SIEMENS Introduction Selecting suitable hardware Installing/removing the 3 WinAC RTX F 2009 software package **SIMATIC Technical data** Industrial software WinAC RTX F 2009 Downloading and commissioning the safety program Archiving and restoring **Product Information** safety programs

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

! DANGER

indicates that death or severe personal injury will result if proper precautions are not taken.

WARNING

indicates that death or severe personal injury may result if proper precautions are not taken.

CAUTION

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

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Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be adhered to. The information in the relevant documentation must be observed.

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Table of contents

1 In	Introduction	
1.	.1 Introduction	5
2 S	Selecting suitable hardware	
2.	.1 Selecting suitable hardware	7
3 In	Installing/removing the WinAC RTX F 2009 software package	
3.	.1 Installing/removing the WinAC RTX F 2009 software package	11
4 To	Technical data	
4.	.1 Quantity structure and technical specifications	13
5 D	Downloading and commissioning the safety program	
5.	.1 Downloading and commissioning the safety program	17
6 A	Archiving and restoring safety programs	
6.	.1 Archiving and restoring safety programs	19
6.	.2 Special considerations relating to the "Data Storage" function	21
6.	.3 Special considerations in creating and importing images	23
In	ndex	25

Introduction

1.1 Introduction

Meaning of this product information

This product information contains important information about WinAC RTX F 2009, version V4.5 (menu command **Start > Simatic > Information > Installed Software**), order number 6ES7671-1RC07-0YA0. It shall be regarded as a separate part and in case of doubt have priority in bindingness over other statements in the manuals and catalogs.

Scope of this product information

This product information is valid for the Windows Automation Center Failsafe with real-time expansions (WinAC RTX F 2009, version 4.5) software package, which includes the following components:

- Windows Logic Controller RTX F (WinLC RTX F V4.5)
- IntervalZero RTX V8.1, Service Pack 1
- WinAC Time Synchronization V4.1
- Automation License Manager V4.0
- License for SIMATIC NET 2008 V7.1 HF1 incl. Softnet S7 Lean V7.1

In this product information we describe the specific features of WinAC RTX F 2009 in comparison to WinAC RTX 2009 with the order number 6ES7671-0RC07-0YA0.

WinAC RTX F 2009 software package

WinAC RTX F 2009 is an F-capable software PLC, that runs on a standard computer (PC) with real-time expansions. WinAC RTX F 2009 provides the same functionality as WinAC RTX 2009 and as an F-CPU (F-capable CPU).

WinAC RTX F 2009 is approved for use in S7 Distributed Safety F systems. This means that a safety program created with S7 Distributed Safety can run with WinAC RTX F 2009 on the PC.

Additional required documentation

You require the following documentation when using WinAC RTX F 2009. The current product information is only a supplement to these manuals.

- Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual, 07/2009 edition
- S7 Distributed Safety, configuring and programming (http://support.automation.siemens.com/WW/view/en/22099875) Programming and Operating Manual, 10/2007 edition

1.1 Introduction

Reading the Readme file

You can find important current product information about the supplied software in the Readme file (for example, which Windows versions are supported). You can display the Readme file during the setup process or open it later via the menu command **Start > Simatic > Information > English**

Important Note for Maintaining Operational Safety of Your System

Note

The operators of systems with safety-related characteristics must adhere to operational safety requirements. The supplier is also obliged to comply with special product monitoring measures. To keep you informed, a special newsletter is therefore available containing information on product developments and properties that are important (or potentially important) for operating systems where safety is an issue. To ensure that you are always upto-date and able to make changes to your system, it is necessary that you subscribe to the appropriate newsletter. To do this, got to the Internet (http://www.siemens.com/automation/csi_en_WW/news).

There, you can register for the following newsletters:

- Embedded/PC-based Automation
- SIMATIC S7-300/S7-300F
- SIMATIC S7-400/S7-400H/S7-400F/FH
- Distributed I/O
- SIMATIC Industrial Software

Select the "Updates" check box for each newsletter.

Selecting suitable hardware

2.1 Selecting suitable hardware

Hardware requirements

The same system requirements apply for WinAC RTX F 2009 as for WinAC RTX 2009. The system requirements are described in the Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual.

Using systems with Programmable Interrupt Controller (PIC)

Older PC systems with Programmable Interrupt Controllers (PIC) are not suitable for WinAC RTX F 2009.

Using removable media (for example, Micro Memory Card, Flash Card or hard disk)

When using removable media there can sometimes be long waiting periods during the memory reset of the WinAC RTX F ("memory reset" see Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual).

Use the corresponding high-performance memory media.

F-capability of the hardware

The hardware used must be compliant for a safety program created with S7 Distributed Safety. You can find a complete, up-to-date list of the hardware tested for F-capability in the Internet at ID 35924276

(http://support.automation.siemens.com/WW/view/en/10805639/133100).



Use a hardware that meets the environment and application conditions, as well as the electromagnetic compatibility.

Using System Management Interrupts (SMI)

A System Management Interrupt (SMI) can influence the real-time behavior of PC systems and result in a stop of the F controller (F-capable controller). In case of an SMI, the PC hardware will switch to System Management Mode (SMM) which executes special system functions. There will be a delay in the cyclic behavior of the real-time operating system that WinAC RTX cannot prevent and that may affect availability.

SMIs may be triggered by monitor switch, volume control and control of brightness via special function keys as they are found on notebooks.

We recommend that you operate systems that are not subject to a significant impact on real-time behavior through SMIs (see ID 35924276 (http://support.automation.siemens.com/WW/view/en/10805639/133100)).

Type tests

WinAC RTX F based F controllers respond fail-safe even with increased electromagnetic interference. Special type tests for functional safety are therefore not required for these F controllers – contrary to F I/O devices.

Testing the F capability of the hardware



If you use F-capable hardware that is not included in the above list, you have use a special software to test the F capability.

The software for the testing is available on your PC once WinAC RTX F 2009 has been installed.

For series PCs with identical hardware (motherboard), you only have to perform the test once as an example.

Assignment of IRQ 8 to the real-time clock

Operation of WinAC RTX F 2009 requires permanent assignment of IRQ 8 (Interrupt Request 8) to the real-time clock (CMOS/real-time clock system). If this is not the case, for example by assigning IRQ 8 to the High Precision Event Timer (HPET), then the system is not suitable for operation with WinAC RTX F 2009.

Under Windows XP you can check the assignment of IRQ 8 prior to the installation of WinAC RTX F 2009 as follows:

- 1. Select START > Settings > Control Panel > System > Hardware tab > Device Manager.
- 2. In View select "Resources by type".
- 3. Under "Interrupt request (IRQ)" check the assignment of IRQ 8 to the real-time clock.

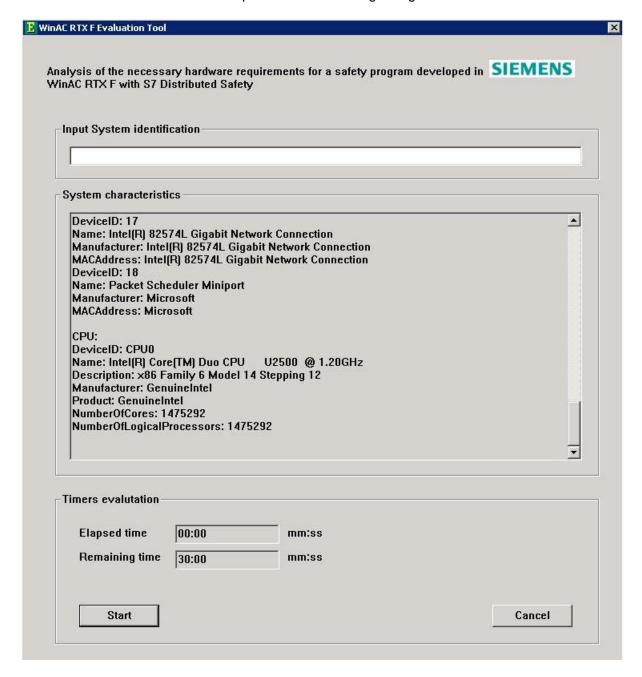
Procedure for testing the F capability of the hardware

Requirement: The WinAC RTX F 2009 software, version V4.5, must be installed on the PC.

To test the F capability, follow these steps:

1. Start the software for testing the F capability under WinAC RTX F, via **START > SIMATIC** > **PC Based Control > WinAC RTX F Evaluation Tool**.

The software opens with the following dialog box:



2.1 Selecting suitable hardware

- 2. Enter an appropriate system designation for your hardware.
- 3. Start the test with the "Start" button.

Result: Data for identifying your hardware (for example, MAC address, CPU ID) are displayed in the "System Information" field. After the expiry of the period for the test, you receive a message indicating whether the F capability of the hardware was determined or not.

The data for the identification of the hardware and the result of the test are offered for saving as a text file.

Note

Note that if you save the file in the installation path of WinAC RTX F, the file will be deleted when if you uninstall WinAC RTX F.

PROFIBUS and PROFINET conformity

You can find a complete, up-to-date list of the hardware tested for PROFIBUS and PROFINET conformity for WinAC RTX F 2009 in the Internet at ID 35923715 (http://support.automation.siemens.com/WW/view/en/10805639/133100).

Installing/removing the WinAC RTX F 2009 software package

3.1 Installing/removing the WinAC RTX F 2009 software package

Installing the WinAC RTX F 2009 software, version V4.5

To install WinAC RTX F, following the WinAC RTX installation instructions. Your PC must satisfy certain system requirements for the installation.

The installation and the system requirements are described in the Windows Automation Center RTX WinAC RTX 2009

(http://support.automation.siemens.com/WW/view/en/10805639/133300) manual.

Software requirements for WinAC RTX F 2009, version V4.5

Table 3-1 Software requirements

You want to use WinAC RTX F 2009 for	You then require
Applications of safety technology	STEP 7 Version 5.4 + SP5 or later + HSP178 for WinAC RTX F 2009 on Embedded Controller + HSP179 for WinAC RTX F 2009 on PC station
	Optional package S7 Distributed Safety V5.4 + SP5 or later
Standard applications	STEP 7 Version 5.4 + SP5 or later + HSP178 for WinAC RTX F 2009 on Embedded Controller + HSP179 for WinAC RTX F 2009 on PC station

PC with multiple Windows installations



If you are using a PC with multiple Windows installations (for example, via Boot Manager), only one WinAC RTX F 2009 may be installed on this PC.

3.1 Installing/removing the WinAC RTX F 2009 software package

Technical data

4.1 Quantity structure and technical specifications

PROFIsafe mode

WinAC RTX F 2009 supports PROFIsafe V1 and PROFIsafe V2 mode.

F local data parameters

You can configure the local data for each priority class for the WinAC RTX F. Therefore, assign the largest possible area of local data for the priority classes, in which the safety program (the F-CALL blocks) are called (for example OB 35) (also refer to the S7 Distributed Safety, configuring and programming

(http://support.automation.siemens.com/WW/view/en/22099875) manual).

Probabilities of failure

The following table shows the failure probabilities for a WinAC RTX F based controller with S7 Distributed Safety:

Table 4-1 Failure probability values WinAC RTX F

Operation in Low Demand Mode	Operation in High Demand or Continuous Mode	Proof-test interval
Low demand mode (average probability of failure on demand)	High demand/continuous mode (probability of a dangerous failure per hour)	
< 1E-04	< 3E-09	10 years

Safety-oriented communication

With WinAC RTX F you have the same options of safety-oriented communication as with other F-CPUs (such as CPU 416F-3 PN/DP) in S7 Distributed Safety F systems.

The configuration and programming of the communication are described in the S7 Distributed Safety, configuring and programming (http://support.automation.siemens.com/WW/view/en/22099875) manual.

4.1 Quantity structure and technical specifications

Start-up protection for inconsistent safety program

In connection with the safety program, WinAC RTX F supports the recognition of an inconsistent safety program. During startup WinAC RTX F recognizes an inconsistent safety program, the F controller goes to STOP and the following diagnostic event is entered in the diagnostic buffer of the F controller:

"Inconsistent safety program"

Restrictions with SFC 22 "CREAT_DB", SFC 23 "DEL_DB", SFC 82 "CREA_DBL" and SFC 85 "CREA_DB"

F-DBs cannot be generated or deleted.

Restrictions with SFC 83 "READ DBL" and SFC 84 "WRIT DBL"

The destination address may not point to an F-DB.

Restriction in the configuration of the retentive behavior of the data block.

The configuration of data block retentivity is not supported for F-DBs. This means that the actual values of the DB are non-retentive at POWER ON/OFF and restart (STOP-RUN) of the CPU. The F-DBs receive the initial values from the load memory. The "Non-retain" ("non-retentive") check box must be selected and grayed out in the block properties of the F-DBs.

Calculation of the runtimes of the F-run-time groups

To support the approximate calculation of the F-run-time group runtimes of the safety program with WinAC RTX F 2009, the Excel file S7fcotia.xls (http://support.automation.siemens.com/WW/view/en/25412441) for S7 Distributed Safety is available on the Internet for sample hardware.

Operation of Embedded Controller with isolation module 6ES7195-7KF00-0XA0

Note

Unlike other modules, it is not permitted to plug the isolation module (order no. 6ES7195-7KF00-0XA0, production version 01 and 02) into the same racks as the F controller. This restriction no longer applies to version 03 or later of the isolation module.

Ensuring availability

You can find Information on ensuring availability in the "Setting the operation characteristics of the controller" chapter of the Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual.

Interference of the IRQ 8 by other applications

IRQ 8 (Interrupt Request 8), which is clocked by the means of the real-time clock (CMOS/real-time clock system) is required for the operation of WinAC RTX F 2009. Therefore, avoid software that affects the IRQ 8 (for example, multimedia applications or kernel debuggers) and do not change the device resources assignment of the IRQ 8 to the real-time clock.

Disable the power-saving functions of the computer

To ensure the real-time capability of the F controller, the power-saving functions of the computer have to remain disabled (see Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual).

Support of dedicated mode

On multiprocessor systems, WinAC RTX F 2009 supports only the dedicated mode of IntervalZero RTX.

Note

For availability reasons, it is prohibited to use the shared mode.

Operation on virtual machines



Operation on a virtual machine is not permitted for WinAC RTX F 2009.

Booting via network drive



Booting via a network drive is not permitted for WinAC RTX F 2009 and must be switched of in the BIOS.

4.1 Quantity structure and technical specifications

Downloading and commissioning the safety program

5

5.1 Downloading and commissioning the safety program

Downloading the safety program to WinAC RTX F

NWARNING

To ensure that the F controller does not contain an "old" safety program, proceed as follows when transferring the safety program to the F controller with a PG/PC:

- Perform a memory reset on the WinAC RTX F (see Windows Automation Center RTX WinAC RTX 2009
 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual).
- Load the configuration in HW Config to the WinAC RTX F (see Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual).
- 3. In the "Safety program" dialog, load the safety program the WinAC RTX F (see S7 Distributed Safety, configuring and programming (http://support.automation.siemens.com/WW/view/en/22099875) manual). If the function test of the safety program does not take place in the target F controller, you will also have to include steps 4. and 5.:
- Perform a program identification (i.e. check whether the complete signatures of all F blocks are identical with the F attribute of the block container online and offline (see S7 Distributed Safety, configuring and programming (http://support.automation.siemens.com/WW/view/en/22099875) manual).
- 5. Perform the startup of the F system (see S7 Distributed Safety, configuring and programming (http://support.automation.siemens.com/WW/view/en/22099875) manual).

Make sure that WinAC RTX F is not closed (for example, by POWER OFF/POWER ON or booting) between the online program identification and the startup of the F system.

Rules for inserting removable media (for example, Micro Memory Card, Flash Card or hard disk)

/!\warning

You must use an access protection to limit access to the WinAC RTX F to persons authorized to insert removable media.

You must ensure that the correct safety program is located on the inserted removable media, either by online program identification or by other measures (such as unique identification of the removable media).

5.1 Downloading and commissioning the safety program

Archiving and restoring safety programs

6.1 Archiving and restoring safety programs

Archiving and restoring with WinAC RTX

Via the WinAC RTX control panel, you use the archive command to save the configuration and the STEP 7 user program to an archive file (*.wld). You can quickly restore the configuration and the STEP 7 user program for the controller with the aid of the archive file.

Special consideration relating to archiving F data blocks

The current values for F-DBs are archived from the load memory, unlike data blocks whose values from the work memory are archived.

Protection of the archiving/restoring of safety programs

/ WARNING

You must use an access protection to limit access to the WinAC RTX F to persons who are authorized to archive and restore, for example by corresponding password protection for the controller panel of WinAC RTX F.

You can use either online program identification or the unique designation of the archive file * wld to determine whether the correct safety program exists in the archive file.

Creating archive files for WinAC RTX F 2009

You can create an archive file as in the standard, via STEP 7 or via the Controller Panel of WinAC RTX F.

/ WARNING

You must comply with the following points when creating an archive file:

- It is not permitted to archive safety programs in an existing archive file. Therefore, create a new archive file.
- Creating an archive file with STEP 7: Based on the collective signature in S7 Distributed Safety in the "Safety program" dialog box, make sure that it is the safety program that is to be archived.
- Create an archive file via the Controller Panel. To ensure that the correct safety program is available in WinAC RTX F, perform an online program identification.
- Assign a unique name for the archive file *.wld.

6.1 Archiving and restoring safety programs

Restoring only possible via the Controller Panel of WinAC RTX F



The restoring of a safety program is only permitted via the Controller Panel function "Restoring an S7 user program" and not via a function created with ODK (Open Development Kit) and CMI (Controller Management Interface).

Message during restoring a safety program



The successful restoring of safety program is indicated by a corresponding message. If this message does not appear, the restoring has failed. Perform the restoring again.

Further information

For more information on archiving and restoring configurations and STEP 7 user programs, refer to the Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual.

6.2 Special considerations relating to the "Data Storage" function

/ WARNING

You must use an access protection to limit the access to WinAC RTX F to persons authorized to handle WinAC RTX F data, for example by limiting access to the PC.

Changing the program and configuration path ("Data Storage" WinAC function)

/!\warning

When you change the program and configuration path you must comply with the following procedure to ensure that no safety program remains in the previous path:

- 1. Archive the safety program and the configuration (see chapter Archiving and restoring safety programs (Page 19)).
 - Alternatively, you can store the safety program and the configuration in STEP 7.
- Perform a memory reset on the WinAC RTX F (see Windows Automation Center RTX WinAC RTX 2009
 - (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual).
- Change the program and configuration path via the WinAC RTX F Controller Panel in the "Data Storage" tab (see Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual).
- 4. Restore the safety program and the configuration (see chapter Archiving and restoring safety programs (Page 19)).
 - Alternatively, you can load the safety program and the configuration from STEP 7 in the WinAC RTX F (see chapter Downloading and commissioning the safety program (Page 17)).

It is not permitted to overwrite data in the storage path for "Program and configuration"

/ WARNING

It is not permitted to overwrite data that was saved in the storage path for "Program and configuration" (see Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual).

Determine the storage path for "Program and configuration" as follows:

- 1. In the WinAC RTX F Controller Panel, select the **CPU > Tools > Options** menu command and open the "Data Storage" tab in the "Options" dialog box.
- 2. Determine the path set for "Program and configuration".

6.2 Special considerations relating to the "Data Storage" function

Disable extended write filter (EWF, FBWF) for data in the storage path for "Program and configuration"



It is not permitted to enable extended write filter (EWF, FBWF) for data in the storage path for "Program and configuration". Prevent activation of the write filter by implementing access protection for WinAC RTX F.

Further information

For more information on the "Data Storage" function and extended write filters, refer to the Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual.

6.3 Special considerations in creating and importing images

Creating an image

/ WARNING

You must comply with the following points when creating an image with a safety program:

- Use access protection to limit access to WinAC RTX F to persons who are authorized to create images.
- Before creating the image, you must use program identification to ensure that the correct safety program is available in WinAC RTX F.
- Images with safety programs must be created on an empty data carrier (deleted or formatted) or an existing image must be explicitly deleted.
- After creating the image, remove the data carrier containing the image.

Import image

WARNING

You must comply with the following points when importing an image with a safety program:

- You must use an access protection to limit access to the WinAC RTX F to persons authorized to import images.
- Make sure that there is no "old" safety program in the F controller. Perform a memory reset prior to importing (see Windows Automation Center RTX WinAC RTX 2009 (http://support.automation.siemens.com/WW/view/en/10805639/133300) manual).
- You must ensure that the correct safety program is located on the image, either by online program identification or unique identification of the data carrier.
- After importing the image, remove the data carrier containing the image.

Further information

For further information on images, refer to the documentation to your PC.

6.3 Special considerations in creating and importing images

Index

	Testing, 8
Α	F-runtime group
A	Runtimes, 14 Functional safety, 8
Archive file, 19 Archiving	Functional Salety, o
of F data blocks, 19	Н
of safety program, 19 Availability	Hardware
Ensuring, 14	F-capability, 7 Requirements, 7
В	1
Booting via network drive, 15	ı
	Image
С	Creating, 23 running, 23
	Importing of images, 23
Changing the configuration path, 21	Inconsistent safety program, 14
the program path, 21	Inserting
Communication	Removable media, 17 Installation, 11
Safety-oriented, 13	IRQ 8, 8, 15
Conformity PROFIBUS, 10	
PROFINET, 10	1
D	Local data, 13
Data storage, 21	M
Dedicated mode, 15 Downloading the safety program, 17	Multiple Windows installations, 11
,	
E	Р
EWF, 22	Parameters
Extended write filter, 22	F local data, 13
	Power-saving function of the computer, 15 PROFIBUS conformity, 10
F	PROFINET conformity, 10
F controllers, 14	PROFIsafe
F data blocks	V1 mode, 13
Archiving, 19	V2 mode, 13 Program identification, 17
F local data, 13	Proof-test interval, 13
Failure probability value, 13 FBWF, 22	•
F-capability of the hardware, 7	
-	

R

Removable media
Inserting, 17
Using, 7
Restoring
of safety program, 19
Retentive behavior of data blocks
Restrictions, 14

S

S7fcotia.xls, 14
Safety program
 Archiving, 19
 Downloading, 17
 Restoring, 19
Safety protector, 14
Safety-oriented communication, 13
Scope, 5
SFC
 Restrictions, 14
Shared mode, 15
Software requirements, 11

Start-up protection for inconsistent safety program, 14 Storage path for "Program and configuration", 21

T

Testing the F capability of the hardware, 8 Type test, 8

V

Virtual machine, 15

W

WinAC RTX F, 5 WinAC RTX F 2009 software package, 5 Windows installations Multiple, 11