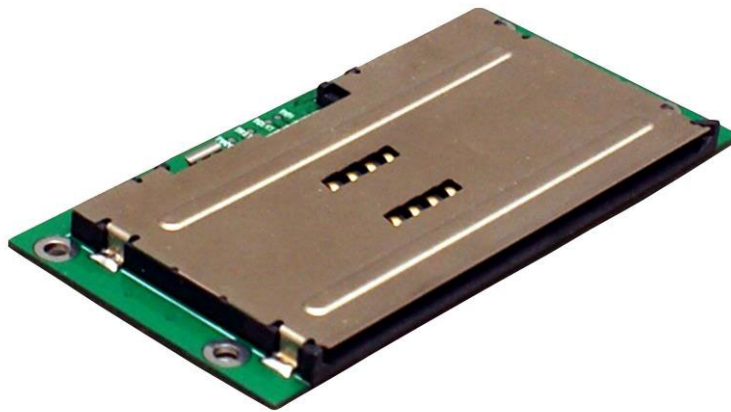




# MiniSmart II Secure Smart Card Reader User Manual



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**FCC warning statement**

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.

The user manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.




**Note:** The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user’s authority to operate the equipment.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter and must be installed to provide a separation distance of at least 20cm from all persons.

**Cautions and Warnings**

	<p><b>Caution:</b> The ViVOpay Vendi should be mounted 1-2 feet away from other ViVOpay Vendi. Can be adjusted based on lane setup.</p>
	<p><b>Caution:</b> Danger of Explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer’s instructions.</p>
	<p><b>Warning:</b> Avoid close proximity to radio transmitters which may reduce the ability of the reader.</p>

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## 1. Introduction

The MiniSmart II is ID TECH's EMV-ready, smart card interface that is certified for EMV Level 1 and Level 2. The MiniSmart II maintains a compact form factor and supports interfaces such as USB, UART, and RS-232. The MiniSmart II has smooth integration abilities that adapts well for EMV transactions and fills the need for a compact, reliable card reader that can serve a wide variety of space-limited applications.

For information about document abbreviations please visit Section 10.

## 2. Product Configurations

The product comes with and without USB-HID or RS-232 connectors.

MINI2-00	MiniSmart II;UART&USB-HID;FPC;No Bezel
MINI2-20	MiniSmart II;RS-232;Connector;No Bezel
MINI2-50	MiniSmart II;USB-HID;Connector;No Bezel

## 3. Features

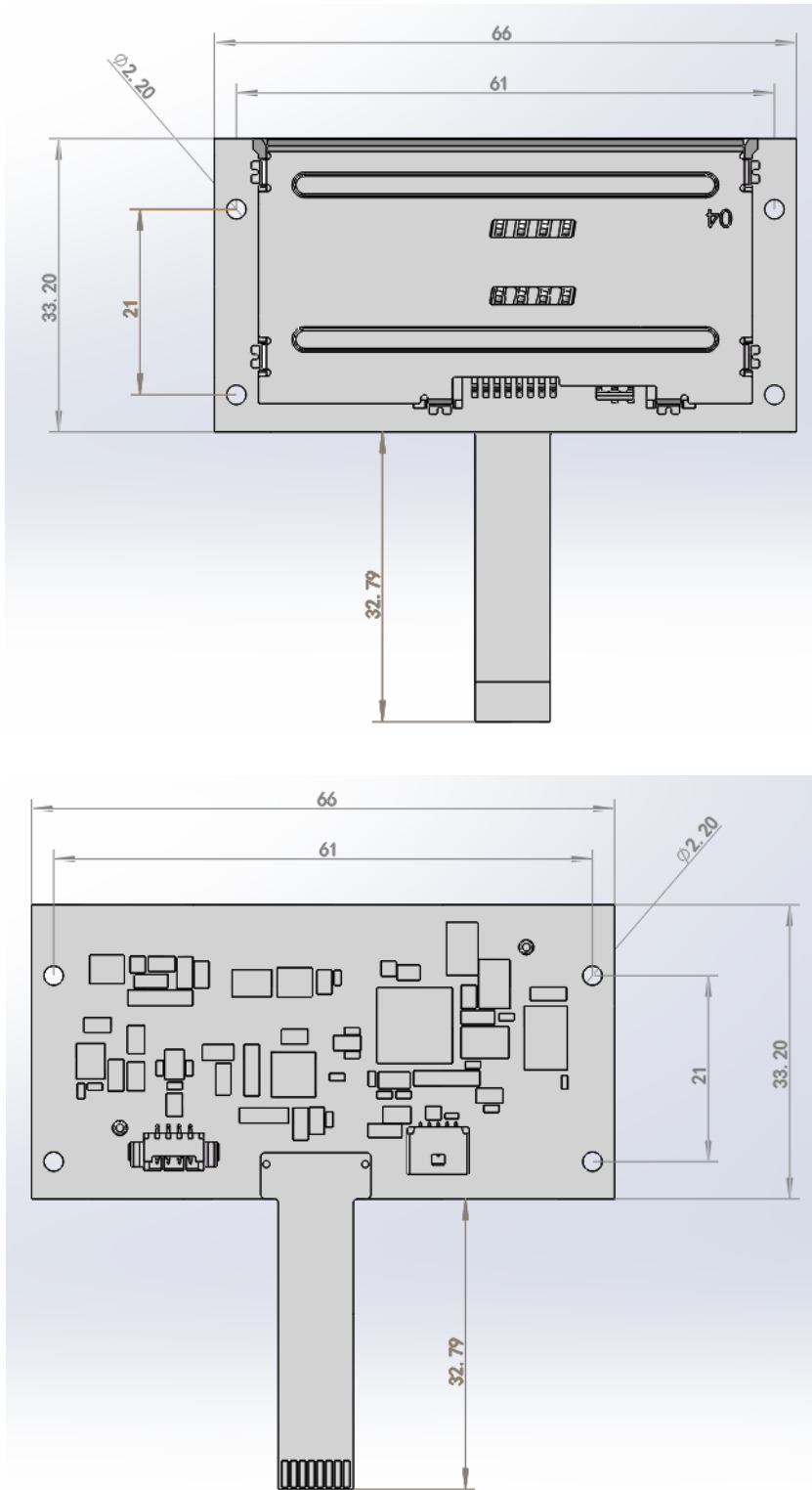
- EMV L1 certified (L2 pending)
- TDES/AES encryption
- DUKPT Key Management (ANSI X9-24)
- Reads ISO 7816 (1,2,3,4) (T=0, T=1) (Class A, B, C) microprocessor cards
- Interface includes: RS-232, UART, USB-HID
- Small form factor: 66 x 33.2 x 6.6 mm
- Friction contacts
- Designed for a minimum of 500,000 cycles and 300,000 operating hours (MTBF)
- Support for remote key injection
- Firmware can be updated in the field
- Supports both clear text output and cipher text output
- FCC/CE certified
- Available with Universal SDK (C# on Windows or Java on Android)

## 4. Applicable Documents

P/N 80000408-001	Communication Protocol of ID TECH Products
P/N 80000404-001	ID-Tech Encrypted Data Format in Command Response Specification
EMV Specifications	Available from <a href="http://www.emvco.com/specifications.aspx">http://www.emvco.com/specifications.aspx</a>
API Reference	See ID TECH document 80161508-001, MiniSmart II Commands.

## 5. Specifications

Outline Diagram:



1. **Size and Weight:**
  - Main Body size: 66.0mm(L) x 33.2mm(W) x 6.6mm(H)
  - Weight: 13.40g
2. **Mounting Method:**
  - Four mounting holes
  - Insertion installation through 2 side edges of PCA board
3. **Module Interface:**
  - FPC cable to connect terminal
  - RS-232 adapter connects to terminal through cable
  - USB adapter connects to terminal through cable

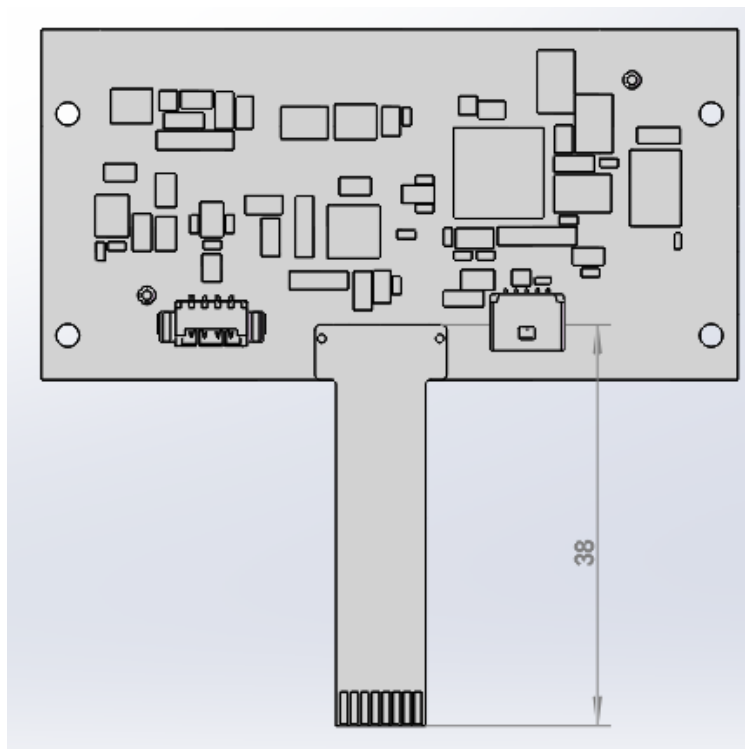
## Connections

### Smart Card Connector

- Model type: Amphenol-M-C702 series
- Dimension: 57.2(L) x 31.2(W) x 3.3(H) mm
- Frictional (sliding) contact connector
- Durability: 500,000 cycles

### PCA

- PCB: 66mm (L) x 33.2mm (W) x 1.0mm (H)
- FPC: Material: PI, 8PIN, 1.0 pitch, 38mm (L), thickness: 0.15mm.

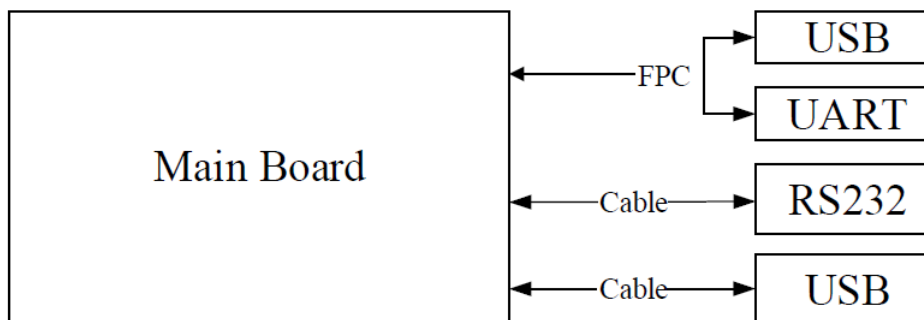


<b>Environmental</b>	
<b>Temperature</b>	Operating: 32°F to 131°F (0°C to 55°C) non-condensing Storage: -22°F to 149°F (-30°C to 65°C) non-condensing
<b>Humidity</b>	Operating: maximum 95% non-condensing Storage: maximum 95% non-condensing
<b>Electrical</b>	
	Electrical Power Requirements: 4.5 VDC to 5.5 VDC, 12mA Max. w/no ICC ICC Interfaces (Compliance): ISO/IEC 7816-1, 2, 3, & 4 ICC Types: Number of cards = 1, Asynchronous, T=0 & T=1 Synchronous (memory) cards (contact factory) ICC Transmission: 9.6 Kbps to 115 Kbps speeds ICC Voltage: 5 V Interface: USB-HID, UART, RS-232 MTBF: 300,000 hours (calculated based on Bellcore standard).
<b>Approvals</b>	
	RoHS 2 & REACH EMV Level 1 & Level 2 FCC/CE

## 6. Hardware Layout

### 6.1. Board Structure

Main PCA design





## 6.2. Communication Interface

PCs and laptops can communicate with the MiniSmart II through the USB interface or the RS-232 interface. An Android device uses USB and a PC might use either USB or RS-232.

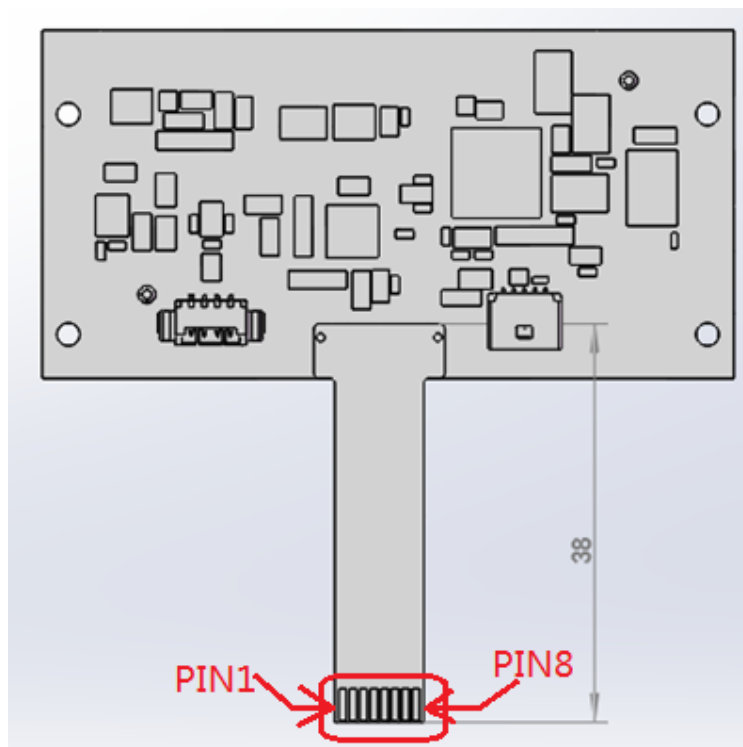
## 6.3. Connector Interface

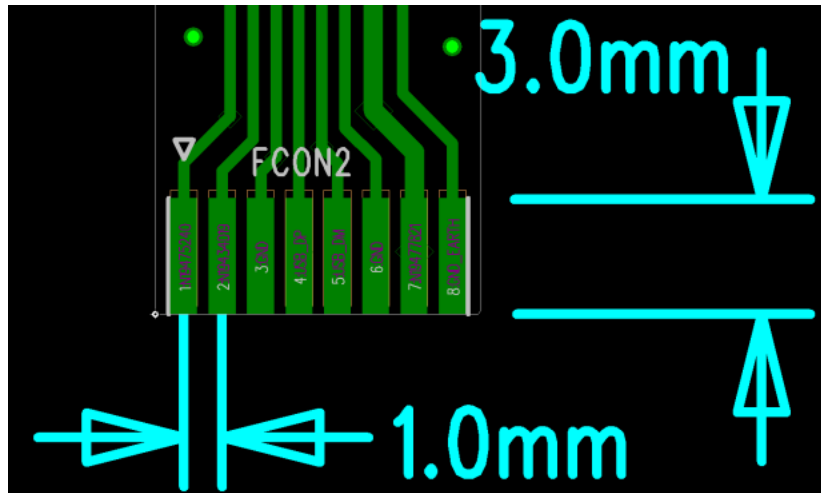
### 6.3.1. FPC Interface

FPC Header Spec: 8PIN, 1.0mm pitch, length 3.0mm, thickness 0.3mm

**Pin out:**

1	TXD
2	RXD
3	GND
4	USB_DP
5	USB_DM
6	GND
7	+5v
8	Earth_GND





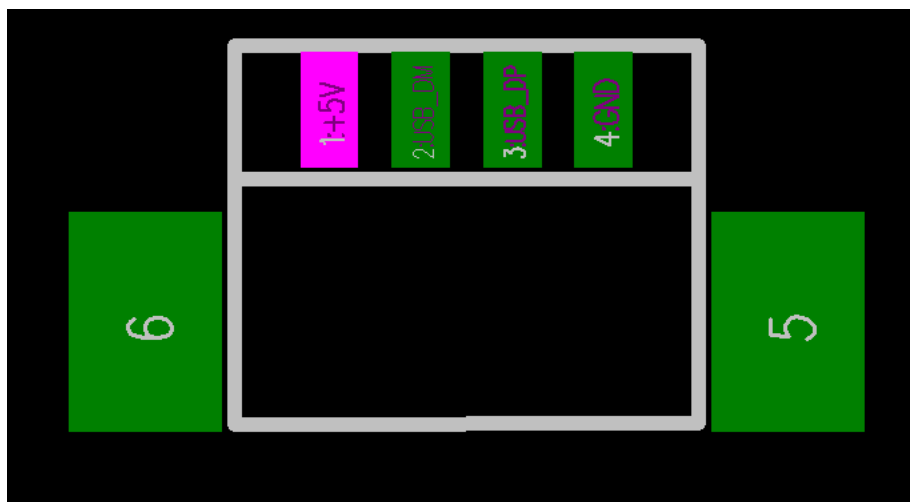
### 6.3.2. USB and no FPC

USB Connector: Molex; 53261-0471

USB Connector Specifications: 4PIN, 1.25mm pitch

Pin out:

1	+5V
2	USB_DM
3	USB_DP
4	GND



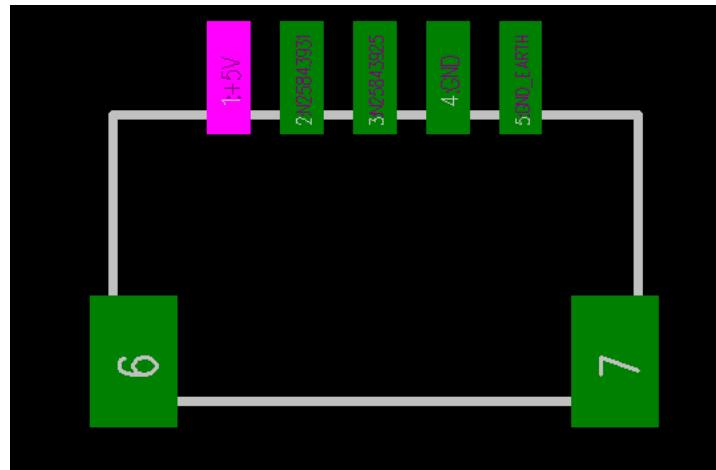
### 6.3.3. RS-232 and no FPC

RS-232 connector: Cherg-Weei Technology Corp.; CCSH-W10R-05-TR

RS-232 connector spec: 5PIN, 1.0mm pitch

**Pin out:**

1	+5V
2	TXD
3	RXD
4	GND
5	Earth_GND



## 7. Interfaces

### 7.1. Smart Card Function

- EMV 2000 Level 1 & 2 compliant (EMV-ready).
- Reads ISO 7816 (1,2,3,4) (T=0, T=1) (Class A, B, C) microprocessor cards.
- Monitors card seated status.
- TDES and AES **Enhanced Encryption Format** supported.

### 7.2. Serial Interface

- RS-232 interface for communication with PC host. (Can communicate with Android host via MicroUSB.)
- Typical size for an EMV card transaction is 300 bytes per transaction.
- Bi-directional communication supported at 9600/19200/38400/115200 baud.
- The USB VID is 0x0ACD. USB PID is 0x3410.

### 7.3. Key Injection Function

- Is compatible with FutureX HSM for Debit and Data Key Injection.
- Can communicate with HSM via RS-232 port.
- Check with an ID TECH representative for latest HSM compatibility list.

## 7.4. Remote Key Injection Function

- Compatible with Local POS Computer (LPC) for **Debit** and **Data Key Injection**.
- Can communicate with Local POS Computer (LPC) via RS-232 port.
- Can communicate with Local POS Computer (LPC) via USB port.

## 7.5. Bootloader Function

The firmware can be upgraded via RS-232 or USB port in the field. The unit does not need to be sent back to the manufacturer.

# 8. APIs

## 8.1. Set Idle Waiting Time

### Command Body

```
78 53 01 05 01 <Time>
```

### Where:

<Time> is 4 seconds ~ 60 seconds (Default is 4 seconds)

### Response Body

```
06
```

**Note:** The "Set Idle Waiting Time" is only available in the FW version V2.00.034 and above.

## 8.2. Get Idle Waiting Time

### Command Body

```
78 52 01 05
```

### Response Time

```
06 78 01 05 01 <Time>
```

### Note:

- If waiting time is 0 and if interface is RS232, disable the device to work in **Low Power Consumption** status.
- If the waiting time is not 0, the Idle status is more than <Time>, the interface is RS232, and the card is not seated, the device will enter **Low Power Consumption** status.
- If the device receives a command in Idle status the waiting time will be reset.
- If IC card is removed the waiting time will be reset.

## 9. Universal SDK

ID TECH's Universal SDK supports MiniSmart II development in C# on Windows and Java on Android. Contact an ID TECH representative for free access to the SDK of choice. ID TECH recommends the use of these SDKs to achieve rapid integration of MiniSmart II with tablets, POS systems, mobile devices, electronic cash registers, and more.

The Universal SDK is designed to provide easy high-level access to virtually all MiniSmart II functionalities while eliminating the need to use low-level firmware commands. The SDK's convenience objects, and rich APIs greatly facilitate exceptional processing, data parsing, and response-code interpretation. As a result, sophisticated integrations are achieved relatively quickly.

The Universal SDK comes with sample code and ample documentation. It also comes with a Universal Demo or "UDemo" app (for Windows) that facilitates troubleshooting, terminal-configuration testing, and data validation. The UDemo app is available for download at [ID TECH's public Knowledge Base](#).

## 10. Abbreviations

AES	Advanced Encryption Standard
DES	Data Encryption Standard
EMV	Europay, MasterCard, and Visa standard
FPC	Flexible Printed Circuit (connection)
KEK	Key-Encryption Key
MSR	Magnetic Swipe Reader
MTBF	Mean Time Between Failures
PCI	Payment Card Industry
POS	Point of Sale
SRED	Secure Reading and Exchange of Data
TDES	Triple Data Encryption Standard
USB	Universal Serial Bus