User Manual ViVOpay Kiosk II

631-0071-00

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 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 an 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.

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

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.

Cautions and Warnings

⚠️	**Caution:** The ViVOpay Kiosk II should be mounted 1-2 feet away from other ViVOpay Kiosk IIs. 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.

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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. This two-part design allows the controller module to be installed within the cabinetry of a kiosk and the antenna installed on an exterior surface with a separation of up to 1 meter. The antenna is available with a square or angled bezel.

The ViVOpay Kiosk II supports USB and serial RS232 host communication using the protocol defined in the *Global Reader Serial Interface Developers Guide*. The ViVOpay Kiosk II is designed to support a wide input power range. Both data and power can be supplied via a single cable to reducing the effort and complexity of installation.

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
- RS232 (9600, 19200, 38, 400, 57, 600, 115, 200 baud) host interface
- RS232 or USB data communications
- Small antenna flush-mounted on external cabinetry with square or angled bezel
- Internal mounted controller board with 1 meter controller/antenna separation

Valid Card Types

ViVOpay Kiosk II supports the following contactless payment applications in the latest release of firmware:
- ISO 14443
- PayPass M/Stripe
- PayPass M/Chip
- PayPass MXI
- VisaWave 1 and 2
- VisaPay/Wave MSD and qVSDC
- JCB J/Speedy
- JCB Mobile/QuicPay
- American Express- ExpressPay
- Discover Zip
- MiFare ePurse

Kiosk II Specifications

Hardware	
MTBF	500,000 hrs based on Telcordia Technologies SR-332 modeled at 40° C.
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 (1.5 to 2.3 inches)
Physical	
Controller	
Height	105 mm (4.13 inches)
Width	76.2 mm (3.00 inches)
Depth	22.5 mm (0.88 inches)
Square Bezel Antenna	
Height	75 mm (2.95 inches)
Width	60 mm (2.36 inches)
Depth	16.8 mm (0.66 inches)
Angle Bezel Antenna	
Height	96.2 mm (3.787 inches)
Width	82.3 mm (3.24 inches)
Depth	16.8 mm (0.66 inches)
Environmental	
Operating Temperature	-25° to 70° C (-13° to 158° F)
Storage Temperature	-40° to 85° C (-40° to 185° F)
Operating Humidity	10% to 90% non-condensing
Operating Environment	Water resistant for indoor and outdoor use
Electrical	
Reader Input Voltage	+7.5v to 36 VDC

ViVOpay Kiosk II Installation

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

Part List

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

- ViVOpay Kiosk II Controller
- ViVOpay Kiosk II Antenna (either square or angle bezel)
- Antenna LED power and data cable
- ViVOpay Kiosk II to ECR/POS cable (customer supplied). This USB or serial cable varies based on the host to be used.
- Drill Template for the antenna (630-1046-00)


Square Bezel Antenna

Angle Bezel Antenna

Mounting the ViVOpay Kiosk II External Antenna

Use the following instructions to mount the antenna on the exterior of the kiosk:

Note: Verify the orientation of the ViVOpay Kiosk II Antenna before marking and drilling the holes. The two larger holes should be located towards the top of the mounting location to ensure that the ViVOpay Kiosk II Antenna is oriented correctly with the LEDs at the top.

1. Using the Drill Template for the antenna (630-1046-00), locate and mark the four 4.4mm (0.173 inch) mounting holes.
2. Using the Drill Template, locate and mark the two 14.0 mm (0.551 inches) across holes (used for connecting the antenna power and the LED power and data cable to the ViVOpay Kiosk II).
3. Drill the four 4.4 mm (0.173) mounting holes using a number 17 drill bit.
4. Drill the two 14.0 mm (0.551 inch) holes using a 35/64 drill bit.
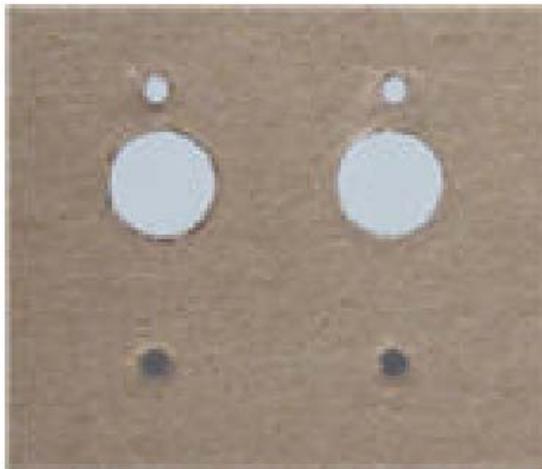
5. Remove the nuts from the four mounting screws.
6. Route the end of the cable (220-2457-00) with the RJ45 connector through the left 14.0 mm (0.551 inch) hole in to the kiosk. Make sure that the front of the antenna will be properly oriented (not upside down) on the kiosk before inserting the four screws into the mounting holes.
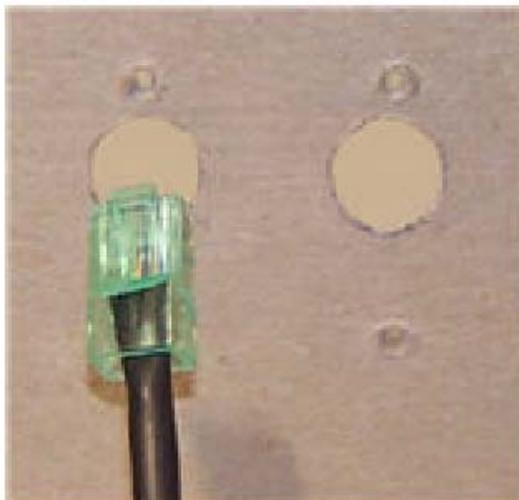
7. Align the four screws with the mounting holes and attach the ViVOpay Kiosk II to the outside surface. Make sure that the cable is not pinched or binding.

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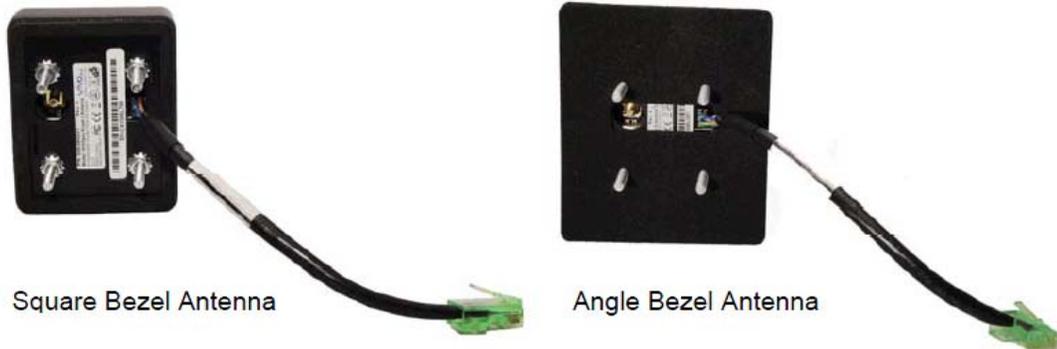
8. Use the four nuts to secure the ViVOpay Kiosk II to the outside surface of the kiosk. Make sure to tighten the nuts securely so that the ViVOpay Kiosk II does not move on the outside surface of the kiosk.

   If you are installing the Angle Bezel Antenna, tighten the nuts to 5-7 in/lbs. for a good weather seal.

9. Attach the end of the cable with the SMB connector through the right 14.0 mm (0.551 inch) hold and attach it to the socket on the back of the ViVOpay Kiosk II antenna. The SMB connector pushes on the socket of the antenna.
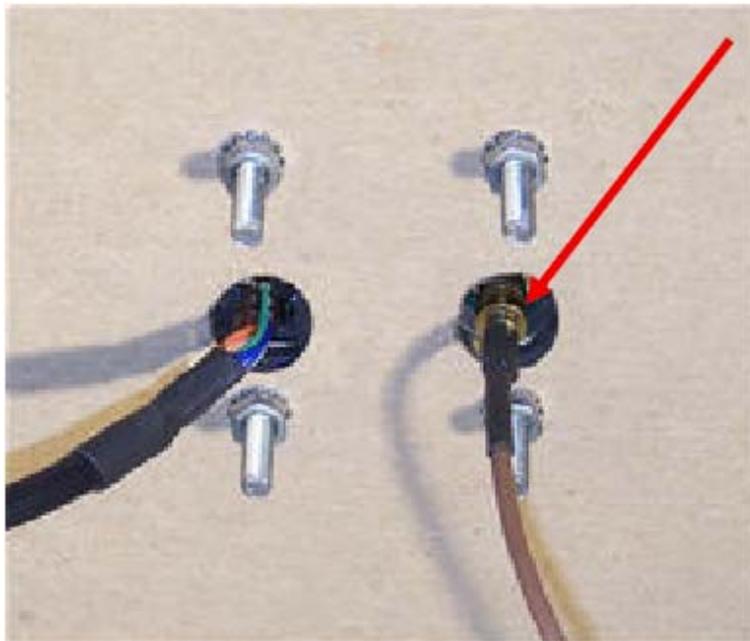
10. Attach the RJ45 connector coming from the ViVOpay Kiosk II Antenna to the RJ45 receptacle on the 220-2457-00 cable.

Flush- Mounting the Square Bezel Antenna

The RF field of the antenna is sensitive to the proximity of metal. If you are flush-mounting the antenna in a metal surface or bezel, you have three options:

- Mount with the RF emitting surface of the antenna at least 1 cm forward of any metal.
- Mount with the RF emitting surface of the antenna at least 1 cm behind any metal. This will reduce the effective range of the antenna.
- Mount flush with the metal but allow a minimum of 1 cm spacing between the antenna and the metal.

In all cases, test the antenna mounting before engaging in a full scale installation.

Mounting the ViVOpay Kiosk II Controller

Note: The ViVOpay Kiosk II Controller must be mounted within 1 meter of the antenna. If the antenna is mounted on a surface that opens (such as a door), make sure the controller and antenna are close enough that there is no tension on the cable when the enclosure is open.

If it is 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.

Mounting the ViVOpay Kiosk II Controller Using Screws

1. Position the ViVOpay Kiosk II controller on the interior of the kiosk making sure that there is sufficient room for the antenna mounting surface to be fully opened.

2. Locate the four 4.4 mm (0.173 inch) mounting holes by holding the ViVOpay Kiosk II 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 inch) mounting holes using a number 17 drill bit.
4. Use four screws and nuts to mount the ViVOpay Kiosk II 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.

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 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.

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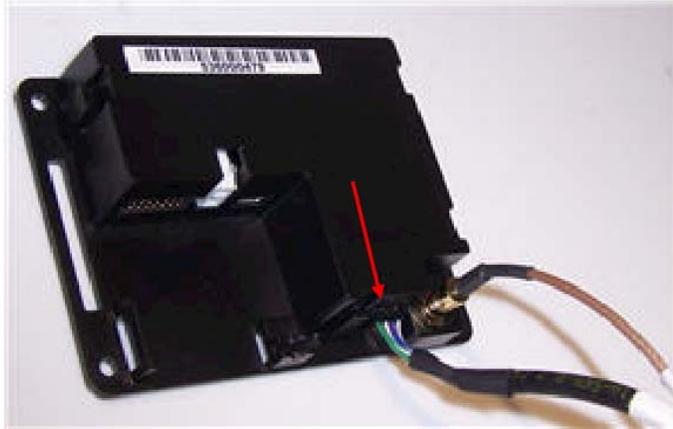
Note: Verify that the polarizing plug on the end of the data cable is facing towards the top of the ViVOpay Kiosk II Controller (away from the mounting plate) before inserting the cable. If the cable is installed incorrectly (upside-down), it will apply the wrong polarity to the LEDs and damage them.

Connecting to Power

The Kiosk II can be powered through the serial communications port or the two-socket power connector. If you are using USB data communications, you must power the Kiosk II through the two-socket power connector.

Connect +7.5 to 36 VDC to the white two-socket Molex connector (mating connector Molex P/N 0039012020 with 5556-series crimps) or to pins 1 and 2 of the RS232 connector (see next section).
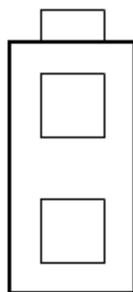
Pin 2 - Ground

Pin 1 - +7.5v to 36VDC

Connecting to the Data Port

The Kiosk II has two data connections options: USB through the USB connector and RS232 through the 14-pin Molex connector.
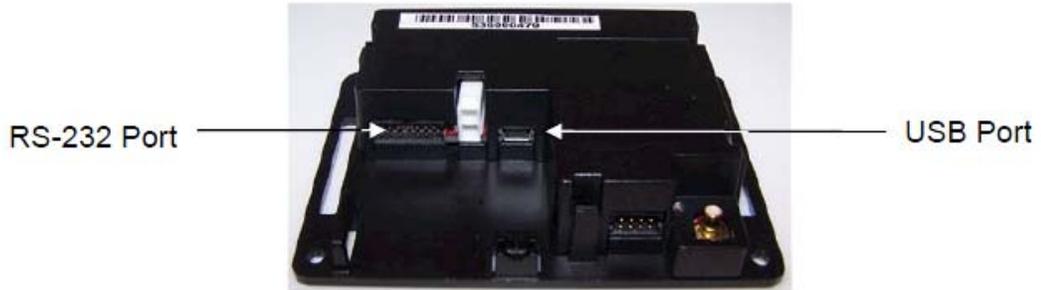
The USB port uses a standard USB connector and pin outs. The RS232 port has the following pin outs.

Pin	Description	Pin	Description
1	Power ground	2	+7.5v to 36VDC
3	Power ground	4	+7.5v to 36VDC
5	No connection	6	Reserved
7	Reserved	8	Reserved
9	Signal ground	10	Signal ground
11	RS232 Tx	12	RS232 Rx
13	ISP Input	14	Reserved

To build your own RS232 cable, use Molex female connector part number 0511101451 with 50394-series crimps (see www.molex.com for more information). Pin 1 is indicated by a triangle (diagram is socket-side view of the female connector). If you are powering the Kiosk II from this connector, wire the two power pins (pins 2 and 4) together and the two power ground pins together (pins 1 and 3).
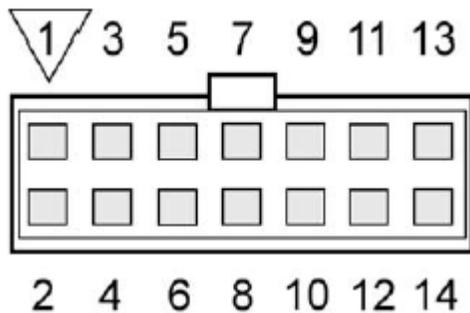
Using the ViVOpay Kiosk II to Make a Purchase

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 antenna module. Present the card/fob/phone so that maximum surface area is parallel to the antenna module as shown below. 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 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 Controller, 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.

Making a Purchase

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

Installation Points

- The ViVOpay Kiosk II is designed to be mounted on a metal surface and in close proximity to any internal motors and electrical devices that may be operating inside the kiosk. However, the ViVOpay Kiosk II is susceptible to RF and electromagnetic interference. It is important that the unit not be mounted near (within 3 or 4 feet) large electric motors, computer UPS systems, microwave transmitters, anti-theft devices, radio transmitters, communications equipment and so on.
- Close proximity of metal to the RF-emitting end of the antenna can greatly reduce the range of the antenna. See the precautions described in Flush Mounting the Kiosk II Antenna.
- Tie all cables neatly with nylon cable-ties and route them so that they are inaccessible and invisible to customers. Label the cable ends, host, ViVOpay, and power, to simplify connection testing or component replacement.

- Test the ViVOpay Kiosk II installation using a test card to perform an end-to-end transaction (the same as an actual purchase on the Kiosk). The kiosk control panel should display "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 card to ensure continued operation and functionality. If the kiosk is rebooted on a regular basis (such as every night) it is important to test the contactless reader as soon as possible afterwards to ensure continued communication to the kiosk.
- Refer to the troubleshooting section of this manual before contacting your distributor with support questions.

RF Interference

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

Q. How can RF interference affect contactless payments?
A. RF interference can cause data errors. If RF interference is present, contactless payment devices may operation 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

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. 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.

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. • 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 ViVOpay Kiosk II.
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 antenna, and ensure it is parallel to the face of the reader. • Verify that the card/fob/phone is valid/current. • Verify that metal is not interfering with the antenna. • Test with "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 ViVOpay Kiosk II.
Some card/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.

If you are unable to resolve the problem, contact your local support representative.

Firmware Upgrade

The Kiosk II can be upgraded using either the serial or USB interfaces.

Serial Firmware Download Process

The ViVOpay Kiosk II can only be upgraded when it is placed in upgrade mode by drawing down the ISP signal on the external connector. Using the cable and dongle mentioned above accomplishes this by connecting the ISP pin to the RS232 signal ground. If the ISP is grounded when the ViVOpay Kiosk II powers on, it enters download mode. Otherwise it will operate normally, emitting a beep and flashing LEDs when powered on.

If you want to build your own download cable, the pin outs to the external connector are given in Connecting to the Data Port. After you have entered download mode, you must erase the current firmware and install the new firmware.

Preparation

To install the new firmware you will need:
* PC with available serial or USB port
* ViVOpay Kiosk II with a serial or USB data cable attached
* For serial downloads: 220-1275-00 Download Dongle (DB-9 serial to RJ45)
* Philips LPC2000 Flash Utility software
* Firmware file for the desired firmware (contact ViVOpaysupport@idtechproducts.com)
* Power supply for the ViVOpay reader (7.5- 36 VDC; 3 Watts output).

Load the ViVOpay Kiosk Firmware

1. Install the LPC2000 flash utility program on the PC.
2. Copy the ViVOpay Kiosk II firmware on the PC.
3. Connect the download dongle (220-1275-00) to the PC COM port and plug in the 220-2374-00 cable from ViVOpay Kiosk II to the dongle.
4. Connect the power to the ViVOpay reader. There should be no beep, and no LED activity.
5. Launch the Philips LPC2000 utility. If the Philips utility fails to identify any reader attached, please follow the troubleshooting steps given in Troubleshooting.
6. Set the **Device** to LPC 2138.
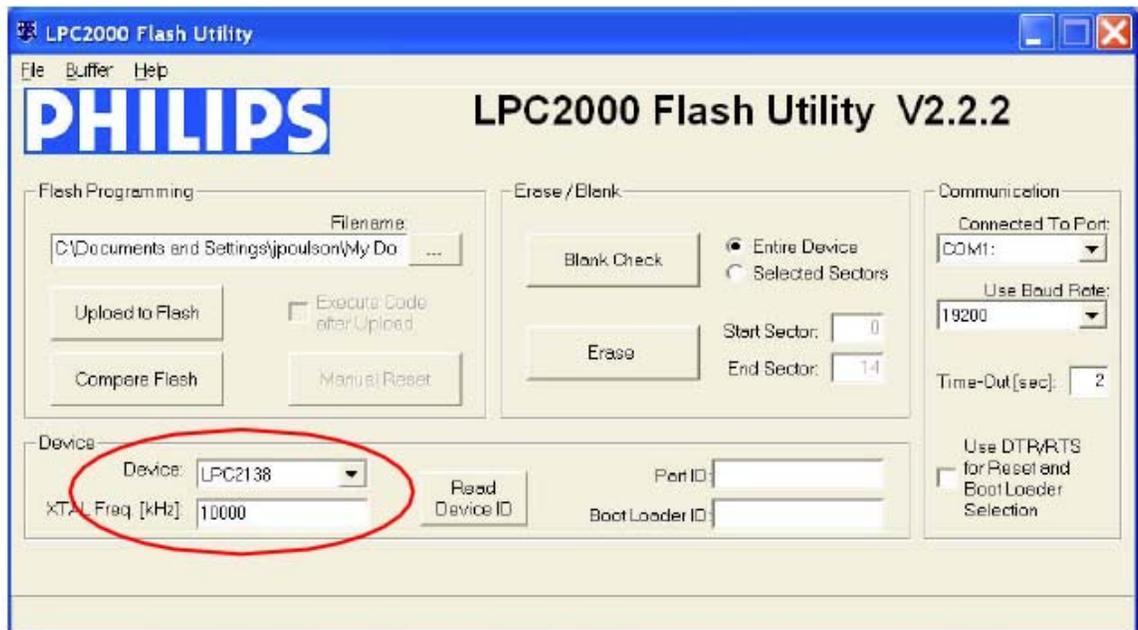
7. The COM port is normally set to **1** but this depends upon your PC Device Manager setup. You can select the COM port to which the cable is connected by navigating to the Windows Device Manager (**Start** -> **Settings** -> **Control Panel** -> **System** -> **Hardware** -> **Device Manager** -> **Ports**) to verify the actual port number that is assigned to the serial port. Press **ENTER** after making the selection.
8. Click **Read Device ID**, the **Part ID**: and **Boot Loader ID**: fields should be filled in if the reader is responding to the utility.
   Note: If the reader does NOT respond to the utility, reset the reader by unplugging and replugging the power connector and try again.
9. Click **Erase**. This erases the old firmware on the reader. A message indicates a successful erase.
10. Click **Blank Check** (with **Entire Device** selected) to confirm that the erase function worked properly.
11. In the **Flash Programming** box, click the "…" box to select the firmware file you want to load on the ViVOpay Kiosk II.
12. Click **Upload to Flash** to load the firmware on the reader (the % completion bar shows the firmware loading progress).
13. Disconnect power and the serial dongle.
14. Connect power to the Kiosk II and connect the standard data cable. It will load the new firmware application.

USB Firmware Download

The download process over the USB interface is performed with the bootloader commands presented in the *Serial Interface Developer's Guide*. For a copy of the *Serial Interface Developers Guide* contact ID TECH or your ID TECH representative.