

General Specifications

GS 33J10D60-01EN

VP6E5425, VP6E5426, VP6E5427
Expanded Test Functions
FCS Simulator Package
HIS Simulator Package



[Release 6]

■ GENERAL

This document describes about specifications of Expanded Test Functions and FCS/HIS Simulator Packages that run on a human interface station (HIS).

■ FUNCTIONAL SPECIFICATIONS

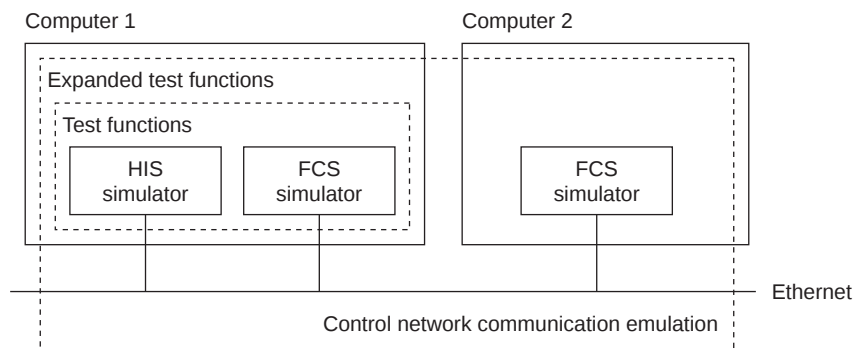
This package establishes intercommunications for FCS simulator, operation and monitoring functions, and engineering functions among several computers via Ethernet network when used together with the virtual test functions of VP6E5420 test function package. With the addition of the UACS simulator, UACS alarm management can be simulated among multiple computers. (*1) In the environment where ProSafe-RS safety instrumented system is integrated with CENTUM VP (*2), SCS simulator can also be used. When Exatif DCS Interface for Training Simulator (CENTUM VP Version) is used, a training simulator system can be configured by connecting a dynamic simulator and the CENTUM VP system (*3).

For a computer to launch FCS simulator using its engineering function, the expanded test functions (license) and the test function package are required. When configuring a simulator system which consists of several computers, at least a computer with the expanded test functions is mandatory. Examples of systems using the expanded test functions and the software packages required per each computer are explained as shown below.

- *1: For testing using the UACS simulator, refer to the General Specification (GS) "VP6A2500 Unified Alarms and Conditions Server (UACS), VP6A2505 UACS Simulator Package, VP6A2510 UACS Advanced Suppression Function, VP6A2580 UACS Multiple Project Connection Package, VP6A2700 UACS Client License" (GS 33J05D30-01EN).
- *2: Refer to the GS of the safety control functions package (GS 32Q03B10-31E and GS 32Q03B20-31E) for the test using the SCS simulator.
- *3: Exatif is a product of Omega Simulation Co., Ltd. For details of its functions, refer to the GS issued by Omega Simulation Co., Ltd.

● Case 1: Test using FCS simulators in several computers

- In Computer 1, the test function license is installed consisting of the FCS simulator function and the HIS simulator function. This FCS simulator is launched by using the engineering function in the Computer 1.
- In Computer 2, the FCS simulator license is installed. The engineering function in the Computer 1 can be used to remotely launch the FCS simulator in the Computer 2. (FCS simulator remote start/stop function).



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The table below shows the software licenses required for each computer.

License	Computer 1	Computer 2
VP6H1100 Standard Operation and Monitoring Function	X	—
VP6E5100 Standard Engineering Function	X	—
VP6E5420 Test Function	X	—
VP6E5425 Expanded Test Functions	X	—
VP6E5426 FCS Simulator Package	—	X
VP6E5427 HIS Simulator Package	—	—
VP6F1□00 Control Function for Field Control Station or VP6F1□05 Control Function for FCS Simulator VP6F8100 Compressor Control for FCS or VP6F8105 Compressor Control for FCS Simulator	X (*1)	X (*1)

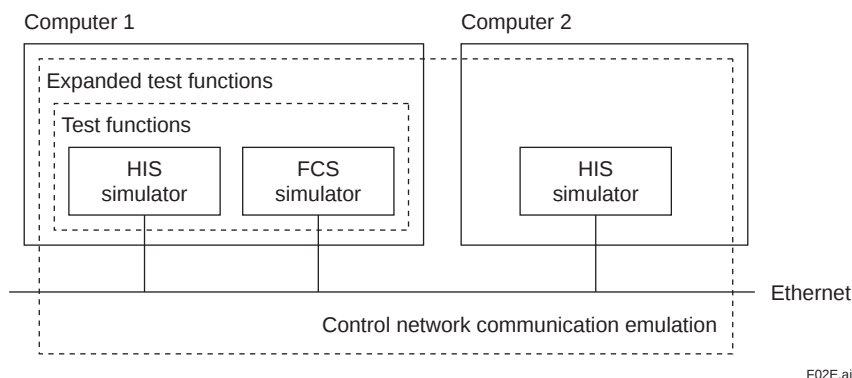
X: Required —: Not Required

*1: In order to perform the virtual tests, licenses of the control function for field control station and optional software are required in accordance with the number of the FCS in the CENTUM VP project and/or the number of the SCS in the ProSafe-RS project to be used in the plant.
Refer to “■ Operating environment / ● Software requirement” for more details.

This table shows the minimum set of software licenses required for each computer to configure a simulator environment. For other optional functions, add software licenses as necessary.

● Case 2: Test using HIS simulators in several computers

- The HIS simulator is launched from the computer to perform the HIS simulator.
- In Computer 1, the test function license is installed consisting both the FCS simulator function and the HIS simulator function. This HIS simulator is launched in the Computer 1.
- In Computer 2, the HIS simulator license is installed. This HIS simulator runs on the Computer 2.



The table below shows the software licenses required for each computer.

License	Computer 1	Computer 2
VP6H1100 Standard Operation and Monitoring Function	X	X
VP6E5100 Standard Engineering Function	X	—
VP6E5420 Test Function	X	—
VP6E5425 Expanded Test Functions	X	—
VP6E5426 FCS Simulator Package	—	—
VP6E5427 HIS Simulator Package	—	X
VP6F1□00 Control Function for Field Control Station or VP6F1□05 Control Function for FCS Simulator VP6F8100 Compressor Control for FCS or VP6F8105 Compressor Control for FCS Simulator	X (*1)	—

X: Required —: Not Required

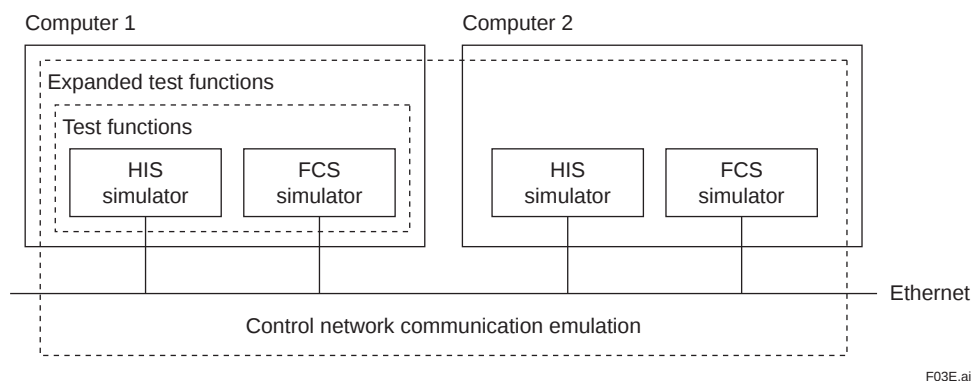
*1: In order to perform the virtual tests, licenses of the control function for field control station and optional software are required in accordance with the number of the FCS in the CENTUM VP project and/or the number of the SCS in the ProSafe-RS project to be used in the plant.
Refer to “■ Operating environment / ● Software requirement” for more details.

This table shows the minimum set of software licenses required for each computer to configure a simulator environment. For other optional functions, add software licenses as necessary.

● Case 3: Testing FCS simulators in several computers from HIS simulators in several Computers

The following test environment can be configured by combining the simulator functions.

- In Computer 1, the test function license is installed consisting of the FCS simulator function and the HIS simulator function. Both the FCS simulator and the HIS simulator can run on the Computer 1.
- In Computer 2, the FCS simulator license and the HIS simulator license are installed. Both the FCS simulator function and the HIS simulator function can run on the Computer 2.



The table below shows the software licenses required for each computer.

License	Computer 1	Computer 2
VP6H1100 Standard Operation and Monitoring Function	X	X
VP6E5100 Standard Engineering Function	X	—
VP6E5420 Test Function	X	—
VP6E5425 Expanded Test Functions	X	—
VP6E5426 FCS Simulator Package	—	X
VP6E5427 HIS Simulator Package	—	X
VP6F1□00 Control Function for Field Control Station or VP6F1□05 Control Function for FCS Simulator VP6F8100 Compressor Control for FCS or VP6F8105 Compressor Control for FCS Simulator	X (*1)	X (*1)

X: Required —: Not Required

*1: In order to perform the virtual tests, licenses of the control function for field control station and optional software are required in accordance with the number of the FCS in the CENTUM VP project and/or the number of the SCS in the ProSafe-RS project to be used in the plant.
Refer to "■ Operating environment / ● Software requirement" for more details.

This table shows the minimum set of software licenses required for each computer to configure a simulator environment. For other optional functions, add software licenses as necessary.

● Connecting with upper layer applications

Connecting with Exaopc OPC interface package can be established by using the control network communication emulation.

■ SYSTEM CONFIGURATION

● Standard system configuration

Using the expanded test functions, several simulator functions can be installed in a single computer; however, considerations to CPU loading on each computer and communication loading among computers are needed when configuring a system. For instance, some simulation windows of the HIS simulator may occupy the CPU for a long time, which prevent other processes from running. In order for the simulator system to run stably for long hours, the CPU and communication loadings must be considered as shown below:

- The HIS simulator and the FCS simulator should not be installed in a single computer.
- A computer with Windows Server OS must be used for storing the project database when three or more computers are used for the test functions.

A typical simulator system configuration with considerations to the CPU loading and communication loading are as shown below.

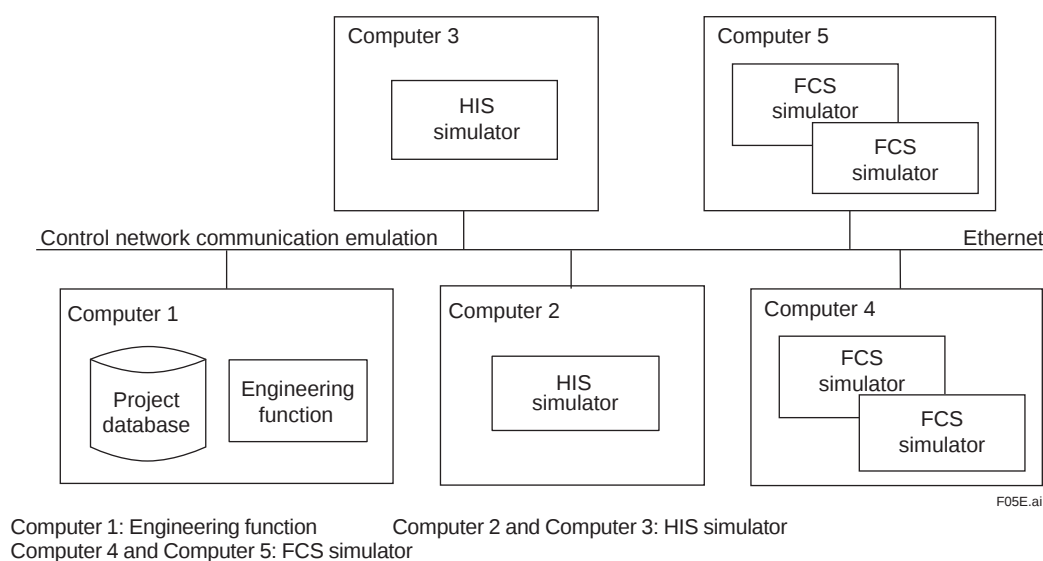


Figure Typical System Configuration

In this configuration, in order to prevent operational delay in responses due to the increased computer's loading, HIS simulator or FCS simulator does not run on a computer where the project database is stored (e.g. Computer 1 in the above figure). Instead, the HIS simulators run on Computer 2 and Computer 3, and the FCS simulators run on Computer 4 and Computer 5.

The table below shows the software package required for each computer. In this system configuration, the FCS simulator is remotely launched from the Computer 1's engineering functions. Thus, standard engineering function, test function, and expanded test functions must be placed in the Computer 1.

Software Package	Computer 1	Computer 2	Computer 3	Computer 4	Computer 5
VP6H1100 Standard Operation and Monitoring Function	—	X	X	—	—
VP6E5100 Standard Engineering Function	X	—	—	—	—
VP6E5420 Test Function	X	—	—	—	—
VP6E5425 Expanded Test Functions	X	—	—	—	—
VP6E5426 FCS Simulator Package	—	—	—	X	X
VP6E5427 HIS Simulator Package	—	X	X	—	—
VP6F1□00 Control Function for Field Control Station or VP6F1□05 Control Function for FCS Simulator VP6F8100 Compressor Control for FCS or VP6F8105 Compressor Control for FCS Simulator)	—	—	—	X (*1)	X (*1)

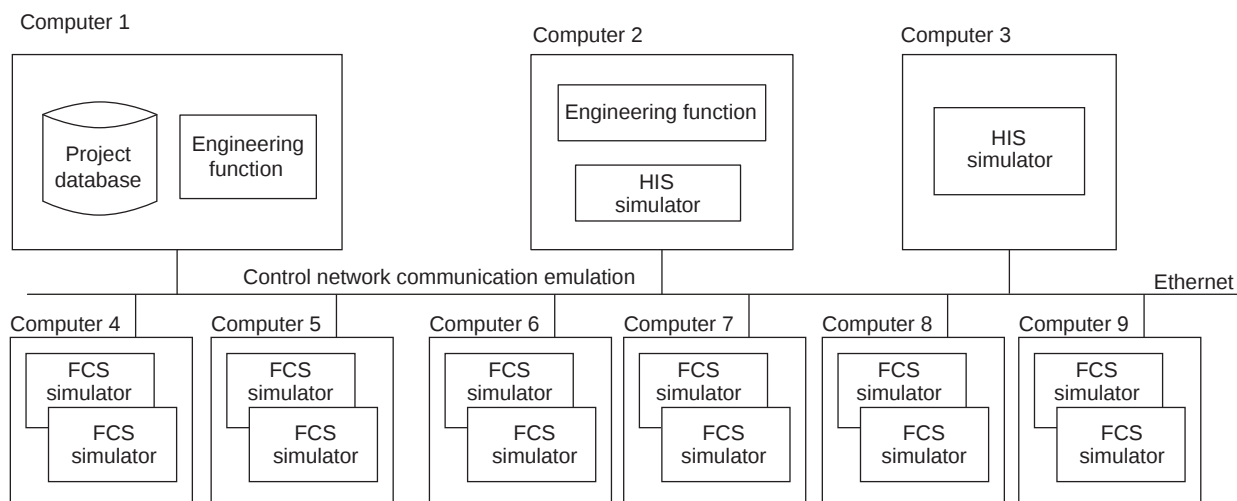
X: Required —: Not Required

*1: In order to perform the virtual tests, licenses of the control function for field control station and optional software are required in accordance with the number of the FCS in the CENTUM VP project and/or the number of the SCS in the ProSafe-RS project to be used in the plant.
Refer to "■ Operating environment / ● Software requirement" for more details.

This table shows the minimum set of software licenses required for each computer to configure a simulator environment. For other optional functions, add software licenses as necessary.

● Large-scale System Configuration

When the expanded test functions are applied for configuring a large-scale simulator system, computers for the HIS simulator and the FCS simulator need to be independent. In the figure shown below, the HIS simulators run on Computer 2 and Computer 3 and the FCS simulators run on Computer 4 to 9. The FCS simulator can be remotely launched using the engineering functions in the Computer 1 and 2; but the HIS simulator does not run on the Computer 1 in this configuration.



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Computer 1: Engineering function
Computer 3: HIS simulator

Computer 2: Engineering function and HIS simulator
Computer 4 - Computer 9: FCS simulator

The table below shows the software licenses required for each computer.

License	Computer 1	Computer 2	Computer 3	Computer 4 to 9
VP6H1100 Standard Operation and Monitoring Function	—	X	X	—
VP6E5100 Standard Engineering Function	X	X	—	—
VP6E5420 Test Function	X	X	—	—
VP6E5425 Expanded Test Functions	X	X	—	—
VP6E5426 FCS Simulator Package	—	—	—	X
VP6E5427 HIS Simulator Package	—	—	X	—
VP6F1□00 Control Function for Field Control Station or VP6F1□05 Control Function for FCS Simulator VP6F8100 Compressor Control for FCS or VP6F8105 Compressor Control for FCS Simulator	—	—	—	X (*1)

X: Required —: Not Required

*1: In order to perform the virtual tests, licenses of the control function for field control station and optional software are required in accordance with the number of the FCS in the CENTUM VP project and/or the number of the SCS in the ProSafe-RS project to be used in the plant.
Refer to "■ Operating environment / ● Software requirement" for more details.

This table shows the minimum set of software licenses required for each computer to configure a simulator environment. For other optional functions, add software licenses as necessary.

The standard engineering function, the test function, and the expanded test functions are installed in the Computer 1 and Computer 2, and the FCS simulator can be remotely launched using the engineering functions in these computers. Refer to "■ APPLICATION CAPACITIES," for the limitations in using the software:

- In a large-scale system when the total number of the FCS/SCS simulators exceeds the maximum number of those to be launched by a computer for engineering, two or more computers for engineering are required as shown in the above configuration.
- Up to eight FCS/SCS simulators can run on a single computer.

● Connecting with Exatif Plant Expert System

The Exatif supports control network interface to create a training environment for a plant expert system. Unlike an ordinary test system, the plant expert system must be configured based on the “● Standard system configuration” for more stable operations for longer period of time.

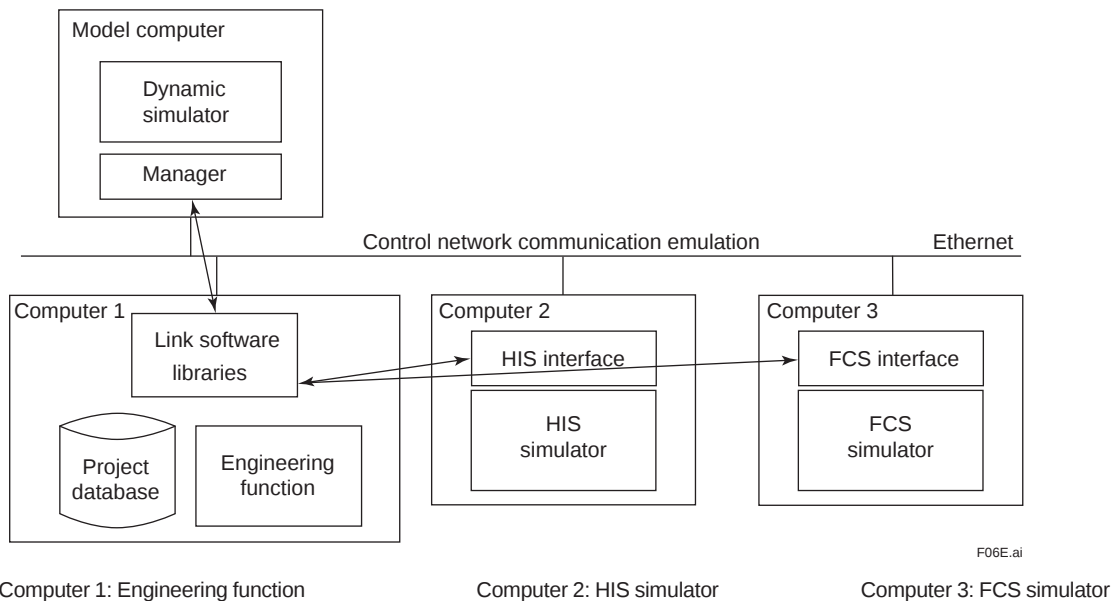


Figure Training Simulator System Configuration

The following software licenses are required on each computer.

License	Computer 1	Computer 2	Computer 3	Note
VP6H1100 Standard Operation and Monitoring Function	—	X	—	
VP6E5100 Standard Engineering Function	X	—	—	
VP6E5420 Test Function	X	—	—	Including the FCS simulator and the HIS simulator
VP6E5425 Expanded Test Functions	X	—	—	
VP6E5426 FCS Simulator Package	—	—	X	
VP6E5427 HIS Simulator Package	—	X	—	
VP6F1□00 Control Function for Field Control Station or VP6F1□05 Control Function for FCS Simulator VP6F8100 Compressor Control for FCS or VP6F8105 Compressor Control for FCS Simulator	X (*1)	—	X (*1)	
Exatif	X	X	X	Install this license in each computer. e.g. Link software libraries, HIS interface, and FCS interface

X: Required —: Not Required

*1: In order to perform the virtual tests, licenses of the control function for field control station and optional software are required in accordance with the number of the FCS in the CENTUM VP project and/or the number of the SCS in the ProSafe-RS project to be used in the plant.
Refer to “■ Operating environment / ● Software requirement” for more details.

This table shows the minimum set of software licenses required for each computer to configure a simulator environment. For other optional functions, add software licenses as necessary.

■ APPLICATION CAPACITIES

Number of FCS/SCS simulators to run per computer: Max. 8

Number of FCS/SCS to be connected: Max. 128

Number of HIS to be connected: Max. 32

Number of computer to be connected: Max. 48 (*1)

Number of FCS/SCS simulators that a single computer for engineering (*2) can launch: Max. 40 (*3)

*1: Including the number of computers where the Exaopc OPC interface package is installed.

*2: For example, the Computer 1 and the Computer 2 in “● Large-scale System Configuration” are the computers for engineering.

*3: The number is valid under the condition that only the standard engineering function, the test function, and the expanded test functions run on a computer for engineering. The maximum number of the FCS/SCS simulators becomes less when other applications run on the same computer.

■ REMARKS FOR SYSTEM CONFIGURATIONS

- When connecting with the Exapoc OPC interface with the FCS/SCS simulators, refer to the license's capacity of the Exaopc.
- When three or more computers are used for simulation tests, the project database has to be stored in a computer where the Windows Server OS is installed.

■ OPERATING ENVIRONMENT

The expanded test functions, the FCS simulator package, and the HIS simulator package run on a computer (IBM PC/AT compatible).

● Hardware Requirement

The hardware requirements conform to VP6E5100 Standard Engineering Function. Ethernet is required as a communication device. (*1)

*1: 1 Gbps Ethernet is mandatory for configuring the Exatif plant expert system.

● Software Requirement

The software requirements conform to VP6E5100 Standard Engineering Function.

For the simulator system configured by using the expanded test functions applied on multiple computers, the following software licenses are required. For configuring a plant training system, the Exatif plant expert system license from Omega Simulation Co., Ltd. is required. Refer to the descriptions and examples in this document for each software licenses required for each computer.

The required licenses:

For VP6E5425 Expanded test functions:

VP6E5100 Standard engineering function

VP6E5420 Test function (*1)

In case the HIS simulator runs on a computer where VP6E5425 is installed, VP6H1100 Standard operation and monitoring function is also required.

For VP6E5426 FCS simulator license:

No other license is required.

For VP6E5427 HIS simulator package:

VP6H1100 Standard operation and monitoring function

*1: Including the FCS simulator function and the HIS simulator function.

When the models of AFV30□, AFV40□, A2FV50□, and A2FV70□ are used either for the target test or the virtual test, following software licenses are required.

VP6F1700 Control Function for Field Control Station (for AFV30□/AFV40□)
 VP6F1705 Control Function for FCS Simulator (for AFV30□/AFV40□)
 VP6F1800 Control Function for Field Control Station (for A2FV50□)
 VP6F1805 Control Function for FCS Simulator (for A2FV50□)
 VP6F1900 Control Function for Field Control Station (for A2FV70□)
 VP6F1905 Control Function for FCS Simulator (for A2FV70□)
 VP6F8100 Compressor Control for FCS
 VP6F8105 Compressor Control for FCS Simulator

In order to perform the virtual tests, licenses of the control function for field control station and optional software are required in accordance with the number of the FCS in the CENTUM VP project and/or the number of the SCS in the ProSafe-RS project to be used in the plant. For segregating the virtual test environment from the target test with the target FCS or SCS, software licenses for those FCS and SCS are required.

■ MODELS AND SUFFIX CODES

		Description
Model	VP6E5425	Expanded Test Function
Suffix Code	-V	Software license
	1	Always 1
	1	English version

		Description
Model	VP6E5426	FCS Simulator Package
Suffix Code	-V	Software license
	1	Always 1
	1	English version

		Description
Model	VP6E5427	HIS Simulator Package
Suffix Code	-V	Software license
	1	Always 1
	1	English version

■ ORDERING INFORMATION

Specify model and suffix codes.

■ TRADEMARK ACKNOWLEDGMENT

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