

# CUSTOMIZING THE IMAQ VISION BUILDER SOLUTION WIZARD

IMAQ Vision Builder 5.0 features a Solution Wizard to help your customers get started with their machine vision or imaging solution. The Solution Wizard displays a list of industries and corresponding tasks that those industries perform. Based on the task your customer selects, the Solution Wizard loads a vision-based solution to the task.

Use the IMAQ Vision Builder Solution Wizard to demonstrate IMAQ Vision functions and how your customers can use these functions to solve their machine vision or imaging needs. IMAQ Vision Builder ships with several solutions. You can find these solutions in `C:\Program Files\National Instruments\IMAQ Vision Builder\Solutions`.

You can also create customer-specific solutions and add them to the Solution Wizard. This document describes how to create elements of a solution and add them to the Solution Wizard. After reading this document, you should know how to set up a location for the solution files, develop the solution elements, and test your solution from within IMAQ Vision Builder.

## Developing a New Solution

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The following elements combine to make an IMAQ Vision Builder solution:

- Industry folder—A folder that contains the industry INI file and all task folders for an industry.
  - Industry INI file—An INI file that populates the Solution Wizard industry list with the title of the industry.
  - Task folder—A folder that contains the problem description INI file, all example images (including template images), and the script file for a solution.
- Problem description—An INI file that populates the Solution Wizard problem description box with a solution summary.

- Example images—Images you acquire that illustrate a typical challenge for your customer.
- IMAQ Vision Builder script—An SCR file that lists every step of your processing algorithm.

## Producing Elements of an Industry Folder

Before you create a machine vision or imaging solution, determine the industry to which it applies. Examples of industries include the automotive industry, biomedical industry, and electronics industry. Check to see if the solution you want to create falls under one of the existing industries by navigating to C:\Program Files\National Instruments\IMAQ Vision Builder\Solutions.

## Creating an Industry Folder and an Industry INI File

If the solution you want to create does not fall under one of the existing industries, perform the following steps to create a new industry folder and an industry INI file. If the solution you want to create falls under one of the existing industries, go to [Creating a Task Folder](#).

1. Create an industry folder.
  - a. Navigate to C:\Program Files\National Instruments\IMAQ Vision Builder\Solutions.
  - b. Select **File»New»Folder**. This industry folder holds all solutions that apply to the new industry. Name the folder according to the industry to which its solutions apply.



**Tip** You can also right-click inside the Solutions folder and select **New»Folder**.

2. Create an industry INI file.
  - a. Open Notepad.
  - b. Create an industry INI file. Open Electronics.ini in C:\Program Files\National Instruments\IMAQ Vision Builder\Solutions\Electronics for an example of the format and content of an industry INI file.
  - c. Select **File»Save As**. Give the file the same name as its industry folder. Save the file with the extension INI in the industry folder.

## Creating a Task Folder

Perform the following steps to create a task folder inside the appropriate industry folder:

1. Navigate to C:\Program Files\National Instruments\IMAQ Vision Builder\Solutions.
2. Double-click on the industry folder to which you want to add a solution.
3. Select **File»New»Folder**. This task folder holds the new solution. Name the folder according to the item you will analyze or inspect.



**Tip** You can also right-click inside the Solutions folder and select **New»Folder**.

## Producing Elements of a Task Folder

The elements of a task folder are the core of your IMAQ Vision Builder solution. The task folder contains a problem description INI file, example images, and a script file.

### Creating a Problem Description

Each solution you create needs a problem description. Problem descriptions help customers determine whether a solution can help them with their machine vision or imaging challenge. Perform the following steps to create a problem description:

1. Open Notepad.
2. Create a problem description. The problem description can have no more than 255 characters. Do not exceed 230 characters per description line. See PCB.ini in C:\Program Files\National Instruments\IMAQ Vision Builder\Solutions\Electronics\PCB for an example of the format and content of problem descriptions.



**Note** The title you give the problem description should describe the type of task the solution illustrates (for example, inspection, calibration, or analysis).

3. Select **File»Save As**. Give the file the same name as its task folder. Save the file with the extension INI in the task folder.

### Acquiring Example Images

The next step to creating a solution for the Solution Wizard is acquiring example images that demonstrate a typical challenge for your customer. You can acquire example images with IMAQ Vision Builder.

For information on acquiring images with IMAQ Vision Builder, see the IMAQ Vision Builder online help or the *IMAQ Vision Builder Tutorial*.

To demonstrate an analysis task, you need to acquire only one image. However, to demonstrate an inspection task, acquire images that both meet and fail customer specifications. For example, if your customer needs to inspect components on a printed circuit board (PCB), acquire an image of a PCB that meets specification. Acquire one or two more images of PCBs that meet specifications but vary slightly from the first image. Then acquire one or two images of PCBs that do not meet the specifications.

When saving your example images, save them in one of the following image file formats: BMP, TIFF, JPEG, or AIPD. Save your example images in the appropriate task folder.



**Note** Do *not* save example images as a PNG file. The PNG file format is reserved for template images.

## Creating a Script

Now that you have acquired example images, load the images into IMAQ Vision Builder and create a custom algorithm with the scripting feature. The scripting feature records every step of your processing algorithm into a script file, which you can run on other images in IMAQ Vision Builder.



**Tip** IMAQ Vision Builder can also generate a Builder file from a script. A Builder file is an ASCII text file that lists the processing functions and relevant parameters of your algorithm. Use the Builder file to port your algorithm to a LabVIEW, CVI, or ComponentWorks program.

Follow these general steps to create a script for your new solution:

1. Open IMAQ Vision Builder.
2. Open an example image.
  - To build a script for an analysis task, open the image you acquired.
  - To build a script for an inspection task, open the image you acquired that meets customer specifications.
3. Select functions from the IMAQ Vision Builder menus to build your custom algorithm. Apply each function to the script.
4. Save the script as an SCR file to the appropriate task folder when you finish building the script.

5. Test the script. Make adjustments to the script and to the function parameters as needed.
  - If the script performs an analysis task, run the script on the example image and make sure the results are correct.
  - If the script performs an inspection task, test the script on the other images you acquired to make sure the script performs as expected.

For more information about creating scripts, see the IMAQ Vision Builder online help or the *IMAQ Vision Builder Tutorial*.



**Note** If the script you create contains pattern matching, shape matching, or color matching functions, follow the steps in the IMAQ Vision Builder online help to create a template file for these functions. Save all template files as PNG files in the appropriate task folder.

## Testing a New Solution

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Now that you have created the elements of a new solution and saved them to a new task folder, test your solution before demonstrating it to customers. Perform the following steps to test your solution from within IMAQ Vision Builder:

1. Open IMAQ Vision Builder.
2. Select the **Solution Wizard** button on the Welcome Screen.
3. Make sure the new solution appears.
  - If you created a new industry folder, make sure the industry appears in the list of industries. If the industry does not appear, but the list has a blank slot, make sure the industry INI file has the same name as the industry folder.
  - Expand the industry that contains the new solution, and make sure the new task appears. If the task does not appear, make sure the problem description INI file has the same name as the task folder.
4. Select the new task from the list. Make sure the problem description appears in the problem description box. If the problem description does not appear, make sure the problem description INI contains the same elements as problem description INI files that ship with IMAQ Vision Builder.
5. Press the **Load Solution** button.
6. Make sure all of the example images for the solution load properly by using the browse buttons under the Reference Window. If some example images do not load, make sure you saved them as a BMP, TIFF, JPEG, or AIPD file.
7. Make sure the script loads properly by running the script on your example images. If the script does not load, make sure you saved the script as an SCR file.