



Getting Started with the *eDART*[®] Software

This section provides detailed information about the *eDART*[®] software component, installation, configuration, and the software's interaction with the *eDART* System.

In This Chapter:

- Working with *eDART* Software
- Creating Job Setups
- Configuring Sensor Locations
- Setting the Machine Size
- Setting Ejector Pin Sizes
- Adjusting the Injection Pressure
- Checking Sequencing
- Checking Sensors
- Working with Scale Graphs

Working with eDART Software

It is important to know the basic functions that apply to eDART software objects. They will be familiar, as they are consistent with other software programs. Table 1 shows commonly-used shortcut keys, objects and their functions.

The tool bar that appears at the bottom of the eDART software screen displays an icon for each program tool that is currently running. To work with the individual tools, click on the icon. To display the full tool name, direct the mouse pointer over the button.

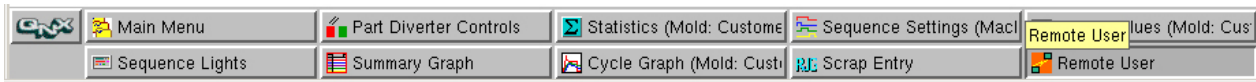


Figure 1: eDART example tool bar

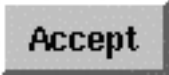


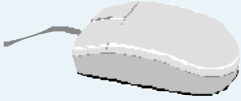



Object	Function
	Buttons - Can be a raised shape, a square with rounded corners, or a round icon. When you click the left mouse button, the software activates the function named on the button.
	Drop Down Menus - Click on the down arrow, on the right side in this box to display a list of items or options. You can scroll the list to choose an item from the list.
	Help - To get help with an object or function with the eDART software, click on the question mark in the upper right corner of each tool. you can also get details about that object if you click on an object within that tool.
	Right Mouse Clicks - Use right mouse clicks with the cursor over a part of the screen to get controls for that feature.
	Dividers - When you position the mouse over a divider, it shows a small double arrow. Click on and drag the divider to expand or contract a divided pane on a tool. This is useful for setting title bar sizes on graphs.
	Column Widths - You can change the column widths of lists by sliding dividers between each header field.
	Sort Lists - You can sort lists by clicking on the header for the desired sort field (reversing order each time).

Table 1: eDART software object examples and their functions

Creating a Job Setup

When you first access the eDART software, the Job Setup tool appears. Within this box you will identify locations for the data you will store for this job. This will save you time when you restart the job, as you will not have to repeat the steps each time.

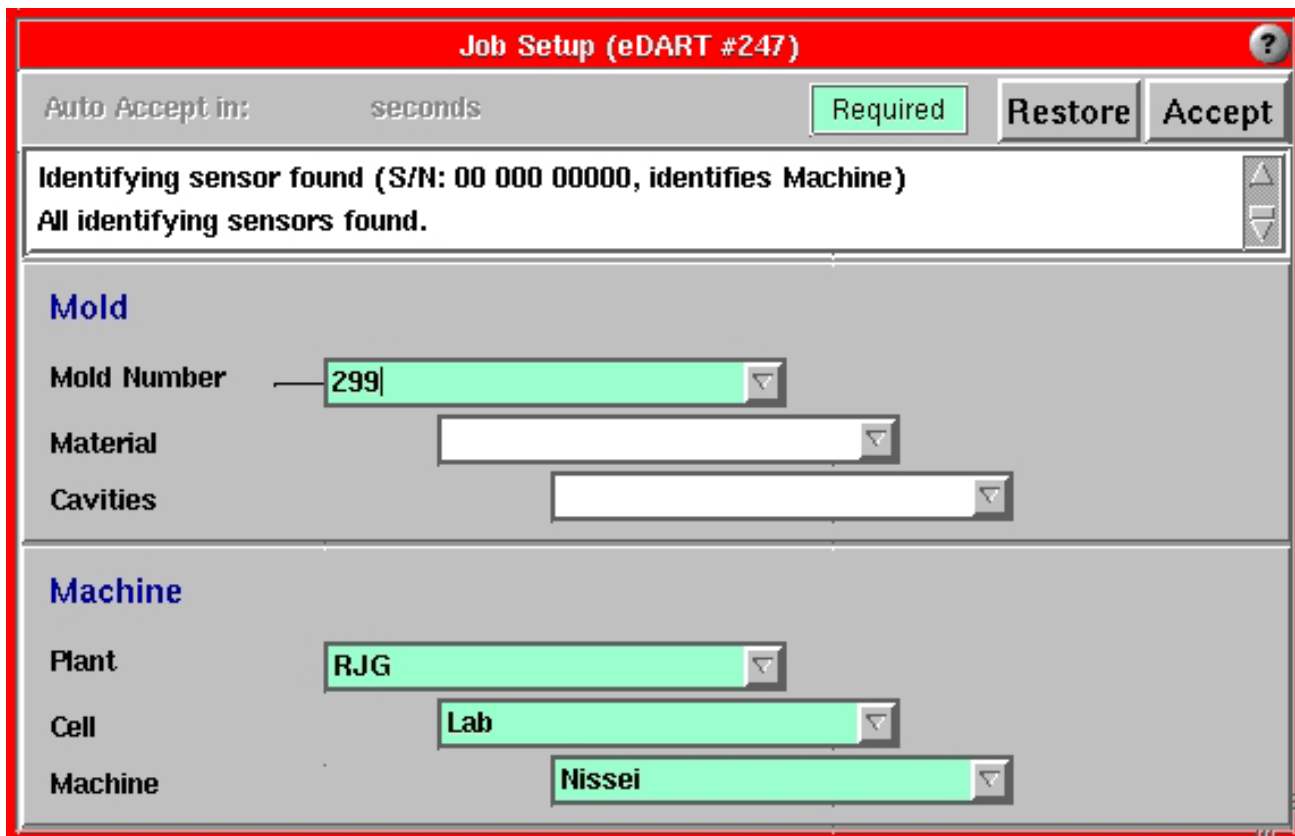


Figure 2: eDART Job Setup tool

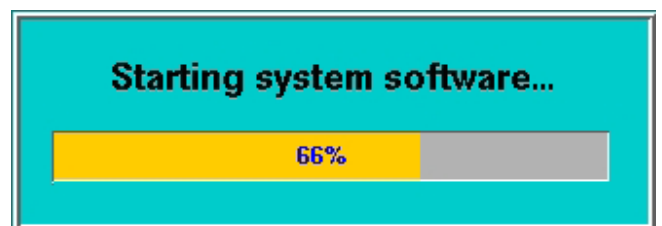
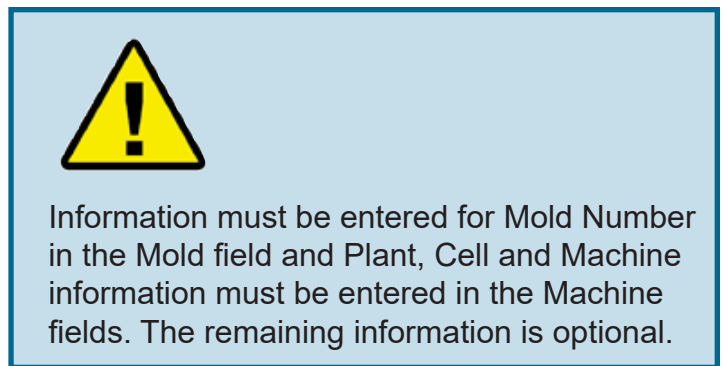
To set up a job:

Fill in the appropriate information in the Mold and Machine sections. You can do this manually or click the down arrows to use predefined entries.

When you have entered all necessary information, click the Accept button. A Sensor Locations tool will appear. See above.

When the system is starting a progress box will appear, indicating how much of the start-up process is complete. This box will remain open until eDART completes the system settings and configures the software for the job startup.

Figure 3: eDART system startup progress bar



Configuring Sensor Locations

The eDART Sensor Locations tool lists all Lynx™ devices attached to the eDART and are listed by type and location.

Serial #. : Signal	Sensor Type	Sensor Location	Ident	Setup	Value
01 060 20000:1	Ejector Pin (indirect)	Post Gate	1	Setup	0
01 236 00121:1	Ejector Pin (indirect)	Post Gate	2		-58.61
02 004 00164:1	Mold Pr. Interface	Not Used		Setup	0.0708
03 003 00175:1	Piezo Adapter	Not Used		Setup	-77.2
03 090 00038:1	0 - 10V Output	Not Used		Setup	
04 001 00100:1	Sensor Adapter	Not Used		Setup	0.0030
04 001 00108:1	Sensor Adapter	Not Used		Setup	0.0030
04 040 00387:1	Seq. Module Input	Injection Forward			<input type="radio"/>
04 040 00387:2	Seq. Module Input	First Stage			<input type="radio"/>
04 040 00387:3	Seq. Module Input	Screw Run			<input type="radio"/>
04 040 00387:4	Seq. Module Input	Mold Clamped			<input type="radio"/>
04 040 00387:5	Seq. Module Input	Mold Opening			<input checked="" type="radio"/>
04 040 00387:6	Seq. Module Input	Machine in Manual			<input type="radio"/>
04 040 00387:7	Seq. Module Input	Not Used			<input type="radio"/>
04 075 00610:1	Control Output	V->P Transfer			
04 075 00610:2	Sorting Output	Good Control			
04 300 00025:1	Hydraulic Pressure	Injection			10.99
04 600 00136:1	Stroke	Injection			0
04 600 00136:2	Velocity	Injection			0

Figure 4: Sensor Locations tool

Sensor Types

The Sensor Type will be static if your cavity pressure or machine mount sensor is connected directly to the eDART. If you are using a sensor adapter or certain DIN Rail I/O modules, you may need to configure the sensor type. Click on the arrow of the drop down menu and select the correct sensor.



When configuring machine signals connected to the Sequence Module, ensure you select the Location that EXACTLY describes what the signal actually is (Mold Closing, for example). To ensure you have wired the signal correctly, watch the green light in the Value column. If you can't exactly ID the signal, select "Not Used".

Example: If you are configuring Screw Run, the light for Screw Run will go on and stay on during Screw Run (and only during Screw Run). This signifies that you have configured the signal correctly.

Sensor Locations

In most cases, you must configure the sensor location. Identify where each sensor is located by clicking the down arrow on the drop down menu and choosing a location. For example:

If you are using a cavity pressure or machine mount sensor:

Post Gate, End of Cavity, Injection Unit, etc.

-or-

If you are using a sequence module or other DIN Rail I/O module:

First Stage, Screw Run, V-P>Transfer, etc.

If the signal is not used, choose Not Used in the Sensor Location Column.

Identifier

No two sensors can have the same type and location unless an identifier is created. For example, use numbers or letters to differentiate between sensors located in the same position, but in different cavities. Refer to the Identifier column in graphic on previous page.

Setting the Machine Size

Upon first-time setup, enter the screw diameter in this tool. For a hydraulic machine enter the intensification ratio (if known) or the injection cylinder diameter. If you have an electric machine producing a plastic pressure signal, you are only required to enter screw diameter.

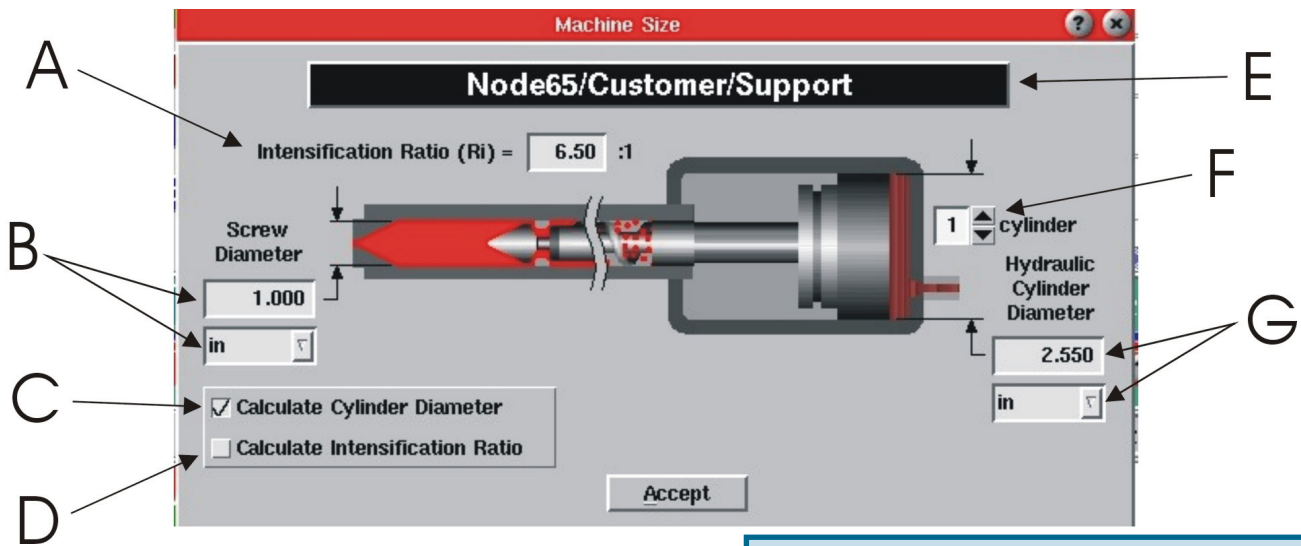


Figure 5: Machine Size tool

A	Hydraulic cylinder area divided by the screw area.
B	Enter screw diameter (barrel inside diameter) and the units.
C	Check this box if you've entered the screw diameter and Intensification Ratio.
D	Check this box if you've entered the screw diameter and hydraulic cylinder diameter.
E	This is the machine to which the <i>eDART</i> is attached.
F	Enter the number of hydraulic cylinders that drive the screw.
G	Enter the injection cylinder diameter and units.

Table 2: Figure Labels



Working with *eDART* for Injection Volume and Plastic Pressure: *eDART* performs most of its calculations in injection volume instead of injection stroke. It also calculates injection plastic pressure, instead of hydraulic pressure.

eDART computes volume by multiplying stroke by the screw area (barrel inside area). It computes plastic pressure from the intensification ratio (injection cylinder area divided by screw area) multiplied by hydraulic pressure. Electric machines commonly read plastic injection pressure directly or provide a force signal, which the *eDART* scales for plastic pressure. This means that values you set for fill volume, pack transfer, alarms and templates can be used unchanged when *eDART* runs a mold in a variety of different sized machines. The volume to fill the mold remains the same even if the barrel diameter varies.

Setting Ejector Pin Sizes

The Ejector Pin Sizes tool requires you enter the pin size for sensors located beneath ejector pins, blades and sleeves. You must enter pin sizes to utilize this tool.

eDART uses the Ejector Pin Sizes tool to convert force on an ejector pin sensor into plastic pressure in the cavity. You can either enter the pin diameter or, if an ejector blade or other nonstandard ejector pin shape is used, you can enter the area instead. It is important that this tool is set up correctly in order for *eDART* to accurately scale the sensors' output.



Figure 6: Ejector Pin Sizes tool

Zeroing the Injection Pressure

The Zero Injection Pressure tool is used to zero out any residual pressure that the machine might have when idle. You should use this tool when the machine is on and the pump is running but the screw is not moving.

You can choose to manually or automatically zero the injection pressure. If you choose to manually zero, click the Zero Now button when injection pressure is zero during the cycle or with the machine idle. If you choose to automatically zero, click the Zero on Signal button, then select a sequence signal and direction at which to zero.

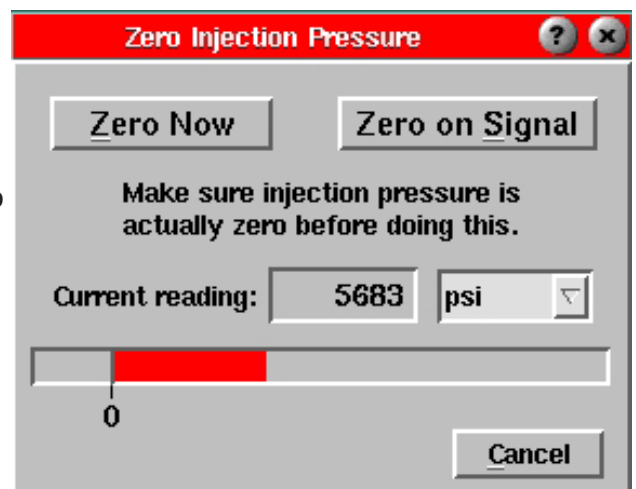


Figure 7: Zero Injection Pressure tool

Checking the eDART Sequencing

It is important to check the eDART sequencing procedures to ensure accurate timing.

Check the machine sequences by watching the Sequence Lights tool. Each light should go on and off at the appropriate times in sequence with the machine. If they do not, the eDART System may be receiving incorrect signals, or you may need to set the appropriate fill volume.

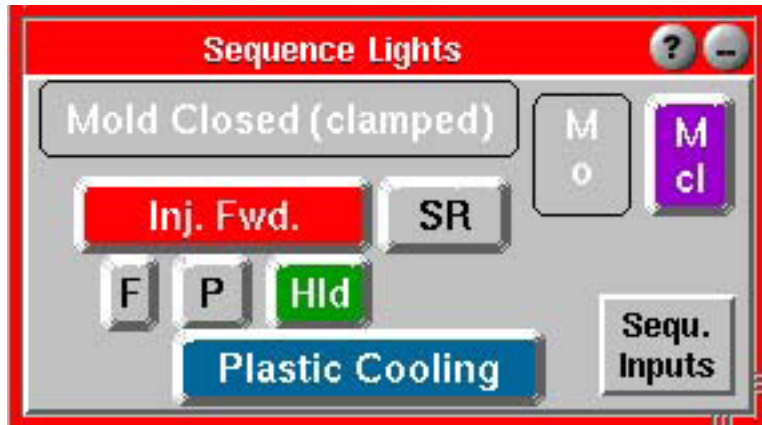


Figure 8: Sequence Lights tool

Sequence Signals

The Sequence Lights tool shows the machine sequences related to the cycle you are running. If you want to see the actual machine signals wired to the Sequence Module, click the Sequ. Inputs button. This will display the hard-wired machine signals. The green lights duplicate the lights on the Sequence Module.

If any of these signals do not appear to be operating at the correct times, you must reconfigure the Sensor Location entries in the Sensor Location tool.



Important Information about Sequencing:

The eDART performs its computations for various process parameters over certain time periods during a typical cycle. In order for these to be accurate, eDART generates internal signals called machine sequences. These sequences are not necessarily wired to the Sequence Module, but can be created from other signals.

For example, the Plastic Cooling Machine Sequence comes on at the end of fill and goes off at the end of the cycle (mold open or other late signal), yet there is no Plastic Cooling signal from the machine.

Setting the Stroke, Zero and Fill Volume

The *eDART* uses the Machine Sequence, Fill signal to compute the effective material viscosity, injection flow rates and to align templates.

The Fill light should go on when the injection position (volume) passes through the position of the ram at the start of decompress on the last cycle. The Fill light should go off at the machine transfer position from high speed fill to low speed pack (3-stage) or hold pressure (2-stage). Since most machines do not produce this signal, the *eDART* can generate the signal with your entry of the zero and fill volume positions.

Step 1:

Set the Stroke Direction

- The Lynx™ Stroke-Velocity Encoder measures screw position and speed, which the *eDART* then interprets as volume injected. This ensures that you get consistent process setups and measurements from machine to machine, regardless of cushion, screw diameter, etc.

If you DO have a Screw Run machine signal wired:

- Allow the machine to run on cycle for about five consecutive shots. During this time, the *eDART* will determine stroke direction.
- Open the Sequence Settings tool by clicking on its button on the tool bar.
- Select the Machine Fill tab.
- Check the Prevent Auto-Stroke Detection box. Now each time you start the machine, it will start with the same stroke direction.

If you DO NOT have a Screw Run machine signal wired:

- Open the Sequence Settings tool by clicking on its button on the tool bar.
- Select the Machine Fill tab.
- If the stroke sensor retracts while the machine is injecting, check the Invert Stroke Signal box. If the stroke sensor pulls out while the machine is injecting, leave the Invert Stroke Signal box unchecked.

Step 2:

Set the Volume to Zero (if you do not have a Screw Run machine signal wired)

- Let the machine cycle twice after you have set the stroke direction. There are two ways to set the stroke (volume) to zero. If you are familiar with graphs, use the Cycle Graph tool. If the tool is not visible, click the Cycle Graph button on the tool bar.
- Right click on the graph. From the Graph Controls menu, select Zoom and then Full Cycle.
- Look at the injection pressure and volume curves and place the cursor at the exact start of decompress. If any decompress is set, the curve will look similar to the graph below.

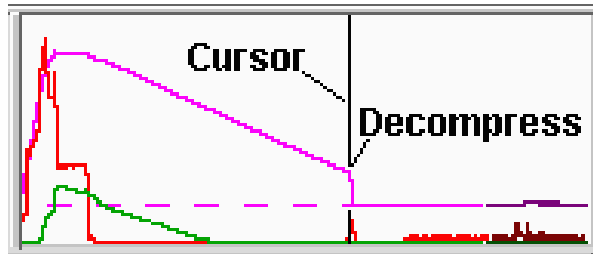


Figure 9: Example cycle graph with decompress set.

- Right click on the graph. On the Graph Controls menu select Set Volume Zero at Cursor and answer Yes to the confirmation.
- If you are unfamiliar with graphs, follow the steps below.
- Turn the decompress off on the machine.
- At the end of a cycle (one without decompress), stop the press.
- Open the Sequence Settings tool by clicking on its button on the tool bar.
- Select either the Machine Fill or Injection Fwd tab.
- Click the Press to Set Stroke Full Back button and answer Yes at the confirmation prompt.
- Start the press again. Turn on decompress and run a couple of cycles. On the graph you should see the volume dip below the graph zero line.

Step 3:

Set Fill Volume

- NOTE: If you are familiar with graphs, open the Cycle Graph by clicking on the Cycle Graph button on the tool bar.
- Find the end of fast fill. This is usually a local peak on injection pressure or a sudden change in volume slope from steep to shallow. Usually, both happen simultaneously.
- Position the cursor slightly before that point.
- Right click on the graph. From the Graph Controls menu, select Set Fill Volume at Cursor and answer Yes to the confirmation prompt.

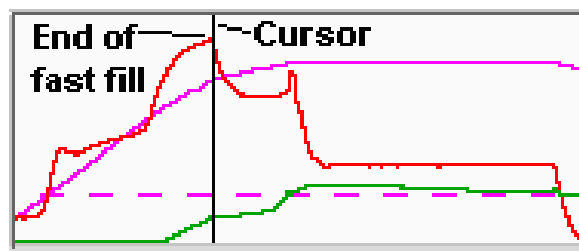


Figure 10: Example fast fill graph

- If you are not familiar with graphs, follow the steps below.
- Set your machine to cycle, making short shots (about 90% full) with just the fill portion of the cycle.
- Open the Sequence Settings tool by clicking on its icon on the tool bar.
- Select the Machine Fill tab.
- Click the Press Button to Set the Fill Volume button and answer Yes to the confirmation prompt.
- Return the press to running a complete cycle.
- After you have finished setting fill volume, the message 'Machine Sequence, Fill' trace at the bottom of the Cycle Graph will appear when the volume exceeds the decompress set point and it will go off when the machine reaches the set volume.

Checking Sensors

Most *eDART* sensors are automatically added to the Cycle Graph and appear as real-time curves. You can also add the running numerical value for any sensor to the Cycle Values tool. If the sensor you seek is not displayed in either tool, you can add it by right clicking on the Cycle Graph and choosing Add Curve, or clicking the Add button in the cycle Values tool. If the sensor type that you are seeking does not appear in the Select type and locations(s) screen, that sensor may not be communicating with the *eDART* system.

If a sensor is not communicating properly, follow the steps below.

S/N:Signal	Attached to	Type	Location	Value	Raw	Accuracy	Status	Last Chg	Failure
		Diagnostic Info	Port 2				Valid	41.918	
		Diagnostic Info	Port 1				Valid	41.936	
01 236 00123:1	Mold	Ejector Pin Force	Post Gate	-1.221	-1	1.00 %	Valid	41.960	
		Flow Rate	Injection	0.000000	0	0.00 %	Valid		
04 300 00026:1	Machine	Hydraulic Pressure	Injection	-2.747	-3	1.00 %	Valid	41.953	
		Plastic Pressure	Post Gate	0.000000	0	1.00 %	Valid	42.002	
01 060 10000:1	Machine	Plastic Pressure	Injection	-14.65	-3	0.10 %	Valid	42.000	
03 090 00042:1	Machine	Plastic Pressure Output	Injection	-14.65	-3	0.10 %	Valid	42.052	
03 040 00459:4	Machine	Seq. Module Input	Mold Clamped	ON	1		Valid	40.533	
03 040 00459:2	Machine	Seq. Module Input	First Stage	ON	1		Valid	41.532	
03 040 00459:3	Machine	Seq. Module Input	Screw Run		0		Valid	36.538	
03 040 00459:1	Machine	Seq. Module Input	Injection Forward	ON	1		Valid	41.532	
04 075 00615:1	Machine	Sorting Output	Good Control		0		Valid	41.541	
04 600 00137:1	Machine	Stroke	Injection	0.000000	0	0.04 %	Valid		
		System Control Output	Operate	ON	1		Valid	40.536	
04 600 00137:2	Machine	Velocity	Injection	0.000000	0	0.04 %	Valid		
		Volume	Injection	0.000000	0	0.00 %	Valid		

Step 1:

Select the Main Menu from the toolbar. Choose the Raw Data Viewer option.

Step 2:

If the Only Show Sensors box (upper left) is unchecked, check it now. This will hide the non-sensor values that the *eDART* is creating.

Step 3:

The list that appears will show each sensor with its serial number, name, values and status. A No Reply status means the sensor was once connected but is no longer communicating with the *eDART*. A Stale status means the sensor is available and is an output, but there is no current software to operate it. An Invalid State means there has been a failure reported from the device.

Step 4.

Click a row (highlighting it in blue) and then right click over it. You will see a display of the details about that particular sensor.

For more information, refer to the Raw Data Viewer section of *eDART* Software Tools.

Scaling Graphs and Running *eDART* Software

The last step before running the *eDART* software is scaling graphs.

Step 1:

Right click over the Cycle Graph background and select Auto scale all, then select Auto Scale from Last Cycle. This will scale the graphs to provide useful levels by default.

Step 2:

In the Help Viewer refer to the How To section for the various procedures for scaling graphs and their outputs. Or, refer to *eDART* Software Tools section for further details about each tool.

After following the steps in this section, you can successfully run the *eDART* software.