TSL Multi-Technology Card Reader

With a compact slimline design and a range of options and features, the TSL Multi-Technology Card Reader series has a solution for every environment. Support for RS-485, OSDP and Wiegand communication interfaces, along with leading credential technologies, enables rapid deployment of secure access control technology.

Available in three sizes, with multiple technology reading capabilities, an optional keypad and the choice of black or white. Select the model that fits the access needs and decor of any installation.

Feature Highlights

- Multi-card technology provides support for DESFire, MIFARE and 125kHz cards from a single reader
- Bluetooth® / NFC credential reading
- 125kHz PSK and G-Prox II support
- Encrypted RS-485, OSDP with secure channel or standard Wiegand connection
- EAL6+ Secure Access Module (SAM) for robust protection of encryption keys
- Custom encryption keys for MIFARE and DESFire credentials
- Programmable using a convenient mobile app
- Live over-the-network firmware updates
- Three convenient sizes suit a range of installation needs
- 16-color LED strip for configurable status display
- Keep alive transmission for intelligent tamper management
- Fully encapsulated design with environmental IP Rating of IP65 for outdoor and indoor operation

Optional Features

A range of optional features means there is a model to suit everyone.

> Available with or without capacitive touch keypad
> Choose from 13.56MHz MIFARE/DESFire or a multi-technology reader that combines both 125kHz proximity and 13.56MHz formats in a single unit
> Opt for either black or white according to your decor

Multi-Card Technology

TSL Readers can read a range of different card types:

> 13.56MHz smart cards (MIFARE and DESFire)
> 125kHz low frequency cards, including native PSK (phase-shift keying) and G-Prox II support

The multi-technology reader combines both capabilities in a single unit, delivering a migration pathway for sites to transition from older cards to the latest technology. This is ideal for organizations that don't want to replace all of their existing cards at once.

Bluetooth® / NFC Credential Reading

Bluetooth® / NFC capability enables you to use your smartphone as your access credential for maximum convenience.

Equipped with support for most modern iOS and Android devices, you can unlock the door using a unique access credential that is entered against your user record in Protege, and authenticated by a secure cloud based server.

Secure Access Module (SAM)

The TSL Reader protects all encrypted communications with an EAL6+ certified Secure Access Module (SAM), greatly enhancing cybersecurity compared to the previous generation of card readers.

The SAM is a dedicated cryptographic chip that safeguards encryption keys and handles encryption and decryption processes whenever the reader communicates with credentials or other hardware. The isolated 'black box' chip provides the highest possible level of security for private encryption keys, making it much more difficult for attackers to access them.

Live Over-the-Network Firmware Updates

TSL Readers can be upgraded directly from the controller's web interface—no need to remove card readers from the wall, reconfigure the wiring or schedule downtime.

The live update process is designed to minimize disruption to the site's operation. The reader will remain operational and respond to card badges and PINs as normal while the controller uploads the firmware package via the RS-485 network. The TSL Reader then does a quick reboot and comes back online with the new firmware.

In addition, the TSL Reader uses signature verification to confirm the authenticity of firmware updates, ensuring that only firmware files from a trusted source will be accepted.

Flexible Communication

TSL Readers offer multiple communication protocols for maximum installation flexibility:

> The industry-standard OSDP 2.2 protocol provides the best security and compatibility with Protege and third-party systems. Using secure channel communications, each reader is paired with the controller or reader expander with a unique AES-128 bit encryption key. RS-485 wiring is easier to deploy, more cost-effective and allows for longer cable runs than traditional Wiegand wiring.

> ICT RS-485 configuration provides fast, flexible and encrypted communication with Protege systems.

> Wiegand wiring is ideal for compatibility with all standard access control systems. This wiring method is useful for transitioning existing sites, but is not recommended for new installations as it is not encrypted.

Many advanced features are only available in OSDP or ICT RS-485 configurations. When you are designing or transitioning a site, consider which features the system owner may need now or in the future.

Feature	OSDP	ICT RS-485	Wiegand
Card reading	✓	✓	✓
ICT mobile credentials	✓	✓	✓
PIN codes (PIN pad models only)	✓	✓	✓
Encrypted Communications	✓	✓	✗
Custom LED colors	✓ *OSDP supports a limited range of colors.*	✓	✗
Over-the-network firmware updates	✓	✓	✗
Mobile wallet (forthcoming)	✓	✓	✗
Offline wireless lock support	✓	✗	✗
Maximum cable run	900m (3000ft)	900m (3000ft)	150m (490ft)

Configurable LED Strip

The card reader provides the ability to change the color of the LED strip (16 colors available) to show when a function has started, succeeded or failed. For example, for a function that is used to arm an area you might set the LED to change to orange to show that the function has started, yellow to show that the area has armed successfully, and red to indicate when the function has failed.

*This feature is only supported when wired using RS-485.

Convenient Programming

The convenient Protege Config App allows you to easily program a wide range of card reader functionality.

Offline Wireless Lock Support

TSL readers form an essential component of the ICT offline wireless locking system. In this system, all programming, access data and events are carried on user cards and mobile devices. TSL readers at key locations in the building act as **update points**, updating access data and retrieving events whenever a user badges their credential.

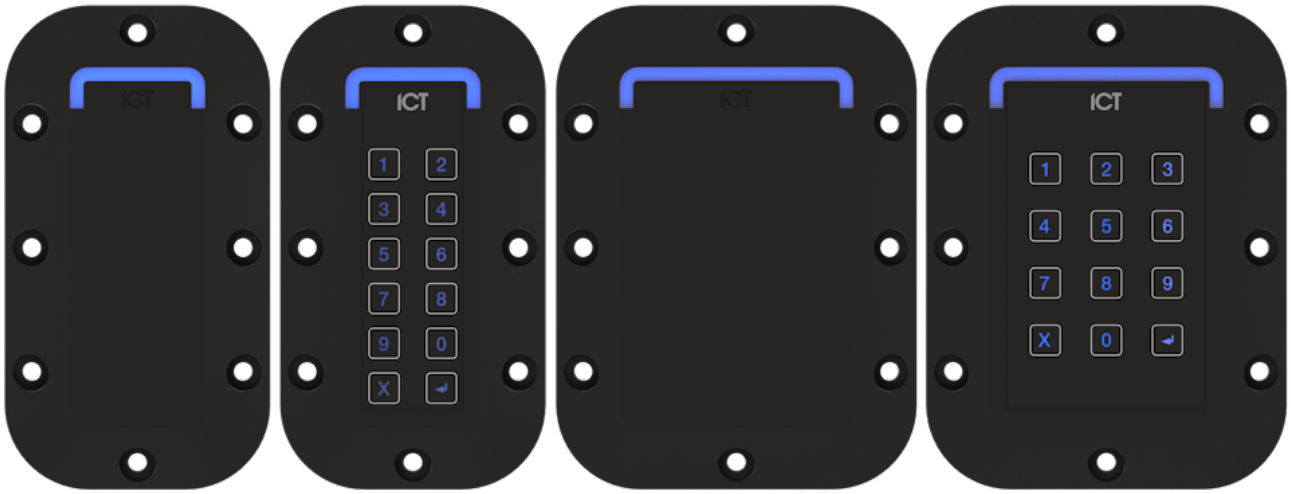
IP65 Protection

The IP65 environmental rating provides a high degree of protection from the elements, making the reader suitable for harsh environments. Readers can be mounted indoors or outdoors, located anywhere from the car park gate to the office door.

Optional Vandal Resistant Cover

Designed to withstand some of the harshest environments, the optional vandal resistant cover is ideal for locations where a card reader may be exposed to damage, including corridors, parking buildings, correctional facilities, and other public places.

Highly resistant to impact, such as from the swing of a hammer or baseball bat, its robust construction provides greater durability and protection against vandalism and malicious damage.



The flush design also serves as an anti-ligature measure for an additional level of safety.

*Mounted correctly the vandal resistant cover is compliant to **DHF TS 001:2013** Enhanced Requirements & Test Methods For Anti-Ligature Hardware to Grade B4 for vertical direction devices, and to impact level **IK10**.*

For installation instructions, see the *TSL Multi-Technology Card Reader Installation Manual.*

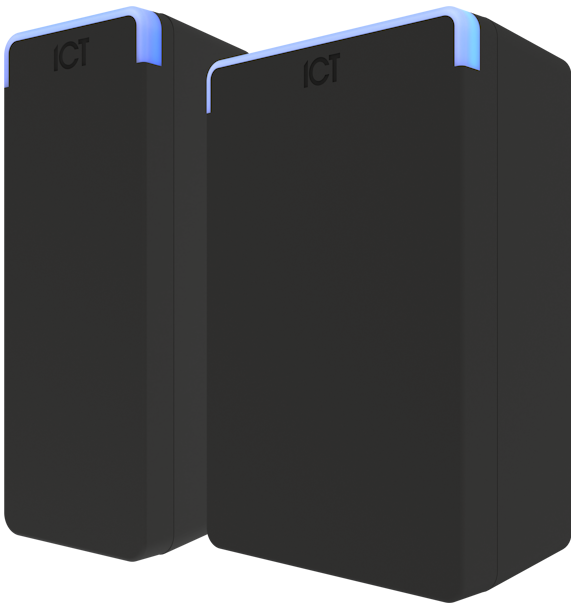
Ordering Codes

Accessory	Ordering Code
TSL Standard Reader VRC	TSL-VRC-STD-B
TSL Standard Reader with Keypad VRC	TSL-VRC-STD-KP-B
TSL Extra Reader VRC	TSL-VRC-EXTRA-B
TSL Extra Reader with Keypad VRC	TSL-VRC-EXTRA-KP-B

* The vandal resistant cover accessory is currently not available for the TSL Mini reader. If this is required please register your interest with the ICT sales team.

Optional Surface Mount Box

The optional surface mount box accessory is ideal for locations where cables cannot run inside the wall and must instead be run through external conduits. The surface mount box allows you to mount the card reader projected from the wall and provides a protected cavity where external cabling can be securely connected to the reader.



Ordering Codes

Accessory	Ordering Code
TSL Standard Reader SMB - Black	TSL-SMB-STD-B
TSL Standard Reader SMB - White	TSL-SMB-STD-W
TSL Extra Reader SMB - Black	TSL-SMB-EXTRA-B
TSL Extra Reader SMB - White	TSL-SMB-EXTRA-W

* The surface mount box accessory is currently not available for the TSL Mini reader. If this is required please register your interest with the ICT sales team.

TSL Reader Faceplates

All TSL readers are shipped with a black faceplate. To switch to a white reader simply order a white faceplate.

Whether you're looking for a color change or need to replace a damaged cover, replacement white and black faceplates are available to suit all TSL reader sizes and configurations.

Ordering Codes

Standard Reader Faceplates	
TSL Standard Reader Faceplate - Black	TSL-FP-STD-B
TSL Standard Reader Faceplate - White	TSL-FP-STD-W
TSL Standard Reader with Keypad Faceplate - Black	TSL-FP-STD-KP-B
TSL Standard Reader with Keypad Faceplate - White	TSL-FP-STD-KP-W
Extra Reader Faceplates	
TSL Extra Reader Faceplate - Black	TSL-FP-EXTRA-B
TSL Extra Reader Faceplate - White	TSL-FP-EXTRA-W
TSL Extra Reader with Keypad Faceplate - Black	TSL-FP-EXTRA-KP-B
TSL Extra Reader with Keypad Faceplate - White	TSL-FP-EXTRA-KP-W
Mini Reader Faceplates	
TSL Mini Reader Faceplate - Black	TSL-FP-MINI-B
TSL Mini Reader Faceplate - White	TSL-FP-MINI-W

Pigtail Cables

TSL readers use a shielded 8-wire pigtail wiring loom with a Hirose socket plug for connection to the reader. As the cable is not hardwired to the reader, it is simple to connect, disconnect and replace the TSL Reader as needed.

A standard 34cm cable is supplied with the reader, and you can order spares in case you need to replace a cable. For even quicker and easier installation, order 3.5m cables that can be routed directly to the controller or reader expander without splicing.

Ordering Codes

Accessory	Ordering Code
Standard 34cm TSL Reader Pigtail Cable	TSL-CABLE-34CM
3.5m TSL Reader Pigtail Cable	TSL-CABLE-3.5M

The 3.5m pigtail cable is not compliant for UL/cUL installations.

Ferrite Shield

A ferrite shield, also known as a noise suppression sheet, is designed to reduce electromagnetic interference and may help to improve read range for readers mounted on a metal surface. The shield is placed between the reader and the mounting surface to suppress interference caused by the reader's proximity to the metal surface.

All TSL Standard and Mini readers come with a ferrite shield fitted. For TSL Extra readers ferrite shields are available as an optional accessory.

Ordering Codes

Accessory	Ordering Code
TSL Extra Reader Ferrite Shield 10pk	TSL-FS-EXTRA

The effectiveness of using a ferrite shield to improve read range is determined by many factors, including the mounting surface material and installation environment, and may not necessarily produce the desired result. Testing should be performed to assess effectiveness before planning installation of multiple readers.

ICT recommends using a **surface mount box** as the preferred solution for interference caused by metal mounting surfaces. A surface mount box is generally more effective at reducing interference and improving read range as it distances the reader from direct contact with the mounting surface, breaking the 'path of transfer'.

Reader Editions: TSL Standard Reader

The TSL Standard reader is available in multiple editions, with a range of optional features:

Standard	117 x 43 x 9.5mm (4.61 x 1.69 x 0.37")			
	Keypad	125kHz	MIFARE/ DESFire/ NFC	Bluetooth® Technology
TSL-STD-RR-HL TSL Standard Multi-Technology Card Reader with Bluetooth® Wireless Technology		✓	✓	✓
TSL-STD-RK-HL TSL Standard Multi-Technology Card Reader with Bluetooth® Wireless Technology and Keypad	✓	✓	✓	✓
TSL-STD-RR-H TSL Standard 13.56MHz Card Reader with Bluetooth® Wireless Technology			✓	✓
TSL-STD-RK-H TSL Standard 13.56MHz Card Reader with Bluetooth® Wireless Technology and Keypad	✓		✓	✓

Reader Editions: TSL Extra Reader

The TSL Extra reader is available in multiple editions, with a range of optional features:

Extra	117 x 75 x 9.5mm (4.61 x 2.95 x 0.37")			
	Keypad	125kHz	MIFARE/ DESFire/ NFC	Bluetooth® Technology
TSL-EXTRA-RR-HL TSL Extra Multi-Technology Card Reader with Bluetooth® Wireless Technology		✓	✓	✓
TSL-EXTRA-RK-HL TSL Extra Multi-Technology Card Reader with Bluetooth® Wireless Technology and Keypad	✓	✓	✓	✓
TSL-EXTRA-RR-H TSL Extra 13.56MHz Card Reader with Bluetooth® Wireless Technology			✓	✓
TSL-EXTRA-RK-H TSL Extra 13.56MHz Card Reader with Bluetooth® Wireless Technology and Keypad	✓		✓	✓

Reader Editions: TSL Mini Reader

The TSL Mini reader is available in multiple editions, with a range of optional features:

Mini	87 x 43 x 9.5mm (3.43 x 1.69 x 0.37")			
	Keypad	125kHz	MIFARE/ DESFire/ NFC	Bluetooth® Technology
TSL-MINI-RR-HL TSL Mini Multi-Technology Card Reader with Bluetooth® Wireless Technology		✓	✓	✓
TSL-MINI-RR-H TSL Mini 13.56MHz Card Reader with Bluetooth® Wireless Technology			✓	✓

Technical Specifications

Ordering Information	
Order Codes	See Reader Editions.
Power Supply	
Operating Voltage	12VDC (9.5 to 14VDC)
Operating Current	165mA (Peak, Reading)
Communications	
Wiegand Interface	Multiple format 26, 34 or 37, customizable; Bit data 0 and data 1 sent at 1kHz
Frequency	13.56 MHz ISO/IEC 14443 Type A 125KHz carrier. Several modulation formats are supported. *
Multi Conductor Cable	Module comms / RS-485: Minimum 24AWG (0.51mm) shielded twisted pair Max distance 900m (3000ft) Wiegand: 22AWG alpha 5196, 5198, 18AWG alpha 5386, 5388. Max Distance 150m (492ft)
OSDP Communication	OSDP standard 2.2 with Secure Channel Protocol
Bluetooth® Wireless Technology	
Bluetooth® Read Range	Up to 0.5m (1.6ft), configurable
Bluetooth® Electronic Credential Transmission Technology	Bluetooth® version 5.1 compliant Proprietary data exchange protocol. AES-128 encrypted Credentials can be distinguished by unique site code and card number
NFC	
NFC Read Range	Up to 60mm
NFC (Near-field communication) electronic credential transmission technology	Android 4.4 or above, with phones which support ISO7816-4 Proprietary Secured DESFire credential Credential is AES-256 (NIST certified AES algorithm) Credentials can be distinguished by unique site code and card number
Security	
Security Level	Contains EAL6+ Certified Secure Access Module (SAM)
Operating Conditions	
Environment IP Rating	IP65
Operating Temperature	UL/cUL -35° to 66°C (-31° to 151°F) : EU EN -40° to 70°C (-40° to 158°F)
Storage Temperature	-10˚ to 85˚C (14˚ to 185˚F)
Humidity	0%-95% non-condensing, indoor/outdoor use (relative humidity)
Mean Time Between Failures (MTBF)	520,834 hours (calculated using RDF 2000 (UTE C 80-810) Standard)
Dimensions (H x W x D)	
Standard Reader	117 x 43 x 9.5mm (4.6 x 1.7 x 0.37")
Extra Reader	117 x 75 x 11.5mm (4.6 x 3.0 x 0.45")
Mini Reader	87 x 43 x 9.5mm (3.4 x 1.7 x 0.37")
Vandal Resistant Cover Dimensions	
Standard Reader VRC	160 x 90 x 13mm (6.3 x 3.5 x 0.51")

Extra Reader VRC	160 x 120 x 13mm (6.3 x 4.7 x 0.51")	
Surface Mount Box Dimensions		
Standard Reader SMB	43 x 55 x 135mm (1.7 x 2.2 x 5.3")	
Extra Reader SMB	43 x 83 x 135mm (1.7 x 3.3 x 5.3")	
Weights	**Net Weight**	**Gross Weight**
Standard Reader	60g (2.1oz)	100g (3.5oz)
Extra Reader	120g (4.2oz)	130g (4.6oz)
Mini Reader	40g (1.4oz)	90g (3.2oz)
Vandal Resistant Cover Weights	**Net Weight**	**Gross Weight**
Standard Reader VRC	60g (2.1oz)	70g (2.5oz)
Extra Reader VRC	80g (2.8oz)	90g (3.2oz)
Surface Mount Box Weights	**Net Weight**	**Gross Weight**
Standard Reader SMB	50g (1.8oz)	70g (2.5oz)
Extra Reader SMB	80g (2.8oz)	110g (3.9oz)
Faceplate Weights	**Net Weight**	**Gross Weight**
Standard Reader Faceplate	10g (0.4oz)	20g (0.7oz)
Extra Reader Faceplate	30g (1.1oz)	40g (1.4oz)
Mini Reader Faceplate	10g (0.4oz)	20g (0.7oz)
Pigtail Cable Weights	**Net Weight**	**Gross Weight**
34cm Pigtail Cable	20g (0.71oz)	20g (0.71oz)
3.5m Pigtail Cable	190g (6.7oz)	230g (8.1oz)
Ferrite Shield Weights	**Net Weight**	**Gross Weight**
Extra Reader Ferrite Shield (10pc)	60g (2.1oz)	60g (2.1oz)

* Applies to multi technology models only

ISO Card Read Ranges

	Mini	Standard	Extra
125kHz	30mm (1.2")	40mm (1.6")	40mm (1.6")
MIFARE Classic	60mm (2.4")	60mm (2.4")	80mm (3.1")
DESFire EV1	20mm (0.8")	20mm (0.8")	30mm (1.2")
DESFire EV2	30mm (1.2")	30mm (1.2")	40mm (1.6")
DESFire EV3	20mm (0.8")	20mm (0.8")	40mm (1.6")

Tag Read Ranges

	Mini	Standard	Extra
125kHz	20mm (0.8")	40mm (1.6")	40mm (1.6")
MIFARE Classic	20mm (0.8")	30mm (1.2")	30mm (1.2")
DESFire EV1	10mm (0.4")	10mm (0.4")	10mm (0.4")
DESFire EV2	10mm (0.4")	10mm (0.4")	10mm (0.4")
DESFire EV3	20mm (0.8")	20mm (0.8")	20mm (0.8")

Read ranges are indications only and may be impacted by a number of factors such as the location, door frame material and condition of the cards/tags. When installing on metal surfaces, a ferrite shield or surface mount box should be used to minimize electromagnetic interference.

The size of conductor used for the supply of power to the unit should be adequate to prevent voltage drop at the terminals of no more than 5% of the rated supply voltage.

Regulatory Notices

For a full regulatory and approval list please visit the ICT website.

New Zealand (RSM) and Australia (RCM)

This equipment carries the R-NZ label and complies with EMC and radio communications regulations of the Australian Communications and Media Authority (ACMA) governing the Australian and New Zealand (AS/NZ) communities.

AS/NZS 2201.1 Class 5

Protege systems conform to AS/NZS 2201.1:2007 Class 5 intruder alarm systems standards for the construction, operation, performance and installation of intruder alarm equipment and systems installed in clients' premises.

CE – Compliance with European Union (EU)

Conforms where applicable to European Union (EU) Low Voltage Directive (LVD) 2014/35/EU, Electromagnetic Compatibility (EMC) Directive 2014/30/EU, Radio Equipment Directive (RED)2014/53/EU and RoHS Recast (RoHS2) Directive: 2011/65/EU + Amendment Directive (EU) 2015/863.

This equipment complies with the rules of the Official Journal of the European Union, for governing the Self Declaration of the CE Marking for the European Union as specified in the above directives.

Security Grade 4, Environmental Class II, EN 50131-1:2006+A2:2017, EN 50131-3:2009, EN 50131-6:2008+A1:2014, EN 50131-10:2014, EN 50136-1:2012, EN 50136-2:2013, EN 60839-11-1:2013, Power frequency magnetic field immunity tests EN 61000-4-8, Readers Environmental Class: IVA, IK07.

UK Conformity Assessment (UKCA) Mark

This equipment carries the UKCA label and complies with all applicable standards.

UL/cUL (Underwriters Laboratories)

> UL 294 for Access Control System Units

> CAN/ULC 60839-11-1 for Electronic Access Control Systems

Industry Canada

ICES-003

This is a Class A digital device that meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CAN ICES-3 (A)/NMB-3(A)

Federal Communications Commission (FCC)

FCC Rules and Regulations CFR 47, Part 15, Class A.

This equipment complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference; (2) This device must accept any interference received, including interference that may cause undesired operation.

Designers & manufacturers of integrated electronic access control, security and automation products.
Designed & manufactured by Integrated Control Technology Ltd.