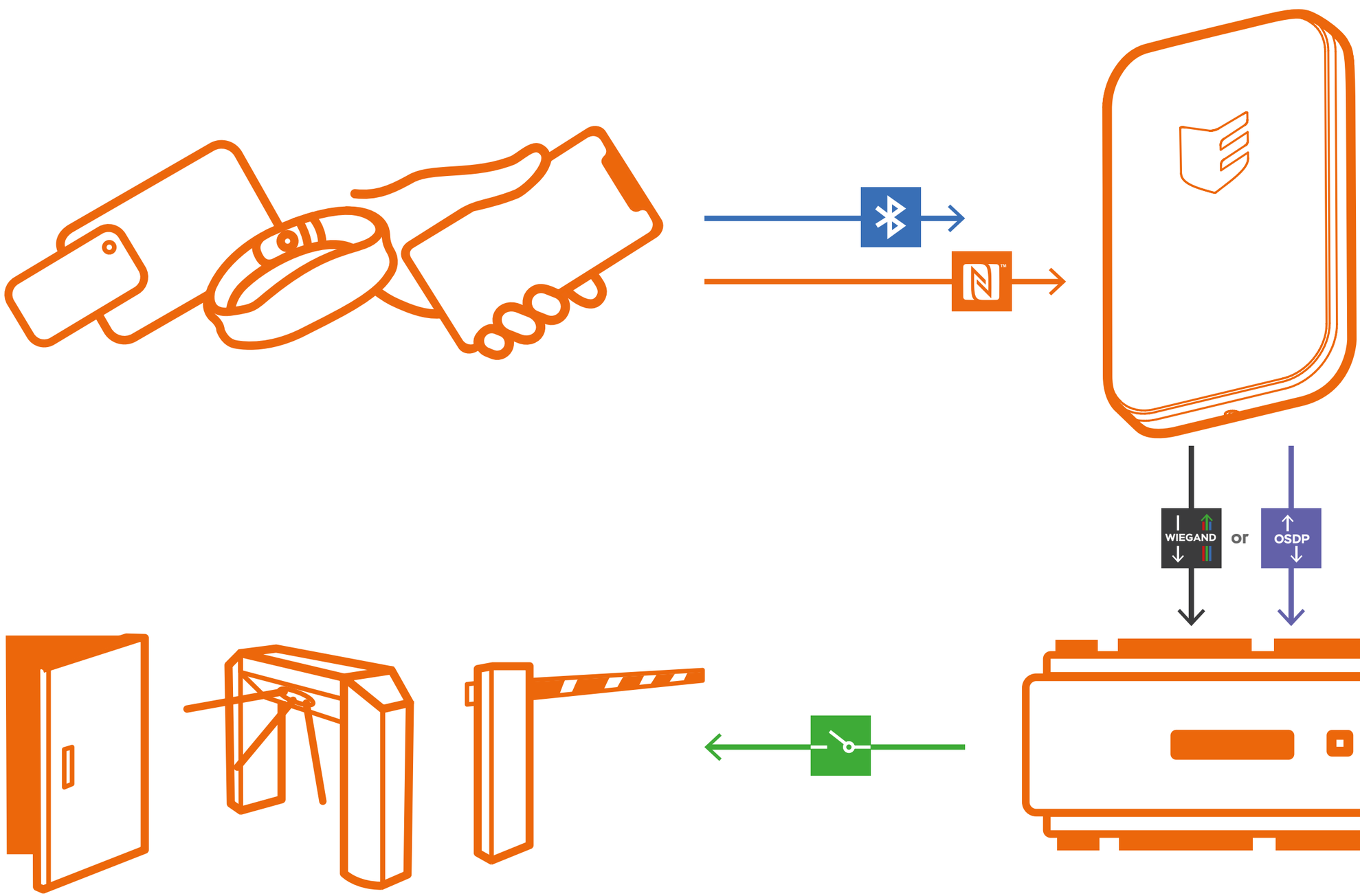


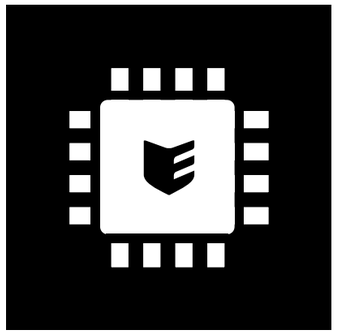
ESMART® Access platform

isbc.com/esmart

Physical Access Control System



ESMART® Access Platform



ESMART® Access Technology

Secure multifunctional technology with five levels of protection against card copying and fraud.



ESMART® Reader

Physical Access Control Readers and Accesories



ESMART® Access

Mobile Credentials for iOS and Android (BLE and NFC)

+

SDK for customer integration



ESMART® Configurator

Device Management application for System Administrators

ESMART® Access Technology

Secure container

Five levels of protection against card copying and fraud:

- **AES-128** encryption
- **Diversification** of the encryption keys
- **CMAC** orginality signature
- Protection against **Replay attacks**
- **Unique** identifier for each credential



iOS and Android

BLE (2.4 GHz) credentials

NFC (13.56 MHz) credentials



JCOP

Bank grade chip

Java Applet

Co-brand functionality

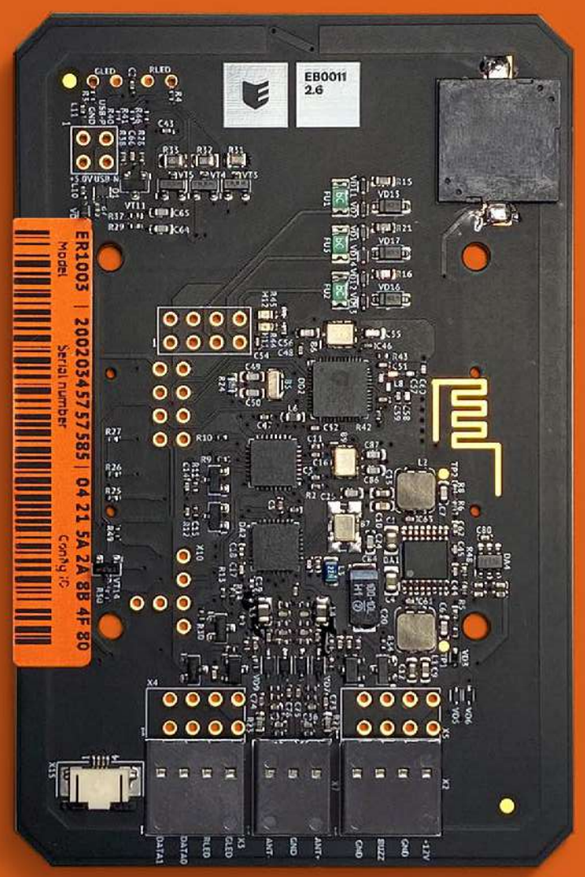
ESMART® Readers



NEO Series BLE



STONE Series BLE



OEM Series BLE



A wall-mounted smartcard reader for secure physical access control. ESMART® offers a wide range of customization options to underline your corporate identity: individual design of the front panel, customized brand colors and your company logo. Orders starting at 1 piece.

Front panel design

Basic design

Bubble design

Customized design



Front panel has a configurable multicolored **RGB-backlight.**

Mobile Access

ESMART® Readers support mobile identification via NFC (Tap as card) and BLE (Free hands) credential technologies using the **ESMART® Access** mobile app.

isbc.com/esmartaccess

ESMART® Access technology

Five levels of protection against card copying and fraud:

- **AES-128** encryption
- **Diversification** of the encryption keys
- **CMAC** orginality signature
- Protection against **Replay attacks**
- **Unique** identifier for each credential

Configuration

ESMART® Readers can be configured without dismounting via **ESMART® Configurator** mobile app. Configuration files are provided by the technical support.

isbc.com/esmartconfigurator

Optionally, ESMART® Readers can be ordered with customized configuration.

Specifications

Reader Model	ER1602
Housing Material	Polycarbonate + ABS
Color	Black / White (Backlight transparent)
2.4 GHz (BLE) Credential Compatibility	ESMART® Access Mobile Credentials
13.56 MHz (NFC) Credential Compatibility	• ESMART® Access • MIFARE Classic, MIFARE Plus (SL1 / SL3) • ISO 14443A and ISO15693 • ESMART® Access Mobile Credentials
Typical Read Range	NFC: up to 4 in (10 cm) / BLE up to 33 ft (10 m)
Connection Interface	Wiegand
Data Communication Format	Wiegand 26 - 3 bytes of data (in basic configuration)
Pigtail Length	18 in (0.5 m)
Operating Voltage	5-16V DC
Current Draw	Peak: 150 mA at 12V
Device Input	Input: Four-mode LED (RLED, GLED), Buzzer (BUZZ) @ Active Low
Device Management	ESMART® Configurator: • Reading of CSN(UID) / MIFARE Memory Data / ESMART® Access only • SL1/SL3 mode settings for MIFARE Plus • Format, amount and order of data transmitted via Wiegand interface, parity bits • Backlight and Buzzer settings • Bluetooth settings: distance and reading frequency
Dimensions (width x length x depth)	4.37 x 2.71 x 0.39 in (111 x 69 x 10 mm)
Product Weight	4.87 oz (139 g)
Operating Temperature & Humidity	-40° F to +185° F (-40° C to +85° C), 0% to 95% non-condensing
Storage Temperature	-40° F to +185° F (-40° C to +85° C)
Ingress Protection	IP68
Supplied parts	• ESMART® Reader (1) • Master card with basic configuration (1) • Hex-nut wrench (1) • Flat head screw with wall plug (4) • Scotch lock connector (8) • Mounting template (1) • Installation guide (1)
Warranty	Limited Lifetime

Black housing. Textures



Bubble



Metal



Zig-zag



Triangles



Silk



Dots

White housing. Textures



Bubble



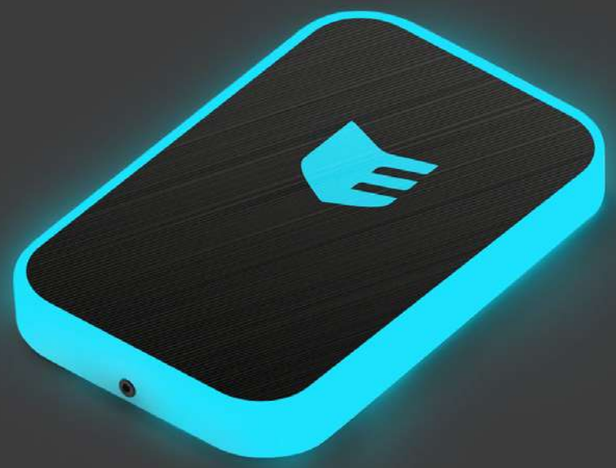
Metal



Zig-zag



Triangles

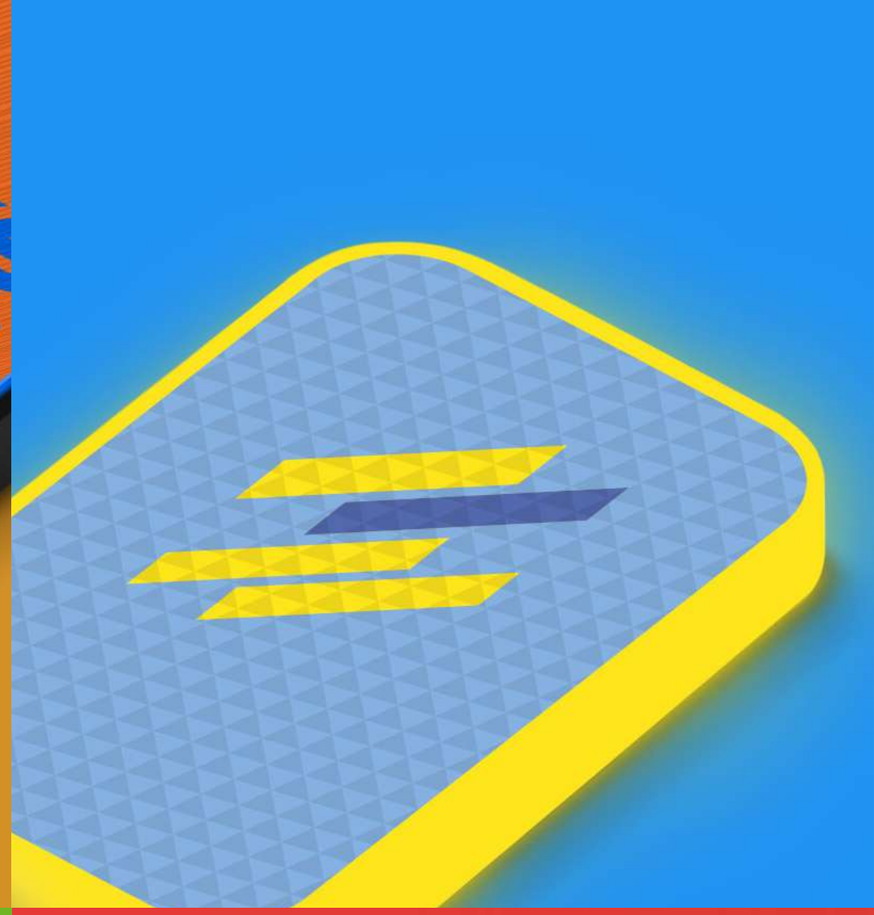


Silk



Dots


identification
unique




DESIGN
studio






panda

STONE Series BLE



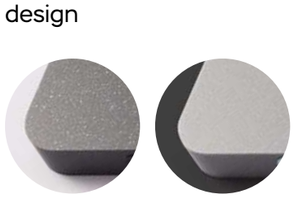
A wall-mounted smartcard reader for secure physical access control with DuPont Corian® housing. ESMART® offers clean-cut elegant design and wide range of customization options to underline your corporate identity: individual engraving and customized brand colors. Orders starting at 1 piece.

Housing design

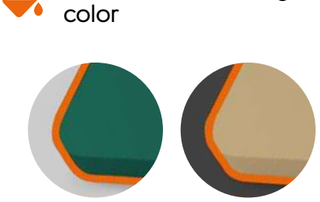
Basic design

Customized laser engraving

Customized housing color







Every reader has a configurable multicolored **RGB LED**.

Mobile Access

ESMART® Readers support mobile identification via NFC (Tap as card) and BLE (Free hands) credential technologies using the **ESMART® Access** mobile app.

isbc.com/esmartaccess

ESMART® Access technology

Five levels of protection against card copying and fraud:

- **AES-128** encryption
- **Diversification** of the encryption keys
- **CMAC** orginality signature
- Protection against **Replay attacks**
- **Unique** identifier for each credential

Configuration

ESMART® Readers can be configured without dismounting via **ESMART® Configurator** mobile app. Configuration files are provided by the technical support.

isbc.com/esmartconfigurator

Optionally, ESMART® Readers can be ordered with customized configuration.

Specifications

Reader Model	ER1701
Housing Material	DuPont Corian®
Color	Anthracite / Silverite / Custom
2.4 GHz (BLE) Credential Compatibility	ESMART® Access Mobile Credentials
13.56 MHz (NFC) Credential Compatibility	• ESMART® Access • MIFARE Classic, MIFARE Plus (SL1 / SL3) • ISO 14443A and ISO15693 • ESMART® Access Mobile Credentials
Typical Read Range	NFC: up to 4 in (10 cm) / BLE up to 33 ft (10 m)
Connection Interface	Wiegand
Data Communication Format	Wiegand 26 - 3 bytes of data (in basic configuration)
Pigtail Length	18 in (0.5 m)
Operating Voltage	5-16V DC
Current Draw	Peak: 150 mA at 12V
Device Input	Input: Four-mode LED (RLED, GLED), Buzzer (BUZZ) @ Active Low
Device Management	ESMART® Configurator: • Reading of CSN(UID) / MIFARE Memory Data / ESMART® Access only • SL1/SL3 mode settings for MIFARE Plus • Format, amount and order of data transmitted via Wiegand interface, parity bits • LED and Buzzer settings • Bluetooth settings: distance and reading frequency
Dimensions (width x length x depth)	4.45 x 2.71 x 0.39 in (113 x 69 x 10 mm)
Product Weight	4.87 oz (139 g)
Operating Temperature & Humidity	-40° F to +185° F (-40° C to +85° C), 0% to 95% non-condensing
Storage Temperature	-40° F to +185° F (-40° C to +85° C)
Ingress Protection	IP68
Supplied parts	• ESMART® Reader (1) • Master card with basic configuration (1) • Hex-nut wrench (1) • Flat head screw with wall plug (4) • Scotch lock connector (8) • Mounting template (1) • Installation guide (1)
Warranty	Limited Lifetime

DuPont Corian®. Base housing colors

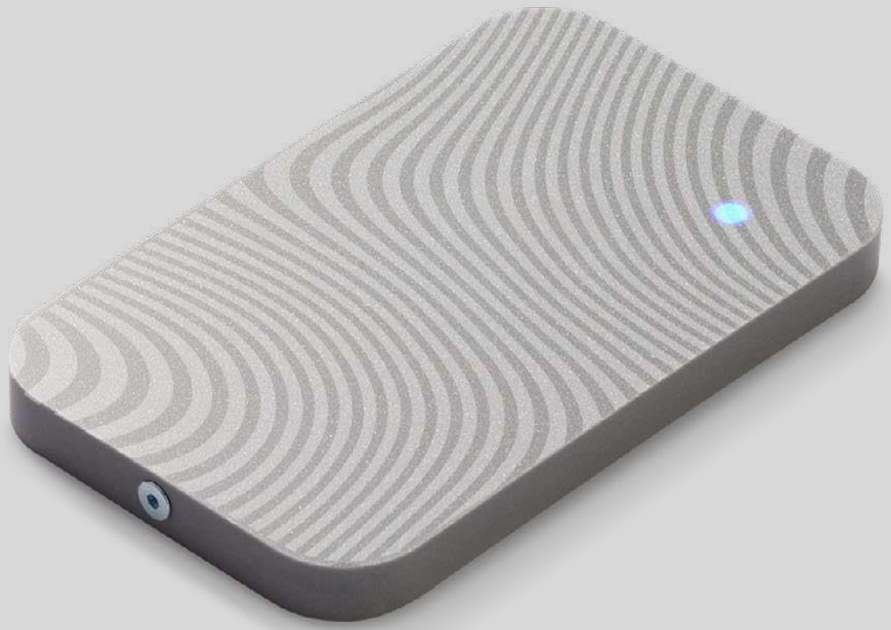
Anthracite





Silverite



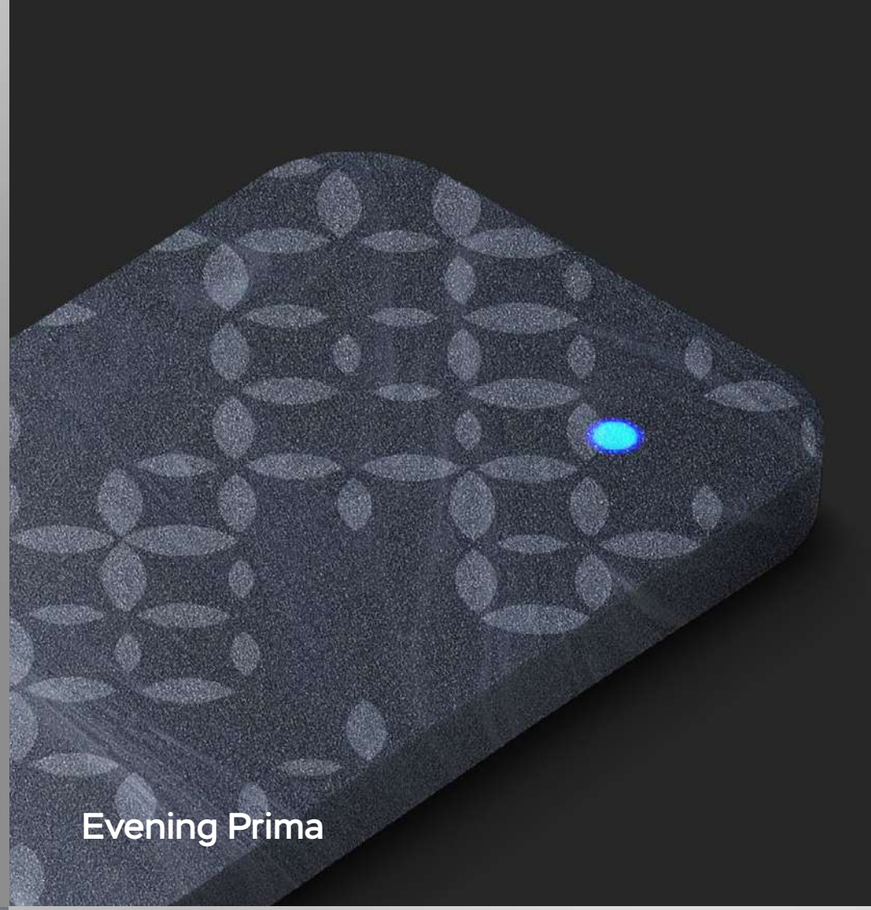




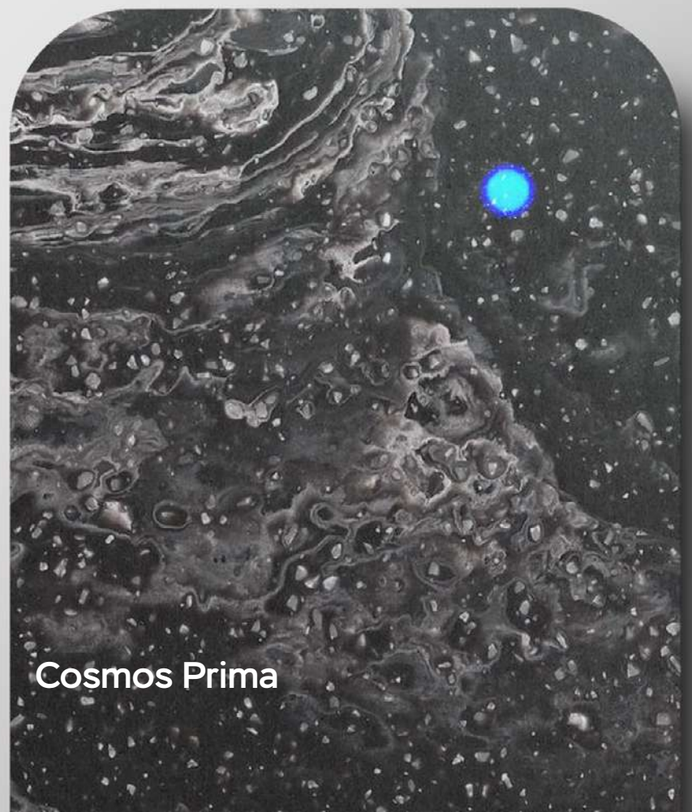
Raffia



Verdan



Evening Prima



Cosmos Prima

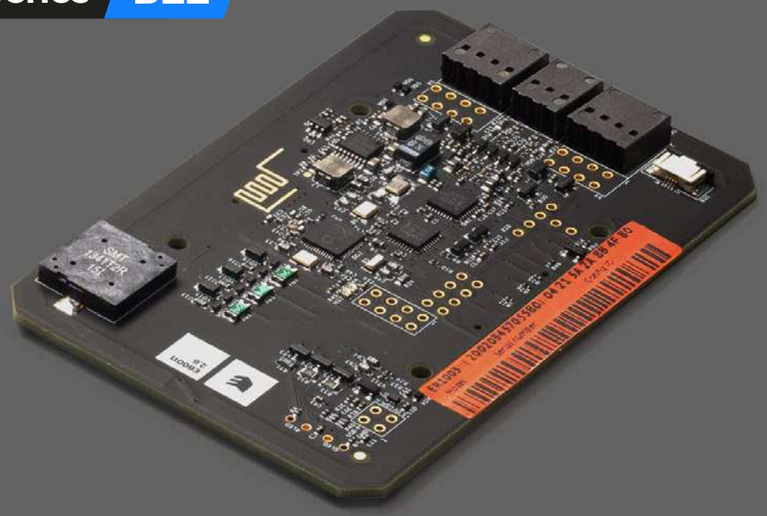


Gray Onyx



Carbon Concrete

OEM Series BLE



An embedded reader board for secure physical access control. Designed to be easily integrated into terminals, validators, outdoor intercom systems and other installations.

External Antenna



Basic model



Model for outdoor intercom systems

The reader board supports an external **NFC-antenna** connection, allowing to integrate the device with limited available space.

Mobile Access

ESMART® Readers support mobile identification via NFC (Tap as card) and BLE (Free hands) credential technologies using the **ESMART® Access** mobile app.

isbc.com/esmartaccess

ESMART® Access technology

Five levels of protection against card copying and fraud:

- **AES-128** encryption
- **Diversification** of the encryption keys
- **CMAC** orginality signature
- Protection against **Replay attacks**
- **Unique** identifier for each credential

Configuration

ESMART® Readers can be configured without dismounting via **ESMART® Configurator** mobile app. Configuration files are provided by the technical support.

isbc.com/esmartconfigurator

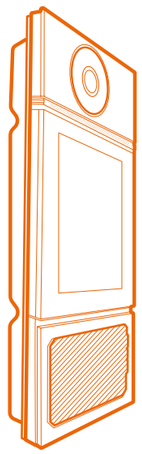
Optionally, ESMART® Readers can be ordered with customized configuration.

Specifications

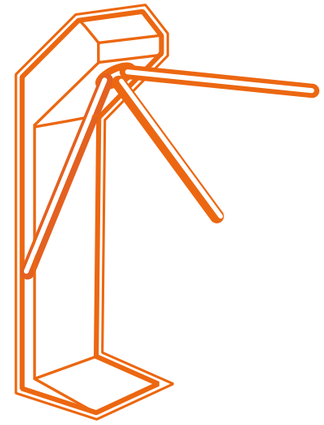
Reader Model	ER1003
Housing Material	No housing
2.4 GHz (BLE) Credential Compatibility	ESMART® Access Mobile Credentials
13.56 MHz (NFC) Credential Compatibility	• ESMART® Access • MIFARE Classic, MIFARE Plus • ISO 14443A and ISO15693 • ESMART® Access Mobile Credentials
Typical Read Range	NFC: up to 4 in (10 cm) / BLE up to 394 in (10 m)
Connection Interface	Wiegand
Data Communication Format	Wiegand 26 - 3 bytes of data (in basic configuration)
Panel Connection	Terminal Strip
Operating Voltage	5-16V DC
Current Draw	Peak: 150 mA at 12V
Device Input	Input: RGB LED (RLED, GLED), Buzzer (BUZ) @ Active Low
Device Management	ESMART® Configurator: • Reading of CSN(UID) / MIFARE Memory Data / ESMART® Access only • SL1/SL3 mode settings for MIFARE Plus • Format, amount and order of data transmitted via Wiegand interface, parity bits • LED and Buzzer settings • Bluetooth settings: distance and reading frequency
Dimensions (width x length x depth)	3.62 x 2.40 x 0.30 in (92 x 61 x 7.5 mm)
Product Weight	0.77 oz (22 g)
Operating Temperature & Humidity	-40° F to +185° F (-40° C to +85° C), 0% to 95% non-condensing
Storage Temperature	-40° F to +185° F (-40° C to +85° C)
Supplied parts	• ESMART® Reader (1) • Master card with basic configuration (1) • Screw with spacer and nut (2) • Mounting template (1) • Installation guide (1)
Warranty	Limited Lifetime

OEM Series complex solutions

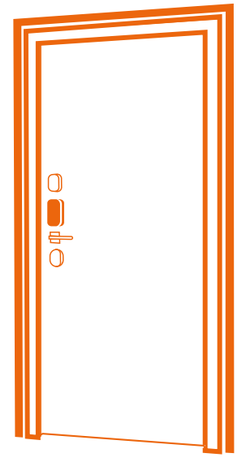




Intercom



Turnstile



Electromechanical Lock and Smart Door

Accessory for ESMART® Reader BLE OEM series embedded readers.
Suitable for integration into turnstiles, outdoor panels, intercoms and other equipment.

External NFC antenna

The antenna is **only suitable for NFC (13,56 MHz)** credentials, BLE (2,4 GHz) credentials are not supported.

Indication

Neither LED and Buzzer indication is implemented on the antenna board.
Indication is implemented the reader board only.

Enable the antenna

To enable an external antenna, a **special configuration** must be applied to the ESMART® Reader BLE OEM series. This can be done using the **ESMART® Configurator** mobile application. Configuration file could be provided by the technical support.

isbc.com/esmartconfigurator

Additional security

Increase the level of security of the access point by installing the reader with an unprotected Wiegand interface in a safe area. For example, next to the controller, and locate the antenna in an unsafe area.

Mouting Kit for Metal



NEO series Mouting Kit for Metal



STONE series Mouting Kit for Metal



OEM series Mouting Kit for Metal

Accessory for ESMART® Reader BLE.
Suitable for installing readers on or near metal surfaces.

Read Range

Installing the reader on or near metal **significantly reduces** reading range.
Tape the special Mounting Kit on the surface for optimal read performance.

Mouting Kit is made of special material **ferrite** and restores **up to 70%** reading range from the original.

Mounting

The mounting kit is **device-shaped**, with all holes cut out. On the reverse side it has an **adhesive surface** for easy tape in place.

Material thickness

The set includes two stickers of 0.04 in (1 mm) thickeness. It is recommended to **use both** for best reading range results.

ESMART® Access Mobile

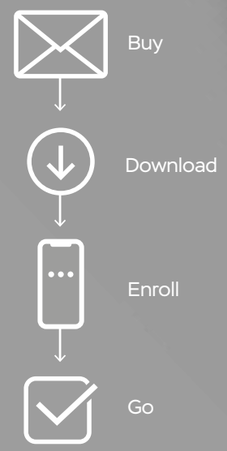
Tap as card

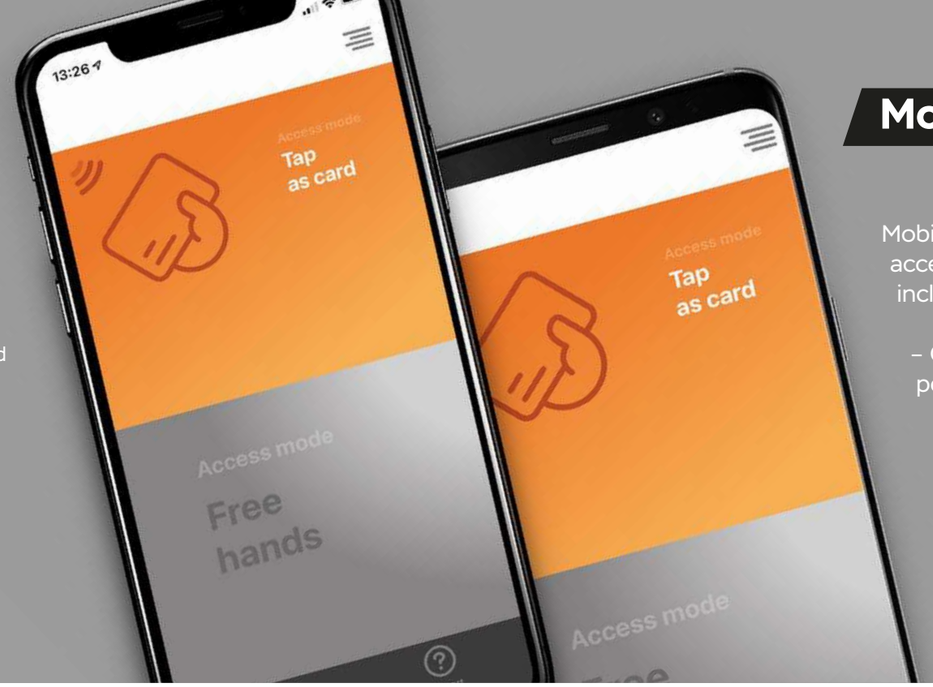
Use your phone as a contactless card. Bring it close to the reader. The mode works with NFC and BLE.

Free hands

No need to bring your phone close. Reading occurs when you approach even if the phone is in your pocket. The mode works only with BLE.

isbc.com/esmartaccess





Mobile Credential

Mobile credentials are becoming more popular in modern access control systems. Pros for mobile identification include:

– Convenience of issuing a card to a user without personal participation, by e-mail or other way

– Mobile phone is always with you and can completely replace cards and tags

– Mobile phone handing to third parties is extremely rare, which excludes fraud with access control or time attendance

ESMART®Access Technology

ESMART® Access Mobile Credentials have five levels of protection against card copying and fraud:

- **AES-128** encryption
- Diversification of the encryption keys - **CMAC orginality signature**
- **Protection** against Replay attacks
- **Unique** identifier for each credential

This makes mobile identification as secure as an identification with physical cards.

Activation code

The activation code is issued to a specific user of the system by the System Administrator and is not intended to be transferred to other users.

Thus, the activation code for each Mobile Credential is valid only once, it is not possible to receive the Credential again using it.

This provides protection against unauthorized transmission of the code to a third-party user, increasing the level of security.

Loss of a Mobile Credential

Mobile Credentials should be concerned in the same way as physical cards, it is important to keep in mind that:
· erasing the Credential from an application
· uninstalling an application
· reseting the phone to the factory settings
· restoring the phone from a backup will lead to permanent deletion of the Mobile Credential without the possibility of its recovery.

This is due security reasons and similar to the loss of a real physical card.

Application running in the background

iBeacon

Restore State

Location Services

ESMART® widget

iBeacon technology literally “wakes up” an iOS mobile application when you are approaching to the reader, even if the application has been terminated.
The response time is iOS dependent and may vary by the system.

The Restore State technology additionally restores the work of the application that was closed by the user if it has happened in the field of visibility of at least one ESMART® Reader.

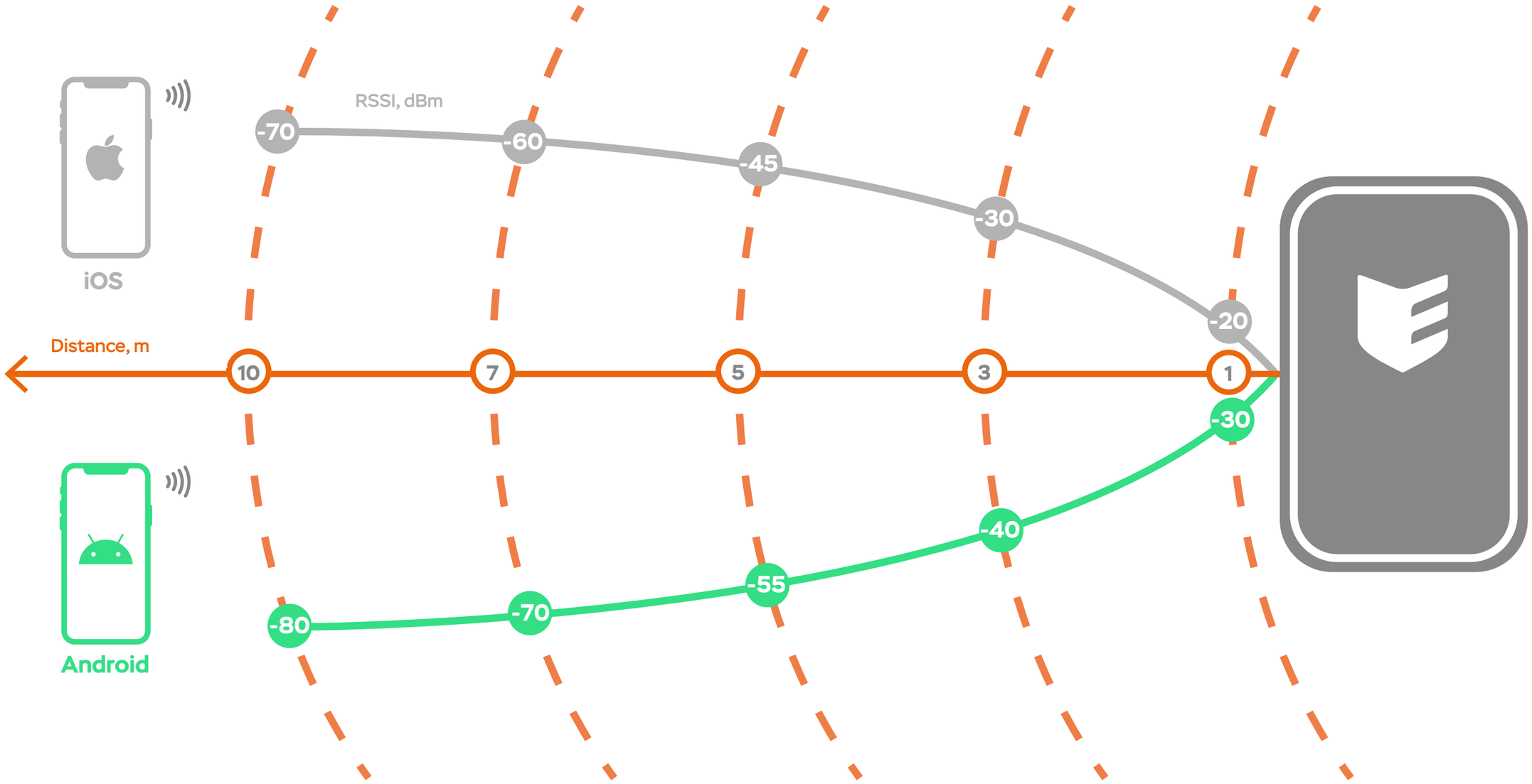
For both technologies to work properly, you need to give a permission to the mobile application to access the Always precise Location: Settings > Privacy > Location Services.

The Android platform has fewer tools available. Availability the ESMART® widget in the area of smartphone notifications allows you to keep the minimized mobile application working as long as possible. A user-terminated application can only be launched automatically when using NFC, this is not available for BLE.

Specifications

Mobile Device Support	iOS 9.0+ using BLE Android 4.4+ using BLE and NFC	
Typical Read Range	NFC: up to 4 in (10 cm) / BLE up to 33 ft (10 m)	
Opening Modes	«Tap as card» (iOS using BLE, Android using NFC and BLE) «Free hands» (iOS and Android using BLE)	
BLE Distance	**On reader side using ESMART® Configurator** · separately for each of the Opening modes · separately for iOS and Android · reading range restriction (for example, for turnstiles)	**On phone side by the user** · separately for each of the Opening modes (Legacy, not recommended for new implementations)
Security	· Secure ESMART® Access Technology	· Mobile Credentials are securely stored in mobile device operating system

BLE Signal Strength



ESMART® Access SDK



ESMART® Access SDK for iOS and Android platforms is based on the libEsmartVirtualCard Library.

After embeddin it, the client application is able to transmit the User ID using BLE and NFC to the ESMART® Readers, using secure ESMART® Access technology.

Infrastructure requirements

Before embedding it is required to prepare the following infrastructure with three key components:

· User Credentials issuing Server connected to the client Mobile Application (with a sufficient level of security)

· Pre-configured ACS system

· Scheme of the User Credentials sharing between the Server and the ACS system

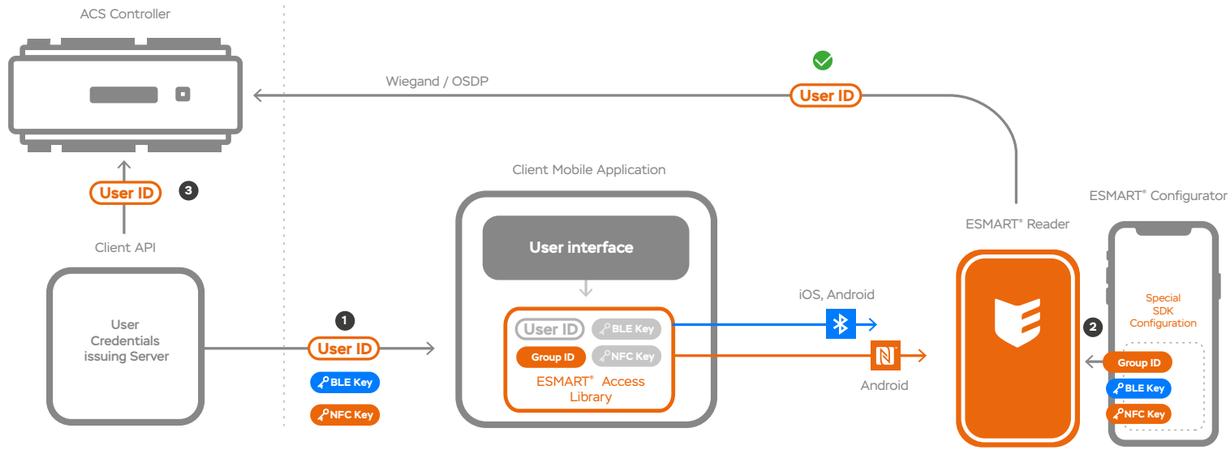
Only after the implementation of all three components is it worth starting to embed the SDK.

Three steps when embedding an SDK

1. First step (configure the Library):
   - User ID — User Identifier
   - NFC Key — Mobile NFC Key
   - BLE Key — Mobile BLE Key
   - Group ID — Unique SDK Identifier
2. Second step (configure the Readers):
   - NFC Key — Mobile NFC Key
   - BLE Key — Mobile BLE Key
   - Group ID — Unique SDK Identifier
3. Third step (configure the ACS Controller):
   - User ID — User Identifier

When you bring the phone the reader User ID from the application will be securely transmitted to ACS Controler.

ACS scheme for the implementation of the mobile identification using ESMART® Access



The main function of the ESMART® Access Library is to securely transfer the User Identifier from the client's mobile application to the reader via NFC and BLE.

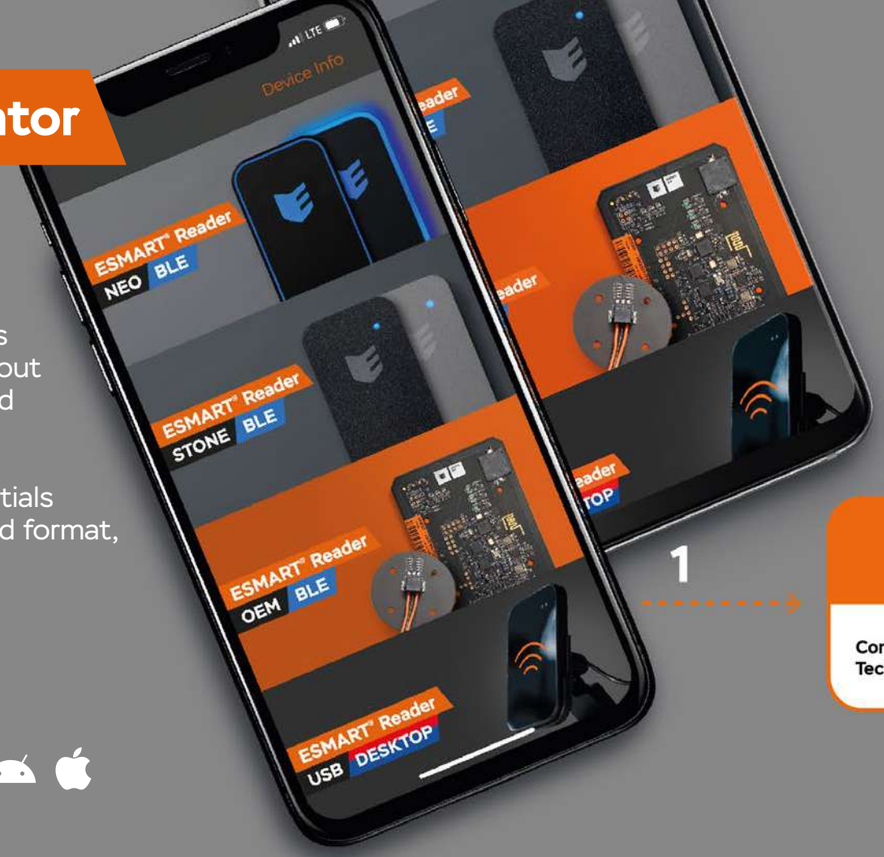
In fact, the Library is responsible only for the «transport» function, the logic of the application, as well as the user interface are implemented by the client.

ESMART® Configurator

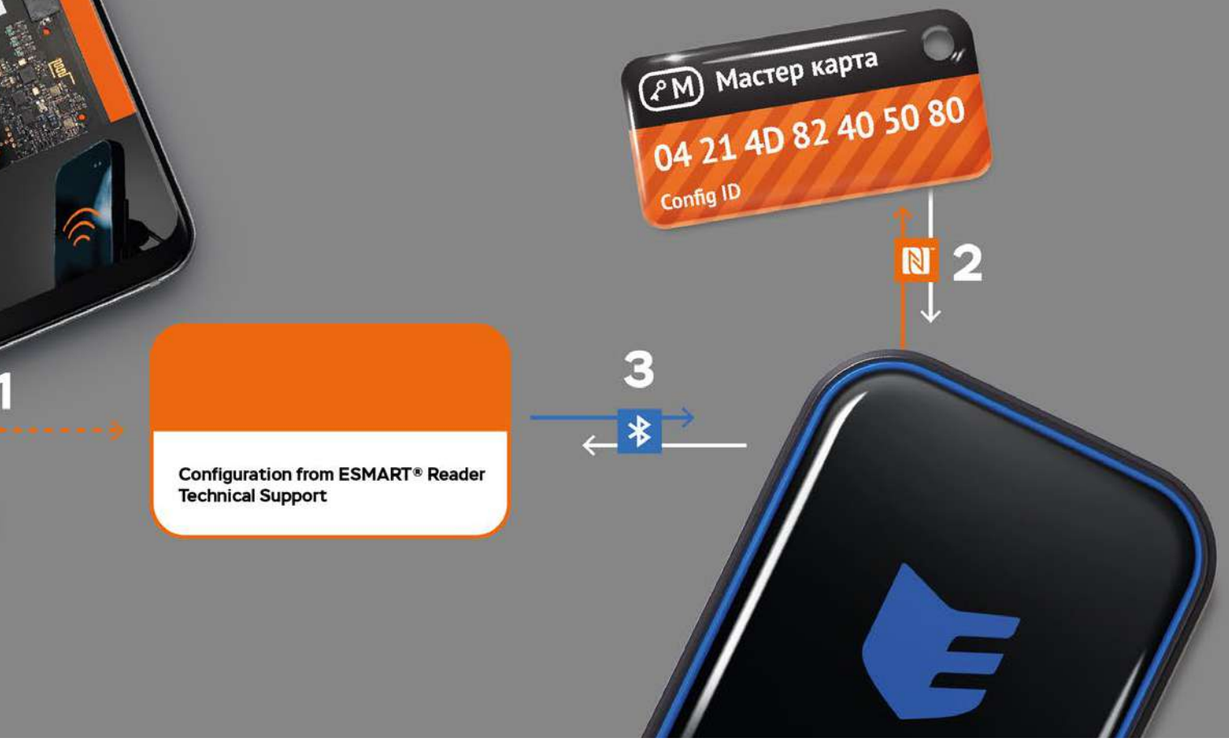
A mobile application for the ACS System Administrators, which allows configuring ESMART® Readers without dismounting using an iOS or Android mobile phones.

You are able to set different Credentials support and modes, output Wiegand format, LED settings and BLE Settings.

isbc.com/esmartconfigurator



How to configure



Master card

A Master card is needed to set the reader into configuration mode, in which it waits for the configuration to be applied, LED blinking blue. Supplied with each reader individually and matches only to it.

The Config ID, which is printed on the card, defines the basic configuration of the reader from the factory.



It is possible to order a batch of readers with a basic client configuration. Master cards in this batch will have the same Config ID and will be marked with M

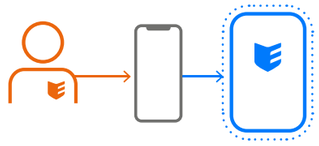
To reset the device to the factory settings present the Master card to the reader in configuration mode. It is recommended to repeat this operation every time before applying a new configuration.

If you lose the Master Card, you will no longer be able to configure the device. Replacement of the Master card is possible by agreement with ESMART® specialists.

ESMART® Configuration

A configuration is a file containing a set of settings for a specific model of ESMART® Reader.

The file is prepared by ESMART® specialists individually for solving a specific client's problem and may contain special settings from the manufacturer.



The configuration is transferred to the reader in the form of an encrypted container, which is stored in an ***.ercd** file and can contain any critical data (for example, encryption keys for client cards). In this case, the mobile application plays the role of «transport» and does not know the content of the encrypted Configuration.

This configuration format is convenient for customers who have ordered the issuance of cards and generation of keys for the ISBC Company, as well as for those who implement the ESMART® Access SDK.

User Configuration SOON

System administrators will be able to independently create Configurations in the mobile application without the participation of ESMART® specialists.

Such Configurations can contain settings for card moders, keys, data transfer format, mobile access settings and LED modes. Manufacturer-specific settings are not available.

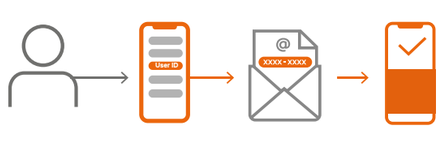


The Configuration created in the application must be recorded on the Special Configuration Card. Only in this case the security of any critical data is guaranteed on it. Until the moment the object is written to the Configuration Card, the user is responsible for the safety of storing any critical data in the Mobile Application.

This configuration format is convenient for customers who issue access cards and generate keys on their own, as well as those who want to quickly change any non-critical settings, for example, indication or data transfer format.

ESMART® Access Mobile Credentials SOON

ACS administrators will be able to issue and manage Mobile Credentials using the ESMART® Configurator application.
The purchased cards will be displayed in the application with the ability to send an activation code to the user's e-mail.
The identifier of each card is available to the administrator for entering into the ACS.



After purchasing new cards and activating cards by users, the Administrator will receive the Push notifications.
The app will also be able to send text notifications to Mobile Credentials users.

Notification will come to ESMART® Access application.
To manage cards, register in the mobile application using the e-mail specified when ordering cards.

ESMART® Configurator

Settings

Supported credentials

Operation mode	UID		SL1 SL3	
ISO14443A	•			
ISO15693	•			
MIFARE® Classic	•	block, data, offset		
MIFARE® Plus	•		block, data, offset	
ESMART® Access				•
VISA	•	•	•	•

ESMART® Reader is compatible with different types of credentials. For each type, it is possible to set up an individual operating mode:

- reading the card UID (CSN)
- read data from the card memory
- work in SL1 / SL.3 mode (MIFARE® Plus)
- work with ESMART® Access cards
- disable specific card reading

It is required to set the sector (block) of data reading, number in bytes and byte offset (if any) for memory cards (including SL1 / SL3).

Bank cards configuration and support is project based. The mode of operation depends on the type of card, as well as on the fact whether or not the cards were already issued at the facility.

Secutity

Encryption	Crypto1	AES128	CMAC	Key diversity
ISO14443A				
ISO15693				
MIFARE® Classic	•			
MIFARE® Plus	•	•		
ESMART® Access		•	•	•
VISA	•	•		

ESMART® Access credentials use preloaded diversified AES128 encryption keys and CMAC keys and are compatible with any ESMART® Reader out of the box.

To solve the copy protection problem, it is necessary to work with credentials in secure mode, excluding reading the CSN (UID).

Readers are capable to work in one or several encryption modes depending on the credential type:

- CRYPTO1 - the least secure mode with a key length of 48 bits
- AES128 - safe mode with key length 128 bits
- CMAC - digital signature of the credential with an additional key length of 128 bits
- Diversification is a technology that guarantees the uniqueness of the encryption key of each icredential

To achive ASC security on the facility, card issuance is required on the client side, as well as it is requred to configure readers.

Data format

Interface	Wiegand	USB
Data format	W26, 34, 42, 50, 58, 64, etc	raw data
Emulation		Wiegand, Magnetic stripe, Virtual COM port
Bite order	configurable by bytes	configurable by bytes
Parity bites	•	
Prefix / postfix		•
Timings	•	•

For readers with Wiegand interface (ER1602, ER1701, ER1003) it is possible to choose one of the standard output formats or set your own by specifying the number of data and parity bitss.

Readers with USB interface (ER1100, ER1200) have emulation of various data formats feature depending on the model, as well as setting prefixes and postfixes to achive compatability.

All readers also have user configurable byte ordering and timings for backward compatibility with other devices.

Mobile Access

Technology	BLE	NFC
Reading frequency setting	•	
«Tap as card» distance	•	
«Free hands» distance	•	
Visibility zone limiting	•	
Separate iOS and Android settings	•	
Storage state indication	•	
SDK ESMART® Access settings	•	•
Disable possibility	•	•

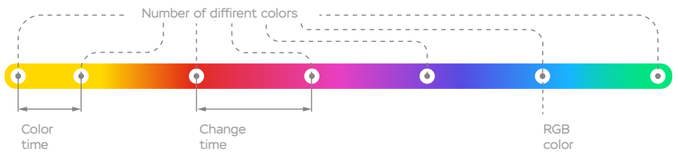
Mobile Access operates using 2.4 GHz (BLE) and 13,56 MHz (NFC) technologies.

NFC works in the near field up to 4 in (10 cm), similar to ordinary smart-cards.

BLE works at a distance of up to 32 ft (10 m) and can be used for both long-range and short-range identification. It is possible to flexibly configure the operating mode for each iOS and Android platforms individually, including completely prohibit distant identification (for turnstiles).

When using the SDK, it is required to reconfigure the readers to work with your SDK-based application.

Indication



«Chameleon Mode» - in Standby reader LEDs (ER1602, ER1701, ER1003) continuously changes its color. Colors sequence, RGB value, color time and color change time can be customized individually.

ACS input signal		GLED	RLED	GLED RLED	
Set RGB color	•	•	•	•	
«Chameleon» mode	•				
Input signal ignore		•	•		•
Disable possibility	•	•	•	•	•

The readers have three inputs: RLED for red LED control, GLED for green LED control and BUZZ for buzzer control.

For each mode of the ASC indication lines signals it is possible to set its own type of indication or completely disable the line.

Additional settings



- External antenna enable for OEM series
- Touch keyboard modes for USB series
- Advacned Bluetooth settings
- SAK remapping for backward compatibility with non-standard cards
- Multi-sector data reading (including reading the entire memory of the card)
- Reassignment of the device inputs
- Additional service and diagnostic parameters of the manufacturer



isbc.com/esmart