



# VP8800

## User Manual

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# FCC Regulatory Compliance

## Notices Class B Equipment

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. This device complies with part 15 of the FCC rules. Operation is subject to 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.

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.

Changes or modifications to the ViVOpay VP8800 not expressly approved by ID TECH could void the user's authority to operate the ViVOpay VP8800.

## This device complies with Part 15 of the FCC Rules. Operation is subject to the following 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 of the device.

## Cautions and Warnings

	<b>Caution:</b> The ViVOpay VP8800 should be mounted at least 1 foot (30 cm) away from other ViVOpay VP8800. Can be adjusted based on lane setup.
	<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.
	<b>Warning:</b> Avoid close proximity to radio transmitters which may reduce the capability of the reader.

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# Chapter 1: Getting Started

The ViVOPay VP8800 is an all-in-one card reader that can accommodate contact EMV, magstripe, and contactless (NFC) payments, while offering PIN pad (chip-and-PIN) capability and electronic signature capture. It is designed to integrate easily with existing POS systems and requires minimal counter space at checkout stands.

The ViVOPay VP8800 is a PCI -certified, SRED-compliant counter-top reader featuring RS-232 (serial), Ethernet, and USB 2.0 communications to POS systems.

The ViVOPay VP8800 includes support for the following contactless payment applications:

- Support for Apple Pay, including VAS protocol
- Support for Google Android Pay/SmartTap
- Support for Samsung Pay
- Support for Mifare cards:
  - Mifare classic
  - Mifare Ultralight
  - Mifare DESFire EV1
- Support for Secure SoftSAM(s)
- Support for Payment Card Brands:
  - VISA – VCPS MSD, qVSDC
  - MasterCard – MCL
  - AMEX – Expresspay
  - Discover –DPAS
  - Interac flash
  - JCB
  - China Union Pay(International)

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

## Features

The following features are supported:

- PCI 4.1 certified
- SRED (Secure Reading and Exchange of Data) compliant, with tamper detection and fulltime encryption\*
- ANSI X.9-24 DUKPT key management
- ISO14443 type A/B and Mifare based contactless payment transactions
- ISO 18092 support for peer-to-peer NFC devices and smartphones
- Support for contactless transactions via NFC devices
- PIN entry for PIN/debit and chip-and-PIN transactions
- Magnetic stripe card transactions
- Electronic signature capture
- Three SAM card slots provided
- One SD card slot provided
- RJ-45 cable and Ethernet support

\*Note that for encryption to be enabled, the VP8800 must be *key-injected*. ID TECH is a certified Key Injection Facility. Contact your ID TECH representative for details.

## Unpacking the ViVOpay VP8800

The ViVOpay VP8800 requires a data cable and a 5VDC 1.2A power supply if the data cable is not of the type that supplies power. Data cable and power supply are not included with the ViVOpay VP8800 and should be purchased separately from ID TECH. Verify that you have all the required components for the installation.

<p>VP8800 (P/N:IDPP-138)</p>	
<p>Data cable (varies by POS and length)</p> <ul style="list-style-type: none"> <li>• Serial Data Cable (P/N 80143236-001)</li> <li>• USB Data Cable (P/N 80143234-001)</li> <li>• USB and RJ-45 Data Cable (P/N 80143235-001)</li> </ul> <p>-</p> <p>These cables are recommended and approved by ViVOpay to comply with FCC rules and regulations.</p>	
<p>Power supply, if required (P/N AC0005R-3B or Powertron PA1008-050), 5V 1.2 A (6W)</p> <p>This power supply is recommended and approved by ViVOpay to comply with FCC rules and regulations.</p>	

You may also need the following:

- Additional SAM card
- Contactless test card (ViVOCARD Contactless Test Card P/N 241-0015-03)
- Magnetic stripe test card

The ViVOpay data cables and power supply are specifically designed to meet FCC requirements. If you are using other cables or power supply, you must install ferrites available from ViVOpay. For your free ferrite core kit with installation instructions, please contact ViVOpay support.

# Chapter 2: Installing the ViVOpay VP8800

## Overview

Before you connect and mount the ViVOpay VP8800, you should plan the installation to conform to PCI 4.1 requirements and minimize radio frequency interference. Once you have determined the location and mounting of the ViVOpay VP8800, you can connect it to power and the POS terminal. Finally, you should test the ViVOpay VP8800 to make sure the installation is successful.

## Site Planning

Two environmental considerations affect how you install the ViVOpay VP8800. PCI certification has specific restrictions on how the reader is positioned to prevent PIN theft. You should also consider objects and devices near the reader that may affect the performance of the contactless radio frequency antenna.

## PCI PED Compliance

The ViVOpay VP8800 is a PCI 4.1 certified PIN/Debit payment device. PCI 4.1 certification requires that sufficient protection be provided to ensure that entering a PIN number CANNOT be viewed by a third party (such as another customer standing nearby, the cashier, or a security camera).

The ViVOpay VP8800 has design elements, such as a recessed keypad, that meet some of these requirements. However, to fully implement PCI 4.1, make sure you consider the following.

1. The ViVOpay VP8800 must be in a location that will NOT force a customer to enter a PIN that can be viewed by a third party (for example, a customer must tilt or rotate the device for better accessibility due to objects blocking a card swipe).
2. If the ViVOpay VP8800 is elevated on a mounting stand, shielding must be provided on the mount to prevent a PIN being viewed by a third party.
3. If the ViVOpay VP8800 is mounted on a counter top, additional shielding (which can include other devices such as a cash register as long as conditions in (1) above are met) must be provided to ensure that the PIN cannot be viewed by a third party (including cashier and security camera).

**WARNING:** PCI requires that the device be mounted so that manual PIN entry cannot be observed by a third party (such as another customer standing in line, the cashier at the counter, or a security camera mounted in the ceiling to observe the cash register area). If the PIN entry can be observed, the store owner may be responsible for any losses incurred by the customer if it can be determined that the customer's PIN was stolen at this location.

## Verifying PCI Compliance

Before completing the installation, you must verify the ViVOpay VP8800 is positioned so that the PIN entry is not visible to other customers, the cashier behind the counter, or video surveillance cameras. If PIN entry is visible, the ViVOpay VP8800 must be repositioned or shielding added until PIN entry cannot be observed.

These tests usually require at least two people—one to simulate entering the PIN while the other attempts to view the keypad.



**Can Another Customer View the PIN?**

While one person stands at the ViVOPay VP8800 with their hand positioned to enter the PIN, the other tester should try to observe the keypad from behind and beside the first person.

**Can the Cashier View the PIN?**

While one person stands at the ViVOPay VP8800 with their hand positioned to enter the PIN, the other tester should stand behind the counter and try to observe the PIN keypad. The second tester should move around a little to see if there is a position where they can observe PIN entry.

**Can the Video Camera View the PIN?**

While one person stands at the ViVOPay VP8800 with their hand positioned to enter the PIN, the other tester should observe what is being recorded by any video camera with a view of the ViVOPay VP8800. This may require playing back a recording to see if PIN entry is visible. If the video camera is moveable, the second person should move the video camera to determine if there is a position where PIN entry can be observed.

**Retesting Requirements**

If PIN entry on the ViVOPay VP8800 is observable in any of the above tests, you must reposition the ViVOPay VP8800 and completely retest all locations to verify that PIN entry is not visible. Consider placing a display to block observation from that position.

Repositioning the ViVOPay VP8800 to block observance of PIN entry at one location may expose PIN entry to observation at another location. PCI requires that you reposition the ViVOPay VP8800 and retest until PIN entry is secure from observation.

**Radio Frequency Interference**

To perform contactless transactions, the ViVOPay VP8800 uses a radio frequency antenna. The range (reading distance) and performance of the reader can be affected by other radio frequency emitters and proximity to metal.

For best performance, adhere to the following guidelines:

- Do not position the ViVOPay VP8800 closer than 1 foot (30 cm) to other RF-emitting devices. Some environments may require greater separation distances.
- Avoid placing the ViVOPay VP8800 near large metal objects.
- Do not position the ViVOPay VP8800 near radio transmitters.

## Installing the ViVOpay VP8800

This section describes how to install the ViVOpay VP8800. The basic steps are:

- Connect to power and POS
- Mount if required
- Test the installation

## Connecting the ViVOpay VP8800

### Accessing the Connectors

The ViVOpay VP8800 connectors are beneath a cover on the bottom of the reader.

#### To access the connectors

1. Turn over the ViVOpay VP8800 so that the connector cover is visible.
2. Open the connector cover.



3. Insert the data cable into the HDMI connector and route the cable through the recesses provided.



4. Close the cover



5. Turn the ViVOpay VP8800 keypad right side up.
6. Place the stylus in the holder along the side of the ViVOpay VP8800.
7. Attach the data cable from the ViVOpay VP8800 to the appropriate port on the POS.
8. Plug in the power supply. The left LED illuminates.



**NOTE:** The ViVOpay VP8800 may take up to 30 seconds to finish booting.

The ViVOpay VP8800 displays the opening set of screens before it displays the **Welcome** screen. The opening screens include:

- ViVOpay logo screen
- Copyright screen
- Firmware version screen

It should then display **Welcome** or **Please present card** or similar wording, depending upon the POS application.

If the unit fails to power up, try reseating the power connector (or change to a different power outlet).

If the unit still fails to power up, try replacing the power supply. If the unit still fails to power up, and the power supply is definitely good, contact your local support representative. For more troubleshooting information, see [“Troubleshooting” on page 9](#).

## Testing the Installation

After you have completed the installation and have checked for PCI 4.1 conformance, run the Onboard Diagnostic program as described in [“Onboard Diagnostics” on page 10](#). Then check that the ViVOPay VP8800 and the POS are communicating correctly by performing a sample transaction. The following test assumes that the host POS is already programmed to communicate with the ViVOPay VP8800.

## Transaction Test

The exact wording that appears on the ViVOPay VP8800 depends on the POS application. Consult the documentation for your POS (or payment app) for details.

### To test a transaction

1. Begin a transaction on the POS. Present a card/fob/phone in close proximity to the reader, or swipe a magnetic stripe card.
3. A single beep and LED flash indicates that the card has been validated. The ViVOPay VP8800 may display **Processing** or similar wording while the transaction is being processed.
4. If the POS software requires a PIN entry, you will see **Please enter PIN**. Use the keypad to enter the PIN.
5. If the POS application requires a signature, you will see **Please sign below**. Use the stylus to enter your signature on the touch screen.
6. A receipt is printed by the POS with the purchase amount. The ViVOPay VP8800 may show **Thank You** or similar wording for a successful transaction.

# Chapter 3: Troubleshooting and Maintenance

## Troubleshooting

The ViVOPay VP8800 is designed for reliability and ease of troubleshooting. The components that may require troubleshooting include the power supply, the reader, and the data cable.

Symptom	Possible Cause	Probable Cause and Remedy
<b>General Issues</b>		
Reader does not appear to be powered on—no LEDs lit, no LCD display.	<ul style="list-style-type: none"> <li>• Reader not powered on.</li> <li>• Incorrect power supply used.</li> </ul>	<ul style="list-style-type: none"> <li>• Check cable connections.</li> <li>• Verify that power is on and correct voltage and current are present.</li> <li>• Replace the power supply.</li> <li>• Verify that power cable plug is fully inserted.</li> <li>• Replace the power supply.</li> <li>• Replace the reader.</li> </ul>
<b>Reading Cards/Fobs/Phones</b>		
LEDs do not light and beeper is not audible when card/fob/phone is presented.	<ul style="list-style-type: none"> <li>• Card/fob/phone not properly presented.</li> <li>• Metal or RF interference.</li> <li>• Wrong Firmware issue (contact your local support representative).</li> <li>• Reader not powered on or incorrect voltage.</li> <li>• Incorrect power supply used.</li> <li>• Unsupported card/fob/phone used.</li> </ul>	<ul style="list-style-type: none"> <li>• Present card/fob/phone closer to the reader and ensure it's parallel to the reader touch screen.</li> <li>• Verify that the card/fob/phone is valid/current.</li> <li>• Test with "ViVOCARD Contactless Test Card" P/N241-0015-03.</li> <li>• Try a different card/fob/phone.</li> <li>• Verify that the unit is not near any large metal objects.</li> <li>• Verify that correct firmware is loaded (local support representative only).</li> <li>• Verify that power is on and correct voltage and current are present.</li> <li>• Verify that power cable plug is fully inserted.</li> <li>• Replace the reader.</li> </ul>
Some cards/fobs/phones read, but not all.	<ul style="list-style-type: none"> <li>• Wrong firmware (contact your local support representative).</li> <li>• Possible bad card/fob/phone.</li> <li>• Unsupported card used.</li> </ul>	<ul style="list-style-type: none"> <li>• Verify that correct firmware is loaded on reader (local support representative only).</li> <li>• Check to see if card/fob/phone is damaged.</li> <li>• Try a different card/fob/phone.</li> </ul>
On power-up, display sticks on firmware version.	SAM card isn't seated properly.	Remove power from unit, remove back cover and reseal SAM card. If unsure, contact ViVOPay Support for assistance.

Symptom	Possible Cause	Probable Cause and Remedy
<b>Communication to POS/ECR</b>		
No data is received, or data is garbled.	<ul style="list-style-type: none"> <li>Faulty or incorrect cable connections.</li> <li>Unsupported card used.</li> <li>Contactless application is not installed on terminal (for serial connections only).</li> <li>Magstripe card not swiped correctly.</li> <li>Magstripe card not level during card swipe.</li> <li>The POS application is not using the correct communications parameters.</li> </ul>	<ul style="list-style-type: none"> <li>Check that the cable connection is secure and in the correct port on the POS/ECR.</li> <li>Check that the POS/ECR has the correct software application to accept data from the contactless reader (may need assistance from the POS vendor).</li> <li>Try a different card/fob/phone or magstripe card if testing the magstripe reader.</li> <li>If testing with the magstripe card, try turning the card around; make sure that the card is level during the card swipe.</li> <li>Contact the payment processor for an application upgrade.</li> <li>Check that the cable is correctly attached to the back of the ViVOpay VP8800</li> <li>Check the POS application.</li> </ul>

## Onboard Diagnostics

Onboard diagnostics (OBD) are available to test the following components of the ViVOpay VP8800.

Test	Possible Results
LCD Test	Pass/Fail
TouchScreen Test	Pass/Fail
Keypad Test	Pass/Fail 1234567890<cancel><backspace><enter>* #
LEDs Test	Pass/Fail virtual leds MSR ICC Keypad backlight
Tone Test	Pass/Fail
Magstripe Test	Pass Tracks 1 or 2 or 3/Fail
RFID Test	Pass Type A or B/Fail
ICC Test	Pass T = 0 or T = 1/Fail
Ethernet Test	Pass/Fail
SAMs Test	Pass SAM1 SAM2 SAM3/Fail

## Accessing the Onboard Diagnostic Tests

### To enter the onboard diagnostics

1. Power off the ViVOpay VP8800 by removing the power supply from the power receptacle.
2. Plug the power supply back into the power receptacle.

3. After applying power. Please press key "1" and then press key "#" within 3 sec after LCD display "Welcome". If you input correctly, The **ViVOpay AR Diagnostics** will appears on the screen and prompt alarm will sound.

**The menu first page as below:**

**ViVOpay AR Diagnostics**  
0 Test Results Summary  
1 Test All  
2 LCD  
3 Touch Screen  
4 Keypad  
5 LEDs  
6 Tone  
7 Magstripe  
8 RFID and Antenna  
9 ICC  
O: Next Page X: Exit

**The menu second page as below:**

**ViVOpay AR Diagnostics**  
0 Ethernet  
1 SAMs  
<: Prev Page X: Exit

## Maintenance

The ViVOPay VP8800 contains no user-serviceable parts within its enclosure. Do not open the ViVOPay VP8800 main enclosure.

**WARNING:** Attempting to open the ViVOPay VP8800 enclosure will trigger PCI security measures and the unit will stop functioning even after reassembly, necessitating its return to the factory.

You can replace the stylus without violating PCI security measures. You can also upgrade the ViVOPay VP8800 firmware if required.

## Replacing the Stylus

It is important that only the stylus be used for writing on the touch screen. If the stylus is lost or the lanyard broken, you can obtain a replacement from your ViVOPay VP8800 distributor

### To replace the stylus

1. Turn the ViVOPay VP8800 upside down and unscrew the screw for the tether wire of stylus.
2. Replace the old stylus with the new one. Then fasten the screw.
3. Turn the ViVOPay VP8800 back and place the new stylus in its holder.

## Upgrading the Firmware

You can upgrade the firmware of the ViVOpay VP8800 if required for your application. You will need the following from your ViVOpay VP8800 distributor:

- New ViVOpay firmware
- ViVOpay download utility
- USB data cable

You also need a PC with a USB port. The PC will likely already have the required USB driver HID.DLL file. If not, it is available for download from Microsoft's website.

### To upgrade the firmware

- 1 Copy the firmware image and ViVOpay download utility to the PC you are using for the upgrade.
- 2 Connect the USB data cable to the ViVOpay VP8800 and PC (see [“Connecting Power, Stylus, and Data Cables”](#) on page 6).
- 3 Double click the ViVOpay download utility icon or .exe to start the utility.



- 4 Power on the ViVOpay VP8800. The bootloader version will appear.
- 5 According to the image type to click the corresponding bottom.
  - 5.1 Click **Download Bootloader** to download bootloader.
  - 5.2 Click **Download Image** to download firmware.
- 6 When prompted, locate and select the bootloader or firmware image to download and click **OK**.
- 7 When the download is complete, disconnect the ViVOpay VP8800 from the PC and power. The new bootloader or firmware will be active next time you apply power to the ViVOpay VP8800.
- 8 Reconnect power.

## ViVOpay VP8800 Specifications

<b>RF Interface</b>	
Frequency	13.56 MHz
Standard	ISO 14443 Type A&B, Mifare, ISO 18092
Reading distance	MAX 4cm
<b>Physical</b>	
Length	175 mm
Width	95 mm maximum
Depth	58 mm maximum
Weight	0.4Kg
Storage	128 MB RAM + 64MB Flash + 32GB of Micro-SD, with 3 SAM slots
<b>Environmental</b>	
Operating Temp.	0 to 55° C (32 to 131° F)
Storage Temp.	-25 to 65° C (-13 to 149° F)
Relative Humidity	10 to 95% non-condensing
Operating Environment	Indoor only
<b>Power</b>	
Voltage	5 VDC regulated, +/- 10%
Consumption	6 W maximum
Power supply	The VP8800 shall be powered by an external power source (P/N AC005R)  (power-pack AC 85-265)
<b>Touch Screen</b>	
LCD	Capacitive 3.5" TN TFT Backlit Color Display
Signature Capture	Yes
Resolution	HVGA 480X320 Pixels
Glass Hardness Rating	7H
Power supply	The VP8800 is powered by an external 5VDC power source (P/N AC005R)

**Electronic Cash Register (ECR)**

The combination of a traditional cash register and a POS terminal, often PC-based.

**ExpressPay from American Express**

American Express contactless payment product that utilizes contactless technology.

**Firmware**

Software that is embedded in a hardware device that allows reading and executing the software, but does not allow modification, e.g., writing or deleting data by an end user.

**Example:** Firmware is a computer program in a read-only memory (ROM) integrated circuit chip. A hardware configuration is usually used to represent the software.

**Example:** Firmware is a program embedded in an erasable programmable read-only memory (EPROM) chip, which program may be modified by special external hardware, but not by an application program.

**Fob**

A key chain device or other non-standard credit card sized form factor that has an embedded radio frequency (RF) chip.

**MasterCard PayPass**

MasterCard's contactless payment product that utilizes contactless technology.

**NFC**

Near Field Communications.

**NFC Phone**

Near Field Communications (NFC) phone. A technology that enables communication between a secure element in a mobile device and a contactless reader to make credit/debit payments. Also see UICC.

**PCI 4.1**

The Payment Card Industry Security Standards Council (PCI SSC) mission is to enhance payment account data security. PCI 4.1 is a set of standards created by PCI SSC to increase the security of card data.

**Point of Sale (POS)**

Refers to terminals used in retail stores with a magnetic stripe reader, keyboard, display and autodialer modem or IP connection, connected to the telephone/internet network and used for on-line credit/debit authorization. Can also be connected to a host computer, which handles all transaction processing including item price look-up, data collection, and credit/debit authorization.

**Proximity Payments**

Payment method utilizing contactless technology such as RF, Infrared (IrDA), or Near Field Communications (NFC).

**Radio Frequency (RF)**

Any frequency that corresponds to radio signals, including those used by cellular telephones and wireless networks.

**RF Reader**

The Point of Sale device that receives the RF transmission from a card, fob or NFC phone.

**Visa Contactless**

Visa's contactless payment product that utilizes contactless technology.

**Symbol Explanations:**

	EMV Contactless Symbol
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