TECHNOLOGY SOLUTIONS UK LTD
part of **HID**

2166 *BLUETOOTH*® RUGGED UHF RFID READER

EXTRA-TOUGH, HIGH PERFORMANCE, LONG RANGE RFID READING WITH EPOP-LOQ® CONNECTIVITY AND CHARGING

Instantly Connect Your Devices

The 2166 UHF RFID Reader features the new TSL® ePop-Loq® connector. The patented ePop-Loq® system allows data and charge connections to be passed from the reader to an attached device, such as a smartphone or handheld terminal.

The ePop-Loq® system is designed to safely separate when the reader is subject to large impacts, such as when dropped.

Single Point Charge Solution

The 2166 Docking Station allows charging of both the 2166 UHF RFID Reader and a smartphone or handheld terminal attached via an ePop-Loq® mount. The unique design can accommodate a wide range of devices from many handheld and smartphone manufacturers. The 2166 Docking Station Kit is supplied separately and includes the docking station, power supply unit and a Mini USB data cable.

A Tough-Enough UHF RFID Reader

The new 2166 *Bluetooth*® Rugged UHF RFID reader from TSL® provides high performance UHF RFID reading in a tough and rugged form factor. The reader is highly resistant to water, dust and mechanical trauma. A high capacity battery enables non-stop operation of the reader over the full working day. Designed to read and write to EPC Class 1 Gen 2 (ISO18000-6C) tags, the 2166 can also be configured with class leading high performance 2D data scanning to bring unparalleled data collection capabilities to any host it is connected to.

Platform Independence

Use existing *Bluetooth*® wireless technology enabled[1] host devices including Enterprise Handhelds, Consumer Phones, Touchscreen MP3 players, Tablets and PC's – the 2166 will bring high performance RFID and 2D scanning to all these devices running a wide range of Operating Systems.

Extensive software support is available for a wide range of platforms including code samples, demonstration applications and source code.

Batch Mode

Transponder EPC readings can optionally be stored on the embedded Micro SD card, meaning that the 2166 UHF RFID Reader can be used independently of a host device. The 2166 can store over 250 million* transponder EPCs - date and time stamped by the on-board Real Time Clock. The internal storage can be directly mounted in a Windows environment using the 2166 Docking Station Kit (separate purchase).

Speedy integration - ASCII 2 Protocol

The new 2166 Rugged *Bluetooth*® UHF 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 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 and ultimately results in un-paralleled levels of performance.

Features:

High Performance *Bluetooth*® Multi-modal Data Capture
UHF RFID and 2D barcode data capture in one integrated *Bluetooth*® device.

Hardware Platform Independence
Operates with wide variety of *Bluetooth*® wireless technology enabled host devices including touchscreen MP3 players, phones, tablets, Enterprise Handhelds and PC's.

OS Independence
Operates with iOS, Windows Mobile, Windows Phone 8, WinCE, Windows 10/8/7/Vista/XP and Android™.

Batch Mode Operation
Real time clock for extended batch data collection independent of host connection. Store millions of tags and barcodes with date and time stamping

High Performance barcode scanning
A range of optional barcode engines can be specified to provide 2D data capture up to 15m

Made for 🎵 iPod 📱 iPhone 📱 iPad

❋ **Bluetooth**®

20th July 2023

2166 SPECIFICATIONS*

*These specifications only apply to TSL 2166 Readers with serial numbers higher than 7000.

Physical and Environmental Characteristics

Dimensions:	178.7 x 107.3 x 173.1 mm (LxWxH).
Weight:	865 g / 30.5 oz (including battery).
User input:	Single stage trigger.
User feedback:	Speaker, vibration motor, LEDs.
Power:	Rechargeable Lithium Ion removeable battery pack (11.25V, 2950mAh, 33.2Wh).
Minimum operating time[1]:	Light use[2]: 25 hrs Moderate use[3]: 18 hrs Heavy use[4]: 10.5 hrs
Input Rating:	15.0Vdc, 4.34A.
Enclosure materials:	Polycarbonate and TPU.

Performance Characteristics

RFID engine:	TSL® custom module with embedded Impinj R2000.
Communication protocols:	TSL® ASCII 2.0 parameterised command set.
Memory:	Embedded 16GB* NAND storage card - store up to 250 million date and time stamped EPCs * For units manufactured in August 2020 onwards. Units sold before this time will have 8GB of storage.
Compatible Host devices (Bluetooth®):	Any Bluetooth® Host[5] 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 55°C (14°F to 131°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 +20°C (-4°F to 68°F).
Humidity:	5% to 85% non-condensing.
Drop Spec:	1.8m.
Tumble:	1500 0.5 metre tumbles at room temperature (3,000 cycles).
Environmental Sealing:	IP67*.
Electrostatic Discharge (ESD):	± 15kVdc air discharge; ± 8kVdc contact discharge.
MIL-STD 810F:	Meets and exceeds applicable MIL-STD 810F for drop, tumble and sealing.

RFID Performance

Standards supported:	EPC Class 1 Gen 2 and EPC C1G2 (TBD).
Nominal read range[6]:	Up to 9 m (29.5 ft).
Nominal write range[6]:	Up to 4 m (13.1 ft).

Field:	110-degree forward facing (approx.) measured from front of device.
Antenna:	Circularly Polarized.
Frequency Range:	EU: 865-868MHz; US: 902-928MHz.
Maximum Output Power:	Up to 30 dBm (region dependent) + 4.0 dBiC Antenna.

`Please note; that this IP rating only applies to units with serials numbers ending in -000800 or higher

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).

Ranges[7]:	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[8]:	Up to 100m.
Bluetooth® Pairing:	Simple Secure Pairing, NFC OOB Pairing.
Direct USB	Connection via ePop-Loq® cases (separate purchase).

[1] Minimum operating time figures are based on new units that have been stored, charged and operated within the stated Environmental Specifications. Units stored over 3 months must be recharged every 3 months. Number of transponders in the environment affects minimum operating time.

[2] Light Use: Continuous RFID inventories for 20s of every 120s

[3] Moderate Use: Continuous RFID inventories for 10s of every 30s

[4] Heavy Use: Continuous RFID inventories for 59s of every 60s

[5] Compatible Bluetooth® stack required in the Host device

[6] Tag Read/Write performance is dependent on tag type, items tagged, number of tags in the field and other radio and environmental factors

[7] Artificial lighting can affect scanning performance

[8] Open field

20th July 2023

2166 SPECIFICATIONS*

*These specifications only apply to TSL 2166 Readers with serial numbers higher than 7000.

Peripherals and Accessories

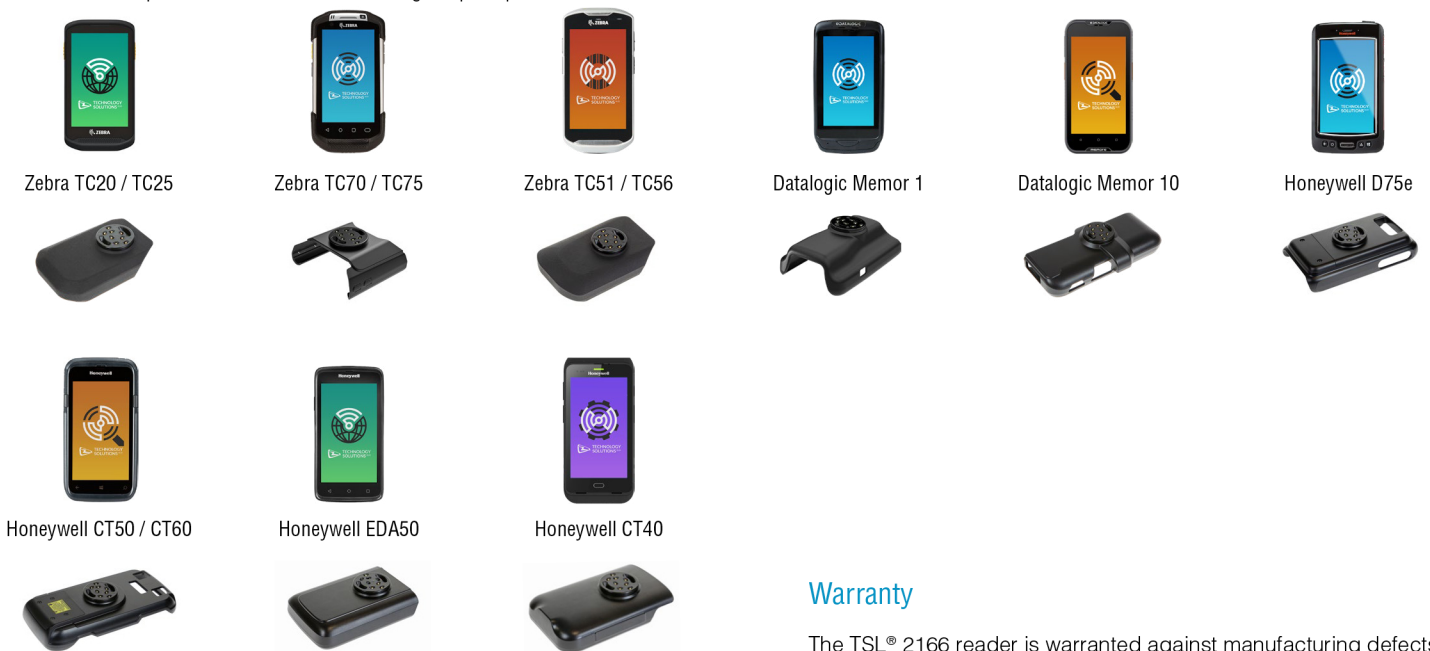|	
External interface:	8-way sealed connector with gold plated contacts.
Bundled items:	Battery.
Other accessories available:	Docking Station with power supply and Mini USB cable. Adapter mounts for a variety of smartphones and handheld terminals.

Regulatory

Regions	EU (CE), USA (FCC), Canada (see page 4 for details)
FCC ID	S6J2166
IC	8948A-2166
EMC	EN 55032:2015 +AC:2016 EN 55024:2010 +A1:2015 EN 301 489-1 V2.2.0 47 CFR Part 15B 15.107, 15.109 ICES-003 Issue 6

RF	EN 300 328 V2.1.1 EN 302 208 V3.1.1 EN 301 489-3 V2.1.1 EN 301 489-17 V3.2.0 47 CFR Part 15C 15.247 RSS-247 Issue 2
RF Exposure	EN 50566:2017 EN 62209-2:2010 EN 50663:2017 EN 62479:2010 47 CFR Part 2.1093 RSS-102 Issue 5
Electrical Safety	IEC 62368-1:2014 CB EN 62368-1:2014 +A11:2017 UL 62368-1:2014 CAN/CSA C22.2 No. 62368-1-14
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

MOUNTS

Connect Enterprise Hand-Held Terminals using ePop-Loq® mounts:

Zebra TC20 / TC25

Zebra TC70 / TC75

Zebra TC51 / TC56

Datalogic Memor 1

Datalogic Memor 10

Honeywell D75e

Honeywell CT50 / CT60

Honeywell EDA50

Honeywell CT40

TSL® RFID Apps

RFID Explorer
www.tsl.com/apps/rfid-explorer

RFID Tag Finder
www.tsl.com/apps/rfid-tag-finder

RFID Web Wedge
www.tsl.com/apps/rfid-web-wedge

RFID Scan Scan Write
www.tsl.com/apps/rfid-scan-scan-write

TSL® Reader Configuration
www.tsl.com/apps/tsl-reader-configuration

Warranty

The TSL® 2166 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.

Terms

"Made for iPod," "Made for iPhone," and "Made for iPad" mean that an electronic accessory has been designed to connect specifically to iPod, iPhone, or iPad, respectively, and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPod, iPhone, or iPad may affect wireless performance.
iPad, iPhone, iPod and iPod touch are trademarks of Apple Inc., registered in the U.S. and other countries.

The *Bluetooth*® word mark and logos are registered trademarks owned by *Bluetooth* SIG, Inc. and any use of such marks by Technology Solutions UK Ltd is under license. Other trademarks and trade names are those of their respective owners.

20th July 2023

2166 PART NUMBERS

Countries			Part Numbers	Operating Frequency
Albania Andorra Austria Belgium Bhutan Bosnia & Herzegovina Bulgaria Croatia Cyprus Czech Republic Denmark Estonia Falkland Islands Finland France French Guiana	Georgia (Licence Required) Germany Greece Greenland Guernsey Guadeloupe Hungary Iceland Ireland Italy Jersey Latvia Liechtenstein Lithuania Luxembourg Macedonia	Malta Martinique Monaco Montenegro Netherlands Norway Poland Portugal Romania Slovakia Slovenia Spain Sweden Switzerland United Kingdom (UK) Zimbabwe	With 2D barcode imager: 2166-ES1 No barcode imager: 2166-EX1	865 – 868 MHz 4 Channels
United States of America (USA) Guam Guatemala Northern Mariana Islands	Canada Ecuador Puerto Rico		With 2D barcode imager: 2166-AS1 No barcode imager: 2166-AX1	902 – 928 MHz 50 Channels
Bangladesh			2166-AS1-BD 2166-AX1-BD	925 – 927 MHz 4 Channels
Colombia			2166-AS1-CO 2166-AX1-CO	915 – 928 MHz 24 Channels

If you are interested in purchasing for a country/region that is not listed above, please contact enquiries@tsl.com for assistance.

Accessories	Part Numbers
1166/2166 Docking Station Kit, 65W PSU and Mini USB lead	1166-CRD-01-KIT
Line Cord (UK Plug, 1m)	IEC-1M-UK
Line Cord (US Plug, 1.8m)	IEC-1.8M-US
Line Cord (EU Plug, 1.8m)	IEC-1.8M-EU
1166/2166 External Battery Charger. Includes PSU and UK Line Cord	1166-BC-UK
1166/2166 External Battery Charger. Includes PSU and US Line Cord	1166-BC-US
1166/2166 External Battery Charger. Includes PSU and EU Line Cord	1166-BC-EU
Spare Battery - Rechargeable Lithium Polymer for 1166/2166 UHF Reader	1166-00-BA-3000

ABOUT TSL®

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

ABOUT HID GLOBAL

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.

Technology Solutions (UK) Ltd reserves the right to change its products, specifications and services at any time without notice.

1 (888) 238-1155 Inside USA • 1 (205) 383-2244 Outside USA
info@atlasRFIDstore.com • www.atlasRFIDstore.com

atlasRFIDstore.com