Rev 9.0 IM-II and IM-III Robot

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Purpose

This note explains changes and additions to the IM-II and new IM-III robot in Rev 9.0.

Supported Cameras

We have greatly improved the support for newer IP cameras. Previously, any camera using digest authentication would not work. The list of models we have verified includes:

1. Foscam Models FI8910W, FR4020A2
2. Amcrest Models IP2M-841S, IP2M-841EB
3. Panasonic models BL-C210A,
4. D-Link Models xxxxxxx

Many other cameras should work.

Camera List

The **Robot Options** dialog shown by clicking the **CONFIG** button to the right of the **MOVE ROBOT** button in the main acquisition window no longer has a list of cameras:
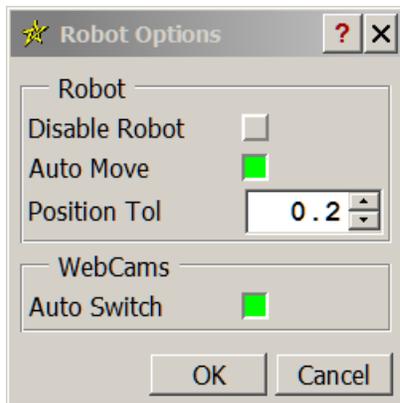
There was a disconnect between setting them here and in the properties dialog of the web cam windows.

In the **PLAN** dialog, right-click in a webcam to bring up the **Properties** for the cam:
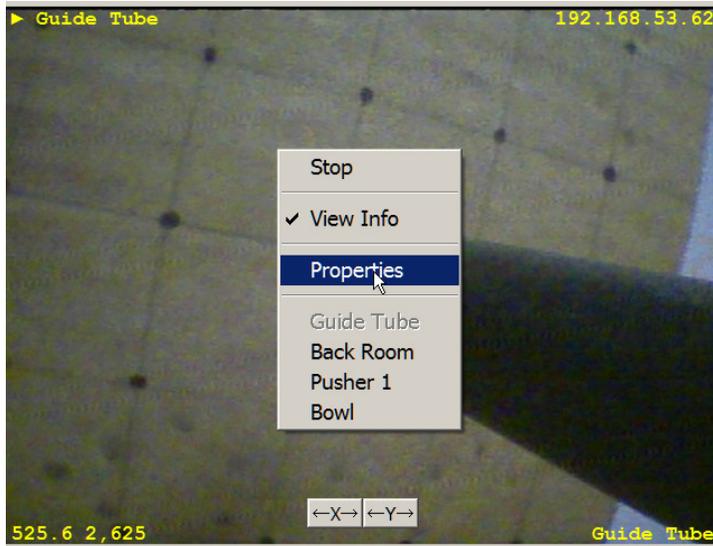
Note that the current camera type is shown in the bottom right hand corner of the webcam window.

The top window always shows the **Guide Tube** camera. The bottom one shows either the **Robot** or **Pusher** camera. The label in the lower-right corner now makes it clear which one.

Middle-click in the lower cam window to switch between the **Pusher** and **Robot** cameras. Since the robot and pusher should never be moving at the same time, only one window is needed. If you have **Auto Switch** enabled in the main **Robot Options**, it will automatically switch to the robot camera when the robot is moving, and the pusher camera when the pusher is moving.

IP Camera Properties
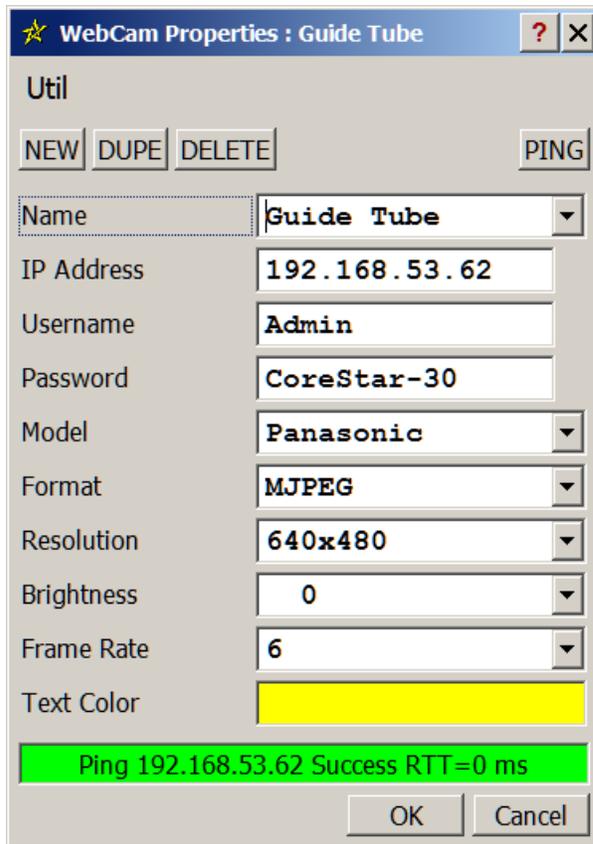
The properties dialog has several new features.
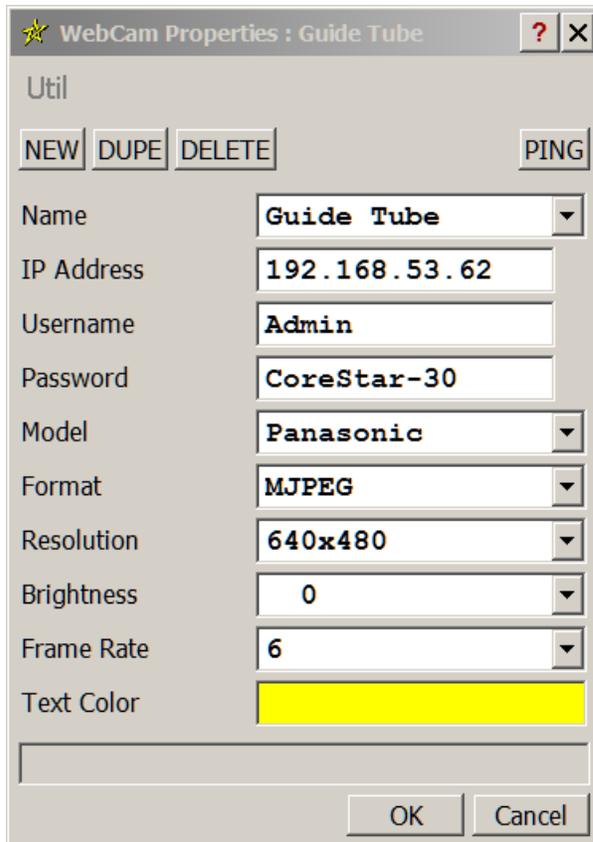
The caption shows the purpose of the camera. It is **Guide Tube** in the above (Note, the Name in this example also happens to be "Guide Tube", but it can be any user-defined name). The other options are **Robot** and **Pusher**. The intent is the **Robot** camera will point at the tubesheet and show the robot and the **Pusher** camera will point at the pusher.

If you change the camera in this dialog and hit Ok, the camera of that type will be updated. The software will automatically load it the next time you boot.

The cameras are no longer started when the software boots. Instead, they are started when the **PLAN** dialog is displayed, and stopped when it is lowered.

There is a new **DUPE** button. If you have more than one camera of a given model, you can use this to configure one and then create copies. The IP address of each duplicate will be incremented by 1.

The **PING** button is used ping the camera at the given IP address. The result will be displayed in the message area:

WebCam Properties : Guide Tube

Util

NEW | DUPE | DELETE   PING

Name	Guide Tube
IP Address	192.168.53.62
Username	Admin
Password	CoreStar-30
Model	Panasonic
Format	MJPEG
Resolution	640x480
Brightness	0
Frame Rate	6
Text Color	

Ping 192.168.53.62 Success RTT=0 ms

OK | Cancel

The **Util –> Export List** menu will export a list of all the cameras you have defined.

Clicking on the **Name** dropdown now shows and more detailed list of the cameras you have defined. If you previously clicked PING, the ✓ before an IP address shows one successfully pinged.
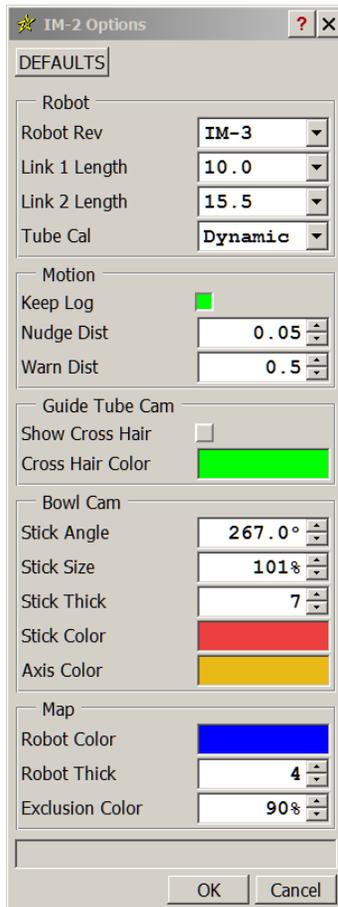
Robot Options

The robot configuration is now set in a single dialog.

From the **PLAN** dialog, click **Robot –> Options...** to display:

For **Robot Rev**, select **IM-2** or **IM-3** based on which robot you are using. This will change the set of allowed link lengths. Select the ones you are currently using an click **Ok**. This will configure your robot controller with the appropriate parameters.

The **Tube Cal** dropdown shows some new options for the cal:

> The **Default** works as always except you only need two points to start. This method simply picks the two tubes farthest apart to compute the transformation from robot to map coordinates. Adding additional cal points has no effect unless they are farther apart.

> The **Best Fit** method uses all the cal points to compute a best fit transformation. This attempts to average out errors when setting the cal points.

> The **Dynamic** method finds two cal points, based on the target tube, that should produce the most accurate transformation.

NOTE: You now only need two tubes for an initial cal.

NOTE: Unlike previous revs, the link lengths will be restored the next time you boot the software.
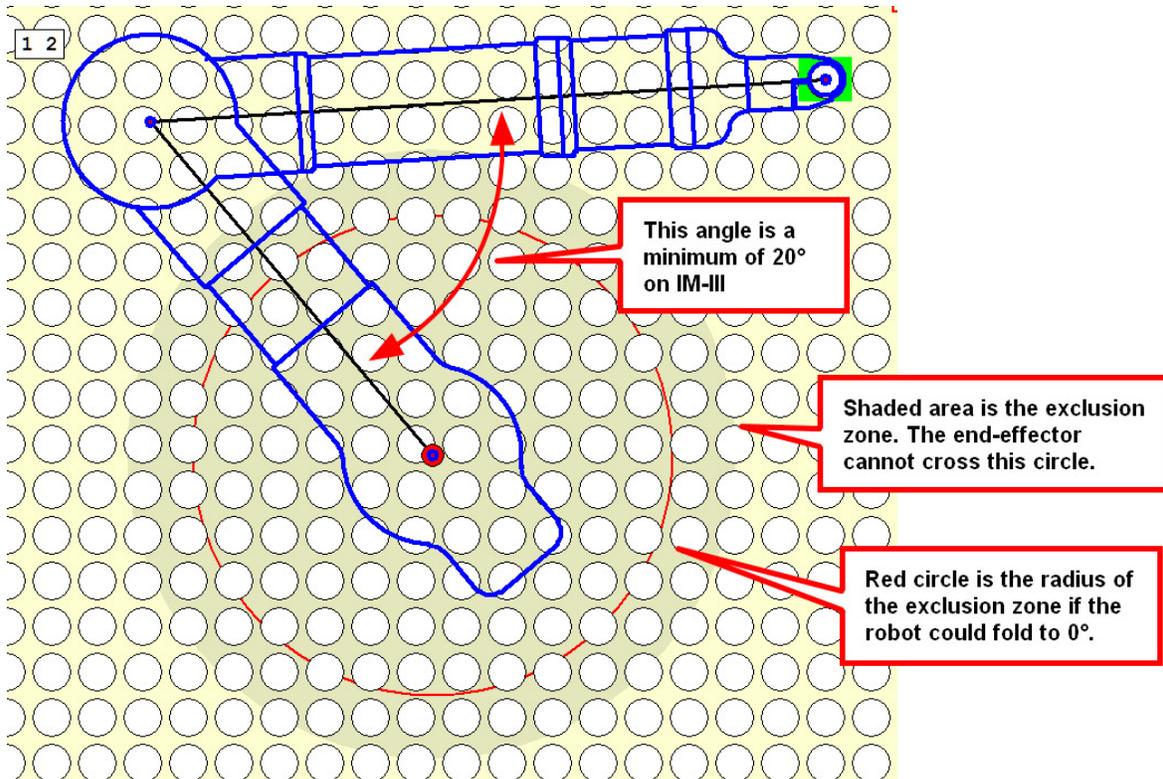
The name of the **Robot Cam** frame has been renamed **Guide Tube Cam**.

The **Max Slide** option has been removed. The **Show Cross Hair** options shows a cross hair in the Guide Tube cam at a user-defined position and in the color shown in **Cross Hair Color**. Use Ctrl+LB in the **Guide Tube** cam window to turn the cross hair on and drag it around. Use MB to toggle it on or off.
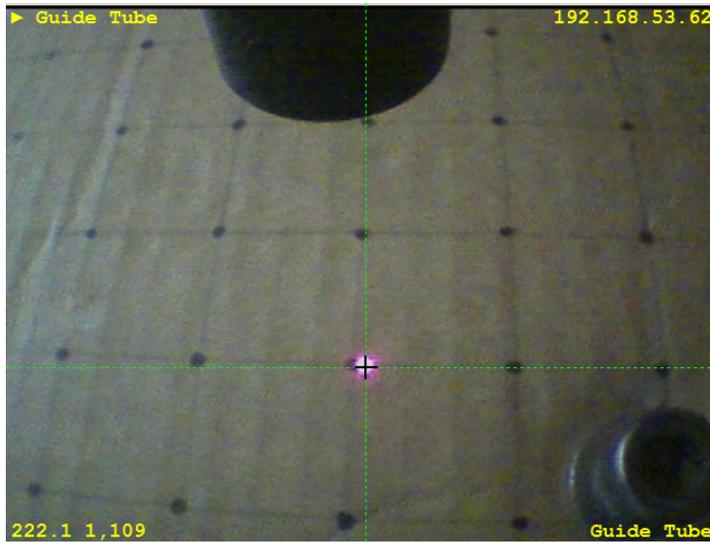
IM-III Robot

The IM-III robot is intended for small tubesheets. Unlike the IM-II, it cannot completely fold up. The angle between the two links is limited to about 20°.

This angle is a minimum of 20° on IM-III

Shaded area is the exclusion zone. The end-effector cannot cross this circle.

Red circle is the radius of the exclusion zone if the robot could fold to 0°.

Miscellaneous Changes

1. You now only need two points for an initial cal.

2. When you double click to move to a tube that is a cal point, it does not use the transformation. Instead, it uses the robot position used to create the cal point. Thus you can see if the cal point was off.