

MSA-134 Marshall Data Acquisition Software

NOTE: Please read the equipment requirements, installation, and operation instructions prior to testing. Reliable test results are dependent on the operator's knowledge of both the software and applicable test methods.

INTRODUCTION

The Marshall Stability & Flow Software automatically records and graphs load and displacement data to determine stability and flow of asphalt pavement mixtures in accordance with ASTM D6927, D5581, and AASHTO T 245. Up to three samples can be included within a single data file. The data is graphed in real time and can also be used to generate a PDF report or imported into applications such as Excel for further processing.

The Marshall Stability & Flow Software offers a variety of benefits including:

- User friendly interface
- Quick and easy installation and updates
- Generates professional testing reports
- Capable of exporting data into spreadsheet applications, such as Excel
- Optimized for both tablet and PC operation
- Compatible with Windows 10, 8, 7, Vista and XP

EQUIPMENT COMPATIBILITY AND TEST SETUP

The following is required to use Gilson Marshall Stability and Flow Software.

Data Readout Box	HM-418 or HM-419
Windows Operating System	Windows 10, 8, 7, Vista, or XP
Computer	Any tablet, PC, or laptop using Windows XP or newer.

Below is a list of Gilson equipment compatible with the Marshall Software. Please contact Gilson Technical Support to inquire about compatibility of transducers and load cells not listed.

Load Cell	HM-428D, HM-430D, or HM-438D
Displacement Transducer	HM-739 or HM-740
Load Frame (2in/min strain rate)	MS-86, MS-398 or HM-398
Marshall Breaking Head	MS-26 or MS-29

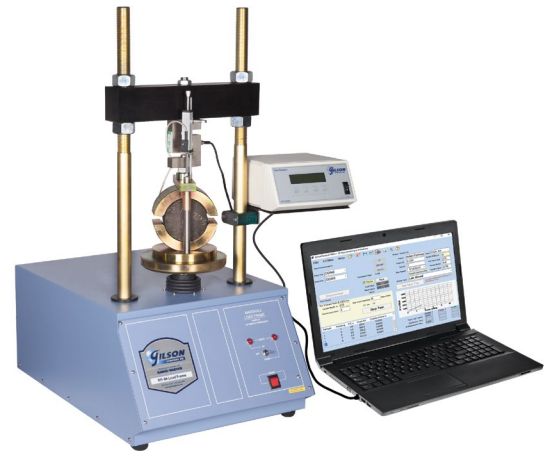


Figure 1: Typical test setup with laptop computer

Above is a typical Marshall test setup using a laptop computer. A touchscreen operated tablet or desktop PC can also be used. The LVDT and load cell are connected to the data readout box which is then connected to a tablet or PC via the mini-USB to USB cable included with the HM-418 and HM-419 data readout Boxes.

INSTALLATION

1. Two USB devices are included with the software: A Gilson flash drive containing the installation files and a small, black USB security key. Insert the Gilson flash drive into the tablet or PC to be used during testing. Navigate to the USB Drive in File Explorer then double click on the USB Drive to open the installation files. Save or copy these files locally. The software can be downloaded onto other devices to open and edit test data, but data collection is only enabled when the USB security key is attached.

If running Windows 7 or below, right click on the application titled dotNetFx40_Full_x86_x64 and select Run as administrator. Doing so will check the current version of the Microsoft .NET framework. If the .NET Framework is not installed or up to date, the most current version will be installed. If the most current version is already installed, the installer will complete with no further action.

NOTE: All software installation files and updates are also available for download on www.globalgilson.com. If you are a registered user, log into your "My Gilson Account" to access the "My Downloads" page.

- Run the **MarshallSetup** file and follow the prompts on the screen. The software should detect any previous versions and uninstall them automatically. If a Windows Installer message appears, follow the prompts and uninstall the previous version of the software. Once installation is complete, close the installer.

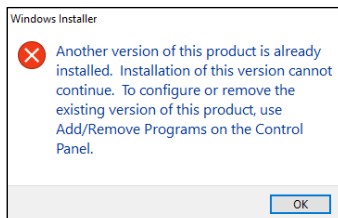


Figure 2: Installation error message

- Eject the USB containing installation files and insert the USB security key. Open the Marshall Data Acquisition Software. Click **Help** along the toolbar then select **Activation** from the drop-down menu. Enter the provided license number, USB ID, and activation code. The software will run normally for 30 days before this information is required to continue use. Activation information can be entered at any point within the first 30 days after installation.

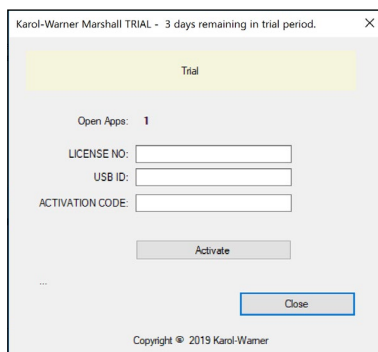


Figure 3: Activation Menu

- Establish the connection between the data readout box and the software:

- Make sure all connections to the computer and data readout box are secure.
- Select the COM port for the data readout box from the **Serial Port** drop down menu in the **Start Communications** tile. To determine the correct COM port, navigate to **Control Panel > Device Manager** and view the devices listed under **Ports (COM & LPT)**. The data readout box will appear as a USB serial port. If multiple devices are listed as a USB serial port, the correct serial port can be identified by unplugging the device from the tablet or PC then identifying which serial port disappeared from the listed devices. Once identified, plug the data readout box back into the tablet or PC and click connect.
- Once connected, the travel values will be displayed at the bottom right of the **Start Communications** tile. Gently move the displacement transducer up and down to confirm the connection. The travel value should change.

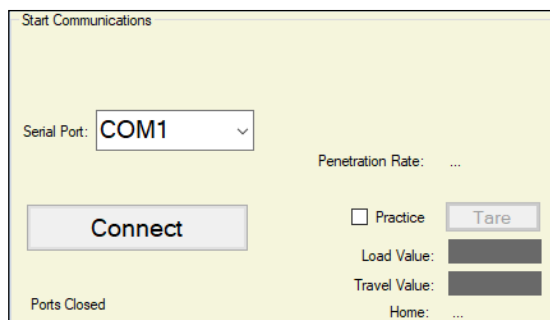


Figure 4: Start communications

SETTINGS AND CONTROLS

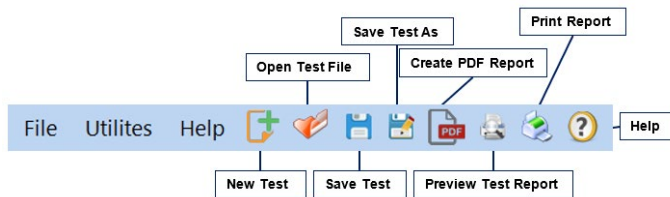


Figure 5: Toolbar

The top toolbar of the Marshall Stability and Flow Software consists of icons used to start, open, save and create test reports. These commands are also listed under the **File** dropdown menu.

The **Program Settings** can be found under the **Utilities** dropdown menu on the top toolbar. Here you can set units and toggle popup keyboards and keypads for use with touchscreen enabled devices. Company and equipment information can also be entered here. This information will be displayed on the report generated at the completion of a test. These settings remain saved for future testing.

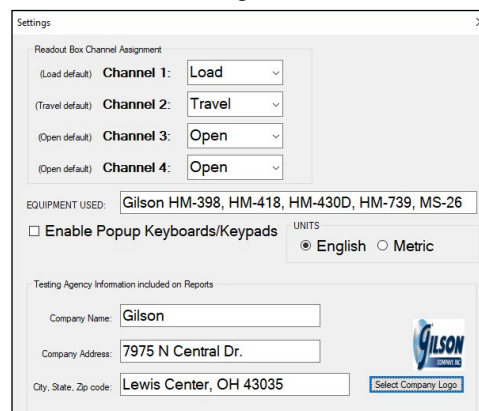


Figure 6: Program settings

Familiarize yourself with the software by using the practice feature. To use practice mode simply click on the box labeled **Practice**. When this is active, random load and displacement values are generated so that you can interact with the software as if a test is being performed.

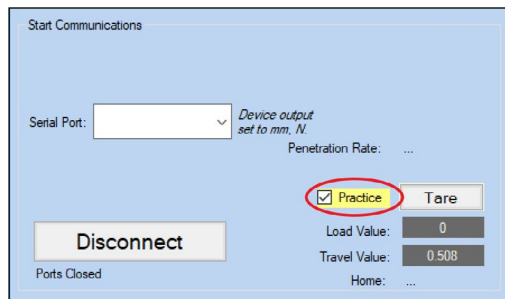


Figure 7: Practice Mode

RUNNING A TEST

1. Prepare three samples in accordance with the ASTM or AASHTO specifications.
2. Complete the fields in the **Project/Sample Info** tile (Figure 6), then click **Set New File**. You can then select where the file is automatically saved at the completion of the test. Files can be saved locally or on a network.

Figure 8: Project sample info tile

3. Complete the fields in the **Sample Tests** tile (Figure 7). The yellow fields indicate required entries for starting the test. If nothing is entered in the recording frequency box, then displacement and load data will be collected at a frequency of 1 reading per second. You can also choose when the program stops recording data by entering a load value in the field labeled **Stop when load drops below peak**. The program automatically stops the test when the measured load drops below peak load by the amount specified.

Figure 9: Sample Tests

4. The software will automatically tare the load and displacement values at the start of a test. There is no need to tare the values displayed on the readout box unless you would like to see real time readings on the data readout screen in addition to the computer screen.

5. To begin the test, click **Start Test**, the program will begin recording data. After starting the test on the program, switch the platen advance to **UP**. Once the test has been completed, lower the platen and remove the first sample. The program will stop recording data when **Stop Test** is selected. If a load drop value was entered, data will stop being recorded automatically. Once the test is stopped, **Sample 1 complete. Proceed to Sample 2** will be displayed.

6. Seat the next sample. Change the sample height value in the **Sample Tests** tile for the second sample and start the test. After the sample has been tested **Sample 2 complete. Proceed to Sample 3** will be displayed.

7. Dismount the second sample and seat the final sample, sample three. Change the sample height value in the Sample Tests tile for the third sample and start the test. At the completion of the test a message will appear reading **Test has finished. Data has been saved to selected file.**

8. A graph with test results for all three samples will be displayed in the bottom right corner of the program window. The **Project/Sample Info** tile will be highlighted to signify that the information should be changed for the next test. At this time the program can be closed, or another test can be started.

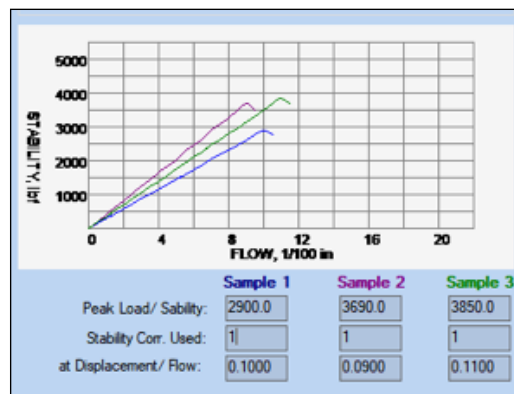


Figure 10: Graphed test results

9. The saved file can be reopened, edited and saved using the icons on the top toolbar. The test data is saved in ASCII Comma Delimited format and can be opened for further analysis and processing in spreadsheet applications such as Excel.

EXPORTING DATA TO SPREADSHEET APPLICATION

To export spreadsheet compatible test data:

1. Open spreadsheet application. Click **File > Open > Browse** to locate the test file(s). In the bottom right corner of the file explorer (Figure 13) select **All Files** from the drop-down menu.

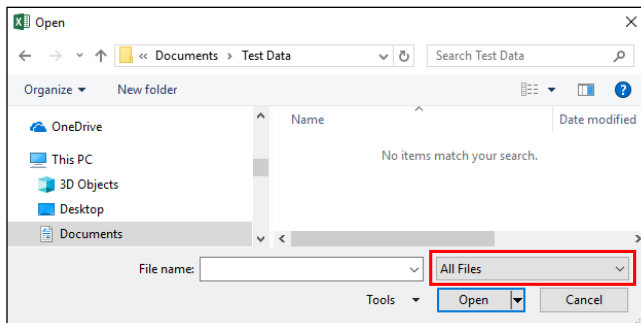


Figure 11: Excel File Explorer

2. Navigate to the test file you are trying to export.
3. Click on the file then select **Open**.
4. The **Text Import Wizard** dialog box (Figure 14) will appear. Select **Delimited** then click next.

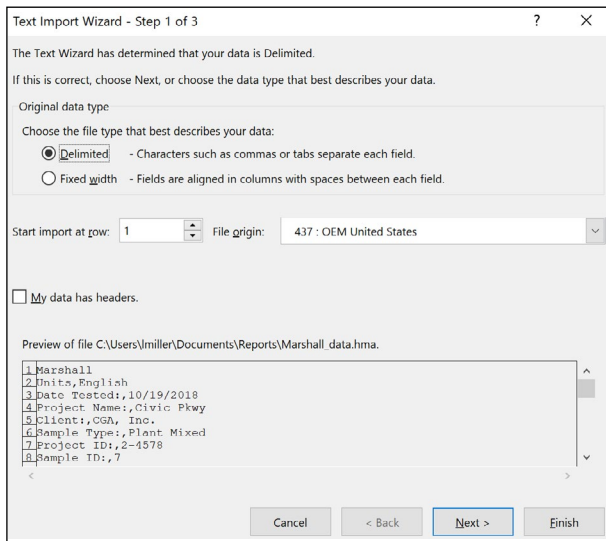


Figure 12: Text Import Wizard Step 1

5. Uncheck the box labeled **Tab** (Figure 15) and select the box labeled **Comma**. Select **Next** then **Finish**.

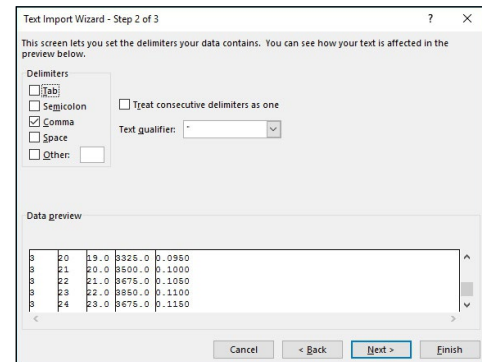


Figure 13: Text Import Wizard Step 2-3

6. The company information, sample information, and test data will be displayed on the spreadsheet.

TROUBLESHOOTING

Software is not identifying serial port connections

Confirm there is power going to the data readout box and that all connections to the box and computer are secure. Make sure all ports and connections are free of dust or debris. Open Windows Device Manager to see if the readout box is listed as a device under **Ports (COM & LPT)**. Instructions for determining the correct serial port can be found in the Installation instructions. Once the readout box appears under **Ports (COM & LPT)**, close then reopen the Software and try reconnecting.

Application License Error Message Appears

This message (Figure 16) will appear when more than the allowed number of test windows is opened. If you would like more than the currently allowed test windows to be opened simultaneously, additional licenses can be purchased. Please contact Gilson at **1.800.444.1508** or **customerservice@gilsonco.com** to purchase additional licenses.

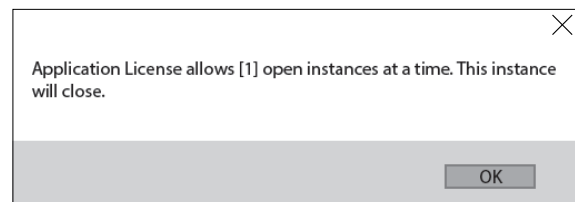


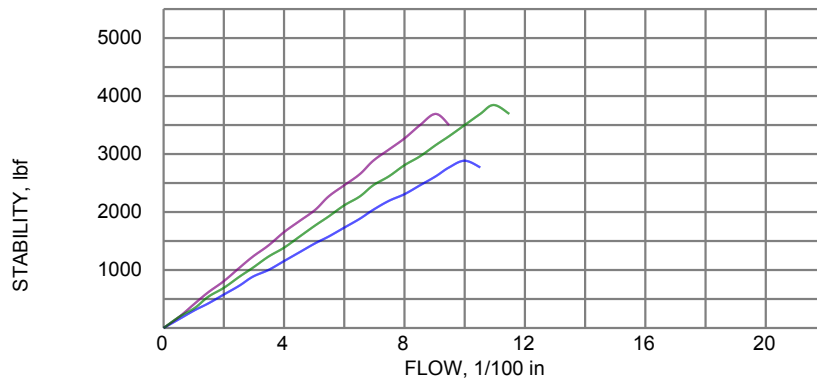
Figure 14: Application License Error Message

If you are not attempting to open more than the allowable windows open Task Manager. If you see **Marshall Test**, select it from the list then select **End Task**. Try reopening the Marshall Stability & Flow Software.

MARSHALL STABILITY AND FLOW OF ASPHALT

ASTM D6927

SAMPLE ID: 7
 DATE TESTED: 5/18/2018
 SAMPLE TYPE: Lab Mixed
 SAMPLE WIDTH, in: 4
 SAMPLE HEIGHT, in: 2.5
 AVG. BULK SPGR: 2.59
 PERCENT BINDER: 5.6
 TEST TEMP, F: 275
 RECORD FREQ, SEC: 1



SAMPLE 1

PEAK STABILITY, lbf: 2900.0 (STABILITY CORRECTION: 1)
 AT FLOW, in: 0.1000

SAMPLE 2

PEAK STABILITY, lbf: 3690.0 (STABILITY CORRECTION: 1)
 AT FLOW, in: 0.0900

SAMPLE 3

PEAK STABILITY, lbf: 3850.0 (STABILITY CORRECTION: 1)
 AT FLOW, in: 0.1100

Equipment: HM-398, HM-418, HM430D, HM-739, MS-26



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 P.O. Box 200
 Lewis Center, OH 43035

Project: Station Parkway
Project ID: 2-722
Client: CGA, Inc.