



## **ROAD System Software User's Manual**



**Logical Machines**

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# Section 1- Introduction

**Important Note: The Logical Machines ROAD software package is only compatible with Windows 7 and newer computers.**

Responding to our customers' requests to be able to collect and analyze their fill data, we are introducing our new ROAD system software package. The ROAD system not only allows you to analyze your fill data, it also offers a suite of other useful features, and it makes the renowned ease of operation of the Logical Controller II that much simpler!

## **ROAD stands for: Remote Operation, Analysis, and Diagnostics**

To use the ROAD system, you will need to first download a small proprietary "app" from our website. Once you've installed the app on your Windows PC, you can access all the features of the ROAD system simply by connecting your Logical Controller II to your PC via a provided USB cable. The ROAD system will allow you to record, visualize, and export the fill data from your Logical Controller II into whatever format you choose including spreadsheets and other accounting platforms. You'll be able to visualize how your scale is performing!

In addition to data collection, the ROAD system provides the following features:

- Remotely control your Logical Controller II by adjusting all fill parameters directly on screen. These include setting your target weight, bulk cutoff weight, dribble cutoff weight, dribble motor speed, and other parameters. You can also store and manage your fill jobs on screen.
- Visualize and analyze how your scale is working in real-time. Watch as the real-time graphing abilities of the ROAD system show each fill in progress. View a single fill or overlay multiple fills to visualize the scale's efficiency.
- In the event that you are having problems setting up your scale, help is just a phone call away. Using the ROAD system and GoToAssist, our technical support representatives can diagnose and directly control your scale and see firsthand what's going on. It's like having our tech support guy right in your shop!

The ROAD system will be available on all new Logical Machine scales starting October 2017. If you currently own a Logical Machines scale system equipped with the Logical Controller II, your system can be upgraded. Simply ship your Controller back to our shop for a hardware upgrade.

## Section 2- Installation Instructions

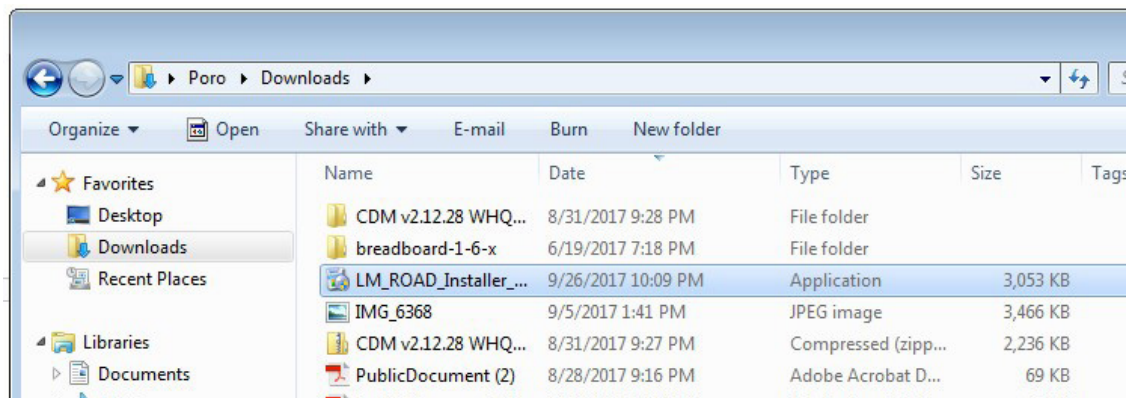
1. Unpack your machine and set it up according to the instructions.
2. Power on your Logical Controller II.
3. Plug in USB cable from bottom of Logical Controller II to a port on your computer.
4. Navigate to **[www.logicalmachines.com/customer-support/](http://www.logicalmachines.com/customer-support/)** and scroll to item 8, **ROAD Software System download**.

### 8. ROAD Software System Download:

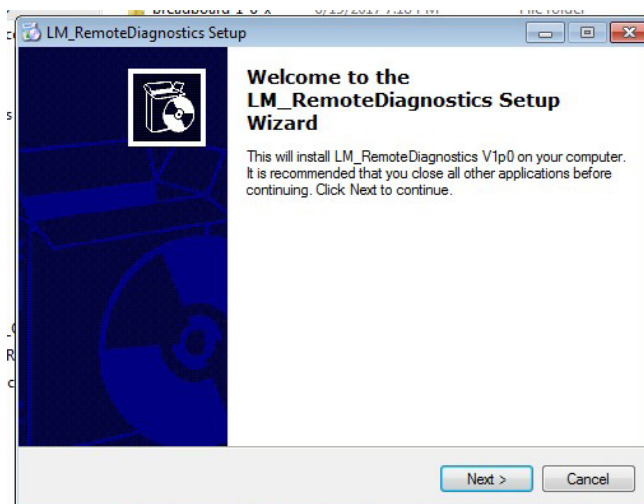
Follow the below steps to make sure that the software will install properly:

1. Ensure that your Logical Machine is plugged into the USB port on your PC and powered on before beginning the download.
2. Download the ROAD system files here: [ROAD System Installer](#)
3. Navigate to your downloads folder and double-click the **LM\_ROAD\_Installer\_1p0.exe** application file. All the necessary files will then be installed on your PC.  
*(Please note that you may need to allow the download through your antivirus software.)*

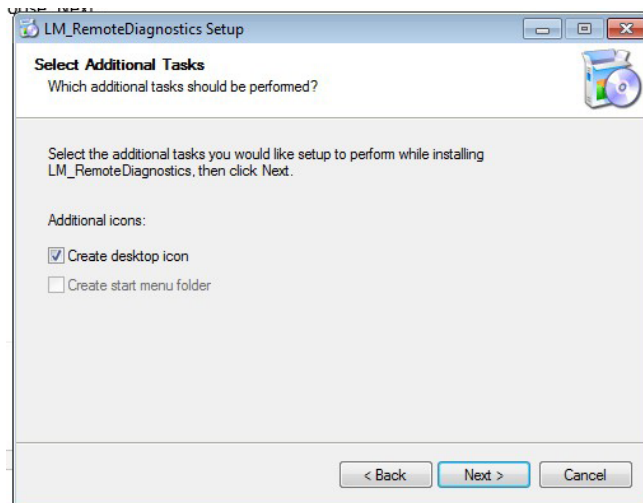
5. Click on the ROAD System Installer link. The file will download to your PC. Navigate to you downloads location and double-click on the **LM\_ROAD\_In-staller\_V1p0.exe** file.



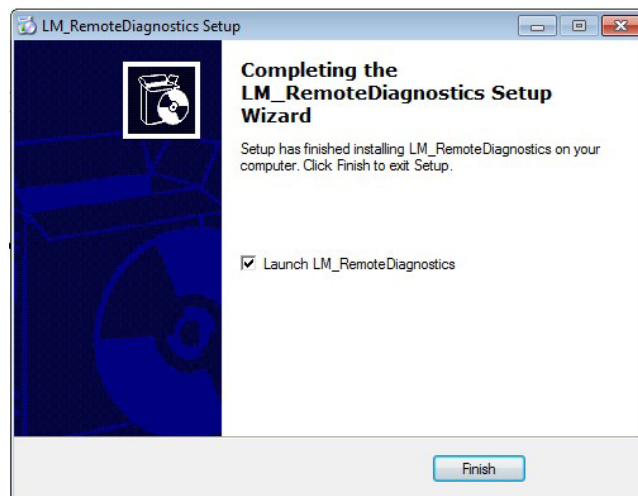
7. Choose 'Next'.



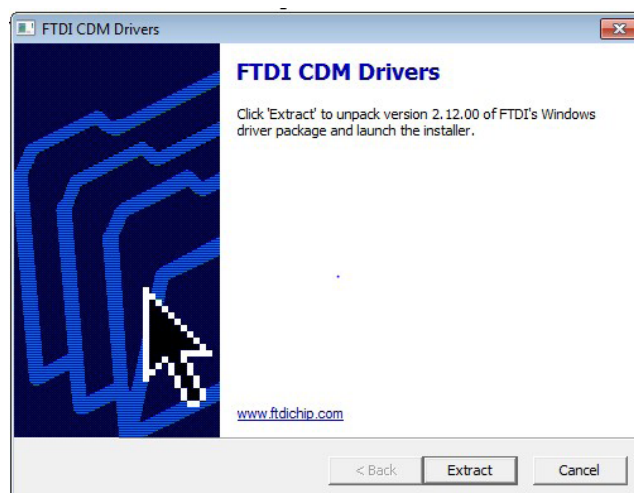
8. Select 'Create Desktop Icon' and choose 'Next'.



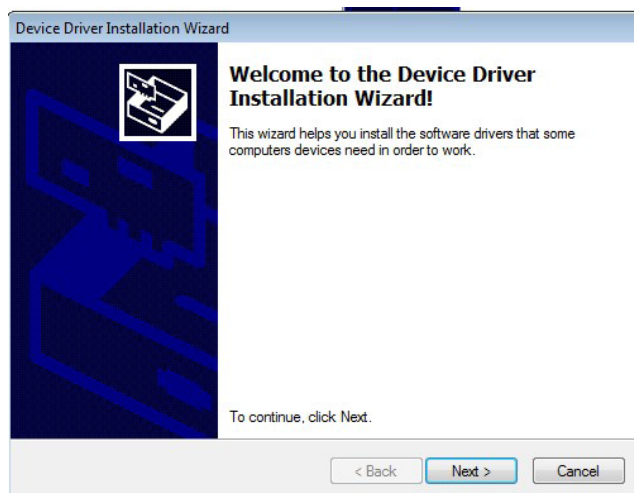
9. Choose 'Launch LM\_RemoteDiagnostics' and click finish. This step actually launches the driver installation that allows the Logical Controller II to communicate with the computer.



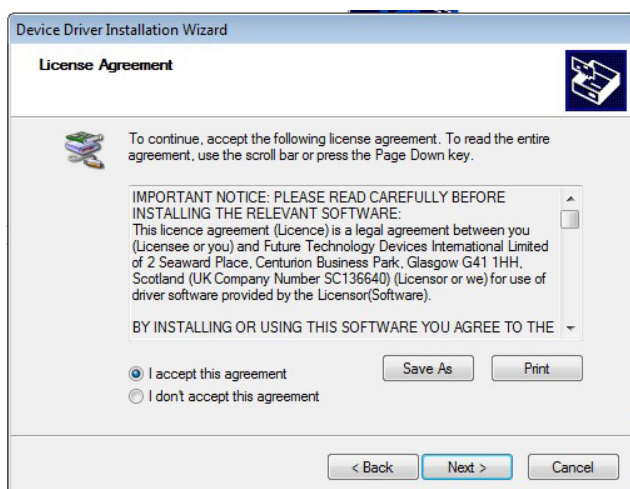
10. The FTDI CDM Drivers wizard should pop up next. This is the last chance to verify that the controller is powered on. Also verify that the USB cable is connected between the Controller II and the PC. Choose 'Extract'.



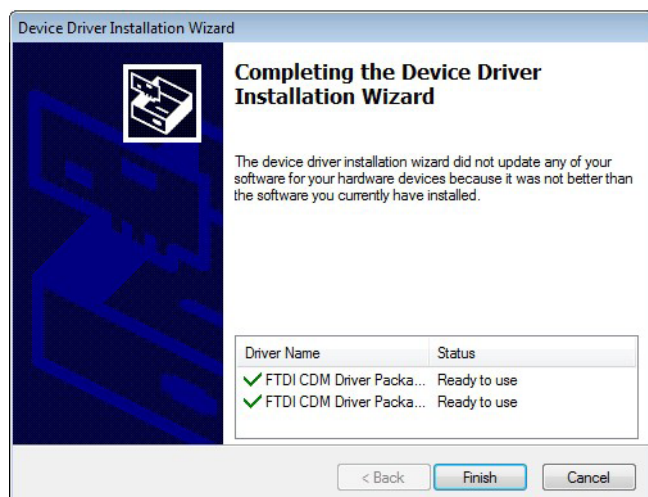
11. Choose 'Next'.



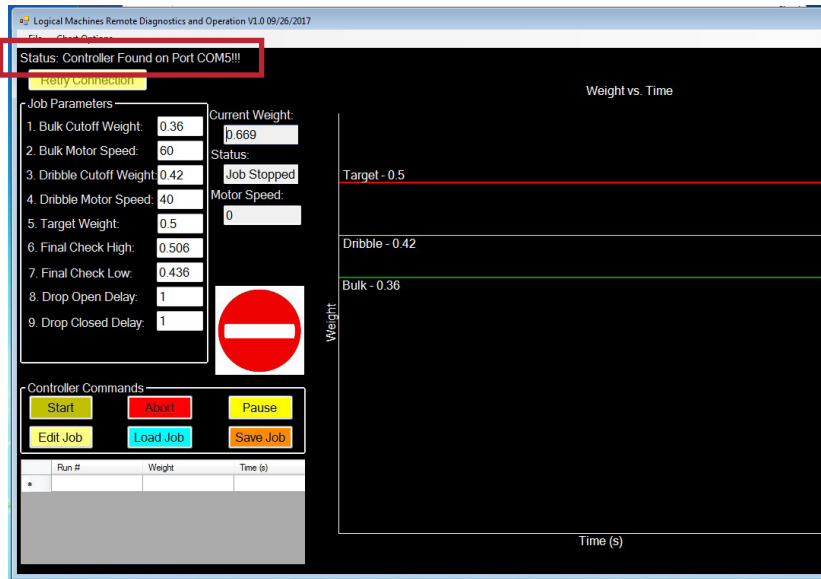
12. Read and accept the agreement and then choose 'Next'.



13. Choose 'Finish'.



14. Verify that you have a shortcut on the desktop called LM\_RemoteDiagnostics\_V1p0 and launch the program by double-clicking on that shortcut. Verify that the status strip on top of the LM ROAD user interface says “Controller Found on Port COMx”. Note that the COM can and will change and is not important.



## Common Installation Issues:

- Pop-up stating that the software didn't install correctly. This is related to the driver installer previously being run for other software versions. Solution: Click the 'Software Installed Properly' button.
- Launch the shortcut and the software says 'Status: Controller not found'. This is caused by the Logical Controller II either not being powered on or connected via USB cable to the PC. Solution: Power On the Logical Controller II, connect via USB from controller to PC, and re-run the installation.

# Section 3- Feature Overview

## Ease of Use:

- Extremely easy installation with just a few clicks of the mouse.
- Large text and white on black contrast create a clean and easy to read interface.
- Buttons with self-explanatory labels

## Data Collection:

- While connected to your PC with the ROAD software running, every product run will be automatically stored in your computer's memory.
- Using this data one could track machine/worker efficiency, product target weight accuracy, and total run time.
- In addition to the auto-saved data, one can manually save data on a particularly interesting data set.
- Utilizing the final weight value and total run time, one can fine tune the machine to produce acceptable accuracy in less time.

## Data Visualization:

- See how your product is weighing as a function of time.
- Using advanced non-linear scaling techniques, the user can see what happens to the slope of the weight plot when the product weight reaches bulk and dribble cutoff.
- Save interesting charts as jpeg images.

## Job Parameter Updates:

- On the fly parameter updates are enabled with the new ROAD software package. Is the machine taking too long to achieve product target weight? Quickly update your job parameters and visualized the product weighing cycle on the graph.

## Remote Control:

- Is your Logical Machine weighing a messy product or do you have to go through a clean room process to access your machine? With a little planning, you can keep your machine running via a long repeater-type USB cable available up to 30 feet in length. You can now feasibly control your Logical Machine from another room.
- Basic controls are enabled such as start, pause, abort, edit job, load job, and save job.

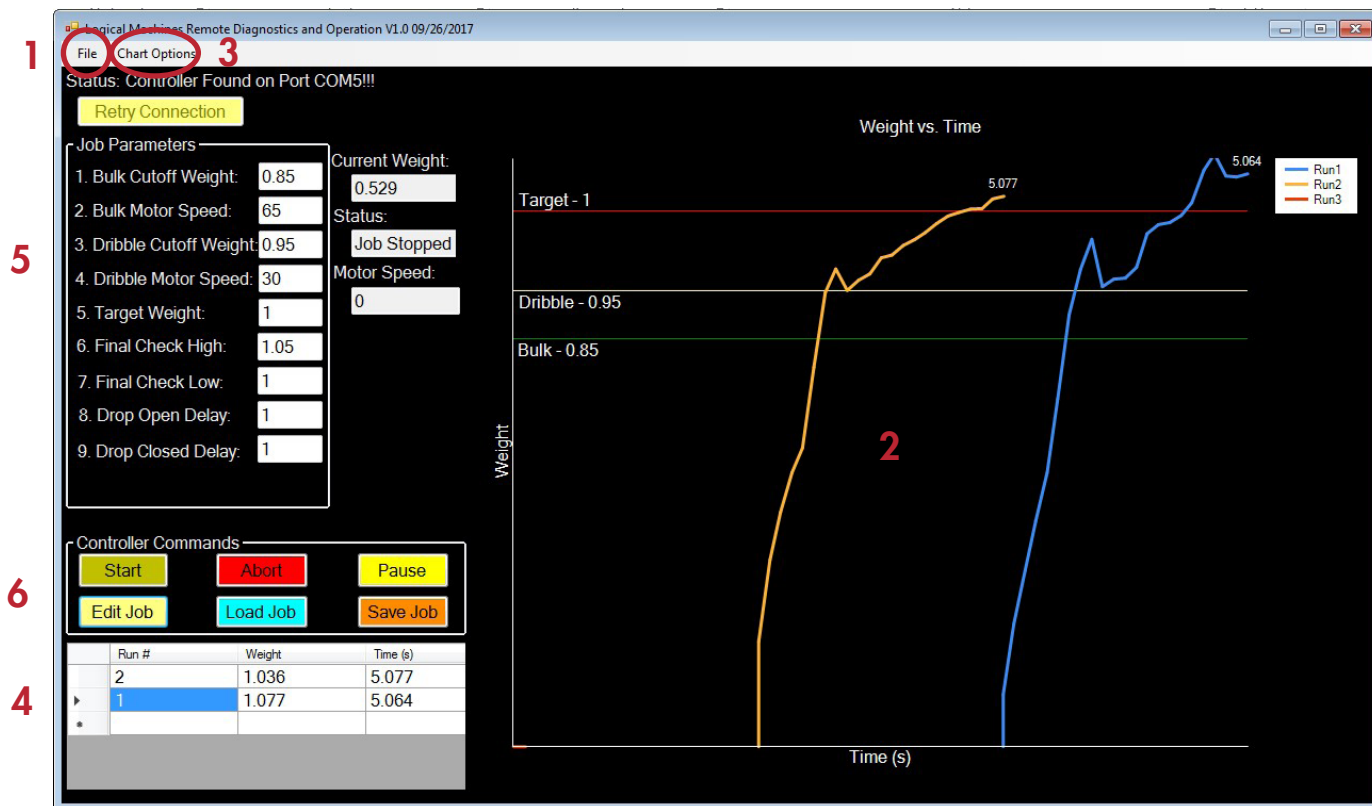
## Technical Support:

- Are you having problems adjusting your Logical Machine for a new product? Help is just a GoToAssist session away. Allow Logical Machines technical support to remotely control your computer desktop for an interactive problem solving session.
- Job parameters can be saved locally to your PC and also loaded from your PC to the ROAD software. If necessary these job parameter files can be sent back and forth for use.

## Future Enhancements:

- Expand the remote control capabilities of ROAD to include Job Modes and other Utilities.
- Enable machine learning for optimizing product runs based on customer accuracy and speed requirements. Example: maybe the customer is willing to trade off 5% accuracy vs. 100% speed increase.
- Multiple Logical Machines controlled by one PC.





## Section 4: User Interface Items

The Logical Machines ROAD software consists of five main components. These components are the File Operations, Chart/Chart Options, Table, Job Parameters, and Controller Commands.

Component	Comment
File Operations Menu (1)	This menu component is located at the upper left hand corner of the ROAD user interface. Here you will find menu items to clear chart and table data, save job parameters to file, load job parameters from file, save chart as .jpg, save table data as .csv, or exit the program.
Chart (2) Chart Options Menu (3)	<p>The chart displays the data sent from the Logical Controller II to the PC. It essential plots Weight vs. Time per product run. Within the Chart Options menu located at the upper left hand corner of the ROAD user interface, the user has several charting options. By default the chart will display the last 5 product runs. The user can also choose the following plotting options:</p> <ul style="list-style-type: none"> <li>• Append all runs to the chart</li> <li>• Overlay runs in time</li> <li>• Show the last 5 product runs.</li> <li>• Show only the last product run.</li> </ul> <p>Also available is a feature to 'Auto-zoom on Dribble' meaning the chart will zoom in once the dribble weight is achieved. Note that the chart must be cleared in file menu before changing chart options.</p>

Table (4)	<p>The table displays information that may be useful for tracking throughput and product weight accuracy. The following information is available in the table:</p> <ul style="list-style-type: none"> <li>• Product run number</li> <li>• Final product weight of a given run</li> <li>• Total time it took to achieve the target weight</li> <li>• A time stamp on when product was weighed. This is hidden on the far right hand side of the table, but is available when the user chooses to save the table data.</li> </ul>
Job Parameters (5)	<p>The job parameters are available on the user interface for 2 reasons. The first and most obvious reason is for the user to be able to view the current job parameters. The second reason is so that the user can change the job parameters on the fly to optimize the product weighing cycle. <b>To quickly change job parameters, simply type in the desired value in any of the 10 input boxes and hit the enter key to upload the change to the Logical Controller.</b></p>
Controller Commands (6)	<p>The controller commands consist of the following:</p> <ul style="list-style-type: none"> <li>• Start/Dump</li> <li>• Abort</li> <li>• Pause/Resume</li> <li>• Edit Job</li> <li>• Load Job</li> <li>• Save Job</li> </ul> <p>- The <b>Start</b> button serves the purpose to begin weighing. This is the same as pressing the footswitch. It will also serve as the dump command if 'Auto Dump' is not enabled.</p> <p>- The <b>Abort</b> button quits the current weighing cycle. This command is just like hitting the 'Home' button during weighing cycle.</p> <p>- The <b>Pause</b> button will halt the test. Additionally it will resume the test when it is paused. This also acts the same as the footswitch</p> <p>- The <b>Edit Job</b> button will load the job parameter values from the ROAD user interface into the controller. The alternate method to download the parameters from the ROAD user interface to the Logical Controller II is by hitting the 'enter' key on the computer keyboard after changing values.</p> <p>- The <b>Load Job</b> button allows the user to recall any job 1-99 from the Logical Controller memory. Additionally the user can choose to load a job from the File &gt; Load Job Parameters option.</p> <p>- The <b>Save Job</b> button allows the user to save the current job to the Logical Controller memory once the parameters have been optimized. Additionally the user may wish to save the parameters on his/her computer using File &gt; Save Job Parameters</p>

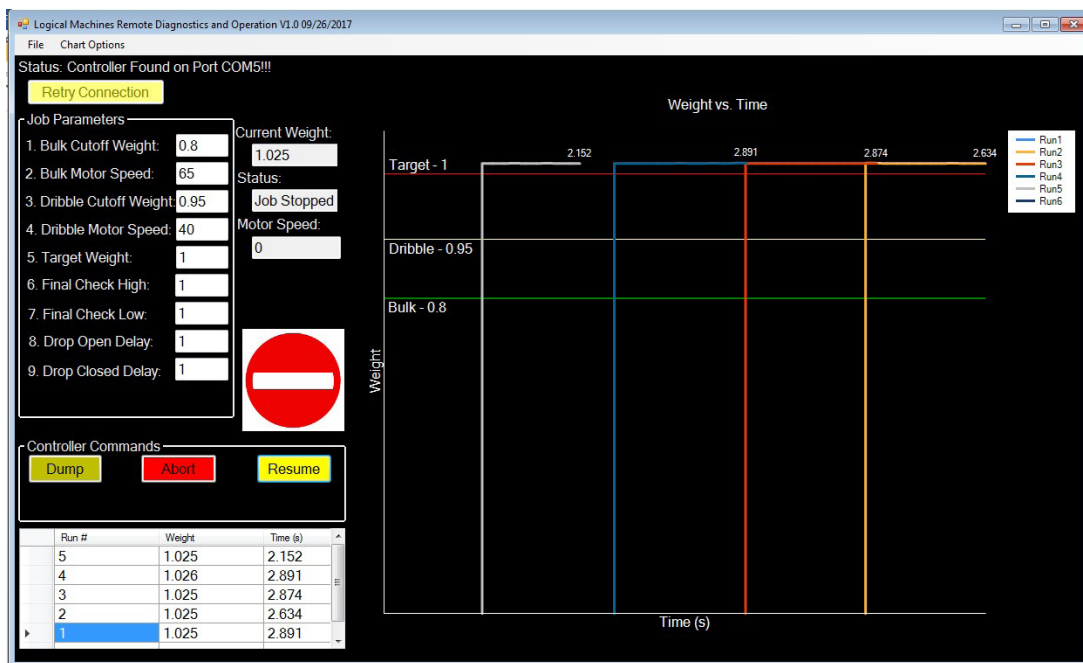
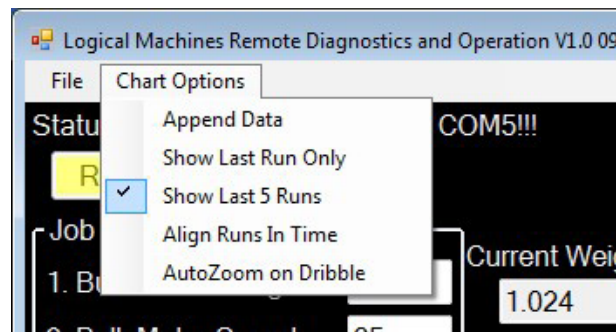
# Section 5: Operation

The operation of the Logical Machines ROAD software is designed to be simple and intuitive. In fact, if the user simply wishes to log data then the only necessary thing to do is to plug in the Logical Controller II via a USB cable to your computer and launch the ROAD software. The user can continue to use their Logical Machine manually while in the background the ROAD software will record data and automatically save it in a file located on your computer's hard drive.

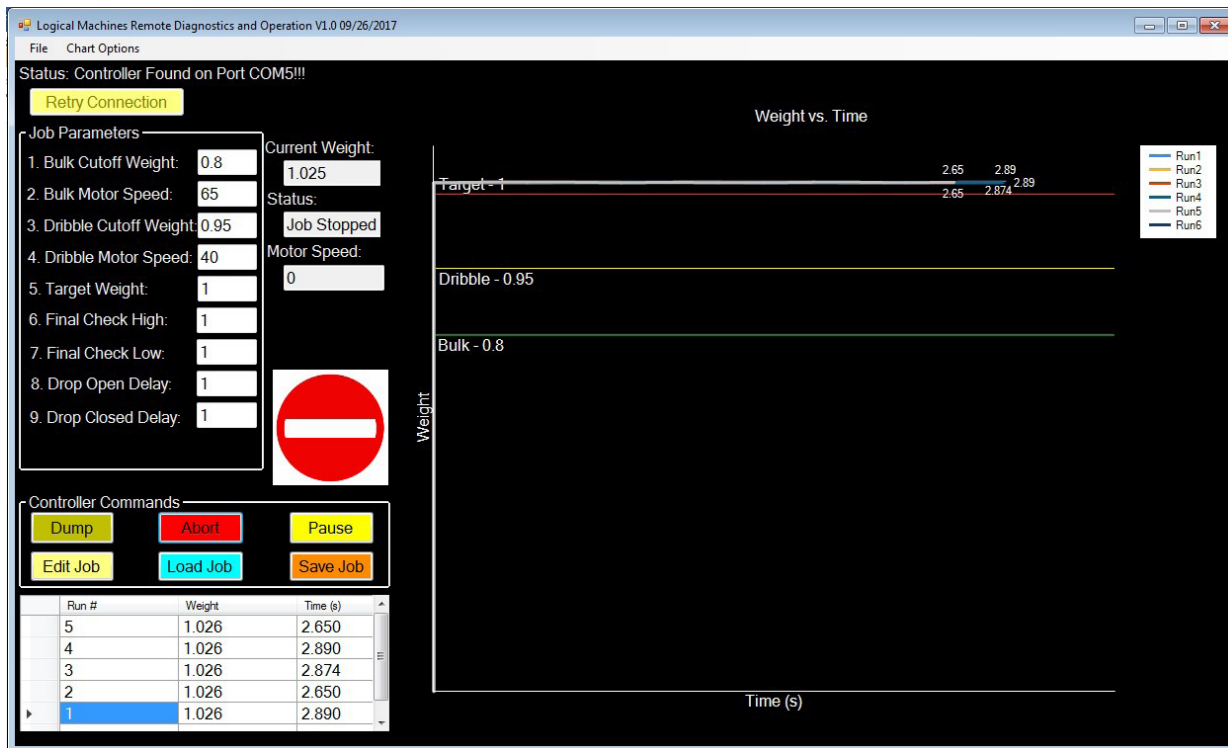
On the other end of the spectrum, the user can choose to completely operate their Logical Machine remotely via the ROAD software. Additional features include the ability to visualize the data coming from the Logical Machine, change job parameters on the fly, and store meaningful data to track product throughput and final weight accuracy.

## Section 5.1: Chart Options

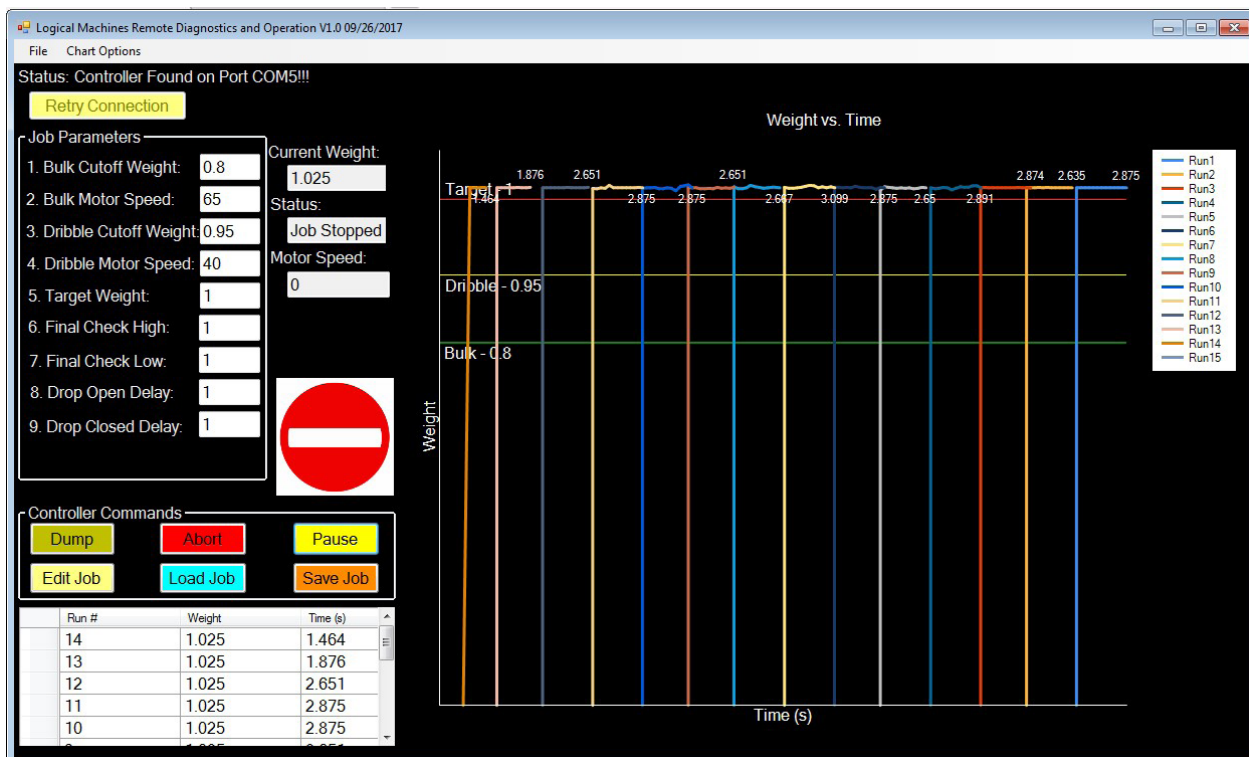
By default, the chart is set up to display only the last five product runs. All previous run values will be available in the table, but the plots are deleted.



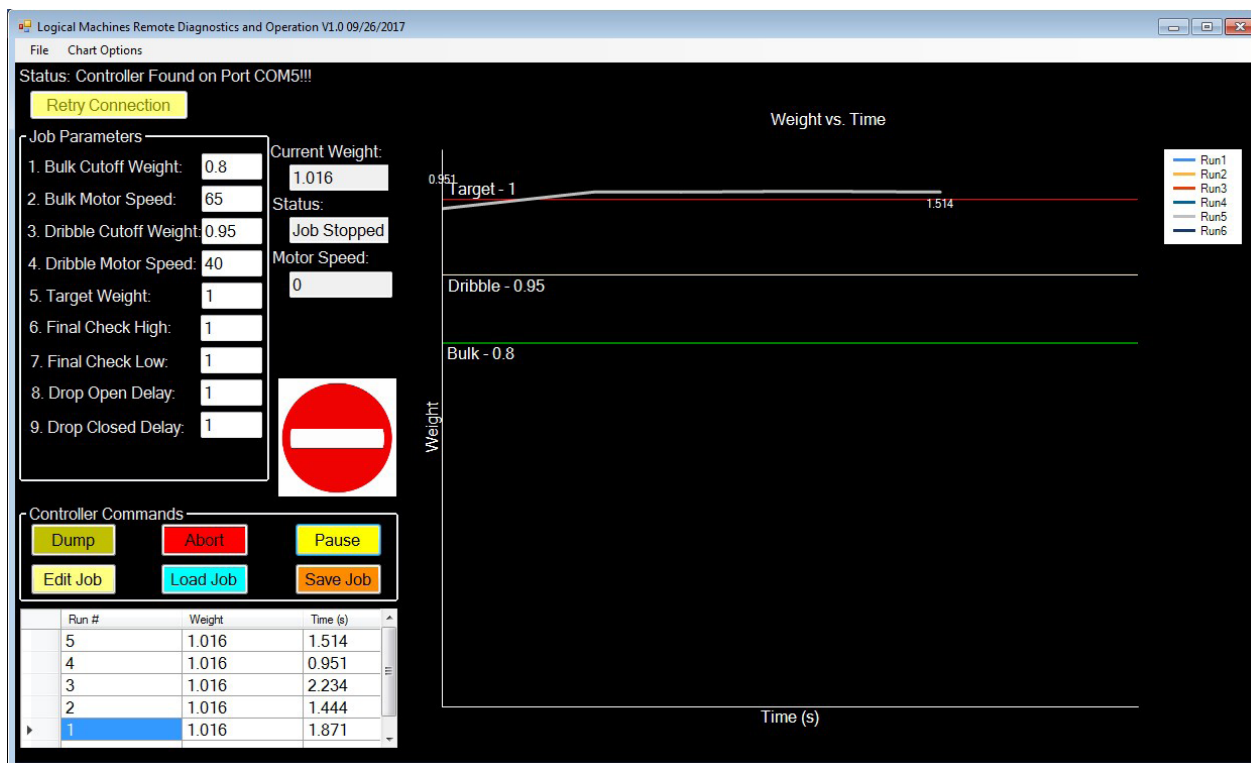
The user can also choose to overlay all runs in time on the chart. This may be an interesting way to visualize data if the user is looking to determine product weighing repeatability. **Note: The user must clear all data from the table and chart before changing the chart options (Go to File > Clear Chart/Table Data).**



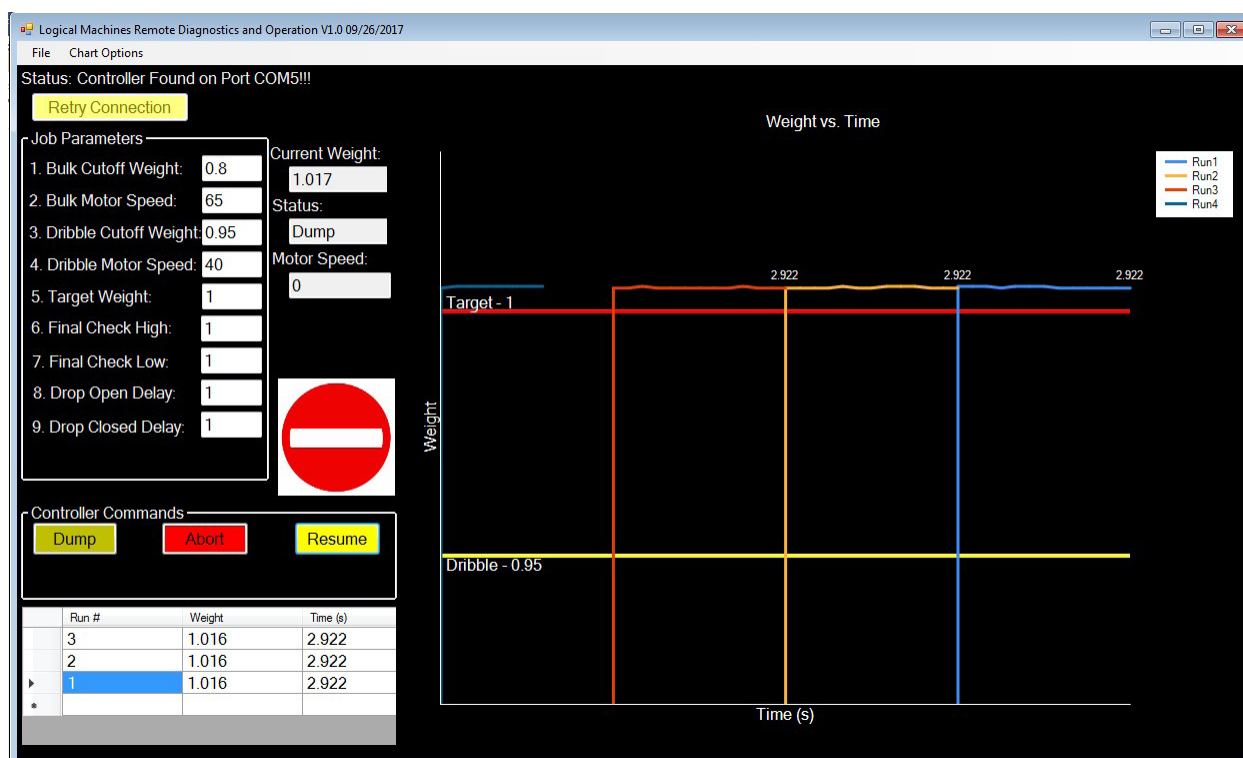
The user can also choose to append all runs to the chart. This may be interesting for a small data set, but the chart becomes difficult to read when more than 10-15 runs are visible. **Note: The user must clear all data from the table and chart before changing the chart options (Go to File > Clear Chart/Table Data).**




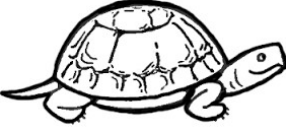
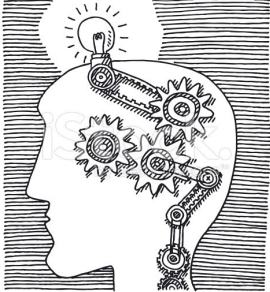



Lastly the user can choose to show just the last run only. This is a good plotting option to use if you just want to validate the parameters being used, but do not care much about the chart. **Note: The user must clear all data from the table and chart before changing the chart options (Go to File > Clear Chart/Table Data).**



Another option within the 'Chart Options' menu is the ability for the chart too zoom in on the dribble region once the weight passes the dribble cutoff value. This feature is useful to get a better picture of what happens near the end of the product weighing cycle. **Note: The user must clear all data from the table and chart before changing the chart options (Go to File > Clear Chart/Table Data).**



One feature categorized within the 'Chart Options' are the indicators just to the left of the chart. Each indicator represents a range between any two of the job parameters.

	<p>The rabbit represents the range between '0' and the Bulk Cutoff Weight. In this range the Bulk Motor Speed will be utilized (vibrator will be at its loudest point)</p>
	<p>The turtle represents the range between Bulk Cutoff Weight and Dribble Cutoff Weight. In this range the Dribble Motor Speed will be utilized (vibrator will be at its quietest point)</p>
	<p>The light bulb represents the range between Dribble Cutoff Weight and Target weight. In this range you will notice that the controller alternates between 'Bump' and 'Evaluating'. While the controller says evaluating, this image will appear to the left of the chart.</p>
	<p>The bump sign represents the range between Dribble Cutoff Weight and Target weight. In this range you will notice that the controller alternates between 'Bump' and 'Evaluating'. While the controller says bump, the user will hear the vibrator submit a short vibration and this image will appear to the left of the chart.</p>
	<p>The target image means that the Logical Controller II is both done evaluating and has reached its target weight. The range represented by the target is greater than Target weight but less than Check High.</p>
	<p>The final image is the caution sign. This image represents the weight range of greater than the Check High value. This indicator will correspond to the red light being lit on the upper left hand corner of your Logical Controller II.</p>



## Section 5.2: Job Parameters

The job parameters are read directly from the Logical Controller II and printed in the corresponding input boxes on the Logical Machines ROAD user interface. These parameters are editable simply by inputting the desired values in the box and hitting the 'Enter' key on the keyboard. For faster modifications the user can simply edit and tab through all the options, either hitting Enter after each input or at the end. Additionally the user can click on the 'Edit Job' button in the controller commands to upload the edited values to the Logical Controller II. If there is a dribble gate installed and enabled on the Logical Controller II, a parameter for Dribble Delay will also appear in the Job Parameters.

Job Parameters	
1. Bulk Cutoff Weight:	0.8
2. Bulk Motor Speed:	65
3. Dribble Cutoff Weight:	0.95
4. Dribble Motor Speed:	40
5. Target Weight:	1
6. Final Check High:	1
7. Final Check Low:	1
8. Drop Open Delay:	1
9. Drop Closed Delay:	1

Within Logical Controller II, the value for Mode DribGate is set to 'OFF'.

Job Parameters	
1. Bulk Cutoff Weight:	0.8
2. Bulk Motor Speed:	65
3. Dribble Cutoff Weight:	0.95
4. Dribble Motor Speed:	40
5. Target Weight:	1
6. Final Check High:	1
7. Final Check Low:	1
8. Drop Open Delay:	1
9. Drop Closed Delay:	1
10. Dribble Delay:	0.8

Within Logical Controller II, the value for Mode DribGate is set to 'ON'.

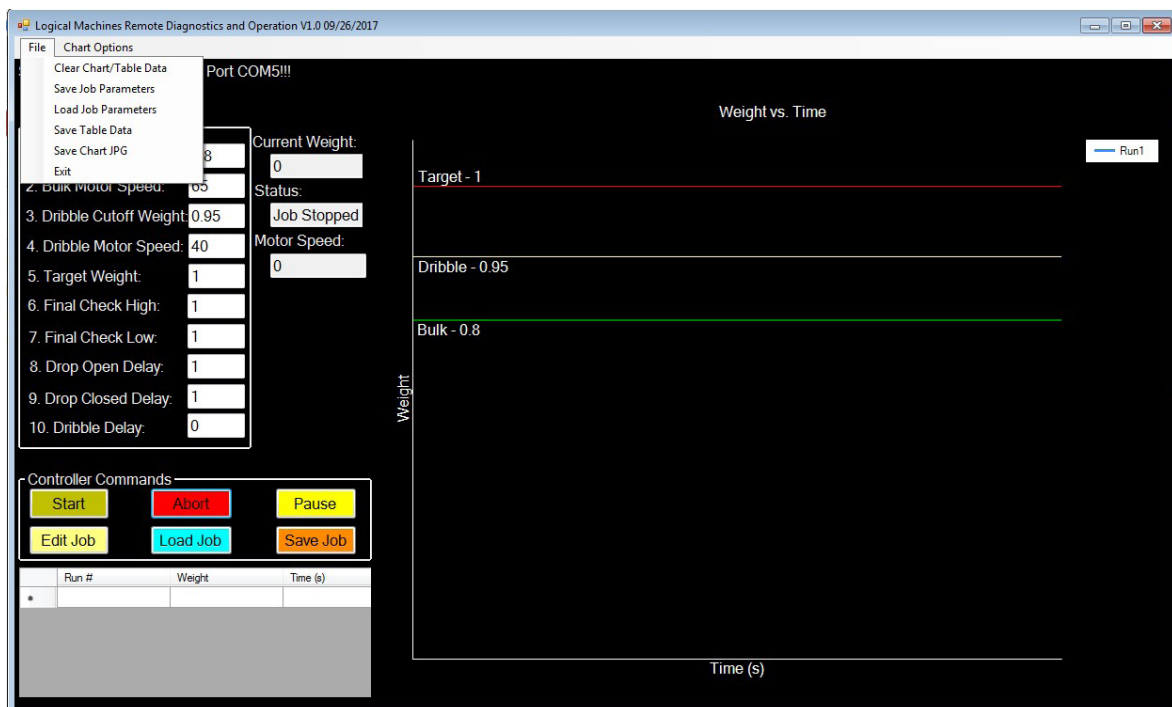
## Section 5.3: Remote Control

The remote control feature of the Logical Machines ROAD system allows the user to fully control their Logical Machine from a computer. Six controller commands are currently integrated into the ROAD software. These commands are Start, Abort, Pause, Edit Job, Load Job, and Save Job.

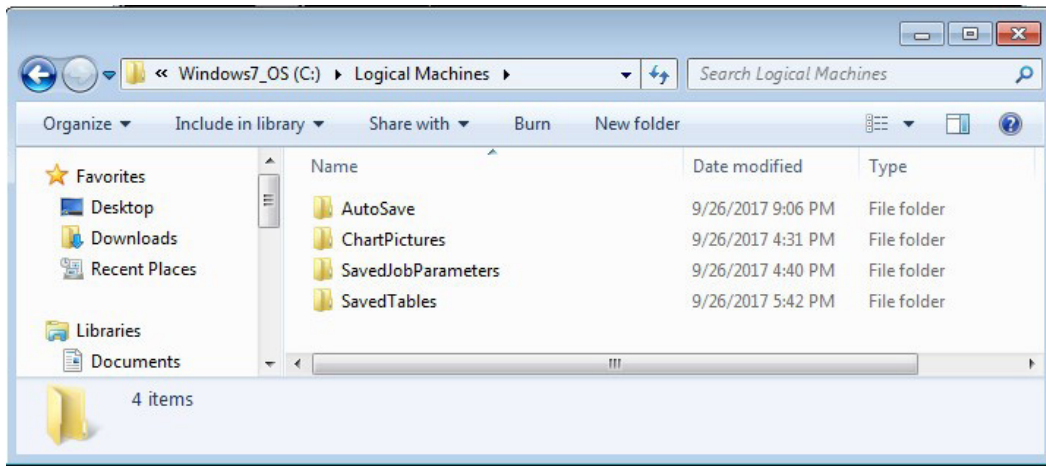
<div>Start</div> <div>Dump</div>	The <b>Start</b> button serves the purpose to begin weighing. This is the same as pressing the footswitch. It will also serve as the dump command if 'Auto Dump' is not enabled.
<div>Abort</div>	The <b>Abort</b> button quits the current weighing cycle. This command is just like hitting the 'Home' button during weighing cycle.
<div>Pause</div> <div>Resume</div>	The <b>Pause</b> button will halt the test. Additionally it will resume the test when it is paused. This also acts the same as the footswitch.
<div>Edit Job</div>	The <b>Edit Job</b> button will load the job parameter values from the ROAD user interface into the controller. The alternate method to download the parameters from the ROAD user interface to the Logical Controller II is by hitting the 'enter' key on the computer keyboard after changing values.
<div>Load Job</div>	The <b>Load Job</b> button allows the user to recall any job 1-99 from the Logical Controller memory. Additionally the user can choose to load a job from the File > Load Job Parameters option.
<div>Save Job</div>	The <b>Save Job</b> button allows the user to save the current job to the Logical Controller memory once the parameters have been.

## Section 5.4: Saving Data

There are three main types of data that the user can save within the Logical Machines ROAD software. These data types are Table Data, Job Parameters, and Chart images. All of these save options are available via the File menu at the upper left hand corner of the ROAD user interface. All of this data is intended to be saved in the C:\Logical Machines directory in its corresponding directory, however, the user can choose to save the data where they like.







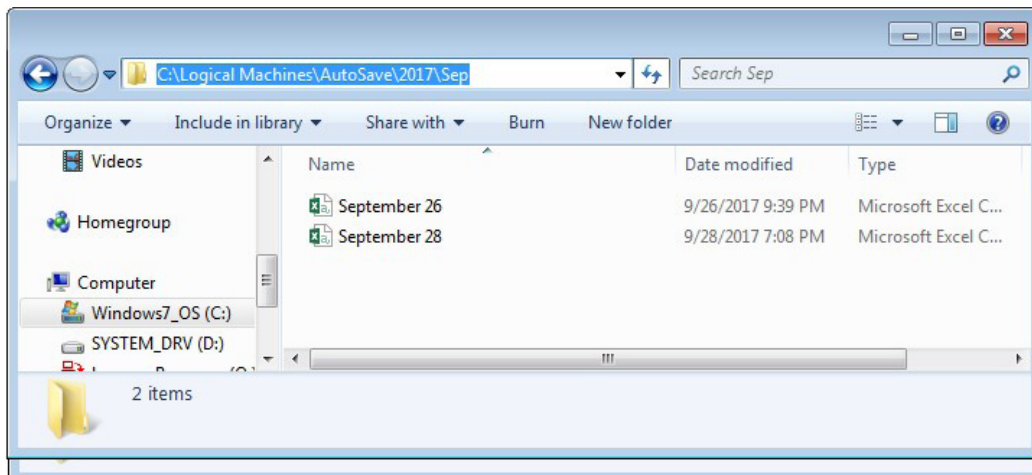
If the user clicks the **'Save Chart JPG'** option under the file menu, they will be prompted to input a file name such as '1 pound coffee'. The format of this file will be .jpg. The ChartPictures directory is intended to be used for saving images of the chart. For convenience, the image saved when choosing 'Save Chart JPG' is actually just a screenshot of the entire ROAD user interface so the user can reference the job parameters when reviewing data.

If the user clicks the **'Save Job Parameters'** option under the file menu, they will be prompted to input a file name such as '10 pounds of pellets'. The format of this file will be .txt. The SavedJobParameters directory is intended to be used for any job parameters that the user would like to save locally on their computer. These parameters can be saved as '1 pound of coffee' or '10 pounds of pellets' so the user can easily recognize which file corresponds to which product.

If the user clicks the **'Save Table Data'** option under the file menu, they will be prompted to input a file name such as '1 pound of popcorn'. This file will be in .csv format and will contain the run number, the final weight of each run, the total time to achieve final weight of each run, and a time stamp when each run was completed. The SavedTables directory is intended to be used for any table data that the user would like to save locally on their computer.

The AutoSave Directory is set up to automatically save all data that is taken while the Logical Machines ROAD software is running and is attached to a Logical Controller II. It will export the run number, the final weight of each run, the total time to achieve final weight of each run, and a time stamp when each run was completed in .csv format. The AutoSave directory is located in C:\Logical Machines\AutoSave and stores data in the following manner:

C:\Logical Machines\<Year>\<3 Digit Month>\<Day>.csv



## Technical Support

For Technical Support, contact Nic Reynolds

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