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SIMATIC

Component based Automation - WinLC PN Addendum to WinAC Basis V3.0

Manual

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Danger

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



Warning

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Caution

indicates that minor personal injury can result if proper precautions are not taken.

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Foreword



Aim of this Documentation

This document provides the information required to use WinAC PN for Component based Automation. WinAC PN performs the same functions as WinAC Basic Version 3.0, plus the additional features of PROFINet capability, routing capability and support for Windows 2000 Professional.

This document is intended for use by engineers, programmers and maintenance personnel with a general knowledge of automation systems and knowledge of Component based Automation and WinAC Basic version 3.0.

Basic Knowledge Required

We assume that you are familiar with the following documentation:

- Component based Automation and PROFINet documentation (on the "Component based Automation" CD-ROM)
- WinAC Basic version 3.0 documentation (on the "WinAC PN V1.0" CD-ROM)

Applicability of this Manual

This manual applies to WinAC PN version 1.0.

Scope of this Documentation

This manual describes the functions of WinAC PN as used in Component based Automation. It provides the following information:

- Integration of WinAC PN into Component based Automation
- Routing with the WinAC PN Windows Logic Controller
- Technical Data for WinLC PN

Further Support

If you have any questions on how to use the products described in this manual that are not answered here, please contact your local Siemens dealer or office.

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• On the Internet, you can find free documentation at:

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Use the Knowledge Manager at this site to quickly search for the information you require. There is also a "Documentation" user group for your questions or suggestions concerning Siemens documentation.

SIMATIC Customer Support Hotline

Accessible round the clock from anywhere in the world:



Figure 1-1 SIMATIC Customer Support Hotline

Worldwide (Nuremberg) Technical Support	Worldwide (Nuremberg) Technical Support	
(Toll free)	(There is a charge for this	
Local time: MonFri. 7:00 to 17:00	service, which can only be accessed with a SIMATIC card)	
Tel: +49 (180) 5050 222	Local time: MonFri. 0:00 to 24:00	
Fax: +49 (180) 5050 223	Tel: +49 (911) 895-7777	
E-mail: techsupport@ad.siemens.de	Fax: +49 (911) 895-7001	
GMT: +1:00	GMT: +1:00	
Europe / Africa (Nuremberg) Authorization	America (Johnson City) Technical Support and	Asia / Australia (Singapore) Technical Support and
Local time: MonFri. 7:00 to	Authorization	Authorization
17:00	Local time: MonFri. 8:00 to	Local time: MonFri. 8:30 to
Tel: +49 (911) 895-7200	19.00	17.30
Fax: +49 (911) 895-7201	Tel: +1 423 461-2522	Tel: +65 740-7000
E-mail:	Fax: +1 423 461-2289	Fax: +65 740-7001
authorization@nbgm.siemens.de	E-mail:	E-mail:
GMT: +1:00	simatic.hotline@sea.siemens.co m	simatic.hotline@sea.siemens.co m.sg
	GMT: -5:00	GMT: +8:00

The languages used on SIMATIC Hotlines are generally German and English, although French, Italian and Spanish are also spoken on the Authorization Hotline.

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- Users and specialists from around the world share their experience and knowledge in the Forum.
- You can find your local partner for Automation & Drives in our contacts database.
- The "Service" section provides information on local service, repairs, spare parts and much more.

Introduction to Component based Automation and WinAC PN

2.1 Product Overview

What is component based automation?

As part of Totally Integrated Automation (TIA), Component based Automation is a concept for implementing modular, distributed automation applications based on open standards.

This concept meets the demand for increased modularization in the field of plant and machine construction by extensively distributing the intelligent processing required. Component based Automation allows different types of programmable controller to be used as **standardized automation components** - known as **PROFINet components** - in large-scale systems.

Component based Automation is implemented by the PROFINet standard for programmable controllers in combination with the SIMATIC iMap engineering tool.

What is **PROFINet**?

To implement Component based Automation, TIA uses the PROFINet standard published by the PROFIBUS User Organization e.V. (PNO). The PROFINet standard defines a cross-vendor communication, automation and engineering model.

PROFINet has the following objectives:

- · Open, distributed automation across networks
- Integrated communication via field bus and Ethernet
- Use of open IT standards

Programmable controllers that conform to the PROFINet standard must offer certain communication interfaces based on Microsoft DCOM (Distributed Component Object Model).

What is SIMATIC iMap?

SIMATIC iMap is a cross-vendor engineering tool for configuring PROFINet applications. It brings together distributed automation applications in a graphical format so that they can be displayed for the entire plant. All the PROFINet components needed are provided in a standardized format in the form of library elements. Every PROFINet component is a discrete automation function with inputs and outputs which, in turn, can be combined with other functions. These interconnections use Ethernet or PROFIBUS communication links. SIMATIC iMap can download the contents of PROFINet components and the associated interconnections to the devices in the plant. During commissioning and while the plant is in operation, you can use SIMATIC iMap to look up process data and diagnostic data concerning the devices, and modify parameters and project data for testing purposes.

The new engineering tool can also integrate device-specific programming and configuration tools.

Product Range

The product range for Component based Automation based on the PROFINet standard comprises:

- PROFINet devices that conform to the PROFINet standard.
- SIMATIC iMap the engineering tool for Component based Automation. It is used to configure plants and provide a link to device-specific programming, configuration and diagnostic tools.

A wide range of existing automation and field devices from various vendors can also be used as PROFINet components.

The PNO has also published a specification for the communication mechanisms and engineering model. This allows other devices to be made PROFINetcompliant, and proprietary configuration and programming tools to be linked to SIMATIC iMap.

2.2 Introduction to WinAC PN

What are WinAC Basic V3.0 and WinLC?

WinAC Basic V 3.0 is the SIMATIC software package for PC-based control. It incorporates the Windows Logic Controller, SIMATIC Computing and the Tool Manager.

The Windows Logic Controller (WinLC) is a PC-based automation system that allows you to carry out process control tasks from your PC.

What is WinAC PN?

WinAC PN (PN = PROFINet) performs the same functions as WinAC Basic V 3.0, the only difference being that WinAC PN has been extended to include the following functions for use in Component based Automation:

- PROFINet capability
- Routing capability
- Support for Windows 2000 Professional

Note

WinAC PN does not support Windows NT.

PROFINet capability

WinLC PN supports the PROFINet standard and participates as a direct user in PROFINet communication functions.



Figure 2-1 WinLC PN as a Direct User in PROFINet

WinLC PN can also act as linking element for other non PROFINet-compliant DP slaves:

Typical examples include distributed peripherals such as ET 200S and ET 200X, which do not support the PROFINet standard. They can, however, be connected to WinLC PN and thus be integrated into PROFINet and Component based Automation. WinLC PN thus acts as a proxy for DP slaves that do not support the PROFINet standard.



Figure 2-2 WinLC PN as a Proxy for other DP slaves

Routing capability

In most automation systems, the programming unit can only be operated via the bus cable (subnet) connected directly to the automation system. In large-scale, networked systems, this requires the programming unit to be connected to a number of different bus cables (subnets) before a remote automation system can be accessed online.

STEP 7 V5.1 SP 2 and WinAC PN now allow you to access automation systems online using the PG/PC beyond the boundaries of an individual subnet in order to download user programs or a hardware configuration, or to run testing and diagnostic functions, for example.

Communication with Industrial Ethernet

You will need the following PC module and the associated software and licenses (SIMATIC NET V 6.0) to operate WinLC PN on an Industrial Ethernet:

• a standard Ethernet card, e.g. a 3COM card.

Communication with PROFIBUS-DP

To use WinLC PN with PROFIBUS-DP, you will have to add a CP (communication processor) to your PC to allow it to be connected to PROFIBUS-DP. The following CPs are suitable:

- CP 5611 or
- CP 5613.

You can also use the CP (communication processor) integrated into SIMATIC PGs/PCs to connect to PROFIBUS-DP.

The drivers for the above CPs are supplied on the "WinAC PN" CD-ROM.

Order number

The order number for WinAC PN is 6ES7 671- 0VC01-0YX0.

Routing with WinLC PN

Introduction

WinLC PN V1.0 supports routing, in contrast to the standard version of the Windows Logic Controller in WinAC Basic V3.0.

Definition of Routing

The "routing" function allows you to access S7 stations online from your PG/PC beyond the limits of an individual subnet. This means that you can access an intelligent DP slave from the Industrial Ethernet via WinLC PN. Typical applications include:

- Loading user programs
- Loading a hardware configuration
- Running testing and commissioning functions.

To do this, special "routing tables" are automatically generated for the network transitions when the network is configured. These routing tables contain special system data, and must be downloaded at the individual network transitions, i.e. to WinLC PN. When the programming unit subsequently goes online, the route to the selected programmable controller can be found via the network transitions.

Routing with WinLC PN

With WinLC PN, the term routing is used exclusively to describe accessing the DP slaves incorporated into the WinLC PN DP master system.

Routing functions that require a connection to be established via the WinLC PN from a PROFIBUS station to a remote communication partner are not supported. This means that routing from PROFIBUS-DP via the WinLC PN to the Industrial Ethernet is not possible, for example.



Figure 3-1 Routing with WinLC PN

Installing WinLC PN

4.1 Requirements

Software Requirements

To install WinLC PN, you will need the following:

- Windows 2000 Professional, service pack 1
- You must be logged on with administrator rights.

Additional Software Products:

You will need the following software to use WinLC PN in Component based Automation:

- SIMATIC iMap version 1.0 for configuring PROFINet
- STEP 7 version 5.1, service pack 2 or later, for configuration and programming
- Softnet S7 for Industrial Ethernet (TCP/IP) version 6.0 (part of SIMATIC NET V 6.0) for access via Industrial Ethernet

Hardware Requirements

Your computer should have at least the following minimum configuration in order to install the WINAC PN components:

- A PC with
 - Pentium III processor, 450 MHz or faster
 - 128 MB RAM
- Color monitor, keyboard and mouse (or other pointer)
- Hard disk with 135 MB free

4.2 Installing WinLC PN

Recommended Order for Installation

We recommend that you install the components in the following order:

- STEP 7 (optional)
- WinLC PN
- Softnet S7 for Industrial Ethernet (TCP/IP) V 6.0
- SIMATIC iMap (optional)

Note

If you are using WinLC PN on a remote PC and download the data to the WinLC PN via an Industrial Ethernet, then it is **not** necessary to install STEP 7 and SIMATIC iMap on this PC.

Installing WinLC PN

Follow the instructions below to install WinLC PN:

- 1. Insert the "WinAC PN" CD into the CD-ROM drive on your computer.
- 2. Use the Windows Start menu (Start > Run) to open the "Run" dialog box.
- 3. In the "Run" dialog box, click on the "Browse" button and select the installation program (setup.exe) on the CD-ROM.
- 4. Click on the "Open" button to accept the Setup.exe program in the "Run" dialog box.
- 5. Click on "OK" to confirm and start the installation program.
- 6. Follow all the instructions that appear on screen.
- 7. In the "SIMATIC WinAC PN V1.0 Setup: Components" dialog, select the components that you wish to install.

Select the CP that you wish to install in order to connect to PROFIBUS-DP (CP 5611/CP 5613). In this way, you will install all the drivers for communication via PROFIBUS-DP.

 Insert the authorization diskette into drive A when the software prompts you to do so. Detailed information on installing the authorization diskette can be found in the WinAC Basic documentation.

Result: WinAC PN is installed on your PC and is entered at index "2" on the PC station. This index corresponds to a virtual slot on the PC and tallies with the slot defined in STEP 7/Configure hardware.

Note

Make sure that index 2 on the PC station is not already assigned to a CP. Click on the component configuration tool on the right of the taskbar for an overview of the procedure for assigning the index on the PC.

4.3 Uninstalling WinLC PN

Uninstalling WinLC PN

Follow the instructions below to uninstall WinLC PN:

- Open the Control Panel and double-click on the "Add/Remove Programs" option.
- 2. Select the "SIMATIC Windows Logic Controller PN V1.0" entry from the list of installed software. Click on the "Add / Remove" button to uninstall the software.
- 3. If the "Remove released file" dialog box appears, click on the ""No"" button if you are in doubt.



Caution

If the authorization for the WinLC PN software is transferred or uninstalled incorrectly, it may be irretrievably lost.

The readme file on the authorization diskette contains guidelines for installing, transferring and uninstalling your authorization for the WinLC PN software. If you do not follow these guidelines, the authorization for the WinLC PN software may be irretrievably lost. Without this authorization, you can neither download programs to WinLC PN nor modify any programs already downloaded to WinLC Basic. Please read the notes in the readme file on the authorization diskette and follow the instructions for transferring and uninstalling authorizations.

Commissioning WinLC PN

5.1 Introduction

Configuration Options with WinLC PN

The following section describes the procedure for commissioning your WinLC PN. We differentiate between the three following scenarios:

- STEP 7/SIMATIC iMap and WinLC PN are installed on the local PC
- STEP 7/SIMATIC iMap are installed on the local PC, while WinLC PN is on the remote PC
- STEP 7/SIMATIC iMap **and WinLC PN** are installed on the local PC, while there is at least one WinLC PN installed on a remote PC

5.2 STEP 7/SIMATIC iMap and WinLC PN are installed on the same PC

Definition

The following diagram illustrates the configuration process for a local PC with WinLC PN and STEP 7/SIMATIC iMap installed:



Figure 5-1 STEP 7/SIMATIC iMap and WinLC PN are installed on the local PC

Procedure

 Use the commissioning wizard to configure the CPs for connecting to the Industrial Ethernet and PROFIBUS. To run the commissioning wizard, select Start > SIMATIC > SIMATIC NET > Commissioning Wizard.

- 2. Click on "Next" and follow the instructions.
- 3. Please note the following points when making the settings for the **Ethernet** module:
 - Select "Use module in configured PC station for production".
 - Select an index of "3" or higher since index "2" is reserved for the WinLC PN. The index corresponds to a virtual slot in the PC, and must be the same slot that you defined using "STEP 7/Configure hardware".
- 4. Please note the following points when making the settings for the **PROFIBUS** module:
 - Select "Use module for programming only."
- 5. Click on "Next" or "Finish" until you exit the commissioning wizard.
- 6. Use Start > Settings > Control Panel > Set PG/PC Interface to make the following settings:
 - Select the "CP_L2_1" application as the access point, then set the interface parameters on the CP that you use to connect to PROFIBUS-DP.
 - Then select the "S7ONLINE (STEP 7) -> PC internal (local)" application as the access point.
- 7. Create the CBA component in SIMATIC iMap. Information on this topic can be found in the SIMATIC iMap documentation.
- 8. Before you download the program to the WinLC PN, make sure that the station name in the component configuration tool is the same as the PC station name in SIMATIC iMap.
 - Component configuration tool: Click on the icon on the right of the taskbar to start the component configuration tool. Click on the "Station name" button to set the station names. The default station name is "PCStation".
 - SIMATIC iMap: In SIMATIC iMap, you can change the name of the PC station via the Properties window in the network view.
- Select Online > Download Selected Device > All to download the program to the WinLC PN in SIMATIC iMap.
- 10.Select **Online > Download Selected Device > All** to download the program to the intelligent DP slaves in SIMATIC iMap.

5.3 STEP 7/SIMATIC iMap are installed on the local PC, while there is at least one WinLC PN on a remote PC

Definition

The following diagram illustrates the configuration process with a local PC on which STEP 7 and SIMATIC iMap are installed. The WinLC PN is installed on a remote PC that is linked via the Industrial Ethernet. There is no WinLC PN installed on the local PC.



Figure 5-2 STEP 7/SIMATIC iMap are installed on the local PC, while WinLC PN is on the remote PC

Procedure on the remote PC with WinLC PN

 Use the commissioning wizard to configure the CPs for connecting to Industrial Ethernet and PROFIBUS. To run the commissioning wizard, select Start > SIMATIC > SIMATIC NET > Commissioning Wizard.

- 2. Click on "Next" and follow the instructions.
- 3. Please note the following points when making the settings for the **Ethernet** module:
 - Select "Use module in configured PC station for production".
 - Select an index of "3" or higher since index "2" is reserved for WinLC PN. The index corresponds to a virtual slot in the PC, and must be the same slot that you set using "STEP 7/Configure hardware".
- 4. Please note the following points when making the settings for the **PROFIBUS** module:
 - Select "Use module for programming only."

- 5. Click on "Next" or "Finish" until you exit the commissioning wizard.
- 6. Use **Start > Settings > Control Panel > Set PG/PC Interface** to make the following settings:
 - Select the "CP_L2_1" application as the access point, then set the interface parameters on the CP that you use to connect to PROFIBUS-DP.
 - Then select the "S7ONLINE (STEP 7) -> PC internal (local)" application as the access point

Procedure on the local PC with STEP 7/SIMATIC iMap (no WinLC PN installed on the PC)

 Use the commissioning wizard to configure the CPs for connecting to the Industrial Ethernet. To run the commissioning wizard, select Start > SIMATIC > SIMATIC NET > Commissioning Wizard.

- 2. Click on "Next" and follow the instructions. Please note the following points when making the settings for the **Ethernet module**:
 - Select "Use module for programming only". This setting is needed in order to be able to download data to the remote WinLC.
- 3. Click on "Next" or "Finish" until you exit the commissioning wizard.
- 4. Select Start > Settings > Control Panel > Set PG/PC Interface to set the PG/PC interface to "S7ONLINE (STEP 7) -> TCP/IP".
- 5. Create the CBA component in SIMATIC iMap. Information on this topic can be found in the SIMATIC iMap documentation.
- 6. Select **Special > Assign PG / PC** in your project in SIMATIC iMap.
- Select the "IP interface" from "Interface parameter settings on the PG/PC". Detailed information on this dialog can be found in the SIMATIC iMap documentation and in the Online Help.
- Select Online > Download Selected Device > All to download the program to the WinLC PN on the remote PC in SIMATIC iMap.
- Select Online > Download Selected Device > All to download the program to the intelligent DP slaves in SIMATIC iMap.

5.4 STEP 7/SIMATIC iMap and WinLC PN are installed on the local PC, while there is at least one WinLC PN installed on a remote PC

Definition

The following diagram illustrates the configuration process with a local PC on which the WinLC PN and STEP 7/SIMATIC iMap are installed. There is a further WinLC PN installed on a remote PC and connected via Industrial Ethernet.

local PC	remote PC
WinLC PN STEP 7 SIMATIC iMap	WinLC PN
Indu	strial Ethernet

Procedure on the remote PC with WinLC PN

 Use the commissioning wizard to configure the CPs for connecting to Industrial Ethernet and PROFIBUS. To run the commissioning wizard, select Start > SIMATIC > SIMATIC NET > Commissioning Wizard.

- 2. Click on "Next" and follow the instructions.
- 3. Please note the following points when making the settings for the **Ethernet** module:
 - Select "Use module in configured PC station for production".
 - Select an index of "3" or higher since index "2" is reserved for WinLC PN. The index corresponds to a virtual slot in the PC, and must be the same slot that you set using "STEP 7/Configure hardware".
- 4. Please note the following points when making the settings for the PROFIBUS module:
 - Select "Use module for programming only."
- 5. Click on "Next" or "Finish" until you exit the commissioning wizard.

- 6. Use **Start > Settings > Control Panel > Set PG/PC Interface** to make the following settings:
 - Select the "CP_L2_1" application as the access point, then set the interface parameters on the CP that you use to connect to PROFIBUS-DP.
 - Then select the "S7ONLINE (STEP 7) -> PC internal (local)" application as the access point

Procedure on the local PC with WinLC PN and STEP 7/SIMATIC iMap

 Use the commissioning wizard to configure the CPs for connecting to Industrial Ethernet and PROFIBUS. To run the commissioning wizard, select Start > SIMATIC > SIMATIC NET > Commissioning Wizard.

- 2. Click on "Next" and follow the instructions.
- 3. Please note the following points when making the settings for the **Ethernet** module:
 - Select "Use module in configured PC station for production".
 - Select an index for the CP. Index "2" is reserved for the WinLC PN. The index corresponds to a virtual slot in the PC, and must be the same slot that you set using "STEP 7/Configure hardware".
- 4. Please note the following points when making the settings for the PROFIBUS module:
 - Select "Use module for programming only."
- 5. Click on "Next" or "Finish" until you exit the commissioning wizard.
- 6. Use **Start > Settings > Control Panel > Set PG/PC Interface** to make the following settings:
 - Select the "CP_L2_1" application as the access point, then set the interface parameters on the CP that you use to connect to PROFIBUS-DP.
 - Then select the "S7ONLINE (STEP 7) -> PC internal (local)" application as the access point
- 7. Create the CBA component in SIMATIC iMap. Information on this topic can be found in the SIMATIC iMap documentation.

- 8. Before you download the program to the WinLC PN, make sure that the station name in the component configuration tool is the same as the PC station name in SIMATIC iMap.
 - Component configuration tool: Click on the icon on the right of the taskbar to start the component configuration tool. Click on the "Station name" button to set the station names. The default station name is "PCStation".
 - SIMATIC iMap: In SIMATIC iMap, you can change the name of the PC station via the Properties window in the network view.
- 9. First select **Online > Download Selected Device > All** to download the program to the **local** WinLC PN in SIMATIC iMap.

Note

You must first transfer the data to the local WinLC PN before you can access the remote WinLC PN, since this is how the local WinLC PN obtains the SDBs that it needs to transmit (route) the data to the remote WinLC PN.

- 10. Then select **Online > Download Selected Device > All** to download the program to the **remote** WinLC PN in SIMATIC iMap.
- 11.Select **Online > Download Selected Device > All** to download the program to the intelligent DP slaves in SIMATIC iMap.

Notes on Using WinLC PN



Notes on configuring WinLC PN using "STEP 7/Configure hardware"

Please note the following points when configuring the WinLC PN with STEP 7:

- Configure the WinLC PN as a PC station.
- A CP for connecting the WINLC PN to PROFIBUS-DP is automatically contained in the DP master for the PC station. In "Configure hardware", double click on the DP master to open, and then define the properties of the CP for connecting to PROFIBUS-DP.

Setting the IP address of the CP for connection to an Industrial Ethernet

To do this, you must assign an IP address and a subnet mask to the CP for connecting to the Industrial Ethernet, both using "Configure hardware" and in SIMATIC iMap.

 Under "Configure hardware", select the CP properties > Properties > Parameters dialog box to set the IP address and subnet mask for the CP for connecting to the Industrial Ethernet.

Note

The properties of the Ethernet interface must tally with the properties that you entered using the commissioning wizard.

General Parame ✓ Set MAC addr MAC address:	ters) ess / use IS <u>D</u> protocol 08.00.06.01.00.00	-	
IP protocol is t IP address: Subnet mask:	being used 157.163.21.156 255.255.224.0	Gateway	3.21.156
Subnet: not networke Ethernet(1)	:d		<u>N</u> ew P <u>r</u> operties Delete

Figure 6-1 Setting the IP address and subnet mask under "STEP7/Configure hardware"

2. In SIMATIC iMap, select the WinLC PN and right click to select the properties.

General Addresses]
IP Address:	223 . 233 . 233 . 233
Subnet Mask:	255 255 255 255
MAC Address:	
	,
Gateway	
Do not use router	
O Use router	
Address:	223 233 233 233
PRUFIBUS Address :	2

3. Enter the IP and subnet addresses in the "General" dialog box.

Figure 6-2 Setting the IP address and subnet mask in SIMATIC iMap

Technical Data for WinLC PN

Introduction

This chapter contains the most important technical data for WinLC PN as used in Component based Automation.

Note

Further technical data concerning WinLC PN can be found in the manual for WinAC Basic version 3.0.

Technical data

Tabelle 7-1 Technical Data for WinLC PN

WinLC PN		
Engineering System	STEP 7, V 5.1, service pack 2	
Possible communication ports (via communication processors added to the PC)	 Industrial Ethernet PROFIBUS-DP MPI 	
Hardware configuration	As for WinLC in WinAC Basic	
Routing capability	Yes	
Number of interconnections		
• Total	Max. 1500	
Per PROFINet component	Max. 100 inputs / 100 outputs	
Number of PROFINet devices that can be connected to WinLC PN	Max. 60 DP slaves	
Transmission frequency (property of the interconnection in SIMATIC iMap)	Multiples of 10 ms	
Max. response time before substitute values are applied	 2 x transmission frequency x ping factor; the ping factor is set to 10 by default) 	

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