



## ViVOpay<sup>®</sup>

### 8100e User Guide

Revision 1.0



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# Chapter 1

## Getting Started

### Overview

The ViVOPay 8100e seamlessly integrates with existing POS systems and requires minimal counter space at checkout stands. The ViVOPay 8100e is a PCI-certified counter-top NFC contactless reader with integrated display, MSR, function keys, PIN pad and optional contact card reader. This device features serial RS-232 and USB 2.0 communications to POS systems as well as an Ethernet port. The ViVOPay 8100e complies with ISO/IEC 18092 and supports the full peer-to-peer NFC feature set.

ViVOPay 8100e is certified for the following contactless payment applications:

- PayPass ISO/IEC 144443
- MasterCard PayPass Magstripe v3.3
- Visa payWave MSD v2.0.2
- American Express, ExpressPay v1.0
- Discover Zip v1.0
- Mifare ePurse (Passthrough)
- ViVOCARD 1 and 2

ViVOPay 8100e also fully supports PIN debit and credit magnetic stripe applications.

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

### Features

The following features are supported:

- PCI certified
- ISO14443 type A/B and Mifare based contactless payment transactions
- ISO 18092 support for peer-to-peer NFC devices and smartphones
- PIN entry for PIN debit transactions
- Three-track magnetic stripe card transactions
- SAM card slot
- Contact card slot
- 10 Base-T Ethernet port

### Options

The following options are available:

- Second SAM slot

This User Guide provides information on all options.

## Unpacking the ViVOPay 8100e

The ViVOPay 8100e requires a data cable and a power supply. Verify that you have all the required components for the installation.

ViVOPay 8100e (P/N 540-2901-XX)	
<p>Data cable (varies by POS and length)</p> <ul style="list-style-type: none"> <li>• Serial Data Cable (P/N 220-2463-0X)</li> <li>• USB Data Cable (P/N 220-2462-0X)</li> </ul> <p>These cables are recommended and approved by ViVOTech to comply with FCC rules and regulations.</p>	
<p>Power supply, if required</p> <ul style="list-style-type: none"> <li>• US/North America (P/N 140-2035-00)</li> <li>• Europe (P/N 140-2035-01)</li> </ul> <p>This power supply recommended and approved by ViVOTech to comply with FCC rules and regulations.</p>	

You may also need the following:

- Four M3 screws

If you want to secure the reader to a surface, you need four M3 screws of the appropriate length (not supplied).

- Contactless test card (ViVOCARD Contactless Test Card P/N 241-0015-03)

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

## Accessories

The following accessories are available for the ViVOPay 8100e.

Part Number	Description
520-2370-00	Wedge Bracket Kit



# Chapter 2

## Installing the ViVOPay 8100e

### Overview

Before you connect and mount the ViVOPay 8100e, you should plan the installation to conform to PCI requirements and minimize radio frequency interference. Once you have determined the location and mounting of the ViVOPay 8100e, you can connect it to power and the POS terminal. Finally, you should test the ViVOPay 8100e to make sure the installation is successful.

### Site Planning

Two environmental considerations affect how you install the ViVOPay 8100e. 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 8100e is a PCI certified PIN/Debit payment device. PCI 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 8100e has design elements, such as a recessed keypad, that meet some of these requirements. However, to fully implement PCI make sure you consider the following.

1. The ViVOPay 8100e 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 8100e 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 8100e 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 the 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 that location.

### PCI Compliance Guidelines

Before completing the installation, you must verify the ViVOPay 8100e 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 8100e must be repositioned or shielding added until PIN entry cannot be observed.

The following sample tests usually require at least two people—one to simulate entering the PIN while the other attempts to view the keypad. For detailed information on PCI compliance, consult PCI compliance documentation.

**Can Another Customer View the PIN?**

While one person stands at the ViVOPay 8100e 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 8100e 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 8100e 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 8100e. 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 8100e is observable in any of the above tests, you must reposition the ViVOPay 8100e 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 8100e 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 8100e and retest until PIN entry is secure from observation.

## Radio Frequency Interference

To perform contactless transactions, the ViVOPay 8100e 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 8100e closer than 1 foot (30 cm) to ViVOPay readers or other RF-emitting devices (non-NFC). Some environments may require greater distances.
- Do not position the ViVOPay 8100e near radio transmitters.
- Avoid placing the ViVOPay 8100e on or near large metal objects.



## Installing the ViVOPay 8100e

This section describes how to install the ViVOPay 8100e. The basic steps are:

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

### Connector Access

The ViVOPay 8100e connectors are beneath a cover on the bottom of the reader.

#### To access the connectors

1. Turn over the ViVOPay 8100e so that the connector cover is visible.
2. Use a Phillips #1 screwdriver to remove the captive screw that holds the connector cover in place.



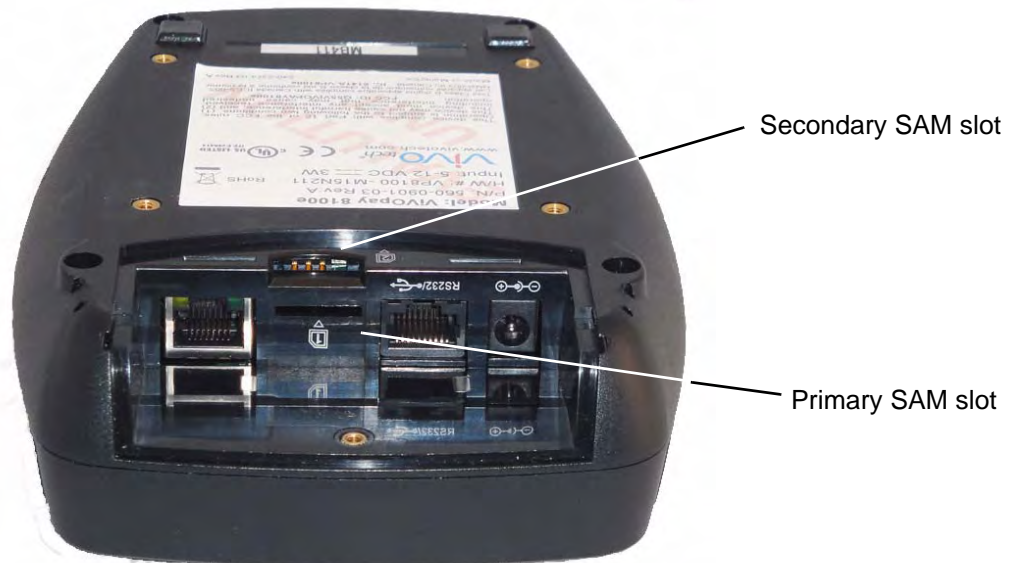
- Slide the connector cover away from the ViVOpay 8100e.



If the captive screw catches, invert the ViVOpay 8100e to remove the connector cover.

## Install a SAM Card

All ViVOpay 8100e models have one SAM card slot with the option of a second. If you are using a SAM card(s) in your application, insert the SAM card as shown by the SAM card icon. Make sure that the SAM card is fully engaged in the slot before inserting all the way.



**Warning:** Do not insert or remove a SAM card while the ViVOpay 8100e is powered. This will cause permanent damage to the SAM card.

## Connect Data and Power

There are connectors for Ethernet (optional), data, and power inside the connector cover. The connections you need to make are dependant on your specific POS configuration and application



### To connect data and power

1. Connect your data cable to the RS232/USB or connect the Ethernet port to a Ethernet switch or hub.
2. Connect the power cable.
3. Pass the cables through the slots in the connector cover. Use the narrow slot for the power cable to provide strain relief.



4. Replace the cover and secure it with the retaining screw.
5. Connect the power supply to a 110-220 VAC outlet.

The ViVOpay 8100e displays the opening set of screens before it displays the **Welcome** screen. The opening screens include:

- Copyright screen
- Firmware version screen

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

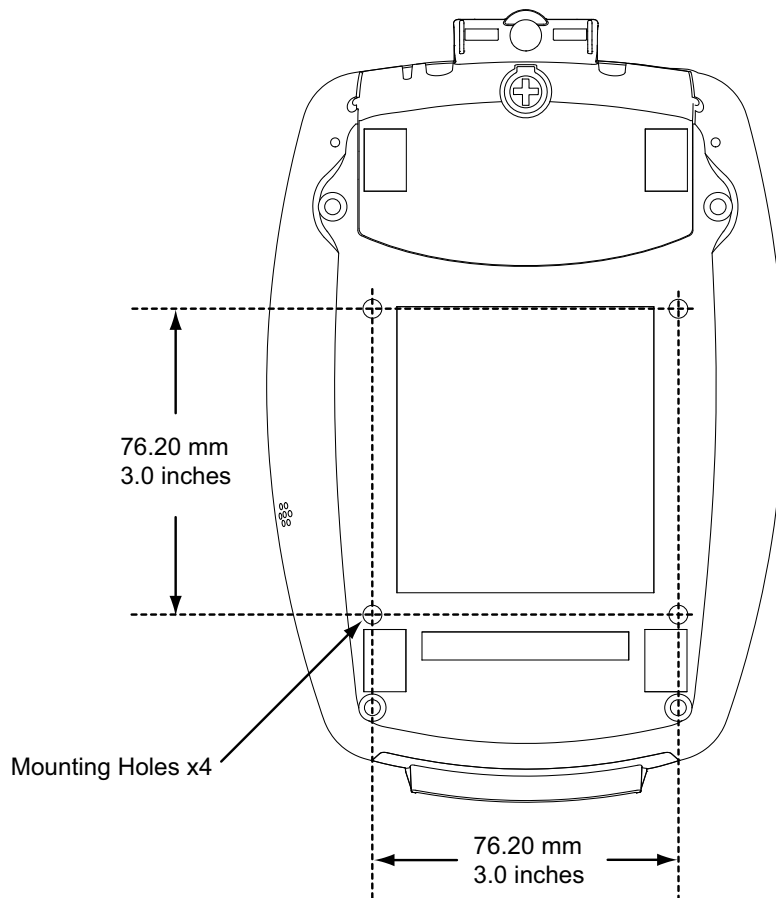
If the reader fails to power up, try reseating the power connector (or change to a different power outlet). For more troubleshooting information, see [“Troubleshooting” on page 11](#).

## Mount the ViVOpay 8100e to a Surface

The ViVOpay 8100e can be mounted to a surface to prevent it from being accidentally dislodged or repositioned.

### To mount the ViVOpay 8100e

1. Drill four 3.5mm (9/64 inch) holes in the surface where the ViVOpay 8600 will be mounted. Use the hole spacing shown in [Figure 1](#).



**Figure 1. Mounting hole locations**

2. Position the ViVOpay 8100e over the mounting holes and use four M3 screws (not supplied) long enough to secure the ViVOpay 8100e to the mounting surface.

## Mounting the Wedge Bracket

The optional wedge bracket tilts the ViVOPay another 7° for easier viewing. The wedge bracket is fastened to the ViVOPay 8100e using the four mounting holes.

### To mount the wedge bracket

1. Align the mounting bracket over the mounting holes with the thickest end over the connector cover.
2. Fasten in place with four M3 screws as shown in [Figure 2](#).



**Figure 2. Attaching the wedge bracket**

## Testing the Installation

After you have completed the installation and have checked for PCI conformance, check that the ViVOPay 8100e and the POS are communicating correctly by performing a sample transaction using a contactless card and a magstripe card.

You can also test basic functionality using the Onboard Diagnostics (OBD) described in [“Onboard Diagnostics” on page 12](#).



# Chapter 3

## Troubleshooting and Maintenance

### Troubleshooting

The ViVOPay 8100e readers are reliable and easy to troubleshoot. The components that may require troubleshooting include the power supply, the reader, and the data cable.

Symptom	Possible Cause	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 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>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's display.</li> <li>Verify that the card/fob/phone is valid/current.</li> <li>Test with "ViVOcard Contactless Test Card" part number 241-0015-03.</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>
<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 8100e</li> <li>Check the POS application.</li> </ul>

## Onboard Diagnostics

The ViVOpay 8100e has a built-in diagnostics program accessible through the RS232 interface. If you did not purchase an RS232 data cable with your ViVOpay 8100e, you will need one to access the diagnostic tests. The Onboard Diagnostics (OBD) tests the following components of the ViVOpay 8100e.

Test	Possible Results
LCD Test	Pass/Fail
Touch Screen Test	Pass/Fail. This test is not valid for the ViVOpay 8100e.
Key Test	Pass/Fail 1234567890<cancel><clear><enter>
LED Test	Pass/Fail
Buzzer Test	Pass/Fail
Magstripe Test	Pass Tracks 1 or 2 or 3/Fail
RFID Test	Pass Type A or B/Fail
Security Keys Test	KPK, DUKPT, Master 1234567890

### Accessing the OBD Tests

#### To connect the ViVOpay 8100e to a terminal emulator

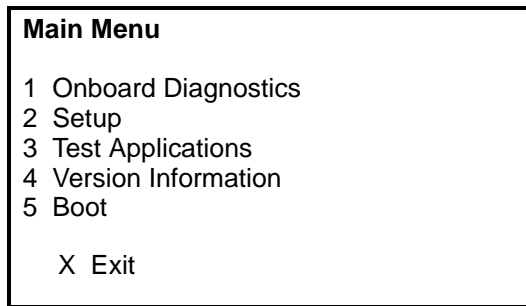
1. Connected the RS232 data cable to the ViVOpay 8100e as described in [“Connect Data and Power” on page 7](#).
2. Launch the terminal emulation program and set the serial communication parameter of the terminal emulation program to the following:
  - Baud rate: 115200
  - Parity: none
  - Data bit: 8
  - Stop bit: 1
  - Flow control: none
3. Connect the BD-9 end of the data cable to the COM port of a computer running a terminal emulation program.

#### To enter the Onboard Diagnostics

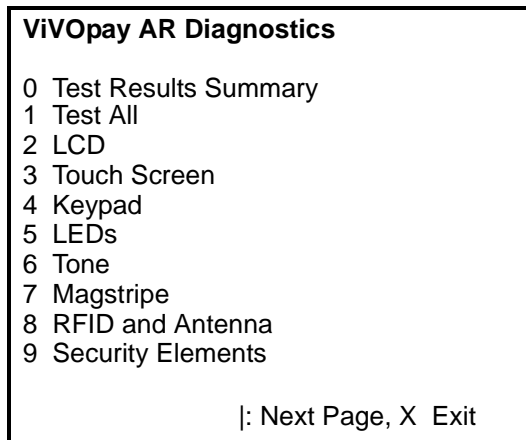
1. Power off the ViVOpay 8100e by removing the power supply from the power receptacle.
2. Plug the power supply back into the power receptacle.



- Press the **3** key and hold it down until the **Main Menu** screen appears. This is approximately 40 seconds after power is first applied.



- Press the 1 key to enter the OBD. The **ViVOpay AR Diagnostics** menu displays.

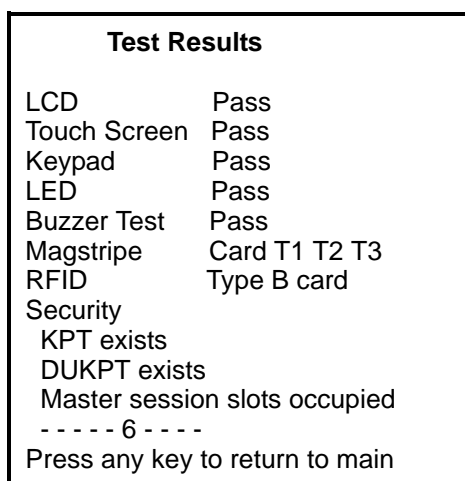


The **ViVOpay AR Diagnostics** screen is the main menu.

### Test Results Summary

The **Test Results Summary** displays the results of all tests performed. Once the ViVOpay 8100e is returned to normal mode, all results are cleared. If you reenter the **ViVOpay AR Diagnostics**, all test are marked as not performed.

- Press **0** on the **ViVOpay AR Diagnostics** screen. The **Test Results** screen is displayed with the results of all the tests run.



## Test All

Test All runs the entire test sequence and displays the results.

1. Press **1** when the **ViVOpay AR Diagnostics** screen is displayed. All of the tests are run in sequence and the results are displayed. See each individual test for information.

## LCD Test

The LCD test turns the pixels on/off and checks screen clarity to verify that the LCD screen is working properly. The results will be displayed on the LCD.

1. Press **2** from the **ViVOpay AR Diagnostics** screen. The **AR LCD Test** screen is displayed.

### AR LCD Test

1 Test Character Display (not run)  
 2 Test all pixels OFF (not run)  
 3 Test clarity of display (not run)  
 4 Set 8100 Contrast (not run)  
 CANCEL(X) Exit to main menu  
 Select Test with 1, 2, or 3 and:  
 Press ENTER (O) to pass test  
 Press CANCEL (X) to fail test

2. Press **1**. The display will fill with alpha characters on line one and numeric characters on line 2.
3. Press **ENTER** if the correct screen is displayed otherwise press **CANCEL** to fail the test. The AR LCD Test screen is displayed.
4. Press **2**. All pixels should be turned off and the screen should be bright.
5. Press **ENTER** if the correct screen is displayed otherwise press **CANCEL** to fail the test. The AR LCD Test screen is displayed.
6. Press **3**. Both lines of the display are filled with the # character.
7. Press **ENTER** if the correct screen is displayed otherwise press **CANCEL** to fail the test. The AR LCD Test screen is displayed.
8. Press **4**. You can change the contrast by pressing the 7 key for more contrast or the 9 key for less contrast. A numeric value (20 high to 42 low) for the contrast is displayed.
9. To save a new contrast setting, press **ENTER** and press the keys as instructed by the prompt.
10. Press **CANCEL** to exit back to the main menu.

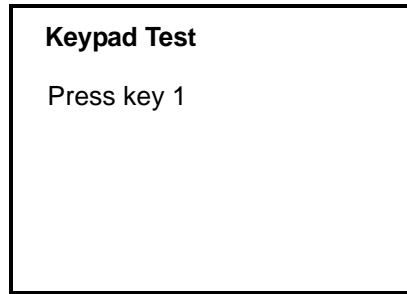
## Touch Screen Test

The Touch Screen test does not apply to the ViVOpay 8100e. **Test All** skips this test or press **CANCEL** to abort this test.

## Keypad Test

This test asks you to enter each of the keys in sequence to verify that the keypad is working correctly. The results will be displayed on the LCD.

1. Press **4** on the **ViVOPay AR Diagnostics** screen. The **Keypad Test** screen is displayed.



2. Press key **1**. The screen then asks for the next key in sequence.
3. Continue pressing each key as requested.

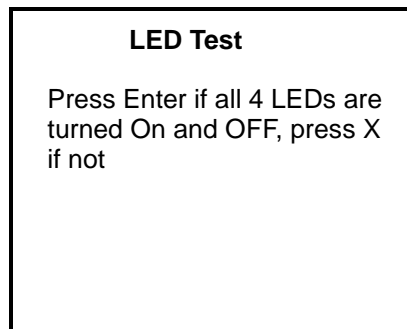
When you have finished testing the keys, the keypad will be tested for intrusion. Remove your hand and any other object from the keypad until the test is complete.

**Note:** If the tamper value is too high (failed), the ViVOPay 8100e will not accept PIN entry. To see if the keypad passed the tamper test, use the **Test Results Summary** option. Readers that fail the keypad tamper test should be returned for recalibration.

## LED Test

This test asks you to verify that all of the LEDs are working correctly. The results will be displayed on the LCD.

1. Press **5** on the **ViVOPay AR Diagnostics** screen. The **LED Test** screen is displayed.

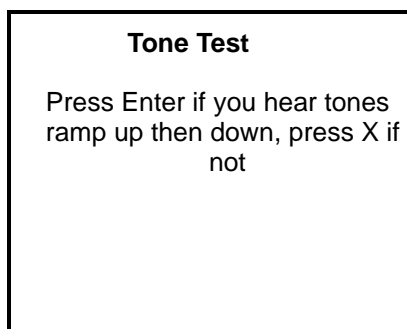


2. Press **ENTER** if all four LEDs flash on and off in sequence otherwise, press **CANCEL** to indicate that the LEDs did not flash. The ViVOPay AR Diagnostics screen appears.

## Tone Test

This test asks you to verify that the buzzer is audible. The results will be displayed on the LCD.

1. Press **6** on the **ViVOPay AR Diagnostics** screen. The **Tone Test** screen is displayed.

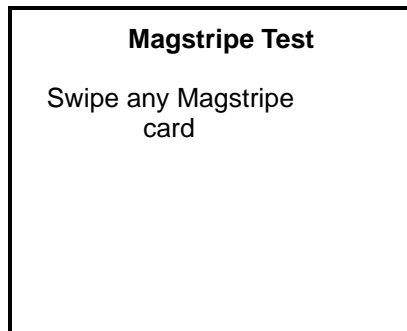


2. Listen for the tones and make sure they ramp up and then down.
3. Press **ENTER** if you hear the tones otherwise press **CANCEL** to indicate that the tones did not ramp up and down.

## Magstripe Test

This test asks you to swipe a magstripe card through the slot at the top of the ViVOPay 8100e and displays the tracks read correctly. The results will be displayed on the LCD.

1. Press **7** on the **ViVOPay AR Diagnostics** screen. The **Magstripe Test** screen is displayed.

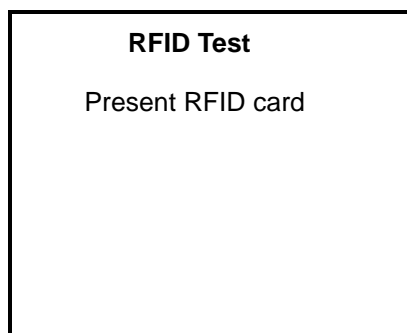


1. Swipe a card with a magnetic stripe through the slot on the top of the ViVOPay 8100e.
2. The panel displays the results of the swipe; either the card has been successfully read or an error is indicated.
3. Press any key to return to the **ViVOPay AR Diagnostics** screen.

## RFID and Antenna Test

This test asks you to present a contactless card/phone/fob close to the touch screen to verify that the antenna is able to detect a contactless card. The results will be displayed on the LCD.

1. Press **8** on the **ViVOPay AR Diagnostics** screen. The **RFID Test** screen is displayed.

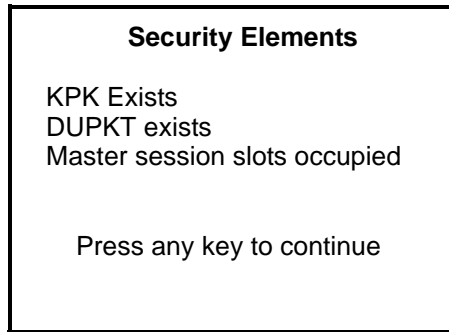


2. Present the card/fob/phone in close proximity to the reader and so that maximum surface area is parallel to the touch screen. The screen indicates if a card/phone/fob has been detected.
3. Press any key to return to the ViVOPay AR Diagnostics main menu.

## Security Elements Test

This test verifies that the KPT and DUPKT keys are loaded into the ViVOPay 8100e. It also verifies which slot contains the master Key. The results will be displayed on the LCD.

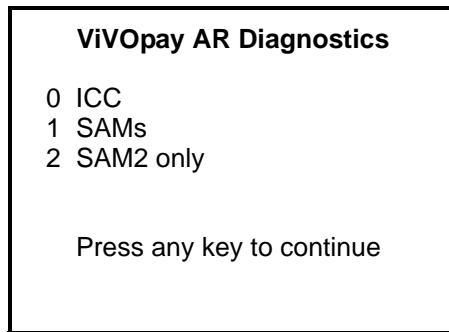
1. Press **9** on the **ViVOpay AR Diagnostics** screen. The **Security Elements Test** screen is displayed.



2. Press any key to return to the **ViVOpay AR Diagnostics** main menu.

### Contact Interface Tests

1. To test the SAM slots, press **ENTER** from the Onboard Diagnostics Main Menu.



If the ViVOpay 8100e does not have an ICC contact card slot, skip the first test.

2. Press 0 to check the contact card reader.
3. Press 1 to check a SAM in SAM slot 1.
4. Press 2 to check a SAM in SAM slot 2.

## Maintenance

The ViVOpay 8100e contains no user-serviceable parts within its enclosure. Do not open the ViVOpay 8100e enclosure.

**WARNING:** Attempting to open the ViVOpay 8100e enclosure will trigger security measures and it will stop functioning even after reassembly!

You can upgrade the ViVOpay 8100e's firmware if required.

### Upgrading the Firmware

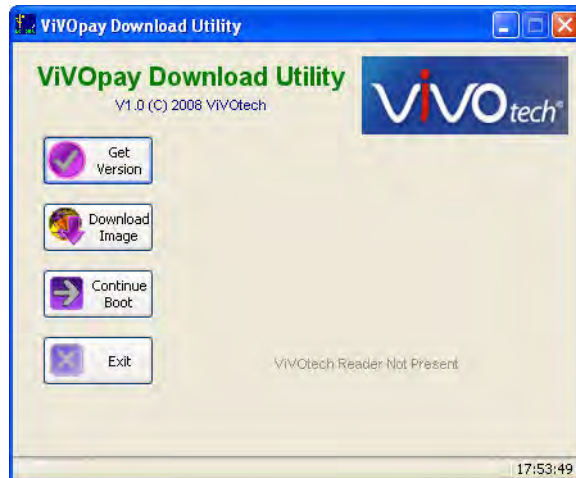
You can upgrade the firmware of the ViVOpay 8100e if required for your application. You will need the following from your ViVOpay 8100e distributor:

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

You also need a PC with a USB port. The PC should have the required USB driver USBSER.SYS and HID.DLL files. If not, they are available for download from Microsoft's website.

### To upgrade the firmware

1. Make sure you have the USBSER.SYS and HID.DLL files installed on the PC.
2. Copy the firmware image and ViVO download utility, provided by ViVOtech Support or your ViVOtech representative, to the PC you are using for the upgrade.
3. Copy the vivopay.inf file to the Windows\inf directory.
4. Connect the USB data cable to the ViVOpay 8100e and PC (see [“Connect Data and Power” on page 7](#)).
5. Double click the ViVO download utility icon or .exe to start the utility.



6. Power on the ViVOpay 8100e. The bootloader version appears under the ViVOtech logo.
7. Click **Download Image**.
8. When prompted, locate and select the firmware (.hex file) to download and click **OK**.  
A progress bar indicates the status of the download. It will take approximately eight minutes to complete the download.
9. When the download is complete disconnect the ViVOpay 8100e from the PC and power.  
The new firmware will be active next time you apply power to the ViVOpay 8100e.
10. Connect the ViVOpay 8100e to the POS with the appropriate data cable.
11. Reconnect power.



## ViVOpay 8100e Specifications

<b>RF Interface</b>	
Frequency	13.56 MHz
Standards	ISO 14443 Type A/B ISO 18092
<b>Physical</b>	
Length	190.5 mm (7.5 in)
Width	129.45 mm (5.1 in) maximum
Depth	47.63 mm (1.875 in)
Weight	0.4 Kg (0.9 lbs)
<b>Environmental</b>	
Operating Temp.	0 to 40° C (32 to 104° F)
Storage Temp.	-20 to 60° C (-4 to 140° F)
Operating Humidity	0 to 85% non-condensing
Operating Environment	Indoor only
<b>Power</b>	
Voltage	9-12 Vdc regulated, +/- 10%
Consumption	5 W maximum

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## Regulatory Compliance

### FCC Part 15 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. 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 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.

### FCC Information for User

The user's manual or instruction 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. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

### Industry Canada Class B Equipment

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

### Industry Canada Information for User

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil numérique de la classe B est conforme aux normes NMB-003, CNR-Gen, et CNR-210 du Canada. Son fonctionnement est assujéti aux deux conditions suivantes: (1) Cet appareil ne peut pas provoquer d'interférences nuisibles et (2) cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant entraîner un fonctionnement non désiré.



**Discover Zip**

Discover's contactless payment product that utilizes contactless technology.

**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 2.1**

The Payment Card Industry Security Standards Council (PCI SSC) mission is to enhance payment account data security. PCI 2.1 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 payWave**

Visa's contactless payment product that utilizes contactless technology.