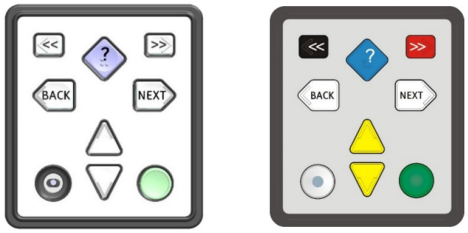

Storm Interface NavPad Audio Enabled Keypads Instruction Manual

NavPad
Technical Manual

Contents

NavPad Audio Enabled Keypads

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Product Features

Kiosks, ATMs, ticketing machines and voting terminals usually present information about available products and services via a visual display or touch screen. NavPad™ is a highly tactile interface that improves accessibility, making audio navigation and selection of screen based menus possible. An audio description of available menu options is transmitted to the user through a headset, handset or cochlea implant. When the desired menu page or menu option is located it can be selected by the press of a distinctive tactile button..
Storm Assistive Technology Products provide improved accessibility for those with impaired vision, restricted mobility or limited fine motor skills.
The Storm NavPad is intended for use as the tactile/audio interface for any ADor EN301-549 compliant application.

RNIB

Tried and Tesed

Coloured and backlit keys make the location of individual keys much easier for those with partial vision. The keytop's distinctive shape and tactile symbols provide the primary means of identifying a key's specific function.
Keypad

- 6 or 8 key versions.
- Option for desktop version or under panel installation to a 1.2mm – 2mm panel only.
- Audio versions have illuminated 3.5mm audio jack socket (illumination under software control)
- Beeper on under panel versions only(duration controlled by software)
- Mini-USB socket for connection to host

Illuminated version has white keys – illumination is switched on when headphones plugged in.
USB 2.0 Interface

- HID keyboard
- Supports standard modifiers, i.e. Ctrl, Shift, Alt
- HID consumer controlled device
- Advanced audio device
- No special drivers required
- Audio Jack Insert / Removal sends USB code to host
- Audio Jack socket is illuminated.
- Versions with microphone support need to be set as the default recording device in the Sound Panel
- Products with microphone support have been tested with the following voice assistants:- Alexa, Cortana, Siri and Google Assistant.

Support Tools
The following support software tools are available for download at **www.storm-interface.com**

- Windows Utility for changing the USB Code Tables and control of illumination / beeper.
- API for custom integration
- Remote Firmware update tool.

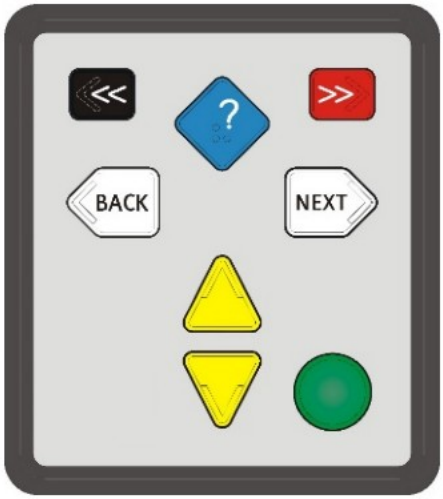
Typical method for audio module volume control using the API

User Action – Plug in the headphone jack	**Host** – Host system detects the connection – Repeating message generated by the host application software : “ Welcome to the audio menu. Press the select key to begin”
User Action – Press the select key	**Host** – Activate the Volume Control function – Repeating message : “Use the up & down keys to change the volume. Press the select key when finished”
User Action – Adjust the volume – Press the select key	**Host** – De-activate the volume control function “Thank you. Welcome to the (next menu)”

Alternate method for audio volume control using the API

User Action – Plug in the headphone jac k	**Host** – Host system detects the connection – Sets volume level to initial default – Repeating message : “Press the volume key at any time to increase the volume level”
User Action – Presses the volume key	**Host** – Message stops if volume key is not pressed inside 2 seconds. **Host** – Host system changes the volume on each key press (up to a max limit, then rev ert to default)

Product Range
NavPad™ Keypad



8 Key

EZ08-22301 NavPad 8-Key Tactile Interface – Underpanel, w/2.0m USB cable
EZ08-22200 NavPad 8-Key Tactile Interface – Desktop, w/2.5m USB cable
NavPad™ Keypad with integrated audio

6 Key

8 Key

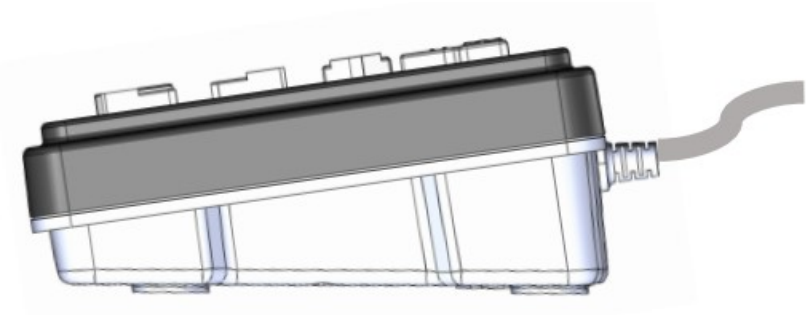
EZ06-23001 NavPad 6-Key Tactile Interface & Integrated Audio – Underpanel, no cable
EZ08-23001 NavPad 8-Key Tactile Interface & Integrated Audio – Underpanel, no cable
EZ08-23200 NavPad 8-Key Tactile Interface & Integrated Audio – Desktop, w/2.5m USB Cable

NavPad™ Keypad with integrated audio – Illuminated

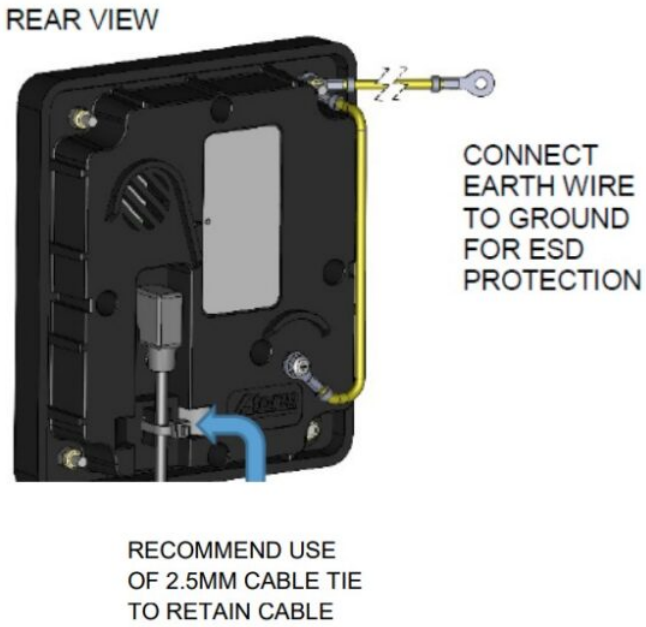
6 Key

8 Key

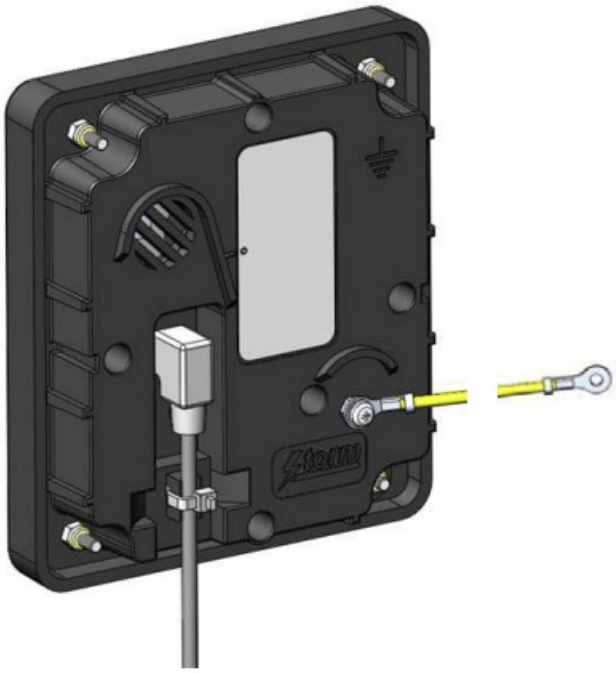
EZ06-43001 NavPad 6-Key Tactile Interface & Integrated Audio – Backlit, Underpanel, no cable
EZ08-43001 NavPad 8-Key Tactile Interface & Integrated Audio – Backlit, Underpanel, no cable
EZ08-43200 NavPad 8-Key Tactile Interface & Integrated Audio – Backlit, Desktop, w/2.5m USB Cable
Rear Case
Desktop



Underpanel



Underpanel Illuminated



Specifications

Rating	5V ±0.25V (USB 2.0), 190mA (max)
Connection	mini USB B socket (desktop versions have cable fitted)
Audio	3.5mm audio jack socket (illuminated) Output level 30mW per channel max into a 32ohm load
Ground	100mm Earth Wire with M3 ring terminal (underpanel versions)
Sealing Gasket	included with underpanel versions
USB Cable	included in some versions, see specific product brochure for more information

The illuminated NavPads also support voice command:-
Microphone input
Mono microphone input with bias voltage suitable for headset microphones (CTIA connection)
Dimensions (mm)

Underpanel version	105 x 119 x 29
Desktop version	105 x 119 x 50
Packed Dims	150 x 160 x 60 (0.38 kg)
Panel Cutout	109.5 x 95.5 Rad 5mm corners.
Underpanel Depth	28 mm

Mechanical

Operational Life	4 million cycles (min) per key

Accessories

4500-01	USB CABLE MINI-B TO TYPE A, 0.9m
6000-MK00	PANEL FIXING CLIPS (PACK OF 8 CLIPS)

Use to install into a 1.6 – 2mm steel panel Refer to drawing EZK-00-33 for cutout dims
Performance/Regulatory

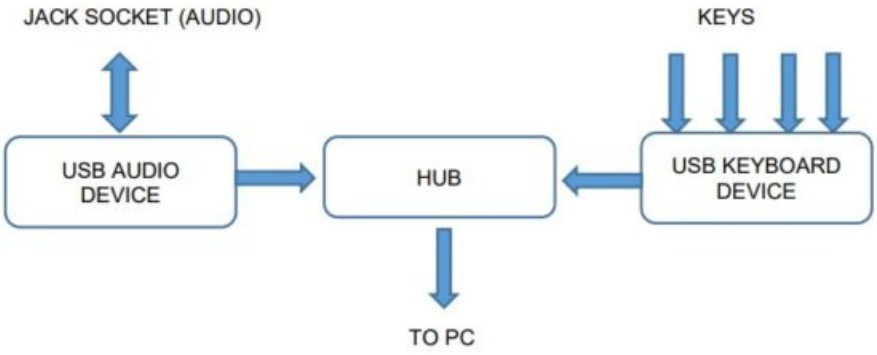
Operational Temp	-20°C to +70°C
Weather Resistant	IP65 (front)
Impact Resistance	IK09 (10J Rating)
Shock & Vibration	ETSI 5M3
Certification	CE / FCC / UL

Connectivity
The USB interface comprises an internal USB hub with connected keyboard and audio module.
This is a composite USB 2.0 device and no additional drivers are required.

PC based software utility and API are available to set/control: –

- Volume key function
- Illumination on audio jack socket
- Illumination on keys (backlit version only)
- Customise the USB codes

USB Device Information
USB HID
The USB interface comprises a USB HUB with keyboard device and audio device connected.



The following VID/PID combinations are used:

For USB HUB:	For Standard Keyboard/Composite HI D/ Consumer Controlled device	For USB Audio device
• VID – 0x0424 • PID – 0x2512	• VID – 0x2047 • PID – 0x09D0	• VID – 0x0D8C • PID – 0x0170

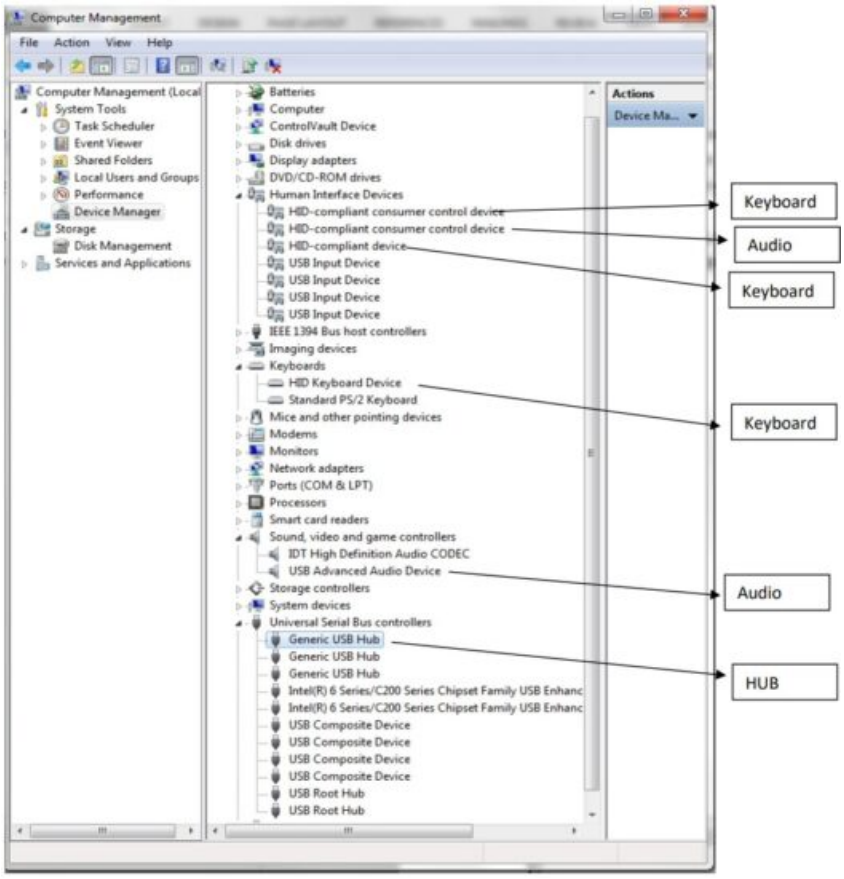
This document will concentrate on the Standard Keyboard/Composite HID/Consumer Controlled device.
This interface will enumerate as

- Standard HID Keyboard
- Composite HID-datapipe Interface
- HID Consumer Controlled device

One of the advantages of using this implementation is that no drivers are required.
The data-pipe interface is used to provide the host application to facilitate customisation of the product.
Supported Audio Jack Configurations
The following jack configurations are supported.

Note: Application software should always ensure the same audio is present on both Left and Right Channels for correct mono operation.
Device Manager

When connected to a PC, the NavPad™ + audio keypad should be detected by the operating system and enumerate without drivers. Windows shows the following devices in the Device Manager:



Code Tables
Default Table

Key Description	KEY LEGEND	TACTILE IDENTIFIER	KEY COLOR	USB Keycode
Home/Menu		<	BLACK	F23
Help		:.	BLUE	F17
End		>	RED	F24
Back	<<	<	WHITE	F21
Next	?	>	WHITE	F22
Up	>>	^	YELLOW	F18
Down	BACK	˅	YELLOW	F19
Action	NEXT	O	GREEN	F20
Detection of headphone connection			WHITE	F15
inserted				F16
removed				

Alternate Multimedia Table

Key Description	KEY LEGEND	TACTILE IDENTIFIER	KEY COLOR	USB Keycode
Home/Menu Help End Back Next Volume Up Volume Down Action Detection of headphone connection inserted removed	 << ? >> BACK NEXT	 < :. > < > ^ ˅ O	 BLACK BLUE RED WHITE WHITE YELLOW YELLOW GREEN WHITE	 F23 F17 F24 F21 F22 F20 F15 F16

For the Volume up/down keys a volume up/down report will be sent to the PC according to the HID descriptor setup for HID consumer controlled device. The following report will be sent:
Volume UP key <0x01><0x02>
Volume DOWN key <0x01><0x04>

Default – Illuminated

Key Description	KEY LEGEND	TACTILE IDENTIFIER	ILLUMINATION COLOR	USB Keycode
Home/Menu Help End Back Next Up Down Action Detection of headphone connection inserted removed	 << ? >> BACK NEXT	< :. > < > ^ ˅ O	WHITE BLUE WHITE WHITE WHITE WHITE WHITE GREEN WHITE	F23 F17 F24 F21 F22 F18 F19 F20 F15 F16

Key illumination is turned on when headphone jack is inserted.
Using the NavPad Windows Utility to change USB Codes
Note that there are 2 Windows Utility packages available for download:

- Standard NavPad
- Illuminated NavPad

Please ensure you use the correct one as shown below
If any other keypad utility software is installed (e.g EZ-Key Utility) then you should un-install that before you start.

Non illuminated NavPad utility
To be used with the following part numbers:
EZ08-22301
EZ08-22200
EZ06-23001
EZ08-23001
EZ08-23200
Illuminated NavPad utility
To be used for the following part numbers:
EZ06-43001
EZ08-43001
EZ08-43200

System Requirements
The utility requires .NET framework to be installed on the PC and will communicate over the same USB connection but via the HID-HID data pipe channel, no special drivers are required.

Compatability

Windows 11	✓
Windows 10	✓

The utility can be used to configure the product for:

- LED On/Off
- LED brightness (0 to 9)
- Buzzer On/Off

- Buzzer Duration (¼ to 2 ¼ seconds)
- Load customised keypad table
- Write default values from volatile memory to flash
- Reset to factory default
- Load Firmware

Note that non-audio versions also support multiple key press combinations.

Change History

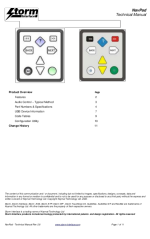
Engineering Manual	Date	Version	Details
	11 May 15	1.0	First Release
	01 Sep 15	1.2	API added
	22 Feb 16	1.3	Added screenshots for Firmware Updating
	09 Mar 16	1.4	Updated tactile symbols on keytops
	30 Sep 16	1.5	Added EZ Access copyright note page 2
	31 Jan 17	1.7	Changed EZkey to NavPad™
	13 Mar 17	1.8	Update to firmware 6.0
	08 Sep 17	1.9	Added Remote Update Instructions
	25 Jan 18	1.9	Added RNIB logo
	06 Mar 19	2.0	Added Illuminated versions
	17 Dec 19	2.1	Removed 5 key version
	10 Feb 20	2.1	WARF info removed page 1 – no issue change
	03 Mar 20	2.2	Added desktop and non-audio versions
	01 Apr 20	2.2	Product name changed from Nav-Pad to NavPad
	18 Sep 20	2.3	Added note re Voice Assistant Support
	19 Jan 21	2.4	Updates to Utility – see below
		2.5	Added Audio Output level to spec table
	11 Mar 22	2.6	Buzzer removed from Desktop versions
	04 Jul 22	2.7	Note added re loading config file from network
	15 Aug 24	2.8	Utility / API / Downloader info removed and split o ut into separate documents

Firmware – std	Date	Version	Details
bcdDevice = 0x0200	23 Apr 15	1.0	First Release
	05 May 15	2.0	Updated so that only vol up / down works as a co nsumer device.
	20 Jun 15	3.0	Added SN set/retrieve.
	09 Mar 16	4.0	Jack In/Out debounce increased to 1.2 sec
	15 Feb 17	5.0	Change 0x80,0x81 work as multimedia codes.
	13 Mar 17	6.0	Improve stability
	10 Oct 17	7.0	Added 8 digit sn, improved recovery
	18 Oct 17	8.0	Set default brightness to 6
	25 May 18	8.1	Changed behaviour (from beep to LED flash) whe n unit powered but not enumerated.

Firmware – illuminated	Date	Version	Details
	6 Mar 19	EZI v1.0	First Release
	06 Jan 21	EZI v2.0	Fix to retain LED settings on reconnection

NavPad – Technical Manual Rev 2.8
www.storm-interface.com

Documents / Resources

	Storm Interface NavPad Audio Enabled Keypads [pdf] Instruction Manual NavPad Audio Enabled Keypads, NavPad, Audio Enabled Keypads, Enabled Keypads, Keypad s

References

- User Manual