ViVOpay ™ VP6300
User Manual

80154502-001 Rev. K
11 March 2021

Warranty Disclaimer
The services and hardware are provided "as is" and "as-available" and the use of the services and hardware are at its own risk. ID TECH does not make, and hereby disclaims, any and all other express or implied warranties, including, but not limited to, warranties of merchantability, fitness for a particular purpose, title, and any warranties arising from a course of dealing, usage, or trade practice. ID TECH does not warrant that the services or hardware will be uninterrupted, error-free, or completely secure.

FCC warning statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The user manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter and must be installed to provide a separation distance of at least 20cm from all persons.

Cautions and Warnings

	Warning: Avoid close proximity to radio transmitters which may reduce the ability of the reader. **Avertissement:** Évitez la proximité d'émetteurs radio, ce qui peut réduire la performance du lecteur.

Table of Contents

1. Introduction

ID TECH's VP6300 is a compact 3-in-1 credit card reader designed to support Magstripe (MSR), contact EMV, and contactless card reading using NFC and RFID.

The VP6300 has a high-contrast LCD display designed to deliver MSR, EMV, and contactless payment such as parking, ticketing, and payment kiosks. This device supports MasterCard PayPass, Visa VCPS, American Express ExpressPay, and Discover DPAS. The VP6300 also supports popular digital wallet technologies, including Apple Pay (and Apple VAS), Google Pay (including Google Pay Smart Tap), and Samsung Pay.

The VP6300 is certified in the latest payment standards of EMV (including Contactless Level 1 support, multiple card brand support, and full Level 1 and Level 2 support for contact EMV), with PCI (5.x) compliance. The unit also offers a SRED upgrade for extra assistance with tamper resistance measures.

The VP6300 supports USB and Serial (RS-232) host communications using the command protocol described in the *NEO Interface Developers Guide*. This comprehensive guide describes firmware commands and other available features in ID TECH's contactless payment devices.

Contact an ID TECH representative to obtain a copy of this guide. Additionally, a feature rich, Windows based Universal SDK is available to aid in rapid development of applications that needs to communicate with the VP6300.

Check the **Downloads** link on the ID TECH Knowledge Base for the latest VP6300 demos, utilities, SDK updates, white papers, and other downloads. All are available for free and without registration.

2. Features

The VP6300 supports the following:
- Contactless: ISO/IEC 14443 Type A and B
- ISO 18092 peer-to-peer communication
- LEDs:
    - 4 green LEDs at the top
    - 1 tri-color LED indicator for MSR
    - LED indicator for contact chip at the bottom
- RS-232 and USB connectivity options
- Programmable beeper for audible cues
- Tamper detection (SRED models only) with automatic data zeroization
- Available with or without 2 SAMs
- Bidirectional magnetic stripe reading of up to 3 tracks of data
- JIS-1 and JIS-II support
- ICC reader (bottom-facing insert slot) with landing contact
- Contact EMV Level 1 and 2 certified
- Contactless EMV Level 1 certified
- Certified to all major card brand contactless specifications

- Uses ID TECH's proven Common Kernel, for EMV L2 compatibility
- Encrypted MSR, contact, and contactless EMV output, with DUKPT key management
- TR34 Remote Key Injection Protocol
- Quick Chip and M/Chip Fast compatibility for rapid contact EMV (less than 2 seconds)
- USB or RS-232 (for data communication)
- 1-year manufacturer warranty

2.1. Approvals

- American Express® ExpressPay 3.1
- Apple VAS
- CE EN55032 or EN55035, Class- B
- Compliance with REACH regulations
- Compliance with UL regulations
- Compliance with USB IF regulations
- Discover® DPAS 1.0 Zip 3.1.2
- EMV Contact L1 & L2 / and Contactless L1 & L2
- FCC Part 15, Class-B
- Google Pay
- Google Pay Smart Tap 2.1
- Interac 1.5d
- MasterCard® Mchip 3.1.1
- PCI PTS 5.X Certified
- RoHS 2002/95/EC
- Visa VCPS 2.2

3. Specifications

Hardware	
Physical Dimensions	108mm x 85mm x 55mm (L x W x H)
Structural Material	PC UL 94V-0 plastic with UV stabilizer
Mounting	Four (4) #8-32 brass nuts
Housing Color	Black
Texture	MT11020
Intrusion Rating	IP 64
Impact Rating	IK 08
LCD display	Graphic display, 128x64 dots
LED	4 LEDs for EMV certification 1 LED for MSR indicator 1 LED for ICC indicator 4 Blue LED vending machine
MTBF	500,000 hours
Receiver Subcarrier Data	ISO 14443-2 Type A: Modified Manchester ISO 14443-2 Type B: NRZ-L, BPSK ISO 18092 ISO 21481 (PCD & NFC)
Typical Read Range	4-6 cm (1.5 to 2.3 inches)
Durability	
Magnetic Head	1,000,000 swipes minimum

|	
Rail	1,000,000 swipes minimum
Keypad	1,000,000 operations per key
Smartcard connector	500,000 cycles minimum per connector
Environmental	
Operating Temperature	–20 °C to 70 °C Non-condensing; limited to the range for LCD specification.
Storage Temperature	–30 °C to 80 °C Non-condensing; limited to the range for LCD specification.
Operating Humidity	5% to 95% Non-condensing.
Storage Humidity	5% to 95% Non-condensing.
ESD Device Unit[1]	Contact ±8kV Air discharge ±12KV
ESD Mag Head	Contact ±4kV Air discharge ±8KV
Electrical and Power	
Power Input: VIN	DC +7.5V: Normal operating input range DC + 6.5V: Absolute minimum input voltage
Power Consumption	DC +47V: Absolute maximum input voltage <1A: Absolute maximum input voltage
Working Current	<500mA(@7.5VDCIN)
Rated Power	<3.8W
Maximum Field Strength	2.6 dBuA/m at 3 m

4. Dimensions

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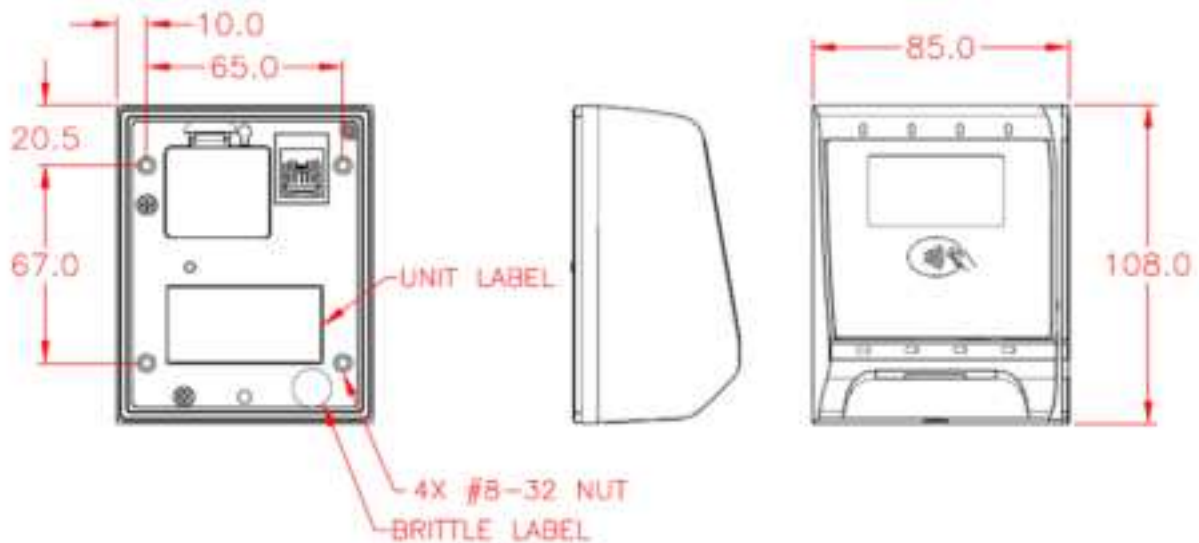
[1] **Note:** Cables and connectors must be fully isolated with insulating material to prevent ESD discharge.
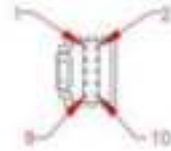
5. Installation

Use the following drill template to install the VP6300 on a mounting surface:

VP6300 Bezel Drill Template
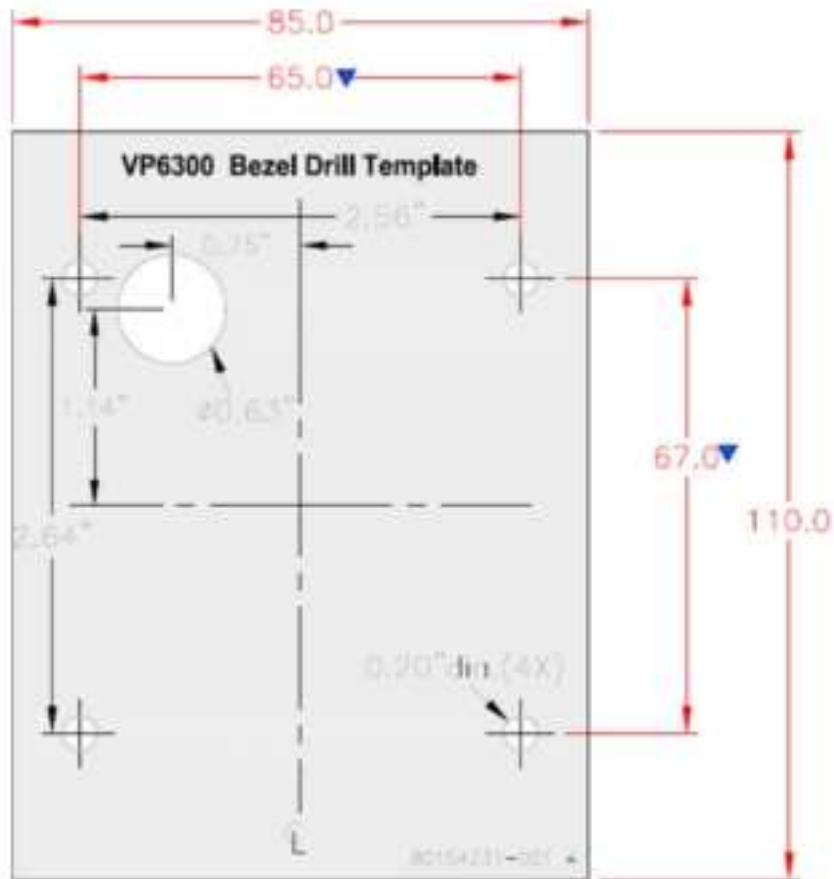
5.1. Custom Wiring

Refer to the wire connection layout below to fabricate custom wiring for the VP6300:

P2	P3	SIGNAL	COLOR	P1
	7	ISP	BLACK	1
	–			2
	1	TXD	RED	3
	2	RXD	BROWN	4
	–			5
	–			6
	4	USB D+	GREEN	7
	5	USB D–	ORANGE	8
PIN	–	DC POWER	YELLOW	9
SLEEVE	6, 8	GROUND	DRAIN	10

Item	Description		
		Function	**Specification**
Connector		Type	2 row lock type JST B10B-PADSS-F or equivalent
		Number of Pins	10 pins
Connector	No	Signal	Description
Pin Assignment	1	+5VIN	Power input: 5VDC
	2	GND_EARH	Chassis Ground
	3	RS-232TX	RS-232 TX signal
	4	RS-232RX	RS-232 RX signal
	5	GND_EARTH	Chassis Ground
	6	GND	Power ground
	7	USB_DATA+	USB DATA+ signal
	8	USB_DATA-	USB DATA- signal
	9	VIN	Power input: 7.5 ~ 45 VDC
	10	GND	Power ground

5.2. Hardware and Cables

Verify that you have the following hardware and cables for installing the VP6300:

- VP6300 P/N IDVV-580801-A, or IDVV-581821P (SRED)

- P/N 140-2035-00-E power supply

- P/N 80139201-001 Eval cable with power-input and RJ-45 ports

- P/N 220-0012-00 USB cable **or** P/N 220-2463-00 cable for serial connection

5.3. Installing the Reader

The installation steps below use the cables listed in **Section 5.2: Hardware and Cables**. Product installers using custom cables will have slightly different steps to follow.

> **Note**: Verify that power cords can physically reach the unit.

Refer to the VP6300 drawing shown above. Proceed to:
1. Use a #12 drill to locate, mark, and drill 0.20-inch holes for the unit's main mounting points.
    a. Space holes 67mm apart lengthwise (on center) and 55mm apart (on center) along the shorter axis.
2. Secure the unit to the enclosure with compatible bolts or screws.
3. Make sure to compress the gasket to protect against unnecessary moisture ingress.

5.4. Connecting the Reader

The VP6300 connects to power and the host device through the Eval cable.
1. Connect the +7.5 to 45VDC power supply to the power input receptacle on the Eval cable.

2. Slide the power supply barrel into the receiving recess.
3. Plug the unit in to an AC outlet and verify that the VP6300 lights up.

> **Note:** The VP6300 requires a power supply whether connected by RS-232 or USB.

4. Connect the USB Cable connector or RS–232 Cable connector to the Eval cable socket.
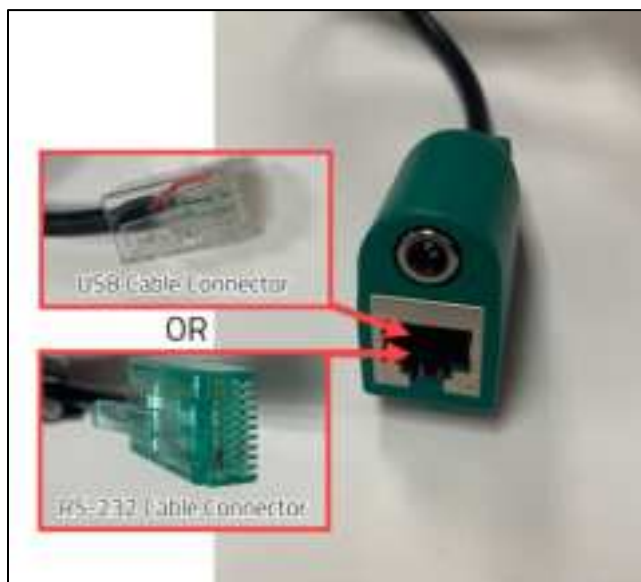
5.5. Installation Guidelines

The VP6300 is designed to be mounted on a metal surface close to any internal motors and electrical devices that may be operating inside the host machine. However, the unit may be susceptible to Radio Frequency (RF) and electromagnetic interference.

Note: 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, routers.

- The presence of large metal objects can reduce device sensitivity.
- Label the cable ends as **Host**, **ViVOpay**, and **Power** to simplify connection testing or component replacement.
- Tie and route all cables neatly with nylon cable-ties so they are inaccessible to customers.
- A responsible party should test each VP6300 on a regular basis (either at the start of each day or at least once per week) by performing a declined end-to-end transaction. The front bezel's lights should illuminate.
- Reboot the unit on a regular basis to ensure functionality and continued communication.

6. Using the VP6300 to Make a Purchase

Use trial transactions to confirm the unit's ability to read Contactless test cards.

1. Connect the VP6300 to a tablet or laptop.
2. Run the **Universal SDK Demo application** ([available on the Knowledge Base](#)).
3. Issue a **CTLS** (contactless) **Start Transaction** command.
4. Results display in the log pane of the demo UI.

The reader will not produce any results for unsuccessful transactions.

6.1. Presenting Cards or NFC Phones

The VP6300 allows for credit and debit card purchases using Contactless technology.

1. Present the card or phone parallel to the module. The unit will beep and all four green LEDs should illuminate briefly to indicate a successful test.
2. Trial transactions should confirm the unit's ability to read the Contactless test card interactions.
3. Connect the VP6300 to a tablet or laptop and run the **Universal SDK Demo application** ([available on the Knowledge Base](#)).
4. Issue a **CTLS** (contactless) **Start Transaction** command.
5. Results display in the log pane of the demo UI.

The reader will not produce any results for unsuccessful transactions.

7. 24-Hour Device Reboot

Per PCI Requirements, this device reboots every 24 hours. Please contact your device integrator if you need to check the reboot time for your unit.
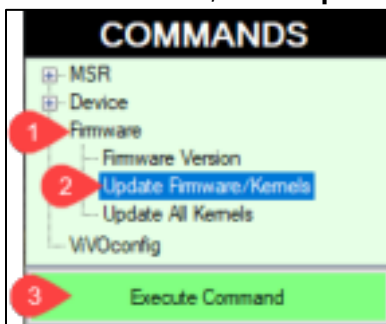
8. Updating VP6300 Firmware

The steps below describe the process for updating VP6300's firmware (for both its K81 and RT1050 processors) via the Universal SDK Demo.

Note: Before you begin, contact your ID TECH representative to receive the most recent VP6300 firmware. Download the ZIP file and extract it to your computer.

1. Connect the VP6300 to your PC via USB or serial port.
2. Download and install the latest USDK Demo app from the ID TECH Knowledge Base (if you cannot access the link, please contact support)
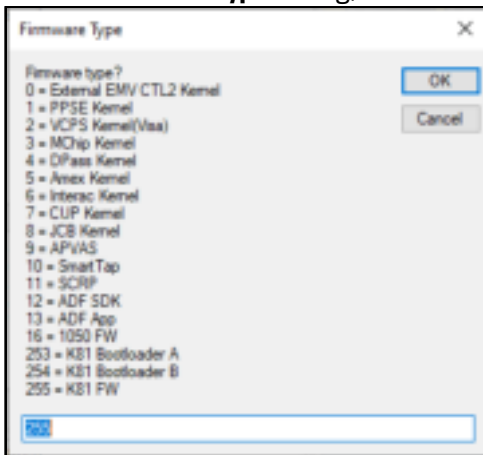3. Open the USDK Demo app from the Windows Start menu.

4. Under **Firmware**, select **Update Device Firmware**, then click **Execute Command**.
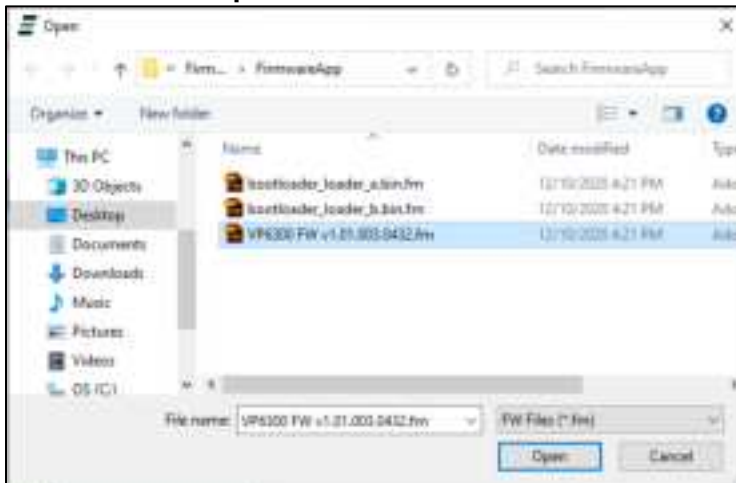
5. In the **Firmware Type** dialog, enter **255** for **K81 FW** and click **OK**.

6. In the File Explorer window, navigate to the directory where you saved the VP6300 firmware update, open the **FirmwareApp** directory, and select the FW file that starts with **VP6300 v1.00...** and click **Open**.

7. The VP6300 reboots and enters the bootloader, at which point the USDK Demo app begins updating the device's K81 firmware.

8. When the K81 firmware update completes, the VP6300 reboots again and the USDK Demo app prints **Firmware Update Successful** in the **Results** panel.
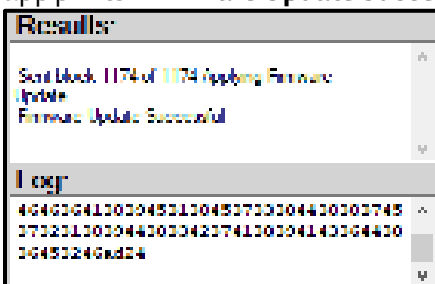
9. Troubleshooting

The VP6300 reader is designed to be reliable and easy to troubleshoot. The components that may require troubleshooting include the power module (if applicable), the reader, and the serial cable.

Symptom	Possible Cause	Remedy
General Issues		
Reader does not appear to be powered on (no LEDs are lit).	• Reader not powered on. • Reader has 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 the correct pins are utilized. • Make sure the power provided is within the specified range of the reader. • Make sure the correct polarity is observed. • For more information, refer to the Input Voltage under the Electrical specification section. • Replace the device with a known-good device to verify the power supply and wiring in the installation are sound.
Reading Cards and Phones		
LEDs do not light and beeper is not audible when card or fob presented.	• Card, fob, and phone not properly presented. • RF interference. • Unsupported card used. • Wrong firmware (contact your local support representative).	• Present card, fob and phone closer to the device, and ensure it is parallel to the face of the reader. • Verify the card, fob, and phone are valid and current. • Verify there are metal is not interfering with the device. • Test with **ViVOcard Contactless Test Card**. • part number 241-0015-03 Rev A. • Try a different card or fob. • Check to see if card or fob is damaged. • Verify that correct firmware is loaded on reader (local support representative only). • Power cable plug is fully inserted. • Replace the unit.
Some cards or fobs read, but not all.	• Possible bad card or fob. • Unsupported card used. • Wrong firmware (contact your local support representative).	• Check to see if card or fob is damaged. • Verify that correct firmware is loaded on reader (local support representative only). • Card readers must contain the latest versions of card-brand public certificates (CAPKs). If a CAPK is out of date, one particular kind of card may no longer be usable. Update the CAPK.
Communication to Kiosk		
No data is received, or data is garbled.	• Faulty or incorrect cable connections.	• Check that the cable connection is secure and in the correct port on the unit
Load Firmware		
Firmware loading software indicates **Open RS-232 Failed**	• Device is not well connected to PC. Or other software is using the serial interface.	• Check the cable connection. • Close other software which might be using the same serial interface.
Firmware loading software indicates **Load Firmware Failed**.	• Device is not well connected to PCs.	• Check the cable connections.

Firmware loading software indicates **Send Command Failed**.	• Bootloader firmware in device is destroyed.	• Contact your support representative to reload manufacture's firmware.

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

9.1. Tamper and Failed Self-Check Indicators

The [DEVICE] displays the following indicators when it has been tampered or has any of the other following internal issues, such as an expired certificate, missing key, or similar fault discovered during a self-check.
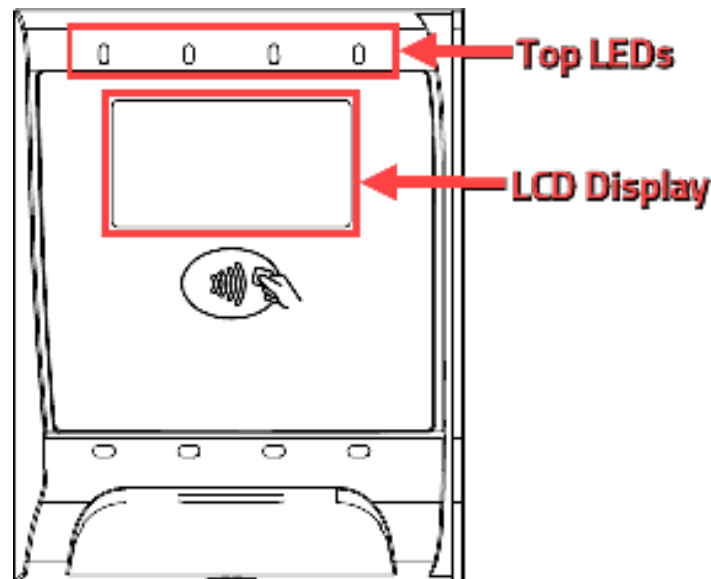
Indicator	Tampered Status	Other Issue Status
Top LEDs	All LEDs off	All LEDs off
LCD Display Message	TAMPERED	See below
Buzzer	Alarm tone	Alarm Tone

The VP6300's LCD display can indicate the following issues in the event of a failed self-check:
- "TAMPERED" indicates a mesh circuit or tamper pin short.
- "CERT FAILED" indicates the battery is drained or certificate expired.
- "RESTRICTED" indicates a suspected attack.
- "FW/BL FAILED" indicates the bin and sign do not match.
- "DEACTIVATED" indicates no certificate injection.
- "ACTIVATED" indicates certification exists.
- "WHITELIST FAILED" indicates that CL or MSR whitelist verification failed.
- "KEYS FAILED" if no injection key happened.

9.2. Radio Frequency

Q. Why do I need to know about RF interference?
A. RF is when contactless payment uses radio frequency technology to send card data to a 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

Q. What should I do if I suspect RF interference exists in my environment?
A. Begin by inspecting the 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 the 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 engineer.

10. Decommissioning SRED Devices

All PCI devices require the proper decommissioning prior to device disposal in order to ensure the protection of all sensitive financial card data.

For instructions on decommissioning the device, see **Decommissioning of SRED Devices** on the ID TECH Knowledge Base.