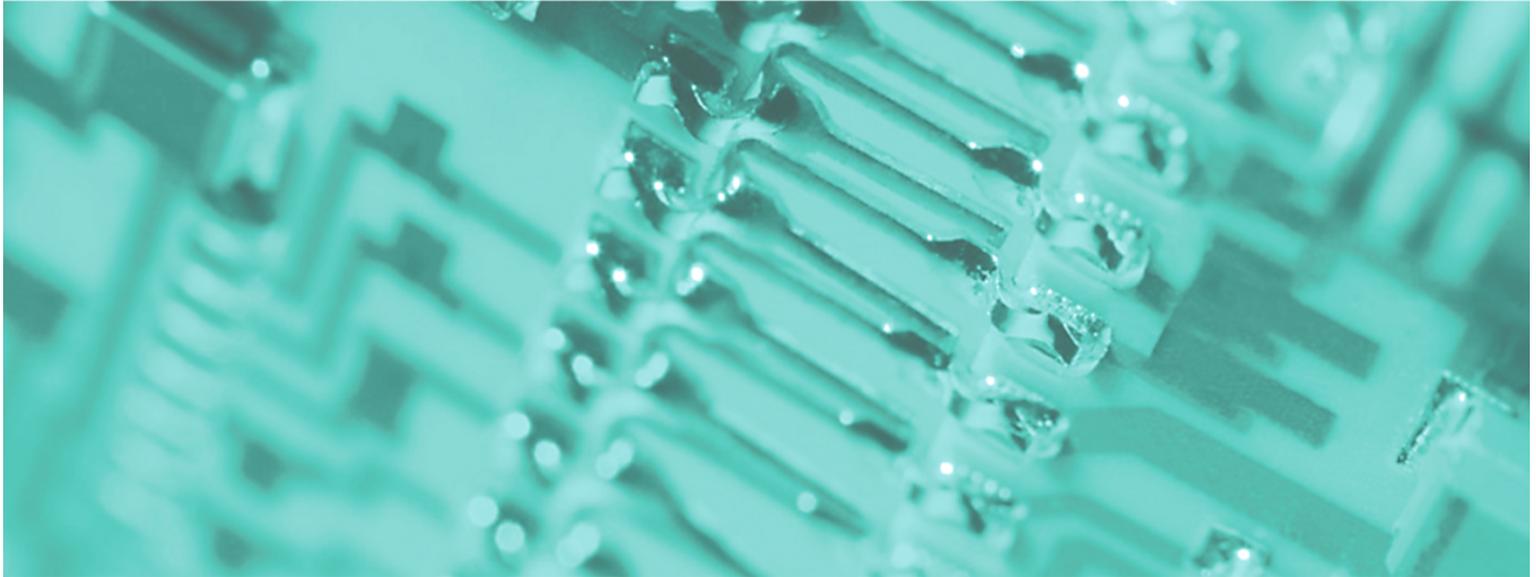




VIPA System 300S



SPEED7 - CP | 342-1DA70 | Manual

HB140E_CP | RE_342-1DA70 | Rev. 09/46

November 2009

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Contents

About this manual	1
Safety information	2
Chapter 1 Basics	1-1
Safety Information for Users.....	1-2
General description of the System 300.....	1-3
System 300S.....	1-4
Hints for the project engineering	1-7
Chapter 2 Assembly and installation guidelines.....	2-1
Overview	2-2
Installation dimensions	2-3
Installation Standard-Bus	2-4
Assembly SPEED-Bus	2-5
Cabling.....	2-8
Installation Guidelines	2-12
Chapter 3 Hardware description	3-1
Properties.....	3-2
Structure	3-3
Technical Data	3-6
Chapter 4 Deployment	4-1
Basics Profibus	4-2
Addressing at SPEED-Bus.....	4-3
Project engineering	4-4
Slave operation	4-10
Profibus installation guidelines	4-13
Appendix.....	A-1
Index.....	A-1

About this manual

This manual describes the CP 342S-DP of the System 300S from VIPA. Here you may find besides of a product overview a detailed description of the modules.

Overview

Chapter 1: Basics

This Basics contain hints for the usage and information about the project engineering of a SPEED7 system from VIPA. General information about the System 300S like dimensions and environment conditions will also be found.

Chapter 2: Assembly and installation guidelines

In this chapter you will find all information, required for the installation and the cabling of a process control with the components of the System 300.

Chapter 3: Hardware description

Here the hardware components of the CP 342S-DP are more described. The technical data are to be found at the end of the chapter.

Chapter 4: Deployment

Content of this chapter is the functionality of the CP 342S-DP for SPEED-Bus from VIPA. The module may only be used at a SPEED-Bus slot at the left side of the CPU.

Objective and contents

The manual describes the CP 341S-DP from VIPA. It contains a description of the construction, project implementation and usage.
 This manual is part of the documentation package with order number HB140E_CP and relevant for:

Product	Order number	as of state:	
		CP HW	CP FW
CP 342S-DP	VIPA 342-1DA70	02	V314

Target audience

The manual is targeted at users who have a background in automation technology.

Structure of the manual

The manual consists of chapters. Every chapter provides a self-contained description of a specific topic.

Guide to the document

The following guides are available in the manual:

- an overall table of contents at the beginning of the manual
- an overview of the topics for every chapter
- an index at the end of the manual.

Availability

The manual is available in:

- printed form, on paper
- in electronic form as PDF-file (Adobe Acrobat Reader)

Icons Headings

Important passages in the text are highlighted by following icons and headings:



Danger!

Immediate or likely danger.
 Personal injury is possible.



Attention!

Damages to property is likely if these warnings are not heeded.



Note!

Supplementary information and useful tips.

Safety information

Applications conforming with specifications

The CP is constructed and produced for:

- for the deployment with VIPA SPEED-Bus
- communication and process control
- general control and automation applications
- industrial applications
- operation within the environmental conditions specified in the technical data
- installation into a cubicle



Danger!

This device is not certified for applications in

- in explosive environments (EX-zone)

Documentation

The manual must be available to all personnel in the

- project design department
- installation department
- commissioning
- operation



The following conditions must be met before using or commissioning the components described in this manual:

- Modification to the process control system should only be carried out when the system has been disconnected from power!
- Installation and modifications only by properly trained personnel
- The national rules and regulations of the respective country must be satisfied (installation, safety, EMC ...)

Disposal

National rules and regulations apply to the disposal of the unit!

Chapter 1 Basics

Overview This Basics contain hints for the usage and information about the project engineering of a SPEED7 system from VIPA.
General information about the System 300S like dimensions and environment conditions will also be found.

Content	Topic	Page
	Chapter 1 Basics	1-1
	Safety Information for Users.....	1-2
	General description of the System 300.....	1-3
	System 300S.....	1-4
	Hints for the project engineering	1-7

Safety Information for Users

Handling of electrostatic sensitive modules

VIPA modules make use of highly integrated components in MOS-Technology. These components are extremely sensitive to over-voltages that can occur during electrostatic discharges.

The following symbol is attached to modules that can be destroyed by electrostatic discharges.



The Symbol is located on the module, the module rack or on packing material and it indicates the presence of electrostatic sensitive equipment.

It is possible that electrostatic sensitive equipment is destroyed by energies and voltages that are far less than the human threshold of perception. These voltages can occur where persons do not discharge themselves before handling electrostatic sensitive modules and they can damage components thereby, causing the module to become inoperable or unusable.

Modules that have been damaged by electrostatic discharges can fail after a temperature change, mechanical shock or changes in the electrical load.

Only the consequent implementation of protection devices and meticulous attention to the applicable rules and regulations for handling the respective equipment can prevent failures of electrostatic sensitive modules.

Shipping of modules

Modules must be shipped in the original packing material.

Measurements and alterations on electrostatic sensitive modules

When you are conducting measurements on electrostatic sensitive modules you should take the following precautions:

- Floating instruments must be discharged before use.
- Instruments must be grounded.

Modifying electrostatic sensitive modules you should only use soldering irons with grounded tips.



Attention!

Personnel and instruments should be grounded when working on electrostatic sensitive modules.

General description of the System 300

The System 300

The System 300 is a modular automation system for middle and high performance needs, which you can use either centralized or decentralized. The single modules are directly clipped to the profile rail and are connected together with the help of bus clips at the backside.

The CPUs of the System 300 are instruction set compatible to S7-300 from Siemens.

System 300V System 300S

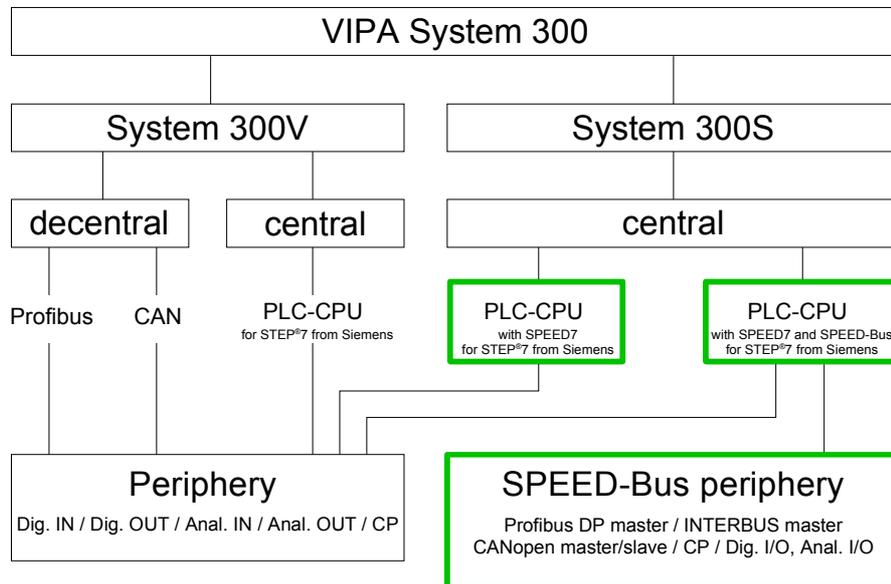
VIPA differentiates between System 300V and System 300S.

- System 300V

The System 300V allows you to resolve automation tasks centralized and decentralized. The single modules of the System 300V from VIPA are similar in construction to Siemens. Due to the compatible backplane bus, the modules from VIPA and Siemens can be mixed.

- System 300S

The System 300S extends the central area with high-speed CPUs that have the integrated SPEED7 chip. Additionally some CPU's have got a parallel SPEED-Bus that allows the modular connection of fast peripheral modules like IOs or bus master.

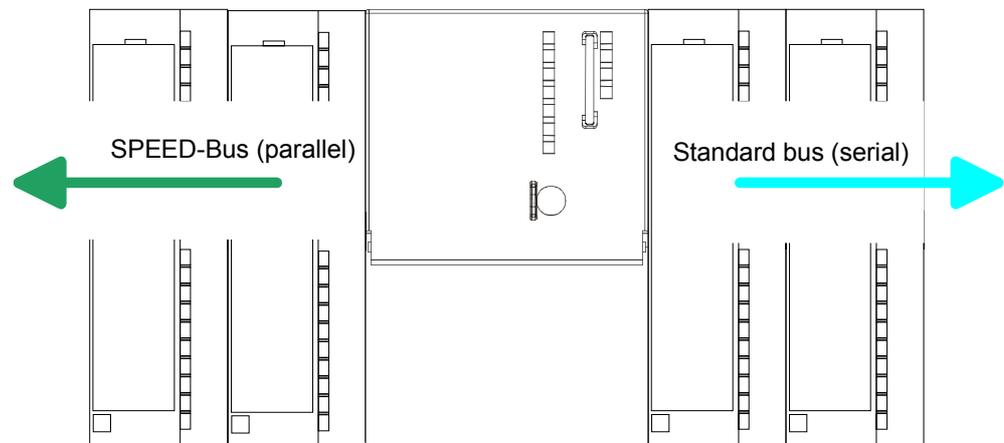


System 300S

Overview

The CPUs 31xS are based upon the SPEED7 technology. This supports the CPU at programming and communication by means of co-processors that causes a power improvement for highest needs.

Except of the basic variant, all SPEED7-CPU's are provided with a parallel SPEED-Bus that enables the additional connection of up to 10 modules from the SPEED-Bus periphery. While the standard peripheral modules are plugged-in at the right side of the CPU, the SPEED bus peripheral modules are connected via a SPEED-Bus bus connector at the left side of the CPU.



CPU 31xS

The System 300S series consists of a number of CPUs. These are programmed in STEP[®]7 from Siemens. For this you may use WinPLC7 from VIPA or the Siemens SIMATIC manager.

CPUs with integrated Ethernet interfaces or additional serial interfaces simplify the integration of the CPU into an existing network or the connection of additional peripheral equipment.

The user application is stored in the battery buffered RAM or on an additionally pluggable MMC storage module.

Due to the automatic address allocation, the deployment of the CPUs 31xS allows to address 32 peripheral modules.

Additionally some SPEED7-CPU's have got a parallel SPEED-Bus that allows the modular connection of fast peripheral modules like IOs or bus master.

- SPEED-Bus** The SPEED-Bus is a 32Bit parallel bus developed from VIPA with a maximum data rate of 40MByte/s. Via the SPEED-Bus you may connect up to 10 SPEED-Bus modules to your CPU 31xS.
- In opposite to the "standard" backplane bus where the modules are plugged-in at the right side of the CPU by means of single bus connectors, the modules at the SPEED-Bus are plugged-in at the left side of the CPU via a special SPEED-Bus rail.
- VIPA delivers profile rails with integrated SPEED-Bus for 2, 6 or 10 SPEED-Bus peripheral modules with different lengths.
- SPEED-Bus peripheral modules** The SPEED-Bus peripheral modules may exclusively plugged at the SPEED-Bus slots at the left side of the CPU. The following SPEED-Bus modules are in preparation:
- Fast fieldbus modules like Profibus DP, Interbus, CANopen master and CANopen slave
 - Fast CP 343 (CP 343 Communication processor for Ethernet)
 - Fast CP 341 with double RS 422/485 interface
 - Fast digital input-/output modules (Fast Digital IN/OUT)
- Memory management** Every CPU 31xS has an integrated work memory. During program run the total memory is divided into 50% for program code and 50% for data.
- Starting with CPU firmware 3.0.0 there is the possibility to extend the total memory to its maximum by means of a MCC memory extension card.
- Integrated Profibus DP master** The CPUs of the System 300S series with SPEED-Bus have an integrated Profibus DP master. Via the DP master with a data range of 1kByte for in- and output you may address up to 124 DP slaves.
- The project engineering takes place in WinPLC7 from VIPA or in the hardware configurator from Siemens.
- Integrated Ethernet PG/OP channel** Every CPU 31xS has an Ethernet interface for PG/OP communication. Via the "PLC" functions you may directly access the Ethernet PG/OP channel and program res. remote control your CPU. A max. of 2 PG/OP connections is available.
- You may also access the CPU with a visualization software via these connections.

- Operation Security**
- Wiring by means of spring pressure connections (CageClamps) at the front connector
 - Core cross-section 0.08...2.5mm²
 - Total isolation of the wiring at module change
 - Potential separation of all modules to the backplane bus
 - ESD/Burst acc. IEC 61000-4-2/IEC 61000-4-4 (up to level 3)
 - Shock resistance acc. IEC 60068-2-6 / IEC 60068-2-27 (1G/12G)

- Environmental conditions**
- Operating temperature: 0 ... +60°C
 - Storage temperature: -25 ... +70°C
 - Relative humidity: 5 ... 95% without condensation
 - Ventilation by means of a fan is not required

- Dimensions/Weight**
- Available lengths of the profile rail in mm: 160, 482, 530, 830 and 2000
 - Dimensions of the basic enclosure:
 - 1tier width: (HxWxD) in mm: 40x125x120
 - 2tier width: (HxWxD) in mm: 80x125x120

Compatibility

Modules and CPUs of the System 300 from VIPA and Siemens may be used at the "Standard" bus as a mixed configuration.

The project engineering takes place in WinPLC7 from VIPA or in the hardware configurator from Siemens.

The SPEED7 CPUs from VIPA are instruction compatible to the programming language STEP[®]7 from Siemens and may be programmed via WinPLC7 from VIPA or via the Siemens SIMATIC manager.

Here the instruction set of the S7-400 from Siemens is used.



Note!

Please do always use the **CPU 318-2DP (6ES7 318-2AJ00-0AB0/V3.0)** from Siemens of the hardware catalog to project a SPEED7-CPU with SPEED-Bus from VIPA. For the project engineering, a thorough knowledge of the Siemens SIMATIC manager and the hardware configurator from Siemens is required!

Integrated power supply

Every CPU res. bus coupler comes with an integrated power supply. The power supply has to be supplied with DC 24V. By means of the supply voltage, the bus coupler electronic is supplied as well as the connected modules via backplane bus. Please regard that the integrated power supply may supply the backplane bus the backplane bus (SPEED-Bus and Standard-Bus) depending on the CPU with a sum with max. 5A.

The power supply is protected against inverse polarity and overcurrent.

Every SPEED-Bus rail has a plug-in option for an external power supply. This allows you to raise the maximum current at the backplane bus for 5.5A.

Hints for the project engineering

Overview

For the project engineering of a SPEED7 system please follow this approach:

- Project engineering of the SPEED7-CPU and the internal DP master (if existing) as CPU 318-2DP (318-2AJ00-0AB00)
- Project engineering of the real plugged modules at the standard bus
- Project engineering of the internal Ethernet PG/OP channel after the real plugged modules as virtual CP 343-1 (Setting of IP address, subnet mask and gateway for online project engineering)
- Project engineering of an internal CP343 (if existing) as 2. CP 343-1
- Project engineering and connection of the SPEED-Bus-CPs res. -DP master as CP 343-1 (343-1EX11) res. CP 342-5 (342-5DA02 V5.0)
- Project engineering of all SPEED-Bus modules as single DP slaves in a virtual DP master module (speedbus.gsd required)



Note!

Please do always use the **CPU 318-2DP (6ES7 318-2AJ00-0AB0/V3.0)** from Siemens in the hardware catalog to configure a CPU 31xS from VIPA. For the project engineering, a thorough knowledge of the SIMATIC manager and the hardware configurator from Siemens is required!

Requirements

The hardware configurator is part of the Siemens SIMATIC manager. It serves the project engineering. Please look at the hardware catalog for the modules that may be configured.

For the deployment of the System 300S modules at the SPEED-Bus the inclusion of the System 300S modules into the hardware catalog via the GSD-file speedbus.gsd from VIPA is necessary.

Approach

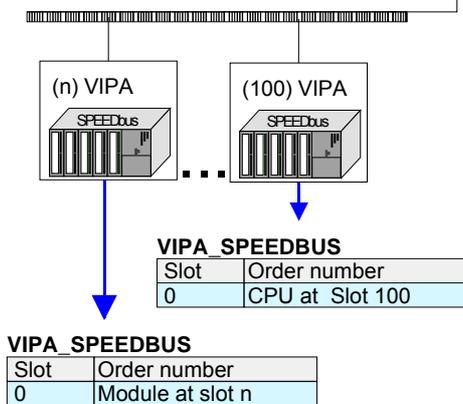
The project engineering of the SPEED7-CPU has the following components:

To be compatible with the Siemens SIMATIC manager, the following steps are required:

Standard bus

Slot	Module
1	
2	CPU 318-2
	X2 <i>DP</i>
	X1 <i>MPI/DP</i>
3	
real modules at the standard bus	
343-1EX11 (internal PG/OP)	
343-1EX11 (internal CP343)	
CPs res. DP master at the SPEED-Bus as 343-1EX11 res. 342-5DA02	
	342-5DA02 V5.0

virtual DP master for CPU
and all SPEED-Bus modules



- Preparation**

Start the hardware configurator from Siemens and include the speedbus.gsd for the SPEED-Bus from VIPA.
- Project engineering of the CPU**

Project a CPU 318-2DP (318-2AJ00-0AB00 V3.0). If your SPEED7-CPU contains a DP master, you may now connect it with Profibus and configure your DP slaves.
- Project engineering of the real plugged modules at the standard bus**

Set the modules that are at the right side of the CPU at the standard bus starting with slot 4.
- Project engineering of the integrated CPs**

For the internal Ethernet PG/OP channel you have to set a CP 343-1 (343-1EX11) as 1. module at the real plugged modules. If your SPEED7-CPU has additionally an integrated CP 343, this is also configured as CP 343-1 but always below the former placed CP 343-1.
- Project engineering of the SPEED-Bus-CPs and -DP master**

Plug and connect all CPs as 343-1EX11 and DP master as 342-5DA02 V5.0 at the SPEED-Bus below the former configured internal CPU components.

Please regard that the sequence within a function group (CP res. DP master) corresponds the sequence at the SPEED-Bus from right to left.
- Project engineering of the CPU and all SPEED-Bus modules in a virtual master system**

The slot assignment of the SPEED-Bus modules and the parameterization of the in-/output periphery happens via a virtual Profibus DP master system. For this, place a DP master (342-5DA02 V5.0) with master system as last module. The Profibus address must be <100!

Now include the slave "vipa_speedbus" for the CPU and every module at the SPEED-Bus. After the installation of the speedbus.gsd you may find this under Profibus-DP / Additional field devices / I/O / VIPA_SPEEDbus. Set the slot number of the module (100...110) as Profibus address and plug the according module at slot 0 of the slave system.

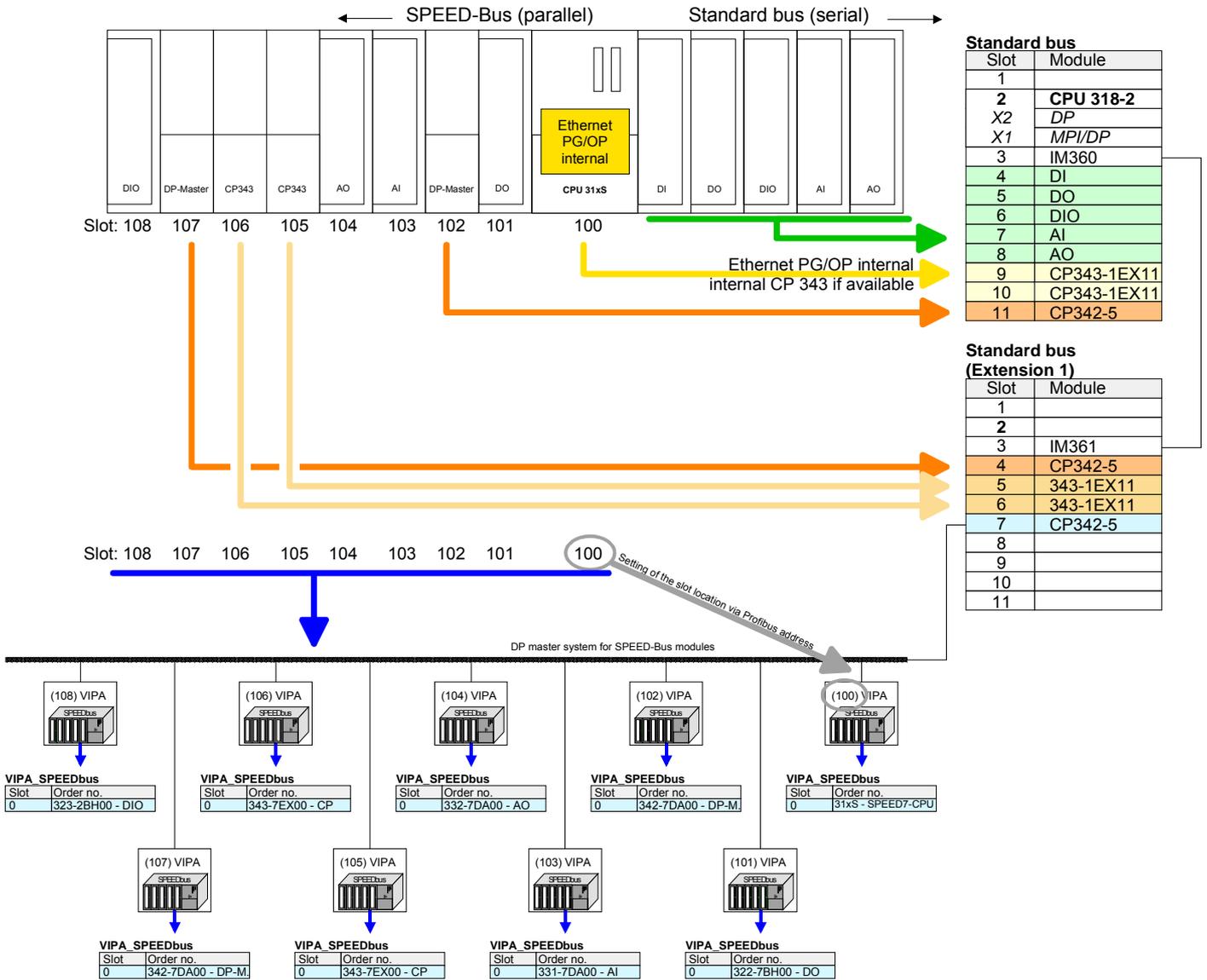
Bus extension with IM 360 and IM 361

To extend the bus you may use the IM 360 from Siemens, where 3 further extensions racks can be connected via the IM 361. Bus extensions must be placed at slot 3.

More detailed information is to be found in the chapter "Deployment CPU 31xS" at "Addressing".

Summary

The following illustration summarizes all project engineering steps:



The according module is to be taken over from the HW catalog of vipa_speedbus on slot 0.



Note!

The sequence of the DPM- and CP function groups is insignificant. You only have to take care to regard the sequence within a function group (DP1, DP2... res. CP1, CP2 ...).



Hint, valid for all SPEED-Bus modules!

The SPEED-Bus always requires the Siemens DP master CP 342-5 (342-5DA02 V5.0) as last module to be included, connected and parameterized to the *operation mode* DP master. Every SPEED-Bus module has to be connected as VIPA_SPEEDbus slave into this master system.

By setting the SPEED-Bus slot number via the Profibus address and by including the according SPEED-Bus module at slot 0, the SIMATIC manager receives information about the modules at the SPEED-Bus.

Additionally the following configurations are required depending on the module.

Project engineering of the DP master at the SPEED-Bus

The hardware configuration and Profibus project engineering happens in the SIMATIC manager from Siemens. You have to parameterize a virtual CP 342-5 (342-5DA02 V5.0) for every SPEED-Bus-DP master at the standard bus following the real modules and connect it with the depending DP slaves.

Project engineering CP 343 at the SPEED-Bus

SPEED-Bus-CPs have to be configured in the Siemens SIMATIC manager at the standard bus behind the real modules as virtual CP 343 (343-1EX11) and are then connected with the according Ethernet components. For the connection, the Siemens project engineering tool NetPro is required.

Project engineering of the CAN master at the SPEED-Bus

The project engineering of the CANopen master at the SPEED-Bus happens in WinCoCT (**Windows CANopen Configuration Tool**) from VIPA. You export your project from WinCoCT as wld-file. This wld-file can be imported into the hardware configurator from Siemens. An additional inclusion at the standard bus is not necessary.

Project engineering of the Interbus master at the SPEED-Bus

The project engineering of the IBS master system takes place in your CPU user application using the VIPA FCs. An additional inclusion at the standard bus is not necessary.

Chapter 2 Assembly and installation guidelines

Overview In this chapter you will find all information, required for the installation and the cabling of a process control with the components of the System 300.

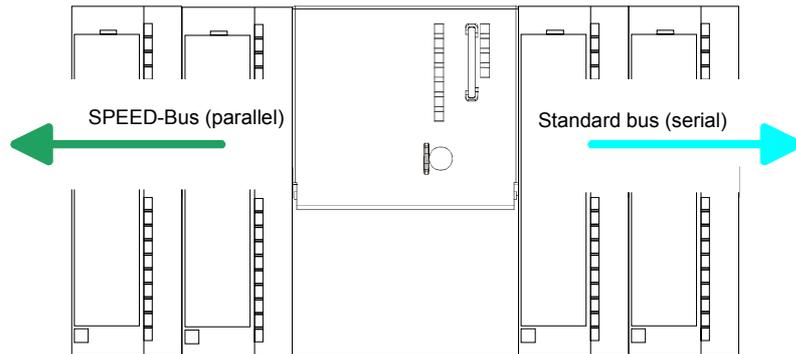
Content	Topic	Page
	Chapter 2 Assembly and installation guidelines.....	2-1
	Overview	2-2
	Installation dimensions	2-3
	Installation Standard-Bus	2-4
	Assembly SPEED-Bus	2-5
	Cabling	2-8
	Installation Guidelines	2-12

Overview

General

While the standard peripheral modules are plugged-in at the right side of the CPU, the SPEED-Bus peripheral modules are connected via a SPEED-Bus bus connector at the left side of the CPU.

VIPA delivers profile rails with integrated SPEED-Bus for 2, 6 or 10 SPEED-Bus peripheral modules with different lengths.



Serial Standard bus

The single modules are directly installed on a profile rail and connected via the backplane bus coupler. Before installing the modules you have to clip the backplane bus coupler to the module from the backside.

The backplane bus coupler is included in the delivery of the peripheral modules.

Parallel SPEED-Bus

With SPEED-Bus the bus connection happens via a SPEED-Bus rail integrated in the profile rail at the left side of the CPU. Due to the parallel SPEED-Bus not all slots must be occupied in sequence.

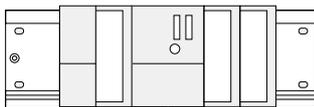
SLOT 1 for additional power supply

At SLOT 1 DCDC) you may plug either a SPEED-Bus module or an additional power supply.

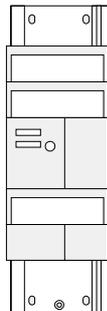
Assembly possibilities

You may assemble the System 300 horizontally, vertically or lying.

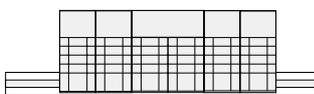
horizontal assembly



vertical assembly



lying assembly



Please regard the allowed environment temperatures:

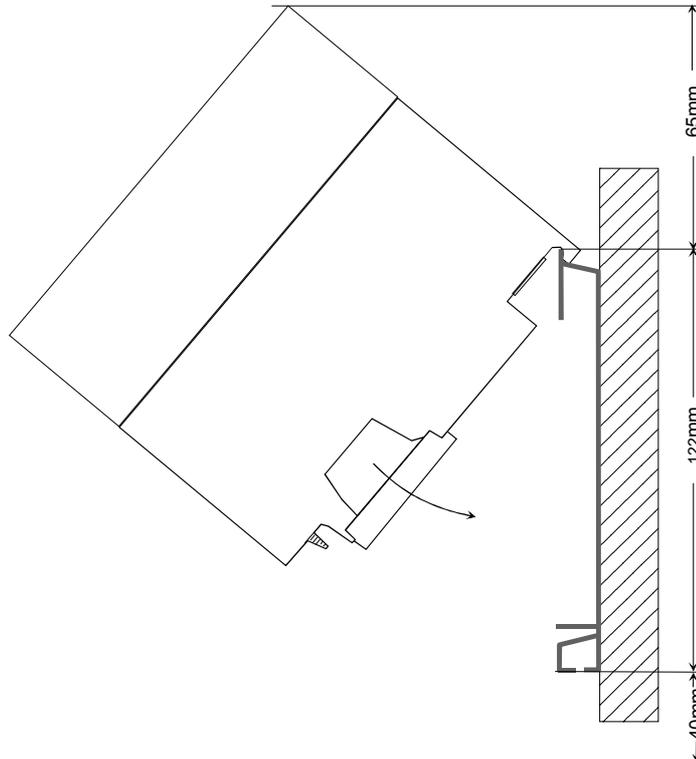
- horizontal assembly: from 0 to 60°C
- vertical assembly: from 0 to 40°C
- lying assembly: from 0 to 40°C

Installation dimensions

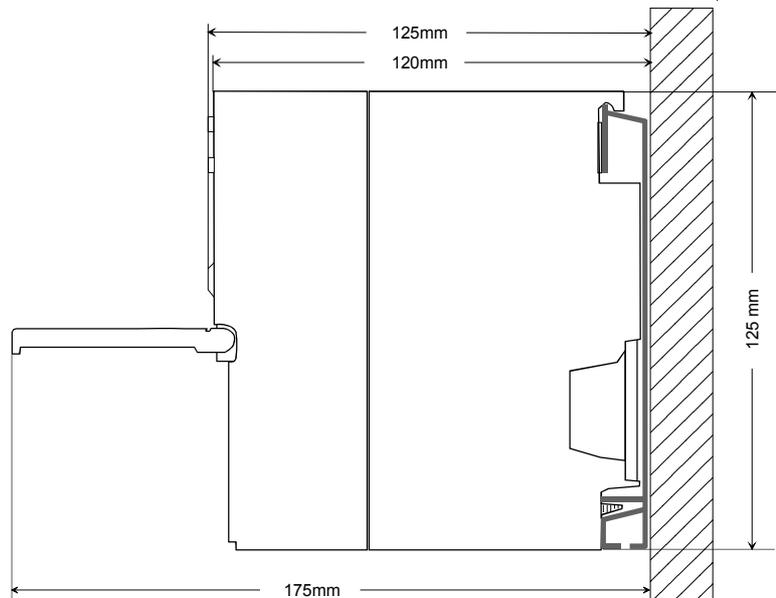
Dimensions 1tier width (WxHxD) in mm: 40 x 125 x 120

Basic enclosure

Dimensions



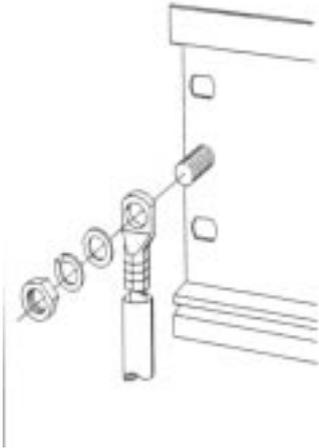
Installation dimensions



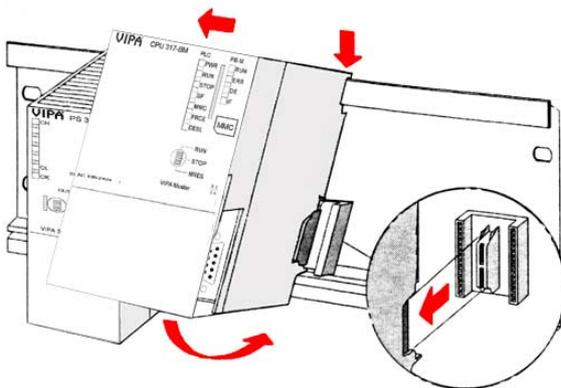
Installation Standard-Bus

Approach

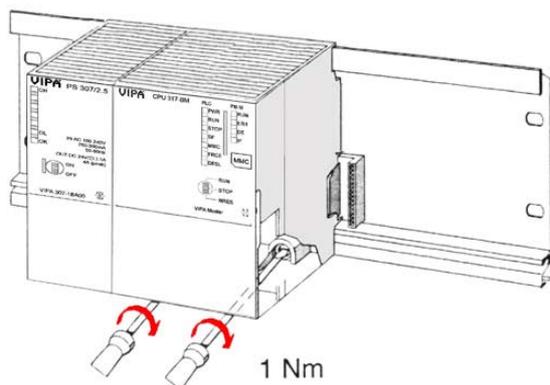
If you do not deploy SPEED-Bus modules, the assembly at the standard bus happens at the right side of the CPU with the following approach:



- Bolt the profile rail with the background (screw size: M6), so that you still have minimum 65mm space above and 40mm below the profile rail.
- If the background is a grounded metal or device plate, please look for a low-impedance connection between profile rail and background.
- Connect the profile rail with the protected earth conductor. For this purpose there is a bolt with M6-thread.
- The minimum cross-section of the cable to the protected earth conductor has to be 10mm².



- Stick the power supply to the profile rail and pull it to the left side up to 5mm to the grounding bolt of the profile rail.
- Take a bus coupler and click it at the CPU from behind like shown in the picture.
- Stick the CPU to the profile rail right from the power supply and pull it to the power supply.



- Click the CPU downwards and bolt it like shown.
- Repeat this procedure with the peripheral modules, by clicking a backplane bus coupler, stick the module right from the modules you've already fixed, click it downwards and connect it with the backplane bus coupler of the last module and bolt it.



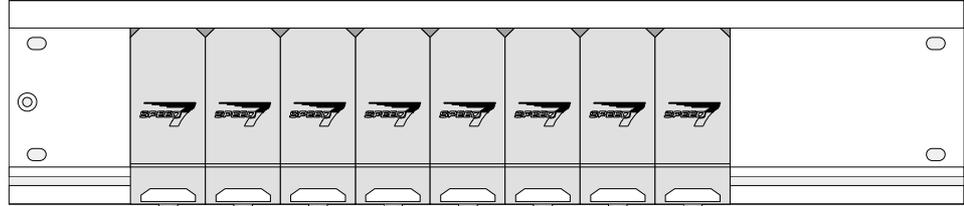
Danger!

- Before installing or overhauling the System 300, the power supplies must be disconnected from voltage (pull the plug or remove the fuse)!
- Installation and modifications only by properly trained personnel!

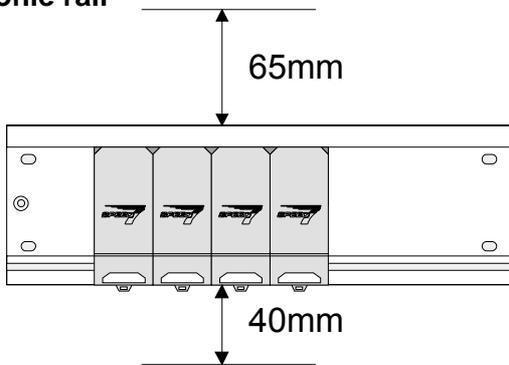
Assembly SPEED-Bus

Pre-manufactured SPEED-Bus profile rail

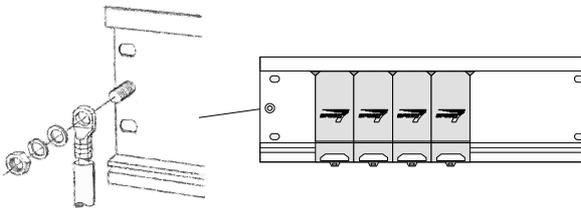
For the deployment of SPEED-Bus modules, a pre-manufactured SPEED-Bus rail is required. This is available mounted on a profile rail with 2, 6 or 10 extension plug-in locations.



Installation of the profile rail

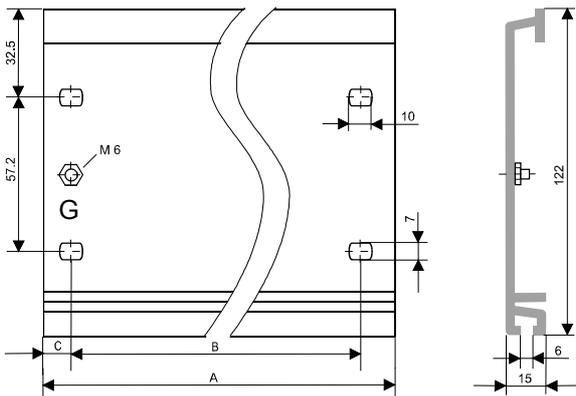


- Bolt the profile rail with the background (screw size: M6), so that you still have minimum 65mm space above and 40mm below the profile rail.
- Please look for a low-impedance connection between profile rail and background



- Connect the profile rail with the protected earth conductor.
The minimum cross-section of the cable to the protected earth conductor has to be 10mm².

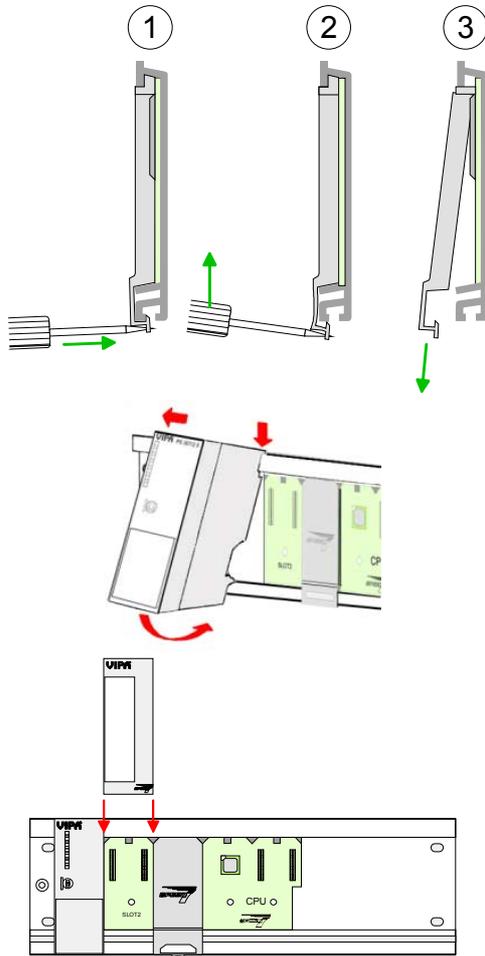
Profile rail



Order number	SPEED-Bus slots	A	B	C
VIPA 390-1AB60	-	160mm	140mm	10mm
VIPA 390-1AE80	-	482mm	466mm	8,3mm
VIPA 390-1AF30	-	530mm	500mm	15mm
VIPA 390-1AJ30	-	830mm	800mm	15mm
VIPA 390-9BC00*	-	2000mm	-	15mm
VIPA 391-1AF10	2	530mm	500mm	15mm
VIPA 391-1AF30	6	530mm	500mm	15mm
VIPA 391-1AF50	10	530mm	500mm	15mm

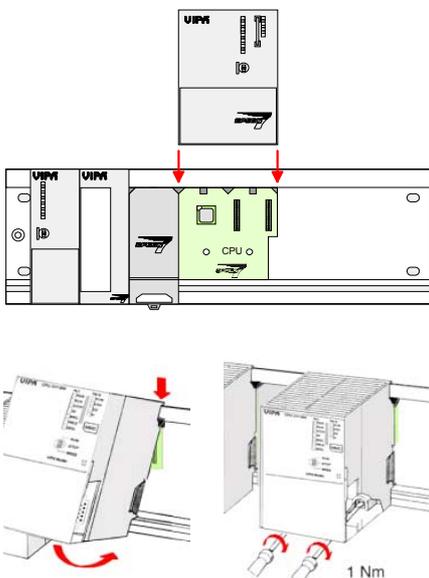
* Unit pack 10 pieces

**Installation
SPEED-Bus-
Module**



- Dismantle the according protection flaps of the SPEED-Bus plug-in locations with a screw driver (open and pull down).
For the SPEED-Bus is a parallel bus, not all SPEED-Bus plug-in locations must be used in series. Leave the protection flap installed at an unused SPEED-Bus plug-in location.
- At deployment of a DC 24V power supply, install it at the shown position at the profile rail at the left side of the SPEED-Bus and push it to the left to the isolation bolt of the profile rail.
- Fix the power supply by screwing.
- To connect the SPEED-Bus modules, plug it between the triangular positioning helps to a plug-in location marked with "SLOT ..." and pull it down.
- Only the "SLOT1 DCDC" allows you to plug-in either a SPEED-Bus module or an additional power supply.
- Fix the modules by screwing.

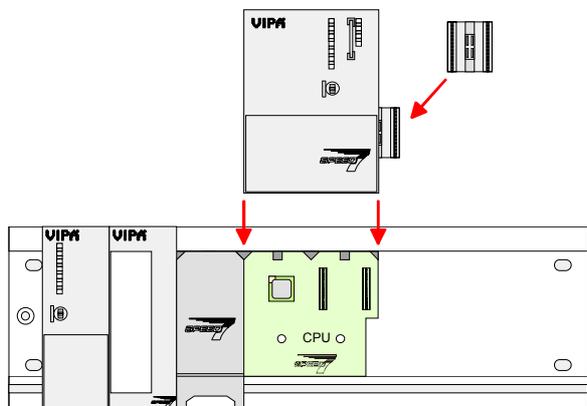
**Installation CPU
without Standard-
Bus-Modules**



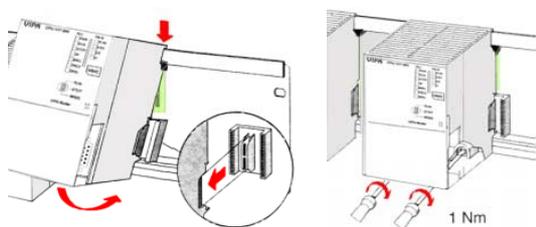
- To deploy the SPEED7-CPU exclusively at the SPEED-Bus, plug it between the triangular positioning helps to the plug-in location marked with "CPU SPEED7" and pull it down.
- Fix the CPU by screwing.

Please regard that not all CPU 31xS may be deployed at the SPEED-Bus!

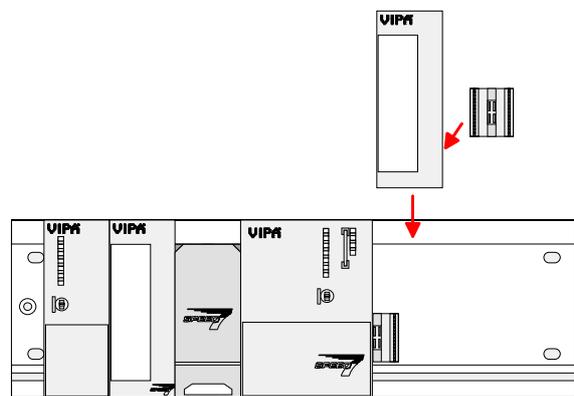
Installation CPU
with Standard-Bus-
Modules



- If also standard modules shall be plugged, take a bus coupler and click it at the CPU from behind like shown in the picture.
- Plug the CPU between the triangular positioning helps to the plug-in location marked with "CPU SPEED7" and pull it down.
- Fix the CPU by screwing.



Installation
Standard-Bus-
Modules



- Repeat this procedure with the peripheral modules, by clicking a backplane bus coupler, stick the module right from the modules you've already fixed, click it downwards and connect it with the backplane bus coupler of the last module and bolt it.



Danger!

- Before installing or overhauling the System 300V, the power supplies must be disconnected from voltage (pull the plug or remove the fuse)!
- Installation and modifications only by properly trained personnel!

Cabling

Overview

The power supplies and CPUs are exclusively delivered with CageClamp contacts. For the signal modules the front connectors are available from VIPA with screw contacts. In the following all connecting types of the power supplies, CPUs and input/output modules are described.

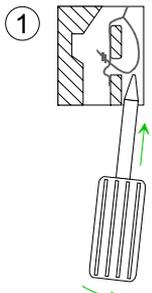


Danger!

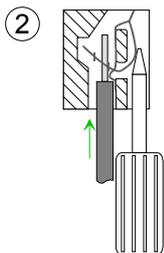
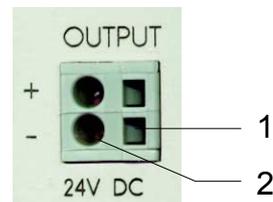
- Before installation or overhauling, the power supplies must be disconnected from voltage (pull the plug or remove the fuse)!
- Installation and modifications only by properly trained personnel!

CageClamp technology (gray)

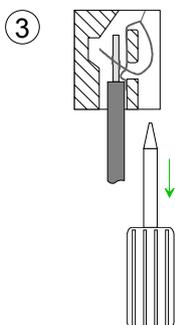
For the cabling of power supplies, bus couplers and parts of the CPU, gray connectors with CageClamp technology are used.



You may connect wires with a cross-section of 0.08mm² to 2.5mm². You can use flexible wires without end case as well as stiff wires.



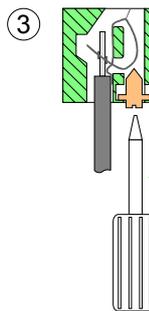
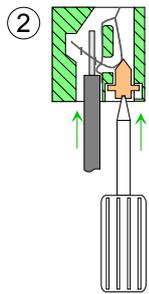
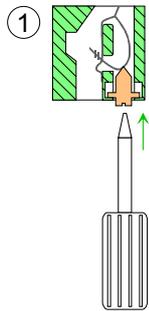
The picture on the left side shows the cabling step by step from top view.



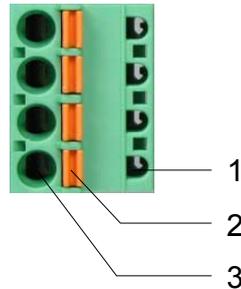
- To conduct a wire you plug a fitting screwdriver obliquely into the rectangular opening like shown in the picture.
- To open the contact spring you have to push the screwdriver in the opposite direction and hold it.
- Insert the insulation striped wire into the round opening. You may use wires with a cross-section from 0.08mm² to 2.5mm².
- By removing the screwdriver the wire is connected safely with the plug connector via a spring.

CageClamp technology (green)

For the cabling of e.g. the power supply of a CPU, green plugs with CageClamp technology are deployed.



Here also you may connect wires with a cross-section of 0.08mm^2 to 2.5mm^2 . You can use flexible wires without end case as well as stiff wires.



- [1] Test point for 2mm test tip
- [2] Locking (orange) for screwdriver
- [3] Round opening for wires

The picture on the left side shows the cabling step by step from top view.

- For cabling you push the locking vertical to the inside with a suitable screwdriver and hold the screwdriver in this position.
- Insert the insulation striped wire into the round opening. You may use wires with a cross-section from 0.08mm^2 to 2.5mm^2 .
- By removing the screwdriver the wire is connected safely with the plug connector via a spring.

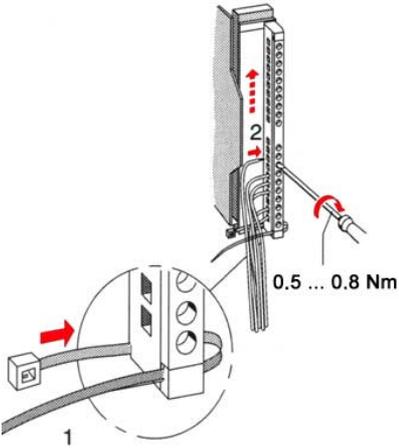
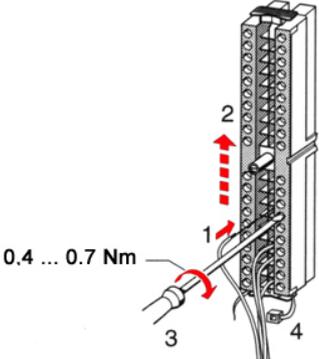
**Note!**

In opposite to the gray connection clamp from above, the green connection clamp is realized as plug that can be clipped off carefully even if it is still cabled.

Front connectors of the in-/output modules

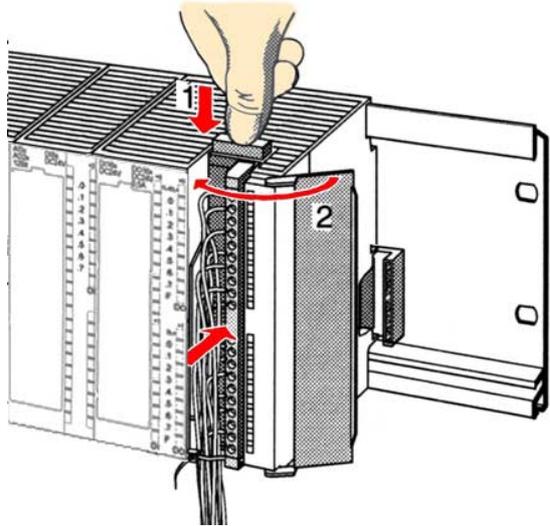
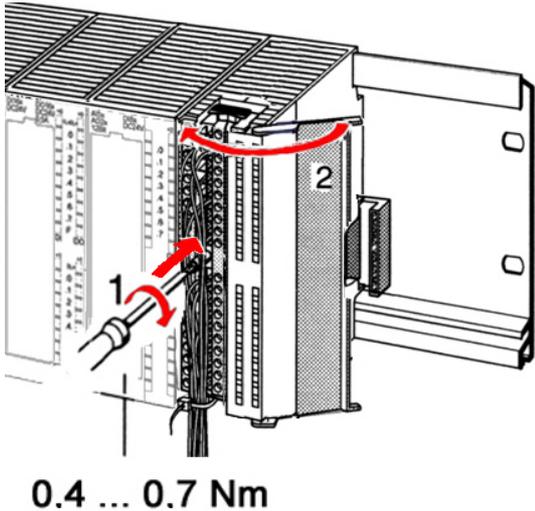
In the following the cabling of the three variants of the front-facing connector is shown:

For the I/O modules the following plugs are available at VIPA:

<p>20pole screw connection VIPA 392-1AJ00</p>	<p>40pole screw connection VIPA 392-1AM00</p>
	
<p>Open the front flap of your I/O module.</p>	
<p>Bring the front connector in cabling position. Here fore you plug the front connector on the module until it locks. In this position the front connector juts out of the module and has no contact yet.</p>	
<p>Strip the insulation of your wires. If needed, use core end cases.</p>	
<p>Thread the included cable binder into the front connector.</p>	
<p>If you want to lead out your cables from the bottom of the module, start with the cabling from bottom to top, res. from top to bottom, if the cables should be led out at the top.</p>	
<p>Bolt also the connection screws of not cabled screw clamps.</p>	
	<p>Put the included cable binder around the cable bundle and the front connector.</p> 
<p>Fix the cable binder for the cable bundle.</p>	

continued ...

... continue

<p>20pole screw connection VIPA 392-1AJ00</p>	<p>40pole screw connection VIPA 392-1AM00</p>
<p>Push the release key at the front connector on the upper side of the module and at the same time push the front connector into the module until it locks.</p> 	<p>Bolt the fixing screw of the front connector.</p>  <p>0.4 ... 0.7 Nm</p>
<p>Now the front connector is electrically connected with your module.</p>	
<p>Close the front flap.</p>	
<p>Fill out the labeling strip to mark the single channels and push the strip into the front flap.</p>	

Installation Guidelines

General

The installation guidelines contain information about the interference free deployment of System 300 systems. There is the description of the ways, interference may occur in your control, how you can make sure the electromagnetic digestibility (EMC), and how you manage the isolation.

What means EMC?

Electromagnetic digestibility (EMC) means the ability of an electrical device, to function error free in an electromagnetic environment without being interferenced res. without interfering the environment.

All System 300 components are developed for the deployment in hard industrial environments and fulfill high demands on the EMC. Nevertheless you should project an EMC planning before installing the components and take conceivable interference causes into account.

Possible interference causes

Electromagnetic interferences may interfere your control via different ways:

- Fields
- I/O signal conductors
- Bus system
- Current supply
- Protected earth conductor

Depending on the spreading medium (lead bound or lead free) and the distance to the interference cause, interferences to your control occur by means of different coupling mechanisms.

One differs:

- galvanic coupling
- capacitive coupling
- inductive coupling
- radiant coupling

Basic rules for EMC

In the most times it is enough to take care of some elementary rules to guarantee the EMC. Please regard the following basic rules when installing your PLC.

- Take care of a correct area-wide grounding of the inactive metal parts when installing your components.
 - Install a central connection between the ground and the protected earth conductor system.
 - Connect all inactive metal extensive and impedance-low.
 - Please try not to use aluminum parts. Aluminum is easily oxidizing and is therefore less suitable for grounding.
- When cabling, take care of the correct line routing.
 - Organize your cabling in line groups (high voltage, current supply, signal and data lines).
 - Always lay your high voltage lines and signal res. data lines in separate channels or bundles.
 - Route the signal and data lines as near as possible beside ground areas (e.g. suspension bars, metal rails, tin cabinet).
- Proof the correct fixing of the lead isolation.
 - Data lines must be laid isolated.
 - Analog lines must be laid isolated. When transmitting signals with small amplitudes the one sided lying of the isolation may be favorable.
 - Lay the line isolation extensively on an isolation/protected earth conductor rail directly after the cabinet entry and fix the isolation with cable clamps.
 - Make sure that the isolation/protected earth conductor rail is connected impedance-low with the cabinet.
 - Use metallic or metalized plug cases for isolated data lines.
- In special use cases you should appoint special EMC actions.
 - Wire all inductivities with erase links that are not addressed by the System 300V modules.
 - For lightening cabinets you should prefer incandescent lamps and avoid luminescent lamps.
- Create an homogeneous reference potential and ground all electrical operating supplies when possible.
 - Please take care for the targeted employment of the grounding actions. The grounding of the PLC is a protection and functionality activity.
 - Connect installation parts and cabinets with the System 300V in star topology with the isolation/protected earth conductor system. So you avoid ground loops.
 - If potential differences between installation parts and cabinets occur, lay sufficiently dimensioned potential compensation lines.

Isolation of conductors

Electrical, magnetic and electromagnetic interference fields are weakened by means of an isolation, one talks of absorption.

Via the isolation rail, that is connected conductive with the rack, interference currents are shunt via cable isolation to the ground. Hereby you have to make sure, that the connection to the protected earth conductor is impedance-low, because otherwise the interference currents may appear as interference cause.

When isolating cables you have to regard the following:

- If possible, use only cables with isolation tangle.
- The hiding power of the isolation should be higher than 80%.
- Normally you should always lay the isolation of cables on both sides. Only by means of the both-sided connection of the isolation you achieve a high quality interference suppression in the higher frequency area.
Only as exception you may also lay the isolation one-sided. Then you only achieve the absorption of the lower frequencies. A one-sided isolation connection may be convenient, if:
 - the conduction of a potential compensating line is not possible
 - analog signals (some mV res. μ A) are transferred
 - foil isolations (static isolations) are used.
- With data lines always use metallic or metalized plugs for serial couplings. Fix the isolation of the data line at the plug rack. Do not lay the isolation on the PIN 1 of the plug bar!
- At stationary operation it is convenient to strip the insulated cable interruption free and lay it on the isolation/protected earth conductor line.
- To fix the isolation tangles use cable clamps out of metal. The clamps must clasp the isolation extensively and have well contact.
- Lay the isolation on an isolation rail directly after the entry of the cable in the cabinet. Lead the isolation further on to the System 300V module and **don't** lay it on there again!

**Please regard at installation!**

At potential differences between the grounding points, there may be a compensation current via the isolation connected at both sides.

Remedy: Potential compensation line

Chapter 3 Hardware description

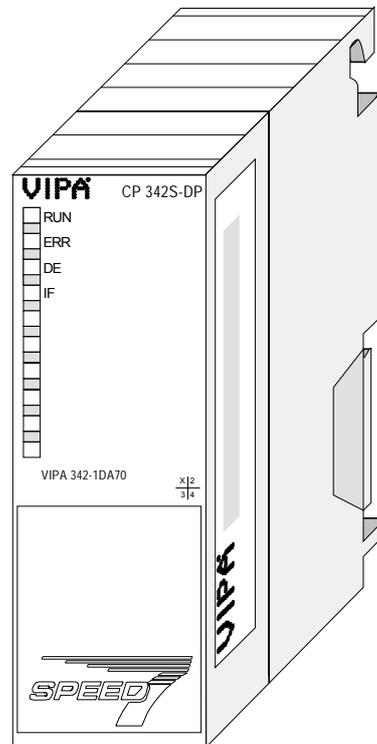
Overview Here the hardware components of the CP 342S-DP are more described. The technical data are to be found at the end of the chapter.

Content	Topic	Page
	Chapter 3 Hardware description	3-1
	Properties.....	3-2
	Structure	3-3
	Technical Data	3-6

Properties

General

The CP 342S-DP may only be used at the SPEED-Bus.



CP 342S-DP

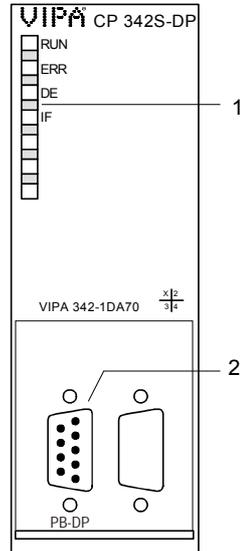
- Profibus DP master (Class 1) for SPEED-Bus
- Project engineering by Siemens SIMATIC Manager
- 124 DP slaves connectable
- DP-V1 (acyclic read-, write-, interrupt services), DP-V1 typical interrupt handling, 1 MSAC_C1 with 244Byte data (4Byte DP-V1-Header + 240Byte user data)
- Diagnostic facilities

Order data

Type	Order No	Description
CP 342S-DP	VIPA 342-1DA70	Profibus-DP Master for SPEED-Bus

Structure

Front view



[1] LED status indicators

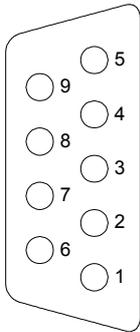
The following components are under the front flap

[2] RS485 Profibus interface

Components

RS485 interface

The CP 342S-DP is connected to your Profibus network via the 9pin RS 485 interface. The RS 485 slot has the following pin assignment:



Pin	Assignment	Bus termination
1	Shield	
2	n.c.	
3	RxD/TxD-P (Line B)	
4	RTS	
5	M5V	
6	P5V	
7	n.c.	
8	RxD/TxD-N (Line A)	
9	n.c.	



Note!

Please regard to terminate the bus at its ends by means of a terminating resistor!

LEDs

The CP 342S-DP carries a number of LEDs that are available for diagnostic purposes on the bus and for displaying the local status.

Dependent on the mode of operation these give information according to the following pattern over the operating condition of the CP:

Master operation

RUN green	ERR red	DE green	IF red	Meaning
○	○	○	○	Master has no project, this means the interface is deactivated.
●	○	○	○	Master has bus parameters and is in RUN without slaves.
●	○	☀	○	Master is in "clear" state (safety state). The inputs of the slaves may be read. The outputs are disabled.
●	○	●	○	Master is in "operate" state, this means data exchange between master and slaves. The outputs may be accessed.
●	●	☀	○	At least 1 slave is missing.
○	○	○	●	Initialization error at faulty parameterization.
○	●	○	●	Waiting state for start command from CPU.

Slave operation

RUN green	ERR red	DE green	IF red	Meaning
○	○	○	○	Slave has no project, this means the interface is deactivated.
☀	○	○	○	Slave is without master.
☀	○	☀	○	Alternate flashing at configuration faults.
●	○	●	○	Slave exchanges data between master.

on: ● off: ○ flashing: ☀

Power supply	<p>The CP 342S-DP receives power via the backplane bus. Here the max. current consumption amounts to 560mA.</p>
Firmware update	<p>There is the possibility to execute a firmware update of the CP 342S-DP among others via the SPPED7 CPU by means of a MMC.</p> <p>So a firmware file may be recognized and assigned with startup, a pkg file name is reserved for each updateable component and hardware release, which begins with "px" and differs in a number with six digits.</p> <p>The pkg file name may be found at a label right down the front flap of the module.</p> <p>Details to the firmware update may be found in manual HB140_CPU at chapter "Deployment CPU 31xS" at "firmware update".</p>
Set Profibus address via project engineering	<p>The assignment of a Profibus address happens during project engineering. The address may be within the range 2 ... 124 in the course of which every address must be unique within the bus system. The address 1 is reserved due to the system.</p> <p>Particularly for SPEED-Bus modules the slot assignment at the SPEED-Bus happens via the Profibus address of the SPEED-Bus slave.</p>
I/O data	<p>The CP 342S-DP may maximally process 8192Byte input and 8192Byte output data. Please regard that in the Siemens SIMATIC manager maximally 2159Byte for input and output data in the sum for all masters at the speed bus may be projected.</p> <p>Likewise regard during project engineering of several DP masters at the speed bus that the address ranges do not overlap, since this is not checked-up in the Siemens SIMATIC manager.</p>
Deployment	<p>With one Profibus DP master up to 124 Profibus DP slaves may be connected to the CPU. The DP master communicates with the DP slaves and links up its data areas with the address area of the CPU.</p> <p>At every POWER ON res. OVERALL RESET the CPU fetches the I/O mapping data from the master. If the CP 342S-DP does not have any parameters, the LEDs are off and the Profibus interface is deactivated.</p> <p>If the CPU goes to STOP during operation, the master remains in RUN. Due to the BASP signal the outputs of every via DP slave connected module are disabled.</p>
Default bus parameters	<p>Address: 2, Transfer rate: 1.5MBaud</p>

Technical Data

Electrical data	VIPA 342-1DA70
Power supply	via backplane bus
Current consumption	max. 560mA
Power dissipation	2.8W
Isolation	≥ AC 500V
Status indicators	via LEDs on the front
Connections/interfaces	9pin D-type slot Profibus connector
Profibus interface	
Connection	9pin D-type slot
Network topology	Linear bus, active bus terminator at both ends
Medium	Screened twisted pair cable, under certain conditions unscreened lines are permitted.
Data transfer rate	9.6kBaud to 12MBaud
Total length	without repeaters 100m (12MBaud), with repeaters 1000m
Max. no. of stations	32 stations in any segment without repeaters. Extendible to 124 stations when using repeaters.
Multimaster operation	yes
PG connections	31
Combination with peripheral modules	
max. no of slaves	124
max. no. of input bytes	8192byte
max. no. of output bytes	8192byte
Dimensions and weight	
Dimensions (WxHxD) in mm	40x125x120
Weight	165g

Chapter 4 Deployment

Overview Content of this chapter is the functionality of the CP 342S-DP for SPEED-Bus from VIPA. The module may only be used at a SPEED-Bus slot at the left side of the CPU.

Content	Topic	Page
	Chapter 4 Deployment	4-1
	Basics Profibus	4-2
	Addressing at SPEED-Bus	4-3
	Project engineering	4-4
	Slave operation	4-10
	Profibus installation guidelines	4-13

Basics Profibus

Profibus-DP

Profibus is an international standard applicable to an open field bus for building, manufacturing used to create a low (sensor-/actuator level) or medium (process level) performance network of programmable logic controllers.

Profibus comprises an assortment of compatible versions. The following details refer to Profibus-DP.

Profibus-DP is particularly suitable for applications in production automation. DP is very fast, offers Plug'n'Play and is a cost-effective alternative to parallel cabling between PLC and the decentralized periphery.

During a single bus cycle the master reads the input values from the various slaves and writes new output information into the slaves.

Data transfer medium

Profibus employs screened twisted pair cable on the basis of the RS485 interfaces or a duplex fiber optic link (FO). The data transfer rate of both systems is limited to a max. of 12MBaud.

Addressing

Every device on the Profibus is identified by an address. This address must be an unique number in the bus system between 1 ... 124.

At the VIPA CP 342S-DP the address may be set between 2 ... 124. System dependent the address 1 is reserved.

GSD file

To configure the slave connections in your own configuration tool, you've got all the information about your VIPA-modules in form of an electronic data sheet file. Install this GSD file in you configuration tool.

Structure and content of the GSD file are dictated by the Profibus User Organization (PNO) and may be retrieved there.

More information about installing the GSD may be found at the online help of the according engineering tool.

Addressing at SPEED-Bus

Overview

To provide specific addressing of the installed peripheral modules, certain addresses must be allocated in the CPU.

With no hardware configuration present, the CPU assigns automatically peripheral I/O addresses during boot procedure depending on the plug-in location amongst others also for plugged modules at the SPEED-Bus.

Maximal pluggable modules

In the hardware configurator from Siemens up to 8 modules per row may be parameterized. At deployment of SPEED7 CPUs up to 32 modules at the standard bus and 10 further modules at the SPEED-Bus may be controlled. CPs and DP masters that are additionally virtual configured at the standard bus are taken into the sum of 32 modules at the standard bus.

For the project engineering of more than 8 modules you may use virtual line interface connections. For this you set in the hardware configurator the module IM 360 from the hardware catalog to slot 3 of your 1. profile rail. Now you may extend your system with up to 3 profile rails by starting each with an IM 361 from Siemens at slot 3.

Define addresses by hardware configuration

You may access the modules with read res. write accesses to the peripheral bytes or the process image.

To define addresses a hardware configuration via a virtual Profibus system by including the SPEEDBUS.GSD may be used. For this, click on the properties of the according module and set the wanted address.

Automatic addressing

If you do not like to use a hardware configuration, an automatic addressing comes into force.

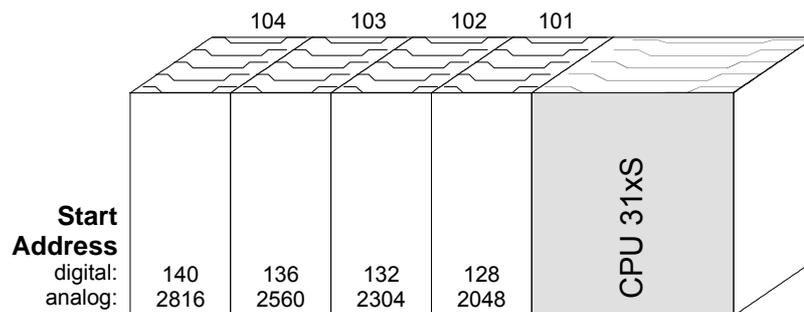
At the automatic address allocation DI/Os are mapped depending on the slot location with a distance of 4byte and AI/Os, FMs, CPs with a distance of 256byte.

Depending on the slot location the start address from where on the according module is stored in the address range is calculated with the following formulas:

DIOs: $\text{Start address} = 4 \cdot (\text{slot} - 101) + 128$

AI/Os, FMs, CPs: $\text{Start address} = 256 \cdot (\text{slot} - 101) + 2048$

← ... ,102 ,101 Slot



Project engineering

Overview

engineering of the DP master at the SPEED-Bus takes place in the hardware configurator from Siemens at the SPEED-Bus section as replacement.

The real project engineering is virtual at the standard bus section. For this you virtually configure a CP342-5 (342-5DA02 V5.0) DP master from Siemens. To this master the slave modules may be connected.

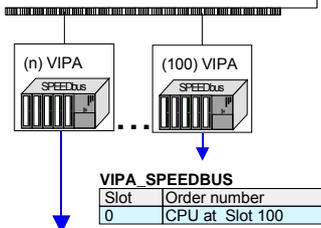
Fast introduction

For the deployment of the System 300S modules at the SPEED-Bus, the inclusion of the SPEEDBUS.GSD from VIPA in the hardware catalog is required.

Standard bus

Slot	Module
1	
2	CPU 318-2
X2	DP
X1	MPI/DP
3	
real modules at the standard bus	
343-1EX11 (internal PG/OP)	
343-1EX11 (internal CP343)	
CPs res. DP-Master at the SPEED-Bus as 343-1EX11 res. 342-5DA02	
	342-5DA02 V5.0

virtual DP master for CPU and all SPEED-Bus modules



VIPA_SPEEDBUS

Slot	Order number
0	Module at slot n

To be compatible with the Siemens SIMATIC manager, you have to execute the following steps:

- Start the hardware configurator from Siemens and include the SPEEDBUS.GSD for SPEED7 from VIPA.
- Configure CPU 318-2DP (6ES7 318-2AJ00-0AB0/V3.0) from Siemens. Configure a possibly existing internal DP master of your SPEED7-CPU via the internal DP master.
- Starting with slot 4, place the System 300 modules in the plugged sequence.
- Project engineering and connection of the SPEED-Bus DP master at the standard bus as virtual CP 342-5 (342-5DA02 V5.0)
- For the SPEED-Bus you always include, connect and parameterize to the *operating mode* DP master the DP master CP 342-5 (342-5DA02 V5.0) as last module. To this master system you assign every SPEED-Bus module as VIPA_SPEEDBUS slave. Here the Profibus address corresponds to the slot no. Beginning with 100 for the CPU. Place on slot 0 of every slave the assigned module and alter the parameters if needed.
- Let with the CPs or DP master (also virtual speed bus master) at *options* the attitude "Save configuration data on the CPU" activated!

Preconditions

The hardware configurator is part of the Siemens SIMATIC manager. It serves the project engineering. The modules that may configured here are listed in the hardware catalog.

For the deployment of the System 300S modules at the SPEED-Bus you have to include the System 300S modules into the hardware catalog via the GSD-file SPEEDBUS.GSD from VIPA.



Note!

For the project engineering a thorough knowledge of the Siemens SIMATIC manager and the hardware configurator from Siemens is required!

Include the SPEED7-GSD-file

The GSD (**Geräte-Stamm-Datei**) is online available in the following language versions. Further language versions are available on inquires.

Name	Language
SPEEDBUS.GSD	german (default)
SPEEDBUS.GSG	german
SPEEDBUS.GSE	english

The GSD files can be found at www.vipa.de at the Service part and at the VIPA ftp server at [ftp.vipa.de/support/profibus_gsd_files](ftp://vipa.de/support/profibus_gsd_files).

The integration of the SPEEDBUS.GSD takes place with the following proceeding:

- Browse to www.vipa.de.
- Click to *Service > Download > GSD- and EDS-Files > Profibus*.
- Download the file *Cx000023_Vxxx*.
- Extract the file to your work directory. The SPEEDBUS.GSD is stored in the directory *VIPA_System_300S*.
- Start the hardware configurator from Siemens.
- Close every project.
- Select **Options** > *Install new GSD-file*.
- Navigate to the directory *VIPA_System_300S* and select "SPEEDBUS.GSD".

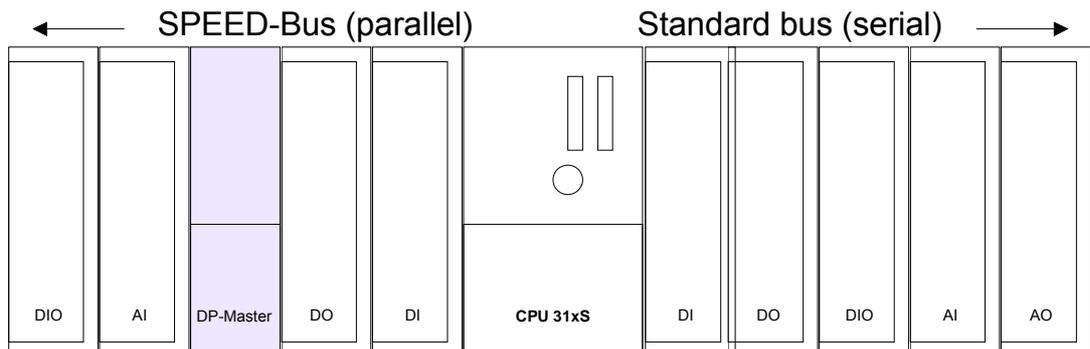
The modules of the System 300S from VIPA are now included in the hardware catalog under *Profibus-DP / Additional field devices / I/O / VIPA_SPEEDBUS*.

Steps of the project engineering

The following text describes the approach of the project engineering in the hardware configurator from Siemens at an abstract sample.

The project engineering is separated into 3 parts:

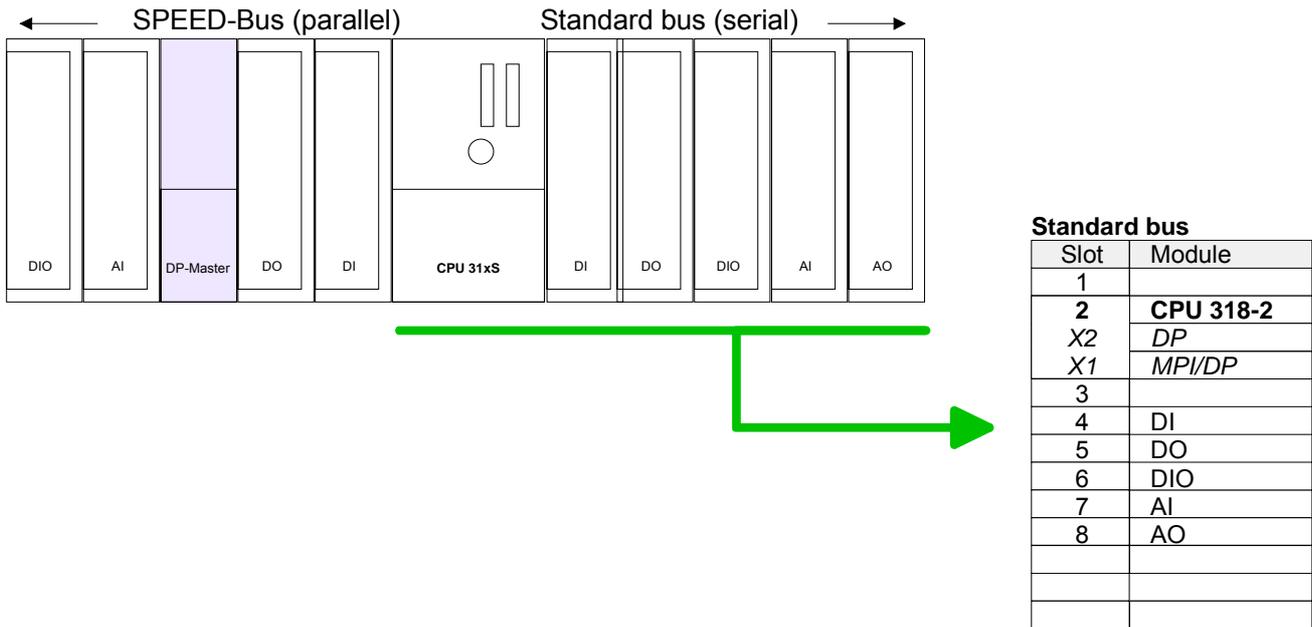
- Project engineering of the real plugged modules at the standard bus
- Project engineering of all SPEED-Bus DP master at the standard bus as 342-5DA02 V5.0 from Siemens
- Project engineering of the SPEED-Bus modules in a virtual master system. Here the SPEEDBUS.GSD is necessary.



Project engineering of the modules at the standard bus

The modules at the right side of the CPU at the standard bus are configured with the following approach:

- Start the hardware configurator from Siemens with a new project and insert a profile rail from the hardware catalog.
- Place the following Siemens CPU at slot 2:
CPU 318-2DP (6ES7 318-2AJ00-0AB0/V3.0)
- Include your System 300 modules at the standard bus in the plugged sequence starting with slot 4.
- Parameterize the CPU res. the modules where appropriate. The parameter window opens by a double click on the according module.
- Since as many as 32 modules can be addressed by the SPEED7 CPU in one row, but only 8 modules are supported by the Siemens SIMATIC manager, the IM 360 of the hardware catalog can be used as a virtual bus extension during project engineering. Here 3 further extension racks can be virtually connected via the IM 361. Bus extensions are always placed at slot 3.
- Save your project.



Project engineering of all SPEED-Bus-DP master at the standard bus

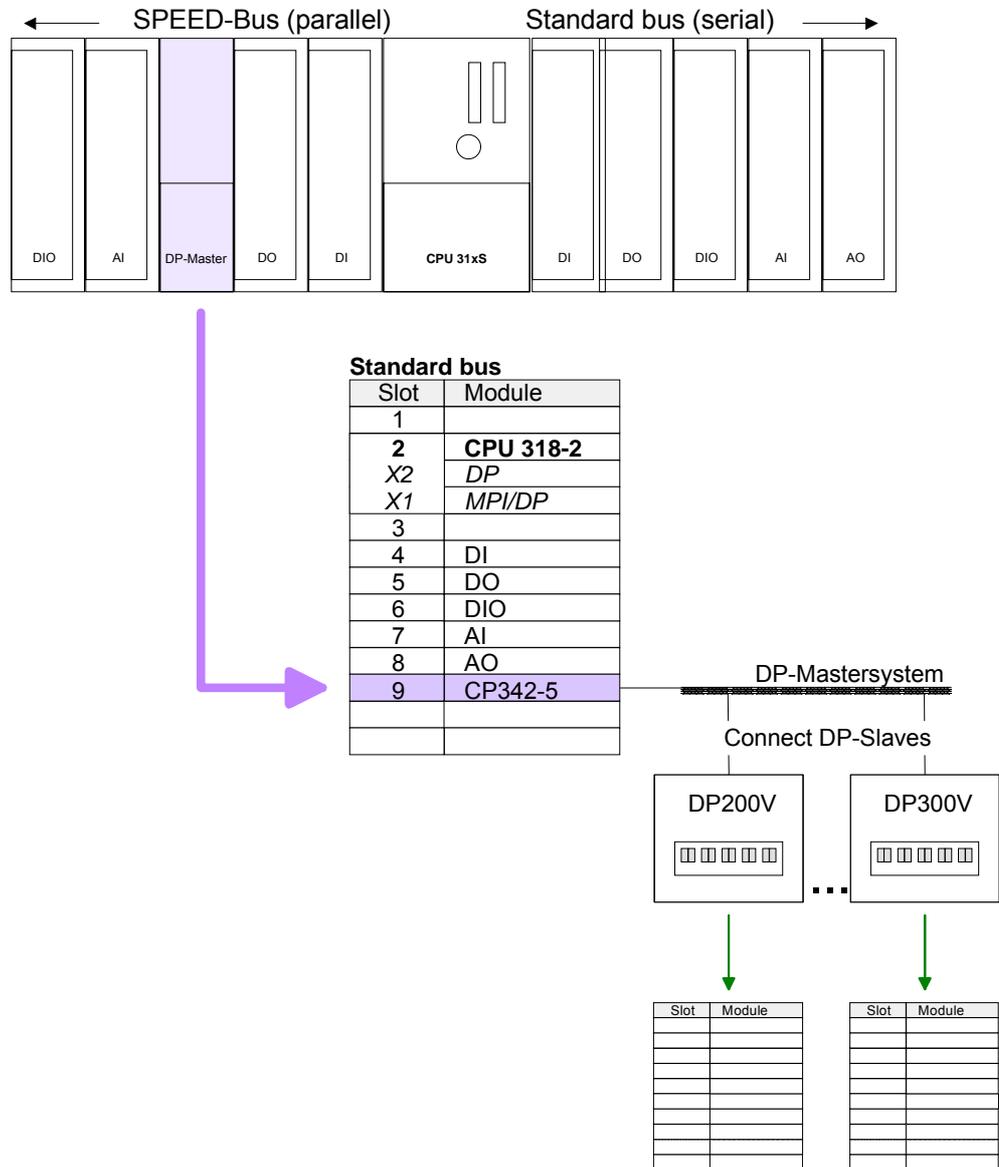
Due to the fact that a SPEED-Bus-DP master is in project engineering and parameterization similar to the DP master CP342-5 from Siemens, every SPEED-Bus-DP master is inserted at the standard bus as CP342-5 (342-5DA02 V5.0) after the already configured modules. The sequence follows the one at the SPEED-Bus from the right to the left.

Create a master system for the CP342-5 and include here your Profibus slave systems.



Attention!

Please take care to not configure ambiguous address assignments at the connection via external Profibus DP master - for the project engineering of SPEED-Bus systems required! The Siemens hardware configurator does not execute an address check for external DP master systems!



Project engineering of all SPEED-Bus modules in a virtual master system

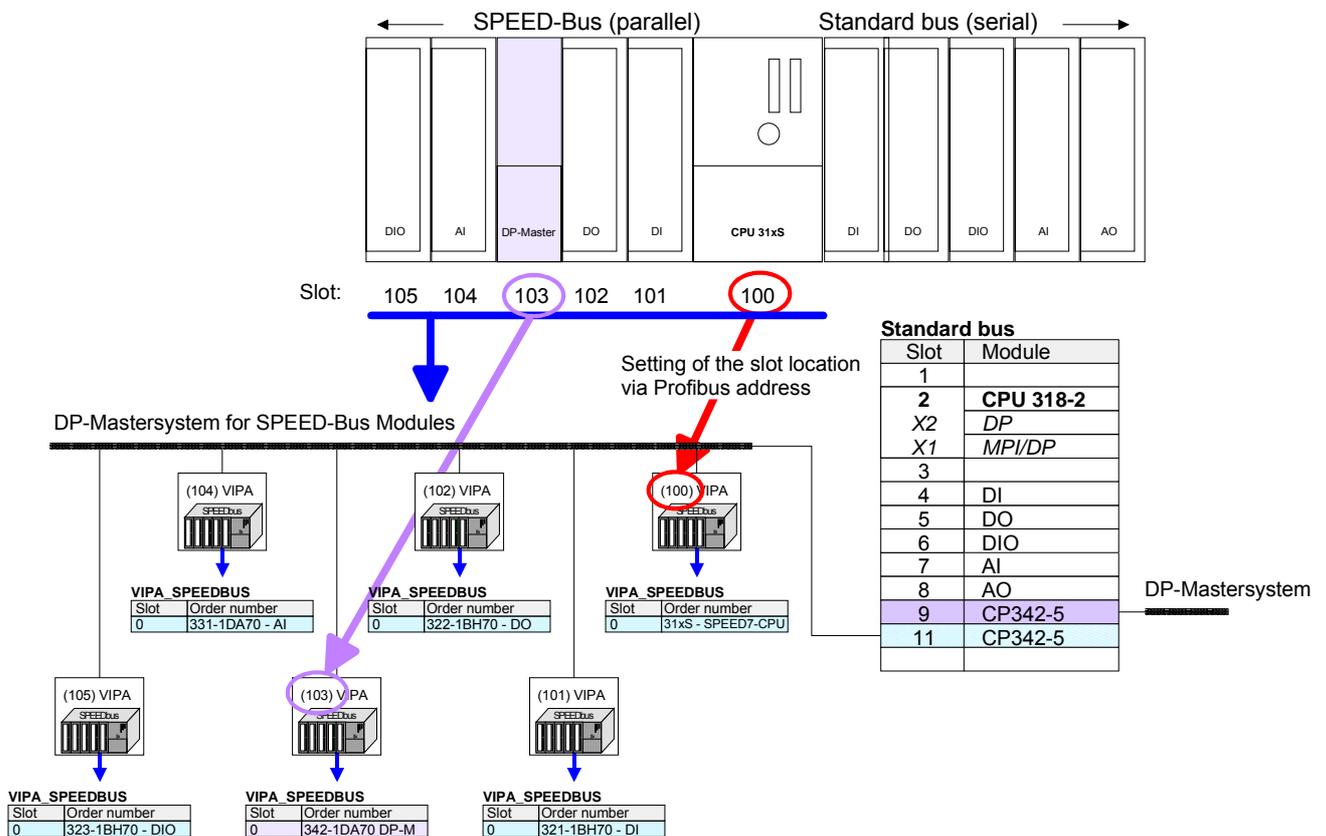
The slot assignment of the SPEED-Bus modules and the parameterization of the in-/output periphery happens via a virtual Profibus DP master system. For this, place as last module a DP master (342-5DA02 V5.0) with master system.

For the employment of the System 300S modules at the SPEED-Bus the inclusion of the System 300S modules into the hardware catalog via the GSD-file SPEEDBUS.GSD from VIPA is required.

After the installation of the SPEEDBUS.GSD you may locate under *Profibus DP / Additional field devices / I/O / VIPA_SPEEDBUS* the DP slave system *VIPA_SPEEDBUS*.

Now include for the CPU and every module at the SPEED-Bus a slave system "VIPA_SPEEDBUS".

Set as Profibus address the slot no. (100...110) of the module and place the according module from the hardware catalog of *VIPA_SPEEDBUS* to slot 0 of the slave system.

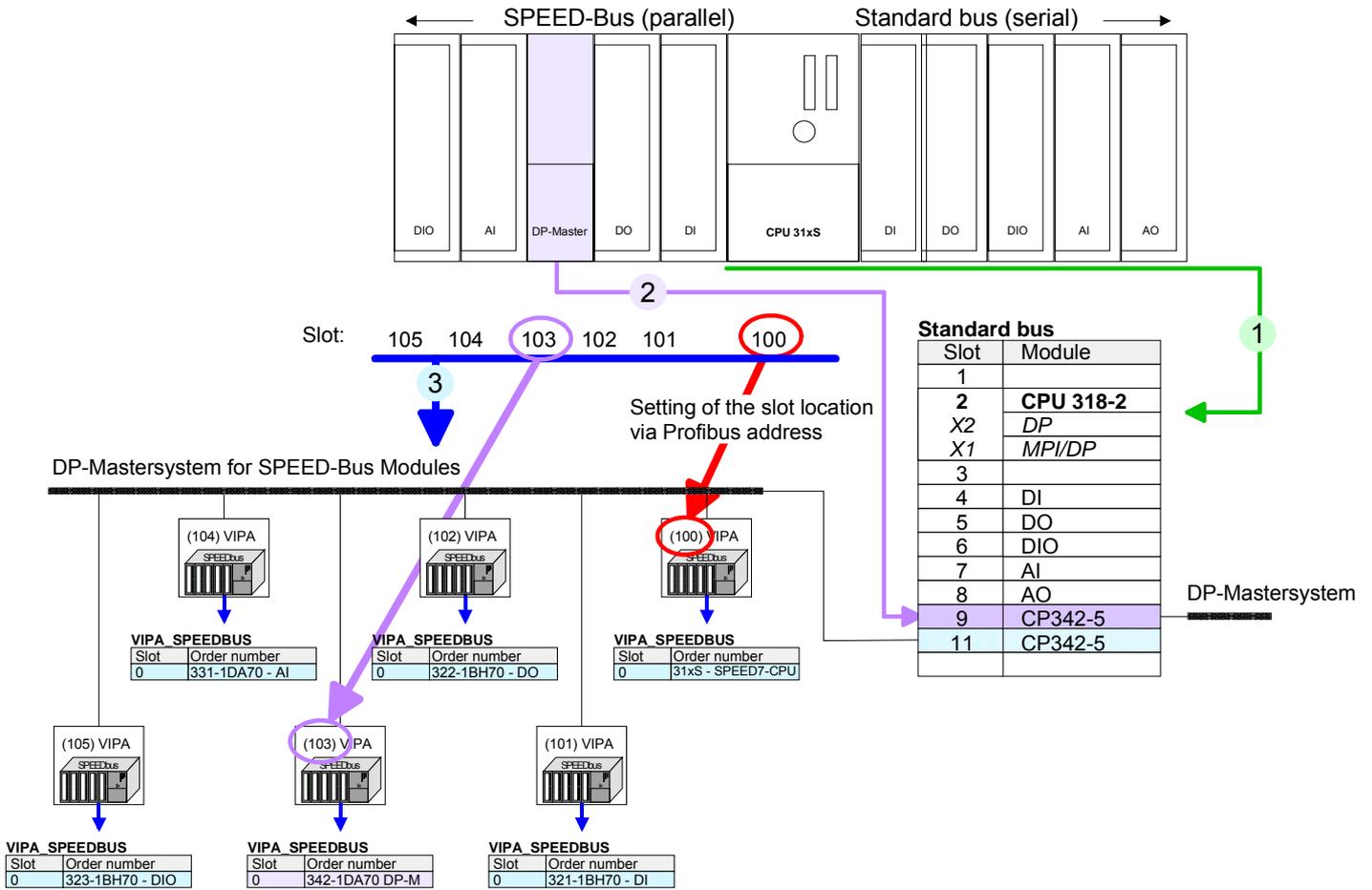


The according module is to be taken over from the HW Catalog of *VIPA_SPEEDBUS* to slot 0.

Together with your hardware configuration you may transfer your DP master project engineering into the CPU. This passes the project engineering on to the DP master.

Summary

The following illustration summarizes the steps of project engineering:



The according module is to be taken over from the HW Catalog of VIPA_SPEEDBUS to slot 0.

Slave operation

Fast introduction The deployment of the CP 342S-DP as DP Slave exclusively takes place at master systems, which may be projected in the Siemens SIMATIC manager. Apart from project engineering at the SPEED-Bus each Profibus CP is to be projected additionally at the standard bus. Here the slave may be switched to slave operation and connected to Profibus.
The I/O communication areas may be set by the SPEED-Bus configuration.

Slave system

- Start Siemens hardware configurator and install SPEEDBUS.GSD for SPEED7 from VIPA.
- Configure a CPU 318-2DP (6ES7 318-2AJ00-0AB0/V3.0) from Siemens.
- Starting with slot 4, place the System 300 modules in the plugged sequence.
- Project engineering and connection of the SPEED-Bus DP master at the standard bus as virtual CP 342-5 (342-5DA02 V. 5.0)
- Switch the appropriate DP master to operating mode slave and connect it to Profibus by means of *properties*.
- For the SPEED-Bus you always include, connect and parameterize to the *operating mode* DP master the DP master CP 342-5 (342-5DA02 V5.0) as last module.
- To this master system you assign every SPEED-Bus module as VIPA_SPEEDBUS slave. Here the Profibus address corresponds to the slot no. Beginning with 100 for the CPU.
- Place at slot 0 of every slave the assigned module, alter the parameters if needed and set the I/O communication areas of the slave system by *properties*.
- Store, translate and transfer the project to the slave system.

Master system

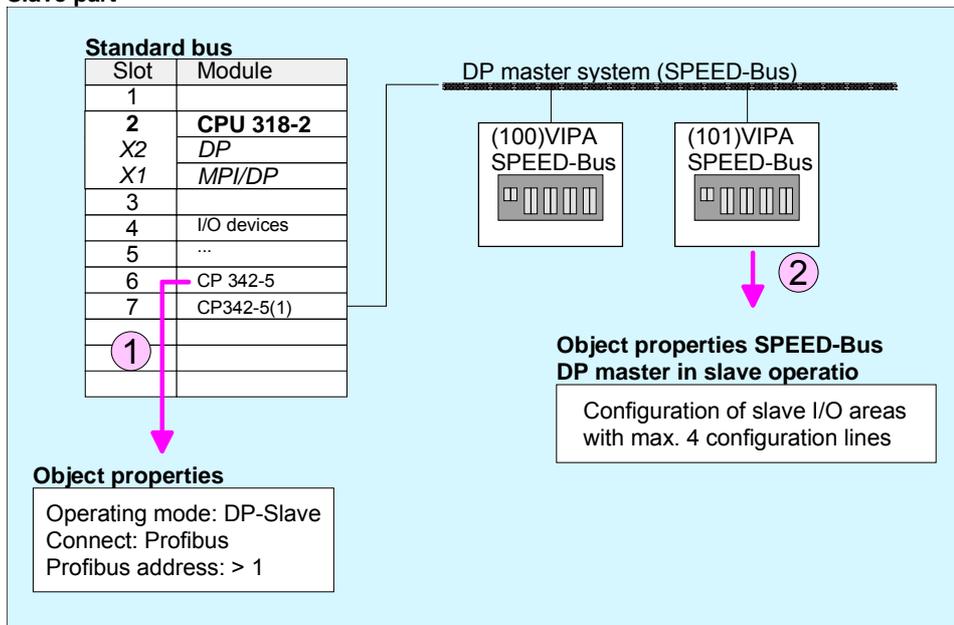
- Configure and connect to Profibus an other CPU 318-2DP (6ES7 318-2AJ00-0AB0/V3.0) from Siemens with *operating mode* "DP master".
- Choose the DP slave of *Configured stations* (S7-300 CP 342-5 DP V. 5.0) and connect to the according slave.
- Assign the I/O communication areas of the slave system to the I/O address areas of the CPU by placing of byte/word elements within the slave system. Here is to be considered:
I slave system = O master system
O slave system = I master system
- Store, translate and transfer the project to the master system.

Let with the CPs or DP master (also virtual speed bus master) at *options* the attitude "Save configuration data on the CPU" activated!

Project engineering of the slave section

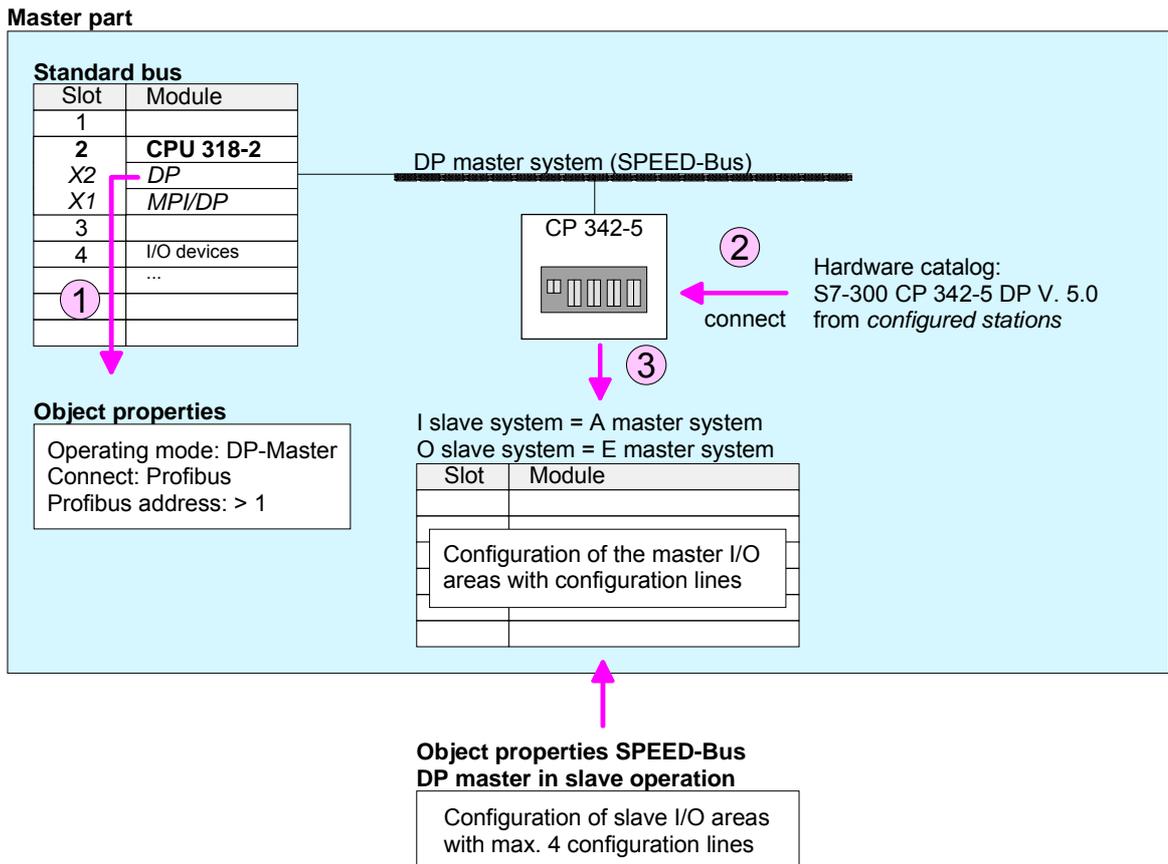
- Start the Siemens SIMATIC manager with an new project.
- Insert a SIMATIC 300 station and name it "... slave system".
- Open the hardware configurator and insert a profile rail from the hardware catalog.
- Place at slot 2 the following Siemens CPU:
CPU 318-2DP (6ES7 318-2AJ00-0AB0 V3.0)
- Include according to the hardware structure the modules at the standard bus.
- Configure for the SPEED-Bus DP master in slave operation a Siemens CP 342-5 (342-5DA02 V. 5.0).
- Switch the DP master to slave operating mode, connect it to Profibus and set a Profibus address > 1 (preferably 3).
- For the SPEED-Bus you always include the DP master CP 342-5 (342-5DA02 V5.0) from Siemens. Parameterize it to the *operating mode* DP master and connect it with a *new* Profibus net.
- To this master system you assign every SPEED-Bus module as VIPA_SPEEDBUS slave. Here the Profibus address corresponds to the slot no. Beginning with 100 for the CPU.
- Place on slot 0 of every slave the assigned module and alter the parameters if needed.
- Configure the I/O communication area of the slave system by means of the properties of the CP 342-1DA70. Maximally 4 areas may be configured.
- Save, translate and transfer your project to the CPU of the slave system.

Slave part



Project engineering of the superimposed master section

- Insert another *SIMATIC 300 station* and name it as "... master system".
- Open the hardware configurator and insert a profile rail from the hardware catalog.
- Place the following Siemens CPU at slot 2:
CPU 318-2DP (6ES7 318-2AJ00-0AB0 V3.0)
- Add your modules according to the real hardware assembly.
- Connect the CPU to *Profibus*, set a Profibus address >1 (preferably 2) and switch the Profibus section via *operating mode* to "master operation".
- Connect your slave system to the master system by dragging the "S7-300 CP 342-5DA02 V. 5.0" from the hardware catalog at *configured stations* onto the master system and select your slave system.
- Click to the connected slave. Assign the I/O communication areas of the slave system to the I/O address areas of the CPU by placing of byte/word elements within the slave system. Here is to be considered:
I slave system = O master system
O slave system = I master system
- Store, translate and transfer the project to the CPU of the master system.



Profibus installation guidelines

Profibus in general

- A Profibus-DP network may only be built up in linear structure.
- Profibus-DP consists of minimum one segment with at least one master and one slave.
- A master has always be deployed together with a CPU.
- Profibus supports max. 126 participants.
- Per segment a max. of 32 participants is permitted.
- The max. segment length depends on the baud rate:

9.6 ... 187.5kBaud	→	1000m
500kBaud	→	400m
1.5MBaud	→	200m
3 ... 12MBaud	→	100m
- Max. 10 segments may be built up. The segments are connected via repeaters. Every repeater counts for one participant.
- All participants are communicating with the same baudrate. The slaves adjust themselves automatically on the baudrate.
- The bus has to be terminated at both ends.
- Master and slaves are free combinable.

Transfer medium

As transfer medium Profibus uses an isolated twisted-pair cable based upon the RS485 interface.

The RS485 interface is working with voltage differences. Though it is less irritable from influences than a voltage or a current interface. You are able to configure the network as well linear as in a tree structure. Your VIPA CPU 31xS includes a 9pin slot where you connect the Profibus coupler into the Profibus network as a slave.

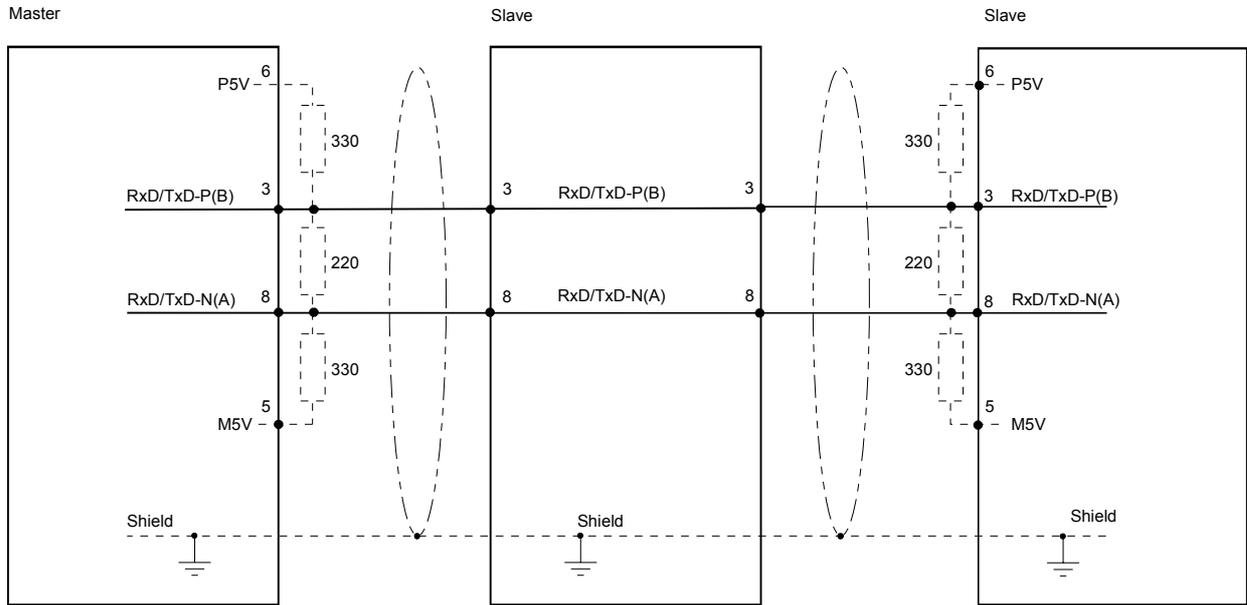
Max. 32 participants per segment are permitted. The segments are connected via repeaters. The maximum segment length depends on the transfer rate.

Profibus-DP uses a transfer rate between 9.6kBaud and 12MBaud, the slaves are following automatically. All participants are communicating with the same baudrate.

The bus structure under RS485 allows an easy connection res. disconnection of stations as well as starting the system step by step. Later expansions don't have any influence on stations that are already integrated. The system realizes automatically if one partner had a fail down or is new in the network.

Bus connection

The following picture illustrates the terminating resistors of the respective start and end station.



Note!

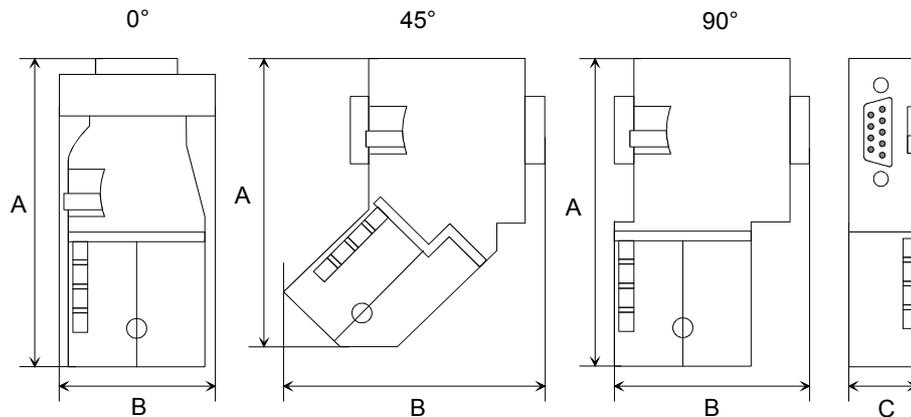
The Profibus line has to be terminated with its ripple resistor. Please make sure to terminate the last participants on the bus at both end by activating the terminating resistor.

"EasyConn" Bus connector



In systems with more than two stations all partners are wired in parallel. For that purpose, the bus cable must be feed-through uninterrupted.

Via the order number VIPA 972-0DP10 you may order the bus connector "EasyConn". This is a bus connector with switchable terminating resistor and integrated bus diagnostic.



	0°	45°	90°
A	64	61	66
B	34	53	40
C	15.8	15.8	15.8

all in mm



Note!

To connect this EasyConn plug, please use the standard Profibus cable type A (EN50170).

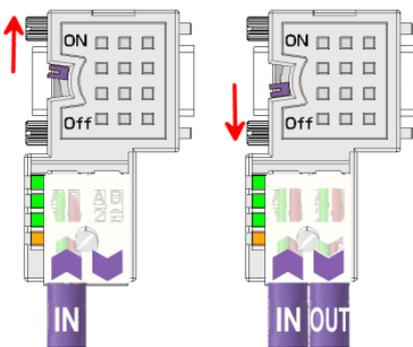
Starting with release 5 you also can use highly flexible bus cable: Lapp Kabel order no.: 2170222, 2170822, 2170322.

With the order no. 905-6AA00 VIPA offers the "EasyStrip" de-isolating tool, that makes the connection of the EasyConn much easier.



Termination with "EasyConn"

The "EasyConn" bus connector is provided with a switch that is used to activate a terminating resistor.



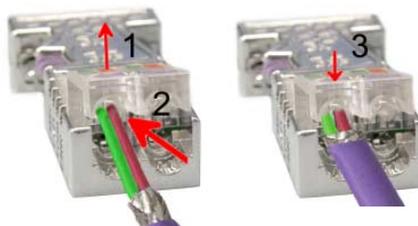
Attention!

The terminating resistor is only effective, if the connector is installed at a slave and the slave is connected to a power supply.

Note!

A complete description of installation and deployment of the terminating resistors is delivered with the connector.

Assembly



- Loosen the screw.
- Lift contact-cover.
- Insert both wires into the ducts provided (watch for the correct line color as below!)
- Please take care not to cause a short circuit between screen and data lines!
- Close the contact cover.
- Tighten screw (max. tightening torque 4Nm).

Please note:

The green line must be connected to A, the red line to B!

Appendix

A Index

A		
Addressing		
SPEED-Bus.....	4-3	
Assembly.....	2-1, 2-4	
CPU 31xS.....	2-4	
Direction.....	2-2	
SPEED-Bus.....	2-5	
B		
Basics.....	1-1	
C		
Cabling.....	2-8	
Front connectors.....	2-10	
Compatibility.....	1-6	
Core cross-section.....	1-6	
E		
EMC.....	2-12	
Basic rules.....	2-13	
Environmental conditions.....	1-6	
F		
Fast introduction.....	4-4	
Firmware update.....	3-5	
G		
GSD file include.....	4-5	
I		
I/O data.....	3-5	
Installation.....	2-1	
Installation guidelines.....	2-12	
Interface.....	3-3	
Interference influences.....	2-12	
Isolation of conductors.....	2-14	
L		
LEDs.....	3-4	
O		
Overview		
System 300.....	1-3	
P		
pkg file.....	3-5	
Power supply.....	3-5	
Power supply.....	1-6	
Profibus		
Basics.....	4-2	
Baud rate.....	4-13	
Connectors.....	4-14	
De-isolating lengths.....	4-15	
Installation guidelines.....	4-13	
Line termination.....	4-15	
Transfer medium.....	4-13	
Profibus address.....	3-5	
Project engineering.....	4-4	
S		
Safety Information.....	1-2	
Slave operation.....	4-10	
SPEED-Bus.....	1-5	
Assembly.....	2-5	
GSD file include.....	4-5	
Hint.....	1-10	
Structure.....	3-3	

