Verix eVo Development Suite

Getting Started Guide

VeriFone Part Number DOC00309, Revision A

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

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The Verix eVo Development Suite contains the Software Development Kit (SDK), and various useful tools, utilities and libraries using which you can develop applications for Verix eVo terminals.

The SDK supports Verix eVo family of terminals. The terminal complements with enrich features to support touch screen with color display and desktop component configurations.

Development Suite Components

Table 1 lists the Development Suite Components.

Table 1 Develop Suite Components

Development Suite
VRXSDK
Verix eVo ACT
CardSlot
Verix eVo Multi-App Conductor
Tools
Font Generation Tool
VeriShield FST
VeriFind
VeriPrint
Verix eVo AutoDL

Scope

This guide contains information on the Development Suite components.

Target Audience

This guide is for developers who develop applications for VeriFone's Verix eVo terminals using the Verix eVo Development Suite. Developers must have knowledge on C and C++ programming languages.

Document Organization

This manual is organized as follows:

Table 2 Document Organization

Chapter	Description
Chapter 1, Development Suite Components	Provides an overview of the tools and libraries used in the Development Suite.

Conventions and Acronyms

The following conventions are used in this document.

- The `courier` typeface is used for code entries, filenames, and anything that might require 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

Note points out interesting and useful information.

CAUTION

Caution points out potential programming problems.

Table 3 presents acronyms and their definitions.

Table 3 Acronyms and Definitions

Acronym	Definition
ACT	Verix eVo ACT
CVLR	Compressed Variable-Length Record
FST	File Signing Tool
ICC	Integrated Chip Cards
IMM	Inter task Message Manager
ITP	Integrated Thermal Printer
OS	Operating System
PIP	Plural Interface Protocol
SDK	Software Development Kit
TXO	Transaction eXpress Option
VLR	Variable-Length Record

Minimum PC Requirements

Table 4 lists the software and hardware requirements for installing and using the DTK for application development.

Table 4 Minimum PC Requirements

Software	• Any one of the following Operating Systems: • Microsoft Windows XP Service Pack 1 or later • Internet Explorer 6.0 or later • Adobe Acrobat Reader, version 6.0 or later
Hardware	• 10 - 15 MB free disk space on the system drive for temporary files created during installation. • ~120 MB disk space for a typical installation of all components.

Minimum Requirements for Developing Applications

Table 5 lists the minimum requirements for installing and using Development Suite components for developing applications.

For Verix eVo

Table 5 Minimum Requirements for Verix eVo

Tool	Requirements
Verix eVo ACT, CardSlot, Verix eVo Multi-App Conductor	• VRXSDK • VeriFone RVDS 4.0 which includes RVCT 4.0 and RVD 4.0.
Tools	• Java Runtime Environment, version 2 (for MakeFile Maker tool) and API converter tool.
VeriPrint	• An application that can print on the VeriFone printer connected to the terminal. • RS-232 download cable to connect Verix eVo terminal to a PC running VeriPrint (VeriPrint is a PC-based application).
VeriFind	• An application enabled for VeriFind. Refer to the *VeriFind Online Help* for more details. • RS-232 download cable to connect Verix eVo terminal with a PC running VeriFind (VeriFind is a PC-based application). • Microsoft Windows XP
Font Generation Tool	• Microsoft Windows XP
VeriShield FST	• Microsoft Windows XP
Verix eVo AutoDL	• Verix eVo Multi-App Conductor

NOTE

- For application developers, ensure you install VeriFone RVDS 4.0 compiler before using Verix eVo ACT and VMAC libraries.
- The minimum requirement for OS is that it should be compiled with SDK 3.3.0. Refer to Verix eVo OS Release Note for more details.
- Refer to the Verix eVo OS ReadMe for details on OS and firmware versions.
- To verify the terminal's OS version number, restart the terminal. The OS version appears on the second line of the copyright screen during the start-up sequence.

Default Installation Directory

The default installation path is:

```
C:\eVoAps\<Project component>
```

NOTE

The components are installed in the default path. If you change the default path, the settings of the project workspace and associated files of the sample programs must be modified to reflect the new path.

Documentation

Table 6 lists the relevant documents and their paths. Refer to these documents for more information on the individual components of the Development Suite.

Table 6 Related Documents

Document	Path
SDK (Verix eVo)	
• MC55 / MC56 Siemens Cellular Engine, Doc ID MC55 / MC56_ATC_V00.11 • Verix eVo Operating System Programmers Manual, VDN DOC00301 • Verix eVo Operating System Programming Tools Reference Manual, VDN DOC00303 • Verix eVo Communication Programmers Guide, VDN DOC00302	<Installation directory>\eVoAps\VRXSDK\Doc
Tools	
• MakeFile Maker Tool Users Guide, VDN 22265	
VeriFind	
• VeriFind Online Help, VDN 22622	<Installation directory>\VerixAps\VeriFind
VeriPrint	
• VeriPrint Online Help, VDN 22623	<Installation directory>\VerixAps\VeriPrint
VeriShield FST	
• VeriShield Online Help, VDN 22311	<Installation directory>Program Files\VeriFone\FST
Font Generation Tool	
• Font Generation Tool Help, VDN 24291	<Installation directory>Program Files\FontGenerationTool
Verix eVo ACT Library	
• Verix eVo ACT Programmers Guide, VDN DOC00310	<Installation directory>\eVoAps\ACT2000
CardSlot Library	
• Verix/Verix V CardSlot Library Programmers Guide, VDN 23288	<Installation directory>\ VxAps\CardSlot
Multi-App Conductor	
• Verix eVo Multi-App Conductor Programmers Guide, VDN DOC00306 • Verix eVo Multi-App Conductor for touch screen terminals Users Guide, VDN DOC00312	<Installation directory>\ eVoAps\VMAC
AutoDL	
• Verix eVo Auto Download Reference Guide, VDN DOC00311 • Verix eVo AutoDL Users Guide for Touch screen Terminals, VDN DOC00313	

CHAPTER 1

Development Suite Components

This chapter provides an overview of the software applications, tools and libraries packaged in the Development Suite. The contents of the installed folders for each component are also explained in this chapter.

NOTE

Development Suite components do not support default certificates. Refer to the respective ReadMe files of the components about signing the binaries.

VRXSDK

The VeriFone SDK provides startup code, ANSI C standard libraries and related tools for the applications to run on Verix eVo terminals. It also provides a standard C-interface library for Verix eVo applications.

The Verix eVo SDK contains the following tools to create applications:

- `DDL` - direct download utility for downloading files to the terminal.
- `VRXCC` - tool for compiling and linking applications.
- `VRXHDR` - utility for changing executable file parameters such as stack and heap sizes.
- `VRXLIB` - utility for creating static and shared libraries.
- `VLR` - utility for converting text files into Verix eVo Variable-Length Record (VLR) and Compressed Variable-Length Record (CVLR) files.

Debugging Tools

Debugging tools for Verix eVo-based terminals are:

- `VRXDB` - debug monitor program (runs on the PC).
- `DBMON` - debug monitor program (runs on the terminal).

Refer to the Verix eVo Operating System Programmers Manual for more details.

Verix eVo ACT

The Verix eVo ACT is a collection of C code modules designed to reduce the effort required to design and develop applications for Verix eVo terminals. You can develop additional specialized functions using the Verix eVo ACT modules as a base. This helps to control the size of the application by re-using code from the toolkit.

Installed Folders

Verix eVo ACT installation folders contain:

- Output - contains Verix eVo ACT Library.
- Include - contains header files required for developing applications based on the Verix eVo ACT Library.

- Docs - contains the *Verix eVo ACT Programmers Guide*.
- Samples - contains following sample applications which demonstrate the usage of libraries:
  - `AIETEST` - demonstrates the capabilities of idle engine.
  - `XModem` - demonstrates modem functionality.

NOTE

For more details on samples refer to the corresponding ReadMe files.

CardSlot

The Verix eVo CardSlot Library is a layer above the OS that communicates with ICCs. This library provides a high-level interface designed to be independent of the protocol between the chip card slot and the ICC.

You can use the CardSlot Library to build Smart Card related transaction applications on Verix eVo terminals. This library ensures correct interaction between ICCs and terminals.

Installed Folders

CardSlot installation folders contain:

- Output - contains the CardSlot Library which can be directly linked to any application.
- Include - contains header files required for developing applications using CardSlot Library.
- Docs - contains the *Verix/Verix V CardSlot Library Programmers Guide*.

Verix eVo Multi-App Conductor

Verix eVo Multi-App Conductor is an application manager designed to manage application selection, device usage, inter-task synchronization and communications, and many other multi-application environment related requirements on the Verix eVo terminals. If your applications are VMAC compliant, even if developed independently, they can run together seamlessly on the same Verix eVo terminal. Refer to the *Verix eVo Multi-App Conductor Programmers Guide* for details on making applications VMAC compliant. Following are the new features of VMAC:

- Localization support.
- Support to view OS, VMAC and VMAC compliant application logs simultaneously.
- Support for DST and APPLOADER has been deprecated.

Installed Folders

VMAC installation folders contain:

- Output - contains executables:
  - `IMM` - Inter Task Message Manager is responsible for running all applications (executables) under the VMAC environment.

- `LogServer` - The LogServer is a service task of VMAC that is used for logging debugging statements efficiently.
- `DevMan` - Device Manager is responsible for device (resource) management within the Verix eVo terminals.
- `FrontEnd` - FrontEnd provides an easy to use interface for selecting applications.
- `Desktop` - comprises of Application Region, Header, Footer, Title Signal, Strength, Date/Time/Time Zone, and Battery and Dock Status
- `Reports` - application is provided as part of VMAC for the users to view and print different reports like: Application Report, Device Reports, Check Report, Summary Report and DevMan Report.
- `Libraries:`
  - `Shared Library` - EESL, VMAC and LOGSYS.
  - `Static Library` - EESL and VMAC.

- Include - contains header files required for developing VMAC applications.
- Docs - contains Verix eVo Multi-App Conductor Programmers Guide.
- Tools - contains resource compiler tool and the associated utilities.
- Template - contains template file for Device Mapping Resource Table.
- Samples - contains sample applications to demonstrate VMAC capabilities:
  - COMMONAPP
  - VMACSMPL
- VMACIF - this is a bridge application working between VMAC and Verix EOS components.

NOTE

For more details on samples refer to the corresponding ReadMe files.

Tools

Comprises of various tools and utilities for developing applications for Verix eVo terminals.

Installed Folders

Tools installation folder contains the following tools and utilities:

Tools available in Verix eVo

- `VERIXVWIZARD` - a custom application wizard to generate a sample application project workspace. This workspace contains template code for developing an application. The wizard guides you through a process of selecting the following options and helps to generate a template code:
  - Verix eVo is the target platform.
  - Verix eVo ACT or SDK based application.

  - Single application or VMAC based application.
  - Application using static library or shared library.
- `FORMCVT` - utility for compiling printer template files.
- `TXOFILE` - PC-based utility that allows you to quickly and easily generate TXO-compatible files, and to download them to Verix eVo based terminals.
- `GENDATA` - utility for compiling gendata resource files.
- `RCK2` - resource compiler to generate binary resource from ASCII templates and resources.

Font Generation Tool

The Font Generation Tool is a GUI application which allows you to create, edit, and manage display font files (VFT and FON), printer font files (PFT), and printer logo files (LGO). The tool supports the P3700 printer.

The main advantage of using Font Generation Tool is that you can generate font files without the knowledge of font file formats. The Font Generation Tool provides the following functionalities:

- Generate display font files (VFT and FON file formats): allows to edit and create display font files in VFT and FON formats. These can be of 6x8, 8x16 and 16x16 resolutions.
- Generate printer fonts (PFT file format): allows to create printer font files in the PFT format in 5x8, 8x8 (supported by P950), 8x14 (32- and 42-column resolution), 16x16, 24x24, 32x32, 48x48 and 64x64 resolutions. It also enables editing of existing PFT files.
- Generate printer logo image files (LGO file format): allows to view printer logo files used to print graphics on printable receipts.
- Convert bitmap files to VFT and LGO files: supports the conversion of bitmaps to display font or logo files. To convert a Windows bitmap file to display, font or logo files, the bitmap file must be monochromatic. You can choose an area of 128x64 for the terminal to convert a bitmap to VFT file. To convert a bitmap file to printer logo file, select an area not exceeding 384x240 pixels, which is the maximum resolution of printer.
- Merging multiple VFT and FON font files: supports merging multiple VFT and FON files into a single VFT or FON file. A wizard guides you through the steps required for merging the files.

  You can select characters by specifying the range from the input file to the output file. Also, you can specify an offset value from where the input file characters need to be merged into the output file.
- Convert standard Windows® TTF fonts to VeriFone fonts.
- Convert UNICODE fonts to VeriFone fonts.

Installed Folders

Components installed in the Typical installation option are:

- Bin - contains executables and batch files for Font Generation Tool.
- Samples - contains display font files, printer font files, logo files, and bitmap files.

NOTE

For more details on samples refer to the corresponding ReadMe files.

VeriShield FST

The VeriShield FST is used for authenticating the files you download to the terminal. Each file must be digitally signed using the smart card.

NOTE

Without authentication, applications do not execute on the terminals.

Installed Folders

VeriShield FST installation folder contains:

- Certificate - contains the default certificate and key files.
- Microsoft Smart Card Base components.
- Smart Card reader drivers.
- HP Multi Card Access Enabler for PKCS#11.
- VeriShield FST.

VeriFind

The VeriFind Test Automation Tool is an integrated testing tool that aids testing applications written for Verix eVo terminals. This Windows-based tool simulates user actions, such as key presses and magnetic card swipes, which help automate the execution of test suites. It provides a scripting utility, file transfer utility, screens on the terminal, RAM status, date and time as in the terminal, and records user actions to play back later.

Installed Folders

VeriFind installation folder contains:

- VeriFind tool.
- Data - contains a card data file.
- Docs - contains file listing the recent changes.
- Hlp - contains *VeriFind Online Help*.
- SQAUtils - contains functions used for testing libraries and applications.
- Target - contains files pertaining to different terminals.
- Utils - contains utilities used by VeriFind.

- Samples - contains samples demonstrating usage of VeriFind tool.

NOTE

For more details on samples refer to the corresponding ReadMe files.

VeriPrint

VeriPrint Printer Simulator is a generic printer simulator for various VeriFone printers (for example V^{x}5xx ITP and P3700). This is a Windows-based tool. The main advantage of using VeriPrint is to save printer stationery that would otherwise be used while testing and debugging applications. It supports two formats:

- Display printer file - this format of fonts are used to display the font on the terminals, saved as `.VFT` file.
- Logo File – this format of fonts are used as a logos, saved as `.lgo` file.

Installed Folders

VeriPint installation folder contains:

- VeriPrint tool and required `.dll` files.
- Hlp - contains *VeriFind Online Help*.
- Sample - contains samples that demonstrate how to use the VeriPrint tool to simulate.

NOTE

For more details on samples refer to the corresponding ReadMe files.

- VFIPrinters - contains configuration files for VeriFone printers.

Verix eVo AutoDL

AutoDL is an application that automates checking and downloading application updates from the server to the terminal.

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