Handbücher/Manuals

VIPA
Gesellschaft für Visualisierung
und Prozessautomatisierung mbH
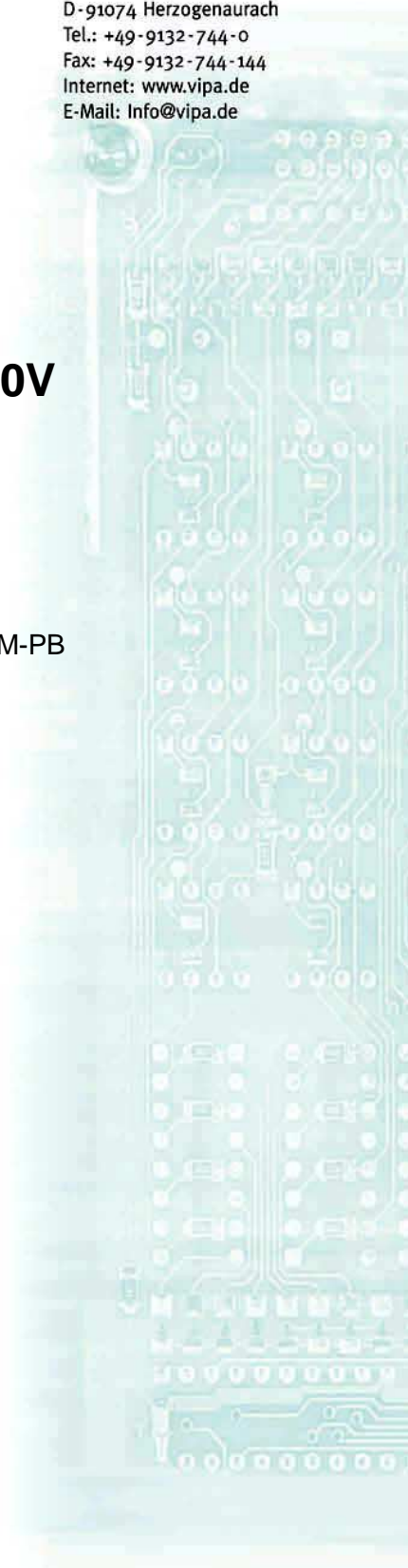
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Manual

VIPA System 100V

SM-PB

Order No.: VIPA HB100E_SM-PB
Rev. 06/14

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Disclaimer of liability

The content of this manual was carefully examined to ensure that it conforms with the described hardware and software.
However, discrepancies can not be avoided. The specifications in this manual are examined regularly and corrections will be included in subsequent editions.
We gratefully accept suggestions for improvement.

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About this Manual

This manual describes the available System 100V decentral block periphery Profibus from VIPA. Besides of a product overview you will find the detailed description of the single components.

You'll get information about installing and operating a decentral block periphery in a Profibus-DP system.

Outline

Chapter 1:   Basics

This introduction includes recommendations on the handling of the modules of the VIPA System 100V as central resp. decentral automation system.

Besides a system overview you will find general information to the System 100V like dimensions, installation and operating conditions.

Chapter 2:   Decentral block periphery Profibus

This Chapter contains all information that is necessary for the deployment of the decentral block periphery in a Profibus-DP system.

Contents

User considerations

Objective and contents
This manual describes components of the System 100V. Here the installation, project engineering and usage of the System 100V is described.

Target audience
The manual is targeted at users who have a background in automation technology and PLC programming.

Structure of the manual
This manual consists of chapters. Every chapter provides the description of one specific topic.

Guide to the document
This manual provides the following guides:
- 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

Application specifications

The System 100V is constructed and manufactured for

- communication and process control
- general control and automation tasks
- 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

- 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

Outline   Main theme of this chapter is to give you information and hints about deployment areas and usage of the System 100V.

Below follows a description of:

- Safety information for the user
- System overview
- Installation and environmental conditions

Safety information for Users

**Handling of
electrostatically
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 electrostatically sensitive modules and they can damage components thereby, causing the module to become inoperable or unusable. Modules that have been damaged by electrostatic discharges may 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 electrostatically sensitive modules.

**Shipping of
electrostatically
sensitive modules**

Modules have to be shipped in the original packing material.

**Measurements
and alterations on
electrostatically
sensitive modules**

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

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

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

Attention!

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

Overview System 100V

General   The System 100V from VIPA is a compact central and decentral usable automation system from VIPA. The system is recommended for lower and middle performance needs.

At a System 100V module, CPU res. bus coupler are integrated together with in-/output functions in one case.

System 100V modules are installed directly to a 35mm norm profile rail.

You may expand the number of I/Os of the Micro-PLC by means of up to 4 expansion modules res. connect System 200V modules via bus couplers.

The following picture shows the performance range of the System 100V:
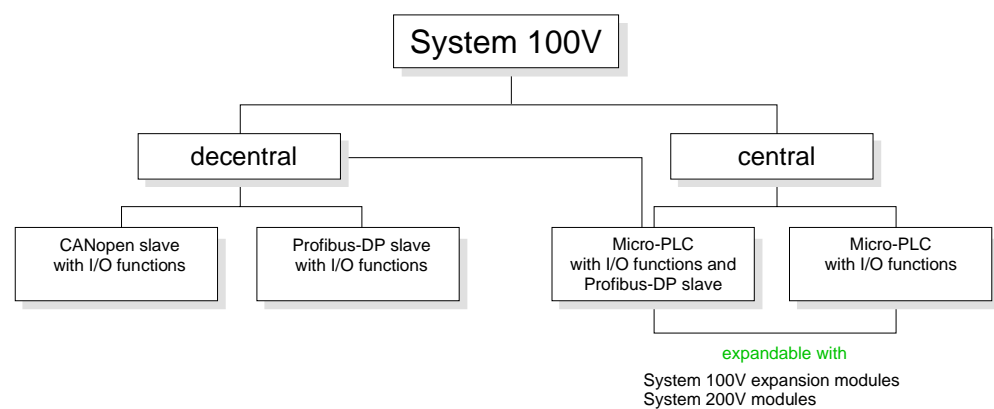
Central system   The central system is built of one CPU and integrated I/O-functions. The CPU is instruction compatible to the S7-300 from Siemens and may be programmed and projected by means of S7 programming tools from Siemens and VIPA via MPI.

By means of bus couplers you may connect up to 4 modules of the System 200V family res. enlarge the number of I/Os by installing up to 4 System 100V expansion modules.

The CPUs are available in different variants.

Central system with DP slave   At the central system besides the CPU and I/O functions, a Profibus-DP slave is included that acknowledges itself within the address range of the CPU.

Decentral system   This system contains a Profibus-DP res. CANopen slave with I/O functions instead of the CPU. The system is not expandable.
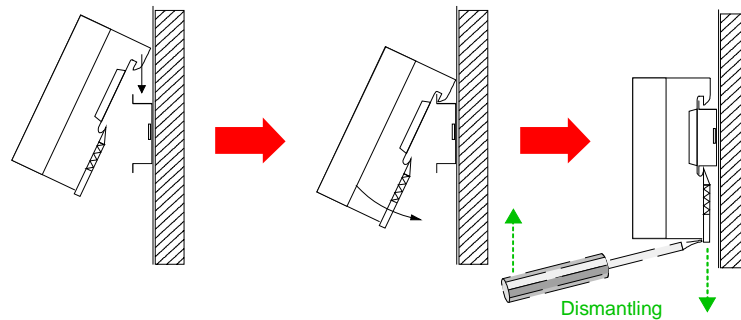
# General Description of the System 100V

Structure and dimensions
- Norm profile head rail 35mm
- Dimensions basic module:
  4tier width: (WxHxD) in mm: 101.6x76x48 / in inches: 4x3x1.9
  6tier width: (WxHxD) in mm: 152.4x76x48 / in Inches: 6x3x1.9

Installation

The installation of a System 100V module works via snapping on a norm profile head rail.

Dismantling

When using expansion modules, you have to clip the included 1tier bus connector at the right side to the module from behind before the installation.
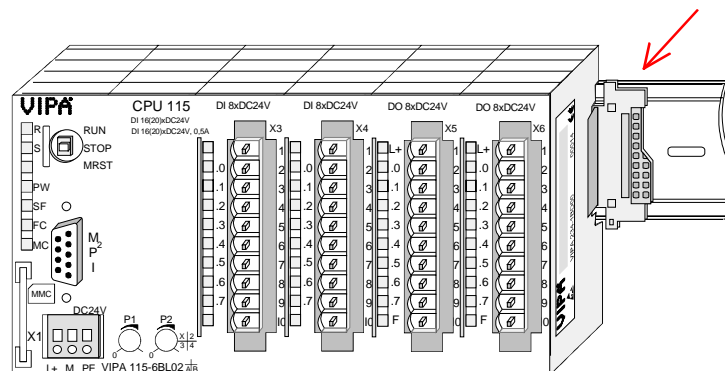

Operation security
- Plug in via CageClamps, core cross-section 0.08...2.5mm^2
- Total isolation of the cables during module changes
- EMV resistance ESD/Burst acc. IEC 61000-4-2 / IEC 61000-4-4 (to level 3)
- Shock resistance acc. IEC 60068-2-6 / IEC 60068-2-27 (1G/12G)
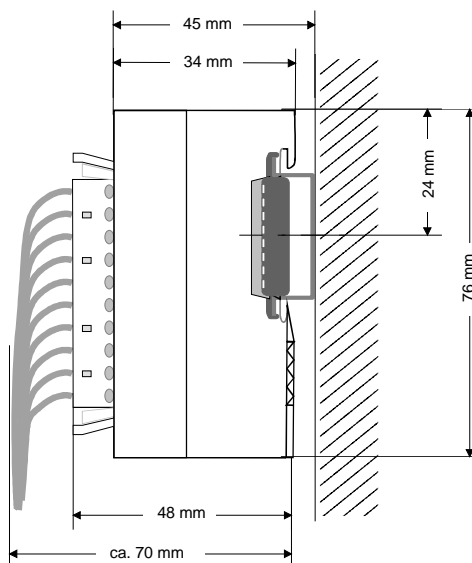
Environmental conditions
- Operating temperature: 0... + 60°C
- Storage temperature: -25... + 70°C
- Relative humidity: 5 ... 95% without condensation
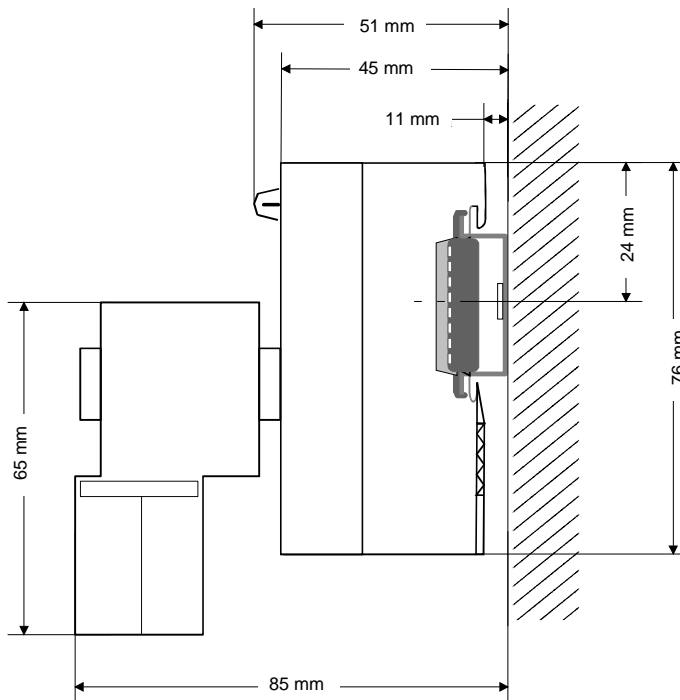- fan-less operation

Assembly dimensions

**Installation
dimensions**
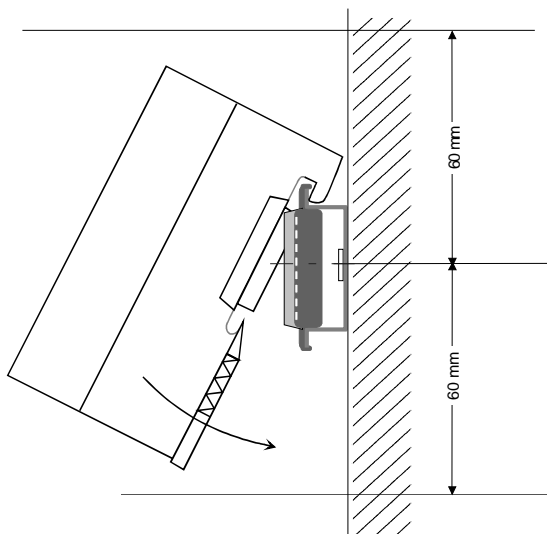
**Installed and
wired dimensions**

**CPU with
EasyConn from
VIPA**

Chapter 2   Decentral block periphery Profibus-DP

Outline   The decentral block periphery consists of a Profibus-DP slave and I/O components.

The decentral block periphery is available in different variants described in this chapter.

This chapter includes all information required for assembly, project engineering and operating this System 100V components.

The following text describes:

- General basics
- Structure
- Assembly
- Commissioning
- Circuit diagrams

Content

Principles

UL Certification   All the modules in this chapter have got the UL Certification:

UL-Recognition-Mark

Underwriters Laboratories (UL)

Standard UL 508, File Nr.: E234291

General   Profibus is an open fieldbus standard for building, manufacturing and process automation. Profibus defines the technical and functional properties of a serial field-bus system that can be used to create a network of decentral digital field-automation equipment on the lower (sensor/actuator level) to middle performance level (process level).

Profibus comprises various compatible versions. The specifications contained in this description refer to Profibus-DP.

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 decentral periphery. Profibus-DP is conceived for high-speed data exchange on the sensor/actuator level. This is where central controllers like PLCs communicate via fast, serial connections with decentral in- and output devices.

During a single bus cycle the master executes one "Data Exchange", i.e. reads the input values from the various slaves and writes new output information into the slaves.

Master and Slaves   Profibus distinguishes between active stations (masters) and passive stations (slaves).

Master devices

Master equipment controls the data traffic on the bus. There may be several masters at one Profibus. This is referred to as multi-master operation. The bus protocol establishes a logical token ring between the intelligent devices connected to the bus.

A master may send unsolicited messages if it has the bus access permission (Token). In the Profibus protocol these masters are also referred to as active stations.

Slave devices

Typical slave equipment holds data of peripheral equipment, sensors, drives, transducers. The VIPA Profibus-couplers of the System 100V are slave devices that transfer data between the System 100V periphery and the leading master.

These devices do not have bus access permission in accordance with the Profibus standard. They can only acknowledge messages or transfer messages to a master if requested by the respective master. Slaves are also referred to as passive stations.

Communication

The bus communication protocol provides two procedures for accessing the bus:

Master to Master

Communications with the master is also referred to as token passing procedure. Token passing guarantees that the station receives access permission to the bus. This access right to the bus is passed between the stations in form of a "token". A token is a specific message that is transferred via the bus.

When a master is in the possession of the token it also has the access right to the bus and can communicate with all other active and passive stations. The token retention time is defined when the system is being configured. When the token retention time has expired the token is passed along to the next master that acquires the bus access rights with the token so that it can communicate with all other stations.

Master-Slave procedure

Data is exchanged in a fixed repetitive sequence between the master and the slaves assigned to the respective master. When you configure the system you define which slaves are assigned to a certain master. You can also specify which DP slave is included in the cyclic exchange of application data and which ones are excluded.
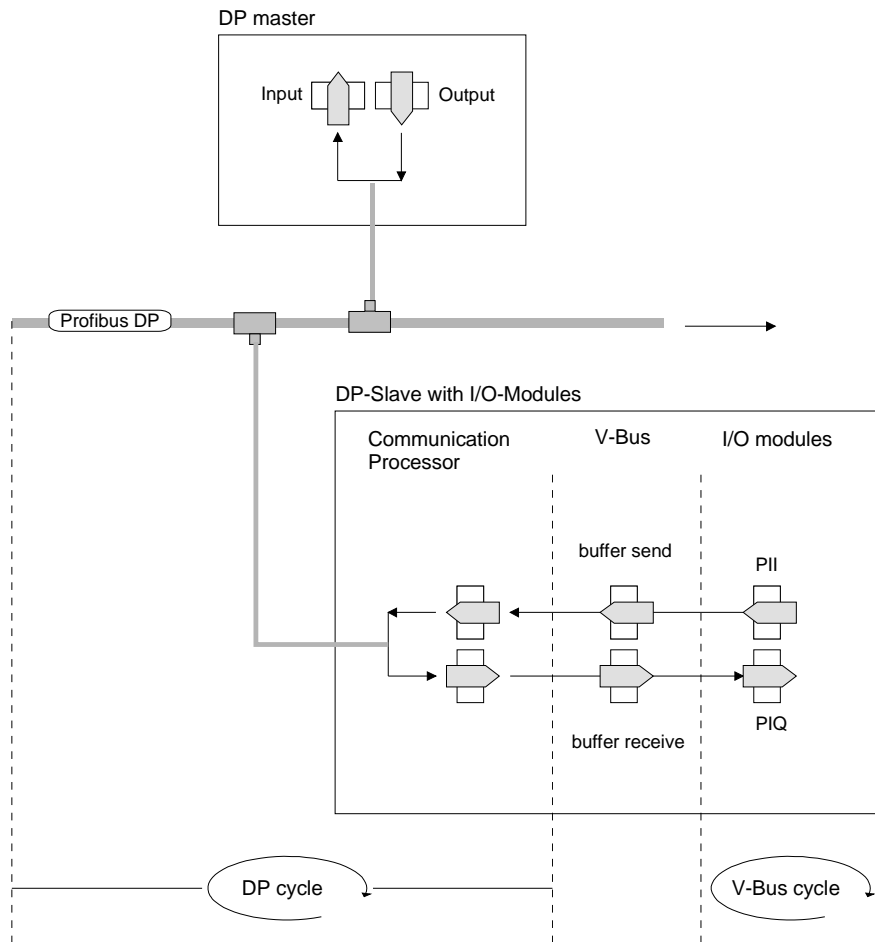
The master-slave data transfer is divided into parameterization, configuration and data transfer phases. Before a DP slave is included in the data transfer phase, the master verifies during the parameterization and configuration phase if the specified configuration is congruent to the effective configuration. This verification process checks the device type, format and length as well as the number of inputs and outputs. This provides you with effective protection against configuration errors.

The master handles application data transfers independently. In addition, you may also send new configuration data to a bus coupler.

If in the status DE "Data Exchange", the master is sending new basic data to the slave ,and the responding telegram of the slave transfers the recent input data to the master.

The principles of data transfer operations

The data exchange between the DP master and the DP slave is performed in a cycle, using send and receive buffers.

DP master

Input   Output

Profibus DP

DP-Slave with I/O-Modules

Communication Processor   V-Bus   I/O modules

buffer send   PII

buffer receive   PIQ

DP cycle   V-Bus cycle

PII: Process image of the inputs
PIQ: Process image of the outputs

V-Bus cycle

In one V-Bus cycle (i.e. VIPA backplane bus), all input data of the single modules are collected in the PII and all output data from the PIQ are transferred to the output modules. After the data exchange is completed, the PII is transferred to the sending buffer (buffer send) and the content of the input buffer (buffer receive) is transferred to PIQ.

DP cycle

In one Profibus cycle, the master contacts all its slaves with a data exchange. There the memory areas assigned to the Profibus are written res. read.

Afterwards the DP master transmits the data of the input area to the receive buffer of the communication processor and the data of the send buffer is transferred into the Profibus output area.

The DP master to DP slave data exchange on the bus is repeated cyclically and does not depend on the V-Bus cycle.

Restrictions

- Max. 125 DP slaves at one DP master - max. 32 slaves/segment
- Peripheral modules may only be plugged in or out after Power-Off!
- max. cable length under RS485 between two stations 1200m (depending on the baudrate)
- max. baudrate 12 MBaud
- You must not alter the Profibus address during operation

Diagnostic

There is a wide range of diagnostic functions under Profibus-DP that allow a fast error localization. The diagnostic data is broadcasted by the bus system and summarized at the master.

Transfer medium

As transfer medium, Profibus uses an isolated drilled twisted-pair cable based upon the RS485 interface. The transfer rate is max. 12MBaud.

Electrical system over RS485

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

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 at the network.

Addressing

Every partner of the Profibus network identifies itself with a certain address. This address has to be unique at the bus system and has a value between 0 and 99. At the VIPA Profibus couplers you adjust the address with the addressing switch at the front side.

For the VIPA Profibus master you choose the address via your software tool.

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.

Structure and content of this file are dictated by the Profibus User Organization (PNO) and are available there.

The GSD-file for the VIPA Profibus-DP Slaves is: VIPA04D4.GSD

Install this file in your configuration tool. Look for more information in the online help of the according tool.

System overview

System overview

The System 100V from VIPA is an universal connecting link between a fieldbus and the sensor/actuator level. In the System 100V, the System 200V technology is integrated in a compact casing.

One System 100V unit consists of a Profibus-DP coupler and a combination of in-/output channels and expansion clamps.
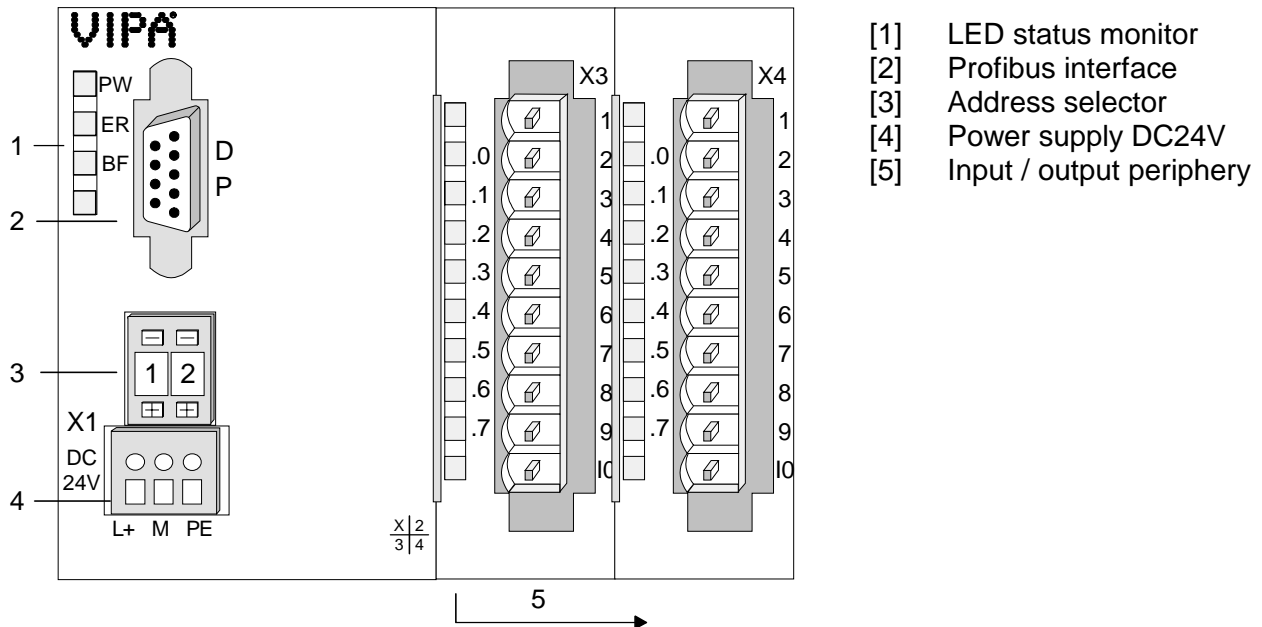
Product overview

Old order no.	New order no.	Module width	Number of input DC 24V	Number of output DC 24V, 1A	Number of relay output DC 30V/AC 230V, 5A	Input data	Output data	Number of clamps	Current consumption module
	Digital input								
121-4BH00	151-4PH00	4tier	16	-	-	2Byte	-	-	55mA
121-6BH00	151-6PH00	6tier	16	-	-	2Byte	-	4x11	55mA
121-6BL00	151-6PL00	6tier	32	-	-	4Byte	-	-	55mA
	Digital output								
122-4BH00	152-4PH00	4tier	-	16	-	2Byte	-	-	55mA
122-6BH00	152-6PH00	6tier	-	16	-	2Byte	4x11	4x11	55mA
122-6HH00	152-6PH50	6tier	-	-	16	2Byte	-	-	200mA
122-4BL00	152-6PL00	6tier	-	32	-	4Byte	-	-	55mA
	Digital in-/output								
123-4BF00	153-4PF00	4tier	total 8		-	1Byte	1Byte	2x11	55mA
123-4BH00	153-4PH00	4tier	8	8	-	1Byte	1Byte	-	55mA
123-6BH00	153-6PH00	6tier	8	8	-	1Byte	1Byte	4x11	55mA
123-6BL00	153-6PL00	6tier	16	16	-	2Byte	2Byte	-	55mA
123-6BL10	153-6PL10	6tier	24	8	-	3Byte	1Byte	-	55mA
	Clamps								
	101-4FH50	4tier	-	-	-	-	-	8x11	-
	101-6FH50	6tier	-	-	-	-	-	12x11	-

Link up to Profibus

Via the integrated Profibus-DP coupler, your System 100V gets the connection to Profibus. The device specific data is delivered on the included disc in an GSD (Electronic Data Sheet; in German: Gerätestammdatei = GSD). With that file you may parameterize your System 100V in every master projecting tool.

Structure

Front view

[1]   LED status monitor
[2]   Profibus interface
[3]   Address selector
[4]   Power supply DC24V
[5]   Input / output periphery

Components

**LEDs
Profibus-DP slave**

At the frontside there are 3 LEDs for bus diagnostic. The usage and the according colors are described in the following table:

Label	Color	Description
PW	yellow	Operating voltage
		Signalizes applying DC 24V operating voltage
ER	red	Error/Diagnostic
		Blinks at working diagnostic for short circuit, overload or missing voltage supply.
		Extinguishes as soon as the error is cleared.
BF	yellow	Profibus bus error
		Blinks during establishing communication. Extinguishes at active communication.

RS485 interface

Via a 9pin RS485 interface you include your Profibus slave into your Profibus.

The pin assignment of this interface is shown in this table:
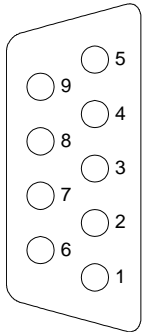
Pin	Assignment
1	screen
2	n.c.
3	RxD/TxD-P (Line B)
4	RTS
5	M5V
6	P5V
7	n.c.
8	RxD/TxD-N (Line A)
9	n.c.

Address adjuster

Via the address selector you choose the address that is used for the project engineering of the DP slave.

Permissible addresses are 1 to 99. Every address has to be unique within the bus.

The slave address has to be adjusted before switching on the bus coupler.
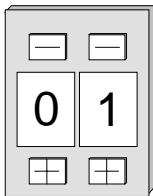
Attention!

You must not change the address during operation!

Power supply

Every Profibus slave has an integrated mains power supply. The mains power supply has to be provided with DC 24V.

The mains power supply is protected against polarity inversion and overvoltage.

Attention!

Please regard the correct polarity at the voltage supply!

Input section   The digital input section of a System 100V module collects the binary control signals of the process level and transmits them to the leading Profibus.

Every input channel shows its status via a green LED with a time delay of max. 3ms. The nominal input voltage is DC 24V. Hereby 0...5V are recognized as signal state "0" and 15...28.8V as signal state "1". More information about the installation of the input section is to find under "Circuit diagrams".

Status monitor
Pin assignment

LED	Description		Pin	Assignment
.0... .7	LEDs (green) I+0.0 to I+0.7 from ca. 15V on, the signal "1" is recognized and the according LED is addressed	DI 8xDC24V	1	not used
			2	Input I+0.0
			3	Input I+0.1
			4	Input I+0.2
			5	Input I+0.3
			6	Input I+0.4
			7	Input I+0.5
			8	Input I+0.6
			9	Input I+0.7
			10	Ground
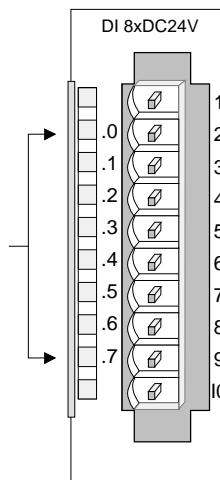
Schematic diagram Input section
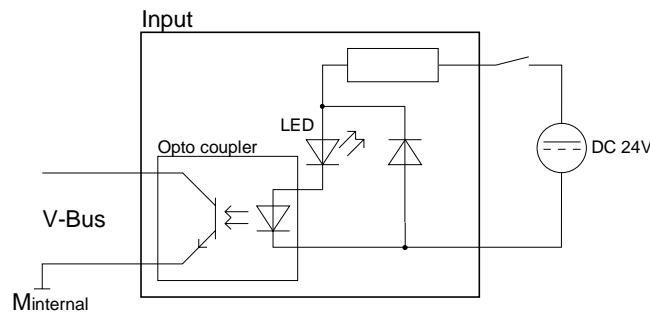
Output section
The digital output section collects the binary control signals of the leading Profibus and transmits them to the process level by means of the outputs. The output section has to be additionally provided with DC 24V via the front-facing connector (see also circuit diagrams). The applying voltage supply is shown via the yellow LED (L+).
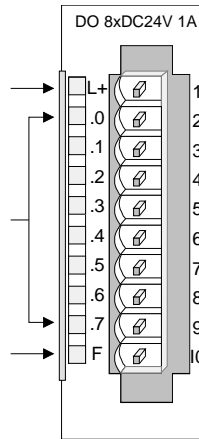
Every digital output channel shows its state via a green LED. When an output is active, the according LED is on.

At overload, overheat or short circuit, the error LED, labeled with "F", blinks red, a diagnostic is initialized and shown via the red ER-LED at the Profibus coupler.

Status monitor
Pin assignment

LED	Description		Pin	Assignment
L+	LED (yellow)		1	Supply voltage DC 24V
	Supply voltage applied		2	Output Q+0.0
.0... .7	LEDs (green)		3	Output Q+0.1
	Q+0.0 to Q+0.7		4	Output Q+0.2
	as soon as an output is		5	Output Q+0.3
	active, the according LED		6	Output Q+0.4
	is addressed		7	Output Q+0.5
F	LED (red)		8	Output Q+0.6
	Error at overload, overheat		9	Output Q+0.7
	or short circuit		10	Supply voltage Ground

DO 8xDC24V 1A

Schematic diagram Output section
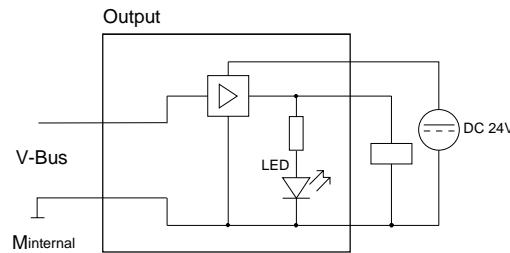
In-/Output section

The In-/Output section has 4 I/O channels that may be used as input or as output channels and 4 normal outputs. Every I/O channel is provided with a diagnostic function, i.e. when an output is active the respective input is set to "1". When a short circuit occurs at the load, the input is held at "0" and the error is detectable by analyzing the input.

The In-/output section has to be additionally provided with DC 24V via the front-facing connector (see also schematic diagrams). The available supply voltage is shown via the yellow LED (L+).

Every digital in-/output channel shows its status via a green LED. At activated in-/output, the concerning LED is on.

If an overload, overheat or short circuit occurs, the error-LED, marked with "F", is blinking red.

Status monitor pin assignment

LED	Description		Pin	Assignment
L+	LED (yellow) Supply voltage is available		1	Supply voltage DC 24V
			2	In-/Output I/Q+0.0
			3	In-/Output I/Q+0.1
.0... .3	LEDs (green) I/Q+0.0 to I/Q+0.3 as soon as an I/O=1 the according LED is addressed		4	In-/Output I/Q+0.2
			5	In-/Output I/Q+0.3
			6	Output Q+0.4
.4... .7	LEDs (green) Q+0.4 to Q+0.7 as soon as an output is active, the according LED is addressed		7	Output Q+0.5
			8	Output Q+0.6
			9	Output Q+0.7
F	LED (red) Error at overload, overheat or short circuits.		10	Supply voltage ground
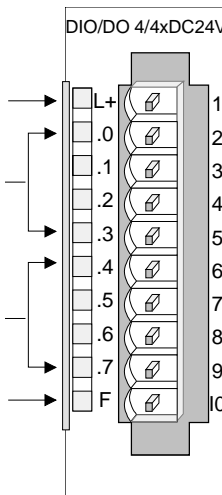
Schematic diagram in-/output section
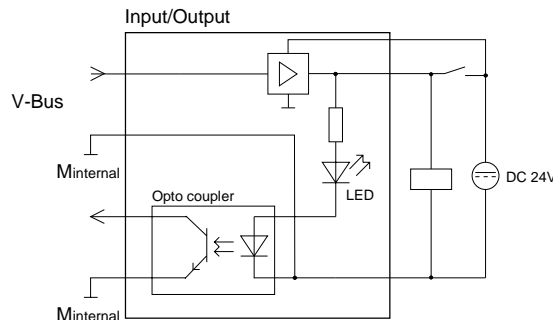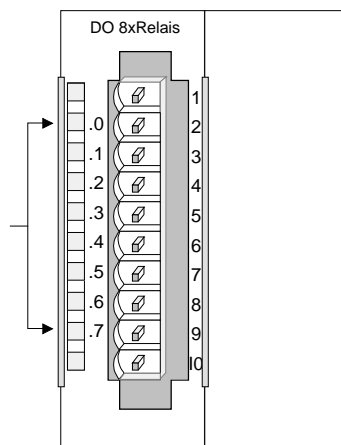
Relay output	At the relay output section, you apply the load voltage on the L+ clamp (10 or 1). From a sum current of 16A on, the load voltage has to be shared between the clamps 1 and 10. The relay output has no LED for errors or applied load voltage. The relay section is not able to diagnose.

Status monitor
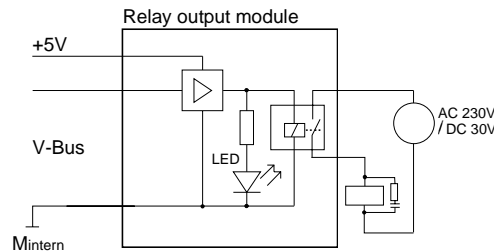**Pin assignment**

LED	Description		Pin	Assignment
.0... .7	LED (green) Q+0.0 to Q+0.7 as soon as an output is active, the according LED is addressed	DO 8xRelais	1	Supply voltage Ca
			2	Relay output Q+0.0
			3	Relay output Q+0.1
			4	Relay output Q+0.2
			5	Relay output Q+0.3
			6	Relay output Q+0.4
			7	Relay output Q+0.5
			8	Relay output Q+0.6
			9	Relay output Q+0.7
			10	Supply voltage Cb

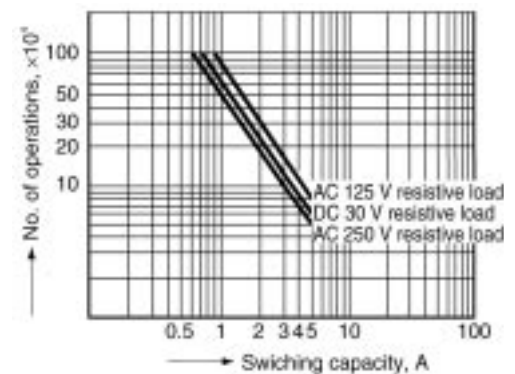**Schematic diagram Relay output**

Note: When using inductive load please take an suitable protector (i.e. RC-combination).
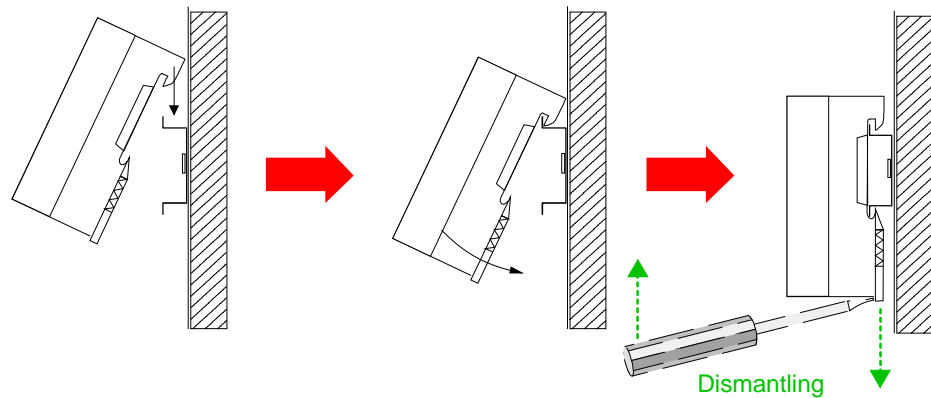
Maximum toggle performance
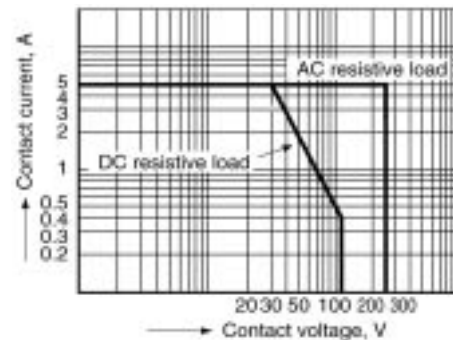
Life time

Assembly and cabling

**Assembly/
Dismantling**

System 100V modules are clipped to 35mm standard norm profile rails.

For the dismantling you have to pull down the locker with a screwdriver and lift the module from the profile rail.

Dismantling

Cabling

Take a fitting screwdriver and push the cage clamp in the <u>rectangular</u> opening to the back, then insert the cable into the <u>round</u> opening.

The cage clamp locks securely by removing the screwdriver.
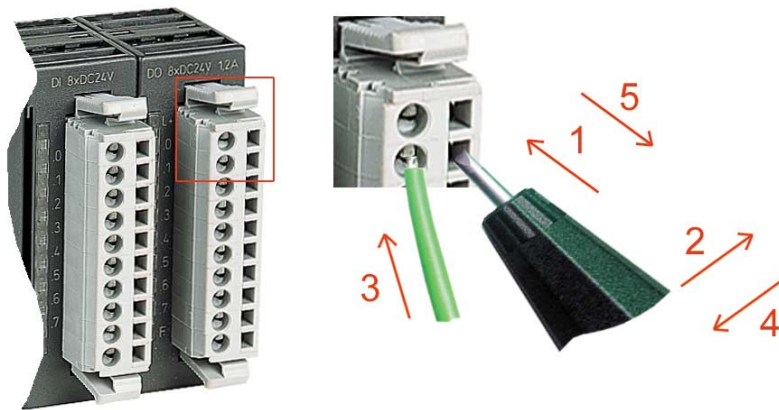
Link up to Profibus

Profibus in general

- The VIPA Profibus-DP network must have a linear structure.
- Profibus-DP consists of minimum one segment with at least one master and one slave.
- A master is always used in conjunction with a CPU.
- Profibus supports a max. of 125 participants.
- A max. of 32 devices are permitted per segment.
- The maximum length of a segment depends on the transfer rate :

9.6 ... 187.5kBaud	$\rightarrow$	1000m
500kBaud	$\rightarrow$	400m
1.5MBaud	$\rightarrow$	200m
3 ... 12MBaud	$\rightarrow$	100m

- The network may have a maximum of 10 segments. Segments are connected by means of repeaters. Every repeater is also seen as participant on the network.
- All devices communicate at the same baudrate, slaves adapt automatically to the baudrate.

Note!

Please regard, that you always have to terminate the bus cable with the ripple resistor at both ends! Otherwise there may occur reflections and therefore transmission problems.

Transfer medium

Profibus employs a screened twisted pair cable based on RS485 interface specifications as the data communication medium.

The following figure shows a Profibus connection using RS485 together with the required terminating resistors:
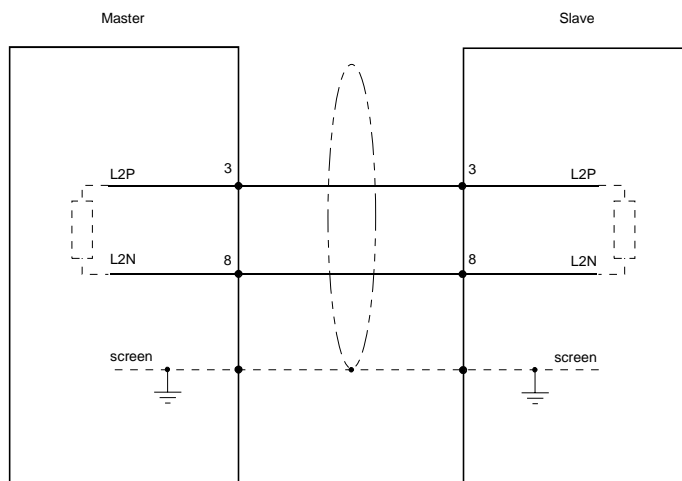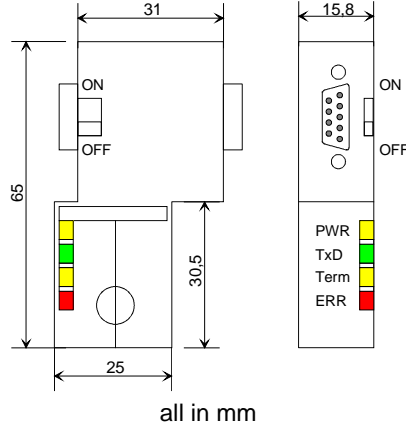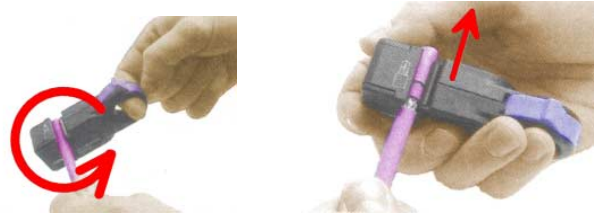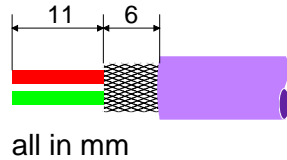
Bus connector

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 PB". This is a bus connector with switchable terminating resistor and integrated bus diagnostic.

all in mm

To connect this plug, please use the standard Profibus cable type A with solid wire core according to EN50170.

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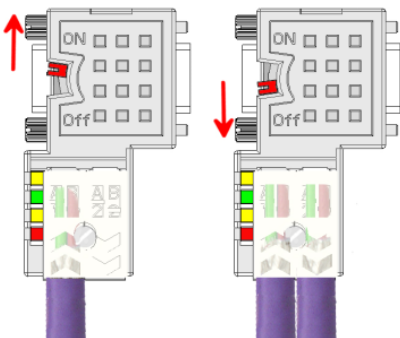

all in mm

Attention!

The bus cable has always to be terminated at the bus ends with the ripple resistor to avoid reflections and therefore communication problems!

Line termination

The 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.

Commissioning

Profibus addressing

Every participant at the Profibus identifies itself with an address. This address has to be unique in this bus system and may cover the range between 0 and 99 at the System 100V.

At the System 100V you adjust the Profibus address via the address adjuster at the module front side.

Note!

Please make sure, that you use the same address in your configuration!

Project engineering

On the included disc you will find the GSD-file of the System 100V in the GSD-folder. Copy it to the GSD-directory of your configuration tool.

When using the configuration tool WinNCS from VIPA together with an IM208-Master from VIPA, the GSD-file is part of WinNCS.

Commissioning

- Install your System 100V at the profile rail.
- Cable your System 100V like shown in the circuit diagrams. Please regard, that the output units need an external voltage supply.
- Choose the Profibus address at the frontside and transfer it into your project engineering.
- Configure your Profibus and transfer your project into the master.
- For further commissioning please proceed the description of your master system.

LEDs Profibus coupler unit

At the frontside there are 3 LEDs, serving the bus diagnostic. The usage and the according colors of this diagnostic LEDs are shown in the table:

Label	Color	Description
PW	yellow	Operating voltage
		Signalizes applying DC 24V operating voltage
ER	red	Error/Diagnostics
		Blink at waiting diagnostic because of a short circuit, an overload or missing voltage supply.
		Extinguishes as soon as the error is cleared.
BF	yellow	Profibus bus error
		Blinks during the communication start. Extinguishes as soon as the bus communication is established.

Diagnostic

At request from the master or at an error event, the integrated Profibus coupler sends a 13Byte diagnostic telegram. At this time only the digital output units are diagnosable.

13Byte Diagnostic data

The diagnostic telegram has the following structure:

Norm diagnostic data

Byte 0	Station state 1
Byte 1	Station state 2
Byte 2	Station state 3
Byte 3	Master address
Byte 4	Ident no (low)
Byte 5	Ident no (high)

Device related diagnostic data

Byte 6	Diagnostic header fixed at 07h
Byte 7	**Diagnostic Byte of the periphery**
Byte 8 ... Byte 12	00h reserved

Overview Diagnostic Byte 7
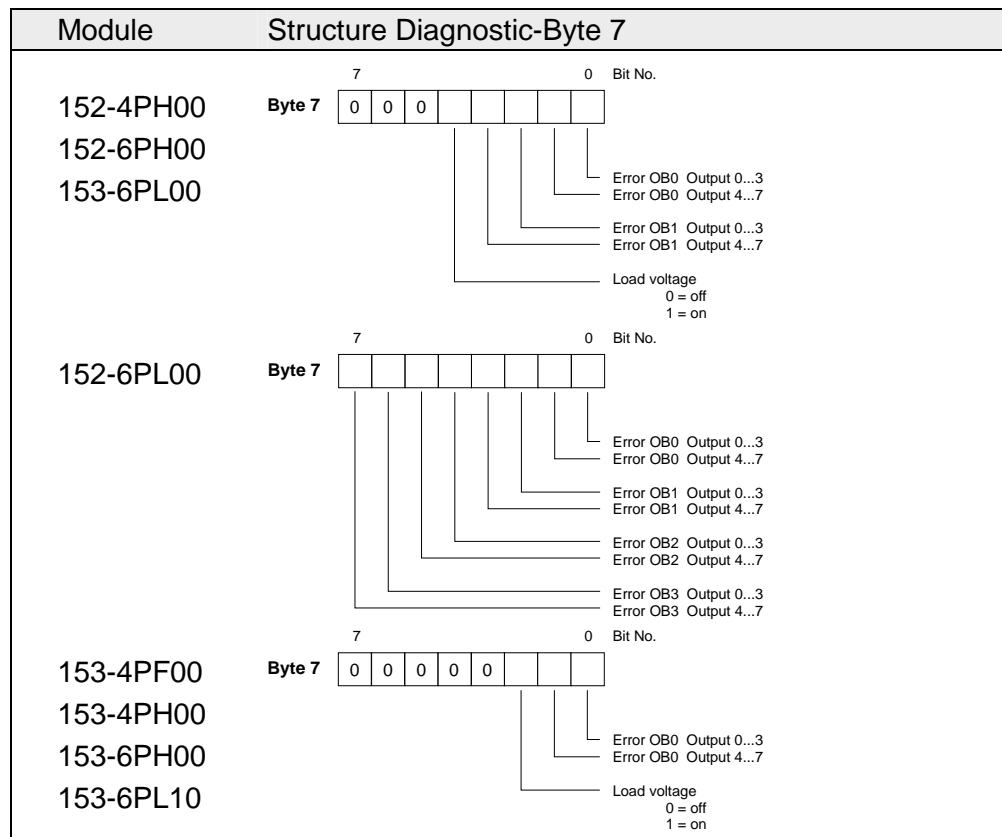
Norm diagnostic data (Byte 0 ... Byte 5)

More information about the structure of the norm diagnostic data are to find in the Profibus Norm papers. These are available at the "Profibus Nutzer Organisation" (Profibus User Org).
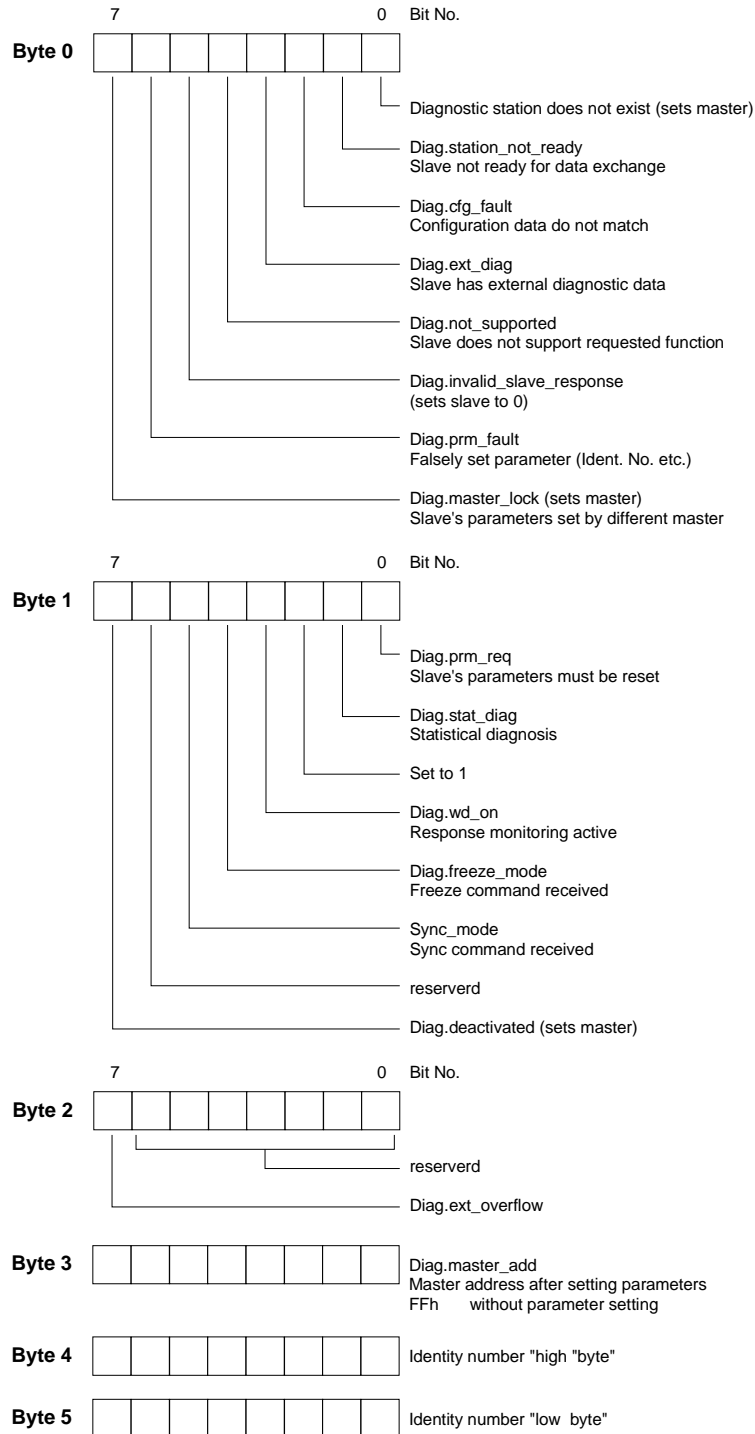

Note!

The Byte 3 of the norm diagnostic data contains the address of the Profibus master that parameterizes the System 100V module.

When an FFh is entered here, the according System 100V module is not parameterized in the master.

Device related
diagnostic data
(Byte 6 ... Byte 12)

The device related diagnostic data contain detailed information about the periphery of the System 100V.

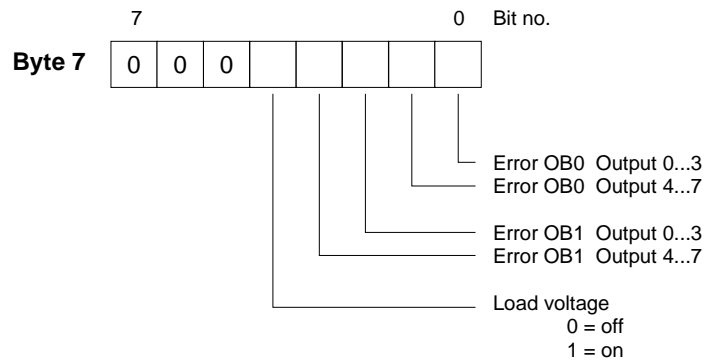The device related diagnostic data have the following structure:
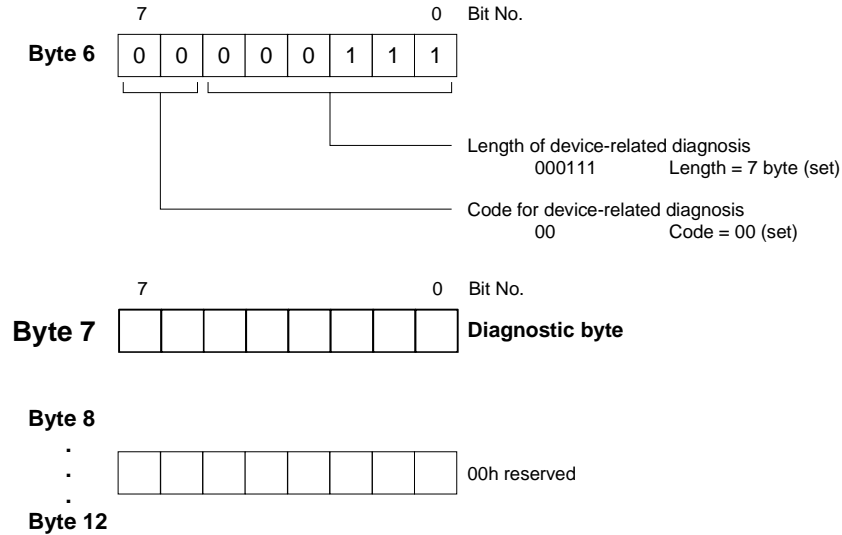
Diagnostic Byte 7

Every output unit is addressed via an output byte (AB). In case of an error, the unit occupies 2 diagnostic bits in ascending series starting at Bit 0, one for Low-AB (output 0...3) and one for High-AB (output 4...7).

For not all modules occupy all bits, the next free bit is used for monitoring the applying load voltage "diagnostic load voltage on".
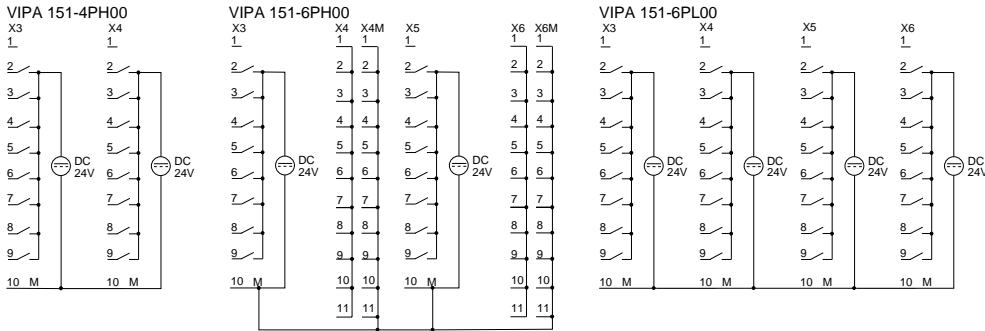
Example

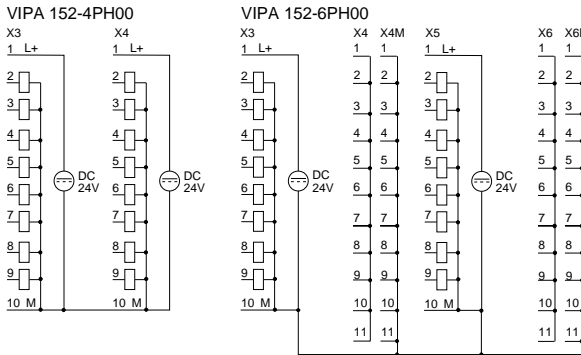The module 153-6PL00 (DI 16xDC 24V / DO 16xDC 24V) has the following diagnostic byte:
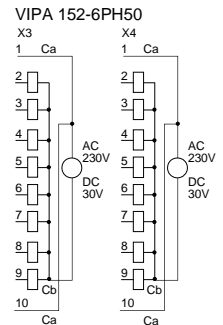
Circuit diagrams

Digital input

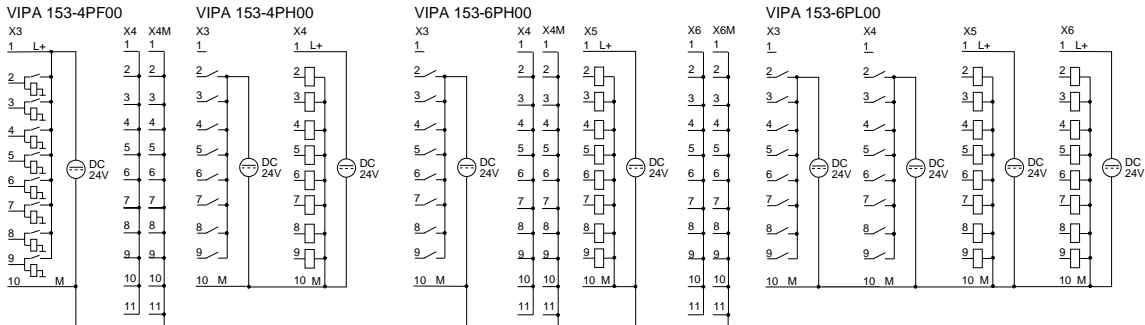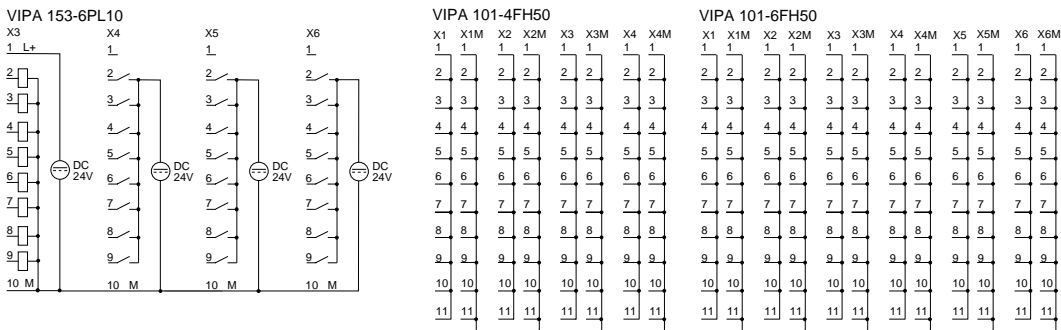VIPA 151-4PH00   VIPA 151-6PH00   VIPA 151-6PL00

Digital output

VIPA 152-4PH00   VIPA 152-6PH00   VIPA 152-6PL00

Relay output

VIPA 152-6PH50

Digital in-/output

VIPA 153-4PF00   VIPA 153-4PH00   VIPA 153-6PH00   VIPA 153-6PL00

VIPA 153-6PL10

Clamps

VIPA 101-4FH50   VIPA 101-6FH50

Technical Data

SM 151   *PROFIBUS-DP slave with digital input*

Electrical Data	151-4PH00	151-6PH00	151-6PL00
Supply voltage L+ Current consumption	DC 24V 55mA	DC 24V 55mA	DC 24V 55mA
Input			
Number of inputs Input data Input voltage at "1" Input voltage at "0" Delay time	16 2Byte DC 15...28.8V DC 0...5V 3ms	16 2Byte DC 15...28.8V DC 0...5V 3s	32 4Byte DC 15...28.8V DC 0...5V 3ms
Module width Number of clamps	4 -	6 4x11	6 -
Interface Transmission rate	RS 485; 9pin D-Sub slot 9.6 kBaud to 12 MBaud		

SM 152   *PROFIBUS-DP slave with digital output*

Electrical Data	152-4PH00	152-6PH00	152-6PL00	152-6PH50
Supply voltage L+ Current consumption	DC 24V 55mA	DC 24V 55mA	DC 24V 55mA	DC 24V 200mA
Output				
Number of outputs DC 24V 1A Number of relay outputs Output data Supply voltage (output) Toggle rate Output current per channel Sum current per group	16 - 2Byte DC 24V - 1A 	16 - 2Byte DC 24V - 1A 	32 - 4Byte DC 24V - 1A 	- 16 2Byte DC 30V / AC 230V 100 Hz 5A 16A
Module width Number of clamps	4 -	6 4x11	6 -	6 -
Interface Transmission rate	RS 485; 9pin D-Sub slot 9.6kBaud to 12MBaud			

SM 153   *PROFIBUS-DP Slave with digital in-/output*

Electrical Data	153-4PF00	153-4PH00	153-6PH00	153-6PL00	153-6PL10
Supply voltage L+ Current consumption	DC 24V 55mA	DC 24V 55mA	DC 24V 55mA	DC 24V 55mA	DC 24V 55mA
In-/Output					
Number of inputs Number of outputs Input data Output data Input voltage at "1" Input voltage at "0" Delay time Output current per channel	0...8 0...8 1Byte 1Byte DC15...28.8V DC 0...5V 3 ms 1A	8 8 1Byte 1Byte DC15...28.8V DC 0...5V 3 ms 1A	8 8 1Byte 1Byte DC15...28.8V DC 0...5V 3 ms 1A	16 16 2Byte 2Byte DC15...28.8V DC 0...5V 3 ms 1A	24 8 3Byte 1Byte DC15...28.8V DC 0...5V 3 ms 1A
Module width Number of clamps	4 2x11	4 -	6 4x11	6 -	6 -
Interface Transmission rate	RS 485; 9pin D-Sub slot 9.6kBaud to 12MBaud				

Appendix

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M.Stich