

# Manual operation of the Falling Rod Viscometer Software for Windows

## 1.0 Introduction:

This windows application is designed to operate with the Model AV-2000 Automatic Viscometer, the Duke Viscometer Conversion Model DC-2008 the manual Laray Viscometer or the Kershaw Instrumentation FRV Viscometer.

When this application is used with the AV-2000, all of the operational functions including data entry will be done automatically. When this application is used with a manual viscometer the data is entered manually. The mathematical algorithms are the same for both the automatic and manual models.

When using the manual data entry method, many of the parameters associated with the automatic functions will be ignored. The following process will get you started.

## 2.0 Installation:

2.1 Install the CD into your computer.

2.2 Double Click, " My Computer"

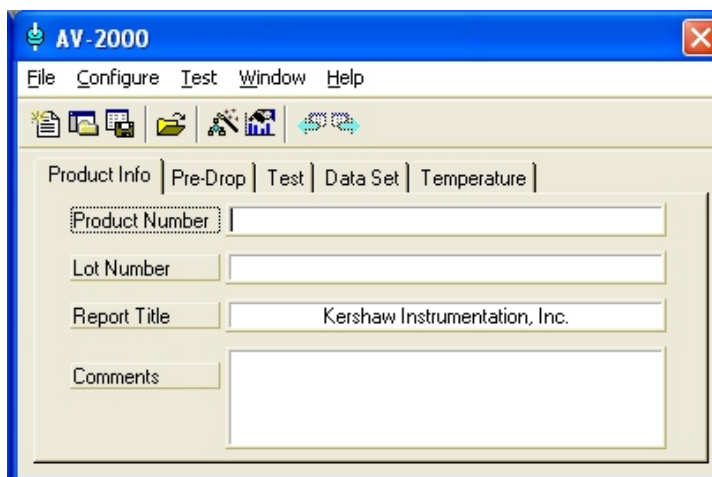
2.3 Double Click, " AV-2000"

2.4 Double Click, "Set-up"

2.5 Upon start-up, you will need to enter the 10 digit license key found inside the Jewel case.

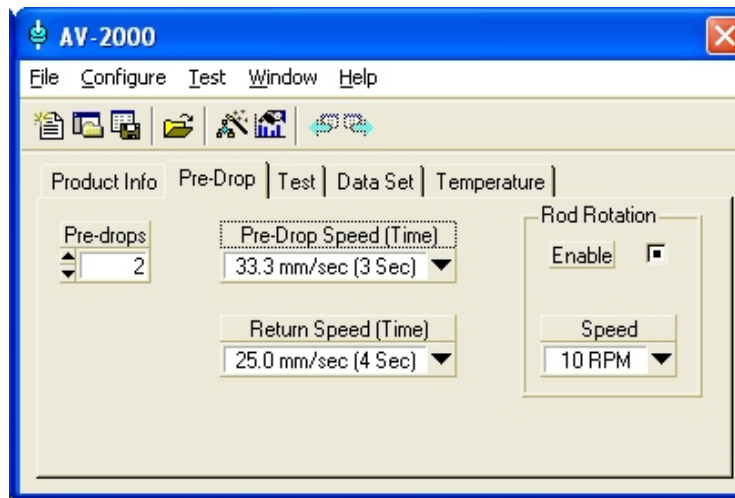
## 3.0 Start- up

Once the installation is complete, upon start-up you will see the main menu as shown below . This main menu contains 5 tabs which allow the operator to build a test "project" as desired. we will discuss the 5 tabs at this time.



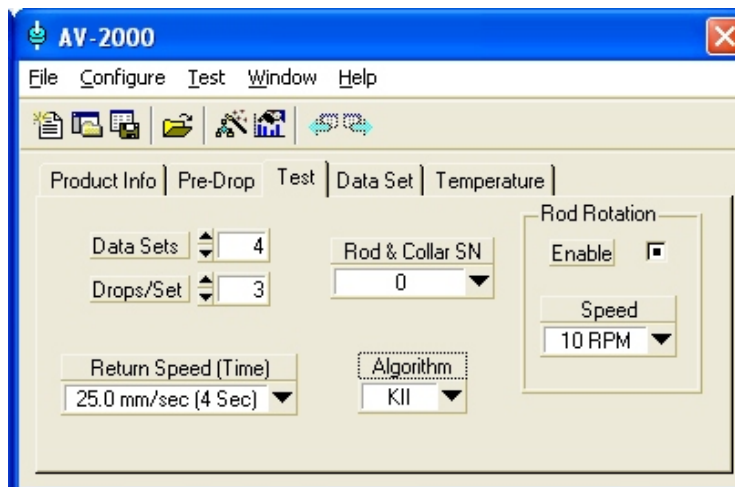
### 3.1 Product Info Tab

The information entered into this tab will be printed on the report.



### 3.2 Pre-Drop Tab

This is only used with the automatic Viscometer, not needed for manual entry of the data.



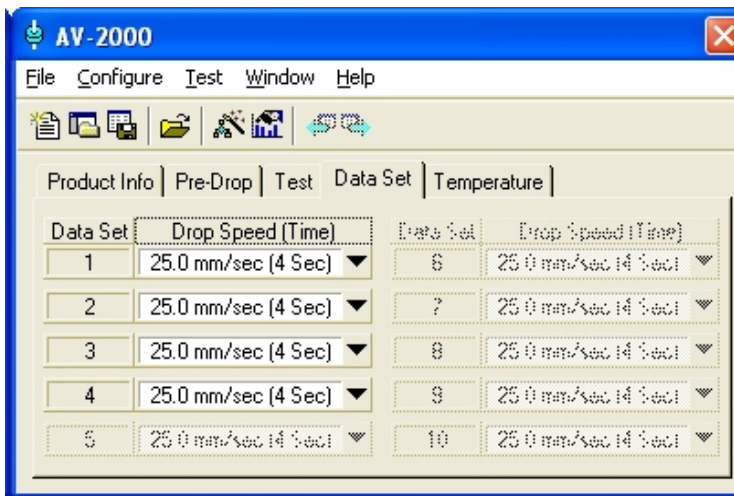
### 3.3 Test Tab

For manual data entry you will need to enter the number of data sets, and the number of drops.

The Rod and Collar serial number will be entered during the calibration section. You will need to select the proper number upon running a test.

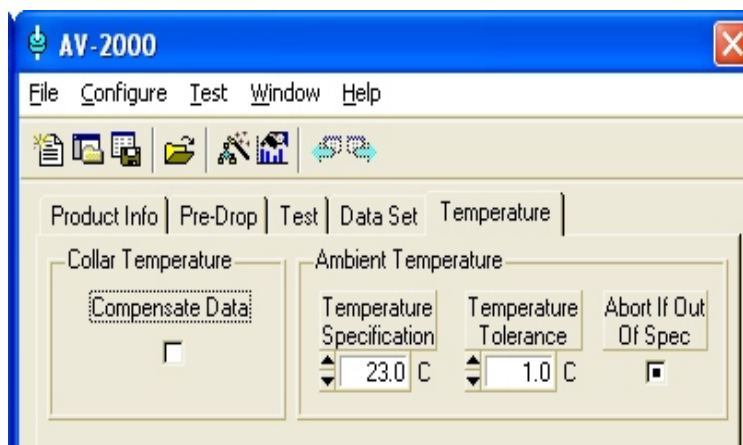
This system feature 2 Algorithms. The one is modeled after the ASTM specification and the other is the Kershaw Instrumentation Inc (KII) standard method. The operator has the option of calculating the viscosity and yield values using either method using the “algorithm” selection box.

The Return Speed and Rod Rotation boxes are not needed for manual entry of the data.



### 3.4 Data Set Tab

This tab is not needed for manual entry of the data.



### 3.5 Temperature Tab

Collar Temperature, compensate Data:

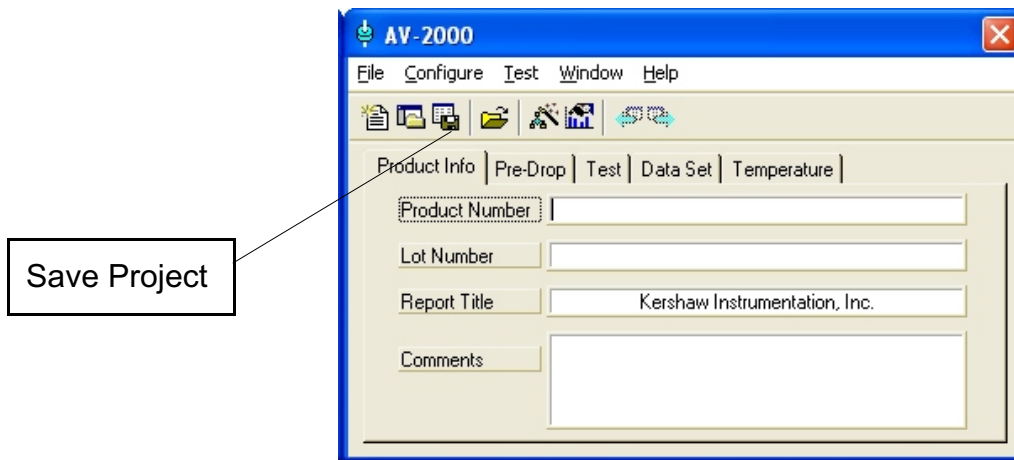
Checking this box will force the algorithm to compensate for temperature at each and every data point. The operator will have to enter the collar temperature for each data point. If the box is left unchecked the operator will only have to enter the temperature one time.

Ambient Temperature:

This tab is not need for manual entry of the data.

#### 4.0 Test Project.

Once the 5 tabs have been set up to your specification this information can be saved for future use. Different projects can be saved to meet the requirements of different products, customers and operators. This project is saved with the following icon.



#### 5.0 Rod and Collar installation

In order to operate and calibrate the system you will need to enter the number of the Rod and Collar used with your viscometer. You may enter the numbers of all of the rod and collars that you are using. The system will store the rod factors for each of these rod and collars. When the operator selects a rod and collar number on the "Test tab" the algorithm will use the proper rod factor. The rod and collar number(s) are entered as follows:

5.1 Click on "Configure"

5.2 Click on "rod & Collar sets...."

5.3 Click on "New"

5.4 Enter the number stamped on the rod and collar, usually 3 digits.

## 5.5 Special note about first time calibration

This next section describes the data entry process. Please note that this systems has a feature which will not allow the operator to use a Rod and collar until it has been calibrated. You won't be able to enter data using the new rod and collar you installed in section 5.0 because it hasn't been calibrated yet, however you can't calibrate the rod and collar without data. To remedy this condition we have assigned a default rod and collar serial number "0" which has been assigned a rod factor of 1.00. This rod and collar set has been placed here so you can enter data upon start up in order to calibrate the system for the first time.

First you must go back into the "test" tab on the project menu (section 3.3) and select rod number 0. Now you can proceed to section 6.0.

Once your calibration is complete, don't forget to return to the "test" tab and select the proper rod and collar set before you run any tests.

## 6.0 Calibration:

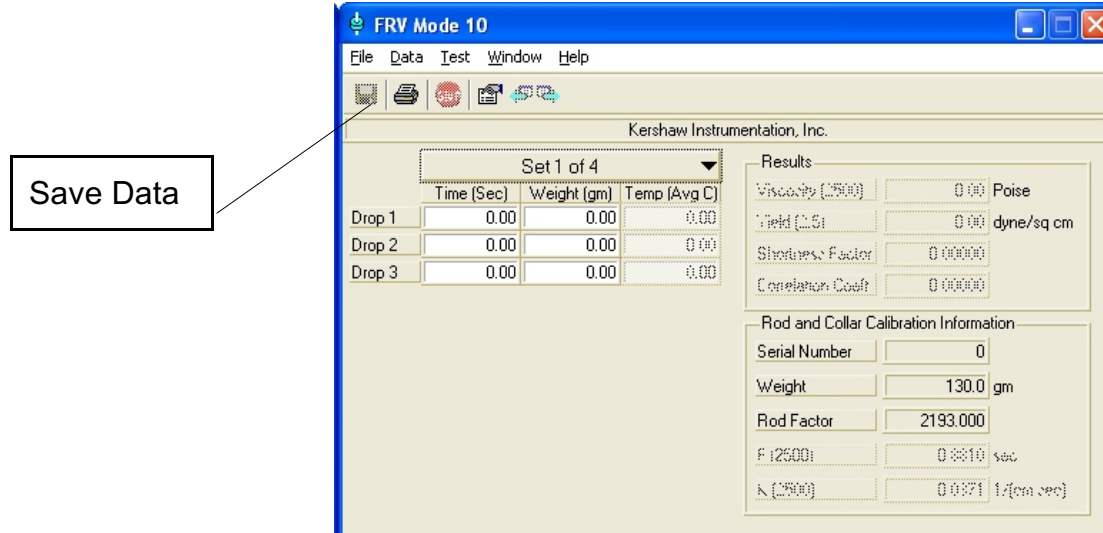
You will need to acquire some data with a known calibration fluid in order for the software to calculate the “rod factor”. We recommend a “Canon” or “Brookfield” calibration standard with known viscosity and temperature specification.

Next you will need to record the fall times using different weights. We recommend 3 drops at each of 5 weights, i.e. a total of 15 tests. Once you have run these tests with the calibration fluid you are ready to enter this data into the software thus calibrating the rod and collar. This data entry is as follows:

6.1 Click on “Test”

6.2 Click on “ New FRV Test”

6.3 Enter the data points generated from the calibration fluid into the following spread sheet



6.4 Once you have entered the calibration data set you will need to save it by using the icon shown above.

6.5 Now you will need to return to the main menu and calibrate the rod and collar as described below:

6.6 Click on “Configure”

6.7 Click on “rod & Collar sets....”

6.8 Click on the rod and collar number being used

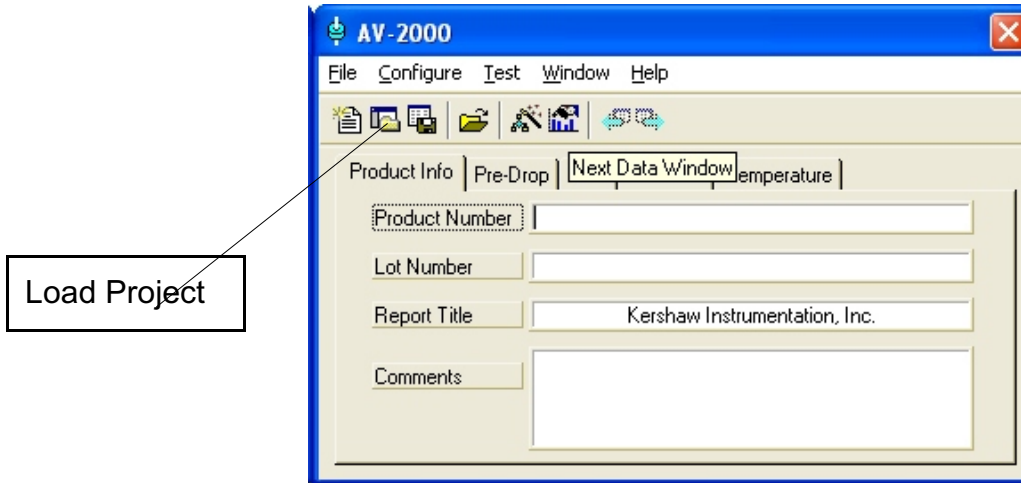
6.9 Click “Calibrate”

6.10 The proper rod factor will now be calculated and stored with the rod

and collar number for future use. Each time the operator selects this rod and collar number this calculated rod factor will be used in the algorithm.

## 7.0 Operation

You are now ready to operate the system. From the main menu the operator will first load the desired project like we set up in section 3. This is done by using the icon shown below.



7.1 Now the operator will acquire the drop times on the viscometer while entering the numbers into the spread sheet as described in section 6.1 - 6.3. Once the data has been entered the results will be displayed as shown.

