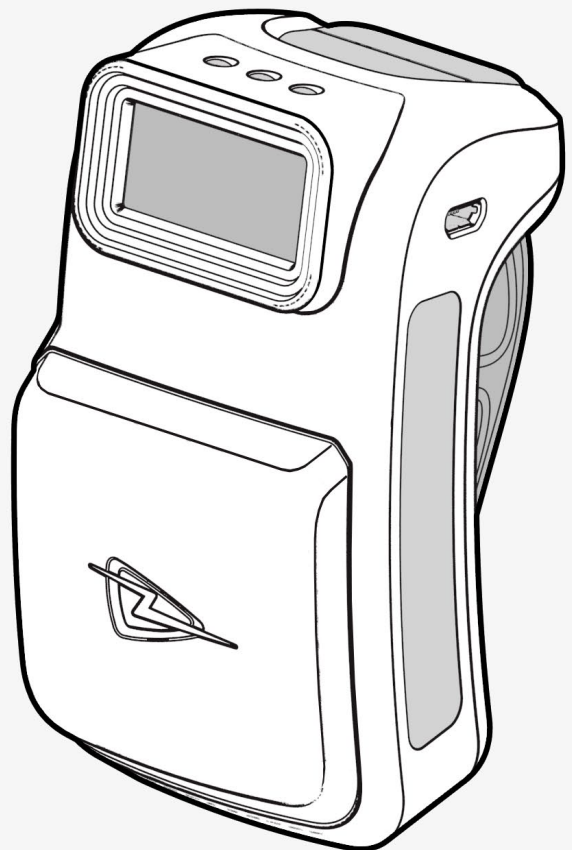# TECHNOLOGY SOLUTIONS UK LTD

part of **HID**

USER GUIDE:
2173 WEARABLE *BLUETOOTH*®
HF/LF RFID READER

www.tsl.com

Design • Development • Manufacture

TERMS & CONDITIONS

CONTENT

INTRODUCTION

Technology Solutions' 2173 HF/LF Reader provides High Frequency (HF) and Low Frequency (LF) Radio Frequency Identification (RFID), with optional barcode scanning functionality. The unit can be used stand alone or paired with a *Bluetooth*® wireless technology enabled host device.
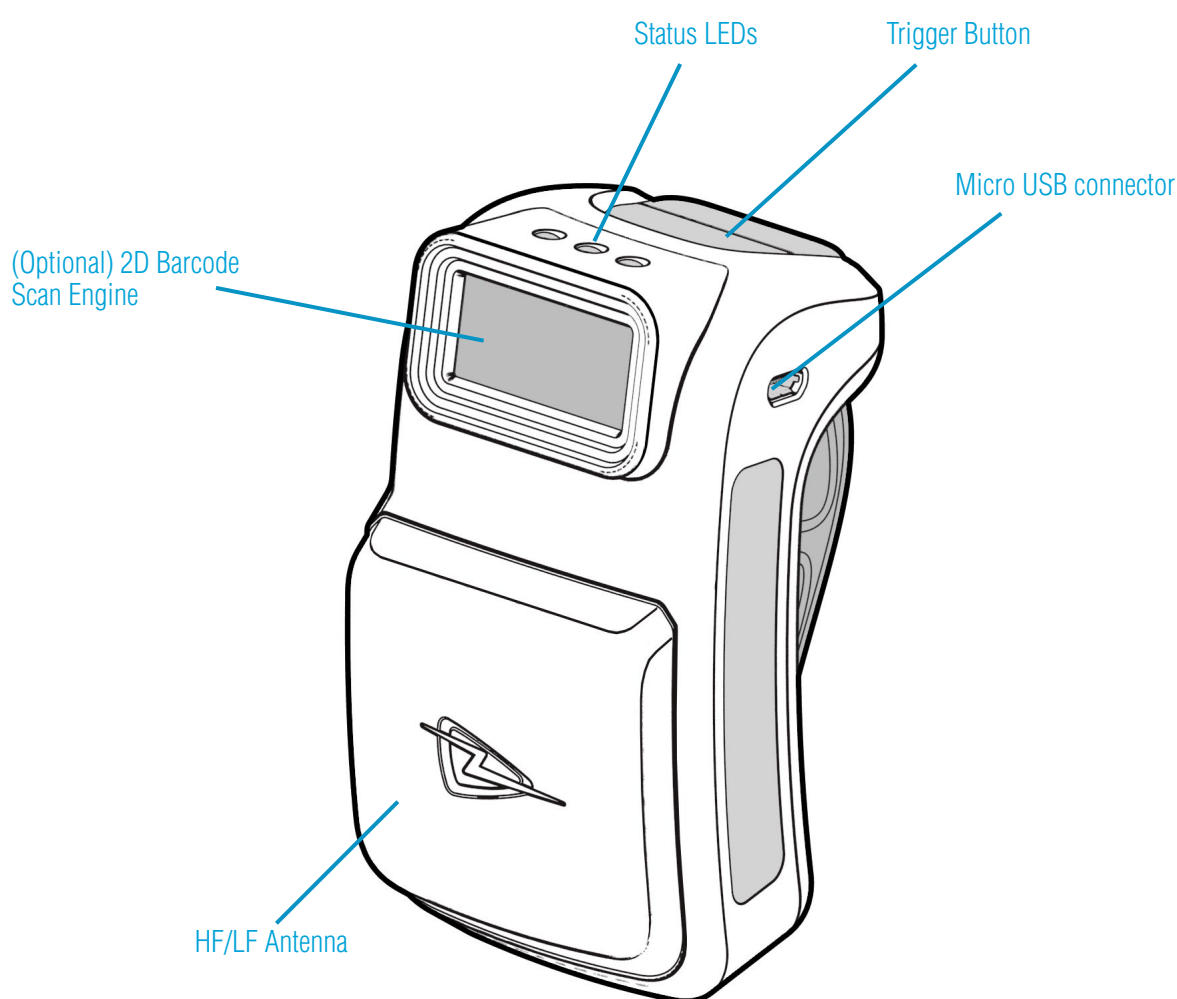
PARTS OF THE 2173 HF/LF READER

figure 1: Parts of the 2173 HF/LF Reader

TECHNICAL SPECIFICATIONS

Physical and Environmental Characteristics

Dimensions (LxWxH):	10.2 cm x 5.5 cm x 5.6 cm.
Weight (inc battery):	157 g / 5.5 oz.
User input:	Two Trigger buttons.
User feedback:	Speaker, vibration motor, three LEDs.
Power:	Removable, rechargeable 3.7 volt Lithium Polymer 1200 mAh battery pack, 4.5 watt hrs.
Enclosure materials:	Polycarbonate.

Performance Characteristics

Communication protocols:	TSL® ASCII 2.0 parameterised command set.
Memory:	Supports up to 32 GB Micro SD/SDHC card.
Compatible Host devices (*Bluetooth*®):	Any *Bluetooth*® Host[1] supporting the Serial Port Profile (SPP) or Human Interface Device (HID) profile (Android, iOS, Linux, Mac, Windows). Comparison of *Bluetooth*® modes for TSL® UHF Readers.
Compatible Host devices (USB):	Any USB host with FTDI VCP driver support (Windows, Linux, Mac, Android).

Environmental

Operating Temp.:	-10°C to 40°C (14°F to 104°F).
Charging Temp.:	5°C to 40°C (41°F to 104°F).
Storage Temp.:	Less than 1 month at at -20 to +60°C (-4°F to 140°F). Less than 3 months at -20°C to +45°C (-4°F to 113°F). Less than 1 year at -20°C to +30°C (-4°F to 86°F).
Humidity:	5% to 85% non-condensing.
Drop Spec:	Multiple drops to concrete: 4 ft./1.2 m ambient, 3ft / 0.9m across the operating temperature range.
Tumble:	500 0.5 metre tumbles at room temperature (1,000 cycles).
Environmental Sealing:	IP54.
Electrostatic Discharge (ESD):	± 15kVdc air discharge; ± 8kVdc contact discharge.
MIL-STD 810F:	Meets and exceeds applicable MIL-STD 810F for drop, tumble and sealing.
Construction:	RoHS compliant.

RFID Performance

Frequency Range:	125/134.2 kHz (LF) / 13.56 MHz (HF).
Read Distance:	LF and HF: Up to 100 mm / 4" (dependent on transponder type).
RF Transmission Speed:	HF Air: up to 848 kbit/s.
Standards supported:	ISO14443A, ISO14443B, ISO18092 ECMA-340 (NFC), ISO15693 plus many 125 kHz, 134.2 kHz standards.

Supported Transponders 13.56 MHz :	**ISO14443A:** LEGIC Advant[1], MIFARE Classic EV1[2], MIFARE Classic, MIFARE Mini, MIFARE DESFire EV1, MIFARE DESFire EV2[2], MIFARE DESFire Light[3], MIFARE Plus S, X, MIFARE Pro X[4], MIFARE Smart MX[4], MIFARE Ultralight, MIFARE Ultralight C, MIFARE Ultralight EV1, NTAG2xx, PayPass[4], SLE44R35, SLE66Rxx (my-d move)[4], Topaz **ISO14443B:** Calypso[4], Calypso Innovatron protocol[4], CEPAS[4], HID iCLASS[1], Moneo[4], Pico Pass[5], SRI4K, SRIX4K, SRI512, SRT512 **ISO18092 ECMA-340:** NFC Forum Tag 1-5, NFC Peer-to-Peer, Sony FeliCa[6], NFC Active and passive communication mode **ISO15693:** EM4x33[4], EM4x35[4], HID iCLASS[1], HID iCLASS SE/SR[1], ICODE SLI, LEGIC Advant[1], M24LR16/64, MB89R118/119, SRF55Vxx (my-d vicinity)[4], Tag-it, PicoPass[5]
Supported Transponders 125 kHz:	AWID, Cardax, CASI-RUSCO, Deister[8], EM4100, 4102, 4200[9], EM4050, 4150, 4450, 4550, EM4305[10], EM4105, HITAG 1[11], HITAG 2[11], HITAG S[11], ICT[10], IDTECK, Isonas[10], Keri, Miro, Nedap[8], Pyramid, Q5, T5557, T5567, T5577, TITAN (EM4050), UNIQUE
PI options only - Additional Supported Transponders:	Cotag, G-Prox[8], HID DuoProx II, HID ISO Prox II, HID Micro Prox, HID ProxKey III, HID Prox, HID Prox II, Indala, ioProx, Nexwatch, HID iCLASS, HID iCLASS SE/SR/Elite, HID iCLASS SEOS (Facility Code/PAC)[12]

[1]UID only [2]r/w enhanced security features on request [3]In preparation [4]r/w in direct chip command mode [5]UID only, read/write on request [6]UID + r/w public area [8]Hash value only [9]Only emulation of 4100, 4102 [10]On request [11]Without encryption [12]r/w on request

Barcode Scanning

Optional 2D Barcode Engine:	Optional TSL® custom 2D Barcode Scan Engine module.
Sensor Resolution:	1280 x 960 pixels, rolling shutter
Field of View:	Horizontal: 44.5°, vertical: 33.5°
Focal Distance:	From front of engine: 15.24 cm (6 in.)
Aiming LED:	Green LED
Illumination:	1 warm white LED
Symbologies Supported:	1D: All major codes 2D: PDF417, MicroPDF417, Composite, RSS, TLC-39, Datamatrix, QR code, Micro QR code, Aztec, MaxiCode Postal Codes: US PostNet, US Planet, UK Postal, Australian Postal, Japan Postal, Dutch Postal (KIX).

(These technical specifications are taken from the 2173 Preliminary Datasheet v2.03 - 13th October 2022)

TECHNICAL SPECIFICATIONS (CONTINUED)

Ranges[3]:	Barcode	Near	Far
	5 mil Code 39	6.1 cm	24.1 cm
	5 mil Code 128	7.1 cm	22.9 cm
	6.67 mil PDF 417	6.1 cm	20.3 cm
	10 mil DataMatrix	7.4 cm	21.6 cm
	100% UPCA	4.6 cm	49.5 cm
	15 mil QR	3.0 cm	29.2 cm
	20 mil QR	3.0 cm	35.6 cm

Communication

Bluetooth®:	*Bluetooth*® Version 4.2.
Bluetooth® Frequency Range:	2.4 - 2.4835 GHz.
Bluetooth® Profiles:	SPP Profile, HID Profile, Apple iAP2, *Bluetooth*® Low Energy.
Bluetooth® Range[4]:	Up to 100m.
Bluetooth® Pairing:	Simple Secure Pairing, NFC OOB Pairing.

Peripherals and Accessories

External interface:	MicroUSB connector for battery charging, and USB connectivity.
USB operating modes:	Tethered for real time data capture in conjunction with SmartWedge software. Download of stored scan data.
Optional accessories:	2136 4-Slot Desktop Battery Charger. 2112 Docking Cradle (Coming Soon).

Regulatory

Regions	EU (CE), USA (FCC)
FCC ID	S6J2173
EMC	EN 55032:2015 +AC:2016 EN 55024:2010 +A1:2015 EN 301 489-1 V2.1.1 47 CFR Part 15B 15.107, 15.109
RF	EN 300 328 V2.1.1 EN 300 330 V2.1.1 EN 301 489-3 V2.1.1 EN 301 489-17 V3.1.1 47 CFR Part 15C 15.209, 15.215, 15.225, 15.247
RF Exposure	EN 62311:2008 EN 50364:2010 EN 62479:2010 47 CFR 2.1093
Electrical Safety	IEC 62368-1:2014 CB EN 62368-1:2014 +A11:2017 UL 62368-1:2014
Environmental	**2011/65/EU (RoHS 2)** Restriction of the use of certain Hazardous Substances in electrical and electronic equipment **2015/863 (RoHS 3)** Amendment to Annex II of 2011/65/EU

(These technical specifications are taken from the 2173 Preliminary Datasheet v2.03 - 13th October 2022)

Warranty

The TSL 2173 reader is warranted against manufacturing defects for a period of one year (12 months) from date of shipment, provided the product remains unmodified and is operated under normal and proper conditions.

Full warranty information can be downloaded from the TSL® website at www.tsl.com/warranty.

[1] Compatible *Bluetooth*® stack required in the Host device
[2] Tag Read/Write performance is dependent on tag type, items tagged, number of tags in the field and other radio and environmental factors
[3] Artificial lighting can affect scanning performance
[4] Open field

USING THE 2173 HF/LF READER

BATTERY INSTALLATION OR REMOVAL

The battery is charged using the supplied micro USB lead and therefore is unlikely to need to be changed once installed. To access the battery compartment a slider switch must be moved. The battery compartment cover has a release latch. To access the battery compartment, move the battery cover release slider to the position shown in the diagram below.

Battery cover release slider
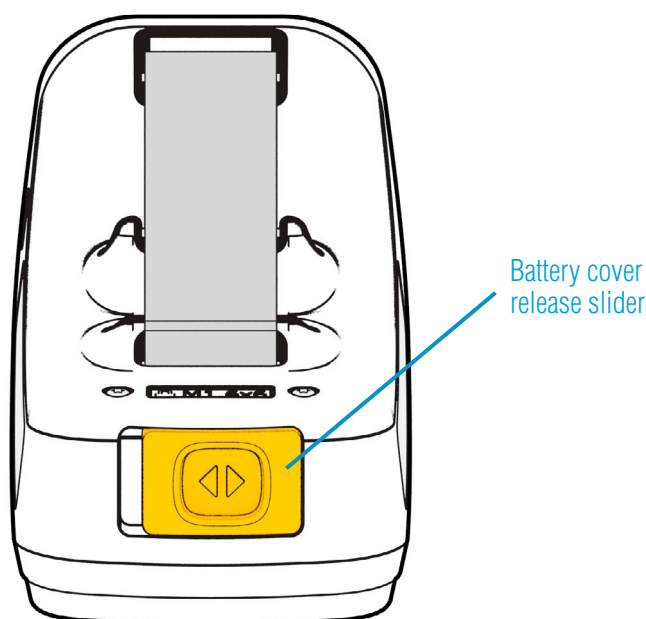
Figure 2: Battery cover release slider in locked position

'Unlocked' warning label
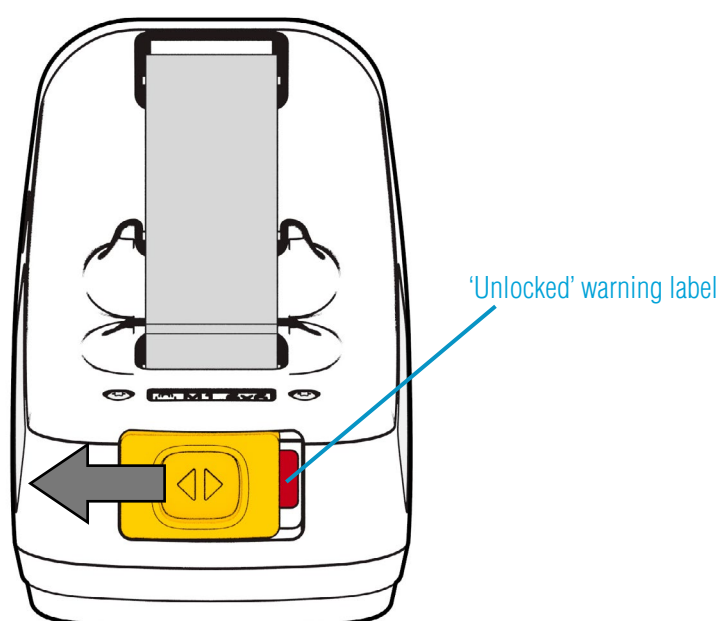
Figure 3: Battery cover release slider in unlocked position

Once the battery cover release slider has been moved to the unlocked position, the battery cover can be removed by simply pulling away from the 2173 body:
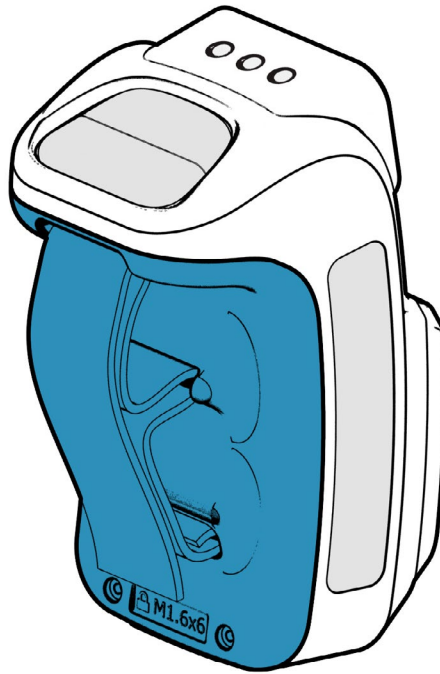
Figure 4: Removeable battery cover
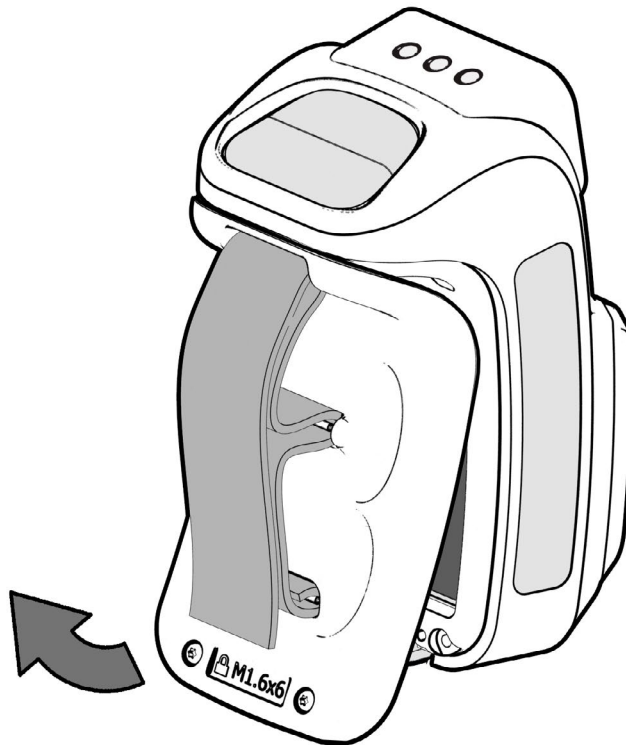
Figure 5: Remove battery cover in this direction

The battery contacts need to be face down at the top of the battery to meet the contacts shown in the image below.

CAUTION!

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.
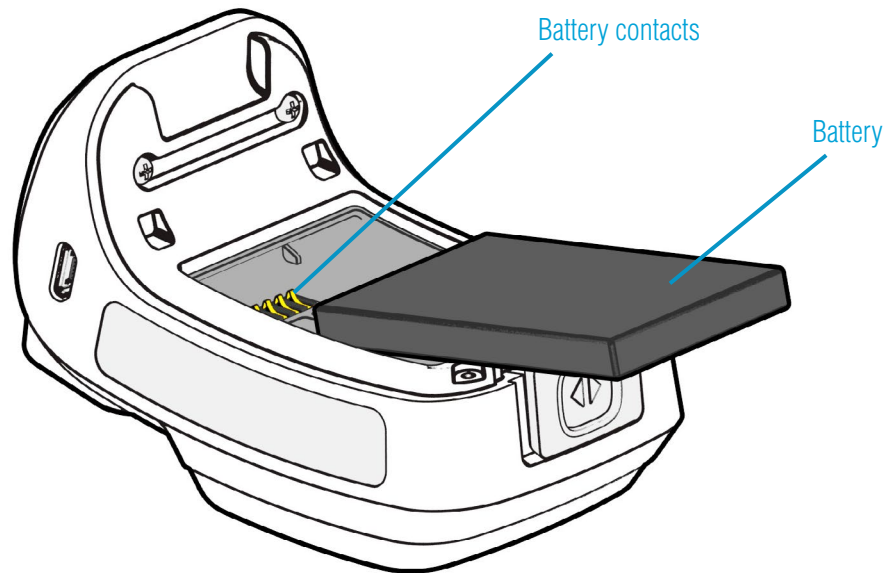
Figure 6: Battery placement
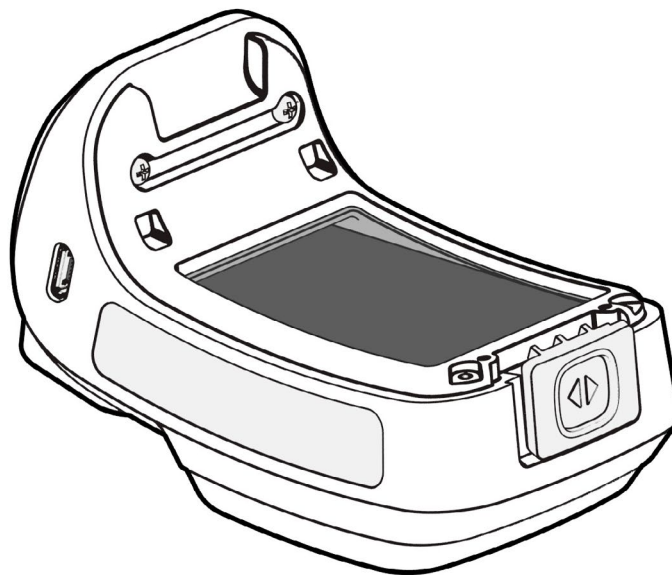
Figure 7: Battery in position

Once the battery is installed the actions to replace the cover are:

- Align the top edge of battery cover with the 2173 body
- Push the battery cover down into position
- Slide the locking switch into position

Figure 8: Replace battery cover
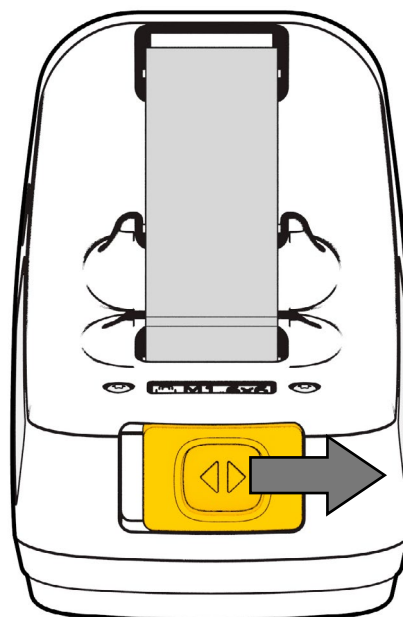
Figure 9: Move battery cover release slider to locked position

LOCKING THE BATTERY COVER (OPTIONAL)

The battery cover can be locked into position using two M1.6x6mm Torx pan head screws.

M1.6x6mm Torx pan head screw.
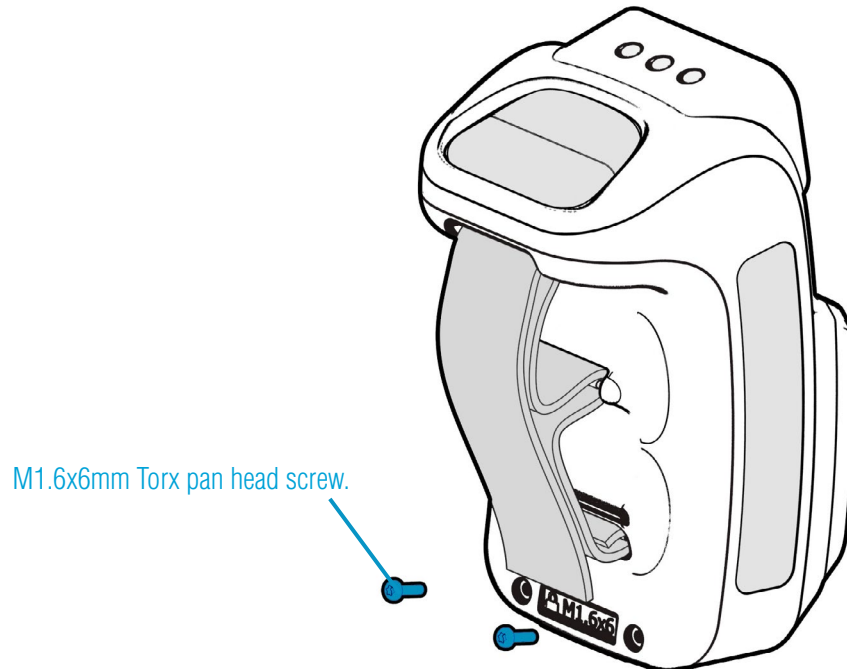
Figure 10: Battery cover locking screw location
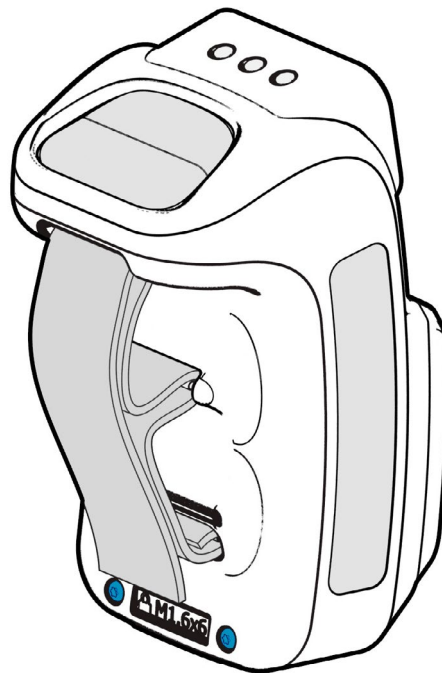
Figure 11: Battery cover fully locked

CHARGING AND MICRO USB CONNECTION

CONNECTING THE MICRO USB CABLE

The 2173 HF/LF Reader is supplied with a micro USB lead for charging and synchronisation. A USB PSU is also supplied for independent charging of the 2173 HF/LF Reader. The Micro USB connector is inserted into the 2173 HF/LF Reader as shown below.
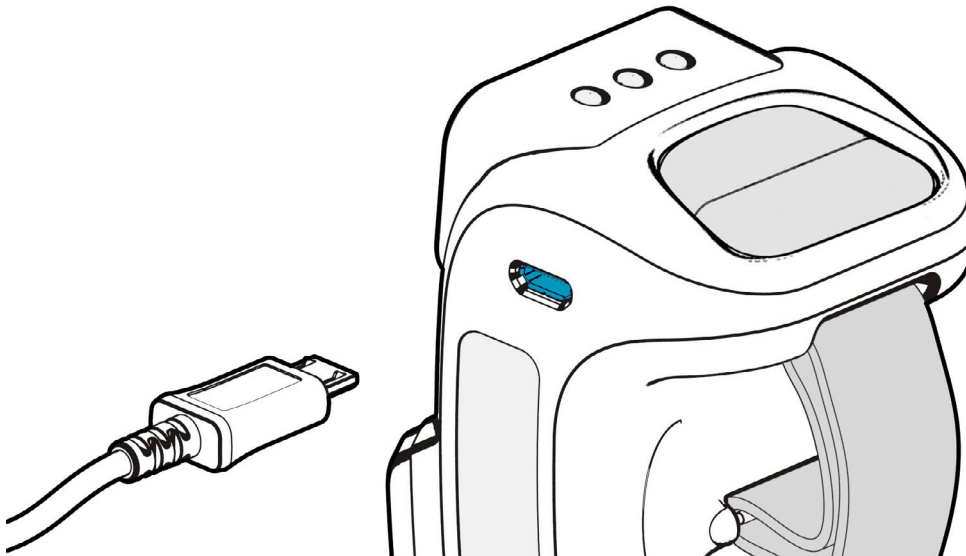
Figure 12: Location of Micro USB socket
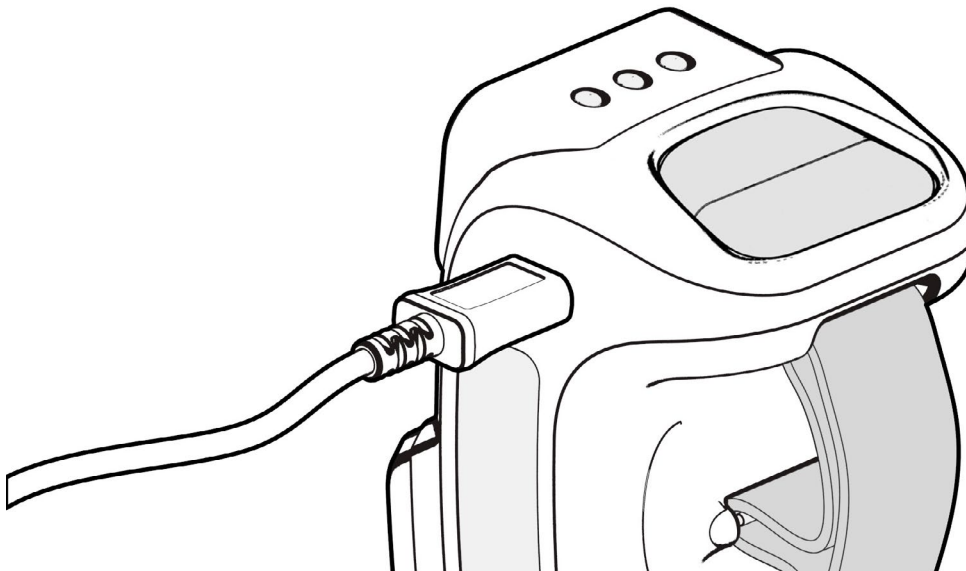
Figure 13: Attaching the Micro USB cable

BUTTON OPERATION

The 2173 HF/LF Reader has a Primary button action and a Secondary button action, which can be initiated by pressing the Primary or Secondary buttons on the top of the 2173 HF/LF Reader. By default, the Primary button action scans for HF/LF transponders, whilst the Secondary button action initiates the barcode scanner (requires 2D Imager). The button actions are also programmable for custom applications.

Secondary button
(Barcode scan)

Primary button
(HF/LF transponder read)
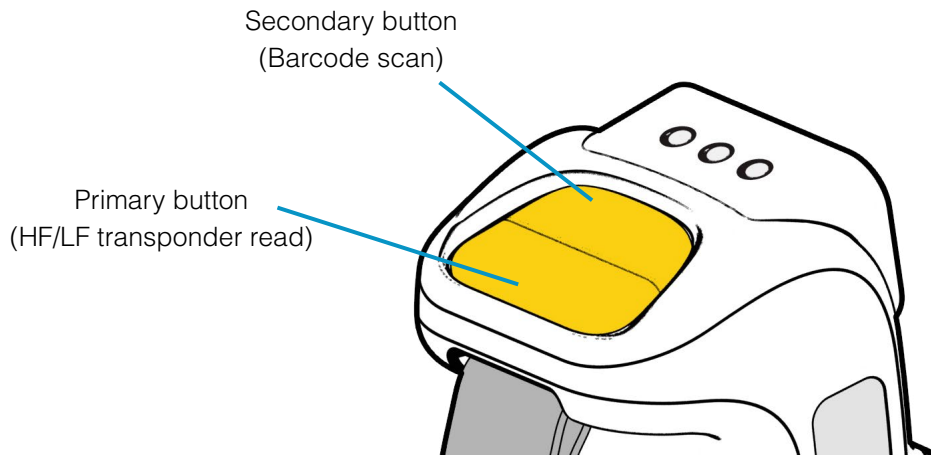
Figure 14: Location of Primary and Secondary Buttons

PRIMARY BUTTON ACTION
- HF/LF Transponder Read

In the default configuration the 2173 HF/LF Reader scans for HF/LF transponders as the primary button action. The 2173 HF/LF Reader will continue to scan for HF/LF transponders whilst the primary button is pressed. It will stop scanning once the button is released (and the current operation completes).

SECONDARY BUTTON ACTION
– Barcode Scan (requires 2D Imager)

In the default configuration the 2173 HF/LF Reader scans for barcodes as the secondary button action. The 2173 HF/LF Reader will continue to scan for a barcode while the button is pressed. It will stop scanning when any of the following conditions are met:

- A barcode is scanned.
- The button is released.
- The barcode engine times out.

In the default configuration, the secondary button action (Barcode scanning) can also be initiated by a rapid double-click-and-hold on the primary button.

READING TRANSPONDERS

An RFID transponder can be read when it is in range of the antenna. The antenna is located on the front of the 2173 HF/LF Reader. Maximum read/write range is up to 100mm - the range at which a transponder can be read can vary depending on the transponder type and size, as well as the environment.

The HF/LF reader reads transponders in front of the antenna
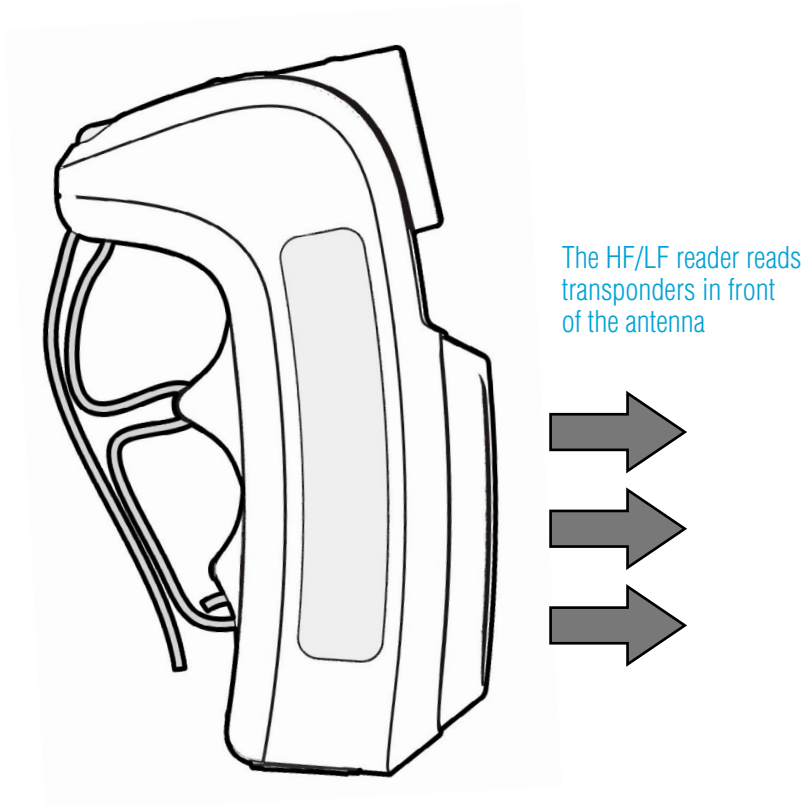
Figure 15: Antenna read direction

STATUS LED

The status LEDs on the top of the 2173 HF/LF Reader provides an indication of the operating status of the 2173 HF/LF Reader.

LED	Status
Blue slow flash (50% on, 50% off)	The reader is awake but there is no connection
Blue constant	The reader is awake and connected to a host
Short green flash	The reader has successfully read a tag or barcode or executed the alert command
Orange slow flash (50% on, 50% off)	Battery low warning (<10% capacity remaining), please recharge immediately
Orange short single slow flash	Battery charging with battery level less than 33%
Orange short double flash	Battery charging with battery level less than or equal to 66%
Orange short triple flash	Battery charging with battery level greater than 66%
Orange rapid flash	There is a charge error / battery fault
Orange constant	The reader is fully charged
All off	The reader is off and not charging

Read indicator   *Bluetooth*® status   Charge status
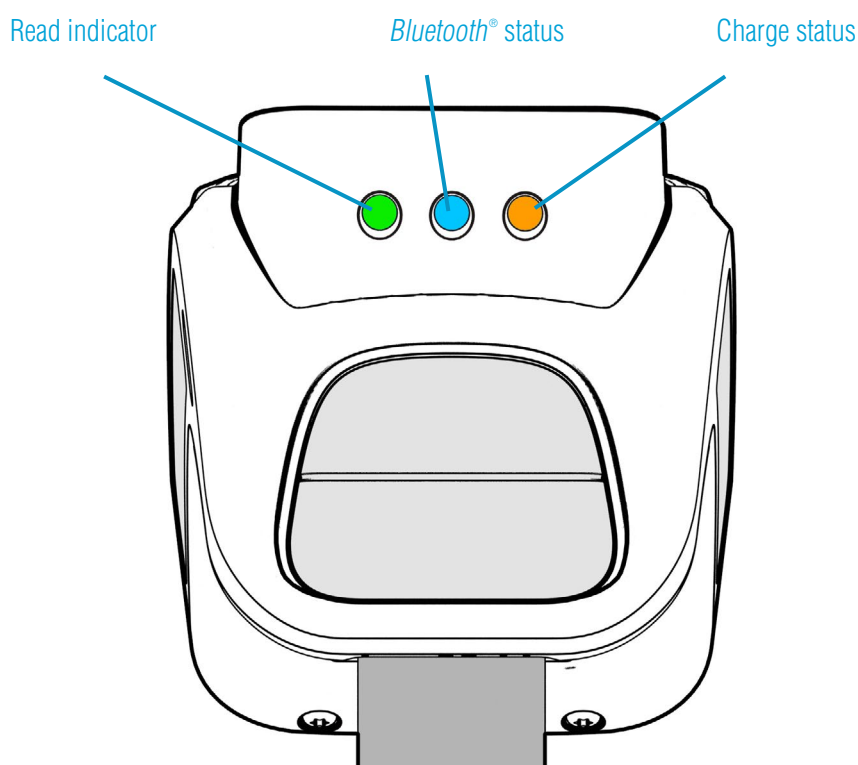
Figure 16: Location of status LEDs

CONNECTIONS

The connection to the 2173 is either via *Bluetooth*® or USB. *Bluetooth*® connections use either a Virtual Com Port (VCP) or via the iAP protocol for Apple devices. Over USB only VCP is available.

For VCP the connection is established at 115200 baud, 8 data bits, no parity, 1 stop bit and RTS/CTS (hardware) flow control.

SUPPORTED APPLE iOS DEVICES

Made for

- iPhone 8 Plus
- iPhone 6s
- iPhone 6s Plus
- iPhone 6
- iPhone 6 Plus
- iPhone 5s
- iPad Pro (10.5-inch)
- iPad 5th generation
- iPad Pro (12.9-inch) 1st generation
- iPad Air
- iPod touch 6th generation

OTHER COMPATIBLE PRODUCTS

The 2173 *Bluetooth*® Handheld HF/LF RFID Reader is compatible with many other *Bluetooth*® wireless technology enabled host devices including Android, Windows CE, Windows Mobile 5/6.1/6.5 and Windows XP/Vista/7/8/10.

COMPARISON OF *BLUETOOTH*® OPERATING MODES

Our HF/LF RFID *Bluetooth*® readers support two modes of operation over *Bluetooth*®. When connected via USB the reader always supports the TSL ASCII 2 protocol, but when connected over *Bluetooth*® the reader can either be set to use the TSL ASCII 2 protocol (*Bluetooth*® SPP Mode) or it can appear as a *Bluetooth*® keyboard (*Bluetooth*® HID Mode).

The comparison chart below is designed to help you understand the differences between the two operating modes:

Bluetooth® SPP Mode	*Bluetooth*® HID Mode
Apps need to be written with specific support for the Reader	Apps can use the Reader without modification
The Reader can be discovered and paired in the Bluetooth Settings or from within the App but the App controls the connection • Connects when instructed by the App • Disconnects when instructed by the App • The reader powers off when no longer connected and idle • The App needs to connect to restore	Reader is discovered and paired in the Host Bluetooth Settings (often appears as a Keyboard) • After pairing the reader connects automatically • If idle the reader sleeps and the connection is dropped • The reader, when woken, automatically reconnects to the host device
Apps receive and interpret TSL ASCII 2 Protocol responses when the user triggers a HF/LF or barcode scan	Apps receive input as Key strokes from the reader including Tab and Return/Enter keys
The App can respond and react intelligently to responses e.g. • duplicate responses can be ignored or counted • incoming tag data can be truncated, stripped or transformed into alternative representations: Hex, ASCII, GS1 EPC URI, etc…	The reader types text for each barcode/HF/LF scan received • The tag values can be returned in Hex or ASCII representations • Up to 2 Additional characters can be inserted before and after the text sent • The reader cannot truncate or strip values from tag data
The App can change the Reader's behaviour	The Reader can only send scanned data to the host, the host cannot change the reader's behaviour
The Reader's behaviour and command parameters are controlled in real time by the App e.g. the trigger action can change to suit the task that the User is performing; the App can allow the User to specify Inventory output power	The Reader's behaviour, such as the action of the reader's trigger switch, the inventory output power, the idle sleep timeout and other command parameters can be configured only once at start-up.
Configuration is held within the App (any configuration in the AUTO.TXT is likely to be overridden by the App settings)	All configuration is held in an AUTO.TXT file stored on an SD-Card. Removing the SD-card or deleting the AUTO.TXT and power-cycling the unit restores default settings.
All reader activity, by default, is saved to a log file if an SD-Card is fitted.	All reader activity, by default, is saved to a log file if an SD-card is fitted.

CHANGING THE *BLUETOOTH*® OPERATING MODE

TSL® *Bluetooth*® RFID Readers can be operated in *SPP mode* where the Reader is controlled by a custom-written application or in *HID mode*, where the Reader behaves like a *Bluetooth*® Keyboard.

The HID mode has two variants[i] :
1. *HID mode*   Compatible with Android, Windows and Apple devices
2. *HID Apple mode*   Compatible only with Apple devices providing an on-screen keyboard toggle

The *Bluetooth*® operating mode of a TSL® RFID Reader can be changed using the steps detailed below.

PREPARATION:

Download and install the "*TSL PC Firmware Downloader*" from the following download page (free, one time, registration required)

https://www.tsl.com/downloads/tsl-products/2173-downloads/

TO SWITCH TO *BLUETOOTH*® HID MODE:

- First delete existing pairings to the HF/LF reader
- Launch the Firmware Downloader (*Desktop Firmware Loader*)
- Connect the HF/LF reader to the computer using the supplied USB cable.
- The driver should install automatically (*)
- The downloader should prompt as the com port arrives and select the com port automatically ("COMn arrived")
- Select **Action>Reset Bluetooth to HID mode** or **Action>Reset Bluetooth to HID Apple mode** (wait for the process to complete)
- Disconnect the HF/LF reader from the computer (unplug USB)
- Wake the HF/LF reader (pull trigger, blue flashing LED)
- Pair to the reader on the device (it typically appears as a keyboard icon and connects automatically)
- Scanned data should now be typed into the current application on the device

TO SWITCH TO *BLUETOOTH*® SPP MODE:

- First delete existing pairings to the HF/LF reader
- Launch the downloader (*Desktop Firmware Loader*)
- Connect the HF/LF reader to the computer using the supplied USB cable.
- The driver should install automatically (*)
- The downloader should prompt as the com port arrives and select the com port automatically ("COMn arrived")

(*) if not download from here *http://www.ftdichip.com/Drivers/VCP.htm*

- Select **Action>Reset Bluetooth to SPP mode** (wait for the process to complete)
- Disconnect the HF/LF reader from the computer (unplug USB)
- Wake the HF/LF reader (pull trigger, blue flashing LED)
- Pair to the reader on the device

FURTHER INFORMATION

Further information can be found from the Reader Download pages (free, one-time, registration required - see links above)

Application Note – Bluetooth® HID mode: Provides further examples for configuring HID mode
Application Note – Using the Micro SD log and auto-run files: Describes using the AUTO.TXT
TSL ASCII Protocol 2.5 Rev A : Details all the commands including for HID `.st`,`.hs`,`.hc`, and `.hd`

If you encounter any issue while following the above procedure please contact *support@tsl.com* providing the following information:

- The serial number of the HF/LF Reader
- The Firmware version of the HF/LF Reader
- The step at which the procedure failed
- A description of the fault that occurred

SETTING UP A *BLUETOOTH*® CONNECTION WITH AN APPLE PRODUCT

Awaken the 2173 HF/LF Reader by squeezing the trigger, which is confirmed by the flashing of the blue LED. To pair with your iOS device, navigate to the *Bluetooth*® option within the Settings menu on your iOS device.

VIEW LIST OF *BLUETOOTH*® DEVICES (IOS 7 OR GREATER)

iPad® :

Figure 18: List of devices in *Bluetooth*® settings

- Go to the Settings App.
- Select the *Bluetooth*® settings in the left hand column.

iPod® / iPhone® :

Figure 19: Select *Bluetooth*® settings
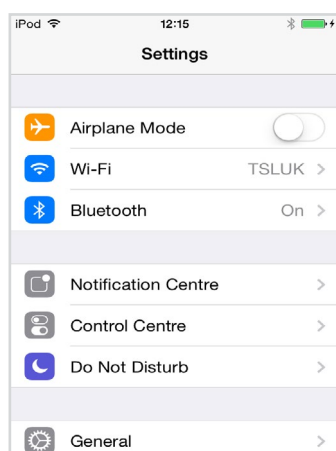
- Go to the Settings App.

Figure 20: List of devices in *Bluetooth*® settings

- Tap on the *Bluetooth*® row to be taken to the *Bluetooth*® settings

PAIR WITH TSL *BLUETOOTH*® DEVICE

In the list of *Bluetooth*® devices, the 2173 HF/LF reader will be identified by its serial number (in the format 2173-xxxxxx or xxxxxx-2173). Click on the corresponding row to pair with the reader.
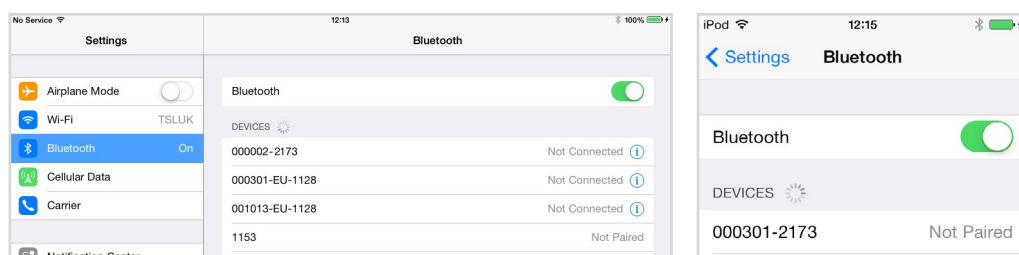
iPad®   iPod® / iPhone®

Figure 21: Identify device

After successfully pairing with the 2173 HF/LF Reader the device will be shown as 'connected'.
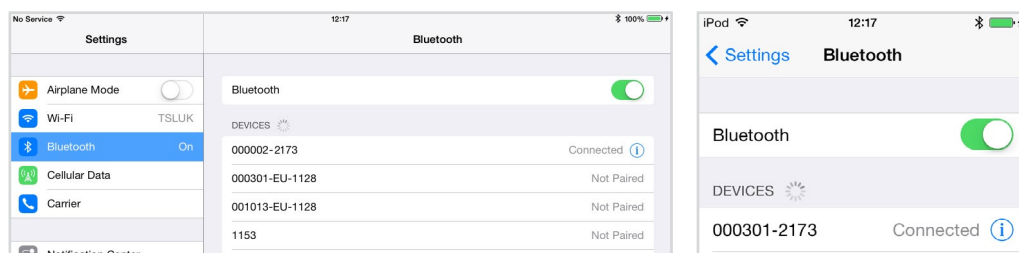
iPad®   iPod® / iPhone®

Figure 22: Device connected

You may also need to set up an additional connection to the 2173 HF/LF Reader within the application you are using.

MICRO SD CARD

A Micro SD card can be installed in to the 2173 reader. The card should be SD/SDHC compatible, formatted in FAT16 or FAT32 and with a capacity of no more than 32 GB.

LOCATION

The Micro SD Card Holder is located inside the battery compartment, and can be accessed by removing both the Battery Cover and Battery.

Figure 23: Micro SD Card Holder Location

INSTALLATION

The top cover of the Micro SD Card Holder must be slid into the correct position in order to lock it.
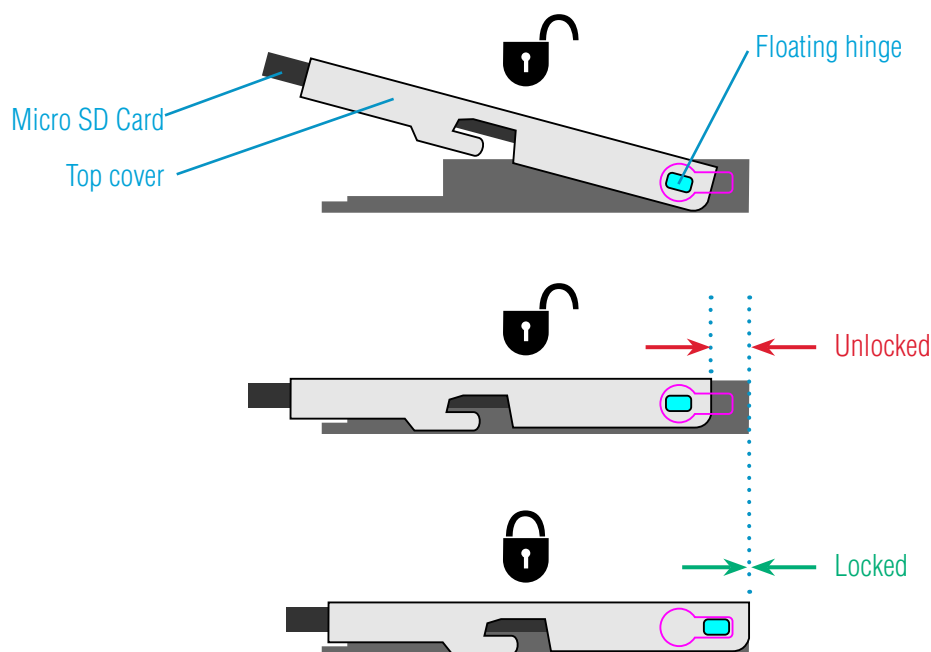
Figure 24: Micro SD Card Holder Slide-to-Lock Mechanism

Please note:

- There is only a small difference between the locked and unlocked postions, so extra care must be taken to ensure the top cover of the Micro SD Card Holder is properly locked in position before replacing the battery.

- If the top cover of the clip is not locked in position, it may snag on the battery during battery installation/ removal and damage the Micro SD Card Holder.

- If the top cover of the clip is forced open without unlocking it first, it will damage the Micro SD Card Holder and may also damage the Micro SD Card.
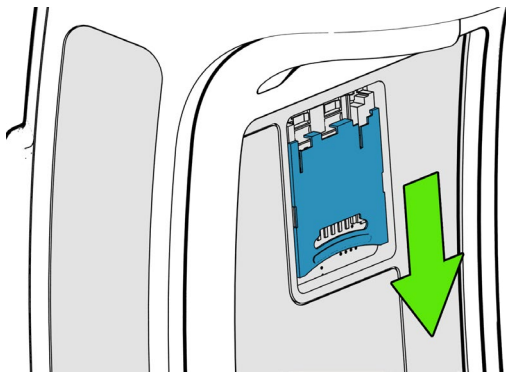
1 Slide top cover downwards to unlock
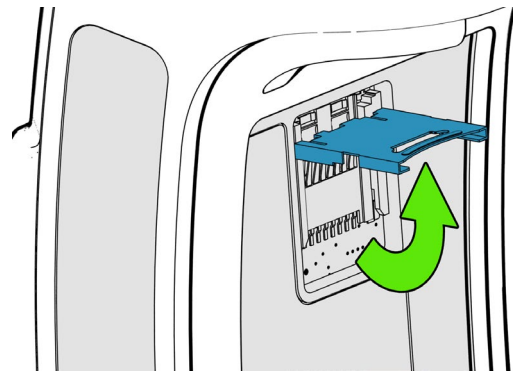
2 Rotate top cover outwards
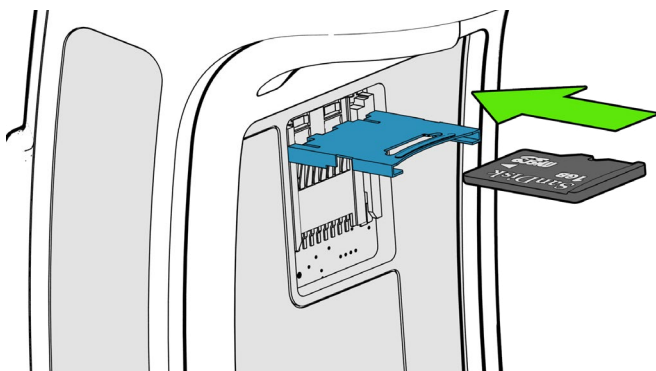
3 Insert Micro SD Card into the top cover (ensure the Micro SD Card is the correct way up)
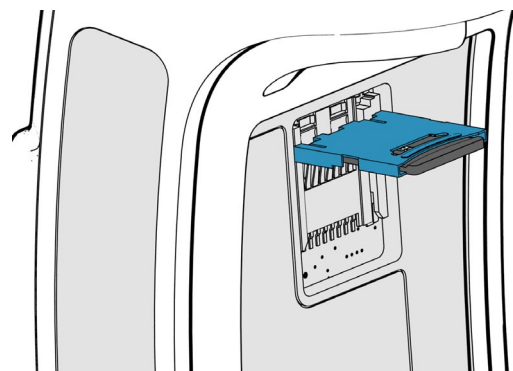
4 Micro SD Card inserted correctly
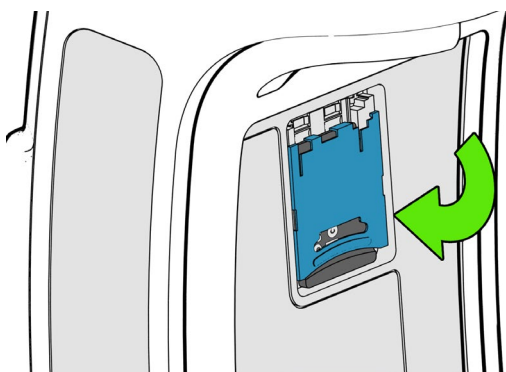
5 Gently close the top cover
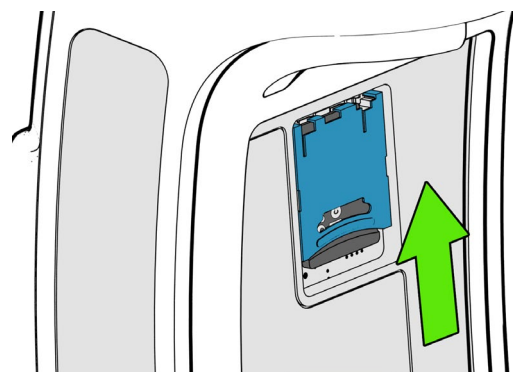
6 Slide top cover upwards to lock

AUTO RUN FILE (AUTO.TXT)

Once an SD card is installed an Auto Run file can be created on the SD card. The Auto Run file contains a list of ASCII 2 commands that are executed as the 2173 powers up. The file should be located at the root of the card and called "AUTO.TXT". Although the file can contain any valid ASCII 2 commands, one per line, it is intended that these have the take no action '-n' flag specified to allow the default parameters for any command to be changed from the firmware defaults as the unit boots without actually executing the command.

For example to change the alert tone from the default high pitch ('hig') to the medium pitch ('med') the line '.al -t med -n' would be appended to the Auto Run file. As is the behaviour with command parameters this will set the tone until a new value is sent with this command. Therefore all commands that have alerts enabled (e.g. '.it') will use the modified medium tone.

The Auto Run file can be created with a text editor, such as Notepad, and copied to the card before it is inserted into the 2173.

LOG FILE (LOG.TXT)

Once an SD card is installed and logging is enabled a log file is created on the SD card. The file is located at the root of the card and called "LOG.TXT". All the lines from every response to every command that is executed by the reader (including those performed from trigger actions) are appended to the end of the file. Events such as Power up are also appended to the file.

The ASCII 2 Read Log File command ('.rl') is provided to enable or disable logging, to read the log file from the card or to delete the log file from the card.

Please note that the log file can quickly become large relative to the speed at which it can be downloaded using the Read Log File Command.

Start of a sample log output:

```
DT: 2019-06-26T16:20:00
EV: Power up
CS: .it
ME: No Transponder found
ER: 005

CS: .it
ID: D0020CA2E14303F0
OK:

CS: .it
ID: E007000006926070
OK:

CS: .it
ID: 1CC770F5
OK:

CS: .it
ID: 04708AFA8B5D81
OK:

CS: .it
ME: No Transponder found
ER: 005

CS: .bc
BC: 1234567890
OK:
```

SOFTWARE DEVELOPMENT

To make full use of the functionality of the 2173 HF/LF Reader, a customised software application will be required.

The new 2173 *Bluetooth*® HF/LF RFID reader incorporates TSL's unique ASCII protocol for faster and easier application development. This sophisticated parameterised ASCII protocol provides the developer a powerful set of commands that carry out multiple actions locally within the *Bluetooth*® reader. This approach enables multiple tag operations executed using simple pre-configured ASCII commands which not only speeds integration of the reader into applications but also abstracts the developer from some of the complexities of the underlying Native API. Simple, text based commands are sent to the reader and responses are returned as text. This allows straightforward access to RFID tag functions such as inventory, read and write. Details of the ASCII command mode are available for download from *https://www.tsl.com/downloads/tsl-products/2173-downloads/*.

TROUBLESHOOTING AND MAINTENANCE

MAINTENANCE

For trouble-free service please observe the following tips when using the 2173 HF/LF Reader:

- Protect the 2173 HF/LF Reader from temperature extremes. Do not leave it on the dashboard of a car on a hot day, and keep it away from heat sources.

TROUBLESHOOTING

Symptoms	Possible cause	Action
Nothing happens when the yellow button is pressed.	If the LEDs are not on then the battery may be flat.	Charge the 2173 HF/LF Reader.
	The 2173 HF/LF Reader may have button actions disabled.	Check the 2173 HF/LF Reader configuration and restore to defaults if unsure.
	Other.	Work through *Troubleshooting Guide* on TSL® Website
The orange LED flashes rapidly when charging.	There is a battery fault.	Replace the battery pack.
	The battery pack temperature is outside recommended limits.	Ensure that charging only occurs between 5°C and 40°C.
The host *Bluetooth*® discovery does not find the 2173 HF/LF Reader.	The 2173 HF/LF Reader has powered off.	Press the yellow button and ensure the blue LED is flashing.
	The 2173 HF/LF Reader is out of range.	Move the 2173 HF/LF Reader closer to the host.
	The *Bluetooth*® friendly name of the 2173 HF/LF Reader has been changed.	Check the *Bluetooth*® friendly name or restore the 2173 HF/LF Reader to factory defaults if unsure.
Opening the *Bluetooth*® virtual com port does not connect to the 2173 HF/LF Reader.	The host has paired to a different *Bluetooth*® device.	Pair to the required 2173 HF/LF Reader.
	The host *Bluetooth*® function has an error.	Warm boot the host. If this does not help, delete the 2173 HF/LF Reader from the favourites list and re-pair.
Bluetooth® pairing fails.	The PIN on the 2173 HF/LF Reader has been changed	Set the *Bluetooth*® PIN to a known value
Other symptoms.	Other fault.	Run *ASCII Remote Diagnostic* and email result to *support@tsl.com* along with a description of the problem.

REGULATORY INFORMATION

INFORMATION TO THE USER – FCC

Federal Communication Commission Interference Statement

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.

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 of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and 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.

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

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

HEALTH AND SAFETY RECOMMENDATIONS

Ergonomic Recommendations

Caution: In order to avoid or minimize the potential risk of ergonomic injury, follow the recommendations below. Consult with your local Health & Safety Manager to ensure that you are adhering to your company's safety programs to prevent employee injury.

- Reduce or eliminate repetitive motion
- Maintain a natural position
- Reduce or eliminate excessive force
- Keep objects that are used frequently within easy reach Perform tasks at correct heights
- Reduce or eliminate vibration

- Reduce or eliminate direct pressure
- Provide adjustable workstations
- Provide adequate clearance
- Provide a suitable working environment
- Improve work procedures.

For vehicle installation and use

An air bag inflates with great force. DO NOT place objects, including either installed or portable wireless equipment, in the area over the air bag or in the air bag deployment area. If in-vehicle wireless equipment is improperly installed and the air bag inflates, serious injury could result.

RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles (including safety systems). Check with the manufacturer or its representative regarding your vehicle. You should also consult the manufacturer of any equipment that has been added to your vehicle.

Power Supply

Use only TSL-approved cradles, chargers and power supplies with the 2173 HF/LF Reader. Use of an alternative power supply will invalidate any approval given to this device, void the warranty for the product and may be dangerous.

BATTERY SAFETY

CAUTION! ⚠

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.

DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting a battery, can result in an explosion.
- Leaving a battery in an extremely high temperature environment can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

For EU Customers: All products at the end of their life must be returned to TSL for recycling. For information on how to return product please contact TSL.

WARRANTY

(A) Warranty

TSL's hardware Products are warranted against defects in workmanship and materials for a period of twelve (12) months from the date of shipment, unless otherwise provided by TSL in writing, provided the Product remains unmodified and is operated under normal and proper conditions. Warranty provisions and durations on software, integrated installed systems, Product modified or designed to meet specific customer specifications ("Custom Products"), remanufactured products, and reconditioned or upgraded products, shall be as provided in the applicable Product specification in effect at the time of purchase or in the accompanying software license.

(B) Spare Parts

Spare parts (i.e. parts, components, or subassemblies sold by TSL for use in the service and maintenance of Products) are warranted against defects in workmanship and materials for a period of thirty (30) days from the date of shipment. Spare parts may be new or originate from returned units under the conditions set forth in subsection D below.

(C) Repair of TSL branded hardware

For repairs on TSL branded hardware Products under this Agreement, including repairs covered by warranty, the repair services provided are warranted against defects in workmanship and materials on the repaired component of the Product for a period of thirty (30) days from the shipment date of the repaired Product, or until the end of the original warranty period, whichever is longer. Any such defects shall be notified to TSL in writing within 7 days of the same becoming apparent.

(D) Product Service

Products may be serviced or manufactured with parts, components, or subassemblies that originate from returned products and that have been tested as meeting applicable specifications for equivalent new material and Products. The sole obligation of TSL for defective hardware Products is limited to repair or replacement (at TSL's option) on a "return to base (RTB)" basis with prior TSL authorisation.

Customer is responsible for prompt shipment to TSL and assumes all costs and risks associated with this transportation; return shipment to the Customer will be at TSL's expense. Customer shall be responsible for return shipment charges for product returned where TSL determines there is no defect ("No Defect Found"), or for product returned that TSL determines is not eligible for warranty repair. No charge will be made to Buyer for replacement parts for warranty repairs. TSL is not responsible for any damage to or loss of any software programs, data or removable data storage media, or the restoration or reinstallation of any software programs or data other than the software, if any, installed by TSL during manufacture of the Product.

(E) Original Warranty Period

Except for the warranty applying solely to the repaired component arising from a repair service as provided in Section C above, the aforementioned provisions do not extend the original warranty period of any Product that had either been repaired or replaced by TSL.

(F) Warranty Provisions

The above warranty provisions shall not apply to any Product:
(i) which has been repaired, tampered with, altered or modified, except by TSL's authorized service personnel;
(ii) in which the defects or damage to the Product result from normal wear and tear, misuse, negligence, improper storage, water or other liquids, battery leakage, use of parts or accessories not approved or supplied by TSL, or failure to perform operator handling and scheduled maintenance instructions supplied by TSL;
(iii) which has been subjected to unusual physical or electrical stress, abuse, or accident, or forces or exposure beyond normal use within the specified operational and environmental parameters set forth in the applicable Product specification; nor shall the above warranty provisions apply to any expendable or consumable items, such as batteries, supplied with the Product.

EXCEPT FOR THE WARRANTY OF TITLE AND THE EXPRESS WARRANTIES STATED ABOVE, TSL DISCLAIMS ALL WARRANTIES ON PRODUCTS FURNISHED HEREUNDER INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE. ANY IMPLIED WARRANTIES THAT MAY BE IMPOSED BY LAW ARE LIMITED IN DURATION TO THE LIMITED WARRANTY PERIOD. SOME STATES OR COUNTRIES DO NOT ALLOW A LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR CONSUMER PRODUCTS. IN SUCH STATES OR COUNTRIES, FOR SUCH PRODUCTS, SOME EXCLUSIONS OR LIMITATIONS OF THIS LIMITED WARRANTY MAY NOT APPLY.

The stated express warranties are in lieu of all obligations or liabilities on the part of TSL for damages, including but not limited to, special, indirect or consequential damages arising out of or in connection with the use or performance of the Product or service. TSL's liability for damages to Buyer or others resulting from the use of any Product or service furnished hereunder shall in no way exceed the purchase price of said Product or the fair market value of said service, except in instances of injury to persons or property.

TSL is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty. If the original shipping container was not kept, contact your local distributor or TSL to have another sent to you.

TSL shall not be responsible for any injury, damage or loss of whatever kind caused directly or indirectly by the goods whether as a result of their manufacture, operation, use or otherwise and the customer shall indemnify TSL from any claim arising from any loss suffered by any third party.

ABOUT

ABOUT TSL®

TECHNOLOGY SOLUTIONS UK LTD
part of **HID**

Technology Solutions UK Ltd (TSL®), part of HID Global, is a leading manufacturer of high performance mobile RFID readers used to identify and track products, assets, data or personnel.

For over two decades, TSL® has delivered innovative data capture solutions to Fortune 500 companies around the world using a global network of distributors and system integrators. Specialist in-house teams design all aspects of the finished products and software ecosystems, including electronics, firmware, application development tools, RF design and injection mould tooling.

TSL® is an ISO 9001:2015 certified company.

ISO 9001: 2015

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ABOUT HID GLOBAL

HID®

HID Global powers the trusted identities of the world's people, places and things. We make it possible for people to transact safely, work productively and travel freely. Our trusted identity solutions give **people** convenient access to physical and digital **places** and connect **things** that can be identified, verified and tracked digitally. Millions of people around the world use HID products and services to navigate their everyday lives, and billions of things are connected through HID technology. We work with governments, educational institutions, hospitals, financial institutions, industrial businesses and some of the most innovative companies on the planet. Headquartered in Austin, Texas, HID Global has over 4,000 employees worldwide and operates international offices that support more than 100 countries. HID Global is an ASSA ABLOY Group brand.

For more information, visit www.hidglobal.com.

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