Instructions for Use

vicosys 19001

**Multi-Camera System
19 inch industrial PC with 2U**

Impress

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Validity

These instructions for use are valid for the following device as well as the derived device configurations.

Device	Description	Order no.
vicosys 19001 Basic Device	PC-based multi camera system, including operating software vcwin pro, configurable	4-21-184

Device configurations

The vicosys 19001 consists of the basic device with software as well as optional components and optional software. The Device is assembled and configured by the manufacturer according to the selected components.

Expansion cards

Only one camera card, one I/O process interface card and one fieldbus interface card can be selected at a time.

The device can be expanded with the following camera card:

Designation	Description	Order no.
Camera interface 4 x GigE	4 Port Gigabit Ethernet PoE, for connecting Gig-E vision cameras, incl. assembly	4-21-178

The device can be extended with one of the following I/O process interfaces:

Designation	Description	Order no.
Digital I/O card ADDI-DATA	16 in-/ 16 outputs, Open Emitter (PNP), Model: APCIe-1500	4-21-170
Digital I/O card ADLINK	16 in-/ 16 outputs, Open Collector (NPN), Model: LPCIe-7230	4-21-171

The device can be extended with the following fieldbus interface:

Designation	Description	Order no.
PROFINET cart HILSCHER	integration of a PROFINET interface, Model: CIFX 50E-RE, including software-license and assembly	4-21-175

Optional Software

The device can be extended with the following optional software:

Designation	Description	Order no.
Thermal imaging functions	license for multi-camera system vicosys	4-20-209
Asynchronous processes	license for multi-camera system vicosys	4-20-210
Halcon	license for multi-camera system vicosys	3-90-032

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1 IMPORTANT INFORMATION

1.1 Information about the Instructions of Use

This document contains technical information, important instructions for correct installation, commissioning and use, as well as product information which were up-to-date at the time of going to press.

Using this document makes it easier for you to familiarise yourself with the device and avoid malfunctions caused by improper operation.

The instructions of use and the local regulations and rules must be followed.

To ensure a save and proper application, please read the instructions of use carefully and keep them for future reference.

1.2 Intended Use

The device is intended exclusively for use as a machine vision system for industrial image processing in automation technology.

It is intended for use in a confined environment.

The device is not suitable for use in potentially explosive areas.

The device may only be used if it is in technically faultless condition and only for its intended purpose, and only in accordance with the specifications in this instructions of use by authorised operative personnel, who are aware of the safety rules and hazards.

If the device is planned to be used for any other purpose or in a different environment, the express authorisation of the manufacturer must be obtained in advance. Any modifications or adaptations required may only be made by the manufacturer.

1.3 Improper Use

All unintended use and all device-related activities not described in these instructions of use is to be deemed as unauthorised misuse outside the legal limits of indemnity of the manufacturer.

Reasonably foreseeable misuse is:

- Non-compliance with the instructions for use,
- Faulty operation,
- Operating by personnel not qualified or instructed,
- Operating the device if it is not in a proper technical condition,
- Operating the device in ambient conditions differing from the corresponding specifications in the instructions of use
- Operating the device with voltages differing from the corresponding specifications in the instructions of use,
- Using spare parts which are not original parts from the manufacturer,
- Using incompatible accessory components,
- Improper maintenance and repair works,
- Unauthorised modifications to the device.

1.4 Qualified Personnel

The device may only be assembled, commissioned, operated, maintained, installed, set up, cleaned, repaired and transported by qualified skilled personnel.

A qualified person is deemed to be someone who has been trained and instructed for his/her activities with the device, and who has proven his/her capability to the purchaser. The operating personnel must be authorised by the purchaser for those activities at the device.

For the installation and operation of the device, the skilled personnel must know and comply with the applicable guidelines and standards for handling control equipment, electrical installations and working materials.

1.5 Warranty and Liability

The contents of this document have been checked carefully and correspond to current legislation and best practise at the time of going to press.

However, the manufacturer shall not be liable for any damage arising from the use of this edition of the manual, and rejects any warranty derived therefrom.

Within the bounds of the legal requirements, the manufacturer shall only be responsible for the technical safety characteristics of the device if the maintenance, repairs and modifications to the device are performed by himself or by authorised skilled personnel in accordance with his instructions.

Loss of warranty

The manufacturer shall accept no liability or warranty in the event of improper use, opening of the device or incorrect maintenance.

2 SAFETY

2.1 Presentation of Safety Instructions

Each safety instruction is introduced by a key word and colour highlighted.

The key word indicates the degree of danger. The danger and its cause are described, and then the measures to prevent conceivable consequences of the danger. These measures must be taken.

⚠ DANGER

Indicates an imminent danger with high risk, resulting in severe injuries or death if not avoided.

⚠ WARNING

Indicates a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.

⚠ CAUTION

Indicates a hazardous situation with low risk, resulting in minor or medium injuries if not avoided.

NOTICE

Indicates a situation that may result in property damage.

2.2 Safe Handling of the Device

Read the following applicable safety instructions carefully and completely. Follow the instructions for your own safety, the safety of other people, and to avoid damage to the device and the connected technical equipment. Hazards going beyond the general safety instructions are referred to separately at the relevant points in this manual.

⚠ CAUTION

Risk of injury due to electric shock.

- Before starting work on the device, disconnect it from the operating voltage supply.
- Follow all applicable safety regulations for the preparation and operation of electrical devices.

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3 SCOPE OF DELIVERY AND ACCESSORIES

3.1 Scope of Delivery

Designation	Quantity
Device vicosys 19001 (configured)	1 x
Small-parts bag • Mounting bracket, handle, screws • Keys • Cold device connection cable	1 x
USB stick with: • Operating software vcwin • Instructions for Use vicosys 19001 and vcwin as PDF • SDDML and EDS files	1 x

3.2 Accessories

On the following pages you will find an overview of all available accessories.

For more detailed technical information on the accessories, please refer to the data sheets in the product catalog under *www.vision-control.com*.

Cameras

Designation	Description
GigE Vision cameras	Cameras with different resolutions and specifications (monochrome / colour / NIR) according to the requirements

Accessories for the option Digital I/O card ADDI-DATA

Designation	Description	Order no.
Terminal Board PX901-DG	D-Sub terminal board with LEDs, for DIN rail mounting, with screw terminal strips for connecting sensors, actuators or similar to the I/O expansion card of the device	4-40-268
WAGO transfer device D-Sub	Transfer device 37-pole with Sub-Min-D female connector strip for connecting sensors, actuators or similar to the I/O expansion card of the device	4-40-269
I/O cable with 2 x D-Sub	Cable for connecting the terminal board PX901-DG to the ADDIDATA expansion card APCIe-1500, length: 2 m	4-40-266
I/O cable with 1 x D-Sub	Length: 2 m Length: 5 m Length: 10 m	 4-40-267 4-40-273 4-40-274

Accessories for the option Digital I/O card ADLINK

Designation	Description	Order no.
Terminal Board DIN-50S-01	Terminal board with a 50-pin SCSI-II connector for DIN rail mounting for connecting sensors, actuators or similar to the I/O expansion card of the device	4-40-288
I/O cable ACL-10250-1	Cable for connecting the I/O card LPCIe-7230 with the terminal board DIN-50S-1, length: 2 m	4-40-289

4 DEVICE DESCRIPTION

4.1 Front panel

Components on the front

The front panel features a lockable door. The door can be closed with or without the key with the rotary lock.

Six LED indicators are visible when the door is closed.

With the door open, six LED indicators, a system reset button, an alarm reset button, and a power button, as well as two USB ports are visible.
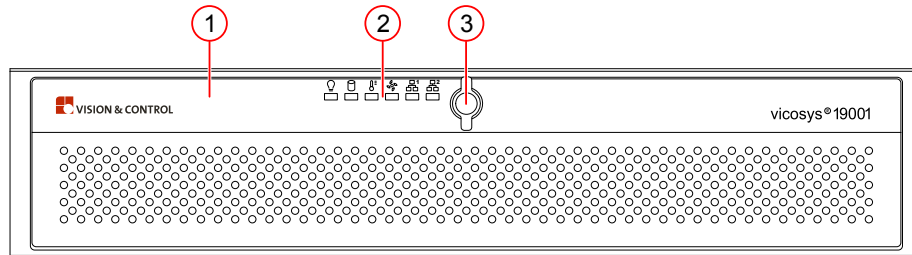

Image 1: Closed front panel

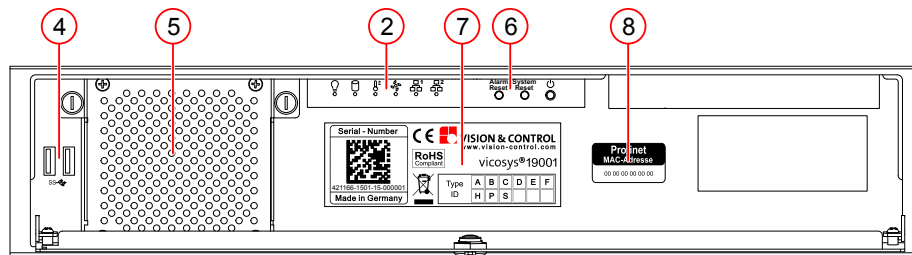(1) Front flap with ventilation holes
(2) LED indicators
(3) Rotary lock
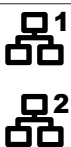
Image 2: Open front panel

(2) LED indicators
(4) USB ports 2 x 3.0
(5) Front fan
(6) Start and reset elements
(7) Type plate
(8) MAC address (only with PROFINET option)

Display Elements

On the top of the front panel there are six LEDs that indicate the status and activity of the system.

Symbol	Designation	Description	Status
	Power	Displays the status of the operating voltage supply	Blue: operating voltage is present Red: malfunction
	Fan	Shows the status of the front fan	Blue: normal Red: malfunction
	Temperature	Displays the status of the temperature in the housing	Blue: normal Red: malfunction
	Hard disk	Displays the status of the hard disk	Blue: data access Off: no access
	LAN 1 / LAN 2	Displays the status of the LAN interfaces	Blue: normal Off: no access Blinking: data transmission

Operating Elements

Designation	Description
Alarm Reset	Whenever a fault occurs in the system (e.g., fan failure or the chassis is overheated), the audible alarm will be activated. Pressing this button stops the alarm from beeping for 3 minutes. Check whether the whole system is running properly.
System Reset	Press this button to reboot the system.
PWR	Press this switch to turn the system power on or off. Use system shutdown or press this switch for few seconds to turn off the system ATX power.

Interfaces and Connectors

Designation	Description
2 x USB 3.0	For connecting USB devices for data transfer, backup or input.

4.2 Rear Panel

The connections for the power supply, interfaces for peripherals and the housing earth are located on the rear panel.
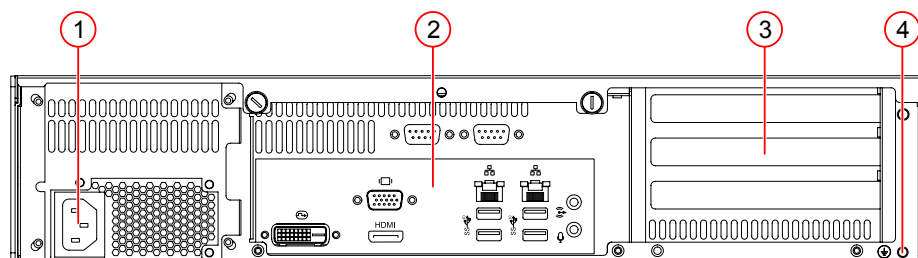
Image 3: Rear panel

(1)   Cold-device built-in plug C14
(2)   Interfaces and connectors
(3)   3 slots for expansion cards
(4)   Grounding screw with washer

4.3 Notices on the device

On the front under the front panel are the following instructions:

Type plate
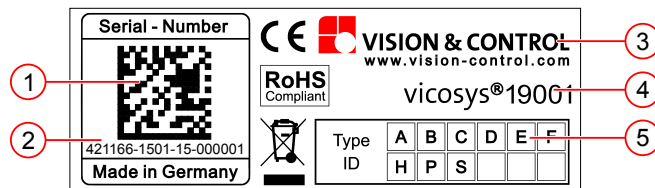
Image 4: Type plate

(1)	Serial number as 2D Data Matrix code	(4)	Device designation
(2)	Serial number as plain text	(5)	Version number
(3)	Manufacturer information		

MAC - Address

With the configuration "PROFINET card HILSCHER" there is a sticker with the MAC address of the Profinet card next to the type plate.

4.4 Technical Drawings
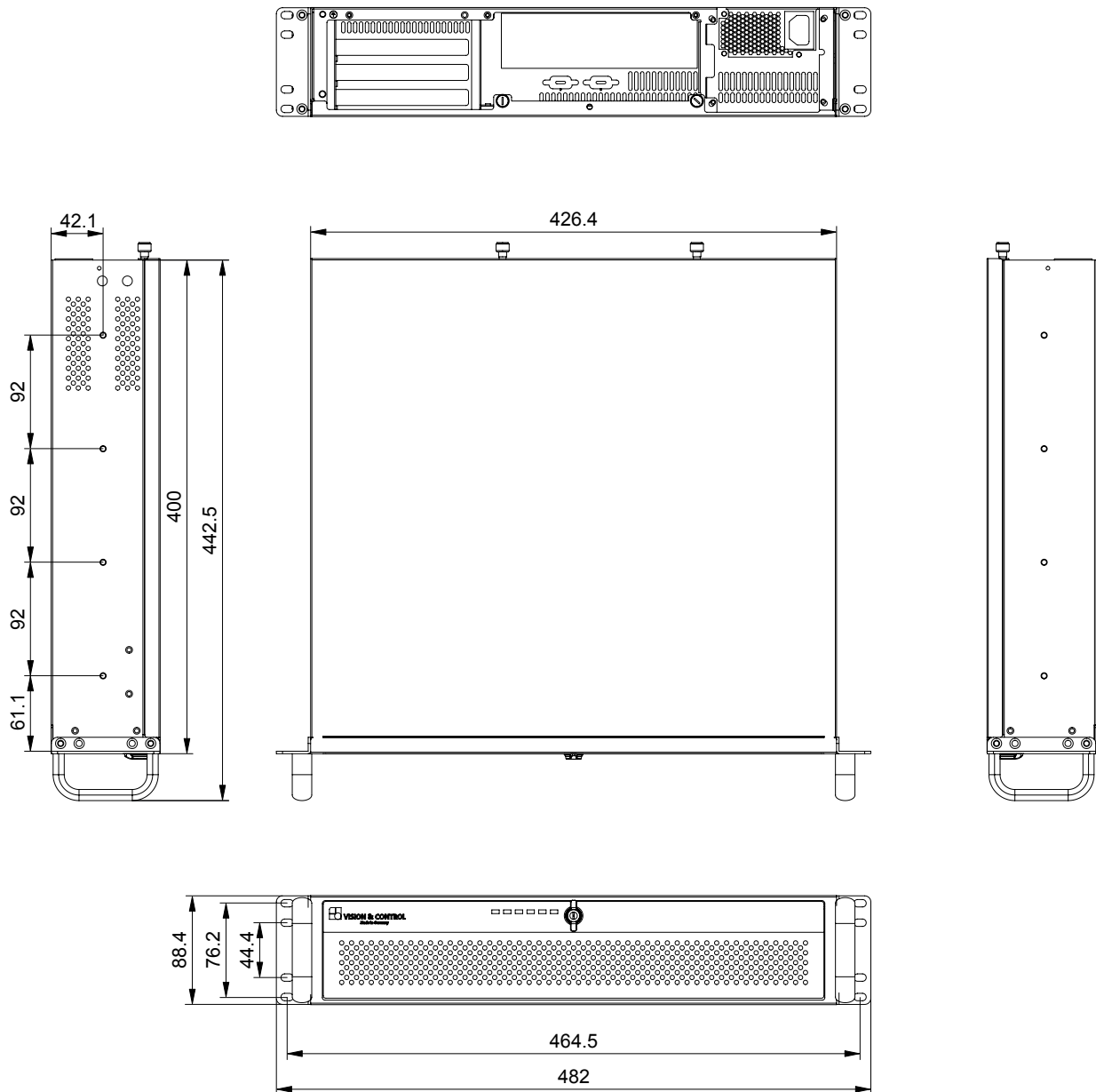
5 TECHNICAL DATA

5.1 General Parameters

Parameter	Characteristic
Type	2U rack mount with short depth
Housing material	Heavy-duty steel
Housing dimensions	W x H x D: 482 mm x 88 mm x 398 mm
Cooling	Fan (active) / Air filter
Weight	approx. 8.6 kg
Degree of protection	IP 20
Safety class	I (protective ground)
Certificate	CE, FCC

Parameter	Characteristic
Processor	Intel Core i7-10700E (16 MB Cache, up to 4.50 GHz)
Main memory	16 GB main memory, DDR4, 3200MHz
SSD	250 GB (of which approx. 3 GB reserved)
Communication interfaces	LAN1: Ethernet 10/100/1000 Mbit LAN LAN2: Ethernet 10/100/1000 Mbit direct connection
	2 x USB 3.0 on the front panel 4 x USB 3.2 on the back panel
	2 x RS232 process communication / data transfer
Camera interface [1]	LAN2: 1 x GigE Vision - no PoE
Expansion card Camera interface	4 x GigE Vision with PoE
Expansion card Process interface	Digital I/O card ADDI-DATA, 16 IN / 16 OUT, PNP
	Digital I/O card ADLINK, 16 IN / 16 OUT, NPN
Expansion card Field bus	PROFINET card HILSCHER, Model: CIFX 50E-RE
Video out	VGA, DVI-D, HDMI

[1] When using the camera interface, the communication interface for the direct connection is deactivated.

5.2 Electrical Parameters

Parameter	Min	Nom	Max
Operating voltage U_O	100 V AC	230 V	240 V AC
Power consumption at U_O = 230 V AC			
vicosys 19001 Basic Device			70 W
Expansion card - camera card			60 W
Expansion card - process interface			15 W
Power consumption P_{tot} at U_O = 230 V DC			
vicosys 19001			350 W

5.3 Conditions for Operation, Storage and Transport

Observe the specified ambient conditions when transporting and storing the device.

For accessories, connected devices and components observe the specific information in the associated instructions for use.

Ambient Conditions

	Operation	Storage / Transport
Temperature	10 °C to 40 °C	-20 °C to 60 °C
Air humidity	10 % to 85 %	10 % to 95 %
Condensation water	not permissible	not permissible

5.4 Interfaces

5.4.1 Ethernet interfaces

The unit has two Ethernet interfaces at the rear:
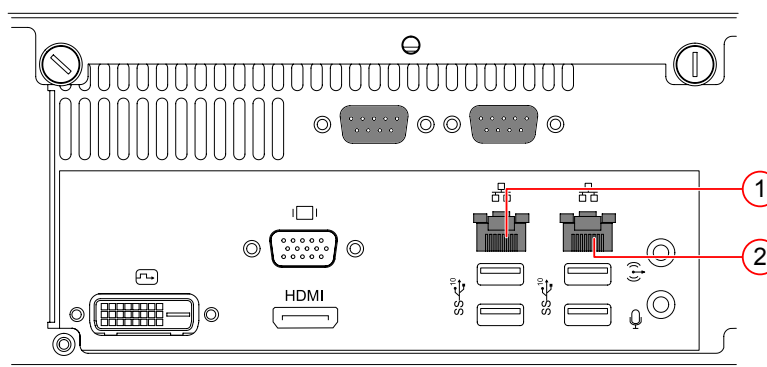
Characteristics

- LAN: 10/100/1000 Mbps
- Ethernet interface 1 (LAN 1):
  - Integration of the device in a LAN, suitable for process communication as well as parametrisation with the operating software vcwin.
- Ethernet interface 2 (LAN 2):
  - Connection of a GigE vision camera. The interface is not PoE capable. The camera must be supplied with power externally.
  - Direct connection to a PC running the operating software vcwin (service connection).

Status indicators

	Speed	Link / Activity	Status LED Left	Status LED right
Left Right	10 Mbps	Link	Off	Green
		Active	Off	Blinking green
	100 Mbps	Link	Orange	Green
		Active	Orange	Blinking green
	1000 Mbps	Link	Green	Green
		Active	Green	Blinking green
		No Link	Off	Off

5.4.2 RS232 interfaces

The unit has two RS232 interfaces at the rear:
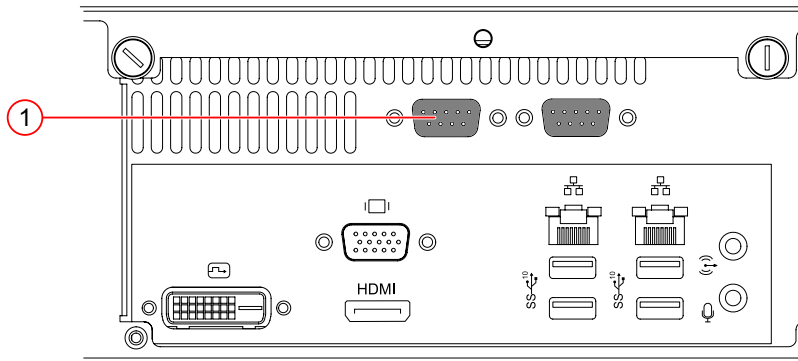
Image 5: RS232 Interface

(1)   Serial / RS232

Characteristics Serial / RS232

- Serial communication to the process computer.
- Serial communication with peripheral devices.
- The baud rate is set in the factory to 9.600 kbit/s. The baud rate can be adjusted with the operating software vcwin.

Parameter

Parameter	Min	Nom	Max
Baud rate	9.6 kBit/s [1]		115.2 kBit/s
Number of bits		8	
Number of stop bits		1	
Parity		none	
Flow control		none	
Galvanic decoupling		non-existent	

[1]   Factory setting

5.4.3 USB interfaces

NOTICE

Overheating due overload

- Each USB port can deliver a maximum output current of 900 mA.
- The total output current on ports 1-2 on the front panel must not exceed 1800 mA.
- The total output current on ports 1-4 on the rear panel must not exceed 3600 mA.

ADVICE

Data loss due to incorrect disconnecting of devices!

- Always unmount USB storage devices before switching off or disconnecting.
- Unmount in vcwin:
  Using the instruction **External Storage Device - Unmount USB Device**.

The unit has four USB 3.2 ports on the back and two USB 3.0 ports on the front.
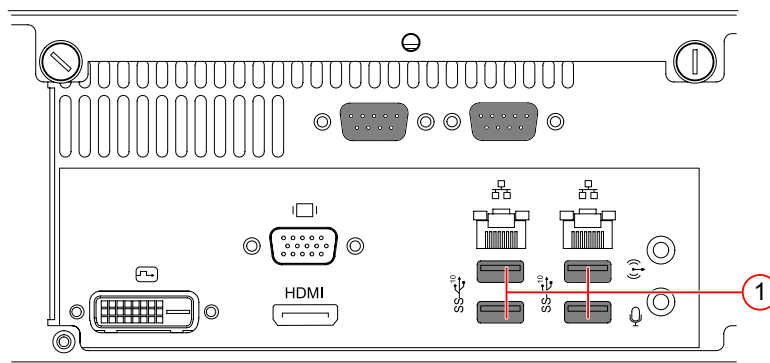
Characteristics

- Connection of peripheral devices such as keyboard and mouse.
- Archiving images to USB storage devices (USB flash drives or USB hard drives with the FAT32 file system).
- Performing updates, backups or restores by means of the vicostick (accessories).

5.5 Expansion cards

Depending on the selected configuration, the cards are installed ex works. The slots are selected in such a way that optimum heat dissipation is ensured.

5.5.1 Camera interface: 4 Port Gigabit Ethernet

The device has four GigE Vision interfaces for the configuration "Camera interface: 4 Port Gigabit Ethernet".
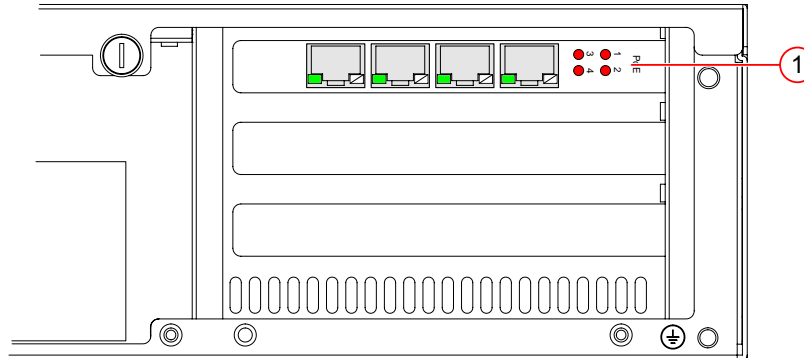
Image 6: 4 x GigE Vision interfaces

(1) 4 x GigE Vision interfaces

Characteristics

- LAN: 10/100/1000 Mbps
- Connection: 4 Port / 4 x RJ45
- Power supply via PoE: yes

Status indicators

LED	Colour	Status	Description
PoE	Red	Off	Power over Ethernet aus
		On	Power over Ethernet an
Active/Link	Green	Off	Port disconnected / not connected
		On	Port connected, no data transmission
		Flashing	Port connected, send / receive data
Speed LED	Orange	On	10 / 100 Mbps
	Green	On	1000 Mbps

5.5.2 Digital I/O card ADDI-DATA

The device has an external digital I/O interface 16 IN / 16 OUT, PNP for the configuration "Digital I/O card ADDI-DATA".
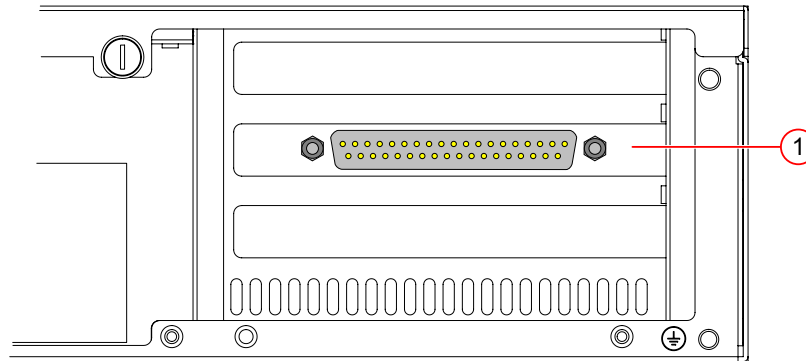
Image 7: Expansion card ADDI-DATA

(1)   Digital I/O card ADDI DATA, 16 IN/ 16 OUT, PNP

Characteristics

- Installed by manufacturer
- PNP-Open Collector
- Connector: 37-pin D-Sub connector

5.5.2.1 Digital input channels
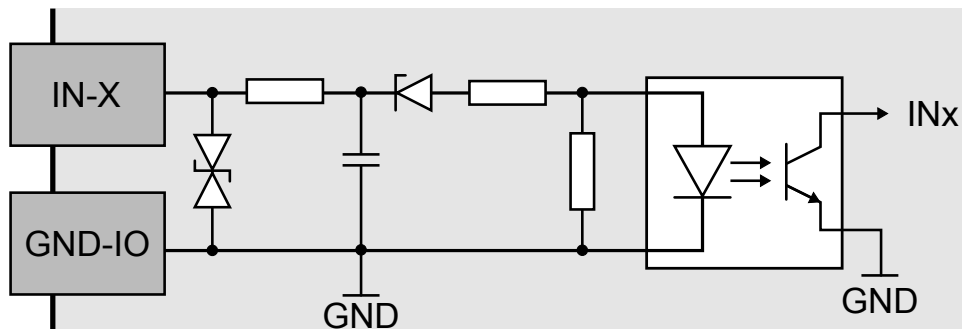
Image 8: Schematic layout of digital input channels 1 to 16

Characteristics

- Polarity protection
- Galvanic decoupled
- Inputs have ESD protection and interference signal filter
- The input channels have a common GND connection (GND-IN)

Parameter

Parameter	Min	Nom	Max
Number of inputs			16
Input voltage + VIN (DC)	0 V	24 V	30 V [1]
Input voltage "Low"	0 V		14 V
Input voltage "High"	19 V		30 V
Input current V_{in} = 24 V		2 mA	
Input frequency at V_{in} = 24 V			5 kHz
Galvanic decoupling		present	

[1]   Higher input voltages destroy the respective input channel.

5.5.2.2 Digital output channels
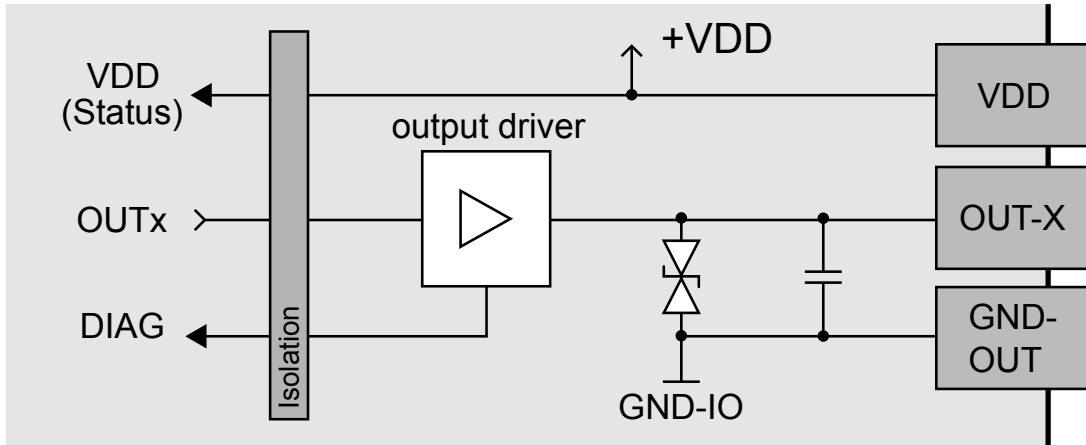
Image 9: Schematic layout of digital output channels 1 to 16

Characteristics

- Galvanic decoupled
- Overload protection (short circuit / overtemperature)
- Output current limit via polyswitch fuse
- Supply voltage monitoring
- Output channels as high-side driver (high-active)
- The output channels are supplied by the operating voltage + VDD
- ESD protection and output signal filter
- The output channels have a common GND connection (GND-OUT)

Parameter

Parameter	Min	Nom	Max
Number of outputs			16
Operating voltage + VDD (DC)	11 V [1]	24 V	36 V
Output current per output			500 mA
Output current for 8 outputs			1.5 A
Short circuit current / output [2]		1,5 A	
Turn-on time [3]		50 µs	
Turn-on time [3]		75 µs	
Galvanic decoupling		present	

[1]   Supply voltage < 7 V leads to an switch-off of all output channels.

[2]   at pulse current, at 24 V and R_{last} < 0.1 Ω

[3]   at I_{out} = 0.5 A and ohmic load

5.5.3 Digital I/O card ADLINK

The device has an external digital I/O interface 16 IN / 16 OUT, NPN for the configuration "Digital I/O card ADLINK".
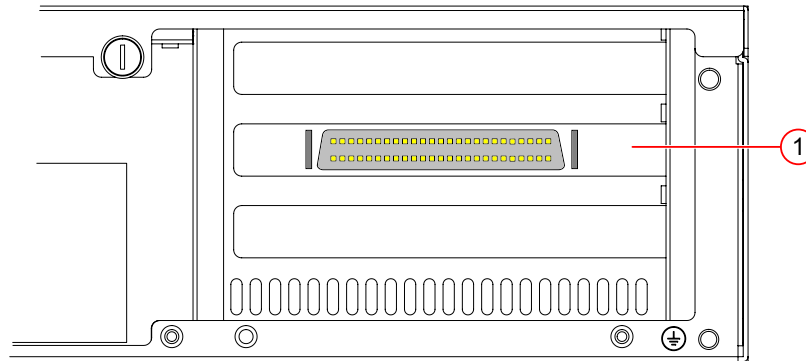
Image 10: Expansion card ADLINK

(1)   Digital I/O card ADLINK, 16 IN/ 16 OUT, NPN

Characteristics

- Installed by manufacturer
- NPN-Open Collector
- Connector: 50-pin SCSI-II Connector

5.5.3.1 Digital input channels

Digital input channels 1 to 8
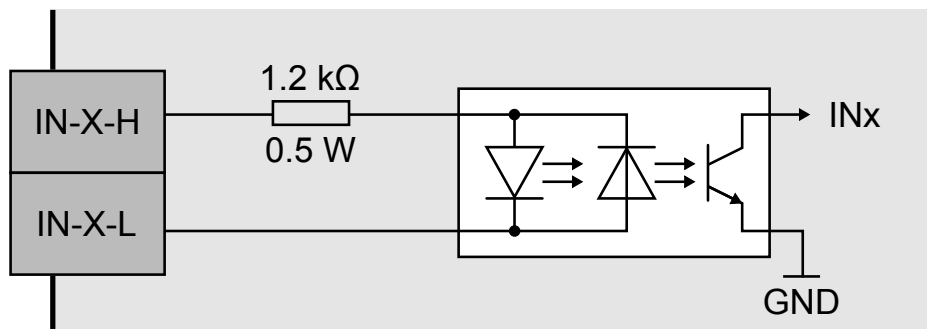
Image 11: Schematic layout of digital input channels 1 to 8

Characteristics

- Non-polarised
- Galvanic decoupled among each other
- For each input channel, both input signals are lead out to the connector.

Digital input channels 9 to 16
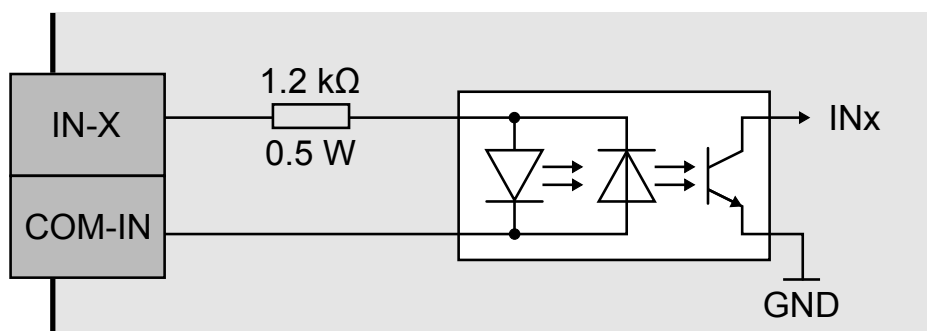
Image 12: Schematic layout of digital input channels 9 to 16

Characteristics

- Non-polarised
- Galvanic decoupled
- For each input channel, an input signal and an input signal for all input channels (9 to 16) are lead out to the connector.

Parameter

Parameter	Min	Nom	Max
Number of inputs			16
Input voltage + VIN (DC)	0 V	24 V	24.5 V [1]
Input voltage "Low"	0 V		1.5 V
Input voltage "High"	5 V		24 V
Input current "Low"	0 mA		1.5 mA
Input current "High"	4.2 mA		20 mA
Input resistance		1.2 kΩ / 0.5 W	
Switching frequency	0 Hz		10 kHz
Galvanic decoupling		present	

[1]   Higher input voltages destroy the respective input channel.

5.5.3.2 Digital output channels
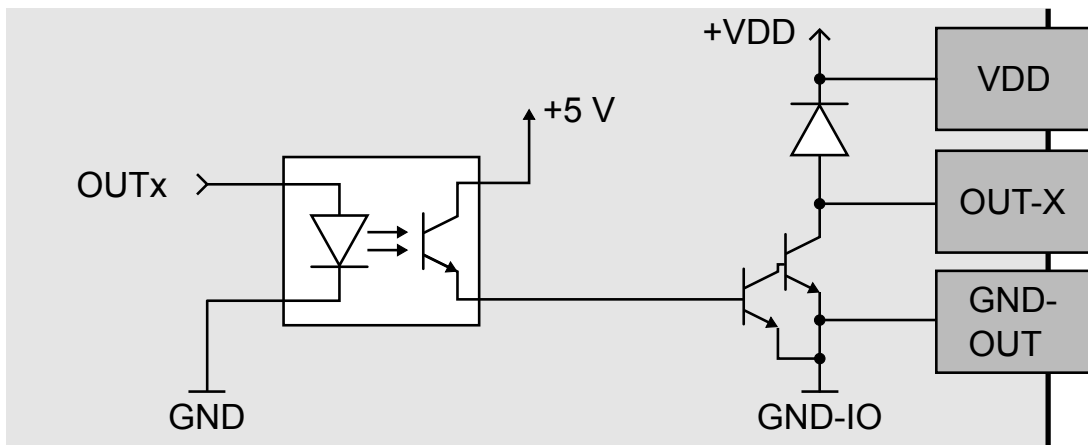
Image 13: Schematic layout of digital output channels

Characteristics

- Galvanic decoupled
- Output channels as NPN open-collector outputs (low-active) with integrated free-wheeling diode.
- The output channels are supplied by the supply voltage + VDD / GND
- The output channels have a common GND connection (GND-OUT).

Parameter

Parameter	Min	Nom	Max
Number of outputs			16
Operating voltage + VDD (DC)	5 V	24 V	35 V
Output current per output [1]			500 mA
Output current of all outputs [2]			370 mA
Output current of all outputs [3]			130 mA
Galvanic decoupling		present	

[1] Duty cycle: unlimited „On", single output channel

[2] Duty cycle: max. 25 ms "ON", all 16 output channels simultaneously, duty factor (ON: OFF): 1 : 9

[3] Duty cycle: max. 25 ms "ON", all 16 output channels simultaneously, duty factor (ON: OFF): 1 : 1

5.5.4 PROFINET card HILSCHER

In the configuration "PROFINET card HILSCHER", the device has a PROFINET interface for process data exchange in a PROFINET network.
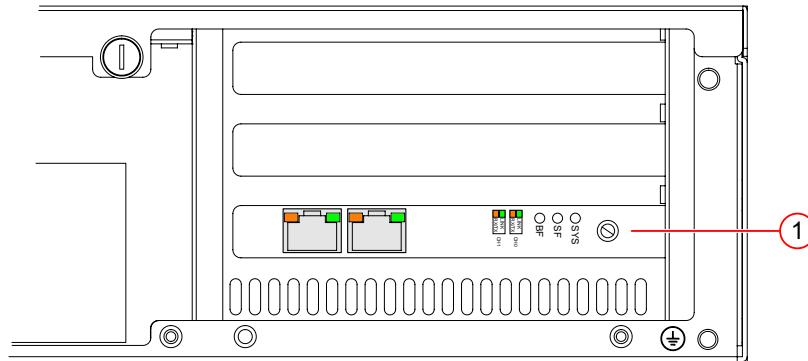
Image 14: PROFINET - interface

(1)   PROFINET card HILSCHER, Model: CIFX 50E-RE

Characteristics

- PROFINET IO Device
- Conformance Class CC_B
- Net Load Class III
- PROFINET RT

Status indicators

LED	Colour	Status	Description
SYS	Green	On	Operating System running
	Green / Yellow	Flashing	Second stage bootloader is waiting for firmware
	Yellow	On	Bootloader netX (= romloader) is waiting for second stage bootloader
		Off	Power supply for the device is missing or hardware defect
SF System Failure	Red	Off	No error
		Flashing	DCP signal service is initiated via the bus
		On	Watchdog timeout; channel, generic or extended diagnosis present; system error
BF Bus Failure	Red	Off	No error
		Flashing	No data exchange
		On	No configuration; or low speed physical link; or no physical link
Link Ch0 / Ch1	Green	On	The device is linked to the Ethernet
		Off	The device has no link to the Ethernet
RX/TX Ch0 / Ch1	Yellow	Flickering (load dependant)	The device sends/receives Ethernet frames
		Off	The device does not send/receive Ethernet frames

6 COMMISSIONING

6.1 Unpacking

<table>
<tr><td>**NOTICE**</td></tr>
</table>

Damage or destruction of the device caused by condensation and large temperature differences!

- Do not subject the device to large temperature fluctuations.
- After storage and transport, allow the device to adjust slowly to the ambient temperature at the place of use.

1. Carefully cut the tape with a knife.

2. Open the box and remove the small parts box.

3. Lift the device out of the box with foam protection.

4. Remove the foam protection. Remove the device from the plastic film.

5. Keep packing material or dispose it.

6.2 Mounting

<table>
<tr><td>**NOTICE**</td></tr>
</table>

Installation and connection operations may only be performed in the off and de-energised state.

<table>
<tr><td>**NOTICE**</td></tr>
</table>

Damage or destruction caused by overheating.

- Do not cover the device. Do not operate the device packed.
- Leave sufficient room for air circulation.
- Do not cover the fan.
- Operate the device in ambient conditions according to the specifications in these instructions of use.

Rack mounting

The unit is designed to be mounted in a rack.

Due to the different mounting types and rack systems, no mounting material is included in the scope of delivery. Mounting may differ depending on the rack. Please also read the installation instructions supplied with the rack.

Use the mounting holes provided on the sides of the unit for mounting.

Requirements for rack mounting

- Do not cover the ventilation slots at the front, rear and left.
- Leave one U free above and one below the unit.
- It must be possible to open the front flap of the unit at any time.
- Leave enough space at the rear for cables.
- Ensure reliable grounding.

Mounting the handles

The accessory box contains two angles and two handles as well as screws. Mount the housing brackets and handles as shown below.
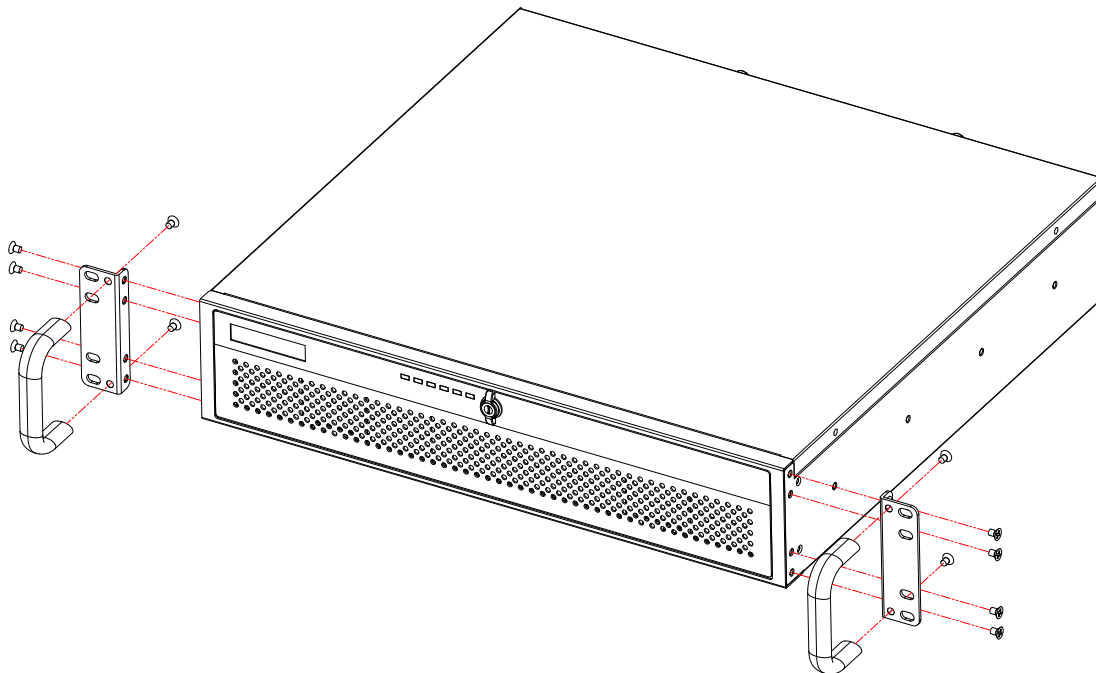
6.3 Connecting

NOTICE

Installation and connection operations may only be performed in the off and de-energised state.

NOTICE

Cable damage

- Comply with the specified minimum bending radius.
- Cables must generally be mounted with a strain relief clamp.
- Use cables corresponding to the specification (see data sheet).

6.3.1 Connect the Ethernet interfaces

Connect the device with the LAN via Ethernet cable.

Use the Ethernet interface LAN 1 for process communication and parametrisation.

Use the Ethernet interface LAN 2 for direct connection to a PC.

6.3.2 Connect the RS232 interface

For serial communication, connect the device to the process environment using an RS232 cable.

6.3.3 Connect a monitor

A monitor can be connected to the device to display the boot process or the outputs of a test program. Use the VGA, DVI-D or HDMI port at the rear for this purpose.

6.3.4 Connect the cameras

The device has a GigE Vision port (LAN2). This port do not provide supply voltage for cameras. An external power supply is required to operate the camera. Connect these according to manufacturer's specifications.

The ports of the optional camera card provide a supply voltage for cameras via PoE. If the connected camera does not support PoE, an external power supply is required. Connect these according to manufacturer's specifications.

Connect the cameras to the corresponding ports.

Use of switches

By using a Gigabit Ethernet switch up to 8 cameras can be connected to the device. However, in this process the bandwidth is divided between the cameras used, so the full frame rat may not be possible.

ADVICE
Requirements of the switch
• Support for Jumbo Frames • A minimum of 64 kB buffer available per port

Line scan cameras

ADVICE
Line scan cameras must be operated alone at one port.

6.3.5 Connect the digital I/O interface (Digital I/O card ADDIDATA)

NOTICE

Damage of the outputs through inductive loads

- With induced loads the outputs have to be switched with a free-wheeling diode anti-parallel to the load.

NOTICE

Destruction caused by potential differences

- The ground potential (GND) of the digital inputs and outputs of the device must be connected to the ground potential (GND) of the control voltage of the device to be controlled.

Connecting

The components required for connection are available as accessories. *"Accessories for the option Digital I/O card ADDI-DATA"*

Connect the 37-pin D-Sub connector of the unit's I/O expansion card to the process environment using one of the following two variants:

- I/O cable with 2 x D-Sub sockets and terminal board
- I/O cable with 1 x D-Sub socket and open cable end

Pin assignment

Digital Input 1	(1)	(20)	Digital Input 2
Digital Input 3	(2)	(21)	Digital Input 4
Digital Input 5	(3)	(22)	Digital Input 6
Digital Input 7	(4)	(23)	Digital Input 8
Digital Input 9	(5)	(24)	Digital Input 10
Digital Input 11	(6)	(25)	Digital Input 12
Digital Input 13	(7)	(26)	Digital Input 14
Digital Input 15	(8)	(27)	Digital Input 16
24 V external outputs	(9)	(28)	24 V external outputs
0 V external inputs	(10)	(29)	0 V external outputs
Digital Output 1	(11)	(30)	Digital Output 2
Digital Output 3	(12)	(31)	Digital Output 4
Digital Output 5	(13)	(32)	Digital Output 6
Digital Output 7	(14)	(33)	Digital Output 8
Digital Output 9	(15)	(34)	Digital Output 10
Digital Output 11	(16)	(35)	Digital Output 12
Digital Output 13	(17)	(36)	Digital Output 14
Digital Output 15	(18)	(37)	Digital Output 16
Diagnose Output	(19)		

Description of the Pin assignment

Pin	Cable colour	Designation	Description
1	White	IN-1	Digital input channel 1
2	Green	IN-3	Digital input channel 3
3	Grey	IN-5	Digital input channel 5
4	Blue	IN-7	Digital input channel 7
5	Black	IN-9	Digital input channel 9
6	Pink-grey	IN-11	Digital input channel 11
7	White-green	IN-13	Digital input channel 13
8	White-yellow	IN-15	Digital input channel 15
9	White-grey	VDD	+24 VDC supply voltage - digital output channels
10	White-pink	GND-IN	Common GND interface - digital input channels
11	White-blue	OUT-1	Digital output channel 1
12	White-red	OUT-3	Digital output channel 3
13	White-black	OUT-5	Digital output channel 5
14	Grey-green	OUT-7	Digital output channel 7
15	Pink-green	OUT-9	Digital output channel 9
16	Green-blue	OUT-11	Digital output channel 11
17	Green-red	OUT-13	Digital output channel 13
18	Green-black	OUT-15	Digital output channel 15
19	Grey-blue	-	Do not use
20	Brown	IN-2	Digital input channel 2
21	Yellow	IN-4	Digital input channel 4
22	Pink	IN-6	Digital input channel 6
23	Red	IN-8	Digital input channel 8
24	Violet	IN-10	Digital input channel 10
25	Blue-red	IN-12	Digital input channel 12
26	Brown-green	IN-14	Digital input channel 14
27	Yellow-brown	IN-16	Digital input channel 16
28	Grey-brown	VDD	+24 VDC supply voltage - digital output channels
29	Pink-brown	GND-OUT	Common GND interface - digital output channels
30	Brown-blue	OUT-2	Digital output channel 2
31	Brown-red	OUT-4	Digital output channel 4
32	Brown-black	OUT-6	Digital output channel 6
33	Yellow-grey	OUT-8	Digital output channel 8
34	Yellow-pink	OUT-10	Digital output channel 10
35	Yellow-blue	OUT-12	Digital output channel 12
36	Yellow-red	OUT-14	Digital output channel 14
37	Yellow-black	OUT-16	Digital output channel 16

6.3.6 Connect the digital I/O interface (Digital I/O card ADLINK)

NOTICE

Destruction caused by potential differences

- The ground potential (GND) of the digital inputs and outputs of the device must be connected to the ground potential (GND) of the control voltage of the device to be controlled.
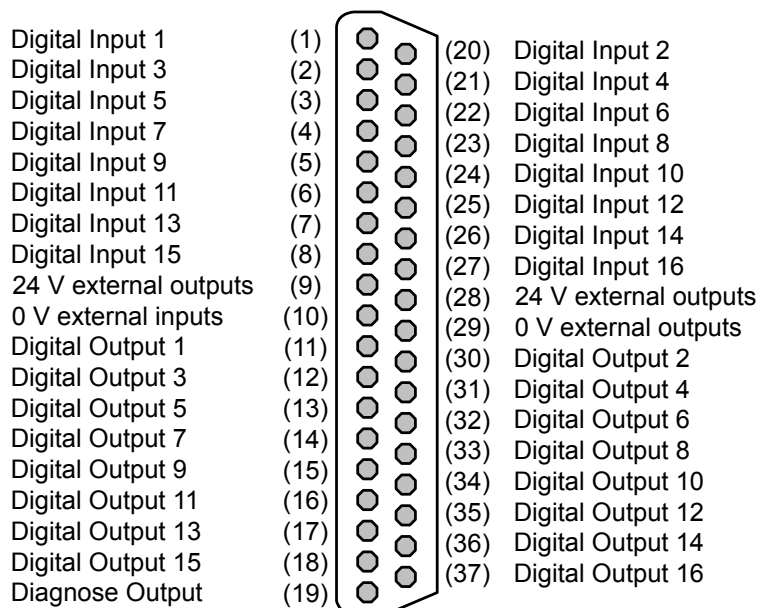
Connecting

The components required for connection are available as accessories. *"Accessories for the option Digital I/O card ADLINK"*

1. Connect the I/O cable ACL-10250-1 to the SCSI-II connector of the expansion card.

2. Connect the other end of the cable to the DIN-50S-01 connection board.

3. Connect the ground potential (GND) of the digital inputs and outputs of the device with the ground potential (GND) of the control voltage of the device to be controlled.

4. Connect the digital I/Os of the unit to be controlled to the DIN-50S-01 connection board.

Pin assignment

VDD	(1)	○ ○	(26)	VDD
EICOM	(2)	○ ○	(27)	ISO5V
EICOM	(3)	○ ○	(28)	EICOM
EICOM	(4)	○ ○	(29)	EICOM
IDO_7	(5)	○ ○	(30)	IDO_14
IDO_6	(6)	○ ○	(31)	IDO_15
IDO_5	(7)	○ ○	(32)	IDO_12
IDO_4	(8)	○ ○	(33)	IDO_13
IDO_3	(9)	○ ○	(34)	IDO_10
IDO_2	(10)	○ ○	(35)	IDO_11
IDO_1	(11)	○ ○	(36)	IDO_8
IDO_0	(12)	○ ○	(37)	IDO_9
IDI_3H	(13)	○ ○	(38)	IDI_7H
IDI_3L	(14)	○ ○	(39)	IDI_7L
IDI_2H	(15)	○ ○	(40)	IDI_6H
IDI_2L	(16)	○ ○	(41)	IDI_6L
IDI_1H	(17)	○ ○	(42)	IDI_5H
IDI_1L	(18)	○ ○	(43)	IDI_5L
IDI_0H	(19)	○ ○	(44)	IDI_4H
IDI_0L	(20)	○ ○	(45)	IDI_4L
IDI_11	(21)	○ ○	(46)	IDI_15
IDI_10	(22)	○ ○	(47)	IDI_14
IDI_9	(23)	○ ○	(48)	IDI_13
IDI_8	(24)	○ ○	(49)	IDI_12
EOGND	(25)	○ ○	(50)	EOGND

Description of the Pin assignment

Pin	Designation	Description
1	VDD	+24 VDC supply voltage - digital outputs
2	EICOM	Common ground or signal - input channels 9 to 16
3	EICOM	Common ground or signal - input channels 9 to 16
4	EICOM	Common ground or signal - input channels 9 to 16
5	IDO_7	Digital output channel 8
6	IDO_6	Digital output channel 7
7	IDO_5	Digital output channel 6
8	IDO_4	Digital output channel 5
9	IDO_3	Digital output channel 4
10	IDO_2	Digital output channel 3
11	IDO_1	Digital output channel 2
12	IDO_0	Digital output channel 1
13	IDI_3H	Digital input channel 4 - high
14	IDI_3L	Digital input channel 4 - low
15	IDI_2H	Digital input channel 3 - high
16	IDI_2L	Digital input channel 3 - low
17	IDI_1H	Digital input channel 2 - high
18	IDI_1L	Digital input channel 2 - low
19	IDI_0H	Digital input channel 1 - high
20	IDI_0L	Digital input channel 1 - low
21	IDI_11	Digital input channel 12
22	IDI_10	Digital input channel 11
23	IDI_9	Digital input channel 10
24	IDI_8	Digital input channel 9
25	EOGND	GND supply voltage - digital outputs
26	VDD	+24 VDC supply voltage - digital outputs
27	ISO5V	Galvanic decoupled 5V output
28	EICOM	Common ground or signal - input channels 9 to 16
29	EICOM	Common ground or signal - input channels 9 to 16
30	IDO_14	Digital output channel 15
31	IDO_15	Digital output channel 16
32	IDO_12	Digital output channel 13
33	IDO_13	Digital output channel 14
34	IDO_10	Digital output channel 11
35	IDO_11	Digital output channel 12
36	IDO_8	Digital output channel 9
37	IDO_9	Digital output channel 10
38	IDI_7H	Digital input channel 8 - high
39	IDI_7L	Digital input channel 8 - low
40	IDI_6H	Digital input channel 7 - high
41	IDI_6L	Digital input channel 7 - low
42	IDI_5H	Digital input channel 6 - high
43	IDI_5L	Digital input channel 6 - low
44	IDI_4H	Digital input channel 5 - high
45	IDI_4L	Digital input channel 5 - low
46	IDI_15	Digital input channel 16
47	IDI_14	Digital input channel 15
48	IDI_13	Digital input channel 14
49	IDI_12	Digital input channel 13
50	EOGND	GND supply voltage - digital outputs

6.3.7 Connect the supply voltage and start the device

NOTICE

Destruction caused by potential differences.

- Ensure that the device is properly grounded (equipotential bonding).

Connecting the supply voltage

The power supply is connected to the power supply device of the unit via a cold device connection cable (scope of delivery).

The device is grounded via the cold device connection cable (scope of delivery).

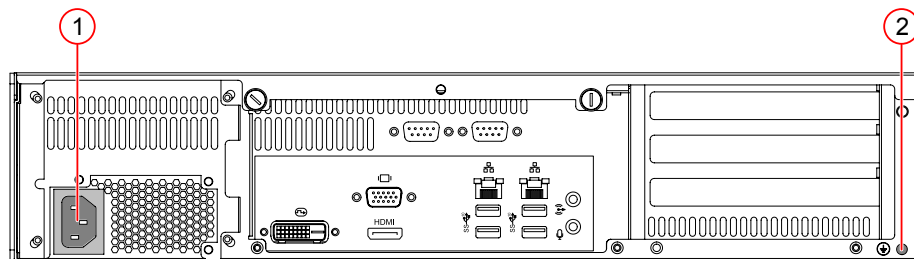The device may only be operated from a grounded socket.

Image 15: Operating voltage supply

(1)   Cold-device built-in plug C14
(2)   Grounding screw with washer (housing ground)

1. Ensure that the supply voltage is switched off.

2. Plug the C13 socket of the cold device connection cable into the C14 power plug on the unit.

3. Plug the protective contact plug of the cold device connection cable into a protective contact socket.

4. Connect the housing ground.

Switch on the device

5. Switch on the supply voltage.

➜ The device boots automatically.

ADVICE

Before switching on the unit, connect a monitor to one of the monitor interfaces. You can observe the booting process.

6.4 Creating a connection

The devices is configured and parametrised with the operating software vcwin. The current version can be found on the homepage *http://www.vision-control.com/products* in the path **Vision Systems > Operating Software**.

The Software must be installed on the PC.

Start and terminate vcwin

The vcwin software is started by either double-clicking on the vcwin icon or from the Windows start menu by calling **Start > Programs > Vision & Control GmbH > vcwin > Vision & Control vcwin**. Terminate vcwin with ALT+F4 or with the menu item **File > Exit**.

Choose the interface in vcwin

After having started vcwin, you should choose the port to which the vision system is connected by calling **Communication > Interface** from the menu.
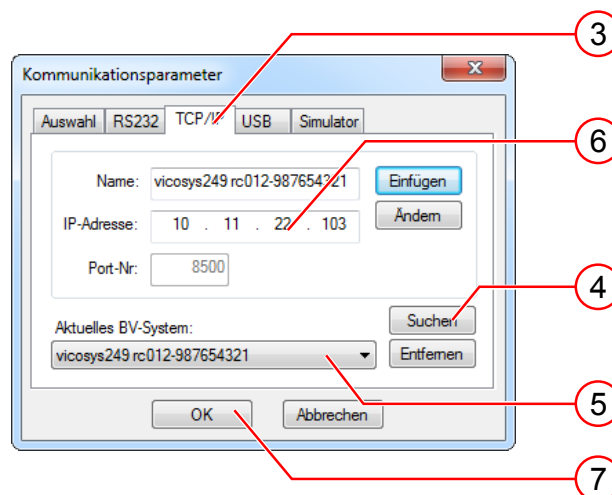
Connecting the device with vcwin

Connect the device by calling **Communication > Connect**.

6.4.1 Create a LAN connection / direct connection

1. Start the operating software vcwin on the PC.

2. Open the window *Communication Parameters* by calling **Communication> Interface**.

   The settings made here are used during each connection setup.

3. Switch to the TCP/IP tab.

4. With the [Search] button, all available devices, on the same subnet, are displayed (UDP broadcast to all participants).

5. Select the appropriate device.

6. Optionally, you can also enter the name and IP address of your device.

7. Click the [OK] button to accept the values.

| ADVICE |
|---|
| Factory setting: The device searches for a DHCP server during initialization in the LAN. If no DHCP server is available, a static IP address is used (default: 192.168.3.180).

If the device cannot be found, a monitor can be connected and the IP can be read off during initialization.

The settings can be changed via vcwin. |

ADVICE
The search function in the TCP/IP tab of the dialogue Communication Parameters only detects devices in the same subnet. For devices in different subnets, the configuration data must be entered manually.

6.4.2 Create a serial connection

The Serial interface on the device is used for serial communication.

1. Connect the device directly to the PC using a RS232 cable.

2. Start the operating software vcwin on the PC.

   Configure the interface by calling **Communication > Interface** in the menu.
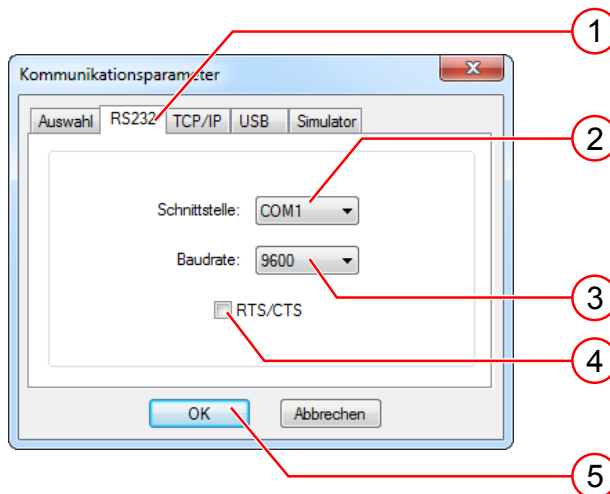
3. Switch to the RS232 tab.

4. Select the COM interface of your computer.

5. Set the baud rate to 9600. Once connected, the baud rate can be adjusted.

6. Deactivate RTS/CTS (Hardware handshake of the RS232 interface).

7. Click the [OK] button to accept the values.

7 OPERATION

7.1 Switching On and Off

Switching on

The unit switches on automatically when the supply voltage is switched on.

If the supply voltage is already on, the unit can be switched on by pressing the PWR key.

Switching off

The unit is switched off by switching off the supply voltage.

If the supply voltage is not to be switched off, the unit can be switched off by pressing the PWR key.

7.2 Operation via Software

ADVICE
Creating and managing programs are performed using the operating software vcwin.
The vcwin Instructions for Use is included on the Product DVD (scope of delivery).

Further information on the use of the software can be found on the homepage *http://www.vision-control.com/products* in the path **Vision Systems > Operating Software**.

8 MAINTENANCE AND SERVICE

8.1 Maintenance

The device is maintenance-free. Depending on the operating environment, it may have to be cleaned.

Cleaning the filter

1. Open the front door.

2. Push the hook (2) and pull the filter (1) out.

3. Clean the filter with a soft brush or wash the dust away from the filter with flowing water. The filter must be dry before installation.
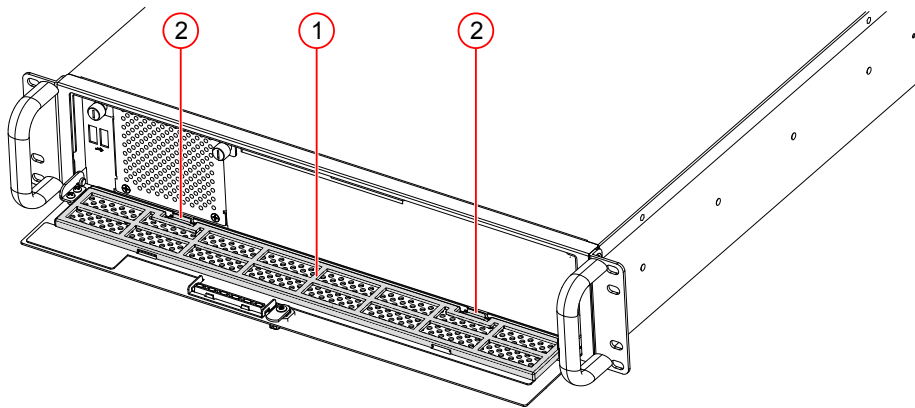
4. Replace the filters inside the unit.

Image 16: Front filter cleaning

Cleaning the outside

- The housing can be cleaned according to the conditions applicable to the given protection class.
- Clean the outside with a damp cloth.
- Remove excessive dirt with an approved varnished steel sheet cleaner. Refer to the instructions of the cleaner.
- Cleaners must not be applied directly to the housing, and the housing must not be bathed.
- The interfaces must be clean and dry before the device is connected and put into operation.

8.2 Service

Technical Support

Please contact our technical support if you have any technical questions concerning our products.

We will be glad to be of service:

Monday to Thursday 8:00 to 17:00, and Friday 8:00 to 15:00.

Vision & Control GmbH

Mittelbergstraße 16

98527 Suhl, Germany

Phone: +49 (0) 3681 7974-0
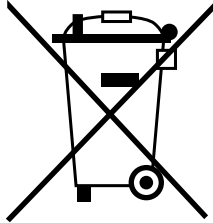
www.vision-control.com

Defective device

If the device has a defect, the manufacturer can repair or exchange it. Please contact your local sales partner or technical support.

9 DISPOSAL

The device and its accessories and packaging must be sent to environmentally compatible recycling.

Do not throw electrical devices or tools into the household waste!

According to European Directive 2012/19/EU on waste electrical and electronic equipment and its implementation in national law, unusable electric tools must be collected separately, and sent to environmentally compatible recycling.

Disposal, including that of individual components, must also always be in a way that does not harm the environment, which means it must be done in accordance with the currently valid legal regulations.

Please contact the manufacturer, your local specialist dealer or the relevant national authority for the proper disposal of old devices.

The electrical and electronic components must be sent to a specialist recycling company or to the manufacturer for proper disposal.

Batteries and rechargeable batteries must not be disposed of with household waste. To recycle them or dispose of them as hazardous waste, use the public collection points or contact the manufacturer in this regard.

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