display capable of representing both braille text and tactile graphics simultaneously. This functionality allows users to access a wide range of visual content in a tactile format, making it easier to understand and interact with complex information. Additionally, with its multi-line braille, users can experience multiple lines of braille on a single screen, engaging with detailed content more effectively.

As a tactile display, Dot Pad X is compatible with screen readers such as JAWS, NVDA and Voiceover. Additionally, it must be connected to software services developed by Dot or third-party developers using Dot's SDK, allowing for versatile usage across various platforms and applications.

1.2.1 What's in the Box

When you purchase a Dot Pad X, it includes the following components:

1. Dot Pad X: 1unit
2. Dot Pad X Pouch: 1 pc
3. Dot Pad bumper case: 1pc
4. C to C Cable: 1pcs
5. 300-cell Protection Cell Protector: 3 pcs
6. 20-cell Protection Cell protector: 3 pcs
7. Screwdriver for protection cell protector replacement: 1 piece
8. Extra Screws: 10pcs
9. User Manual and Warranty Card: 1 set

1.3 Before Using Your Dot Pad X

- Please fully charge Dot Pad X before first use. We recommend charging for at least 2 hours using the included USB-C cable and a certified power adapter that meets the rated specifications (5V, 3A).
- When fully charged, Dot Pad X can typically be used for 8 hours or more. Actual battery life may vary depending on usage patterns and environmental conditions.
- When the battery level reaches Level 5 (approximately 90% or higher), the charging speed slows to prevent overcharging and prolong battery life. It may take up to 2 hours to reach full charge from Level 5, but you can safely disconnect the charger and use your Dot Pad X even if the charging message isn't displayed.
- Dot Pad X must be connected to a host Your Dot Pad X via Bluetooth or a USB cable. When both Bluetooth and USB are connected at the same time, USB takes priority.

1.4 Dot Pad X Appearance

When you take the Dot Pad X out of the box and place it on a desk, your Dot Pad X is correctly positioned when the main body is slightly inclined downward toward you.

1.4.1 Dot Pad X Top View

When the Dot Pad X is properly oriented, the top surface consists of the following components, arranged from closest to farthest from the user:

- Text Display Area: This area consists of 20 braille cells arranged in a horizontal rectangular frame. Each cell follows the standard braille spacing, allowing for the simultaneous display of up to 20 braille characters.
- Control buttons Area: From left to right, the control buttons area includes the Previous Panning Key, Function Keys (F1, F2, F3, F4), and the Next Panning Key.
- Tactile indicators are provided on the F1 and F4 keys to distinguish them from the others. The panning keys are triangular in shape, making them easily distinguishable from the oval-shaped function keys.
  ※ The panning keys are used to navigate to the previous or next line, based on the 20-cell braille text area.
- LED Status Indicator: Located at the far right of the control buttons area, the LED status light communicates Your Dot Pad X status such as power, Bluetooth connection, and charging via color and blinking patterns.
- Graphic Display Area: This is the largest area on the front of the Dot Pad X, consisting of 300 8-dot braille cells (30 columns × 10 rows).
  The cells in this area are more densely packed than those in the text area, with evenly spaced pins in all directions, enabling precise tactile rendering of graphical content.
  It can display real-time screen content from iPhones or iPads, as well as tactile graphics from dedicated applications compatible with the Dot Pad X.

1.4.2 Dot Pad X Right Side

On the right side of the Dot Pad X, you'll find a USB-C port labeled with the braille character for the letter "p." This port is dedicated solely to charging the device and does not support data transfer. Beneath the USB-C port is the power switch. To turn on your Dot Pad X, slide the switch forward away from you, you'll feel a long vibration as confirmation. To turn it off, slide the switch backward toward you.

1.4.3 Dot Pad X Left Side

The Dot Pad X's left side has a USB-C port labeled "d." In Braille (dots 1, 4, and 5), it connects to screen readers and apps or performs firmware updates with Dot Canvas.
※ Please note: This port does not support charging. To charge your Dot Pad X, always use the USB-C port on the right side.

1.4.4 Dot Pad X Bottom Surface

On the bottom side of the Dot Pad X, you will find the battery compartment and screws that allow access to the protective film covering the braille cells. The built-in battery is not user replaceable. If replacement is necessary, it must be performed by Dot Inc. or an authorized service provider.
The protective film on the braille cell surface can be replaced by removing the screws located on the bottom of your Dot Pad X.
For more information or assistance regarding the protective film, please contact Dot Inc. customer support.

2. Basic Functions

This section introduces the basic functions and notifications of the Dot Pad X.

2.1 Powering on the Dot Pad X

To turn on the Dot Pad X, slide the power switch forward away from you—located at the midway along on the right edge of your Dot Pad X. Your Dot Pad X will emit a long vibration, indicating that it is powering on.

Upon startup, the Dot logo will appear on the 300-cell graphic display. Approximately 4 seconds later, a 4-character Bluetooth ID—consisting of uppercase letters and numbers—will be shown in tactile Latin print format.

The same 4-character ID is also displayed in English Grade 1 Braille on the 20-cell text display, preceded by the prefix "le", which stands for Low Energy Bluetooth mode. This indicates that your Dot Pad X is ready to wirelessly connect to an iOS device or computer.

This 4-character ID is unique to each unit, so please confirm the code when connecting your Dot Pad X to a PC or IOS device to ensure proper pairing.

Once powered on, the LED indicator located at the bottom right corner of your Dot Pad X will blink blue, signaling that the Dot Pad is searching for a host device. When a connection is successfully established, the LED will stay solid blue (no longer blinking).

2.2 Powering off the Dot Pad X

To turn off the Dot Pad X, slide the power switch backward toward you. All braille pins will retract and reset, indicating that your Dot Pad X has shut down properly. When turning your Dot Pad X back on, please wait at least 3 seconds after powering it off. If the power is turned back on immediately, the pins may not have fully retracted, and the previous braille display may remain visible. To ensure proper initialization, always wait a few seconds before restarting your Dot Pad X.

2.3 Charging the Dot Pad X

Always use the USB-C port located on the right side of your Dot Pad X. We recommend using the included USB-C cable and a certified power adapter that supports QC 3.0 and provides an output of DC 5V / 3A.

For optimal performance, it is best to use your Dot Pad X when the battery is fully charged. If the battery level is low, please ensure your Dot Pad X is sufficiently charged before use.

You can check the current battery level using the method described in the section below.

2.3.1 Checking the Battery Level

To check the battery level of the Dot Pad X, make sure your Dot Pad X is powered on.
Then, press and hold both the Previous and Next Panning Keys simultaneously for at least 1.5 seconds, and release.

The battery level is divided into five levels and can be checked through vibration and tactile feedback.

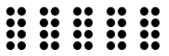
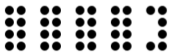
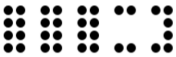
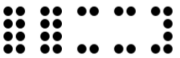
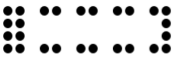
- When Bluetooth is not connected, the battery level is displayed on the 20-cell text display as tactile output for 7 seconds, along with vibration feedback.
- When Bluetooth is connected, only vibration feedback is provided, and no information is shown on the 20-cell display.

The battery level is divided into five levels, and each level is indicated by the number of vibrations. The number of vibrations corresponds to the battery level: 5 for Level 5, 4 for Level 4, and so on down to 1 for Level 1.

Number of Vibrations	**5**	**4**	**3**	**2**	**1**
Battery Level	Level 5	Level 4	Level 3	Level 2	Level 1

In addition to vibration feedback, the battery level is also displayed tactilely on the 20-cell text display.

The battery level is divided into five levels (Level 1 to Level 5), and the cells are filled sequentially according to the current battery level.

Tactile Feedback					
Battery Level	Level 5	Level 4	Level 3	Level 2	Level 1

If your Dot Pad X is used extensively while the battery is at Level 1, it may become completely discharged and shut down unexpectedly.

If your Dot Pad X vibrates twice every 5 minutes, it indicates that the battery level is low, and it needs to be charged. When this feedback occurs, please charge fully up to Level 5 before further use. Charging from this low-battery state to Level 5 typically takes approximately 2 hours and 30 minutes.

2.4 Checking the Charging Status

2.4.1 Charging While Powered On

When Dot Pad X is powered on but not connected to a host device via Bluetooth, your Dot Pad X provides multiple indicators during charging. A red LED light turns on at the bottom right corner of your Dot Pad X to indicate that charging is in progress. At the same time, vibration feedback is provided to show the current battery level. Additionally, the 20-cell text display presents tactile output that corresponds to the battery level, allowing users to confirm charging status through touch.

When Dot Pad X is powered on and connected to a host device via Bluetooth, charging is indicated by a red LED light at the bottom right corner of your Dot Pad X, along with vibration feedback that reflects the current battery level. In this state, tactile feedback on the 20-cell text display is not shown, to avoid disrupting the user experience during Bluetooth communication.

2.4.2 Charging While Powered Off

When your Dot Pad X is powered off, no vibration feedback is provided to indicate the battery level. However, the red LED indicator at the bottom right corner will light up, allowing users to confirm that charging is in progress.

2.4.3 Charging Complete

If Dot Pad X is switched on while charging, you will know when the battery is full when the red LED indicator turns off and you feel two vibrations.

If Dot Pad X is switched off while charging, the red LED still turns off when fully charged, but you

will not receive any vibration alerts.

3. Using Dot Pad X

Dot Pad X is a braille display that must be connected to other devices such as laptop, iPad, or iPhone. It offers new experience in using braille and tactile graphics through software developed based on the Dot Pad SDK, along with screen readers like JAWS, NVDA and Voiceover, providing multi-line and tactile graphic braille Your Dot Pad X experience.

3.1 Using Dot Pad X with Dot Canvas

Dot Canvas is a versatile digital tool for the Dot Pad X developed by Dot Inc., available as both an app and a web-based platform. It allows users to create, edit, save, and share tactile graphics and braille text. Tailored for visually impaired and blind users, Dot Canvas facilitates the creation of rich, multi-sensory content, enhancing learning, creativity, and accessibility. For comprehensive usage instructions, please refer to the most recent 'Using the Dot Pad X with Dot Canvas' manual.

Download link: Using Dot Pad X with Dot Canvas

Link to Dot Canvas Web: https://apps-dotincorp.com/

Link to download Dot Canvas App: https://apps.apple.com/kr/app/dot-canvas/id1613110785

3.2 Using Dot Pad X with Dot Book (TBD)

3.3 Using Dot Pad X with Voiceover

Voiceover is Apple's advanced screen reader designed to assist users with visual impairments by providing both audio and tactile feedback. When used with Dot Pad X, Voiceover delivers tactile output for both text and graphics, offering a comprehensive and intuitive accessibility solution. This combination significantly enhances interaction between your Dot Pad X and the user.
For detailed instructions, please refer to the latest guide titled "Using Dot Pad X with Voiceover.".

Download link: Using Dot Pad X with VoiceOver

3.4 Using Dot Pad X with JAWS (TBD

3.5 Using Dot Pad X with NVDA

NVDA (NonVisual Desktop Access) is a free and open-source screen reader developed by NV Access for Microsoft Windows. Dot Inc. provides a dedicated NVDA driver to ensure seamless compatibility with Dot Pad X, enhancing the tactile graphic display experience for users. For detailed instructions on how to effectively use Dot Pad X with NVDA, please refer to the latest guide titled "Using Dot Pad X with NVDA."

Download link: Using Dot Pad X with NVDA

4. Specifications

4.1 Hardware Specifications

Tactile Display: 300 cells

Braille Display: 20 cells

Cell Protection: Separate covers for 300-cell (graphics) and 20-cell (text) areas

Processor: ARM Cortex-M4, 32-bit, 120MHz

RAM: 64KB

Flash Memory: 128KB.

External Memory: Not supported.

Wireless: Bluetooth LE 5.0

Sensor / Camera: None

Dimensions & Weight

Size: 273.5(W) × 228.5(D) × 31.0(H) mm

Weight: Approx. 1,200g ±10%

Function Keys: 4

Panning Keys: Left, Right

Power Switch: 1

Left USB-C: Data & firmware updates.

Right USB-C: Power & charging

Battery: Li-ion 3.60V, 10.05Ah, 36.18Wh (1S3P)

Charging: DC 5V / min. 3A

Fast Charging: QC and PD supported.

Operating Temp: 0°C ~ 35°C

Storage Temp (Short): -20°C ~ 45°C

Storage Temp (Long): -20°C ~ 25°C

Recovery Time (min temp): 24 hours

Operating Humidity: 20% ~ 75% R.H.

Storage Humidity: 10% ~ 80% R.H.

Operating Pressure: 500 ~ 1060 hPa

4.2 Communication Specifications

Specification: Bluetooth 5.0 (LE, up to 10 kbps)

Output Power: 0 dBm.

Data Rate: 10 kbps

Protocols: GAP, GATT, SM, L2CAP, Integrated public profile protectors

Sensitivity: -90 dBm

Frequency Band: 2.402 GHz – 2.480 GHz

5. Handling and Safety Precautions

The contents of this manual may differ from the actual product, depending on the software version of the product, the specifications of the model, and the user's settings. Only use Dot Pad X for the intended purposes as described in this user guide. Use with caution as the product may be damaged if impacted.

- Keep the Dot Pad X dry. If used in a humid place or becomes wet, the product may not work properly.
- The Dot Pad X has a built-in magnet. Do not place it close to other magnetic products or metals. There is a risk of damage to the product.
- Use the Dot Pad X on a table away from the body and when used in a dusty area, foreign objects may get inside and interfere with your Dot Pad X’s operation.
- Only use accessories provided by Dot Inc. Use of other third-party accessories may cause the product to malfunction and may result in the user not receiving the warranty services provided by Dot Inc.
- Dot Pad X has passed the EMC (Electromagnetic Compatibility) test. Situational or environmental variables may still cause interference or affect signals via surrounding products. Heat generation and malfunction issues may occur.
- Dot Pad X’s wireless conducting power follows the RF (Radio Frequency) standard. However, if the voltage and temperature are not within the standard range, the product's wireless conducting power may be unstable and could impact the performance.
- Dot Pad X has passed the RSE (Radiated Spurious Emission) test. However, if Dot Pad X is used with non-component accessories, it may cause malfunction.
- Dot Pad X’s Short Range Wireless Communication function satisfies the data transfer security standards. However, if the software or firmware is modified or changed without authorization, the product’s data transfer security may operate abnormally.
- Dot Pad X has passed all the qualification tests mentioned above by qualified laboratories. However, if the product is placed in different conditions that could cause functional errors or is applied to atypical operation methods, the product may operate abnormally. It is

advised to turn off your Dot Pad X, disconnect the power, stop using your Dot Pad X, and contact customer service.

- If pressure is applied while the braille cells are moving, the product may not function normally. In this case, it is not a breakdown, so we suggest you remove your hand and try to print the desired image again.
- If the product is used in the opposite direction, it may not be able to represent the image or braille correctly.
- Some product specifications are subject to change without notice to better serve you.
- If Dot Pad X's firmware provided by Dot Inc. is changed or applied to the product through an unofficial channel, it may cause damage to the product or cause errors. In this case, the warranty service is voided.
- Since Dot Pad X has the possibility of radio interference during use, it cannot perform services related to human safety.
- When charging Dot Pad X, the product temperature may rise, and if the temperature of the battery rises above a certain level, the charge may be automatically stopped for safety reasons.

Use safety in the following situations:

1. Do not use Dot Pad X in a severe lightning storm.

During severe lightning and thunder, refrain from using the product and disconnect the charger from the power source. Continuing its use can cause injury, fire, or malfunction.

2. Do not use Dot Pad X in prohibited areas.

Do not use Dot Pad X in areas where use of the product is prohibited, such as in airplanes or hospitals. Electronics and communication products can be affected by electromagnetic waves.

3. Never disassemble and modify.

Do not disassemble or shock the product. There is a risk of electric shock, short circuit, or

fire. Warranty services do not cover disassembly of the product. If your Dot Pad X needs service, contact customer service at your local distributor or contact Dot Inc. Do not use it in a damaged or broken state as it may cause fires, burns, and electric shock. In this case, please stop using the product and contact customer service.

4. Use only the correct power cable and an appropriate power outlet.

Please connect and use the USB cable correctly to avoid the charging cable from loosening. Do not bend, pull, heat, cut, or loosen the cables as it may cause fire or electric shock. When not in use, disconnect the charger's cable. There may be a risk of electric shock if your Dot Pad X is used while charging. When removing the adapter, hold the adapter and remove it. If you remove the adapter by pulling the cable, a disconnection within the cable may cause charging failure.

5. Avoid high temperatures and humid environments.

Do not use the product in a hot and humid place. If the product gets wet, turn it off and dry it thoroughly before reusing. Do not place it on duvets, carpets, household electric appliances, or in direct sunlight (such as car seats) for extended periods. The exterior may become deformed, broken, or explode. If the temperature of the product sharply rises, stop using the product and contact customer service.

*Operating Temperature: 0℃ ~ +50℃, Storage Temperature: -20℃ ~ +60℃

6. Do not use any chemicals.

Never use chemicals such as alcohol or benzene to clean Dot Pad X. This may start a fire. If any foreign objects get on the product or charger, wipe it with a soft cloth.

7. Avoid metal and magnetism.

Do not keep the charging ports close to any metal such as necklaces, keys, coins, nails, watches, etc. If a metal object is short circuited with the charging port, there is a risk of explosion. Do not store your Dot Pad X near magnetic fields. Magnetic fields can impact your Dot Pad X. It may cause a malfunction from exposure to magnetic fields.

8. Use special caution for children and pets

Store products, chargers, parts, etc. out of reach of children or pets. If the product, charger, or parts gets in your mouth or damaged by impact, you may be at risk of electric shock or exposure to electromagnetic waves. Be careful not to allow children or pets to swallow products, chargers, parts, etc. There is a risk of suffocation, explosion, and fire.

9.Do not use in an explosive atmosphere.

Do not use the product in explosive areas. This may affect high frequency your Dot Pad X. Do not place the product on an unstable surface, such as on a shaky or sloping area. your Dot Pad X's fall may cause injury or damage to the product.

10. Be aware of fire risks.

Do not cover or wrap Dot Pad X with fabric materials such as a blanket during use or when charging. Do not dispose of Dot Pad X with general waste. It can cause fires, explosions, and environmental pollution.

11. Avoid excessive contact under heated conditions.

Avoid using the product when the temperature on the surface of the product rises above the appropriate level. If you come into contact with the product in this state for a long time, there is a risk of burns or disturbing cell protector pigmentation. If the external protective cover comes off or you experience an allergic reaction to the material of the product, stop using the product immediately and consult a physician.

12. Keep Dot Pad X in a safe place for storage.

When not in use for a long time, disconnect the charger from Dot Pad X and store it in a safe place. When storing the charger, be careful not to severely fold or twist the USB cable. If the USB cable is stored or used with an excessive fold or twist, the silicone coating of the cable can be stripped off or the cable may break and cause a failure or accident.

13. Be careful in handling the battery.

In hot and humid places, the battery may not charge well or may drain quickly. Do not expose it to direct sunlight or use your Dot Pad X in a humid place, such as a bathroom.

- If you want to use Dot Pad X after a long period of unuse, please use it again after fully charging.
- Please note that it may explode if the battery is forcibly removed.
- Do not change, modify, or expose the Dot Pad X to liquids. Once your Dot Pad X is fully charged, disconnect the charger from the outlet and your Dot Pad X to avoid unnecessary power consumption.
- Please bring your product and charger with you when you visit a service center due to battery problems.
- If the product gets heated while charging, please wear gloves or use a tool other than your body to separate the charger and Dot Pad X.
- Overheating may cause damage to the product. If your Dot Pad X overheats while charging, please unplug the USB charging cable and contact a Dot Inc. licensed service center.

14. Do not give any shock or impact.

If you apply strong force to your Dot Pad X, place heavy objects on top, etc., it may cause an impact to the product. This may damage your Dot Pad X, cause malfunction, or shorten its lifespan. This may also cause overheating, combustion, or fire. When not in use, store it in a safe place to avoid shock and damage to your Dot Pad X.

15. Do not use chargers that have not been certified.

Avoid using uncertified chargers as it may lead to damage of the battery causing injury to the user or your Dot Pad X.

6. Customer Support

For any inquiries, support, or additional information, you can contact Dot Inc. at the following:

Dot Email: inquiry@dotincorp.com

Dot Phone Number: +82) 2-864-1113

Dot Homepage: https://www.dotincorp.com/

7. Product Certification

South Korea: KC (KC ID: R-R-DOT-DPA320X)

United States: FCC (FCC ID: 2BAM7DPA320X)

Europe: CE

United Kingdom: UKCA

Japan: Japan MIC (ID: 217-252498)

Australia: RCM

1. KC: Korea Certification

※ The wireless equipment in use may cause radio interference.

※ The manufacturer and installer cannot provide services related to human safety as the wireless equipment may cause radio interference.

2. FCC: Federal Communications Commission



FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital Your Dot Pad X, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital Your Dot Pad X, 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 or television reception, which can be determined by turning the equipment off and back 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 receiver.

- Connect the equipment into an outlet in a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Caution

The manufacturer is not responsible for any radio or TV interference caused by unauthorized changes or modifications to this equipment. Such changes or modifications could avoid the user's authority to operate the equipment.

This equipment must be installed and operated in accordance with the instructions provided and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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3. CE: European Conformity



“CE” mark indicates that this product complies with the European requirements for safety, health, environment, and customer protection. “CE” mark devices are intended for sales in Europe.

4. WEEE: Waste from Electrical and Electronic Equipment



This symbol [crossed-out wheeled bin WEEE Annex Ⅳ] indicates separate collection of waste electrical and electronic equipment in the EU countries. Please do not throw the equipment into the domestic refuse. Please use the return and collection systems available in your country for proper disposal of this product.

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[FCC and CE Compliance Statement]

These limits are designed to provide reasonable protection against frequency interference in

residential installation. This equipment generates uses and can radiate radio frequency energy, and if not installed or used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in television reception, which can be determined by turning the equipment off and on.

The user is encouraged to try and 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 to.