Sherlock 7 Technical Resource

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Camera Simulator

It is not uncommon to develop or modify an investigation "off line", on a computer that does not have the same camera and digital input/output channel assignments as the target system on which the investigation will eventually be deployed – or, perhaps, does not have any camera or input/output channels at all.

For example, suppose the target system (a VA-61 with cameras, lighting, part-in-place sensors and digital I/O) is already in place on a manufacturing line on the factory floor, and an investigation on the computer is checking the quality of the product coming down the line. You need to modify the investigation – perhaps add some new measurements – but starting and stopping the manufacturing line to make the modifications is not feasible: 100% of the product must be checked, the line runs 16 hours a day, five days a week, and they don't pay you enough for you to come in on the weekend or at 2:00 a.m. to work on the investigation on-line. So you decide to work on a copy of the investigation on the development PC in your office.

Since the development PC doesn't have any camera channels, you can select either the **File** or **Sequence** option for the investigation's image windows' sources. You'll need at least one image from each camera on the target system to load into the image windows in the investigation; a sequence of images would be even better. These images can be acquired with an image window's image logging capabilities. (See the **Image logging** page on any image window's **Options** dialog.)

But when you change the image window's sources from cameras to image files, the image windows' camera assignments are undone. After making and testing the modifications and installing the modified investigation on the target system, you'll have to reset the image window's camera assignments. Annoying at best, and downright headache-inducing if the investigation contains many image windows connected to several cameras.

Even worse, since your laptop doesn't have any digital inputs or outputs, calls to instructions that try to access them (**IO : Digital Output : Pulse**, **IO : Digital Input : Read**, etc.) will generate runtime errors that cause the investigation to halt immediately. You can remove the **IO** instructions or add **Jump** instructions to bypass them, but when you install the modified investigation on the target system you'll have to remember to replace the **IO** instructions or remove the **Jump** instructions. Another opportunity to really mess things up.

The solution is to use the **Camera Simulator**, which acts much like the image window's **Sequence** option, with the advantage that it preserves the camera and I/O settings of the target system. Instructions that acquire images and access digital inputs and outputs execute as if physical cameras and input/output channels exist.

 Use of the camera simulator requires a Sherlock license.

Setting up the camera simulator

In Sherlock's **Drivers** directory, enable the simulation driver in **Drivers.ini**:

```
[DRIVER7]
NAME = Simulation driver
FILE = IpeCamSim.dll
CONFIG = IpeCamSim.ini
ENABLED = 1
```

In **IpeCamSim.ini** , set the parameters appropriately.

```
;number of simulated IOs
[GENERAL]
Inputs = 8
Outputs = 8
AcqTime = 30
;first simulated camera
[CAMERA0]
StartIndex=0
EndIndex =11
FileSequence = "D:\BottleCapper\topview0000.BMP"
```

AcqTime is the minimum number of milliseconds between image loads.
The image files in the file sequence must have names of the format

anythingNNNN.ext

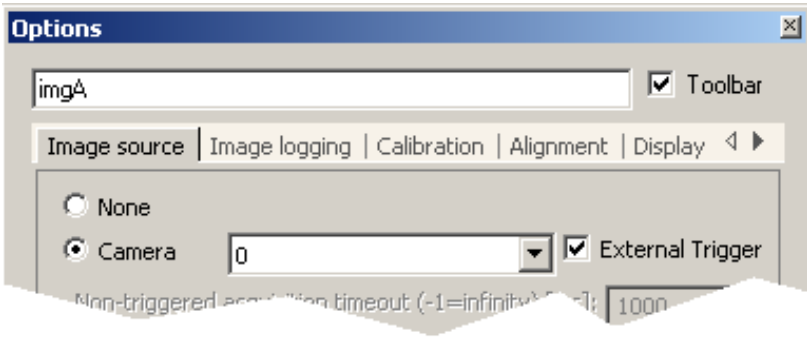
where

anything is a valid root file name – for example, image, **LeftView** or **phone_keypad**.
NNNN is a four digit sequence number, 0000, 0001, 0002, 0003, etc. Numbers in the sequence must be contiguous.
ext is a valid image file extension. Sherlock supports image types **bmp**, **tif**, **jpg**, and **png**.
StartIndex is the number of the first image in the file sequence you want the Camera Simulator to load. It does not have to be 0.
EndIndex is the number of the last image in the file sequence you want the Camera Simulator to load. (Unlike the image window **Sequence** option, you cannot enter –1 to mean "run to the end of the sequence.")

You can add more camera entries if necessary:

```
; second simulated camera
[CAMERA1]
StartIndex=0
EndIndex =11
FileSequence = "D:\BottleCapper\sideview0000.BMP"
```

In the **Options** dialog for the image windows for which you have defined simulated cameras, leave the camera assignments at their on-line settings.



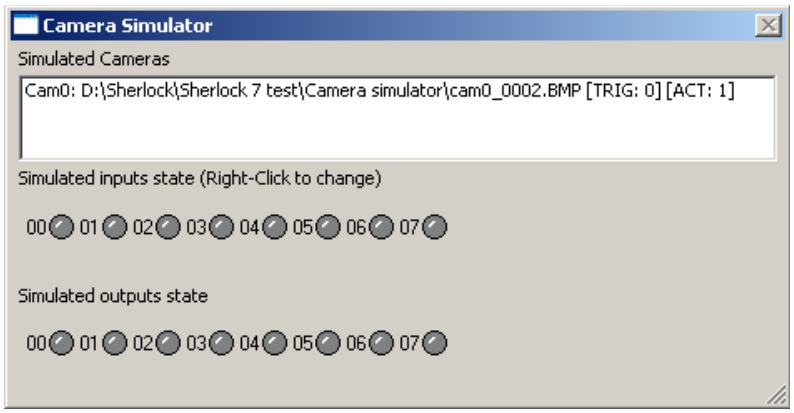
Running the investigation

Cameras

When you run the investigation, image windows that have Camera {0, 1, 2, …} selected as their image source load images from the file sequence specified in IpeCamSim.ini.

Digital I/O

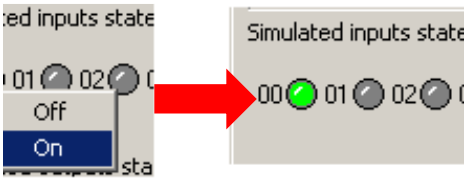
When you load an investigation that uses the camera simulator, a window that shows the simulated digital inputs and outputs specified in IpeCamSim.ini is displayed.



Instructions that write to digital outputs (**IO : Digital Output : Pulse**, etc.) update the display. Setting an output to **True** turns the simulated output on (red); setting an output to **False** turns the simulated output off (gray).

Instructions that read from digital inputs and outputs (**IO : Digital Input : Read**, **IO : Digital Output : Read**, etc.) read the states of the simulated inputs and outputs.

You can change the state of an input at any time by right-clicking it with your mouse.



 Some digital input instructions (**IO : Digital Input : Wait for State**, **IO : Digital Input : Wait for Pulse**) have a timeout parameter. If this parameter is set to –1 (no timeout, wait forever) the investigation will hang if the input never changes to the specified state.

 The camera simulator ignores an image window's **External trigger** setting.

 If you define file sequences for more than one camera, they do not have to contain the same number of images (although it usually makes more sense if they do).

```
; first simulated camera
[CAMERA0]
StartIndex=0
EndIndex =5
FileSequence = "D:\BottleCapper\topview0000.BMP"

; second simulated camera
[CAMERA1]
StartIndex=0
EndIndex =11
FileSequence = "D:\BottleCapper\sideview0000.BMP"
```

In the **Simulated Cameras** area of the camera simulator window, **[TRIG :0/1]** shows whether the investigation requested triggered acquisition. 0 = non-triggered, 1 = triggered. **[ACQ: 0/1]** shows whether the investigation initiated a "grab" on the specified camera. 0 = grab not initiated, 1 = grab initiated.