OMRON
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Visionscape AppRunner User Manual

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Disclaimer

The information and specifications described in this manual are subject to change without notice.

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PREFACE

Welcome

Purpose of This Manual

This manual describes AppRunner and how to use it.

Manual Conventions

The following typographical conventions are used throughout this manual:

- Items emphasizing important information are **bolded**.
- Menu selections, menu items and entries in screen images are indicated as: Run (triggered), Modify..., etc.

Preface

CHAPTER 1 AppRunner

AppRunner is the primary Visionscape® Deployment interface. Typically, you will use FrontRunner to build and debug your vision inspections, and then you will deploy them on the factory floor using AppRunner. AppRunner is a runtime-only user interface. It allows you to load and run any AVP on a single Visionscape® GigE System, or it can monitor up to four Visionscape® Smart Cameras. AppRunner provides the following major features:

- Allows you to watch up to four camera views simultaneously.
- Allows you to view the uploaded results and counters of up to eight inspections.
- Provides a locking feature, which will lock certain elements of the user interface. A password must be entered to unlock these features. When locked, you are restricted from the following areas:
  - Cannot change the selected device.
  - Cannot access the Options dialog, and therefore can not modify the AppRunner configuration.
  - When monitoring Smart Cameras, you can exit without a password.
- Allows you to switch between devices.
- Allows you to change Jobs (AVP files) on any given Visionscape® Device.

- Can be configured to automatically run when your PC starts up, and to automatically load and start the last Job you were running (when using a GigE System) or to automatically connect to the last Smart Camera(s) you were monitoring.
- Can log uploaded results to a text file.
- Can save images to disk.

  Note: You must have Administrator permissions to install and run AutoVISION and Visionscape.

AppRunner Startup Behavior

When AppRunner starts for the very first time, it will scan your hardware configuration to see if it detects a Visionscape® GigE System, Visionscape® Smart Camera, or both. AppRunner treats a Visionscape® GigE System differently than it treats Visionscape® Smart Cameras.

With a GigE System, AppRunner must have a Job (AVP file) to load from disk, and it will then run that Job locally within its process, on the PC.

Smart Cameras are standalone devices. They do not need the PC or AppRunner in order to run. AppRunner makes the assumption that you have already downloaded and started your Job on the Smart Camera, and therefore, whenever it is instructed to deal with a Smart Camera, it will always simply connect to that device and begin displaying images and results. This is referred to as “Monitoring”. Once you have selected a Smart Camera, AppRunner does allow you to select a new AVP file, and to download it to the camera; it just does not require you to do so.

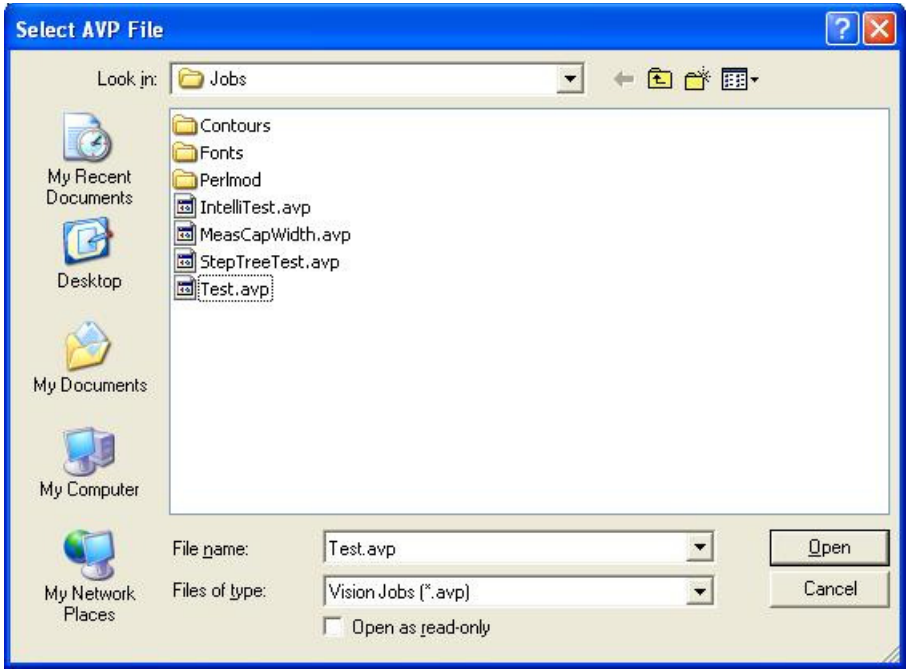
So, AppRunner always requires you to specify an AVP file when you are using a Visionscape® GigE System; it never requires you to specify an AVP file when you are using Smart Cameras.

Starting AppRunner for the First Time

As described in the previous section, when AppRunner starts up for the first time, it needs to know what kind of hardware you want to work with. You should have one of the following scenarios:

GigE Systems Installed, No Smart Cameras on your Network

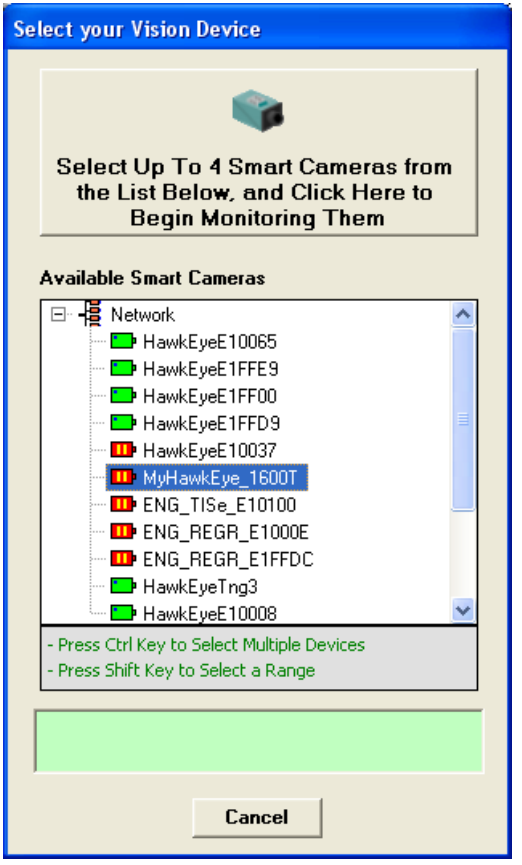
When you only have a Visionscape GigE System installed, and no Smart Cameras available on the network, AppRunner will automatically select your GigE System as the Visionscape Device that it will work with. As described previously, AppRunner requires you to load an AVP onto your Visionscape GigE System. So when starting up for the first time, you will be asked to select the AVP file to be loaded to the GigE System.



Select an AVP file, and it will be loaded, connected to your hardware, and all of the inspections will be started. From this point on, whenever you start AppRunner, it will automatically load and start the AVP file that was loaded the last time it was shut down.

Smart Cameras on your Network, No GigE Systems Installed

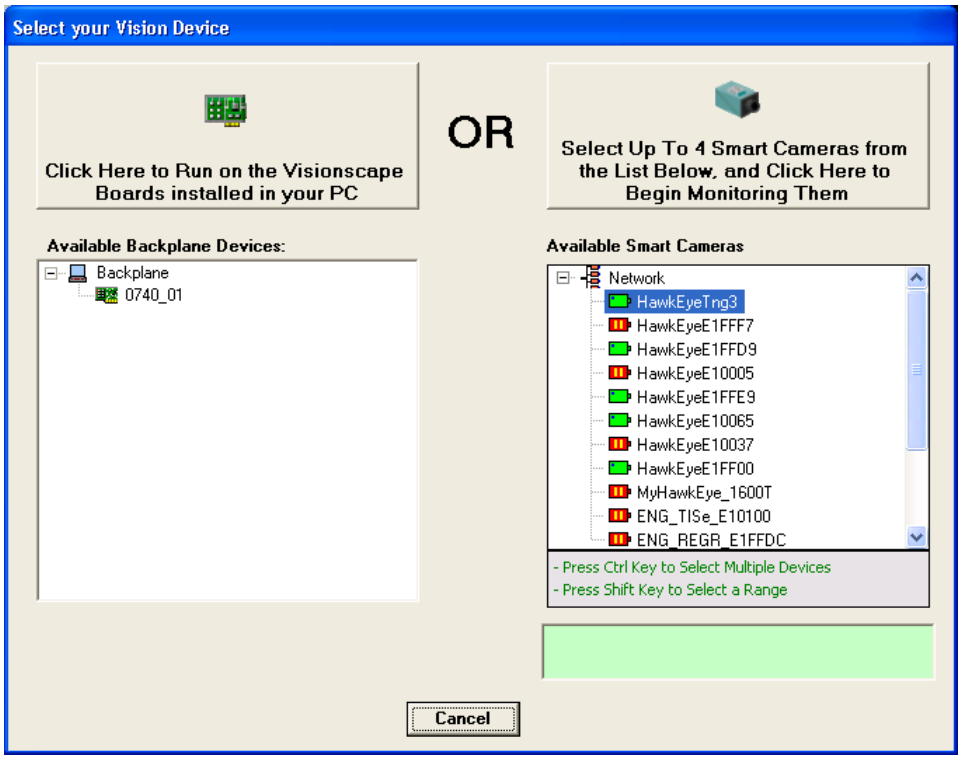
In this scenario AppRunner does not attempt to make any assumptions. You are required to select the Smart Camera(s) you want AppRunner to work with. When AppRunner starts for the first time, it will present you with a dialog that looks something like this:



Select up to 4 Smart cameras, then click the big button at the top of the dialog.

Both GigE Systems and Smart Cameras Detected

If your PC has Visionscape GigE Systems installed, and there are smart cameras detected on your network, then you will be presented with the following dialog.



Use this dialog to select whether AppRunner should run with the installed GigE Systems, or whether it should run with your chosen Smart Cameras.

No Visionscape Devices Detected

AppRunner will warn you that it can not detect any Visionscape Devices. AppRunner will complete its startup procedure, but all toolbar buttons will be disabled accept the “Options...” button. AppRunner does not provide any useful functionality when no Visionscape Devices are present.

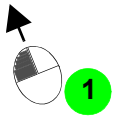
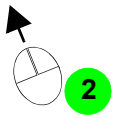
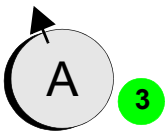
Interface Differences Between GigE Systems and Smart Cameras

Visionscape GigE Systems and Smart Cameras are handled very differently by AppRunner. When you use Visionscape GigE Systems, you are essentially turning your PC into a Vision System. The GigE Systems all work together as a single entity, and are thus stopped and started all together by AppRunner. Smart Cameras however are independent entities. Each Smart Camera is a separate system that does not depend on the state or outputs of the other Smart Cameras that you may be connected to. So AppRunner allows you to control each of your Smart Cameras separately. For these reasons, AppRunner will look and behave very differently depending on whether your are using Visionscape GigE Systems or Smart Cameras. The following sections show how to accomplish common tasks when using GigE Systems, and when using Smart Cameras.

Icons

Table 1–1 describes the icons used throughout this chapter:

TABLE 1–1. Icons and Descriptions

Icon	What It Means
	This is step #1 of a procedure. Click the left mouse button.
	This is step #2 of a procedure. Hover the mouse over the location indicated.
	This is step #3 of a procedure. Type information in the appropriate location.
	This is step #4 of a procedure. Press and hold the Ctrl key.

The following pages contain procedures, some with a single step, and some with multiple steps. For multi-step procedure, perform the steps in the order specified.

Accomplishing Common Tasks with Visionscape GigE Systems

When using GigE Systems, all of your control options will appear on the main toolbar at the top of the AppRunner window. It will typically look like this:

Open: Loads an AVP file to the Visionscape GigE System. This button is disabled if jobs are currently running. Press the 'Stop All' button to re-enable this button

Device Select: Allows you to select different Visionscape Hardware for AppRunner to run with. Note that this button is only visible if Smart Cameras are detected on your network. If you are only using GigE Systems, you will never see this button.

Start All: Starts all inspections on all GigE Systems.

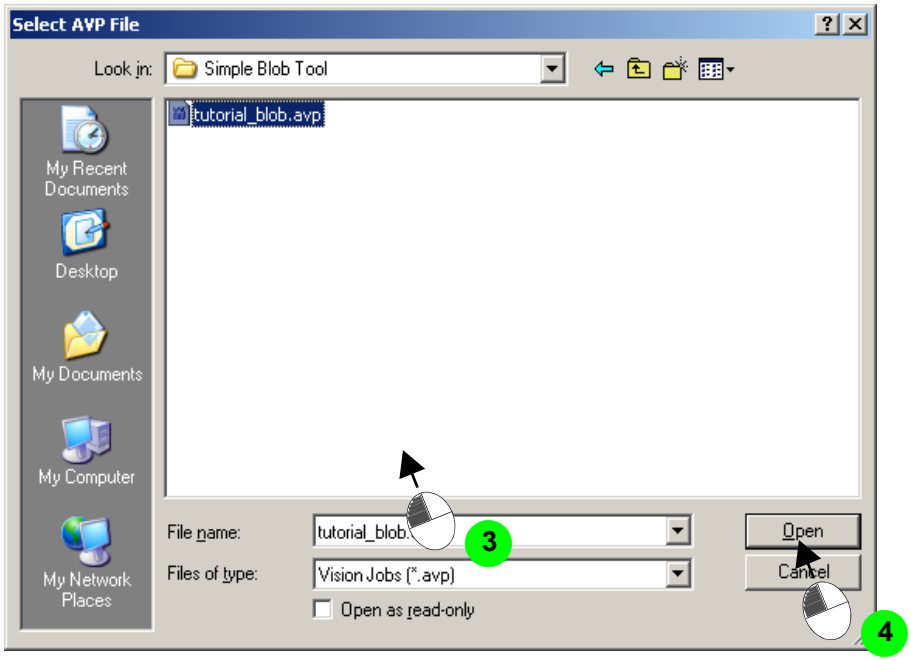
Stop All: Stops all inspections on all GigE Systems.

Options...: Displays the AppRunner Options dialog. Use this dialog to configure the various options provided by AppRunner. These are covered in more detail in the section "Application Options" on page 1-30.

Lock: This button is disabled by default. When password protection is enabled, this button is used to "Lock" and "Unlock" the user interface. A password must be entered to "Unlock" the interface. This is covered in more detail in a later section.

Loading a New Job

Use this procedure to load a new job to a Visionscape GigE System.



Start All Inspections

All inspections on all GigE Systems are started by simply clicking “Start All”.

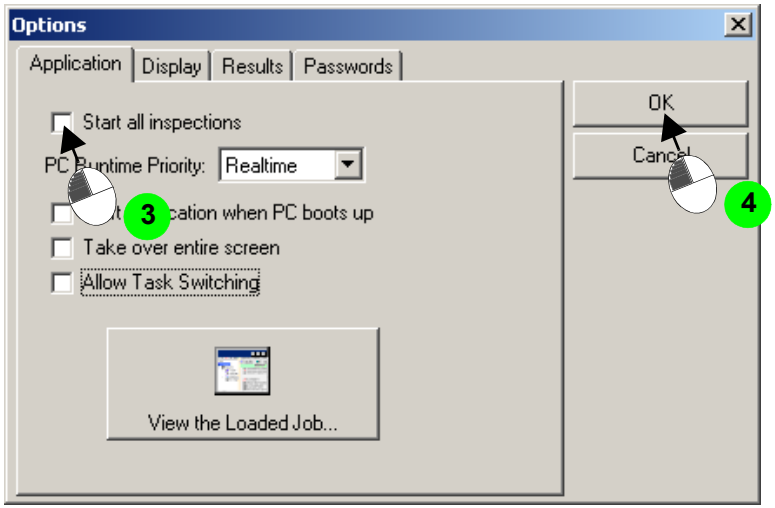
Stop All Inspections

All inspections on all GigE Systems are stopped by simply clicking “Stop All”.

Note*: Most options are disabled while inspections are running, so you will need to “Stop All” before you can change jobs, modify AppRunner options, etc.

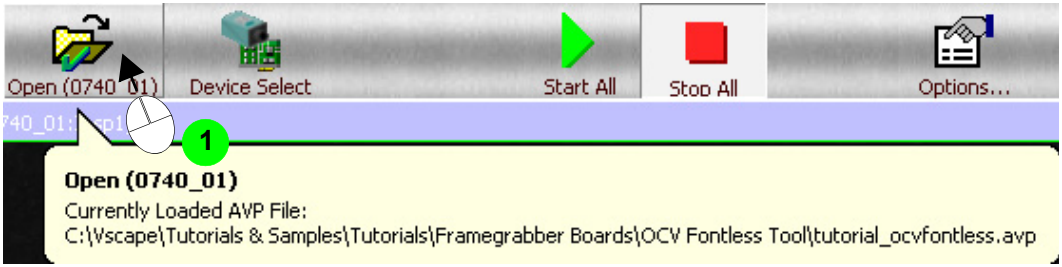
Start All Inspections Automatically Whenever A Job Is Loaded to a Visionscape® GigE System

Use this procedure to specify that all inspections should start automatically whenever AppRunner loads a new Job to a Visionscape® GigE System. This includes when AppRunner first starts up, in which case it will always try to load the Job(s) from the last time it ran. By selecting this option, you insure that it starts the inspections as well.



Display Name of Currently Loaded Job

Hover the mouse over the Open button to display the name of the currently loaded Job.



Accomplishing Common Tasks with Smart Cameras

AppRunner allows you to connect to 1 to 4 Smart Cameras, and allows you to control each of these devices independently. For this reason, the main toolbar will look quite different than it does when using GigE Systems. This is illustrated in the following sections.

Monitoring Multiple Smart Cameras at Runtime

You can monitor up to four Visionscape® Smart Cameras at runtime.

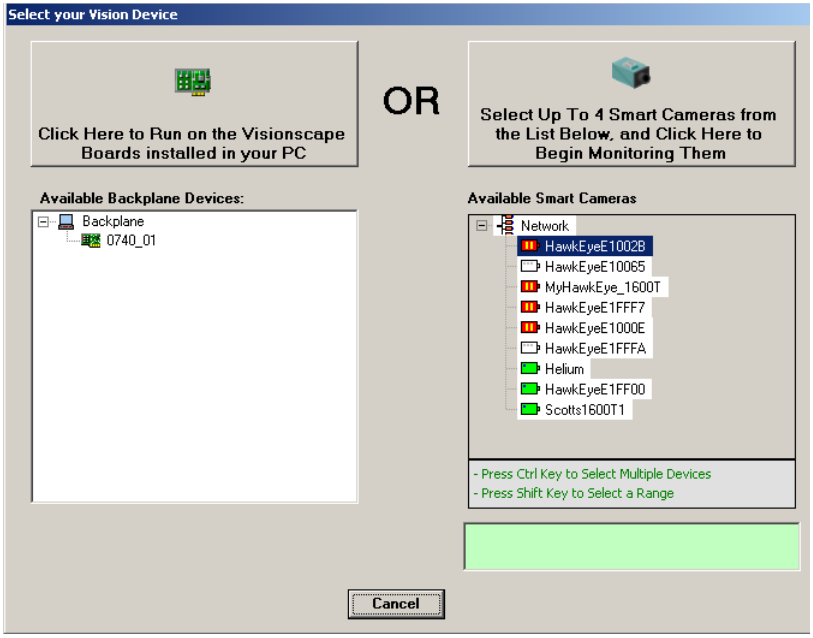
Selecting Multiple Smart Cameras

Use the following procedure to select multiple Smart Cameras:

1. Click “Device Select” on the main AppRunner toolbar.

   AppRunner displays the “Select your Vision Device” window, as shown in Figure 1–1.

FIGURE 1–1. Select A Device



2. **While holding down the Ctrl key**, highlight the Smart Cameras you want to select (limit of four).

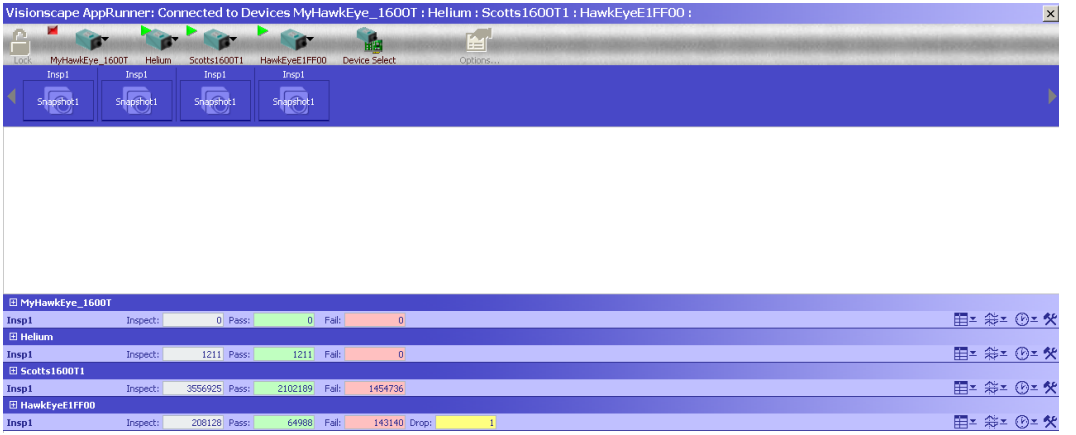
3. Click the “Select Up to 4...” button above the list of Smart Cameras.

Note: In the previous screen capture, a list of GigE Systems and Smart Cameras is shown. If you are using only Smart Cameras, then the list of GigE Systems is not shown.

Behavior When Smart Cameras Are Selected

Whenever you select one or more Smart Cameras in AppRunner, the device control options (“Open”, “Start”, “Stop”) are removed from the main toolbar, and instead a separate button for each Smart Camera is added. For example, assume the devices “MyHawkEye_1600T”, “Helium”, “Scotts1600T”, and “HawkEyeE1FF00” are selected. The AppRunner main screen would look like the following:

FIGURE 1–2. AppRunner Main Screen After Smart Cameras



Icons in each Device button display the current state of the device:

No Job Loaded on the Smart Camera

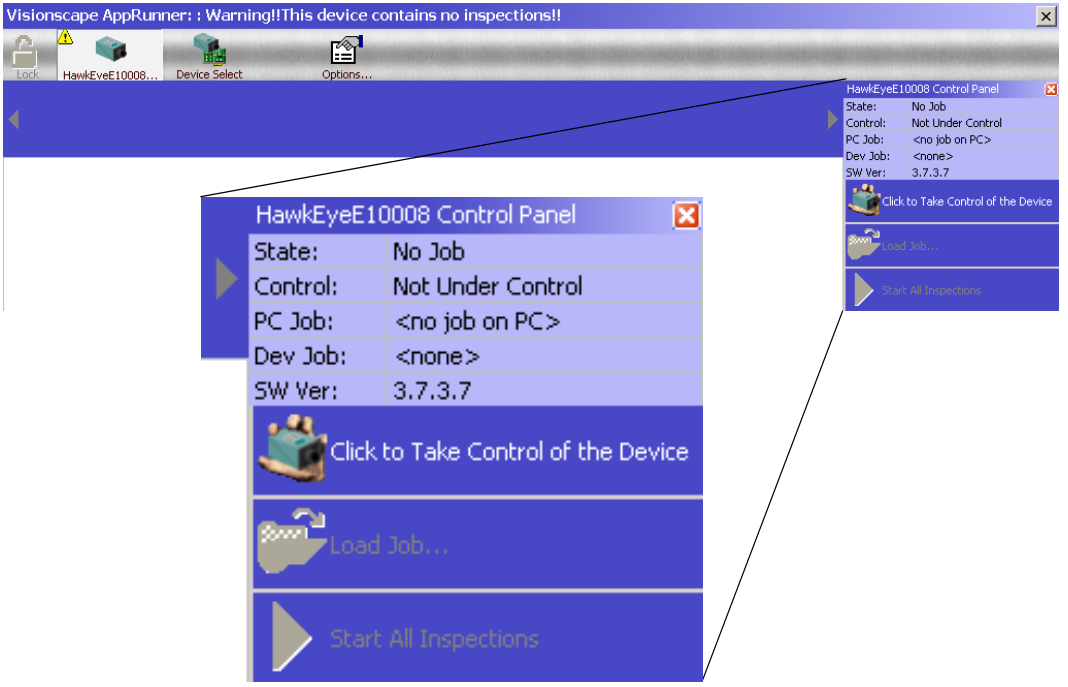
Smart Camera Running

Smart Camera Stopped

Smart Camera Stopped and Controlled

If you want to perform an action on a particular Smart Camera, like taking control, or loading an AVP, etc., then click that Smart Camera's corresponding button. A control panel for that device is displayed along the right edge of the screen, as shown in Figure 1–3.

FIGURE 1–3. **Device Control Panel**



- Status Grid — The grid at the top of the panel displays information about the device:
  - State — Running, Stopped or No Job
  - Control — States whether the device is under control or not
  - PC Job — Displays the path of the job that is currently loaded on the PC (if any)
  - Dev Job — Displays the name of the Job that is loaded on the Smart Camera (if any)
  - SW Ver — Displays the current version of Visionscape running on the device.
- Take Control Button — Used to take control and release control of the Smart Camera. All of the other control options are disabled until you have taken control of the Smart Camera.

- Load Job Button — This is disabled if you do not have control or if inspections are running currently. Clicking this button allows you to load a new AVP file into memory, which will then be downloaded to the Smart Camera.
- Stop/Start Button — This is disabled if you do not have control or if there is no job on the device currently.

Use the control panels to take action upon a device. You can close a control panel, either by clicking the device button again, or by clicking the Close button in the upper right hand corner of each panel.

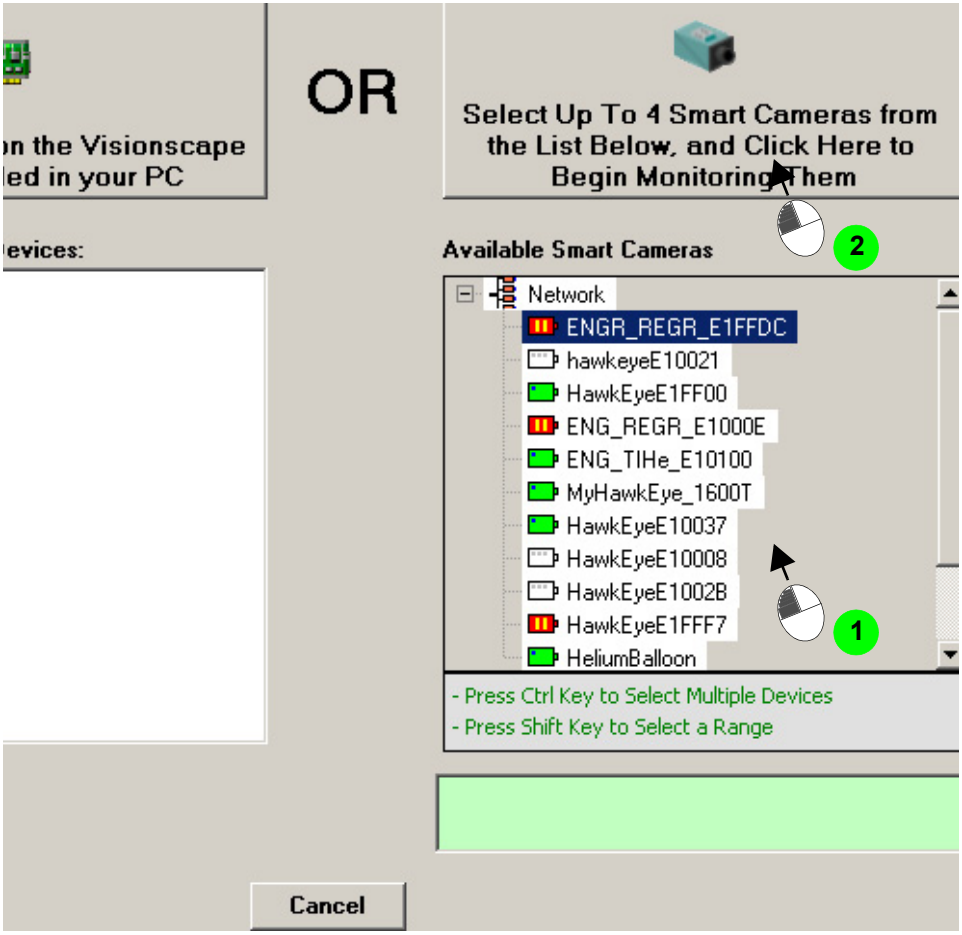
After you select multiple Smart Cameras, and shut down AppRunner, the list of devices is written to the AppRunnerConfig.xml file. When AppRunner restarts, it will attempt to reconnect to and monitor those same Smart Cameras.

Changing the Selected Smart Cameras

To select a different set of Smart Cameras to monitor, click the “Device Select” button on the main toolbar. see “Selecting Multiple Smart Cameras” on page 1-13 for more details.

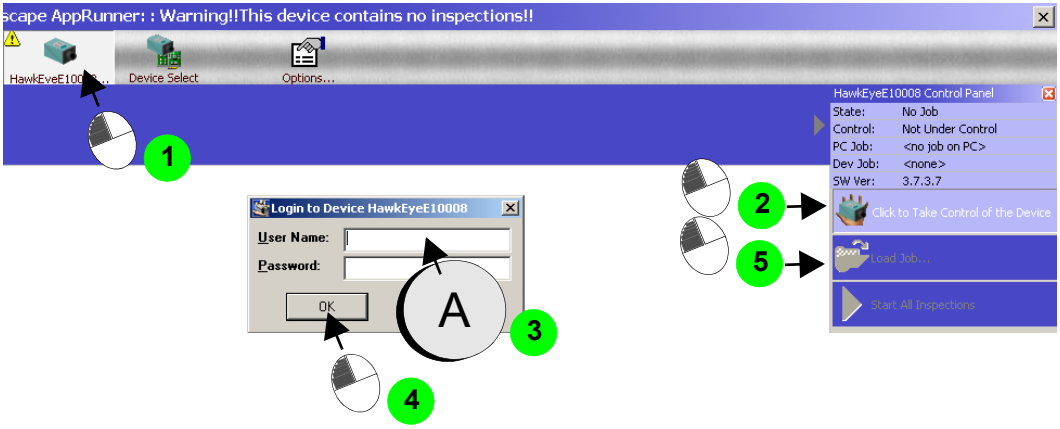
Selecting Devices and Loading Jobs

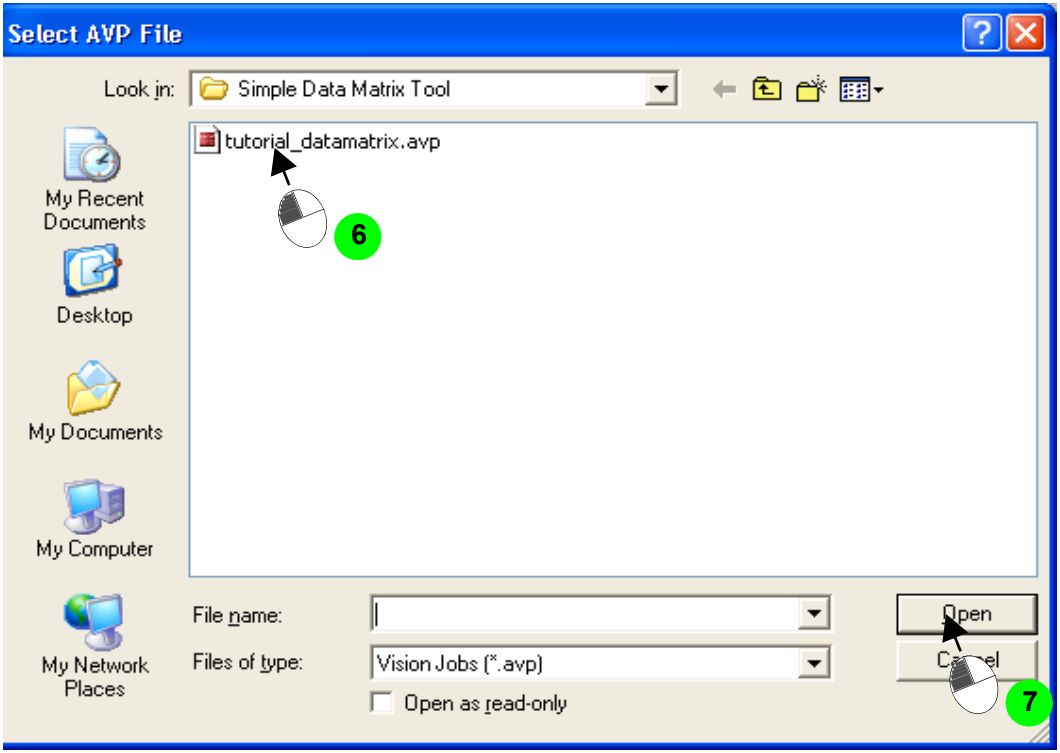
Select a Smart Camera and Connect to It



*Note: you can hold down the Ctrl Key to select more than one Smart Camera.

Loading a New Job to a Smart Camera

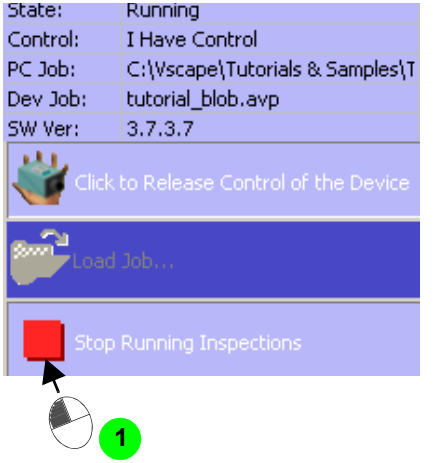




Starting and Stopping Inspections

Start All Inspections

Stop All Inspections



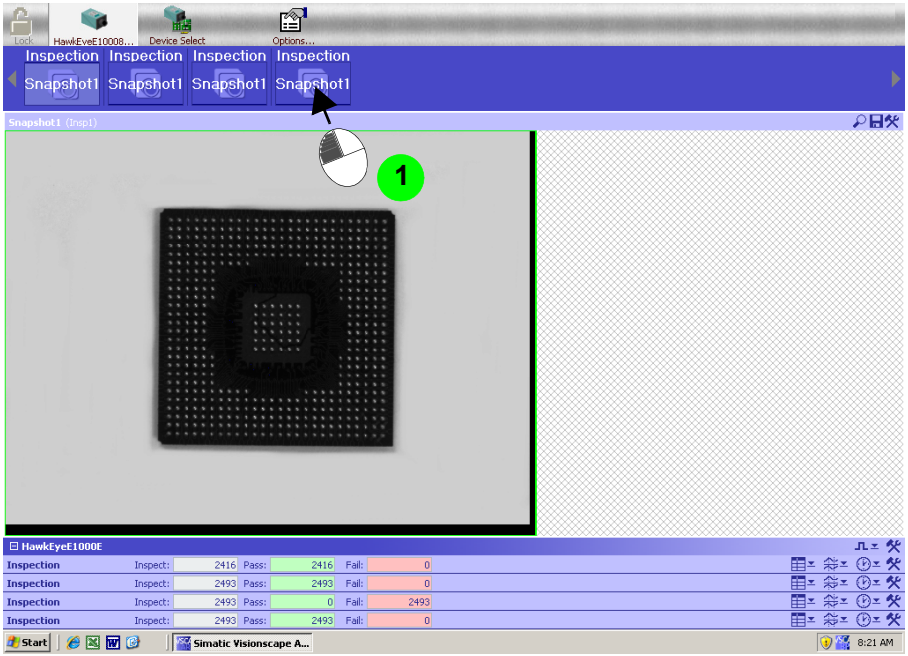
Note*: You must have control of the camera before you can start or stop inspections.

Image Display Options

This section explains and demonstrates the various options that AppRunner provides that govern image display. These options are not specific to the hardware being used, and are always available.

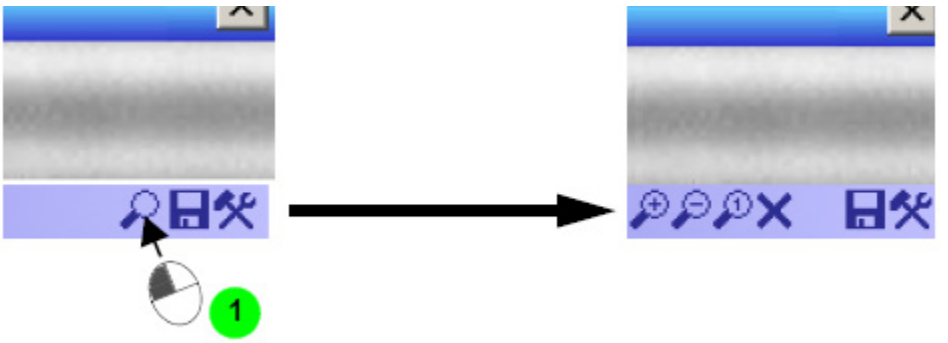
Displaying More Than One Image at a Time

AppRunner can display up to 4 images simultaneously. A snapshot toolbar is displayed just below the main toolbar, and lists all available snapshots across all of the Visionscape devices you have selected. Assume you have a job loaded on a Smart Camera that contains 4 inspections and 4 snapshots. If the image from Inspection 1 is displayed, and you want to also display the image from Inspection 4...:

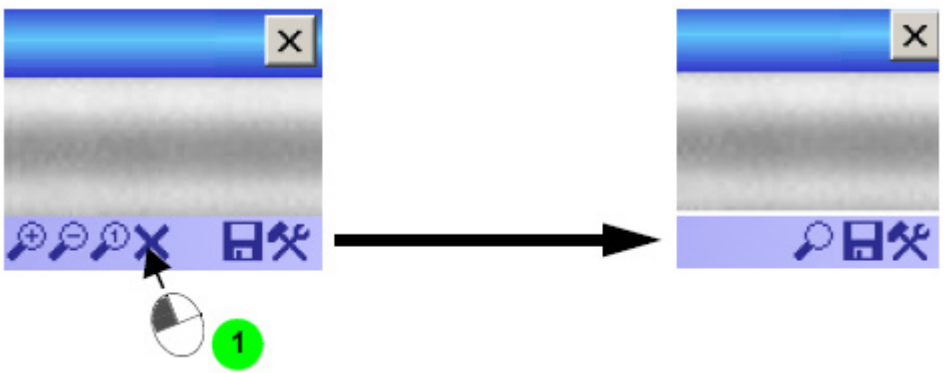


Click the snapshot button again to turn off the display of that snapshot.

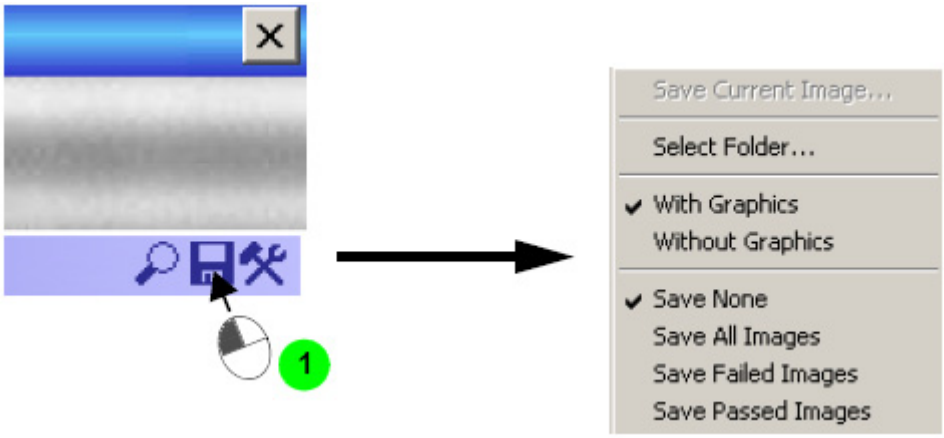
Display Zoom Buttons for an Image



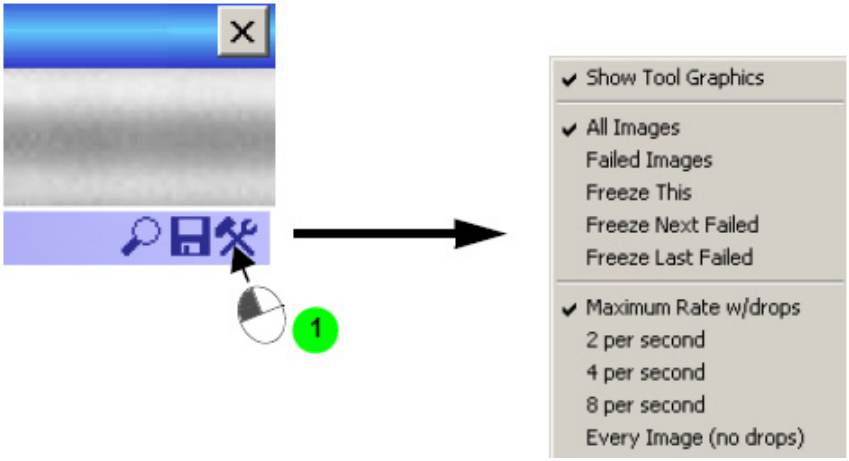
Hide Zoom Buttons for an Image



Saving Images



Displaying Images - Which Ones and How Often



Note*: Choosing the “Every Image (no drops)” option may adversely affect the performance of your inspections. This will cause the inspections to block until each image has been fully transferred to AppRunner, which could lead to timing spikes and/or overruns in higher speed applications. Use this option with caution.

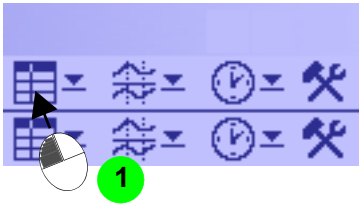
Inspection Results and Statistics Display Options

Use these options to control the display of uploaded inspection results, counters and timing information. These toolbar buttons are found in the lower right-hand corner of the AppRunner window.

Display Results for an Inspection

Use this procedure to display results for an inspection.

Note: Click the button again to hide the results.



Result

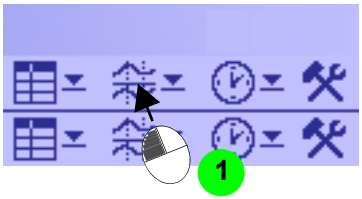
HawkEyeE1000E

Inspection	Inspect: 178	Pass: 89	Fail: 89
Blob Tool.Error Code	0		
Blob Tool.Status	False		
Blob Tool.Blob Tree	...		
Blob Tool.Number of blobs	2		
Blob Tool.Number of parts	2		
Blob Tool.Total Area	492.000		

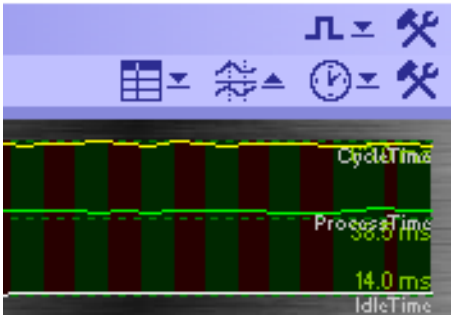
Display a Timing Chart for an Inspection

Use this procedure to display a timing chart for an inspection.

Note: Click the button again to hide the timing chart.



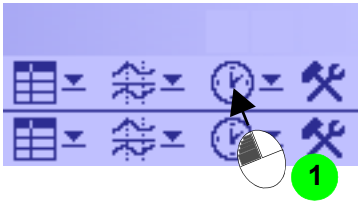
Result



Display Extended Timing Information for an Inspection

Use this procedure to display extended timing information for an inspection.

Note: Click the button again to hide the extended timing information.

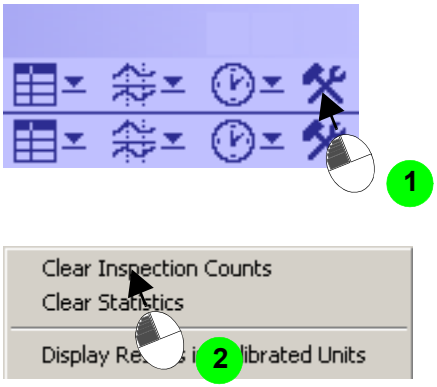


Result

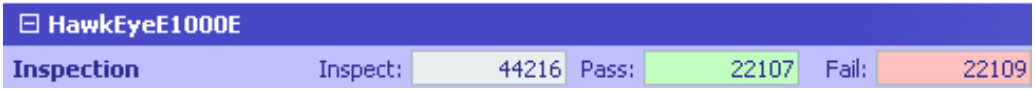
HawkEyeE1000E

Inspection	Inspect: 46927	Pass: 23462	Fail: 23465		
Cycle	62	Cyc Worst	92	Process	41	Draw	0
PPM	953	PPM Worst	882	Idle	16	DMA	0
Buffers	2 of 20 used (10%)			Overruns	None		

Clear Inspection Counts for an Inspection



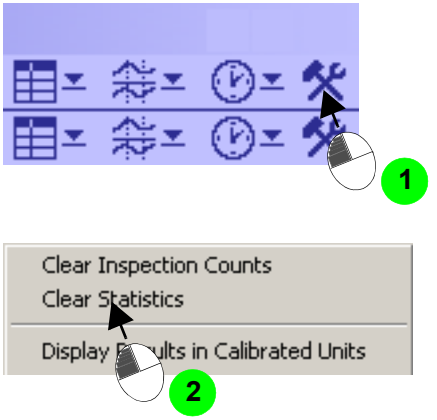
Before Clearing



After Clearing

Clear Statistics for an Inspection

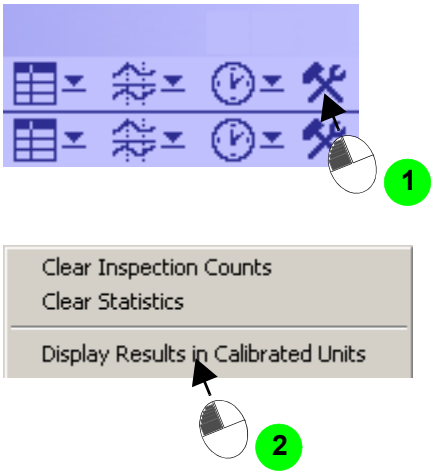
Some tools, like the Tolerance Meas tool, collect statistical information about measured values. This statistical information includes mean, maximum and minimum values, and standard deviation. Use this procedure to clear statistical information for an inspection.



Toggling “Display Results in Calibrated Units”

Use this procedure to turn on or turn off “Display Results in Calibrated Units”.

Note: A check mark is displayed to the left of “Display Results in Calibrated Units” when it is turned on.

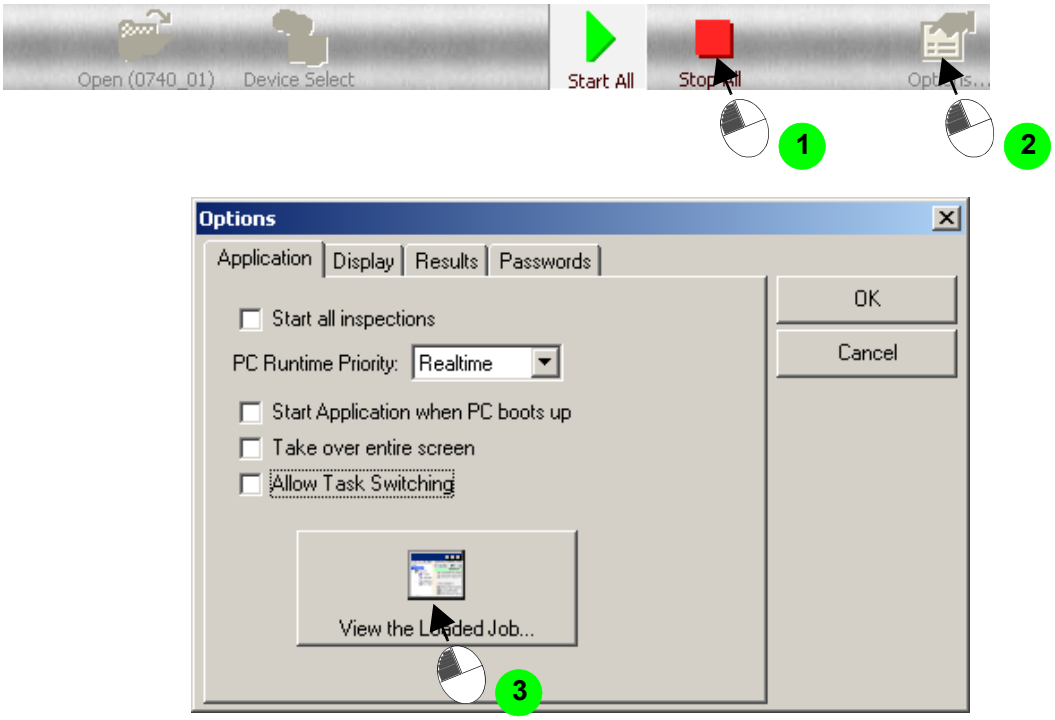


Application Options

The Options dialog in AppRunner provides various options that control the behavior of the application. Most of these options are not hardware specific. Each of the options is explained and demonstrated here.

View the Contents of the Loaded Job in Memory

Use this procedure to view the current Job in memory (if any). You cannot make modifications; you may view only.

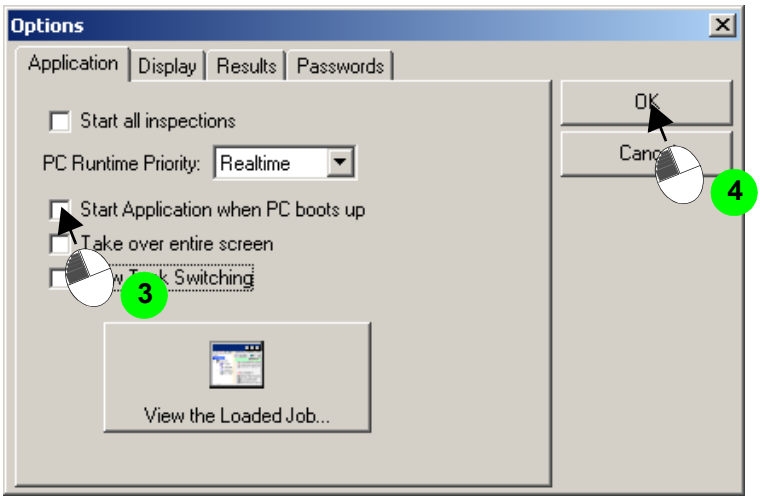


This will open a dialog that will show you the Step Tree for the currently loaded vision program(s). You may click through the Steps and view the settings for each, but you will not be allowed to change anything.

Start AppRunner When PC Boots

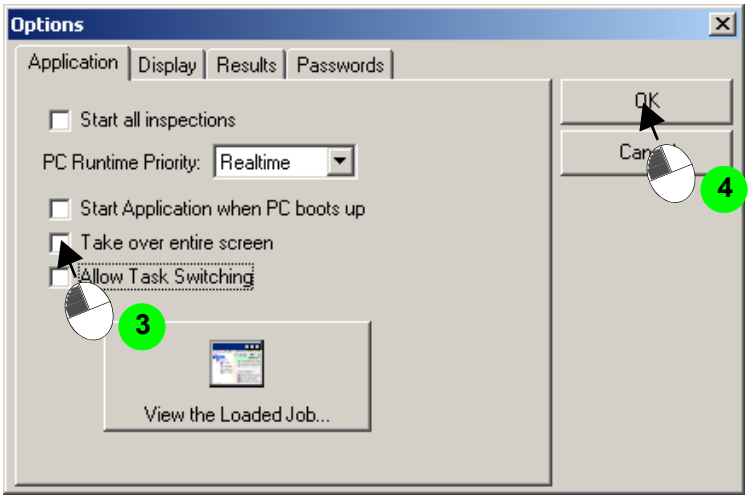
Use this procedure to specify that AppRunner should start whenever the PC boots.

Note: When running with a Visionscape® GigE System, you will most likely want to have the “Start All Inspections” option checked. This insures that, when your PC is rebooted, AppRunner will be launched, it will load the last Job it was running, all inspections will be started, and your system will be fully ready to run.



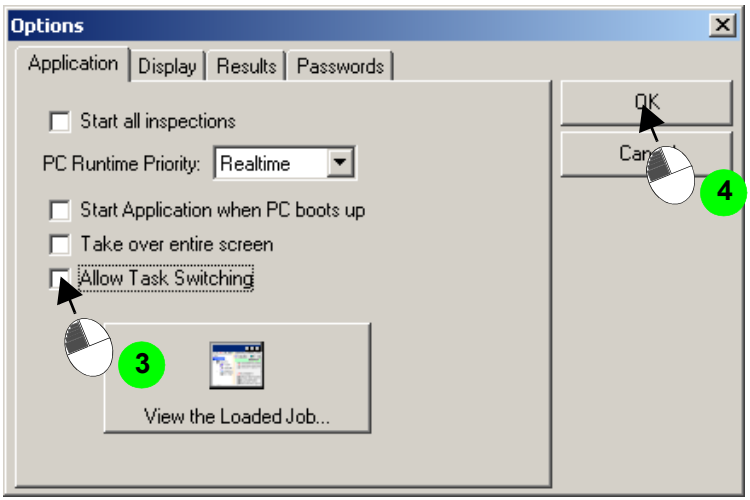
Take Over Entire Screen

Use this procedure to display graphics using the entire screen. You can switch tasks using Alt +Tab (assuming Allow Task Switching is selected).



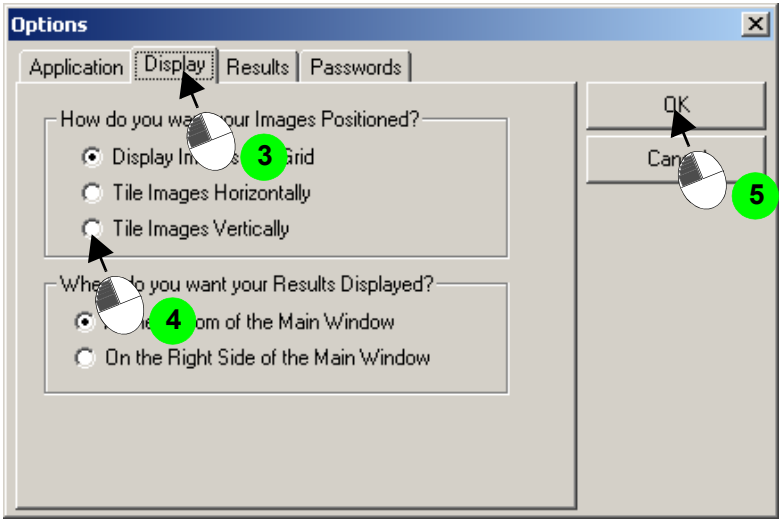
Allow Alt-Tab Task Switching

Use this procedure to enable or disable the ability to switch between tasks using Alt +Tab while AppRunner is running. By default, this is enabled.



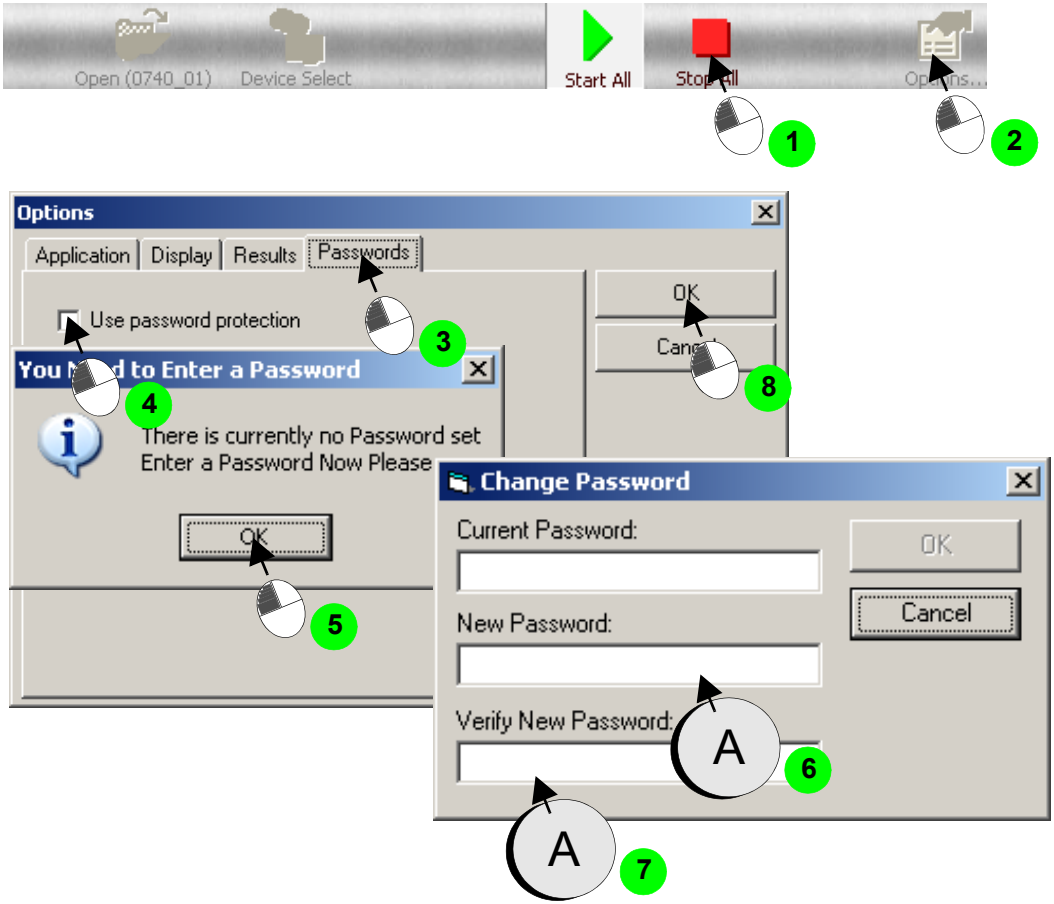
Position Images

Use this procedure to specify how you want to display images (grid, tile horizontally, tile vertically)

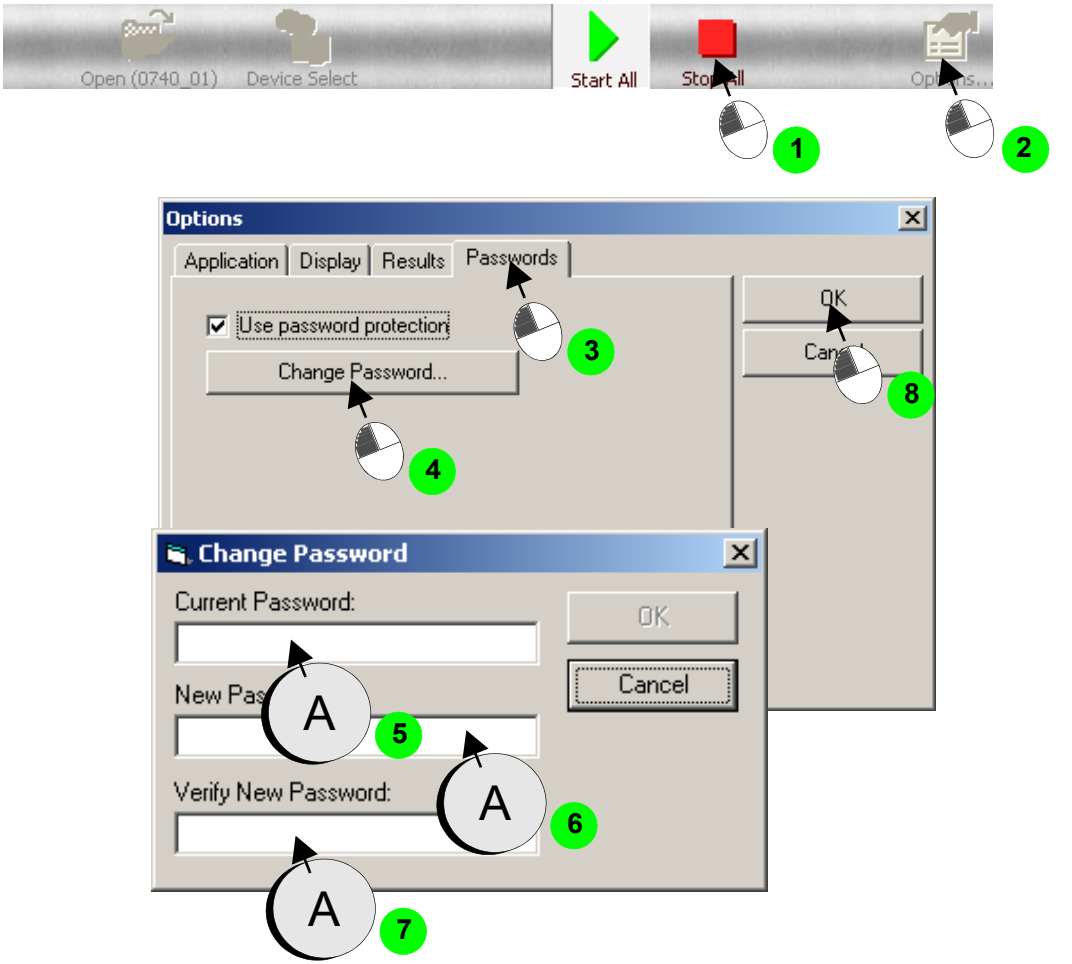


Turn On Password Protection

It is possible to lock and unlock the AppRunner user interface. When the user interface is locked, you cannot access the Options dialog box or use the Exit button. Before you can lock and unlock the user interface, you have to turn on password protection and specify a password. Use this procedure to turn on password protection.



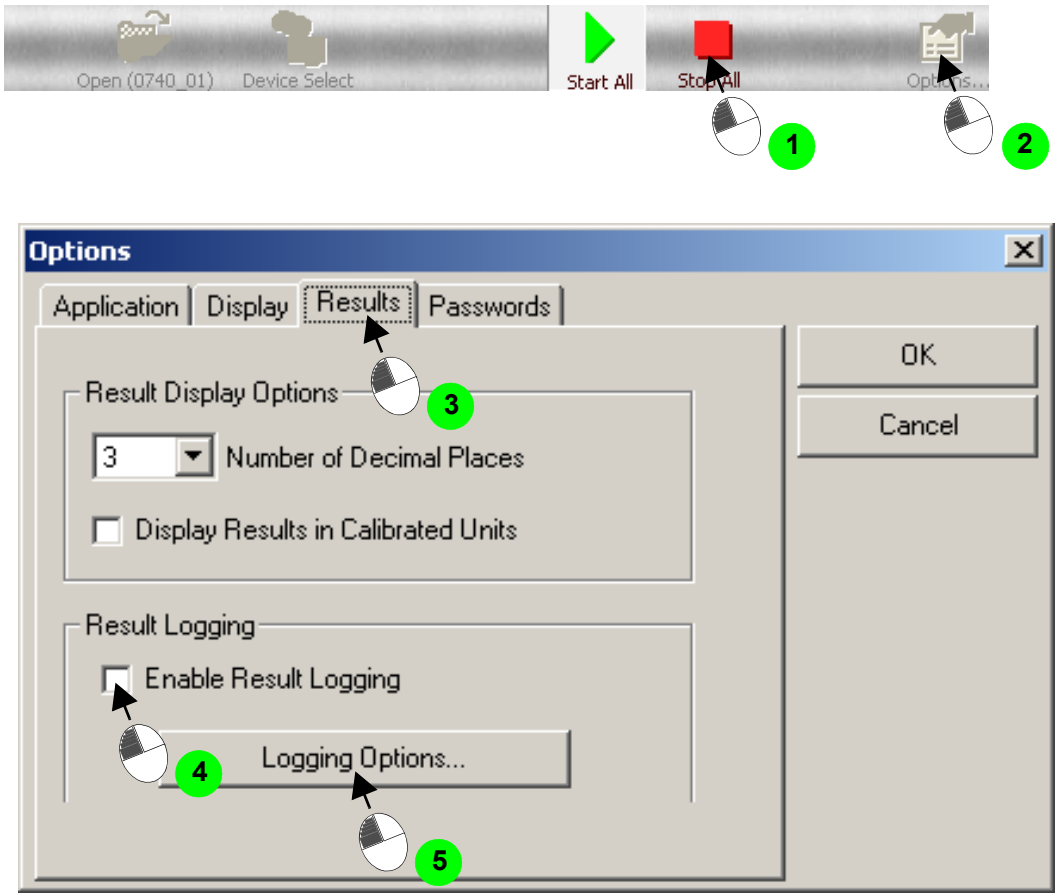
Change the Password



Logging Results to File

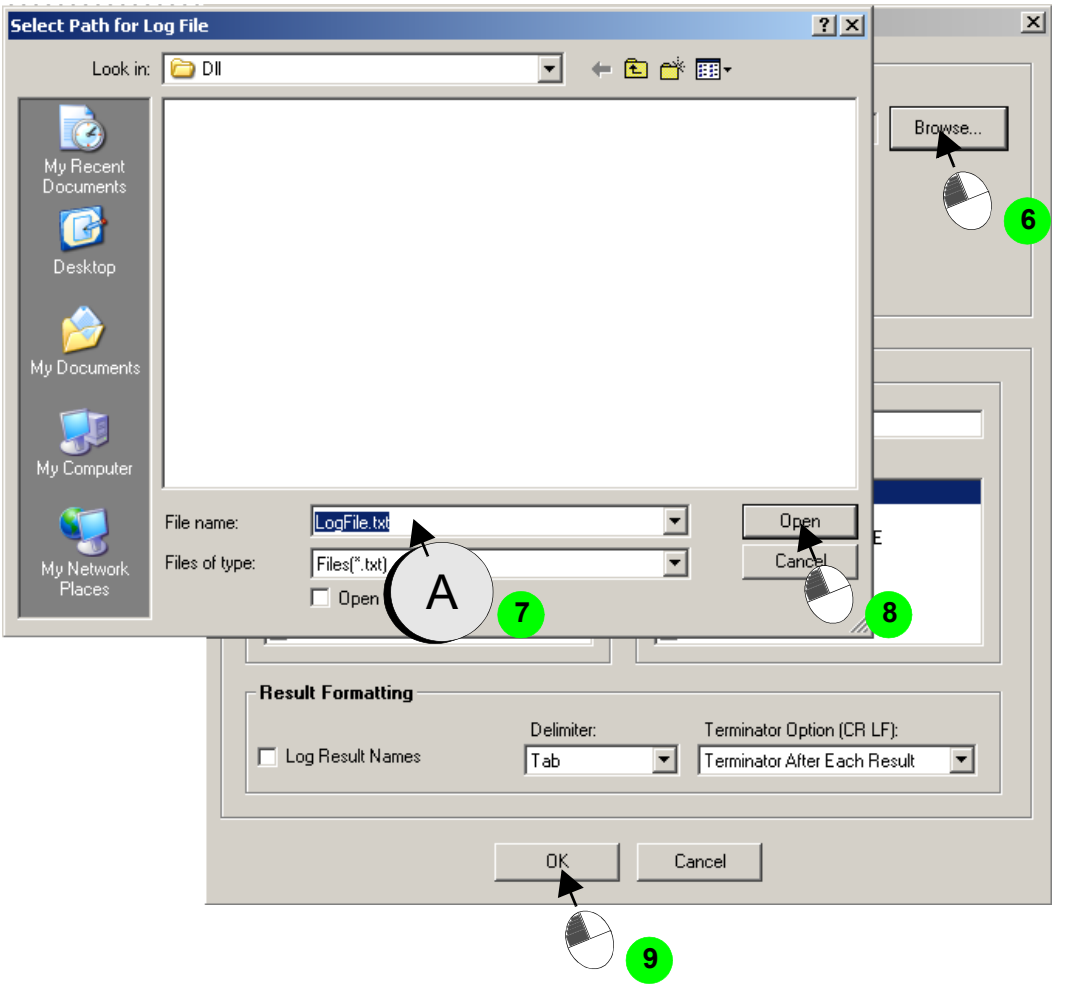
The Log File Options dialog box allows you to configure the various options that control the logging of uploaded results to disk.

FIGURE 1–4. Logging Options (Screen 1)



Please Proceed To Next Page

FIGURE 1–5. **Logging Options (Screen 2)**



- Formatting Options — Use these options to specify how the uploaded results will be formatted before they are written to disk.
  - Prefix section — Use this area to specify any text and data that you want to be logged at the beginning of each inspection cycle. Enter your own text in the text box (i.e., “Start of Cycle”), and/or use the check box list to add information like the date, time, inspection name, status and counts.

  - Suffix Section — Identical to the Prefix, only this data will be added to the end of each cycle's data.

- Result Formatting — These options control how the uploaded results themselves are formatted before they are written to disk:

  - Log Result Names — By default, only the uploaded result data is written to disk. If you check this box, the names of each result will also be written.

  - Delimiter — Specifies the character that will be used to separate each element of data in the file. The default is the Tab character. You may also choose to use a Comma or a Space.

  - Terminator Option (CR LF) — This option defines when the terminator (Carriage Return and Line Feed) should be applied. Options are:

    - Terminator after Each Result — A CR-LF will be appended after each result in the text file. This option makes it easier to view all of the results from each cycle when opening the log file in a text editor.

    - Terminator at End of All Results — A CR-LF will not be applied until all of the result data is written to file. This is the better option to use when you are logging result data so that you can later import the file into Excel in order to analyze it.

Color Image Display Options

Color Image Display in AppRunner

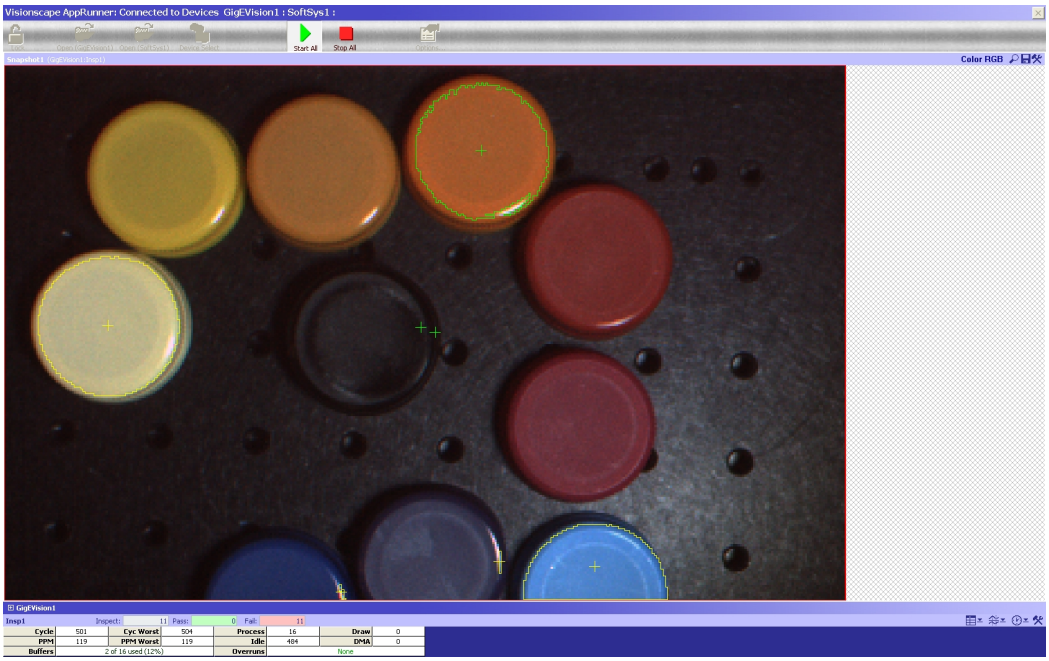
The snapshot step shows the color image as acquired from the camera. The buffer manager control in AppRunner shows both the RGB and HSI (red = 0) values under the cursor if the image acquired is a color image. Zooming fully into the image will show the individual RGB values for each pixel of a color image.

FIGURE 1–6. Color Buffer Display of Zoomed Image

Running Color Plane Selection

When using a color camera, the upper right of the image display will include the text of the current image plane displayed. The default with be the RGB color image. Channel selection will be limited to those channels used by vision tools that are inserted in the current snapshot.

FIGURE 1–7. Runtime Displaying Color Image

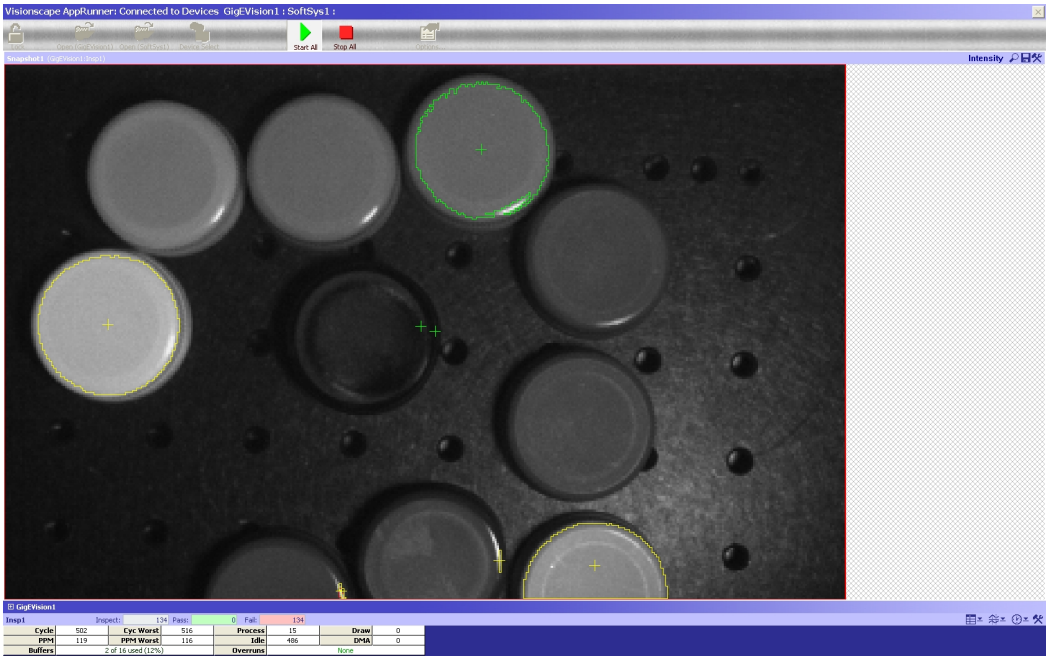


When the user selects the “RGB Color” text a dropdown menu will appear, allowing the user to select from the image channels used in the job.

FIGURE 1–8. Runtime Image Channel Selection Dialog

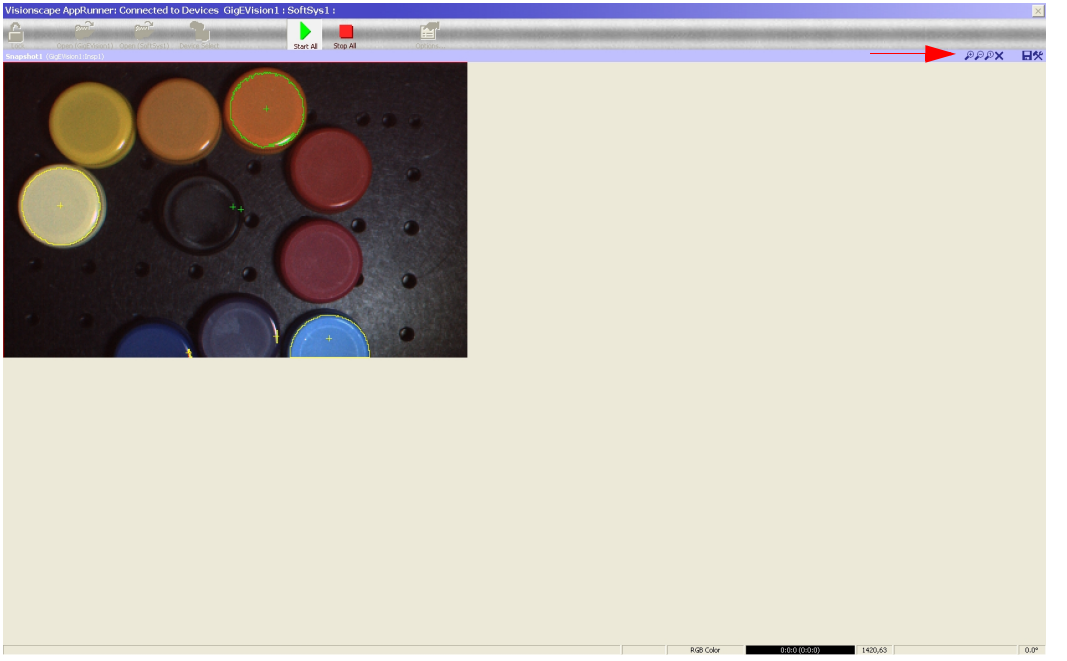
In the following example, the user has selected the “Intensity” image channel. At this point, the software will now display that channel.

FIGURE 1–9. Runtime Display of Intensity Channel



Finally, if the user clicks on the magnifying glass icon to zoom the image the name of the image channel zoomed will appear in the image status bar next to the pixel value and location.

FIGURE 1–10. Zoom Options with Color Runtime Display



Note: The user will be able to select what image channel to display but ALL the enabled graphics for the job will be displayed regardless of which plane they are running in.