Quick Guide

ZEN 2 core SP1

ZEISS

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1 Welcome

Welcome to the ZEN 2 core SP1 Quick Guide.

ZEN 2 core SP1 is the new image acquisition and analysis software from ZEISS. Its design and intuitive user interface help you examine samples quickly, easily, and reliably, especially in quality assurance environments. Furthermore, in ZEN 2 core SP1, you can choose between a free examination environment or a workflow-based design.

2 Jobs and Free Examinations

ZEN 2 core SP1 is designed to support two fundamental ways of using your microscope:

- Working with jobs (creating, running, editing and managing jobs)
- Performing free examinations

Jobs In ZEN 2 core SP1, the term *job* refers to a collection of examination tasks. Jobs can be created to ensure that the same examination tasks are carried out each time the job is run, in the same manner, and with the same settings. Jobs are used mainly in routine quality control examinations where it is essential that identical examinations are performed for each sample.

Free examinations Free examinations can be used to inspect a sample quickly, easily, and flexibly without defining examination tasks. A typical use is to examine a faulty sample where the cause of the fault is unknown or for one-off examinations that will not be repeated. In such cases only the examination results, reports and images need to be saved rather than the examination tasks.

Operating modes The above ways of using your microscope are reflected in the operating modes of the software.

3 User Roles

User management is an optional component. It is disabled by default. When user management is enabled, three types of user role are defined initially in the software:

- Administrator
- Supervisor
- Operator

The available modes and tasks you can perform in the software depend on your user role. User roles can be added and modified in **Maintenance** mode.

If user management is disabled, the user has all user rights at the same time.

Administrators Administrators install and configure the software. This includes:

- Managing system settings
- Managing users
- Specifying the connected hardware in the Microscope Tool Box application (MTB)
- Configuring and managing the archives.

Supervisors Supervisors perform the following main tasks:

- Creating job templates for the operators to run
- Performing free examinations

They are also able to perform the following tasks:

- Running jobs
- Managing jobs in the archive (running, editing, deleting)
- Defining and evaluating job reports

Operators Operators can only perform a limited number of tasks:

- Searching for a job
- Running a job
- Browsing the job results

4 Starting the Software and Logging In

Prerequisites

- The software and all required licenses have been installed.

Procedure

1. On your Windows Desktop, double-click the ZEN 2 core SP1 program icon.
   The **Login** screen is displayed if user management is enabled.
   Otherwise you are logged in automatically.
2. Click your name in the list of users.
3. Enter your password and click **Login**.
   The **Home Screen** is displayed.
4. Click the icon of the operating mode you wish to use.

INFO

When you start the software for the first time, user management is disabled.

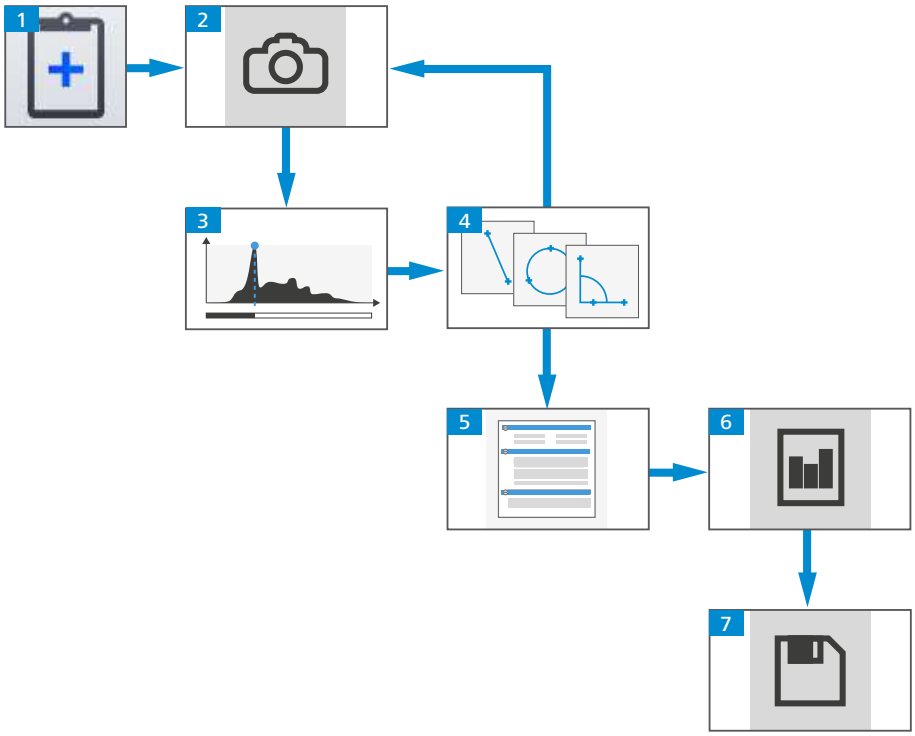
5 Creating a Job Template

5.1 Introduction

This chapter only applies to supervisors.

5.2 Workflow

One typical workflow when creating a job template can be summarized in the following figure. Each step represents one task in the job template and is represented with an icon in the **Task List**.



1. Select **Create Job Template** mode from the **Home Screen**.
2. Acquire an image.
   Use the microscope camera or load an image from the file system.
3. Process the image.
   Enhance the image and configure which parameters can be modified, for example adjust the brightness and specify that contrast can only be altered +/- 10%.
4. Analyze the image.
   Define the measurements to be performed and configure the accepted measurement tolerances.
   If desired, repeat steps 2 – 4.

5 Configure the input form.
Select a form template and specify the metadata to be recorded (e.g. sample ID, current time) and how it is entered (manually, automatically).

6 Configure the report.
Select a report template and configure how measurement results and metadata should appear in it.

7 Save the job.
Specify a name for the job template and which users are allowed to run it.

5.3 Creating a New Job Template

ZEN 2 core SP1 is supplied with example job templates which you can configure to your requirements.

However, you can also create a new job template from scratch.

Prerequisites

- You are logged in as a supervisor or you have the sufficient privileges to create a job template
- The **Home Screen** is visible

Procedure

1. Click **Create Job Template**.

   An empty job template is created.

2. Select the category of the first task to be performed, typically **Acquisition**.

3. Select the workbench for the first task to be performed and click **Add**.

   Alternatively, you can double-click the desired workbench.

   The first task is displayed in the **Task List** and the corresponding workbench and tools are displayed in the **Workbench Panel**.

4. Continue with the steps described in the typical workflow.

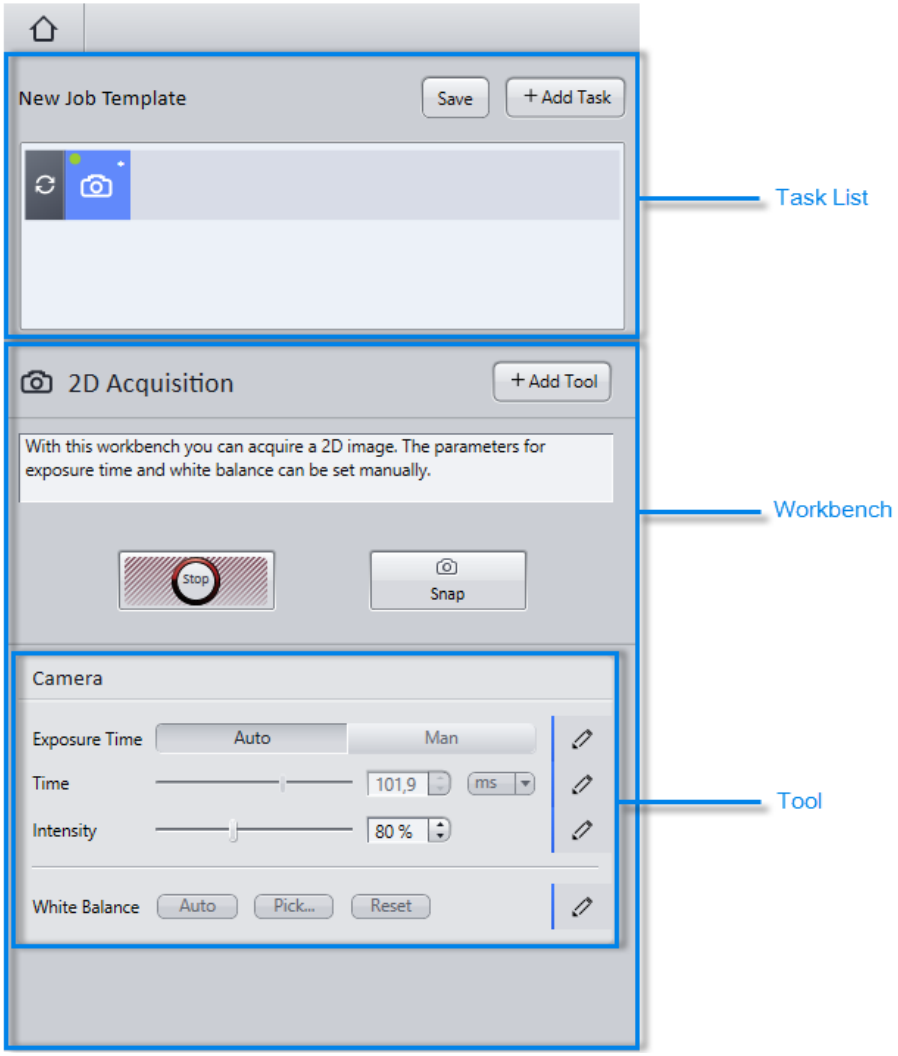


Fig. 5.1: Creating a Job Template

5.4 Specifying Tools for a Task

For each task to be performed when the job is run, you can specify which tools are available to complete the task. For example, for a processing task, you can specify that only the **White Balance** tool and **Gauss** tool are available.

This is done by adding and removing tools from the corresponding workbench so that only those required when running the job are included in the workbench.

INFO

If a tool is required when running a job, it must be included in the workbench. However, if you do not want the operator to be able to change the values of the tool parameters you can lock or hide individual parameters. To hide the entire task from the operator, right-click it and apply the **Run Silent** option. The task is then executed but not visible to the operator when the job is run.

Adding tools To add a tool to a workbench:

Procedure

1. Select the workbench to which you wish to add a tool.
2. Click the **Add tool** button in the workbench header.
3. Select the desired tool.

   The tools that are available depend on the current workbench.

> **TIP**
>
> If you wish to add large numbers of tools to a workbench, it may be advisable to add another workbench of the same type and to distribute the tools across the two workbenches.

Removing tools To remove a tool from a workbench:

Procedure

1. Right-click anywhere within the tool.
2. Click **Delete**.

Alternatively, you can click  to remove the tool.

If you remove a processing tool, the new processing result is not displayed until you click the corresponding  icon in the **Task List**.

5.5 Locking and Hiding Parameters in Tools

When creating a job template you can specify the operator's privileges for each parameter individually. The privilege is indicated by the following icons:

-  Parameter can be seen and changed by the operator

  If the parameter can be changed by the operator, you can choose to limit the range of permitted values.

-  Parameter can be seen but not changed by the operator

-  Parameter is hidden from the operator (and thus cannot be changed)

To change the property of a parameter:

Procedure

- Click the icon until it has the desired state.

  The icon cycles between the three states in the above order.

If all the parameters in a workbench are hidden or locked, the corresponding task is performed automatically in the background when the job is run.

If you want an entire task to be performed automatically in the background without user interaction, you can use the **Run Silent** option. This overrides the settings of individual parameters within the task.

Procedure

- Right-click the icon of the task in the **Task List** and select **Run Silent**.

5.6 Applying an Image Optimization

ZEN 2 core SP1 contains various image processing tools you can apply to your images. To apply an image processing tool, you must select the **Image Processing** workbench and add the desired tool (if not already available).

Adding an image processing tool

To add an image processing tool:

Prerequisites

- You are logged in as a supervisor.
- The **Image Processing** workbench is selected.

Procedure

1. Open the **Tool Overlay** by clicking the **+ Add Tool** button in the **Workbench Area**.
2. Double-click the desired tool in the **Tool Overlay**.

   The categories help you find the tool you need for your job.

The tool is added to the **Image Processing** workbench. You can now adjust it as required for the job, add more tools, or remove tools you do not need.

If you are working in **Create Job Template** mode and a branch in the **Task List** contains multiple processing workbenches, they are all applied, from left to right. The output of a processing workbench provides the input for subsequent processing workbenches.

The same holds for the tools within one processing workbench: the processing tools are applied from top to bottom and the output of a processing tool provides the input for the subsequent processing tool.

5.7 Analyzing the image

Once you have acquired an image you can analyze its properties by performing various types of measurements. The measurement results can then be added to a report.

In **Create Job Template** mode you can specify which measurement tools are available when the job is run as well as tolerances (upper and lower limits for the measurement value).

Procedure

1. Click **Add Task** | **Measurement** | **Interactive Measurement** | **Add**

   The four most common tools are visible in the **Interactive Measurements** tool. For further tools, click **Add Tool**.

2. Select a tool and click in the image to measure the sample.

3. To specify measurement tolerances click the  icon.
   Expected value: Typically the theoretical value contained in the CAD data or sample specification.
   Upper limit/Lower limit: Limits between which the measurement must lie, e.g. to fulfill quality control criteria.

4. Enter instructions about how to perform the task, for example which part of the sample should be measured in the input field of the workbench.

5.8 Creating or Modifying a Form Template

Forms provide a simple way to add information to a job when it is run by an operator. If the available form templates in the **Archive** are not suitable for your purposes, you can create a new form template or modify an existing one.

The **Form** workbench is selected.

Procedure

1. To create a new form template, click the plus icon.

2. To modify an existing form template, click the folder icon and select the desired form template.

3. Modify the form template as desired:
   - Customize the layout (e.g. add or remove fields)
   - Customize the properties of the fields
   - Translate the form

4. When you are satisfied with the form template, click the **Apply** button to use the form template in your job template.

5.9 Configuring a Job Report

Reports enable you to collate all the information from your examination, e.g. images, measurement data and hardware setup, in a single document as a protocol of your examination.

Reports contain placeholders to enable you to collate the information easily. The placeholders also ensure that each time the job i run, the same information is added to the report.

Procedure

1. Click **Add Task** | **Reporting** | **Reports** | **+ Add**.
2. Click on the **Folder** button in the **Add Templates** tool.

   Opens the **Select Report Templates** dialog.
3. Activate the checkbox of the desired report template, e.g. Report Form, and click the **Select** button.
4. Select the report template in the **Add Template** tool to display the available placeholders.
5. Click on the arrow in a placeholder, e.g. Image and select the corresponding measurement information that you wish to add. You can add multiple items to a single placeholder.

5.10 Saving and Completing the Job Template

You can save a job template at any time during its creation. The **Save Job Template** dialog enables you to specify the following:

- Job template properties (name and description)
- Category to which the job template is assigned
- Permissions (users that can run the job)

You can also modify the above in the **Archive** later.

For each job you can specify which users are allowed to run it. Typically, a group of users is specified, but you can also specify individual users. By default, a job can be performed by any user.

Prerequisites

- You are in **Create Job Template** mode

Procedure

1. Click the **Save** button.
2. In the **General** tab enter a meaningful **Name** and **Description**.
3. In the **Security** tab specify which users or user groups should be allowed to run the job.

   By default all users can run the job.

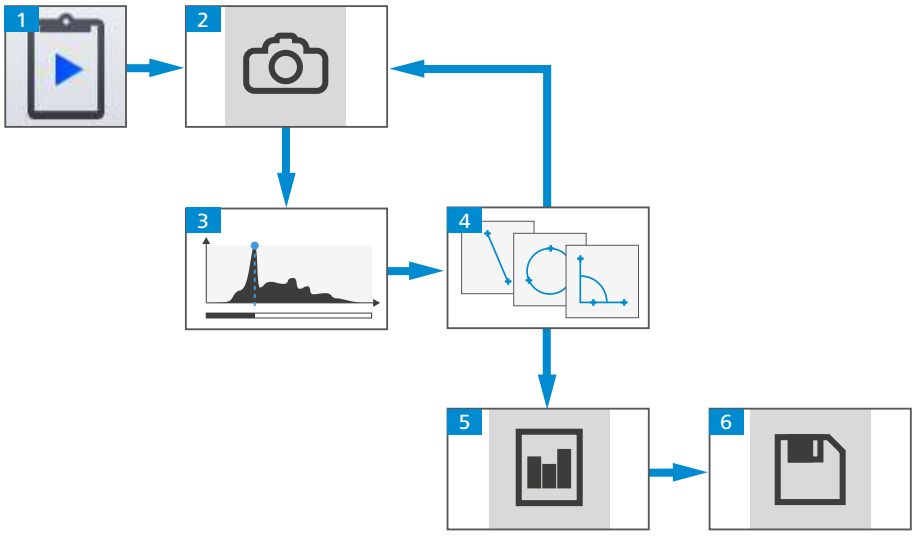
6 Running a Job

6.1 Introduction

This chapter applies to supervisors and operators.

6.2 Workflow

The following diagram shows an example of the workflow when running a job. Any steps where no interaction is required are performed automatically in the background.



1. Select the appropriate job for the sample.
2. Acquire an image of the region defined by the supervisor.
3. Process the image as defined by the supervisor.
4. Perform the analyses defined by the supervisor.
   You are automatically guided through the analyses and presented with the appropriate tool.
   Repeat steps 2 - 4 for other areas of the sample as defined by the supervisor.
5. Check the information in the job report.
6. Save the job results.

6.3 Selecting a Job to Run

When you log in as an operator, you can choose between selecting a job to run and viewing the results of a job in the archive that you have run previously.

Prerequisites

- You are logged in as an operator
- You are on the **Home Screen**

Procedure

1. Click **Run Job Template**.
2. Click the desired job in the list.
3. Click the **Run** button.

   Alternatively, you can double-click the desired job.

   The first step in the job is displayed (typically acquire an image).

If the job requires a different hardware configuration to your current setup, the system prompts you which components need to be changed. For more information about how to change components, see your microscope instruction manual.

6.4 Acquiring an Image

Acquiring an image is typically the first step when running a job. The image is acquired using the camera on your microscope. To load an image from the file system, see Loading an Existing Image.

Procedure

1. Ensure you acquire the same area of the sample as the supervisor.

   Follow any instructions added by the supervisor in the workbench panel.
2. If your microscope has a motorized stage, you can navigate the sample and adjust the focus using the software.

   Otherwise, move the sample on the motorized stage by hand and focus manually. For more information, see your microscope instruction manual.
3. If your microscope has a motorized object revolver you can select the correct zoom level using the software.

   Otherwise, select the correct objective by hand. For more information, see your microscope instruction manual.
4. If desired, adjust the acquisition parameters.

   For more information about individual parameters, click ?.
5. Click **Snap**.

   If you are not satisfied with the image, click **Live** and repeat the above steps.
6. When you are satisfied with the image, click **Next**.

6.5 Processing the Image

Image processing enables you to adjust the appearance of the image after it has been acquired, for example to compensate changes in brightness if the illumination changes between jobs.

Typical processing actions include:

- Brightness and contrast
- Reduce noise and enhance contours
- Adjust the size, rotation, and quality

The tools that you can use, and thus the properties that you can alter, depend on what the supervisor has enabled in the job template.

Procedure

1. Adjust the values of the parameters.
2. All processing tools are applied in one go, in the order displayed in the workbench.
3. Repeat the above steps until you are satisfied with the resulting image.

   For more information about individual parameters, click ?.
4. Click **Next**.

6.6 Performing an Interactive Measurement

Interactive measurements enable you to measure e.g. distances, angles, area, and intensities of pixels. All the measurements to be performed in the current image are displayed in the **Center Screen Area** at the locations specified by the supervisor.

Procedure

1. Follow any instructions added by the supervisor in the workbench panel.
2. Drag each measurement to the correct location.
3. Click the measurement to move or resize it.

   The corresponding handles for moving or resizing the measurement are displayed in the image.
4. Click **Next**.

INFO

If the supervisor specified an expected value and upper/lower limits for a measurement value (e.g. area or diameter), a corresponding color symbol in the **Task Panel** indicates whether your measurement result lies inside the expected limits (green) or outside the limits (red).

6.7 Creating a Report

Reports enable you to collate all the information from your examination in a single document. Typical information includes:

- Images
- Measurement data
- Metadata (e.g. examination time, hardware setup)

Each report template contains placeholders for the above information to enable you to collate the information easily. The placeholders are usually filled automatically with the correct information. Depending on the settings applied when the job was created, you might be allowed to change the content of a placeholder.

Procedure

1. Follow any instructions added by the supervisor in the workbench panel.
2. Check that all the information is included in the report (for example the correct images).

   A preview of the report is displayed in the **Right Tool Area**.
3. To change the information in a placeholder, select the desired report template in the **Add Templates** tool.

   Various placeholders are listed in the **Workbench Area**.
4. Click the arrow icon in a placeholder and select the corresponding measurement information that you wish to add, for example image, measurement result, etc.

   You can add multiple items to a single placeholder. The report preview updates accordingly.
5. If you require a paper copy click **Print Report**.

6.8 Saving and Completing a Job

When you have completed the last examination task, you can save the job.

Procedure

1. Check that you are satisfied with all your measurement results.
2. If you are not satisfied with a result, navigate back to the corresponding task and change the parameters accordingly.

   For information, see Running a Job.
3. To complete the job, click the **Save** icon.

   The measurement results are saved and a report is generated automatically.
4. Choose what you want to do next:
   - Repeat the same job with a new sample
   - Return to the **Home Screen**

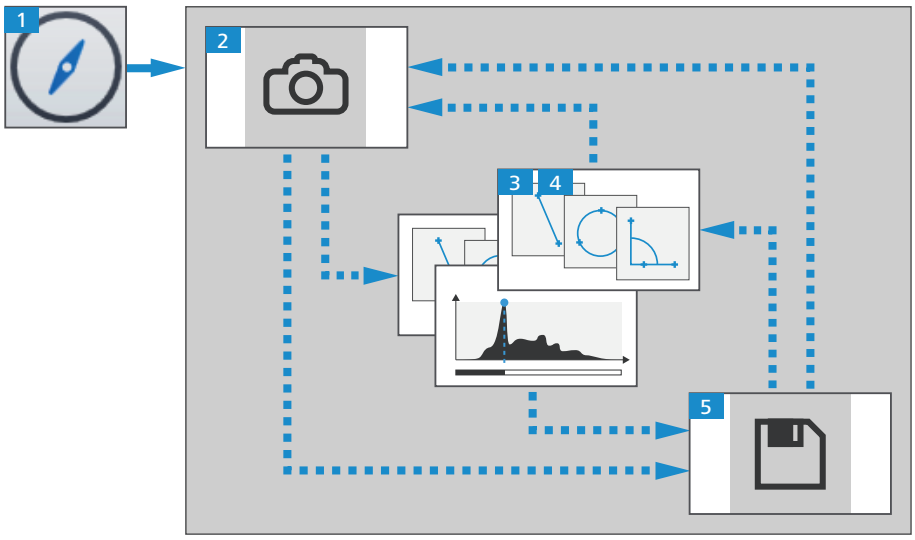
7 Performing a Free Examination

7.1 Introduction

This chapter only applies to supervisors.

7.2 Workflow

In **Free Examination** mode there is no typical workflow. In this mode, workbenches can be used in any sequence.



1. Select **Free Examination** from the **Home Screen**.
2. Acquire an image.
   Acquire an image using the camera or load an image from the file system.
3. Process the image.
   Enhance the appearance of the image using various processing tools.
4. Analyze the sample
   If desired, repeat steps 2 – 4.
5. Save or export the images and analysis results.

Each time you apply a tool a new image is generated in the **Documents Area**. You can apply any number of processing or analysis tools in any order.

7.3 Documents and Images

In **Free Examination** mode, there is no **Task Area** as in **Create Job Template** mode. Instead, user-created documents such as images, tables, forms, or reports are listed in the **Documents Area**.

The **Documents Area** displays the current image and all previous images. You can navigate to a previous image by clicking on it. If you then use a tool, it is applied to the currently selected image (rather than the most recent image). The resulting image is then added to the bottom of the **Documents Area**.

7.4 Selecting Workbenches

In **Free Examination** mode you can change which workbenches are displayed in the **Workbench Area**. To be able to use the tools within a workbench it must be selected. However, you can add or remove a workbench from the **Workbench Area** at any time without affecting the examination results. The order of the workbenches also does not affect the examination results.

TIP

Remove any workbenches you do not require to reduce the number of workbenches displayed in the **Workbench Area**.

Adding workbenches

To add a workbench to the **Workbench Area**:

Procedure

1. Click the **Add Workbench** button.

2. In the left pane, click the desired workbench category.
3. In center pane, click the desired workbench.

   A description of each workbench is displayed in the right pane.
4. Click **+ Add**.

Removing workbenches

To remove a workbench from the **Workbench Area**:

Procedure

1. Right-click the icon of the workbench.
2. Click **Close workbench**.

INFO

The next time you start a free examination the workspace is displayed as you left it.

7.5 Customizing Workspace

The **Free Examination** workspace always starts with the same workbenches displayed in the **Workbench Bar** as were used for the previous free examination.

- If you have a set of workbenches that you commonly use for free examinations, you can simplify your work by adding them to the **Workbench Bar**.
- Furthermore, if there are workbenches you rarely need, you can remove these from the **Workbench Bar**.
- You can also modify existing workbenches by adding and removing tools.

By combining the above methods, you can configure the free examination workspace to your requirements.

7.6 Assigning Examination Information to Report Placeholders

Reports enable you to collate all the information from your examination in a single document. Typical information includes:

- Images
- Measurement data tables
- Metadata (e.g. examination time, hardware setup)

Each report template contains placeholders for the above information to enable you to collate the information easily. The placeholders also ensure that each time the job is run, the same information is added to the report.

Prerequisites

- At least one report template is listed in the **Add Templates** tool.

Procedure

1. Select the desired report template in the **Add Templates** tool.

   Various placeholders are listed in the **Workbench Area** and a preview of the report is displayed in the **Center Screen Area**.

2. Click the arrow icon in a placeholder and select the corresponding measurement information that you wish to add, for example image, table containing measurement results, etc.

   As a rule you can add a single item to each placeholder. The image placeholder is an exception: you can add multiple images to a single image placeholder.

   The report preview updates accordingly.

3 Repeat the above step until you have added information to all the placeholders.

4 Click **Create Report** to create the document in the **Documents Area**.

You can export the report from the **Documents Area** by using the context-menu.

5 If you require a paper copy of the template click **Print Report**.

7.7 Exporting Results

You can export images or measurements results, e.g. to publish them or to archive them on an external storage device.

Procedure

1 Click **Add Workbench** an select the **Documents** category.

2 Select the **Save File** workbench and click **Add**.

3 Select the image to be exported, specify a filename in the **Save Image** tool, and click **Apply**.

Alternatively, you can right-click a document (such as an image or report) in the **Documents Area** and use the context menu to export it.

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