Guided Assembly: Design Studio
Operator Manual v2.0.1.2

Design Studio V2.0.1.2

SUPPORT INFORMATION:

If any service is required on the equipment, contact KolverUSA Service Department during normal business hours (9am-5pm, Monday-Friday):

   KolverUSA Service Department – (978) 455-0672

If you are calling after-hours, leave a detailed message and our service department will contact you on the following business day.

If you have a less critical support question, contact us through e-mail:

   KolverUSA email -   crobertson@blkcorp.com

A response to the question will be sent within 48-hours

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Smart Motion - Design Studio

The Smart Motion Design Studio is used to create visual instructions for manual assembly processes. The instructions contain digital images and guidance messages that are displayed during the assembly process by the Smart Motion Runtime application. The Smart Motion Runtime interfaces with a Smart-Control Box to display the image and guidance message that corresponds to the current assembly step.

The benefits of the Smart Motion Design Studio and Runtime are:

- Reduces ramp up time for new products and operators

- Improves quality by providing additional assembly guidance

- Increases productivity by providing intuitive tool position feedback

Overview

The Design Studio allows users to create instruction sets. The screen shot below shows the editor that is used to create and edit these instruction sets:
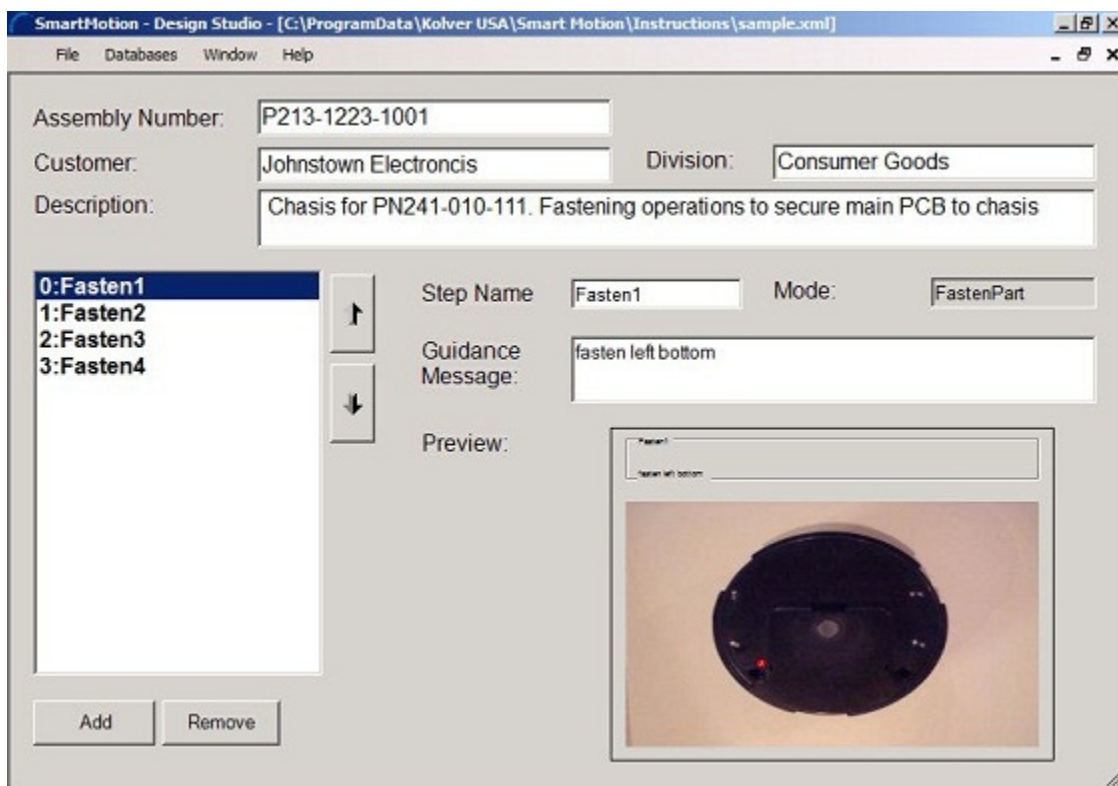
Each instruction set is composed of a sequence of instructions that are displayed in the list box on the left side of the screen above.

The Runtime application used these instructions to display a digital image with a crosshair to show the current location and target position as shown below:
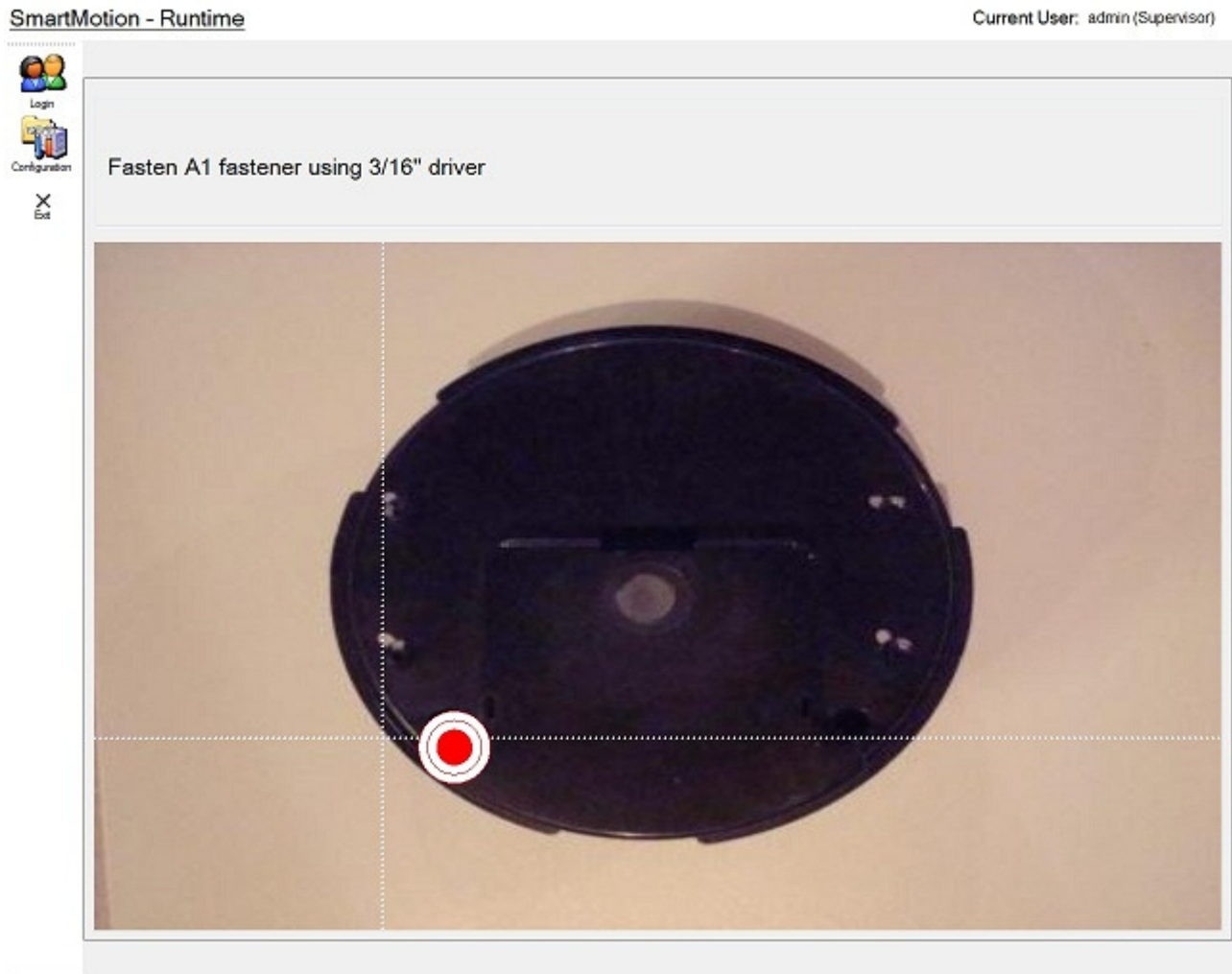
Getting Started

System Requirements

Processor: 1 GHz

RAM: 512 Mb

Free Disk Space: 2 Gb

Minimum Screen Resolution: 800x600

Operating Systems: Windows XP, Windows Vista, Windows 7

Additional Requirements

The Design Studio applications requires Microsoft .NET 4.0. If not present, the installer will automatically prompt the user to download and install it before continuing

Installation

See Guided Assembly Installation Instructions

Uninstalling

To Uninstall Design Studio

1. Click the [Start] button.

2. Select Settings > Control Panel.

3. Double-click Add/Remove Programs.

4. Click Install/Uninstall.

5. Then select Smart Motion Design Studio from the list of programs that can be automatically removed.

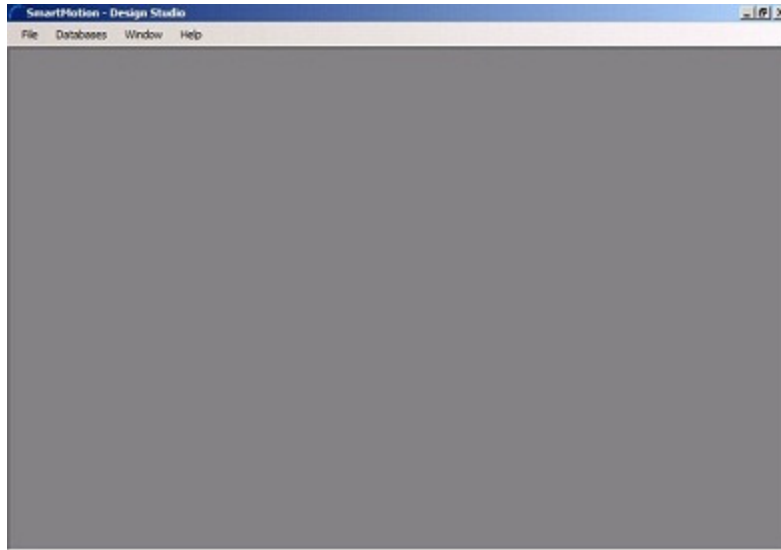6. Click the [Remove...] button to uninstall Design Studio.

Launching the program

To start Design Studio, click the Design Studio icon found in the Start menu, in:

Programs > Kolver USA > Design Studio

After the application has initialized, the main screen will be displayed as shown below:

Tutorial

This section contains a series of tutorials designed to help guide you through many different tasks in the application.

Managing User Accounts

When a user starts the Runtime application they will be asked to logon using a user name and password. Each user can be configured to use one of the two predefined user levels: operator or supervisor. The Design Studio application provides the capability to configure the user names, passwords and user levels used by the Runtime.

To begin managing user accounts, select Databases > Users as shown in the screenshot below:
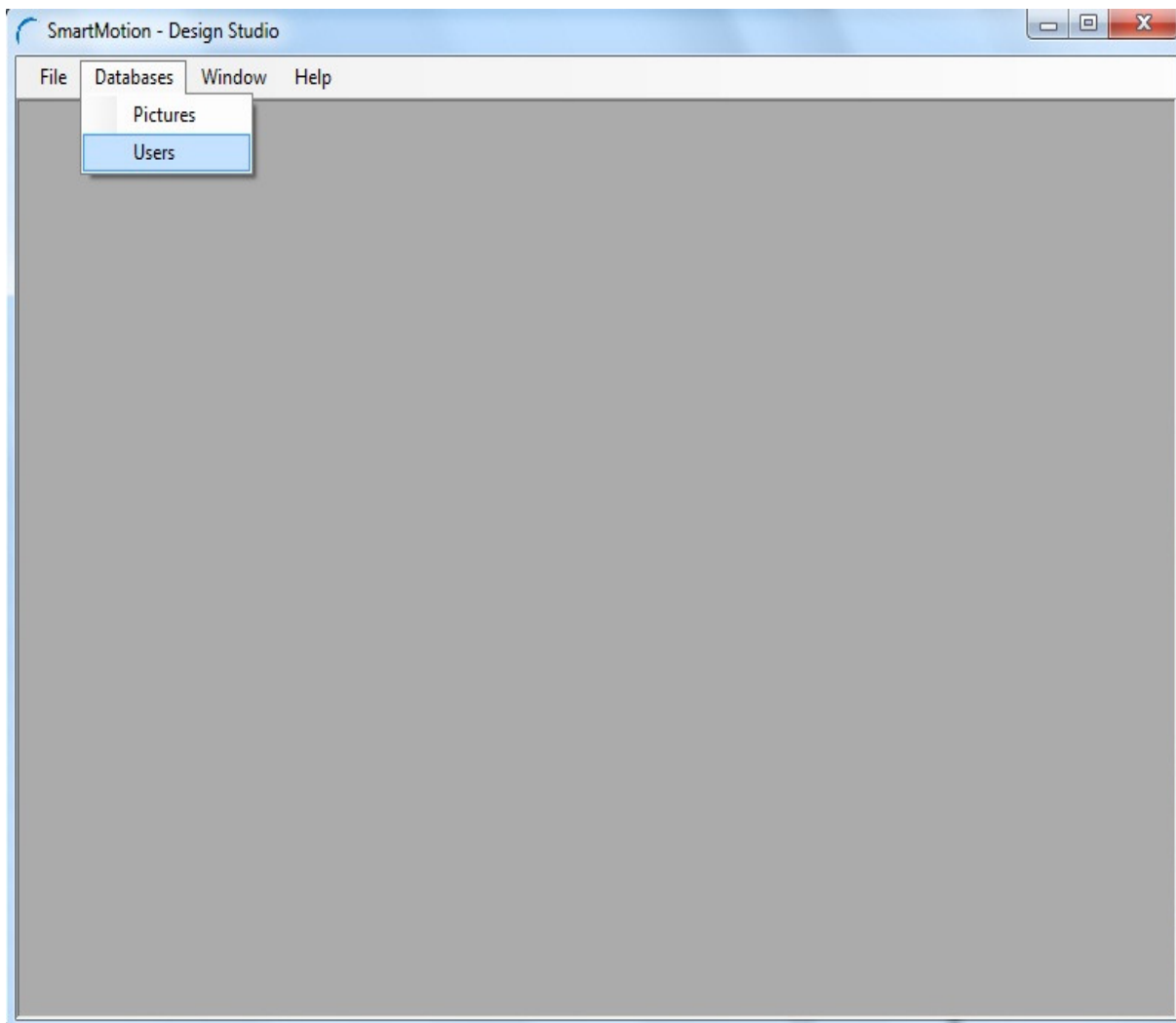
This will launch the user database editor screen which is shown below:
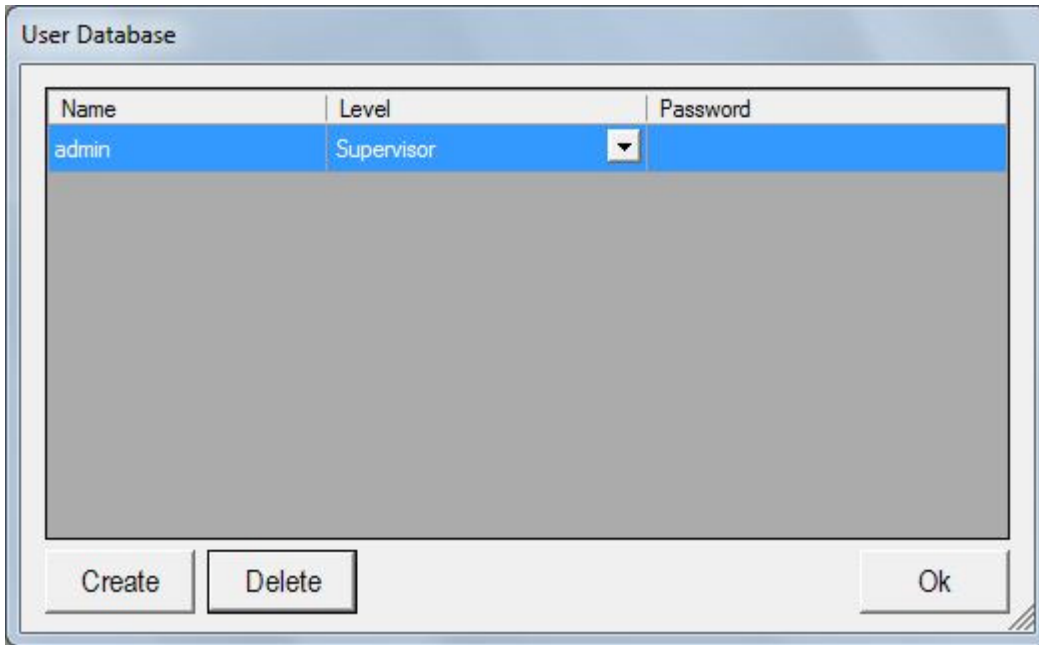
The user database editor screen allows you to create, delete, or modify user accounts. To create a new user account, press the create button. This will add a new line to the display. You can then double click on the name, level, and password fields to edit these values for either new or existing user accounts. To delete an account, select the account by clicking on it, and then press the delete button.

When finished editing click the OK button, which will prompt you to save any changes:
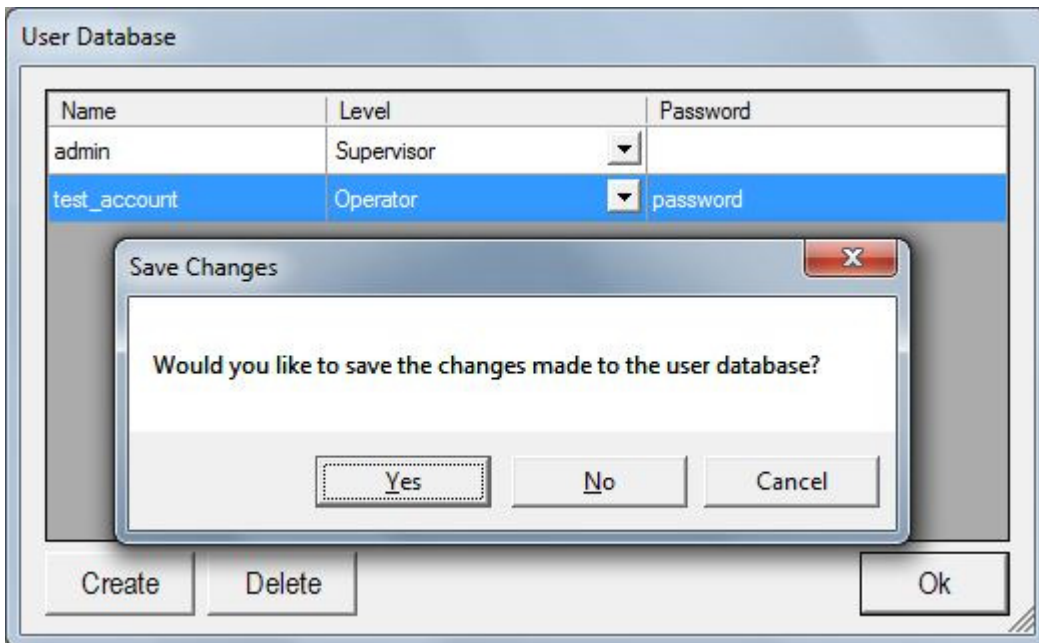
Once you click OK to this message box, the updates to the user database will be saved to disk. If for any reason you do not wish to save your changes you may select No, and all changes made on this screen will be undone.

Importing digitial images

During the assembly process the Runtime application displays a digital image of the assembly with a crosshair to indicate the current tool position and a target position. Digital images that are used in the instruction sets must first be imported into Design Studio using the "Picture Browser".

To access the Picture Browser, select Databases > Pictures as shown in the screenshot below:
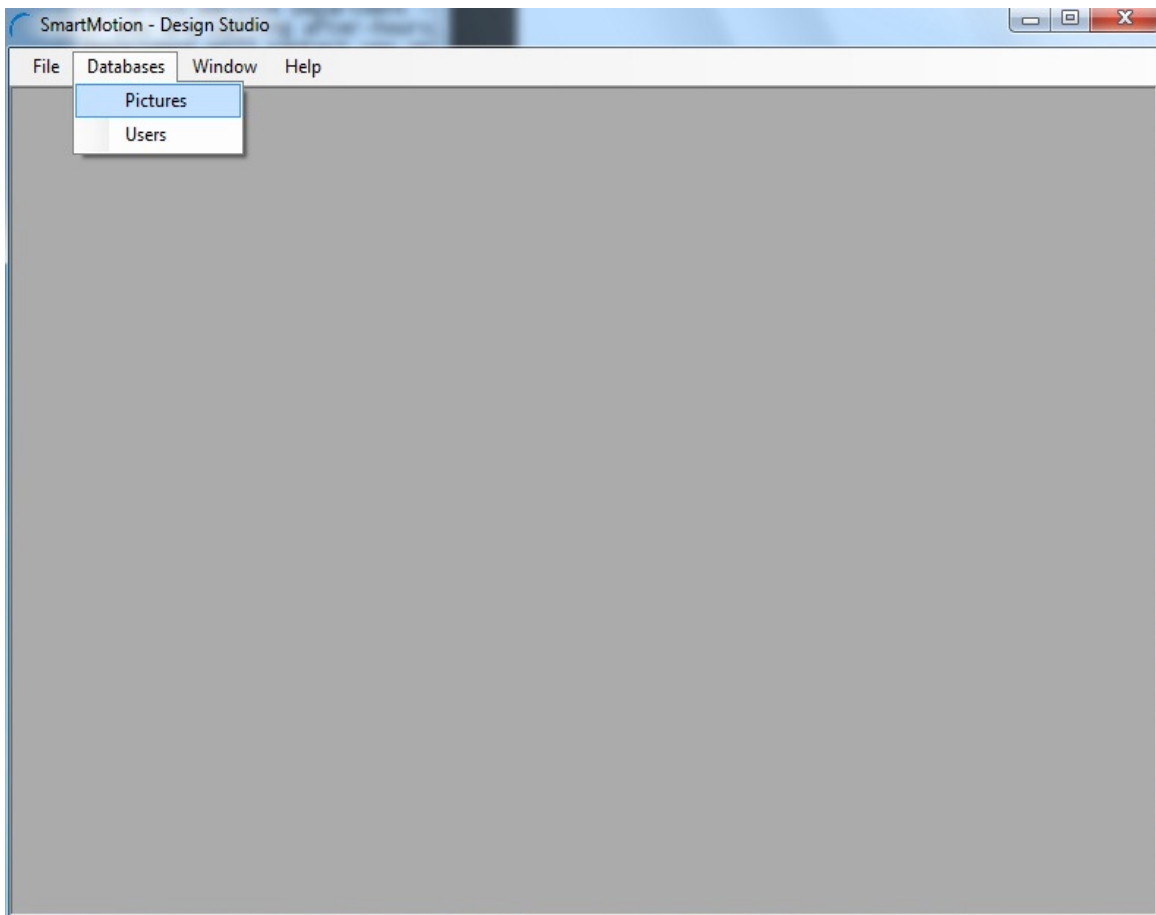
This will launch the Picture Browser screen as shown below:
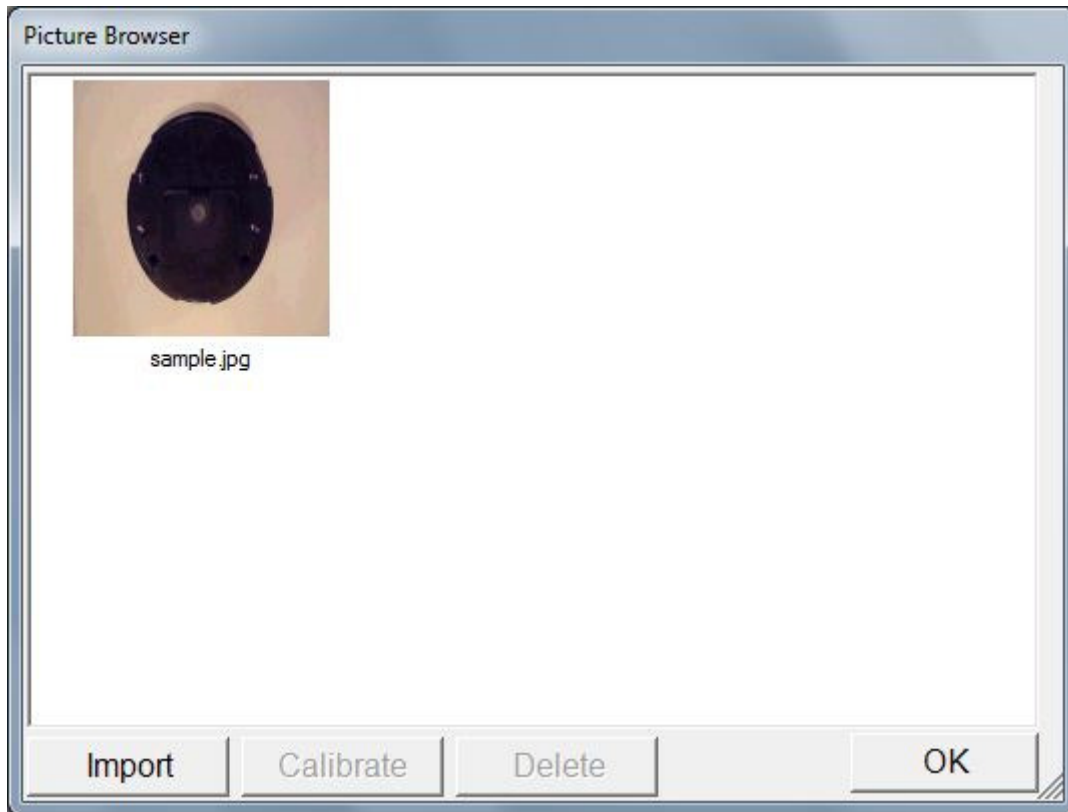
To import a new picture, press the Import button and then use the file open dialog to navigate to the location where the picture is stored. Once the picture has been selected, it will be imported in the Design Studio database and the program will automatically launch the Crosshair Calibration Wizard (see calibrating a Digital Image).

The Picture Browser can also be used to re-run the crosshair calibration on images that have previously been imported, and to delete existing images from the Design Studio image database.

Note: In order for the tool position to be displayed properly, the images must be taken looking down at the work area, with the smart encoder origin near the bottom left corner of the image and the x-axis running horizontally through the image.

Calibrating a digital image

When the Runtime application displays a digital image during the assembly process, it includes a crosshair to indicate the current tool position and a target. The crosshair calibration wizard is used to calibrate the scale factor used by the runtime to display the actual tool position accurately.
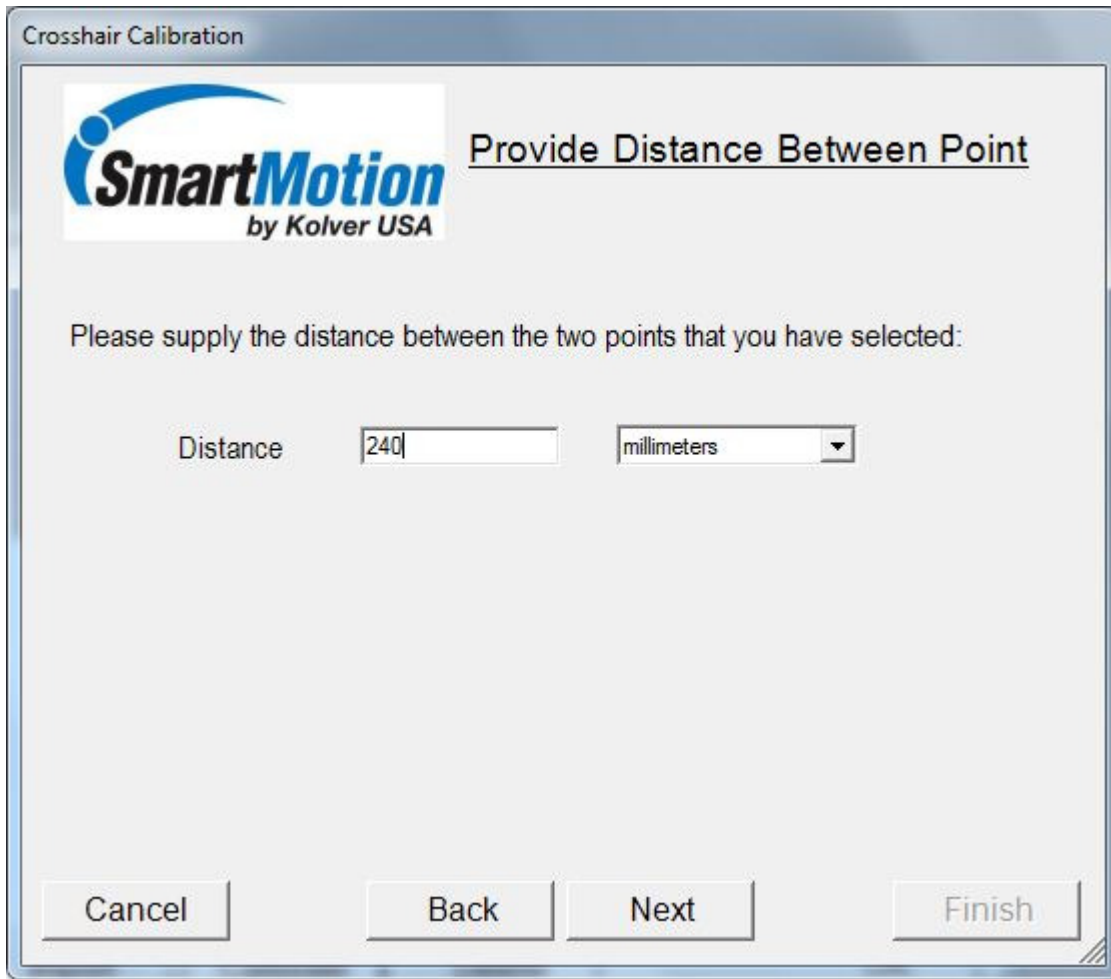
The crosshair calibration wizard opens automatically when a new image is imported, or it can be manually launched from the picture browser (see Importing digital images)

Note: In order for the tool position to be displayed properly, the images must be taken looking down at the work area, with the smart encoder origin near the bottom left corner of the image and the x-axis running horizontally through the image.
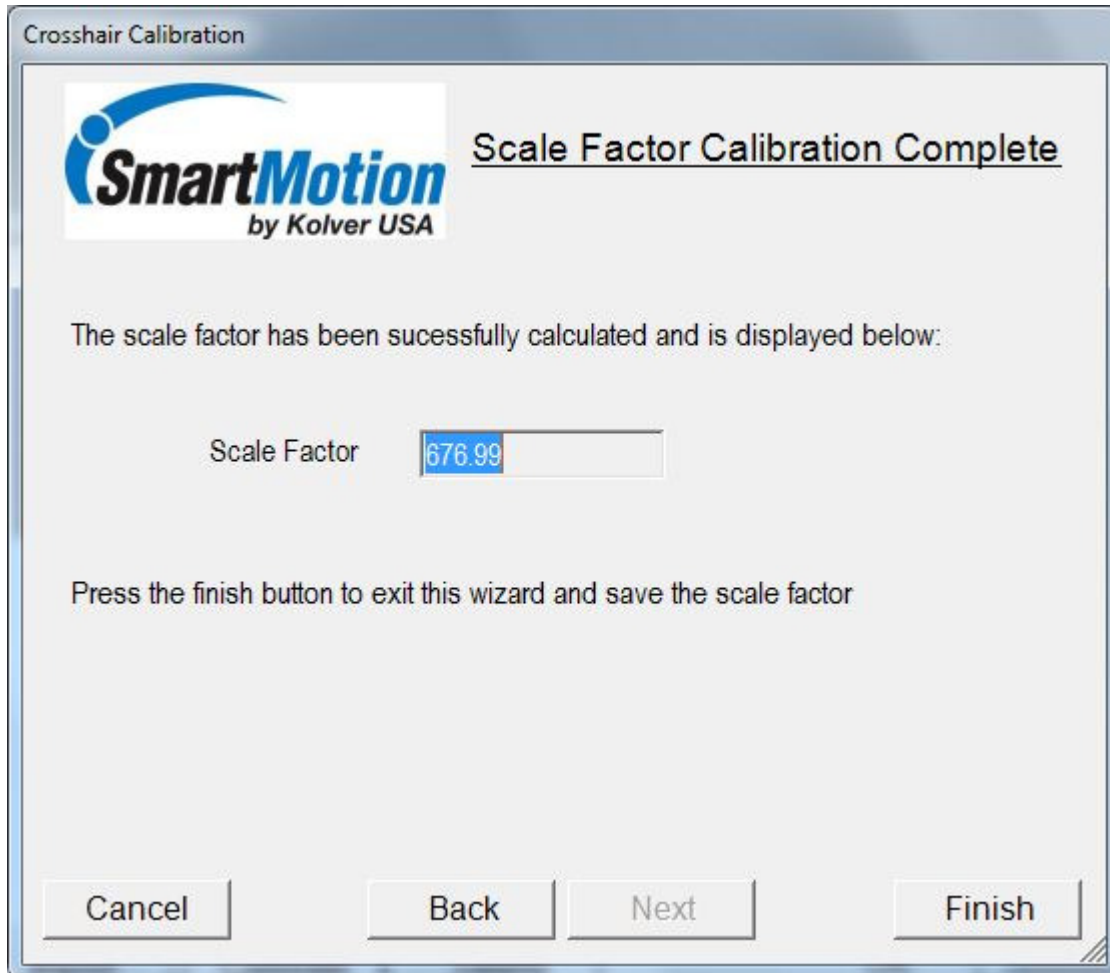
The crosshair calibration wizard prompts the user to select two points on the picture by clicking on them with their mouse:
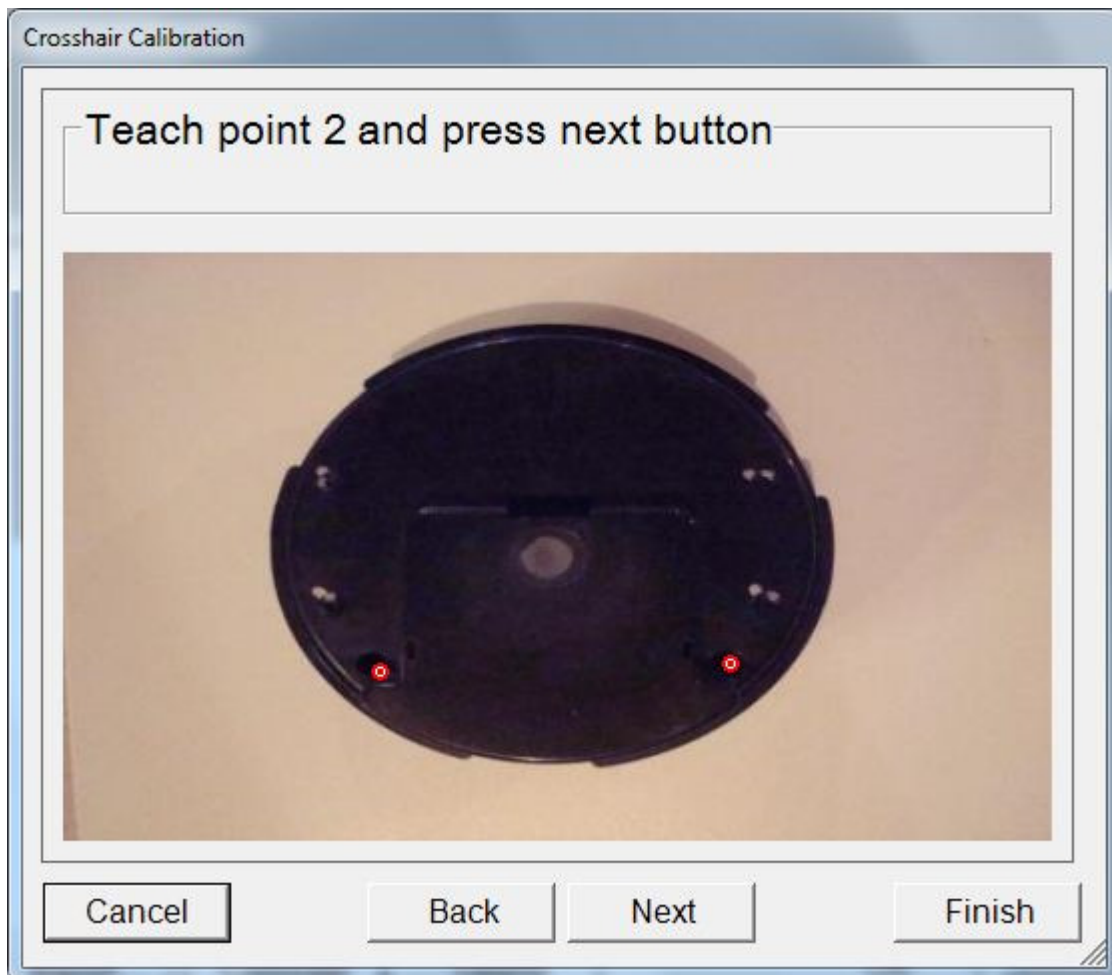
After selecting the two points, the user specifies the distance between these points as shown below:
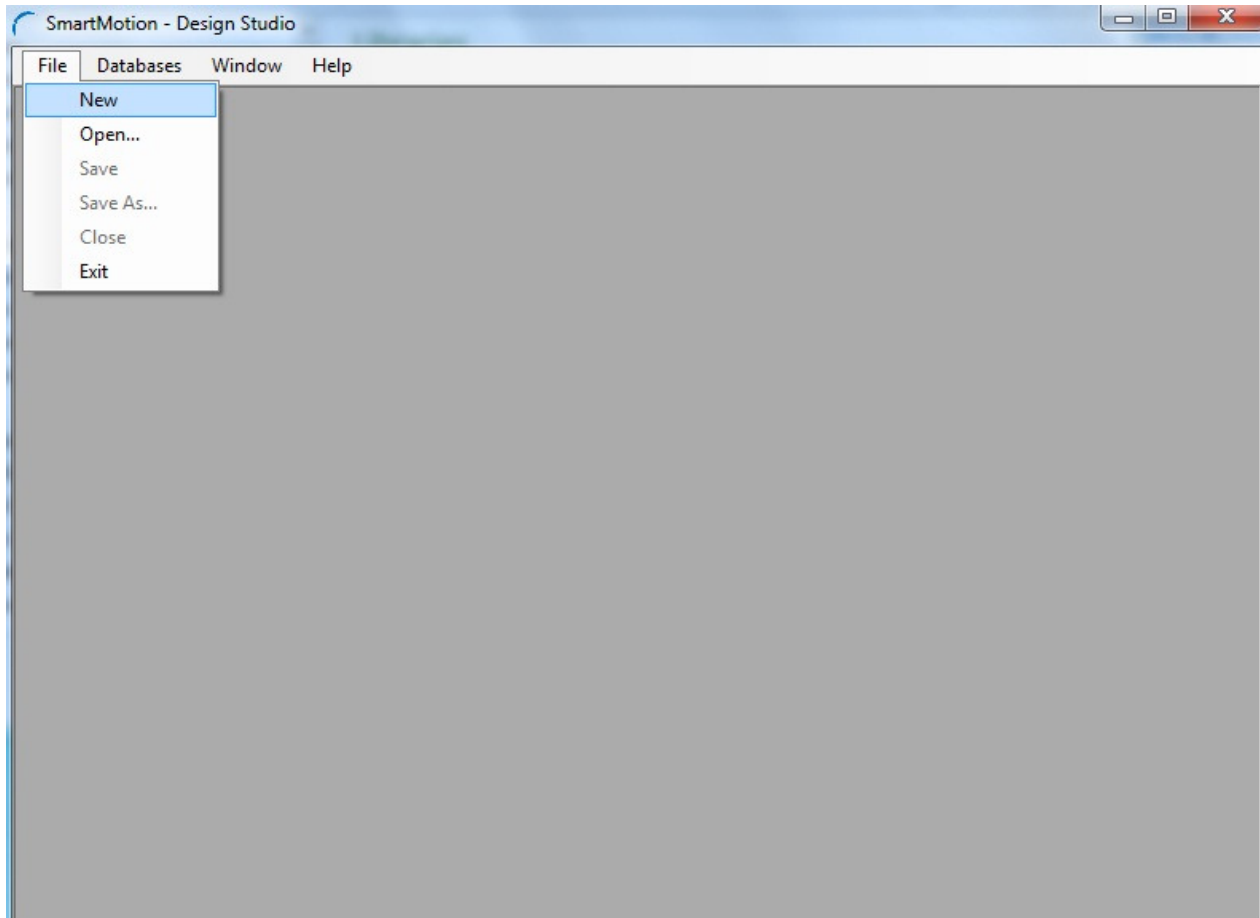
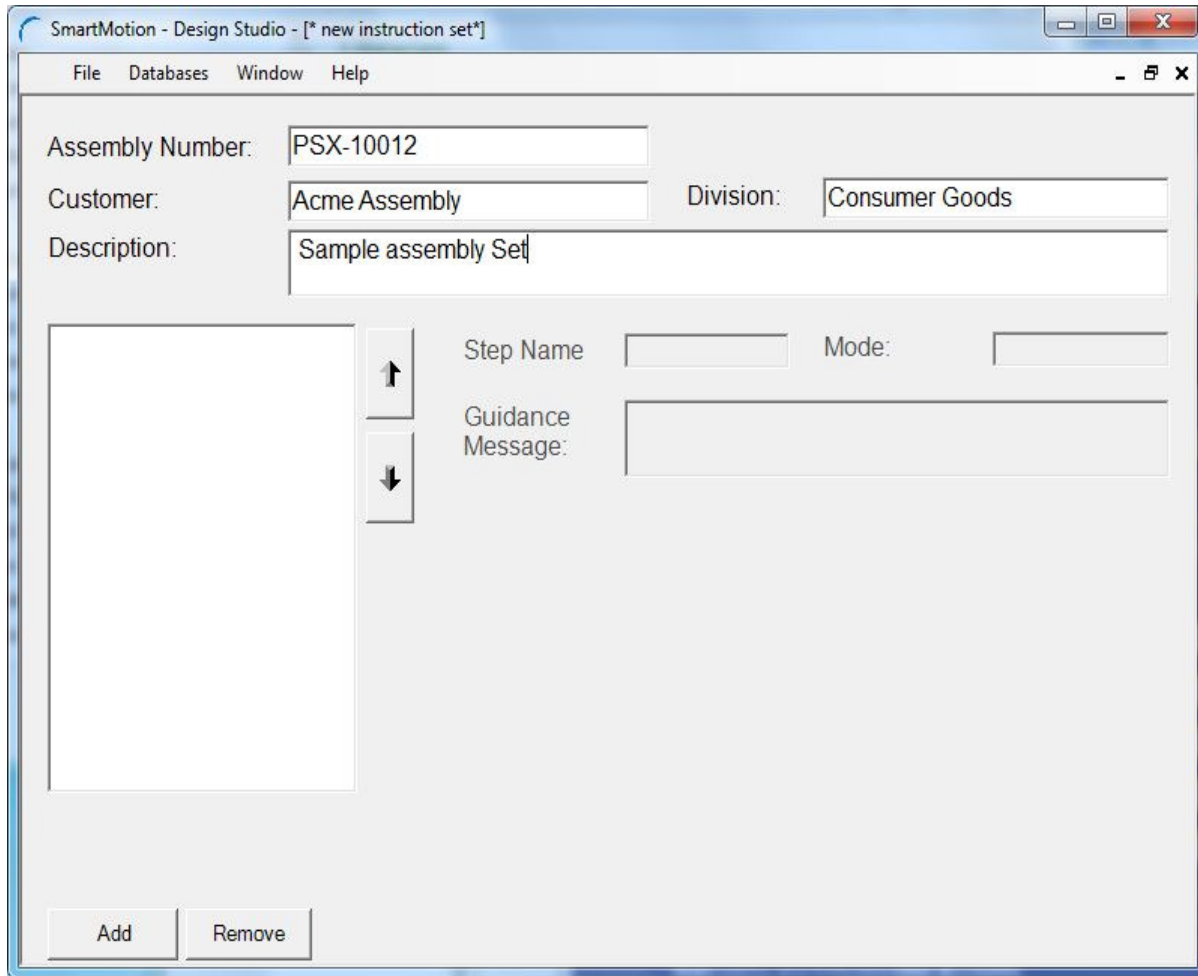The final screen of the wizard shows the calculated scale factor:

Note: Digital images using the same resolution and taken from the same height over the workplane should have roughly the same scale factor.

Creating a new instruction set

To create a new instruction set, start by selecting "New" from the file menu:

Then fill out the header information (Assembly Number, Customer, Description, Division):

**Note:** These fields are optional and used for informational purposes only

Then save the newly created instruction set by selecting "Save As..." from the file menu:
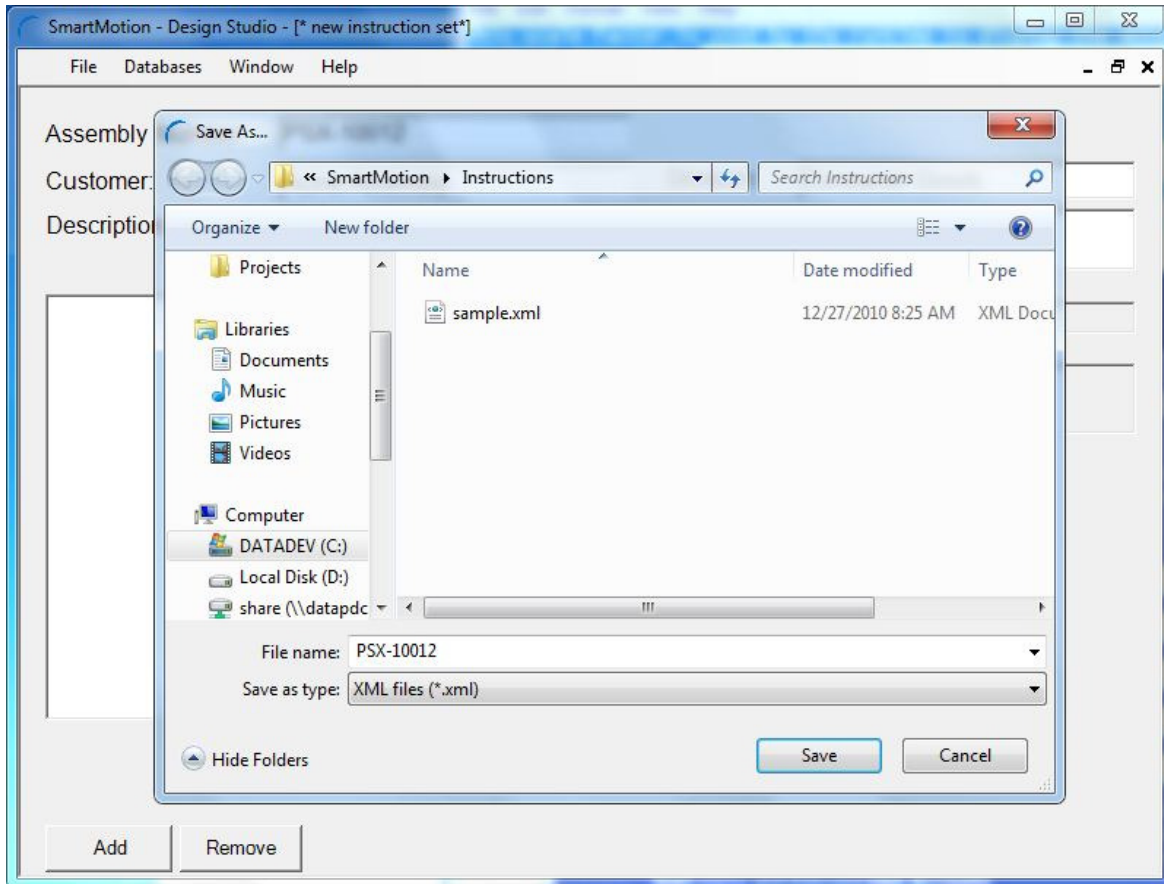
Note: In order for the instruction set to be accessible by the runtime application you must save it in the initially selected directory.
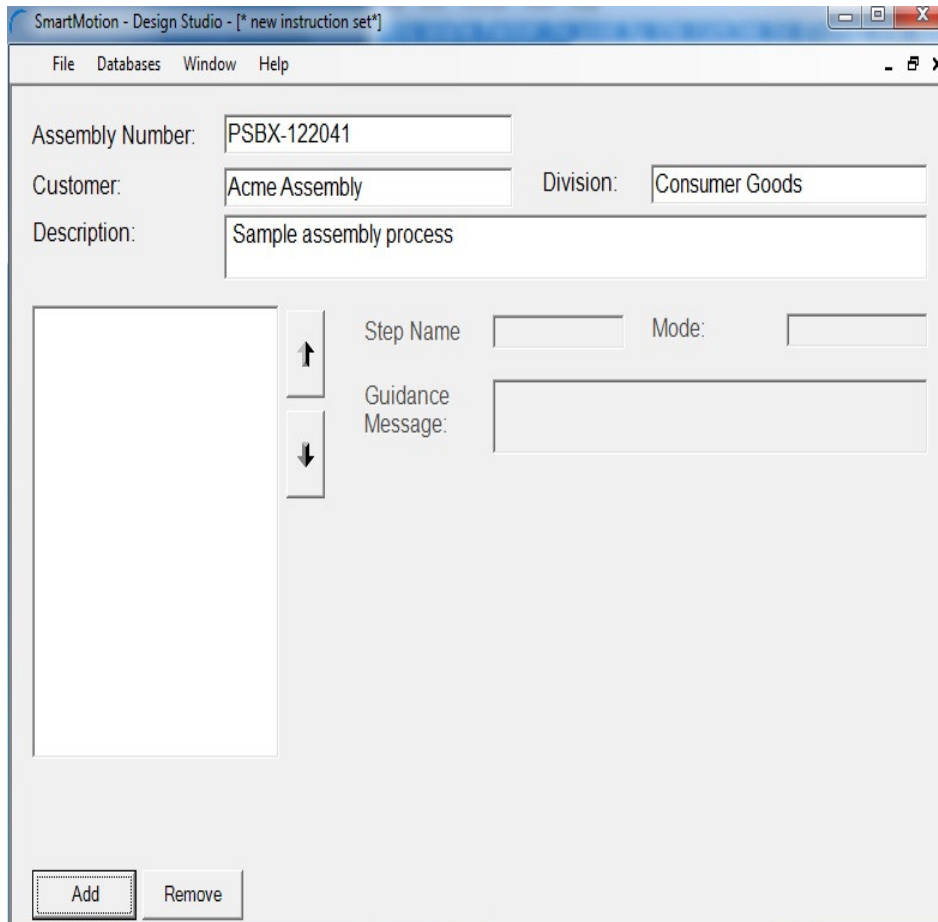
Opening a saved instruction set

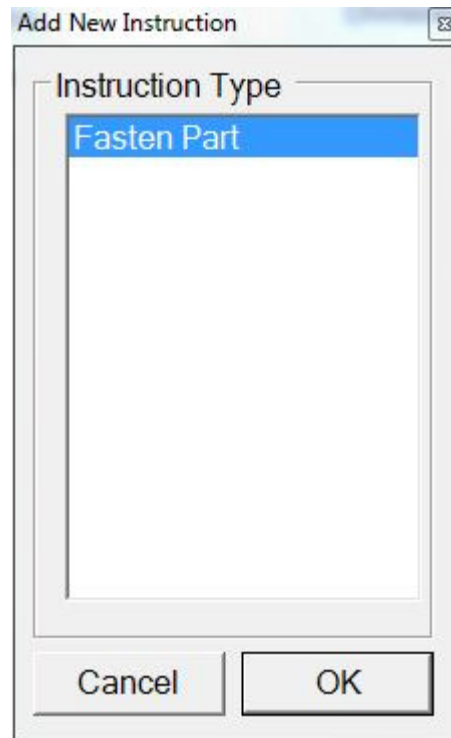To open a previously saved instruction set, select "Open" from the File menu:
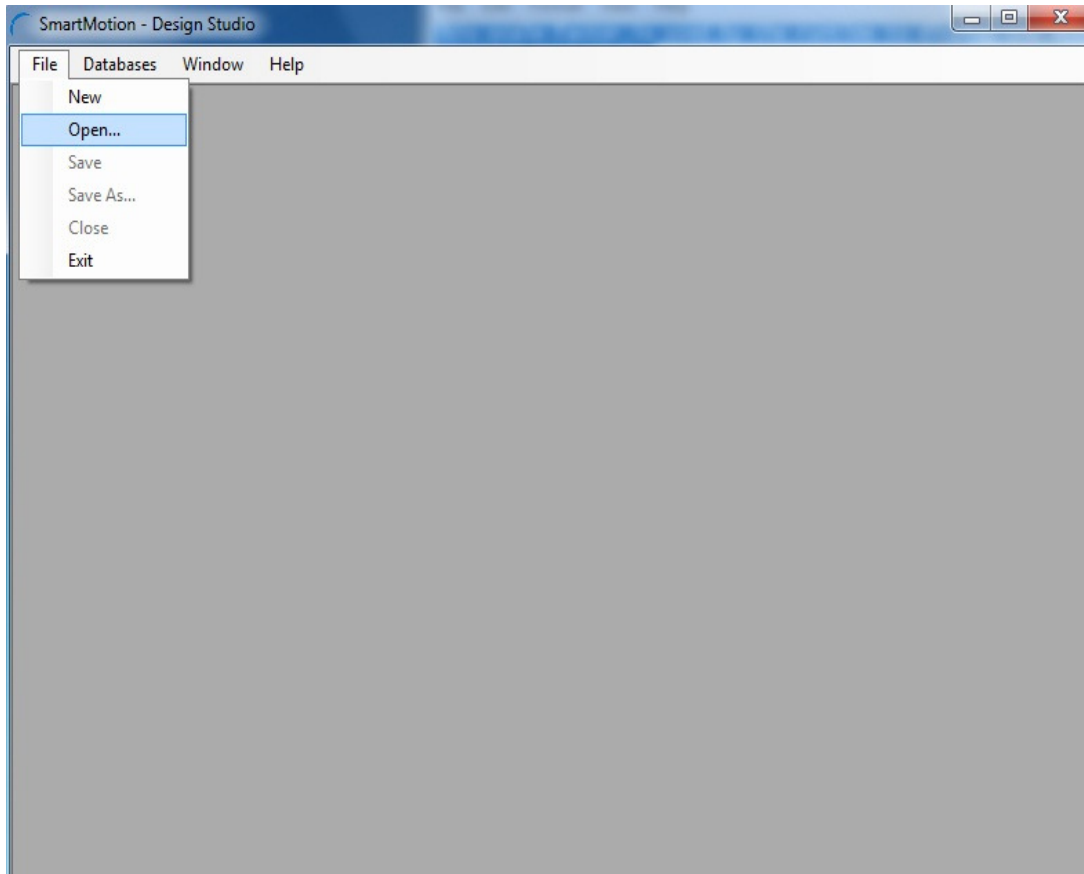
Adding a new instruction

To add a new instruction, start by clicking on the add button in the bottom left of the instruction set screen:
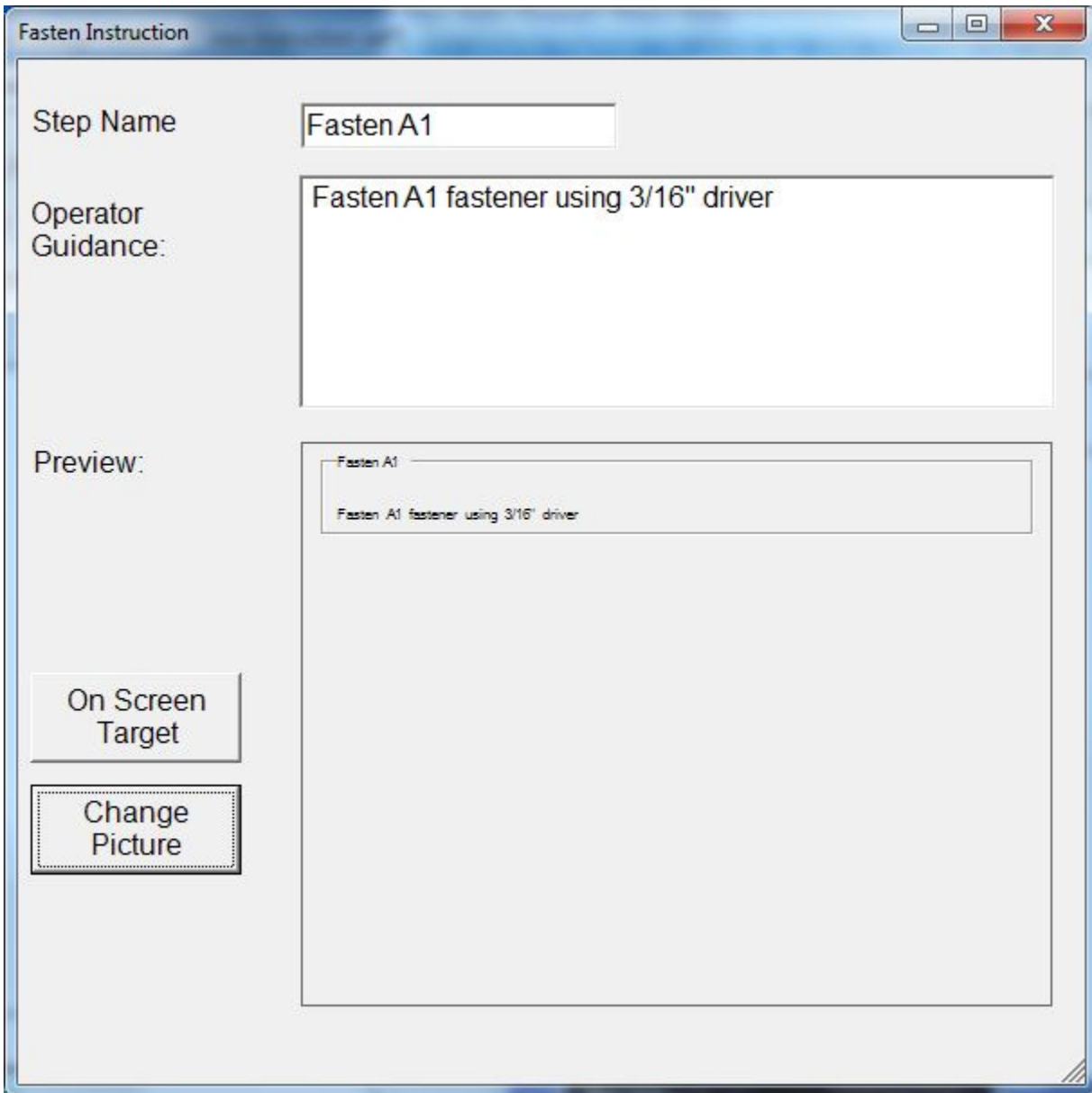
Then select "Fasten Part" from the next screen:

This will open the fasten instruction editing screen (see Editing a fasten instruction)

Editing a fasten instruction

The dialog shown below is used to edit the details of a fastening instruction. This dialog is shown when a new instruction is added, or when double clicking on the instruction in the instruction set editor window.


Provide a "Step Name" that will function as the title for the instruction. The operator guidance allows you to provide a more detailed message that will be displayed by the Runtime application. A preview of what will be displayed on the runtime is also shown.

To select the picture that will be used by the instruction set, select the "Change Picture" button, which will open the picture browser as shown below:
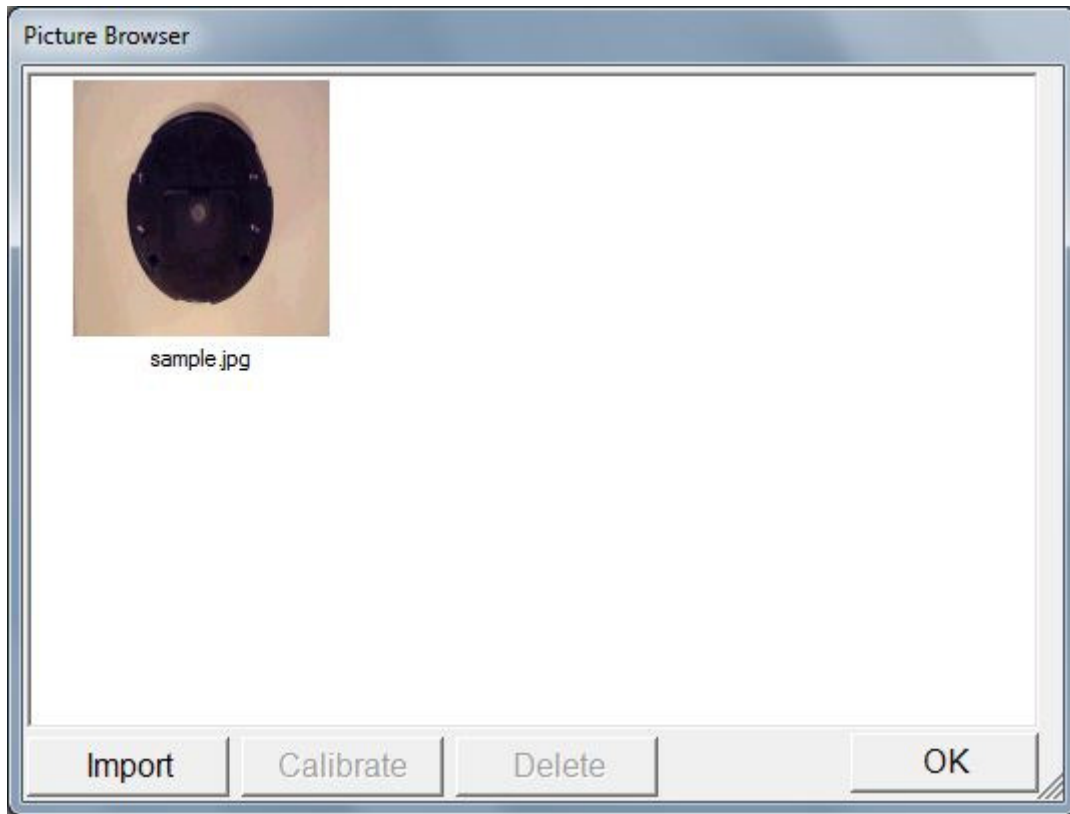
Select the image to be displayed by clicking on it and then selecting OK.

After the image has been selected, you can specify the location of the on screen target by pressing the "On Screen Target" button and then clicking on the image in the location where the target should be displayed:
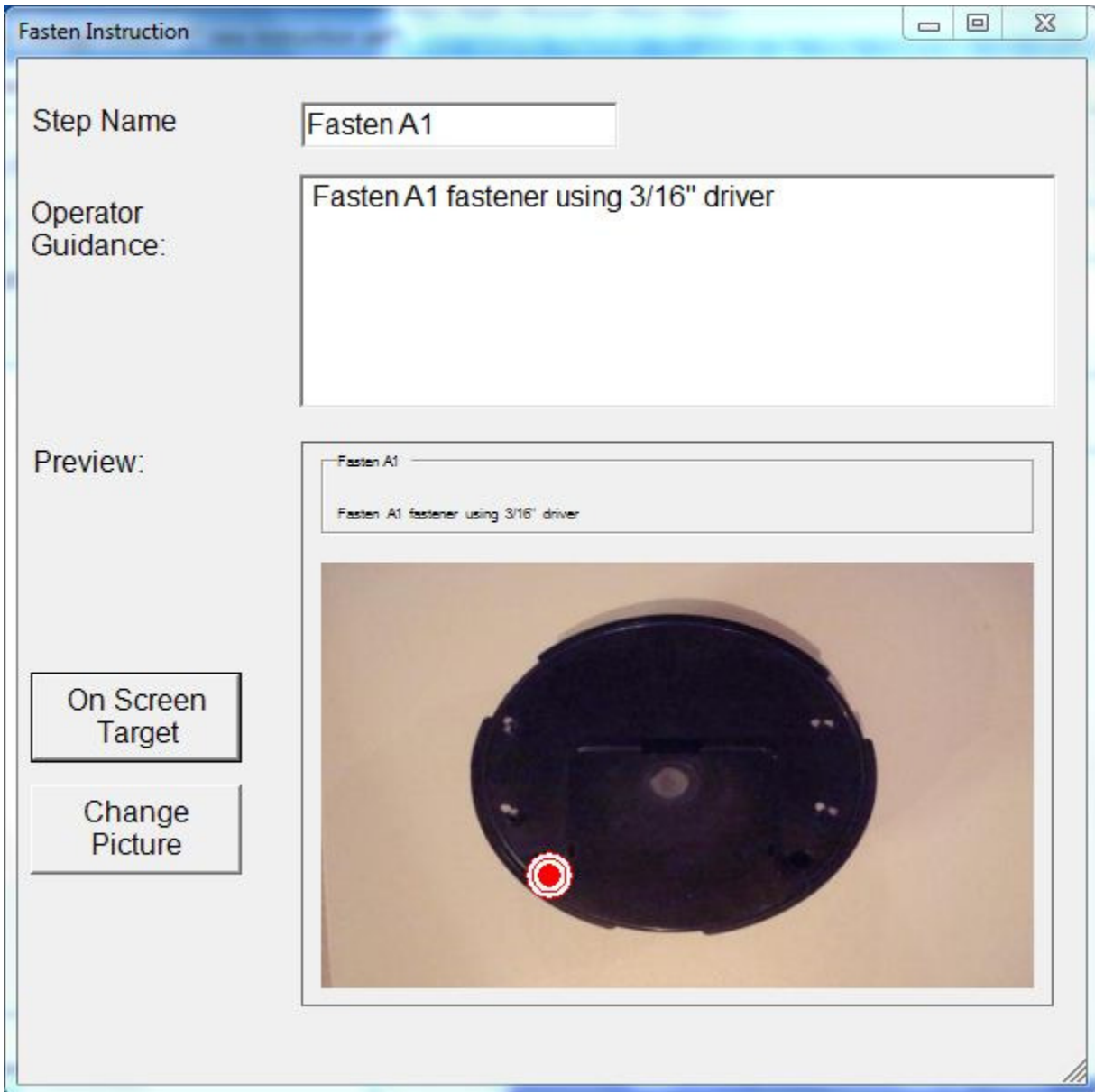
Reordering instructions

When editing an instruction set, all the instructions are listed on the left side of the screen.
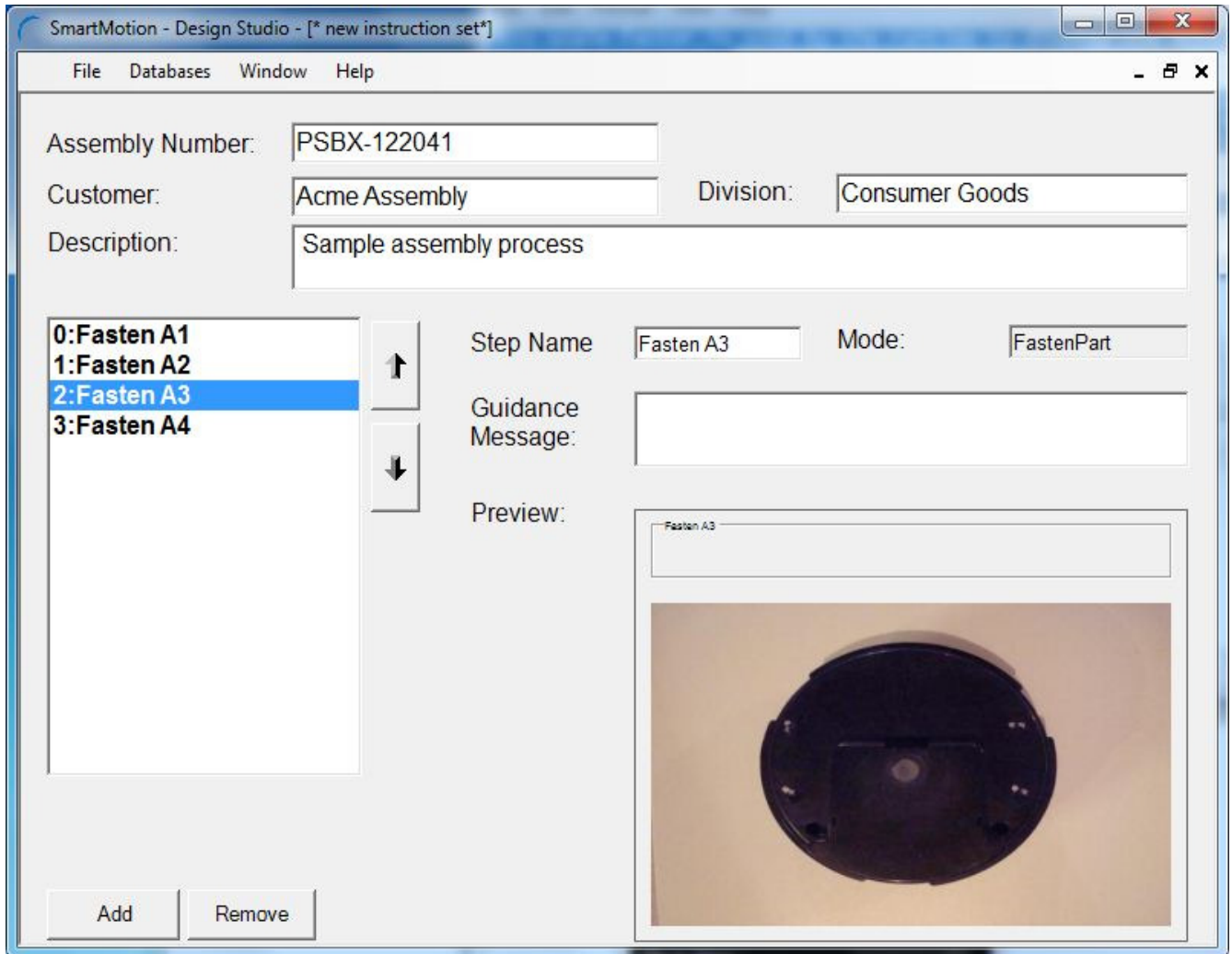
The list uses the following format: "Instruction Index: Instruction Title". The instruction index is automatically assigned based on the order of the instructions in the instruction set. To reorder instructions press the up/down arrow to the right of the list.

For example if the up arrow was pressed in the screen above, the result would be:
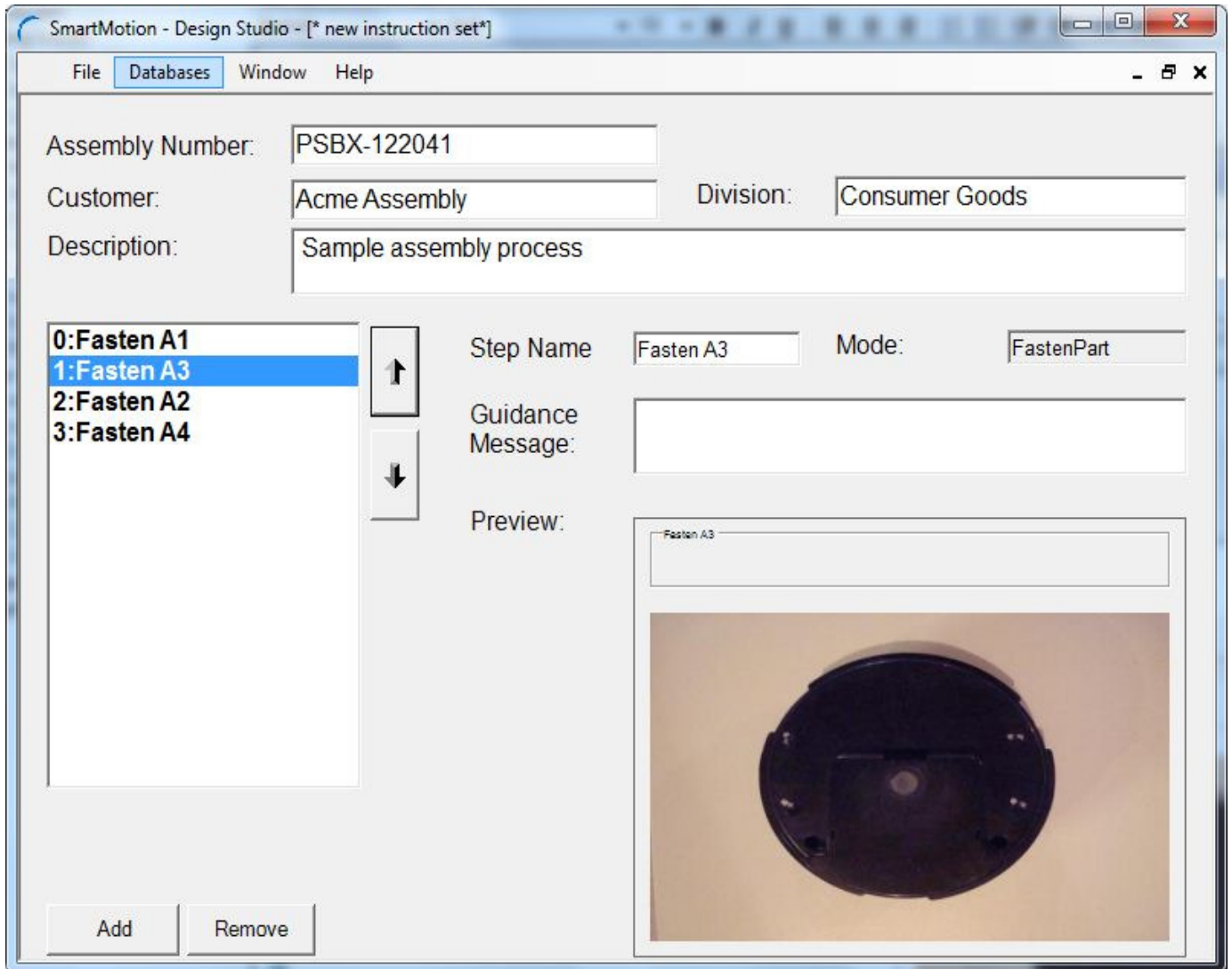
Notice that the instruction index of "Fasten A3" is now 1. The instruction index must correspond to the step number used in the Smart Control Box.
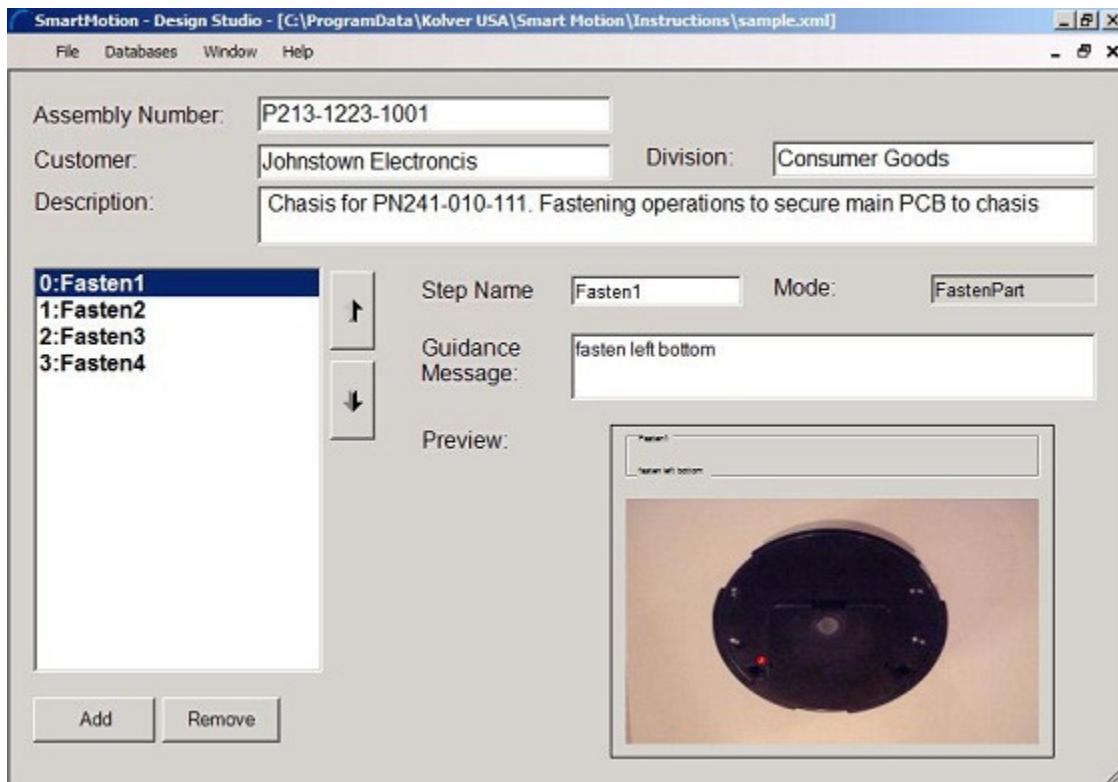
User Interface

This section describes the user interface of the application.

Instruction Set Editor

The instruction set editor form provides an overview of the entire assembly instruction set.
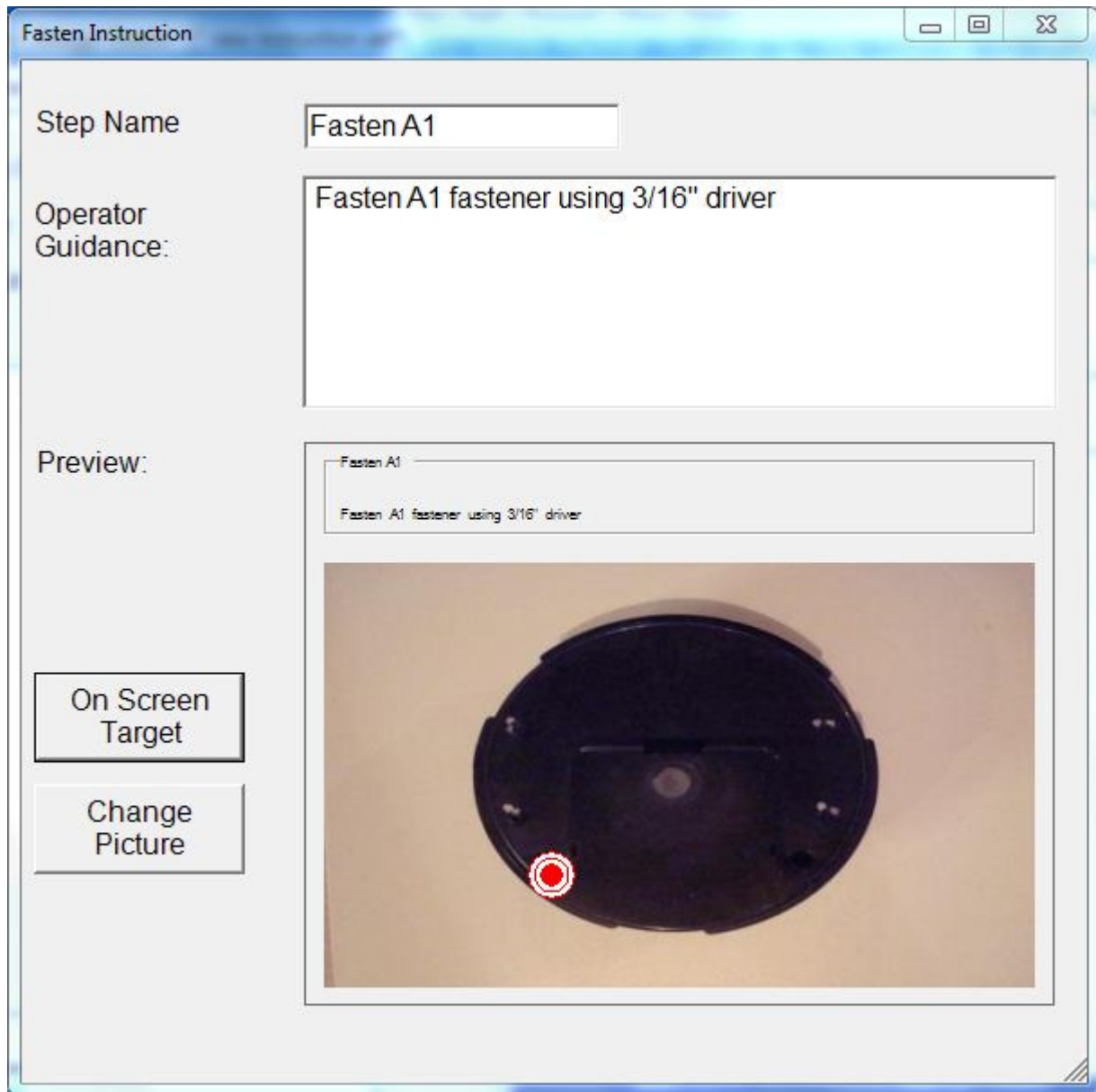
The instruction editor screen is shown below:

The top of the form contains header level fields which apply to the entire instruction set. Individual assembly steps are shown in the list view on the left side of the screen. As you click on each step, the picture and guidance messages are previewed on the right side of the screen. Double clicking on an instruction step in the list view will open the properties window for that instruction set. Instruction steps can be reordered using the arrow buttons located to the right of the list view.

Fasten Instruction

The fastening instruction form allows the user to edit the details of fastening instructions. It is shown when a new instruction is added, or after double clicking on an instruction in the list view on the Instruction set editor form.

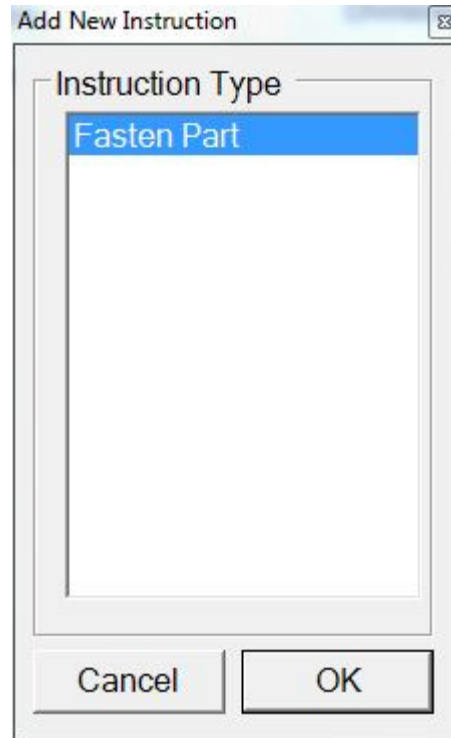The fastening instruction form is shown below:

For more information on using the fastening instruction form, please see the following tutorial section.
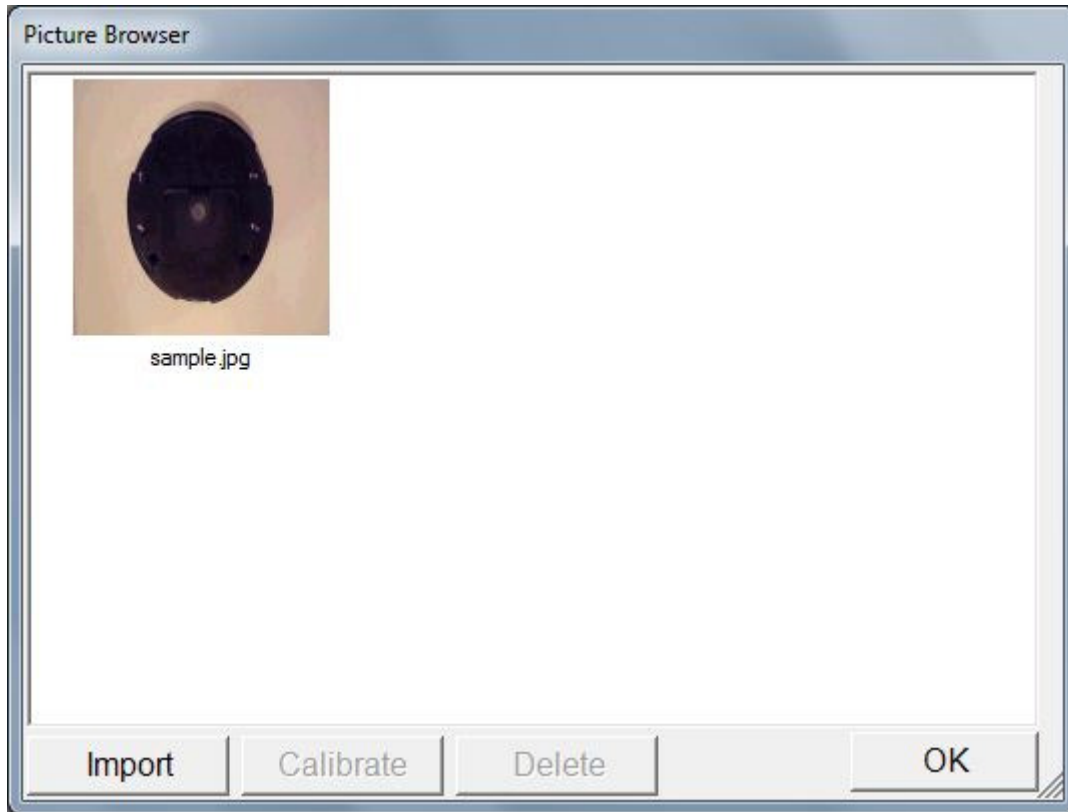
Add New Instruction

The add new instruction form is shown below:

This form allows the user to select which type of instruction to add. At the current time, the Design Studio only supports fastening instructions

Picture Browser

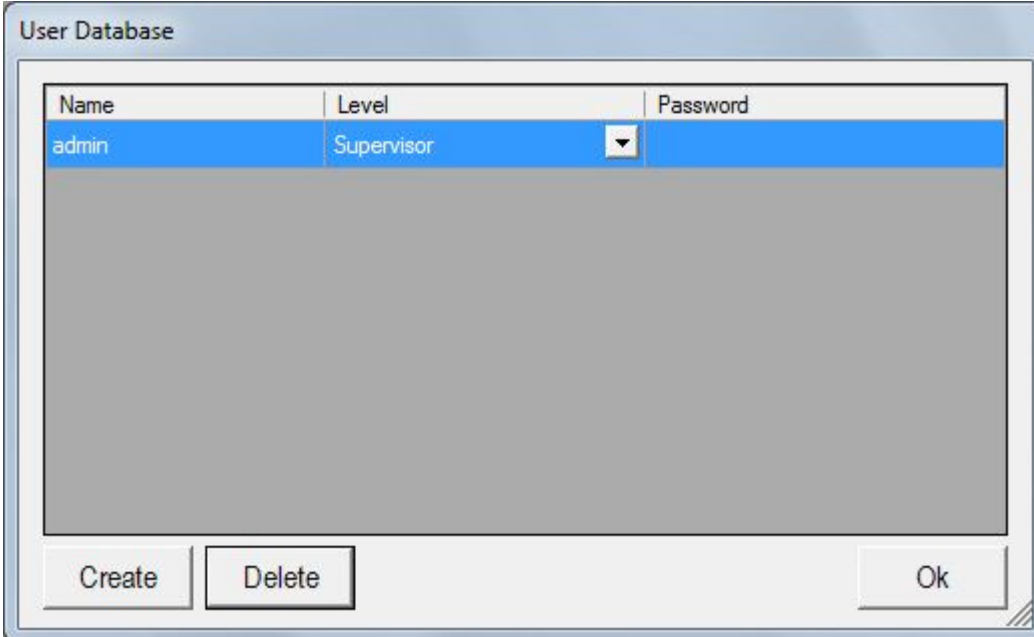The picture browser form is shown below:

The picture browser allows the user to select the image that will be displayed with the assembly instruction. It also allows the user to import, calibrate and delete images.

User Database

The user database for is used to maintain the user ids and password that are used by the Runtime application.

The user database form is shown below:

Support

For additional information, please visit http://www.kolverusa.com

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