VIPA Accessories

VIPA®

art of automation

Note

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CE Conformity

Hereby, VIPA GmbH declares that the products and systems are in compliance with the essential requirements and other relevant provisions of the following directives:

- 2004/108/EC Electromagnetic Compatibility Directive
- 2006/95/EC Low Voltage Directive

Conformity is indicated by the CE marking affixed to the product.

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Technical support

Contact your local VIPA Customer Service Organization representative if you encounter problems with the product or have questions regarding the product. If you are unable to locate a customer service center, contact VIPA as follows:

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Contents

About this manual

This manual describes the PC-AG adapter with USB-MPI/PROFIBUS link from VIPA.

Here you may find every information to operate the adapter between PC and CPU.

Overview

Chapter 1:   **Hardware description**

In this chapter the hardware of the USB-MPI/PROFIBUS adapter is more described.
The chapter closes with the technical data.

Chapter 2:   **Deployment**

Here the deployment and the firmware update of the USB-MPI/PROFIBUS adapter are described.

Objective and contents

This manual describes the USB-MPI/PROFIBUS adapter from VIPA. It contains a description of the structure, project engineering and deployment.

This manual is part of the documentation package
with order number VIPA HB158E_PC-AG and relevant for:

Product	Order number	as of state: HW	FW
USB-MPI/ PROFIBUS adapter	VIPA 950-0KB31	01	1.1.5

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

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 System USB-MPI/PROFIBUS adapter is constructed and produced for:

- VIPA CPUs 11x, 21x, 31x, 51x und S7-300/400 from Siemens
- communication and process control
- industrial applications
- operation within the environmental conditions specified in the technical data

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:

- Hardware modification to the process control system should only be carried out when the system has been disconnected from power!

- Installation and Hardware 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   Hardware description

Overview   In this chapter the hardware of the USB-MPI/PROFIBUS adapter is more
described.
The chapter closes with the technical data.

Contents   **Topic**   **Page**

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.

Properties

Overview
The PC may be connected via USB to the MPI/PROFIBUS interface of the CPU by means of the PC-AG-Adapter.

Here no slot is occupied in the PC, this means the adapter is suitable for computers, which are not expandable like e.g. notebooks.

To connect a PC there is a USB-B jack integrated. The connection of the CPU happens by the cable of the adapter with a MPI plug on its end.

In the connected condition the adapter is power supplied by USB.

A driver is necessary for operation, which serves for a virtual COM port via USB. The adapter may be accessed via this interface by your PCL programming tool.

Note!
Maximally <u>one</u> PC-AG adapter may be connected to your PC!
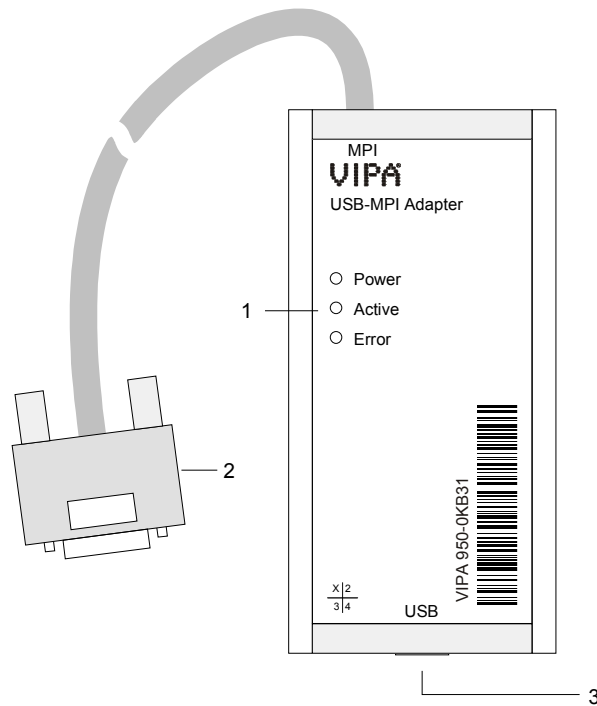
Properties
- PC-AG adapter with USB-MPI/PROFIBUS link
- USB-B jack for USB 1.1/2.0
- Cable with RS485 plug (up to 1.5Mbit/s)
- Automatic bus profile recognition
- Compatible to WinPLC7 from VIPA and Siemens SIMATIC manager

Order data

Type	Order number	Description
USB-MPI	VIPA 950-0KB31	USB-MPI/PROFIBUS adapter

Structure

**USB-MPI/
PROFIBUS
adapter**
950-0KB31

[1] LEDs

[2] Cable with
MPI/PROFIBUS plug
to connect the CPU

[3] USB-B jack to connect
the PC

Components

LEDs   For diagnostics the PC-AG adapter has 3 LEDs integrated:

| Power green	Active green	Error red	Meaning
○	○	○	PC-AG adapter is not power supplied.
●	○	○	PC-AG adapter has started up and ready for communication.
●	●	○	PC-AG adapter communicates via MPI/PROFIBUS interface.
☼	○	○	- PC-AG adapter is starting up. - Firmware is transferring.
☼	○	○	- Firmware is flashed.
☼	–	☼	An error has occurred, which requires a restart of the PC-AG adapter. Disconnect the adapter from the MPI jack of the CPU and reconnect it.

on: ●   off: ○   flashes (1Hz): ☼   flashes (8Hz): ☼   irrelevant: –

USB-B jack

There is a USB-B jack integrated for the connection of the PC-AG adapter to your PC. As soon as the PC-AG adapter is connected to an active PC the adapter is power supplied.

The USB-B jack has the following assignment:

USB-B jack:
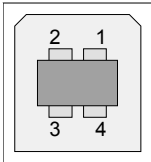
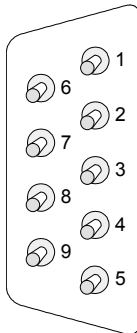| Pin	Assignment
1	VCC
2	DM
3	DP
4	GND

VIPA USB cable

In the scope of delivery there is a USB cable. The PC-AG adapter may be connected to the USB-A slot of your PC by means of this cable.

The cable has a length of 1.8m.

MPI/PROFIBUS plug (RS485)

The PC-AG adapter hat a cable integrated with a 9pin plug on its end.

The 9pin plug has the following assignment:

Pin	Assignment	Description
1	n.c.	not used
2	M24V	not used
3	RxD/TxD-P (Line B)	Data line B (In-/Output)
4	RTS_AS	RTS output signal of the CPU. The signal is "1", as soon as the CPU sends.
5	M5V	Reference potential of the interface for the signals RTS_AS.
6	P5V	5V power supply interface
7	P24V	not used
8	RxD/TxD-N (Line A)	Data line A (In-/Output)
9	RTS_PG	RTS output signal of the PC-AG adapter. The signal is "1", as son as the PC-AG adapter sends.

Technical Data

**USB-MPI/
PROFIBUS
adapter**

Electrical Data	VIPA 950-0KB31
Power supply	DC 5V via USB interface
Power consumption	90mA (max.)
Interfaces	
to AG	RS485 (up to max. 1.5MBit/s)
to PC	USB-B (USB 1.1/2.0)
EMC	
Noise emission	Limit value class B according to EN55022
Noise immunity on signal lines	2 kV (according to IEC 61000-4-4; burst; length > 3m)
ESD/Burst	according to IEC 61000-4-2 / IEC 61000-4-4 (to level 3)
Shockproof	according to IEC 60068-2-6 / IEC 60068-2-27 (1G/12G)
Radio interference level	according to IEC 61000-6-4
Environment conditions	
Operating temperature Storage temperature Relative humidity	0 ... +60°C -25 ... +70°C 5 ... 95% without condensation
Dimensions and Weight	
Degree of protection Dimensions (WxHxD) Length MPI cable Weight	IP20 53 x 100 x 28mm 1.2m 145g

Chapter 2   Deployment

Overview   Here the deployment and the firmware update of the USB-MPI/PROFIBUS
                        adapter are described.
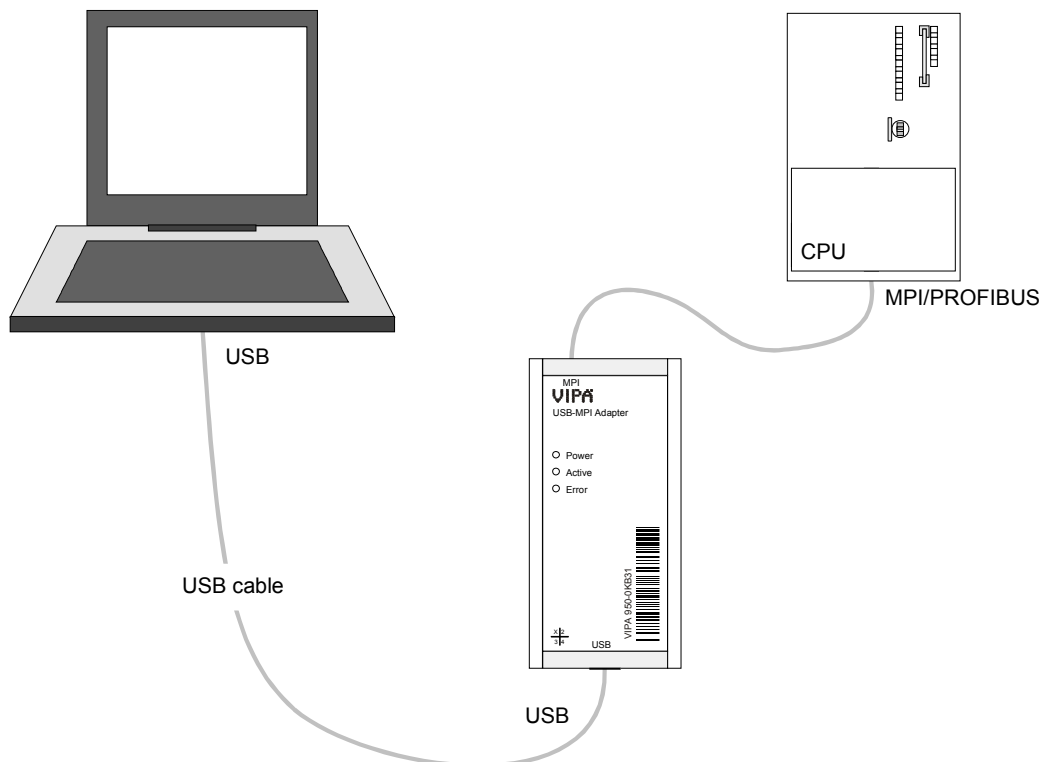
Establishing a connection

Overview

For operation there is an additional driver necessary, which serves for a virtual COM interface via USB. The driver may be found at "Service" at www.vipa.de.

Connect the USB-B slot of the PC-AG adapter with the USB-A slot of your PC by means of the provided USB cable.

As soon as the PC-AG adapter is power supplied via USB the adapter starts up and shows the ready state by the "Power" LED. If still no driver is installed, you are now requested to install the driver. After the driver installation the adapter may be accessed by means of the virtual COM port via USB.

Connect the MPI respectively PROFIBUS jack of your CPU to the mounted MPI cable of the PC-AG adapter.

Now the adapter is ready for communication.

Hardware precondition

For the deployment of the PC-AG adapter a pc is necessary, which has a USB-A interface integrated.

Software precondition

For the deployment of the PC-AG adapter a Windows® operating system and a SPS software package is necessary, which supports the interface of the *PC Adapter MPI/*PROFIBUS.

For operation there is an additional driver necessary, which serves for a virtual COM port via USB. By selecting this COM port you get access to the PC-AG adapter via USB.

Installing the USB driver

USB driver

For operation of the PC-AG adapter there is the installation of an USB driver necessary. The corresponding driver may be found at "Service" of www.vipa.de respectively at www.ftdichip.com/drivers/vcp.htm.

The driver package consists of a driver for the USB hardware binding and a driver, which establishes a virtual COM port.

Installing hardware driver

Depending on the operating system and the USB drivers used before, the installation of the hardware driver may no longer be necessary. Here the installation starts with the hardware wizard to install the virtual COM port (see below).

Otherwise the installation takes place after the following approach:

- Load the ZIP file of the driver and unzip the file to an empty directory.

- Connect the PC-AG adapter with the provided USB cable and attach this to a free USB-A interface of your PC. The PC-AG adapter is power supplied via USB and shows the ready state by the "Power" LED. Depending on the operating system a dialog window of the hardware wizard is opened to show that a new hardware was found.

- Negate the access to the "Windows Update" Web side and enter the directory on which the unzipped driver is located.

- Continue the installation, if a message about a not passed "Windows Logo test" is shown. The hardware driver is installed and this is shown by a corresponding message.

Installing virtual COM interface

As soon as the hardware driver is installed, the installation of the virtual COM port starts automatically with the hardware wizard.

Here proceed with the following approach:

- Negate the access to the "Windows Update" Web side and enter the directory on which the unzipped driver is located.

- Continue the installation, if a message about a not passed "Windows Logo test" is shown. The driver for the virtual COM interface is installed and this is shown by a corresponding message.

- As default always the next free COM port is set. Since however in some PLC programming tools COM1 to COM8 may be preset as COM port, you should preset here a COM port between 1 and 8.

After installation the driver may be found in the Device Manager as "USB-Serial-Converter". Here also the corresponding COM port, which is assigned to the USB interface, is listed.

De-installation

For de-installation remove the PC-AG adapter from your PC and start the uninstall routine at Control panel > Software.

Setting the PLC programming software

Overview

The PC-AG adapter may be used with each PLC programming software, which supports the interface *PC Adapter MPI/PROFIBUS*.

Suitable PLC programming software is e.g. WinPLC7 from VIPA or the Siemens SIMATIC manager. In the following the deployment with these two software packages is described.

Deployment with WinPLC7 from VIPA

WinPLC7 only supports *PC Adapter MPI*.

- Attach the PC-AG adapter via USB to your PC and connect the MPI cable to your CPU.
- If not already happen switch the power supply of the CPU on.
- Start WinPLC7 with your project on your PC.
- Set at the toolbar above "Target: RS232".
- Click to [...]. A dialog window for setting the serial interface is opened.
- Set the corresponding COM port, which was established at your PC as virtual COM port by the USB driver installation.
- Presetting of a transfer rate is not necessary and is ignored when accessing the USB interface.
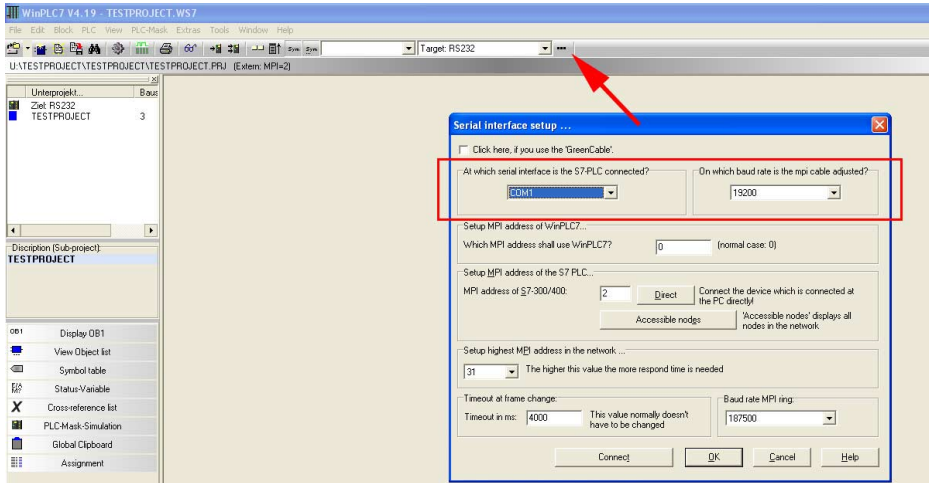
Setting the MPI address

If you know the MPI address of your CPU - CPUs of VIPA are delivered with address 2 - the MPI address may be entered at "MPI address of S7-300/400" and a connection may be established by the button [Connect].

If you do not know the MPI address, a connection to the direct to your PC via PC-AG adapter attached CPU may be established by [Direct].

With the button [Accessible nodes] each via MPI reachable station is listed in a dialog window. Here the MPI address of the CPU, direct attached with the PC-AG adapter, is emphasized represented. For more information see online help.

**Deployment with
Siemens SIMATIC
manager**

- Attach the PC-AG adapter via USB to your PC and connect the MPI cable to your CPU.
- If not already happen switch the power supply of the CPU on.
- Start the Siemens SIMATIC manager with your project on your PC.
- Set at **Extras** > *Set PG/PC interface* as *Interface parameter assignment* "PC Adapter (MPI)" respectively "PC Adapter (PROFIBUS). If this is supported by your hardware, you can choose "PC adapter (Auto). Here the bus parameters are automatically determined.
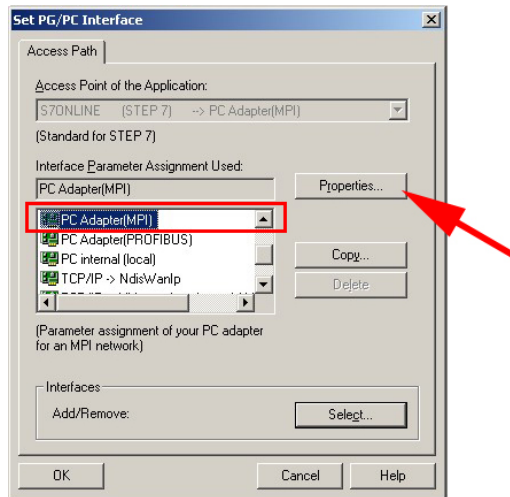
- Click to [Properties].
- Enter your bus parameters at the register "MPI" respectively "PROFIBUS". With "PC Adapter (Auto)" the bus parameters are automatically determined.
- Choose to the register "Local connection".
- Set the corresponding COM port, which was established at your PC as virtual COM port by the USB driver installation.
- Presetting of a transfer rate is not necessary and is ignored when accessing the USB interface.
- Confirm your input with [OK].

Installation of the
PC adapter if it
does not exist

If the according *PC-Adapter (...)* is not listed, it may be added with [Select].

Choose at *Selection* "PC-Adapter" and click to [Install-->]. More about this may be found in the online help.
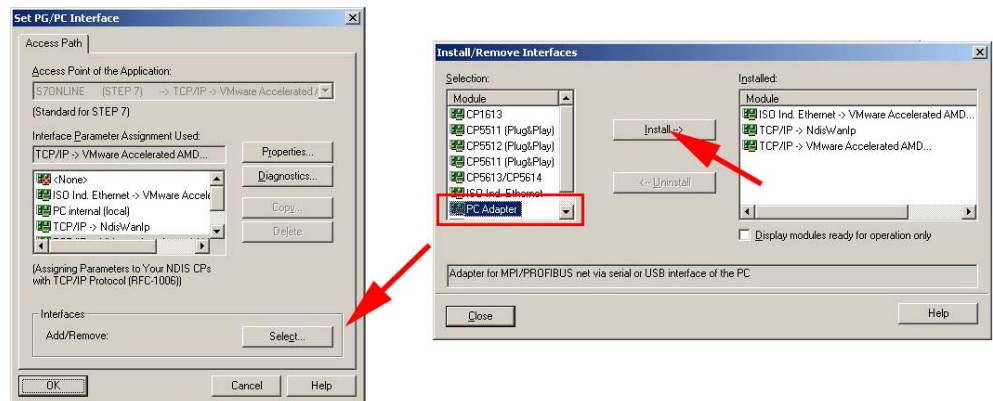
Firmware update

Overview

By means of an update software there is the opportunity to execute a firmware update of your adapter. For the firmware update the PC-AG adapter is to be connected via USB to your PC.
The update takes approx. 1 minute.

The most current firmware may be found at www.vipa.de.

Attention!

When installing a new firmware you have to be extremely careful. Under certain circumstances you may destroy the PC-AG adapter, e.g. if the power supply is interrupted during the update. In this case please call the VIPA hotline!

Preparation

- Call www.vipa.de and navigate at "Service" to the area "Firmware updates".
- At "Firmware for PC-AG-Adapter" the newest firmware for the PC-AG adapter may be found, if available.
- Download this to your PC.
- Navigate at "Service" to the area "Software", download the updater software for the PC-AG adapter to your PC and unzip the file.

Proceeding

- Connect your PC via USB to the adapter. The adapter is now power supplied via USB and it shows the ready state by the "Power" LED.
- Start the downloaded Tool *Updater.exe* at your PC.
- Set the corresponding COM interface and click to [Connect]. The "Power" LED on the adapter flashes with 1Hz.
- Click to [Browse] and navigate to the downloaded firmware file.
- Start the transfer with [Write].

Display behavior

The proceeding of the firmware update is shown at the PC as a moving line.

During the transfer of the firmware file into the PC-AG adapter the "Power" LED blinks with ca. 1Hz. At this time the update may be interrupted.

As soon as the LED flashing increases to 8Hz, the data are internally flashed (takes approx 10s). This procedure may and also the power supply should not be interrupted.

After the update each LED shortly switch on and the PC-AG adapter is rebooted.