ViVOpay®

Kiosk II
User Guide

Version 1.0.1

Document Number 631-0071-01

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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 and 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.

IC Compliance Warning:

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.

User Information

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. [54 FR 17714, Apr. 25, 1989, as amended at 68 FR 68545, Dec. 9, 2003]

Cautions and Warnings

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

Table of Contents

1 Overview

The ViVOpay Kiosk II is a compact stand-alone contactless reader designed to support contactless transactions based on ISO 14443 Type A/Type B/MiFare compatible cards, fobs and tags as well as NFC phones. The ViVOpay Kiosk II is comprised of a compact controller module and an antenna module packaged individually with a separation of up-to 1-Meter. This design approach allows the controller module to be easily installed within the cabinetry of a 3rd-party host system and the customer-facing antenna to be installed with minimal footprint and effort.

The ViVOpay Kiosk II supports serial RS-232 host communication. The accompanying ViVOpay serial interface protocol can be implemented with minimal effort. The ViVOpay Kiosk II is also designed to support a wide input-power range while both data and power is provided via a single cable thus minimizing the effort and complexity of installation and integration.

1.1 Features

- Supports ISO 14443 Type A, Type B, MiFare and NFC based contactless transactions
- 32-bit Microcontroller with ample memory capable of supporting future application upgrades
- Crypto data processing for contactless EMV cards
- RS-232 (9600, 19200, 38,400, 57,600, 115,200 baud) host interface
- Remote firmware updates over serial RS-232
- Small form-factor antenna flush-mounted on external cabinetry
- Internal mounted controller board with 1 Meter controller/antenna separation

1.2 Valid Card Types

ViVOpay Kiosk II supports the following contactless payment applications in the latest release of firmware:

- PayPass ISO/IEC
- PayPass M/Stripe
- PayPass MChip
- PayPass MXI
- Maestro – must be configured
- RBS Application (M/Flex)
- VisaWave
- qVSDC/MSD
- JCB J/Speedy
- JCB Mobile/QuicPay
- American Express – ExpressPay
- Discover Zip
- ViVOwallet
- ViVONFC
- Mifare ePurse

1.3 Kiosk II Specifications

Hardware	
MTBF	200,000 hrs.
Transmitter Frequency	13.56 MHz +/- 0.01%
Transmitter Modulation	ISO 14443-2 Type A Rise/Fall Time: 2-3 µsec. Rise, < 1 µsec fall ISO 14443-2 Type B Rise/Fall Time: < 2 µsec. each; 8% - 14% ASK
Receiver Subcarrier Frequency	847.5 KHz
Receiver Subcarrier Data	ISO 14443-2 Type A: Modified Manchester ISO 14443-2 Type B: NRZ-L, BPSK
Typical Read Range	4-6 cm.
Physical	
Antenna Height	75 mm (2.95 inches)
Antenna Width	60 mm (2.36 inches)
Antenna Depth	17.2 mm (0.67 inches)
Controller Height	105 mm (4.13 inches)
Controller Width	76.2 mm (3.00 inches)
Controller Depth	22.5 mm (0.88 inches)
Environmental	
Operating Temperature	-25° C to 70° C (-13° F to 158° F)
Storage Temperature	-40° C to 85° C (-40° F to 185° F)
Operating Humidity	10% to 90% non-condensing
Operating Environment	Indoor and outdoor use. Unit is water resistant.
Electrical	
Reader Input Voltage	7.5 to 36 VDC, 3 Watts

2 ViVOpay Kiosk II Installation

2.1 Parts List

Verify that you have the following hardware for the installation of the ViVOpay Kiosk II:

- ViVOpay Kiosk II Controller – 520-2305-00

- ViVOpay Kiosk II Antenna – 520-2304-00

- Antenna LED Power and data cable - 220-2457-00

- ViVOpay Kiosk II to ECR/POS Cable (14 pin) – application specific. This cable varies based on the ViVOpay Kiosk II to be used.

2.2 ViVOpay Kiosk II Installation

This section provides information on how to install the ViVOpay Kiosk II unit on a Kiosk.

## 2.3 Mounting the ViVOpay Kiosk II External Antenna

Use the following instruction for mounting the external antenna on the exterior of the Kiosk:

Note: Verify the orientation of the ViVOpay Kiosk II Antenna before marking and drilling the holes. The 2 larger holes should be located towards the top of the mounting location to ensure that the ViVOpay Kiosk II antenna is oriented correctly so that the LED lights are at the top.

1. Using the Drill Template for the External Antenna (630-1056-00), locate and mark the four 4.4mm (0.173 inch) mounting holes.

2. Using the Drill Template for the External Antenna (630-1056-00), locate and mark the two 15.880 mm (0.625 inch) access holes (used for connecting the antenna power and the LED power and data cable to the ViVOpay Kiosk II unit).

3. Drill the four 4.4 mm (0.173) mounting holes using a number 17 drill bit.

4. Drill the two 15.88 mm (0.625 inch) holes using a 5/8 drill bit.
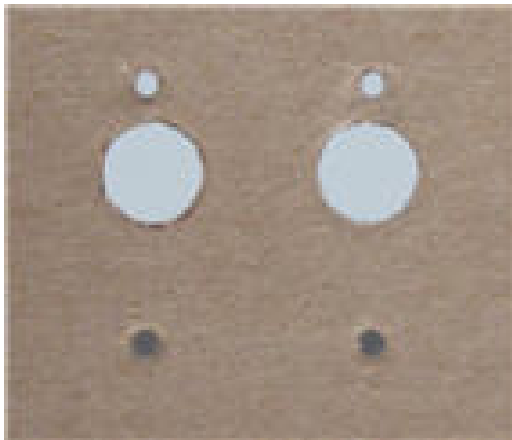
5. Remove the nuts from the four mounting screws.

6. Route the end of the cable (220-2457-00) with the RJ45 connector through the left 15.88 mm (0.625 inch) hole in to the Kiosk. Make sure that the front of the external antenna will be properly oriented (not up side down) on the Kiosk before inserting the four screws into the mounting holes.
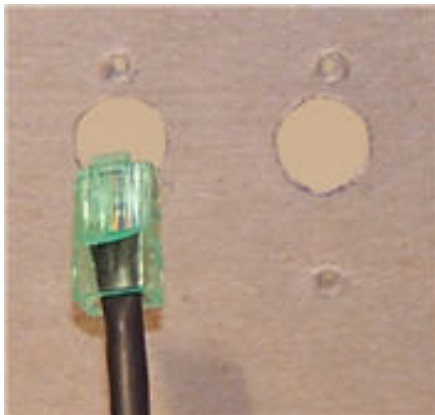
7. Align the four screws with the mounting holes and attach the ViVOpay Kiosk II unit to the outside surface. Make sure that the cable is routed cleanly through the left hole.

8. Use the four nuts to secure the ViVOpay Kiosk II unit to the outside surface of the Kiosk. Make sure to tighten the nuts securely so that the ViVOpay Kiosk II unit does not move on the outside surface of the Kiosk.

9. Attach the end of the cable with the SMB connector through the right 15.88 mm (0.625 inch) hole and attach it to the socket on the back of the ViVOpay Kiosk II Antenna. The SMB connector pushes on to the socket on the Antenna.
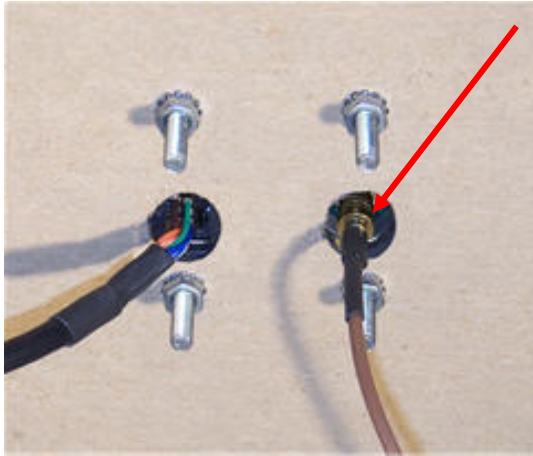
10. Attach the RJ45 connector coming from the ViVOpay Kiosk II Antenna to the RJ45 receptacle on the 220-2457-00 cable.

2.4 Mounting the ViVOpay Kiosk II Controller

Note: The ViVOpay Kiosk II Controller must be mounted within 1 meter of the external antenna. Make sure that the cable will be able to reach from the external antenna to the ViVOpay Kiosk Controller if the external antenna is mounted of a surface that opens (such as a door) when the antenna mounting surface is fully opened.

The ViVOpay Kiosk II installer must use their discretion when mounting the Controller.

If it acceptable, the installer can drill four holes for mounting the Controller if screw heads can appear on the outside of the Kiosk. In this case, it would be advisable to use security screws to prevent tampering with the screws.

If drilling additional holes on the outside of the Kiosk surface is not acceptable, the installer can use double-sided tape to mount the Controller to any clean surface.

2.4.1 Mounting the ViVOpay Kiosk II Controller Using Screws

1. Position the ViVOpay Kiosk Controller on the interior of the II making sure that there is sufficient room for the external antenna mounting surface to be fully opened.
2. Locate the four 4.4mm (0.173 inch) mounting holes by holding the ViVOpay Kiosk Controller in position and mark the holes. The following diagram shows the spacing on the holes to be drilled for mounting the ViVOpay Kiosk II Controller.
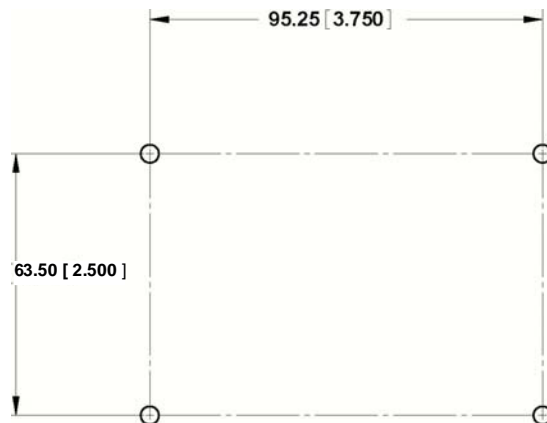
3. Drill the four 4.4 mm (0.173) mounting holes using a number 17 drill bit.
4. Use four screws and nuts to mount the ViVOpay Kiosk Controller to the Kiosk surface. (Mounting screws are not provided and must be supplied by the installer.)
5. Tighten the nuts to hold the ViVOpay Kiosk II Controller in position so that it does not move.

2.4.2 Mounting the ViVOpay Kiosk II Controller Using Mounting Tape

1. Position the ViVOpay Kiosk II Controller on the interior of the Kiosk making sure that there is sufficient room for the external antenna mounting surface to be fully opened.
2. Attach double-sided tape to the mounting surface.
3. Position the ViVOpay Kiosk II Controller over the mounting tape and gently apply pressure to hold the Controller in position.

2.5 Attaching the Cables from the Antenna to the Controller

1. Attach the SMB end of the cable (220-2457-00) from the antenna to the ViVOpay Kiosk II Controller.
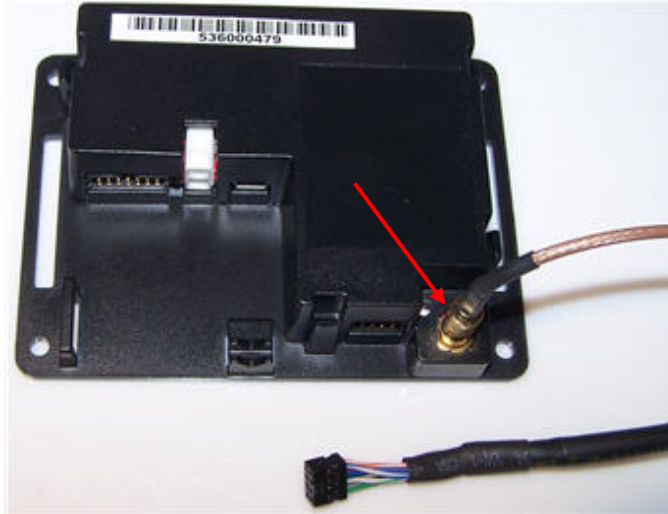
2. Attach the other end of the cable (220-2457-00) from the antenna to the ViVOpay Kiosk II Controller.

Note: Verify that the nub on the end of the data cable is facing towards the top of the ViVOpay Kiosk II Controller (away from the mounting plate) before inserting the cable. If the cable is installed incorrectly (up-side-down), it will apply the wrong polarity to the LEDs and cause them to be damaged.

2.6 Installing a SIM Card in the ViVOpay Kiosk II Controller

Under certain circumstances, it might be necessary to install a SIM card in the ViVOpay Kiosk II Controller.

Note: Opening the ViVOpay Kiosk II Controller unless directed to perform this operation by your local Support personnel may void the warranty.

There are four clips that hold the ViVOpay Kiosk II Controller to the mounting base
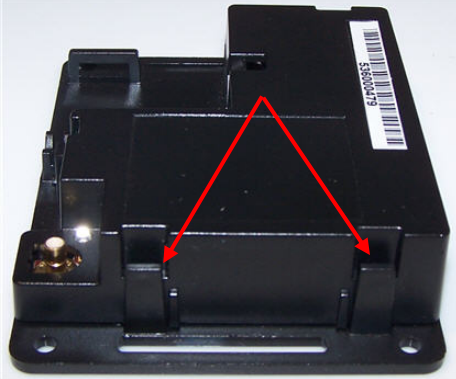
- One beside the cable receivers.
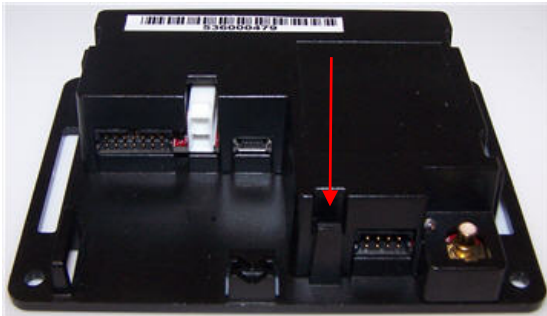
- One on the narrow end of the ViVOpay Kiosk II unit.

1. Gently pry all of the clips outward and remove the case from the base. The circuit board should remain inside the case.

2. Turn the case over so that you can access the circuit board.
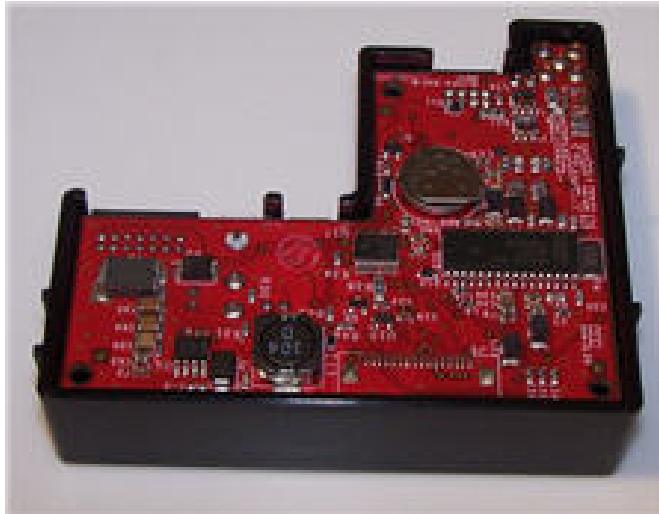
3. Use the cable receptacles to loosen the circuit board from the case and place the circuit board flat on a non-conductive surface with the SIM holder facing up.
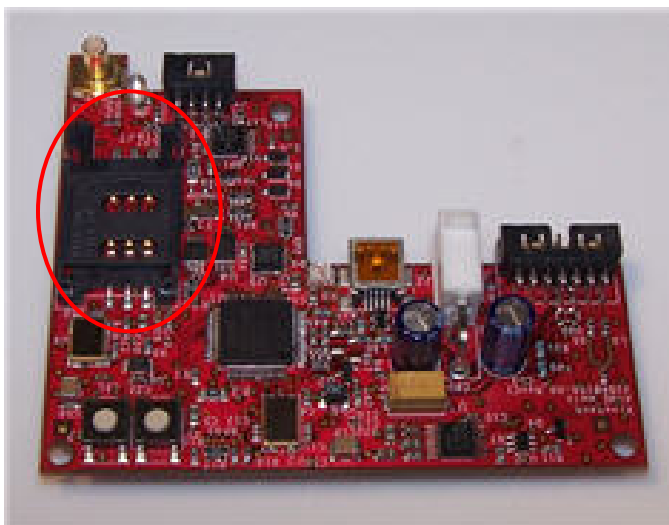
4. Slide the SIM holder away from the power and cable receptacles to loosen it from the lock.
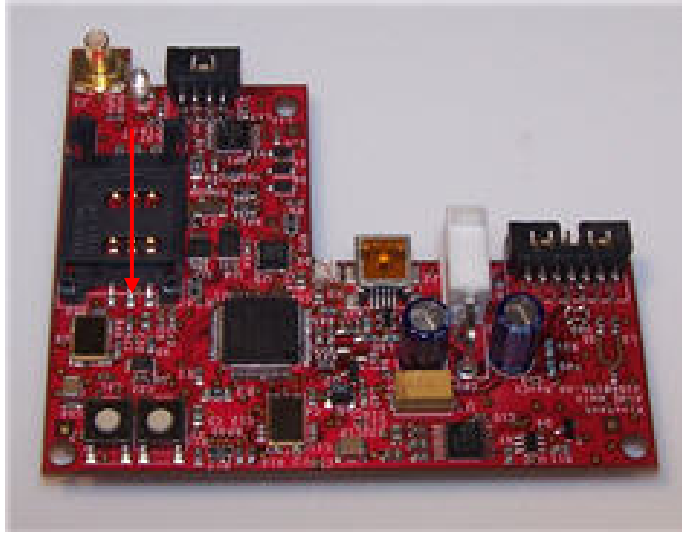
5. Raise the SIM holder so that you can install the SIM. Make sure that the SIM is positioned so that the contacts on the SIM will make contact with the circuit board when the SIM is lowered into position.

6. Insert the SIM into the SIM holder until it stops when it reaches the bottom of the holder.
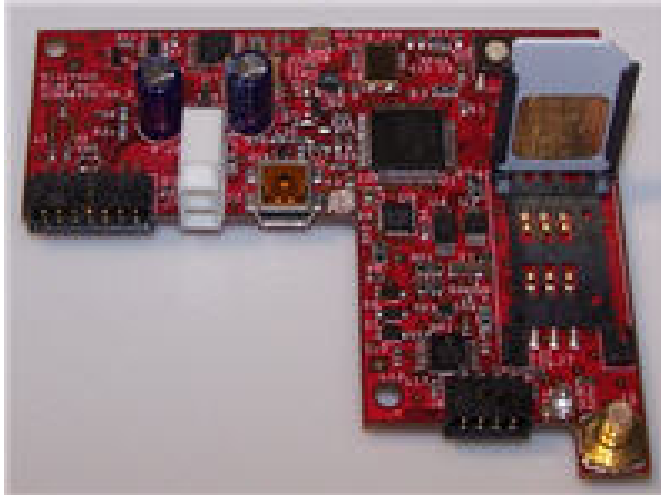
7. Gently lower the SIM holder and lock it into position by sliding it towards the cable receptacles.
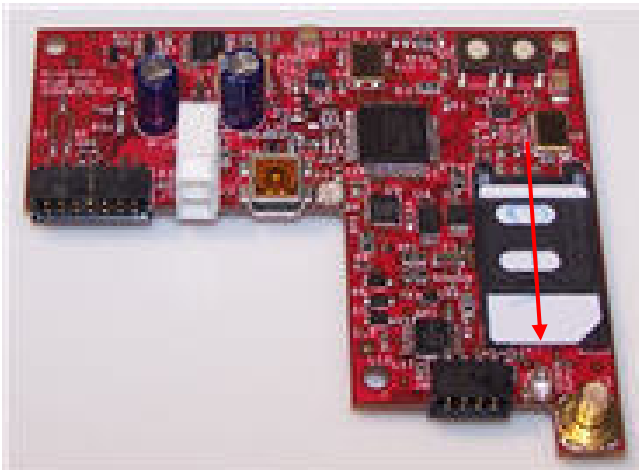
8. Reinstall the circuit board into the case.

9. Reattach the holder to the base making sure that all four clips lock in place.

10. Installation of the SIM in the ViVOpay Kiosk II Controller is complete.

2.7 Using the ViVOpay Kiosk II to Make a Purchase

2.7.1 Presenting Cards, Fobs, or NFC Phones

Your new ViVOpay Kiosk II allows for credit/debit card purchases using the new contactless technology.

Present the card/fob/phone in close proximity to the front portion of the reader. Present the card/fob/phone so that maximum surface area is parallel to the antenna as shown below. The reader should beep and all four green LEDs should illuminate briefly to indicate a successful test.

This tests the reader's ability to read the RFID test card. If unsuccessful, there will be no reaction from the reader. If you use a test card and the ViVOpay reader is attached to the ViVOpay Kiosk II control unit, a dummy transaction can be tested. The transaction will not be authorized and will come back with a response, but will at least test for end-to-end connectivity.

2.7.2 Making a Purchase

1. After the transaction has been entered on the ViVOpay Kiosk II control panel, the customer should present their card/fob/phone in close proximity so that maximum surface area is parallel to the antenna.
2. A single beep and all four LEDs briefly flashing indicates the card/fob/phone has been read correctly.

3 Installation Points

- Although the ViVOpay Kiosk II Reader is designed to be mounted on to a metal surface and in close proximity to any internal motors and electrical devices that may be operating inside the Kiosk, it should be noted that in general, RFID readers can be susceptible to RF-induced interference. Therefore, the ViVOpay unit is susceptible to RF and electromagnetic interference. Therefore, it is important that the unit not be mounted next to or near (within 3 or 4 feet) large electric motors, computer UPS systems, microwave transmitters, anti-theft devices, radio transmitters, communications equipment etc.

- All cables should be neatly tied with nylon cable-ties and routed in such a way that they are inaccessible and invisible to customers. Cables should be clearly labeled at both ends to indicate where they should be connected to.

- The ViVOpay unit should be tested after installation with a test card. An end-to-end transaction should be run (the same as an actual purchase on the Kiosk). The ViVOpay Kiosk II should register "Requesting Authorization". 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 unit 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 ViVOpay Kiosk II is rebooted on a regular basis (such as every night) it is important to test the contactless reader as soon as possible afterwards in order to ensure continued communication to the Kiosk.

- In order to minimize the incidence of non-functioning readers being reported, it is important that ViVOpay Kiosk II distributors, technicians, and IT specialists servicing the retail locations are made aware of how to troubleshoot the contactless readers. From past experience it has been found that a large percentage of units that are returned to your local support representative under the RMA process have been found to be in good working order. Some simple troubleshooting while the reader is still installed can greatly reduce this number.

- If the ViVOpay unit does not appear to be working, verify that the unit is powered on.
    - Make sure that the correct pins are utilized
    - Make sure that the power provided is within the specified range of the ViVOpay Kiosk II reader
    - The correct polarity is observed

4 RF Interference

Q. Why do I need to know about RF interference?

A. Contactless payment uses radio frequency technology to send card data to a contactless terminal reader.

Q. How can RF interference affect contactless payment?

A. RF 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, pagers
    Mobile telephones
    Power lines, transformers
    Medical equipment
    Microwaves
    Electromechanical switches
    Many others

Q. What should I do if I suspect RF interference exists in my environment?

A. Begin by inspecting your environment for possible culprits for RF interference.

Q. Do equipment manufacturers test their devices for RF interference?

A. 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 devices that would be encountered in your 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 - so 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.

5 Troubleshooting

The ViVOpay Kiosk II readers are reliable and easy to troubleshoot. The components that may require troubleshooting include the power module (if applicable), the reader, and the serial cable.

Symptom	Possible Cause	Remedy
General Issues		
Reader does not appear to be powered on (no LEDs lit).	• Reader not powered on or incorrect voltage. • Incorrect power supply used. • Improper use of internal power supply provided by the Kiosk	• Check cable connections. • Verify that power is on and correct voltage and current are present. • Make sure that the correct pins are utilized. • Make sure that the power provided is within the specified range of the Kiosk II reader. • Make sure that the correct polarity is observed. • For more information, refer to the Input Voltage under the Electrical specification section. • Replace the power module. • Replace the reader.
Reading Cards/Fobs/Phones		
LEDs do not light and beeper is not audible when card/fob/phone is presented.	• Card/fob/phone not properly presented. • RF interference. • Unsupported card used. • Wrong firmware (contact your local support representative).	• Present card/fob/phone closer to the reader antenna, and ensure it is parallel to the face of the reader. • Verify that the card/fob/phone is valid/current. • Test with "ViVOcard Contactless Test Card" part number 241-0015-03 Rev A. • Verify that the Phone Wallet is enabled for payments. • Try a different card/fob/phone. • Check to see if card/fob/phone is damaged. • Verify that phone cover is correctly attached to phone (Nokia 3220). • Verify that correct firmware is loaded on reader (local support representative only). • Power cable plug is fully inserted. • Replace the reader.
Some cards/fobs/phones read, but not all.	• Possible bad card/fob/phone. • Unsupported card used. • Wrong firmware (contact your local support representative).	• Check to see if card/fob/phone is damaged. • Verify that phone cover is correctly attached to phone. • Verify that correct firmware is loaded on reader (local support representative only).

Symptom	Possible Cause	Remedy
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 Kiosk.

6   Customer Support

Contact your local support representative for all support questions.