



# Card Reader One USER GUIDE



Card Reader One User Guide

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Card Reader One User Guide

**FCC ID: YRWCRONE**

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.

No changes shall be made to the equipment without the manufacturer's permission as this may void the user's authority to operate the equipment.

This device has been designed and complies with the safety requirements for portable RF exposure in accordance with FCC rule part 2.1093 and KDB 447498 D01.

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## PREFACE

This guide is the primary source of information for setting up and installing Card Reader One.

### Audience

This guide provides simple descriptions of Card Reader One features, as well as basic information for anyone installing and configuring Card Reader One.

### Organization

This guide is organized as follows:

[Chapter 1, Overview](#). Provides an overview of the Card Reader One.

[Chapter 2, Specifications](#). Discusses power requirements and dimensions of Card Reader One, etc.

[Chapter 3, Setup](#). Explains setup and installation of Card Reader One. This chapter tells how to establish connections with other devices.

[Chapter 4, Maintenance and Cleaning](#). Explains maintenance of Card Reader One.

[Chapter 5, Service and Support](#). Provides information on contacting your Datecs representative or service provider and information on how to order accessories or documentation from Datecs.

[Chapter 6, Troubleshooting Guidelines](#). Provides troubleshooting guidelines should you encounter a problem in terminal installation and configuration.

## Related Documentation




To learn more Card Reader One, refer to the following set of documents:

- *Card Reader One Physical Security Features*
- *Card Reader One Firmware API Specifications*
- *Card Reader One Software Design Specifications*

## CONVENTIONS

Various conventions are used to help you quickly identify special formatting. [Table 1](#) describes these conventions and provides examples of their use.

**Table 1 Document Conventions**

Convention	Meaning	Example
<a href="#">Blue</a>	Text in blue indicates terms that are cross references.	See <a href="#">Guide Conventions</a>
<i>Italics</i>	Italic typeface indicates book titles or emphasis.	You <i>must</i> not use this unit underwater.
	The Information icon is used to highlight important information.	USB-type devices work on the Card Reader One USB communication port.
	The caution symbol indicates hardware or Software failure, or loss of data.	The unit is not waterproof or dustproof, and is intended for indoor use only.
	The warning symbol is used as a warning when bodily injury might occur.	Due to risk of shock do not use the terminal near water.

## Overview

This chapter provides a brief description of Datecs’s Card Reader One device.

### Card Reader One Payment Terminal

The Card Reader One unit is a handheld PIN pad with an integrated smart, magnetic stripe, and contactless card reader offering advanced security and payment processing capabilities to handle credit and PIN-based debit card transactions.

Card Reader One supports both symmetric encryption algorithms (DES, 3DES, and AES) and asymmetric encryption (RSA). This device internally manages simultaneous multiple keys through either Fixed, Master Session- or DUKPT-based processes, and offers high performance smart card processing, as well as support for the new generation of 3-volt cards. The Card Reader One sleek and stylish ergonomic design offers power and performance in a smart, MSR, and contactless-integrated PIN pad device.



Datecs ships variants of Card Reader One unit for different markets. Your unit may have a different configuration. However, the basic processes described in this guide remain the same, regardless of configuration.



### Features At a Glance

- Delivers **power** and **usability** in a **small convenient** hand-held design.
- **Security** architecture meets specifications for PIN-entry devices (PED) and sophisticated **file authentication**.

The Card Reader One provides the right combination of features and functions in a small stylish device that fits in the palm of your hand. This includes magnetic stripe, smart card, and contactless reader in an integrated PIN pad, with USB, and Bluetooth communication.



## Features and Benefits

### Exceptional Ease of Use

- Ergonomic design is sleek, stylish, and lightweight for conveniently handing the unit to the consumer for PIN entry.
- Intuitive interface and large, colored control keys simplify training and reduce support requests.
- Highly readable display handles multiple languages.

### Critical Security Protection

- Incorporates tamper-detection circuitry to resist unauthorized intrusion and supports a broad spectrum of hardware and software-based security features.
- Integrated security modules simultaneously support sophisticated encryption (AES, DES, 3DES, RSA) and key management schemes, including single and 3DES Master Session, single, and 3DES Derived.

### Strong Feature Set

- Primary smart card reader support for synchronous and asynchronous smart cards.
- Support for international character sets and Unicode standard.
- Card Reader One has received EMV Level 1 approval for contact smart card solutions.
- Card Reader One has received EMV Level 2 approval for contact smart card solutions.
- Card Reader One has received EMV Level 1 approval for contactless smart card solutions.
- Card Reader One has received Visa PayWave (MSD qVSDC) approval for contactless smart card solutions.
- Card Reader One has received MasterCard PayPass (MagStripe and M/Chip) approval for contactless smart card solutions.
- Card Reader One has received American Express ExpressPay approval for smart card solutions.
- Card Reader One has received Discover ZIP and D-PAS approval for smart card solutions.
- Card Reader One has received PCI PTS 4.x SRED Security Certification.

## Device Specifications

Processor	ARM Cortex® M3 Security Microcontroller
Memory	<ul style="list-style-type: none"> <li>• 256KB of SRAM</li> <li>• 1MB Flash with Cache</li> </ul>
Application Memory	32 Mbit SPI Serial Flash
Display	LCD, monochrome, 128 x 32
Keypad	<ul style="list-style-type: none"> <li>• 10 numeric keys</li> <li>• 2 functional keys</li> </ul>
Magnetic Card Reader	<ul style="list-style-type: none"> <li>• 3-track bi-directional reading</li> <li>• ISO 7810, 7811 and 7813</li> </ul>
Smart Card Reader	<ul style="list-style-type: none"> <li>• ISO7816, EMV L1 certified</li> </ul>
Contactless Card Reader for payment applications (option)	<ul style="list-style-type: none"> <li>• AMEX ExpressPay MagStripe and EMV</li> <li>• Discover ZIP and D-PAS</li> <li>• MasterCard PayPass MagStripe and M/Chip</li> <li>• VISA PayWave MSD and qVSDC</li> </ul>
Peripheral Ports	Single multi-connector supports USB
Battery	Rechargeable Li-Ion-Poly battery 3.7 V / 620 mAh
Connectivity	<ul style="list-style-type: none"> <li>• USB</li> <li>• Bluetooth 3.0 + HS</li> </ul>
OS compatibility	iOS, Android, Windows, Windows Phone 8, Windows Mobile
LED indication	4 LEDs for transaction and device status
Audio indication	Electro-Magnetic Buzzer
Buttons	1 power button
Reliability	<ul style="list-style-type: none"> <li>• 500 000 chip card cycles</li> <li>• 1 000 000 magnetic card swipes</li> <li>• 1 000 000 single button clicks</li> </ul>
Certifications	FCC, CE, EMV Level 1, EMV Level 2, EMV Level 1 Contactless, PCI PTS 4.x
Dimensions (LxWxH), mm	110mm x 69mm x 20mm
Weight, g	130 grams
Environmental	Operating: -10°C to +40°C / 5% to 90% RH Storage: -15°C to +50°C / 5% to 90% RH
Power Supply	<ul style="list-style-type: none"> <li>• 5V External and charge power supply Vdc, USB</li> </ul>

## Device Operation

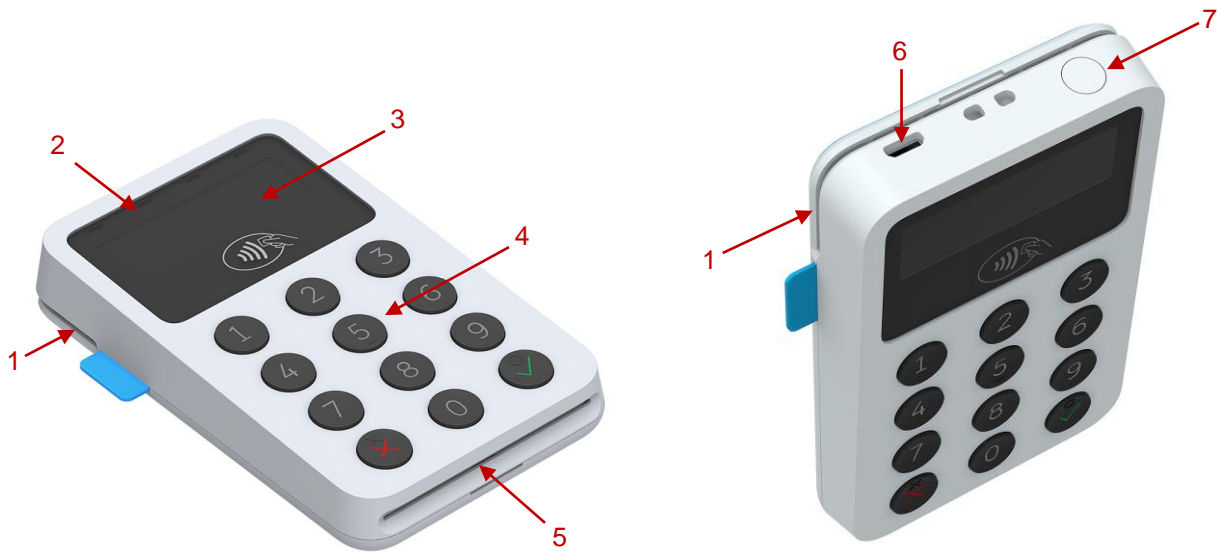



Figure 1

1. Magnetic Stripe Reader
2. Contactless Reader LED Indications
3. Display
4. Keypad
5. Smart Card Reader
6. 10-pin micro-USB Connector
7. Power Button


The battery is charged by the 5V micro-USB connector.

The Card Reader One is switched on and off by pressing the  button.

The Card Reader One comes with a USB communication cable.


The USB communication cable is connected to the Card Reader One's micro-USB connector.

## Setup





When Card Reader One is switched on and the button  is kept pressed, on the display will be shown the name and the version of the Secure Boot Loader and the firmware.

Service personnel can access two different system modes: **Service Mode** and **Application Download Mode**.

### SERVICE MODE

To enter Service Mode for key loading and test operations, the button  has to be pressed while switching on the Card Reader One.

The following keyboard buttons can be used in service mode:

-  : move through the list one position upwards
-  : move through the list one position downwards
-  : selection of the active option
-  : return to previous level or exit the service mode

The following menu options can be selected in service mode:

INFO VERSION  
INFO HARDWARE  
INFO KEYS  
TEST DISPLAY  
TEST KEYBOARD  
TEST MSR  
TEST SCR  
KEYS DOWNLOAD  
DELETE DEA KEYS  
EXIT

### INFO VERSION

Shows the serial numbers and the versions of the detached program modules:

DEV SN Card Reader One serial number  
CPU SN USIP serial number  
CPU VER USIP version  
SBL VER USIP Boot loader version  
HAL VER CPU Hardware Abstraction Layer (HAL) version  
LOAD VER Secure Boot Loader (SBL) version and name  
FW VER Firmware version and name  
PROM VER Prompts version  
APPL VER Application version and name  
PKFA VER Version of the public key used for firmware authentication  
PKAA VER Version of the public key used for application authentication  
PKKA VER Version of the public key used for manufacturing keys authentication

## INFO HARDWARE

Gives information about the status of the following hardware properties:

BATT: indicates the voltage of the 620 mAh battery

VBUS: indicates if external power supply is plugged in

CHARGE: indicates if the battery is charging





BATLOW: identifies low battery


## INFO KEYS

Shows the version of the following keys:

AIK keys version

## TEST DISPLAY

Performs a display test. Initially a blank screen is displayed. When  button is pressed once, completely black screen is displayed. When  button is pressed twice, checkmate background is displayed, its contrast can be changed with the  and  buttons.

To exit the test at any time the button  has to be pressed.

## TEST KEYBOARD

Performs a keyboard test. At first the symbols of all the keys appear on the display. Pressing a key makes its corresponding symbol to disappear. The test ends when all the buttons have been pressed.

## TEST MSR

Performs magnetic card reading test. The test waits for a card to be inserted. On a successful card reading, the tracks data are displayed.


## TEST SCR

Performs smart card reading tests. On the display appears a menu with the supported options. To perform a test, insert a card in the card slot and select the corresponding menu option:

1: RESET : performs card reset and returns the ATR

2: GET CHALLENGE : calls the command GET CHALLENGE and returns a random number

## KEYS DOWNLOAD

To download the Acquirer Initial Keys (AIK) the PINPAD has to be set in Keys Download Mode, in which it exchanges information in a secure way through the USB interface using proprietary communication protocol. To exit the mode the  button has to be pressed.

## CLEAR DEA KEYS





Deletes the customer's DEA key hierarchy.

## EXIT

Exit the service menu forwarding the control to the application.



## APPLICATION DOWNLOAD MODE

To enter application download mode on the Card Reader One:

- Connect Card Reader One to a PC using the supplied USB communication cable.
- While holding down the  button, press the  button.
- Release both the  and  buttons simultaneously.
- The pinpad is in the Secure Boot Loader mode (SBL).

MODE: FW/APP is displayed and the Terminal listens for application download commands on the USB serial interface. When application download is initiated, on the display is shown the progress in percentages of the downloading process.

To exit the mode, press  or  buttons.

The Application download process shall not be interrupted to prevent memory corruption. If the buttons  or  are pressed during the downloading process, the application integrity checking will fail on booting up and process will have to be repeated.

## COMMUNICATION PARAMETERS

The default USB VC serial port communication parameters are the following:

115200bps  
8bit  
1 stop bit  
no parity

## APPLICATION SETTINGS

USB MODE	DEVICE
BLUETOOTH	Settings
	Mode: ENABLE/DISABLE
	ADDR: MAC ADDRESS of the Bluetooth
	NAME: Bluetooth name
	PASS: Bluetooth password
	PAIR: DISCOVERABLE/HIDDEN
	AUTO: ENABLE/DISABLE
	VER: Bluetooth firmware version
	MASTER RESET: return to default settings
	PAIRING
	FW UPDATE
AUTO OFF	60min

\*Default settings

Note: Setting can vary depending on the application loaded. To clear Bluetooth settings use Bluetooth master reset.

## Magnetic Card Reader Use

The magnetic card transaction procedure can vary depending on the application loaded on the Card Reader One. Verify the proper procedure with your application provider before performing a magnetic card transaction.

### To Conduct a Magnetic Credit/Debit Card Transaction

- 1 Position a magnetic card with the stripe facing front and down ([Figure 5](#)).
- 2 Insert it into the MS card reader slot and then quickly swipe it.
- 3 Hand Card Reader One to the customer for signature or PIN entry



Figure 5



## Smart Card Reader Use

The smart card transaction procedure can vary depending on the application loaded on the Card Reader One. Verify the proper procedure with your application provider before performing a smart card transaction.

### To Conduct a Smart Card Transaction

- 1 Position a smart card with the gold contacts facing upward (Figure 6).
- 2 Insert it into the ICC card reader slot in a smooth, continuous motion until it seats firmly.
- 3 Hand Card Reader One to customer for PIN entry
- 4 Remove the card when the display indicates the transaction is completed.



Figure 6  
Smart card with the gold contacts upward



Leave the smart card in the card reader until the transaction is completed. Premature removal can void the transaction.

## Contactless Card Reading

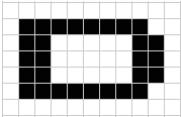
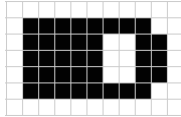
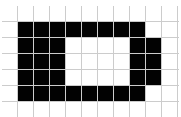
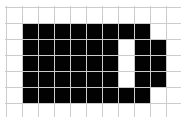
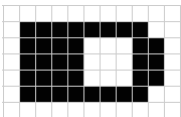
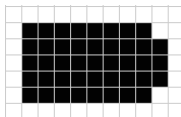


Figure 7

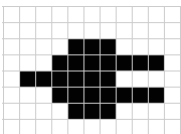
Place the card on the shown spot and press the reading RFID card button on the application.  
Note: The center of the smart card must be aligned with the center of the contactless logo on the display, regardless of the orientation of the card.

## Display indicators

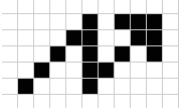
Battery level status:

<p><i>If battery level - 1 bar – low battery</i></p> 	<p><i>If battery level - 4 bars</i></p> 
<p><i>If battery level - 2 bars</i></p> 	<p><i>If battery level - 5 bars</i></p> 
<p><i>If battery level – 3 bars</i></p> 	<p><i>If battery level - 6 bars - fully charged</i></p> 

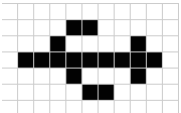
Outside power from cable or Power station – “Plug”



Battery is charging from power cable or Power station – “Flash”




"USB" - connection



## Troubleshooting Guidelines

This chapter lists typical examples of malfunction you may encounter while operating your Card Reader One unit and steps you can take to resolve them.

The troubleshooting guidelines provided in the following section are included to assist successful installation and configuration of Card Reader One units. If you are having problems operating your Card Reader One unit, please read through these troubleshooting examples. If the problem persists even after performing the outlined guidelines or if the problem is not described, contact your local Datecs representative for assistance.

	The Card Reader One unit contains no user-serviceable parts. Do not, under any circumstance, attempt to disassemble the unit. Perform only those adjustments or repairs specified in this guide. For all other services, contact your local Datecs service provider. Service conducted by parties other than authorized Datecs representatives may void any warranty.
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### Blank Display

When the Card Reader One unit display does not show correct or clearly readable information:

- Check battery power.
- If the problem persists, contact your local Datecs service provider.

### Keypad Does Not Respond

If the keypad does not respond properly:

- Check the display. If it displays is not blank, follow the steps outlined in [Transactions Fail To Process](#).
- If the problem persists, contact your local Datecs representative.

### Transactions Fail To Process

There are several possible reasons why the unit may not be processing transactions. Use the following steps to troubleshoot failures.

### Check Magnetic Card Reader

- Perform a test transaction using one or more different magnetic stripe cards to ensure the problem is not a defective card.
- Ensure that you are swiping cards properly (see [Magnetic Card Reader Use](#)).
- If the problem persists, contact your local Datecs representative.

## Check Smart Card Reader

- Perform a test transaction using several different smart cards to ensure the problem is not a defective card.
- Ensure that the card is inserted correctly (see [Smart Card Reader Use](#)).
- If the problem persists, contact your local Datecs representative.



Due to risk of shock or damage, do not use the Card Reader One unit near water, including a bathtub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool.

## Maintenance and Cleaning

Card Reader One units have no user-serviceable parts.

To clean the unit, use a clean cloth slightly dampened with water and a drop or two of mild soap. For stubborn stains, use alcohol or an alcohol-based cleaner.

Do not attempt to clean the card readers. Doing so can void any warranty. For card reader service, contact your Datecs distributor or service provider.



Never use thinner, trichloroethylene, or ketone-based solvents – they can deteriorate plastic or rubber parts. Do not spray cleaners or other solutions directly onto the keypad or display.

## Main battery replacement

To replace the main battery of Card Reader One please contact with your your local Datecs representative or service provider.

## Service and Support

For Card Reader One problems, product service, and repair information, contact your local Datecs representative or service provider.

- International – Contact your local Datecs distributor

## Service Returns

All customers, please contact your local Datecs representative or distributor for assistance with your service, return, or replacement.

## Individual Packaging

