Panasonic

IMAGECHECKER

P400XD

Hardware Manual

Panasonic®

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We invite your comments on this manual. Please email us at:

tech-doc@eu.pewg.panasonic.com.

Please direct support matters and technical questions to your local Panasonic representative.

Important Information

Please read the following information **before** you begin with the installation or operation!

◆NOTE

- **Use only products (cameras and camera cables) offered by Panasonic for specific use with the PC Imagechecker P400. The use of any other products will negate the warranty for the entire system since third-party components can damage the P400. In this case, Panasonic will not assume liability for the proper functioning of the P400.**
- **Under no circumstance should you ever disassemble the P400 or change the system's factory settings unless you are specifically asked to do so in this manual. Any tampering will negate the warranty for the entire system since such changes may damage the P400. In this case, Panasonic will not assume liability for the proper functioning of the P400.**
- **The P400 is a precision device and should under no circumstance be exposed to shocks or vibrations.**
- **The P400 is neither waterproof, dustproof nor rustproof. Consequently, it is absolutely necessary to install the P400 in a dry, clean environment.**
- **Protect the P400 from exposure to direct sunlight and explosive or corrosive gases.**
- **Disconnect the power supply before connecting or disconnecting any connectors to or from the P400.**
- **Never apply force to any P400 connectors or cables. Do not bend the cables. The connections should never be unplugged by pulling on the cable. Always hold the connector by the plug when unplugging any component from the P400.**
- **NEVER touch an exposed connector contact after unplugging a connector from the P400, and ensure that no fluids/chemicals come into contact with the contacts.**
- **Leave ample space around the P400 so that heat generated during operation can be dissipated by the ventilators.**
- **Please ensure that the ventilators function properly.**
- **Clean the dust filters regularly. Warm air cannot pass readily through a dirty filter, which, in turn, may lead to damage from overheating.**
- **Guard against unintended data loss by maintaining data protection in a safe location.**
- **Ensure that the power supply is disconnected while you work on the equipment.**
- **Avoid discharges of static energy.**

- **Use the components only within the humidity and temperature ranges specified.**
- **Take care to keep dust accumulation to a minimum since dust may impair the functioning of the components.**
- **Do NOT clean the components with solvents or aggressive cleansers. These substances can destroy equipment parts and damage the paint.**

Important Symbols

One or more of the following symbols may be used in this documentation:

Warning!
The warning triangle indicates especially important safety instructions. If they are not adhered to, the results could be fatal or critical injury.

◆CAUTION

Indicates that you should proceed with caution. Failure to do so may result in injury or significant damage to instruments or their contents, e.g. data.

◆NOTE

Contains important additional information.

◆EXAMPLE

Contains an illustrative example of the previous text section.

◆Procedure

Indicates that a step-by-step procedure follows.

◆REFERENCE

Indicates where you can find additional information on the subject at hand.

◆KEY POINTS

Summarizes key points in a concise manner.

◆SHORTCUTS

Provides helpful keyboard shortcuts.

◆EXPLANATION

Provides brief explanation of a function, e.g. why or when you should use it.

☛ next page

Indicates that the text will be continued on the next page.

The manual uses the following conventions to indicate elements from the user interface or the keyboard:

"Data field"	Data field entries and option names are rendered in quotation marks.
[Button]	Buttons are indicated by square brackets.
<Key>	Keys are indicated by pointed brackets.

Table of Contents

Chapter 1

System Description

1.1 Introduction

This page provides you with an overview of all the major P400XD components and optional accessories. These components will be described in more detail in the sections to follow.

Equipment/Accessories	Order number
Controller Set	ANPXD 4211V1CL
Frame grabber	ANPCL 8021D
Digital I/O board	ANPC 850V3D
Mouse	ANPMA 836D
Operating system	Windows XP embedded (multi language: Czech, Dutch, English, French, German, Italian, Spanish, Simplified Chinese)
CompactFlash card	ANPMA 862 (4GB CF card)
Hard disk	ANPM A861 (2,5" without software , 80GB, 24/7)
USB flash drive	ANPMA 866 (Storage capacity 4GB)
Flash cable for a frame grabber	ANPMD8101
Others:	Angle bracket/handles
Accessory	
Camera	ANPVC 1510D (5-mega-pixel digital camera) ANPVC 1210 (2-mega-pixel digital camera) ANPVC 1040(Quad-speed digital camera) ANPVC 1021(ultra compact digital camera)
Camera cables	ANPVC 87103D (3m) ANPVC 87103RD (3m, for pick-and-place applications) ANPVC 87105D (5m) ANPVC 87105RD (5m, for pick-and-place applications) ANPVC 87110D (10m) ANPVC 87110RD (10m, for pick-and-place applications) ANPVC 87115D (15m, not suitable for camera ANPVC 1510D and ANPVC 1210) ANPVC 87115RD (15m, for pick-and-place applications, not suitable for camera ANPVC 1510D and ANPVC 1210) ANPVC 87005D (5m, MDR connector at the camera side, SDR connector at the Imagechecker side) ANPC 870004CLD (0,4m, MDR to MDR connector) ANPC 870015CLD (1,5m, MDR to MDR connector) ANPC 87003CLD (3m, MDR to MDR connector) ANPC 87005CLD (5m, MDR to MDR connector)
Keyboard (PS/2)	ANPC 835ED (English) ANPC 835DD (German) ANPC 835FD (French)
Flash cable for two frame grabbers	ANPMD 8102

Equipment/Accessories	Order number
Flash cable for three frame grabbers	ANPMD 8103
Optional components	
Frame grabber with FPGA	ANPC804 V2CLD (supports Camera Link Full and customer-specific cameras)
Camera Link I/O	CLIOIVFULL (for connecting one camera to several P400XD)
TTL-trigger extension board	TTLTRIGGER (for connecting an encoder to the frame grabber)
Opto-trigger	OPTOTRIGGERIV (for inputting external signals at the frame grabber, e.g. a camera trigger signal)

1.2 Industrial PC

The Industrial PC P400XD (called Imagechecker hereafter) was developed especially for use in demanding industrial environments. The Imagechecker provides ultimate convenience as a result of:

- Service-friendly backplane technology
- Protection of operating system and installed software by the Panasonic Security Console (activate, if required)
- Backup and recovery functionality via flash drive and network
- Removable rack and CF card accessible from the front
- Ready for operation

The device has the CE mark.

CE

The industrial PC P400XD conforms to the following standards:

1. According to the EMC directive:
   - EN 55022:1998+A1:2000+A2:2003: Class A
   - EN 55011:2007+A2:2007: Group 1 class A
   - EN 61000-6-2:2005
   - EN 61000-6-4:2007
   - EN 61000-3-2:2006
   - EN 61000-3-3:1995+A1:2001+A2:2005

   According to the LVD directive:
   - EN 60950-1:2006

Danger of radio interferences!
The Imagechecker is an appliance of class A. The Imagechecker is designed for industrial use only. This appliance may cause radio interferences if installed in a residential area. If you are using the Imagechecker in a residential area, you are obliged to take suitable precautions against radio interference and to pay for the cost involved.

All connected cables must be shielded. The camera and power supply cables must be equipped with ferrite core (impedance: ca. 141/241Ohm at 25/100MHz).

1.2.1 Specifications

Specification	Specification
Dimensions	Width: 426,0mm Height: 172,7mm (without feet) Depth: 478,6mm (without protruding connectors)
Processor	Intel C2D E8400 3GHz with active cooling and Papst-Sintec sleeve bearing
Ventilation	2 x DC tubeaxial fans: Max. air flow 85.2 (CFM), type ADDA AD1212HB-A73GL. 1 x CPU fan with Papst-Sintec sleeve bearing
Graphics	• Chip set: Intel Q35 with GMA 3100 • 256MB RAM • Max. resolution (pixel): 2048 x 1536 with an image refresh rate of 75Hz
RAM	2 GB DDR2-800 RAM (max. 4GB)
BIOS	AMIBIOS, version 08.00.15, ID 124x1351
Chip set	Intel Q35 with ICH9DO
Hard disk	80GB S-ATA, 2,5", for 24/7 operation, mounted in a removable rack
Optical drive	DVD-RW drive
CompactFlash card	4GB CompactFlash card by TRS-Star (operation system and Vision P400 installed, mounted in removable rack)
Serial interface	2 RS232C, baud rate: up to 115200 bytes
Digital I/O board	PCI board (ANPC850V3) with 16 opto-isolated inputs; 16 outputs, PhotoMOS relays, short-circuit protected bipolar; 1 start input and 1 flash signal output
Ethernet	• Chip set: LAN1: Intel 82566DM (PCIe GbE) LAN2: Intel 82573V (PCIe GbE) • 2 x RJ-45 connectors at the back
USB	• 4 x USB 2.0 at the front • 4 x USB 2.0 at the back
Keyboard and mouse port	PS/2 connector at the back with ADA adapter cable; 3-button mouse, IBM-compatible (right-handed) included with delivery. Keyboard can be ordered separately
Monitor	15-pin Sub-D plug connection for VGA monitor
Frame grabber, PCIe (ANPCL 8021D)	2 cameras parallel; maximal 3 frame grabbers
Battery	CR2032
Power supply	ATX compatible, 500 Watt; input 115-230V AC
Backplane	Available slots: • 7x PCI • 3x PCIe x4 • 1x PCIe x16 • 1x slot for CPU board
Casing	Powder-coated galvanized steel case with ground connection
Weight (industrial PC)	Approx. 20,0kg
Mounting (option)	If you want to mount the Imagechecker in a 19" cabinet, you find angle brackets in the box with the accessories.

Specification	Specification
USB flash drive	4GB with software license and system recovery
LED diodes	The LEDs indicate the following: • On/Off status • Voltage • Temperature • Proper operation of hard disk and fan
Operating system	Windows XP Embedded OEM version
Image-processing software	Vision P400
Packaging	Width: 57cm Height: 35cm Depth: 62cm Weight: Approx. 22kg (device incl. packaging)
Protection class	1
Protection type	IP20
Power consumption	Approx. 150 Watt when 6 cameras are used (240V AC/0.65 A)
Temperature	• Operation: 5°C to 40°C (no ice, no condensation) • Storage: -20°C to 60°C (no ice, no condensation)
Ambient humidity	• Operation: 10% - 85% non-condensing • Storage: 10% - 95% non-condensing
Vibration resistance	• Operation: 5 to 500Hz, 9,8m/s^2 0-peak (1G 0-peak) • Storage: 5 to 500 Hz, 49m/s^2 0-peak (5G 0-peak)
Shock resistance (half-wave pulse of sine wave)	• Operation: 3185m/s^2 0-peak (325G 0-peak) 2ms duration • Storage: 8820m/s^2 0-peak (900G 0-peak) 1ms duration 1176m/s^2 0-peak (120G 0-peak) 11ms duration
Others:	Push button switch on front panel

◆NOTE

Specifications are subject to change without notice.

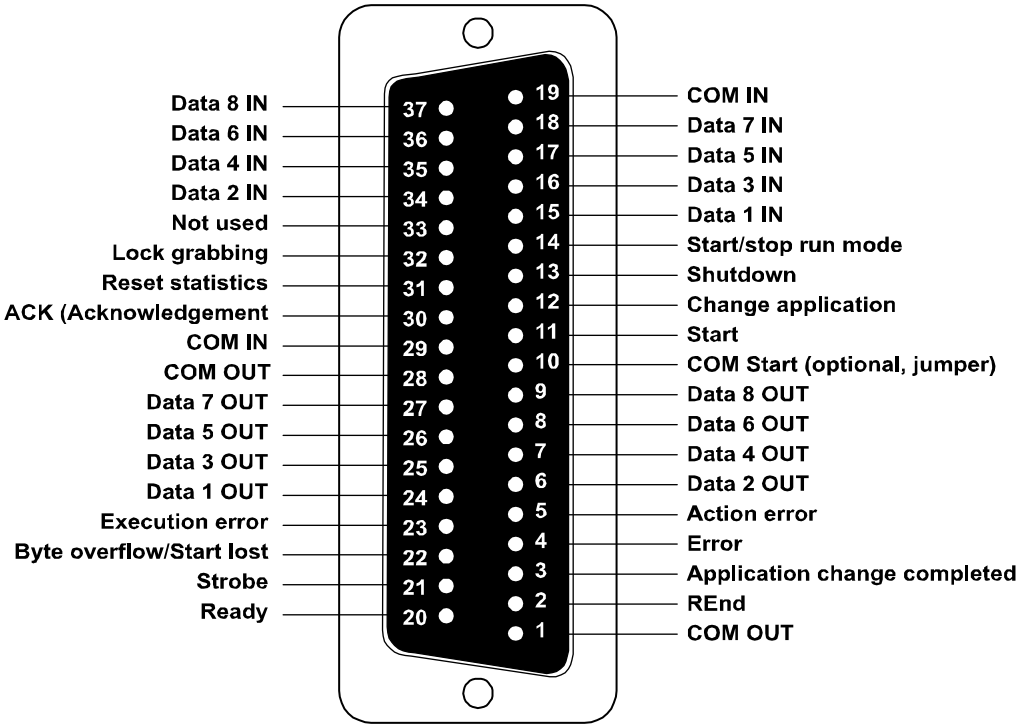
1.2.2 Digital I/O Board

The digital I/O board ANPC 850V3D has 16 digital inputs and outputs (see page 7) each and can be used to control a flash (see page 33).

The digital outputs are equipped with short-circuit protected PhotoMos relays to protect against overload. It is possible to connect further peripheral devices (see page 10). The Imagechecker P400MD offers one PCI slot for a digital I/O board.

1.2.2.1 ANPC 850V3D

The figures below show the pin assignment of the digital I/O board ANPC 850V3D when you look at the Imagechecker.



Female sub-D connection on the board (top view)

Inputs of the digital I/O board ANPC 850V3D

Inputs (16 Signals)			
Pin No.	**Pin for COM**	**Functionality**	
11	29 (Default. Alternatively, pin 10 can be defined as an individual ground terminal by changing the jumper setting)	Start: starts the application Please refer to the information on wiring the optional ground terminal! Identical with Phoenix contact pin 2	
30	29	ACK: response of external device	
12		Change application	
31		Reset statistics	
13		Shut down	
32		Lock grabbing	
14		Start/Stop run mode	
33		Not used	
15	19	Data 1	8 bit data input of the application or execution group number. Input of 0000 0000 means selecting application No. 1 or execution group 0.
34		Data 2	
16		Data 3	
35		Data 4	
17		Data 5	
36		Data 6	
18		Data 7	
37		Data 8	

Outputs of the digital I/O board ANPC 850V3D

Outputs (16 Signals)			
Pin No.	**Pin for COM**	**Functionality**	
20	1	PCReady: next application start possible	
2		REnd: Read image end	
21		Strobe: indicates output data available	
3		Application change completed	
22		Error due to byte overflow / lost start	
4		Error	
23		Execution error	
5		Action error	
24	28	Data 1	8 bit data output
6		Data 2	
25		Data 3	
7		Data 4	
26		Data 5	
8		Data 6	
27		Data 7	
9		Data 8	

Pin assignment of the Phoenix Contact connector

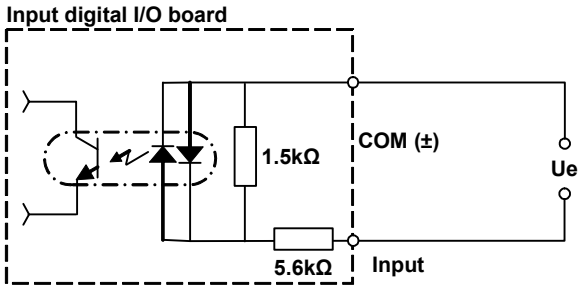
Pin No.	Functionality
1	Individual ground terminal for start signal (same potential as pin 10 at the Sub-D plug). **Note:** By default, this terminal is NOT active. Please refer to the details about this terminal (see page 13)!
2	Start signal (same potential as pin 11 at the Sub-D plug) **Note:** By default, this terminal is NOT active. Please refer to the details about this terminal (see page 13)!
3	Flash emitter (see page 33)
4	Flash collector (see page 33)

1.2.2.2 Connect Peripheral Devices to ANPC 850V3D

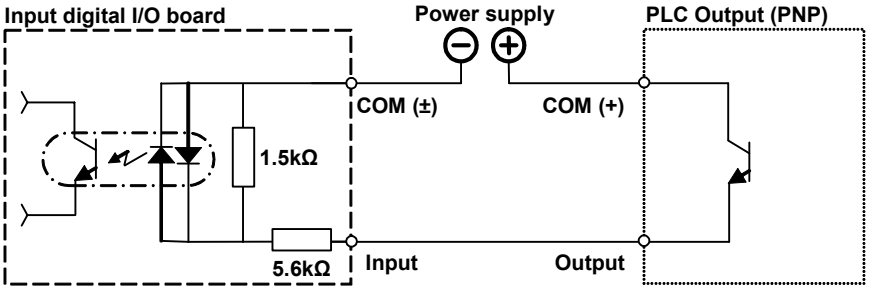
Please note the following specifications for the input and output circuit:

Input circuit

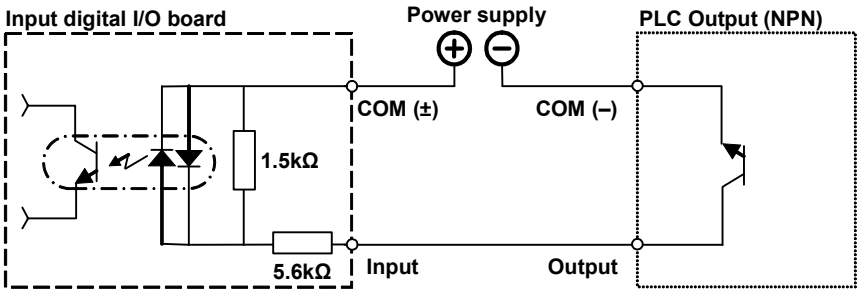
Voltage range Ue	State
0V up to 4V	OFF
12V up to 24V	ON (rated input voltage)
Min. 9.6V to max. 26.4V	ON (operating voltage)
More than 26,4V	Not permissible! Danger of destruction!



Input circuit principle



Circuit diagram with PNP connection

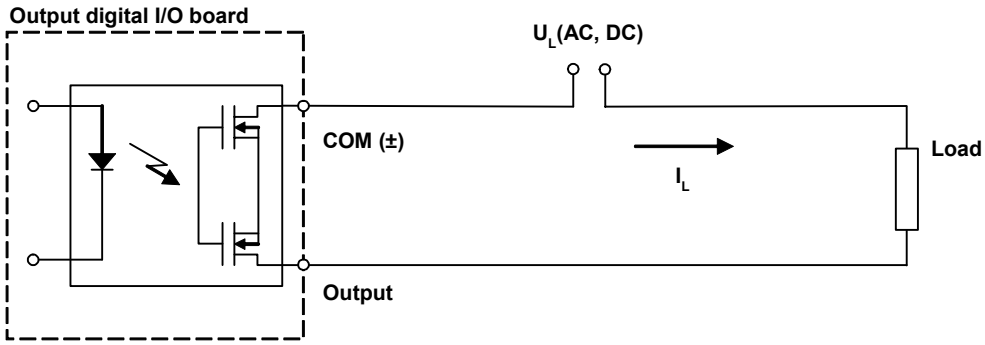


Circuit diagram with NPN connection

Danger of damage to the equipment!
Applying more than 26.4V to the inputs may destroy them!

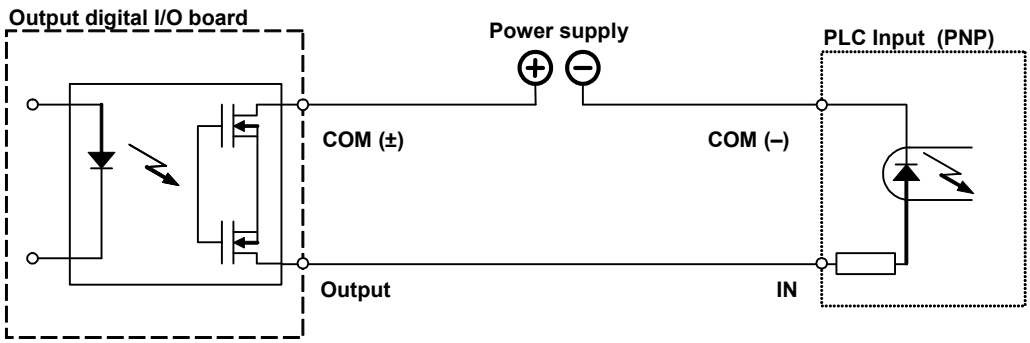
Output circuit

Important: The description of the PhotoMos output circuit is valid for all output signals. For reasons of speed, the flash signal will be output via a special PhotoMOS output with a rise time of 2µs. Please note the following specifications for the output circuit:

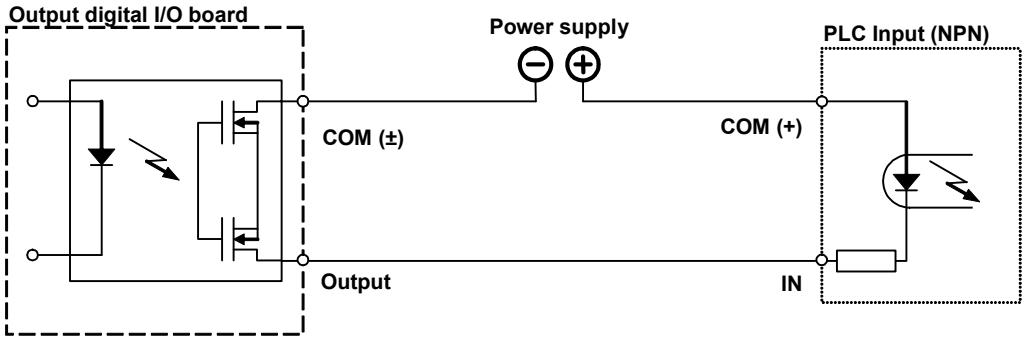


PhotoMOS output circuit principle

Specification	I_L	V_L
Maximum load	100mA	24V DC



Connecting a PLC with PNP inputs



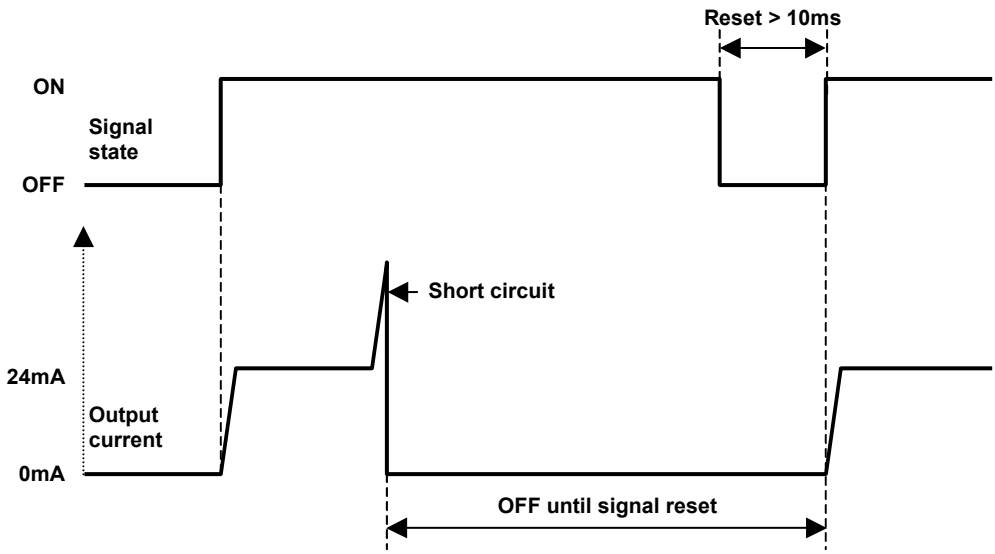
Connecting a PLC with NPN inputs

Danger of damage to the equipment!
Do not connect circuits with more than 26.4V (AC or DC)!
When you apply more than 100mA to the outputs, they may be destroyed due to overheating!

Short-circuit protection of the outputs

After a short circuit with a load of more than 160mA the outputs automatically switch to the state "OFF". It is absolutely necessary to find and correct the cause of the short circuit!

The output is ready for operation again when you have reset the signal for at least 10ms.



Short-circuit protection of the outputs

1.2.2.3 Details on Pin 11 (Start Signal)

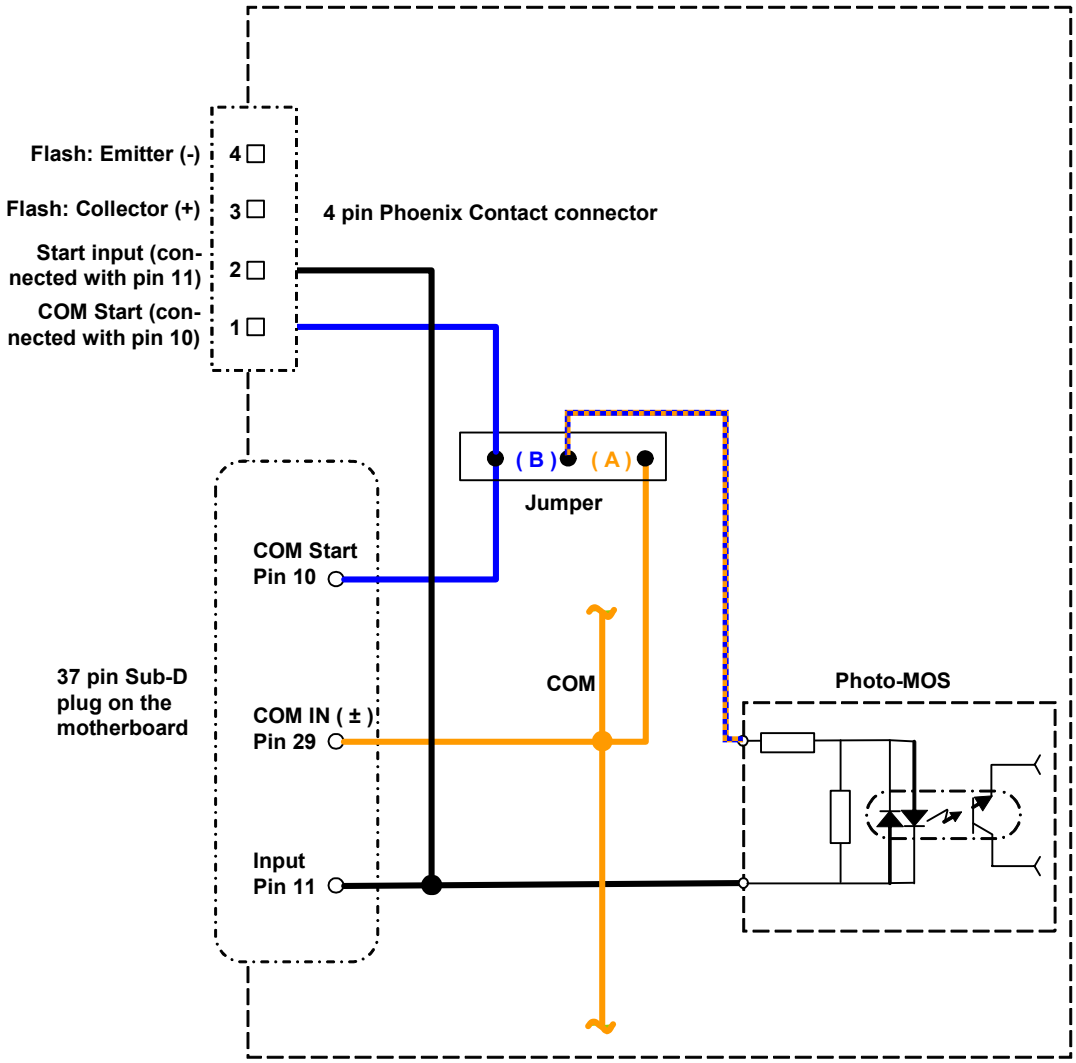
By default, the output signal at pin 11 (start) uses pin 29 as a common ground with input signals at pins 12 to 14 and pins 30 to 30, see figure. By using a jumper you can separate the ground for pin 11 from the common ground at pin 29 and move it to a separate contact at pin 10.

There are two reasons to do this:

1. You can use a sensor with an NPN output to trigger the start signal. At the same time, you can use the other pins to connect a PLC with PNP outputs.
2. You can connect the start signal wire directly to the Phoenix connector without having to change the Sub-D plug.

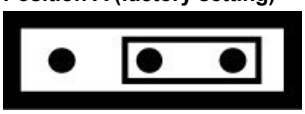
◆NOTE

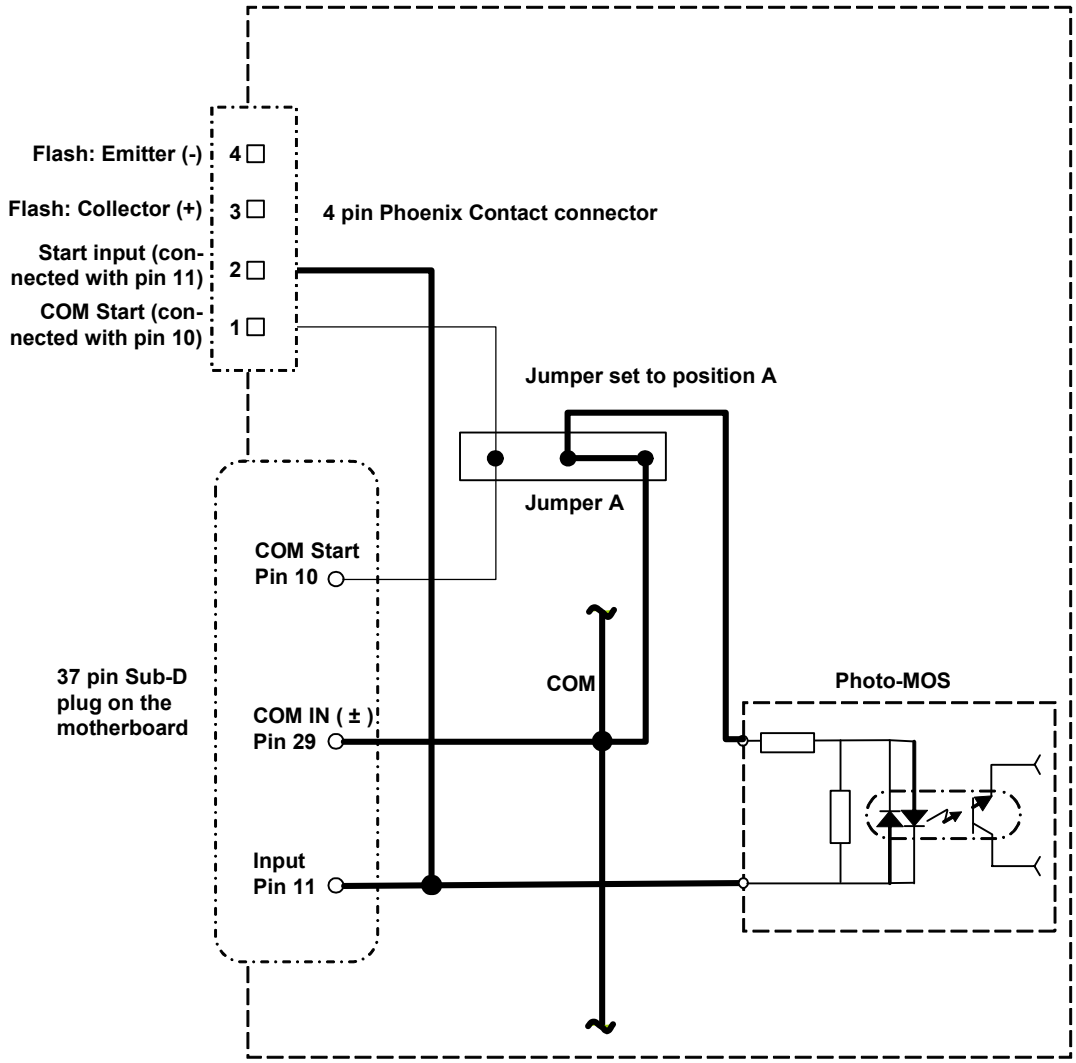
- **The signal pin 2 of the 4-pin Phoenix Contact plug is hardwired with pin 11 of the 37-pin Sub-D plug of the board.**
- **The ground terminal of the 4-pin Phoenix Contact plug is hardwired with pin 10 of the 37-pin Sub-D plug of the board.**



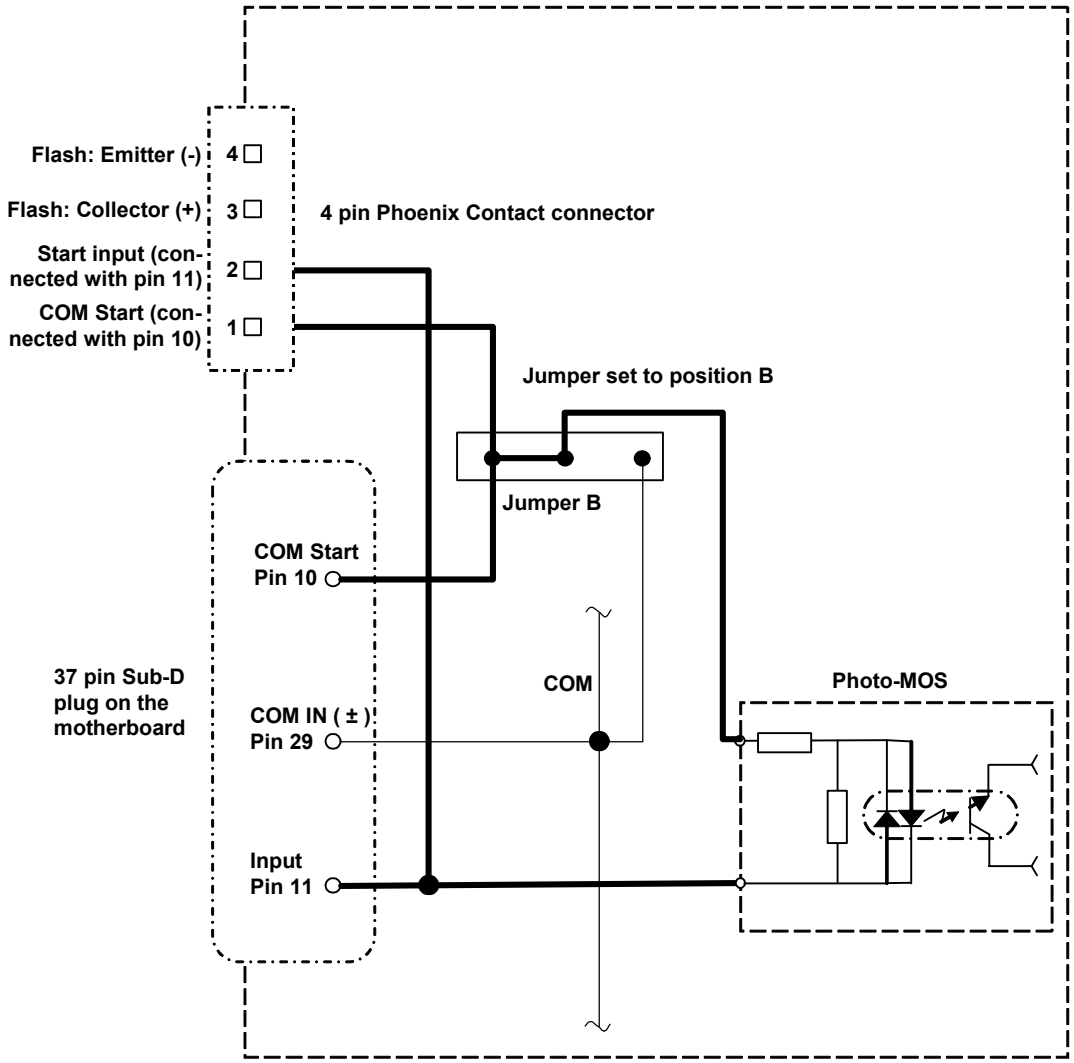
Wiring diagram for using the jumper on ANPC 850V3D

Using the jumper

Jumper position	Functionality
Position A (factory setting) 	The start signal must be connected to pin 37 of the 37-pin Sub-D plug of the board. • The start signal at pin 11 of the 37-pin Sub-D plug uses COM pin 29 as a common COM wire together with pins 12 to 14 and 30 to 33. • The contacts pin 10 of the 37-pin Sub-D plug and pin 1 of the 4-pin Phoenix Contact plug have no functionality.
Position B 	• Pin 11 of the 37-pin Sub-D plug now has a separate COM wire at pin 10. • In addition, you can transmit the start signal separately at the 4-pin Phoenix Contact connector and the pins 1 and 2.



Wiring diagram showing the factory setting (jumper at position A)



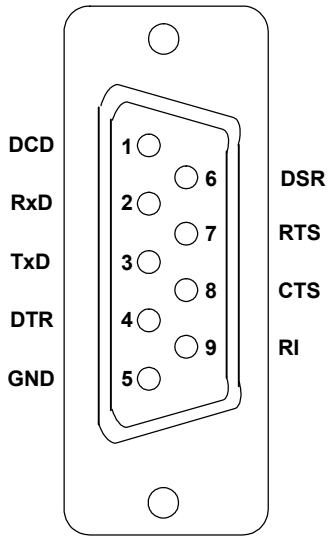
Wiring diagram when jumper is at position B

1.2.3 Serial Interface

Vision P400 supports serial I/O communication via RS232.

1.2.3.1 Pin Assignment and Pin Connection

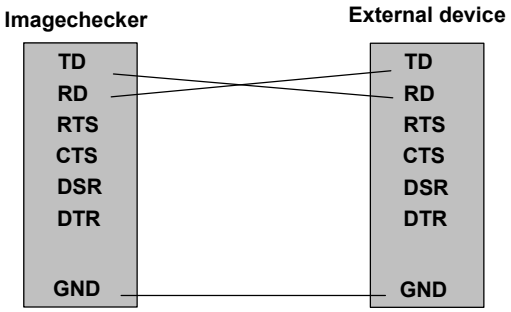
The following sections explain how to connect the Imagechecker correctly to an external device depending on the settings of the "Handshake" parameter. The Imagechecker has a 9-pin male connector.



Pin assignment of the 9-pin male RS232 port on the Imagechecker

Parameter "Flow Control" = None

The figure below illustrates how to use a Sub-D plug to make a simple three-wire connection between the Imagechecker and an external device.



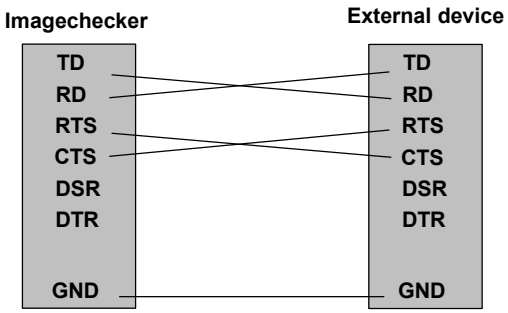
Most simple connection via the serial interface

Parameter "Flow Control" = Xon / Xoff

To improve the data transfer, a three-wire-connection is often used together with the XON/XOFF protocol. When the receiver is ready to accept data, it sends the signal XON (this usually corresponds to code DC1 = ASCII code 11h). As long as the receiver is still busy processing data, it sends the signal XOFF (code DC3 = ASCII code 13h). Please note that this connection method only works when you set the parameter "Flow Control" to "Xon / Xoff" and when the external device actively supports the XON/XOFF protocol.

Parameter "Flow Control" = Hardware

Another way to improve the data transfer is to set the devices to perform a hardware handshake. This does not only mean a connection of data lines (depending on the configuration the lines are crossed or not), but also to connect the pins RTS and CTS. CTS (CLEAR TO SEND) is used by the external device to indicate that it is ready to receive data. Usually the external device sends this signal as a reaction to receiving the signal REQUEST TO SEND from the P400. Data transfer only takes place when both RTS and CTS are active (low).



Connection with handshake

◆**NOTE**

The hardware handshake uses the timeouts you set in the Vision P400 settings on the "Timeouts property page. If you are using MEWTOCOL as the communication protocol, the Handshake timeout and the MEWTOCOL timeout are added together.

1.2.4 Operating System

The operating system is Windows XP Embedded. The C drive with the pre-installed operating system and the Vision P400 software is on the CompactFlash Card (4GB). The D drive is the hard disk with a maximal storage capacity of 80GB.

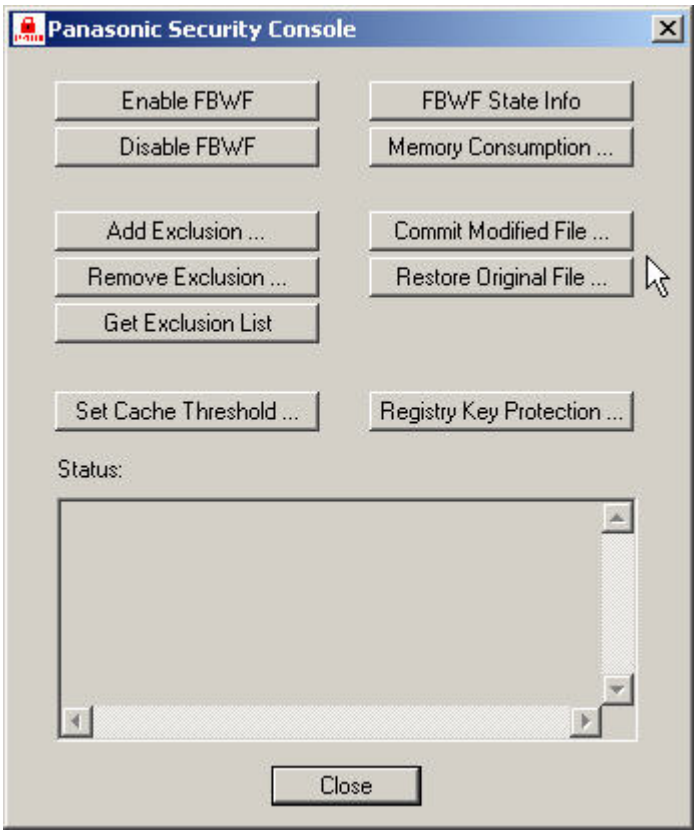
The following languages are installed (in alphabetical order):

- German
- English
- French
- Italian
- Dutch
- Swedish
- Spanish
- Czech
- Simplified Chinese

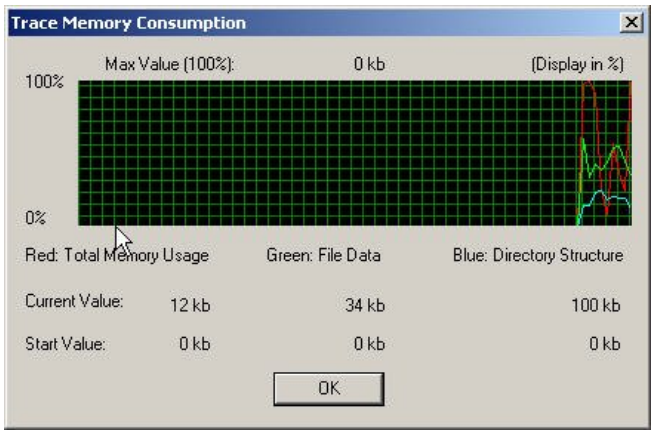
Menus and dialog windows will be displayed in the language you have selected.

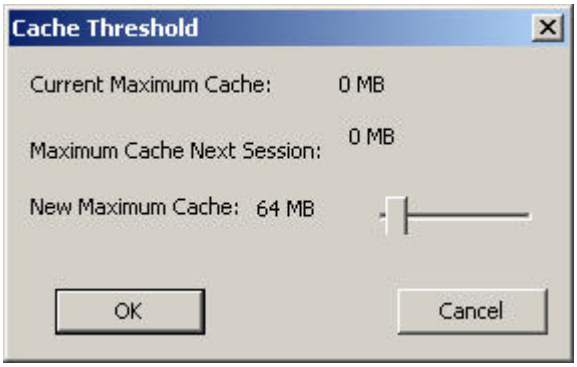
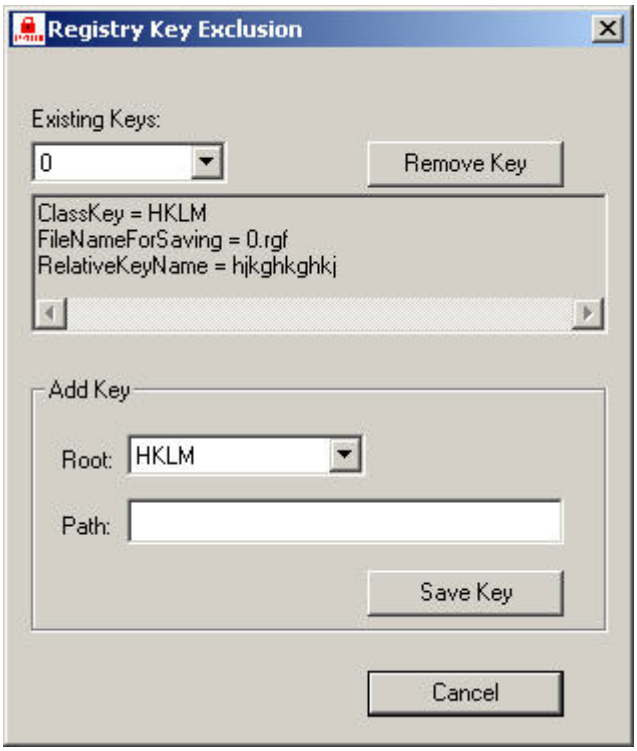
1.2.4.1 Changing the Write Protection with Panasonic Security Console

Use the tool Security Console if you want to save settings in the registry file permanently or if you wish to switch the write protection on or off.



Security Console start-up screen

Button	Available functionality
Enable FBWF	Switches on the "File-Based Write Filter" (FBWF) (see page 21). This activates the write protection of the operating system. You need to restart the system to apply the change. **Please note: By default the write protection is OFF.**
Disable FBWF	Switches off the FBWF. This deactivates the write protection of the operating system. You need to restart the system to apply the change.
FBWF State Info	Informs you about the current state of the system, e.g. whether the FBWF is switched on or off.
Memory Consumption	Allows you to track the RAM memory consumption of the FBWF. All system changes are written to the cache (see below) for temporary storage. When data is written continuously to a write-protected area, you may run out of memory. In this case it is necessary to transfer data to an area that is not write-protected, e.g. drive D:. Use the button [Memory Consumption] to see how much memory has been used so far: 
Add Exclusion **Remove Exclusion**	Use this button to define which files and/or folders should be excluded from the write protection. You can add or remove exclusions. You can select whether you want to exclude individual files are complete folders from the write protection.
Get Exclusion List	This function gives you an overview which files and folders have been excluded from the write protection in the current session and which changes have already been made for the next session.
Commit Modified File	Use this button to transfer changed files into the protected area without having to restart the system.
Restore Original File	Use this button to reset a changed file to its original state without having to restart the system.
Set Cache Threshold	Use this button to access the dialog box where you can set how much cache memory should be available to save system changes. The cache memory is located in the system RAM and cannot be used for other software applications. The default setting is 64MB, which should be sufficient for most applications.

<table>
<tr><th>Button</th><th>Available functionality</th></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>Registry Key Protection</td><td>Not only can you exclude files and folders from the write protection, but also complete paths in the registry file. This is necessary if you want to be able to save system changes permanently. Use this function to modify the registry settings individually to suit your requirements:
 

The items excluded from the write protection are also managed by the registry file. To exclude a path from the write protection, set the root and path under "Root" and "Path" and select the button [Save Key]. With [Remove Key] you remove the selected exclusion.</td></tr>
</table>

1.2.4.2 Write Protection

The operating system Windows XP Embedded uses a sophisticated write protection to prevent users from inadvertently changing the system settings.

File-Based Write Filter (FBWF)

Windows XP Embedded supports the "File-Based Write Filter" (FBWF). With FBWF it is possible to protect the complete operating system against changes so that it cannot be corrupted by accident. All changes to files or to the settings of the operating system are saved temporarily in the RAM and will be lost when you switch off the system.

However, it is possible to exclude parts of the operating system from the write protection. This means you can give write access to individual files or folders.

The following Imagechecker folders grant the user write access by default:

- C:\Temp
- D: drive (to save permanent data)
- C:\SysFiles
- Some log and temporary files of the operating system

◆**NOTE**

- **The C: drive with the pre-installed operating system and the Vision P400 software is on the CompactFlash Card (2GB).**
- **The D: drive is the hard disk with a maximal storage capacity of 40GB.**

Registry Filter

Windows XP Embedded supports the "Registry Filter". Together with the file-based write filter the registry filter allows you to save changes to individual registry keys permanently. This means you can save Vision P400 settings stored in the registry file permanently.

◆**NOTE**

- **The parts of the registry file used for storing the Vision P400 settings are excluded from the write protection.**
- **Use the tool Security Console (see page 19) if you want to save settings in the registry file permanently or if you wish to switch the write protection on or off.**

1.2.5 Time Response of the System

The operating system is not truly a real-time operating system. Therefore, other programs running simultaneously with Vision P400 on the Imagechecker and mouse/keyboard actions may influence the time response of your image processing application.

As a result, please make sure that the image processing during operation in run mode is not affected by such actions. We recommend unplugging the mouse and the keyboard when in run mode. This will help prevent unauthorized or accidental interference with the process.

The system performance also depends on the selected display. Updating parameters such as camera image, checker shape, spreadsheet etc. needs time and may effect the overall performance of the system. Updating all display parameters is possible when there is

sufficient time available for the testing of a particular object. In addition, it takes processing time to compress the camera images.

◆NOTE

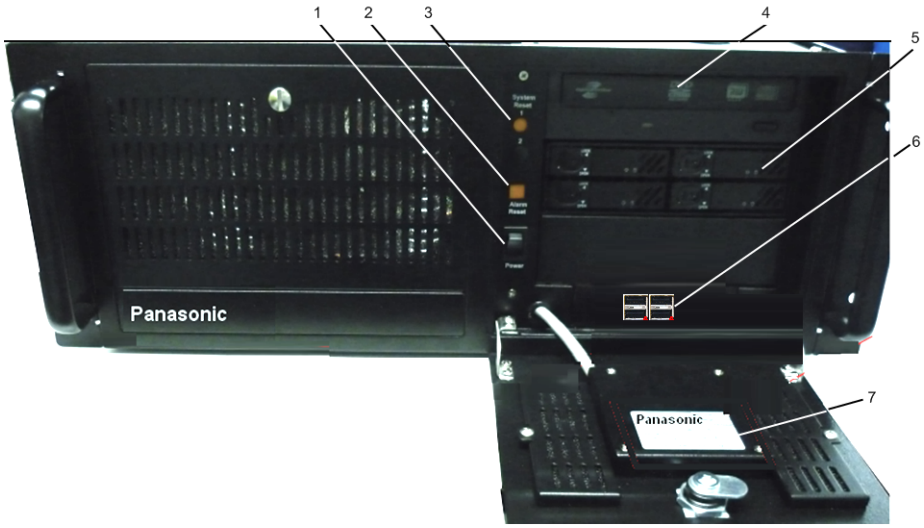
- **To ensure maximal system performance for the image processing task, all screensaver options are deactivated when the software is started. They will be reactivated automatically when you exit Vision P400.**
- **Please note that the power scheme options in the control panel may also have a negative effect on the time response. This is why the option "Always On" is selected. The options "Switch off monitor", "Switch off hard disk", "Standby" and "Hibernation" are deactivated and should be set to "Never".**

1.2.6 Description of the Casing

Front view of the P400XD with front cover closed

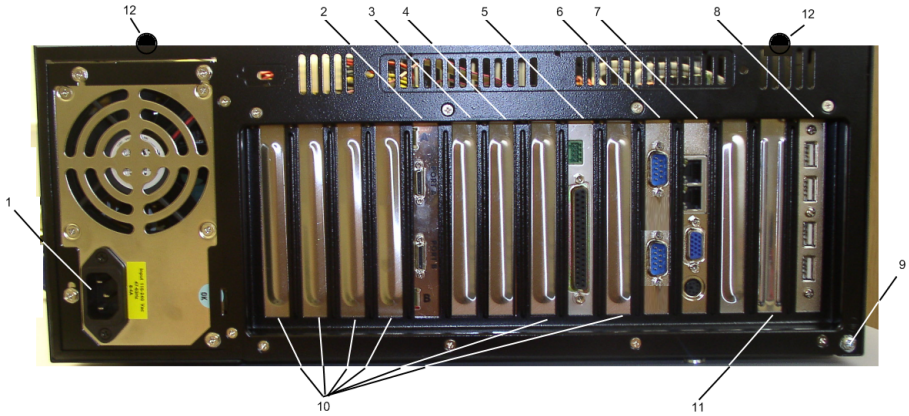
1	Screw for opening the filter lid
2	Lock for opening the filter lid The key is enclosed in the packaging.
3	Status LEDs (green = OK, red = malfunction): • PWR = Power • HDD = Hard disk • TMP = Temperature inside the casing • FAN = Fan • +3.3V +5V +12V -5V -12V = Status of the PC power supplies

When you open the front cover of the P400XD, you see the ON/OFF button, the reset button, the DVD-RW drive, the removable rack for the CF card as well as the USB ports. Inside the panel door you find a sticker with the Vision P400 PC Imagechecker number and the serial number:



Front view of the P400XD with front cover opened

1	Button to: Switch on (press lightly once), Shut down (press lightly once) and Switch off (press and hold until the device switches off)
2	"Alarm Reset" for resetting errors indicated by the LEDs.
3	CPU hardware reset button
4	DVD-RW drive
5	Removable rack for CF card and hard disk CF card is installed top left, the hard disk top right. The two lower removable racks are not in use. The removable racks can be secured with a lock. The key is enclosed in the packaging.
6	4x USB port
7	Label with product number and serial number



Back view of the P400XD

1	Power connection
2	Frame grabber with two camera connectors. Connect camera 1 to the upper connector and camera 2 (if needed) to the lower connector.
3	Optionally, you can install a second frame grabber here. Connect camera 3 to the upper connector and camera 4 (if needed) to the lower connector.
4	Optionally, you can install a third frame grabber here. Connect camera 5 to the upper connector and camera 6 (if needed) to the lower connector.
5	Digital inputs/outputs
6	2 x serial interfaces (top COM1, bottom COM2)
7	Slot for CPU board, network connectors, VGA monitor and PS2 keyboard/mouse via Y cable
8	4x USB port
9	Connector for grounding
10	Unoccupied PCI slots
11	Unoccupied PCIe-x16 slot
12	Knurled-head screw to remove the cover of the casing

1.2.7 Important Information

Please read the following information **before** you begin with the installation or operation!

◆NOTE

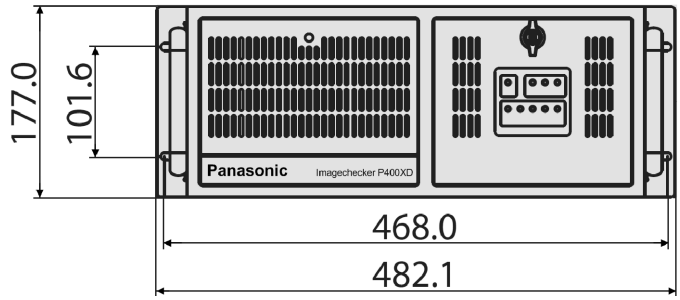
- **Use only products (cameras and camera cables) offered by Panasonic for specific use with the Imagechecker. The use of any other products will negate the warranty for the entire system since third-party components can damage the Imagechecker. In this case, Panasonic will not assume liability for the proper functioning of the Imagechecker.**
- **Under no circumstance should you ever disassemble the Imagechecker or change the system's factory settings unless you are specifically asked to do so in this manual. Any tampering will negate the warranty for the entire**

system since such changes may damage the Imagechecker. In this case, Panasonic will not assume liability for the proper functioning of the Imagechecker.

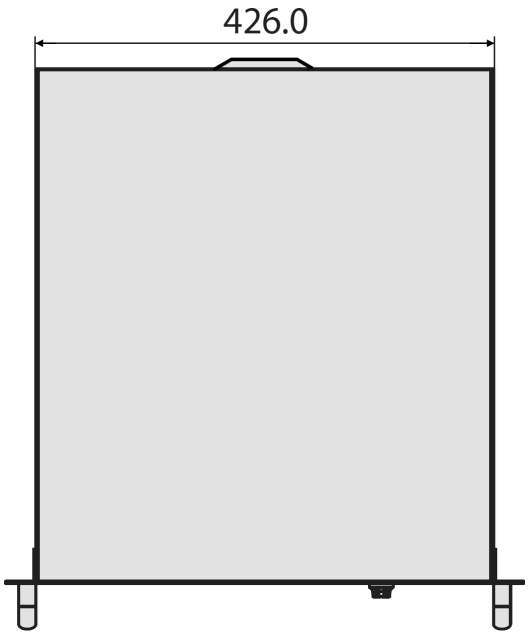
- **The Imagechecker is a precision device and should under no circumstance be exposed to shocks or vibrations.**
- **The Imagechecker is neither waterproof, dustproof nor rustproof. Consequently, it is absolutely necessary to install the Imagechecker in a dry, clean environment.**
- **Protect the Imagechecker from exposure to direct sunlight and explosive or corrosive gases.**
- **Disconnect the power supply before connecting or disconnecting any connectors to or from the Imagechecker.**
- **Never apply force to any Imagechecker connectors or cables. Do not bend the cables. The connections should never be unplugged by pulling on the cable. Always hold the connector by the plug when unplugging any component from the Imagechecker.**
- **NEVER touch an exposed connector contact after unplugging a connector from the Imagechecker, and ensure that no fluids/chemicals come into contact with the contacts.**
- **Leave ample space around the Imagechecker so that heat generated during operation can be dissipated by the ventilators.**
- **Please ensure that the ventilators function properly.**
- **Guard against unintended data loss by maintaining data protection in a safe location.**
- **Ensure that the power supply is disconnected while you work on the equipment.**
- **Avoid discharges of static energy.**
- **Use the components only within the humidity and temperature ranges specified.**
- **Take care to keep dust accumulation to a minimum since dust may impair the functioning of the components.**
- **Do NOT clean the components with solvents or aggressive cleansers. These substances can destroy equipment parts and damage the paint.**

1.2.8 Dimensions

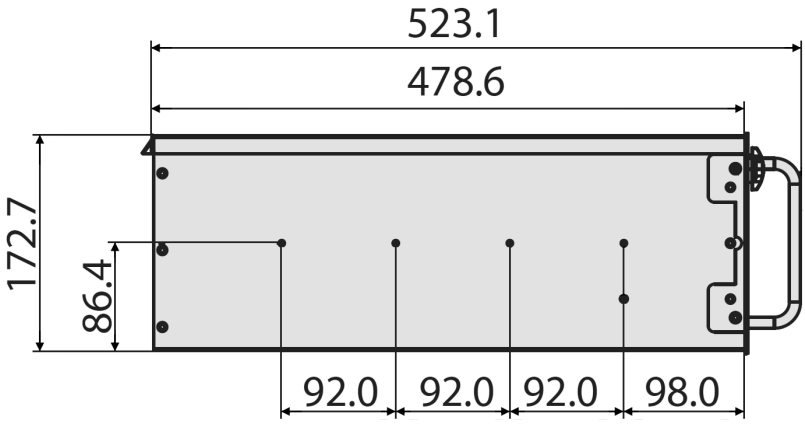
All dimensions are in millimeters.



Front view



Top view



Side view

You can fasten rails at the side so that you can push it into a switching cabinet. You can obtain suitable rails from the manufacturer of your switching cabinet.

◆**NOTE**

Please take care to leave enough space between ventilations slots and mounting area (approx. 20mm) to prevent the Imagechecker from overheating.

1.3 Frame Grabber

The frame grabber ANPCL 8021D is available for parallel image grabbing with two cameras with the Imagechecker P400XD.

The Imagechecker offers three PCIe slots for three frame grabbers. You can work with one camera or connect up to six cameras for parallel image grabbing. Use the table below to find out about possible combinations of frame grabber and cameras.

Frame grabber ANPCL 8021D with parallel grabbing

Camera ANPVC xxxD	Standard image format in pixel	Max. No. of cameras per frame grabber	Max. No. of cameras	Camera cable ANPVC xxxxx
ANPVC 1040	640 x 480	2	6	ANPVC 87103D (3m) ANPVC 87103RD (3m, for pick-and-place applications) ANPVC 87105D (5m) ANPVC 87105RD (5m, for pick-and-place applications) ANPVC 87110D (10m) ANPVC 87110RD (10m, for pick-and-place applications) ANPVC 87115D (15m not suitable for ANPVC 1510D and ANPVC 1021) ANPVC 87115RD (15m, for pick-and-place applications, not suitable for ANPVC 1510D and ANPVC 1021)
ANPVC 1210	1600 x 1200	2	6	
ANPVC 1021	640 x 480	2	6	
ANPVC 1510D	2448 x 2050	2	6	

◆NOTE

- **You can combine the different camera types, for example by connecting camera ANPVC 1040 to connector 1 and camera ANPVC 1021 to connector 2. In addition, you can make individual camera settings.**
- **When the Imagechecker receives the start signal, the images from all connected cameras are grabbed.**

1.3.1 Triggering the Camera and Image Grabbing

The Imagechecker P400MD comes installed with a frame grabber installed in the PCIe slot. You can connect up to two digital cameras (Camera Link, PoCL). With the P400XD, you can install up to three frame grabbers and connect up to six cameras. After the start signal the images of the cameras of the frame grabber are transferred to the Imagechecker memory in parallel operation.

As it is possible to combine different camera types with different grabbing times in an application, the duration of the image grabbing depends on the camera which takes longer to

grab and transfer the image. The system uses the REnd signal to indicate the process "image grabbing" at the interfaces.

For example, if you are using the cameras ANPVC 1040 and ANPVC 1210, the image grabbing time is about 34ms (with a shutter speed of 1/10000 for both cameras), independent of the fact that camera ANPVC 1040 only needs 8ms for image grabbing.

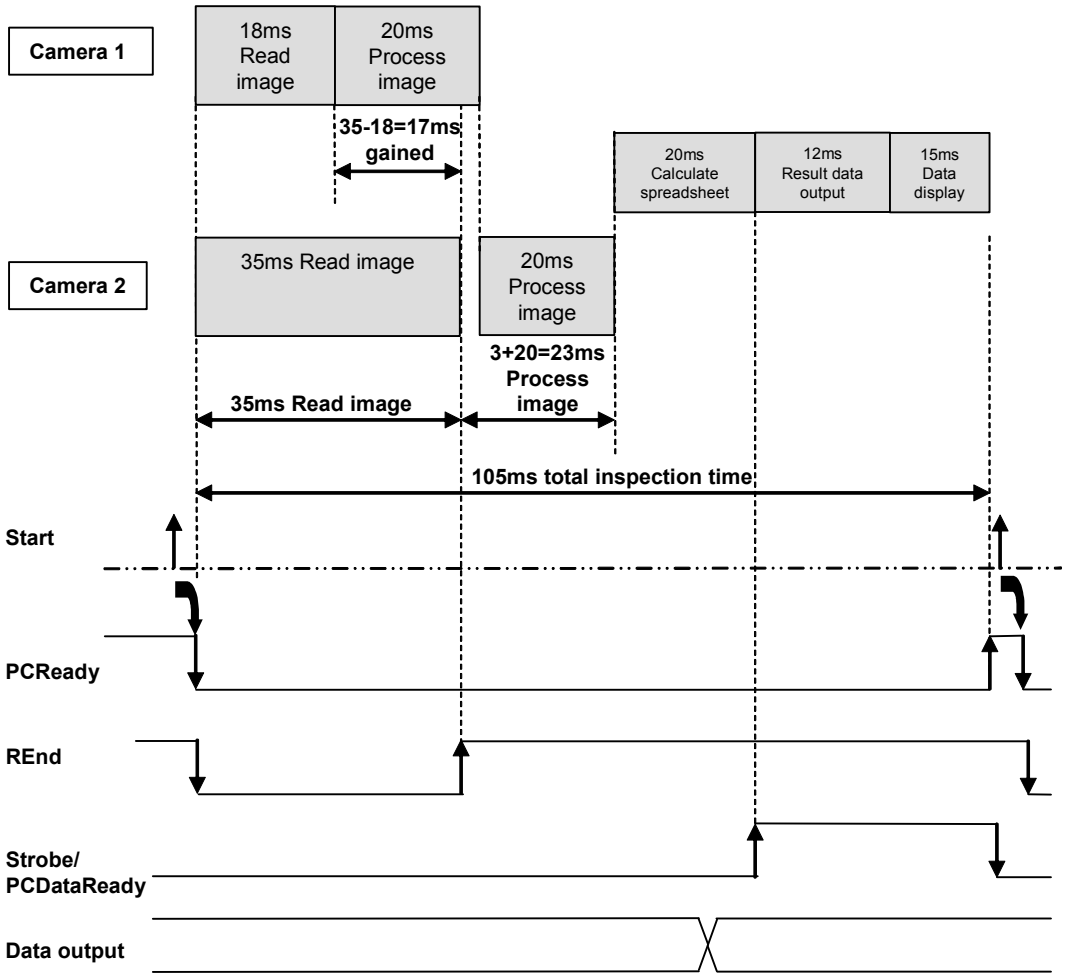
The transfer of images from the cameras to the memory of the Imagechecker is controlled and executed by the frame grabber and does not have an effect on the Imagechecker's CPU. In the case of differing image transfer times this means that the image of the faster camera can already be processed, while the image of the slower camera is still being transferred.

The following two application examples work with 2 cameras. The same goes for applications with more than 2 cameras, which is possible if you use P400XD.

Using different camera types

Camera 1: ANPVC 1021 with a shutter speed of 1/1000s

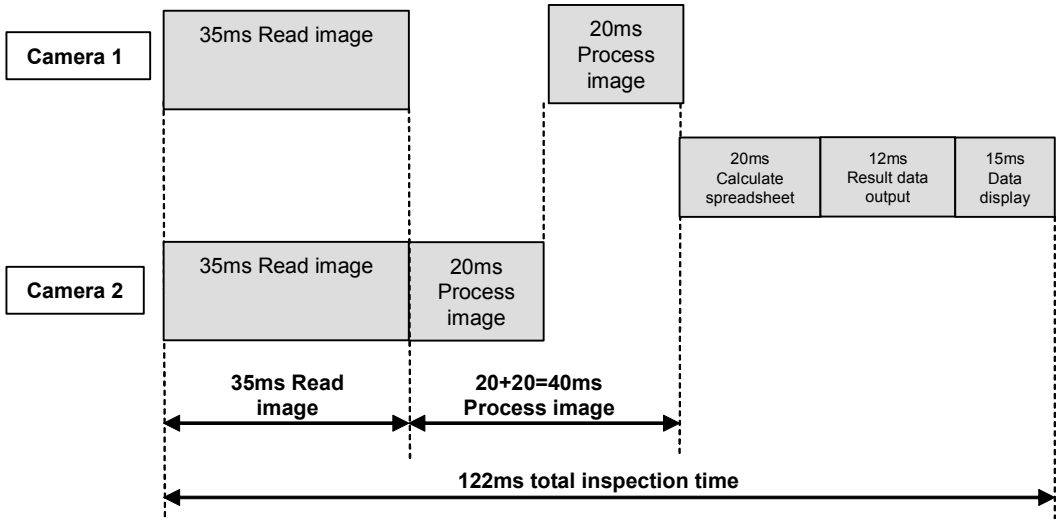
Camera 2: ANPVC 1210 with a shutter speed of 1/1000s



Time diagram when triggering cameras of differing types

Using the same camera type

Camera 1 and 2: ANPVC 1210 with a shutter speed of 1/1000s



Time diagram when triggering cameras of the same type

1.3.1.1 Displaying the Camera Image in Parallel Operation

The screen always displays the image recorded by the camera selected. Vision P400 updates the display when the images have been grabbed from the cameras, the images have been processed by the image-processing algorithms, the spreadsheet has been updated, and the results have been output to the interfaces.

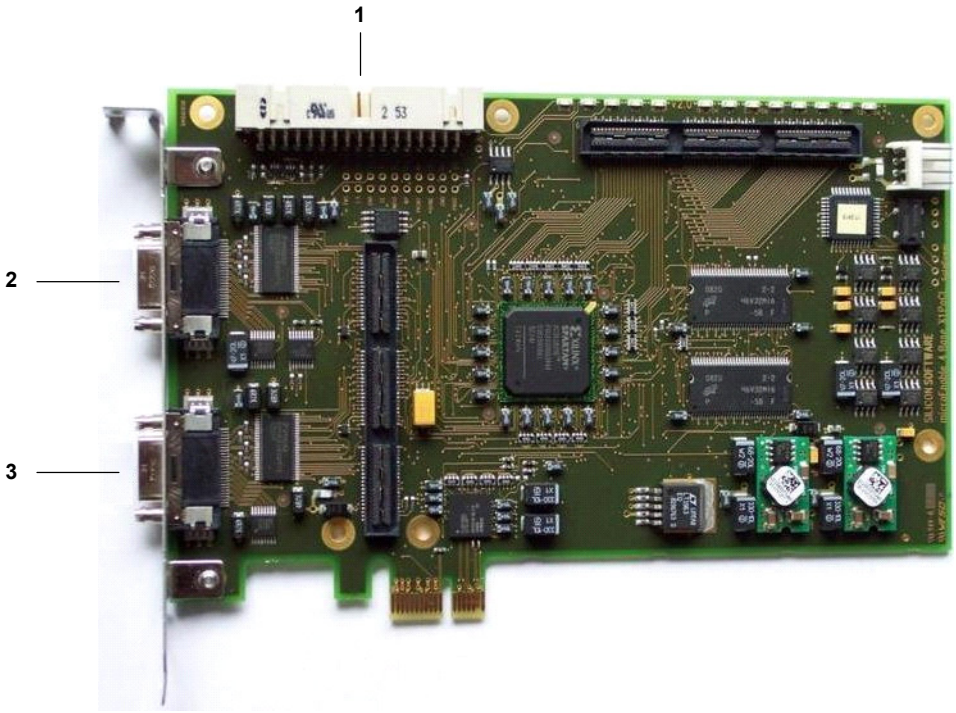
When you are in live image mode, the image display of the currently selected camera is updated.

1.3.1.2 Camera Connection to the Frame Grabber

You can connect up to 2 cameras to the frame grabber ANPCL 8021D. You can connect the cameras in any order, either only at connector 1 or connector 2 or at both connectors. In addition, you can mix cameras of different types with the Imagechecker.

◆NOTE

- **The camera connector type is Mini Camera Link SDR.**
- **You can only connect the PoCL cables (Power over Camera Link) a cameras supplied by Panasonic Electric Works for the Imagechecker.**



Camera connection to the ANPC 8021D

1	Connection to ANPC 850V3 output flash signal
2	Connection for camera 1
3	Connection for camera 2

1.3.1.3 Specifications

ANPCL 8021D (2 cameras parallel)	
Bus interface	PCIe x 1, DMA image transmission
Transmission band width	maximal 203 MBytes/second
Synchronization	For flash and camera
Camera Types	2 x BASE or 1 x MEDIUM Gray value and color, line and matrix cameras
Maximal pixel rate	85MHz
Onboard image buffer	128MBytes SDRAM

1.4 Working with a Flash

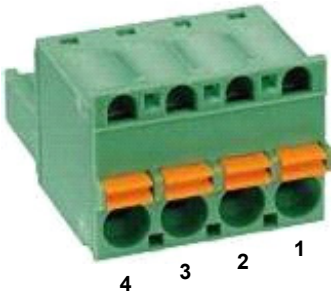
Depending on the digital I/O board installed, the flash signal is output via the parallel outputs or via a special connector (optional). There are different possibilities of connecting and controlling a flash, depending on whether you have installed a digital I/O board or not. This table provides an overview of the machine vision systems P400, P400MA, and P400MD, as well as P400S:

Device	Parallel I/O board	Connecting a flash
P400	---	at the 15-pin sub-D plug connector
P400	ANPC 850V3D	at the 4-pin plug (see page 33)
P400MA/MD/XD	ANPC 850V3D	at the 4-pin plug (see page 33)
P400MA	---	at the 15-pin sub-D plug connector (ANPC 8101D, optional)

1.4.1 Imagechecker with ANPC 850V3D

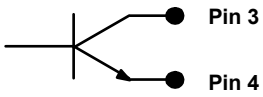
Depending on the I/O board installed, the flash signal is output via the digital outputs or via a special connector. To output the flash signal via the ANPC 850V3D digital I/O board, make sure to connect the Flash Controller to the 4 pin Phoenix Contact plug as follows:

Slot bracket (top view)



4-pin Phoenix Contact plug

Pin	Signal
1	Optional start signal (see page 7)
2	Individual ground (GND) for start signal
3	Flash (+) (collector)
4	COM (-) (emitter)



Circuit diagram

Plug specifications

Maximum current	50mA
Variable current	5,0V up to 24,0V
Maximum reverse voltage	7,0V

◆NOTE

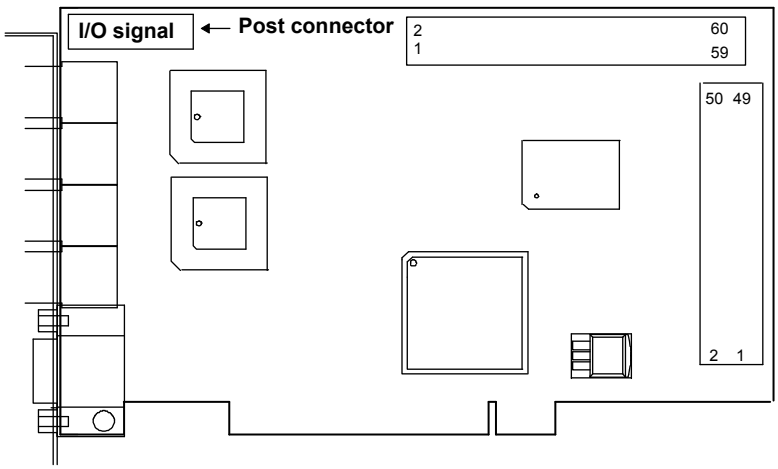
- **When there is a digital I/O board installed, please note the pin assignment for the other outputs (see page 7).**
- **Please refer to the notes on connecting peripheral devices (see page 10).**

1.4.2 Imagechecker without Digital I/O Board

If you have no digital I/O board installed, you can connect a flash to the output signal I/O of the frame grabber by proceeding as follows:

◆Procedure

1. **Plug the ICH P400 Flashtrigger Unit in the 16-pin post connector of the frame grabber**

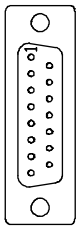


This way you activate the slot for the Flashlight Controller at the back of the Imagechecker.

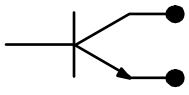
2. **Connect the Flashtrigger Unit to slot 2 of the PC casing**

3. Plug the Flashlight Controller in the 15-pin slot of the ICH P400 Flashtrigger Unit at the back of the Imagechecker

The flashtrigger signal is taken from the 15-pin Sub-D plug at pins 10 and 11. The output transistor is of the type NPN. Pin 10 works as the collector and pin 11 as the emitter of the transistor.



Pin	Signal
1	NC
2	NC
...	...
10	COM (+) (collector)
11	SG (-) (emitter)
12	NC
13	NC
14	NC
15	NC



Pin 10 (+) 5 - 24V DC (max. 30mA)

Pin 11 GND

◆NOTE

The frame grabber only sends a flash trigger signal if the option "Send Flash Signal" is activated in the frame grabber's property page.

1.5 Software for Industrial Image Processing

The Vision P400 software version 5.0 is multi-lingual. It supports English, German, and French.

The following camera types are supported:

- ANPC 831D
- ANPC 834D
- ANPC 836D
- ANPC 837D

If you wish to use the old camera types (ANPC 830D, ANPC 832D, ANPC 833D), please contact your local Panasonic Electric Works branch.

The installation procedure is described in detail elsewhere (see page 62).

◆**NOTE**

To upgrade version 3.x or older versions to version 5.0, you need to buy a new license file!

1.5.1 Vision P400 Demo Version

For testing and demonstration purposes, there is a demo version available on the USB flash drive. You can download the latest demo version from our internet page at http://www.panasonic-electric-works.com.

The demo version lets you simulate different applications of Vision P400. With the help of sample bitmaps you can test the functions and features of Vision P400. However, for reasons of software protection, it is not possible to use the demo version with a frame grabber. Every 5 minutes a message is displayed reminding you that the current version of Vision P400 is the demo version.

1.5.2 Software Protection

Different versions of the Vision P400 software use different type of software protection.

Version number	Software protection
From version 5.0	From version 5.0 onwards, the software Vision P400 is protected by a USB hardware dongle, see picture. You cannot start the software without the dongle. If you disconnect the dongle when the software is running, the software stops after about 10 seconds and has to be restarted. When you update the software, you also need to update the contents of the dongle. In this case, please contact your local Panasonic branch.
Version 1.4x to version 4.3x	For older versions ((version 1.4x to version 4.3x) the software is protected by a license file. Using hardware information, Panasonic has created the license file “license.dat" in the installation subfolder \license. This file ensures that you can run the software only on the Imagechecker that has been delivered by Panasonic and not on any other PC. This does not affect the demo version of Vision P400, which can be run and installed on any PC. A backup copy of the license file will be stored with Panasonic as well as your local PEW branches. In addition, a time-limited license is also available for the current month at Panasonic and the local PEW branches in case you need to compensate the loss of a license file temporarily.

USB hardware dongle

Chapter 2

Camera Specifications

2.1 Introduction

This chapter deals with the three different types of cameras available for the Imagechecker. You will find information on how to connect a camera to the Imagechecker as well as a detailed description of each camera type.

You will find the following information:

- available camera modes (progressive scan, partial scan)
- how to use a flash
- camera hardware data (dimensions)
- tables with specifications.

Please read the information on the three different camera types and their configuration carefully. The right camera choice optimizes results in processing speed and image resolution.

2.1.1 Camera Types

The three camera types listed below are available. Select the type most suitable for your application.

	2-mega-pixel digital camera (ANPVC 1210)	Quad-speed digital camera (ANPVC 1040)	Ultra compact double speed digital camera (ANPVC 1021)
No. of pixels	2 million pixels	300000 pixels	300000 pixels
Image transfer time	Ca. 34ms	Ca. 9ms	Ca. 17ms
Dimensions (width x height x depth)	29 x 29 x 58mm	29 x 29 x 58mm	12 x 13 x 48mm
CCD size	1/1.8 inch	1/3 Inch	1/3 Inch
Pixel size	4.4 x 4.4μm	7.4 x 7.4μm	7.4 x 7.4μm

2.1.2 Connecting Cameras to the Imagechecker

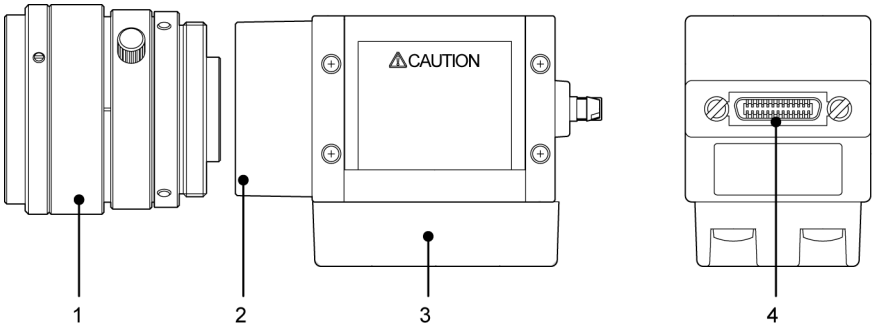
To hook up a camera, connect it to the frame grabber camera connector via the camera cable (PoCL) (see page 39). Please read the notes below prior to operating any of the cameras.

◆NOTE

- **Only use the cameras and camera cables recommended by Panasonic.**
- **For lens selection tables, please turn to our homepage: http://www.panasonic-electric-works.com/peweu/en/downloads/dd_x633_en_lens_selection_table.xls Select your camera type by clicking one of the tabs at the bottom.**
- **Do not twist or bend the camera cables forcibly or apply load to the connector joints.**

- **Do not touch the CCD element or the lens surface of the camera. Attach the lens cap to keep off dust when not in use.**
- **When removing the cable from the connector, be sure to hold it by its plug to prevent excess force applying to the cable.**
- **Do not touch the terminals inside the connector of cameras and camera cables and take care not to allow foreign objects to come into the connectors.**

2.2 2-Mega-Pixel Digital Camera (ANPVC 1210)



No.	Description	Additional information
1	Lens	Use the proper lens for each camera. Make sure to use only lenses with a resolution suitable for the camera. For more information please contact your local Panasonic branch. The following lenses are available: • ANPVL162, lens f=16 for 2-mega-pixel digital camera • ANPVL252, lens f=25 for 2-mega-pixel digital camera • ANPVL502, lens f=50 for 2-mega-pixel digital camera
2	Lens fixture	C-Mount lens
3	Mounting plate	Insulation type plate. The plate can be attached to four sides of the camera.
4	Cable connector	Connects the camera cable Mini CL SDR (PoCL).

◆**NOTE**

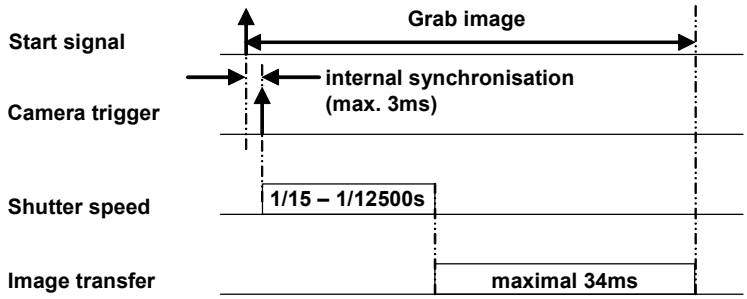
- **From now on, the 2-mega-pixel digital camera ANPVC1210 will be referred to as "2-mega camera".**
- **All camera settings like shutter speed, offset, gain, gamma, flash signal output etc. are made on the property page "Camera Settings" under** Camera → Properties **in the software.**

2.2.1 Time Diagram for Image Grabbing

The camera ANPVC 1210 is a black-and-white progressive scan CCD camera. The camera is suitable for grabbing images of moving objects. The image grabbing is triggered by a signal from the frame grabber. With a delay of only a few μs the sensor will be completely exposed according to the shutter speed (exposure time) you have set. Immediately afterwards the frame grabber starts the transfer of the digital image signal to the memory of the Imagechecker, where it will be processed and evaluated.

There are 30 different settings between 1/15 seconds and 1/12500 seconds available for the shutter speed. The transfer time for an image from the camera to the memory is about 34ms for a full image with 1200 lines. This means a maximum image rate of about 30 full images per second.

When you are using partial scan mode, only a reduced number of image lines will be transferred and this reduces the transfer time. This helps you to increase the image or inspection rate considerably. As the transfer time is not reduced proportionally to the number of image lines used, you need to determine the transfer time case by case.

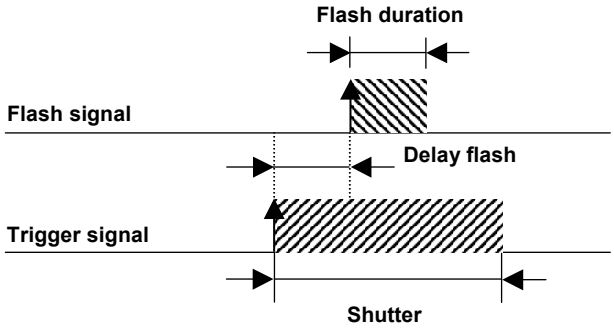


Time diagram for image grabbing

◆NOTE

Important: The duration of the image grabbing depends to a large degree on the image transfer time and the shutter speed:
image grabbing = shutter speed + image transfer time

All camera settings like shutter speed, offset, gain, gamma, flash signal output etc. are made on the property page "Camera Settings" under **Camera** → **Properties** in the software. For example, it is possible to set a delay between the camera trigger and the flash signal output so that you can set the optimum exposure time and duration for the image grabbing. This will help to reduce the interfering effect of other light sources and increase the service life of your flash. Make sure to activate the output of the flash signal with the option "Send flash signal".

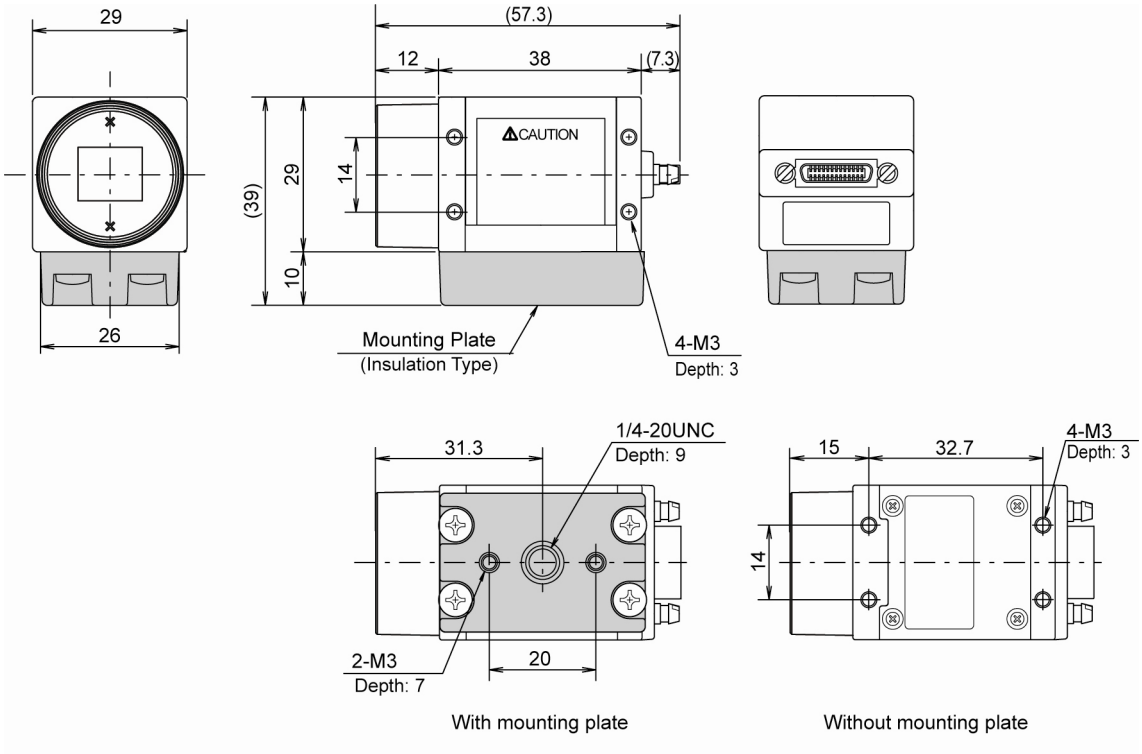


Example for flash signal and camera trigger

◆NOTE

Please also refer to the information supplied by the manufacturer of your flash!

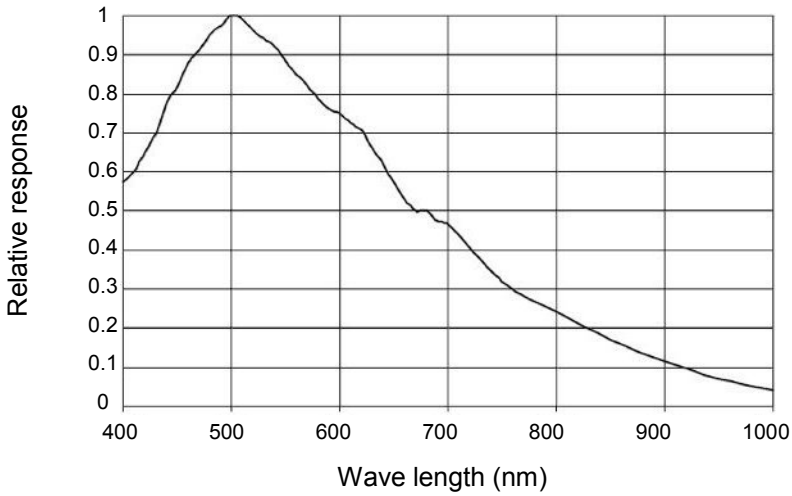
2.2.2 Dimensions



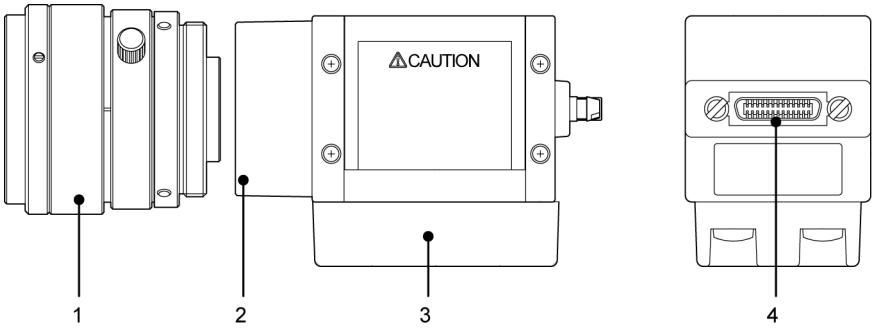
2.2.3 Specifications

Feature		Specification
Image sensor		Interline transfer method. 1/1.8" CCD, pixel size: 4.4μm x 4.4μm (tetragonal pixel)
No. of effective pixels		1628 x 1236 pixels (horizontal x vertical)
Grabbing mode		Progressive scan, full image mode/partial scan mode
Shutter speed		1/15 - 1/12500s
Synchronous method		Internal synchronous
Image output		Digital output, adapted for progressive mount, 30fps
Lens fixture		C-Mount lens
Rating	Power supply voltage	12V DC +/- 10%
	Power consumption	360mA maximum
Environmental requirements	Operational temperature	0°C to +40°C (avoid ice and condensation)
	Operating ambient humidity	35% to 85% RH (avoid ice and condensation at 25°C)
	Vibration resistance	10 to 55 Hz, 1 sweep per minute, amplitude 1mm, 30 minutes each in X/Y/Z direction
	Shock resistance	700 m/s^2, 3 times each in X/Y/Z direction
Weight		About 65 g (without lens)

2.2.4 Spectral Response



2.3 Quad-Speed Digital Camera ANPVC 1040



No.	Description	Additional information
1	Lens	Use the proper lens for each camera.
2	Lens fixture	C-Mount lens
3	Mounting plate	Insulation type plate. The plate can be attached to four sides of the camera.
4	Cable connector	Connects the camera cable Mini CL SDR (PoCL).

◆**NOTE**

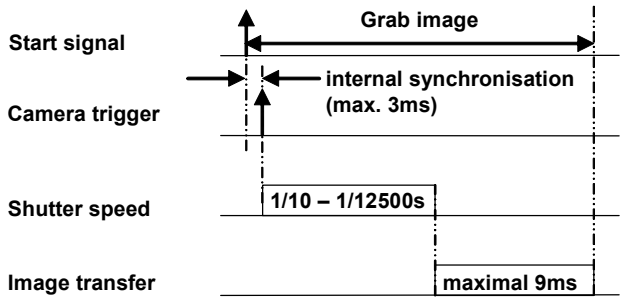
- **From now on, the quad-speed digital camera ANPVC1210 will be referred to as "quad-speed camera".**
- **All camera settings like shutter speed, offset, gain, gamma, flash signal output etc. are made on the property page "Camera Settings" under** Camera → Properties **in the software.**

2.3.1 Time Diagram for Image Grabbing

The camera ANPVC 1040 is a black-and-white progressive scan CCD camera. The camera is suitable for grabbing images of moving objects. The image grabbing is triggered by a signal from the frame grabber. With a delay of only a few μs the sensor will be completely exposed according to the shutter speed (exposure time) you have set. Immediately afterwards the frame grabber starts the transfer of the digital image signal to the memory of the Imagechecker, where it will be processed and evaluated.

There are 30 different settings between 1/10 seconds and 1/12500 seconds available for the shutter speed. The transfer time for an image from the camera to the memory is about 9ms for a full image with 480 lines. This means a maximum image rate of about 120 full images per second.

When you are using partial scan mode, only a reduced number of image lines will be transferred and this reduces the transfer time. This helps you to increase the image or inspection rate considerably. For example, if you only use two image lines and set a shutter speed of 100µs, image grabbing only takes 2ms. This enables an image rate of 500 images per second. As the transfer time is not reduced proportionally to the number of image lines used, you need to determine the transfer time case by case.

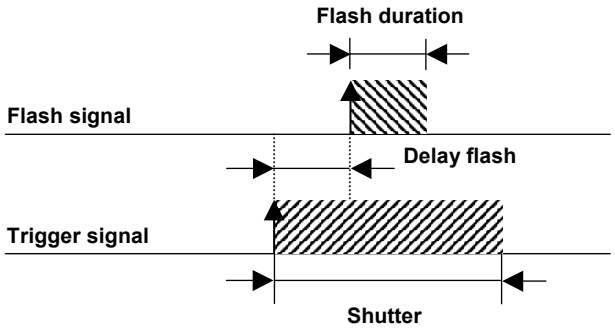


Time diagram for image grabbing

◆NOTE

Important: The duration of the image grabbing depends to a large degree on the image transfer time and the shutter speed:
image grabbing = shutter speed + image transfer time

All camera settings like shutter speed, offset, gain, gamma, flash signal output etc. are made on the property page "Camera Settings" under **Camera → Properties** in the software. For example, it is possible to set a delay between the camera trigger and the flash signal output so that you can set the optimum exposure time and duration for the image grabbing. This will help to reduce the interfering effect of other light sources and increase the service life of your flash. Make sure to activate the output of the flash signal with the option "Send flash signal".

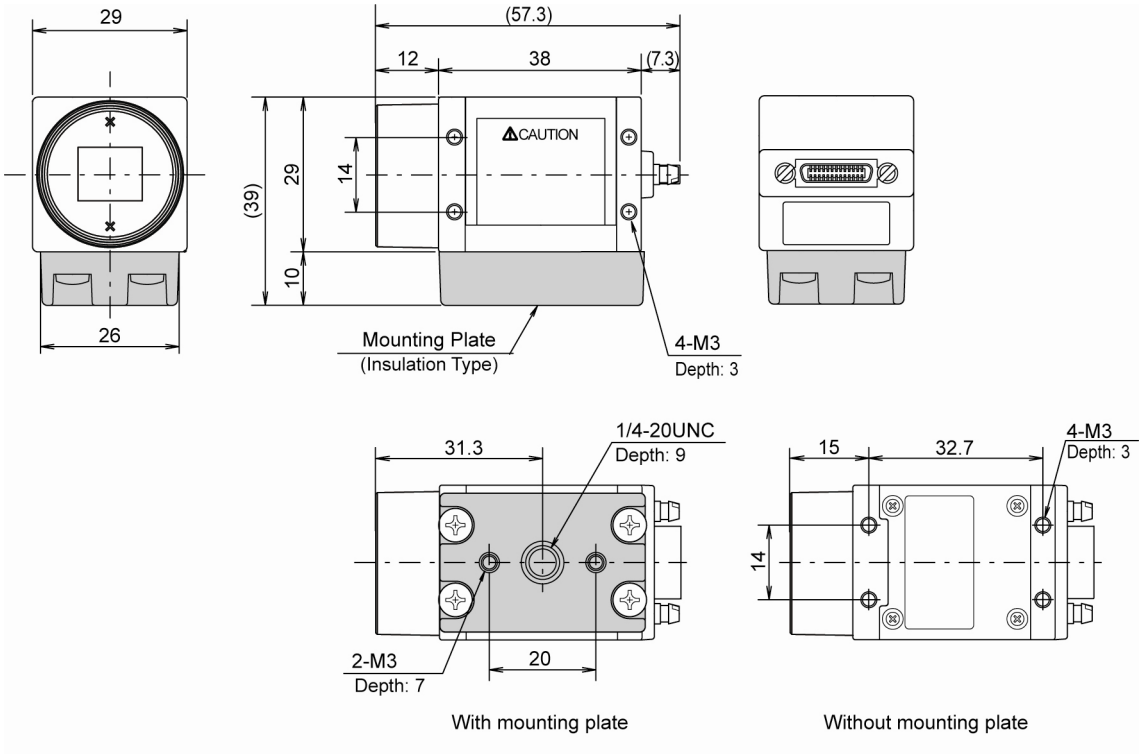


Example for flash signal and camera trigger

◆NOTE

Please also refer to the information supplied by the manufacturer of your flash!

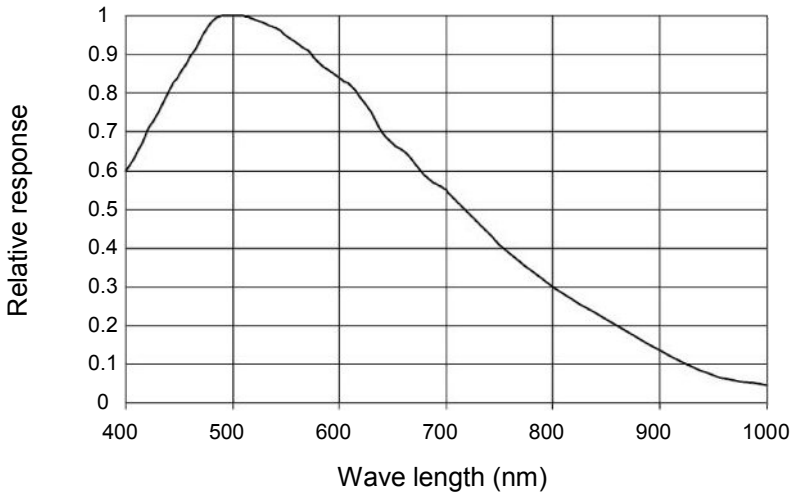
2.3.2 Dimensions



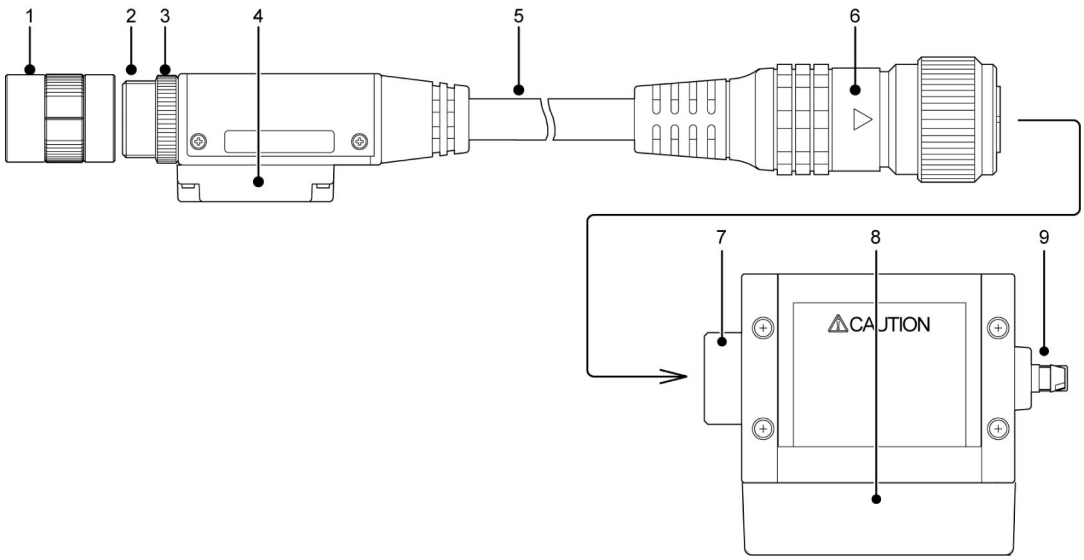
2.3.3 Specifications

Feature		Specification
Image sensor		Interline transfer method. 1/3" CCD, pixel size: 7.4μm x 7.4μm (tetragonal pixel)
No. of effective pixels		659 x 494 pixels (horizontal x vertical)
Grabbing mode		Progressive scan, full image mode/partial scan mode
Shutter speed		1/10s - 1/12500s
Lens fixture		C-Mount lens
Synchronous method		Internal synchronous
Image output		Digital output, adapted for progressive mount, 120fps
Rating	Power supply voltage	12V DC +/- 10%
	Power consumption	235mA maximum
Environmental requirements	Operational temperature	0°C to +45°C (avoid ice and condensation)
	Operating ambient humidity	35% to 85% RH (avoid ice and condensation at 25°C)
	Vibration resistance	10 to 55 Hz, 1 sweep per minute, amplitude 1mm, 30 minutes each in X/Y/Z direction
	Shock resistance	700 m/s^2, 3 times each in X/Y/Z direction
Weight		About 65g (without lens)

2.3.4 Spectral Response



2.4 Ultra Compact Double Speed Digital Camera ANPVC 1021



Camera head

No.	Description	Additional information
1	Lens	
2	Lens fixture	Special mount.
3	Lens securing ring	Use the ring to fix the lens.
4	Mounting plate	
5	Camera cable	Mounted directly to the camera. Cannot be removed.
6	CCU connector	Connects to the camera with the camera control unit.

Camera control unit

No.	Description	Additional information
7	Camera head connector	Connects the cable of the camera head.
8	Mounting plate	
9	Cable connector	Connects the camera cable Mini CL SDR (PoCL).

◆NOTE

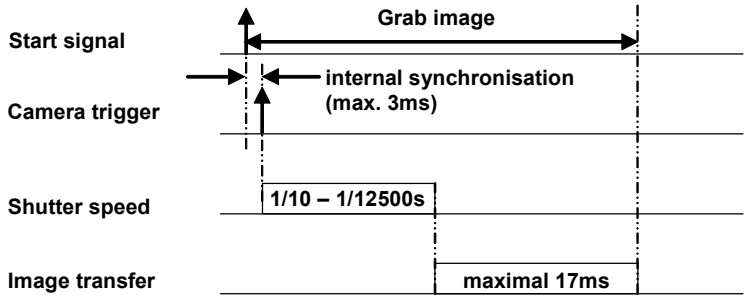
- **From now on, the ultra compact double speed digital camera ANPVC1021 will be referred to as "ultra compact camera".**
- **All camera settings like shutter speed, offset, gain, gamma, flash signal output etc. are made on the property page "Camera Settings" under** Camera → Properties **in the software.**

2.4.1 Time Diagram for Image Grabbing

The camera ANPVC 1021 is a black-and-white progressive scan CCD camera. The camera is suitable for grabbing images of moving objects. The image grabbing is triggered by a signal from the frame grabber. With a delay of only a few μs the sensor will be completely exposed according to the shutter speed (exposure time) you have set. Immediately afterwards the frame grabber starts the transfer of the digital image signal to the memory of the Imagechecker, where it will be processed and evaluated.

There are 30 different settings between 1/10 seconds and 1/12500 seconds available for the shutter speed. The transfer time for an image from the camera to the memory is about 17ms for a full image with 480 lines. This means a maximum image rate of about 60 full images per second.

When you are using partial scan mode, only a reduced number of image lines will be transferred and this reduces the transfer time. This helps you to increase the image or inspection rate considerably. As the transfer time is not reduced proportionally to the number of image lines used, you need to determine the transfer time case by case.

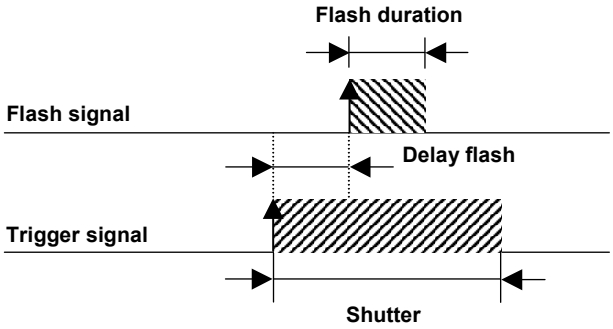


Time diagram for image grabbing

◆NOTE

Important: The duration of the image grabbing depends to a large degree on the image transfer time and the shutter speed:
image grabbing = shutter speed + image transfer time

All camera settings like shutter speed, offset, gain, gamma, flash signal output etc. are made on the property page "Camera Settings" under **Camera** → **Properties** in the software. For example, it is possible to set a delay between the camera trigger and the flash signal output so that you can set the optimum exposure time and duration for the image grabbing. This will help to reduce the interfering effect of other light sources and increase the service life of your flash. Make sure to activate the output of the flash signal with the option "Send flash signal".

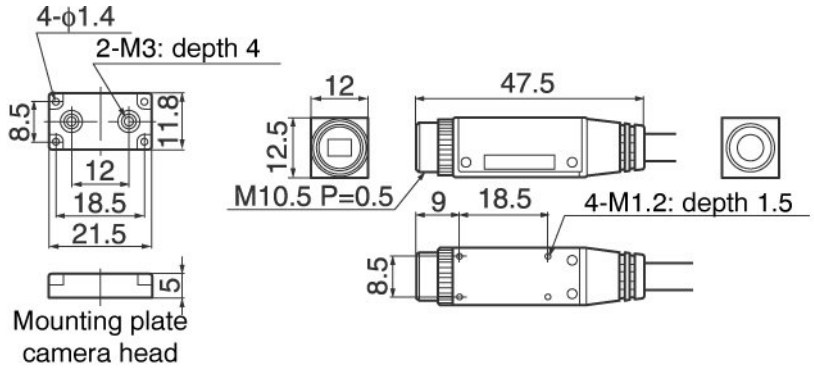


Example for flash signal and camera trigger

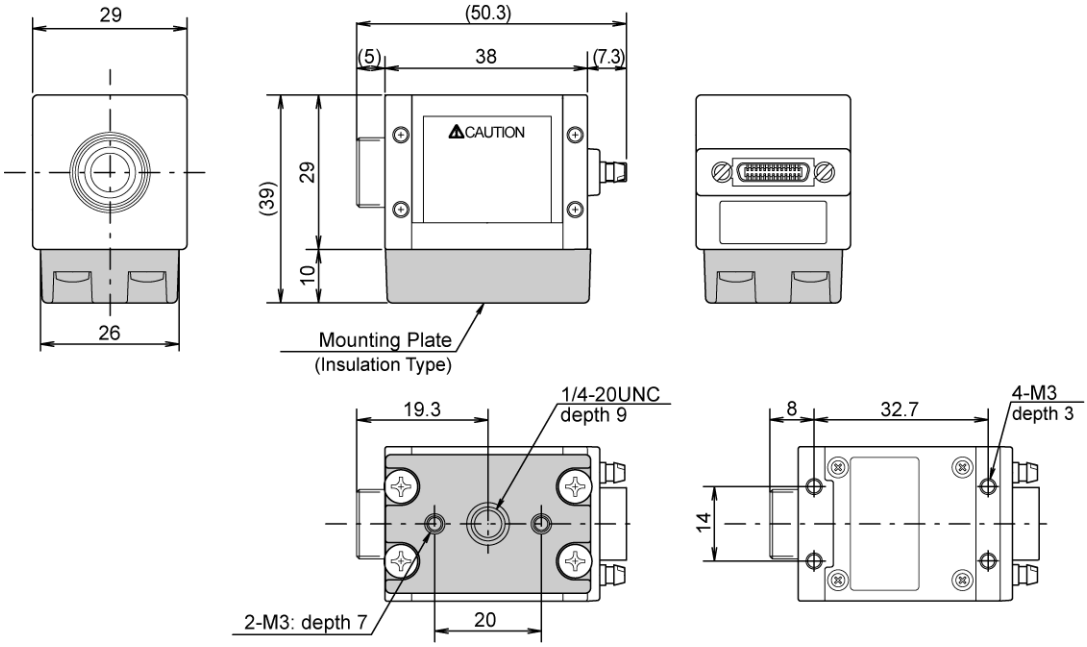
◆**NOTE**

Please also refer to the information supplied by the manufacturer of your flash!

2.4.2 Dimensions



Dimensions of ultra compact camera head



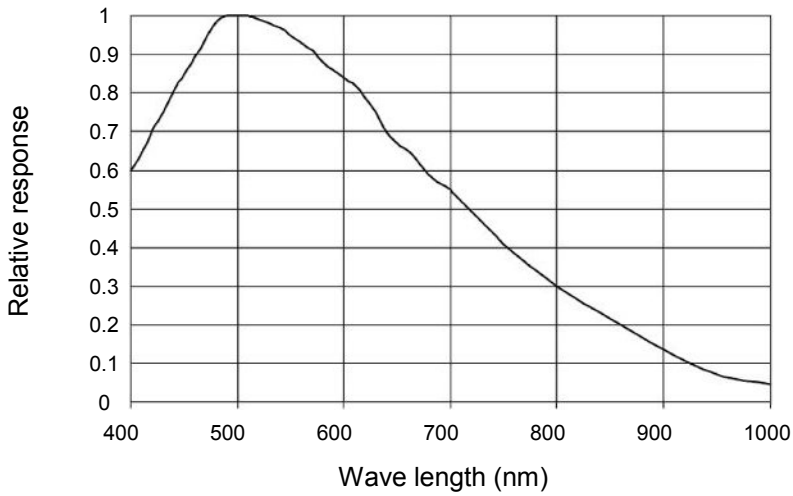
Dimension of the camera control unit

2.4.3 Specifications

Feature	Specification
Image sensor	Interline transfer method. 1/3" CCD, pixel size: 7.4μm x 7.4μm (tetragonal pixel)
No. of effective pixels	659 x 494 pixels (horizontal x vertical)
Grabbing mode	Progressive scan, full image mode/partial scan mode
Shutter speed	1/10s - 1/12500s
Synchronous method	Internal synchronous

Feature		Specification
Image output		Digital output, adapted for progressive mount, 60fps
Lens fixture		Special mount
Rating	Power supply voltage	12V DC +/- 10%
	Power consumption	250mA maximum
Environmental requirements	Operational temperature	0°C to +45°C (avoid ice and condensation)
	Operating ambient humidity	35% to 85% RH (avoid ice and condensation at 25°C)
	Vibration resistance	10 to 55 Hz, 1 sweep per minute, half an amplitude 1mm (camera head), 30 minutes each in X/Y/Z direction
	Shock resistance	700 m/s2, 3 times each in X/Y/Z direction
Weight		Camera head: About 185 g (without lens) Camera control unit: Approx. 65g
Cable length		Camera head cable (between camera and camera control unit): Approx. 3m

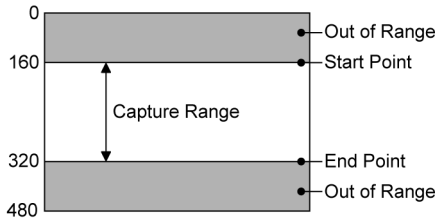
2.4.4 Spectral Response



2.5 Partial Scan Mode

Here you can specify which part of the image sensor should be used for image grabbing. If you reduce the sensor area used, the image grabbing time will be shorter. The image size for a full image is 640 x 480 pixels for the quad-speed and the ultra-compact camera, and 1600 x 1200 pixels for the 2-mega camera.

The image part to be captured is defined by a start line and an end line. The example shows a partial image to be captured from start point at 160 and end point at 320.



◆**NOTE**

- **You can set up to two partial areas per camera.**
- **The following minimum values apply when you set the capturing area:**
  1 line for the quad-speed camera ANPVC 1040 and the ultra compact camera ANPVC 1021.
  100 lines for the 2 Mega camera ANPVC 1210.

Chapter 3

Installation

3.1 Important Information

Please read the following information **before** you begin with the installation or operation!

◆**NOTE**

- **Use only products (cameras and camera cables) offered by PEWEU for specific use with the Imagechecker. The use of any other products will negate the warranty for the entire system since third-party components can damage the Imagechecker. In this case, PEWEU will not assume liability for the proper functioning of the Imagechecker.**
- **Under no circumstance should you ever disassemble the Imagechecker or change the system's factory settings unless you are specifically asked to do so in this manual. Any tampering will negate the warranty for the entire system since such changes may damage the Imagechecker. In this case, PEWEU will not assume liability for the proper functioning of the Imagechecker.**
- **The Imagechecker is a precision device and should under no circumstance be exposed to shocks or vibrations.**
- **The Imagechecker is neither waterproof, dustproof nor rustproof. Consequently, it is absolutely necessary to install the P400 in a dry, clean environment.**
- **Protect the Imagechecker from exposure to direct sunlight and explosive or corrosive gases.**
- **Disconnect the power supply before connecting or disconnecting any connectors to or from the Imagechecker.**
- **Never apply force to any Imagechecker connectors or cables. Do not bend the cables. The connections should never be unplugged by pulling on the cable. Always hold the connector by the plug when unplugging any component from the Imagechecker.**
- **NEVER touch an exposed connector contact after unplugging a connector from the Imagechecker, and ensure that no fluids/chemicals come into contact with the contacts.**
- **Leave ample space around the Imagechecker so that heat generated during operation can be dissipated by the ventilators.**
- **Please ensure that the ventilators function properly.**
- **Clean or change the dust filter regularly (if there is one). Warm air cannot pass readily through a dirty filter, which, in turn, may lead to damage from overheating.**
- **Guard against unintended data loss by maintaining data protection in a safe location.**
- **Ensure that the power supply is disconnected while you work on the equipment.**

- **Avoid discharges of static energy.**
- **Use the components only within the humidity and temperature ranges specified.**
- **Take care to keep dust accumulation to a minimum since dust may impair the functioning of the components.**
- **Do NOT clean the components with solvents or aggressive cleansers. These substances can destroy equipment parts and damage the paint.**

3.2 Unpacking the P400XD

As you unpack your P400XD, please check the package contents to make sure nothing is missing.

◆**NOTE**

- **Be careful! The P400XD weighs approx. 20kg.**
- **Install the P400XD in a 19" built-in enclosure (follow the manufacturer's installation instructions) or place the equipment on a strong, firm base (space requirements: 0.5 m x 0.5 m).**

◆**Procedure**

1. **Remove the box containing the accessories and periphery from the package**
2. **Using both hands, lift the P400XD out of the package**
3. **Check package contents to make sure nothing is missing**

Product	Description	Amount
Industrial PC	P400XD by Panasonic Electric Works Europe AG	1
Periphery	IBM-compatible mouse, 3 buttons key to front cover and removable hard disk / CF ADA keyboard adapter	1
Connector	Connector for serial and parallel interface	1
Flash drive	Flash drive with system recovery and license file Advantech driver & with manual CD (CPU board)	1 1

4. **Remove the protective sheet from the equipment**
5. **Check to see that the ventilation slots are unobstructed**
6. **Check again to ensure that there is sufficient space (minimum 0.5m x 0.5m)**

3.3 Connecting the Imagechecker

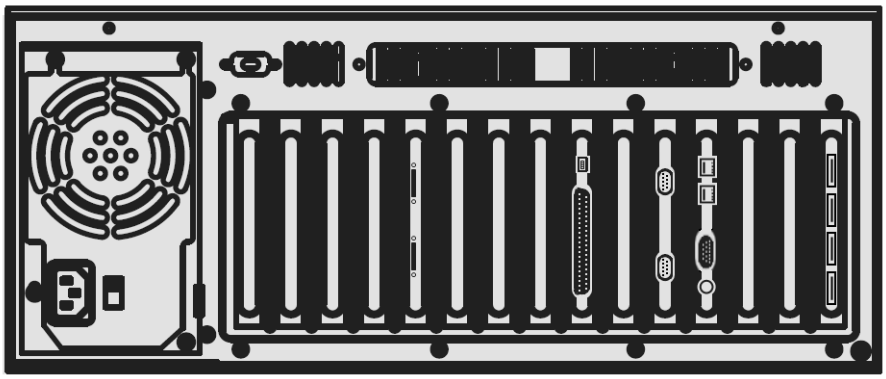
◆Procedure

1. **Check the current consumption of your power supply**

   For operating the P400XD you need a current consumption of 240V AC/500Watt.

2. **Ground the Imagechecker casing**

   Use the screw at the bottom right on the back intended for grounding.



3. **Use the power cord to connect the PC to the power supply**

4. **Connect the monitor, the mouse, and the keyboard**

   As a rule, the mouse and the keyboard are connected at the back of the Imagechecker with the Y-shaped cable. The keyboard can be connected directly to the back of the Imagechecker without using the Y-shaped cable. Connect the monitor to the 15-pin Sub-D plug.

5. **Connect the cameras, interface and network cables**

6. **Unlock the front cover with a quarter turn of the key**

7. **Press the push button switch at the front to switch on the Imagechecker**

   The green LED PWR at the front will light up and indicate proper operation. The LED HDD will flash and indicate operation of the hard disk. The computer will boot up the operating system.

3.4 Software Installation

Vision P400 is available in different editions. The following editions are available in English, French, or German:

- Vision P400 Essentials version 5.0
- Vision P400 version 5.0
- Vision P400 Demo version 5.0 (free of charge)

3.4.1 Upgrading from an Older Version of Vision P400

Up to version 4.1 you need to de-install Vision P400 before you can install the new version.

Existing license files become invalid with version 5.0 and need to be replaced by a USB hardware dongle, which you will receive when you buy the software.

◆ Procedure

1. **Insert CD "Vision P400" in the CD-ROM drive or plug the flash drive into a free USB port**
2. **Select "5.0" from the menu "Install Vision P400"**

   When you install Vision P400 anew, all software settings are reset to the standard values. On the other hand, when you install an update, the interface settings from the old version are retained.
3. **Follow the installation instructions on your screen**

   Please also check whether there are service packs (patches) on the CD and install them, when available.
4. **Restart the system**

3.4.2 Applying for a New License

Older versions of Vision P400 (before version 5.0) use a license file for software protection. If you need a new license for an older version, please proceed as follows:

Procedure

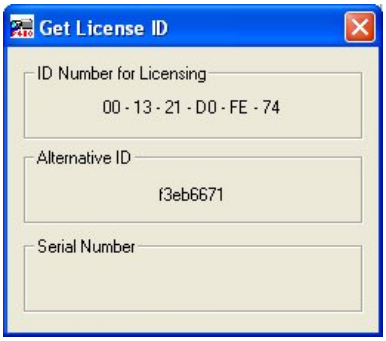
1. **Insert the flash drive in a free USB port**

   The auto start menu of the flash drive is displayed.

2. **Select "Start my P400xx Recovery System"**

3. **Select "Get License ID" from the following menu**

   A window appears displaying the license ID. In addition, a second field displays an alternative ID. Use the alternative ID in case the primary license ID is not displayed.



4. **Write down the number displayed under "ID Number for Licensing" or, if nothing is displayed there, the number under "Alternative ID"**

5. **To close the window click the cross in the top right corner**

6. **Write down the serial number of your Imagechecker**

   The serial number can be found on the product label on the casing.

7. **Inform your local Panasonic Electric Works branch that you need a new license file**

   Tell them the license ID you have written down and the serial number.

8. **Carry out the new installation of Vision P400**

   Follow the procedure (see page 64) for new installations.

9. **When you have received the new license file, install it**

   When you have received the new license file per mail: After installing Vision P400, copy the file into the folder \<installation folder>\license on your Imagechecker.

3.4.3 New Installation of Vision P400

The system comes readily installed with the following components:

- Current (see page 36) version of Vision P400
- Operating system Windows XP Embedded
- Necessary drivers
- Security Console (EnhancedWriteFilter) software
- USB hardware dongle (included with software package or already plugged in inside the Imagechecker)

It is necessary to perform a new installation when:

- You have deleted the software by accident
- A hardware failure has occurred

To install Vision P400 again, use the flash drive (see page 70) you have received.

◆Procedure

1. **Insert the flash drive in a free USB port**

   The auto start menu of the flash drive is displayed.

2. **Click "Start my P400XX Recovery System"**

3. **Select "Install Vision P400" from the menu**

   Select the Vision P400 software version you wish to use.

4. **Follow the installation instructions on the screen**

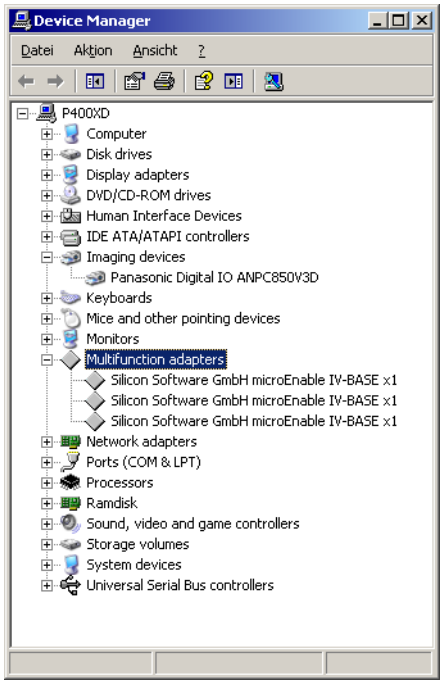
5. **If you have bought a software bundle, plug the USB dongle into a free USB port**

   If you have bought a complete Imagechecker with hardware, the dongle has been built in.

3.5 Driver for the Frame Grabber and the Digital I/O Board

The Imagechecker uses by default a frame grabber of type ANPCL 8021D for image grabbing and the digital I/O board ANPC 850V3 for digital data output. All devices need the appropriate drivers for correct operation.

If you install additional or new devices (like for example another frame grabber) or if you change slots, it is necessary to install the drivers for these devices manually.



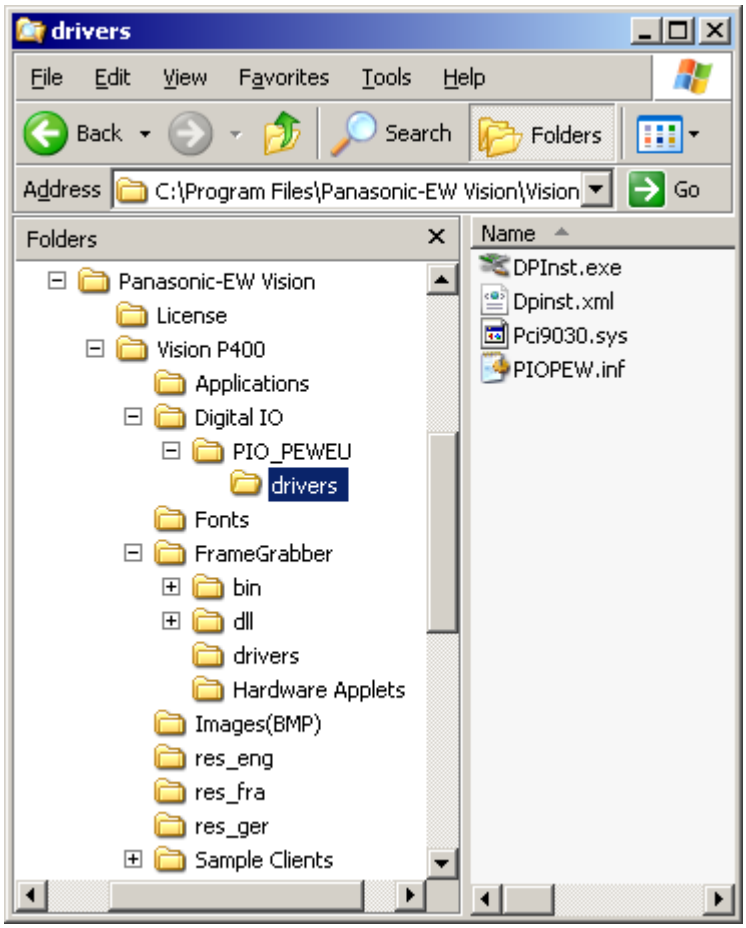
Device manager shows all devices installed

Yellow circles with exclamation marks appear in the Windows Device Manager next to devices which have not been installed completely. Under "Imaging devices" you find "Digital I/O" by Panasonic (if installed), as used by the Imagechecker P400. The frame grabber ANPCL 8021D is listed under "Multifunction adapters".

The table below shows how frame grabbers and digital I/O boards are displayed and which .INF and .SYS files they require.

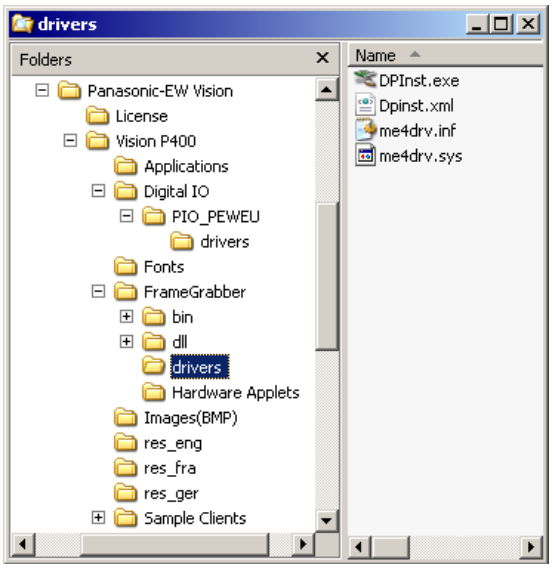
Device type (Imaging devices)	ANPC 850V3D (I/O P400MD/P400)	ANPCL 8021D (frame grabber)
Displayed as	Panasonic Digital IO ANPC850V3D	Silicon Software GmbH microEnable IV-BASE x1
.INF file	PIOPEW.inf	me4drv.inf
.SYS file	PCI9030.sys	me4drv.sys

Both .INF and .SYS files can be found in the installation folder of Vision P400.



Driver installation via "DPInst.exe" or Windows Device Manager

In order to install a driver like "me4drv.sys", simply use the application **DPInst.exe**, which you find in the installation folder. Double-clicking the application starts the installation wizard.



DPInst.exe

Alternatively, please proceed as follows:

Procedure

1. **Open the Windows Device Manager**
2. **Double-click the device you wish to install**
3. **Select the tab "Driver"**
4. **Select [Update Driver ...]**
5. **Select [Install from a list or specific location]**
6. **Click [Don't search, I will choose the driver to install] and select the suitable file in the folder "Drivers" shown above**

   The frame grabber ANPCL 8021D uses the same driver "me4drv.sys", which can be found in the installation folder under FrameGrabber\drivers\.
   The digital I/O board ANPC 850V3D uses the driver "piopew.sys", which you find in the installation folder under under Digital IO\PIO_PEWEU\drivers.
7. **Select the corresponding .INF file and click [Open]**

   This file contains all information needed to install the driver. The driver installation is carried out. In some cases there may be another prompt asking you to select the actual driver file. Next, in the installation folder open the file with the extension .SYS.

   The drivers for all other PC devices like graphic boards, Ethernet, etc. are installed with the setup from the recovery CD. If the necessity for an update of the driver arises, please contact your local Panasonic branch.

3.6 System Backup and Recovery

You have several possibilities to use the recovery software on the flash drive:

- Start recovery from flash drive (see page 74)
- Create and save a backup copy of the current system:
  - on the flash drive (see page 70)
  - on the network (see page 72)
- Restore system from backup copy
  - from the flash drive (see page 70)
  - from the network (see page 72)
- Burn system backup on CD (see page 70, see page 72)

Required settings in "Recovery_Settings.ini"

In order to be able to use all possibilities, please make the following settings in the file "Recovery_Settings.ini". You find this file in the main folder of the flash drive.

[NetShare]	• Share=\\computer name\path password /user:domain\username Here you define the network path for reading or writing system backups. Enter the name of the computer, the path, the user name, and the password.
[FileName]	• NameForRecovery=VisionP400MAMasterImage.wim Name of the master image. Please do not change as this may make it impossible to use the function to restore the original system state. • NameForBackupMemStick=BackupVisionP400Image.wim Name of the backup file for reading from or writing to the flash drive. • NameForBackupNetwork=BackupVisionP400image.wim Name of the backup file for reading from or writing to the network.

3.6.1 Using the Flash Drive

Use the flash drive you have received to back up and restore the system as follows:

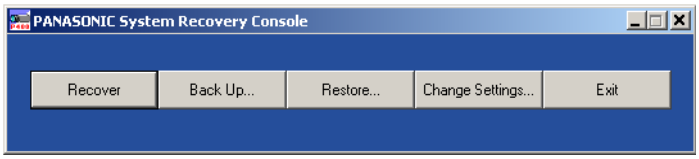
◆**NOTE**

Please note that you need to make certain settings in the file "Recovery_Settings.ini" (see page 70) before you can back up or restore the system.

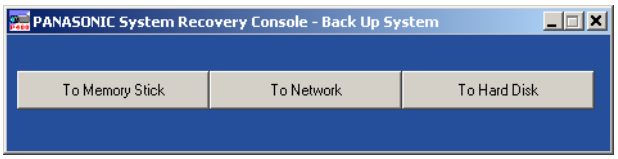
Back up the system

Procedure

1. **Insert the flash drive in a free USB port**
2. **Start the system and wait until the system has booted from the flash drive**



3. **Click [Back Up...]**



Select the location for the backup copy.

4. **Click [To Memory Stick]**

The backup process should take 10 to 20 minutes to complete. When the backup process has finished, you will find the backup copy called "BackupVisionP400image.wim" in the corresponding folder on the network. The backup copy comprises the complete contents of the device. You can burn the system backup on CD if you have connected a CD recorder.

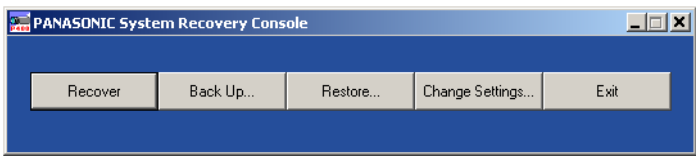
With the help of your backup CD you can restore the system as it was when you created the backup CD.

5. **When you have completed the backup, remove the flash drive and restart the Imagechecker**

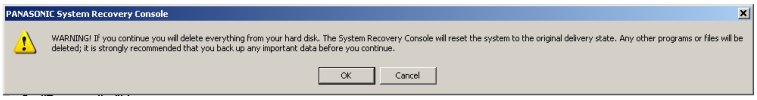
Restore the system

Procedure

1. **Insert the flash drive in a free USB port**
2. **Start the system and wait until the system has booted from the flash drive**



3. **Click [Restore...]**



4. **Confirm the warning message**

   The data on the hard disk get lost when you do a system recovery.

   The restore process should take 10 to 20 minutes to complete. After you have completed the restore process, the Imagechecker is in the same state as it was when you created the backup. All data or settings changed afterwards will be lost.

5. **When you have completed the backup, remove the flash drive and restart the Imagechecker**

3.6.2 Using the Network

Use the network to back up and restore the system as follows:

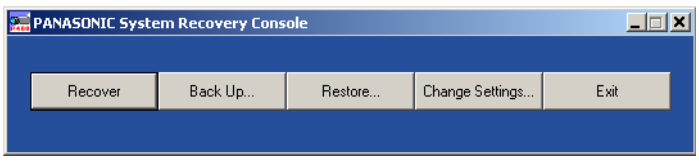
◆**NOTE**

- **Please note that you need to make certain settings in the file "Recovery_Settings.ini" (see page 70) before you can back up or restore the system.**
- **Make sure that the file contains the following line and that the values are appropriate your network configuration:**
  [NetShare]
  \\PC_NAME\FOLDER_NAME Username /user:Domain\Password

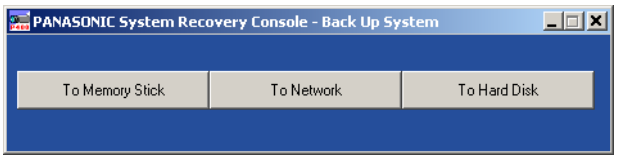
Back up the system

◆**Procedure**

1. **Insert the flash drive in a free USB port**
2. **Start the system and wait until the system has booted from the flash drive**



3. **Click [Back Up...]**



4. **Click [To Network]**

   The backup process should take 10 to 20 minutes to complete. When the backup process has finished, you will find the backup copy called "BackupVisionP400image.wim" in the corresponding folder on the network. The backup copy comprises the complete contents of the device. You can burn the system backup on CD if you have connected a CD recorder.

5. **Select the corresponding menu option to burn the system backup on a CD**

6. **Follow the instructions on the screen**

   With the help of your backup CD you can restore the system as it was when you created the backup CD.

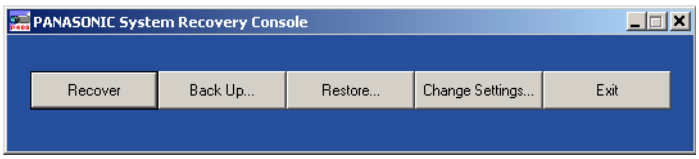
7. **When you have completed the backup, remove the flash drive and restart the Imagechecker**

Restore the system

◆Procedure

1. **Insert the flash drive in a free USB port**

2. **Start the system and wait until the system has booted from the flash drive**



3. **Click [Recover]**

4. **Click [From Network]**

   The restore process should take 10 to 20 minutes to complete. After you have completed the restore process, the Imagechecker is in the same state as it was when you created the backup. All data or settings changed afterwards will be lost.

5. **When you have completed the backup, remove the flash drive and restart the Imagechecker**

3.6.3 Recover the Original State of the System

Before you reset your system to the original state, please carry out the following steps to back up important information from you current system:

Procedure

1. **Create backup copies of all your applications and data files with inspection results**

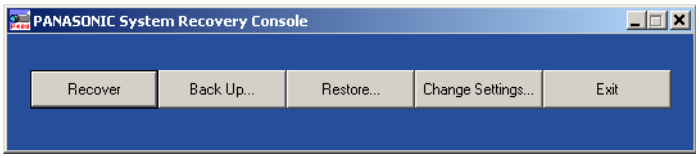
   These files may be overwritten when you use the recovery files.

2. **Save all your favorites, user layouts, network IP addresses, and user-specific files**

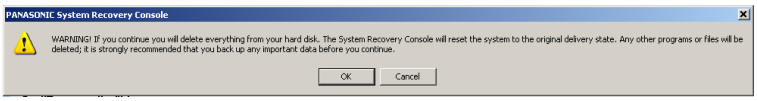
To recover the original system from the flash drive you have received from us, please proceed as follows.

Procedure

1. **Insert the flash drive in a free USB port**
2. **Start the system and wait until the system has booted from the flash drive**



3. **Click [Recover]**



4. **Confirm the warning message**
5. **Follow the instructions on the screen**

   This process should take 10 to 20 minutes to complete.

6. **When you have completed the backup, remove the flash drive and restart the Imagechecker**
7. **After restarting log on as administrator (no password)**

   At first boot, you are prompted for your Microsoft Product ID.

8. **Enter the user name, company name, and Vision P400 serial number**

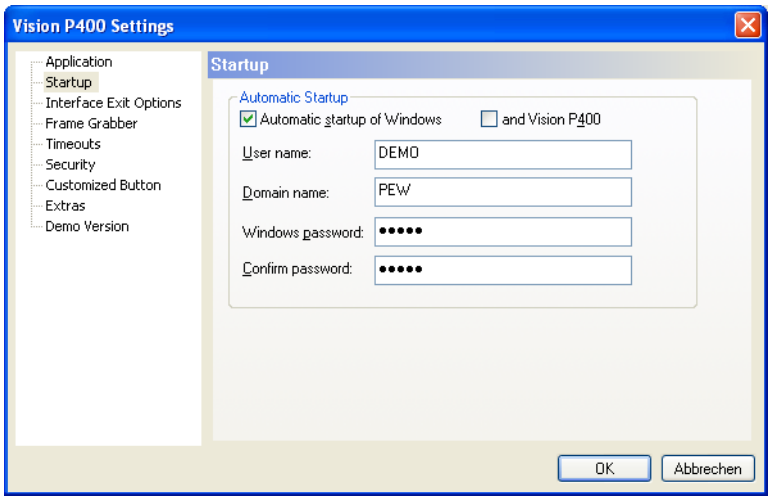
You find the serial number on the Panasonic product label on the hardware casing.

9. **Configure the network adapter, if necessary**

10. **Restore all files you have backed up previously**

3.7 Assign a Password for Windows

If you wish to start the Imagechecker and/or Vision P400 automatically, you need to assign a Windows password in order to be able to activate the corresponding settings for Vision P400. You need to specify a user name and a password at login.



Vision P400 settings for automatic startup

To assign a Windows password, please proceed as follows.

◆Procedure

1. **Press <Ctrl>+<Alt>+<Del>**
2. **Select the [Change Password...] button**
3. **Enter a password under "New Password"**

   Make sure the "User Name" is the same as entered in Vision P400.
4. **Enter the same password under "Confirm Password"**
5. **Select [OK]**

◆NOTE

- **You have to define a Windows NT password (see page 76) before you can configure automatic startup. It is possible to leave the password field empty under Windows XP.**
- **The password for the Windows XP/Windows 2000 login will be saved unencrypted in the registry file! This means everybody logging in on the PC can read it.**
- **If you do not belong to a domain, you must leave the "Domain Name:" field empty.**

3.8 Maintaining the Imagechecker

Aside from cleaning the device and replacing or cleaning the dust filter, the Imagechecker is maintenance-free. Consequently, you should never open the Imagechecker.

Ensure that the PC has ample space for ventilation in both front and back. Heat build-up can destroy the electronic components.

If a dust filter is installed, check the extent of dust contamination regularly. If it is dirty, please clean or exchange it.

◆NOTE

- **Use only slightly moistened towels or a dry, soft brush to clean the Imagechecker.**
- **Never apply aggressive cleansers, alcohol or other chemical substances since these may damage the parts.**
- **Protect the Imagechecker from exposure to direct sunlight and humidity.**

3.9 Resolving Problems

If your Imagechecker should ever cease to function, please check all plug connections first, then check the software configuration. If you cannot find the reason for the problem there, **do NOT open the device** and do not attempt to repair anything inside the Imagechecker.

3.9.1 Radio Interference

The Imagechecker generates and utilizes signals in the frequency range of radio and television. If the Imagechecker is not installed and operated in accordance with the instructions, interference in the reception of radio services may result or the Imagechecker itself may be impaired as a result of interference from external signals.

There can be no guarantee that interference with reception or operations are ruled out entirely with proper installation and operation. If the Imagechecker creates interference with your television or radio reception or if it is itself disturbed by these, verify the cause and effect by briefly turning off the systems and then attempt to rectify the interference with one of the following measures.

◆Procedure

1. **Change the orientation or placement of the receiving antenna of the radio or television affected**
2. **Increase the physical distance between the Imagechecker and the radio or television receiver**
3. **Hook the Imagechecker to a power circuit separate from the radio or television receiver**

If none of these measures are successful please ask your local Matsushita Electric Works branch or a qualified radio and television technician.

◆NOTE

- **Please ensure that the Imagechecker is operated exclusively with the cables provided or with shielded data cables.**
- **Unauthorized tampering with the Imagechecker or the equipment will invalidate the warranty!**

3.10 Environmental Protection

◆NOTE

- **Please disconnect the Imagechecker from the electrical outlet when it is not in use for an extended period of time (e.g. vacation, etc.).**
- **Turn off the Imagechecker when not in use (e.g. upon completion of the work with the Imagechecker).**
- **For proper disposal, please turn to your local or municipal waste management or the appropriate community institution. The equipment casing is made of nearly 100% galvanized steel.**
- **Beware! The Imagechecker contains batteries. Danger of explosion in the event of improper handling! Replace the batteries only with batteries of the same type. Dispose of used batteries properly in the designated battery recycling containers at your local waste management department or recycling center.**

Chapter 4

Appendix

4.1 Hardware Settings

This chapter deals with the following hardware-related topics:

- BIOS configuration data (see page 82)
- Environment variables (see page 82)
- IRQs and addresses

4.1.1 BIOS Configuration Data

If you wish to restore the correct BIOS settings for the Imagechecker, please proceed as follows:

◆Procedure

1. **Start the PC while holding the <Del> key down until BIOS setup menu appears**
2. **Use action "Load Optimized Defaults" to restore the predefined system state**
3. **Save the settings with <F10>**

4.1.2 Environment Variables

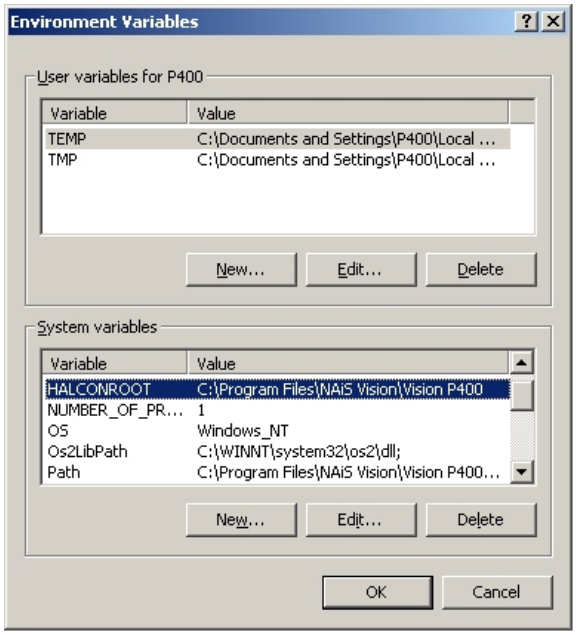
The following settings are made when you install Vision P400. The settings are absolutely necessary for working with Vision P400. If the path settings are not correct or missing altogether, Vision P400 will not be able to operate.

System

HALCONROOT: This is the path for the license file "license.dat". If the path set here is not the correct path for the license file, an error message will appear and Vision P400 will not start. This entry only exists when you are working with the demo version.

User

TEMP and TMP: This setting is used to store temporary variables.



Environment variables for Vision P400

4.2 Repair Service Instructions

Danger for people and equipment!
These instructions are intended for the exclusive use of authorized personnel. You should never even open the Imagechecker casing unless you have expert knowledge of applied computer engineering and are qualified to work on computer hardware.

4.2.1 Changing the Assembly

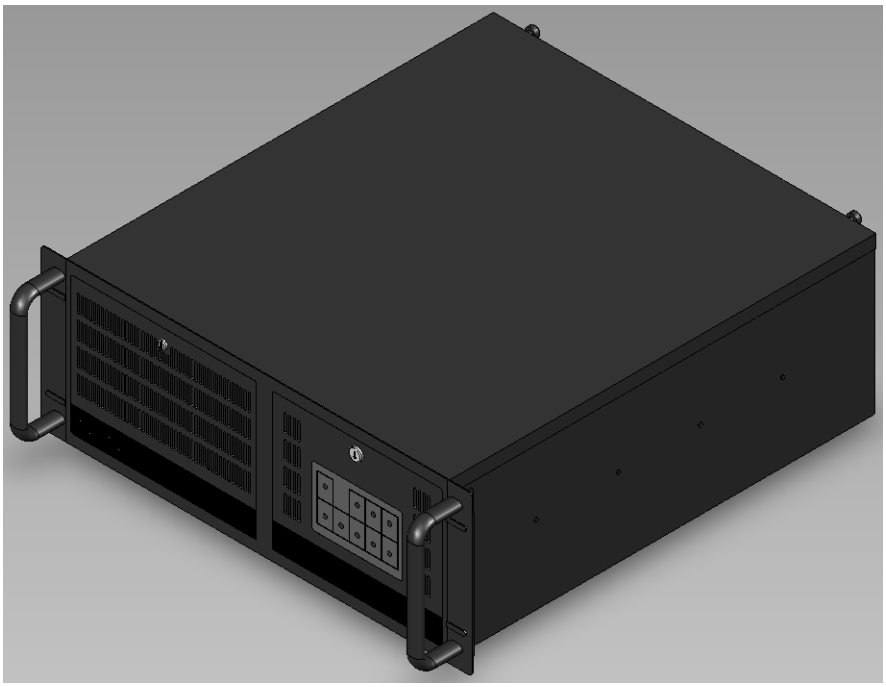
For repairs, you will need the following tools:

- No. 1 screwdriver for recessed head screws for:
  - Installing drives and slot cards
  - Replacing assemblies

Now open the casing:

◆Procedure

1. **Pull the mains cable and disconnect the power supply**
2. **Open the two thumb screws at the back of the casing**



3. **Remove the lid**

4.2.2 Installing a Slot Card

To install a slot card please proceed as follows:

◆Procedure

1. **Pull the mains cable and disconnect the power supply**
2. **Open the casing**
3. **Using a screw driver for recessed head screws, loosen and remove the catch of the slot card clamp**
4. **Remove the slot card clamp**
5. **Insert the slot card in the backplane**
6. **Fasten the slot card frame to the Imagechecker casing**
7. **Re-fasten the slot card clamp**
8. **Adjust the slot card clamp**
9. **Replace the cover of the Imagechecker casing**

4.2.3 Replacing the Power Unit

To replace the power unit:

◆Procedure

1. **Pull the mains cable and disconnect the power supply**
2. **Open the PC casing**
3. **Disconnect the internal power supply from the drives, motherboard, etc.**
4. **Unfasten the cable guides**
5. **Unscrew the four recessed head screws**
6. **Remove the old power unit**
7. **Insert the new power unit**
8. **Fasten the new power unit with the six recessed head screws**
9. **Re-fasten the cable guides**
10. **Re-connect the internal power supplies**
11. **Close the PC casing**

4.2.4 Installing Drives

There are slots for three 5 1/4 inch drives and two 3 1/2 inch slots for floppy disk, CD-ROM or hard-disk drives.

◆Procedure

1. **Pull the mains cable and disconnect the power supply**
2. **Remove the bottom and top covers (same type of screws)**
3. **Remove the recessed head screws holding the drive frames in place**
4. **Set the drive jumpers in accordance with manufacturer's instructions**
5. **Connect the drive to the data cable**
6. **Re-install the drives in the frames and fasten them to the PC casing**
7. **Reconnect the drives to the power supply and motherboard**

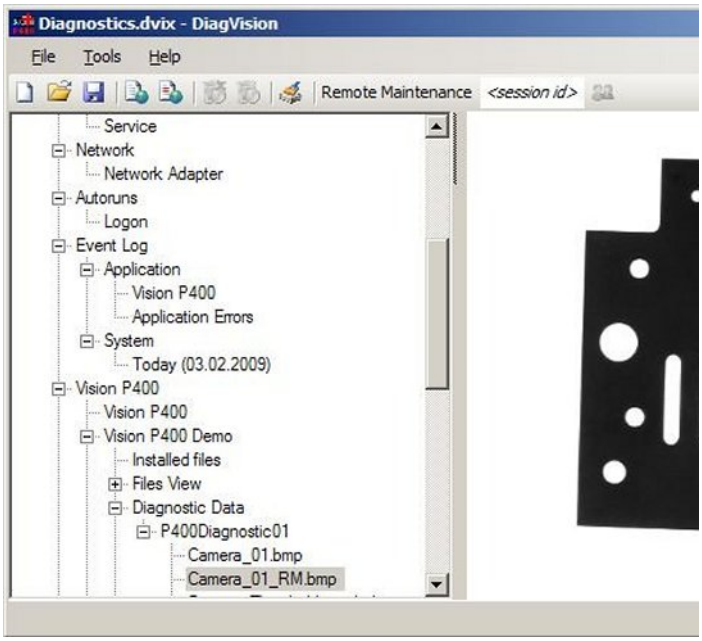
4.3 Error Handling and System Diagnosis

This chapters contains information about how you can diagnose and fix errors when operation Vision P400. You find information on the following topics:

- System diagnosis (see page 87)
- Feedback form (see page 88)

4.3.1 System Diagnosis with DiagVision.exe

The English-language diagnosis tool "DiagVision.exe" is located in your Vision P400 installation directory. You can use this tool to retrieve a wide range of information about your hardware and software, which may help solve problems with Vision P400.



"DiagVision.exe" diagnosis tool

DiagVision: Available functionality

Menu	Description
File → New	Performs a new system diagnosis. The information displayed here is derived exclusively from the PC running the program.
File → Open...	Opens a diagnosis file with the extension *.dvi.
File → Save.../Save As...	Saves all the available information in a file with the extension *.dvi. This file can be viewed with the DiagVision software.
File → Exit	Exits DiagVision.
Tools → Generate a report view of the current diagnostics...	Displays a report dialog box for the entire analysis.
Tools → Generate a report view of selected item...	Displays a report dialog box for the current analysis selection.

Menu	Description
Tools → Install Vision P400 Drivers	Installs Vision P400 drivers.
Tools → Uninstall Vision P400 Drivers	Uninstalls Vision P400 drivers. Note: The standard procedure is via **Control Panel→ Add/Remove Programs**
Tools → System clean of Vision P400 Software...	Use this option to remove all installed versions of Vision P400 from your PC. This is useful if you have installed several versions of Vision P400 on your PC and the standard deinstallation routine for the setup is no longer working. Before the installation directories of Vision P400 and Vision P400 Demo are deleted, the system backs up all files with the extensions *.nav, *.fnt, *.nft, and the file "License.dat" in a user-defined file. All other files in the Vision P400 and Vision P400 Demo installation directories will be deleted together with these directories.

Remote maintenance

You can also use DiagVision for remote maintenance purposes.

◆**Procedure**

1. **Enter the remote maintenance session ID number, which is generated automatically, in the input field**
2. **Start remote maintenance by clicking the adjacent icon**

4.3.2 User Feedback

When producing the Vision P400 software we did everything possible to detect and remove software errors by highly sophisticated quality checks. As you know, it is nearly impossible to produce a flawless software product. That is why we kindly ask you for your support if a software error occurs in spite of all our efforts.

◆**NOTE**

If you wish to report an error, please send or fax a print-out of the file "error.txt" together with the report sheet on the next page. Alternatively, use the tool DiagVision.exe (see page 87) to create a *.dvi file and mail it to us. This will speed up the trouble-shooting process.

Thank you very much in advance for your help and understanding.

☐ **Software Error Report**

☐ **Change Request/Suggestion for Improvement**

From

Name:

Address:

Phone:

Facsimile:

Date:

Panasonic Electric Works Europe AG

Machine Vision

Facsimile: +49-8024-648-222

Error description

Vision P400 version number
Vision P400 software serial number: Vision P400 Imagechecker number: Imagechecker serial number: (see label on casing or behind front door)
Environment (version number of the operating system, service pack installed, system configuration (network card, etc.)):
System behavior (C = Crash, P = Program failure, M = Miscellaneous):
Description of the problem or change request (in case of a software problem please attach a print-out of the file “error.txt”, a print-out of the faulty application (*.nav), and a screen-shot to document the problem):
Explain step by step what you have been doing before the problem appeared so we can reproduce the system behavior:

4.4 Recommended Literature

Title	Author	Published by
Fundamentals Of Digital Image Processing	Anil K. Jain	Prentice Hall Englewood Cliffs 1989
Digitale Bildverarbeitung	Bernd Jähne	Springer Verlag Berlin Sechste überarbeitete und erweiterte Auflage 2005
Bildverarbeitung in der Praxis	R. Steinbrecher	Oldenbourg Verlag München 1993
Methoden der digitalen Bildsignalverarbeitung	P. Zamperoni	Vieweg Verlag Braunschweig Zweite überarbeitete Auflage 1991
Einführung in die digitale Bildverarbeitung	Wolfgang Abmayr	B.G. Teubner Verlag Stuttgart Zweite Auflage 2002
Digitale Bildverarbeitung: Grundlagen und Anwendungen	Peter Haberäcker	Hanser Verlag München 1991
Praxis der Digitalen Bildverarbeitung und Mustererkennung	Peter Haberäcker	Hanser Verlag München 1995
Das Handbuch der Bildverarbeitung. Methoden, Programme, Anwendungen.	Rolf-Jürgen Ahlers	Expert-Verlag Renningen 2000
Industrielle Bildverarbeitung. Wie optische Qualitätskontrolle wirklich funktioniert.	Christian Demant et al.	Springer Verlag Berlin Zweite Auflage 2001
Einführung in die industrielle Bildverarbeitung	Gerhard Weißler	Franzis Verlag Poing 2006

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Record of Changes

Manual No.	Date	Description of changes
ACGM0105EN V1.0	March 2010	First edition (based on ACGM0101V80DE)
ACGM0105EN V2.0	August 2010	Second edition Changed: • System recovery via USB flash drive • Software protection via USB hardware dongle

North America | Europe | Asia Pacific | China | Japan

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	PEW Electronic Materials Europe GmbH	Ennshafenstraße 30, 4470 Enns, Tel. +43 (0) 7223 883, Fax +43 (0) 7223 88333, www.panasonic-electronic-materials.com
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▶ Italy	Panasonic Electric Works Italia s.r.l.	Via del Commercio 3-5 (Z.I. Ferlina), 37012 Bussolengo (VR), Tel. +39 (0) 456752711, Fax +39 (0) 456700444, www.panasonic-electric-works.it
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Asia Pacific / China / Japan

▶ China	Panasonic Electric Works (China) Co., Ltd.	Level 2, Tower W3, The Tower Oriental Plaza, No. 2, East Chang An Ave., Dong Cheng District, Beijing 100738, Tel. (010) 5925-5988, Fax (010) 5925-5973, www.pewc.panasonic.cn
▶ Hong Kong	Panasonic Electric Works (Hong Kong) Co., Ltd.	RM1205-9, 12/F, Tower 2, The Gateway, 25 Canton Road, Tsimshatsui, Kowloon, Hong Kong, Tel. (8520) 2956-3118, Fax (0852) 2956-0398
▶ Japan	Panasonic Electric Works Co., Ltd.	1048 Kadoma, Kadoma-shi, Osaka 571-8686, Japan, Tel. (06)-6908-1050, Fax (06)-6908-5781 http://panasonic-electric-works.net
▶ Singapore	Panasonic Electric Works Asia Pacific Pte. Ltd.	101 Thomson Road, #25-03/05, United Square, Singapore 307591, Tel. (06255)-5473, Fax (06253)-5689

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