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# SIMATIC

## S7-GRAPH V 5.6 Programming Software for Runtime Control with SIMATIC S7

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<http://www.siemens.com/industrialsecurity>

### Installation and Usage Notes

The information presented in these notes should be considered more up-to-date than information provided in other documents.

Please read these notes carefully because they contain important information about the installation and use of S7-GRAPH V5.6.

The version S7-GRAPH V5.6 is referred to simply as "S7-GRAPH" in the following.

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# **1        Corrections and Modifications to S7-GRAPH**

## **1.1      Changes from S7-GRAPH V5.6**

### **Operating systems**

The operating systems MS Windows 10 Pro and Enterprise, MS Windows Server 2012 and MS Windows Server 2016 are supported.

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## Installation Notes

The installation notes contain important information needed for the installation of the S7-GRAPH software. Please read these notes before beginning the installation.

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## 2 Contents of the Consignment

This DVD contains the complete software for S7-GRAPH Version V5.6.

The STEP 7 version is available in 5 languages and can be run using the operating systems listed in section 4.1.

S7-GRAPH Version V5.6 is supplied as the "S7-GRAPH V5.67" DVD in the delivery package described in the following together with a floating or upgrade license:

### **S7-GRAPH V5.6 (Floating License),**

Order number: 6ES7811-0CC07-0YA5

The delivery package includes:

- 1 DVD S7-GRAPH V5.6
- 1 License key stick
- 1 Certificate of license

### **S7-GRAPH V5.6 Upgrade (Floating License) (V3/V4/V5/V5.1/V5.2/V5.3-> V5.6)**

Order number: 6ES7811-0CC07-0YE5

The delivery package includes:

- 1 DVD S7-GRAPH V5.6
- 1 License key stick (upgrade license)
- 1 Certificate of license

### **Content of the DVD S7-GRAPH V5.6**

- S7-GRAPH V5.6
- Notes about the Product, "What's New?"
- Electronic manual, "Getting Started with S7-GRAPH"
- Electronic manual, "S7-GRAPH for S7-300/400"
- Converter for converting GRAPH 5 programs to S7-GRAPH
- Automation License Manager

The manuals are available on your computer following installation.

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## **3      Hardware Requirements**

In order to be able to work with the S7-GRAPH software, the requirements for operating STEP 7 must be fulfilled (see STEP 7 readme file).

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## 4 Software Requirements

### 4.1 Runtime Environment

#### Operating Systems

S7-GRAPH V5.6 is released for the following operating systems :

- MS Windows 7 Ultimate, Professional and Enterprise (64-bit), with SP1
- MS Windows 10 Pro and Enterprise (64-bit)
- MS Windows Server 2008 R2 (64-bit) with SP1 (Standard Edition as work station computer)
- MS Windows Server 2012 R2 (64-bit) (Standard Edition as work station computer)
- MS Windows Server 2016 (64-bit) (Standard Edition as work station computer)

The capability of running S7-GRAPH on any other operating systems is not guaranteed. Use on other operating systems is at the user's own responsibility..

### 4.2 Required Disk Space

S7-GRAPH uses approximately 40 MB of space on your hard disk.

Ensure that you abide by the STEP 7 rules that apply to disk space also here (see readme file for STEP 7).

### 4.3 Compatibility to STEP 7

S7-GRAPH V5.6 requires at least one of the following versions of STEP 7:

- STEP 7 V5.5 SP1
- STEP 7 V5.6

### 4.4 Upgrading an Older Version of S7-GRAPH

A valid license for S7-GRAPH V3.x, V4.x, V5.0, V5.1, V5.2 or V5.3 is required to install the upgrade package.



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**Note:**

Please note that an upgrade may call for a change of operating systems, because older operating systems (for example, MS Windows XP) are no longer supported as of S7-GRAPH V5.6 (cf. chapter 4.1). Additional notes on installation are included in the product information.

Before changing operating systems, the existing authorization/license key with the program AuthorsW/Automation License Manager must be backed up on a floppy disk or USB stick.

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## 5 Installation

### 5.1 Installation of S7-GRAPH

You can install S7-GRAPH V5.6 over an existing installation of S7-GRAPH. Older versions do not need to be uninstalled.

Before starting Setup, close all other applications (MS Word, etc.) and close the "Control Panel" window.

Insert the S7-GRAPH DVD in the drive. The installation of S7-GRAPH is performed with a user-guided setup. The installation program starts automatically when the S7-GRAPH DVD is inserted in the drive. If you have disabled the auto-play function on your computer, start the setup program manually by opening MS Windows Explorer and double-clicking on SETUP.EXE in the root directory of the DVD.

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#### Note

STEP 7 and S7-GRAPH register themselves in the MS Windows registry files. You should never use MS Windows tools such as the Explorer to move or rename STEP 7 and S7-GRAPH files and folders or to modify STEP 7 and S7-GRAPH information in the MS Windows registry. The program may not operate correctly if you fail to heed this warning.

The security settings of your system are modified during installation so that you can use STEP 7: Port 4410 for TCP is entered as an exception in the Windows Firewall.

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### 5.2 License Key for S7-GRAPH

Before you can work with S7-GRAPH, you need to transfer the license key (usage authorization) from the license key stick to the computer. You have two options in this regard:

- During the installation phase of the S7-GRAPH "Setup" program, you will receive a prompt when no suitable license key is installed on your computer. You can select to have the license key installed by the "Setup" program or to install it later using the Automation License Manager program.
- If you select not to install the license key at this time, the setup continues with the installation of the license key. When the setup is completed, you can restart your computer and install the license key with the menu command, Siemens Automation \Automation License Manage.

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### **Note**

The license key can be installed on any local drive.

The Automation License Manager prevents license keys from being installed on inadmissible drives or media such as RAM drives, floppies or compressed drives (e.g. DBLSPACE). If a drive of a computer is registered as "Removable disk drive" and not as a normal "Disk drive", it is treated as a DVD drive and is inadmissible as a storage location for license keys.

On compress drives you can install the license key on the corresponding host drive.

In any case, read the notes in the almreadme.rtf file for the Automation License Manager on the STEP 7 installations DVD in the folder, "InstData\Automation License Manager\ALM32\".

The "<Drive where the license key is installed>:\AX NF ZZ" contains hidden files. These files and its folder should never be deleted, moved or copied. They contain data required for the licensing of your software!

The license key may be permanently lost if this warning is not heeded.

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### **Note about using license keys correctly**

- The License key stick cannot be write-protected. Since the License key stick is not write-protected, it is susceptible to virus attack from the hard disk. You should therefore carry out a virus check on your programming device or PC before installing or removing a license key.
- If you use an optimization program that is capable of moving fixed blocks, you should first transfer the license keys from the hard disk to the License key stick before using this option.
- A specially marked cluster is created on the target drive when you install a license key. Some disk utilities show this cluster as "bad". Do not attempt to recover this cluster.
- Do not forget to transfer the license key to a License key stick before formatting, compressing or restoring your hard disk or installing a new operating system.
- If a backup of your hard disk contains copies of license keys, there is the danger that restoring the disk from a backup will overwrite the currently valid license keys and destroy them. To avoid the risk of overwriting a licensed system and thereby losing the license key, it is strongly recommended to either remove all license keys before making the backup or to exclude them from the backup at the start.

### **Using the trial license**

When no valid license key for S7-GRAPH is installed, a trial license key is used. This license key is always supplied and installed with S7-GRAPH. However, this license key only allows you to use S7-GRAPH for 21 days. The trial license is activated with a user prompt the first time S7-GRAPH starts and no valid license key is found.

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## 5.3 Removing S7-GRAPH

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### Note

Software products must be removed according to Microsoft Windows conventions, otherwise they cannot be uninstalled.

Use the removal function of the Windows operating system (in the taskbar under **Start > Settings > Control Panel > Add/Remove Programs**) to remove your software package or under Vista **Start > Settings > Control Panel > Programs and Features**.

You can also run the setup program to remove the program.

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## **Release Notes**

The information presented here should be considered more up-to-date than information provided in the manuals and online help.

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## 6 Notes about Configuration and Operation

### 6.1 S7-GRAPH Compliance with Standards

The exact definition of compliance with the standard can be found in the NORM\_TLB.RTF file in the subfolder which you selected during setup (default setting: C:\PROGRAM FILES\SIEMENS\STEP7). This document is also stored in WordPad format.

### 6.2 General

The general notes about configuration and operation of STEP 7 also applies to S7-GRAPH (see readme file for STEP 7). The following points deserve special attention:

**Umlauts or special characters** should not be used in the names of files, folders or projects.

**Screen saver:** If you use a screen saver, be aware that it takes CPU time and therefore may result in an overload on the system. It is known that some screen savers do not release their memory area when they close. This continually reduces the usable memory.

**Virus scanner:** The use of a virus scanner during runtime can lead to conflicts with hardware add-ons. It may result in blockage of the process interface to the modules when working with WinCC. This is exactly why a gatekeeper mechanism cannot be used for dynamic virus protection. It is recommended to run virus tests offline and activate the process interface only after a hardware reset. Furthermore, no unchecked data should be copied to a station.

**User data** (such as MS Word documents) should not be saved in STEP 7 project directories since it will be deleted when a STEP 7 project is deleted in the SIMATIC Manager. The data cannot be retrieved from the Windows Recycle Bin with the "Restore" command!

### 6.3 Switching to Different S7-GRAPH Versions

- Projects set up and edited as V3 projects with S7-GRAPH V3.0/4.0/V5.0/V5.1/V5.2/V5.3 can still be used as (current) projects unchanged with S7-GRAPH V5.6.
- The project data from S7-GRAPH V2.0 can be used in a V2 project in S7-GRAPH V5.6 without modifications being necessary.
- Different software versions of S7-GRAPH cannot be operated at the same time on a programming device/PC.

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## 6.4 Library and Example Projects

S7-GRAPH V5.6 includes a variety of libraries and example projects. These libraries and projects can be deleted in the SIMATIC Manager. Use the S7-GRAPH V5.6 setup program to install them again.

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### Note

The S7-GRAPH V5.6 libraries and example projects are always included in the S7-GRAPH installation. Any modified examples or libraries are overwritten by their original versions when S7-GRAPH V5.6 is reinstalled. For this reason, it is best to copy the examples and libraries and to only work with the copies.

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## 6.5 Version of Created Function Blocks

S7-GRAPH V5.x offers you several new functions that cannot be interpreted by S7-GRAPH Versions 4.0 or earlier. Created function blocks are automatically kept to the lowest possible version. In the simplest of cases, a version 3 block will be created. If you have chosen the synchronization options or the use of a standard block for the run time system, at least version 4 will be generated. Setting a user-defined interface or editing operations (insert or delete) in the interface, the use of timers, counters, arithmetic or assignment of operations, or the activation of mode selection locks unavoidably leads to version 5. You can see the version of the compiled block under Properties in the Block Comments box

Please note the effect of this setting when using one of the supplied standard blocks. If you have created a program with S7-GRAPH V4 that uses FC70 or FC71 you can keep these blocks even if you make changes unless the changes include functions that are only available as of V5.0 / V5.1. You would then have to replace FC70 or FC71 with FC72 and set the corresponding compiler options. Alternatively, you could, of course, also replace FC70 with FC72 (rename) in your block folder.

As of S7-GRAPH V5.1, the functionality of FC70/71 has been expanded. It is now possible to use these new function blocks when using timers, counters, arithmetic or assignments in actions.

When the block is saved, you will receive a message about the incorrect use of FCs.

## 6.6 Handling Message Numbers when Copying Sequencer Blocks and their Associated Instance DBs

When copying the FB/I-DB pairs to a new block folder, the messages will be created automatically with new numbers in the copy of the instance data. The S7-GRAPH FB must then be opened in the new folder and saved again and the "Create Instance DB" command executed.

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## 6.7 Status of Temporary Variables

In actions, the value for scan cycle checkpoint will be shown as the status. This leads unavoidably to the result that no status for temporary variables can be displayed.

## 6.8 CPUs with Block Buffers <= 8 KB

You cannot use FC72 if you use a CPU that works only with blocks of 8 KB or less. When using V5 features select the compilation option "Full code".

## 6.9 Using UDTs

As of S7-GRAPH V5.1, it is possible to use user-defined data types (UDTs) for variables in conditions or actions. You create UDTs with the basic STEP 7 package. Please read the relevant section in the online help of the STEP 7 program editor ("LAD/STL/FBD: Programming Blocks").

If you change a UDT definition that is used in an S7-GRAPH block, S7-GRAPH displays a time stamp conflict when you open such a block. This time stamp conflict is resolved automatically for a UDT with a simple structure and the accesses that have become invalid due to the changes are shown as being incorrect.

If changes are made to a nested UDT, this can lead to a time stamp conflict in the parent UDT. Automatic resolution of the conflict is then no longer possible. Therefore, update the nested UDT using the STEP 7 program editor or the "Check Block Consistency" function of the SIMATIC Manager.

## 6.10 Control Sequencer Dialog

If the mode of the sequencer is changed using the "Control Sequencer" dialog (for example from AUTOMATIC to MANUAL), a step should also be selected in the dialog.

Selecting a step using the block parameters S\_NEXT/S\_PREV/S\_SEL is not always possible. In the MANUAL mode, a step can, for example, only be selected from the set of active steps.

## 6.11 Jumping to a S7-GRAPH Block from a WinCC Picture

- The STEP 7 cross-reference list for an address can be launched in a WinCC operator control picture (depending on the configuration). The STEP 7 point of use of the address can be displayed in the cross-reference list. After selecting a point of use via a double-click, the block editor for the programming language (e.g. S7-GRAPH, LAD/FBD/STL) will be launched with the corresponding block. The cursor will be positioned on the respective location within the block.

WinCC transfers the mode (write-protected or not write-protected) to S7-GRAPH, in which the block is to be opened. If the write-protected mode has



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been configured in WinCC, the block cannot be changed offline. All other blocks will only be opened in this mode set.

S7-GRAPH is launched with an activated status and positioning on the active step when opened in the write-protected mode.

- You can also open the S7-GRAPH block directly from a WinCC operator control picture. The procedure for opening the block depends on the configuration (e.g. within a WinCC script via a suitable function). This way, it is possible to open S7-GRAPH blocks in the write-protected mode/status.

## **6.12 Update Calls**

The "Update Calls" menu command allows you to update an invalid block call.

However, it can only be used if the STEP7 block consistency check (SIMATIC Manager) was launched previously. If possible, the inconsistencies are corrected here automatically and the blocks are compiled. If an automatic correction is not possible, an error message is output in the output window. You can now open the block with the "Display Errors" command and display the area in the program you want to change.

If block calls that have become invalid are not yet corrected, you can do this via the Edit > Update Calls menu command.

## **6.13 Termination Address / Exclusion Address**

When a termination address is reached, the use of auxiliary networks for criteria analysis will be terminated (S7-PDIAG).

The variables of a S7-GRAPH block can also be defined as termination addresses on its interface. This has no effect within a S7-GRAPH block, since no address replacement is performed for S7-GRAPH blocks.

The Termination Address/Exclusion Address columns are hidden in S7-GRAPH sources and cannot be used for editing.

If a source is created from a S7-GRAPH block, available termination/exclusion addresses will not be saved. This means, you have to reenter these attributes in the generated blocks when the blocks are created again.

## **6.14 Symbol Priority Setting**

The following settings were made for the S7-GRAPH V5.3 for the address priority: "Behavior as in STEP 7 < V5.2".

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## 6.15 Event-dependent Actions for Activating and Deactivating Steps

The number of event-dependent actions for activating and deactivating Steps (e.g. S1 OFF) is limited. The limit is calculated from the number of simultaneous branches in the block.

### **Example:**

Your block is structured as follows:

- The complete block contains two sequencers.
- Each sequencer contains a simultaneous branch with 3 branches. This means that the block has a total of 6 simultaneous branches.

You can use six event-dependent actions in this block for activating and deactivating steps.

Remedy: Divide the actions among multiple steps.