

V^x670

Installation Guide



All rights reserved. No part of the contents of this document may be reproduced or transmitted in any form without the written permission of VeriFone, Inc.

The information contained in this document is subject to change without notice. Although VeriFone has attempted to ensure the accuracy of the contents of this document, this document may include errors or omissions. The examples and sample programs are for illustration only and may not be suited for your purpose. You should verify the applicability of any example or sample program before placing the software into productive use. This document, including without limitation the examples and software programs, is supplied "As-Is."

VeriFone, the VeriFone logo, Omni, VeriCentre, Verix, and ZonTalk are registered trademarks of VeriFone. Other brand names or trademarks associated with VeriFone's products and services are trademarks of VeriFone, Inc.

All other brand names and trademarks appearing in this manual are the property of their respective holders.

Comments? Please e-mail all comments on this document to your local VeriFone Support Team.

WARNING



Do not dispose of the Vx670 Li-ion smart battery in a fire. Li-ion batteries must be recycled or disposed of properly. Do not dispose of Li-ion batteries in municipal waste sites.





CONTENTS

PREFACE	5
Audience	5
Organization	5
Related Documentation	5
Conventions and Acronyms	6
Document Conventions	6
Acronym Definitions	6
 CHAPTER 1	
Terminal Overview	
Features and Benefits	10
Exceptional Ease of Use	10
Performance and Durability	10
True Multi-Application Capability	11
Expandable Communication Capabilities	11
Wireless Connectivity	11
Security	11
 CHAPTER 2	
Terminal Setup	
Select Terminal Location	13
Ease of Use	13
Environmental Factors	14
Electrical Considerations	14
Unpack the Shipping Carton	14
Examine Terminal Features	15
Front Panel	15
The Handy-Link Connector	17
Cable Adapters	17
Connection Ports	17
USB Connection	18
Establish Telephone Line Connections	19
Install the Paper Roll	20
Install/Replace MSAM Cards	23
Install/Replace SIM Card	
(GSM/GPRS Models)	24
Connect the Smart Card Reader (Optional)	25
Vx670 Smart Card Reader Connection	25
Connect the Terminal Power Pack	26
Smart Battery	27
Smart Battery Features	28
Installation	29
Removal	29
Charging	29
Battery Life	30
The Vx670 Base Station	30
Standard Base Station	30
Full-featured Base Station	31

	Powering up the Base Station.	31
	Place the Vx670 Terminal Onto the Base Station.	32
	Attach the USB Dongles to the Base Station	32
	Charge the Spare Battery on the Base Station	33
	Wireless Transactions	34
	Smart Card Transaction	34
	Magnetic Card Reader Use	35
CHAPTER 3		
Specifications	Power	37
	DC Power Pack	37
	Temperature.	37
	Vx670 External Dimensions	37
	Base Station Specifications	37
CHAPTER 4		
Maintenance	Clean the Terminal	39
	Terminal Contacts	39
	Smart Card Reader	39
CHAPTER 5		
VeriFone Service and Support	Return a Terminal or Smart Battery for Service	41
	Accessories and Documentation	42
	Power Pack.	42
	Thermal Printer Paper.	42
	VeriFone Cleaning Kit.	43
	Telephone Line Cord	43
	Swivel Stand	43
	Documentation	43
CHAPTER 6		
Troubleshooting Guidelines	Terminal Does Not Start.	45
	Terminal Display Does not Show Correct/Readable Info	45
	Smart Battery Will Not Charge	46
	Spare Battery in Base Station Will Not Charge	46
	Blank Display	46
	Terminal Does Not Dial Out	46
	Printer Does Not Print.	46
	Printer Paper Jam.	47
	Peripheral Device Does Not Work	47
	Keypad Does Not Respond	47
	Transactions Fail To Process.	47
	INDEX	49



This guide is your primary source of information for setting up and installing the V*670 terminal.

Audience

This guide is useful for anyone installing and configuring a V*670 terminal. Basic descriptions of the terminal features are also provided.

Organization

This guide is organized as follows:

[Chapter 1, Terminal Overview](#). Provides an overview of the V*670 terminal.

[Chapter 2, Terminal Setup](#). Explains how to set up and install the V*670 terminal. It tells you how to select a location, establish power and telephone line connections, and how to configure optional peripheral devices.

[Chapter 3, Specifications](#). Discusses power requirements and dimensions of the V*670 terminal.

[Chapter 4, Maintenance](#). Explains how to maintain your V*670 terminal.

[Chapter 5, VeriFone Service and Support](#). Provides information on contacting your local VeriFone representative or service provider, and information on how to order accessories or documentation from VeriFone.

[Chapter 6, Troubleshooting Guidelines](#). Provides troubleshooting guidelines, should you encounter a problem in terminal installation and configuration.

Related Documentation

To learn more about the V*670 terminal, refer to the following set of documents:

V*670 Reference Manual	VPN XXXXX
Verix V Operating System Programmer's Manual	VPN 23230
Verix V Tools Programmer's Manual	VPN 23231

Conventions and Acronyms

This section describes the conventions and acronyms used in this guide.

Document Conventions

Various conventions are used to help you quickly identify special formatting. [Table 1](#) describes these conventions and provides examples of their use.

Table 1 Document Conventions

Convention	Meaning	Example
Blue	Text in blue indicates terms that are cross referenced.	See Conventions and Acronyms .
<i>Italics</i>	Italic typeface indicates book titles or emphasis.	You <i>must</i> install a roll of thermal-sensitive paper in the printer.
Courier	The courier type face is used while specifying onscreen text, such as text that you would enter at a command prompt, or to provide an URL.	<code>http://www.verifone.com</code>
 NOTE	The pencil icon is used to highlight important information.	RS-232-type devices do not work with the PINpad port.
 CAUTION	The caution symbol indicates possible hardware or software failure, or loss of data.	The terminal is not waterproof or dustproof, and is intended for indoor use only.
 WARNING	The lightning symbol is used as a warning when bodily injury might occur.	Due to risk of shock do not use the terminal near water.

Acronym Definitions

Various acronyms are used in place of the full definition. [Table 2](#) presents acronyms and their definitions.

Table 2 Acronym Definitions

Acronym	Definitions
AC	Alternating Current
ATM	Automated Teller Machine
CDMA	Code Division Multiple Access
CR	Check Reader
EMV	Europay MasterCard and VISA
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
ITP	Internal Thermal Printer

Table 2 **Acronym Definitions** (continued)

Acronym	Definitions
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MRA	Merchandise Return Authorization
MSAM	Micromodule-Size Security Access Module
PED	PIN-Entry Devices
PIN	Personal Identification Number
RJ45	Registered Jack 45
RS-232	Recommended Standard 232
SAM	Security Access Module
SIM	Subscriber Identity Module
UART	Universal Asynchronous Transmitter/Receiver
USB	Universal Serial Bus
VPN	VeriFone Part Number
Wi-Fi	Wireless Fidelity

DRAFT
TEMPLATE REV L

DRAFT
TEMPLATE REV E



Terminal Overview

This chapter provides a brief description of the V^x670 terminal. The V^x670 terminal represents the shape of things to come in e-payment. The V^x670 uses a bold ergonomic design that is sleek and stylish, offering countertop power and 32-bit performance in an integrated terminal that can be handed to the consumer for input, making it ideal for pay-at-table usage.

The V^x670 is a portable, battery-powered device that uses wireless technologies, including Wi-Fi with 802.11g technology and GSM/GPRS. It also features a 128-by-128 pixel display and a speedy thermal printer.

NOTE



VeriFone ships variants of the V^x670 terminal for different markets. Your terminal may have a different configuration. The following devices may or may not be present: a smart card reader, zero or three MSAM cardholders, and/or a SIM cardholder.



Features at a glance

- **32-bit ARM9 processor** delivers **power** and **usability** in a **convenient** “hand-over” design.
- **Multi-application** operating environment.
- **32-bit processing** and **multi-tasking** capabilities.
- **USB support** for VeriFone peripheral devices.
- **Backward compatibility** with VeriFone solutions **reduces development costs**.
- **Drop resistant** design minimizes breakage.
- Securely supports and runs **payment** and **value-added applications**.
- Offers **unsurpassed performance** on **EMV** smart card transactions.
- **Security** architecture meets specifications for PCI-PED and sophisticated **file authentication**.
- **Max UI design** provides **large display** on small footprint.
- Designed to meet the needs of **TablePAY, DeliveryPAY, and CarsidePAY** markets.
- **Spill resilient design** forces liquid down and off the front of the terminal.

Features and Benefits

VX670 terminals provide the right combination of features and functions. This includes a triple-track magnetic-stripe card reader, smart card reader, integrated PINpad, and a quiet yet fast internal thermal printer (ITP).

Exceptional Ease of Use

- Lightweight (less than 1 pound), tapered design is compact and stylish and the ergonomic balance allows for convenient terminal hand-off to the consumer for PIN entry or other input.
- 128-by-128 pixel display with anti-glare, adjustable contrast, dimming capability, intuitive ATM-style interface, and oversized menu prompts simplify training and reduce calls to the helpdesk.
- Large, well-placed, blue backlit keys provide improved tactile response to simplify usage and minimize finger slips.
- Integrated high-speed thermal printer prints quickly and silently, and simplified paper loading virtually eliminates paper jams.
- Triple-track, high-coercivity card reader handles most magnetic stripe cards.
- Optional Base Station with battery charger supports connectivity to a UART module or a 1.4.Kbps modem via USB dongles.
- Accepts all types of payments – including debit.

Performance and Durability

- 32-bit processing and multi-tasking capabilities make short work of payment, payment-related, and value-added applications.
- Exceptional graphics-handling capabilities of display and printer quickly render logos, graphical fonts, and character-based languages.
- VeriCentre Appliance Management Suite employs advanced file compression to streamline simultaneous downloads of application software to hundreds of terminals.
- Rounded corners and drop-resistant design minimizes breakage.

- Sealed MSR blade locks out moisture for excellent spill resistance.
- Innovative design protects terminal from spills by forcing liquid down and off the front of the terminal
- Anti-UV coating prevents terminal casing from becoming brittle and protects keys from discoloration.
- Integrated PINpad offers added convenience to handle PIN-based applications.
- Uncompromising reliability from VeriFone, the worldwide leader in e-payment.
- Complies with RoHS (Restriction of Hazardous Substances) directive of the European Union.

True Multi-Application Capability

- 6 MB of memory and the Verix V OS dynamic memory allocation support two or three typical-sized applications on a single terminal.
- Primary smart card reader and MSAMs safeguard sensitive financial data and support multiple smart card schemes.
- Vx670 series of terminals and SoftPay EMV software have received EMV Level 1 and Level 2 Type approval for smart card solutions. Verix EMV Library provides efficient development of other EMV-compliant applications.
- VeriShield security architecture meets published specifications for PCI-PED and provides sophisticated file authentication to prevent execution of unauthorized software on Vx670 terminals.

Expandable Communication Capabilities

- USB Host Port
- USB Device Port for application debugging
- RS-232, Serial Port
- 14.4Kbps Modem
- Universal Asynchronous Receiver/Transmitter (UART) module

Wireless Connectivity

- Customers are not tied to a fixed location with the Vx670 wireless terminals – the point of payment can be almost anywhere.
- “Always-on” wireless connection uses the latest wireless technologies, including GSM/GPRS and Wi-Fi with 802.11g technology for faster transmission and enhanced compatibility with access points and routers.

Security

- WPA-PSK (pre-shared keys) protects Wi-Fi transactions.
- Other security features include tamper-resistant construction, adoption of SSL protocols, and VeriShield file authentication.

DRAFT
TEMPLATE REV E





CHAPTER 2

Terminal Setup

This chapter describes the terminal setup procedure. You will learn how to:

- [Select Terminal Location](#) and Protect the Terminal From Adverse Environmental Factors.
- Unpack the Shipping Carton.
- Examine Terminal Features.
- Examine The Handy-Link Connector.
- Establish Telephone Line Connections.
- Install the Paper Roll in the Printer.
- Install/Replace MSAM Cards.
- Install/Replace SIM Card (GSM/GPRS Models).
- Connect the Smart Card Reader (Optional).
- Connect the Terminal Power Pack.
- Use and charge the [Smart Battery](#).
- Use the The V^x670 Base Station.
- Place the V^x670 Terminal Onto the Base Station.
- Attach the USB Dongles to the Base Station.
- Charge the Spare Battery on the Base Station.
- Conduct [Wireless Transactions](#).
- Conduct Smart Card or Credit/Debit Transactions. See [Smart Card Transaction](#) and [Magnetic Card Reader Use](#).

Select Terminal Location

Use the following guidelines when selecting a location for your V^x670 terminal.

Ease of Use

- Select a location convenient for both merchant and cardholder.
- Select a flat support surface, such as a countertop or table.
- Select a location near a power outlet and a telephone/modem line connection. For safety, do not string the power cord in a walkway or place it across a walkway on the floor.

Environmental Factors

- Do not use the terminal where there is high heat, dust, humidity, moisture, or caustic chemicals or oils.
- Keep the terminal away from direct sunlight and anything that radiates heat, such as a stove or motor.
- Do not use the terminal outdoors.

CAUTION



The terminal is not waterproof or dustproof, and is intended for indoor use only. Any damage to the unit from exposure to rain or dust may void any warranty.

Electrical Considerations

- Avoid using this product during electrical storms.
- Avoid locations near electrical appliances or other devices that cause excessive voltage fluctuations or emit electrical noise (for example, air conditioners, electric motors, neon signs, high-frequency or magnetic security devices, or computer equipment).
- Do not use the terminal near water or in moist conditions.

Unpack the Shipping Carton

Open the shipping carton and carefully inspect its contents for possible tampering or shipping damage. The V^x670 is a secure product and any tampering may cause the terminal to cease to function properly.

To unpack the Shipping Carton

- 1 Remove and inspect the following items:

- Terminal
- Power pack
- Telephone line cord
- Power cord
- Battery pack
- Handy-Link connector
- Paper roll
- USB Dongle - Modem
- USB Dongle - Serial
- Base Station
- Cable adapters
(need additional info regarding list above)

- 2 Remove all plastic wrapping from the terminal and other components.

- 3 Remove the clear protective film from the LCD screen.



Do not use a terminal that has been damaged or tampered with. The V^x670 terminal comes equipped with tamper-evident labels. If a label or component appears damaged, please notify the shipping company and your VeriFone representative or service provider immediately.

- 4 Save the shipping carton and packing material for future repacking or moving the terminal.

Examine Terminal Features

Before you continue the installation process, notice the features of the V^x670 terminal (see [Figure 1](#)).

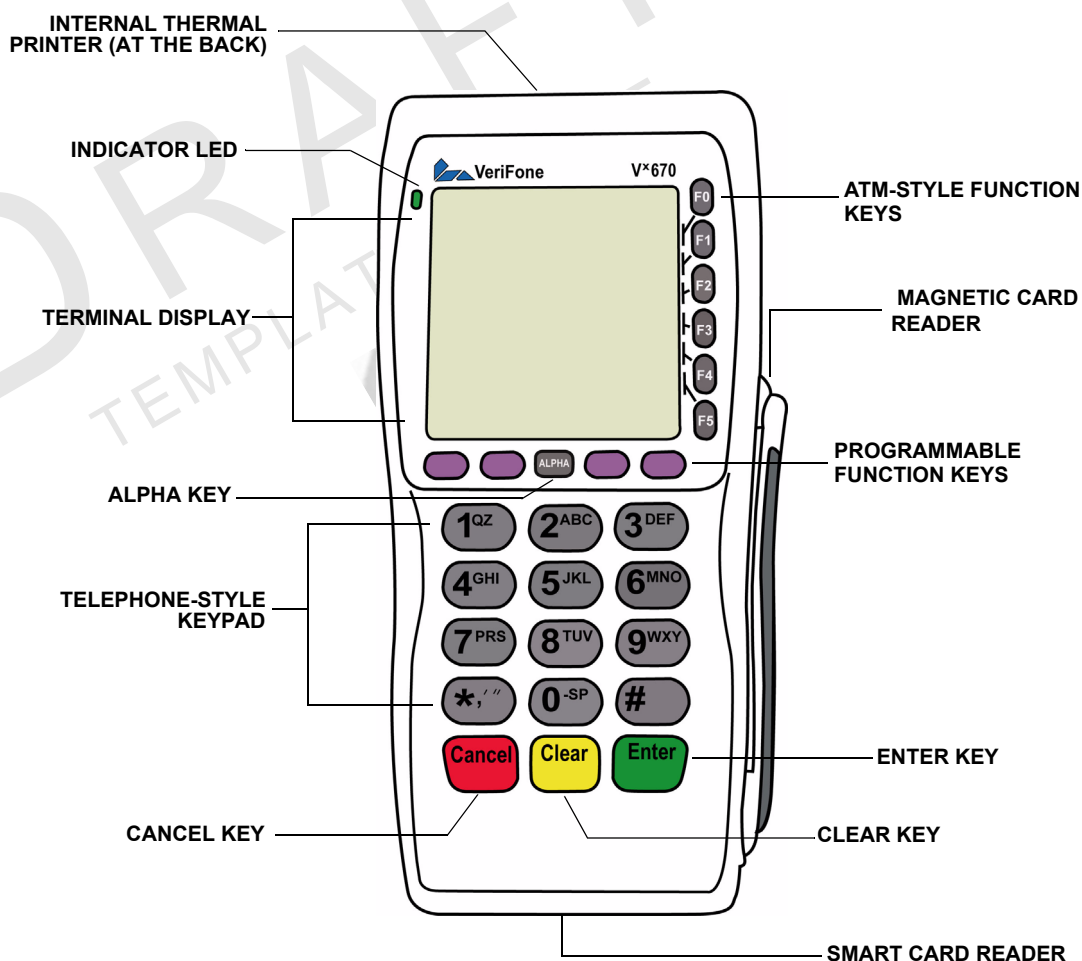


Figure 1 V^x670 Terminal Features (Front Panel)

Front Panel The front panel includes the following features:

- A **terminal display**, backlit LCD screen.
- Five types of keys:
 - a A 12-key, **telephone-style keypad**.

- b** Six **ATM-style function keys**, labeled F0 to F5, to the right of the LCD screen.
- c** Four unlabeled, **programmable function keys** above the keypad.
- d** Three **color-coded function keys** below the keypad (icons at right; from left to right: CANCEL, CLEAR, ENTER).
- e** An **ALPHA key** centered at the top of the keypad.



- A **magnetic card reader**, built into the right side. The icon at right shows the proper swipe direction, with the stripe down and facing inward, toward the keypad. (need to verify if magnetic card reader icon is on Vx670)



- A green **indicator LED** indicates power is ON.
- An **internal thermal printer** at the back of the terminal.
- A **smart card reader**, built into the front of the terminal. The icon shown at right indicates proper card position and insertion direction.
- A **SAM (security access module) compartment**, built into the bottom of the terminal. The Vx670 terminal contains MSAM cardholders to support multiple stored-value card programs or other merchant card requirements.



NOTE



VeriFone ships variants of the Vx670 terminal for different markets. Your terminal may have a different configuration. The following devices may or may not be present: a smart card reader, or zero or three MSAM cardholders. However, the basic processes described in this guide remain the same, regardless of terminal configuration.

The Handy-Link Connector

The Handy-Link connector is a cell phone style connector that supports a wide variety of communication ports via cable adapters.

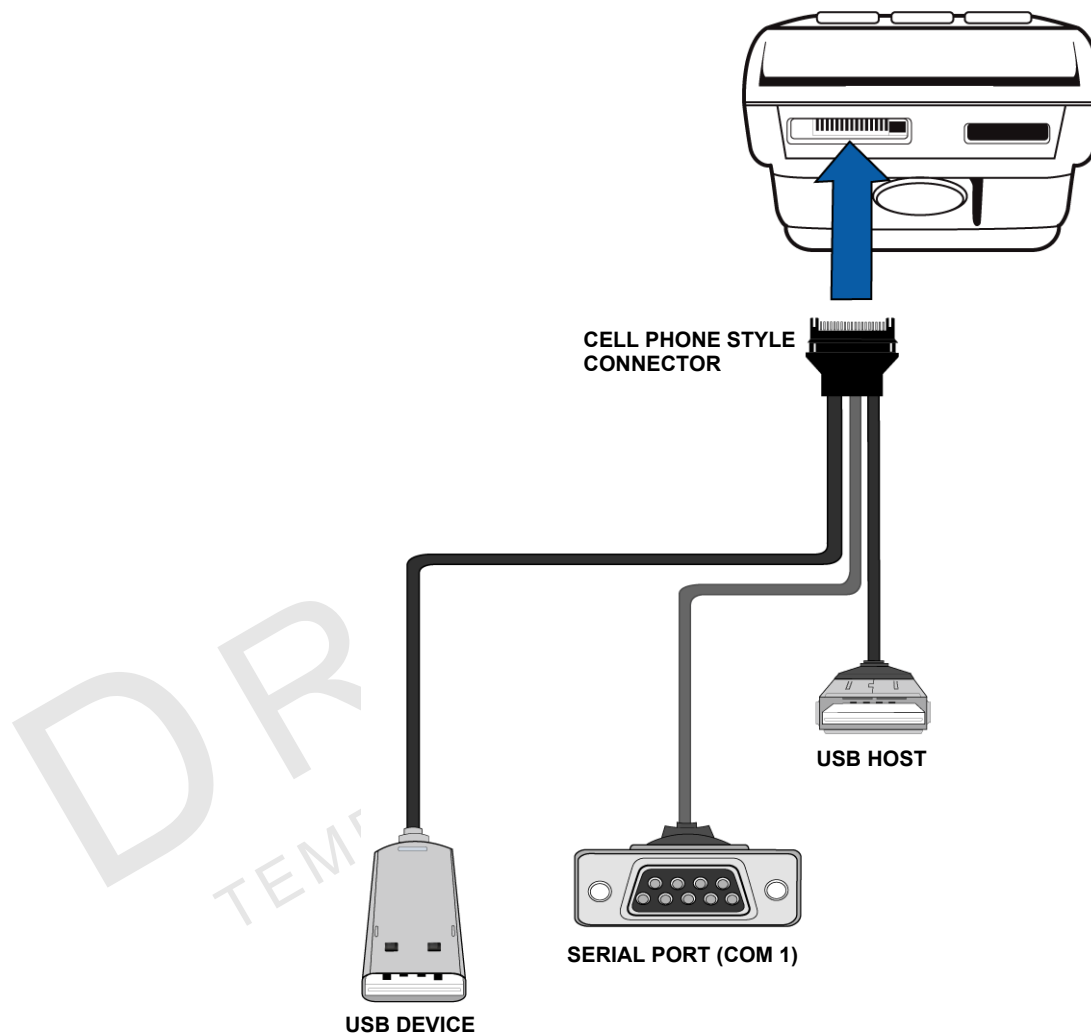


Figure 2 The Vx670 Handy-Link Connector

Cable Adapters cThe cable adapters enable the Vx670 terminal to connect to

(need content and images of cable adapters for this section, or are these the same as the ports shown above?)

Connection Ports The Vx670 has one primary port that uses the Handy-Link connector to support the following peripherals through the use of cable adapters:

Serial Port (COM 1)

A 4-Wire RS232 port with TX, RX, RTS, and CTS signals. This port will provide for “back-to-back” download capability.

USB Host

A 2-Wire USB Host port for external peripherals. A connector adaptor provides for standard USB host connection.

USB Device

A 2-Wire USB device port connected directly to the PC's USB ports. This port is mainly for debugging purposes.

NOTE



A Base Station is also provided with the V^x670. A full-feature Base Station has two USB host ports for external dongles as well as a battery charger slot for charging an extra lithium-ion battery pack. A standard Base Station does not have any USB ports and is capable of charging the terminal only and not the extra battery pack.

Turn the terminal upside down to view the V^x670's primary port. [Figure 3](#) shows the primary port for the V^x670 terminal.

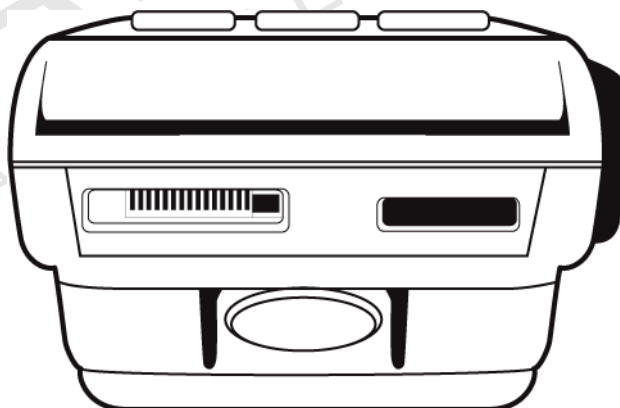


Figure 3 The V^x670 Primary Port (Bottom View)

WARNING



Do not connect the terminal to the power supply until all the peripherals are attached.

For information on how to attach peripheral devices, see [Connect the Smart Card Reader \(Optional\)](#).

USB Connection

Aside from the Handy-Link connector that connects to the primary port, the V^x670 has a USB port that supports a modem or an RJ45 connector.

(need more info and new images for this section; is this the same as the USB port attached to the Handy-Link cable?)

USB Dongle – Modem

A modem in the form of a USB dongle is provided with the Vx670 terminal. The USB Dongle – Modem provides communication via a telephone line at speeds of up to 14.4Kbps. The USB Dongle – Modem can also be connected to the full-feature Base Station when the terminal is in the station.

USB Dongle – Serial

The USB Dongle – Serial provides the Vx670 terminal with a serial communication port for backward compatibility. It is designed to accommodate the RJ45 connector. The USB Dongle - Serial can also be connected to the full-feature Base Station when the terminal is placed in the station.

Establish Telephone Line Connections

Connect the USB Dongle – Modem to the USB port of the Handy-Link connector, which is connected to the Vx670 terminal. Connect the telephone cord to the modem, then route the other end directly to a telephone wall jack (see Figure 4).

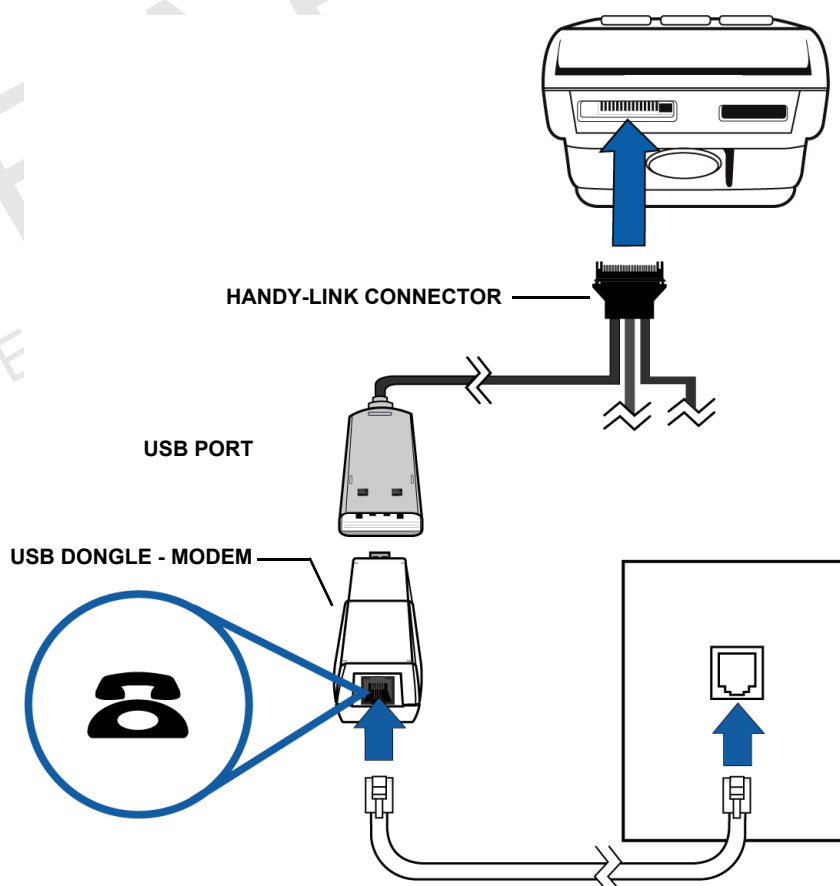


Figure 4 Vx670 Telephone Connection Via Modem



WARNING

To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

(are we going to remove the USB port on top of current prototypes?)

Install the Paper Roll

A fast, quiet thermal printer is built into the Vx670 terminal. Before you can process transactions that require a receipt or record, you *must* install a roll of thermal-sensitive paper in the printer.

The ITP uses a roll of single-ply, thermal-sensitive paper 57 millimeters (2.24 inches) wide and 25 meters (82 feet) long. A pink *out-of-paper* indicator line appears on the edge of the paper approximately 18 inches before the end of the roll. After this line appears, there is enough paper remaining on the roll to conclude at least one transaction.

CAUTION



Poor-quality paper can jam the printer and create excessive paper dust. To order high-quality VeriFone paper, refer to [Accessories and Documentation](#).

Store thermal paper in a dry, dark area. Handle thermal paper carefully: impact, friction, temperature, humidity, and oils affect the color and storage characteristics of the paper.

Never load a roll of paper with folds, wrinkles, tears, or holes at the edges in the print area.

- To Install a Paper Roll**
- 1 Gently pull the latch located on the bottom of the terminal to unlock the paper roll cover.

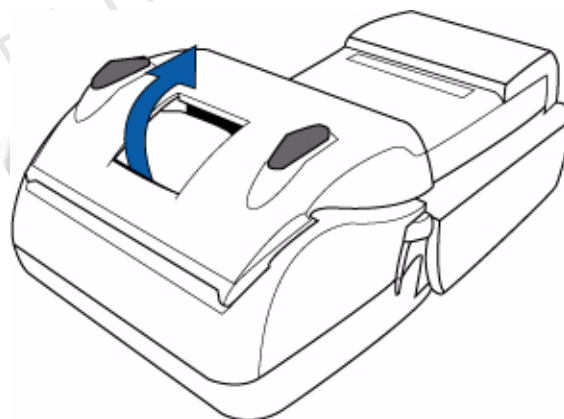


Figure 5 Unlocking the Printer Cover

- 2 Lift the printer cover up and back.

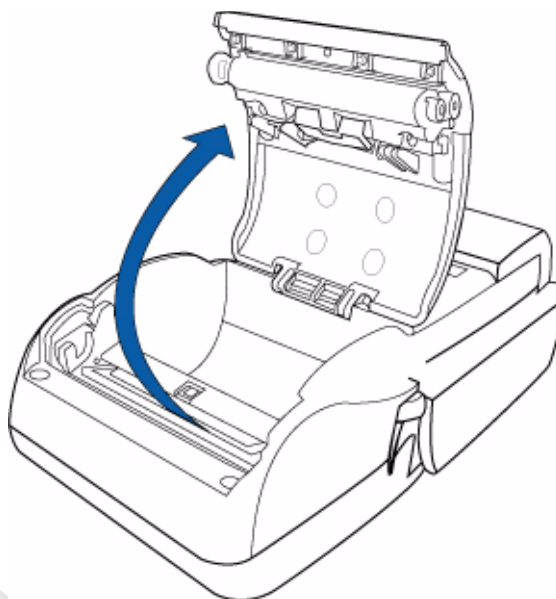


Figure 6 **Opening the Printer Cover**

- 3 Remove any partial roll of paper in the printer tray by lifting it up (see [Figure 7](#)).
- 4 Loosen the glued leading edge of the paper or remove the protective strip from the new roll of paper. Unwind the paper roll past any glue residue.

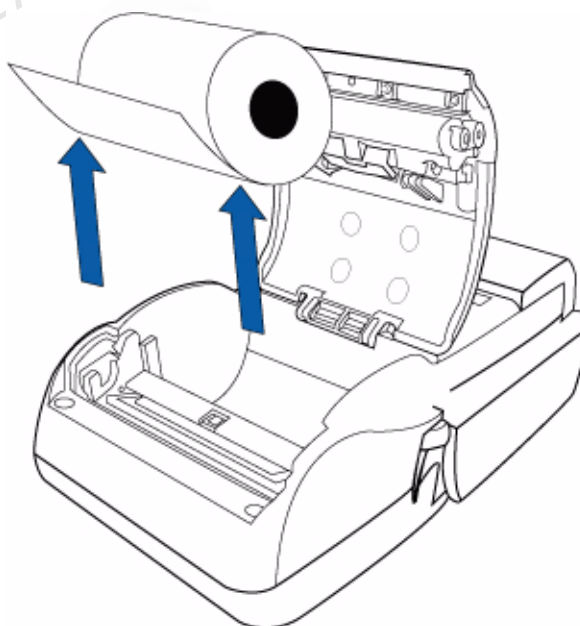


Figure 7 **Removing Partial Paper Roll**

- 5 Hold the roll so the paper feeds from the *bottom* of the roll (see [Figure 9](#)).

- 6** Drop the paper roll into the printer tray.

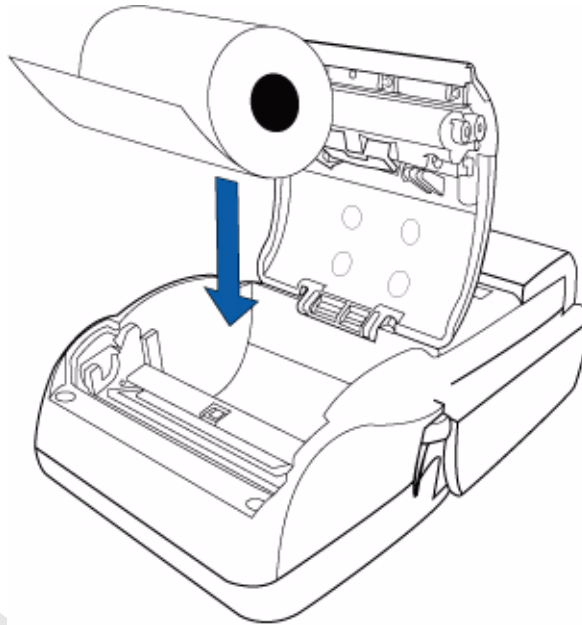


Figure 8 Loading Paper Roll

- 7** Pull paper up past the glue residue from the printer tray.
- 8** Close the paper roll cover by gently pressing directly on the cover until it clicks shut, allowing a small amount of paper past the glue residue to extend outside the printer door.

CAUTION



To prevent damaging the print roller, always gently press down on the paper roll cover to close it.

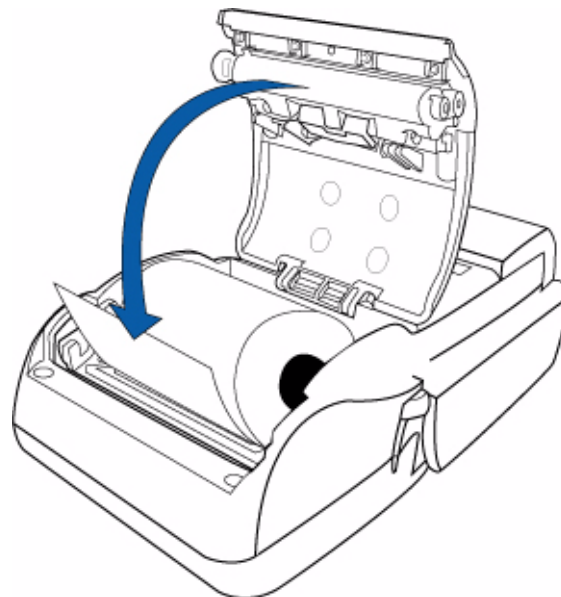


Figure 9 Closing Paper Roll Cover

- 9 Tear the paper off against the serrated plastic strip in the printer.

Install/Replace MSAM Cards

When you first receive your V^x670 terminal, you may need to install one or more MSAM cards or you may need to replace old cards.



CAUTION Observe standard precautions when handling electrostatically sensitive devices. Electrostatic discharges can damage this equipment. VeriFone recommends using a grounded anti-static wrist strap.

To Install/Replace MSAMs

- 1 Place the terminal upside down on a soft, clean surface to protect the lens from scratches.
- 2 Remove the battery.

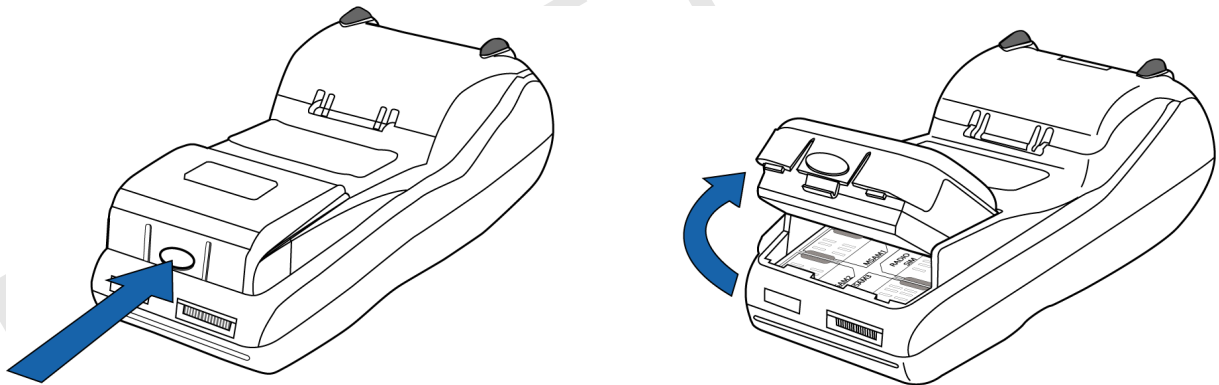


Figure 10 Removing the Smart Battery

- 3 After removing the battery, the MSAM compartments are exposed.
- 4 Remove any previously installed MSAM card by sliding the card from the MSAM cardholder.

- 5 Install an MSAM card by aligning the card and carefully sliding it within the guides on the cover until it is fully inserted (see [Figure 11](#)). The MSAM card holders are labeled MSAM1, MSAM2, and MSAM3.

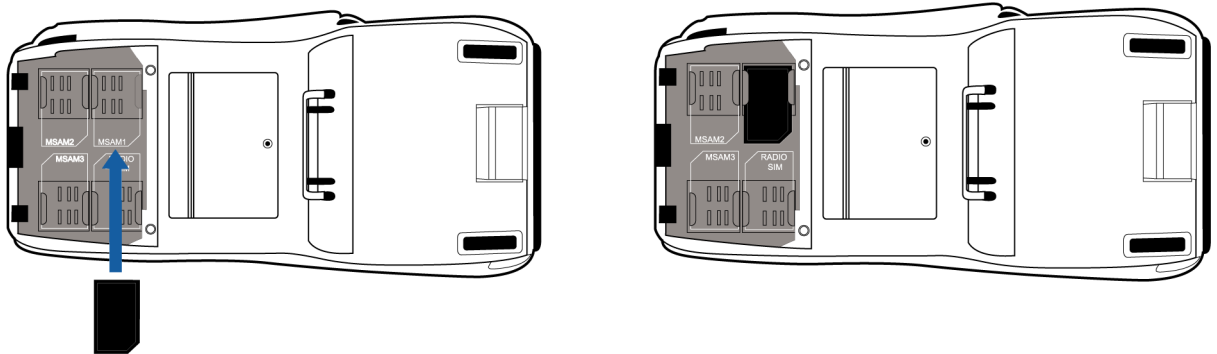


Figure 11 Installing MSAM Card

NOTE



Before inserting the MSAM card, position it as shown in [Figure 11](#), with the card's gold contacts facing the smart card reader end of the terminal. The cardholder connector base has a set of contacts and a notch on one corner to ensure the MSAM card is positioned correctly. The MSAM card has a notch on one corner to ensure that it fits into the connector base in only one way. The MSAM compartment door will not close properly if the MSAM cards are installed incorrectly.

- 6 Install the battery (see [Figure 16](#)).

**Install/Replace
SIM Card
(GSM/GPRS
Models)**

The V×670 terminal supports the installation of a SIM (Subscriber Identity Module) card. Use the following procedure to replace or install a SIM card.

- 1 Place the terminal upside down on a soft, clean surface to protect the lens from scratches.
- 2 Remove the battery.

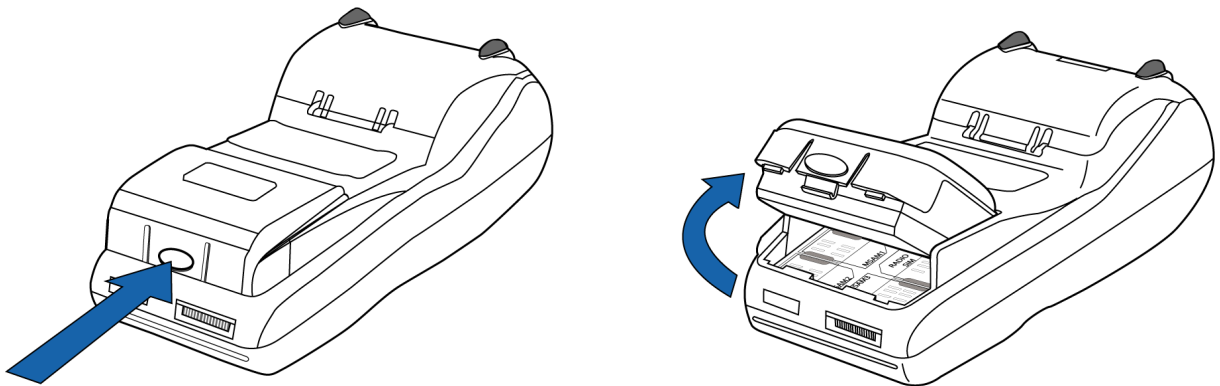


Figure 12 Removing the Smart Battery

- 3 After removing the battery, the SIM compartment is exposed. The SIM card holder is labeled RADIO SIM.

- 4 Insert the SIM into the cardholder.

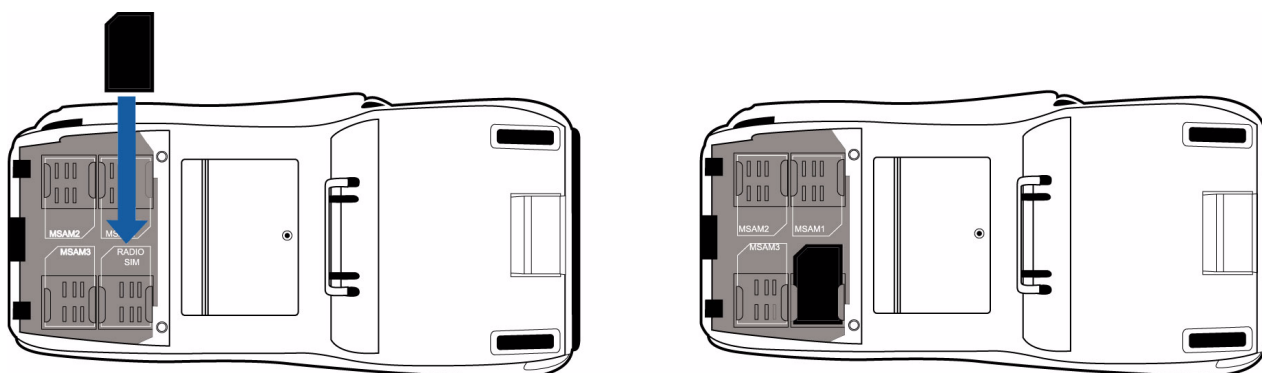


Figure 13 Inserting SIM Card

- 5 Install the battery (see Figure 16).

Connect the Smart Card Reader (Optional)

The Vx670 supports the connection of an external smart card reader.

Different terminals support different devices. For more information about optional devices, please contact your VeriFone distributor.



CAUTION Before connecting any peripheral device, remove the power cord from the bottom of the terminal and ensure that the green indicator LED is not lit. Reconnect the power cord only *after* you are finished connecting the peripheral device(s). For complete information about peripheral installation and use, refer to the user documentation supplied with those devices.

Vx670 Smart Card Reader Connection

The Vx670 supports external smart card readers via the USB Dongle - Serial connected to the USB port of the terminal.

(not sure if this section should be deleted. what exactly is the use of the USB Dongle - Serial? is this different from the RS232 port?)

Connecting the Smart Card Reader to the Vx670

Use the following procedure to connect a smart card reader.

- 1 Connect the RS232 module (USB dongle) to the USB port of the Handy-Link connector, which is connected to the primary port of the Vx670 terminal. (need more info about this procedure)
- 2 Insert the RJ45-type connector on the end of the smart card reader into the RS232 port.

If a cable is not connected to the smart card reader, insert the small modular plug on one end of the interface cable into the optional device's modular jack.

- Figure 14 provides an example of a smart card reader to the RS232 port.
(need new image for this)

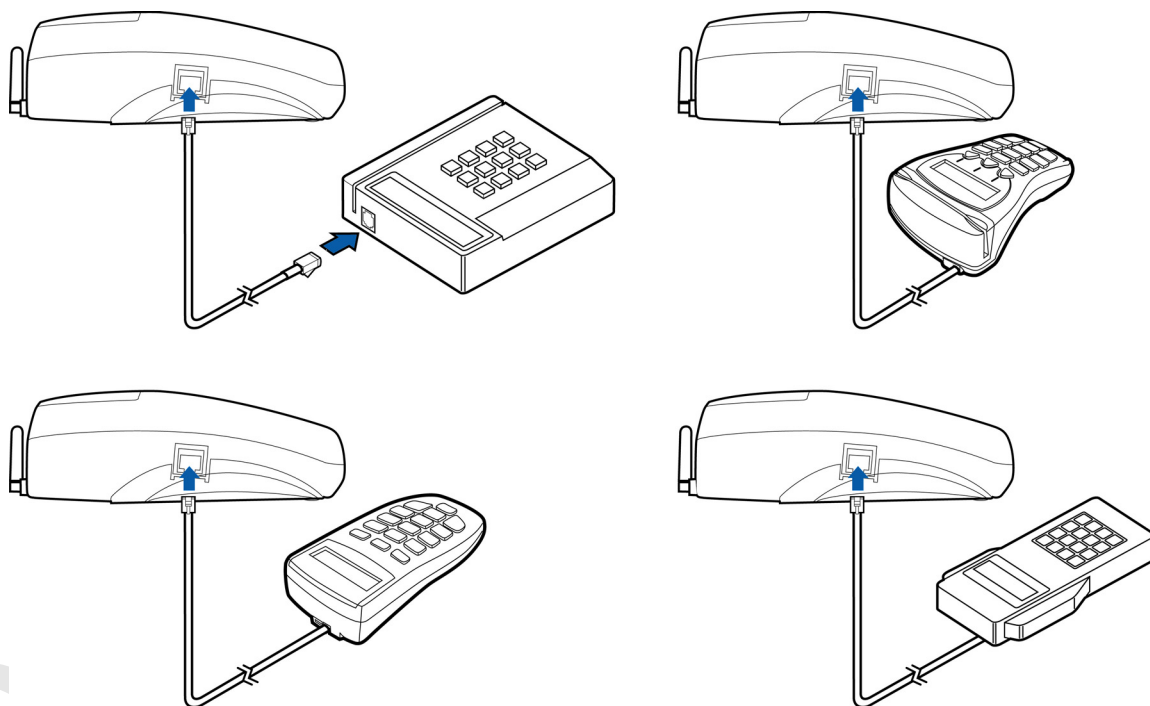


Figure 14 Vx670 Example Smart Card Reader Connection

Connect the Terminal Power Pack

When you have finished connecting optional peripheral(s), you are ready to connect the Vx670 terminal to the provided power source.



CAUTION Using an incorrectly rated power supply may damage the terminal or cause it not to work as specified. Before troubleshooting, ensure that the power supply being used to power the terminal matches the requirements specified on the bottom of the terminal. (See [Chapter 3, Specifications](#), for detailed power supply specifications.) Obtain the appropriately rated power supply before continuing with troubleshooting.

The Vx670 comes with a universal input power pack capable of operating from voltages of 100VAC to 240VAC.

To Connect the Terminal Power Pack

- 1 Insert the round barrel connector into the power port in the Handy-Link connector, identified by the icon at right.
(need to updated this image after QIG is updated)



Figure 15 Vx670 Power Pack Connection

- 2 Insert the AC power cord into the power pack.
- 3 Plug the AC power cord into a wall outlet or powered surge protector.

WARNING



Do not plug the power pack into an outdoor outlet or operate the terminal outdoors.

WARNING



Disconnecting the power during a transaction may cause transaction data files not yet stored in terminal memory to be lost.

NOTE



To protect against possible damage caused by lightning strikes and electrical surges, consider installing a power surge protector.

When the terminal has power, the terminal lights are activated and the green LED indicator remains lit.

If an application is loaded in the terminal, it starts after the initial VeriFone copyright screen and usually displays a unique copyright screen. If no application is loaded in the terminal, **DOWNLOAD NEEDED** appears on screen after the initial VeriFone copyright screen.

Smart Battery

The Vx670 terminal uses an Li-ion *smart* battery (see [Accessories and Documentation](#) for ordering information). The internal logic of the smart battery prevents both overcharging and undercharging (a fault condition in which the battery level goes well below the minimum acceptable charge and the battery becomes unusable).

NOTE



The Vx670 terminal will operate on battery power or on power pack power. The smart battery charger in the terminal will be active whenever the power pack is connected.

The V×670 comes with two types of battery packs, the standard battery pack and the high-capacity battery pack.

Standard Battery Pack

The standard battery has a capacity of 1250mAh. It is suited for WiFi and pay-at-table applications where frequent charging is required.

High-Capacity Battery Pack

The high-capacity battery pack is bigger than the standard battery pack and is more suitable for GPRS/CDMA applications.

Smart Battery Features

The following are features of the smart battery:

- Two Li-ion cells
- A fuel gauge module that
 - monitors state of charge (voltage and current),
 - communicates with the terminal (charge parameters and status to indicate full discharge),
 - determines full charge capacity (on charge cycle and uninterrupted discharge cycle), and
 - automatically shuts down when cell voltage is extremely low.
- A safety circuit that
 - prevents cell damage from overcharge, over-discharge, or overheating
 - activates when the battery is left in an unused terminal for extended periods, and
 - resets when battery voltage reaches a preset threshold during the charge cycle.

NOTE



Conserve battery power by turning the V×670 terminal off when not in use. If the terminal is not to be used for several days, remove the battery from the terminal as it continues to discharge even when the terminal is turned off.

Installation The V×670 smart battery fits in a slot on the back of the V×670 terminal, as shown in [Figure 16](#). The locking tab clicks when the battery is in place. The slot is *keyed*, so that there is only one way to insert the battery.

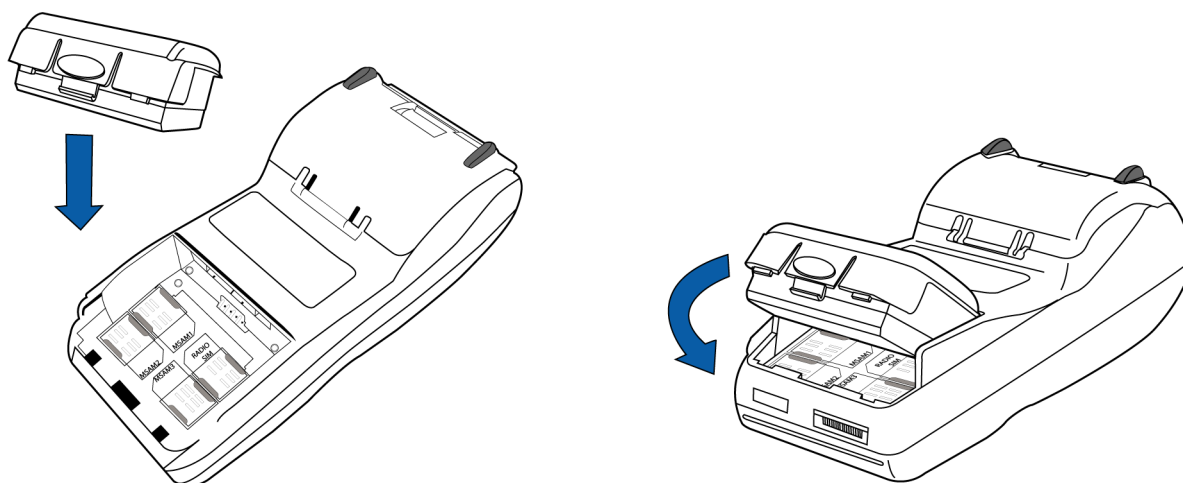


Figure 16 Install the Smart Battery

Removal To remove the V×670 smart battery, press the locking tab at the top of the battery and pull the smart battery from its slot.

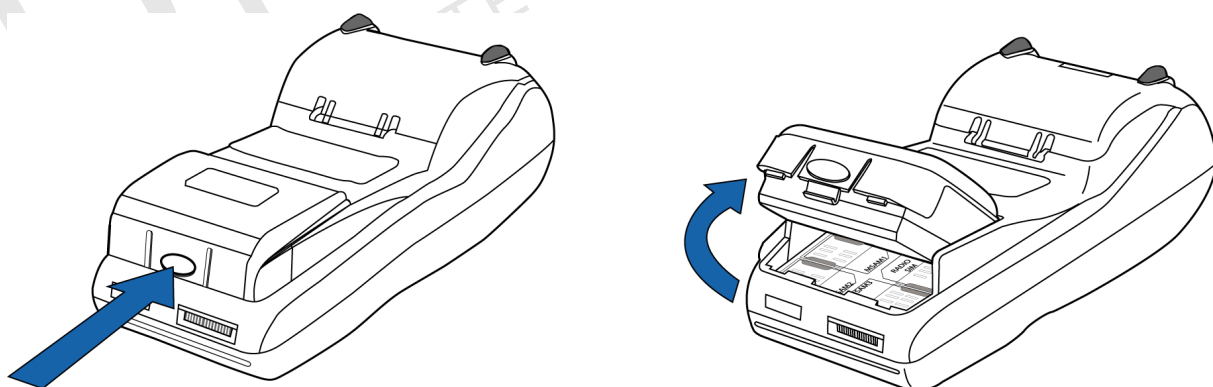


Figure 17 Detaching the Smart Battery from the V×670 Terminal

Charging After unpacking your V×670 terminal, install the battery and connect the power pack to the unit for 6 hours.

It is also recommended that the smart battery receive a periodic full discharge. To ensure a full discharge, use the unit until the battery is fully drained.

NOTE



The V×670 terminal's smart battery is also charged when the terminal is in the Base Station. For more information, see [Place the V×670 Terminal Onto the Base Station](#).

The smart battery has a safety circuit to protect the Li-ion cells from overcharging and over-discharging. If the battery is over-discharged, the safety circuit shuts down the battery. The battery must then be recharged to restore operation.

NOTE



The V^x670 terminal automatically shuts off when the smart battery reaches the *critically low* charge state. If this occurs, the smart battery must be recharged for a minimum of 1/2 hour before it can power the terminal. *It may take several recharge attempts to reset the safety circuit* when charging a smart battery that has been discharged below this critical state.

Battery Life

The V^x670 smart battery can be charged and discharged hundreds of times, but will eventually wear out. When operating times are noticeably shorter than usual, it is time to buy a new battery (see [Accessories and Documentation](#) for ordering information).

WARNING



Do not dispose of batteries in a fire. Li-ion batteries must be recycled or disposed of properly. Do not dispose of Li-ion batteries in municipal waste sites.



The V^x670 Base Station

The primary purpose of the Base Station is to charge the terminal battery and provide a docking station for the terminal after being used in pay-at-table environments. The Base Station can be positioned on a countertop or mounted to the wall (see).

There are two types of Base Station, the standard model and the full-featured model.

Standard Base Station

The standard Base Station can charge the V^x670 terminal. However, it does not have any USB port and has a single LCD to indicate power status.

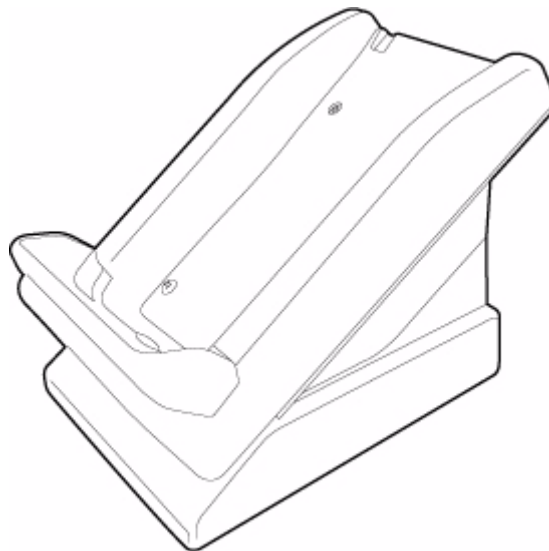


Figure 18 **The V^x670 Standard Base Station**

Full-featured Base Station

The full-featured Base Station can charge the V^x670 terminal while charging an extra battery pack. In addition, it has two USB ports for external dongles, together with one LED for power indication and another LED for the charger status.

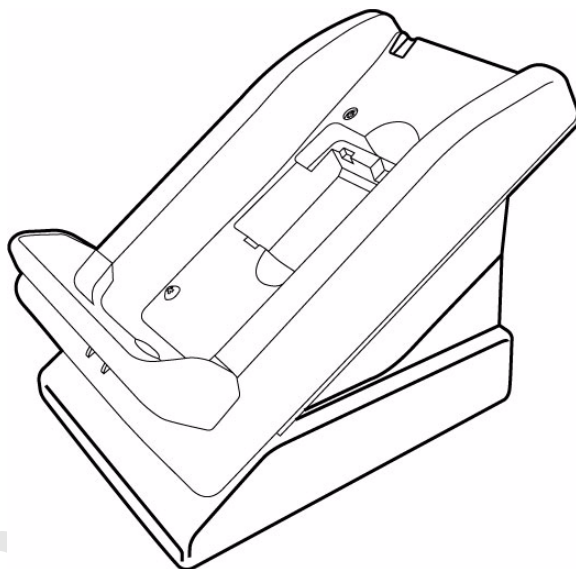


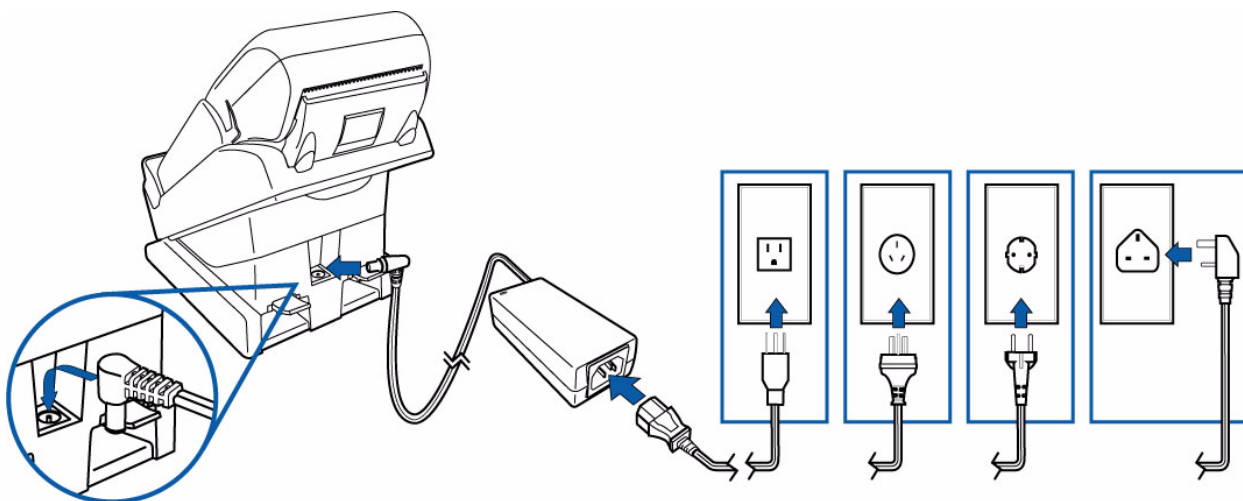
Figure 19 The V^x670 Full-Featured Base Station

For more information on charging the spare battery on the Full-Featured Base Station and connecting external dongles to the USB ports, see [Charge the Spare Battery on the Base Station](#) and [Attach the USB Dongles to the Base Station](#).

Powering up the Base Station

Use the procedure in this section to connect the V^x670 Base Station to a power source.

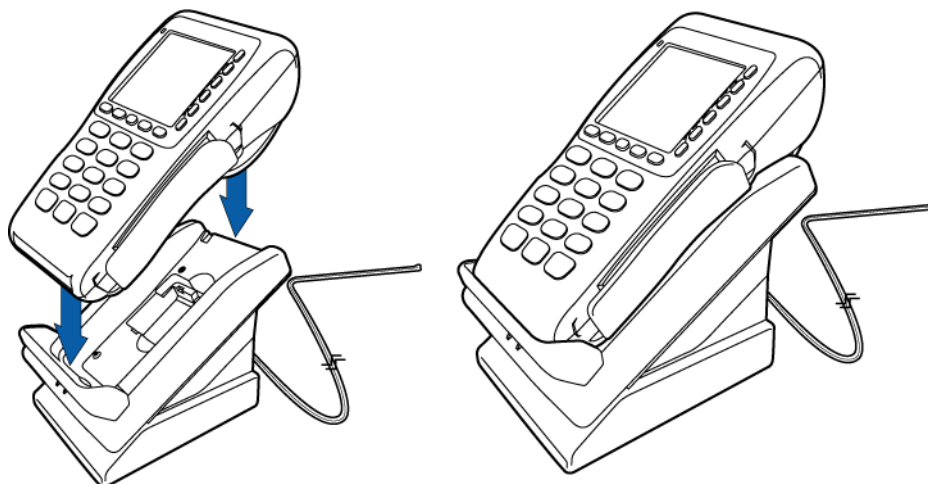
- 1 Insert the round barrel connector of the power pack into the power port at the back of the Base Station.



- 2 Insert the AC power cord into the power pack.
- 3 Plug the AC power cord into a wall outlet or powered surge protector.

Place the V^x670 Terminal Onto the Base Station

The V^x670 terminal can be placed on the Base Station when not in use or to charge the battery. External peripherals can also be attached to the terminal via USB dongles while it is on the Base Station (see [Attach the USB Dongles to the Base Station](#)).



NOTE



The Full-Featured Base Station can also charge a spare battery while it charges the battery attached to the terminal (see [Charge the Spare Battery on the Base Station](#)).

WARNING



Do not plug the power pack into an outdoor outlet or operate the terminal outdoors.

WARNING



Disconnecting the power during a transaction may cause transaction data files not yet stored in terminal memory to be lost.

NOTE



To protect against possible damage caused by lightning strikes and electrical surges, consider installing a power surge protector.

Attach the USB Dongles to the Base Station

While the V^x670 terminal is resting on the Base Station, you can attach external peripherals to the terminal using USB dongles, including modems and RS232 devices.

NOTE



The full-featured Base Station has USB ports for two external dongles. The standard Base Station does not have USB ports.

- 1 Insert the USB dongle into the USB port located at the back of the Base Station.

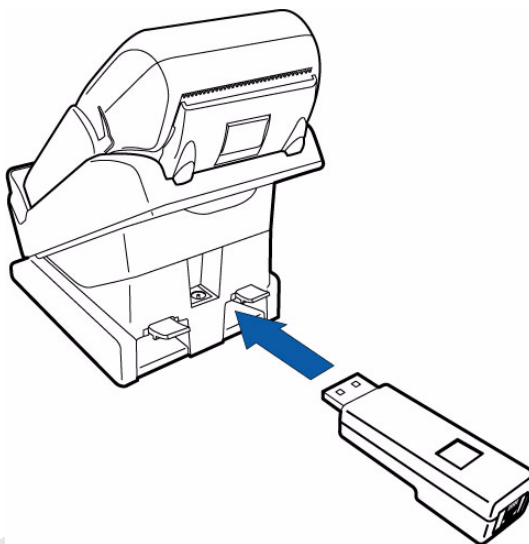


Figure 20 Insert External Dongle Into USB Port

- 2 After inserting the external dongle into the USB port, place the V×670 terminal onto the Base Station (see [Powering up the Base Station](#)).
- 3 Connect the peripheral to the external dongle.

Charge the Spare Battery on the Base Station

The Full-Featured Base Station can charge the V×670 terminal while charging an extra battery pack.

- 1 Connect the Base Station to a power source (see [Powering up the Base Station](#)).
- 2 Place the spare battery pack onto the Base Station as shown in [Figure 21](#).

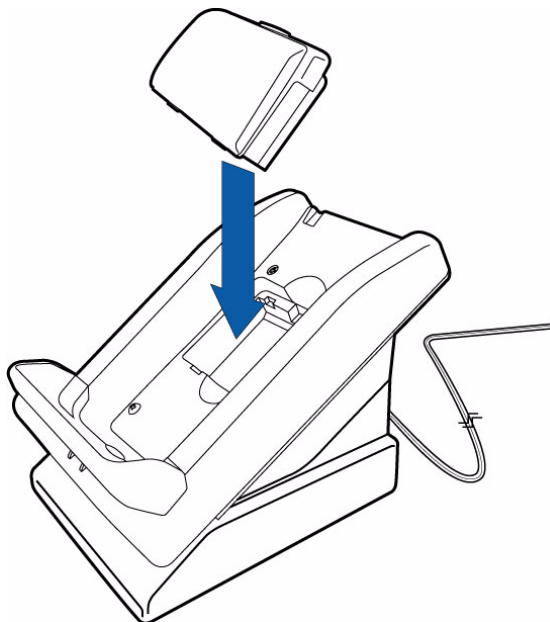
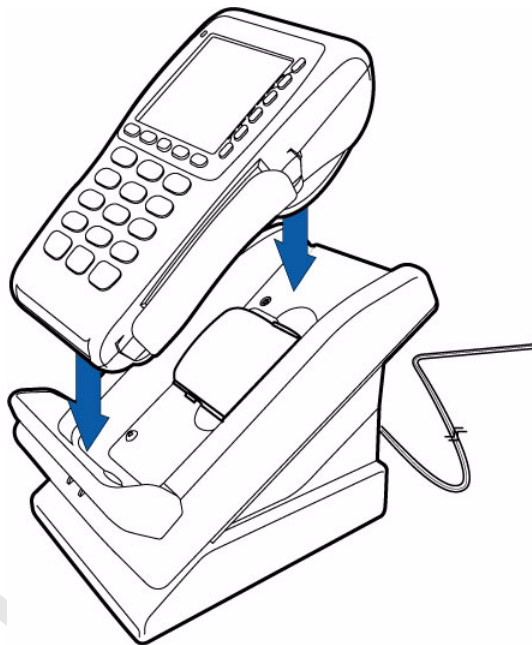


Figure 21 Put Spare Battery Pack Into the Base Station

- 3 Place the V×670 terminal onto the Base Station to charge both the spare and installed battery packs at the same time.



Wireless Transactions

To conduct a wireless transaction:

- Ensure the terminal is in an optimal position for transmitting.
- Follow the on-screen instructions provided with your application.

Smart Card Transaction

The smart card transaction procedure may vary from one application to another. Verify the procedure with your application provider before performing a smart card transaction.

To Conduct a Smart Card Transaction

- 1 Position a smart card with the contacts facing upward (see [Figure 22](#)).
- 2 Insert the smart card into the smart card reader slot in a smooth, continuous motion until it seats firmly.

- 3 Remove the card only when the application indicates the transaction is complete.

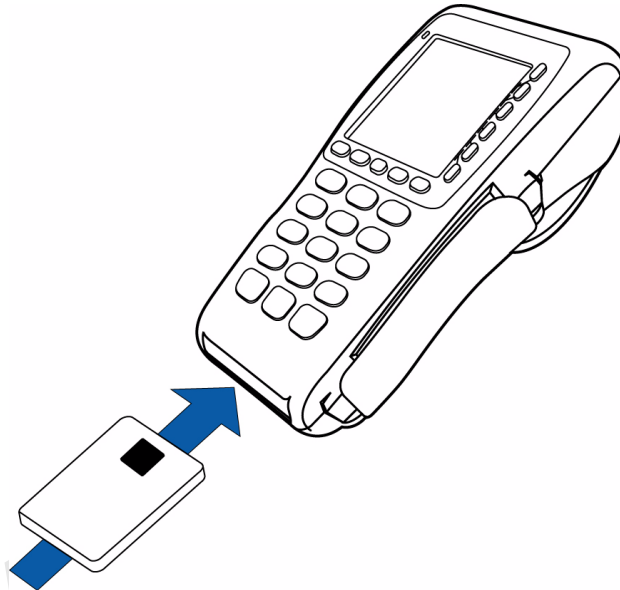


Figure 22 Inserting a Smart Card



Leave the smart card in the card reader until the transaction is complete. Premature card removal will invalidate the transaction.

Magnetic Card Reader Use

The V^x670 terminal supports credit/debit card transactions.

To Conduct a Credit/Debit Card Transaction

- 1 Position a magnetic card with the stripe in the card reader and facing inward, toward the keypad.
- 2 To ensure a proper read of the magnetic swipe card, the user should insert the magnetic card from the top of the unit, as shown in Figure 23.

- 3 Swipe the card through the magnetic card reader.



Figure 23

Using the Magnetic Card Reader

Specifications

This chapter discusses power requirements, dimensions, and other specifications of the V^x670 terminal.

Power V^x670 terminal: 9 V DC; 4.0 A

DC Power Pack UL, ITE listed, Class 2 power supply:

a Input rated: 100 - 240V AC, 50/60 Hz

b Output rated: 8.6 - 9.4V DC 4.0 A

Barrel connector polarity:



Temperature

- Operating temperature: 0° to 40° C (32° to 104° F)
- Storage temperature: -30° to + 60° C (-22° to 140° F)
- Relative humidity: 5% to 90%; no condensation

V^x670 External Dimensions

For V^x670 Terminals:

- Length: <180 mm (8.2 in)
- Width: <78 mm (4.0 in)
- Depth: TBD mm (2.8 in)

(need more accurate info for external dimensions)

Base Station Specifications

(need more info for this section)

DRAFT
TEMPLATE REV E





Maintenance

The V*670 terminal has no user-maintainable parts.

(need more info for this section. is the base station user maintainable? what about the USB dongles and the Handy-Link connector?)

Clean the Terminal

To clean the terminal, use a clean cloth slightly dampened with water and a drop or two of mild soap. For stubborn stains, use alcohol or an alcohol-based cleaner.



CAUTION Never use thinner, trichloroethylene, or ketone-based solvents – they may cause deterioration of plastic or rubber parts.

Do not spray cleaners or other solutions directly onto the keypad or terminal display.

Terminal Contacts

Gently swab the contacts with alcohol or contact cleaner to remove the dirt. It is important that the exposed contacts of the V*670 battery stay clean and unbent.



CAUTION Avoid touching the contacts in the raised area in the center of the V*670 battery and the recessed area on the terminal. Finger oils tarnish contacts, causing bad connections. When operating on battery power and experiencing a high occurrence of bad or incomplete data transfers, clean the contacts.

Smart Card Reader

Do not attempt to clean the smart card reader. Doing so may void any warranty. For smart card reader service, contact your VeriFone distributor or service provider.

DRAFT
TEMPLATE REV E





VeriFone Service and Support

For V*670 terminal problems, contact your local VeriFone representative or service provider.

For V*670 product service and repair information:

- USA – VeriFone Service and Support Group, 1-800-VeriFone (837-4366), Monday - Friday, 8 A.M. - 8 P.M., Eastern time
- International – Contact your VeriFone representative

Return a Terminal or Smart Battery for Service

Before returning a V*670 terminal, smart battery, or sled module to VeriFone, you must obtain an MRA number. The following procedure describes how to return one or more V*670 terminals, smart batteries, or sled modules for repair or replacement (U.S. customers only).

NOTE



International customers are advised to contact their local VeriFone representative for assistance regarding service, return, or replacement of terminals or batteries.

To Return a Terminal for Service

- 1 Get the following information from the printed labels on the bottom of *each* V*670 terminal, smart battery, or sled module to be returned:
 - Product ID, including the model and part number. For example, “V*670” and “Pxxx- xxx-xx,” “Mxxx-xx-xx-xxx,” or “2xxxx-xx”
 - Serial number (S/N xxx-xxx-xxx)
- 2 Obtain the MRA number(s) by completing one of the following:
 - a Call VeriFone toll-free within the United States at 1-800-VeriFone and follow the automated menu options.
 - Select the MRA option from the automated message. The MRA department is open Monday to Friday, 8 A.M.–8 P.M., Eastern Time.
 - Give the MRA representative the information you gathered in Step 1. If the list of serial numbers is long, you can fax the list, along with the information gathered in Step 1, to the MRA department at 727-953-4172 (U.S.).
 - b Address a fax to “VeriFone MRA Dept.” with the model and part number(s)
 - Include a telephone number where you can be reached and your fax number.

- c Complete the Inquiry Contact Form at http://www.verifone.com/aboutus/contact/contact_form.cfm.
- Address the Subject box with to “VeriFone MRA Dept.”
 - Reference the model and part number in the Note box.

NOTE



One MRA number must be issued for each Vx670 terminal you return to VeriFone, even if you are returning several of the same model.

- 3 Describe the problem(s).
- 4 Provide the shipping address where the repaired or replacement unit must be returned.
- 5 Keep a record of the following items:
 - Assigned MRA number(s).
 - VeriFone serial number assigned to the Vx670 terminal, smart battery, or sled module you are returning for service or repair (terminal serial numbers are located on the bottom of the unit).
 - Shipping documentation, such as air bill numbers used to trace the shipment.
 - Model(s) returned (model numbers are located on the VeriFone label on the bottom of the Vx670 terminal).

Accessories and Documentation

VeriFone produces the following accessories and documentation for the Vx670 terminal. When ordering, please refer to the part number in the left column.

- VeriFone online store at www.store.verifone.com
- USA – VeriFone Customer Development Center, 800-VeriFone (837-4366), Monday - Friday, 7 A.M. - 8 P.M., Eastern time
- International – Contact your VeriFone representative

Power Pack

Contact your local VeriFone distributor to determine which power pack or power cord fits your needs.

CPS10936-3A DC power pack (universal)

21973-01 AC power cord (US)

(need updated info for this section)

Thermal Printer Paper

CRM0039-01 CRM0039 in 30-roll bulk package

CRM0040 High-grade thermal printer paper, 57 mm (2.24-inch) width, 25-meter (82-feet) length; single roll; Available in 20-roll or 50-roll bulk packages

(need updated info for this section)

VeriFone Cleaning Kit

02746-01 Cleaning Kit

(need updated info for this section)

Telephone Line Cord

00124-17 2.1-meter (7-foot) telephone line cord, black, with modular RJ11-type connectors

(need updated info for this section)

Swivel Stand

23050-01 V*510 Swivel Stand

(need updated info for this section)

Documentation For V*670 Terminals:

24003 *V*670 Installation Guide*

23217 *V*670 Reference Manual*

24004 *Verix V Operating System Programmer's Manual*

23231 *Verix V Tools Programmer's Manual*

DRAFT
TEMPLATE REV E



Troubleshooting Guidelines

The troubleshooting guidelines provided in the following section are included to assist you to successfully install and configure your V^x670 terminal. If you have problems operating your V^x670 terminal, please read through these troubleshooting examples.

If the problem persists even after performing the outlined guidelines or if the problem is not described below, contact your local VeriFone representative for assistance. Typical examples of malfunction you may encounter while operating your V^x670 terminal and steps you can take to resolve them are listed.

NOTE

The V^x670 terminal comes equipped with tamper-evident labels. The V^x670 contains no user serviceable parts. Do not, under any circumstance, attempt to disassemble the terminal. Perform only those adjustments or repairs specified in this guide. For all other services, contact your local VeriFone service provider. Service conducted by parties other than authorized VeriFone representatives may void any warranty.

CAUTION

Use only a VeriFone-supplied power pack. Using an incorrectly rated power supply may damage the terminal or cause it not to work as specified. Before troubleshooting, ensure that the power supply being used to power the terminal matches the requirements specified on the bottom of the terminal. (See [Chapter 3, Specifications](#), for detailed power supply specifications.) Obtain the appropriately rated power supply before continuing with troubleshooting.

Terminal Does Not Start

- Ensure that the smart battery charge state is not below the critically low level.
- Recharge or replace the smart battery.
- Ensure that you pressed the ENTER/ON key for approximately 3 seconds, until the unit lits up.

Terminal Display Does not Show Correct/Readable Info

- Recharge or replace the battery.
- Connect the V^x670 terminal into a known-good power supply (if you have one) to see if this clears the problem.

If the problem persists, contact your local VeriFone representative for assistance.

Smart Battery Will Not Charge

The Vx670 smart battery must initially receive a full charge to calibrate its full charge capacity.

NOTE



Allow the Vx670 terminal to remain connected to the power pack for 6 hours to ensure the battery receives a full charge.

Conserve battery power by turning the Vx670 terminal off when not in use. If the terminal will not be used for several days, remove the battery from the terminal as it continues to discharge even when the terminal is turned off.

NOTE



The Vx670 terminal automatically shuts off when the smart battery reaches the *critically low* charge state. If this occurs, the smart battery must recharge a minimum of 1/2 hour before it can power the terminal. *It may take several recharge attempts to reset the safety circuit* when charging a smart battery that has been discharged below this critical state.

Spare Battery in Base Station Will Not Charge

(Need info for this section)

Blank Display

When the Vx670 terminal display screen does not show correct or clearly readable information:

- Check terminal power connection.
- Remove and reapply power to the terminal.
- Check all cable connections and verify that the telephone line is properly connected.
- If the problem persists, contact your local VeriFone service provider.

Terminal Does Not Dial Out

If the terminal does not dial out:

- Check the telephone line connections.
- Check that the telephone line is working by plugging it into a working telephone and listening for a dial tone.
- Replace the telephone cable that connects the terminal with a cable you know is working correctly.
- If the problem persists, contact your local VeriFone service provider.

Printer Does Not Print

If the printer does not work properly:

- Check battery status or terminal power connection. The printer will not print if there is an insufficient charge remaining in the battery to complete the print operation.
- Check if the printer is out of paper and that the roll is properly installed. Open the paper roll cover and install a new roll of printer paper or ensure that the roll is feeding from the bottom.

- Verify that the printer roller and paper roll dust cover are properly installed.
- If the problem persists, contact your VeriFone distributor or service provider.

Printer Paper Jam

If paper jams inside the printer:

- Press the button on the side of the terminal to unlatch the paper roll cover, then open the cover.
 - Remove the damaged paper from the paper roll and clear the feed mechanism.
 - Install a roll of printer paper, as described in [Install the Paper Roll](#).
 - If the problem persists, it may be due to poor paper quality. Install a new roll of higher-quality paper.

WARNING



Poor-quality paper may jam the printer. To order high-quality VeriFone paper, refer to [Accessories and Documentation](#).

Peripheral Device Does Not Work

If any peripheral device (PINpad or smart card reader) does not work properly:

- Check the power cord connection to the peripheral device.
- Check that the device connected to the proper port has power and is functioning properly. If possible, perform a self-test on the device in question.
- The cable connecting the optional device to the V*670 terminal serial port may be defective. Try a different serial cable. See [Connect the Smart Card Reader \(Optional\)](#).
- If the problem persists, contact your local VeriFone representative.

Keypad Does Not Respond

If the keypad does not respond properly:

- Check the terminal display. If it displays the wrong character or nothing at all when you press a key, follow the steps outlined in [Transactions Fail To Process](#).
- If pressing a function key does not perform the expected action, refer to the user documentation for that application to ensure you are entering data correctly.
- If the problem persists, contact your local VeriFone representative.

Transactions Fail To Process

There are several reasons why the terminal may not be processing transactions. Use the following steps to troubleshoot failures.

Check the Magnetic Card Reader

- Perform a test transaction using one or more different magnetic stripe cards to ensure the problem is not a defective card.

- Ensure that you are swiping cards properly. With the V^x670 card reader, the black magnetic stripe on the card should face down and inward, toward the keypad and must be inserted from the top of the terminal (see [Figure 23](#)).
- Process a transaction manually, using the keypad instead of the card reader. If the manual transaction works, the problem may be a defective card reader.
- Contact your VeriFone distributor or service provider.
- If the manual transaction does not work, proceed to [Check the Telephone Line](#).

Check the Smart Card Reader

- Perform a test transaction using several different smart cards to ensure the problem is not a defective card.
- Ensure that the card is inserted correctly and that the card is not removed prematurely.
- Ensure the MSAM cards are properly inserted in the cardholders and that the cardholders are properly secured (see [Install/Replace MSAM Cards](#)).
- Contact your VeriFone distributor or service provider.
- If the manual transaction does not process, proceed to [Check the Telephone Line](#).

Check the Telephone Line

- Disconnect the telephone line from the V^x670 terminal and connect it to a working telephone to check for a dial tone. If there is no dial tone, replace the telephone cable.
- If the problem appears to be with the telephone line, check with the party you are trying to call to see if their system is operational. If they are not experiencing difficulties with their line, contact the telephone company and have your line checked.
- If the telephone line works, contact your local VeriFone representative for assistance.



A

- accessories **42**
 - documentation **43**
 - ordering **43**
 - power packs **42**
 - swivel stand **43**
 - telephone line cord **43**
 - thermal printer paper **42**
 - VeriFone cleaning kit **43**

B

- Base Station **30**
- batteries
 - extending the battery life **30**
 - See also smart battery

C

- cable adapters **17**
- cleaning kit **43**
- connection ports **17**
 - serial **17**
 - USB device **18**
 - USB host **18**
- contact VeriFone **41**

D

- dial out problems
 - troubleshooting **46**
- displays
 - troubleshooting **45, 46**
- documentation **42**
 - acronym definitions **6**
 - conventions **6**
 - ordering **43**

E

- electrical considerations **14, 23**
- electrostatic discharges **23**
 - prevention **23**
- environmental factors **14**

F

- Full-Featured Base Station **31**

H

- Handy-Link connector **17**

I

- installation **9**
 - connecting a PINpad to V×670 **25**
 - connecting a smart card reader to V×670 **25**
 - connecting optional device(s) **25**
 - connecting the terminal power pack **26**
 - connecting the terminal to a telephone line **19**
 - MSAM cardholders **23**
 - MSAM cards **23**
 - terminal location **13**
 - unpacking the shipping carton **14**
 - using the magnetic card reader **35**

K

- keypads
 - troubleshooting **47**

M

- magnetic card readers
 - using **35**
- maintenance
 - cleaning the terminal **39**
 - cleaning the terminal contacts **39**
 - returning a battery for repair or replacement **41**
 - returning a terminal for repair or replacement **41**
- MSAM cardholders **23**
- MSAM cards **23**

O

- optional devices
 - connecting **25**

P

- paper jams
 - troubleshooting **47**

- paper rolls
 - for thermal printers **20, 47**
 - installation **20**
- peripherals
 - troubleshooting **47**
- power packs
 - AC version **42**
 - connecting **26**
 - DC version **42**
 - ordering **42**
- printer paper
 - ordering **42**
- printers
 - troubleshooting **46**

S

- service
 - returning a battery for repair or replacement **41**
 - returning a terminal for repair or replacement **41**
- SIM cards
 - for GSM models **24**
- smart battery **30**
 - battery life **30**
 - charging **29**
 - conserving power **28**
 - disposal **30**
 - features **28**
 - installation **29**
 - recharging **30**
 - removal **29**
 - troubleshooting **46**
- spare batteries
 - charging on the Full-Featured Base Station **33**
- specifications
 - DC power pack **37**
 - power **37**
 - temperature **37**
- Standard Base Station **30**
- ordering **43**
- terminal features
 - general **15**
- terminals
 - accessories **42**
 - benefits **10**
 - cleaning **39**
 - documentation **42**
 - electrical considerations **14**
 - environmental factors **14**
 - features **15**
 - repair **41**
 - replacement **41**
 - service and support **41**
 - troubleshooting **45, 46**
- thermal printer paper
 - storage **20**
- thermal printers
 - about the thermal printer paper **20, 47**
 - paper jams **47**
 - troubleshooting **46**
- transactions
 - smart cards **34**
 - wireless **34**
- troubleshooting
 - batteries **46**
 - displays **45, 46**
 - guidelines **45**
 - keypads **47**
 - peripherals **47**
 - printers **46**
 - terminal transactions **47**
 - terminals **45, 46**

U

- USB connections **18**
- USB dongles
 - modem **19**
 - serial **19**

V

- VeriCentre Appliance Management Suite
 - simultaneous downloads **10**
- Vx670
 - multi-application capability **11**

W

wireless connection

CDMA **11**

GSM/GPRS **11**

Wi-Fi **11**

wireless transactions **34**

DRAFT
TEMPLATE REV E



DRAFT
TEMPLATE REV E



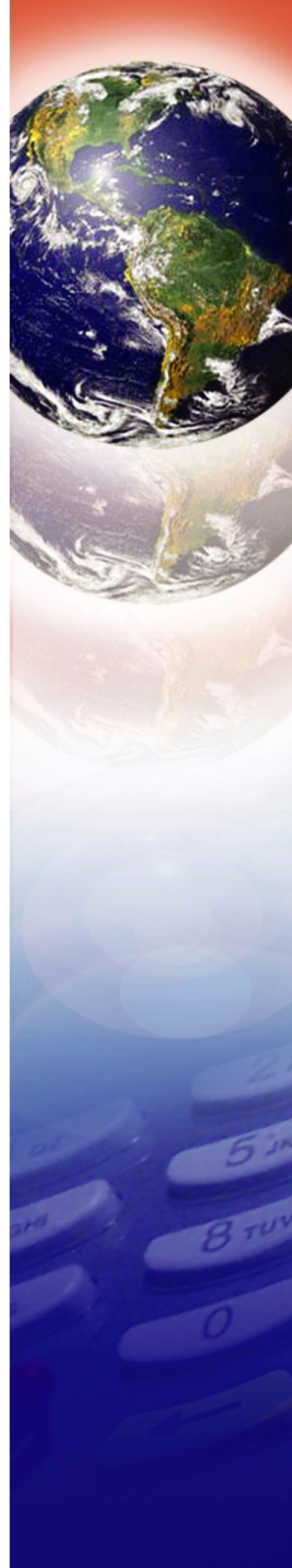


VeriFone, Inc.
2099 Gateway Place, Suite 600
San Jose, CA, 95110 USA
Tel: (800) VeriFone (837-4366)
www.verifone.com

DRAFT
TEMPLATE REV E

V^x670

Installation Guide



FCC Regulations:

●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.

●This device 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 radiated 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

●The antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

► RF Exposure Information (SAR)

This device meets the government's requirements for exposure to radio waves.

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard for wireless devices employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6W/kg.

*Tests for SAR are conducted using standard operating positions accepted by the FCC with the device transmitting at its highest certified power level in all tested frequency bands. Although the SAR is determined at the highest certified power level, the actual SAR level of the device while operating can be well below the maximum value. This is because the device is designed to operate at multiple power levels so as to use only the power required to reach the network. In general, the closer you are to a wireless base station antenna, the lower the power output.

The highest SAR value for the device as reported to the FCC when tested for worn on the body, as described in this user guide, is 0.211 W/kg for GSM Body SAR and 0.254 W/kg for PCS Body SAR. (Body-worn measurements differ among device models, depending upon available enhancements and FCC requirements.)

While there may be differences between the SAR levels of various devices and at various positions, they all meet the government requirement.

The FCC has granted an Equipment Authorization for this device with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR information on this device is on file with the FCC and can be found under the Display Grant section of <http://www.fcc.gov/oet/fccid> after searching on FCC ID: B32VX670GPRS.

For body worn operation, this device has been tested and meets the FCC RF exposure guidelines for use with an accessory that contains no metal and the positions the handset a minimum of 1.5 cm from the body. Use of other enhancements may not ensure compliance with FCC RF exposure guidelines.