Value through Innovation

# VP5300M User Manual

**80171500-001 Rev. C**
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# 1. Overview

ID TECH's VP5300M is a motorized, compact SRED credit card reader designed to support MSR (MagStripe) and contact EMV, plus contactless EMV (when the device is mated with the VP5300M's NFC antenna).

The VP5300M is designed to deliver MSR, EMV, and optional NFC (contactless) payment acceptance with SRED security and reliability in unattended payment scenarios, such as Parking, ATM, Ticketing, and Payment Kiosks (among others).

The VP5300M leads the industry in low power consumption and ruggedness, with its plastic bezel and IK07 and IP42 ratings to ensure long life in demanding conditions. The VP5300M is certified to the latest payment standards of EMV (Level 1 and Level 2) and PCI (5.x) and offers easy integration of payments into self-serve kiosk and unattended environments.

The VP5300M


NFC Antenna

## 1.1. VP5300M PCI/EMV Certified Insert Reader

| Model Number | Description |
|---|---|
| **IDM-181** | VP5300M; Ethernet, 8 SAM, JIS; No conformal coating; Production Unit; No custom features. |
| **IDM-081** | VP5300M; No Ethernet, 8 SAM, JIS; No conformal coating; Production Unit; No custom features. |
| **IDM-101** | VP5300M; Ethernet, No SAM, JIS; Production Unit; No conformal coating; No custom features. |
| **IDM-180-** | VP5300M; Ethernet, 8 SAM, No JIS; Production Unit; No conformal coating; No custom features. |
| **IDM-001** | VP5300M; JIS; Production Unit; No conformal coating; No custom features. |

## 1.2. Optional Accessories

| Model Number | Description |
|---|---|
| **80171201-001** | USB cable |
| **80171203-001** | RS-232 cable |
| **80171204-001** | Power cable, with Molex coupling |
| **AC0005R-12** | Power supply, USA plug, 12VDC, 4.25A; 90-264 VAC input (60Hz US, 50Hz Europe), Molex plug |
| **80141220-001** | L100 cable |

## 1.3. NFC Antenna

| Model Number | Description |
|---|---|
| **ID-80152002-003 Antenna** | NFC Antenna, silver overlay, with RJ-45 (male) coupling. |

The VP5300M supports USB and serial (RS-232) host communication using the command protocol defined in the *NEO 2 Interface Developers Guide*. This comprehensive guide describes all the firmware commands and other features available in ID TECH's NEO-series devices; it is the authoritative source for technical information of interest to systems integrators. Contact your ID TECH representative to obtain a copy of this guide, which is available under NDA. Note, also, that a feature-rich, Windows-based Universal SDK is available to aid in rapid development of applications that talk to the VP5300M.

Be sure to check the Downloads page on the ID TECH Knowledge Base for the latest VP5300M demos, utilities, SDK updates, white papers, and other downloads, all of which are freely available without registration.

**NOTE:** The VP5300M requires the use of an external 12V DC power supply; it cannot run on USB port power alone. When other peripherals are connected to it, such as an NFC antenna, the VP5300M powers those peripherals.

## 1.4. Features

The VP5300M supports the following features:

- Contactless: ISO/IEC 14443 Type A and B
- PCI-PTS 5.x certification with SRED
- Tamper responsive (with automatic zeroization of keys in the event of tamper)
- MSR reads up to 3 tracks of data (Bi-Directional), with JIS-I and JIS-II support
- ICC reader with landing contact
- Contact and Contactless EMV Level 1 certified
  - Contact EMV Level 2 certified, using ID TECH's proven Common Kernel
  - All major Contactless kernels supported
- State-of-the-art encryption support
  - Triple DES
  - AES
  - TransArmor RSA
- Support for DUKPT key management (with 15 DUKPT slots) of data and/or MAC keys
- NGA Key Injection Protocol
- TR34 Remote Key Injection Protocol
- 32 Key slots supported
- Optional contactless (NFC/RFID) antenna
- Mechanical and optical combination front switch
- Plastic bezel with a gate
- Dedicated RS232, USB, and Ethernet ports (for data communication)
- Dedicated DC 12 to 24V power input
- LAN with network function 2 colored LEDs for link state and speed indication
- Audio feedback for MSR, contact EMV, and contactless transactions
- RoHS 2, and REACH compliance
- 1-year manufacturer's warranty

This document assumes that users are familiar with their host systems and all related functions.

## 1.5. Applicable Documents

- ISO 7810 Identification cards: Physical characteristics
- ISO 7811 1 - 6 Identification Cards: Track 1 - 3
- ISO 7816 Identification cards: Integrated circuit cards
- ISO 4909 Magnetic stripe content for track 3
- 80171400 Product Requirement Document: Motorized PCI SRED / EMV Insert Reader
- 80000403-001 Enhanced Encrypted MSR Data Output Format
- 80000404-001 ID-Tech Encrypt Data Format in Command Response Specification
- 80000405-001 IDTECH NGA Key Injection Protocol

## 1.6. VP5300M: Approvals

| Item | Regulation & Class |
|---|---|
| **CE** | EN55032/EN55035, Class- B |
| **FCC** | Part 15, Class-B |
| **RoHS** | Compliant |
| **UL** | Certification with UL regulation |
| **REACH** | Compliance with REACH regulation |
| **USB IF** | Compliance with USB IF regulation |
| **EMV** | Contact L1 & L2 / Contactless L1 |
| **PCI** | PCI PTS 5.X |
| **Contactless Technology** | **Specification Compliance** |
| **American Express** | ExpressPay 3.1 |
| **Discover** | DPAS 1.0 Zip 3.1.2 |
| **FeliCa** | 1.44 |
| **Interac** | v1.5 |
| **JCB** | 1.3 |
| **Mastercard** | MCL 3.1.1 |
| **PBOC** | qPBOC 3.0 |
| **UPI (Union Pay)** | QUICS 1.0.2 UICS 3.0 |
| **Visa** | VCPS 2.2 |
| **Mobile wallets** | Apple Pay<br>Apple Pay VAS<br>Google Pay<br>Google Pay Smart Tap 2.1 |

# 2. VP5300M: Electrical

**Voltage requirement:** 12V DC (minimum) is recommended, to 24V maximum.
**Battery:** The unit contains a small lithium battery to power the Real Time Clock and certain anti- tamper features. This battery has a shelf life of five years. The battery is not user replaceable. Do not attempt to open the VP5300M for any reason; this will trigger the anti-tamper features, causing the unit to become inoperable. If a replacement battery is required, return the VP5300M to ID TECH. Contact support@idtechproducts.com for more information.

## 2.1. VP5300M: Firmware

| Feature | Support Function |
|---|---|
| **Magnetic stripe** | • Meets ISO 7810/ISO 7811 specification Supports AAMVA format<br>• Supports JIS I/II card format<br>• Supports single, dual and triple tracks; dual head. |
| **Contactless** | • EMVCo Contactless Level 1 & 2's (listed in Sec. 1.6)<br>• ISO 14443 Type A&B, MIFARE, ISO 18092 MIFARE: Classic, Ultralight C, DESFire, DESFire EV1 supported via passthrough mode |
| **Contact** | • EMVCo Contact Level 1 & 2 (L2 Common Kernel) |
| **Key injection** | • Compatible with FutureX and Geobridge HSMs for Data Key Injection<br>• Can communicate with HSM via RS232 port<br>• Support for RSA keys generation and certificates loading Support for Asymmetric TR-34 Remote Key Injection |
| **Security** | • PCI PTS SRED 5.X<br>• Supports ID TECH Encrypted Data Output Format – 80000502-001<br>• Support multiple types of encryption formats:<br>o TDES<br>o AES<br>o RSA-based TransArmor<br>• Supports Multiple Key management techniques: DUKPT<br>• Master Session Key<br>• Secure firmware. Remote key injection, and application download using PKI<br>• Secure commands (PKI) for configuring device (RTC, whitelist, reset device, etc.) |
| **Command Set** | • Reference the NEO 2 Interface Developers Guide - 80139403-002 |

| Feature | Support Function |
|---|---|
| **Host Interfaces** | • RS232, USB-HID |
| **Firmware/Application Download** | • Use host interfaces to download firmware/application |
| **Application** | • Future development to supports payment applications hosted by the VP5300M to send payment packets to different gateways/processors/acquirers<br>• QSPI Flash for code storage and SDRAM for memory |
| **LEDs** | • LEDs – Green NFC Certification LED on antenna<br>• diagnostic LED<br>• 1 tri-color LED indicator for MSR |
| **Audio** | • Beep for contactless transaction and other functions |
| **Logs** | • Keep logs for firmware/application download, secure events |

# 3. VP5300M: Physical/Mechanical Characteristics

| Item | |
|---|---|
| **Physical Dimensions: VP5300M Reader** | 163mm from back of mounting surface x 65mm flange width x 27.5 mm flange height (LxWxH) |
| **Physical Dimensions: VP5300 NFC Antenna Bezel** | 65mm x 54mm x 14.5mm (LxWxH), not counting 15.5mm-deep M4 studs that protrude from the back of the unit |
| **Structure Material** | Plastic bezel, PC UL 94V-0 |
| **Housing Color** | Black |
| **Weight** | 0.51 kg without SAM board |
| **Bezel** | Plastic bezel with texture |

## 3.1. VP5300M: Environmental Characteristics

| Category | Support | |
|---|---|---|
| **Operating Temperature** | -0° C to 50° C (32° F to 122° F), | |
| **Storage Temperature** | -20° C to 70° C (-4° F to 158° F) | |
| **Operating Humidity** | 10% to 95% non-condensing | |
| **Storage Humidity** | 10% to 95% non-condensing | |
| **Transit Humidity** | 5% to 95% non-condensing | |
| **Operating Environment** | Water resistant for indoor use | |
| **IK Rating** | IK07 | |
| **IP Rating** | IP42 | |
| **ESD (Device)** | Air discharge | ±15kV |

**Note:** Cables and connectors must be fully isolated with insulating material to prevent ESD discharge.

## 3.2. VP5300M: Durability and Reliability Specs

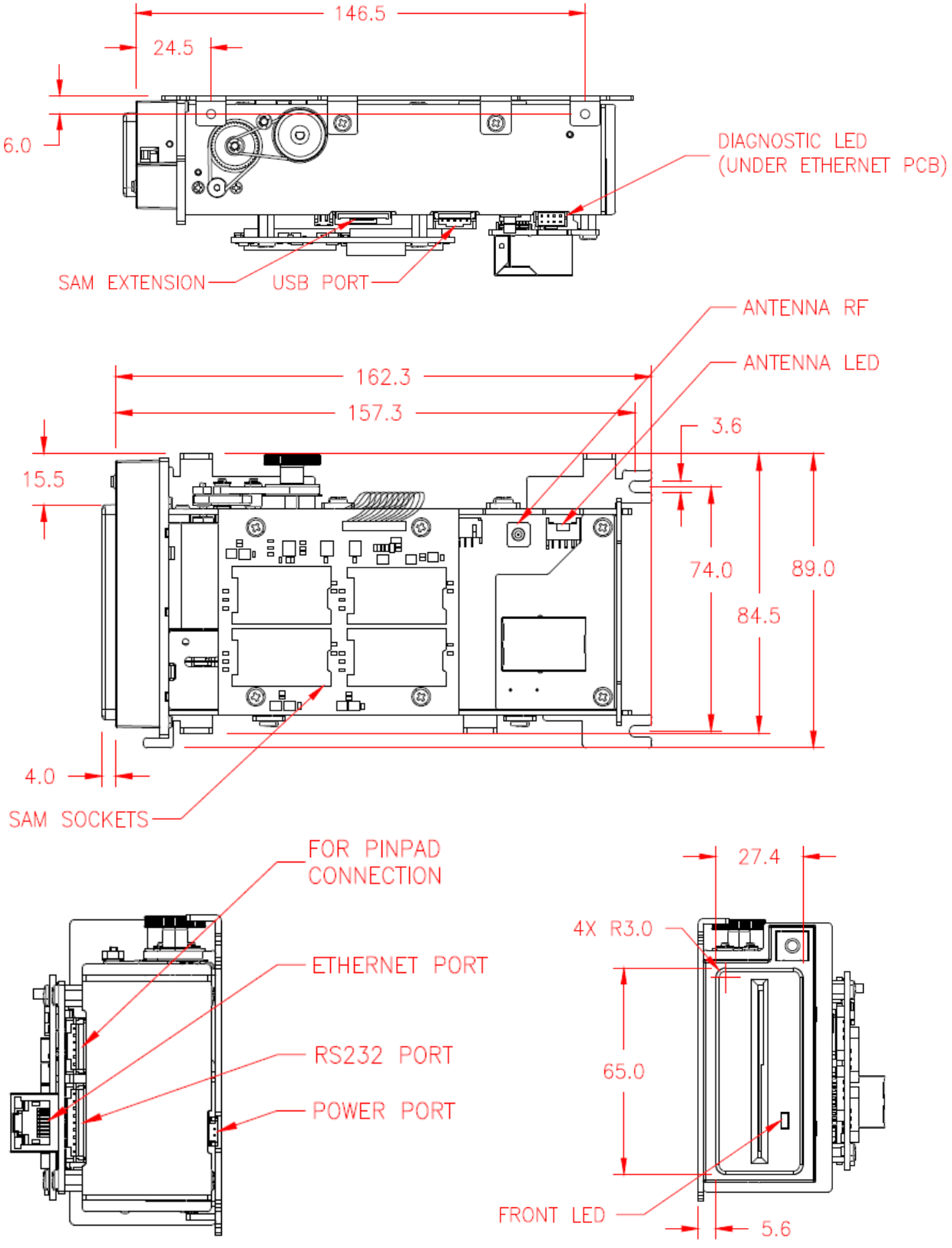
| Item | Specification |
|---|---|
| Magnetic Head | 600,000 cycles minimum |
| Chassis, card slot | 600,000 cycles minimum |
| Smartcard contact block | 600,000 cycles minimum |
| Bezel and gate | 600,000 cycles minimum |
| Motorized mechanism | 600,000 cycles minimum |
| Impact Resistance | The front face is impact resistant to IK07 rating |
| Ingress Resistance | The front face meets IP42 rating |

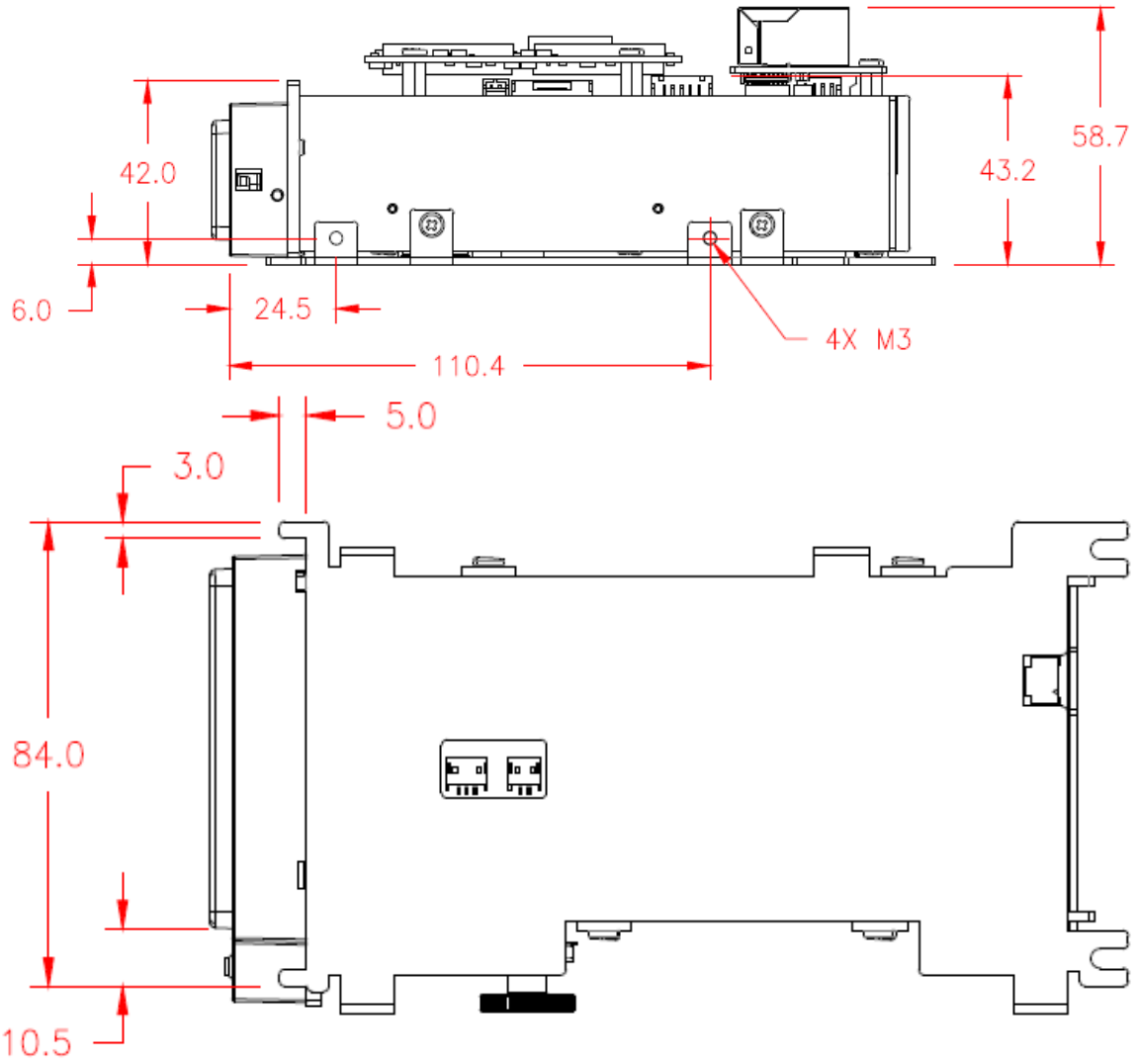
## 3.3. VP5300M Contactless Specifications

| Hardware | |
|---|---|
| **MTBF** | 100,000 hours |
| **Receiver Subcarrier Data** | ISO 14443-2 Type A/ISO 14443-2 Type B; ISO 18092 |

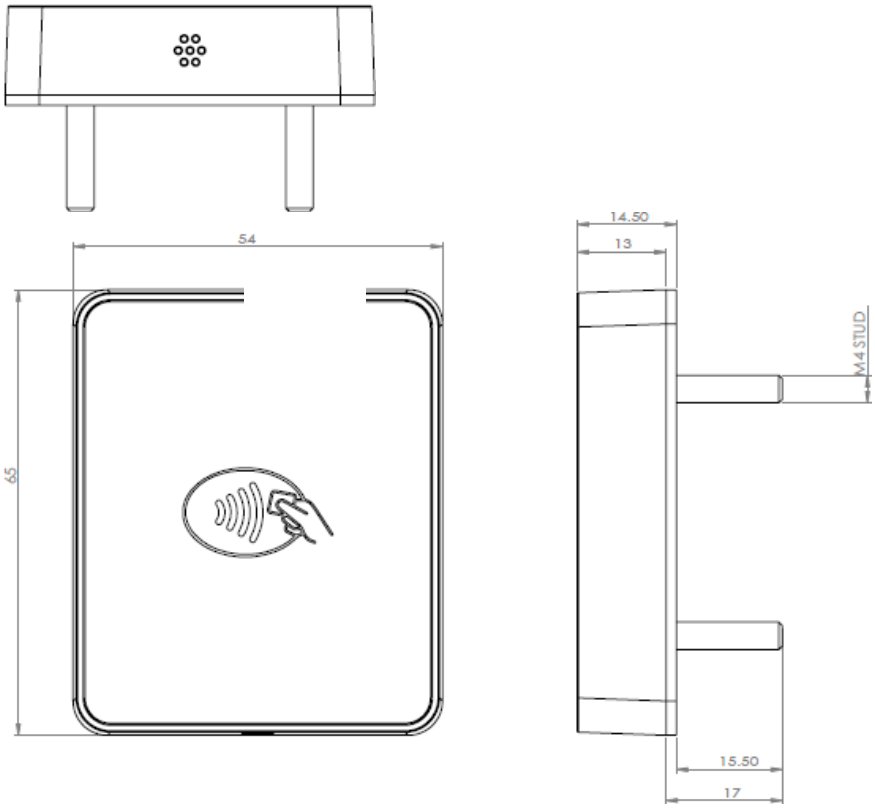
| | |
|---|---|
| **Typical Read Range** | 0~4cm (0~1.5 inches) |

# 4. VP5300M 3-View Drawing

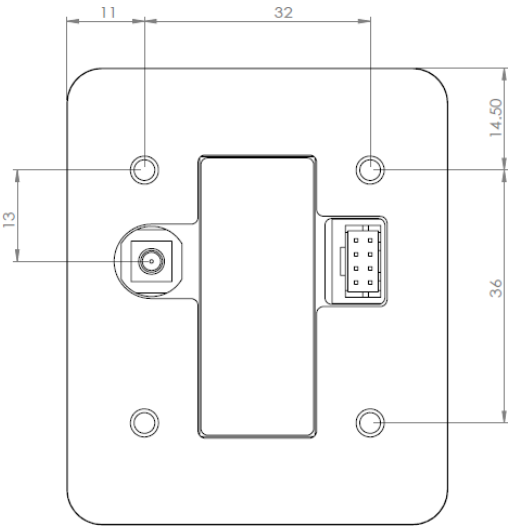



42.0
58.7
43.2
6.0
24.5
4X M3
110.4
5.0
3.0
84.0
10.5

# 5. VP5300M NFC Antenna 3-View




Antenna mounting details:



# 6. VP5300M Installation

This section provides information on how to install the VP5300M in an enclosure.

Note that the unit may be installed edgewise (vertically), or in a horizontal manner. It can also be bolted to or custom-mounted flush with a surface. In the latter case, make sure to allow a 3mm (minimum) cutout clearance around the edge of the metal face flange (assuming the enclosure is metallic) to maintain good NFC performance. **Do not tightly flush-mount the unit to a metal enclosure.** Test NFC performance thoroughly to be sure no interference or signal attenuation occurs.

## 6.1. Parts List

Verify that you have the following hardware for installing the VP5300M:

- IDM-1XX: VP5300M product
- (Optional) VP5300M NFC Antenna P/N ID-80152002-003 and it includes these 2 cables - P/N 80152235-001 & 80152236-001) to use for VP5300M's contactless (NFC) capabilities.
- USB cable P/N 80171201-001, or RS-232 cable P/N 80171203-001.
- Power supply P/N **AC0005R-12** with cable 80171204-001.

## 6.2. Installing the Reader

Refer to the VP5300M 3-view drawing. Verify that power cords can physically reach the unit. Then proceed to:

- Locate, mark, and drill holes for the mounting points of the unit.
- Secure the unit to the enclosure with bolts or screws of appropriate depth. Note that the anti-tamper nubs, located on the unit's left side, must be depressed when the unit is mounted.

## 6.3. Mounting the VP5300M External NFC Antenna

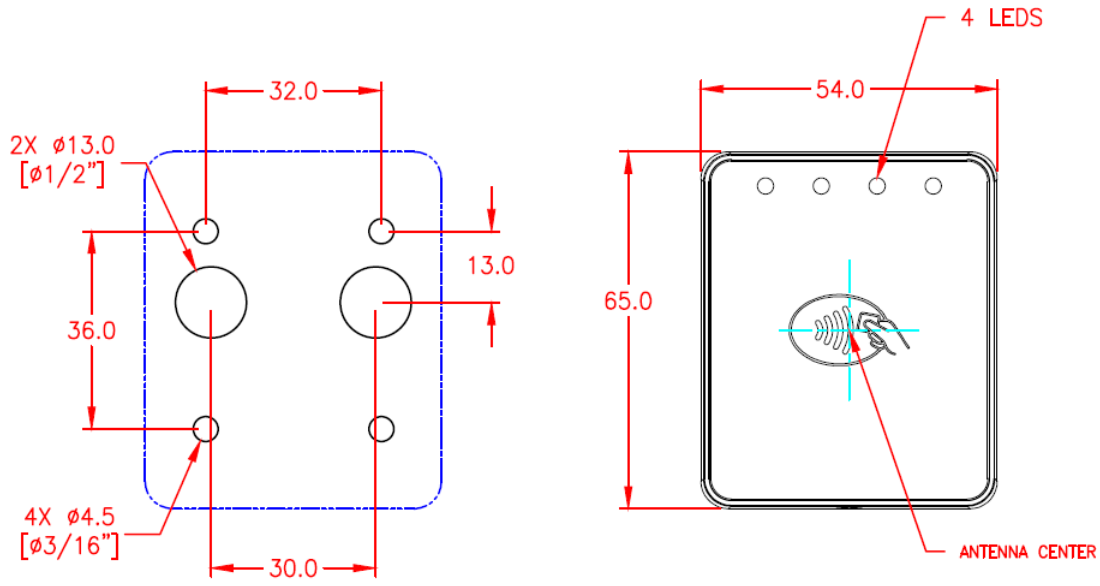
Refer to the VP5300M Antenna 3-view drawing. If you are using the VP5300M's contactless capability, you will need to install the optional NFC antenna and its cabling.

Use the following instructions to mount the antenna on the exterior of a kiosk.

**Note:** It is recommended that you experiment with and verify the orientation of the VP5300M NFC Antenna before marking and drilling mounting holes, ensuring that the antenna is far enough away from the main body of the VP5300M so that insertion of a "tap card" in the unit's contact-EMV slot doesn't trigger an unwanted NFC interaction.

**Important:** Mark holes in such a way as to ensure that the NFC Antenna is oriented with the LEDs at the top.

1. Locate and mark the four 4.5 mm (3/16 inch) mounting holes.



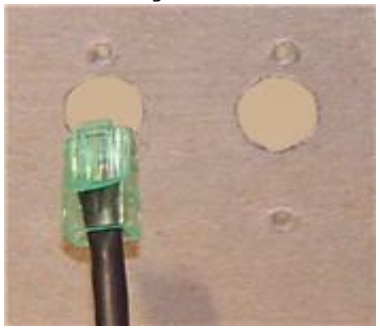

RECOMMENDED CUTOUT
FOR MOUNTING

2. Locate and mark two 14.0 mm (0.551 inches) access holes (used for connecting the antenna barrel connector and the LED power and data cable to the unit. Notice that these holes are located off-center toward the top of the unit.
3. Drill the four 4.5 mm (3/16 inch) mounting holes.
4. Drill the two access holes (14.0 mm, 0.551 inch) holes using a

35/64 drill bit.

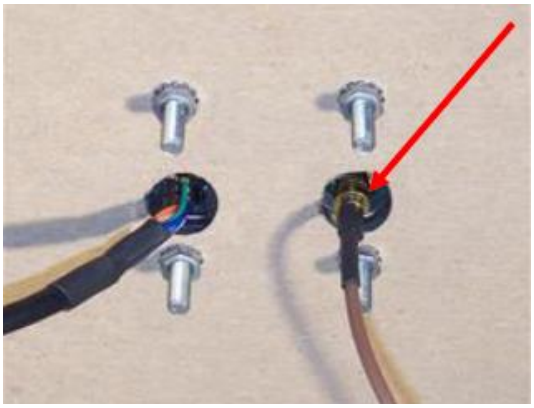
5. Use the nuts that are supplied with the unit (in plastic bag).

6. Route the end of the cable (80152235-001) with the RJ-45 connector through the matching 14.0 mm (0.551 inch) hole into the kiosk. Make sure that the front of the antenna will be properly oriented (not upside down) on the kiosk before inserting the four screws into the mounting holes.



7. Align the four threaded posts with their mounting holes and attach the NFC Antenna to the mounting surface. Make sure that the cable is not pinched, rubbing, or binding.


8. Use the four nuts to secure the NFC Antenna to the surface of the kiosk. Make sure to tighten the nuts securely so that the antenna does not move freely on the outside surface of the kiosk.



**Note:** Tighten the nuts to 5-7 in/lbs. for a good weather-tight seal.

9. Attach the end of the cable with the SMB barrel connector through the right 14.0 mm (0.551 inch) hole and secure it to it's socket on the back of the antenna. The SMB connector pushes onto the socket.
10. Attach the RJ-45 connector (male) coming from the NFC Antenna to the RJ-45 receptacle (female) on the 80152236-001 cable.

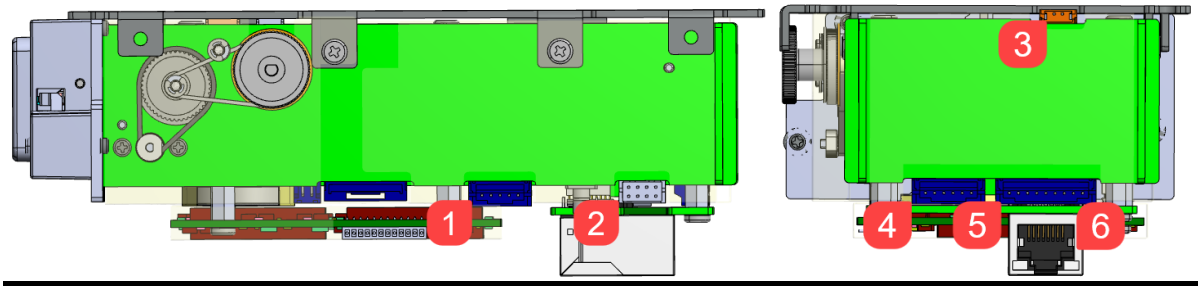
### 6.3.1. Flush-Mounting the Antenna

The antenna's RF field is sensitive to the proximity of metal. There are three options when flush-mounting the antenna in a metal surface or bezel:

1. Mount with the RF emitting surface of the antenna at least 1cm forward of any metal.
2. Mount with the RF emitting surface of the antenna at least 1cm behind any metal. **Note:** this reduces the antenna's effective range.
3. Mount flush with the metal but allow a minimum of 1cm spacing between the antenna and the metal.

In all three cases, **make sure to test the antenna** mounting before engaging in a production-ready installation.

## 6.4. VP5300M Connectors

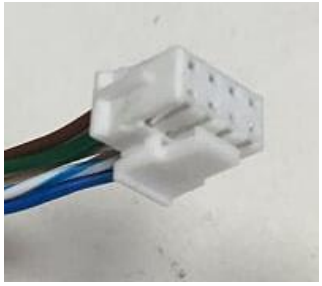



| # | Description | Cable |
|---|---|---|
| 1 | USB port | 80171201-001, 4-pin USB cable |
| 2 | Antenna | 80152236-001, connect to NFC antenna (ID-80152002-003) |
| 3 | Power | 80171204-001, 2-pin power cable, with adaptor AC0005R-12 |
| 4 | PINPAD | 80141220-001, L100 cable |
| 5 | RS-232 | 80171203-001, 9-pin RS-232 cable |
| 6 | Ethernet | RJ-45 Ethernet cable |

## 6.5. Attaching the Cables from the Antenna to the VP5300M

1. Attach the SMB barrel end of the cable (80152236-001) from the antenna to the SMB post of the VP5300M. The connector slides on.
2. Attach the 8-pin end of the cable (80152235-001) from the antenna to the VP5300M, where

the receptacle sits next to the RJ-45 (Ethernet) receptacle.



## 6.6. Connecting to Power

The VP5300M is powered through the power input connector.

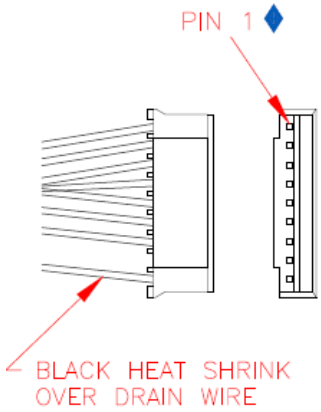
1. Connect the 12V DC power supply (P/N AC0005R-12) with cable 80171204-001 to the receptacle on the bottom side of unit.
2. Plug the unit in to an AC outlet and verify that the VP5300M lights up.

## 6.7. Connecting to the Data Port

Use 9-pin JST P/N PHR-9 (or equivalent) for the RS232 connector or 5-pin JST P/N PHR-5 (or equivalent) for the USB connector. See diagrams below for RS-232 or USB, as appropriate.

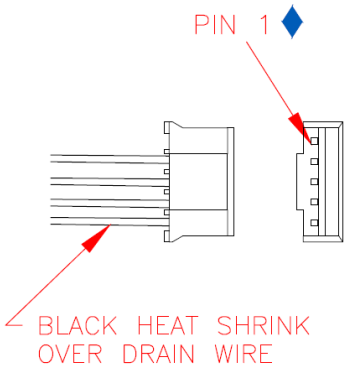
## 6.8. VP5300M External Cable Pin Assignments: RS-232

| WIRE CONNECTIONS | | | | |
|---|---|---|---|---|
| P1 | COLOR | GAUGE | SIGNAL | J1 |
| 2 | | 26 | RXD | 3 |
| 3 | | 26 | TXD | 5 |
| 4 | | 26 | DTR | 6 |
| 5 | | 26 | GND | 7 |
| 6 | | 26 | DSR | 1 |
| 7 | | 26 | RTS | 2 |
| 8 | | 26 | CTS | 4 |
| SHELL | DRAIN | 26 | CASE GND | 9 |




## 6.9. VP5300M External Cable Pin Assignments: USB

| WIRE CONNECTIONS | | | | |
|---|---|---|---|---|
| P1 | COLOR | GAUGE | SIGNAL | J1 |
| 1 | -- | -- | N/C | -- |
| 2 | WHITE | 28 | DATA- | 3 |
| 3 | GREEN | 28 | DATA+ | 2 |
| 4 | BLACK | 26 | GND | 4 |
| SHELL | DRAIN | 26 | CASE GND | 5 |



# 7. LED Management

The VP5300M has three LED indicators:

- One user-interface LED on the reader's front bezel
- Four LEDs on the RF antenna on the front of the unit
- One diagnostic LED on the back of the device

## 7.1. Front LED Status

- The LED turns green when the unit is idle.
- LED handling for MagStripe card operation is as follows:

| State | LED1 | Buzzer | Indicated State |
|---|---|---|---|
| 1 | Off | Off | No external power. |
| 2 | Solid Green | Off | Idle or a non-MagStripe card was inserted. |
| 3 | Off ->Solid Green->Off | One short beep | Successfully read MagStripe card. |
| 4 | Off ->Solid Red->Off | Off | Failed to read MagStripe card. |

## 7.2. RF LED Status

- The LED on the VP5300M's external antenna shows the transaction status for smart and contactless cards.
- The LEDs can be off, solid, or flashing slow or fast, depending on the indicated status.

| State | LED1 | LED2 | LED3 | LED4 | Buzzer | Indicated State |
|---|---|---|---|---|---|---|
| 1 | Off | Off | Off | Off | Off | RF antenna is not connected to the unit. |
| 2 | Slow Flashing | Off | Off | Off | Off | Unit is ready. |
| 3 | Solid | Off | Off | Off | Off | Unit is waiting to read cards. |
| 4 | Fast Flashing | Off | Off | Off | Off | Powering on the smart card slot and starting smart card operation. |
| 5 | Solid | Solid | Solid | Solid | One long beep | Successful contactless card transaction. |
| 6 | Off | Off | Off | Off | Three short beeps | Failed contactless card transaction. |
| 7 | Off | Off | Off | Off | Two short beeps | Declined contactless card transaction. |
| 8 | Solid | Solid | Solid | Solid | One short beep | Successful MagStripe card read. |

## 7.3. Diagnostic LED Status

- The LED on the *back* of the VP5300M is used for diagnostic purposes.
- The LED can be off, solid, or flashing (one second on and one second off), depending on the indicated status.

| State | Green LED | Amber LED | Red LED | Buzzer | Indicating | Service action |
|---|---|---|---|---|---|---|
| 1 | Off | Off | Off | Off | No external power. | Check the power cable and power supply. |
| 2 | | | | | Power is on, but firmware doesn't run. | Dismount the device and send it back to the manufacturer. |
| 3 | Flashing | Off | Off | | Power on. Missing transaction keys. | Download the required key. |
| 4 | Solid | Off | Off | | Firmware download and update in progress. | Wait for download to finish. |
| | | | | | Unit is ready. | Host can send commands to the reader. |
| 5 | Off | Off | Flashing | Intermittent beep | Unit is tampered. | Unmount the device and send it back to the manufacturer. |

# 8. Using the VP5300M to Make a Contactless Purchase

## 8.1. Presenting Proximity Cards or NFC Phones

The VP5300M allows for credit/debit card purchases using Contactless technology when the optional NFC antenna is installed.

Present the card or phone in close proximity to the front portion of the antenna module. Present the card or phone so that maximum surface area is parallel to the antenna module.


The antenna should beep, and all four green LEDs should illuminate briefly to indicate a successful test.

This tests the antenna's ability to read the Contactless test card. An unsuccessful test produces no reaction from the reader. If you use a test card and the antenna is attached to the VP5300M, a dummy transaction can be tested. The transaction will not be authorized and return a response but will at least test for end-to-end connectivity.

# 9. Installation

- The VP5300M is designed to be mounted on a metal surface and in reasonably close proximity to any internal motors and electrical devices that may be operating inside the kiosk. However, the unit (like all NFC/RFID devices) is susceptible to RF and electromagnetic interference.

  ***NOTE: DO NOT mount the VP5300M near (within 3 or 4 feet of) large electric motors, computer UPS systems, microwave transmitters, anti-theft devices, radio transmitters, routers, or similar electronics.***

- Close proximity of metal to antenna's the RF-emitting end can greatly reduce the antenna's range.
- Tie all cables neatly with nylon cable-ties and route them so that they are inaccessible and invisible to customers. Label the cable ends (these are suggestions) as "host," "Antenna," and "power" to simplify connection testing or component replacement, particularly when untrained individuals might be involved.
- Test the installation using a test card to perform an end-to-end transaction (the same as an actual purchase). The NFC antenna front panel's light should illuminate. Even if the transaction is declined (as it should be with a test card), it will prove connectivity all the way through the system. If possible, the store manager or some other responsible party should test each VP5300M on a regular basis (perhaps at the start of each day or at least once per week) with a test card to ensure continued operation and functionality. If the unit is manually rebooted, it is important to test the contactless reader portion as soon as possible afterwards to verify continued communication. Note that the reader automatically reboots once every 24 hours on its own, and performs a firmware self-check at that time, to meet PCI requirements.

# 10. Maintenance

Clean the VP5300M on a weekly basis with a card reader cleaning card to clean the device's magnetic heads and rollers. Clean the surface of the card insertion bezel with a lint-free cloth.

# 11. Pairing with PIN Pad

The VP5300M is designed to be paired with ID TECH's SmartPIN L100 or L80[1] keypads to create a full chip- and-PIN solution. Follow the pairing procedures below to use the L100 or L80 with the VP5300M.

First, set up the L100 for paired operation by specifying two user passwords; then set up the VP5300M; and then, finally, pair the two devices.

## 11.1. Setting up the L100

1. Cycle the power to the insert reader (unplug the power from the USB cable and plug it back in).
2. After plugging the power into the USB cable again, you have only 2 seconds to begin entering the special pairing command on the keypad (otherwise, you'll need to cycle the power again). To get into the special menu, press the following keys in this order:
   - Cancel
   - Clear
   - Enter
   - Blank
   - Clear
   - Enter
3. The L100 will start beeping to indicate that the user passwords are not yet set, and the LCD screen will prompt to enter a password.
4. Enter default Password A: **12345678**. Make sure the device beeps after each button is pressed to register the input. After correctly entering the default Password A, the device beeps twice.
5. Enter a new user-created Password 1 to replace Password A. The new Password 1 must be eight digits (for example: 11111111). After entering the new Password 1, the device beeps twice to confirm the input. Make a note of the new Password 1 in your records.
6. The device will prompt to reenter the password. Enter the new Password 1 again to confirm it. After entering the new Password 1 a second time, the device beeps twice to confirm successful verification.
7. Next, enter default Password B: **87654321**. Make sure the device beeps after each button is pressed to register the input. After entering the default Password B correctly, the device beeps twice.
8. Enter a new user-generated Password 2 to replace Password B. The new Password 2 must be 8 digits and must be different from Password 1 (for example: 22222222). After entering the new Password 2, the device beeps twice to confirm successful verification. Make a note of the new Password 2 in your records.

[1] Forthcoming.

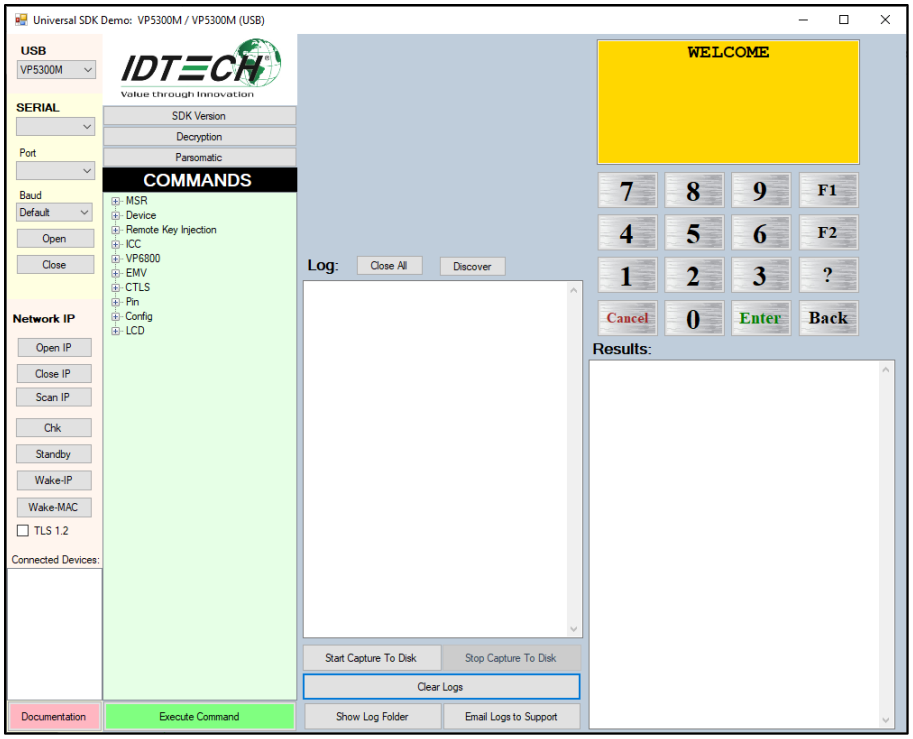
9. The device prompts to reenter the password. Enter the new Password 2 again to confirm it. After entering the new Password 2 for a second time, the device beeps twice to confirm the input. The SmartPIN L100 Removal Detection passwords are now set.
10. The next menu on the L100 screen has the option to **Enable**. Choose the top option (scroll up or down using the * and # keys) and press the green **Enter** key. The device displays an "Activate Success" prompt to indicate success.

## 11.2. Setting up the VP5300M

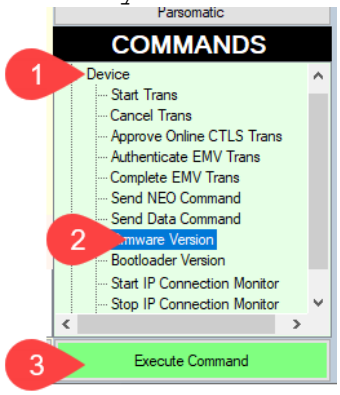
To set up the VP5300M for chip-and-PIN operation, you will need to configure the unit to operate in Configuration 3C. Out of the box, the VP5300M uses the **4C configuration**, which indicates the reader performs EMV transactions without a PIN pad.

Switching the unit to a 3C configuration can be done easily with ID TECH's free USDK Demo program on any Windows computer. Download the free demo program from the VP5300M product section of the ID TECH Knowledge Base (look for the USDK_DEMO zip file). No registration is required.

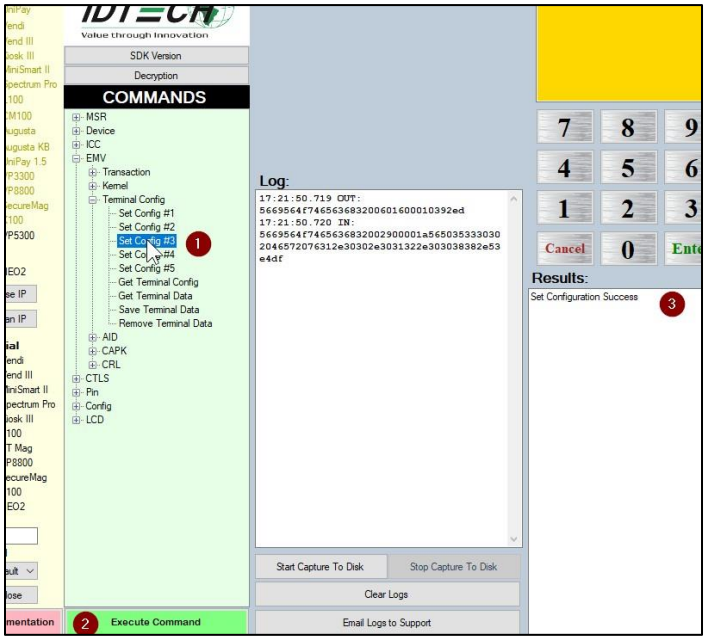
1. Launch the USDK Demo program and plug the VP5300M into the USB port of your computer. Verify that the VP5300M is shown as selected on the left side of the window:



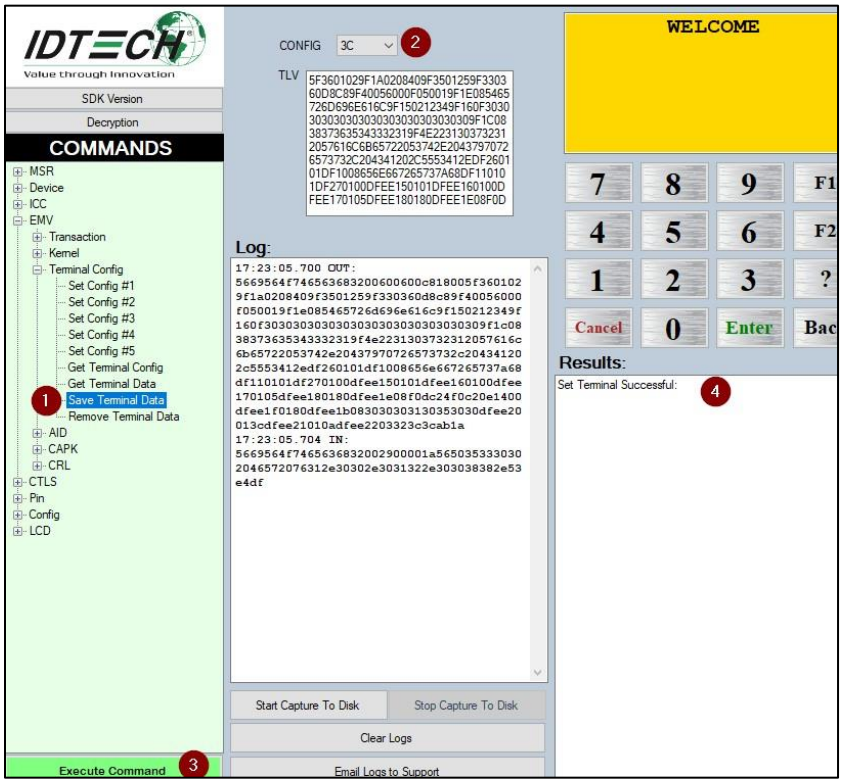
2. Verify that the firmware version of your VP5300M is higher than v72. Select the **Device** command tree, select the **Firmware Version** command, and click **Execute Command**. If the firmware version is lower, please contact your ID TECH sales rep for more instructions.




3. Open **Commands > EMV > Terminal Config** to expose command names. Select the **Set Config #3** command and click the **Execute Command** button. This configures the VP5300M reader to accept 3C configuration settings.

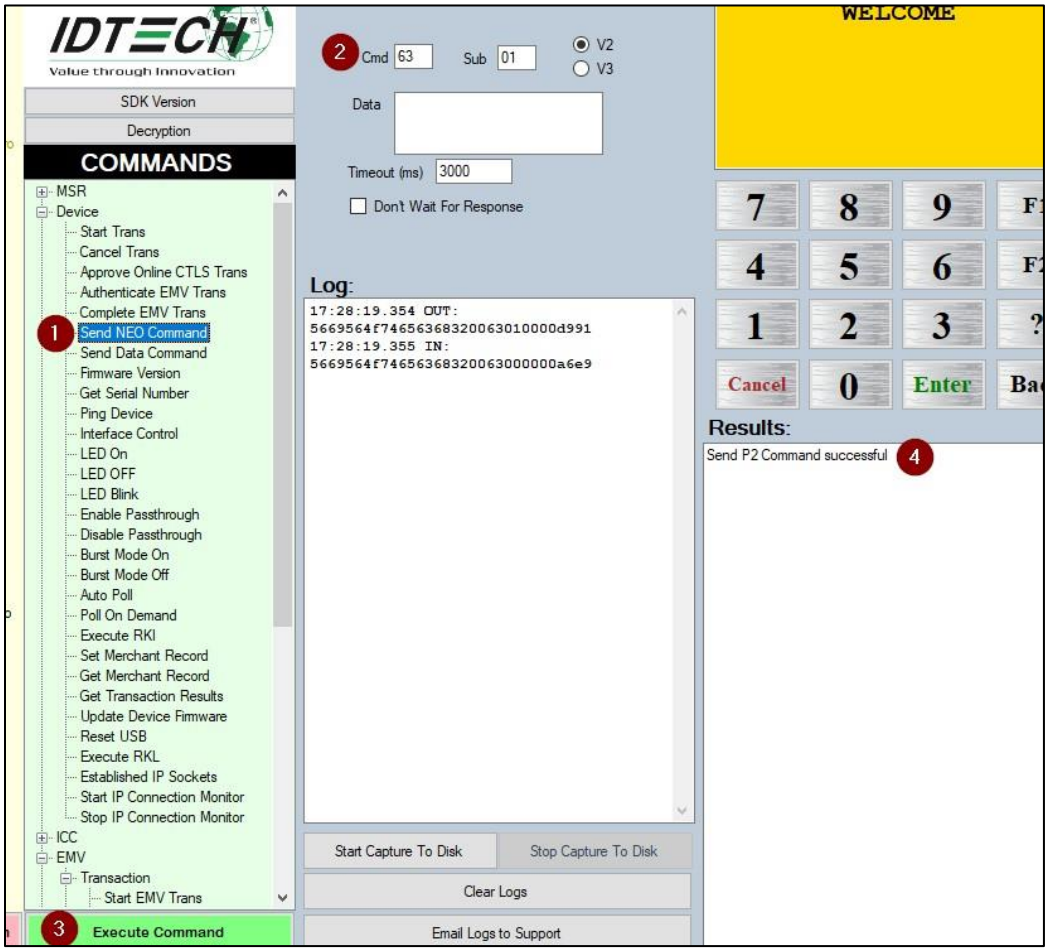


4. Find the **Save Terminal Data** command (see below). When you select it, the upper portion of the center panel will change appearance and show a CONFIG dropdown menu along with a TLV text area. Select **3C** from the dropdown (leave the TLV area as it is), then click **Execute Command.**



## 11.3. Pair the devices:

1. Open **Device > Send NEO Command.** Enter **63** for Cmd and **01** for Sub in the text boxes at the top of the center panel (as shown below). This command pairs the readers.

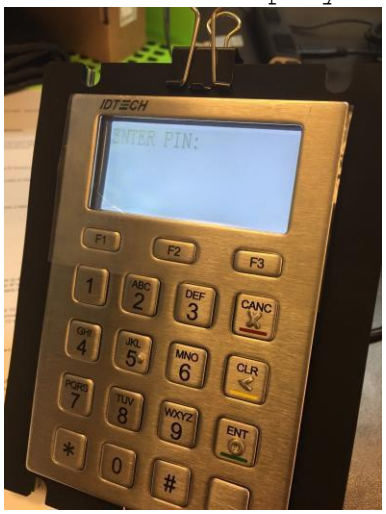


2. The VP5300M is now fully configured to do PIN-based transactions (if the presented credit card supports them). Verify that the VP5300M's front removal detection switch is firmly pressed down. The pressure switch is located on the front bezel's left side and looks like a small button on a white rubber square. If the unit is not mounted in a kiosk or other fixture, temporarily engage the pressure switch by attaching a binder clip to the left side of the flange:

3. Next, return to the L100 and power-cycle the PIN pad. You have only 2 seconds to start entering the special pairing command on the keypad. To get into the special menu, press:
   - Cancel
   - Clear
   - Enter
   - Blank
   - Clear
   - Enter

4. The L100's front display now shows two options: **Enable PIN Pad**, and **Enable CR** (in this case, CR means "card reader"). Use the **#** and ***** keys to scroll up or down. Select **Enable CR** and press **Enter**.


5. Setup is now complete. Execute the **Start EMV Transaction** command in the USDK Demo, or start a transaction from your own software, and then insert a PIN debit card. After the prompt for PIN comes up, the unit should display this:




**Note:** The test card must be a PIN-capable EMV card. We recommend using the appropriate test card from a deck of test cards.

# 12. RF Interference

**Q. Why do I need to know about RF interference?**
**A.** Contactless payment devices use radio frequency technology to send card data to a contactless terminal reader.

**Q. How can RF interference affect contactless payment?**
**A.** Radio frequency interference can cause data errors. If RF interference is present, contactless payment devices may operate intermittently or inconsistently.

**Q. Where does RF interference come from?**
**A.** Radio frequency interference (RFI) can originate from a wide number of sources at the point-of-sale (POS). Some examples of sources of RF energy and RF interference include:

- AM/FM radio and TV transmitters
- 2-way radios and pagers
- Mobile telephones
- Power lines and transformers
- Large electric motors
- Medical equipment
- Microwaves
- Electromechanical switches
- Wireless routers

**Q. What should I do if I suspect RF interference exists in my environment?**
**A.** Begin by inspecting your environment for possible sources of RF interference.

**Q. Do equipment manufacturers test their devices for RF interference?**
**A.** Yes. Electronic equipment is tested for RFI sensitivity by the manufacturers. These tests are performed in a controlled laboratory environment and will often not replicate the types of situations that would be encountered in your own point-of-sale (POS) environment.

**Q. What RF levels will impact RF operations?**
**A.** Factors that can cause RF interference vary case-by-case. There are no set rules defining a single RF level that will cause RFI. RFI depends on the sensitivity of the equipment under consideration, or how low an interpreting signal can be in the presence of the equipment and cause problems.

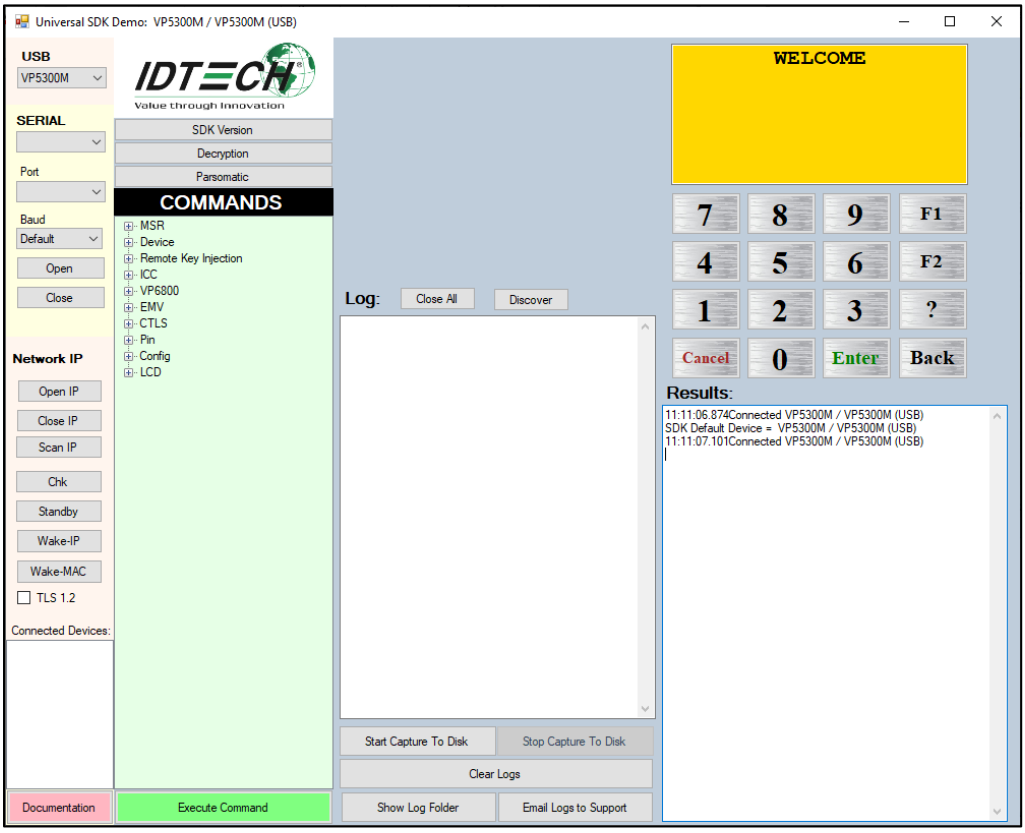
Equipment can be particularly sensitive to very low signal levels of one frequency and yet be quite immune to high signal levels of another frequency; frequency is an important factor. Some electronic system components are internally shielded and have a very high immunity to interference; but generally, most equipment has not been so engineered.

# 13. Updating VP5300M Firmware

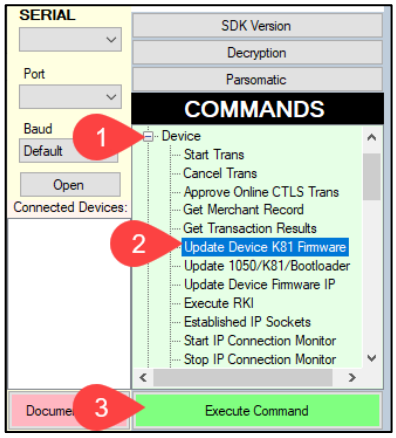
The steps below describe the process for updating VP5300M firmware via the Universal SDK Demo.

**Note:** Before you begin, contact your ID TECH representative to receive the most recent VP5300M firmware. Download the ZIP file and extract it to your computer.

1. Connect the VP5300M to your PC via either USB or serial port.
2. Download and install the latest USDK Demo from the ID TECH Knowledge Base (if you cannot access the link, please contact support).
3. Open the USDK Demo app from the Windows Start menu.



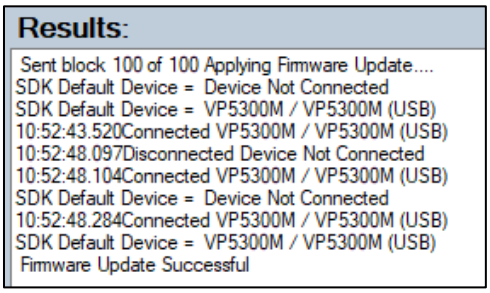
4. Under **Device**, select **Update Device K81 Firmware**, then click **Execute Command.**




5. Navigate to and select the VP5300M firmware you downloaded earlier and click **Open**.
6. The VP5300M will reboot and enter the bootloader, at which point the USDK demo begins updating the device.

> **Note:** It may take several minutes to complete the firmware update.

7. When the firmware update completes, the VP5300M will reboot again and the USDK demo will prompt **Firmware Update Successful.**



# 14. Troubleshooting

The VP5300M reader is designed to be reliable and easy to troubleshoot. The components that may require troubleshooting include the power module (if applicable), the reader, and the serial cable.

If you are unable to resolve the problem, please contact support@idtechproducts.com (sending an e-mail to this address will automatically open a support ticket).

| Symptom | Possible Cause | Remedy |
|---|---|---|
| **General Issues** | | |
| Reader does not appear to be powered on (no LEDs are lit). | • Reader not powered on or incorrect voltage.<br>• Improper use of internal power supply provided by the kiosk. | • Check cable connections.<br>• Verify that power is on and correct voltage and current are present.<br>• Make sure that the correct pins are utilized.<br>• Make sure that the power provided is within the specified range of the reader.<br>• Make sure that the correct polarity is observed.<br>• For more information, refer to the Input Voltage under the Electrical specification section.<br>• Replace the device with a known-good device to verify that the power supply and wiring in the installation are sound. |
| **Reading Cards/Phones** | | |
| LED is lit, but beeper is not audible when card/fob presented. | • Card/fob/phone not properly presented.<br>• RF interference.<br>• Unsupported card used.<br>• Wrong firmware (contact your local support representative). | • Present card/fob/phone closer to the antenna, and ensure it is parallel to the face of the reader.<br>• Verify that the card/fob/phone is valid/current.<br>• Verify that metal is not interfering with the antenna.<br>• Test with "ViVOpay Contactless Test Card" part number 241-0015-03 Rev A.<br>• Try a different card/fob.<br>• Check to see if card/fob is damaged.<br>• Verify that correct firmware is loaded on reader (local support representative only). |

| Symptom | Possible Cause | Remedy |
|---|---|---|
| | | • Power cable plug is fully inserted.<br>• Replace the unit. |
| Some cards/fobs read, but not all. | • Possible bad card/fob.<br>• Unsupported card used.<br>• Wrong firmware (contact your local support representative). | • Check to see if card/fob is damaged.<br>• Verify that correct firmware is loaded on reader (local support representative only).<br>• Card readers must contain the latest versions of card-brand public certificates (CAPKs). If a CAPK is out of date, one particular kind of card may no longer be usable. Update the CAPK. |
| **Communication to Kiosk** | | |
| No data is received, or data is garbled. | • Faulty or incorrect cable connections. | • Check that the cable connection is secure and in the correct port on the unit. |
| **Load Firmware** | | |
| Firmware loading software indicates "open RS-232 failed" | Device is not completely connected to PC, or other software is using the serial interface. | • Check the cable connection<br>• Close other software which might be using the same serial interface. |
| Firmware loading software indicates "Load firmware failed." | Device is not well connected to PCs. | • Check the cable connections. |
| Firmware loading software indicates "Send Command failed." | Bootloader firmware in device is destroyed. | • Contact your support representative to reload manufacture's firmware. |

# 15. 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.

# 16. IC Compliance Warning

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L’émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d’Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes :

1. l'appareil ne doit pas produire de brouillage, et, and
2. l'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

## 17. Cautions and Warnings

| | |
|---|---|
|  | **Warning:** Avoid close proximity to radio transmitters which may reduce the capability of the reader.<br>**Avertissement :** Évitez la proximité d'émetteurs radio, ce qui peut réduire la performance du lecteur. |
|  | **Caution:** Do not drop the device.<br><br>**Attention :** Ne pas laisser tomber le lecteur. |
|  | **Caution:** Electrostatic sensitive device. Use caution in handling, in high ESD conditions.<br>**Attention :** Le lecteur est sensible aux décharges électrostatiques. Manipulez le lecteur avec précaution dans une situation d’électricité statique élevée. |