TECHNOLOGY SOLUTIONS UK LTD
part of HID

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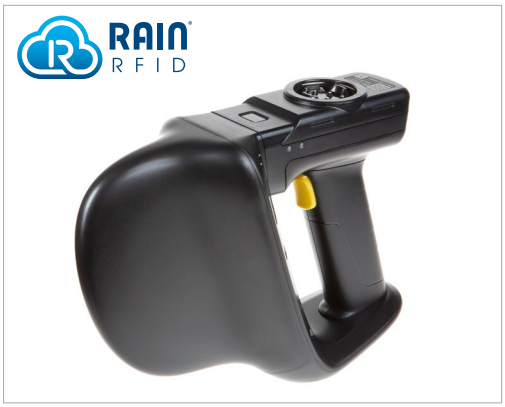
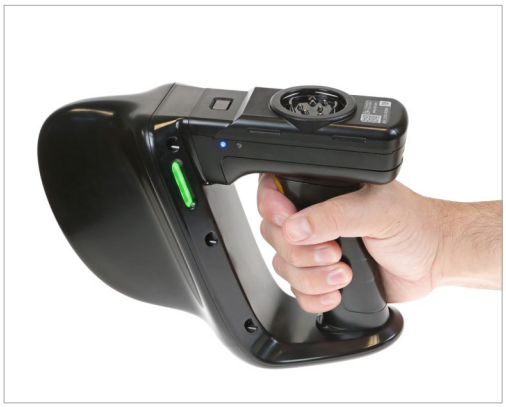
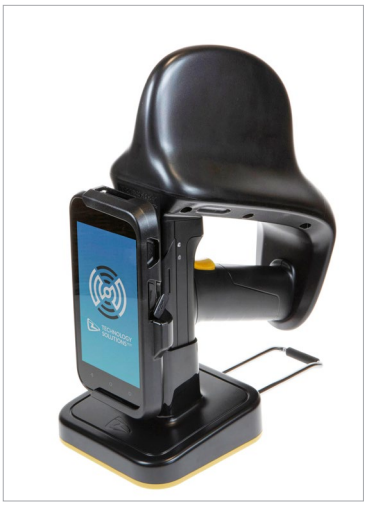
2128L *BLUETOOTH*® UHF RFID RAIN READER

LONG RANGE UHF RFID READING USING A LINEARLY POLARISED ANTENNA







Linear Antenna for Maximum Read Range

The 2128L RAIN RFID UHF Reader uses a high gain linear antenna to provides the greatest read ranges of all of TSL's handheld RFID readers - up to 15m (49ft) of read range. The Linear Antenna is tuned to give exceptional scanning performance to both the front and sides of the antenna, particularly useful in applications where longer read range is required or where there is a very dense collection of tags.

An Important Note on Linear Antennas and Tag Orientation

Unlike other TSL UHF RFID readers, the 2128L Reader uses a *linearly* polarised antenna. This enables far greater read ranges, but *tag orientation is critical.* If the tag is not in the same orientation as the polarisation read range will be drastically reduced.

For use cases where tags can be orientated to match the reader (e.g. this could be arranged in garment tracking applications), the 2128L provides an ideal solution with the greatest possible read range performance.

Enhanced Modes of Operation

The 2128L RAIN RFID Reader can provide in-reader tag de-duplication for more than 50,000 unique tags from more than 1 million tag reads. In addition the Reader can store on-board (using the embedded micro SD card) more than 250 million* unique tags with date and time stamping for a truly powerful batch collection mode of operation.

Sophisticated user feedback provides the most configurable, in-depth and capable 'search and find' features currently available.

Connect Devices Using ePop-Loq

The 2128L RAIN RFID Reader features the 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.

Single Point Charge Solution

The 2128-CRD-02 Docking Cradle allows charging of both the 2128L RAIN RFID Reader and a smartphone or handheld terminal attached via an ePop-Loq mount. This unique design can accommodate a wide range of devices from many handheld and smartphone manufacturers. The 2128L Docking Cradle Kit is supplied separately and includes the docking cradle, power supply unit and a USB data cable.

Powerful and Comprehensive Software Development Tools

Applications developed for the 1128, 2128P 1153, 1166, 3138 or 3166 RAIN RFID Readers can easily be configured to work with the 2128L, as all of these readers share TSL's unique 'ASCII Protocol'. This sophisticated, parameterised set of commands carry out multiple actions locally within the reader. This approach enables multiple tag operations to be executed using simple pre-configured ASCII commands which speeds up integration of the reader into applications.

Flexible *Bluetooth* Connectivity

The 2128L supports both *Bluetooth* Classic as well as *Bluetooth* Low Energy (BLE). The reader can be operated in Serial Port Profile (SPP) or Human Interface Device mode (HID), as well as supporting iApp2 for Apple iOS devices. The reader also supports an automatic re-connect mode for both Android and Apple devices.

Ultra Secure Data Gathering Option

As the ePop-Loq system provides a wired connection between the host device and RFID Reader, sensitive data can be given that extra level of security by avoiding the use of wireless data transfer.

Features:

Wide Area Scanning
High Performance Linearly Polarised UHF RFID Antenna enables a wide beam shape ideal for retail applications.

Hardware Platform Independence
Operates with wide variety of *Bluetooth* wireless technology enabled host devices from smartphones to tablets, laptops and desktop computers.

OS Independence
The reader is compatible with Android, iOS and Windows.

Integrated ePop-Loq Socket
A smarter way of mounting devices to the RAIN RFID Reader.

Bluetooth LE Support
Lower power consumption and longer battery life.

Direct USB Connection
For increased security of data transfer via ePop-Loq mounts.

Bluetooth®

Made for iPod iPhone iPad

* For units manufactured in August 2020 onwards.

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2128L SPECIFICATIONS

Physical and Environmental Characteristics

Dimensions:	240 x 88 x 180 mm (LxWxH).
Weight:	700 g (including integrated battery).
User input:	Trigger button.
User feedback:	Speaker, vibration motor, LED - user configurable.
Power:	Integrated 3.6V, 6700mAh, 24Wh Lithium Polymer pack.
Minimum operating time[1]:	Light use[2]: 22.5 hrs Moderate use[3]: 15.5 hrs Heavy use[4]: 7 hrs
Input Rating:	5.2VDC, 4.0A.
Enclosure materials:	Polycarbonate.

Performance Characteristics

RFID engine:	TSL custom module.
Communication protocols:	TSL ASCII 2.0 parameterised command set and Impinj binary protocol.
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). See *Bluetooth* Mode Comparison.
Compatible Host devices (USB):	Any USB host with FTDI VCP driver support (Windows, Linux, Mac, Android).

Environmental

Operating Temp.:	-10°C to 50°C (14°F to 122°F).
Charging Temp.:	0°C to 45°C (32°F to 113°F).
Storage Temp.:	Less than 1 month at -20°C to +45°C (-4°F to 113°F). Less than 6 months at -20°C to +35°C (-4°F to 95°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).
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.
Nominal read range[6]:	Up to 15 m (49 ft) - correct tag orientation is essential
Nominal write range[6]:	Up to 6 m (19.6 ft) - correct tag orientation is essential
Antenna:	Linearly Polarised with field shaping.
Frequency Range:	865 - 868 MHz (EX1 variant). 902 - 928 MHz (AX1 variant).
Maximum Output Power:	Up to 28 dBm (region dependent) + 7.0 dBi Antenna.

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[7]:	Up to 100m.
Bluetooth Pairing:	Simple Secure Pairing, NFC OOB Pairing.
Direct USB	USB connection to handheld terminal via ePop-Loq cases (separate purchase).

Peripherals and Accessories

External interface:	Custom connector - requires Docking Cradle 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.
Desktop charger:	TSL 2128-CRD-02 Docking Cradle (separate purchase).
Other Accessories:	New ePop-Loq cases can be ordered by special request (volume dependent, lead times apply).

[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] Open field

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2128L SPECIFICATIONS

Regulatory

Regions	EU (CE), USA (FCC) - see page 4 for details.
FCC ID	S6J2128L
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
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
RF Exposure	EN 50566:2017 EN 62209-2:2010 EN 50663:2017 EN 62479:2010 47 CFR Part 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

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 2128L 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.

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.

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2128L PART NUMBERS

Countries	Part Numbers	Operating Frequency
Albania Andorra Austria Belgium 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)	2128L-EX1	865 – 868 MHz 4 Channels
United States of America (USA) Guam Guatemala Northern Mariana Islands Ecuador Puerto Rico	2128L-AX1	902 – 928 MHz 50 Channels
Bangladesh	2128L-AX1-BD	925 – 927 MHz 4 Channels
Brazil (Licensed via ACURA)	2128L-AX1-BR	902 – 907.5, 915 – 928 MHz 50 Channels
Colombia	2128L-AX1-CO	915 – 928 MHz 24 Channels
India	2128L-EX1-IN	865 – 867 MHz 4 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
Docking Station, Power Supply, Support Bar and Mini USB Cable	2128-CRD-02-KIT

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MOUNTING A HOST DEVICE ON THE UHF READER

You can physically connect Enterprise Hand-Held Terminals to your UHF RFID Reader using ePop-Loq® mounts. These custom made mounts can provide direct USB charge and data connections (when available) between the Reader and host device. To enquire about ePop-Loq mounts for devices not listed below, please contact enquiries@tsl.com.


Datalogic Memor 10/11


Datalogic Memor 12/17


Datalogic Memor 30/35


Honeywell CT40/45/45XP/47


Honeywell CT50/60


Honeywell D75e

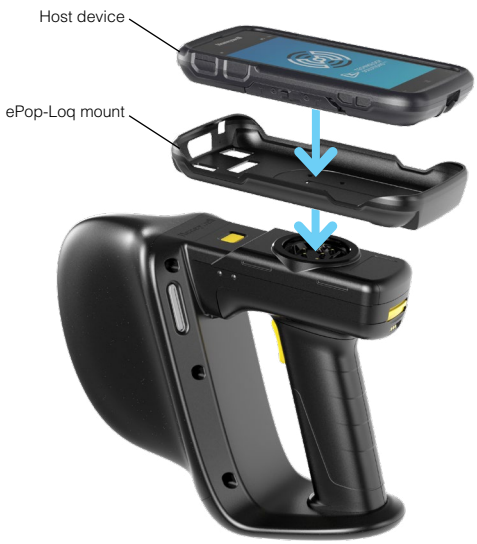

Honeywell EDA50/51


Janam XT30/40


Zebra TC22/27


Zebra TC51/52/56/67

Device Mount	Part Numbers
ePop-Loq Mount for Datalogic Memor 10/11	2108-A-EPL-CASE
ePop-Loq Mount for Datalogic Memor 12/17	2118-A-EPL-CASE
ePop-Loq Mount for Datalogic Memor 30/35	2117-A-EPL-CASE
ePop-Loq Mount for Honeywell CT40, CT45/ CT45XP and CT47 (CT47: Charging only)	2103-A-EPL-CASE-V2
ePop-Loq Mount for Honeywell CT50/CT60	1192-A-EPL-CASE
ePop-Loq Mount for Honeywell D75e	1190-A-EPL-CASE
ePop-Loq Mount for Honeywell EDA50	1195-C-EPL-CASE
ePop-Loq Mount for Honeywell EDA51	1217-C-EPL-CASE
ePop-Loq Mount for Janam XT30/XT40	ATC-XT-01 (order through Janam Technologies)
ePop-Loq Mount for Xiaomi Mi A2	2106-A-EPL-CASE
ePop-Loq Mount for Zebra TC22/TC27	2119-A-EPL-CASE
ePop-Loq Mount for Zebra TC51/52/56/57	1199-A-EPL-CASE



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ABOUT TSL

Technology Solutions UK Ltd (TSL®), part of HID, 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

HID 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 has over 4,000 employees worldwide and operates international offices that support more than 100 countries. HID is an ASSA ABLOY Group brand.

For more information, visit www.hidglobal.com.

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