

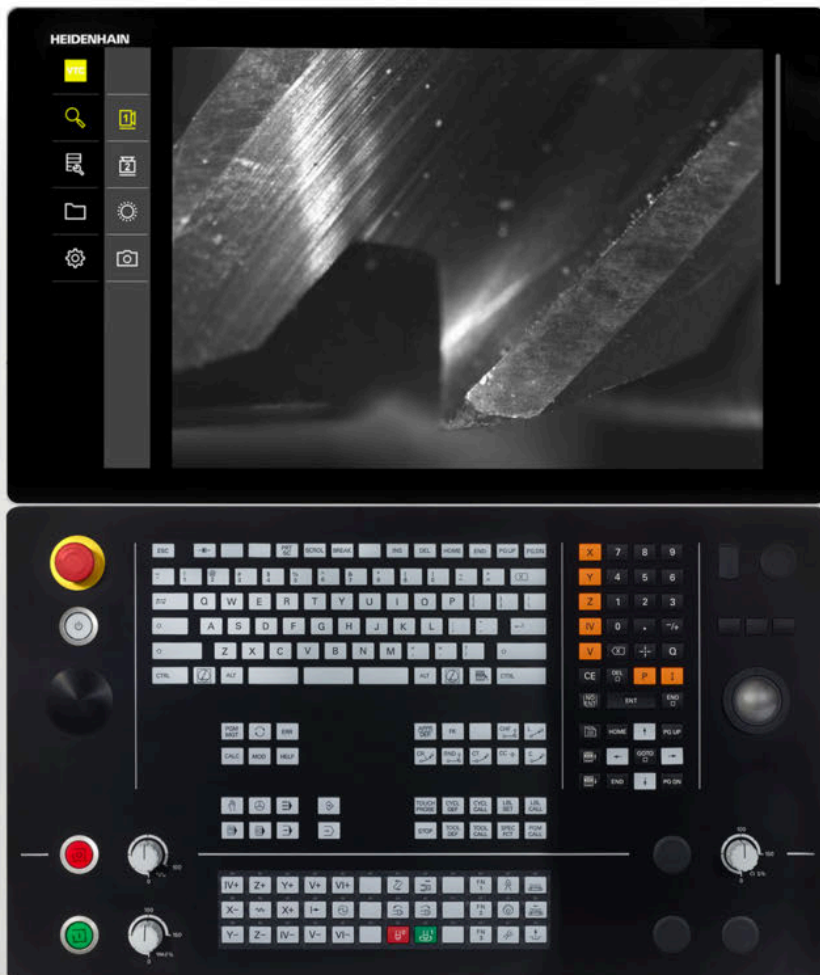


HEIDENHAIN

VTC

User's Manual

Software for VT 121 Vision System



03/2022

Contents

1	Fundamentals.....	9
2	Safety.....	15
3	Software installation.....	19
4	Commissioning.....	23
5	VTC cycles.....	25
6	Basic operation.....	41
7	Manual tool inspection.....	51
8	Tool evaluation.....	61
9	File management.....	79
10	Settings.....	85
11	Servicing and maintenance.....	93
12	Index.....	99
13	List of figures.....	100

- 1 Fundamentals..... 9**
 - 1.1 Overview.....10**
 - 1.2 Information on the product..... 10**
 - 1.2.1 Software for the product..... 10
 - 1.3 Documentation on the product..... 10**
 - 1.3.1 Validity of the documentation.....10
 - 1.3.2 Notes on reading this document.....11
 - 1.3.3 Storage and distribution of the documentation..... 11
 - 1.4 About these instructions..... 11**
 - 1.4.1 Document type..... 12
 - 1.4.2 Target groups for the instructions.....12
 - 1.4.3 Notes in this documentation.....12
 - 1.4.4 Symbols and fonts used for marking text.....13
- 2 Safety..... 15**
 - 2.1 Overview.....16**
 - 2.2 General safety precautions.....16**
 - 2.3 Intended use..... 16**
 - 2.4 Improper use..... 16**
 - 2.5 Personnel qualification.....16**
 - 2.6 Obligations of the operating company.....17**
 - 2.7 General safety precautions.....17**
- 3 Software installation..... 19**
 - 3.1 Overview.....20**
 - 3.2 Installing the software.....20**
 - 3.3 Requesting the license key and activating the application.....21**

4	Commissioning.....	23
4.1	Overview.....	24
4.2	Configuring the vision system driver software.....	24
4.3	Selecting the vision system.....	24
5	VTC cycles.....	25
5.1	Fundamentals.....	26
5.1.1	VTC tool table.....	29
5.1.2	Overview.....	30
5.2	Cycle 620 VT 121 CALIBRATION.....	31
5.2.1	Cycle parameters.....	32
5.3	Cycle 621 MANUAL INSPECTION.....	32
5.3.1	Cycle parameters.....	33
5.4	Cycle 622 IMAGES.....	34
5.4.1	Cycle parameters.....	35
5.5	Cycle 623 BREAKAGE CHECK.....	37
5.5.1	Cycle parameters.....	38
5.5.2	Possible queries.....	38
5.6	Cycle 624 MEASURING CUTTING EDGE ANGLES.....	39
5.6.1	Cycle parameters.....	40
6	Basic operation.....	41
6.1	Overview.....	42
6.2	Operation with touchscreen and gestures.....	42
6.3	General operating elements and functions.....	44
6.4	User interface.....	46
6.5	Main menu of the user interface.....	46
6.6	Manual tool inspection menu.....	47
6.7	Tool evaluation menu.....	48
6.8	File management menu.....	48
6.9	Settings menu.....	49

7	Manual tool inspection.....	51
7.1	Overview.....	52
7.2	Displaying a camera image.....	53
7.3	Lighting palette.....	54
7.3.1	Opening the lighting palette.....	54
7.3.2	Operating elements of the Lighting palette.....	55
7.3.3	Configuring the lighting.....	56
7.4	Manual single shots.....	57
7.4.1	Opening a manual single shot.....	57
7.4.2	Parameters of the single shot.....	58
7.5	Cleaning with compressed air.....	59
8	Tool evaluation.....	61
8.1	Overview.....	62
8.2	Menu levels.....	62
8.3	First menu level of Tool evaluation menu.....	63
8.3.1	Operating elements of the Tool evaluation menu level.....	63
8.3.2	Add group.....	63
8.3.3	Customize group.....	64
8.3.4	Rename group.....	64
8.3.5	Delete group.....	65
8.4	Second menu level: Group.....	65
8.4.1	Operating elements of the Group menu level.....	66
8.4.2	Add tool entry.....	66
8.4.3	Customize tool entry.....	67
8.4.4	Rename tool entry.....	68
8.4.5	Delete tool entry.....	68
8.5	Third menu level: Tools.....	69
8.5.1	Operating elements of the Tools menu level.....	70
8.5.2	Working with the View image function.....	70
8.5.3	Working with the Inspection view function.....	73
8.5.4	Add image series.....	77
8.5.5	Customize image series.....	77
8.5.6	Rename image series.....	78
8.5.7	Delete image series and single shots.....	78

9	File management.....	79
9.1	Overview.....	80
9.2	File types.....	81
9.3	Managing folders and files.....	81
9.4	Viewing files.....	83
10	Settings.....	85
10.1	Overview.....	86
10.1.1	Software information.....	86
10.1.2	Sounds.....	86
10.1.3	Units.....	87
10.1.4	Copyrights.....	88
10.2	Sensors.....	88
10.2.1	Camera.....	88
10.2.2	Virtual camera or hardware camera.....	88
10.3	Interfaces.....	89
10.3.1	OPC UA-Server.....	90
10.4	Service.....	90
10.4.1	Firmware information.....	90
10.4.2	Back up and restore.....	91
10.4.3	Software options.....	91
10.4.4	Tools.....	91
11	Servicing and maintenance.....	93
11.1	Overview.....	94
11.2	Back up settings.....	94
11.3	Restore settings.....	95
11.4	Activating Software options.....	95
11.5	Requesting license key.....	95
11.6	Activating a license key.....	96
11.6.1	Uploading license key from license file.....	97
11.6.2	Entering license key manually.....	97
11.7	Checking the Software options.....	98

12 Index.....	99
13 List of figures.....	100

1

Fundamentals

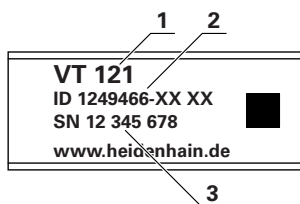
1.1 Overview

This chapter contains information about the product and this manual.

1.2 Information on the product

Product designation	Part number (ID)
VTC	1249466-01


The ID label is provided on the side panel that houses the connections:



- 1 Product designation
- 2 Part number
- 3 Serial number

1.2.1 Software for the product

In order to use the product, you need to install the VTC software on an IPC industrial computer with Microsoft Windows operating system. For information about how to install and use the software, please refer to the VTC User's Manual (ID 1322445).


 The product and its software can be used in conjunction with HEIDENHAIN TNC 640 controls with NC software 34059x-10 or later.

1.3 Documentation on the product

1.3.1 Validity of the documentation

Before using the documentation and the software, you need to verify that the documentation matches the software.

This User's Manual is valid for version 1280600.1.1.x of the VTC software for the VT 121 vision system.

 If the version numbers do not match so that the documentation is not valid, you will find the current documentation for the product at www.heidenhain.com.

1.3.2 Notes on reading this document

⚠ WARNING	
Fatal accidents, personal injury or property damage caused by non-compliance with the documentation!	
Failure to comply with the documentation may result in fatal accidents, personal injury or property damage.	
<ul style="list-style-type: none"> ▶ Read the documentation carefully from beginning to end ▶ Keep the documentation for future reference 	

The table below lists the components of the documentation in the order of priority for reading.

Document type	Description
Addendum	An addendum supplements or supersedes the corresponding contents of the Operating Instructions and the User's Manual.
Operating Instructions	The Operating Instructions contain all the information and safety precautions needed for the proper mounting and installation of the product. The Operating Instructions are included in delivery. This document has the second highest priority for reading.
User's Manual	The User's Manual contains all the information and safety precautions needed for the proper operation of the software according to its intended use. The User's Manual is included on the supplied storage medium and can be downloaded from the download area at www.heidenhain.com . The User's Manual has the third highest priority for reading.

Have you found any errors or would you like to suggest changes?

We continuously strive to improve our documentation for you. Please help us by sending your suggestions to the following e-mail address:

userdoc@heidenhain.de

1.3.3 Storage and distribution of the documentation

The instructions must be kept in the immediate vicinity of the workplace and must be available to all personnel at all times. The operating company must inform the personnel where these instructions are kept. If the instructions have become illegible, the operating company must obtain a new copy from the manufacturer.

If the product is given or resold to any other party, the following documents must be passed on to the new owner:

- Addendum (if supplied)
- Operating Instructions
- User's Manual

1.4 About these instructions

These instructions provide all the information and safety precautions needed for the proper operation of the VTC software.

1.4.1 Document type

User's Manual

These instructions are the **User's Manual** for the software.

The User's Manual

- Are oriented to the product life cycle
- Contain all information and safety precautions needed for the proper operation of the product according to its intended use

1.4.2 Target groups for the instructions

These instructions must be read and observed by every person who performs any of the following tasks:


- Software configuration
- Operation
- Service and maintenance


1.4.3 Notes in this documentation

Safety precautions

Precautionary statements warn of hazards in handling the product and provide information on their prevention. Precautionary statements are classified by hazard severity and divided into the following groups:

 DANGER
Danger indicates hazards for persons. If you do not follow the avoidance instructions, the hazard will result in death or severe injury .


 WARNING
Warning indicates hazards for persons. If you do not follow the avoidance instructions, the hazard could result in death or serious injury .


 CAUTION
Caution indicates hazards for persons. If you do not follow the avoidance instructions, the hazard could result in minor or moderate injury .

NOTICE
Notice indicates danger to material or data. If you do not follow the avoidance instructions, the hazard could result in property damage .


Informational notes

Informational notes ensure reliable and efficient operation of the product. Informational notes are divided into the following groups:

	The information symbol indicates a tip . A tip provides additional or supplementary information.
---	--

 The gear symbol indicates that the function described **depends on the machine**, e.g.

- Your machine must feature a certain software or hardware option
- The behavior of the functions depends on the configurable machine settings

 The book symbol represents a **cross reference** to external documentation, e.g. the documentation of your machine tool builder or other supplier.

1.4.4 Symbols and fonts used for marking text

Format	Meaning
▶ ...	Identifies an action and the result of this action Example: ▶ Tap OK > The message is closed
> ...	
■ ...	Identifies an item of a list Example: ■ TTL interface ■ EnDat interface ■ ...
■ ...	
■ ...	
Bold	Identifies menus, displays and buttons Example: ▶ Tap Shut down > The operating system shuts down ▶ Turn the power switch off

2

Safety

2.1 Overview

This chapter provides important safety information needed for the proper mounting and installation of the product.

2.2 General safety precautions

General accepted safety precautions, in particular the applicable precautions relating to the handling of live electrical equipment, must be followed when operating the system. Failure to observe these safety precautions may result in personal injury or damage to the product.

It is understood that safety rules within individual companies vary. If a conflict exists between the material contained in these instructions and the rules of a company using this system, the more stringent rules take precedence.

2.3 Intended use

The VTC software is intended solely for the following use:

- Inspection and visual checking of tools in milling centers

2.4 Improper use

Any use not specified in 'Intended use' is considered improper use. The machine manufacturer and the company operating the machine are solely liable for any damage resulting from improper use.

Especially its use as part of working-space monitoring or part of a safety function, as well as for tool measurement is not permitted.

2.5 Personnel qualification

The personnel for operating the product must be appropriately qualified for this work and must have obtained sufficient information from the documentation supplied with the product and with the connected peripherals.

The personnel required for the individual activities to be performed on the product are indicated in the respective sections of these instructions.

The personnel groups are specified in detail as follows with regard to their qualifications and tasks.

Operator

The operator uses and operates the product within the framework specified for the intended use. He is informed by the operating company about the special tasks and the potential hazards resulting from incorrect behavior.

Qualified personnel

The qualified personnel are trained by the operating company to perform advanced operation and parameterization. The qualified personnel have the required technical training, knowledge and experience and know the applicable regulations, and are thus capable of performing the assigned work regarding the application concerned and of proactively identifying and avoiding potential risks.

2.6 Obligations of the operating company

The operating company owns or leases the device and the peripherals. At all times, the operating company is responsible for ensuring that the intended use is complied with.

The operating company must:

- Assign the different tasks to be performed on the device to suitable, qualified and authorized personnel
- Verifiably train the personnel in the authorizations and tasks
- Provide all materials and means necessary in order for the personnel to complete the assigned tasks
- Ensure that the device is operated only when in perfect technical condition
- Ensure that the device is protected from unauthorized use

2.7 General safety precautions



The safety of any system incorporating the use of this product is the responsibility of the assembler or installer of the system.

The specific safety precautions required for the individual activities to be performed on the product are indicated in the respective sections of these instructions.

3

**Software
installation**

3.1 Overview

This chapter provides all of the information needed for downloading and properly installing VTC on a computer.

3.2 Installing the software

Downloading the installer

To install VTC, you need to download the installer from the **HEIDENHAIN Portal**.

- ▶ Download the current version from:
HEIDENHAIN Portal
- ▶ Navigate to the Download folder of your web browser
- ▶ Unzip the downloaded files into a temporary folder
- > The installer files will be unpacked into the temporary folder.

Verifying the requirements

In order to run VTC, you need a PC that meets the following minimum requirements:

- Quad-core processor
- Main memory: 8 GB RAM
- Hard disk space of 0.5 GB for approx. 1000 images
- Microsoft Windows 10

Installing VTC and the driver software



In order to perform the installation, you need to log in to Microsoft Windows as an administrator.

To install VTC and the driver software:

- ▶ Double-click each installer file to start it
- > The Setup Wizard opens.
- ▶ Accept the license conditions
- ▶ Follow the setup wizard instructions
- > VTC and the driver software are installed; if selected, a desktop icon is created.
- ▶ Click the **Finish** button to complete the installation process
- > VTC and the driver software have been installed successfully.

3.3 Requesting the license key and activating the application

Before starting VTC, you need to request a license key and enable VTC.

i You have the possibility of testing VTC based on a free-of-charge trial license. This trial license must also be enabled with a license key.

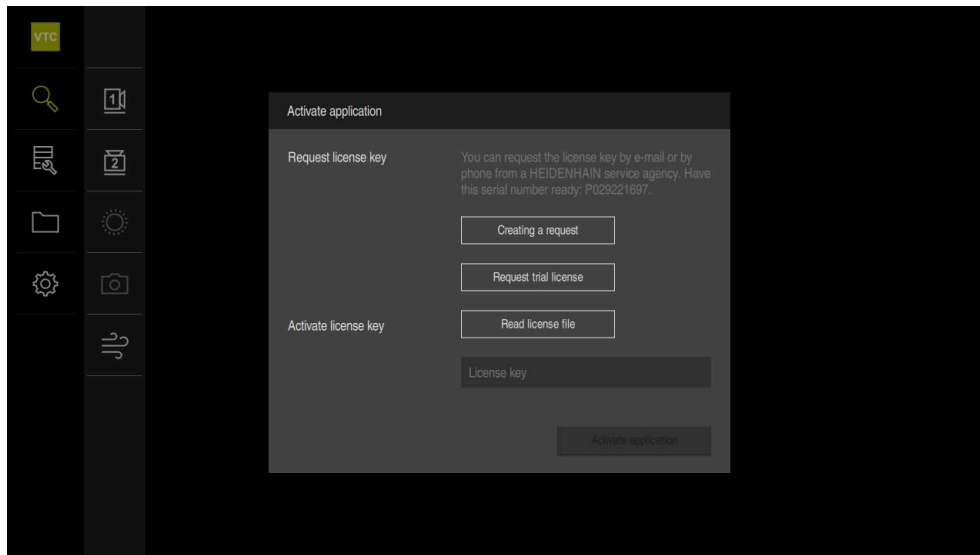


Figure 1: **Activate application** dialog box

Requesting the license key

- ▶ Tap **Creating a request** or **Request test license**
- ▶ In the dialog box, select the storage location in which you want to save the license key request
- ▶ Enter a suitable file name
- ▶ Confirm your input with **RET**
- ▶ Tap **Save as**
- > The license key request is created and saved in the selected folder.
- ▶ Contact a HEIDENHAIN service agency and submit the file you created in order to request a license key
- > The license key and the license file are generated and submitted by e-mail

Uploading the license key from the license file

- ▶ Tap **Read license file**
- ▶ Select the license file in the file system, on the USB mass storage device, or on the network drive
- ▶ Confirm your selection with **Select**
- ▶ Tap **OK**
- > The license key is activated
- ▶ Tap **OK**
- > VTC starts.

Entering the license key manually

- ▶ Enter the license key into the **License key** input field
- ▶ Confirm your input with **RET**
- ▶ Tap **Activate application**
- > The license key is activated.
- ▶ Tap **OK**
- > VTC starts.

4

Commissioning

4.1 Overview

This chapter contains all the information necessary for putting the product into operation. This requires the connection between the VT 121 vision system and the VTC software to be configured.

4.2 Configuring the vision system driver software


In order for VTC to detect the vision system, the connected VT 121 vision system must be configured by means of the IDS Camera Manager driver software.

To configure the connected vision system:

- ▶ Start the **IDS Camera Manager** driver software via the Microsoft Windows Start Menu.
- > An entry for the vision system is shown in the **Camera list** table.
- ▶ Tap the **Automatic ETH configuration** button
- > The configuration is automatically run and confirmed by means of a dialog box
- > The **Camera list** table shows the entry **Yes** in the columns **Free** and **Avail.**

If automatic configuration fails:

- ▶ Tap **Expert mode**
- ▶ The **IDS Camera Manager** dialog is expanded
- ▶ Tap the **Manual ETH configuration** button
- ▶ Enter the static IP address of the vision system in the **Parameters** area

 Have an IT specialist enter the IP address.

- ▶ Tap the **Close** button

4.3 Selecting the vision system

In order for VTC to control the vision system, you must select it in the settings.



- ▶ Tap **Settings** in the main menu



- ▶ Tap **Sensors**
- ▶ Tap **Camera**
- ▶ Select the desired vision system
- ▶ Click **Activate**
- > The selected vision system is available in VTC.

5

VTC cycles

5.1 Fundamentals



Refer to your machine manual.
This feature must be enabled and adapted by the machine tool builder.
Option 46 must have been enabled.



HEIDENHAIN only guarantees the proper operation of the VTC cycles if the vision system is calibrated with a HEIDENHAIN touch probe.

In order to use the camera-based tool inspection, you need the following components:

- VTC software
- Python (option 46)
- Hardware:
 - HEIDENHAIN VT 121 vision system and accessories
 - External computer unit with Microsoft Windows operating system
 - Touch probe

Application

The camera-based tool inspection allows you to inspect your tool visually on an external computer unit on the basis of images, thus checking it for wear. It also helps you to detect tool breakage before and during the machining process. The cycles become available on the control immediately after setup of the VTC software. You run the VTC software on an external computer unit with Microsoft Windows operating system.

Visual tool inspection can be performed on cylindrical, ball-nose, or toroid cutters. Camera 2 also allows you to visually inspect drills. The minimum tool diameter is 0.2 mm, or 0.1 mm for breakage control, or 1.9 mm for the MEASURING CUTTING EDGE ANGLES cycle. The maximum tool radius is 15 mm for permanently sharp images of ball-nose and toroid cutters.

The control uses the following tool management entries to identify the different tool types.

Tool shape	R	R2	T-ANGLE
Cylindrical cutter	> 0	0	0
Ball-nose cutter	> 0	= R	0
Toroid cutter	> 0	> 0 and < R	0
Drill	> 0	0	> 0

Terms

The following terms are used in connection with VTC:

Term	Explanation
Camera 1	Usually shows the tool from the side.
Camera 2	Usually shows the tool from below.
Single shot	A single shot is an image of an individual cutting edge.
Panoramic image	A panoramic image is a 360° view of the tool, possibly with inspection mode.
Mosaic image	A mosaic image is a complete image of the tool from below.
Profile image	A profile image is an image of individual cutting edges of ball-nose or toroid cutters with indexable inserts.
Tool evaluation	The images that were taken are stored in the tool evaluation.
Clearance height	The clearance height is specified in the cycle. The clearance height is 20.5 mm and is based on the reference surface of camera 2.
Safety clearance	The safety clearance is specified in the cycle. The safety clearance is 20.5 mm and is based on the reference surface of camera 1.

Things to keep in mind regarding VTC cycles

All VTC cycles are DEF-active. The control runs the cycle automatically as soon as it reads the cycle definition in the program run.



Your machine tool builder defines the feed rates, positioning and spindle speed.

NOTICE

Danger of collision!

Danger of collision if the tool is positioned automatically in front of the camera. The camera, the machine and the tool may be damaged.

- ▶ Refer to the machine manual to learn about the coordinates the tool is positioned to by the control
- ▶ If required, move to maximum height with **M140 MB MAX** prior to positioning

NOTICE

Danger of collision!

When camera 1 is used, the cycle moves the tool to the outer tool radius. If the radius of the tool shaft is larger than the tool radius, there is danger of collision.

- ▶ Test the NC program or program section in **Program run, single block** operating mode

NOTICE

Danger of collision!

If you switched on the spindle before calling the cycle, the control will **not** reconstruct this previous state at the end of the cycle if there is a cycle **interruption**. There is a danger of collision!

- ▶ Check the spindle speed after execution of the cycle. If necessary, call the tool again with the required speed.
- ▶ Program a spindle start after an interruption of the NC program

NOTICE

Danger of collision!

If the tool has not been measured based on its bottom edge, then there is a danger of collision!

- ▶ Measure the tool based on its bottom edge.

NOTICE

Danger of collision!

If the actual tool diameter is greater than the measured tool diameter, then there is a danger of collision with camera 1!

- ▶ Measure the tool based on its outermost radius where appropriate

- HEIDENHAIN recommends executing the cycle in **FUNCTION MODE MILL** machining mode.
- To attain useful results, the light must be adjusted optimally. Cycle **621 MANUAL INSPECTION** allows you to adjust the light.
- The images must be taken in the same position of the rotary axes and with the same kinematic configuration that was used for the calibration of the vision system. Your machine manufacturer can save this position setting in the cycles, if required.

5.1.1 VTC tool table

Use the **VTC-TOOLS.TAB** to save the data that you need to take single shots. The table can be found in the **TNC:\table** folder.

Abbr.	Inputs	Dialog
T	Tool number Tool number from the TOOL.T	-
START-ANGLE	Spindle angle of the cutting edge You can use Cycle 624 to determine or manually enter the spindle angles of the cutting edges. The minimum tool diameter is 1.9 mm for automatic cutting edge measurement.	Spindle angle of the first cutting edge
TOOL-ID	Tool ID number The tool ID number enables the operator to identify the tool in the tool evaluation. The ID number consists of the current date and a timestamp accurate to the second, e.g. 20191014112159 .	TOOL-ID
ANGLE-2 to ANGLE-32	Spindle angle of cutting edges 2 to 32 You can use Cycle 624 to determine or manually enter the spindle angles of the cutting edges.	Spindle angle of the second cutting edge
REF-ANGLE	Contact angle in degrees Using the contact angle, you define the point on the tool radius R or R2 to which the camera will focus on the tool. This value is effective for ball-nose and toroid cutters only.	Contact angle



Operating notes:

- If the cutting edges are spaced evenly along the circumference of the milling tool, one angle and the number of cutting edges are sufficient in the tool table.
- You can ascertain the spindle angle of the cutting edge with Cycle **624** or by means of a tool presetter.
- The tool is saved until you delete it manually or overwrite it with a tool with identical tool number **T**.

5.1.2 Overview

The control provides cycles that enable you to program camera-based tool monitoring:

Proceed as follows:

- ▶ Select the **TOUCH PROBE** soft key
- > The control displays various cycle groups.
- ▶ Select **VT 121 VISION SYSTEM**

The control provides the following cycles:

Cycle number	Cycle	Page
620	VT 121 CALIBRATION <ul style="list-style-type: none"> ■ Calibration of the vision system 	31
621	MANUAL INSPECTION <ul style="list-style-type: none"> ■ Tool check with live image ■ Adjustment of lighting ■ Selection of camera 1 or camera 2 	32
622	IMAGES <ul style="list-style-type: none"> ■ Automatic taking and storage of images ■ Selection of image capture mode ■ Selection of camera 1 and/or camera 2 	34
623	BREAKAGE CHECK <ul style="list-style-type: none"> ■ Simple breakage detection ■ Selection of camera 1 	37
624	MEASUREMENT OF CUTTING EDGE ANGLE <ul style="list-style-type: none"> ■ Automatic measurement of the spindle angle of all cutting edges ■ Selection of camera 2 	39

5.2 Cycle 620 VT 121 CALIBRATION

Application

Cycle **620 VT 121 CALIBRATION** allows you to calibrate the vision system by using a touch probe.

The cycle uses the circular top surface of the camera as starting position. You have to pre-position your touch probe manually above the starting position before or during the cycle.

The coordinates of the vision system determined during calibration are coordinates in the machine coordinate system.

Cycle run:

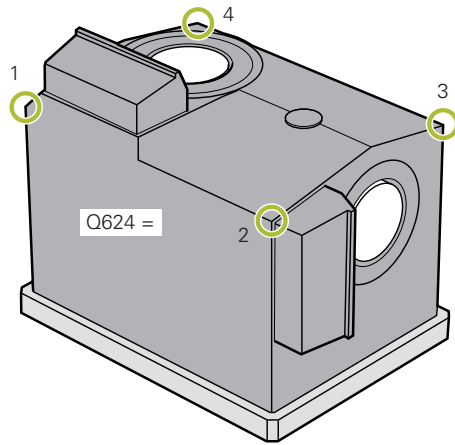
- 1 This cycle interrupts the NC program.
- 2 The control displays a dialog window indicating that the touch probe must be placed at the right position.
- 3 Manual intervention:
 - ▶ Position the touch probe above the circular surface.
 - ▶ Press **NC start** as soon as the touch probe has reached the right position.
- 4 Then the control probes the circular surface in the tool axis.
- 5 The touch probe moves to the adjacent sides of the corner point **Q624** and probes the two sides.
- 6 At the end, the touch probe returns to the clearance height.

Notes

- VTC cannot be run actively in combination with **Tilt working plane**.
- **Further information:** "Things to keep in mind regarding VTC cycles", Page 28

5.2.1 Cycle parameters

Help graphic



Parameter

Q623 Viewing angle of side camera X+

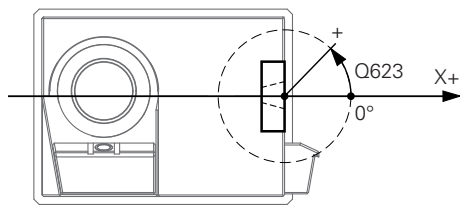
Approximate angle ($\pm 10^\circ$) of the viewing direction of camera 1 from the principal axis X+. The control determines the exact angle during calibration.

Input: **0...360**

Q624 Number of corner for preset

The number of the corner defines the adjacent sides to be probed.

Input: **1, 2, 3, 4**



Example

11 TCH PROBE 620 VT 121 CALIBRATION ~	
Q623=+0	;VIEWING ANGLE ~
Q624=+1	;NUMBER OF CORNER

5.3 Cycle 621 MANUAL INSPECTION

Application

Cycle **621 MANUAL INSPECTION** allows you to check tools visually and adjust the lighting.

Cycle run:

- 1 The control moves the tool to the clearance height and then positions it in front of the selected camera.
 - **Q620 = 1**: The control positions the tool next to camera 1, shifted by the tool radius and the safety clearance. Positioning depends on **Q629 Contact angle**.
 - **Q620 = 2**: The control positions the tool to the clearance height above the camera 2.
- 2 Then the cycle deactivates any spindle revolution that may be active.
- 3 You can resume the cycle with **NC start**.
- 4 At the end of the cycle, the control positions the tool to the clearance height.
- 5 If the spindle revolution was active before the cycle call, the control restores this condition at the end of the cycle.

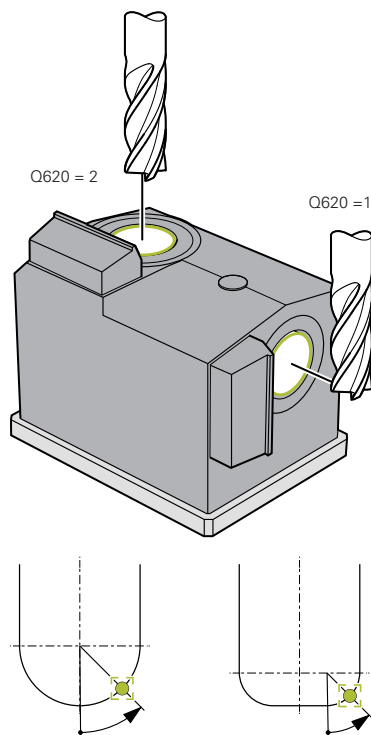
Further information: "Things to keep in mind regarding VTC cycles", Page 28

Cleaning function

- Before the start of the cycle, the compressed-air jets on the two cameras are activated for two seconds.
- Before the **MANUAL INSPECTION** cycle, compressed air is applied to the tool for one second.

5.3.1 Cycle parameters

Help graphic



Parameter

Q620 Selection of the camera(s)

Select the camera 1 or camera 2:

1: Camera 1 – live image of the tool from the side

2: Camera 2 – live image of the tool from below

Input: **1, 2**

Q629 Contact angle at R/R2

Using the contact angle, you define the point on the tool radius or **R2** to which the camera will focus on the tool.

>= 1: The control uses the defined contact angle to focus on the individual cutting edges.

0: No contact point; the control focuses on the lower cutting edge of the tool.

-1: **REF-ANGLE** value from the VTC tool table

This parameter is effective for ball-nose and toroid cutters only.

Input: **-1...90**

Example

```
11 TCH PROBE 621 MANUAL INSPECTION ~
```

```
Q620=+1 ;CAMERA SELECTION ~
```

```
Q629=+0 ;CONTACT ANGLE
```

5.4 Cycle 622 IMAGES

Application

Cycle **622 IMAGES** allows you to take and store images of the tool.

Cycle run:

- 1 The control moves the tool to the clearance height and then positions it in front of the selected camera:
 - **Q620 = 1**: The control positions the tool next to camera 1, shifted by the tool radius and the safety clearance.
 - **Q620 = 2**: The control positions the tool to the clearance height above the camera 2.
- 2 The spindle revolution is stopped or reduced depending on **Q621**:
 - Panoramic image at camera 1: Spindle revolution is reduced
 - Panoramic image at camera 2: Spindle revolution is stopped
 - Single shot: Spindle revolution is stopped
- 3 The cycle generates the desired images
 - If **Q622** is not equal to 0, the control takes multiple images on several focal planes, depending on radius **R2**.
- 4 The external computer unit saves the images in the tool evaluation of the VTC software in the subfolder defined.
- 5 At the end of the cycle, the control positions the tool to the clearance height.
- 6 If the spindle revolution was active before the cycle call, the control restores this condition at the end of the cycle.

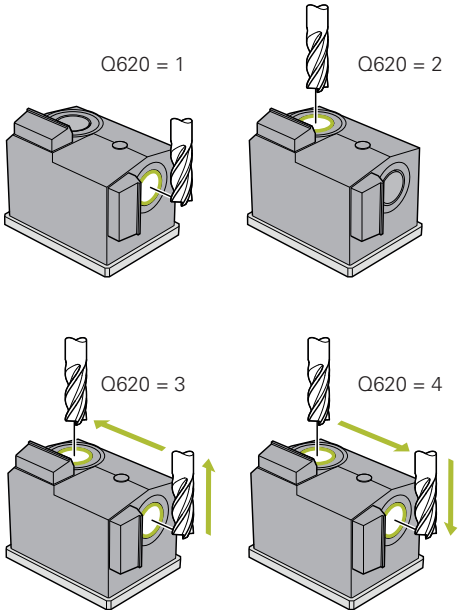
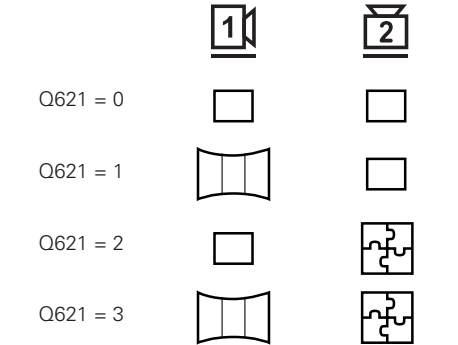
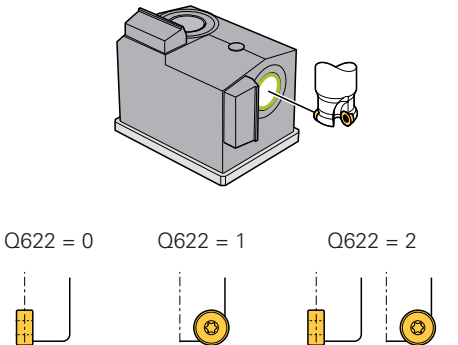

Cleaning function

- Before the start of the cycle, the compressed-air jets on the two cameras are activated for two seconds.
- Before an image is taken, compressed air is applied to the tool for one second.
- During the single shots, compressed air is applied to each required cutting edge for half a second.
- When panoramic images are taken, compressed air is applied to the tool briefly at the beginning of imaging.

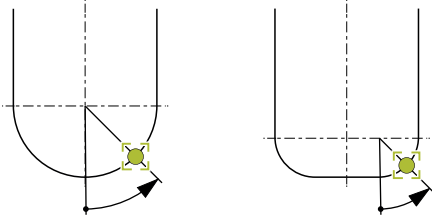
Notes

- When you program individual shots, the spindle angles of the cutting edges must be specified in the **VTC-TOOLS.TAB**.
Further information: "VTC tool table", Page 29
Further information: "Things to keep in mind regarding VTC cycles", Page 28
- The profile view is intended for ball-nose cutters or toroid cutters with indexable inserts without twist.
- If you define a mosaic image to be taken by camera 2, then the camera will take multiple images of the bottom of the tool and will automatically compose them into one sharp image.

5.4.1 Cycle parameters

Help graphic	Parameter
	<p>QS610 Designation for the job Name of the folder in which the images are stored in the tool evaluation. Input: Max. 255 characters</p>
	<p>Q620 Selection of the camera(s) Select the camera 1 or camera 2: 1: Images are captured by camera 1 2: Images are captured by camera 2 3: Images are first captured by camera 1, and then by camera 2 4: Images are first captured by camera 2, and then by camera 1 Input: 1, 2, 3, 4</p>
	<p>Q621 Selection of image capture mode Selection of single shot, panoramic image, or mosaic image: 0: Single shots by camera 1 and single shots by camera 2 1: Panoramic image by camera 1 and single shots by camera 2 2: Single shots by camera 1 and mosaic image by camera 2 3: Panoramic image by camera 1 and mosaic image by camera 2 Input: 0, 1, 2, 3</p>
	<p>Q622 Selection of view Selection of plan view image or profile view image of the cutting edge. This process is repeated for each cutting edge stored. 0: Plan view of single cutting edge. If Q629 = 0, the camera takes multiple images of the individual cutting edges on several focal planes. The VTC software composes the individual images into one sharp image. 1: Profile view; the control rotates the tool by 90° and shifts the tool such that the camera's focus is on the profile of the cutting edge. The camera takes an image of the complete profile of the cutting edge. If the profile cannot be captured in one image, the control moves the tool in the machining plane and takes multiple images of the profile of the cutting edge. The VTC software composes the individual images into one image. 2: The camera takes an image of the plan view and then an image of the profile view of the individual cutting edges. See modes 0 and 1. This parameter is effective for camera 1 only. Input: 0, 1, 2</p>

Help graphic



Parameter

Q629 Contact angle at R/R2

Using the contact angle, you define the point on the tool radius or **R2** to which the camera will focus on the tool.

>= 1: The control uses the defined contact angle to focus on the individual cutting edges.

0: No contact point; the control focuses on the lower cutting edge of the tool.

-1: **REF-ANGLE** value from the VTC tool table

This parameter is effective for ball-nose and toroid cutters only.

Input: **-1...90**

Example

11 TCH PROBE 622 IMAGES ~	
QS610=""	;JOB NAME ~
Q620=+1	;CAMERA SELECTION ~
Q621=+0	;IMAGE CAPTURE MODE ~
Q622=+0	;SELECTION OF VIEW ~
Q629=+0	;CONTACT ANGLE


5.5 Cycle 623 BREAKAGE CHECK

Application

Cycle **623 BREAKAGE CHECK** helps you to detect tool breakage. The control saves the result in parameter **Q601**. You can check cylindrical cutters, drills, ball-nose cutters, and toroid cutters for breakage.

Cycle run:

- 1 The control moves the tool to the clearance height and then positions it next to camera 1 on the outermost tool radius plus safety clearance.
- 2 The control switches on the spindle.
- 3 The VTC software compares the breakage check value with the **LBREAK** value from the control and checks whether the tool is broken or not. The control saves the result in **Q601**.
- 4 At the end of the cycle, the control positions the tool to the clearance height.
- 5 If the spindle revolution was active before the cycle call, the control restores this condition at the end of the cycle.

 The control moves ball-nose cutters, toroid cutters, and drills closer to the camera than cylindrical cutters:

- Ball-nose cutter: Closer to the camera by **R**
- Toroid cutter: Closer to the camera by **R2**
- Drill: Closer to the camera by **R**


Result parameters Q601:

Result	Meaning
0	No result found
1	Tool is not broken
2	Tool is broken

Cleaning function

- Before the start of the cycle, the compressed-air jets on the two cameras are activated for two seconds.
- Before an image is taken, compressed air is applied directly to the tool for one second.

Notes

 Your machine manufacturer specifies whether your tool will be locked in case of breakage.

- If **LBREAK** is specified in the tool table, the breakage check can be performed on the tool.
- **Further information:** "Things to keep in mind regarding VTC cycles", Page 28
- The control is capable of checking ball-nose cutters, toroid cutters, and drills with a tool diameter of no more than 15 mm.

5.5.1 Cycle parameters

Help graphic	Parameter
	Cycle 623 does not have a cycle parameter. Finish the cycle input with the END key.

Example

```
11 TCH PROBE 623 BREAKAGE CHECK
```

5.5.2 Possible queries

The **BREAKAGE CONTROL** cycle enters a value in parameter **Q601**.

The following values are possible:

- **Q601** = 0: No result
- **Q601** = 1: Tool not broken
- **Q601** = 2: Tool broken

Example showing a request of parameter **Q601**:

0 BEGIN PGM 6 MM	
1 BLK FORM CYLINDER Z R42 L150	Workpiece blank definition: cylinder
2 FUNCTION MODE MILL	Activate milling mode
3 TOOL CALL 1 Z S4500	
4 L Z+250 R0 FMAX M3	
5 LBL 20	
6 TCH PROBE 623 BREAKAGE CHECK	Define Cycle 623
7 FN 9: IF +Q601 EQU +0 GOTO LBL 20	If parameter Q601 = 0, then jump to LBL 20
8 FN 9: IF +Q601 EQU +1 GOTO LBL 21	If parameter Q601 = 1, then jump to LBL 21
9 FN 9: IF +Q601 EQU +2 GOTO LBL 22	If parameter Q601 = 2, then jump to LBL 22
10 LBL 21	Program the machining operation
...	
57 LBL 22	Definition of LBL 22
58 STOP	Program stop; the operator can inspect the tool
59 LBL 0	
60 END PGM 6 MM	

5.6 Cycle 624 MEASURING CUTTING EDGE ANGLES

Application

Cycle **624 MEASURING CUTTING EDGE ANGLES** allows you to automatically determine the spindle angles of the cutting edges. The control enters them in the **VTC-TOOLS.TAB** table.

Further information: "VTC tool table", Page 29

The spindle angles of the cutting edges are needed for prepositioning in Cycle **621**, and for individual shots and profile images in Cycle **622**. **Cycle 624** is therefore recommended for every tool being used.

Cycle run:

- 1 The control moves the tool to the clearance height and then positions it above camera 2.
- 2 If a spindle revolution is activated, the control stops this movement.
- 3 The cycle automatically determines the spindle angles of the cutting edges.
- 4 The spindle angles are entered in the **VTC-TOOLS.TAB** table.
- 5 At the end of the cycle, the control positions the tool to the clearance height
- 6 If the spindle revolution was active before the cycle call, the control restores this condition at the end of the cycle.

Cleaning function

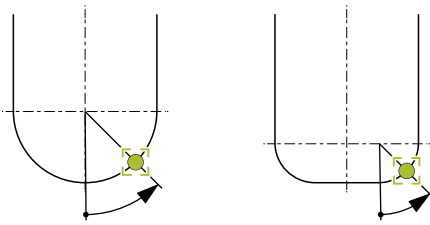
- Before the start of the cycle, the compressed-air jets on the two cameras are activated for two seconds.
- Before an image is taken, compressed air is applied directly to the tool for one second.
- During measurement of the spindle angles of the cutting edges, compressed air is applied to each successive cutting edge for half a second.

Notes

- For optimum cutting edge measurement, HEIDENHAIN recommends programming a value between +30° and +60° in parameter **Q629 Contact angle**.
- Measurement of the spindle angle of the cutting edges can be performed only with cylindrical, ball-nose, or toroid cutters.
- **Further information:** "Things to keep in mind regarding VTC cycles", Page 28

5.6.1 Cycle parameters

Help graphic	Parameter
	<p>Q625 Assign new tool ID</p> <p>In order to identify the tool in the tool evaluation, a tool ID number must have been assigned. This makes it possible to distinguish the tools. The tool ID numbers are stored in the VTC-TOOLS.TAB table.</p> <p>0: If a tool ID number exists, the control will use it. If there is no tool ID number, the control adds a new line with the active tool and assigns a new tool ID number.</p> <p>1: The control always generates a new tool ID number. If an ID number was already assigned for this tool, it is overwritten.</p> <p>Input: 0, 1</p> <p>Further information: "VTC tool table", Page 29</p>



Q629 Contact angle at R/R2

Using the contact angle, you define the point on the tool radius **R** or **R2** to which the camera will focus on the tool and measure the cutting edge.

>= 1: The control uses the defined contact angle to focus on the individual cutting edges.

The control stores this value in the **REF-ANGLE** column of the VTC tool table.

This parameter is effective for ball-nose and toroid cutters only.

Input: **1...90**

Example

11 TCH PROBE 624 MEASUREMENT OF CUTTING EDGE ANGLE ~	
Q625=+0	;NEW TOOL ID ~
Q629=+30	;CONTACT ANGLE

6

Basic operation

6.1 Overview

This chapter describes the user interface, operating elements and basic functions of the software.

6.2 Operation with touchscreen and gestures

The user interface of the VTC software is operated with gestures on the touchscreen or with a connected mouse.

To enter data, you can use the screen keyboard of the touchscreen.

i The gestures for operating the touchscreen may differ from the gestures for operating the mouse.
If the gestures for operating the touchscreen differ from those for operating the mouse, then these instructions describe both operating options as alternative actions.
The alternative actions for operating the touchscreen or the mouse are identified by the following symbols:



Operation using the touchscreen



Operation using the mouse

The following overview describes the different gestures for operating the touchscreen or the mouse:

Tapping



Means touching the screen briefly with your fingertip



Means pressing the left mouse button once

The actions initiated by tapping include



- Selection of menus, features, or parameters
- Entering characters with the screen keyboard
- Closing dialogs

Double-tap



Means touching the screen twice briefly with your finger tip



Means pressing the left mouse button twice

Double tapping leads to the following actions, for example:

- Magnify or minimize images in the Display function and the Inspection View function

Holding (long press)



Means touching the screen and holding your finger(s) on it for a few seconds



Means pressing the left mouse button once and holding it down

The actions initiated by holding are

- Quickly changing the values in input fields with plus and minus buttons

Dragging



Is a combination of long press and then swipe, moving a finger over the touchscreen when at least the starting point of motion is defined



Means pressing the left mouse button once and holding it down while moving the mouse; at least the starting point of the motion is defined

The actions initiated by dragging include

- Scrolling through lists and texts

6.3 General operating elements and functions

The operating elements described below are available for configuration and operating the product via the touchscreen or input devices.

Screen keyboard

With the screen keyboard, you can enter text into the input fields of the user interface. Depending on the input field, a numeric or alphanumeric screen keyboard is shown.

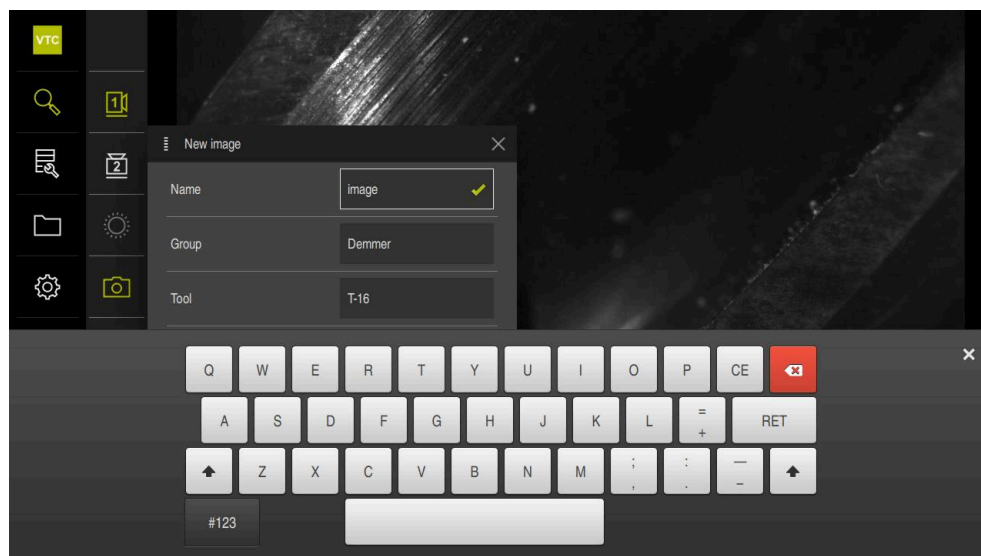


Figure 2: Screen keyboard

- ▶ To enter values, tap an input field
- > The input field is highlighted
- > The screen keyboard is displayed
- ▶ Enter text or numbers
- > The correctness of the entry in the input field is shown with a green check mark, if applicable
- > If the entry is incomplete or incorrect, a red exclamation mark is displayed. In this case, the entry cannot be completed
- ▶ To apply the values, confirm the entry with **RET**
- > The values are displayed
- > The screen keyboard disappears

Input fields with plus and minus buttons

To adjust a numerical value, use the + (plus) and - (minus) buttons to the left and right of the numerical value.



- ▶ Tap + or - until the desired value is displayed
- ▶ Long-press + or - to scroll through the values more quickly
- > The selected value is displayed

Slide switch

With the slide switch, you can activate or deactivate a function.



- ▶ Drag the slide switch to the desired position
- or
- ▶ Tap the slide switch
- ▶ The function is activated or deactivated

Slider

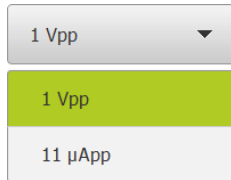
Use the slider (horizontal or vertical) to continuously adjust values.



- ▶ Drag the slider to the desired position
- ▶ The selected value is displayed graphically or in percent

Drop-down list

Buttons that open drop-down lists are indicated by a triangle pointing down.



- ▶ Tap the button
- ▶ The drop-down list opens
- ▶ The active entry is highlighted in green
- ▶ Tap the desired entry
- ▶ The selected entry is applied

Operating element	Function
	Close <ul style="list-style-type: none"> ▶ Tap Close to close a dialog
	Confirm <ul style="list-style-type: none"> ▶ Tap Confirm to conclude an action
	Back <ul style="list-style-type: none"> ▶ Tap Back to return to the higher level in the menu structure







6.4 User interface

6.5 Main menu of the user interface

User interface of the VTC software

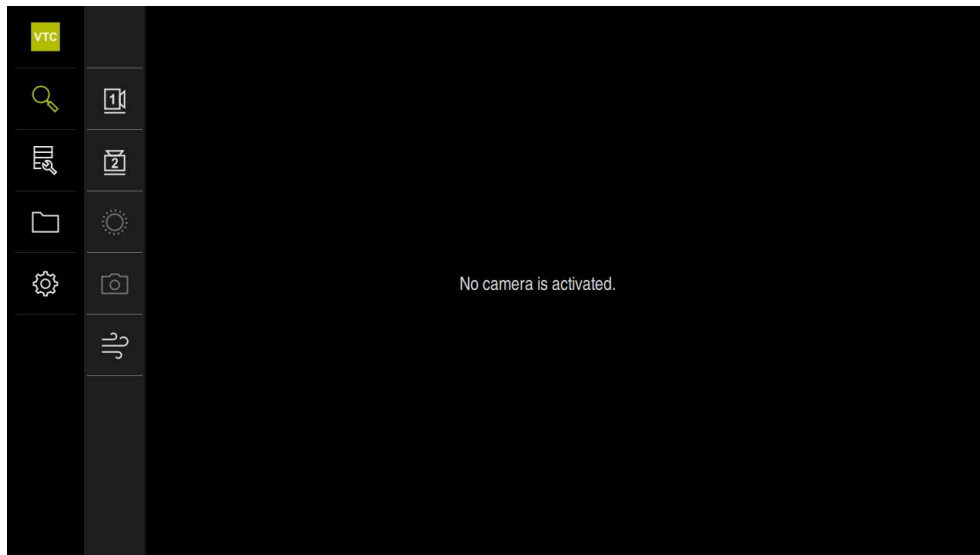






Figure 3: Main menu of the user interface

Main menu operating elements

Operating element	Function
	<p>Manual tool inspection</p> <p>Live image of the tool with choice of camera, lighting control by means of the lighting palette and taking of single shots and panoramic images</p>
	<p>Tool evaluation</p> <p>Overview of the images taken and evaluation of the tool condition</p>
	<p>File management</p> <p>Management of the files that are available on the control</p>
	<p>Settings</p> <p>Settings of the product, such as software configuration or enabling of software options</p>

6.6 Manual tool inspection menu

Activation








- ▶ Tap **Manual tool inspection** in the main menu
- > The user interface for the tool inspection is displayed

Short description



Figure 4: **Manual tool inspection** menu

Functions

Operating element	Function
	Camera 1 Usually shows the tool from the side
	Camera 2 Usually shows the tool from below
	Lighting palette Setting the lighting with the LEDs on the device
	New image Taking a single shot or panoramic image
	Blow off Activation of the product's jet blocks for cleaning the cover glasses and the tool with compressed air

6.7 Tool evaluation menu

Activation



- ▶ Tap **Tool evaluation** in the main menu
- ▶ The user interface for the evaluation of the tool condition is displayed

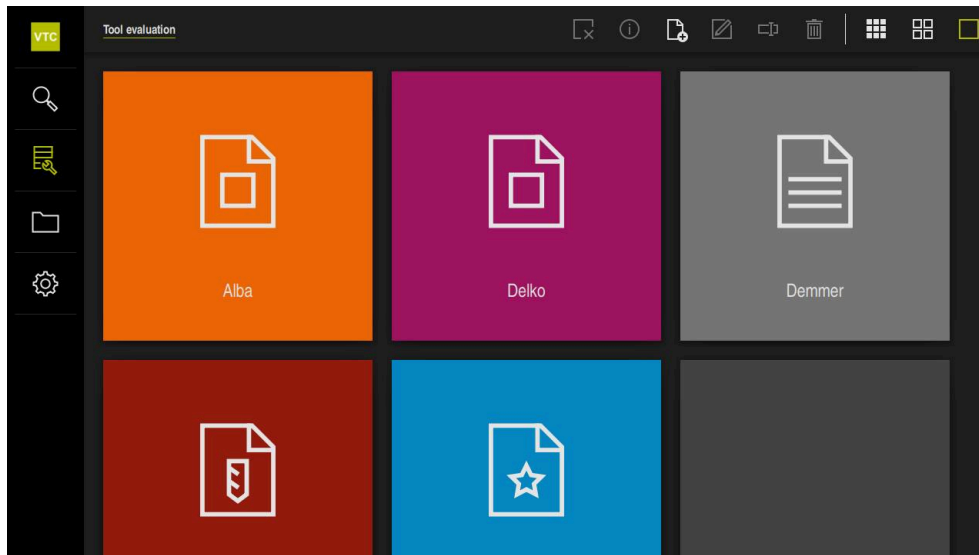


Figure 5: **Tool evaluation** menu

Navigation elements

The **Tool evaluation** menu has several menu levels that are based on one another. The navigation path in the function area helps you to orient yourself within the menu levels.

Tool evaluation ▶ Group ▶ Tool ▶ Image series

6.8 File management menu

Calling up



- ▶ Tap **File management** in the main menu
- ▶ The file management user interface is displayed

Short description

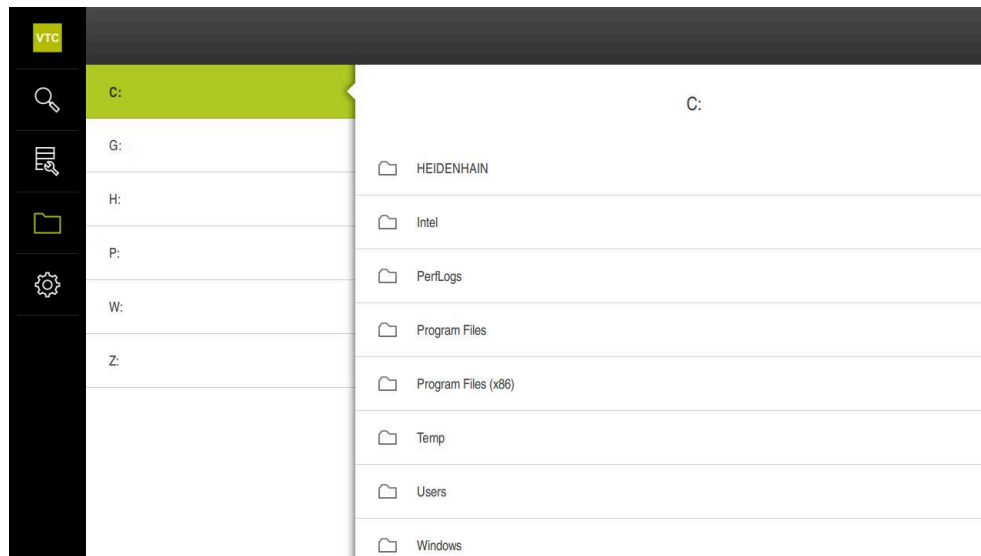


Figure 6: **File management** menu

The **File management** menu shows an overview of the files stored in the control's memory.

6.9 Settings menu

Calling up



- ▶ Tap **Settings** in the main menu
- > The user interface for the product settings is displayed

Short description

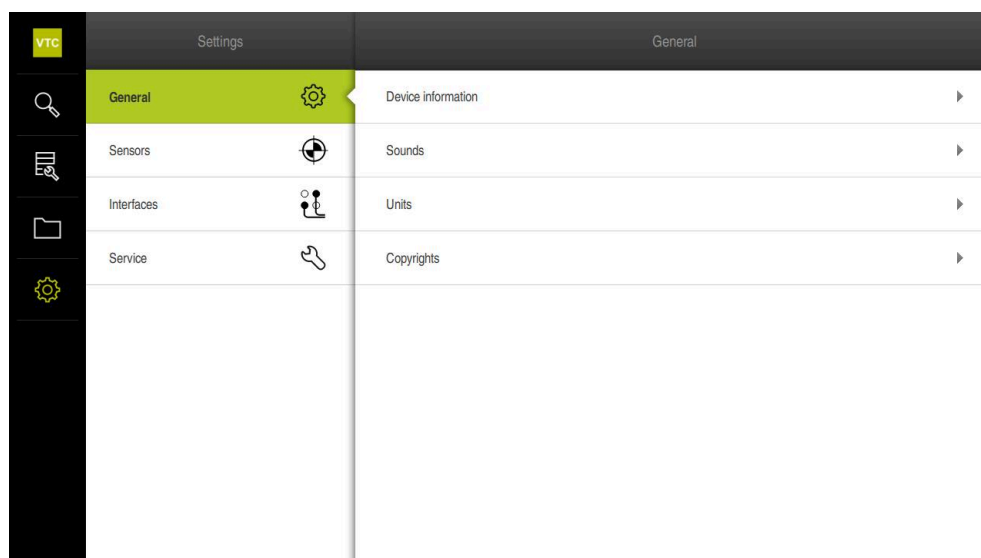


Figure 7: **Settings** menu

The **Settings** menu shows all of the options for configuring the product. The settings parameters allow you to adapt the product to on-site requirements.

7

**Manual tool
inspection**

7.1 Overview

In the **Manual tool inspection** menu, you can view the live image of a camera. You can also configure the lighting and save an image. The live image can be called via Cycle **621** at the connected control.



Figure 8: **Manual tool inspection** menu

7.2 Displaying a camera image

Camera 1 shows the side view of the tool. Camera 2 shows the tool view from below.

The camera views are activated via Cycle **621**.

To switch manually between the camera views of camera 1 and camera 2:



- ▶ Tap **Camera 1** to show the side view
- > The side view is displayed
- > The active camera is displayed in green



- ▶ Tap **Camera 2** to show the bottom view
- > The bottom view is displayed
- > The active camera is displayed in green

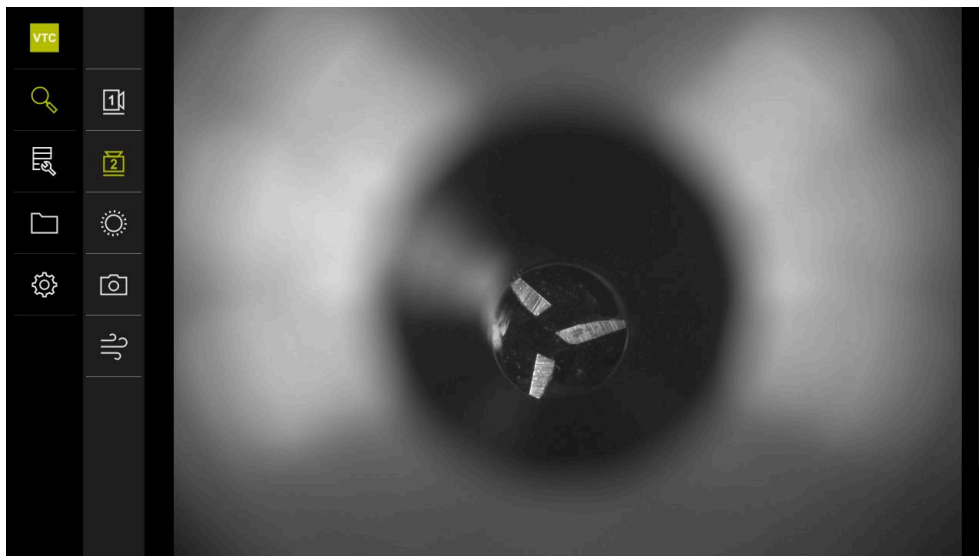


Figure 9: Live image of camera 2

7.3 Lighting palette

You can individually adapt the brightness of the LEDs on the device depending on the light conditions inside the machine tool. Camera 1 and camera 2 each have a ring light with twelve LEDs for this purpose.

Under **Simple**, you can set the brightness of the individual sectors. Under **Extended**, you can control each LED in the ring light separately.

7.3.1 Opening the lighting palette



- ▶ Tap **Lighting** in the **Manual tool inspection** menu
- ▶ The **Simple** lighting palette is opened
- ▶ Tap **Extended** to control each LED separately
- ▶ The **Extended** lighting palette is opened

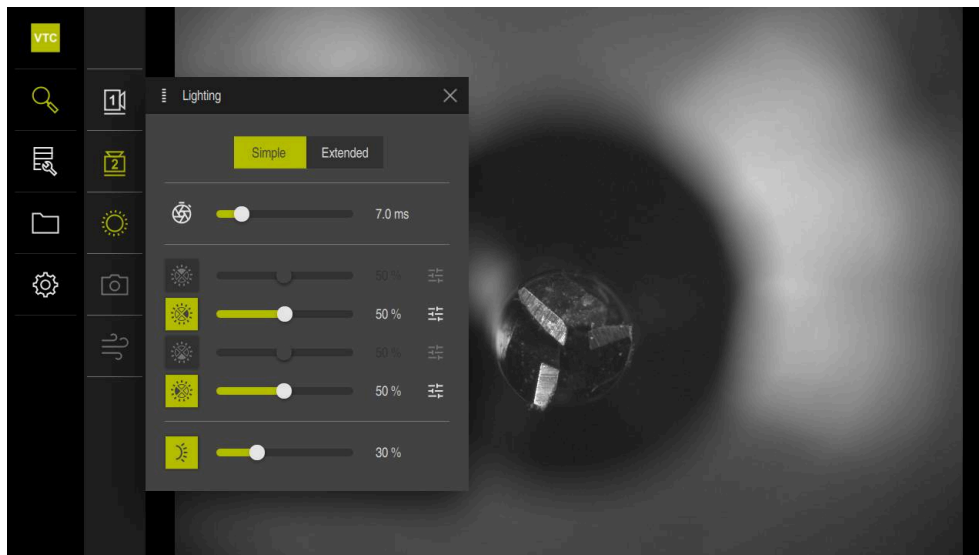





Figure 10: **Lighting** dialog box

7.3.2 Operating elements of the Lighting palette

The lighting palette in simple and extended mode is configured via sliders. In simple mode, the sliders show the average value of the three LEDs in percent. In extended mode, the sliders show the individual values of the LEDs.

Symbol	Explanation
	<p>Simple: Exposure time with an accuracy of 1/10 ms</p> <p>Extended: Exposure time with an accuracy of 1/100 ms</p> <ul style="list-style-type: none"> Settings: 0 ms...66 ms Default setting: 7 ms <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  The settings options vary depending on the connected vision system. </div>
	<p>Simple: Average brightness of the upper sector</p> <p>Extended: Brightness of the upper three LEDs. The LEDs can be controlled separately.</p> <ul style="list-style-type: none"> Settings: 0%...100% Default setting: 50%
	<p>Simple: Average brightness of the right-hand sector</p> <p>Extended: Brightness of the upper three LEDs. The LEDs can be controlled separately.</p> <ul style="list-style-type: none"> Settings: 0 % ... 100 % Default setting: 50 %
	<p>Simple: Average brightness of the lower sector</p> <p>Extended: Brightness of the lower three LEDs. The LEDs can be controlled separately.</p> <ul style="list-style-type: none"> Settings: 0 % ... 100 % Default setting: 50 %
	<p>Simple: Average brightness of the left-hand sector</p> <p>Extended: Brightness of the three left-hand LEDs. The LEDs can be controlled separately.</p> <ul style="list-style-type: none"> Settings: 0 % ... 100 % Default setting: 50 %
	<p>The operating element is displayed in simple mode if three bundled LEDs have different lighting values.</p>
	<p>Brightness of the lateral LED on the jet block</p> <ul style="list-style-type: none"> Settings: 0 % ... 100 % Default setting: 50 %

7.3.3 Configuring the lighting

The lighting palette provides sliders for stepless adjustment of the lighting. In simple mode, the sliders show the average value of the three LEDs in percent. In extended mode, the sliders show the individual values of the LEDs in percent.

The percentage value shows the brightness setting of the LEDs for the respective camera. If the value is below 100 %, the LEDs are dimmed.

To adjust the lighting:

Configuring the lighting in simple mode



- ▶ Select the desired camera



- ▶ Tap **Lighting**
- ▶ To set the brightness of individual sectors, tap **Simple**
- ▶ To activate the sensor, tap the corresponding operating element
- > The operating element and the slider are displayed in green
- ▶ To set the desired lighting, drag the slider horizontally to the right or left
- > The lighting is adjusted

Configuring the lighting in extended mode



- ▶ Select the desired camera



- ▶ Tap **Lighting**
- ▶ To set the brightness of individual LEDs, tap **Extended**
- ▶ To activate the sensor, tap the corresponding operating element
- > The operating element and the slider are displayed in green
- ▶ To set the desired lighting, drag the slider horizontally to the right or left
- > The lighting is adjusted



The lighting that was configured in one mode is automatically transferred to the other lighting mode.

Closing the lighting palette



- ▶ Tap **Close** to close the dialog
- or



- ▶ Tap **Lighting**
- > The lighting configuration is saved
- > The dialog is closed

7.4 Manual single shots

You can manually take images of a live image and save them. Based on the images, you can inspect the tool for breakage.

i To take an image, enter the name, group, and tool in the **New image** dialog.
This information is necessary to be able to save an image in the **Tool evaluation**.

i If you create and open a group and a tool entry in the **Tool evaluation** menu beforehand, this information is automatically transferred when a new image is taken.

Further information: "Add group", Page 63

Further information: "Add tool entry", Page 66

7.4.1 Opening a manual single shot



- ▶ Tap **Record** in the Manual tool inspection menu
- > The **New image** dialog box appears

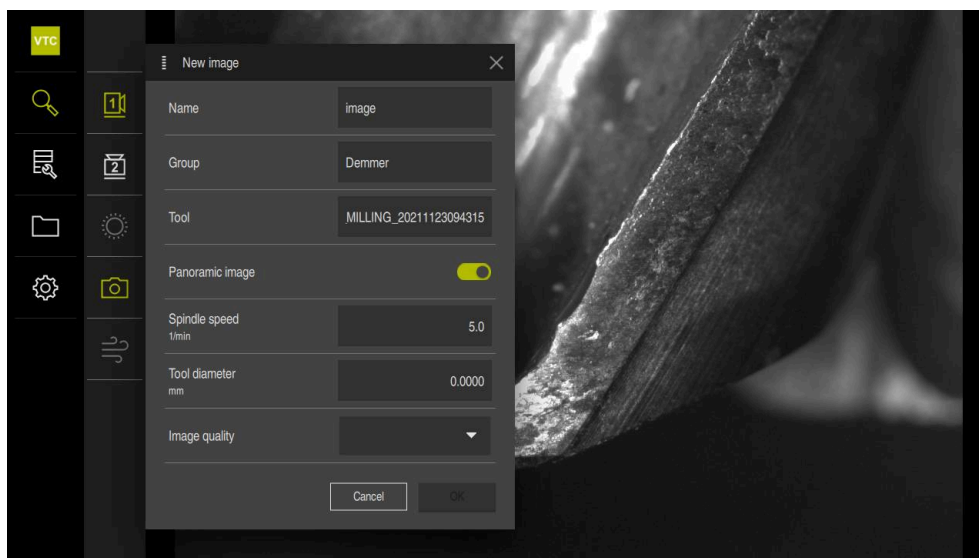


Figure 11: **New image** dialog box

7.4.2 Parameters of the single shot

In the **New image** dialog box, you can define the parameters of the image. If the Pano software option is enabled, you can also take a panoramic image.

Parameter	Explanation
Name	Name of the image under which it is saved in the Tool evaluation
Group	Assignment to a group in the Tool evaluation
Tool	Assignment to a tool entry in the Tool evaluation
Panoramic image	Activation of the panoramic image <ul style="list-style-type: none"> ■ Setting: ON or OFF ■ Default setting: OFF
Spindle speed	Entry of the tool rotation value. The camera needs this information to generate a panoramic image <ul style="list-style-type: none"> ■ Setting: Corresponding spindle speed of the machine tool ■ Default setting: 0.0 rpm
Tool diameter	Entry of the diameter of the respective tool. The application needs this information to generate a panoramic image <ul style="list-style-type: none"> ■ Setting: Diameter of the tool in the machine ■ Default setting: 0.0000 mm
Image quality	Selection of the quality in which the image is to be saved <ul style="list-style-type: none"> ■ Setting: Low, Medium, or High ■ Default setting: /



A higher quality requires a lower spindle speed.

Saving single shots

- ▶ Tap **OK** to save the image
- > The image is saved in the corresponding menu of the **Tool evaluation**

Discarding single shots

- ▶ Tap **Cancel** to discard the image
- > The image is discarded
- > The **New image** dialog box is closed

7.5 Cleaning with compressed air

The **Blow off** button allows you to clean the cover glasses and the area around the tool with compressed air.



- ▶ Tap **Blow off** in the Manual tool inspection menu
- > The **Blow off** dialog box appears
- ▶ Tap and hold **Start** in the **Blow off** dialog box
- > The cover glasses and the tool are cleaned with compressed air from the product's jet blocks.
- ▶ Release **Start**
- > The compressed air is switched off

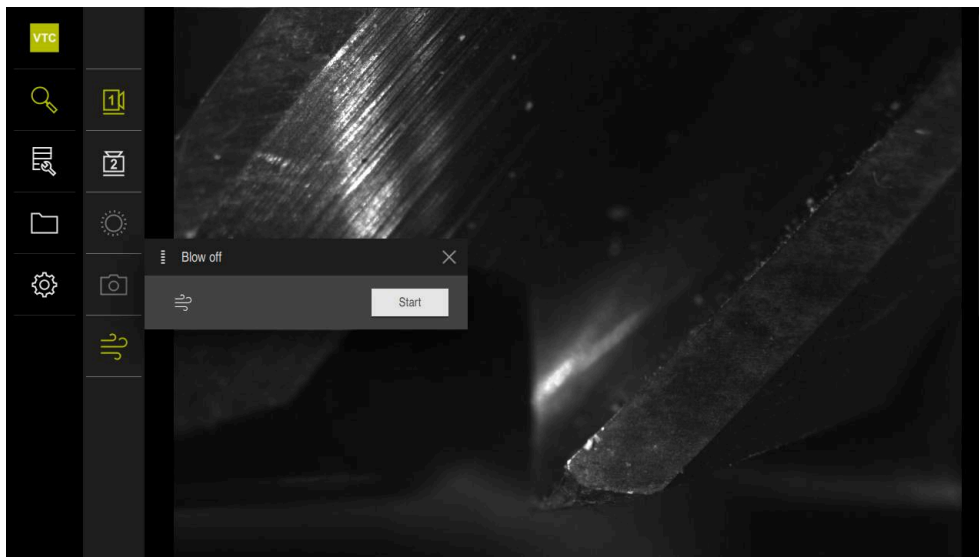


Figure 12: **Blow off** dialog box

8

Tool evaluation

8.1 Overview

The images taken manually and the images from Cycle **621** and Cycle **622** are saved in the **Tool evaluation** menu. To get an overview of the images taken, you can combine the tools in different groups and create image series.

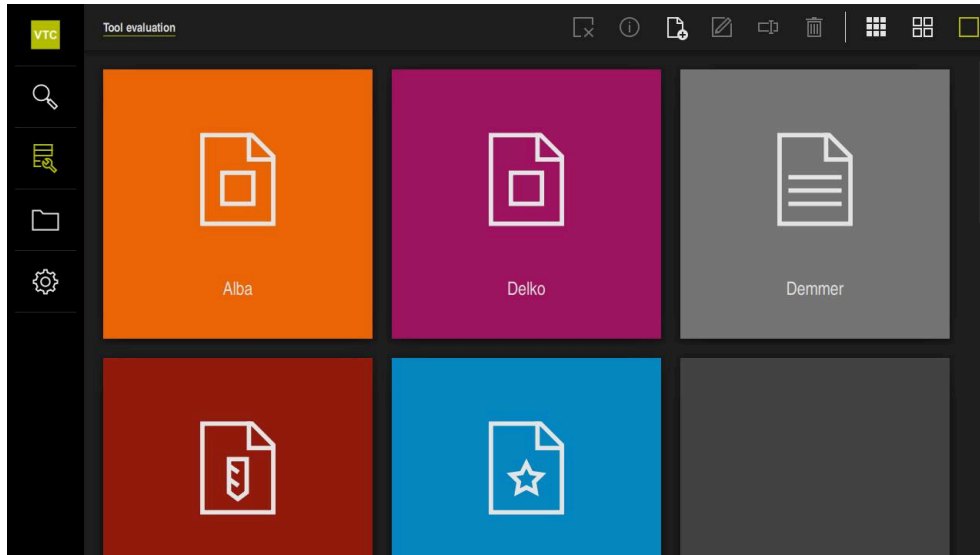


Figure 13: **Tool evaluation** menu

8.2 Menu levels

The **Tool evaluation** menu has three menu levels that can be operated analogously to one another.

The following menu levels are available to store the images:




- First menu level **Tool evaluation**
- Second menu level **Group**
- Third menu level **Tools**



The navigation path in the function area of the menu provides an overview and enables you to navigate between the menu levels.

Further information: "Navigation elements", Page 48

Depiction of the contents

Operating elements	Explanation
	View small All entries of the menu level are displayed in small size.
	View medium The entries of the menu level are displayed in medium size.
	View large The entries of the menu level are displayed in large size.









The entries of all menu levels are sorted numerically and/or alphabetically. Numbers come before letters.

8.3 First menu level of Tool evaluation menu

In the first menu level of the **Tool evaluation** menu, you can define groups. The groups allow you to structure the tool entries, single shots, and serial images. You will also indicate this group as "Job" in Cycle **622** when generating serial images.

8.3.1 Operating elements of the Tool evaluation menu level

The **Tool evaluation** menu level provides the following functions:

Operating elements	Explanation
	<p>Deselect</p> <p>Deactivates the selection of groups, tool entries or image series.</p>
	<p>Information</p> <p>Activates the display of various information about the group, tool entry, or image series, such as:</p> <ul style="list-style-type: none"> ■ Creation date ■ Change date ■ Last opened on ■ Image size, if applicable ■ Lighting information, if applicable ■ Exposure time, if applicable
	<p>Add group</p> <p>Creates a new group and opens the Add group dialog box.</p>
	<p>Customize group</p> <p>Opens the Customize group dialog box. The display of the group can be individualized by selecting:</p> <ul style="list-style-type: none"> ■ Icons ■ Color ■ Comment field
	<p>Rename</p> <p>Opens the Rename dialog box. A new name for the group can be defined.</p>
	<p>Delete</p> <p>Opens the Delete dialog box.</p>

8.3.2 Add group



- ▶ Tap **Add group** to create a new group
- > The **Add group** dialog box appears
- ▶ Tap the **Name** field
- ▶ Enter the desired name via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- > The new group is created

8.3.3 Customize group

- ▶ To edit a group, tap and hold the group in question
- > The group is shown in green



- ▶ Tap **Customize**
- > The **Customize** dialog box appears
- ▶ Tap the icon as needed
- ▶ Tap the desired color, if applicable
- ▶ Tap the comment field, if needed
- ▶ Enter the comment via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- > The representation of the group is adjusted

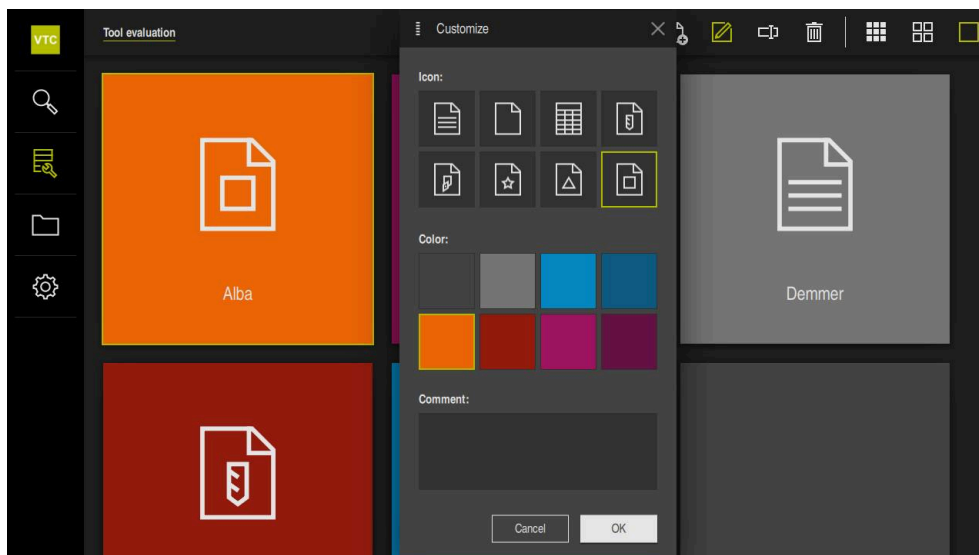


Figure 14: **Customize** dialog box

8.3.4 Rename group

- ▶ To edit a group, tap and hold the group in question
- > The group is shown in green



- ▶ Tap **Rename**
- > The **Rename** dialog box is opened
- ▶ Tap the **Name** field
- ▶ Enter the new name via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- > The name of the group is changed
- > The groups are sorted alphabetically, if applicable

8.3.5 Delete group



Please note that deleting a group also deletes all of the tool entries and their contents in the group.

- ▶ To edit a group, tap and hold the group in question
- > The group is shown in green



- ▶ Tap **Delete**
- > The **Delete** dialog box appears
- ▶ To delete the group and all of the tool entries in the group, confirm with **OK**
- > The group is removed

8.4 Second menu level: Group

In the second menu level of the **Tool evaluation** menu, you can make tool entries. The tool entries allow you to structure the images individually. You will also make tool entries when generating image series in Cycle **622**.

Opening the Group menu level

The **Group** menu level is only available when you have already created a group. To open the **Group** menu level:

- ▶ Tap the desired group
- > The group opens
- > The navigation path shows the menu level

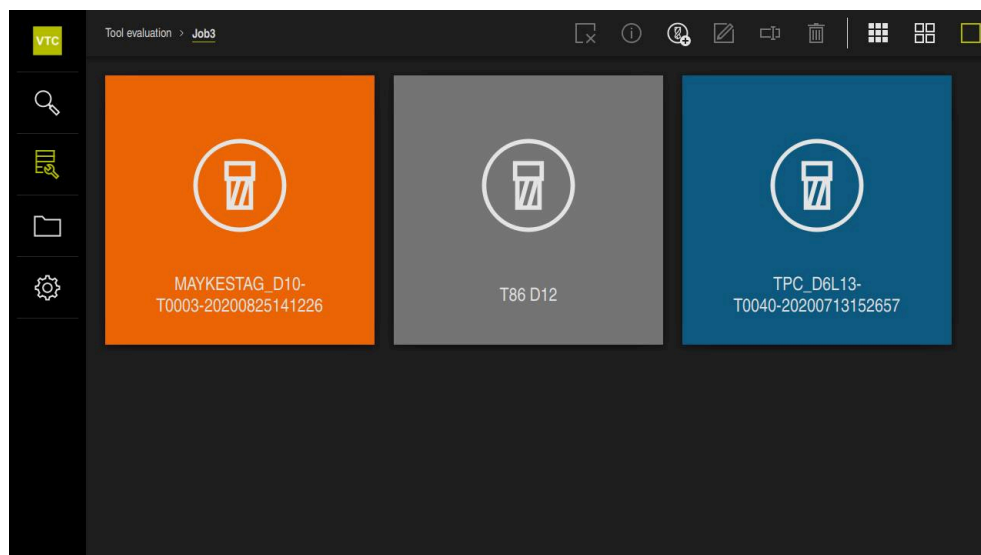








Figure 15: **Group** menu level

8.4.1 Operating elements of the Group menu level

The **Group** menu level provides the following functions:

Operating elements	Explanation
	<p>Deselect</p> <p>Deactivates the selection of groups, tool entries or image series.</p>
	<p>Information</p> <p>Activates the display of various information about the group, tool entry, or image series, such as:</p> <ul style="list-style-type: none"> ■ Creation date ■ Change date ■ Last opened on ■ Image size, if applicable ■ Lighting information, if applicable ■ Exposure time, if applicable
	<p>Add tool entry</p> <p>Creates a new tool entry and opens the Add tool entry dialog box.</p>
	<p>Customize tool entry</p> <p>Opens the Customize tool entry dialog box. The display of the tool entry can be individualized by selecting:</p> <ul style="list-style-type: none"> ■ Icons (various tool types) ■ Color ■ Comment field
	<p>Rename</p> <p>Opens the Rename dialog box. A new name for the tool entry can be defined.</p>
	<p>Delete</p> <p>Opens the Delete dialog box.</p>

8.4.2 Add tool entry



- ▶ To create a new tool entry, tap **Add tool entry**
- > The **Add tool entry** dialog box appears
- ▶ Tap the **Name** field
- ▶ Enter the desired name via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- > A new tool entry is created

8.4.3 Customize tool entry

- ▶ To edit a tool entry, tap and hold the desired tool entry
- The tool entry is now shown in green



- ▶ Tap **Customize**
- The **Customize** dialog box appears
- ▶ Tap a tool-type icon as desired
- ▶ Tap the desired color, if applicable
- ▶ Tap the comment field, if needed
- ▶ Enter the comment via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- The representation of the tool entry is adjusted

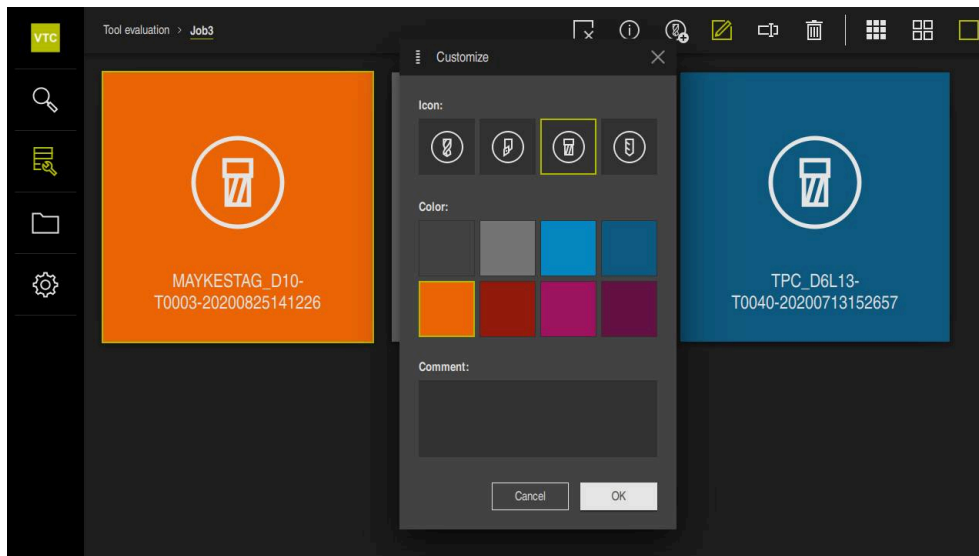


Figure 16: **Customize** dialog box


8.4.4 Rename tool entry

- ▶ To edit a tool entry, tap and hold the desired tool entry
- > The tool entry is now shown in green



- ▶ Tap **Rename**
- > The **Rename** dialog box is opened
- ▶ Tap the **Name** field
- ▶ Enter the new name via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- > The name of the tool entry is changed
- > The tool entries are sorted alphabetically, if applicable

8.4.5 Delete tool entry

 Please note that deleting a tool entry also deletes all images and image series of the tool entry.

- ▶ To edit a tool entry, tap and hold the desired tool entry
- > The tool entry is now shown in green



- ▶ Tap **Delete**
- > The **Delete** dialog box appears
- ▶ Confirm with **OK** to delete the tool entry and the images contained
- > The tool entry is removed

8.5 Third menu level: Tools

In the third menu level of the **Tool evaluation** menu, you can display the images of the tool and change the tool status. You can also create image series to combine various images in a series.

You can either create the images in this menu level yourself via the **Manual tool inspection** or use Cycle **622** to generate them. You can define the storage location yourself when taking manual single shots, or use the cycle.

Further information: "Opening a manual single shot", Page 57

Opening the Tools menu level

You can get to the **Tools** menu level when you have already created a tool entry. To open the **Tools** menu level:

- ▶ Tap the desired tool entry
- > The tool entry is opened
- > The navigation path shows the menu level

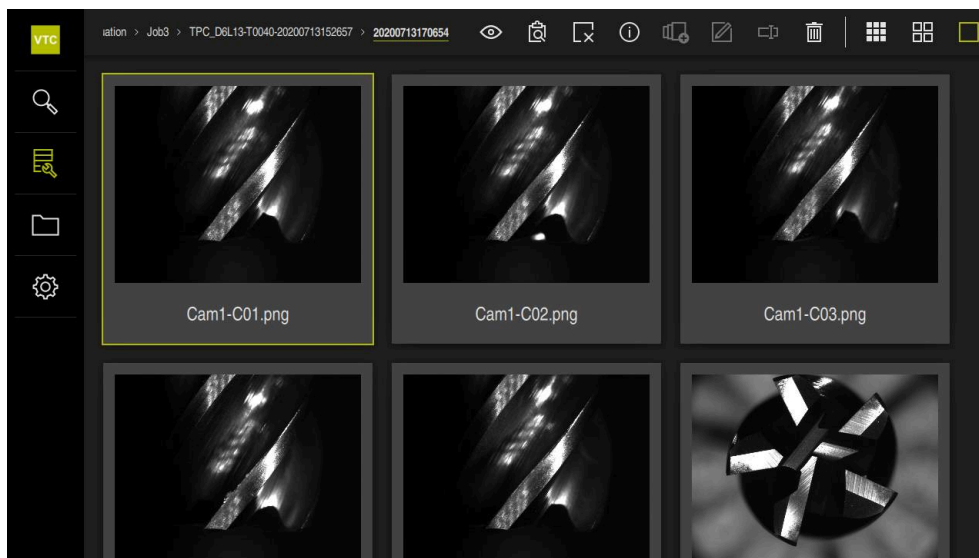










Figure 17: **Tools** menu level

8.5.1 Operating elements of the Tools menu level

The **Tools** menu level provides the following functions:

Operating elements	Explanation
	<p>View image</p> <p>Activates the display of an image. The View image function allows you to magnify or minimize the recorded images of the tools. The individual series or sequence of the series is provided for navigation.</p>
	<p>Inspection view</p> <p>Opens the Inspection view. The tool status is defined via the cycle. The tool can be inspected in different views.</p>
	<p>Deselect</p> <p>Deactivates the selection of groups, tool entries or image series.</p>
	<p>Information</p> <p>Activates the display of various information about the group, tool entry, or image series, such as:</p> <ul style="list-style-type: none"> ■ Creation date ■ Change date ■ Last opened on ■ Image size, if applicable ■ Lighting information, if applicable ■ Exposure time, if applicable
	<p>Add image series</p> <p>Creates a new image series and opens the Add image series dialog box.</p>
	<p>Customize image series</p> <p>Opens the Customize image series dialog box. The display of the image series can be individualized by selecting:</p> <ul style="list-style-type: none"> ■ Color ■ Comment field
	<p>Rename</p> <p>Opens the Rename dialog box. A new name for the image series can be defined.</p>
	<p>Delete</p> <p>Opens the Delete dialog box.</p>

8.5.2 Working with the View image function

The **View image** function is available for all images from the cycles and for images from the manual tool inspection. The **View image** function allows you to magnify parts of the image and to navigate between the images.

If the image is a panoramic image, you can improve wear control by virtually adapting the displayed illumination angle of individual cutting edges via the slider in order to illuminate the tool optimally and to remove any reflections.

Opening the "View image" function



- ▶ Tap the desired view
 - ▶ Tap **View image**
- or
- ▶ Double-tap the desired image
 - ▶ The full view is opened

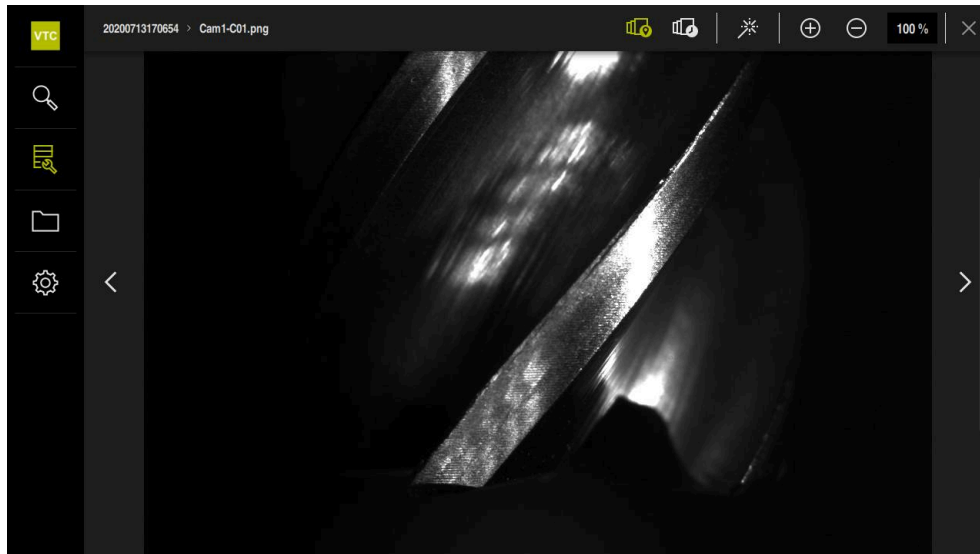


Figure 18: **View image** function with single shot

Brightening single shots



- ▶ Tap the wand icon to brighten the image
- ▶ The image is brightened.

Magnifying or minimizing single shots



- ▶ Tap + to magnify the image
- ▶ The image is magnified in 10% steps
- ▶ The image size is shown in percent



- ▶ To minimize the image, tap –
 - ▶ The image size is reduced in 10 % steps
 - ▶ The image size is shown in percent
-
- ▶ To switch between the 100 % view and the full-surface view in the window, double-tap the image

Removing reflections from the tool in panoramic images

- ▶ To adjust the illumination angle of a panoramic image, drag the slider to the right and left
- > The incidence angle of the light is adjusted

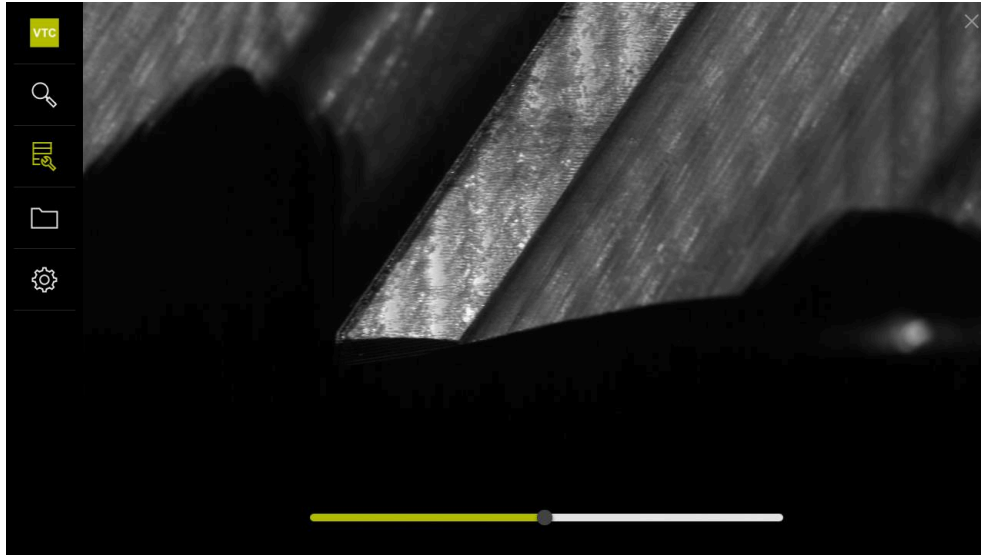


Figure 19: **View image** function with panoramic image

Closing the "View image" function

- ▶ Tap **Close** to close the **View image** function
- > The **View image** function is closed

8.5.3 Working with the Inspection view function

i The **Inspection view** function is only available for automatically generated image series from the cycles.

Overview

Within the **Inspection view** function, you can use the **Side view**, **Bottom view**, and **Magnification view**. The **Side view** and the **Bottom view** each are supplemented by the **Magnification view**.

The **Side view** and the **Bottom view** provide a single view or, if required, panoramic view. If you select **Bottom view** or **Side view**, an image detail is shown in the **Magnification view**.

The zooming frame can be used in both views. If you change the image position in the **Magnification view**, the zooming frame will show you the current position in the **Side view** or **Bottom view**.

The **Magnification view** allows you to magnify or minimize the image detail. The zooming frame adapts according to the image detail. When you have checked your tool based on the images, you can define the tool status.

i If you set a zooming frame and switch between the images within a series, the set zooming frame remains at the same position.

Opening the inspection view



- ▶ Tap **Inspection view**
- The **Inspection view** function is opened

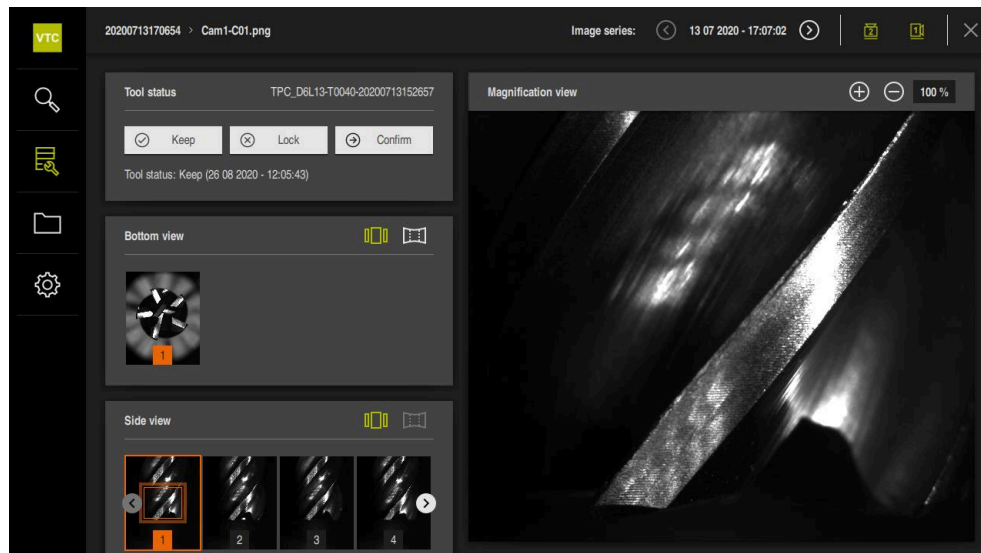







Figure 20: **Inspection view** function

Operating elements of the inspection view

The following operating elements are available:

Operating element	Function
	<p>Camera 1</p> <p>Activates and deactivates the Side view. The Side view shows the selected tool image from the perspective of camera 1.</p>
	<p>Camera 2</p> <p>Activates and deactivates the Bottom view. The Bottom view shows the selected tool image from the perspective of camera 2.</p>
	<p>Single view</p> <p>Activates and deactivates the Single view of the images of a series.</p>
	<p>Panoramic view</p> <p>Activates and deactivates the Panoramic view if a panoramic image was taken within the series.</p>
	<p>Mosaic view</p> <p>Activates and deactivates the mosaic view. The mosaic view generates a composite image from single shots of a tool from below (camera 2).</p>

Working with the single view

To use the views and the zooming frame in the **single view**:



- ▶ Tap **single view** in the **Bottom view** or **Side view**
- ▶ Tap an image in the **Bottom view** or **Side view**
- ▶ An orange frame is placed around the selected image
- ▶ The zooming frame shows the image detail in **Magnification view**
- ▶ To change the image detail, tap the **Magnification view** and drag it to the desired position
- ▶ The zooming frame shows the new position in the selected image



- ▶ Tap **Magnify** to enlarge the image detail
- ▶ The size of the zooming frame is adjusted



- ▶ Tap **Minimize** to reduce the size of the image detail
- ▶ The size of the zooming frame is adjusted
- ▶ Repeat the inspection of the cutting edges in the other views

i In the **single view**, numbers show the connection between the **Side view** and the **Bottom view**. This allows you to put the images of the cutting edges in relation to one another.

i Double-click the **Magnification view** to switch directly between the 100 % view and the entire image.

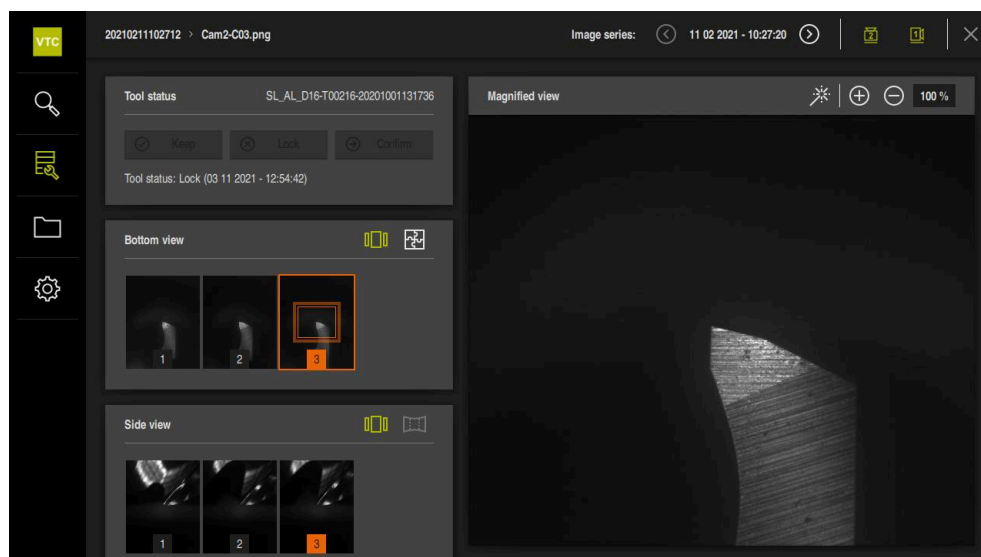


Figure 21: Inspection view of the single view

Working with the panoramic view



The **panoramic view** is only available for panoramic images within the series. The **panoramic view** is useful for inspecting the **Side view**.



- ▶ Tap **panoramic view** in the **Side view**
 - An orange frame is placed around the selected image
 - The zooming frame shows the image detail in **Magnification view**
 - ▶ To change the image detail, tap the **Magnification view** and drag it to the desired position
 - The zooming frame shows the new position in the selected image
 - ▶ To illuminate the tool optimally without any reflections, drag the slider to the right or left
 - The representation of the cutting edge is optimally illuminated to remove any reflections

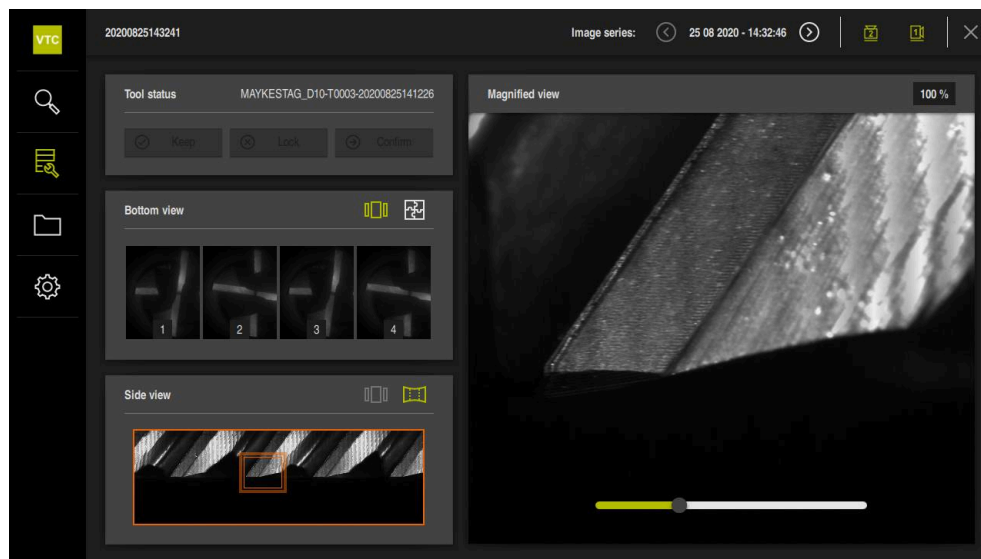


Figure 22: Inspection view of the panoramic view

Defining the Tool status

In the **Tool status**, you can evaluate the images from the cycles after the inspection was performed. Proceed as follows:

- ▶ Tap **Keep** or **Lock**
- ▶ Tap **Confirm**
- The tool status is saved with date and time



For HEIDENHAIN TNC 640 controls only:
If you select the **Lock** tool status, then the tool will be locked permanently in the TNC tool table **TOOL.T**.

8.5.4 Add image series



- ▶ To create a new series of images, tap **Add image series**
- > The **Add image series** dialog box appears
- ▶ Tap the **Name** field
- ▶ Enter the desired name via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- > A new image series is created

8.5.5 Customize image series

- ▶ To edit an image series, tap and hold the image series in question
- > The image series is shown in green



- ▶ Tap **Customize**
- > The **Customize** dialog box appears
- ▶ Tap the desired color, if applicable
- ▶ Tap the comment field, if needed
- ▶ Enter the comment via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- > The representation of the image series is adjusted

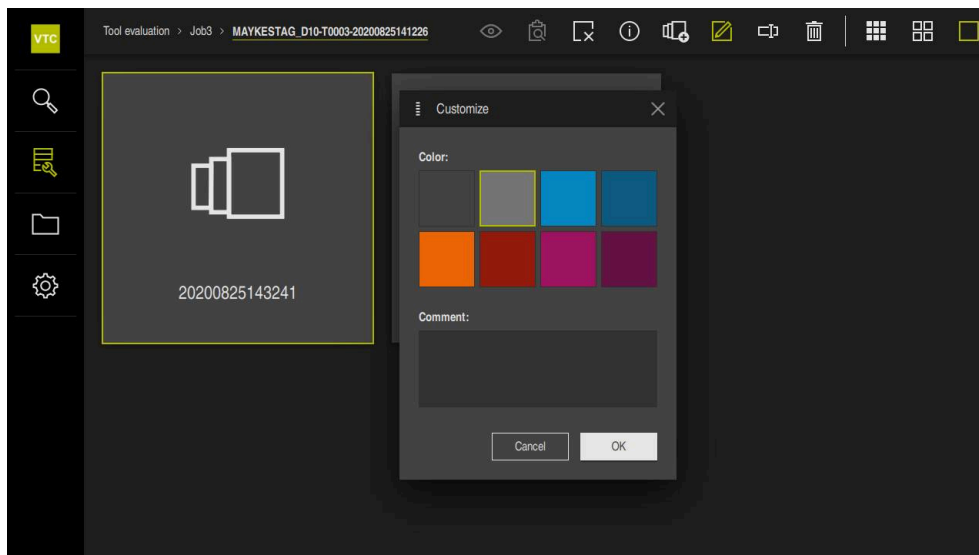


Figure 23: **Customize** dialog box


8.5.6 Rename image series

- ▶ To edit an image series, tap and hold the image series in question
- > The image series is shown in green



- ▶ Tap **Rename**
- > The **Rename** dialog box appears
- ▶ Tap the **Name** field
- ▶ Enter the new name via the screen keyboard
- ▶ Confirm with **RET**
- ▶ Confirm with **OK**
- > The name of the image series is changed
- > The order of the image series is sorted automatically

8.5.7 Delete image series and single shots

 Please note that deleting an image series deletes all of the images that belong to this series.

- ▶ To edit an image series, tap and hold the image series in question
- > The image series is shown in green



- ▶ Tap **Delete**
- > The **Delete** dialog box appears
- ▶ To delete the image series and all of the images contained in it, confirm with **OK**
- > The image series is removed



- ▶ To delete a single shot, tap the desired single shot
- ▶ Tap **Delete**
- > The single shot is removed

9

File management

9.1 Overview

This chapter describes the **File management** menu and its functions.



Make sure that you have read and understood the "Basic operation" chapter before carrying out the actions described below.

Further information: "Basic operation", Page 41

Short description

The **File management** menu shows an overview of the files stored in the control's memory.

Calling up



- ▶ Tap **File management** in the main menu
- > The file management user interface is displayed

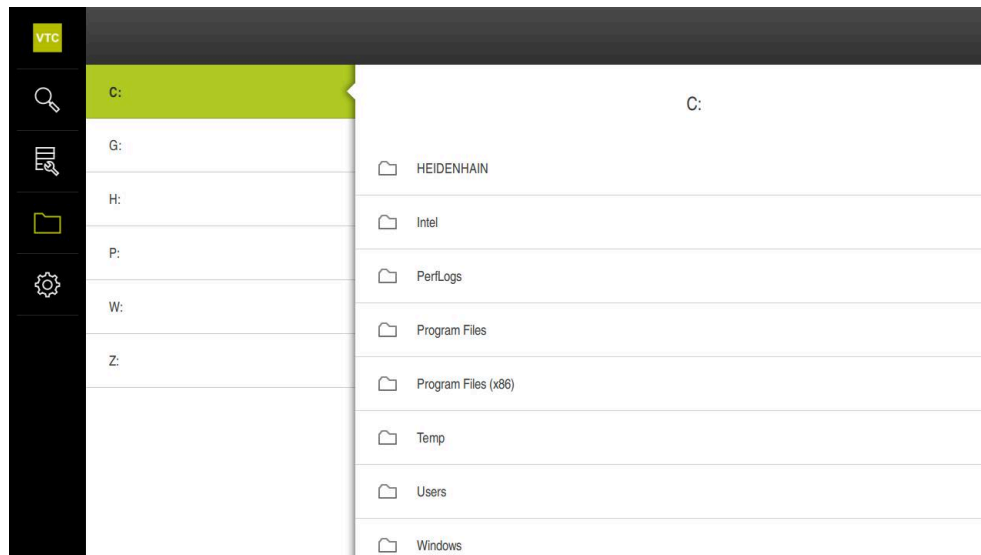


Figure 24: **File management** menu

9.2 File types

In the **File management** menu you can edit the following file types:

Type	Use	Manage	View	Open	Print
*.mcc	Configuration files	✓	–	–	–
*.dro	Firmware files	✓	–	–	–
*.svg, *.ppm	Image files	✓	–	–	–
*.jpg, *.png, *.bmp	Image files	✓	✓	–	–
*.wav	Audio files	✓	✓	–	–
*.csv	Text files	✓	–	–	–
*.txt, *.log, *.xml	Text files	✓	✓	–	–
*.pdf	PDF files	✓	✓	–	–



Access to the files depends on the configuration of the access rights on the PC or server.

9.3 Managing folders and files

Folder structure

In the **File management** menu, the files in the installation folder are saved in the following folders in `..\HEIDENHAIN\VTC\ProductsMGE5\Metrology\VTC\user`:






Folders	Application
Documents	Document files
Images	Image files for the user interface
System	Audio files and system files
ToolManagerFileBase	Available data, tool images
User	User data




Operating element Function



Creating a new folder

- ▶ Touch the icon of the folder in which you want to create a new folder, and drag it to the right
- > The operating elements are displayed
- ▶ Tap **Create a new folder**
- ▶ Tap the input field in the dialog box and enter a name for the new folder
- ▶ Confirm your input with **RET**
- ▶ Tap **OK**
- > A new folder is created

Operating element	Function
	<p>Moving a folder</p> <ul style="list-style-type: none"> ▶ Touch the icon of the folder you want to move, and drag it to the right > The operating elements are displayed ▶ Tap Move to ▶ In the dialog box, select the folder to which you want to move the folder ▶ Tap Select > The folder is moved
	<p>Copying a folder</p> <ul style="list-style-type: none"> ▶ Touch the icon of the folder you want to copy, and drag it to the right > The operating elements are displayed ▶ Tap Copy to ▶ In the dialog box, select the folder to which you want to copy the folder ▶ Tap Select > The folder is copied
	<p>Renaming a folder</p> <ul style="list-style-type: none"> ▶ Touch the icon of the folder you want to rename, and drag it to the right > The operating elements are displayed ▶ Tap Rename folder ▶ Tap the input field in the dialog box and enter a name for the new folder ▶ Confirm your input with RET ▶ Tap OK > The folder is renamed
	<p>Moving a file</p> <ul style="list-style-type: none"> ▶ Touch the icon of the file you want to move, and drag it to the right > The operating elements are displayed ▶ Tap Move to ▶ In the dialog box, select the folder to which you want to move the file ▶ Tap Select > The file is moved
<div style="border: 1px solid black; padding: 5px;"> <p> If you move a file into a folder containing a file with the same name, that file is overwritten.</p> </div>	

Operating element	Function
	<p>Copying a file</p> <ul style="list-style-type: none"> ▶ Touch the icon of the file you want to copy, and drag it to the right > The operating elements are displayed ▶ Tap Copy to ▶ In the dialog box, select the folder to which you want to copy the file ▶ Tap Select > The file is copied
	<p>Renaming a file</p> <ul style="list-style-type: none"> ▶ Touch the icon of the file you want to rename, and drag it to the right > The operating elements are displayed ▶ Tap Rename file ▶ Tap the input field in the dialog box and enter a name for the new file ▶ Confirm your input with RET ▶ Tap OK > The file is renamed
	<p>Deleting a folder or file</p> <p>The folders and files you delete will be permanently deleted and cannot be recovered. If you delete a folder, all subfolders and files contained in that folder will also be deleted.</p> <ul style="list-style-type: none"> ▶ Touch the icon of the folder or file you want to delete, and drag it to the right > The operating elements are displayed ▶ Tap Delete selection ▶ Tap Delete > The folder or file is deleted

9.4 Viewing files

Viewing files



- ▶ Tap **File management** in the main menu
- ▶ Navigate to the storage location of the desired file
- ▶ Tap the file
- > A preview image (only with PDF and image files) as well as information about the file are displayed
- ▶ Tap **View**
- > The file contents are displayed
- ▶ Tap **Close** to close the view



10

Settings

10.1 Overview

This chapter describes settings for configuring the operation and representation mode.

10.1.1 Software information

Path: **Settings ► General ► Software information**

The overview displays basic information about the software.

Parameter	Displays the information
Product designation	Product designation of the software
Serial number	Version number of the software
Firmware version	Version number of the software
Firmware built on	Software creation date
Last firmware update on	Date of most recent software update

10.1.2 Sounds

Path: **Settings ► General ► Sounds**

The available sounds are grouped into categories. The sounds differ within a category.

Parameter	Explanation
Speaker	Use of the built-in speaker on the <ul style="list-style-type: none"> ■ Settings: ON or OFF ■ Default setting: ON
Speaker volume	Volume of the product's speaker <ul style="list-style-type: none"> ■ Setting range: 0 % ... 100 % ■ Default setting: 50 %
Message and Error	Sound to be played when a message is displayed When you select a setting, the associated sound is played <ul style="list-style-type: none"> ■ Settings: Standard, Guitar, Robot, Outer space, No sound ■ Default setting: Standard
Touch tone	Sound to be played when using a touch element When you select a setting, the associated sound is played <ul style="list-style-type: none"> ■ Settings: Standard, Guitar, Robot, Outer space, No sound ■ Default setting: Standard

10.1.3 Units

Settings ► General ► Units

Parameter	Explanation
Unit for linear values	Unit of measure for linear values <ul style="list-style-type: none"> ■ Settings: Millimeters or Inch ■ Default setting: Millimeters
Rounding method for linear values	Rounding method for linear values Settings: <ul style="list-style-type: none"> ■ Commercial: Decimal places from 1 to 4 are rounded down, decimal places from 5 to 9 are rounded up ■ Round off: Decimal places from 1 to 9 are rounded down ■ Round up: Decimal places from 1 to 9 are rounded up ■ Truncate: Decimal places are truncated without rounding up or down ■ Round to 0 and 5: Decimal places ≤ 24 or ≥ 75 are rounded to 0, decimal places ≥ 25 or ≤ 74 are rounded to 5 ■ Default setting: Commercial
Decimal places for linear values	Number of decimal places for linear values Setting range: <ul style="list-style-type: none"> ■ Millimeters: 0 ... 5 ■ Inch: 0 ... 7 Default value: <ul style="list-style-type: none"> ■ Millimeters: 4 ■ Inch: 6
Unit for angular values	Unit for angular values Settings: <ul style="list-style-type: none"> ■ Radian: Angles in radian (rad) ■ Decimal degrees: Angles in degrees ($^{\circ}$) with decimal places ■ Deg-Min-Sec: Angles in degrees ($^{\circ}$), minutes [$'$] and seconds [$''$] ■ Default setting: Decimal degrees
Rounding method for angular values	Rounding method for decimal angular values Settings: <ul style="list-style-type: none"> ■ Commercial: Decimal places from 1 to 4 are rounded down, decimal places from 5 to 9 are rounded up ■ Round off: Decimal places from 1 to 9 are rounded down ■ Round up: Decimal places from 1 to 9 are rounded up ■ Truncate: Decimal places are truncated without rounding up or down ■ Round to 0 and 5: Decimal places ≤ 24 or ≥ 75 are rounded to 0, decimal places ≥ 25 or ≤ 74 are rounded to 5 ■ Default setting: Commercial

Parameter	Explanation
Decimal places for angular values	Number of decimal places for angular values Setting range: <ul style="list-style-type: none"> ■ Radian: 0 ... 7 ■ Decimal degrees: 0 ... 5 ■ Deg-Min-Sec: 0 ... 2 Default value: <ul style="list-style-type: none"> ■ Radian: 5 ■ Decimal degrees: 3 ■ Deg-Min-Sec: 0
Decimal separator	Separator for the display of values <ul style="list-style-type: none"> ■ Settings: Point or Comma ■ Default setting: Point

10.1.4 Copyrights

Settings ► General ► Copyrights

Parameter	Meaning and function
Open source software	Display of the licenses of the software used

10.2 Sensors

This chapter describes settings for configuring the sensors.

Depending on the software options that have been activated on the product, various parameters are available for configuring the sensors.

10.2.1 Camera

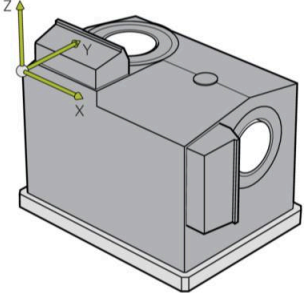
Path: **Settings ► Sensors ► Camera**

The **Camera** menu shows a list of the virtual cameras.

10.2.2 Virtual camera or hardware camera

Settings ► Sensors ► Camera ► **Camera designation**

Parameter	Explanation
Camera	Shows the name of the camera
Serial number	Shows the serial number of the camera
Sensor resolution	Shows the resolution of the camera sensor
Frames per second	Shows the number of camera images per second
Frames (successful/faulty)	Shows the number of successful and faulty images taken since the last time the product was powered up
Pixel format	Displayable color range of the camera image Settings: <ul style="list-style-type: none"> ■ 8 Bit: 256 colors

Parameter	Explanation
Image directory	Location in which the demo image is stored on the product (can only be set for virtual cameras) <ul style="list-style-type: none"> Default setting: Camera folder in installation folder
Network settings	Network address and subnet mask of the network connection (can only be set for connected (GigE) camera) <p>Settings:</p> <ul style="list-style-type: none"> IPv4 address: Network address IPv4 subnet mask: Subnet mask Default setting: OFF <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>i The camera must be in the same subnet as the product.</p> </div>
Rotation of the image	Depending on the mechanical mounting of the camera, the image can be rotated in the camera <p>Settings:</p> <ul style="list-style-type: none"> 0° 90° 180° 270° Default setting: 270°
Pixel clock (MHz)	Rate at which the image data are read from the camera sensor <ul style="list-style-type: none"> Setting range: depending on connected camera
Frame rate (fps)	Number of single images acquired per second <ul style="list-style-type: none"> Setting range: depending on connected camera
Default values	Resets Pixel clock (MHz) and Frame rate (fps) to the default values
Focus points	Shows the values of the camera's focal points <div style="text-align: center; margin-top: 20px;">  </div>
Deactivate camera	Deactivates the camera and live image

10.3 Interfaces

This chapter describes settings for configuring networks, network drives, and USB mass storage devices.

10.3.1 OPC UA-Server

Path: **Settings ► Interfaces ► OPC UA-Server**

Parameter	Explanation
Port	Entry of OPC UA interface

10.4 Service

This chapter describes the settings for the product configuration and for the maintenance of the firmware.

10.4.1 Firmware information

Path: **Settings ► Service ► Firmware information**

The following information on the individual software modules is displayed for service and maintenance.

Parameter	Explanation
Core version	Version number of the microkernel
Boot ID	ID number of the boot process
C Library Version	Version number of the C library
Compiler Version	Version number of the compiler
Number of unit starts	Number of times the product was switched on
Qt build system	Version number of the Qt compilation software
Qt runtime libraries	Version number of the Qt runtime libraries
Kernel	Version number of the Linux kernel
Login status	Information on the logged-in user
SystemInterface	Version number of the system interface module
GuiInterface	Version number of the user interface module
TextDataBank	Version number of the text database module
CameraInterface	Version number of the camera interface module
NetworkInterface	Version number of the network interface module
OSInterface	Version number of the operating system interface module
VTCComServer	Version number of the VTC ComServer module
VTCDatase	Version number of the VTC database module
VTCSettings	Version number of the VTC settings module
system.xml	Version number of the system parameters
info.xml	Version number of the information parameters
audio.xml	Version number of the audio parameters
camera.xml	Version number of the camera parameters
network.xml	Version number of the network parameters

Parameter	Explanation
os.xml	Version number of the operating system parameters
runtime.xml	Version number of the runtime parameters
users.xml	Version number of the user parameters
vtcCameraSettings.xml	Version number of the VTC camera parameters
vtcDataBaseSettings.xml	Version number of the VTC database parameters
vtcDisplaySettings.xml	Version number of the parameters for the VTC representation
vtcLightSettings.xml	Version number of the parameters for the lighting
vtcServerSettings.xml	Version number of the VTC server parameters
GI Patch Level	Patch level of the golden image (GI)

10.4.2 Back up and restore

Settings ► Service ► Back up and restore

The product's settings or user files can be backed up as a file so that they are available after a reset to the factory default settings has been performed or for installation on multiple products.

Parameters	Explanation
Restore settings	Restoring of the backed up settings Further information: "Restore settings", Page
Back up settings	Backing up of settings of the product Further information: "Back up settings", Page

10.4.3 Software options

Path: **Settings ► Service ► Software options**

10.4.4 Tools

Path: **Settings ► Service ► Tools**

Parameter	Explanation
Remote access for screenshots	Activation of remote access for screenshots of the software <ul style="list-style-type: none"> ■ Settings: ON or OFF ■ Default setting: OFF
Developer tools	The developer tools can only be accessed with a password

11

**Servicing and
maintenance**

11.1 Overview

This chapter describes the service functions of the software. You can save and restore your settings. You can also enable the software options.



The following steps must be performed only by qualified personnel.

Further information: "Personnel qualification", Page 16

11.2 Back up settings

The settings can be backed up as a file to make them available after a reset to the factory default settings or for installation on multiple products.



- ▶ Tap **Settings** in the main menu



- ▶ Tap **Service**
- ▶ Open in succession:
 - **Back up and restore**
 - **Back up settings**
- ▶ Tap **Complete backup**
- ▶ If required, connect a USB mass storage device (FAT32 format) to a USB port
- ▶ Select the folder to which you want to copy the configuration file
- ▶ Specify a name for the configuration data (e.g., "<yyyy-mm-dd>_config")
- ▶ Confirm your input with **RET**
- ▶ Tap **Save as**
- ▶ Tap **OK** to confirm the successful backup of the configuration
- ▶ The configuration file has been backed up

Further information: "Back up and restore", Page 91

11.3 Restore settings

Backed-up settings can be reloaded. The current configuration of the software is replaced in the process.



- ▶ Tap **Settings** in the main menu
- ▶ Open in succession:
 - **Service**
 - **Back up and restore**
 - **Restore settings**
- ▶ Tap **Complete restoration**
- ▶ If required, connect a USB mass storage device to a USB port
- ▶ Navigate to the folder containing the backup file
- ▶ Select the backup file
- ▶ Tap **Select**
- ▶ Confirm the successful transfer with **OK**
- > The software is terminated.

11.4 Activating Software options

You can activate additional **Software options** via a **License key**.



You can view the enabled **Software options** on the overview page.
Further information: "Checking the Software options", Page 98

11.5 Requesting license key

You can request a license key by using the following procedure:

- Creating a license key request

Creating a license key request



- ▶ Tap **Settings** in the main menu



- ▶ Tap **Service**
- ▶ Tap **Software options**
- ▶ To request a software option that is available for a fee, tap **Request options**
- ▶ To request a free trial option, tap **Request trial options**
- ▶ To select the desired software option, tap its check mark



- ▶ To deselect an entry, tap the check mark for the respective software option

- ▶ Tap **Creating a request**
- ▶ In the dialog box, select the storage location in which you want to save the license key request
- ▶ Enter a suitable file name
- ▶ Confirm your input with **RET**
- ▶ Tap **Save as**
- > The license key request is created and saved in the selected folder
- ▶ Contact a HEIDENHAIN service agency and submit the file you created in order to request a license key
- > The license key and the license file are generated and sent by e-mail

11.6 Activating a license key

You can activate a license key by

- Reading the license key from the provided license file into the product
- Entering the license key manually into the product

11.6.1 Uploading license key from license file



- ▶ Tap **Settings** in the main menu



- ▶ Tap **Service**
- ▶ Open in succession:
 - **Software options**
 - **Activate options**
- ▶ Tap **Read license file**
- ▶ Select the license file in the file system, on the USB mass storage device or on the network drive
- ▶ Confirm your selection with **Select**
- ▶ Tap **OK**
- > The license key is activated
- ▶ Tap **OK**
- > You may need to restart the product, depending on the software option
- ▶ Confirm the restart with **OK**
- > The activated software option is available

11.6.2 Entering license key manually



- ▶ Tap **Settings** in the main menu



- ▶ Tap **Service**
- ▶ Open in succession:
 - **Software options**
 - **Activate options**
- ▶ Enter the license key into the **License key** input field
- ▶ Confirm the entry with **RET**
- ▶ Tap **OK**
- > The license key is activated
- ▶ Tap **OK**
- > You may need to restart the product, depending on the software option
- ▶ Confirm the restart with **OK**
- > The activated software option is available

11.7 Checking the Software options

On the overview page, you can check which **Software options** are enabled for the product.



- ▶ Tap **Settings** in the main menu



- ▶ Tap **Service**
- ▶ Open in succession:
 - **Software options**
 - **Overview**
- > A list of enabled **Software options** is displayed

12 Index**A**

Activating Software options..... 95

C

Camera

Settings..... 88

Cycles

breakage check..... 37

Images..... 34

manual inspection..... 32

measuring cutting edge

angles..... 39

VT 121 calibration..... 31

D

Decimal places..... 87

Decimal separator..... 87

Documentation

Addendum..... 11

Download..... 10

Double tap..... 42

Dragging..... 43

F

File

copying..... 83

deleting..... 83

moving..... 82

opening..... 83

renaming..... 83

File management

file types..... 81

Menu..... 48

Short description..... 80

Folder

copying..... 82

creating..... 81

deleting..... 83

moving..... 82

renaming..... 82

Folders

managing..... 81

Folder structure..... 81

G

Gestures

Double-tap..... 42

Dragging..... 43

Holding..... 43

Tapping..... 42

H

Holding..... 43

I

Informational notes..... 12

Inspection view..... 73

L

LEDs..... 54

License key

Activating..... 96

entering..... 22, 97

requesting..... 21, 95

Lighting settings..... 56

Extended..... 54

Simple..... 54

Live image..... 53

M

Menu

File management..... 48

Manual tool inspection..... 47

Settings..... 49

Tool evaluation..... 48

Mouse actions

Dragging..... 43

Holding..... 43

Tapping..... 42

Mouse operation

Double-tap..... 42

O

Obligations of the operating

company..... 17

Operating elements

Back..... 45

Close..... 45

Confirm..... 45

drop-down list..... 45

Main menu..... 46

plus/minus button..... 44

Screen keyboard..... 44

slider..... 45

slide switch..... 45

Operating Instructions..... 11

Operation

General operation..... 42

Operating elements..... 44

Operator..... 16

P

Personnel qualification..... 16

Q

Qualified personnel..... 16

R

Rounding methods..... 87

S

Safety precautions..... 12, 16

Settings

backing up..... 94

menu..... 49

Restoring..... 95

T

Taking single shots..... 57

Tapping..... 42

U

Units..... 87

Uploading license file..... 21, 97

User's Manual..... 11

User interface

File management menu..... 48

Manual tool inspection menu.. 47

Settings menu..... 49

Tool evaluation menu..... 48

V

VTC cycles..... 30

13 List of figures

Figure 1:	Activate application dialog box.....	21
Figure 2:	Screen keyboard.....	44
Figure 3:	Screen keyboard.....	
Figure 4:	Main menu of the user interface.....	46
Figure 5:	Manual tool inspection menu.....	47
Figure 6:	Tool evaluation menu.....	48
Figure 7:	File management menu.....	49
Figure 8:	Settings menu.....	49
Figure 9:	Manual tool inspection menu.....	52
Figure 10:	Live image of camera 2.....	53
Figure 11:	Lighting dialog box.....	54
Figure 12:	New image dialog box.....	57
Figure 13:	Blow off dialog box.....	59
Figure 14:	Tool evaluation menu.....	62
Figure 15:	Customize dialog box.....	64
Figure 16:	Group menu level.....	65
Figure 17:	Customize dialog box.....	67
Figure 18:	Tools menu level.....	69
Figure 19:	View image function with single shot.....	71
Figure 20:	View image function with panoramic image.....	72
Figure 21:	Inspection view function.....	73
Figure 22:	Inspection view of the single view	75
Figure 23:	Inspection view of the panoramic view	76
Figure 24:	Customize dialog box.....	77
Figure 25:	File management menu.....	80

HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH

Dr.-Johannes-Heidenhain-Straße 5

83301 Traunreut, Germany

☎ +49 8669 31-0

FAX +49 8669 32-5061

E-mail: info@heidenhain.de

Technical support FAX +49 8669 32-1000

Measuring systems ☎ +49 8669 31-3104

E-mail: service.ms-support@heidenhain.de

NC support ☎ +49 8669 31-3101

E-mail: service.nc-support@heidenhain.de

NC programming ☎ +49 8669 31-3103

E-mail: service.nc-pgm@heidenhain.de

PLC programming ☎ +49 8669 31-3102

E-mail: service.plc@heidenhain.de

APP programming ☎ +49 8669 31-3106

E-mail: service.app@heidenhain.de

www.heidenhain.de

