NavBar™ & Audio Module Technical Manual

Product Features

Kiosks, ATMs, ticketing machines and voting terminals usually present Information about available products and services via a visual display or touch screen. The NavBar™ is a highly tactile interface that have been designed to facilitate audio navigation of software applications by those with sensory or mobility impairment. An audio description of available menu options can transmitted to the user through a plug-in audio headset. When the desired page or menu option is located, it can then be selected by the press of a distinctive tactile button.

An important feature of the module is that it provides compliance as far as is practicable with various country standards for equipment use by disabled people, including the Americans with Disabilities Act (ADA – USA) , the Disabilities Discrimination Act (DDA – EUR) & the Equality Act (UK)

R N I B

Tried and Tested

Internal colour coded illumination makes 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. The intensity of keytop illumination can be adjusted or turned off when not in use.

By use of the NavBar™ utility software, default illumination status and 'wake-up' behaviour can be selected. The USB codes can also be changed. Connection to the host is via a single USB cable.

NavBar

- Keypad can be specified with coloured keys or white illuminated keys.
- Illuminated keys can be individually controlled in software
- Reverse printed silver or black colour front label.
- Designed for both top fixing or under panel installation to a 1.2mm - 2mm panel only.
- Mini USB socket for connection to host computer.

Audio Module

- Available for Vertical or Horizontal installation underpanel
- Raised Headphone symbol
- Volume up/down rocker key
- Illuminated 3.5mm audio jack socket (illumination under software control)
- Supplied with a 0.75m ribbon cable to allow easy connection to the NavBar™.

USB 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

Support

- Windows Utility for changing the USB Code Tables
- API for custom integration
- Remote Firmware update support

Please note: The audio processor is contained within the NavBar™ (not within the Audio Module itself).

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 jack

> **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**
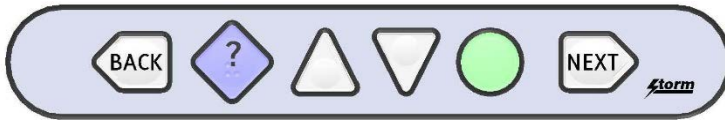> - Presses the volume key

> **Host**
> - Host system changes the volume on each key press (up to a max limit, then revert to default)

> **Host**
> - Message stops if volume key is not pressed inside 2 seconds.

NavBar™ & Audio Module Technical Manual

Product Range

EZB6-4300

Storm ATP NavBar™, Silver with White Keys, Surface or Under panel Install
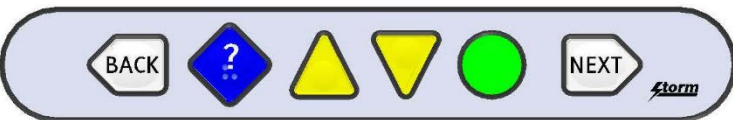
EZB6-5300

Storm ATP NavBar™, Black with White Keys, Surface or Under panel Install
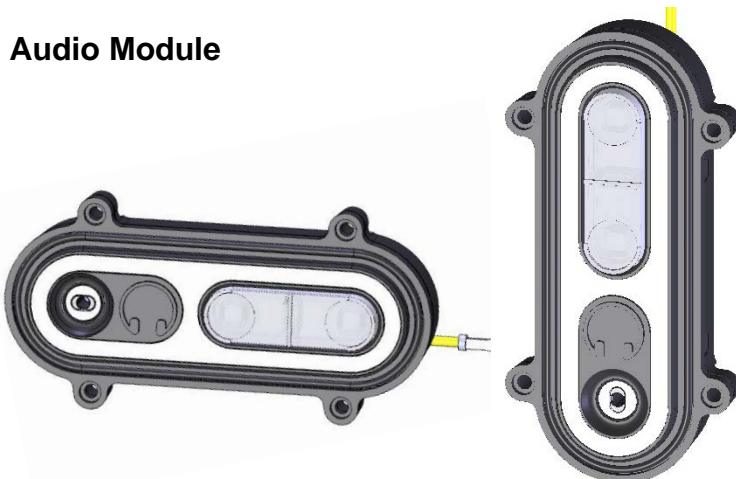
EZB6-6300

Storm ATP NavBar™, Black with Coloured Keys, Surface or Under panel Install

EZB6-7300

**Storm ATP NavBar™,** Silver with Coloured Keys, Surface or Under panel Install

Audio Module

Audio Module Silver or Black Label, Horizontal or Vertical Orientation

Product Range: Part Numbers

EZB6-43000	Storm ATP NavBar™, Silver with White Keys, Surface Fix
EZB6-43002	Storm ATP NavBar™, Silver with White Keys, Under panel
EZB6-53000	Storm ATP NavBar™, Black with White Keys, Surface Fix
EZB6-53002	Storm ATP NavBar™, Black with White Keys, Under panel
EZB6-63000	Storm ATP NavBar™, Black with Coloured Keys, Surface Fix
EZB6-63002	Storm ATP NavBar™, Black with Coloured Keys, Under panel
EZB6-73000	Storm ATP NavBar™, Silver with Coloured Keys, Surface Fix
EZB6-73002	Storm ATP NavBar™, Silver with Coloured Keys, Under panel
EZB2-40500	Audio Module (Vertical) Silver, with Interconnect Cable
EZB2-405H0	Audio Module (Horizontal) Silver, with Interconnect Cable
EZB2-50500	Audio Module (Vertical) Black, with Interconnect Cable
EZB2-505H0	Audio Module (Horizontal) Black, with Interconnect Cable

Accessories / Cables

Description	Stock Code
SPARE INTERCONNECT CABLE 0.75m	EZB2-01
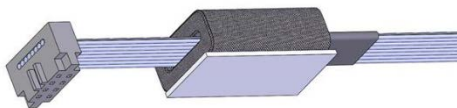
Description	Stock Code
USB CABLE MINI-B TO TYPE A, 0.9m	4500-01

Specifications

Rating	**5V ±0.25V (USB 2.0)**
Connection	**mini USB B socket**
Audio	**3.5mm audio jack socket (illuminated)**
Ground	**150mm ESD ground wire fitted to audio module**
USB Cable	**Not Included**
Interconnect cable	**0.75m cable (NavBar to Audio Module) included with Audio Module**

Dimensions (mm)

	W	x	H	x	D	Packed	W	x	H	x	D	Kilos
NavBar™ ABOVE PANEL	208		37		16	>	230		50		30	0.16
NavBar™ UNDER PANEL	211.5		53		29	>	230		50		30	0.16
Audio Module	107.5		32.5		26	>	140		70		40	0.16

Mechanical

Operational Life	4 **million cycles (min) per key**

Performance/Regulatory

Operational Temp	**20°C to +70°C**
Impact Rating	**1K09 (10J)**
Vibration & Shock	**ETSI 5M3**
Water / Dust sealed	**IP65**
Certification	**CE / FCC / UL**

Connectivity

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

Wake-up behaviour: NavBar™ keys are illuminated when audio jack inserted.
(and then dim when jack is removed)

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

• Volume key function
• Illumination level / selectively control for individual keys
• Customise the USB codes
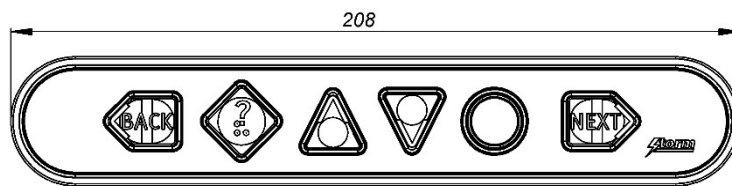
Installation

The NavBar™ can be supplied as a surface fix or under panel install product (panel thickness of 1.2mm - 2mm only.) Ensure that you purchase the correct version for your application. Note that the Audio Module is under panel installation only.
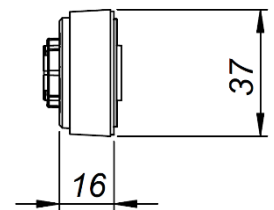
NavBar™ ABOVE PANEL

DIMENSIONAL DETAILS

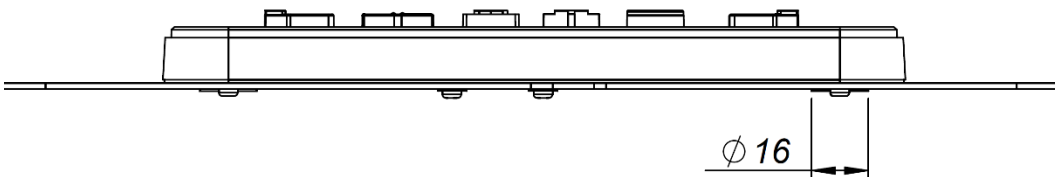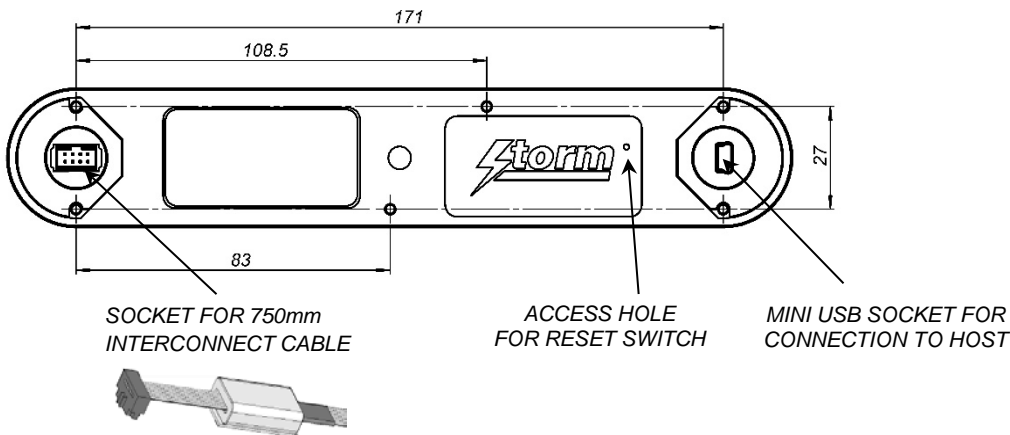OVERALL SIZE 208mm x 37mm x 16mm (ABOVE PANEL)

TOP VIEW

END VIEW

208

37

16

SIDE VIEW (SHOWN WITH 2mm PANEL)

$\emptyset$ *16*

*FIX WITH QTY 6, 3mm X 8 PANHEAD SCREWS (PLAS-TECH 30 SCREW IS RECOMMENDED)
USE NYLON WASHERS ON 2 CENTRE SCREWS.
Ø 16MM BOSS THROUGH PANEL EACH END*

REAR VIEW

171

108.5

27

83

*SOCKET FOR 750mm
INTERCONNECT CABLE*

*ACCESS HOLE
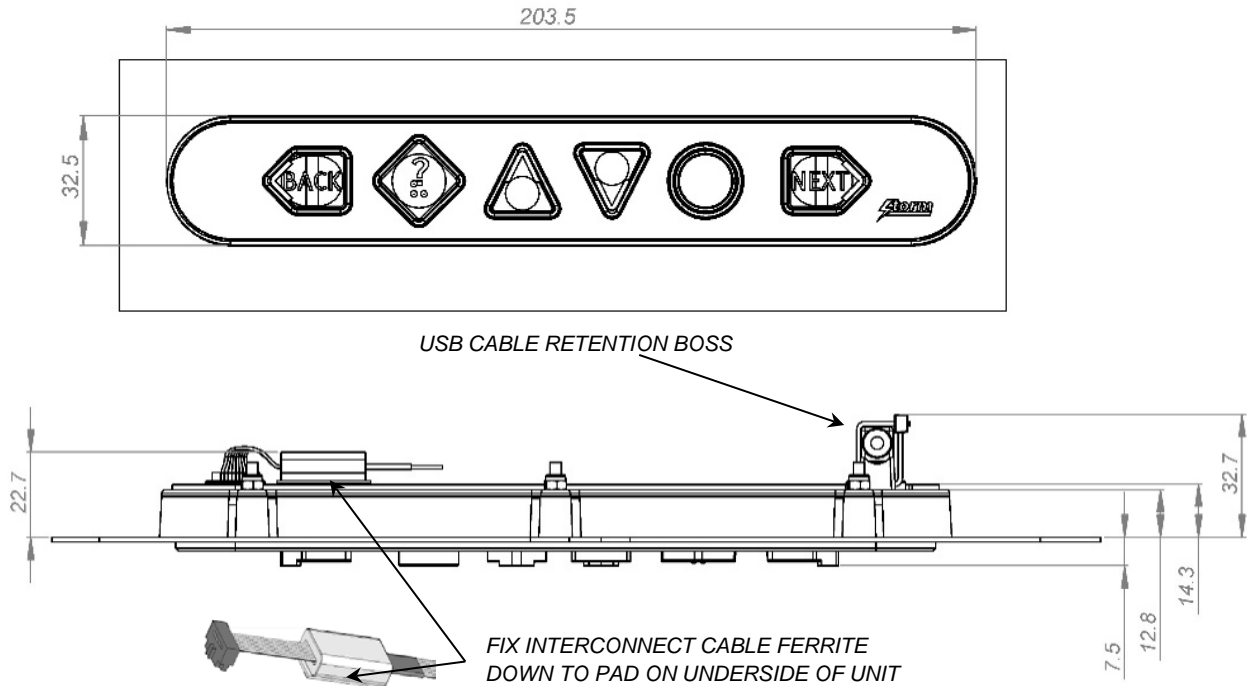FOR RESET SWITCH*

*MINI USB SOCKET FOR
CONNECTION TO HOST*

Installation

NavBar™ UNDER PANEL

DIMENSIONAL DETAILS
OVERALL SIZE 211.5mm x 53mm x 29mm
RECOMMENDED PANEL THICKNESS 1.2mm TO 2mm

USB CABLE RETENTION BOSS

*FIX INTERCONNECT CABLE FERRITE
DOWN TO PAD ON UNDERSIDE OF UNIT*

*FIX WITH M3 x 20mm or equivalent STUDS ON PANEL (X 6 LOCATIONS).
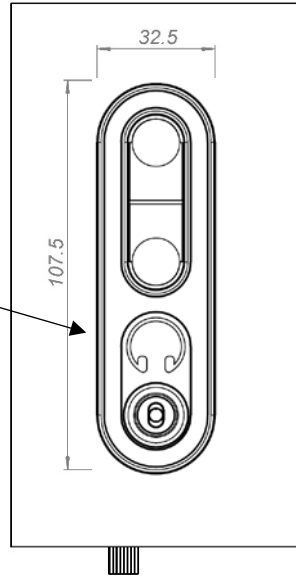RECOMMENDED PANEL CUT-OUT SLOT 203.5mm x 32.5mm.*
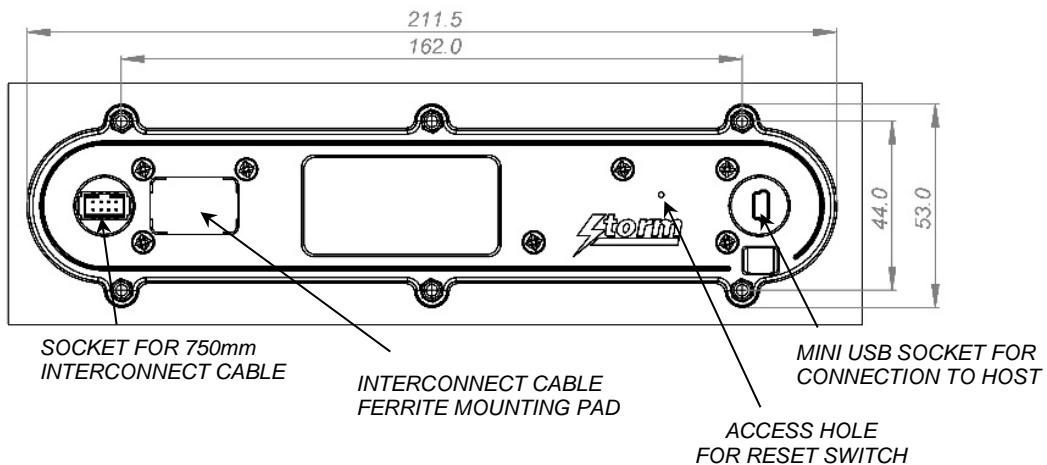
*SOCKET FOR 750mm
INTERCONNECT CABLE*

*INTERCONNECT CABLE
FERRITE MOUNTING PAD*

*ACCESS HOLE
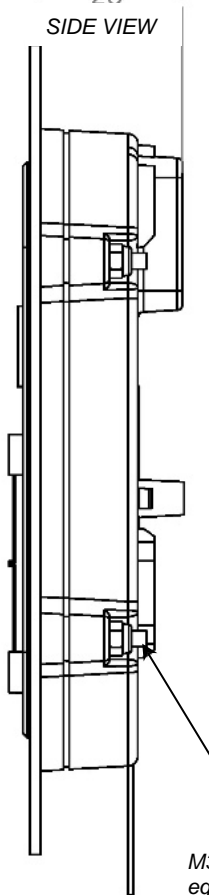FOR RESET SWITCH*

*MINI USB SOCKET FOR
CONNECTION TO HOST*

Installation

AUDIO MODULE – UNDERPANEL ONLY

NOTE THAT THE RAISED HEADPHONE SYMBOL WILL BE ROTATED 90° CLOCKWISE FOR HORIZONTAL VERSION
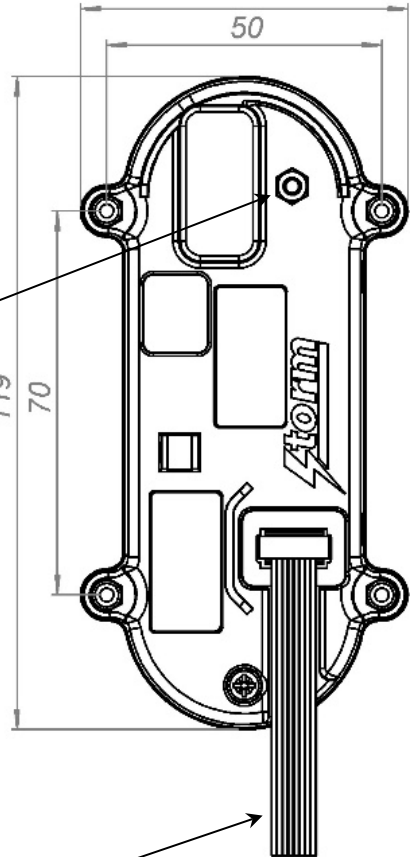
32.5

107.5

26

SIDE VIEW

REAR VIEW

50

119

70

M3 THREAD ESD GROUND TO CASE (150MM GROUND WIRE NOT SHOWN)

M3 x 20MM or equivalent WELD STUD ON PANEL (x 4 POSITIONS).

INTERCONNECT CABLE

USB Device Information

USB HID

The USB interface comprises a USB HUB with keyboard device and audio device connected.
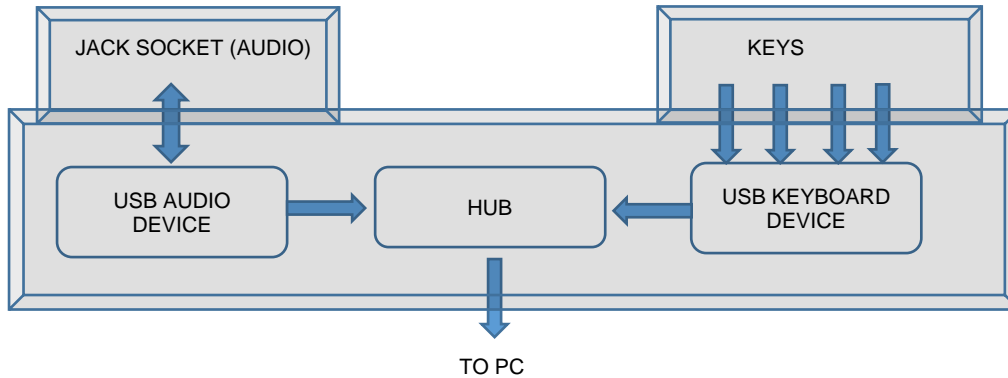
The following VID/PID combinations are used:

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

Notes: Application software should always ensure the same audio is present on both Left and Right Channels for correct mono operation. Headsets with microphones can be used but there is no microphone support.

Device Manager

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

(Note that other audio devices will need to be disabled in Device Manager otherwise they will take priority).
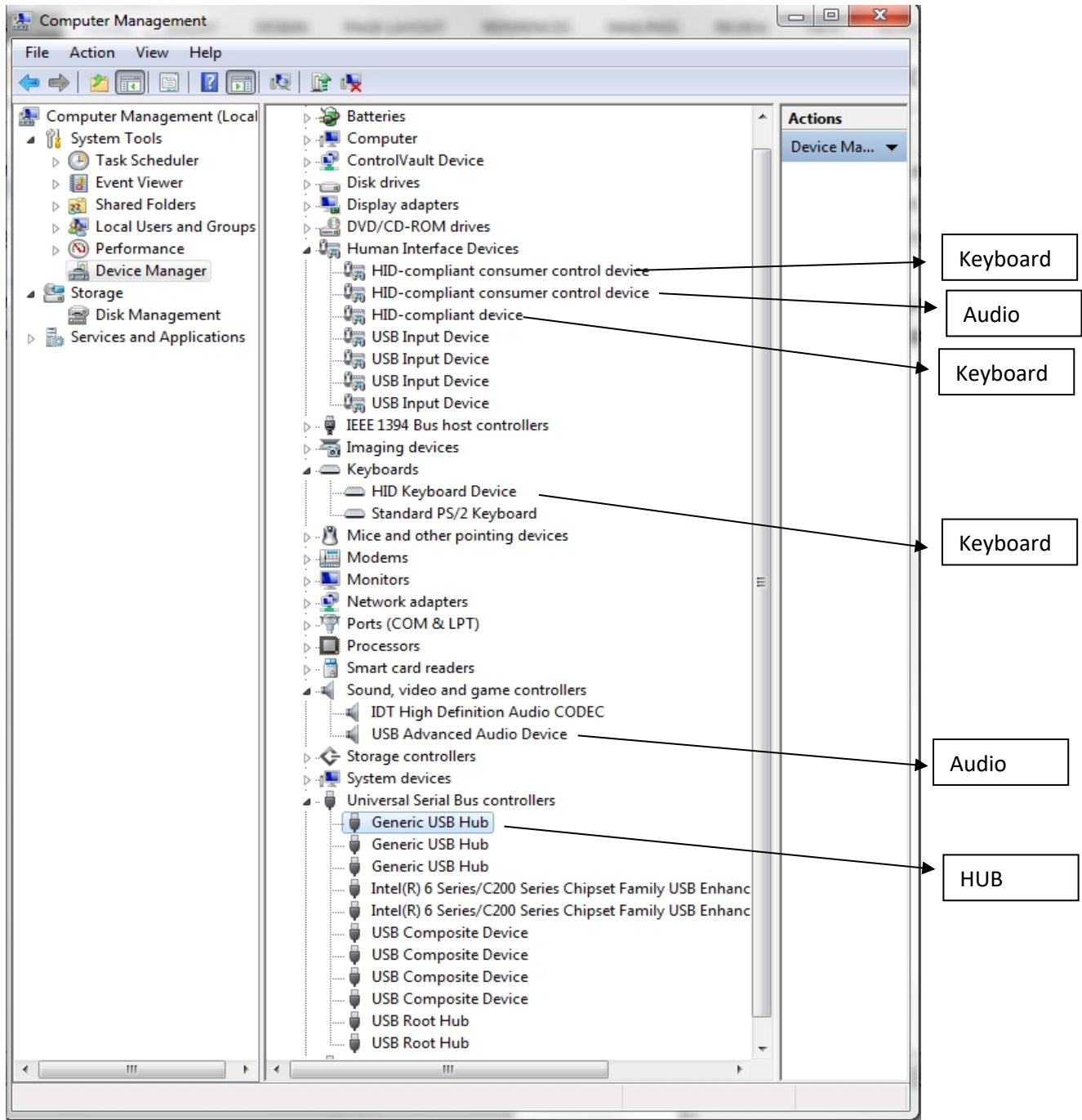
Code Tables

The factory defaults are shown below. The customer can use the utility or API to assign any HID USB code and if volume up/down is selected the keys will act as multi-media volume up/down.

White Keys

NavBar Function	HID USB Codes	Hex	LED Illumination
Back	F21	0x70	White
Help	F17	0x6C	Blue
Up	F18	0x6D	White
Down	F19	0x6E	White
Select	F20	0x6F	Green
Next	F22	0x72	White
Audio Module Function			
Jack IN	F15	0x6A	White
Jack OUT	F16	0x6B	White
Volume Up	F13	0x68	White
Volume Down	F14	0x69	White

Coloured Keys

NavBar Function	HID USB Codes	Hex	LED Illumination
Back	F21	0x70	White
Help	F17	0x6C	
Up	F18	0x6D	
Down	F19	0x6E	
Select	F20	0x6F	
Next	F22	0x72	White
Audio Module Function			
Jack IN	F15	0x6A	White
Jack OUT	F16	0x6B	White
Volume Up	F13	0x68	White
Volume Down	F14	0x69	White

Using the Windows Utility

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.

Compatibility

Windows 10   ✓
Windows 8   ✓
Windows 7   ✓
Windows Vista ✓

The utility can be used to configure the product for:

• LED brightness (0 to 9) 0 – off and 9 – full brightness.
• Load customised NavBar™ table.
• Write default values from volatile memory to flash.
• Reset to factory default.
• Load Firmware.
• JACK IN/OUT LED Control.

Installing the Utility

To install the StormNavBarUtility click on the setup.exe (windows installer package) and follow instructions as below:
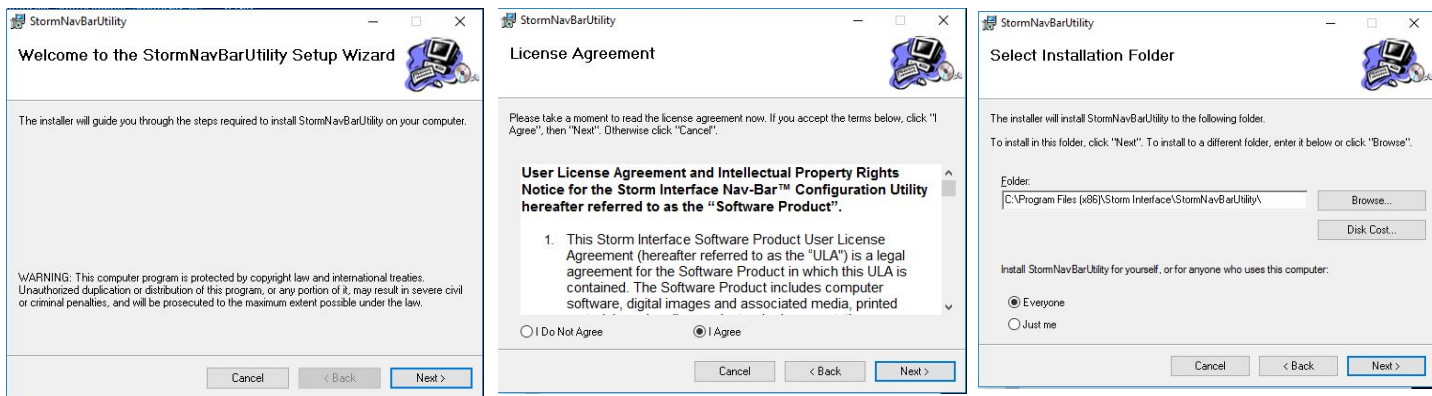
Click on "Next" to accept the license agreement.

Select if you would like to install for just you or everyone and select location (Browse) if you do not want to install at the default location.

Then click on "Next".

Click on "Next" and the installation process will
start.
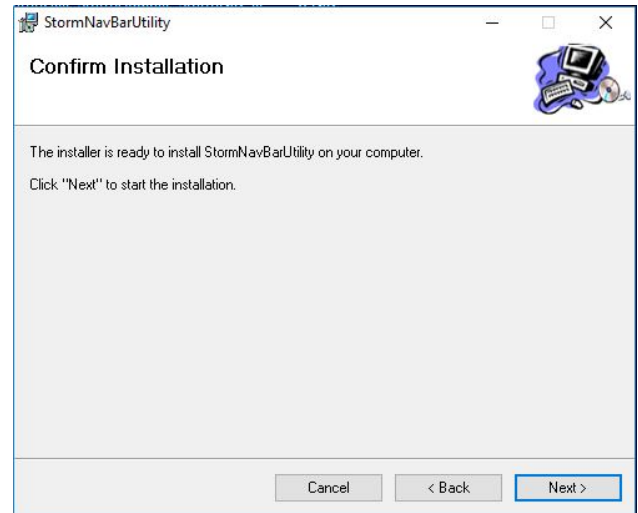
Click on "Close" for a successful
installation.
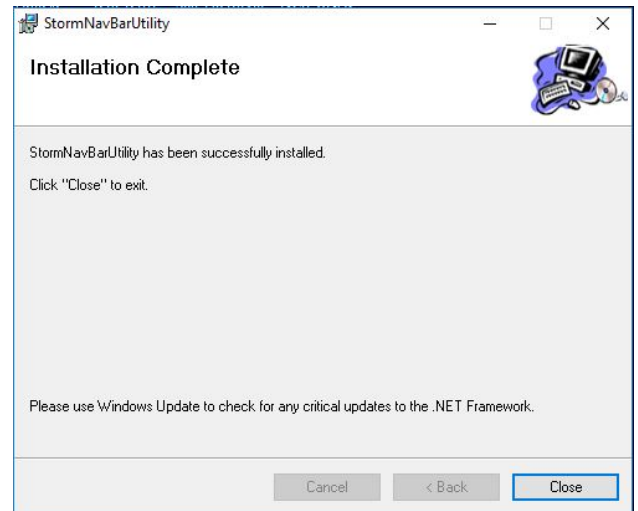
Using the Utility

When the NavBar is connected it will be detected on the home screen.
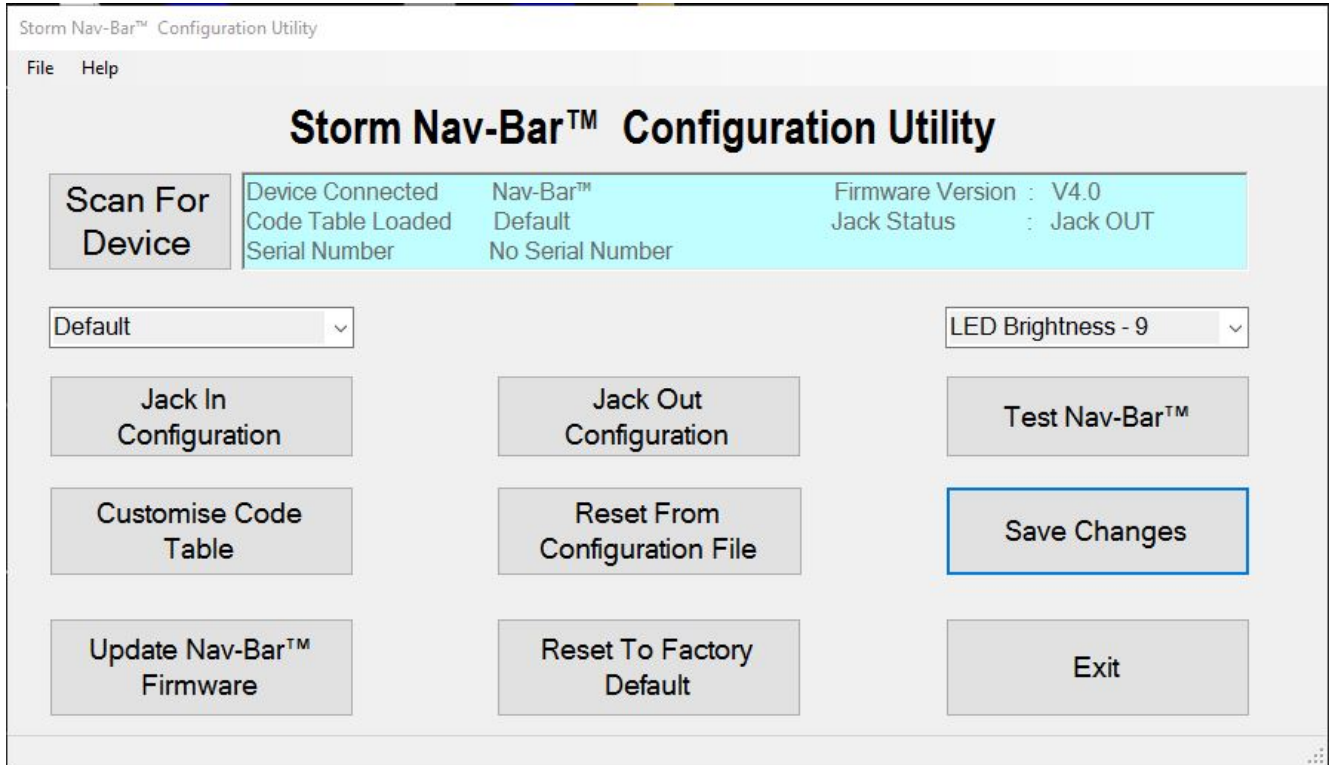
Changing the LED brightness

The user can change the LED brightness from low to high by selecting the LED Brightness and selecting from 1 to 9.

NB: Remember to save any required changes otherwise they will be lost when the application is closed or the NavBar™ is disconnected.

Jack In/Out Configuration

The user can select which LEDs are ON/OFF for Jack In. By selecting Jack In or Jack Out a sub screen will appear. Click on required buttons and LED state will change ON <->OFF. Then click on Apply to download the configuration to the keypad. If a Jack is plugged in, the LED state will be applied.
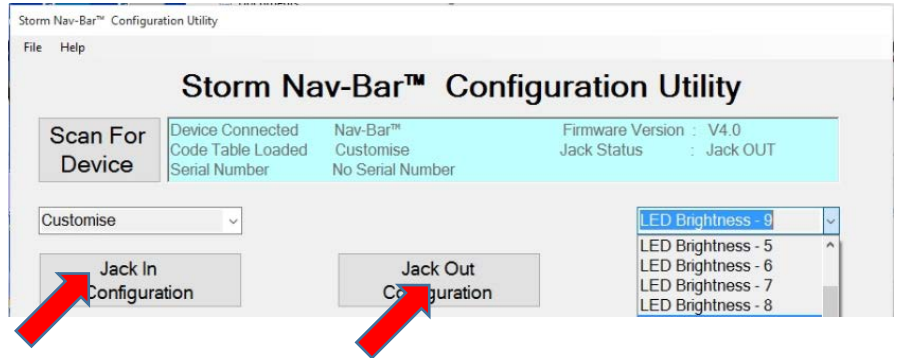
You can select which LEDs are ON/OFF for Jack In and for Jack Out. Click to show the next screen
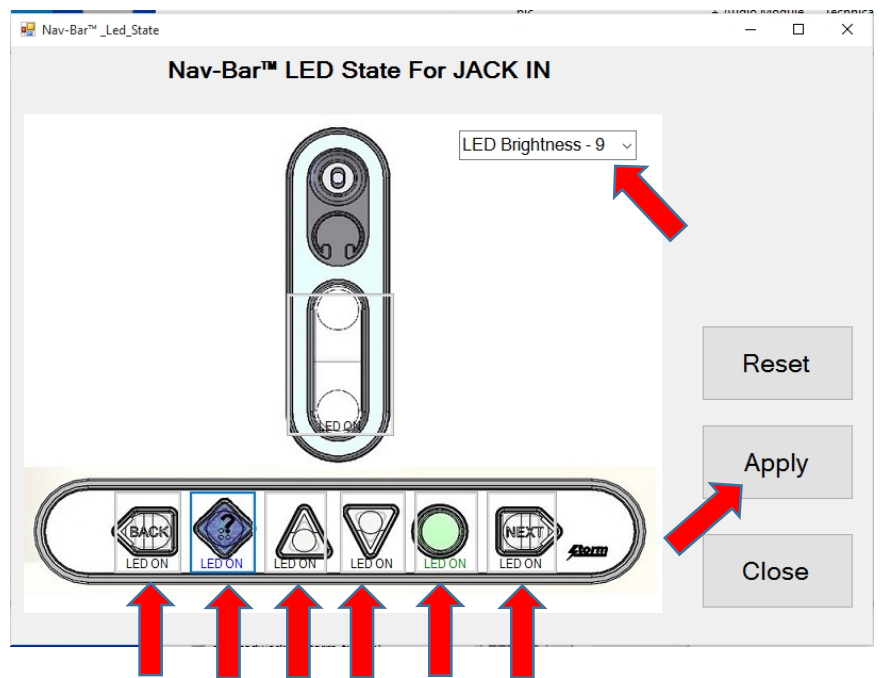
Click on each key to change the LED state : ON <->OFF.

The LED brightness can also be set for each key

Click on Apply to download the configuration to the NavBar

Customising the Key Codes

The NavBar retains 3 stored Code Tables, the Code Table to be used can be selected from the drop-down

- Factory Default
- Alternate
- Customised

The Default and Alternate tables are shown on the next page.
If you need specific key codes then use the Customised Table

Select "Customised Table" then "Customise code" and the following is displayed showing the current USB Code (in hex) for each key of the product.
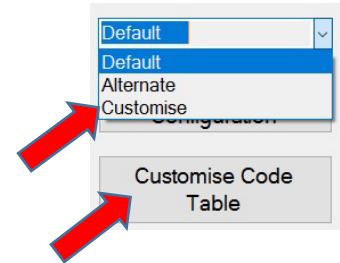
Above each key is a button to show the modifier. As no codes have been changed, the buttons show None.
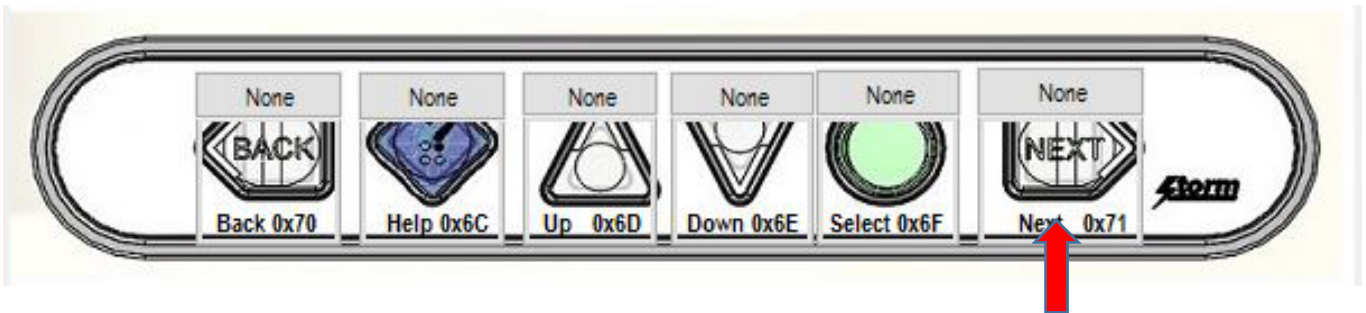
To customise a key, click on it and the "Select Code" combo box will appear.
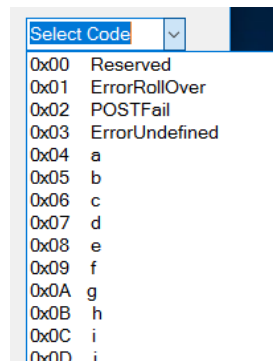
Select the code you require from the dropdown list

Once a code is selected, the button's background colour will display the new code selected.

Repeat for the other keys

Press Apply to send the new codes to the keypad

Don't forget to SAVE YOUR CHANGES

Default Key Code Table
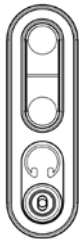
LEGEND	TACTILE IDENTIFIER	LED COLOUR	USB (KEYCODE)	HEX CODES	DESCRIPTION
NavBar™					
	<	WHITE	F21	0x70	Back
?	∴	BLUE	F17	0x6C	EZ-Help
	^	WHITE	F18	0x6D	Up
	v	WHITE	F19	0x6E	Down
	O	GREEN	F20	0x6F	Action
NEXT	>	WHITE	F22	0x71	Next
Audio Module					
		WHITE	F13	0x68	Volume Up
		WHITE	F14	0x69	Volume Down
In addition the unit will also output keycodes for JACK IN and JACK OUT					
		WHITE	F15	0x6A	JACK IN
		WHITE	F16	0x6B	JACK OUT

Alternate Key Code Table
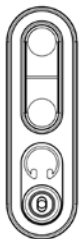
LEGEND	TACTILE IDENTIFIER	LED COLOUR	USB (KEYCODE)	HEX CODES	DESCRIPTION
NavBar™					
BACK	<	WHITE	F21	0x70	Back
?	∴	BLUE	F17	0x6C	EZ-Help
	^	WHITE	F18	0x6D	Up
	v	WHITE	F19	0x6E	Down
	O	GREEN	F20	0x6F	Action
NEXT	>	WHITE	F22	0x71	Next
Audio Module					
		WHITE			Volume Up
		WHITE			Volume Down
In addition the unit will also output keycodes for JACK IN and JACK OUT					
		WHITE	F15	0x6A	JACK IN
		WHITE	F16	0x6B	JACK OUT

Upgrading the Firmware

To upgrade the firmware, click on "Update NavBar™ Firmware" button the screen below will be displayed
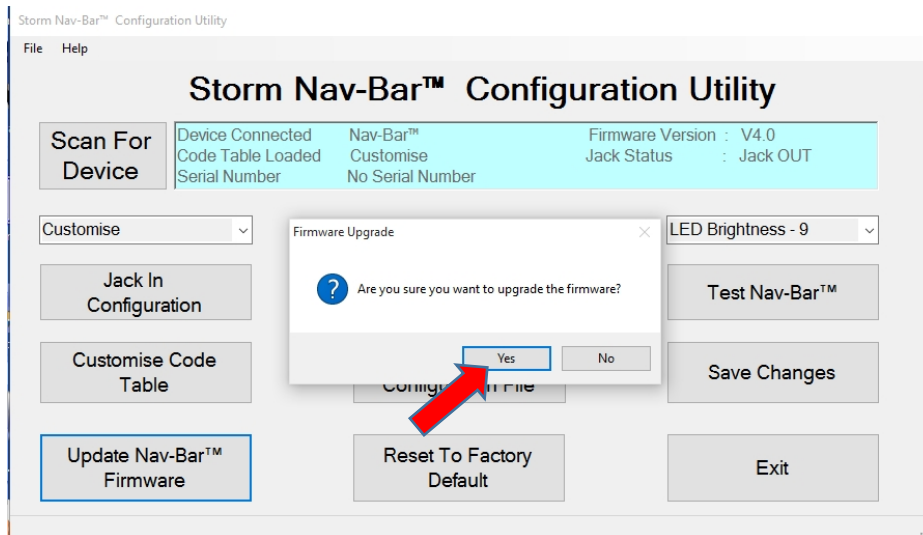
Click on "Yes"

After a few seconds the "Browse" and "Upgrade" button will be enabled.

(If both buttons are greyed out then reset the unit and retry)

Click on the "Browse" button and navigate to the firmware file. Click "Open" to select.

Then click on "Upgrade".
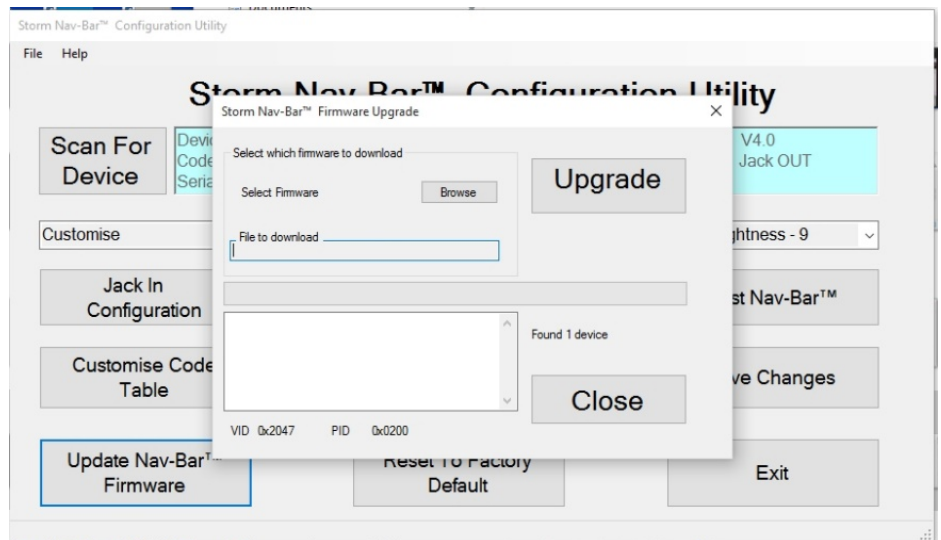
Do not disconnect the cable while the upgrade is in progress.

Reset Procedure

Unplug the USB cable for the NavBar™ from the PC, press the reset switch on NavBar™ and keep it pressed.

(To press the switch use a paperclip in the access hole – see page 7-8 for location)

Plug the USB cable into the PC and let go of the switch. The "Browse" and "Upgrade" button should now be enabled

Once unit has upgraded to the new firmware, the NavBar™ & Audio Module will auto reboot and the new firmware version will be displayed on the utility.

Reset to factory defaults

Clicking on "Factory Default" will set the NavBar™ & Audio Module with values that are pre-set.

NAVBAR™ – default table

LED brightness – 9

API Overview

This section is prepared for application developers who will implement a host application for the NavBar™.

The Host API Library for the NavBar™ is a middleware application between the Host application and keypad device. You can download this together with the HIDAPI library from www.storm-interface.com.

- NavBar™ API – The NavBar™ Api library allows for the host application to invoke NavBar™ functions as listed above. The API encapsulates all the communications to USB and provides a simple API for the host application developers.

- HIDAPI - This is a third party library, which allows an application to interface with USB HID-Compliant devices on Windows, Linux, and Mac OS X. While it can be used to communicate with standard HID devices like keyboards, mice, and Joysticks, it is most useful with custom (Vendor-Defined) HID devices. This allows for host software to scan for the device using its VID/PID.

The NavBar™ uses USB for communicating with the host. It includes an HID-compliant device. One of the advantages of using this implementation, which using only HID interfaces, is that no drivers are required on host system.
The basic architecture of the NavBar™ API is shown below.

```
+--------------------------------+
| NavBar™ Functions              |
| e.g. Set Led Level             |
+--------------------------------+-------+
| NavBar™ API                            |
+----------------------------------------+
| HIDAPI                                  |
+----------------------------------------+
```
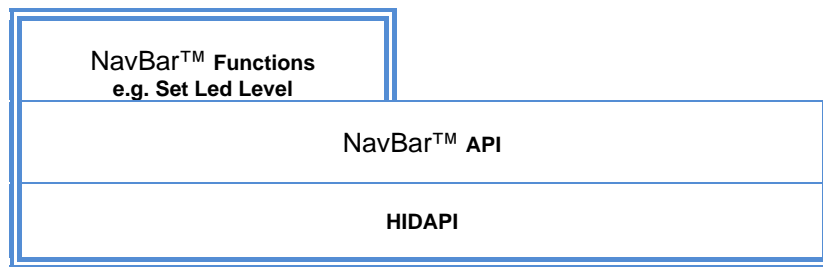
The developer does not need to worry about the communication at low level. You can request source code from us for the library so it can be ported to your specific platform. Currently the library has been tested on Windows and Linux (Ubuntu) platform.

The API incorporating this command set is downloadable separately from http://www.storm-interface.com.

Controlling the NavBar™ from the Host Computer

Device Communications and Message Format

The NavBar™ & Audio Module uses the ASCII/binary Message format described below. Every message that is sent from a host should be acknowledged with the control byte ACK (0x06). A retransmission should be initiated if a NAK (0x15) is received or if no acknowledge is received at all.

Message Formats

A	Alpha character, 'A'-'Z' and 'a' - 'z'
C	Control character one byte in length.
H	Hexadecimal characters, '0'-'9', 'A'-'F'
N	Numeric character, '0'-'9'
S	Special characters, entire character set 0x00 - 0xFF

ASCII Message Format

	Message Field	Type	Length	Description
1	STX	C	1	Control character Start of Text = 0x02
2	Message Id	H	2	Defines the type of message and format of the data field
3	Data Length	H	2	Hexadecimal value represented in ASCII defines the number of bytes in the data field. '00' to 'FF'. Maximum data field size is 256 bytes.
4	Data Field	S	var	In binary format
5	ETX	C	1	Control character ETX = 0x03
6	LRC	C	1	Longitudinal Redundancy Check digit, calculated on all previous data including STX

Controlling the Keypad from the Host Computer

List of Messages

(Structure of Messages from Host to NavBar™ is on the following pages)

ID	Name	Description
01	Device Status Request	Output the firmware version & selected parameters
02	LED Brightness	Adjust led brightness.
03	Set Jack Led State	sets the default LED setting for Jack IN/OUT
04	Reserved	Reserved for future use
05	Load New code table	Load new code table
06	Reserved	Reserved for future use
07	Keypad Type	Select layout table
08	Reserved	Reserved for future use
09	Write to default	NavBar™ writes configuration data from ram to flash
10	Reset to factory default	Reset device back to factory default
11	Reserved	Reserved for future use
12	Load Firmware	Sets the NavBar™ to detect the device loader for firmware loading
13	Reserved	Reserved for future use
14	Reserved	Reserved for future use
15	Retrieve Jack Status	Retrieves the status of Jack (i.e. JACK IN/OUT)

Structure of Messages from NavBar™ to Host

01 Key Press Code sends a key scan code back to HOST when a key is pressed on NavBar™

Device Status Request (01)

Host sends this message to NavBar™ to request the status of the NavBar™ keypad

NavBar™ **Status Response**

Secure device sends this message to Host in response to the Device Status message.

	Data Field	Type	Length	Description	
ec	Error Code	SH	2		
Lb	LED Brightness	SN	1	Value (0 – 9)	
Rs	Reserved	SN	1	Reserved	
Ji	LED state Jack IN	SN	1	LED state when Jack IN	
Jo	LED state Jack OUT	SN	1	LED state when Jack OUT	
Di	LED brightness Jack In	SN	1	LED brightness when Jack IN	
Do	LED brightness Jack Out	SN	1	LED brightness when Jack OUT	
Js	Jack Status	SN	1	0 – Jack IN, 1 – Jack OUT	
Kt	Keypad Table	SN	1	0 – Default Table 1 – Alternate Table 2 – Customised Table	
Kc	Keycode	SH	20	Customised keycode for each key	
fw	Firmware Version	ANS	20	Left justified, if Firmware Version is less than 20 then just add enough spaces after the Firmware Version until this field is completed, for instance, "123456" becomes: "123456 "	
Sn	Serial Number	ANS	12	YYQQSSSSSSSS. Where YY – year, QQ – Quarter (1-4), SSSSSSSS – unique serial number.	

Host sends this message to request information from the NavBar™

Host Device		NavBar™
[01]	⟹	
	⟸	[01][ec][Lb[Rs][Ji][Jo][Di][Do][Js][Kt][20*Kc][fw][sn]
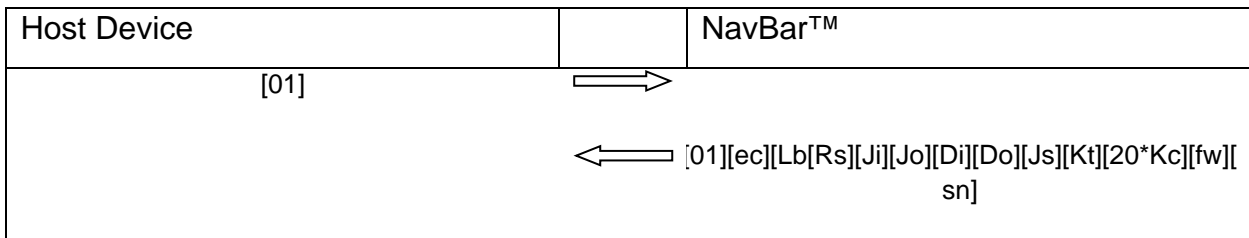
LED Brightness Command (02)

Host sends this message to control brightness of LEDs

	Data Field	Type	Length	Description
1	LED brightness	SN	1	0 - 9

LED Brightness Command Response

	Data Field	Type	Length	Description
ec	Error Code	H	2	

Host Device		NavBar™
[02][lb]	⟹	
	⟸	[02][ec]
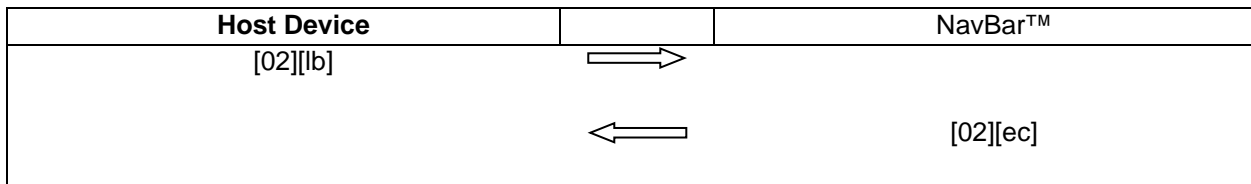
Note: LED brightness of 0 value indicates LEDs are off

LED brightness of 9 value indicates full brightness

Set Jack LED State (03)

Host sends this message to set Jack IN/OUT led state.

	Data Field	Type	Length	Description
Js	JACK STATE	SN	1	1 – JACK IN, 2 – JACK OUT
Ls	LED STATE	SN	1	Bit 7 6 5 4 3 2 1 0 LED Next Select Down Up Help Back N/A Vol If Bit is set to 1 – LED ON, 0 – LED off
Lb	LED Brightness	SN	1	0 - 9

LED Brightness Command Response

	Data Field	Type	Length	Description
ec	Error Code	H	2	

Host Device		NavBar™
[03][Js][Ls][Lb]	⟹	
	⟸	[03][ec]
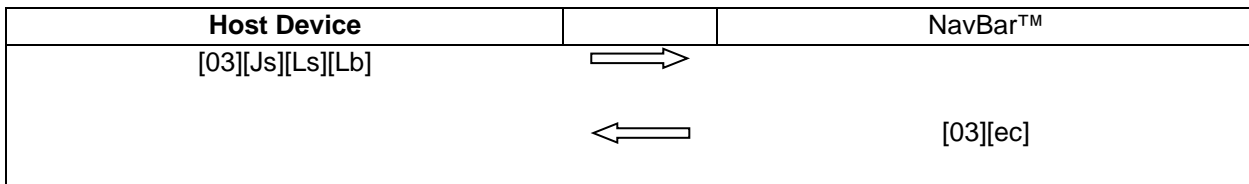
Reserved (04)

Load New Key Code Table Command (05)

Host sends this message to Load New Code Table

	Data Field	Type	Length	Description
1	Load New Code Table	SH	20	Key Code Table:

Load New Table Command Response

	Data Field	Type	Length	Description
ec	Error Code	H	2	

Host Device		**NavBar™**
[05][lt][32 scan codes]	⟹	
	⟸	[05][ec]
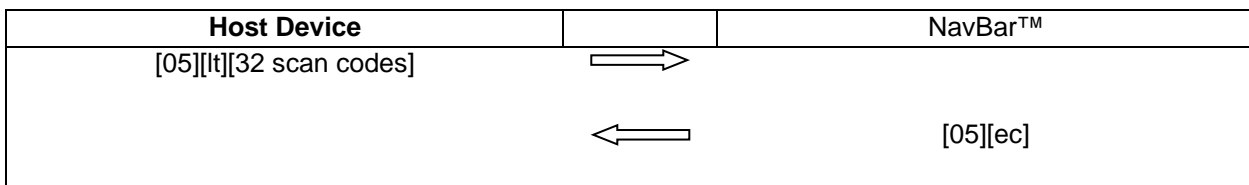
Note: Length is always 20,

Format of table is as follows:

<modifier for key 1><code for Key 1><modifier for key 2><Code for Key 2>..........etc

The code table is specified in the user manual together with the modifier code. For example to program the following for 4 way :

Key 1 – A

Key 2 – a

Key 3 – 9

Key 4 - !

<0xE1><0x04><0x00><0x04><0x00><0x26><0xE5><0x1E>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>< 0x00><0x00>

Note: 20 bytes must be sent, for unused key code pad the values with 0x00.

Note: For shift modifiers there is a left and right modifiers value defined. So we can use 0xE1 – Left Shift and 0xE5 – Right shift. Similarly there is left and right Alt

Reserved (06)

Select Keypad Table Command (07)

Host sends this message to set keypad type

	Data Field	Type	Length	Description	
Kt	Keypad Type	SN	1	0 – Default Table 1 – Alternate Table 2 – Customised Table	

Keypad Command Response

	Data Field	Type	Length	Description
ec	Error Code	H	2	

Host Device		NavBar™
[07][Kt]	⟹	
	⟸	[07][ec]
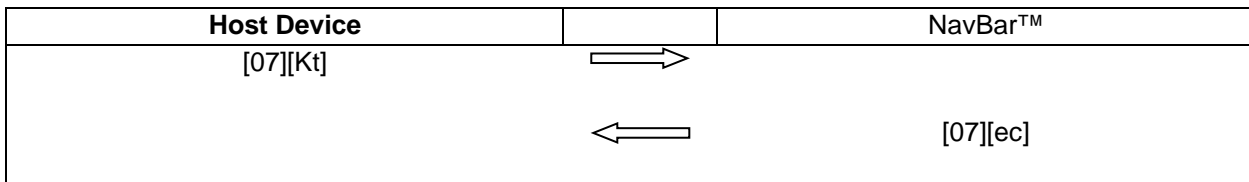
Reserved (08)

Write Config Data To Flash command (09)

Host sends this command to request the NavBar™ to write the configuration data from RAM to FLASH. This command has no data associated with it.

RAM to FLASH command **Response**

	Data Field	Type	Length	Description
ec	Error Code	H	2	

Host Device		NavBar™
[09]	⟹	
	⟸	[09][ec]
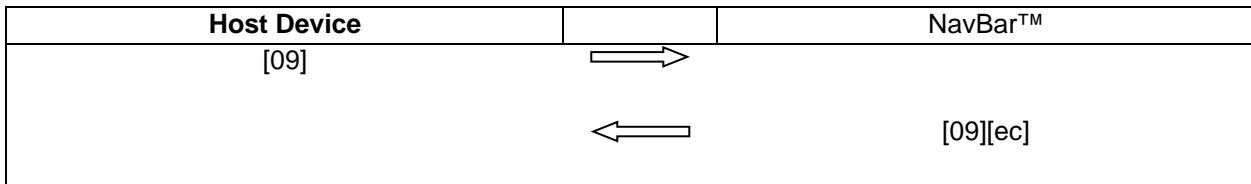
Reset To Factory Default command (10)

Host sends this command to request the NavBar™ to reset parameters back to factory default. This command has no data associated with it.

Reset To Factory Default **Response**

	Data Field	Type	Length	Description
ec	Error Code	H	2	

Host Device		NavBar™
[10]	⟹	
	⟸	[10][ec]
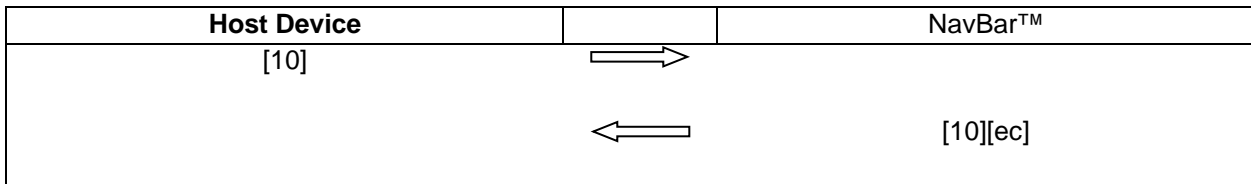
Reserved (11)

Enable BSL Command (12)

Host sends this command to request the NavBar™ to start downloader

Enable BSL command **Response**

	Data Field	Type	Length	Description
ec	Error Code	H	2	

Host Device		NavBar™
[12]	⟹	
	⟸	[12][ec]
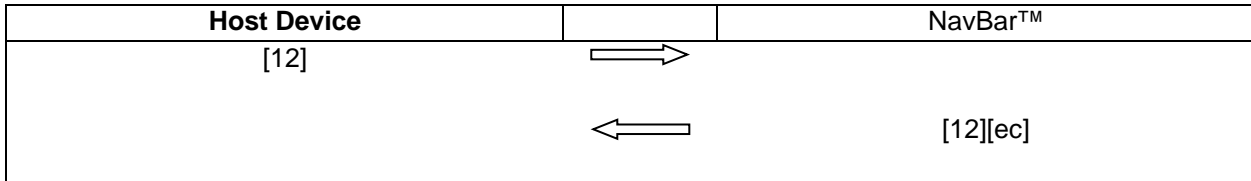
Reserved (13)

Reserved (14)

Retrieve Jack Status (15)

Host sends this command to request the status of the Jack.

Retrieve Jack Status **Response**

	Data Field	Type	Length	Description
Js	Jack Status	SN	1	0 – Jack Out, 1 – Jack IN
ec	Error Code	H	2	

Host Device		NavBar™
[15]	⟹	
	⟸	[15][Js][ec]

Key Press Code

With the USB stack configured for a standard keyboard interface, the NavBar™ sends appropriate key report to HOST when a key is pressed on keypad.
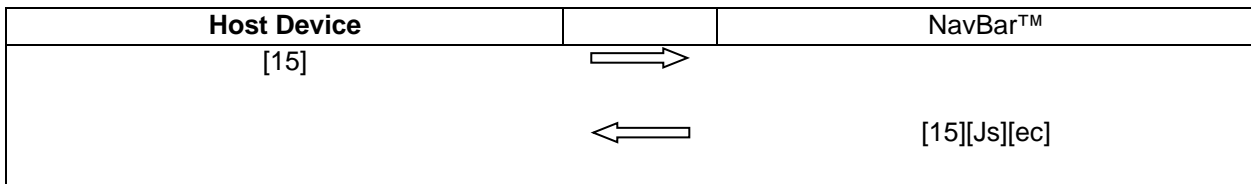
NavBar™ Report

HID NavBar™ Report Format

	BIT7	**BIT6**	**BIT5**	**BIT4**	**BIT3**	**BIT2**	**BIT1**	**BIT0**
Byte0	*Right GUI*	*Right Alt*	*Right Sft*	Right Ctrl	Left GUI	Left Alt	Left Shift	Left Ctrl
Byte1	Reserved							
Byte2	Key_array[0]							
Byte3	Key_array[1]							
Byte4	Key_array[2]							
Byte5	Key_array[3]							
Byte6	Key_array[4]							
Byte7	Key_array[5]							

For example if user has configured for Default Table. If the user now presses the left key, which is "BACK" and USB code of 70. Then NavBar™ report sent to host would be:

Byte 0 – 0

Byte 1 – 0

Byte 2 – 70

Byte 3 – 0

Byte 4 – 0

Byte 5 – 0

Byte 6 – 0

Byte 7 – 0

Now if the user customizes the top key to be "R SHIFT" (modifier) and USB code for "a" (04). If the user presses the top key, then the keyboard report sent to host would be:

Byte 0 – 20 This is Right Shift modifier.

Byte 1 – 0

Byte 2 – 04

Byte 3 – 0

Byte 4 – 0

Byte 5 – 0

Byte 6 – 0

Byte 7 – 0

Remote Update of Device Firmware

This is to allow customers to   check firmware version

or   remotely update the firmware

in products that are already installed.

Files included

- BSL430.dll
- NavbarApi.dll
- NavbarDownloaderUtility.exe

Program Usage

The utility will work on any windows platform, and allows you to update a NavBar with a new version of firmware.

In operation it will

- Connect to the Navbar
- Save the Navbar existing configuration data, including serial number, keycodes.
- Update the Navbar with the new firmware.
- Restore the Navbar stored configuration data, including serial number

Run the following command in a batch file

NavbarDownloaderUtility -p NAVBAR -f FILENAME -r NUMBER

where :-

FILENAME   is a text file which is the firmware file (e.g. 000-IC-169-EZKV05-DWG.txt)

NUMBER – (best value to use is 3) – This value is used internally, retry failure counter.

The NavBARDownloaderUtility returns 0 for failure and 1 for Success.

If you need to check what firmware is installed then run the following to retrieve firmware version number

NavbarDownloaderUtility -p NAVPAD -v

Change History

Technical Manual	Date	Version	Details
	17 Oct 16	1.0	First Release
	17 Nov 16	2.0	Updated
	03 Mar 17	2.1	Minor change – Config Utility updated (see below) + Firmware update.
	04 Jul 17	2.2	Added new part numbers.
	08 Sep 17	2.3	Added Remote Update Instructions
	25 Jan 18	2.3	Added RNIB logo
	03 Apr 19	2.4	Updated RNIB logo + corrected pic on front page
	10 Feb 20	2.4	WARF info removed page 1 – no issue change
	29 Apr 20	2.5	Product is now NavBar (not Nav-Bar)
	18 Sep 20	2.6	Added note regarding Reset Switch location

Configuration Utility	Date	Version	Details
	17 Oct 16	1.0	First Release
	17 Nov 16	2.0	Updated
	09 Feb 17	3.0	Superscript Characters removed from filenames so that utility installs correctly on Windows 7
	16 Feb 17	5.0	Added fix for install to Win 7 POS Ready O/S
	08 Sep 17	6.0	Added Win 10 Compatability
	21 Jan 20	7.0	Added support for NavBar SF

Product Firmware	Date	Version	Details
	17 Oct 16	3.0	First Production Release
	03 Mar 17	4.0	Improve stability
	07 Nov 17	5.0	Jack In debounce reduced to 200 msec, improved recovery, 8 digit SN support

Host API Library	Date	Version	Details
	7 Nov 16	1.0	Updated
	08 Sep 17	2.0	Win 10 fix

Remote Firmware Update	Date	Version	Details
NavbarDownloaderUtility	08 Sep 17	1.0	New Release, added to Tech Manual