



Guided Assembly: Design Studio Operator Manual v2.0.1.2

The information contained within this document is confidential. Any unauthorized reproduction or dissemination of its contents, in whole or in part, is strictly prohibited without the expressed written consent of KolverUSA

KolverUSA
10 Kidder Rd
Unit 4
Chelmsford, MA 01824
url: www.kolverusa.com
Phone: (978) 455-0672
Fax: (978) 455-0684



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



Table of contents

Smart Motion - Design Studio.....	4
Overview.....	4
Getting Started.....	6
System Requirements.....	6
Additional Requirements.....	6
Installation.....	6
Uninstalling.....	6
Launching the program.....	7
Tutorial.....	8
Managing User Accounts.....	8
Importing digital images.....	10
Calibrating a digital image.....	11
Creating a new instruction set.....	15
Opening a saved instruction set.....	18
Adding a new instruction.....	19
Editing a fasten instruction.....	21
Reordering instructions.....	24
User Interface.....	26
Instruction Set Editor.....	26
Fasten Instruction.....	26
Add New Instruction.....	28
Picture Browser.....	29
User Database.....	30
Support.....	31
Copyright.....	31

Smart Motion - Design Studio

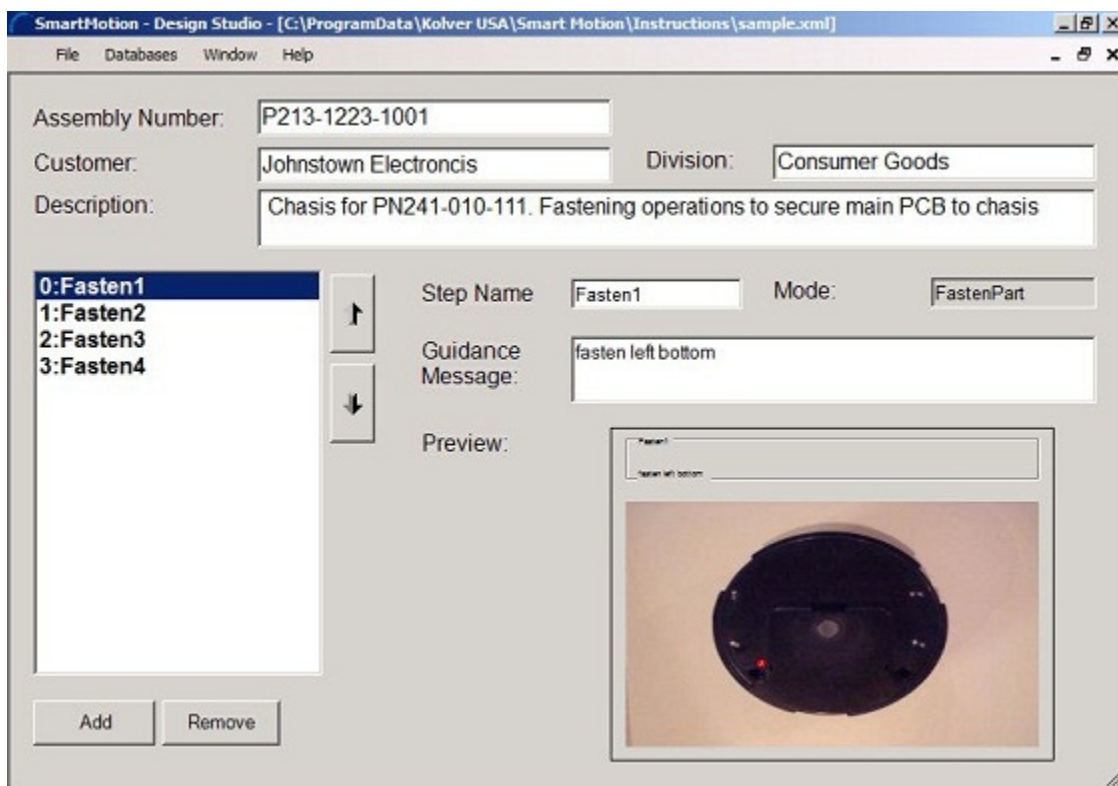
The Smart Motion Design Studio is used to create visual instructions for manual assembly processes. The instructions contain digital images and guidance messages that are displayed during the assembly process by the Smart Motion Runtime application. The Smart Motion Runtime interfaces with a Smart-Control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

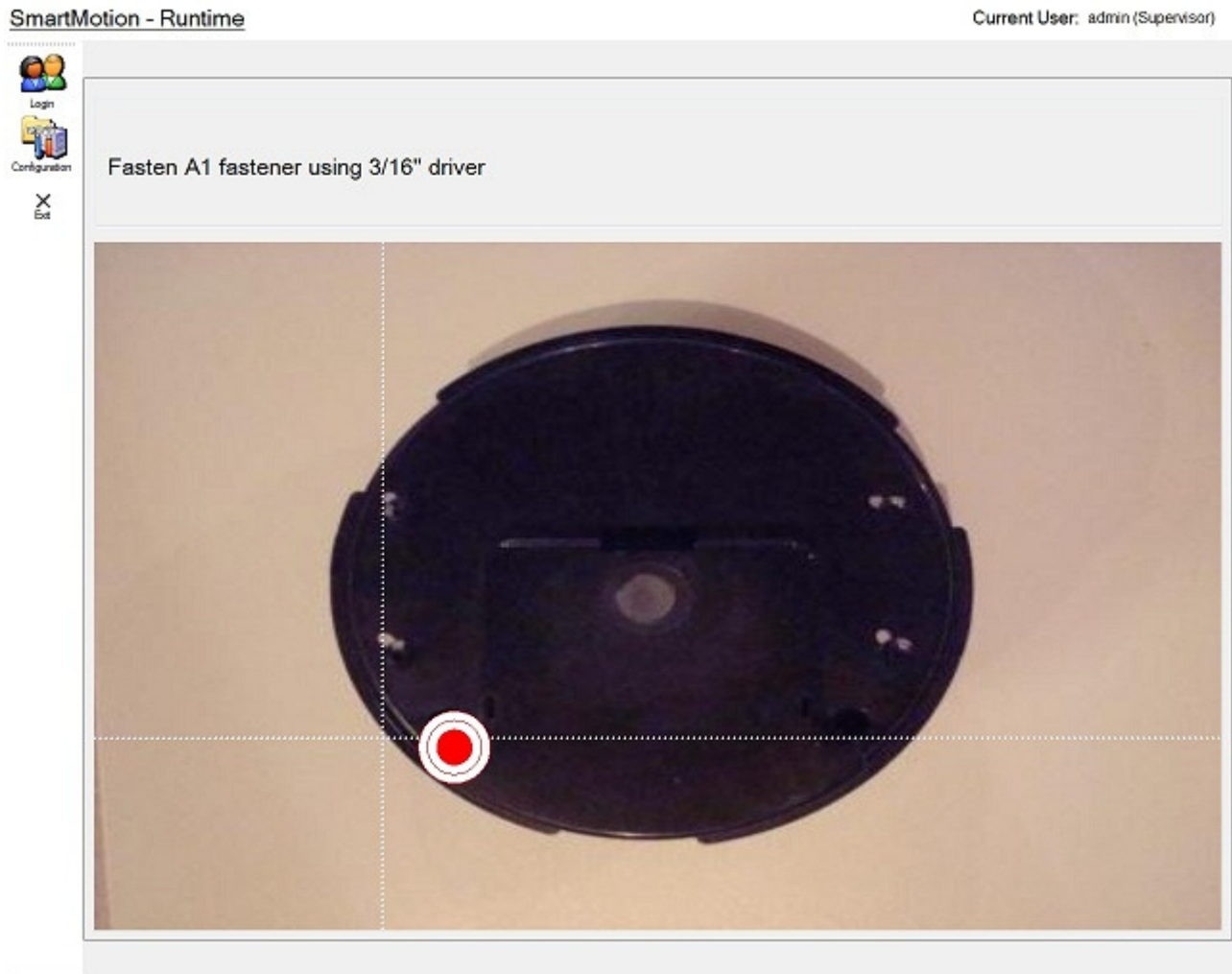
Overview

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.

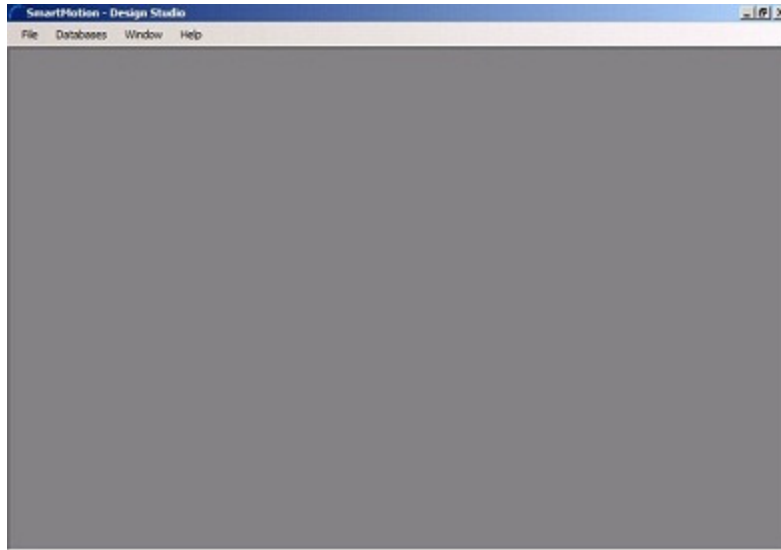


Launching the program

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:



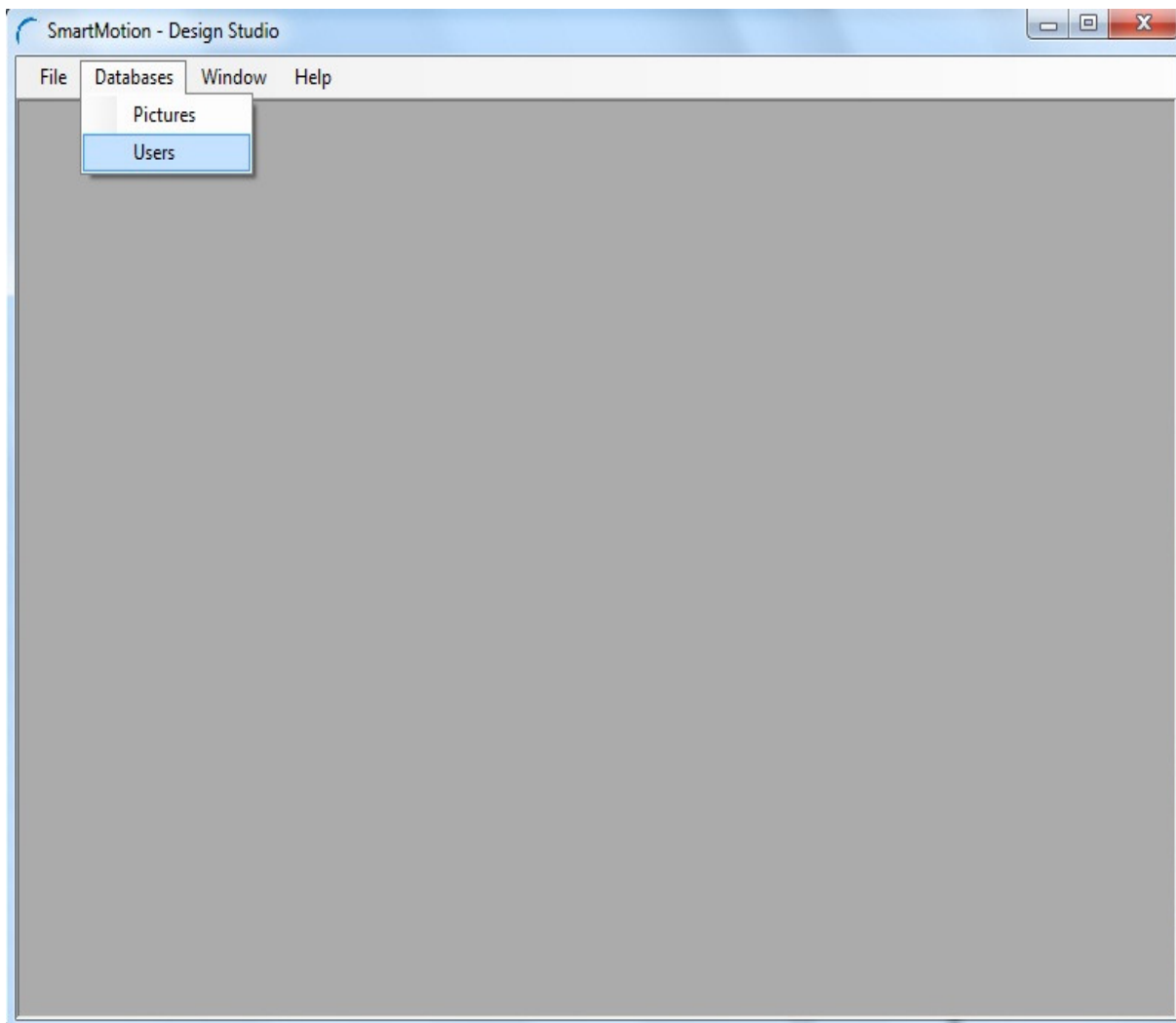
Tutorial

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

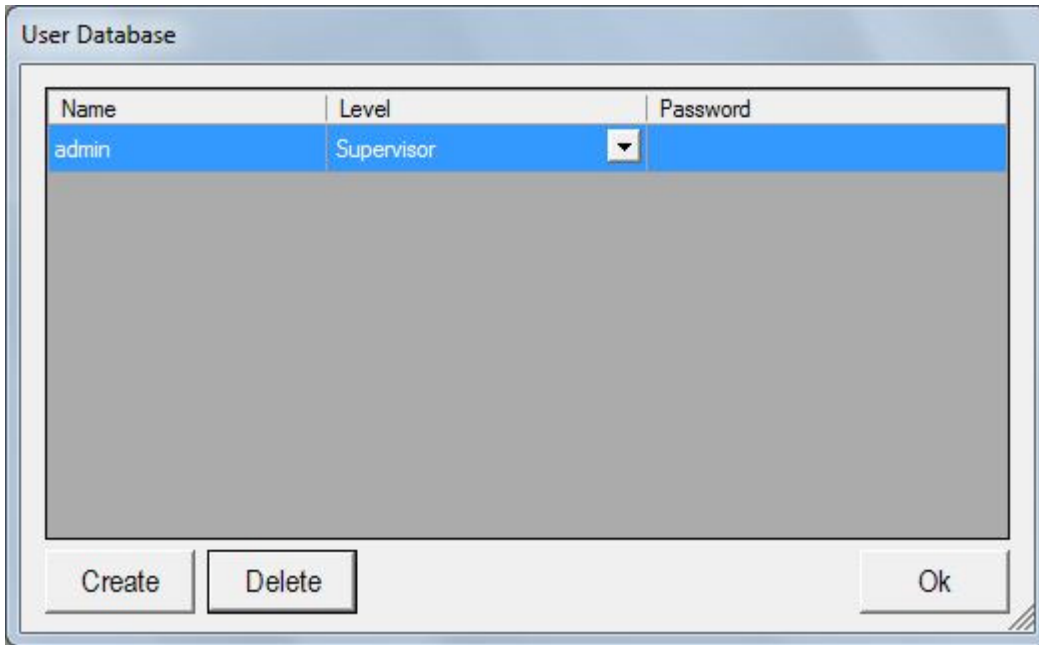
Managing User Accounts

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:

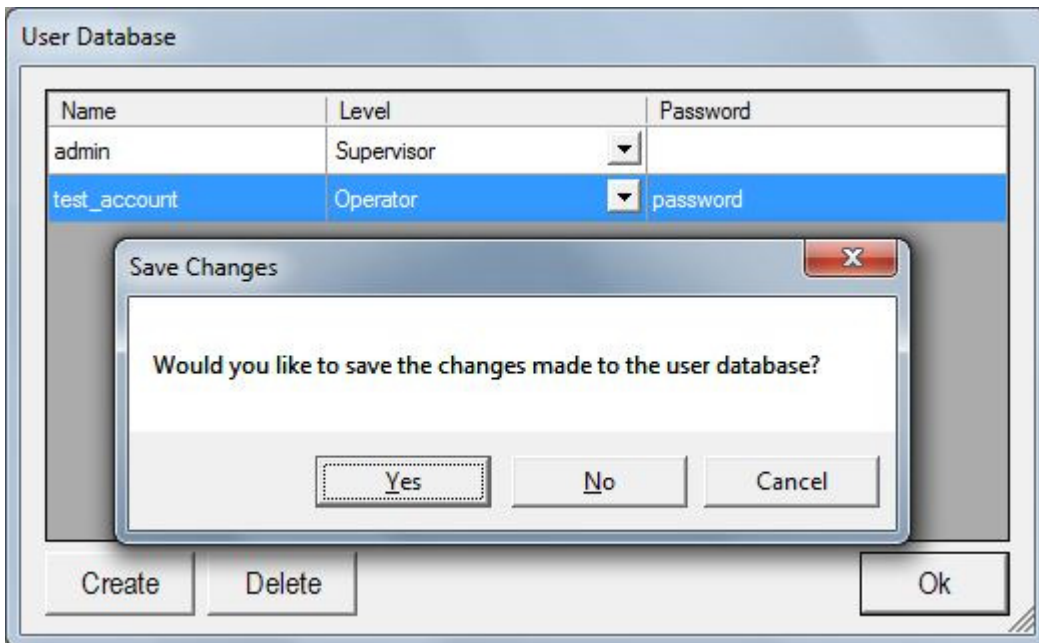


This will launch the user database editor screen which is shown below:



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:



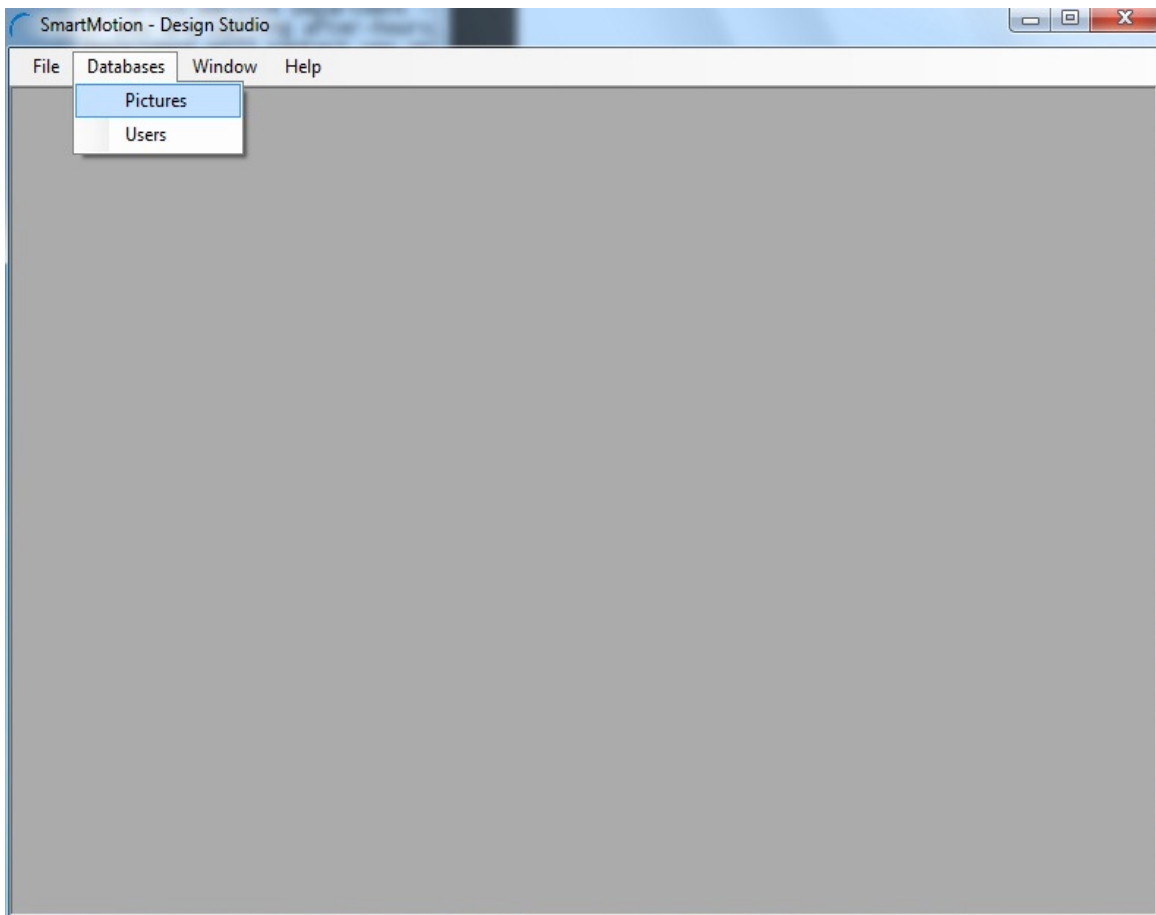


Once you click OK to this message box, the updates to the user database will be saved to disk. If for any reason you do not wish to save your changes you may select No, and all changes made on this screen will be undone.

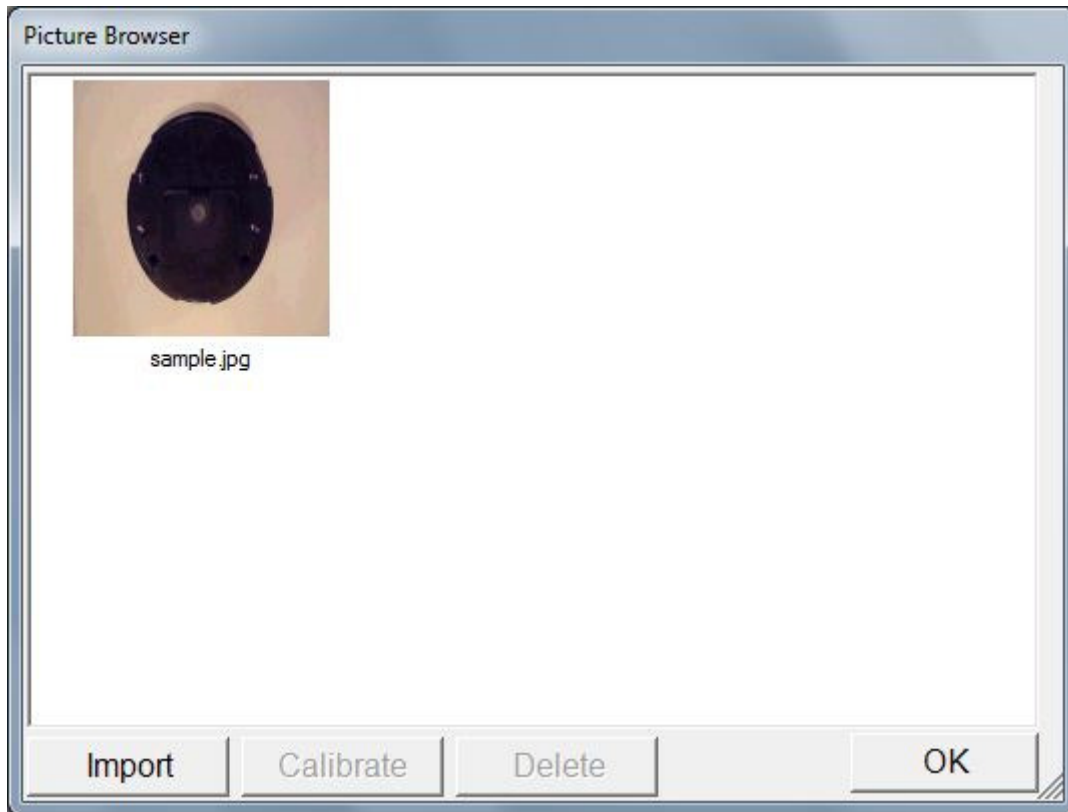
Importing digital images

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.

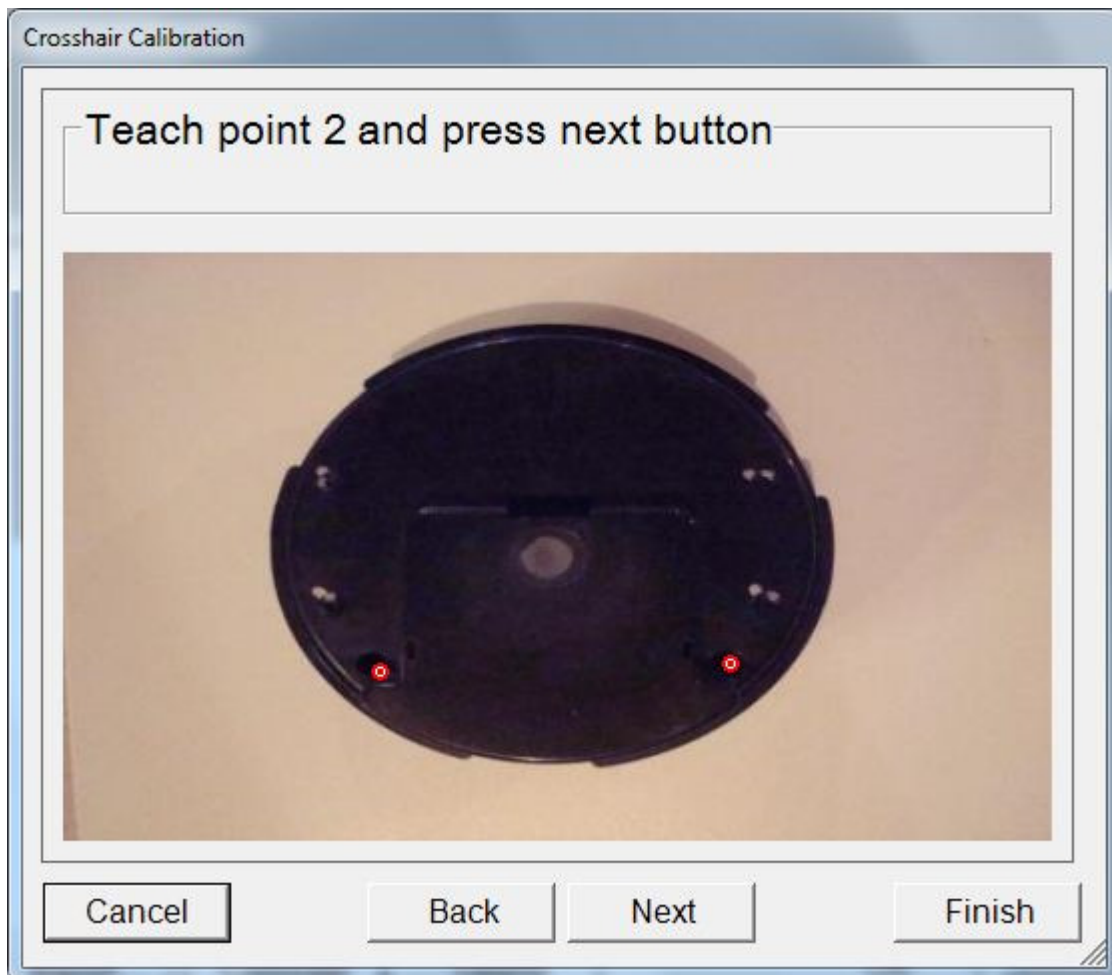
Calibrating a digital image

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.

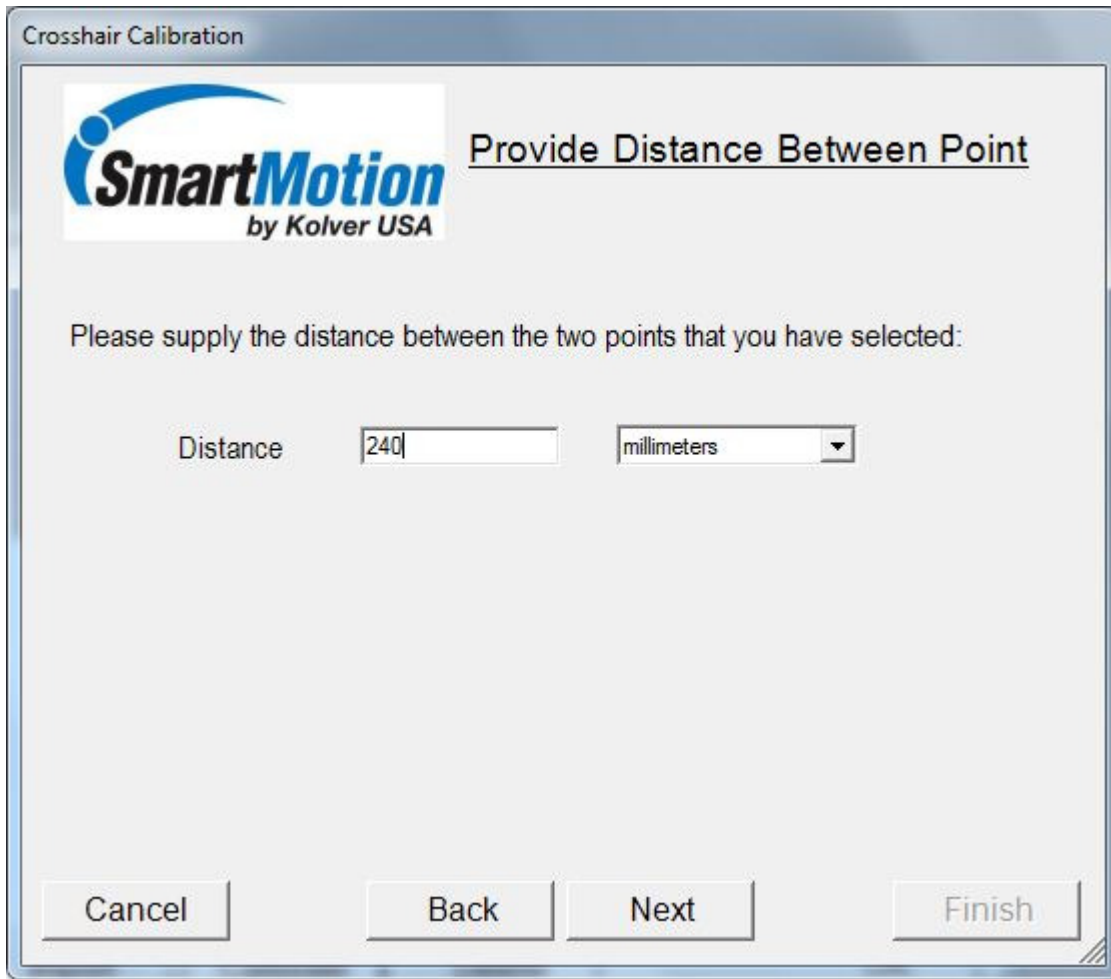
The crosshair calibration wizard opens automatically when a new image is imported, or it can be manually launched from the picture browser (see [Importing digital images](#))

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.

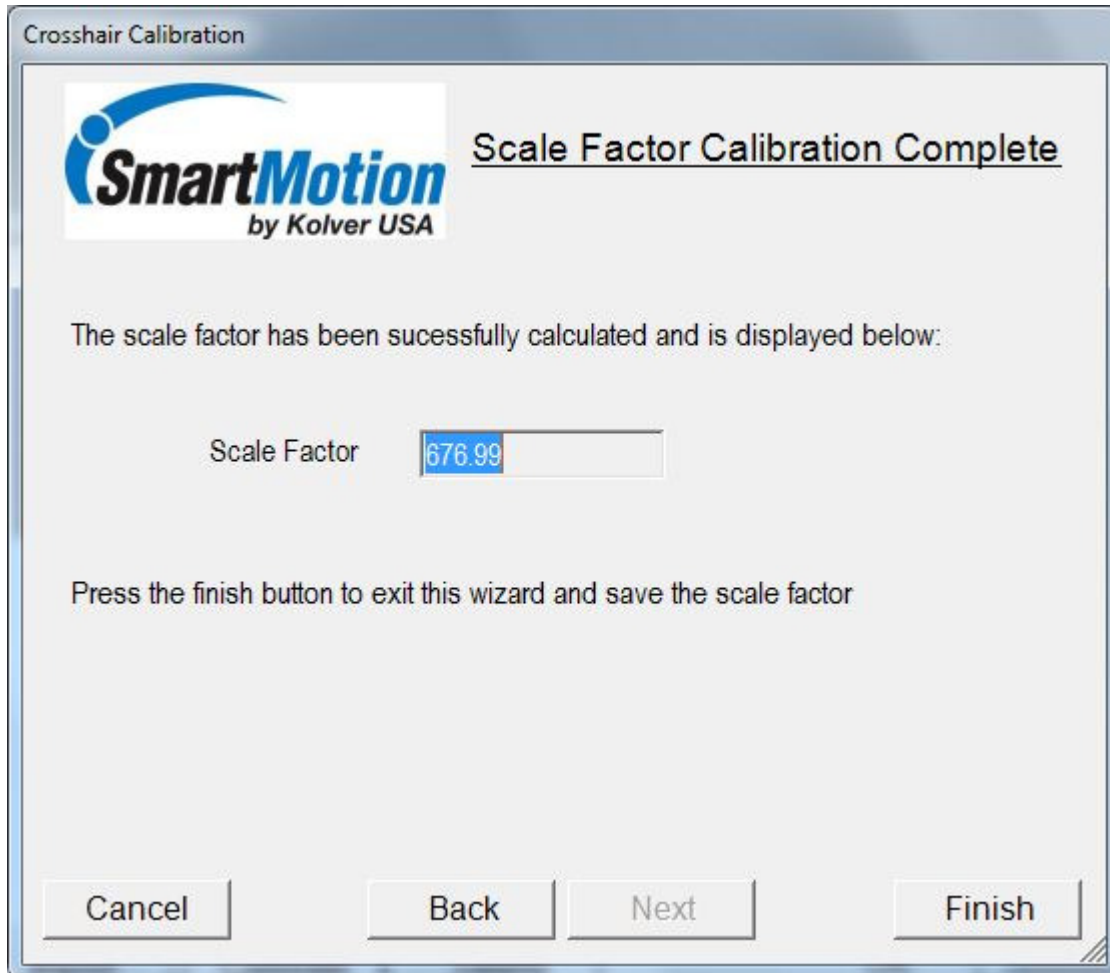
The crosshair calibration wizard prompts the user to select two points on the picture by clicking on them with their mouse:



After selecting the two points, the user specifies the distance between these points as shown below:

A screenshot of a software dialog box titled 'Crosshair Calibration'. The dialog box has a light gray background and a blue border. In the top-left corner, there is a logo for 'SmartMotion by Kolver USA'. To the right of the logo, the text 'Provide Distance Between Point' is displayed in a bold, black font. Below this, a message reads: 'Please supply the distance between the two points that you have selected:'. Underneath the message, there is a label 'Distance' followed by a text input field containing the number '240' and a dropdown menu currently set to 'millimeters'. At the bottom of the dialog box, there are four buttons: 'Cancel', 'Back', 'Next', and 'Finish', arranged from left to right.

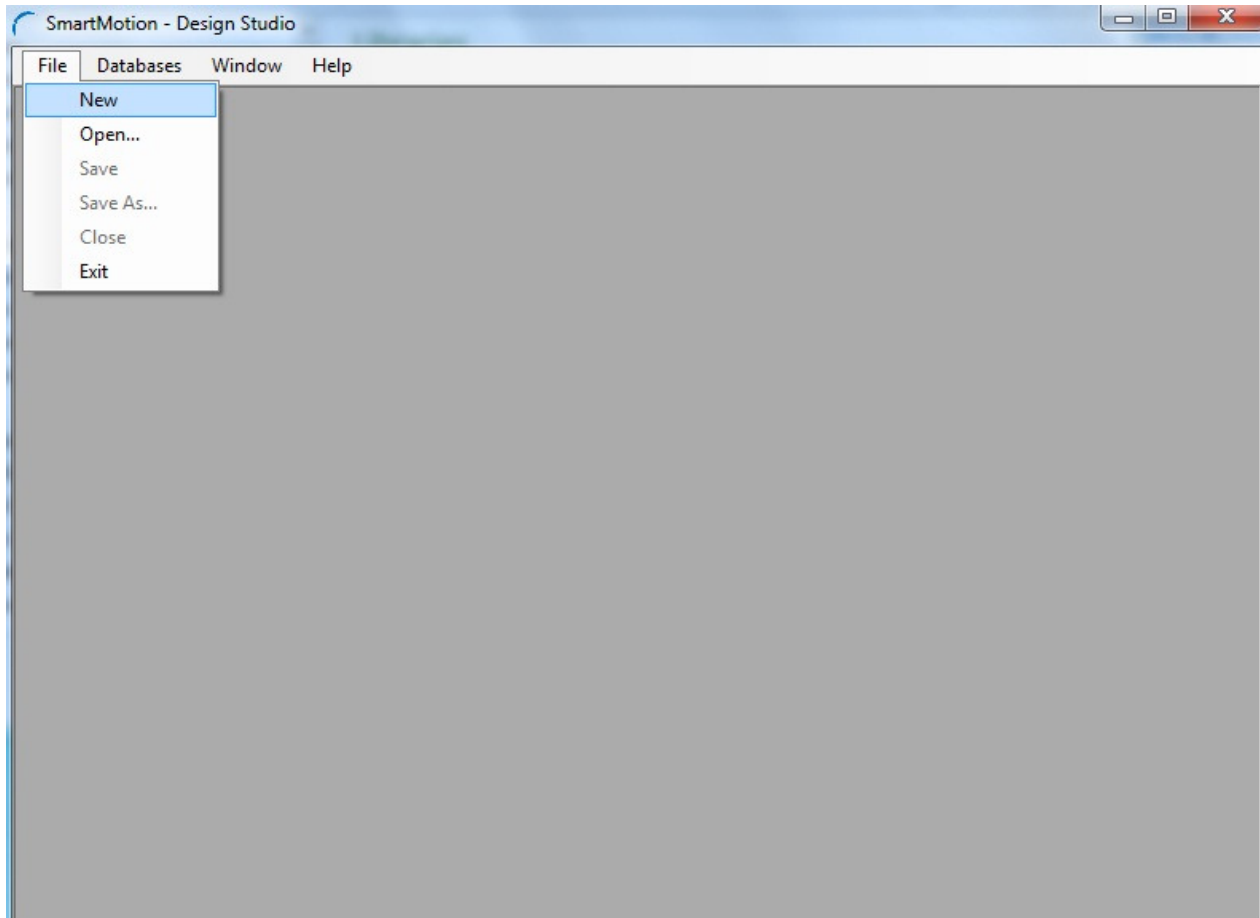
The final screen of the wizard shows the calculated scale factor:



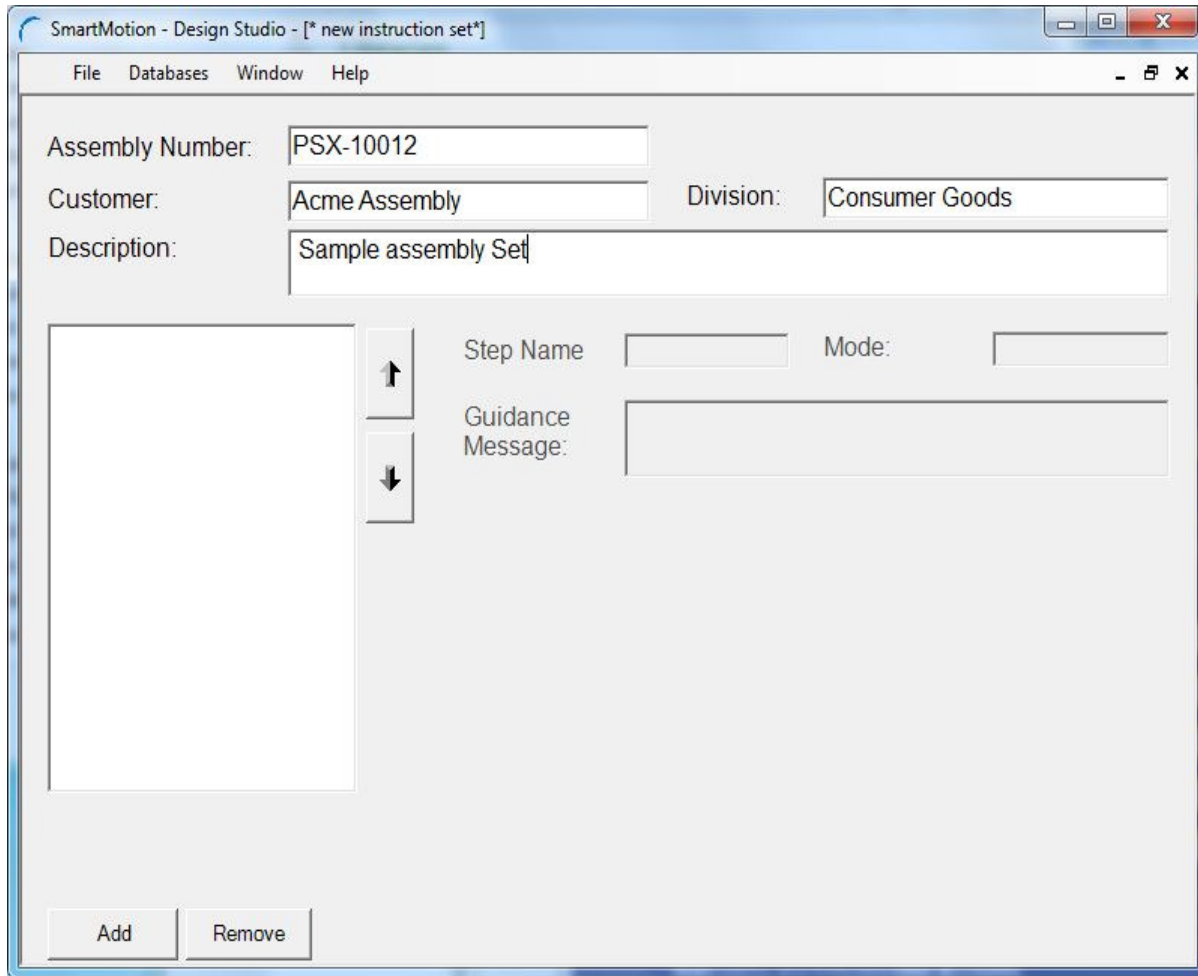
Note: Digital images using the same resolution and taken from the same height over the workplane should have roughly the same scale factor.

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):



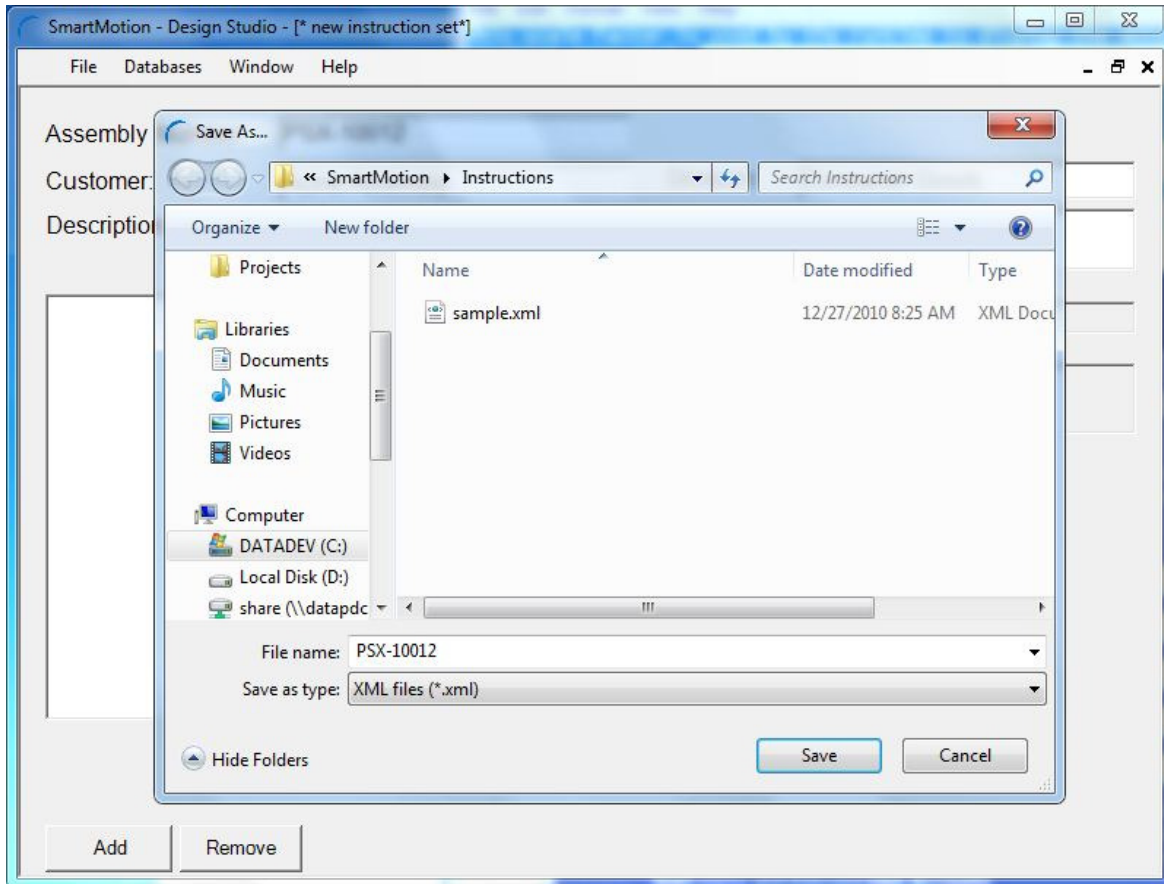
The screenshot shows the 'SmartMotion - Design Studio' window with the following fields filled out:

- Assembly Number: PSX-10012
- Customer: Acme Assembly
- Division: Consumer Goods
- Description: Sample assembly Set

Below the description field is a large empty text area. To its right are two buttons: 'Add' and 'Remove'. Further right are fields for 'Step Name' and 'Mode', and a 'Guidance Message' field.

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

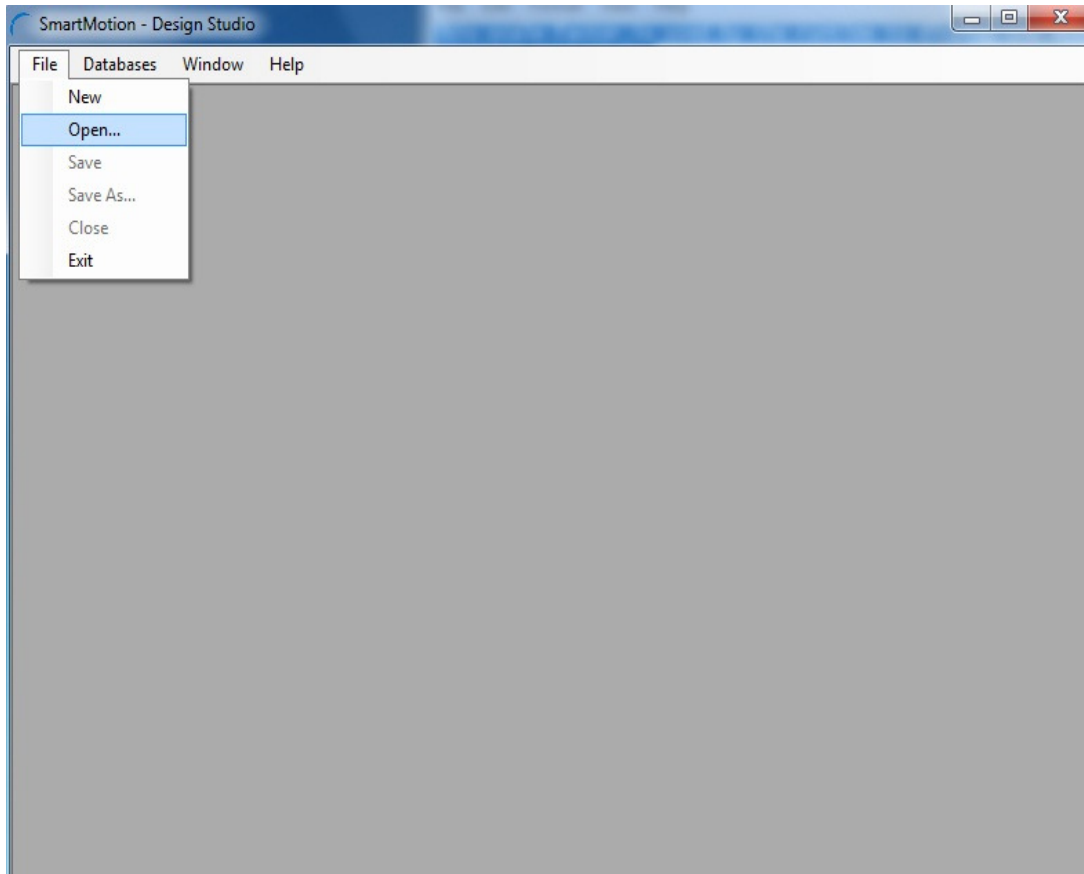
Then save the newly created instruction set by selecting "Save As..." from the file menu:



Note: In order for the instruction set to be accessible by the runtime application you must save it in the initially selected directory.

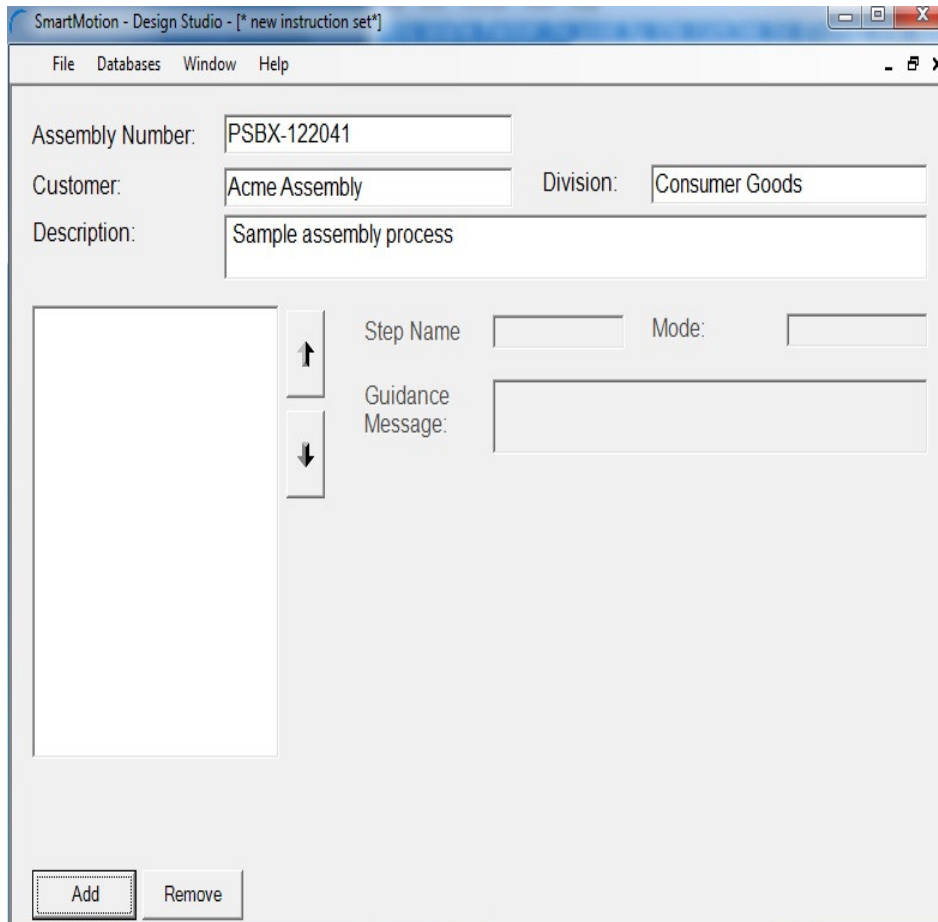
Opening a saved instruction set

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



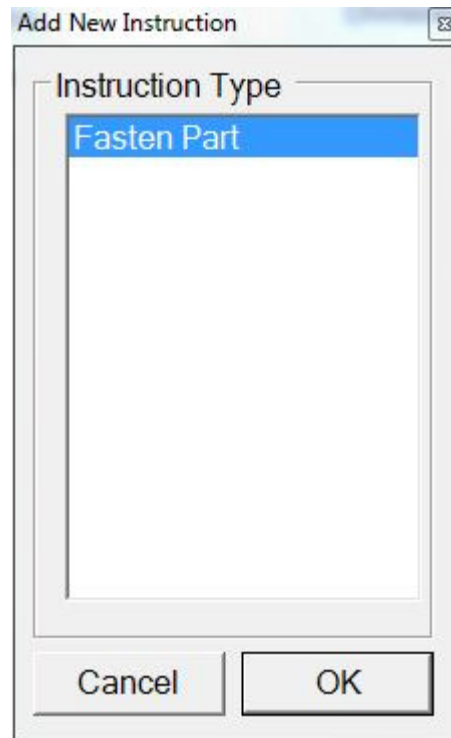
Adding a new instruction

To add a new instruction, start by clicking on the add button in the bottom left of the instruction set screen:



The screenshot shows the 'SmartMotion - Design Studio - [* new instruction set*]' window. The interface includes a menu bar with 'File', 'Databases', 'Window', and 'Help'. The main area contains several input fields: 'Assembly Number' (PSBX-122041), 'Customer' (Acme Assembly), 'Division' (Consumer Goods), and 'Description' (Sample assembly process). Below these fields is a large empty box for instructions, with an upward arrow button to its right. To the right of the instruction box are fields for 'Step Name' and 'Mode'. Below these are fields for 'Guidance Message'. At the bottom left, there are 'Add' and 'Remove' buttons.

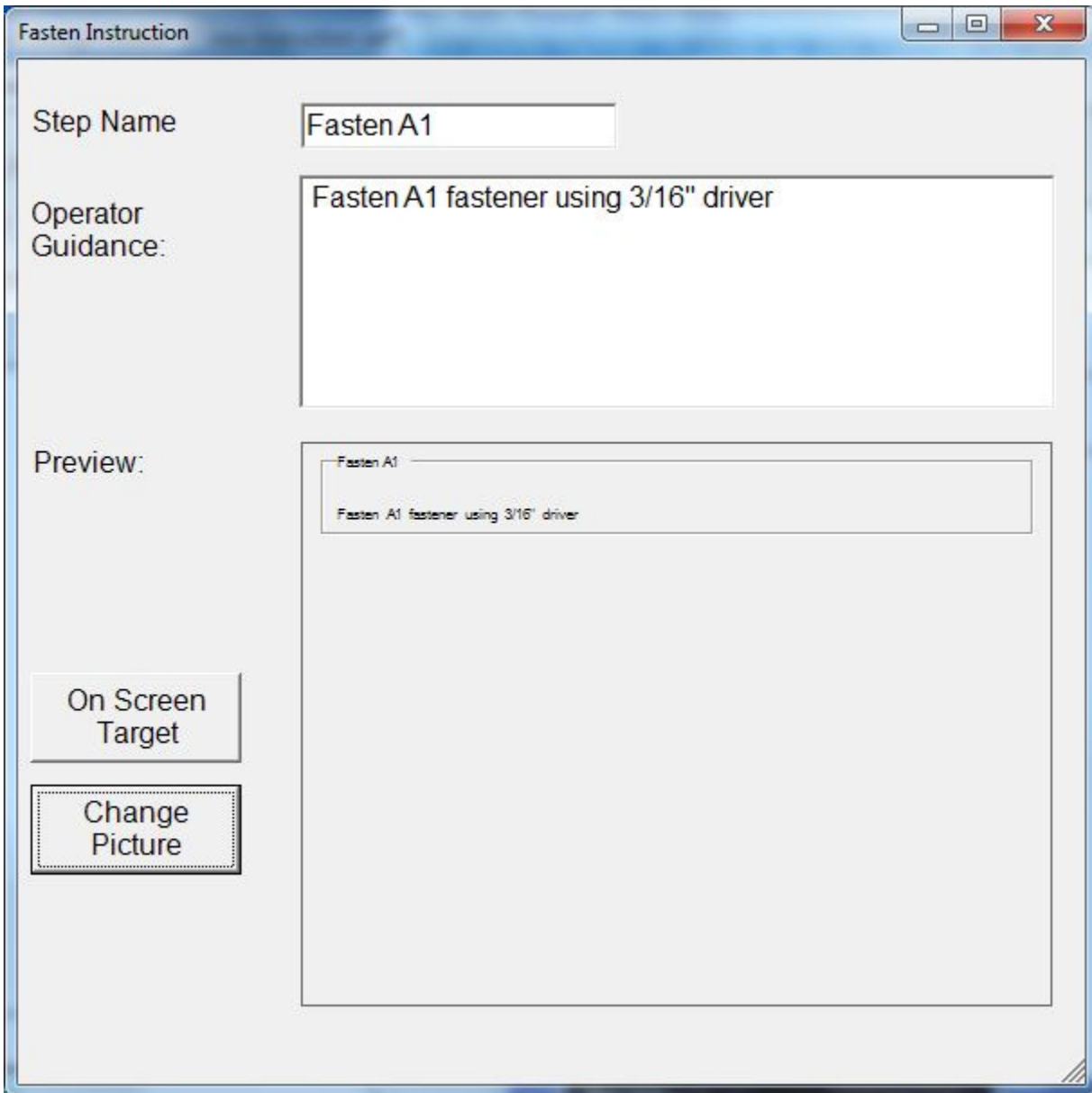
Then select "Fasten Part" from the next screen:



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.

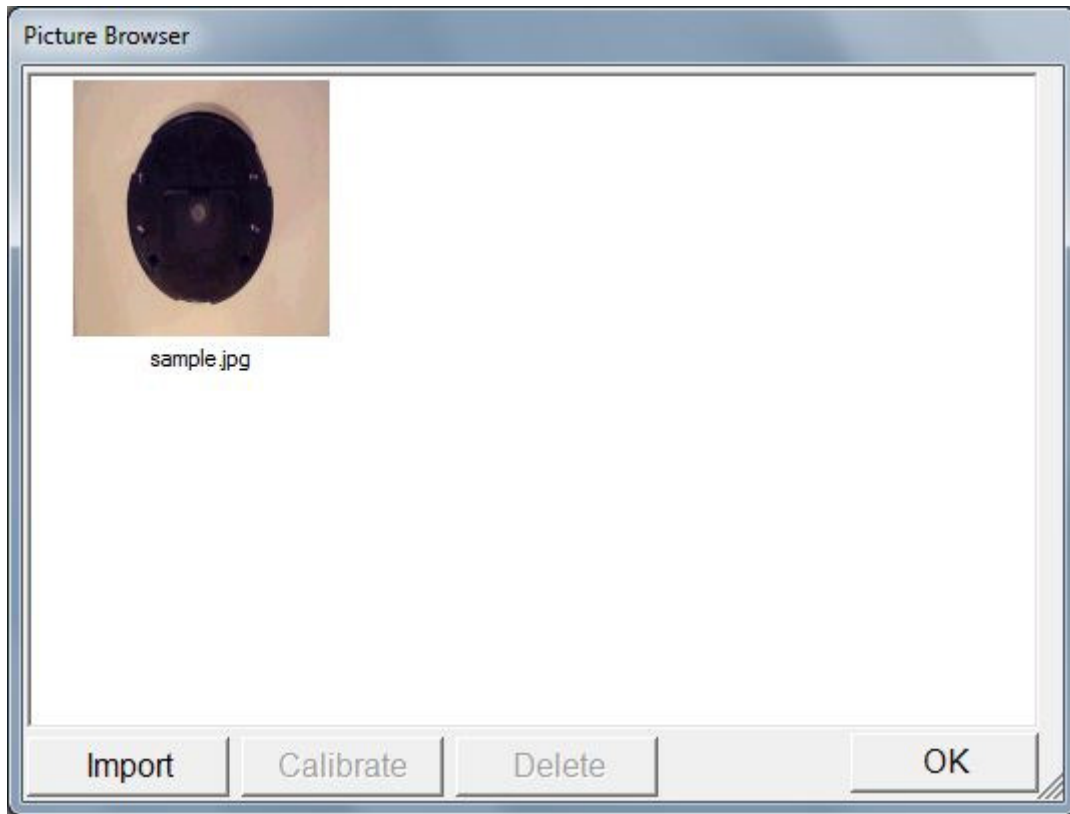


The image shows a software dialog box titled "Fasten Instruction". It contains the following fields and controls:

- Step Name:** A text input field containing "Fasten A1".
- Operator Guidance:** A larger text area containing "Fasten A1 fastener using 3/16" driver".
- Preview:** A smaller text area showing a preview of the instruction text: "Fasten A1" followed by "Fasten A1 fastener using 3/16" driver".
- On Screen Target:** A button located below the preview area.
- Change Picture:** A button located below the "On Screen Target" button.

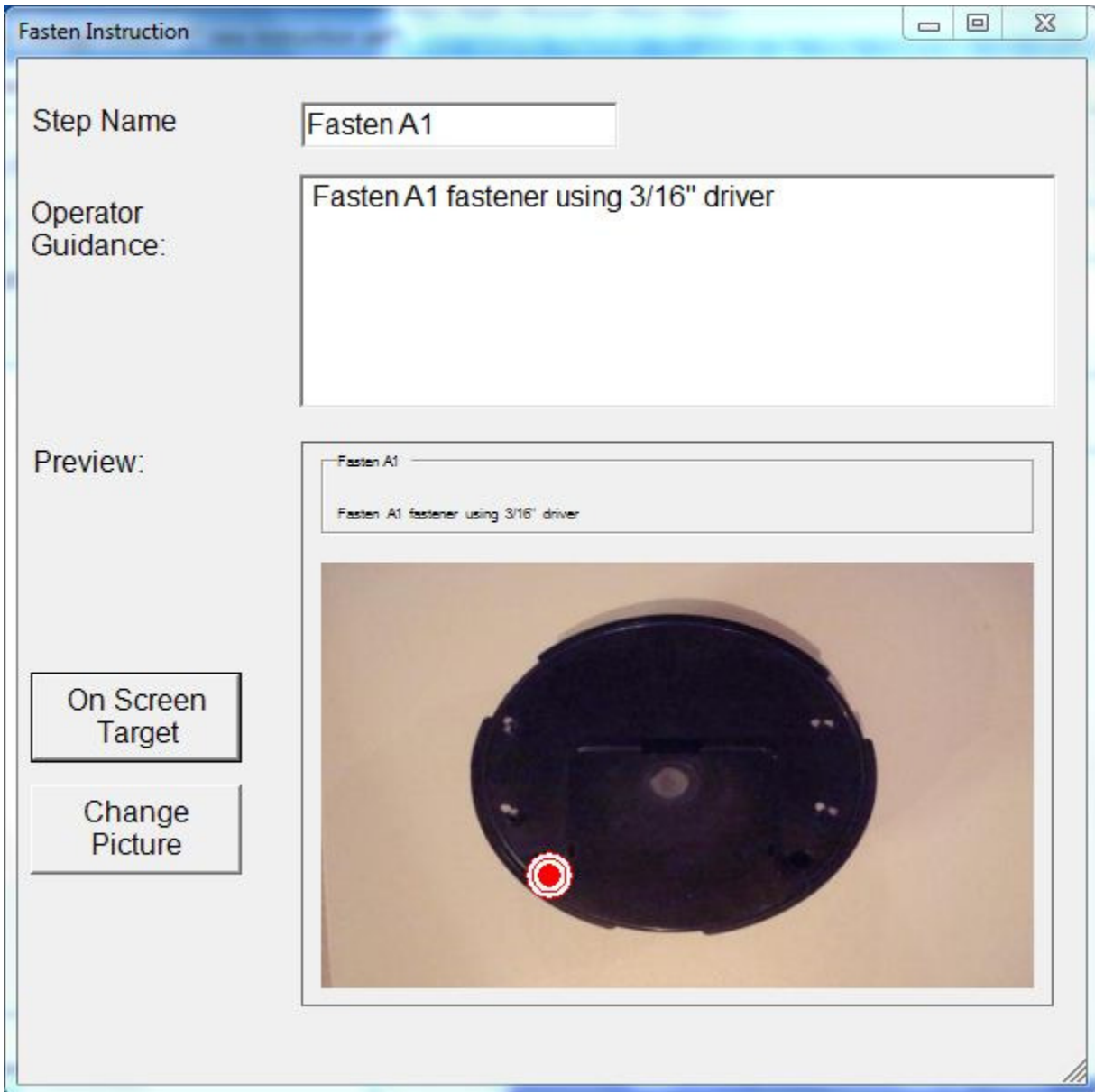
Provide a "Step Name" that will function as the title for the instruction. The operator guidance allows you to provide a more detailed message that will be displayed by the Runtime application. A preview of what will be displayed on the runtime is also shown.

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:



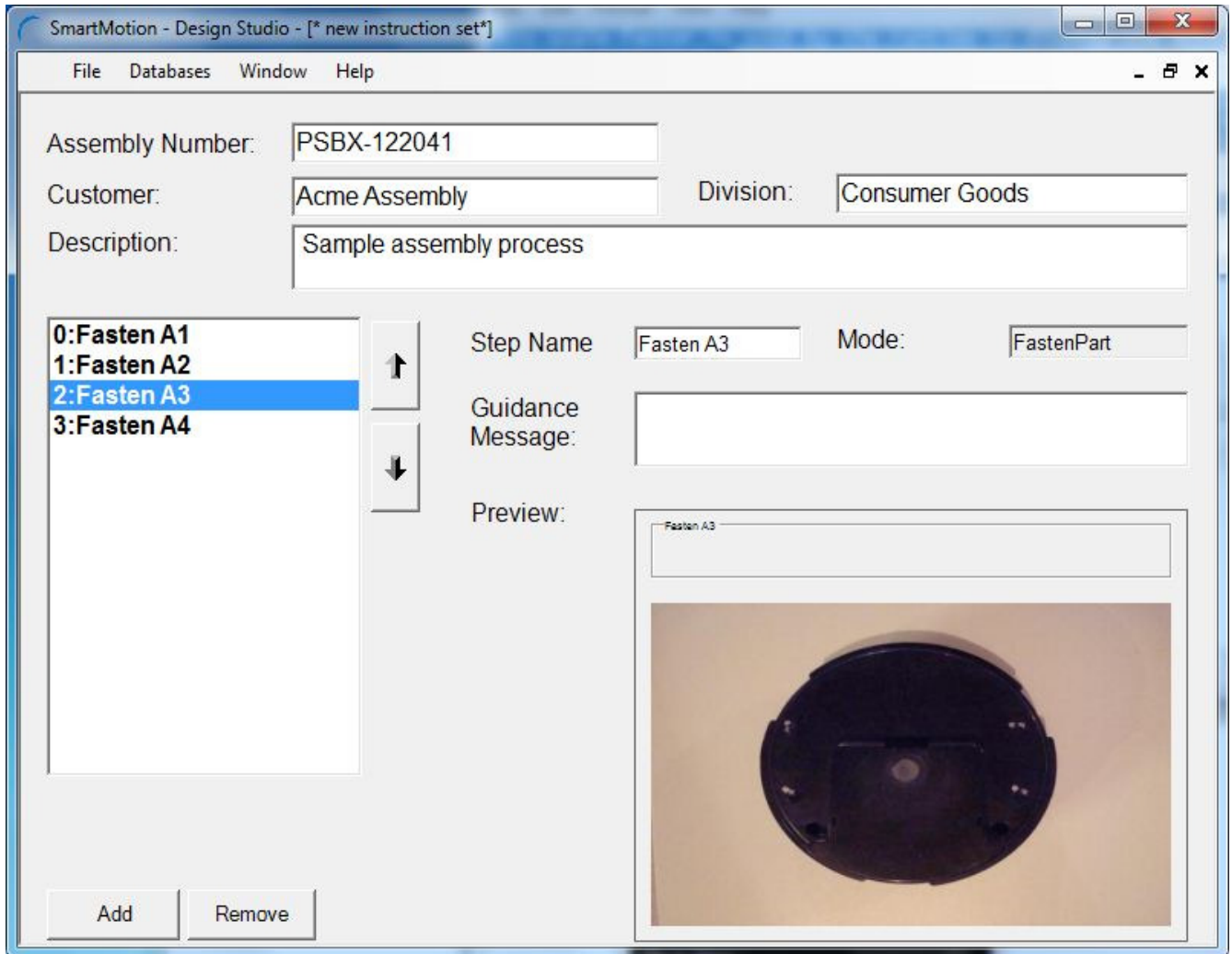
Select the image to be displayed by clicking on it and then selecting OK.

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:



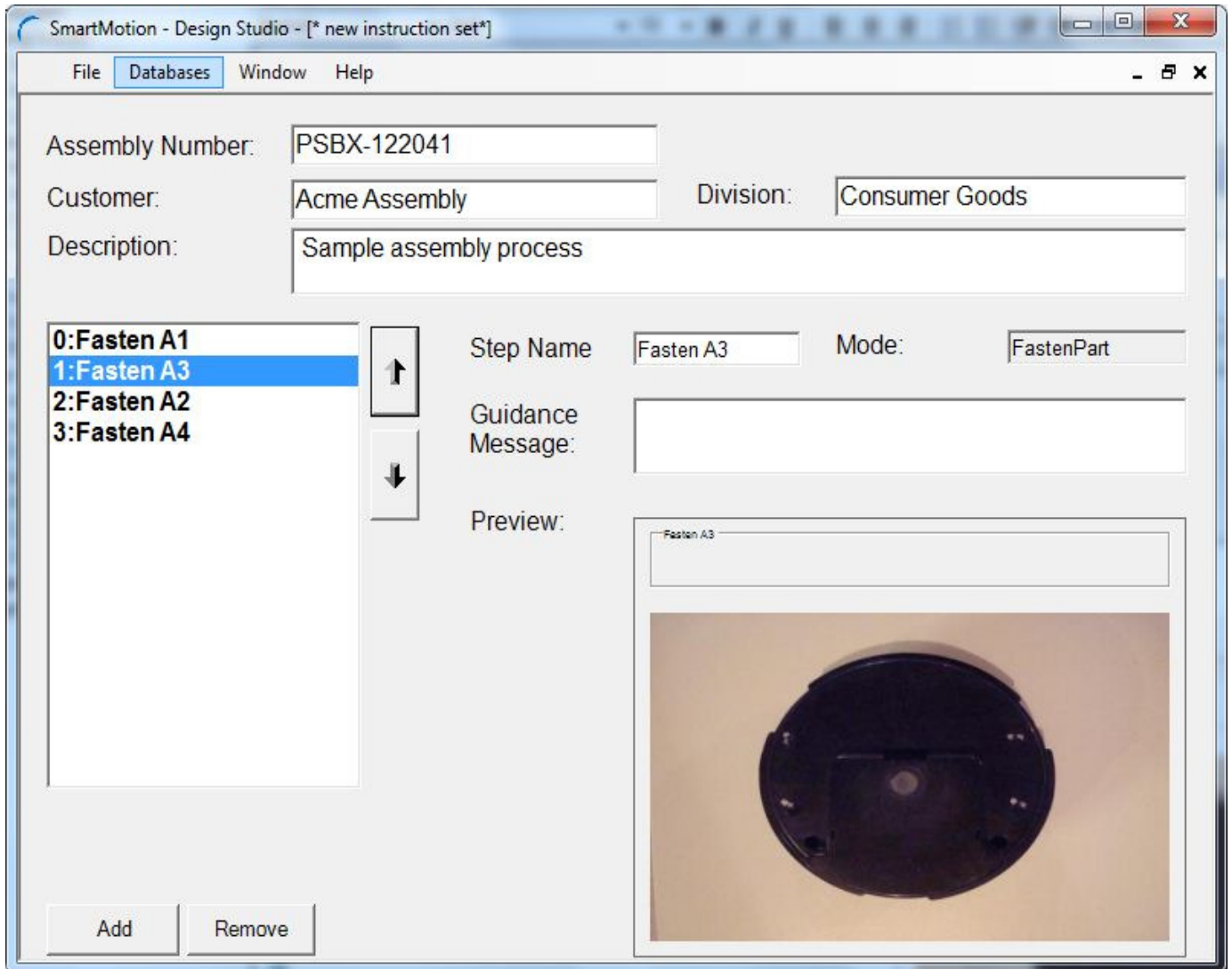
Reordering instructions

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.

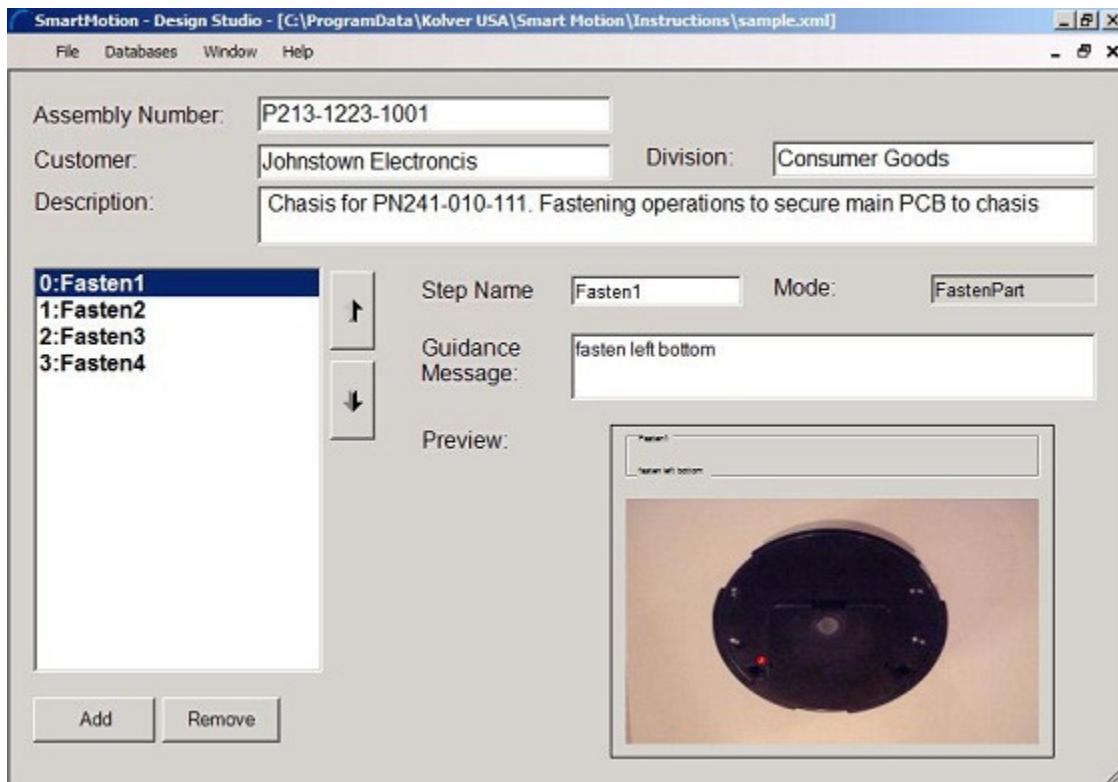
User Interface

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:

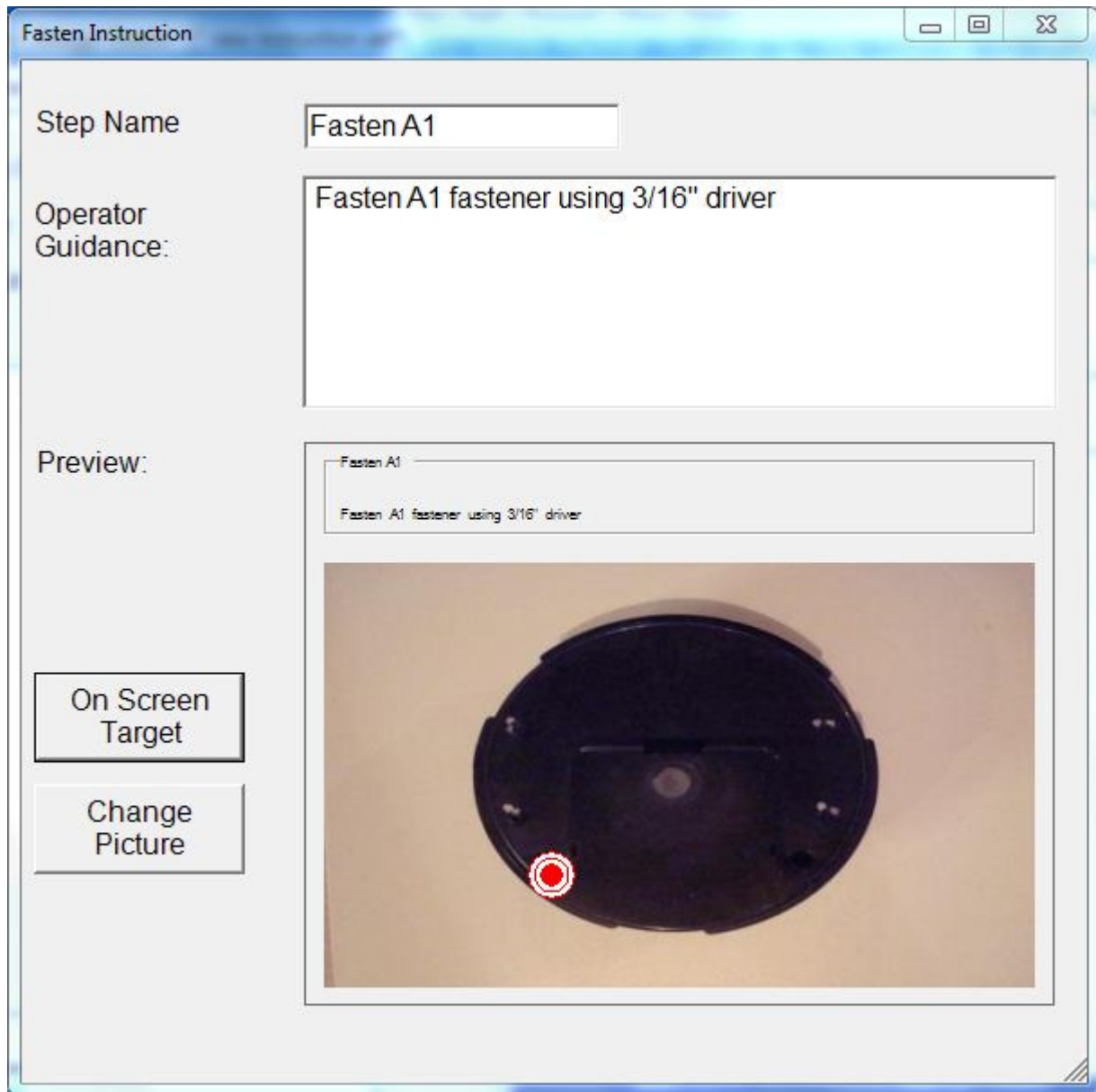


The top of the form contains header level fields which apply to the entire instruction set. Individual assembly steps are shown in the list view on the left side of the screen. As you click on each step, the picture and guidance messages are previewed on the right side of the screen. Double clicking 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:



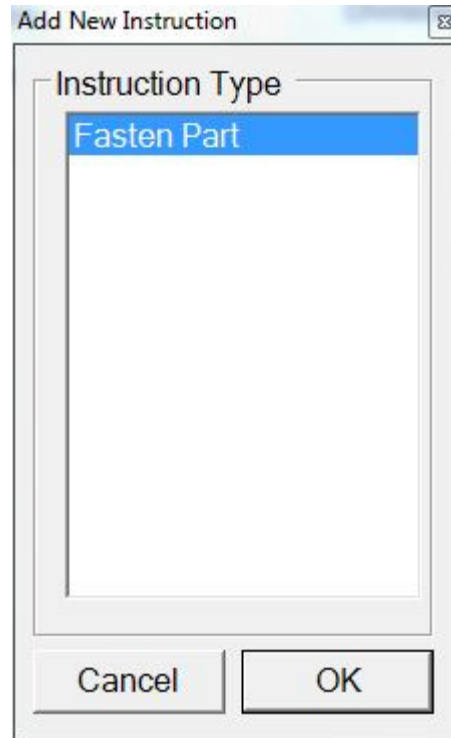
The screenshot shows a software window titled "Fasten Instruction". It contains the following fields and controls:

- Step Name:** A text box containing "Fasten A1".
- Operator Guidance:** A larger text box containing "Fasten A1 fastener using 3/16" driver".
- Preview:** A section containing a smaller version of the "Operator Guidance" text and a photograph of a dark, circular component with a red target marker on its surface.
- On Screen Target:** A button located to the left of the preview image.
- Change Picture:** A button located below the "On Screen Target" button.

For more information on using the fastening instruction form, please see the following [tutorial](#) section.

Add New Instruction

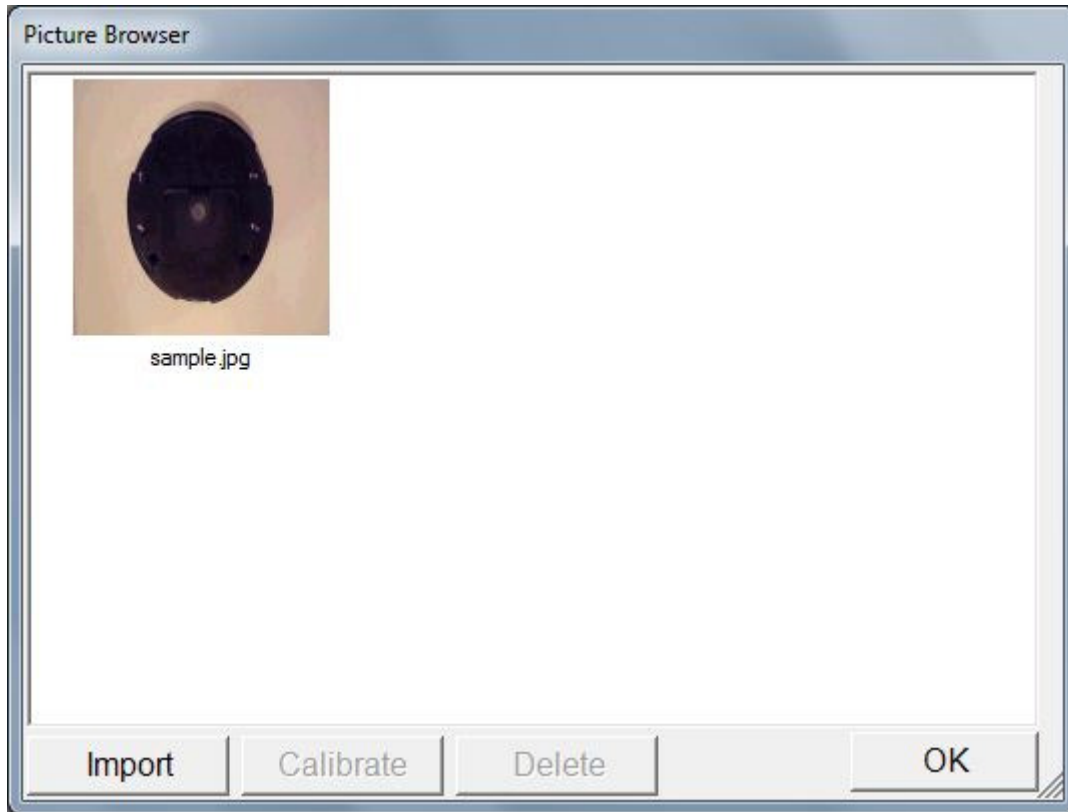
The add new instruction form is shown below:



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:

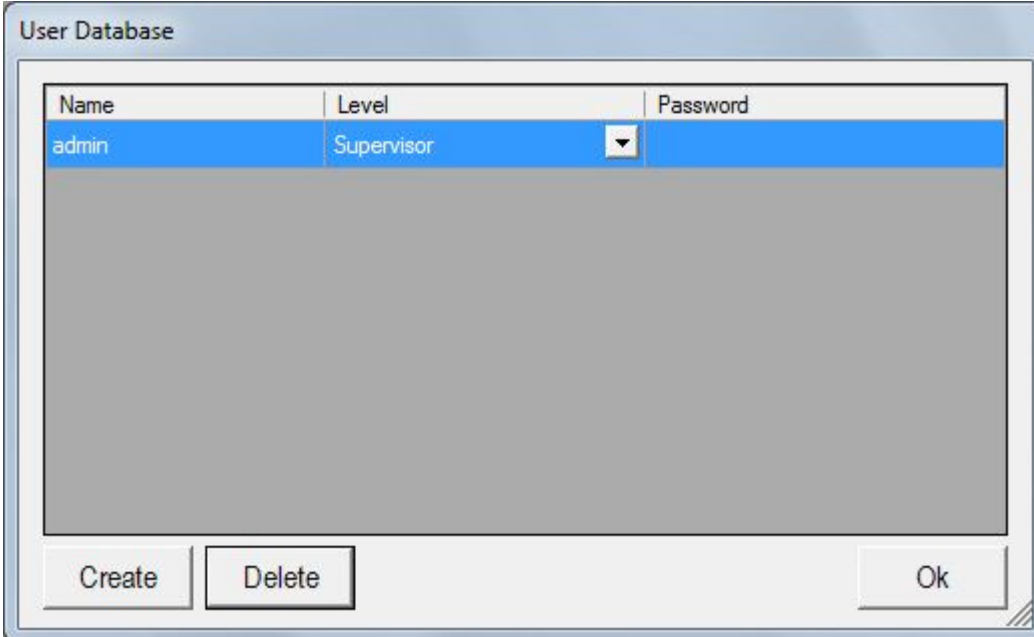


The picture browser allows the user to select the image that will be displayed with the assembly instruction. It also allows the user to import, calibrate and delete images.

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:



The screenshot shows a window titled "User Database" containing a table with three columns: "Name", "Level", and "Password". The "Name" column contains the text "admin", and the "Level" column contains "Supervisor" with a dropdown arrow. The "Password" column is empty. Below the table are three buttons: "Create", "Delete", and "Ok".

Name	Level	Password
admin	Supervisor	



Support

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

For customer support, contact the 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.

Copyright

The copyright and intellectual property rights of this software, Smart Motion Design Studio, and all its documentation, including this online help system, are owned by Kolver USA, and are protected by copyright laws and international intellectual property right treaties. You may not copy any portion of the software or documentation in any form, except to use this software in accordance with the terms of the agreement. You may not alter the software in any way.