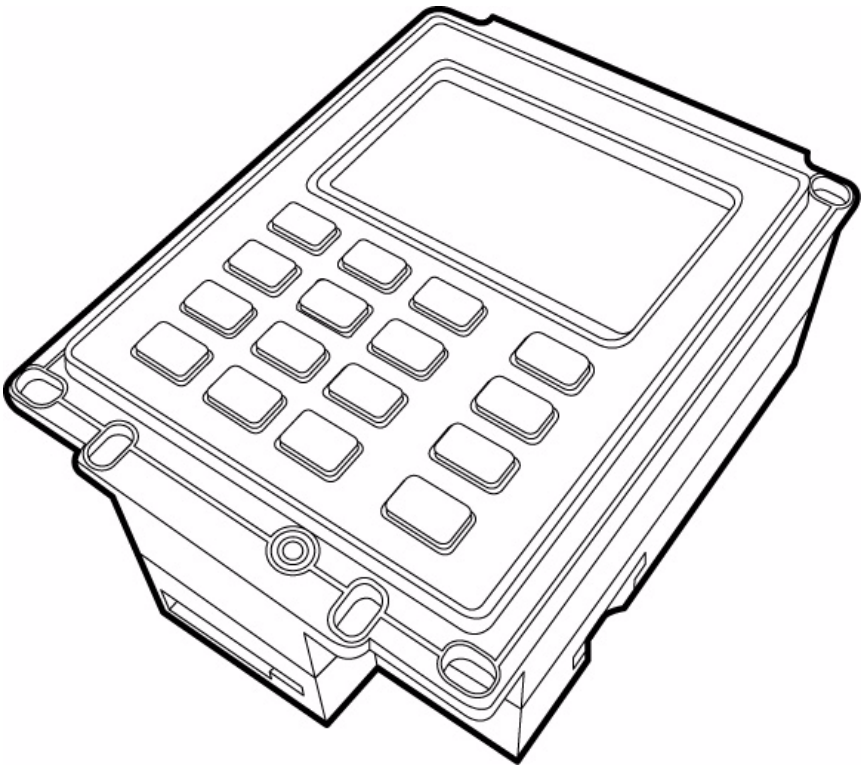
V^x700

Installation Guide



VeriFone Part Number 28212, Revision A

V^x700 Installation Guide

Comments? Please email all comments on this document to your local VeriFone Support Team.

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VeriFone Part Number 28212, Revision A

This installation guide assists machine manufacturers to properly install the V^{x}700 in terms of electrical connectivity as well as mechanical, security, and privacy specifications.

Target Audience

This document is useful to payment/banking machine manufacturers/implementors.

Document Organization

This document is organized as follows:

Chapter 1, Terminal Overview, provides an overview of the basic features and benefits of the V^{x}700.

Chapter 2, Terminal Setup and Usage, explains how to set up and install the V^{x}700 into a payment machine/ATM.

Chapter 3, Specifications, discusses power requirements and dimensions of the V^{x}700.

Chapter 4, Maintenance, explains how to maintain the V^{x}700.

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.

Guide Conventions

This section provides a quick reference to conventions used in this guide.

The following conventions help the reader distinguish between different types of information:

- The `courier` typeface is used for code entries, filenames and extensions, and anything that requires typing at the DOS prompt or from the terminal keypad.
- The *italic* typeface indicates book title or emphasis.
- Text in blue indicates terms that are cross-referenced. When the pointer is placed over these references the pointer changes to the finger pointer, indicating a link. Click on the link to view the topic.

NOTE

Notes point out interesting and useful information.

CAUTION

Cautions point out potential programming problems.

WARNING

Warnings point out potential incidents where bodily injury might occur.

Acronym Definitions

Various acronyms are used in place of the full definition. Table 1 presents acronyms and their definitions.

Table 1 Acronym Definitions

Acronym	Definitions
AES	Advanced Encryption Standard Algorithm
API	Application Programming Interface
ARM	Advanced RISC Machines
CAPK	Certification Authority Public Key
CBC	Cipher Block Chaining mode
COG	Chip on Glass
COGS	Cost of Goods Sold
CTS	Clear to Send
DEA/DES	Data Encryption Algorithm/Standard
DUKPT	Derived Unique Key Per Transaction Method
ECB	Electronic Code Book mode
ECR	Electronic Cash Register
EMV	Joint Europay, MasterCard and Visa Standard
ERS	Engineering Requirements Specification
HDLC	High-level Data Link Control
ICC	Integrated Chip Card (Smart Card)
LCD	Liquid Crystal Display
MAC	Message Authentication Code
MDB	Multi-Drop Bus
MMU	Memory Management Unit
MSAM	Multiple Secure Access Module
MSR	Magnetic Stripe Reader
OS	Operating System
PED	PIN Entry Device
PIN	Personal Identification Number
POS	Point-of-Sale
PRD	Product Requirement Document
PSCR	Primary Smart Card Reader
RTS	Ready to Send
SOC	System on Chip
SAM	Secure Access Module
SC	Smart Card (Integrated Chip Card)
SDK	Software Development Kit
SL3	Security Level 3 and 4

Table 1 Acronym Definitions (continued)

Acronym	Definitions
SR	Ship Release
SRAM	Static Random Access Memory
STN	Super Twisted Nematic
UI	User Interface
USB	Universal Serial Bus
VSS	VeriShield Security Scripts

CHAPTER 1

Terminal Overview

This chapter provides a brief description of the V^x700. The V^x700 is one of VeriFone's versatile unattended payment solutions set. The V^x700 is designed for manufacturers who want secure, PCI PED approved, EMV-compliant transaction payment technology in their own payment/transaction machines.

The V^x700 Keypad

The V^x700 is an outdoor-rated unattended keypad, suitable for payment applications and process control, and features high reliability in tough environments. Built around VeriFone's successful Verix-based programming environment, the V^x700 gives access to a broad range of application software components and sophisticated development tools.

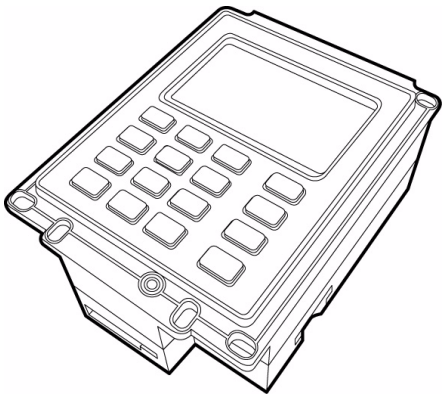
Capable of operating from a wide range of input voltages, the V^x700 has low power capabilities to enable use in critical power applications. An interface for USB host and slave provides for simple connectivity over local or wide area networks.

The V^x700 links to a variety of VeriFone card accepting devices for a complete payment solution ranging from magnetic stripe to full EMV chip card processing. It has options to directly support contactless payment cards, including MasterCard PayPass, Visa payWave, M/Chip, and qVSDC, with the addition of an optional plug-in contactless interface module and an external antenna that is mounted on the integration equipment – such as a vending machine or kiosk.

Features at a Glance

The V^x700 has a stainless steel front panel that is rated at IP65. The rear panel containing the cable connections is rated at IP34. These features allow the V^x700 to operate in extreme environments. It is PCI PED approved for assured payment security, has superior graphical display with optional backlighting, easy-to-use long-life keypad with concave keys, and is vandal-resistant.

The unique form factor of the V^x700 allows it to be fitted into bill acceptor cut-outs for vending applications. It is equally suited for ticketing, transportation, kiosk, petroleum dispensing, or drive-through restaurant deployments.



- **Verix-based** programming environment.
- Small, easy to integrate **form factor**.
- Fits into **bill acceptor** cut-out.
- **2 million** operation keypad, **16 keys**.
- **128 x 64** backlit graphical display.
- **IP65 sealed, -25C to +60C** operating range.

Figure 1 V^x700 overview

Features and Benefits

Exceptional Ease of Use

- 16-key keypad with concave keys, high contrast legends, and tactile identifiers.
- External interface for four function user-defined keys.
- 128 x 64 backlit LCD.
- Built-in multi-tone beeper.
- External sounder connection.
- USB and Serial connectivity.
- Wide input voltage range (9V to 28V).
- Low power consumption.

Critical Security Protection

- Stainless steel front panel rated IP65 and IK09 vandal resistance (10 Joules impact resistance).
- Rear panel rated at IP34.
- Petroleum and chemical resistant.
- PCI PED 1.3 on-line and off-line approved.

Strong Feature Set

- Ensures uncompromising reliability from VeriFone, the worldwide leader in e-payment.
- Verix-based – able to run existing applications with only minor modifications.
- High-level API for easy integration.
- RS-232 and USB 2.0 serial ports.
- Optional MDB interface for host and slave vending applications.
- Optional V.22bis - V.34 modem with HDLC capability via USB connection.
- Optional Ethernet 10/100 BaseT via USB connection.
- Connects to SCR710 secure card reader.
- Support for magnetic stripe cards (3 track) via SCR710.
- EMV cards (EMV 4.0) via SCR710.
- Optional support for 2 SAMs (Secure Access Modules).

Other Features

- 200 MHz ARM9 processor
- 4MB Flash, 2MB SRAM (standard)
- 8MB Flash, 4MB SRAM (option)

Terminal Setup and Usage

Ergonomic References

To ensure that the Vx700 is mounted in the most comfortable viewing and reach position, this section shows a series of guide dimensions for both standing persons and wheelchair users.

NOTE

The data in this section is based on average Caucasian males. For different ethnic groups, refer to more accurate anthropometric data.

Terminal Positioning and Orientation

This section provides a general overview of the preferred mounting angle, orientation, and viewing angle for ease of use and privacy. When installing the Vx700 in an unattended transaction/payment machine, consider the situations illustrated in Figure 2.

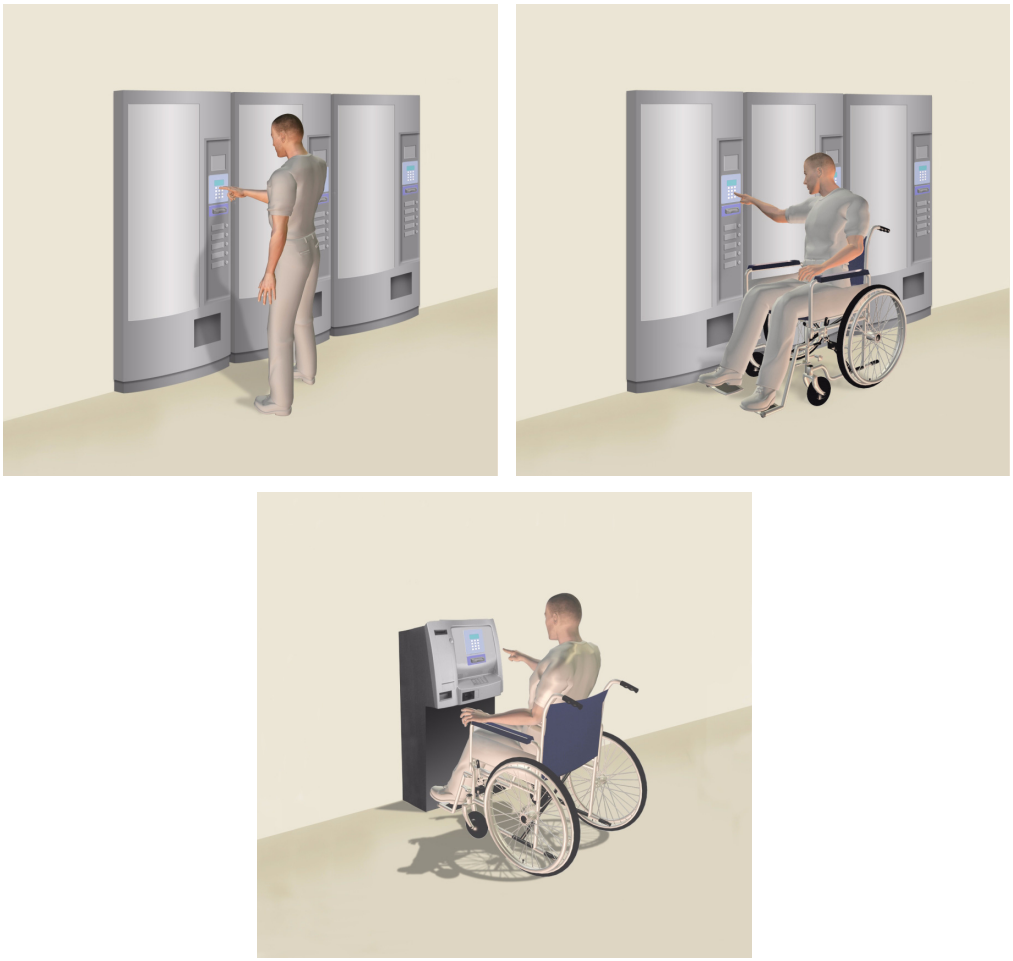


Figure 2 Typical Terminal Usage Situations

Screen Viewing Angle

The screen viewing angles, illustrated in Figure 3, denotes the angle at which the screen can be viewed comfortably.

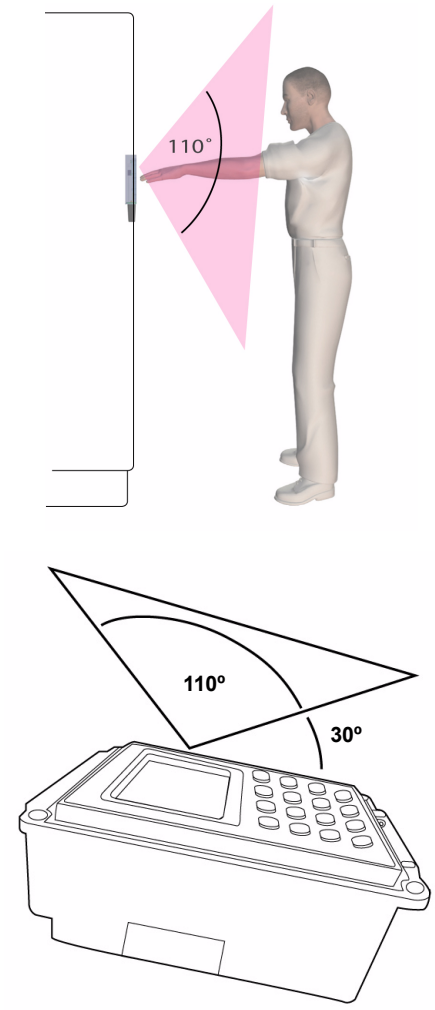


Figure 3 Screen Viewing Angles

Privacy

The following requirements relates to the user's privacy when entering PIN. The area of visibility should be no larger than a cone taken from the number 5 key at an angle of 45º and covering an area of 270º directly in front of the user, as shown in Figure 4.

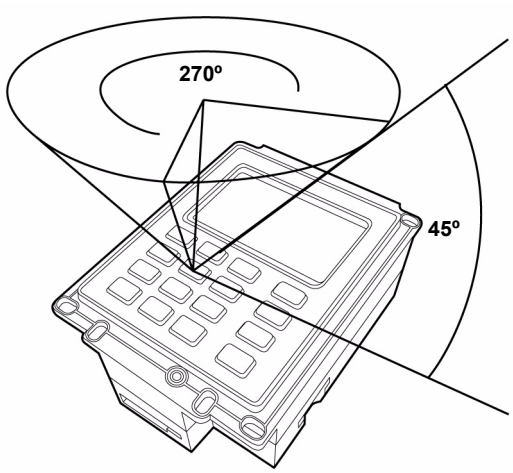


Figure 4 PIN Entry Visibility Area

PIN entry can be secured using the payment machine's structure (Figure 5) or by installing a privacy shield (Figure 6).

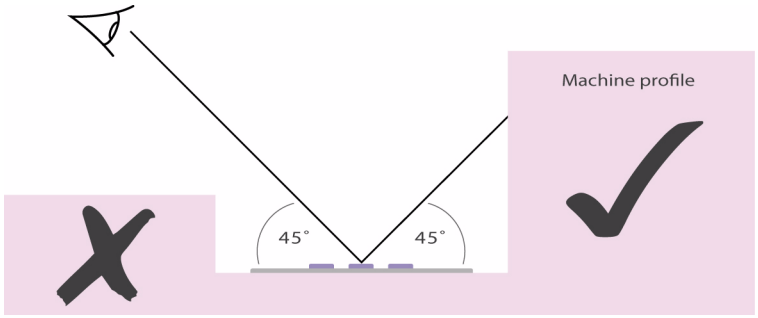


Figure 5 PIN Entry Privacy Using the Machine's Structure

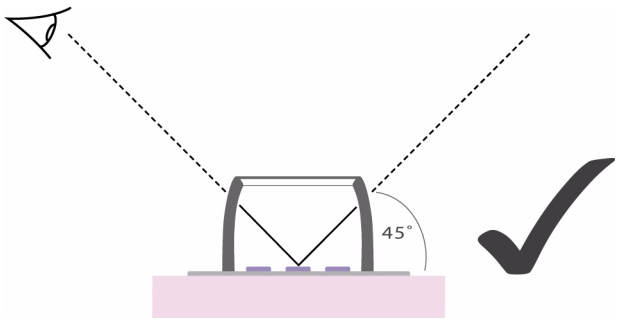


Figure 6 PIN Entry Privacy Shield

Reach and Viewing Angles (Standing Users)

Refer to Figure 7 and Figure 8 for the viewing angle and reach contours most comfortable for a standing user when utilizing a payment machine/ATM.

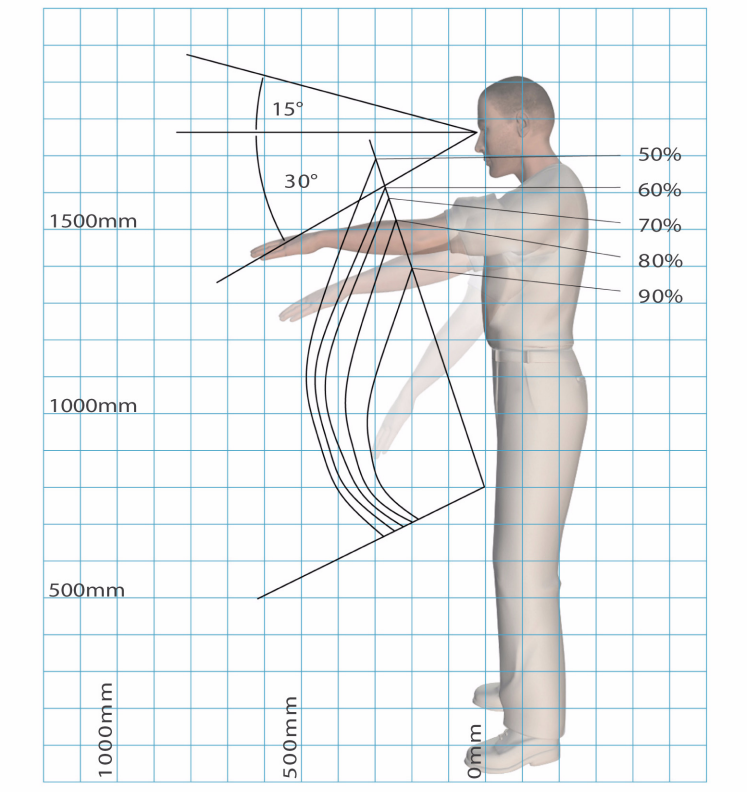


Figure 7 Comfortable Reach and Viewing Angle (Standing)

Figure 8 shows additional reach contours for standing users.

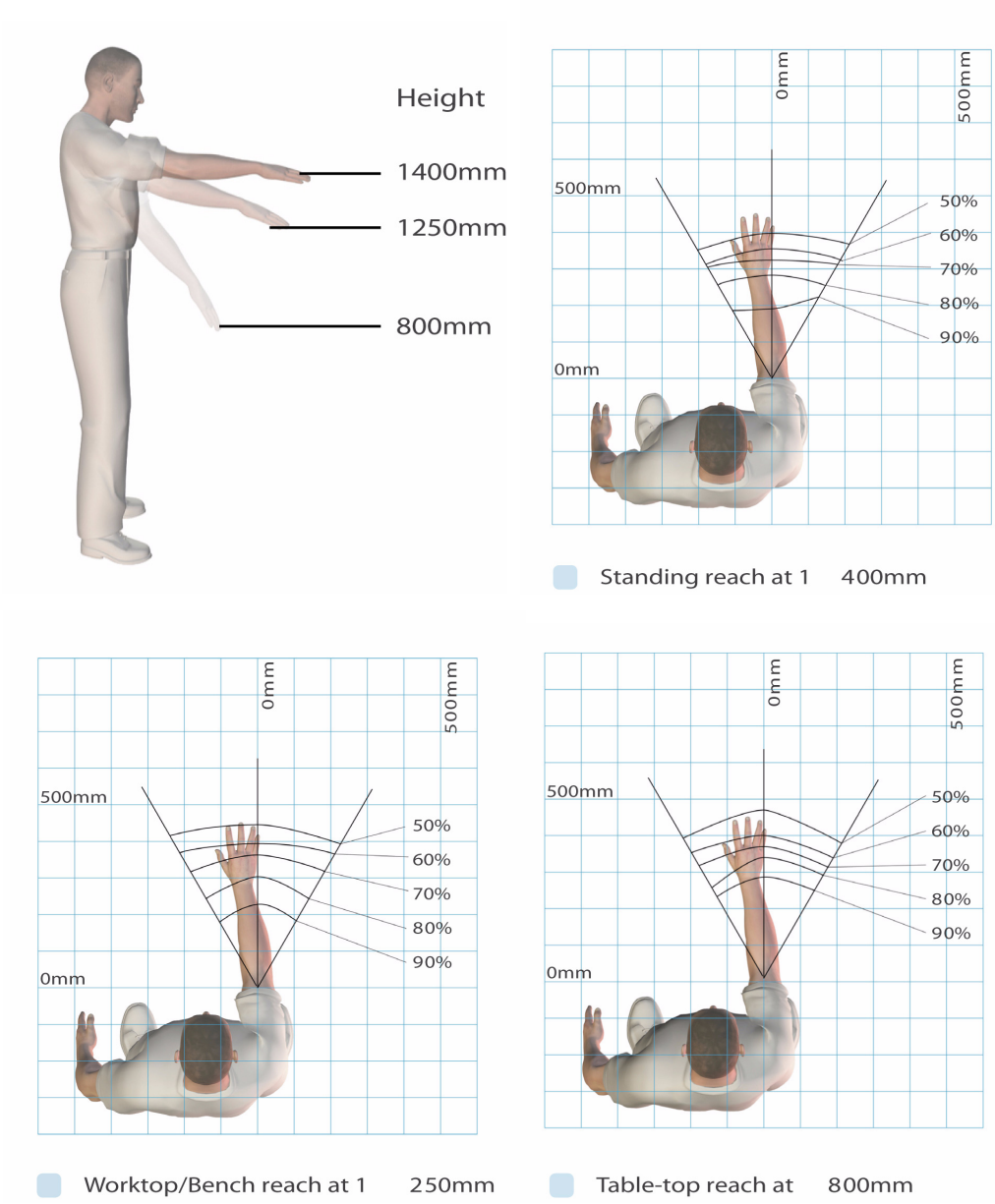


Figure 8 Reach Contours (Standing Users)

Reach and Viewing Angles (Wheelchair Users)

Wheelchair users prefer to use and view operating features when facing a payment machine/ATM. They may also want to reach to the side for security, mobility, and privacy reasons. It is important that, where possible, the machine design provides a knee space to allow a frontal approach for wheelchair users.

Figure 9 and Figure 10 shows the viewing angle and reach contours that are most comfortable for a wheelchair user when utilizing a payment machine/ATM.

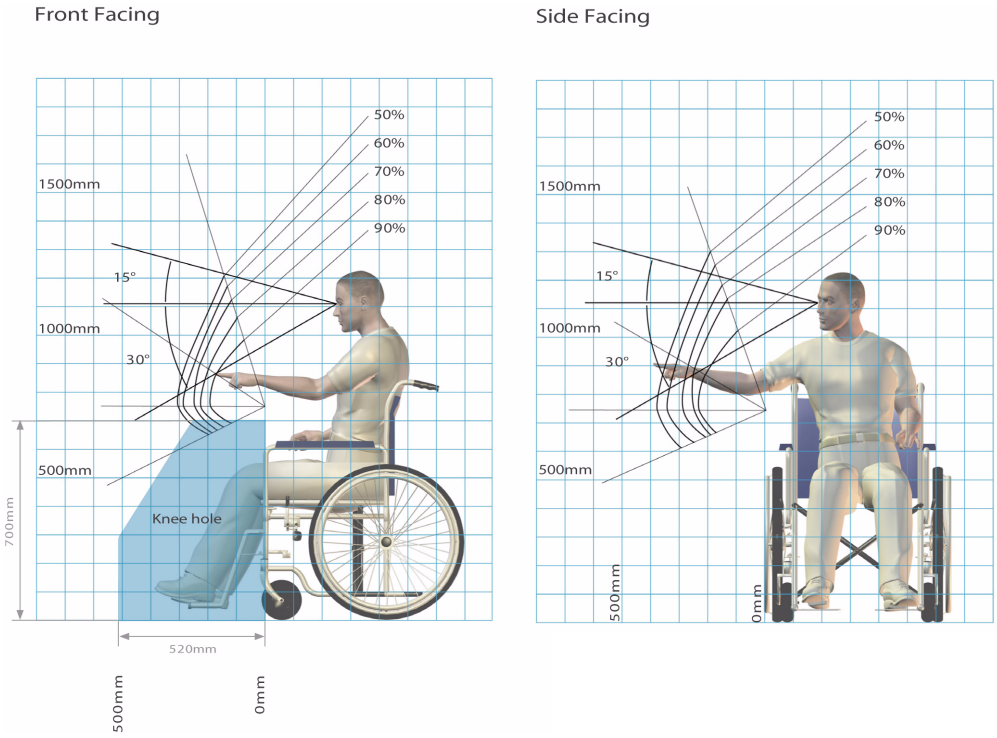


Figure 9 Reach and Viewing Angles (Wheelchair Users)

Figure 10 shows additional reach contours for wheelchair users.

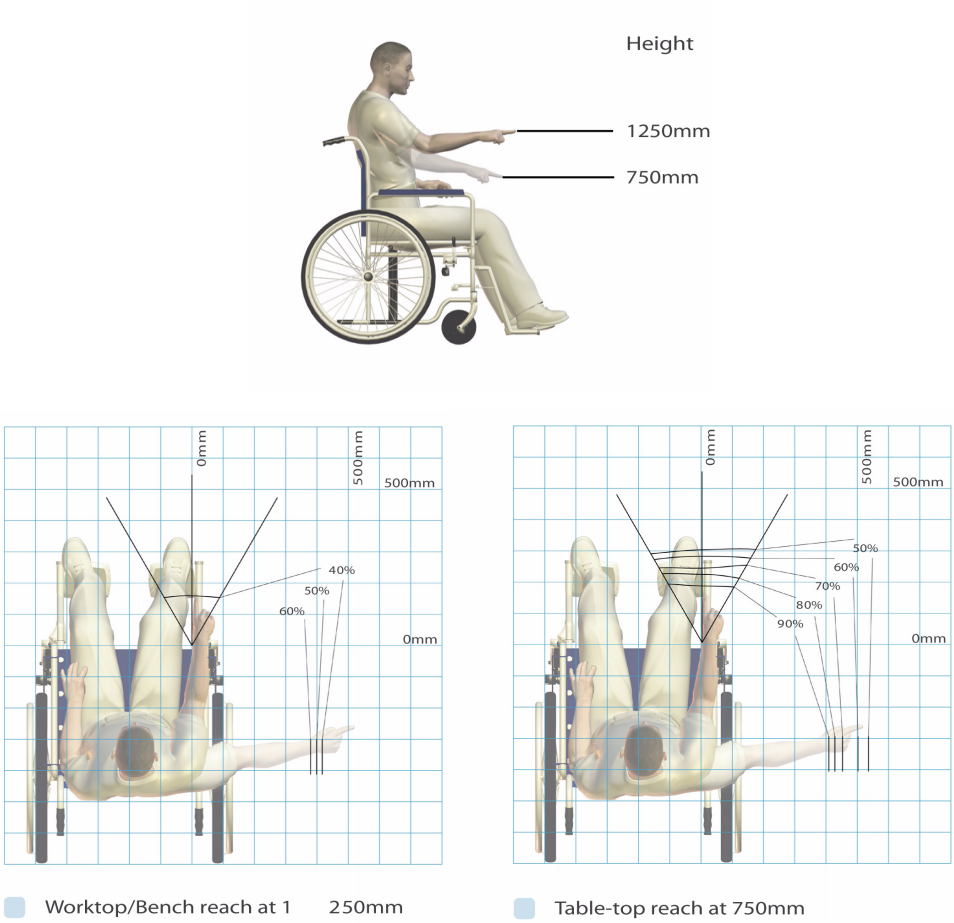


Figure 10 Reach Contours (Wheelchair Users)

Examine Vx700 Features

Before you continue with the installation process, familiarize yourself with the Vx700 features:

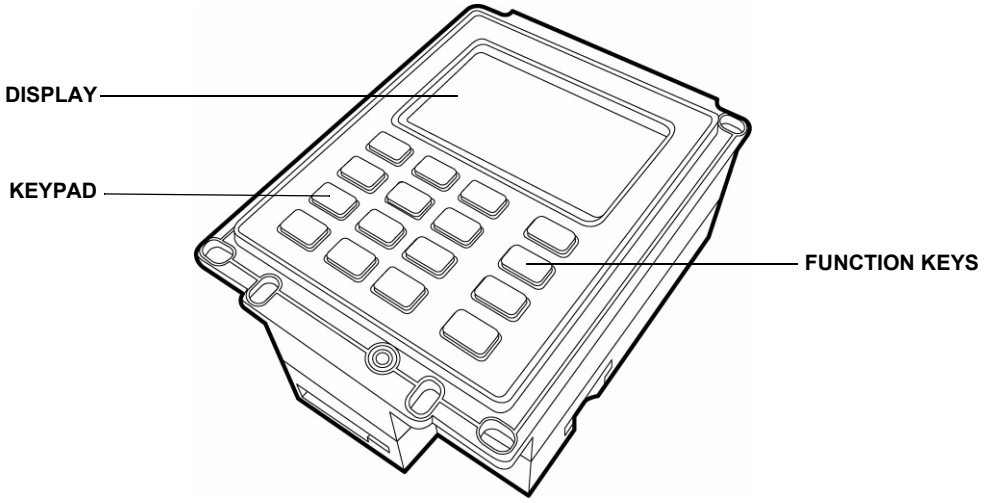


Figure 11 Vx700 Features

The Vx700 includes the following features:

- A 128 x 64 backlit **display**.
- **16-key Keypad** and **four Function** keys.
- Four **color-coded function keys** beside the Keypad (CANCEL [RED], CLEAR [YELLOW], HELP [BLUE], ENTER [GREEN]).

Cable Connections

The Vx700 has 3 general connection options, depending on what the Vx700 connects to:

1. MDB (Multi-Drop Bus) interface for host and slave vending applications.
2. V.22bis - V.34 modem with HDLC capability via USB connection.
3. Ethernet 10/100 BaseT via USB connection.

WARNING

Do not use a unit that has been tampered with or otherwise damaged.

The Vx700 comes equipped with tamper-evident label. If a label or component appears damaged, immediately notify the shipping company and your VeriFone representative or service provider.

RS-232 and USB Connections

The V^{X}700 USB and RS-232 ports are shown in Figure 12.

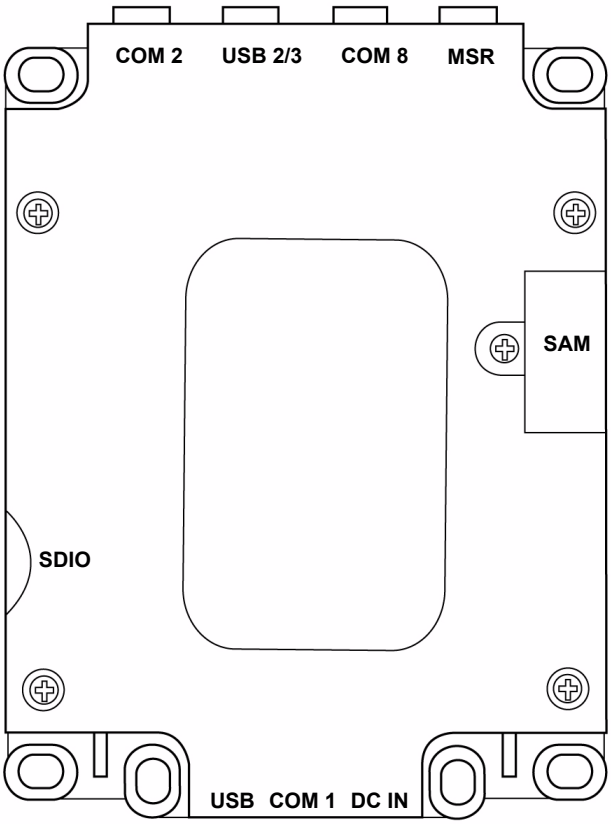


Figure 12 Underside with Port Labels

Connection Options

The different connection options are listed below:

1. USB connects to a host system using cable VPN 27720-01-(R).
2. USB 2/3 connects to Ethernet networks using VPN 08448-03(R), USB memory sticks, USB modem, or other USB devices. Additional software may be required to support particular USB devices.
3. COM 1 connects to host system using a cable VPN 27716-01-(R) or an MDB interface thru VPN 27712-01-(R).
4. COM 2 connects to the SCR710 Card Reader using a VPN 27718-01-(R).
5. COM 8 connects specific applications using a cable VPN 27717-01-(R).
6. SDIO connects to a contactless module (future expansion).
7. MSR connects to a card reader (future expansion).
8. DC IN connects to the power supply unit VPN CPS11224-3B-(R) (if required).

Pin Connections

The following are the possible options for cable adapters to support the peripherals for the Vˣ700:

1 Serial Port (COM 1): Logical Port 1 (USB Slave, Serial, Power)

- 6-Wire RS232 port with TX, RX, RTS, CTS, DTR, and DCD signals.
- Provides for back-to-back download capability.
- Pin 10 allows the terminal to be turned off by raising this pin high; a low on this pin re-powers the unit (default is low if this feature is not implemented by the host).

Table 2 Logical Port 1 (UPSTREAM) Serial connections

PIN	RJ-48 (10 Way Connector)
1	TX
2	RX
3	RTS
4	CTS
5	DTR
6	VIN 9 - 28V
7	GND
8	DCD
9	MDB 12V
10	RECYCLE POWER

2 USB Slave: Logical Port 1 (USB Slave, Serial, Power)

- Provides for 2-Wire USB device port.
- Port is directly connected to CPU USB ports and is a USB slave.
- Power is not supplied from the USB Host, Pin 1 is NC. This configuration powers the Vˣ700 by the DC Jack.

Table 3 Logical Port 1 (UPSTREAM) USB connections

PIN	Mini USB “B” (5 way connector)
1	NC
2	nUSB (Slave)
3	nUSB (Slave)
4	NC
5	GND

3 Serial Port (COM 2 and 3): Logical Ports 2 and 3 (USB Host, Serial)

- 6-Wire RS232 port with TX, RX, RTS, CTS, DTR, and DCD signals and VSYS out.

Table 4 Logical Port 2 (DOWNSTREAM) Serial connections

PIN	RJ45 (8 Way Connector)
1	TX
2	RX
3	RTS
4	CTS
5	DTR
6	VSYS OUT 12V
7	GND
8	DCD

Table 5 Logical Port 3 (DOWNSTREAM) Serial connections

PIN	RJ45 (8 Way Connector)
1	TX
2	RX
3	RTS
4	CTS
5	DTR
6	VSYS OUT 12V
7	GND

4 USB Host: Logical Ports 2 and 3 (USB Host, Serial)

- 2-Wire USB Host port for external peripherals.
- Both ports provide up to 500mA, at 5V, for external peripherals.
- Devices requiring a higher current and voltage are not supported.
- A connector adaptor provides for a standard USB host connection.
- The host may use existing USB Verifone dongles, such as the USB-Modem and USB-Serial, as well as devices in development, USB-Ethernet and USB memory sticks.

Table 6 Logical Ports 2 & 3 (DOWNSTREAM) USB connections

PIN	USB "A" (8 Way Connector)
1	USB POWER OUT 500mA
2	nUSB (HOST)
3	pUSB (HOST)
4	GND
5	USB POWER OUT 500mA
6	nUSB (HOST)
7	pUSB (HOST)
8	GND

The following figure shows the approximate location of Pin 1 on the ports of the V^x700:

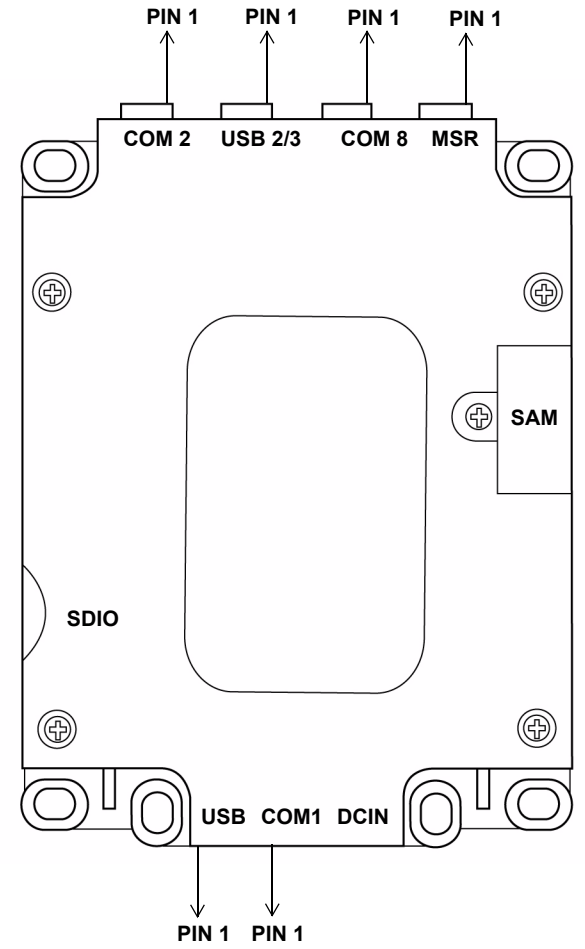


Figure 13 Approximate Location of Pin 1

NOTE

For further assistance on the location of Pin 1, please contact your VeriFone representative.

WARNING

Turn off or unplug the host system when connecting or disconnecting the V^x700. Memory corruption and data loss can result if the host system is processing data when power is removed.

Refer to the host system instructions for specific warnings.

If an extension cable is required, only USB-certified cables should be used.

NOTE

Standard accessories included with the V^x700 depends on the selected V^x700 part number. For more information, contact your VeriFone representative.

Connection to Secure Card Reader (Optional)

This section describes the connection of the Vx700 to the optional smart card reader SCR710.

The SCR710 Secure Card Reader

VeriFone's SCR710 is an outdoor-rated and robust secure card reader, suitable for payment card acceptance in tough environments where reliability is paramount.

The SCR710 provides three-track magnetic stripe reading capability along with a full EMV 4.0 chip interface and Interac approval. It is PCI certified, which ensures that sensitive cardholder data remains confidential during transfer to the attached Vx700 PIN pad or Mx700 EPP.

NOTE

The SCR710 is powered by the Vx700 and has a power supply requirement of 12V DC with a maximum power consumption of 2.4W.

Power Supply

Not all Vx700 configurations and device contexts require the use of a power supply – VeriFone ships power supplies with the Vx700 as required.

If you have changed the context in which the Vx700 is used or have questions about which power supply should be used, contact your VeriFone representative.

CAUTION

Using an incorrectly rated power supply can damage the unit or cause it not to work properly. Use only the recommended power supply, CPS11224-3B-(R), for the Vx700 VPN (see Specifications for detailed power supply specifications).

Connect and route all cables from the Vx700 before plugging the power pack cord into a wall outlet or surge protector.

WARNING

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

NOTE

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

When the Vx700 has power and an application is loaded, the application starts after the initial VeriFone copyright screen and displays a unique copyright screen. If no application is loaded, **DOWNLOAD NEEDED** appears on the display after the initial VeriFone copyright screen.

Specifications

This chapter discusses power requirements, dimensions, and other specifications of the V^x700.

Power

9V to 28V; 4A (option to support 45V DC)

Power Consumption

The V^x700 has the following power consumption modes:

- 1.5W: Full Speed
- 1W: Low Power Mode
- 0.39W: Sleep Mode

DC Power Pack

UL, ITE listed, Class 2 power supply:

a Input rated: 100 - 240V AC, 50/60 Hz, 0.6A

b Output rated: 12V DC, 4A

Power connector dimensions:

Outer: 5.5mm Center: 2.1mm Shaft Length: 9.5mm

Barrel connector polarity:

Temperature

The V^x700 operating range and humidity tolerance as follows:

- Operating Temperature -25° to 60° C (13° to 140° F)
- Relative Humidity 5% to 95%; non-condensing

External Dimensions

The V^x700 has the following dimensions:

- Length: 132mm (5.2 in)
- Width: 100mm (4.0 in)
- Height: 48.9mm (2.0 in)

Maintenance

The V^x700 has no user-maintainable parts. This section discusses procedures and precautions for terminal care and maintenance.

Cleaning the Terminal

To Clean the Terminal:

- Slightly dampen a clean cloth with water and a drop or two of mild soap.
- Wipe the V^x700 gently.
- 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.

VeriFone Service and Support

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

For 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.

Returning the Terminal for Service

Before returning a V^{x}700 to VeriFone, you must obtain an MRA number. The following procedure describes how to return one or more terminals, 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.

To Return a Terminal for Service

1. Get the following information from the printed labels on the bottom of *each* V^{x}700 to be returned:
   - Product ID, including the model and part number. For example, “V^{x}700” 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 V^{x}700 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 V^{x}700 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 V^{x}700).

Accessories

VeriFone produces the following accessories for the V^{x}700. 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.

CPS11224-3B-(R)	Universal DC power pack (supplied separately)
21973-01	AC power cord (US)

Data Cables

27720-01-(R)	Host USB
08448-03-(R)	Ethernet Adapter
27716-01-(R)	Host RS-232
27712-01-(R)	MDB interface
27718-01-(R)	SCR710 Card Reader
27717-01-(R)	USB Application

Vˣ700 ATM - Vending Machine Integration

This appendix shows the terminal dimensions of the Vˣ700 and the proper orientation of the terminal for installation in an ATM or Vending Machine.

Terminal Dimensions

This section illustrates the terminal dimensions for Vending Machine integration of the Vˣ700. The images indicate measurements in Metric units.

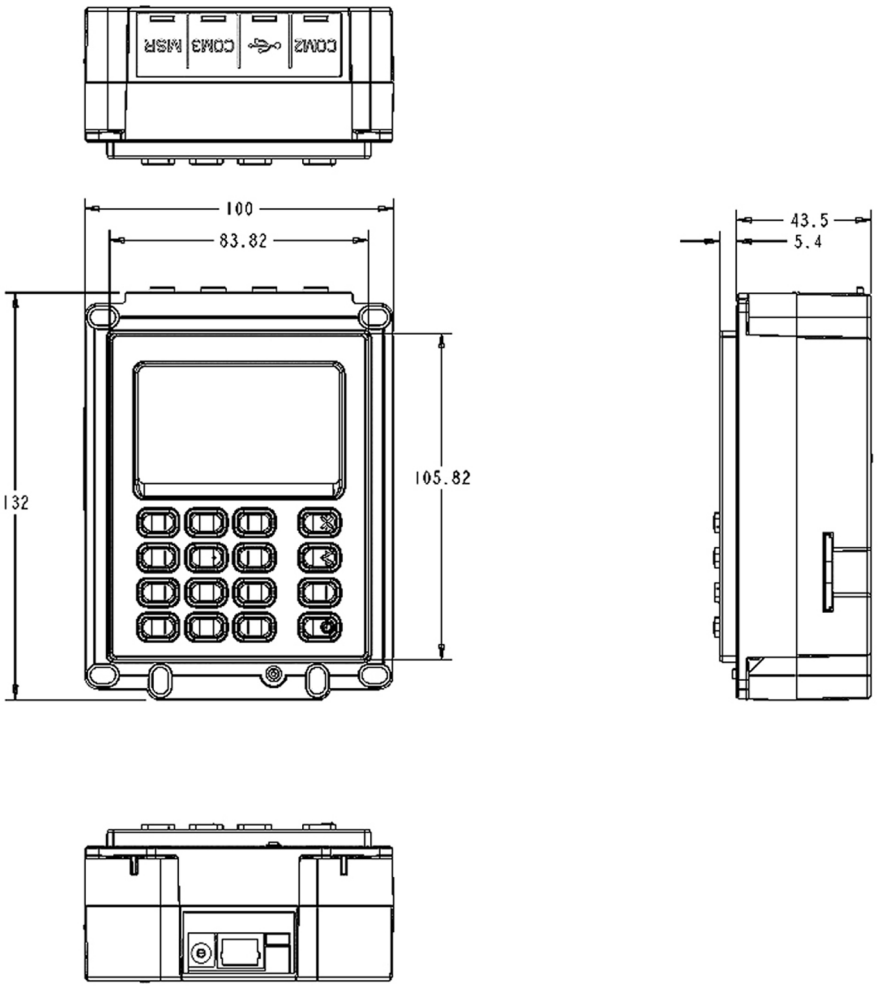


Figure 14 Terminal Dimensions showing Length, Width, and Height

Rear Terminal Dimensions

This figure illustrates the rear terminal dimensions.

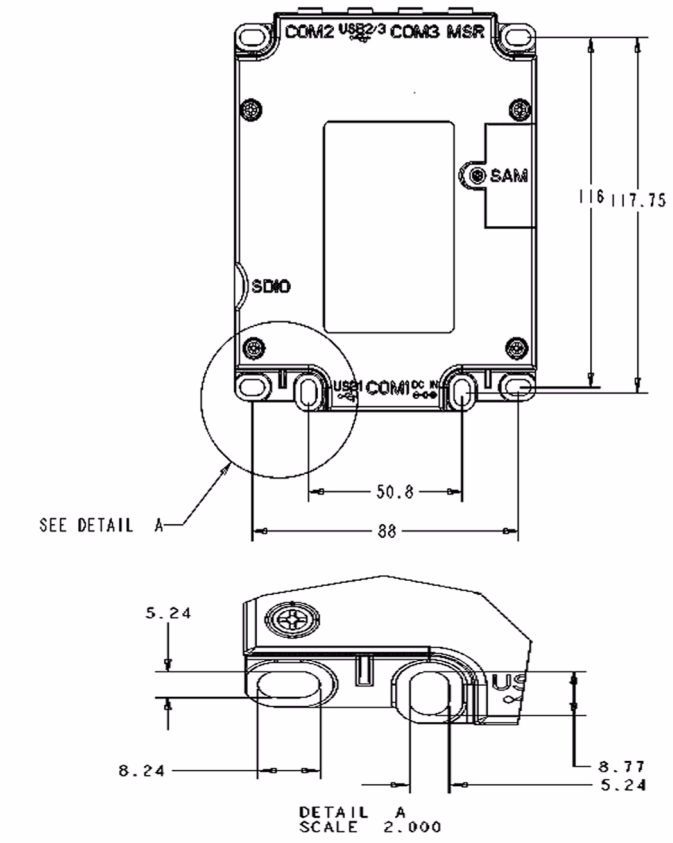


Figure 15 Rear Terminal Dimensions, with a close up of Earth Stud slot

Vending Machine Integration for the Vˣ700

This section illustrates the proper orientation of the Vˣ700 terminal with a Vending Machine terminal panel.

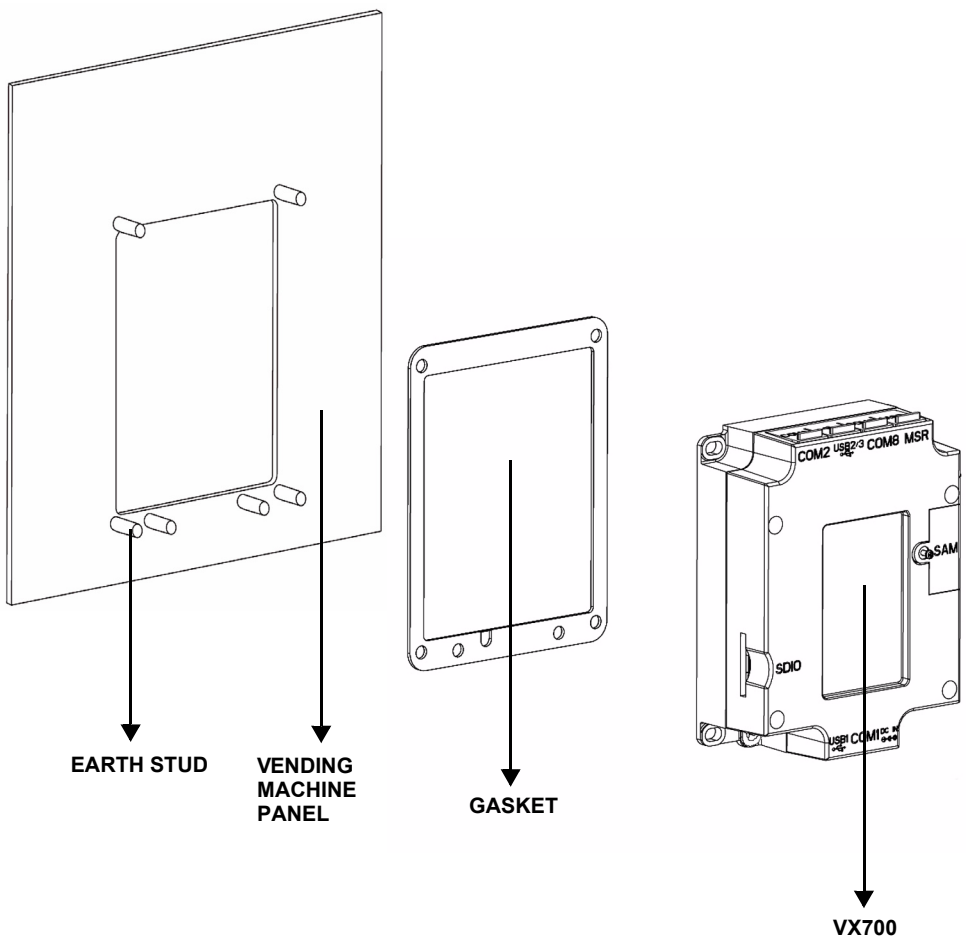


Figure 16 Vending Machine Panel Orientation with the Vˣ700

VeriFone, Inc.
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VX700

Installation Guide

VeriFone Part Number 28212, Revision A