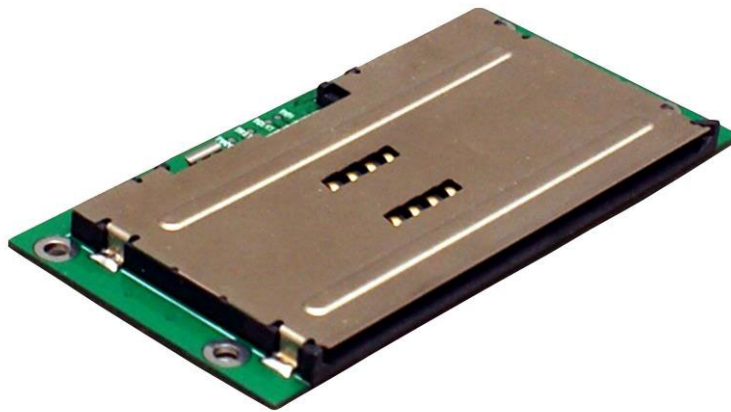




MiniSmart II Secure Smart Card Reader User Manual



80161502-001 Rev. D

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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

	Caution: The ViVOpay Vendi should be mounted 1-2 feet away from other ViVOpay Vendi. Can be adjusted based on lane setup.
	Caution: 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.
	Warning: Avoid close proximity to radio transmitters which may reduce the ability of the reader.

Revision History

Date	Rev	Changes	By
05/25/2021	D	Restored Revision History Style and Format update Added Connecting to the FPC Conversion Board section	CB

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1. Overview

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 adapt well for EMV transactions and fills the need for a compact, reliable card reader that can serve a wide variety of space-limited applications.

1.1. Product Configurations

The MiniSmart II 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

1.2. 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)

1.3. Approvals

- RoHS 2 & REACH
- EMV Level 1 & Level 2
- FCC/CE
-

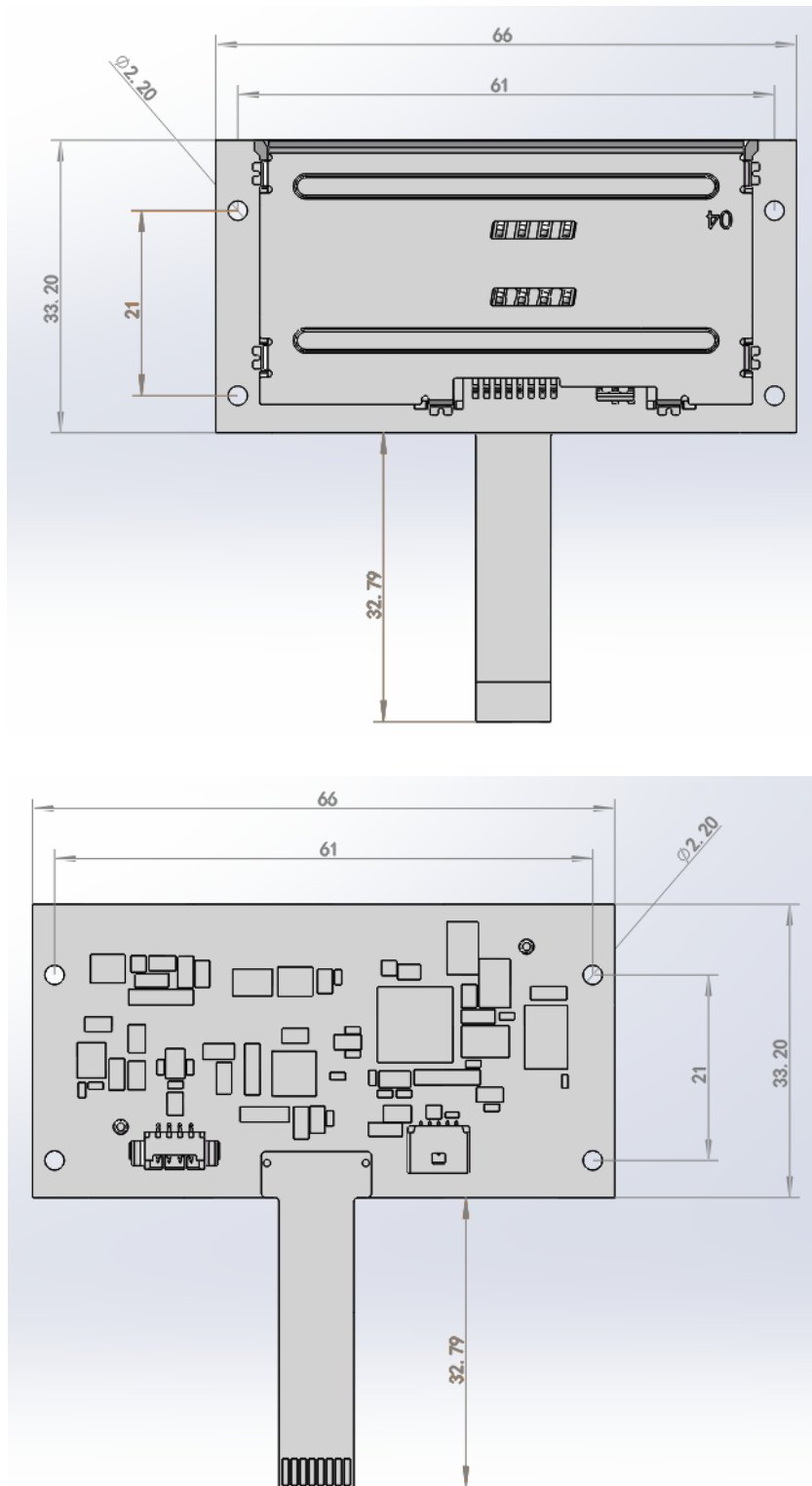
1.4. Applicable Documents

P/N 80000408-001	ID TECH Product Communication Protocol
P/N 80000404-001	ID TECH Encrypted Data Format in Command Response Specification
EMV Specifications	Available from http://www.emvco.com/specifications.aspx
API Reference	See ID TECH document 80161508-001, MiniSmart II Commands.

2. Specifications

Hardware	
Connections	<p>Smart Card Connector</p> <ul style="list-style-type: none"> • 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 <p>PCA</p> <ul style="list-style-type: none"> • PCB: 66mm (L) x 33.2mm (W) x 1.0mm (H) • FPC: Material: PI, 8PIN, 1.0 pitch, 38mm (L), thickness: 0.15mm.
Interface	<ul style="list-style-type: none"> • FPC cable to connect terminal • RS-232 adapter connects to terminal through cable • USB adapter connects to terminal through cable
Physical	
Dimensions	66.0mm(L) x 33.2mm(W) x 6.6mm(H)
Weight	13.40g
Environmental	
Temperature	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
Humidity	Operating: maximum 95% non-condensing Storage: maximum 95% non-condensing
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).

2.1. MiniSmart II 2D Drawing



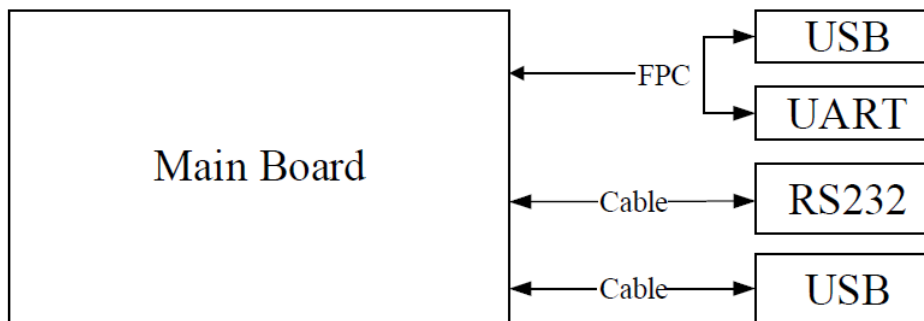
2.2. Mounting Method

- Four mounting holes
- Insertion installation through 2 side edges of PCA board

3. Hardware Layout

3.1. Board Structure

Main PCA design



3.2. 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.

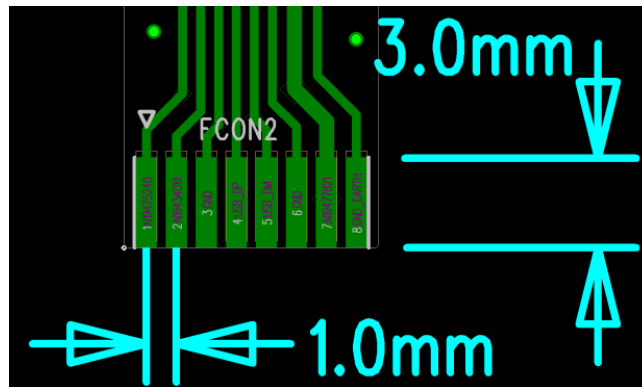
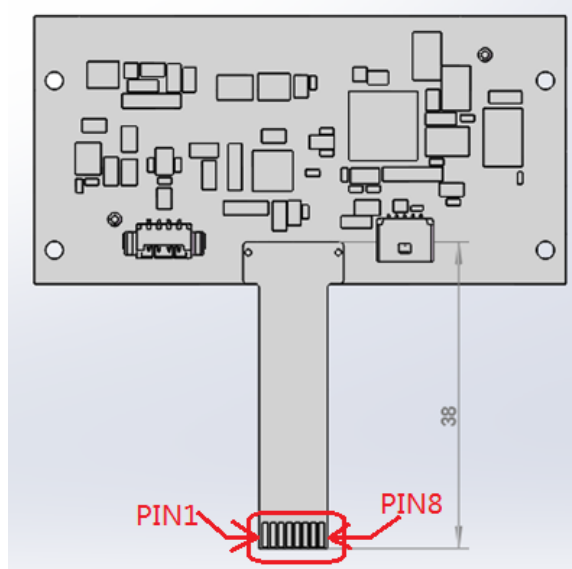
3.3. Connector Interface

3.3.1. FPC Interface

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

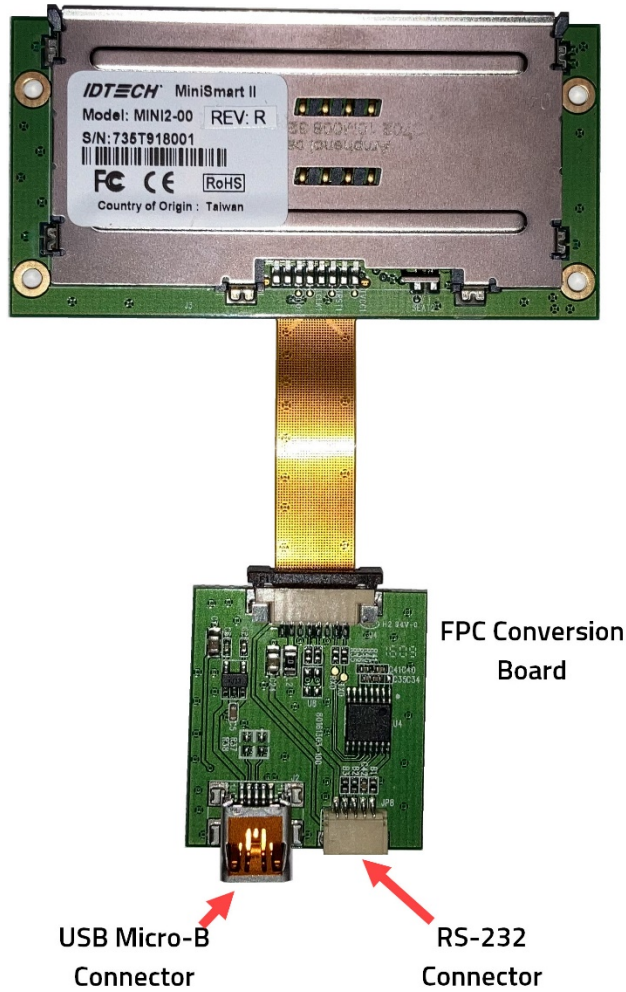
Pinout:

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



3.3.2. Connecting to the FPC Conversion Board for Testing

The Flexible Printed Circuit Conversion Board (80161303-001), available for the FPC version of the MiniSmartII (MINI2-00), turns the FPC connection into a USB micro-B connector for testing purposes. The connector next to the USB micro-B is designed for use with ID TECH's RS232 interface cable. Note the orientation of the conversion board to the reader for proper use, as shown here:



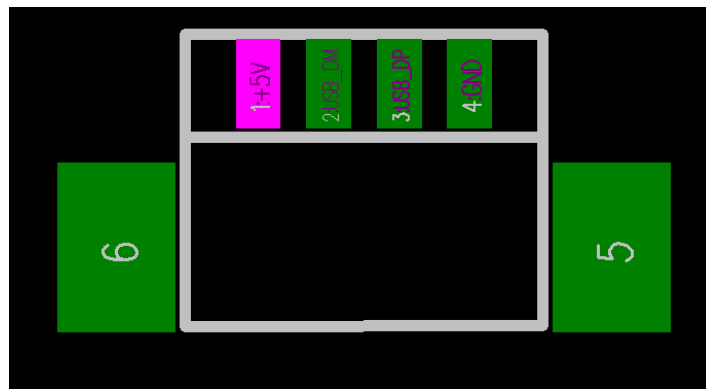
3.3.3. USB and no FPC

USB Connector: Molex; 53261-0471

USB Connector Specifications: 4PIN, 1.25mm pitch

Pinout:

1	+5V
2	USB_DM
3	USB_DP
4	GND



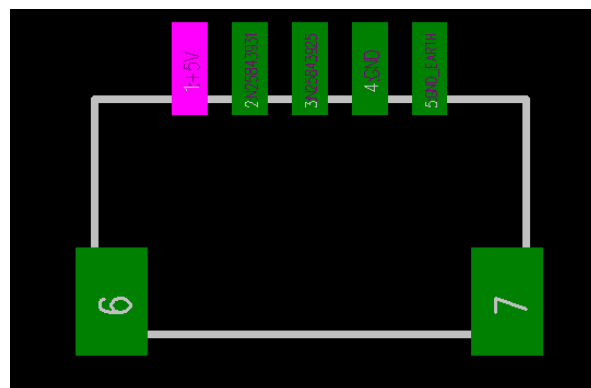
3.3.4. RS-232 and no FPC

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

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

Pinout:

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



4. Interfaces

4.1. 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.

4.2. 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.

4.3. Key Injection Function

- Is compatible with FutureXHSM 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.

4.4. 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.

4.5. 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.

5. MiniSmart II Commands

For a full listing of MiniSmart II commands, see the MiniSmart II Command Reference, available on the [ID TECH Knowledge Base](#).

6. Universal SDK and USDK Demo App

ID TECH's Universal SDK supports MiniSmart II development in C# on Windows and Java on Android. Visit the [Universal SDK page](#) 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 app (for Windows) that facilitates troubleshooting, terminal-configuration testing, and data validation. The USDK Demo app is available for download on the [ID TECH Knowledge Base](#).

7. 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

8. For More Information

- To learn more about the MiniSmart II and other ID TECH products, visit the [ID TECH Knowledge Base](#).
- Visit us online at <http://idtechproducts.com>.
- Find more Tech Support resources at the [ID TECH Tech Support home page](#) or send an email describing any issues to support@idtechproducts.com.