Basic Setup with *eDART®* Software

This section walks you through the setup for the software for the *eDART®*.

Start Machine

The *eDART®* allows for many Machine, Mold, and Process setups to be stored in the memory for future runs. It is necessary to set up the Mold or Machine only once, the first time that it is started. Machine input, output configurations and the Machine size information are stored in the Machine file. Mold Sensor locations are stored in the Mold file. Alarm Limits and diverter settings are stored in the Process folder.

Always choose the Machine name from the Drop-down menu if it already exists. Only create a new Machine after checking for an existing Machine setup.

Once a Machine is created there is no need to set it up again. The *eDART®* will remember all of the configurations for the machine. The Sequence Module is a Machine Identifier and will automatically select the Machine from the Machine Drop-down menu when connected to the system.
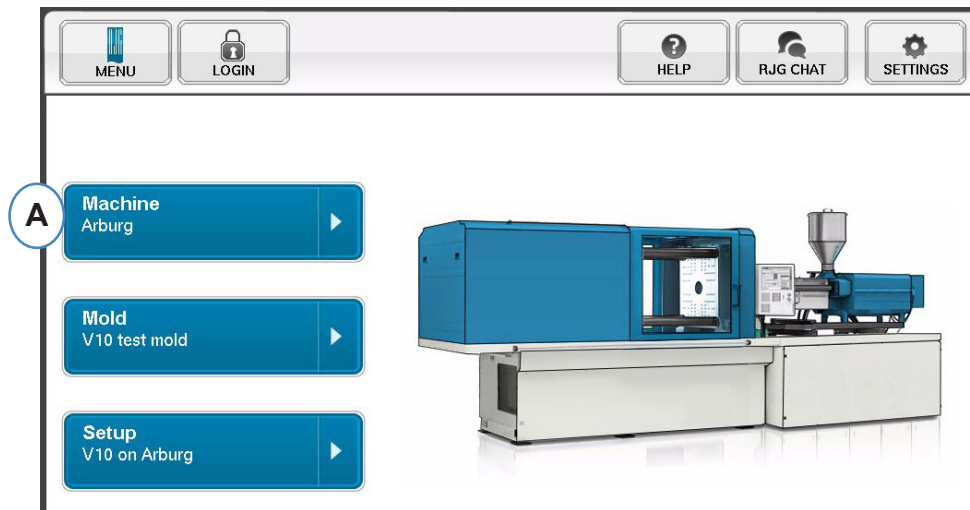
A: Click on the "Machines" Button on the *eDART®* Home Page.
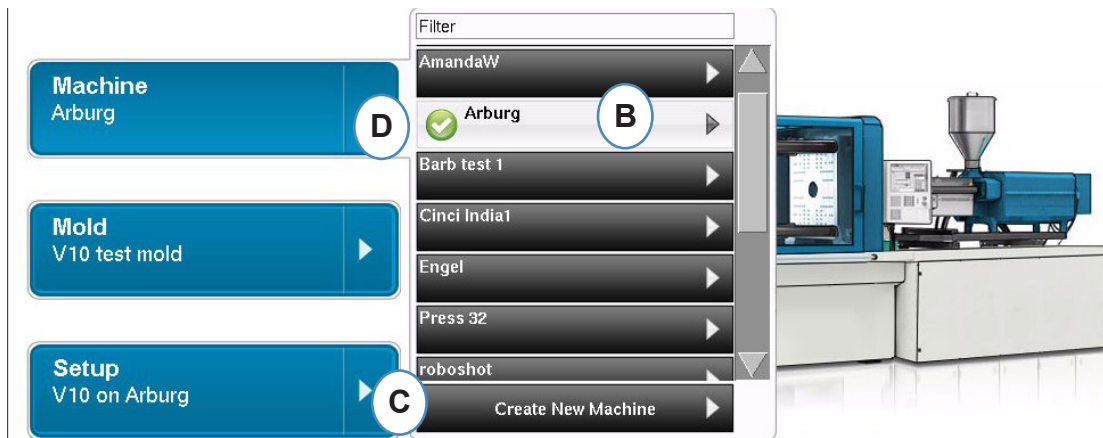
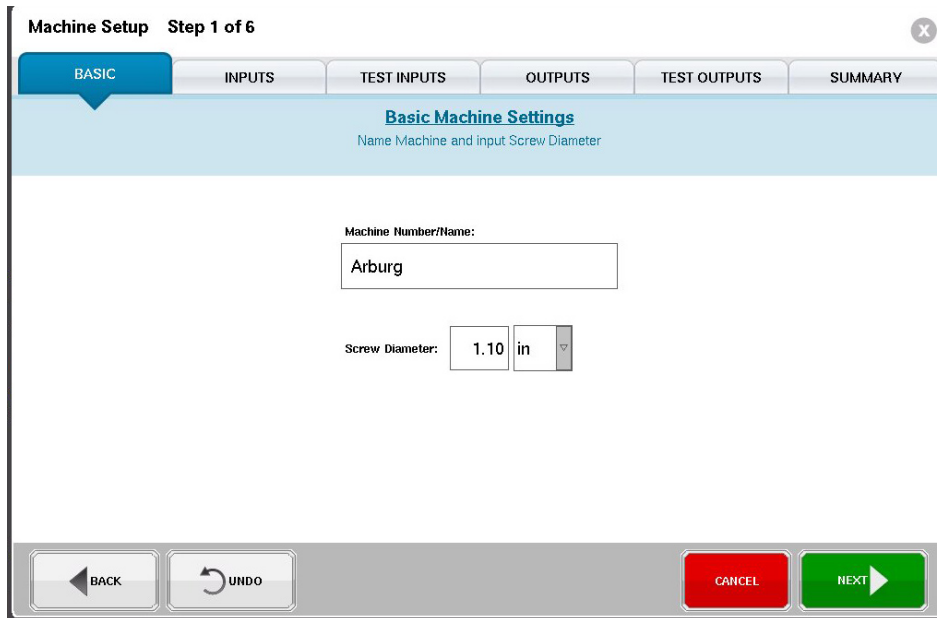**B:** If the Machine is in the list click on it to select.

C: If the Machine is not in the list click on "Create New Machine".

D: The selected Machine will be highlighted and have a check mark beside the name.

> If a Machine is selected from the drop-down menu the Machine Name will show on the Machine button.

Create New Machine

When Create New Machine is selected the *eDART®* will step through the Machine Creation Process. The first window will show the "Basic" tab. Do not use the Create new Machine Button if the Machine exists in the drop down menu. Instead, click on it to select.

Machine Setup Step 1 of 6	✕

BASIC	INPUTS	TEST INPUTS	OUTPUTS	TEST OUTPUTS	SUMMARY

Basic Machine Settings
Name Machine and input Screw Diameter

Machine Number/Name:

Arburg

Screw Diameter: 1.10 in ▽

◄ BACK   ↺ UNDO   CANCEL   NEXT ►

Sensor Icon Legend

Icon	Description
⇄	LE-R-50 - Stroke Encoder
◇	Proximity Switch
◷	Hydraulic Sensor
⬓	Pressure Sensor
∿	Analog Input
⊶	OR2-D
⊿P	Delta Pressure Sensor
⊓⊓	ID-7
◖◗	Mold Deflection
🌡	Temperature Sensor

Placing Sensors
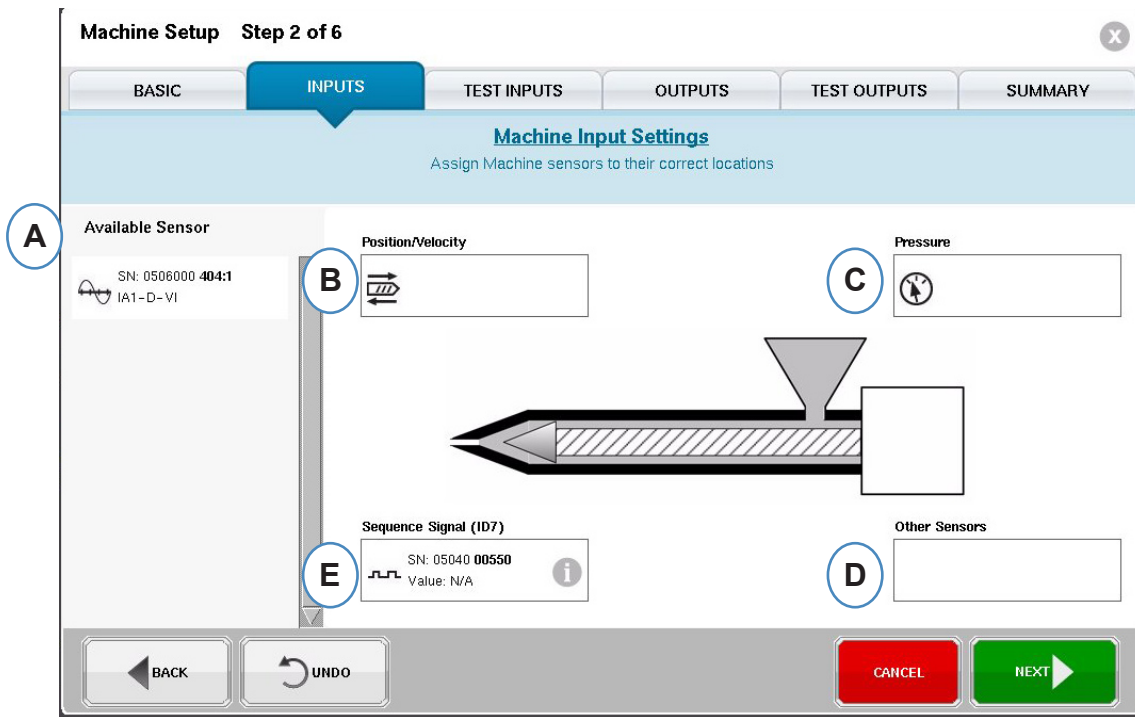
A: Available Sensor List - Drag and drop sensors from the Available Sensor list into their correct locations. When a sensor is held over a location the window will open and allow correct placement of sensor within the location.

B: Drag the LE-R-50 or analog input modules connected for screw position into this box. See Position/Velocity section for details.

C: Drag the Hydraulic sensor or the analog input module connected for injection pressure into this box. See Injection Pressure section for details.

D: Drag any other Machine sensors that are connected to the Machine into this box.

E: When you connect the Sequence Module to the *eDART®* it will automatically assign it to the Sequence Signal area. See Sequence Module Config for more information.
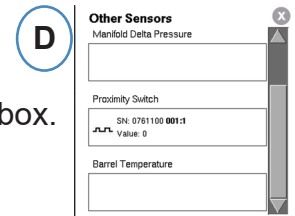
All sensors attached to the system will automatically display in one of the Available Sensor lists. Mold sensors will show up in the Mold Available Sensor list and Machine Sensors will show up in the Machine Available Sensor List from the setup portion of the Job creation process.

The Sequence Module is a Machine Identifier for the *eDART®* system. After the initial setup for the Machine the *eDART®* will automatically display the Machine Name on the start page.

Configuring Sensors

Position/Velocity For LER-50

When the Position/Velocity sensor is placed over the Position/Velocity location on the machine, a window will open up to allow the sensors to be dropped into the correct location.

Position/Velocity

Position

A SN: 0460000 **136:1**
Value: 0 in

Velocity

B SN: 0460000 **136:2**
Value: 0 in/sec.
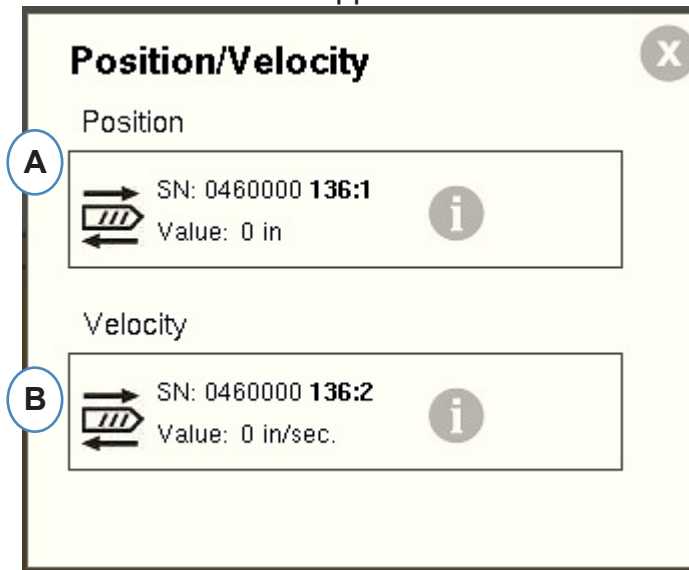
A: Drop the LE-R-50 sensor output 1 from the "Available Sensor" List into the Position location. Select the screw direction. (see Set Screw Direction)

B: The Velocity sensor will automatically assign.

Position/Velocity From Analog Input

Position/Velocity

Position

A SN: 0460000 **136:1**
Value: 0 in **B**
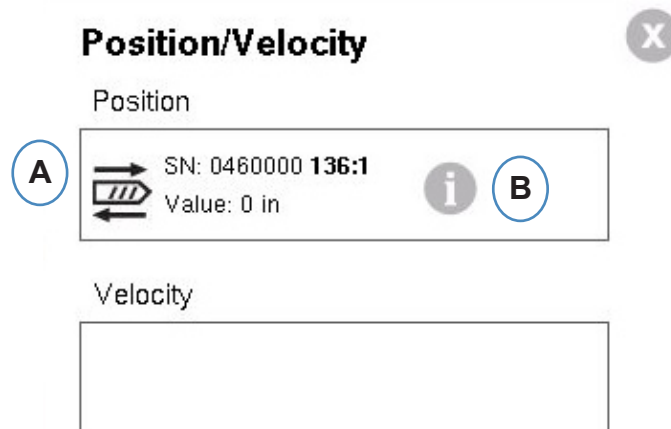
Velocity

A: Drag analog input connected to Position or Velocity into the correct locations.

B: Click on the "i" to get Analog Input scaling window Scale Analog Inputs for Position and Velocity.

Position/Velocity Analog Configuration

Enter the AI Position Module's Parameters

A Maximum Position: `0` `in` ▽

B Voltage at Maximum Position: `10.00` V [SET]

C Voltage at 0 Position: `0` V [SET]

[Cancel]   [Save]

A: Enter the maximum shot size on the machine.

B: Run the screw to the maximum shot size, select "Set" to automatically set the maximum position voltage level.

C: Run the screw to bottom (0 cushion), select "Set" to automatically set the 0 position voltage level.

Enter the AI Velocity Module's Parameters

Maximum Velocity: `10.00` `in/sec.` ▽

Voltage at Maximum Velocity: `10.00` V

Voltage at 0 Velocity: `0.00` V

[Cancel]   [Save]

Injection Pressure Hydraulic Sensor Configuration

Hydraulic Machines require a Hydraulic Pressure sensor.
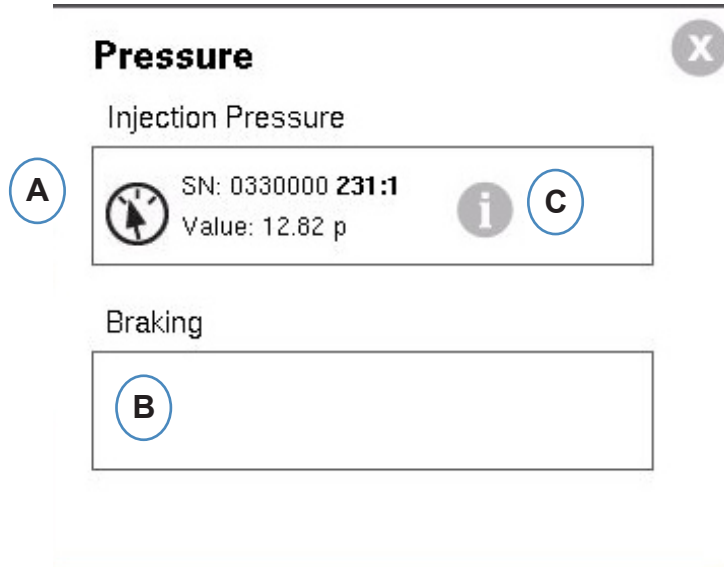
A: Drag the Hydraulic sensor from the Available Sensor List to the Injection Pressure Location.

B: If the Machine has the Dynamic Braking option, drag that sensor into the Braking Pressure Location.

C: Click on the "i" to enter the Intensification Ratio window.
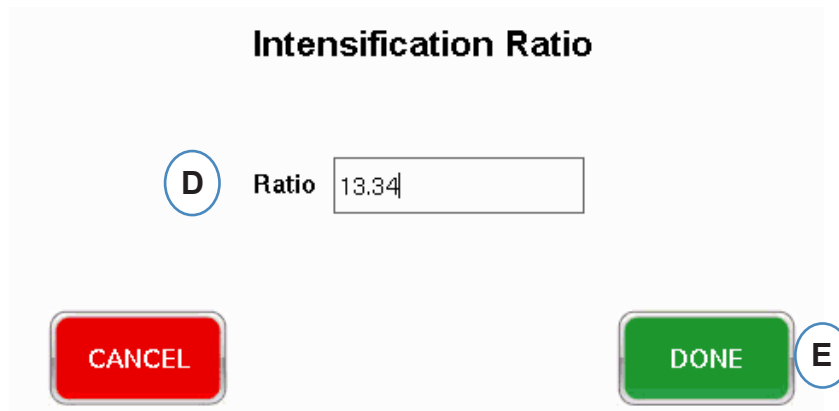
Injection Pressure Analog Configuration

Electric Machines Require an Analog Input Module to be wired to the Output for Injection Pressure from the Machine.

Pressure

Injection Pressure

A SN: 0330000 **231:1**
Value: 12.82 p **B**

Braking

A: Drag the Analog Input wired to the Injection Pressure Output to the Injection Pressure location.

B: Click on the "i" to get the scaling window.

Enter the AI Pressure Module's Parameters

Maximum Pressure: 30000 PSI **C**

D Voltage at maximum pressure: 10 V

E Voltage at 0 pressure: 0.0000 V

Cancel　　Save **F**

Sequence Module Configuration

Triggers or Machine Sequence signals are 24VDC on/off signals from the machines digital outputs. The *eDART®* uses these signals for timing. The sequence module will automatically assign itself to the Sequence signal box.

A: Click on the "i" to see the trigger lights and assign signals

Triggers tell the *eDART®* when to execute different functions like zeroing sensors, Starting Cycles, and calculating values, therefore, it is important that the triggers are labeled exactly what they are.

The required signals, Injection Forward, Screw Run and Mold Clamped are pre assigned to the sequence module and can't be changed.
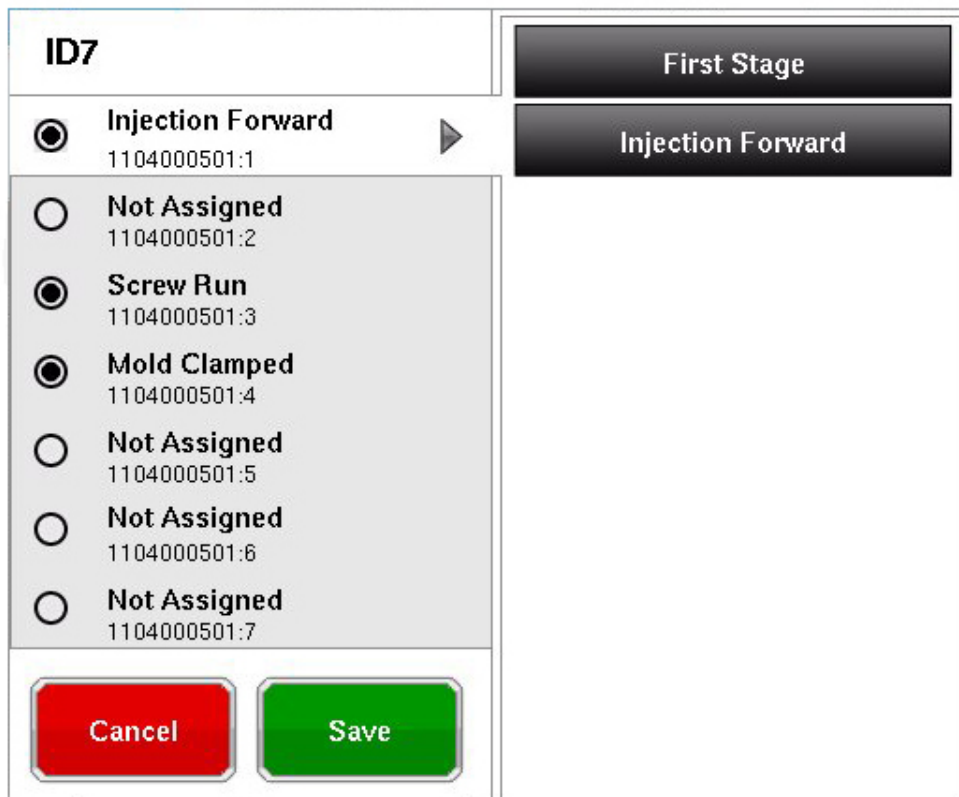
Triggers that are connected but not Pre-Assigned need to be labeled.

**B:** Click the terminal location to assign the trigger name.

C: Click on the correct label for the trigger connected to the terminal.

D: To unassign a previously selected trigger, click on the terminal and change it to "Not Assigned".

It is extremely important to label the triggers correctly. Leave them as "Not Assigned" if you are unsure.

Testing Inputs/Outputs

When all sensors have been assigned, and the "Next" Button is clicked, the *eDART®* will automatically take you to the Test Inputs Screen.
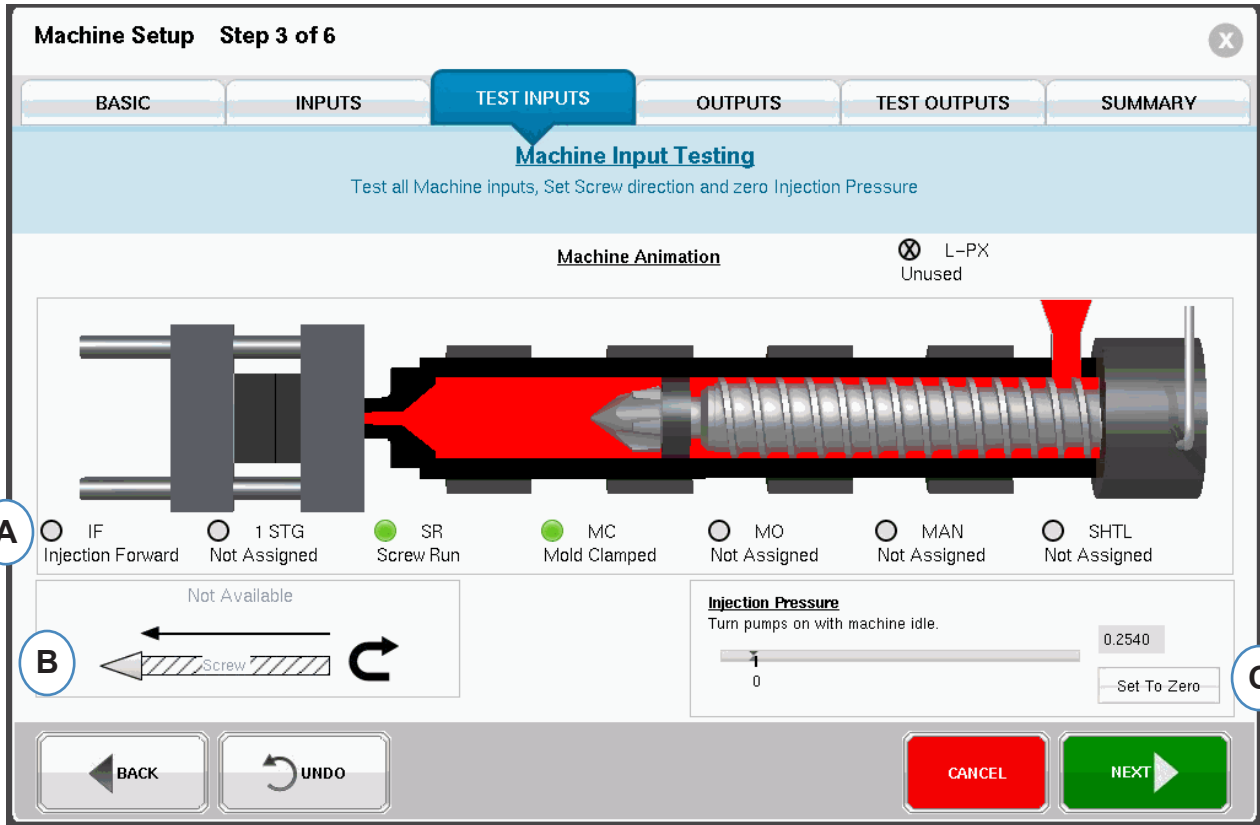
A: To verify triggers, watch the lights to make sure that the triggers come on and off at the correct times.

The Picture is an animation of your Machine and should move with the machine as a visual aid in Trigger assignment.

If the trigger light does not light up, label that input terminal not used or correct wiring to module.

If the trigger lights up at the wrong times, label that input terminal not used or correct wiring to module. You must go back to the Inputs page to makes changes.

B: Click on this button to set the direction of the screw. See Set Screw Direction for details.

C: Click this button to zero the injection pressure. See Zero Injection Pressure for details.
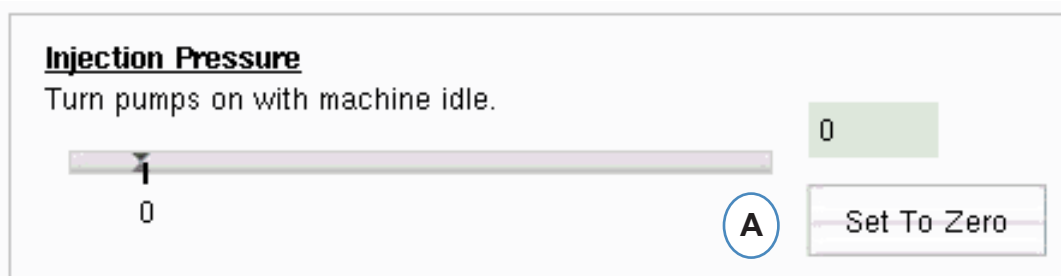
Set Screw Direction
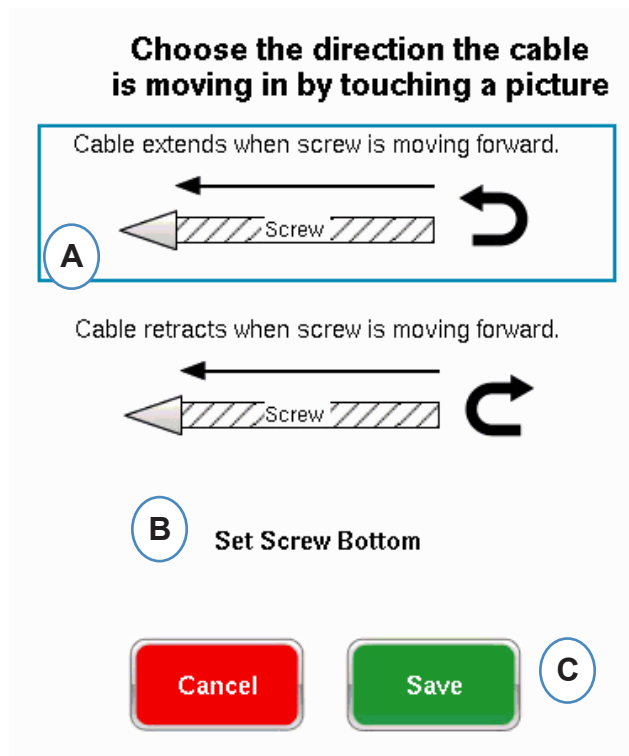
A: Select option that matches the stroke sensor cable direction.

B: Bottom the screw and select, to set the screw bottom postition.

Zero Injection Pressure

This needs to be completed while the machine is not injecting.

A: Select "Set To Zero" to set the Zero (0) while the machine is idle.

Automatic Trigger Testing

This window will appear after completing the Test Input page. If the triggers are incorrect during the cycle, an error message will appear once the job has started.
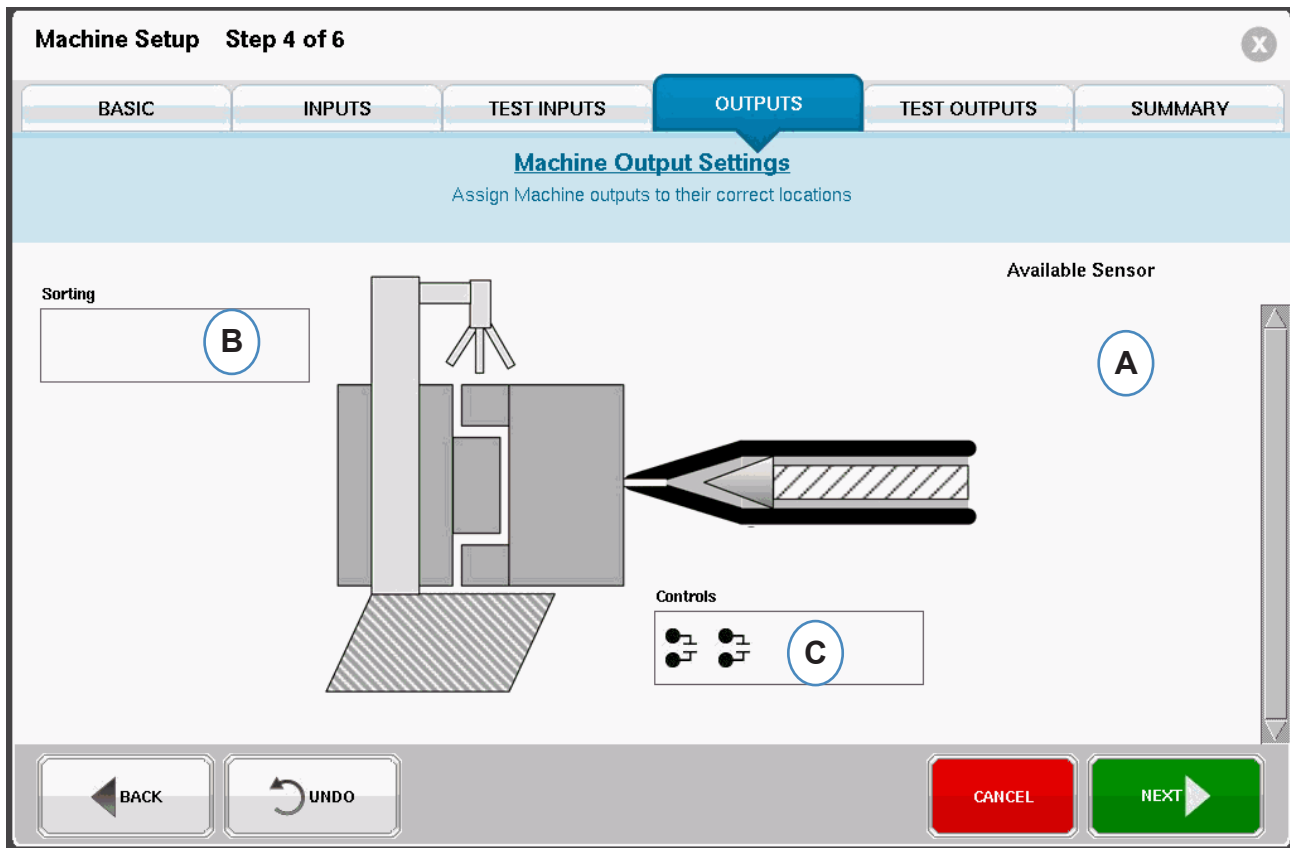

A: Click on the "This input is not used" box if the trigger is not working or incorrect.

B: Select "OK" to proceed without correcting the errors.

C: Select "Cancel" to return to the test inputs page to correct the errors.
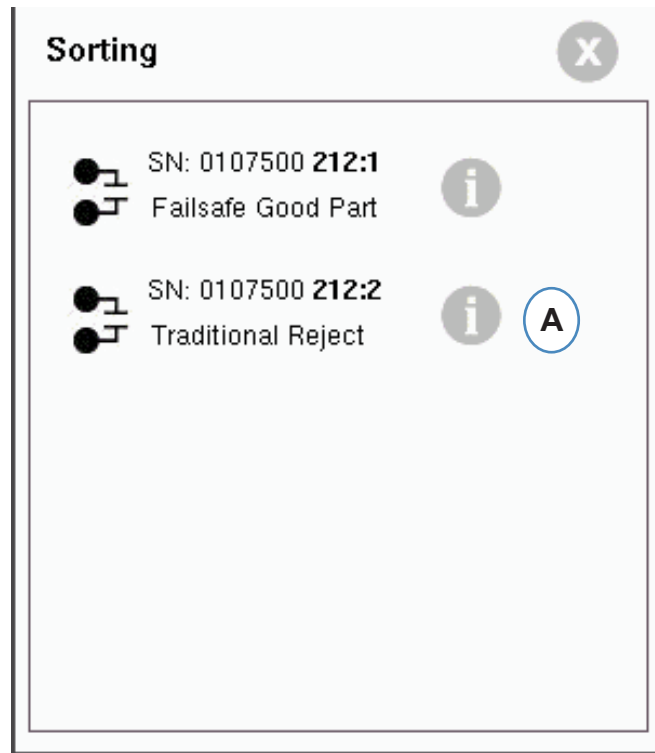
Configure Outputs

Use the *eDART®* Outputs page to assign the output modules wired to machine.

A: Available Sensor List - Drag Output Modules from the Available sensor list into the location where they are wired.

B: If a module is attached to the Robot or Part Diverter drop it into the Sorting box. See Sorting for details.

C: If a module is wired to V>P transfer of the machine drop it into the Controls box. See Control Velocity to Pressure Transfer for details.
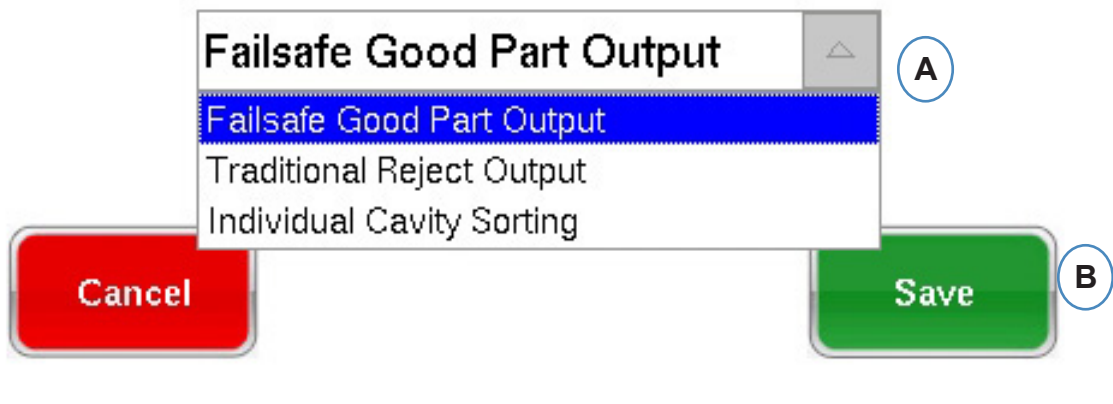
Sorting

When a Sensor from the Available Sensor list is held over the Sorting box, the window will open so that the sensors can be dropped into their positions.

A: Click on the "i" to configure the sorting output.

Sorting cont.

Shot Containment:

If the entire shot is to be segregated for inspection you will need one side of an OR2 module wired to Robot or Diverter. There will be only one OR2 module entry in the Sorting box. Click on the "i" and choose "Failsafe Good Part Output".

Individual Cavity Containment:

If individual cavities are to be segregated you will need one side of an OR2 Module for each cavity. Drag all of the OR2 entries into the Sorting box. Click the "i" and choose "Individual Cavity Sorting" for each module.
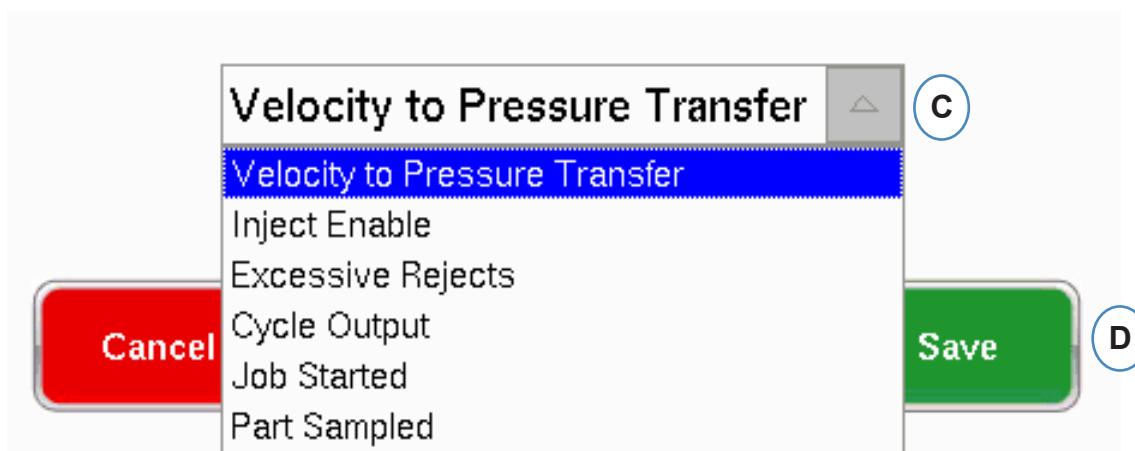
The cavity identification for each module will be set in the Mold setup screen.

Control Velocity to Pressure Transfer

When you hold a sensor over the Control box, the window will open so that all of the control sensors can be added to control list.
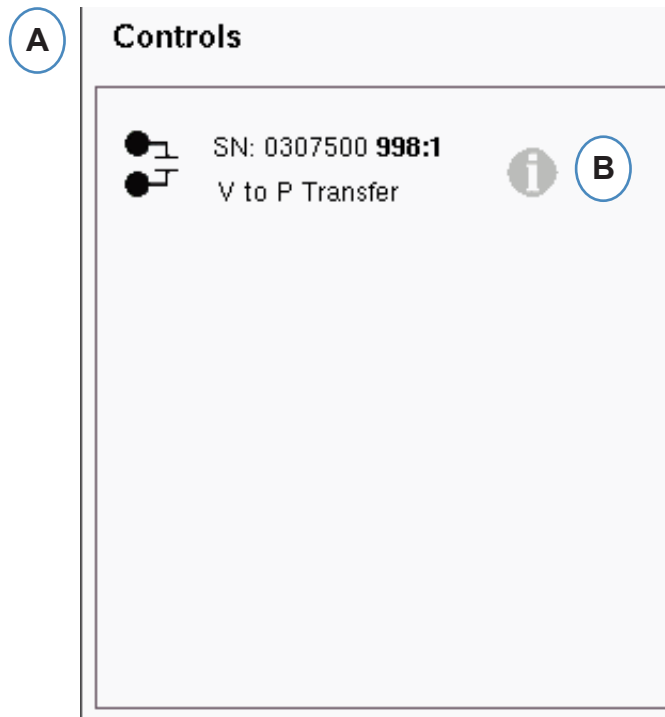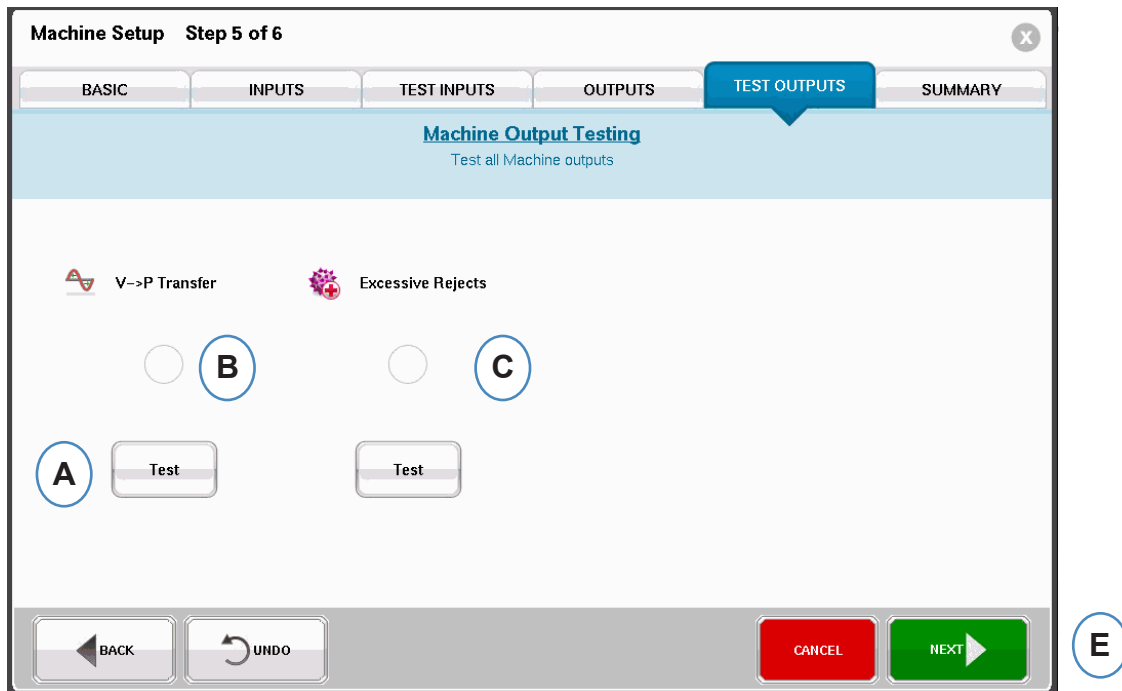

A: Drop all of the Modules wired to controls into the Controls box.

B: Click on the "i" button to set up the control output type for each module.

C: Choose the desired setting from the drop down.

Output Testing

Use the Test output page to insure that the outputs work as expected.
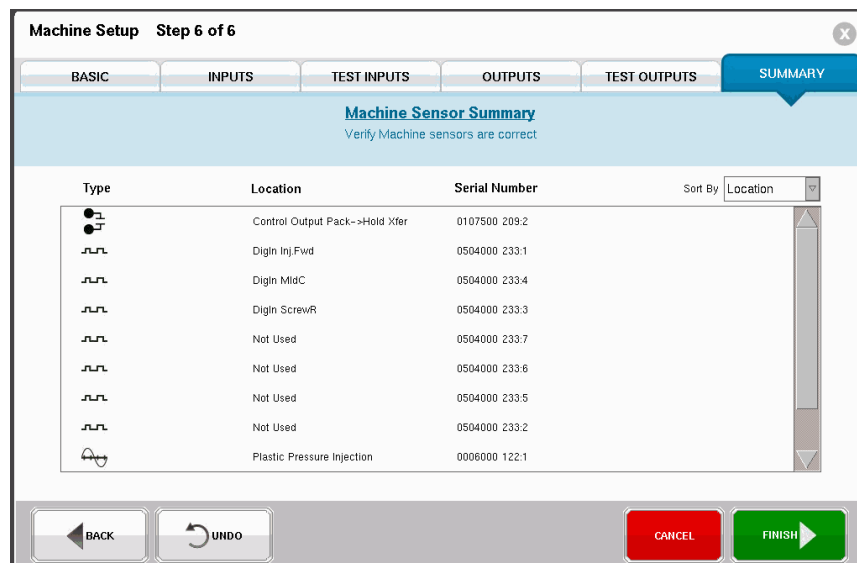
| BASIC | INPUTS | TEST INPUTS | OUTPUTS | TEST OUTPUTS | SUMMARY |

Machine Output Testing
Test all Machine outputs

V–>P Transfer   Excessive Rejects

B   **C**

A   Test   Test

BACK   UNDO   CANCEL   NEXT   **E**

A: Click on the Test button to test each output.

B: Check that the light turns green.

C: Check that the LED on the output module turns green. Check that the device alternates correctly on the machine, robot, etc.
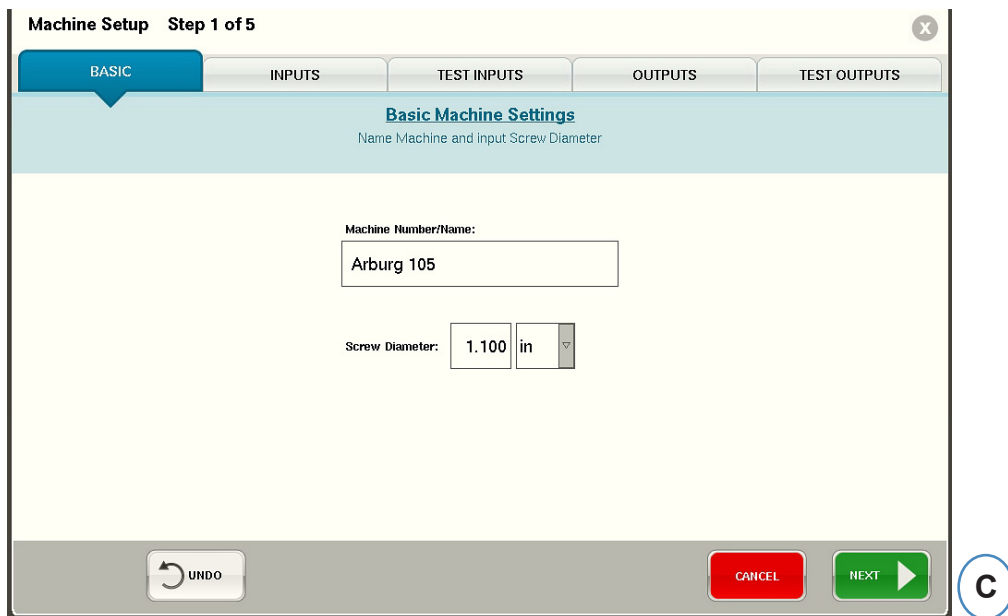
Summary Tab

This tab shows the type, location and serial number of all sensors relating to this machine, whether they are in use or not. Click 'Finish' to continue.

| BASIC | INPUTS | TEST INPUTS | OUTPUTS | TEST OUTPUTS | SUMMARY |

Machine Sensor Summary
Verify Machine sensors are correct

Type	Location	Serial Number	Sort By Location
	Control Output Pack–>Hold Xfer	0107500 209:2	
	DigIn Inj.Fwd	0504000 233:1	
	DigIn MidC	0504000 233:4	
	DigIn ScrewR	0504000 233:3	
	Not Used	0504000 233:7	
	Not Used	0504000 233:6	
	Not Used	0504000 233:5	
	Not Used	0504000 233:2	
	Plastic Pressure Injection	0006000 122:1	

BACK   UNDO   CANCEL   FINISH

Modify Existing Machine

A: Click on the "Machine" button.


B: Click on the arrow beside the Machine Name to get to the Machine Setup window.

Choose Pre-Existing Mold

When a Mold is created the *eDART®* will remember all of the Sensor Locations and Types. It is not necessary to set the Mold up again. Instead, just select it from the Mold Drop-down menu.

Lynx Mold Pressure Sensors are Mold Identifiers. Once they have been set up in a Mold file the *eDART®* will remember which Mold they are in and automatically select it from the Mold list. If they are moved to a different Mold you will need to choose the correct Mold from the Mold select drop-down menu or create a new mold if it does not yet exist.
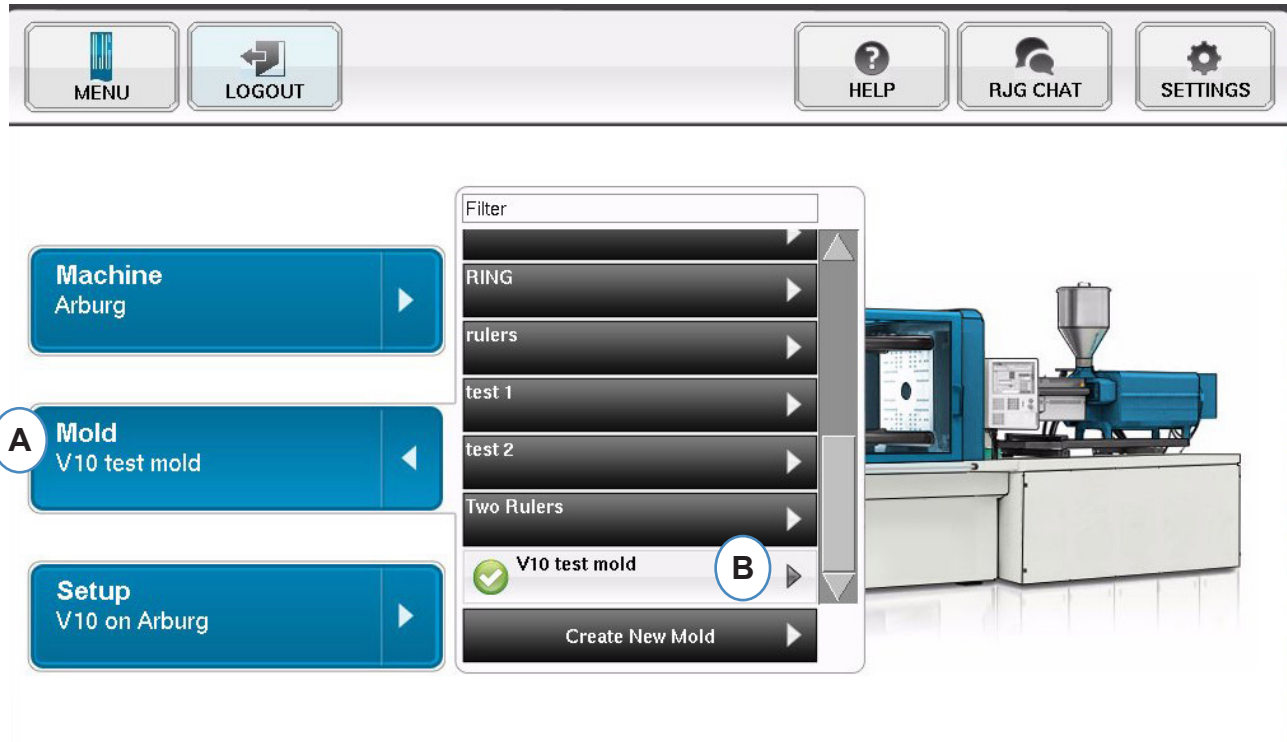
A: Click on the "Mold" Button.

B: Click on the correct Mold to Select.

Create New Mold

Do not use the "Create New Mold" button if the Mold has been set up previously. Instead select it from the drop-down menu.
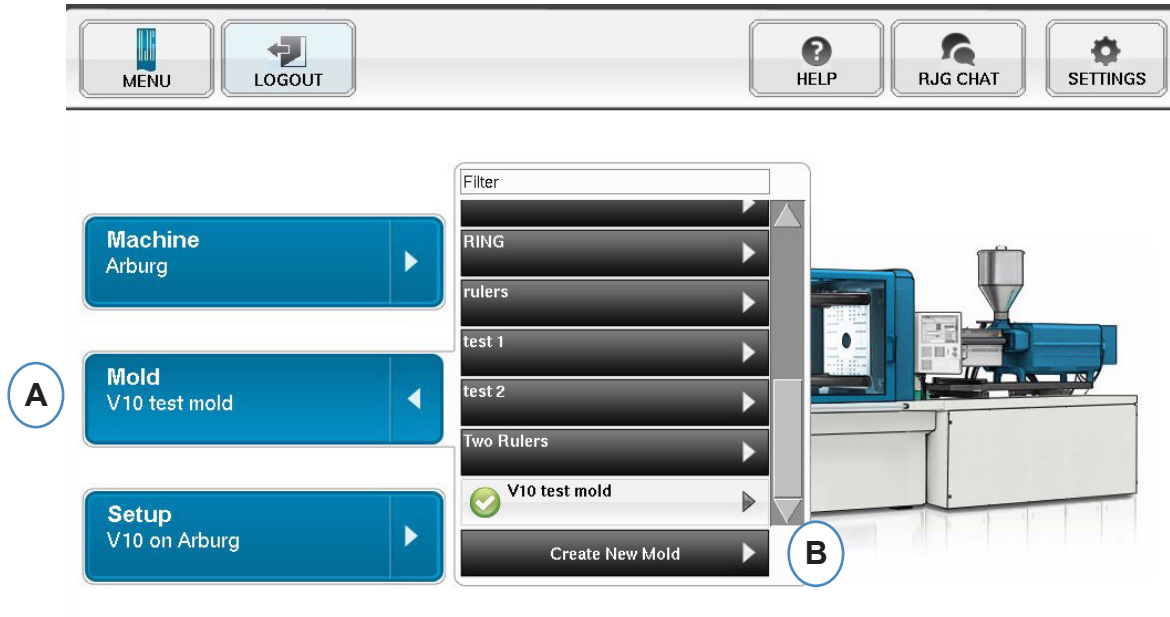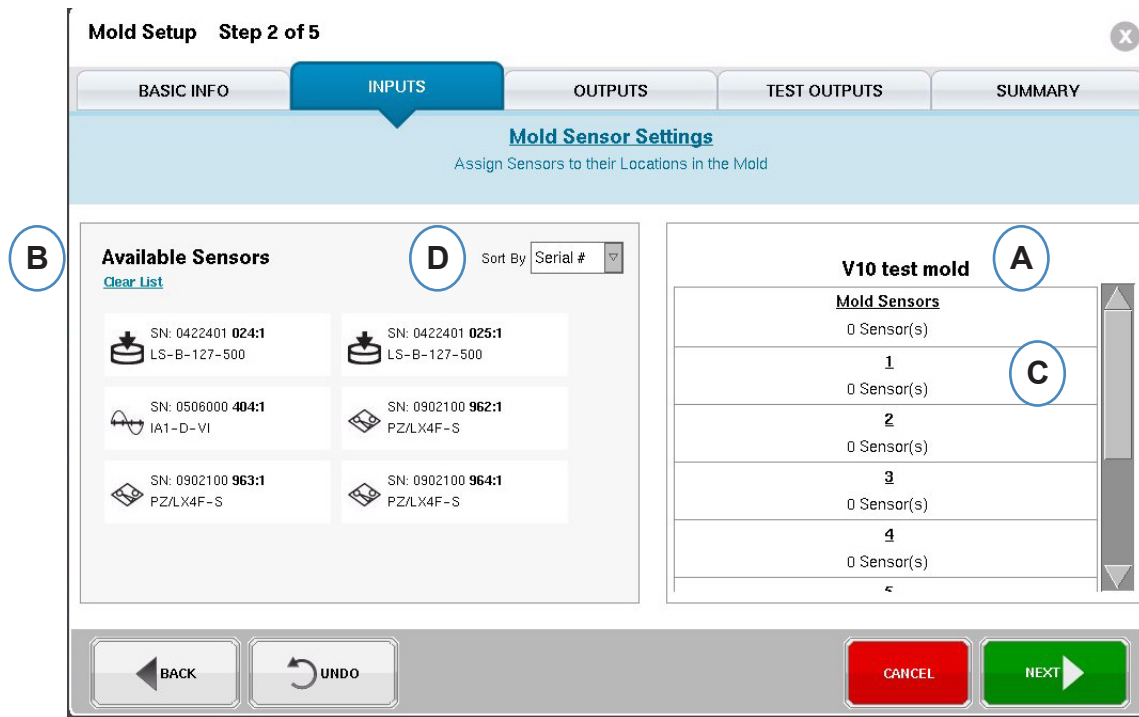
A: Click on the "Mold" Button to get the Mold Menu.

**B:**   Click on the "Create New Mold" Button.

When "Create New Mold" button is selected the Mold Setup window will appear.
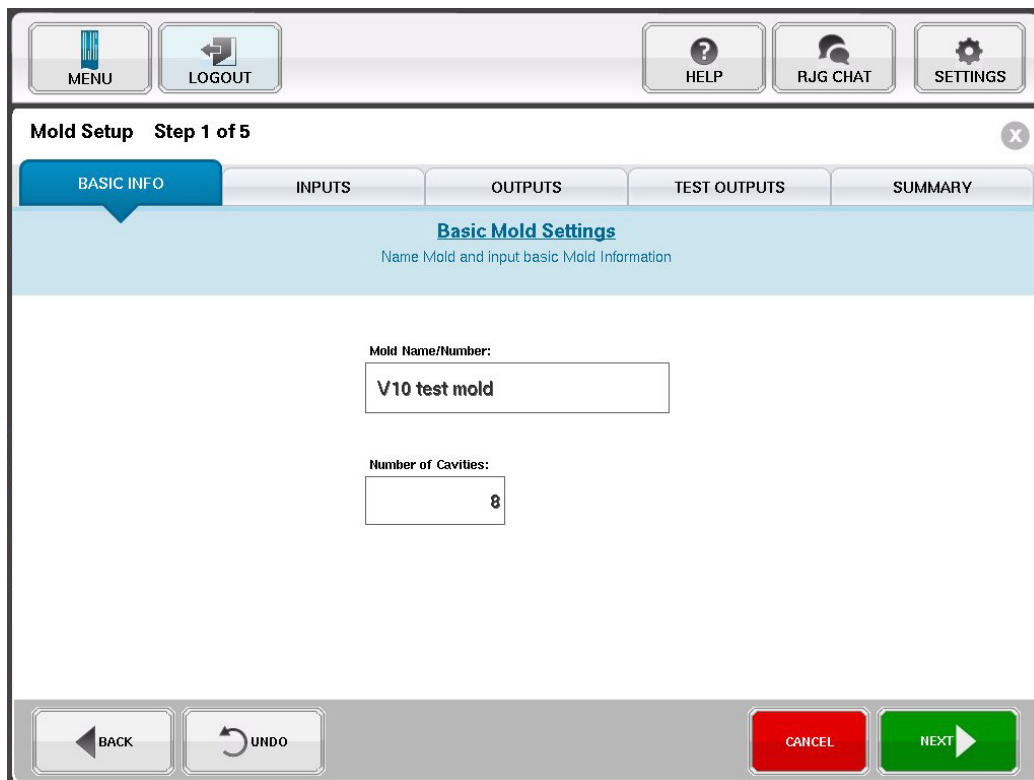
Sensor Assignment/Placement

A: The Mold Name portion of the display will reflect the number of cavities entered for the Mold.

B: Available Sensor List - Drag a sensor from the "Available Sensor" list on the left to the correct cavity in the Mold on the right side of the window.

C: When you place the sensor over the cavity, a window will appear for that Cavity only. Drop the sensor into the correct location within the cavity. See Cavity Location Sensor Placement for details.

D: Sort Sensors by either Serial number or Model number.
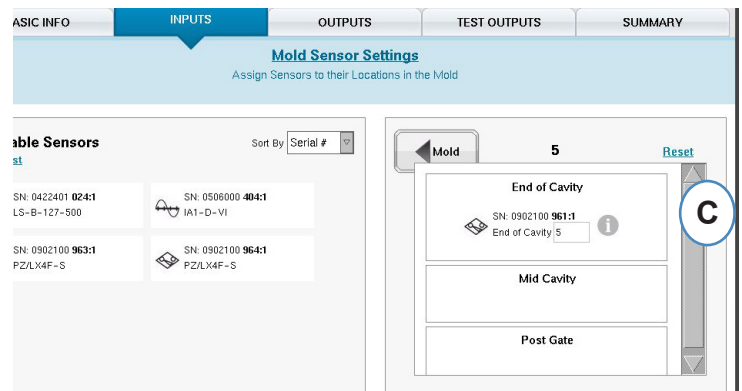
Cavity Location Sensor Placement

The Individual Cavity Window will appear when a sensor is held over a cavity in the mold window.
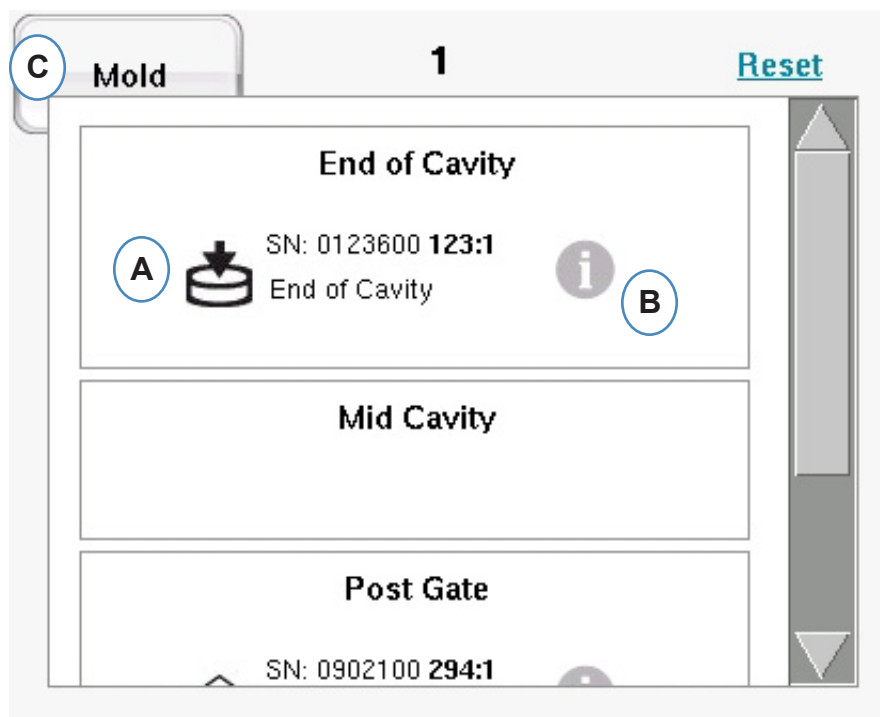
A: Drop the sensor into the correct Location within the individual cavity window.

Post Gate, End of Cavity, Mid Cavity - There may be several sensors in each Cavity.

B: Click on the "i" to display the "Mold Sensor Config" window. See "Mold Sensor Config" window for more details..

C: Click the Mold button to go back to all cavities.

Configuring Sensors in the Mold
Mold Sensor Config - Strain Gage

When the "i" is selected next to an indirect sensor a window will appear to allow for entry of pin size.

A: Choose to enter the Ejector Pin diameter.

B: Enter Ejector Pin diameter.

C: Choose to enter pin/blade area.

D: Enter pin/blade area.

E: If all pins are the same size, select this option.

Mold Sensor Config - Piezo - Indirect

a: Choose the piezo style from the drop down menu.

Mold Sensor Config - Piezo Flush Mount

Clicking on the "i" button for a sensor will start the sensor identification window. If you are using a sensor adapter instead of a Lynx Sensor you will need to identify what sensor is attached to the adapter.

Mold Sensor Config

(A) Model #: 6157B

CANCEL   DONE (B)

Piezo Sensor Adapter

Mold Sensor Config

(A) Model #: 6157B

Sensor Full Scale: 2000.0000   bar

Sensor Sensitivity: 9.4000   pC/bar

☐ Use this value as default

CANCEL   DONE (B)

Locate Sensors

If placement of sensors within the mold and cavities is unknown, the "Sensor assignment" tab can help locate them. When the mold is initially set up the "Available Sensor" list will have a "Clear List" choice to aid you.
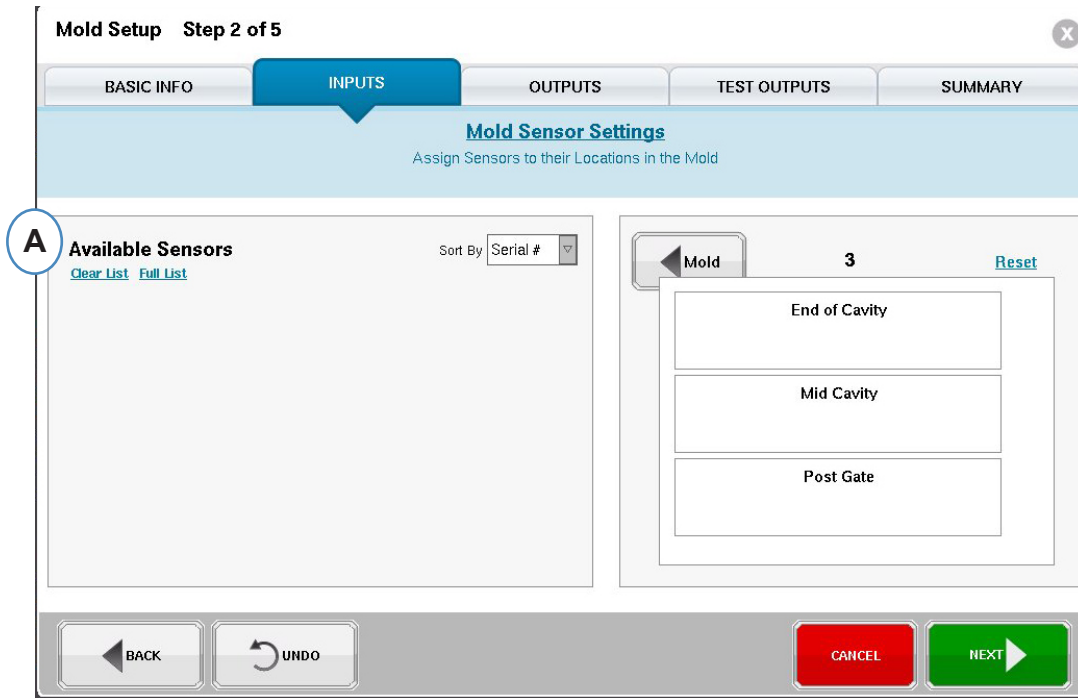
A: Click on "Clear List" to remove all sensors from the "Available Sensor" list.

Apply Pressure to each sensor; or pin.

Indirect Sensors:
1. Open mold
2. Extend ejector pins
3. Push on pins one at a time
4. Note the order that pins were pushed

Direct Sensors
1. Apply pressure to sensors
2. Note the order that sensors were loaded
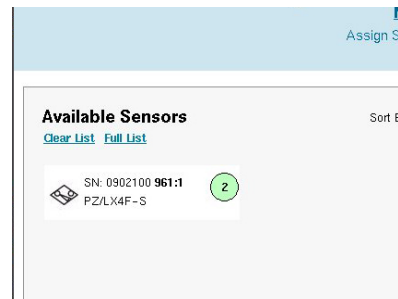
Locate Sensors cont.

Sensors will appear in the "Available Sensor" list when pressure is applied to them.

C: Watch "Available Sensor" list for sensors to appear.

D: Sensors will highlight and be numbered in the order in which they were pressed.

**E:** Drag sensors into their correct cavity and location.

Configuration for Individual Cavity Part Containment

Individual cavity containment requires one relay from an OR2-D module to be assigned to each cavity. In the Machine setup, each relay should have been labeled as "Individual Cavity Good Part Sorting". Any relay labeled as such will appear in the "Available Sensor" list.

It is helpful if maintenance notes the serial numbers wired to the robot for each cavity.
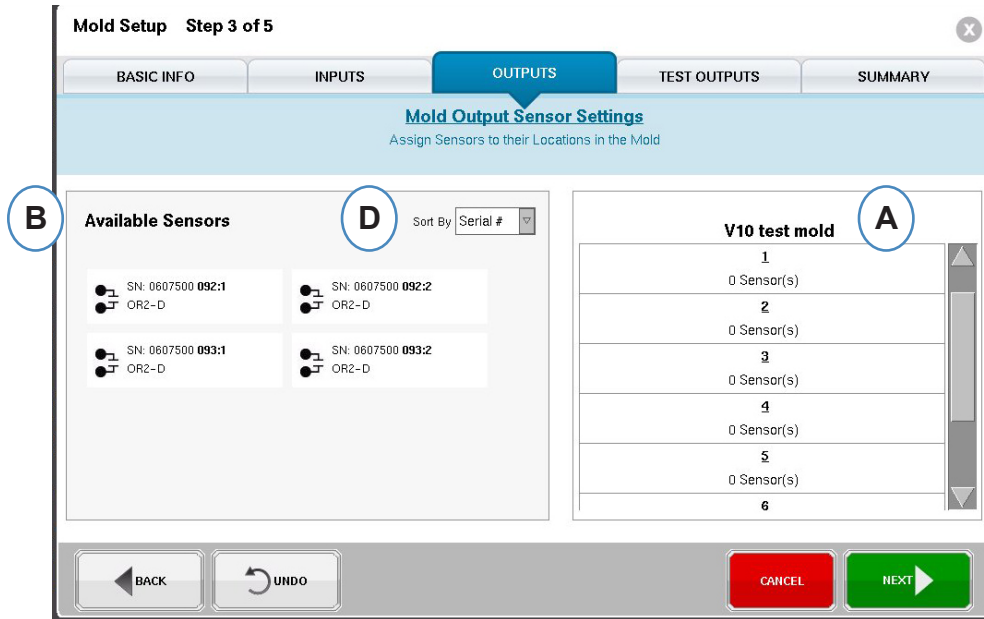
A: The Mold Name portion of the display will reflect the number of cavities entered for the mold.

B: Available Sensor List - Drag a sensor from the "Available Sensor" list on the left to the correct cavity in the Mold on the right side of the window.

C: When you place the sensor over the cavity a window will appear for that Cavity only. Drop the sensor into the correct location within the cavity. See Cavity Location Sensor Placement for details.
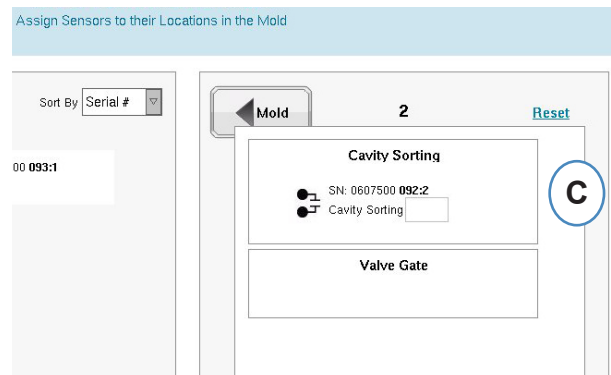
D: Sort Sensors by either Serial number or Model number.
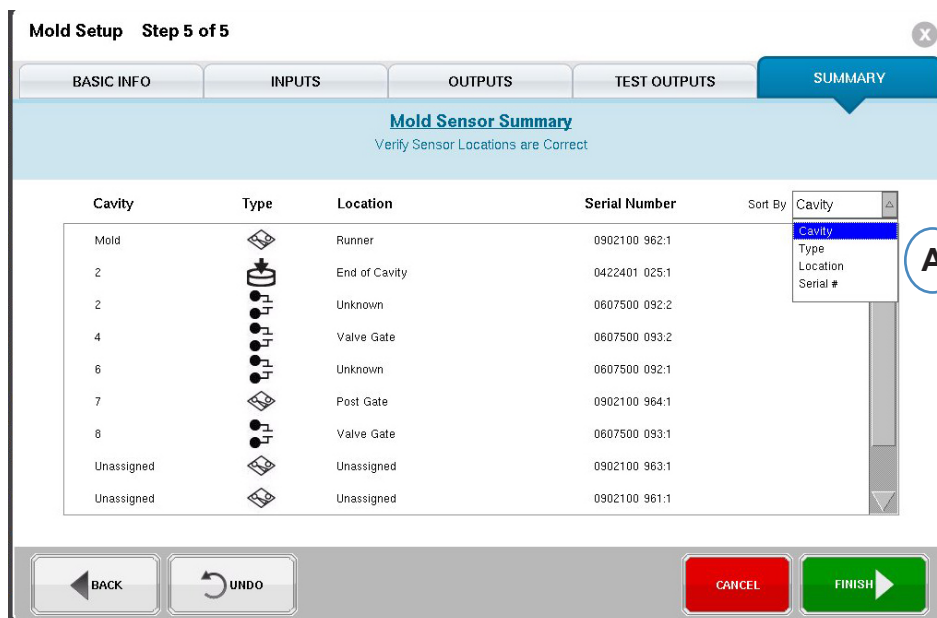
Mold Setup - Test Outputs
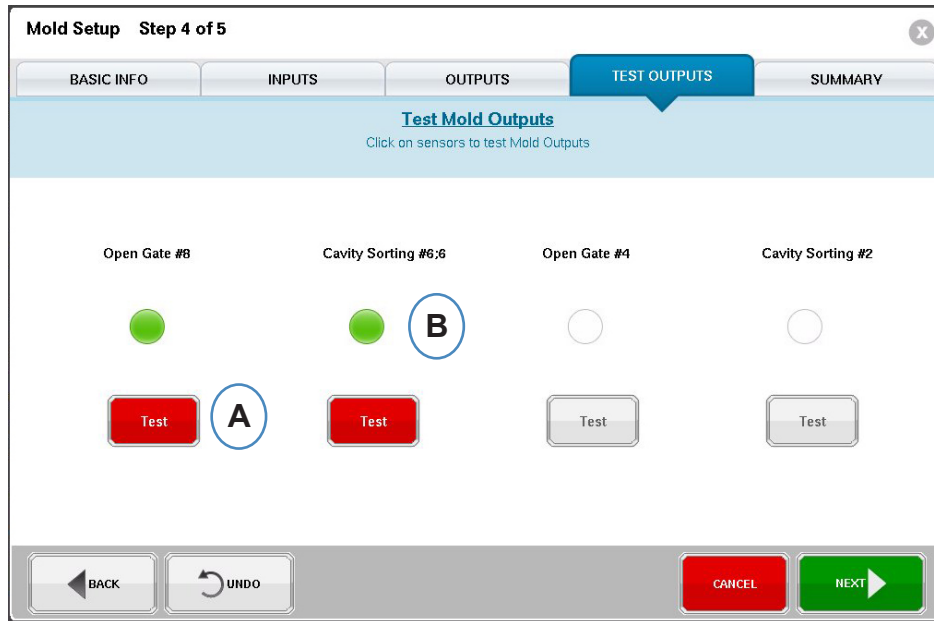
A: Click on the Test button to test each output.

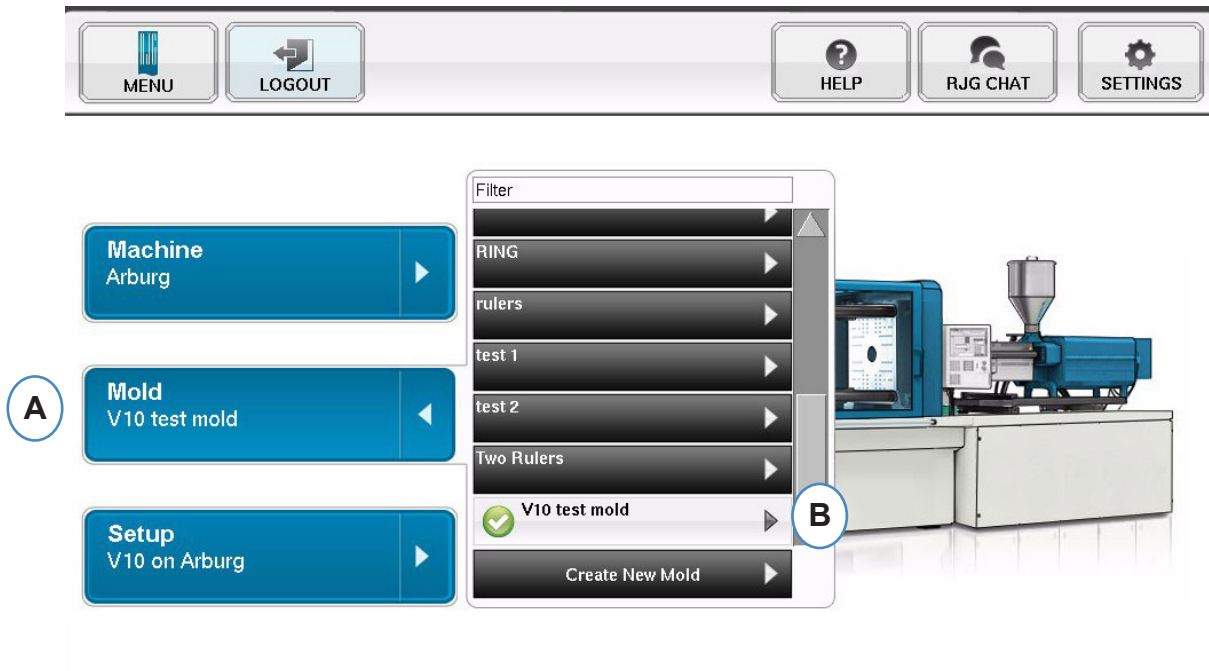**B:** If the test is successful the light associated with that output turns green.

Mold Setup - Summary

At a glance view of all sensors, their placement in the mold and their serial numbers.

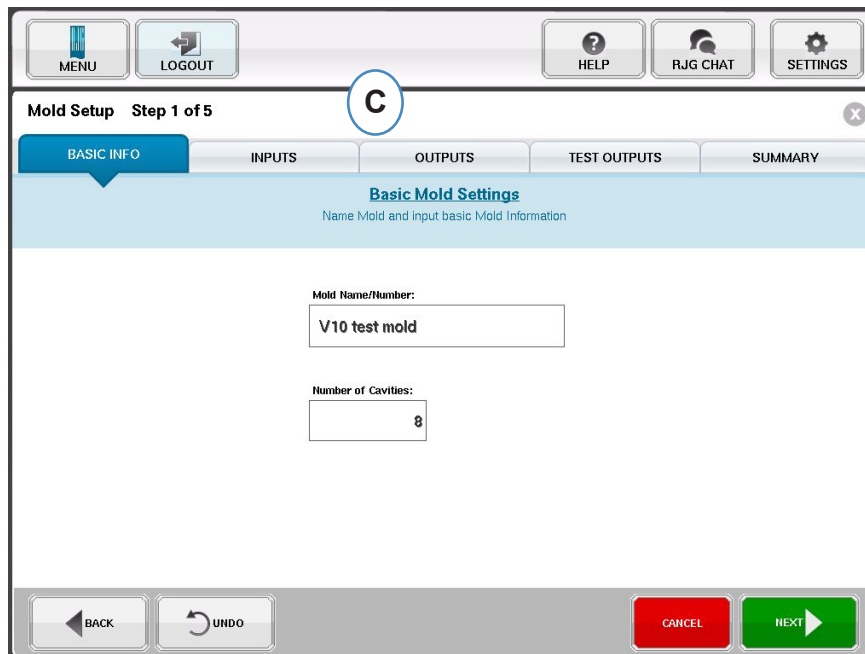**A:** Sort by Cavity, Type, Location or Serial Number.

Modify Existing Mold

A: To modify an existing mold, click on the "Mold" button.

B: Click on the arrow next to the Mold that needs to be edited.

C: Go to the appropriate tab or field to make the required edits. Click "Next" until the last screen is reached. Click 'Finish' to continue.

Setup Process Overview

Setup

Use this to create a new setup or if something has changed in a saved process that will affect alarm settings or the timing of the part segregation device. Saving a setup for the new process allows you to get back to the old process at a later time if necessary. (Refer to the Process Setup Manual for more details)
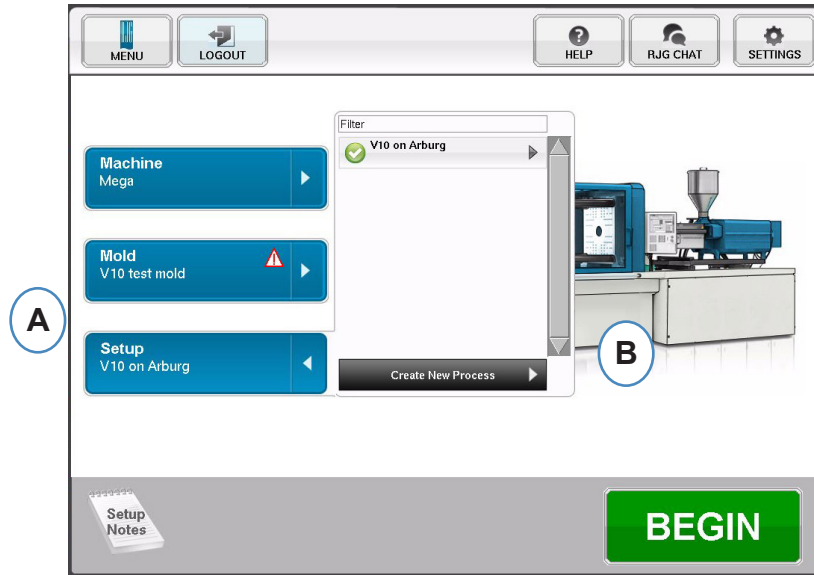
A: Click on the "Setup" button from the Home Page of the *eDART®.*

B: Click on the "Create New Process Button".

Basic Setup
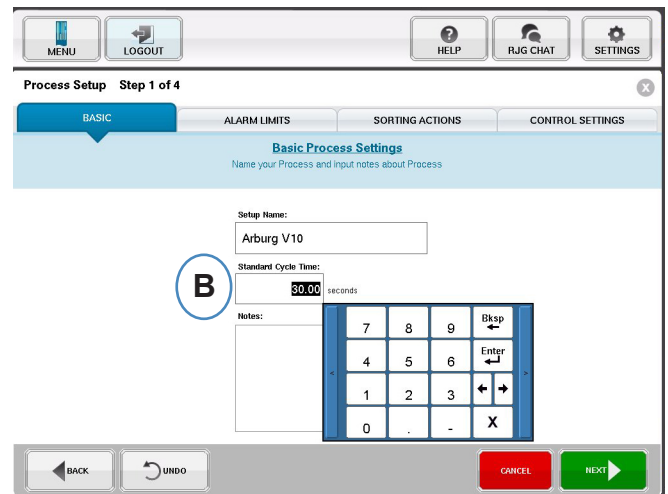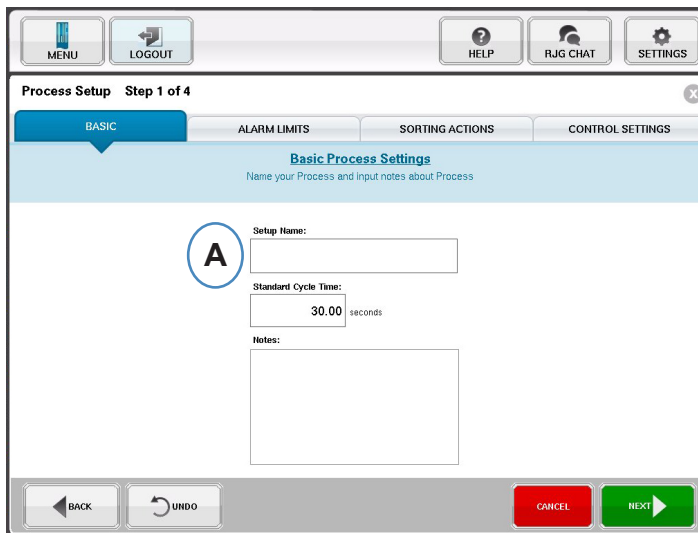
When "Create New Process" is selected, the "Basic" process setup screen will appear.

**A:** Enter the Process Name.

B: Enter the Standard Cycle Time for this process

Alarm Limits

Click on the "Next" button to go to the "Alarm Limits" tab. (Refer to the Process Setup Manual for more details)

This configuration will include the addition of Process Alarms/Warnings and Part Diverter/Robot Signal Controls.

When a process alarm or warning is added, the *eDART®* will display both a low and high alarm. These alarm levels can be set either automatically or manually based on actual part characteristics.
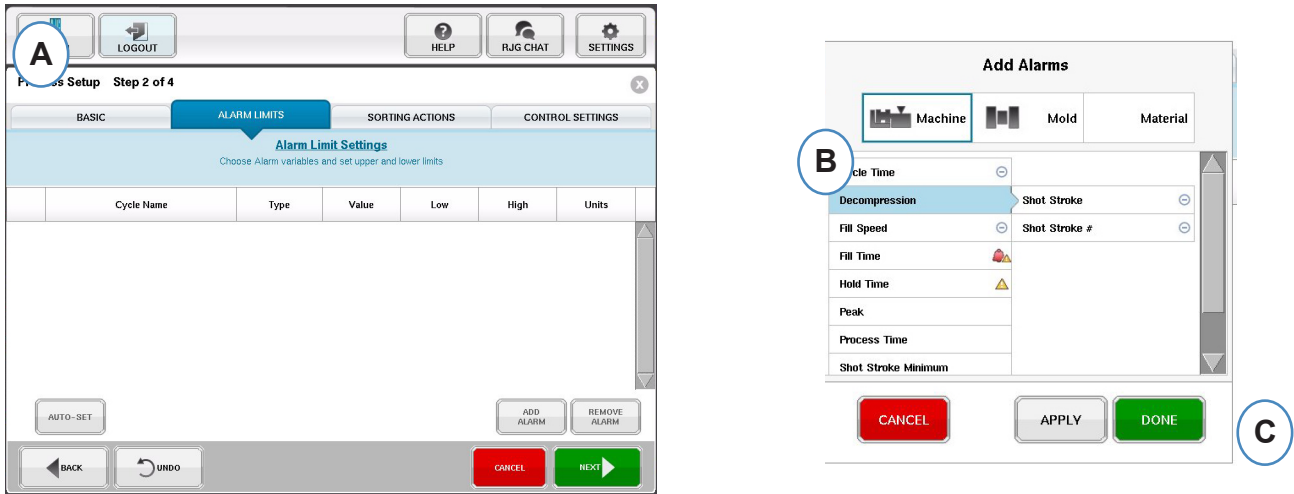
A: Click on the "Add Alarm" Button. When "Add Alarm" Button is selected the *eDART®* will display the list of available alarms.

B: Choose the positions you wish to monitor or alarm

C: Click "Done" to apply Warnings and Alarms when complete

Sorting Actions

Click the "Next" button to display the "Sorting Actions" Window. This window will allow for input on how to treat the sorting output signal to insure the parts reach their proper destination. (Refer to the Process Setup Manual for more details)

A: Check this box to hold the part diverter in one position until there is a change in the alarm state.

B: Check this box and enter the amount of time for the contact to be held closed when a good part signal is generated.

C: To use the "Reject After Down" feature, check this box and enter number of parts to be rejected after the Machine has been down.

D: To use the "Diverter Delay" feature, check this box and enter the number of cycles that you would like to delay the output. Use this feature for conveyers that have many parts on it before the diverter device or over-mold processes that have alarms set on the 1st shot.

Control Settings

This page allows the user to configure how alarms are calculated. It also contains the settings for additional control output configurations. This page allows for the modification of Integration limits and for configuration so that you can see a temperature drop instead of temperature rise in LSR or other thermo-set materials. (Refer to the Process Setup Manual for more details)
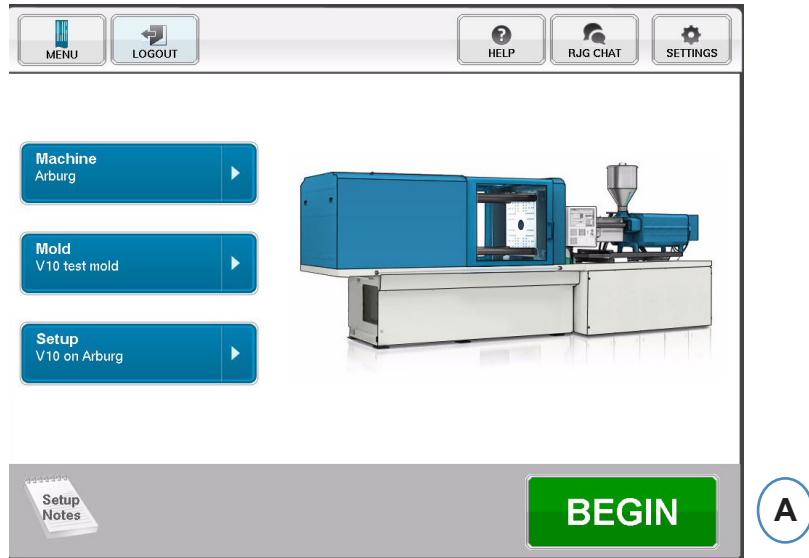

A: Click here for more control options.

B: Click on "Less" to hide them.

C: Click on "Finish" to complete the process setup and go back to the main window.

Start Job

Once you have set up the machine, the mold, and the process as seen in the previous pages, you are ready to start your job.

A: To Start the process, click on the "Begin" button at the bottom of the screen.

Job Overview

At the top of the Overview page are four 'buttons'. These allow you to navigate between the screens. You can click on each button or use the arrows to go back and forth as well.
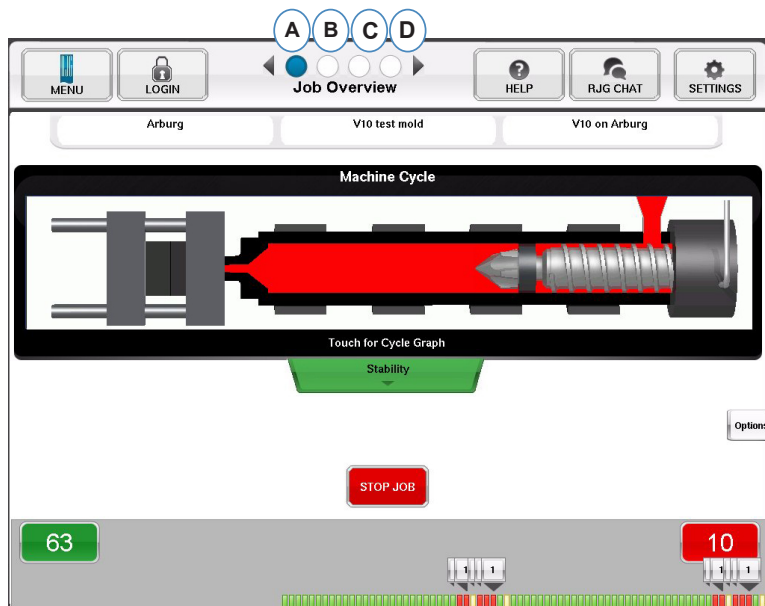
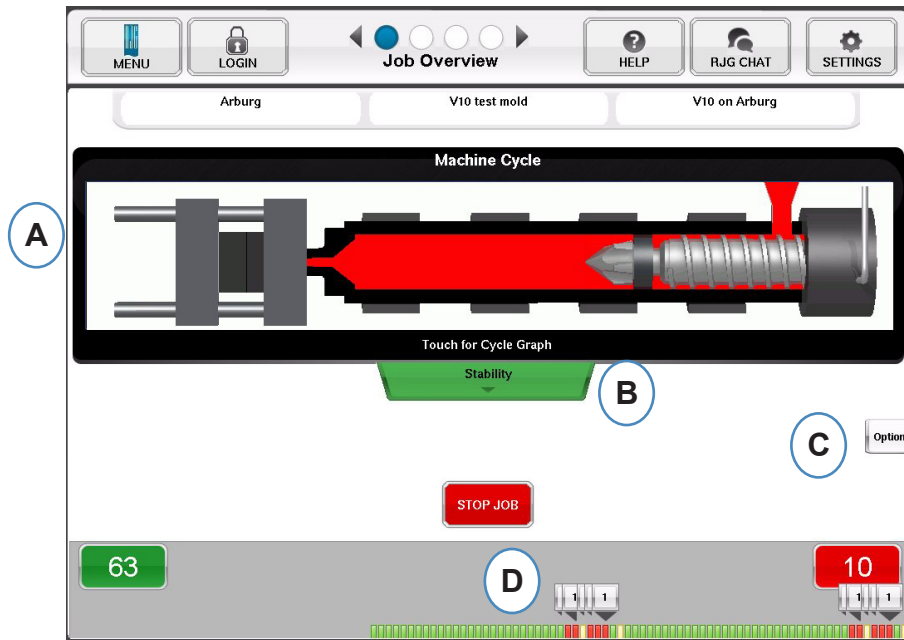**A:** Job Overview: At a glance basic information

B: Cycle and Summary Graphs

C: Job Audit page
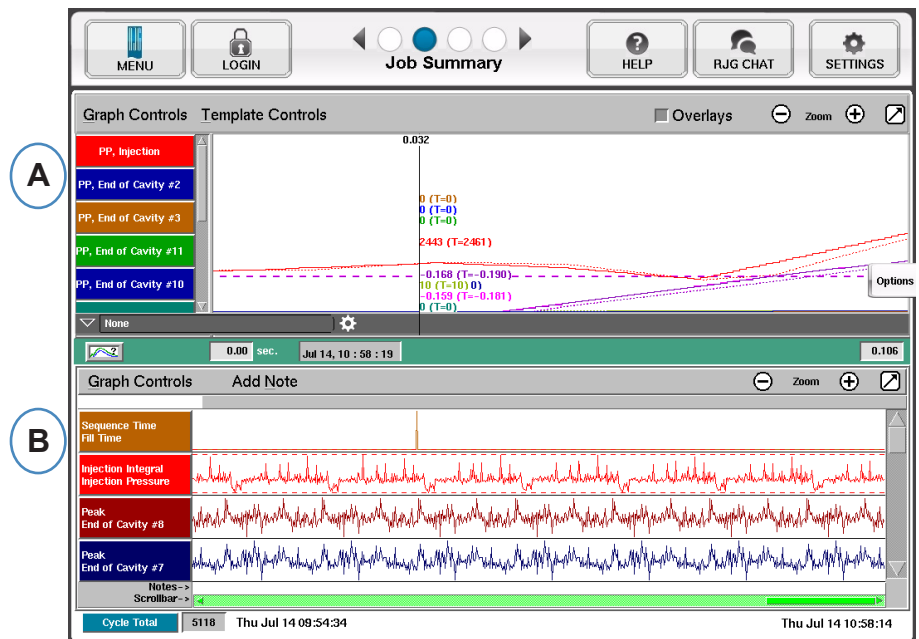
D: Diagnostics page

Job Overview, continued

On this screen you will see:

A: Machine Status

B: Machine, Material and Mold Match status indicator

C: Software Tools and Options

D: Good / Bad Part Counts and 100 shot history
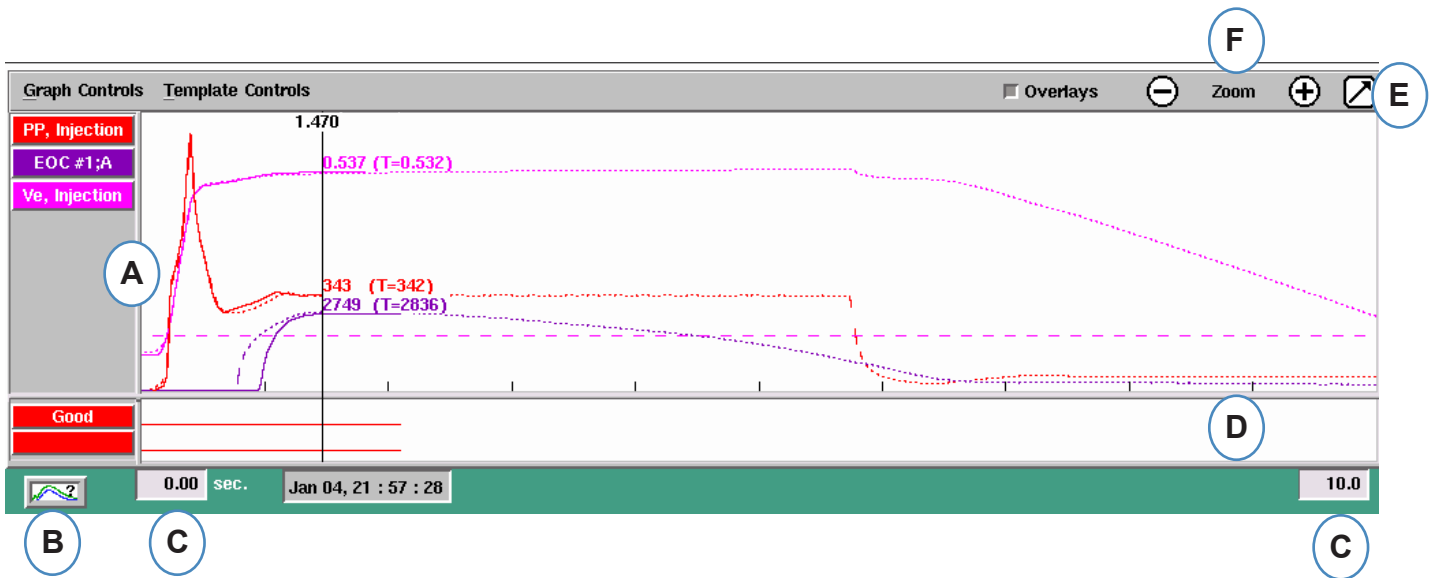
Cycle and Summary Graph View

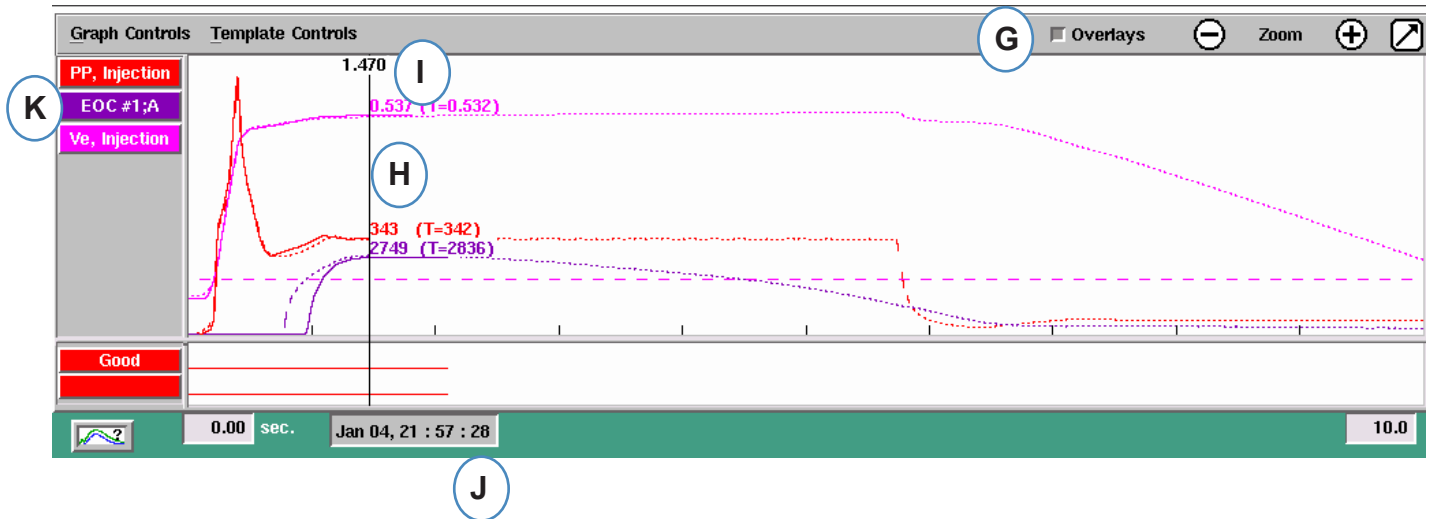**A:** Cycle Graph

B: Summary Graph

Cycle Graph

The Cycle Graph is where the real time data is displayed visually. All active sensors will be available to view in the graphical real time form.


A: Main Graph Area. All real time graphs will be displayed in this area.

B: Curve Help Screen. This screen shows sample curves and gives descriptions of important features of each curve.

C: Time span visible on the graph. These values can be changed to show any portion of the graph in detail.

D: Digital input-output graph area. Any on/off signals can be displayed in this portion of the graph. These signals would include triggers, control outputs, and sorting outputs.

E: Click this button to maximize or minimize the graph.

F: Use the plus and minus signs to zoom in and out. The graph will always start from 0 seconds as you zoom.

Cycle Graph cont.

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G: Click this button to overlay all future cycles on the display.

H: Cursor. The cursor can be placed on the graph to view values for curves at specific times.

I: Time into the cycle will be displayed at the top of the cursor.

J: Time Date Stamp for the present shot is displayed here. All shots are differentiated with a time date stamp.

K: Each Curve displayed on the Cycle Graph will have a Curve Identification button. The Curve name will be displayed on the button and will be the color of the curve.

# Graph Control Menu Auto Scale Curves
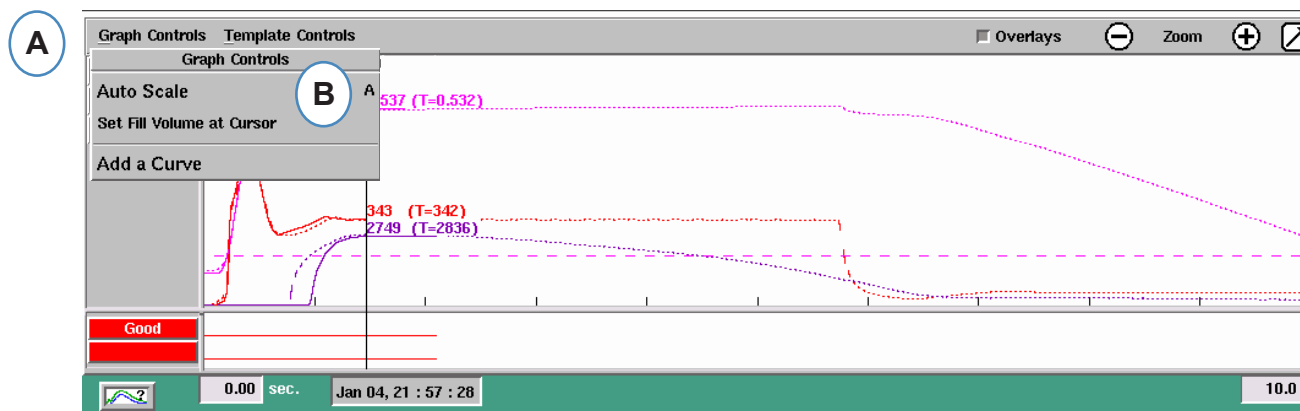
A: Click on the "Graph Controls" Menu.

B: Click on "Auto Scale" from the menu. The curves will automatically scale fit the screen.

Set Fill Volume at Cursor

The *eDART®* uses the area under the fill portion of the Injection Curve as an Effective Viscosity Measurement as the area varies directly with variation in viscosity. This value is correct only when calculated during the dynamic fill portion of the cycle. To insure that this is calculated at an appropriate place, the volume at transfer needs to be entered into the *eDART®.*
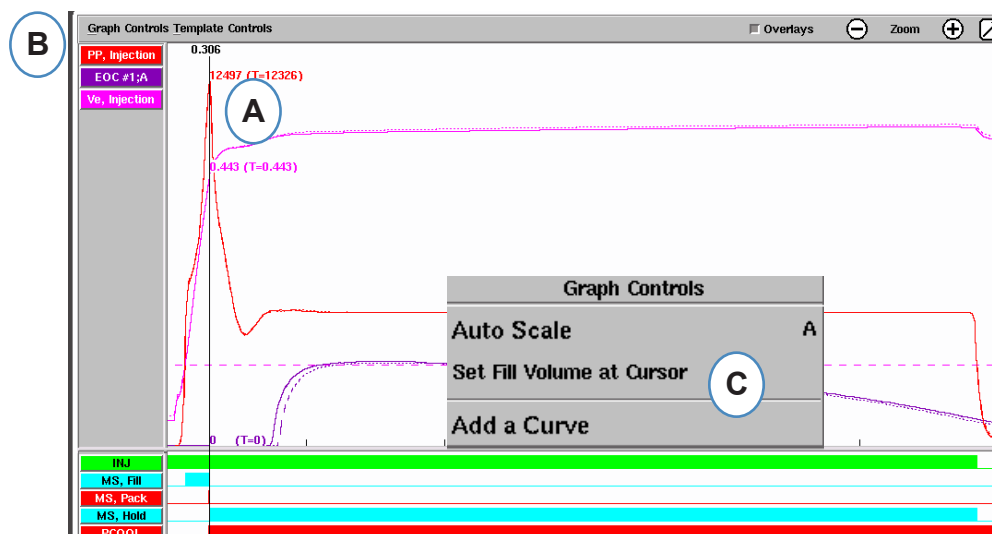
A: Place the Cursor at transfer on the Cycle Graph.

B: Click on the "Graph Controls" Menu.

C: Click on "Set Fill Volume at Cursor". The *eDART®* will use the volume measurement at that point as an ending point for the Effective Viscosity Measurements.

Cycle Graph Values

A: To see numerical values for curves on the Cycle Graph, click your curser on Summary Data Table, select the settings gear, and check the boxes for the values you wish to see, and click Apply.

B: When 4 or more sensors are present, a bar graph can been also be obtained by clicking Summary Bar Chart to veiw the desired curve.

Audit Log

A: Sort by Date, Activity or User to see what changes have been made over a period of time, and who made them.

Diagnostics

	Serial # ▲	Attached to	Sensor Type	Location	Status
🟢			Diagnostic Info	Port 1	Ok
🟢			Diagnostic Info	Port 2	Ok
⚠️	0123600123:1	Mold	Ejector Pin Force	End of Cavity #1;A	Valid
⚠️	0407500037:1	Machine	Control Output	V–>P Transfer	Valid
🟢	0407500037:2	Machine	Sorting Output	Reject Control	Valid
🟢	0460000136:1	Machine	Stroke	Injection	Valid
🟢	0460000136:2	Machine	Velocity	Injection	Valid
⚠️	0504000261:1	Machine	Seq. Module Input	Injection Forward	Valid
⚠️	0504000261:3	Machine	Seq. Module Input	Screw Run	Valid
⚠️	0504000261:4	Machine	Seq. Module Input	Mold Clamped	Valid

A: Click on the arrow or the fourth dot to get to the diagnostic page.

B: Click on the triangle to display information about sensor status.

C: Click on the "View Raw Data" button to display more detailed information about the sensor.