Fungilab

V·Pad

Mobile Application User Manual

History inspires us in ways that leave a lasting mark on our ideologies and beliefs. We often look toward the individuals who have come before us and relish in their accomplishments, remembering their feats and successes as the reasons we are able to flourish and grow. This motivates us to move forward, to contribute to our field in ways untapped.

Here at Fungilab, we believe that innovation paves the way for a clearer, more triumphant path into the future. We do not follow the road most traveled; instead, we make our own way, seeking the newest and most creative directions to achieve our goals.

So here we are, ready and anxious to spur a change of our own. Decades of experience have made us masters of our field, but evolution has pushed us to be even better. With locations all around the world, our global presence is heightened by our commitment to progression and ingenuity.

At the core of our values is an indelible need to support our customers with the best experience possible. In a world that can seem so large, Fungilab is ready to bridge the gap with a creativity and originality that will unite us unlike ever before.

Let's move forward together.
Fungilab Team

MOVING FORWARD

V·Pad

Software Version: 1.0
Manual Version 1.0

Mobile Application User Manual

Index

1. Introduction

Thank you for acquiring the V-Pad rotational viscometer model and corresponding mobile application from Fungilab.

The V-Pad is a rotational viscometer, based on the torque measurement of a rotating spindle in the sample at a specified velocity. Three different models (type L, R and H), as well as various accessories, allow it to cover a wide range of viscosity measurement.

The Fungilab APP is an intuitive mobile application that provides users with full functionality and control over the entire instrument.

2. Welcome Screen and Model Selection

After launching the Fungilab APP you will be guided to the welcome screen. Here you will find several options:

- **PRODUCTS:** Access the V-Pad, V-Compact, and New Product applications.
- **COMPANY**: Learn more about Fungilab's history, goals, and future initiatives.
- **NEWS**: A direct link to Fungilab's website for the latest news and updates.
- **WORLDWIDE**: A global map of Fungilab's international network and contact details.

Coming Soon:

- **FORMS**: Sign-up forms for important enhancements and services
- **DIRECT CUSTOMER SUPPORT**: Fungilab customers will have direct access to technical representatives
- **E-SHOP:** Explore Fungilab's wide range of products on an interactive online store.

3. How to Pair for the First Time

To begin testing, press the ENTER button located on the PRODUCTS display window [1]. Then, select the desired instrument from the PRODUCTS menu; you will then be prompted to pair the tablet to the equipment [2].
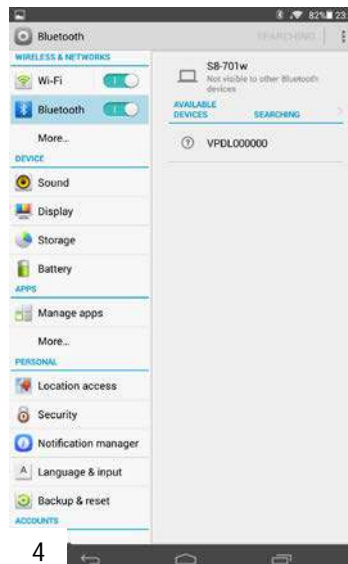
After selecting a product, the user will be prompted to pair the tablet to the device. To pair the devices for the first time, press the "+" icon on the screen [3]. This will direct you to the Bluetooth settings menu [4].

Activate Bluetooth by sliding the switch button from OFF to ON; the tablet will automatically start searching for all available devices.

Note: Click on SEARCH if an automatic search does not initiate.

Once the search is complete, select the desired device from the list (the device will be labeled with the viscometer's serial number, ex. VPDX######). To proceed, the user must verify that the device's serial number on screen corresponds to the serial number on the back of the equipment's head [5].

6

7

After selecting the desired device, a "Bluetooth Pairing Request" will appear [6]. This window will prompt the user to input the required PIN to continue [7]. Type in the 10-digit password that comes with your Fungilab product (this password is unique for each device). Press OK.

8

After pairing the tablet to the device, press the BACK arrow button on the bottom navigation bar to return to the Fungilab APP [8].

9

The following screen lists all currently paired devices—in the future, any paired devices will remain listed here for future use [9].

Once the devices are paired via Bluetooth, the user must select the numbered icon that corresponds to the desired instrument. This icon is also labeled with the device's serial number.

10

11

After selecting the desired instrument, an image of the instrument's head will appear [10]. An indicator light on both the unit and digital image will change from orange to blue [11].

The user will now be prompted to set-up the instrument.

4. Proper Instrument Set-up

12

13

The user will be guided through the following screens:

1. The user will be asked to level the device by adjusting the feet while monitoring the leveling bubble atop the head. When level, press OK to proceed [12].

2. The user will be asked to confirm the leveling bubble is centered. Press OK to proceed [13].

14

3. The user will be asked to verify that the sample area is clear and that no spindles are installed. Press ENTER to proceed [14].

15

16
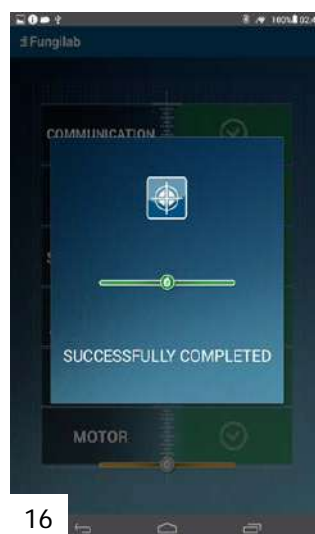
4. The device will automatically initiate an Autotest Checklist.

Note: The Autotest is activated when the viscometer is powered for the first time and after the device has been properly leveled. For future tests, it is not required to repeat the Autotest and it will no longer initiate automatically (unless the device has been disconnected from the power supply or if the device has been powered off).

5. Main Screen

Once the Autotest has successfully completed and all software and hardware components have been checked, the main screen will appear. A panel with various menus, settings and programming features will appear along the left side of the screen. Users can open the menu bar by clicking on the pull-out tab on the bottom left corner of the screen or by swiping from the left edge of the screen to the right [17].

6. Quick-start Measurements

For quick-start measurements, select the first icon labeled MEASUREMENT from the slide-out menu bar at the bottom of the screen.

The MEASUREMENT CONFIGURATION screen displays several parameters that can be modified to suit the user's testing needs: spindle selection, speed and density [19]. The MEASUREMENT screen also displays the Full Scale Range values (see Section 6.4 for more information).

6.1 Spindle

Click on the spindle button to open the Spindle Selection list. Scroll through the list to choose the appropriate spindle for the test [20].

The spindle image to the right of the selection list will change as the user scrolls through the various options. This feature helps the user verify they are selecting the appropriate spindle for their test.

To proceed, the image must correspond to the installed spindle.

The user can also click on the image to view additional information about the spindle such as: maximum allowable speed, inter-spindle value, and shear rate [21].

Note: Every time the user changes the spindle, the FSR changes accordingly.

Note: If the selected spindle is not a coaxial spindle, the shear stress and shear rate cannot be calculated.

Note: If the selected spindle is a "P" spindle, the max speed for this configuration is 12 rpm. A HELDAL must also be installed (refer to the assembly manual).

After reviewing the spindle selection, press OK to confirm that the selected spindle and the mounted spindle in the shaft match. Proceed to the next setting.

6.2 Speed

Press the speed button to open the Speed Selection list [22]. Above the selection list is a switch button to choose between Standard Speed and Custom Speed.

Note: Every time the user changes the spindle, the FSR changes accordingly.

Note: The Standard Speed list includes 55 programmed speeds. The Custom Speed list includes customized speeds that are input manually and then saved by the user for later use. Users can personalize these speeds in the Custom Menu located in the slide-out menu along the left side of the screen (for more information, refer to Section 11.2.).

Select the desired speed by scrolling through the speed selection list. Confirm the speed setting by pressing OK [23].

Note: If the incorrect speed is selected for a spindle's range, an alarm during the test will sound and the data bar at the bottom of the measurement screen will be highlighted red. Choose the correct spindle and speed combination for accurate results.

6.3 Density

Press the density button to open the number pad [24].

For kinematic viscosity values in centistokes (cSt), a density value must be input by the user. For values in centipoise (cP), a default value of 1 g/cm^3 is used.

Note: As the density value is changed, the Full Scale Range changes accordingly.

Press OK to confirm the entered density values and proceed.

6.4 Full Scale Range

Full Scale Range indicates the maximum viscosity range that can be measured in relation to the selected spindle and speed combination. The second and third FSR values indicate the suggested minimum and maximum torque percentages. Fungilab recommends that users measure within these minimum (15%) and maximum (95%) torque values.

6.5 Measuring Screen

Once all the parameters are set, press RUN to proceed to the measuring screen. At the top of the screen is a quick summary of the selected parameters, as well as shear stress (SS) and shear rate (SR) values (if the selected spindle allows it) [25].

The speed can be modified if desired; however, for modifications performed during an experiment, it is recommended that users only increase the speed. To decrease the speed while ensuring proper measurement, Fungilab recommends that users cancel the experiment and return to the initial speed selection list.

The measuring screen also displays data within three different fields: viscosity, torque and temperature. Users have the option to change the measuring units of this data (i.e., centipoise to millipascal; Celsius to Fahrenheit) by clicking on the button displaying the current measuring unit. In the center of the measuring screen is a progress bar with the maximum and minimum FSR values.

At the bottom of the screen are the PAUSE and CANCEL buttons. The PAUSE button enables the user to view and save results or modify measuring parameters to resume testing. The CANCEL button redirects the user to the home menu; all experiment data will be lost.

6.5.1 Graphic Mode

26

27
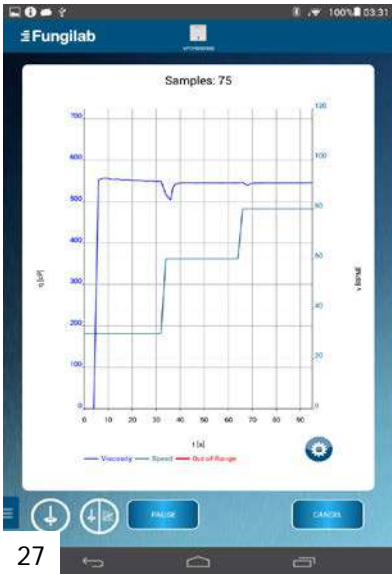
Users have the option of viewing data on a dual view display (graph and numerical values) [26] or a full-screen graph [27].

28

Switch between these two options by selecting the appropriate button on the bottom left corner of the screen [28].

29

On the graphic display, a settings button on the bottom right corner of the graph will open a display window that allows the user to change the axis configuration. Once the graph has been configured, press OK to return to the graph display or press CANCEL if no changes are necessary [29].
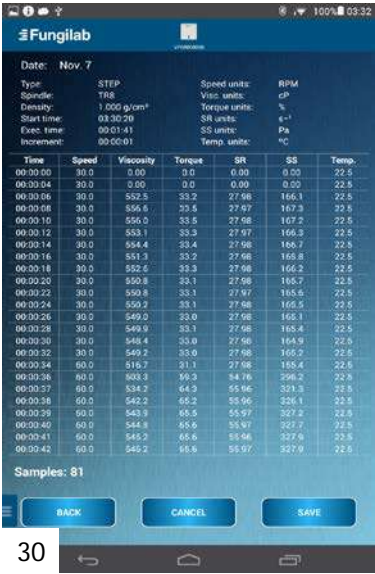
Note: This axis change is only for the experiment in progress. To change the axis for all future experiments, go to the SETTINGS menu and input all desired changes (for more information, refer to Section 11.4)

6.5.2 Results

30

To review the results of an experiment, press PAUSE and then click on the RESULTS button.

On the RESULTS display, all experiment data is organized on a clear and comprehensive table that can be saved for later use [30]. The user will also have three options at the bottom of the screen:

BACK: The user can return to the experiment screen and resume testing.

CANCEL: The user can stop the experiment completely. All data will be lost.

SAVE: The user can choose to save the data currently in view.

The table will include data parameters, such as: date of experiment, spindle selection, units, time, speed, viscosity, torque, shear stress, shear rate and temperature.

Note: If the spindle is not a coaxial spindle, SS and SR will be "0".

Note: The following symbol: (---) is displayed whenever the data is out of range.

31

To SAVE the experiment, the user will be prompted to give it a name. Input a name and press OK [31]. Saved data will be archived in the DATA STORAGE menu.

After saving the data, press BACK to resume testing or press NEW to begin a new experiment (users can also refer to the DATA STORAGE menu for additional experiment options).

7. Programs

Users can create a customized test by selecting the PROGRAMS icon from the slide-out menu bar located along the left side of the screen.

The PROGRAMS menu contains two options: click on the NEW button to create a new program or select LOAD to work with a previously saved program [33].

7.1 Creating a New Program

After clicking on the NEW button, the initial configuration screen will display three fields: program name, location and comments. These are optional and are completed at the discretion of the user [34].

The initial configuration screen will also display two customizable parameters: spindle and density. Scroll through the selection list to choose the spindle and then, input the density value required by the test on the keyboard.

Note: If the selected spindle is a "P" spindle the maximum speed for this configuration is 12 rpm. A HELDAL must also be installed (refer to the assembly manual).

7.1.1 Density

For kinematic viscosity values in centistokes (cSt), a density value must be input by the user. For values in centipoise (cP), a default value of 1.0 g/cm^3 is used.

7.2 Select STEP or RAMP

At the bottom of the screen are two additional options: STEP and RAMP. Select and configure at least one of the two to proceed.

7.2.1 STEP

The STEP configuration screen contains two scroll lists [35]:

Speed: Above the selection list is a switch button to choose between Standard Speed and Custom Speed.

Note: The Standard Speed List includes 55 programmed speeds. The Custom Speed List includes customized speeds that are input manually and then saved by the user for later use. Users can personalize these speeds in the Custom Menu located in the slide-out menu along the left side of the screen.

The second scroll list includes two additional configurations:

- Time to Stop (TTS): the experiment ends when the desired time is achieved.

Note: The "Time to Stop" field allows the user to program the desired duration of time for the measurement or experiment. Programming this field with a time limit will define the maximum duration of the viscometer's measurement. When the viscometer stops because the program is finished, the viscosity measurement will be displayed on the screen.

- Time to Torque (TTT): the experiment ends when the desired torque percentage is achieved.

Note: To measure viscosity, a spindle immersed in a sample will rotate through a spring. The "Time to Torque" field tells us how much compression the spring can tolerate before it deflects. When the overture has reached the entered torque value, the measurement in progress will stop. When the viscometer stops because the program is finished, the viscosity measurement is displayed on the screen.

Users can select between TTS and TTT by sliding the switch button located above the scroll list.

7.2.2 RAMP

36

If RAMP is selected, the user must define the start and final speed [36]. The time can be increased but the minimum time value cannot be decreased. To select the Custom Speed function, a minimum of two speeds is required.

Speed: Above the selection list is a switch button to choose between Standard Speed and Custom Speed.

Note: The Standard Speed List includes 55 programmed speeds. The Custom Speed List includes customized speeds that are input manually and then saved by the user for later use. Users can personalize these speeds in the Custom Menu located in the slide-out menu along the left side of the screen.

7.3 QC Limits

The QC Limits option allows users to select working limits within the measuring range. Users can accept or reject the results of an experiment by verifying whether the data falls within the selected QC Limits.

Users can set QC Limits for the following three parameters: torque, viscosity and temperature. Check off the box next to the corresponding parameter to display the upper and lower limit values. To change these values, click on the field to open the keyboard and input the required values (for more information on QC Limits, see Section 9).

After completing all necessary configurations, press NEXT to proceed. A screen displaying all selected parameters will prompt the user to make any final changes as required by the experiment.

7.4 Editing the Experiment

37

At any time, users can cancel the test, erase all customized configurations/settings and return to the initial program screen.

Selecting SAVE will archive the experiment in the LOAD list for future use [37].

Users can also add additional STEPS and RAMPS before clicking RUN to begin the experiment.
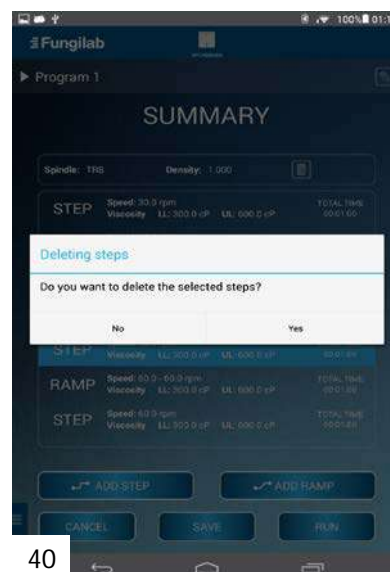

38

A long click on a STEP will give the user the option to reorganize the STEPS or delete them [38]. At the top of the list are the UP and DOWN arrows (to reorganize) and the trash icon (to delete).

39

40

By selecting multiple STEP configurations, users can delete them simultaneously with just one click. [39].

On the upper right corner is an edit button which allows the user to return to the initial configuration screen. The user will be able to modify all fields.

7.5 Initializing the Experiment

41

42

Selecting RUN will initiate the experiment. A screen will display program details, such as: spindle selection, speed, TTS and/or TTT, etc. [41].

At the bottom of the screen is a summary window containing details for each step configuration [42]. Press the arrows to navigate through the steps. The top right corner of the summary window notes the total number of steps in the experiment.

Note: During a program, the speed will be fixed and the user will not be able to modify it. The bottom of the screen also includes the STOP and CANCEL buttons.

Clicking STOP will display additional options: RESTART the experiment, view RESULTS or CANCEL to return to the initial program screen.

Note: If the experiment is not saved before clicking on RESTART, the experiment will not be saved for later use.
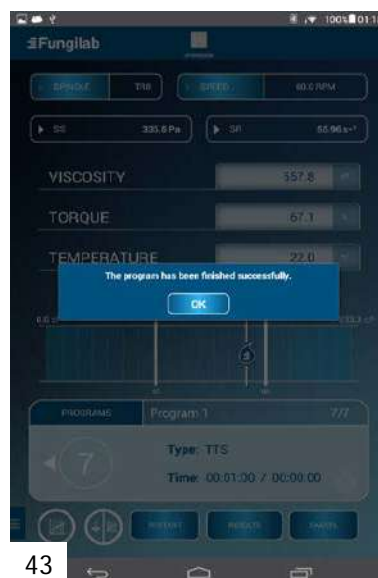
43

When the experiment has finished successfully, the following message will appear [43].

7.5.1 Graphic Mode

Users have the option of viewing data on a full-screen graph or in a dual view display (graph and numerical values). Switch between these two options by selecting the appropriate icon on the bottom left corner of the screen as indicated in point 6.5.1.

8. Calibration

The calibration menu consists of three calibration configurations [45]: Factory Calibration, Factory Reset and User Calibration.

Note: In order to access the calibration menu, no experiments can be running.

8.1 Factory Calibration:

This option can only be performed by an authorized Fungilab representative.

8.2 Factory Reset:

Completely resets the device, erases all saved data and reverts back to the original factory settings. All previously completed user calibrations will be lost [46].

8.3 User Calibration:

Allows the calibration of three parameters: viscosity, temperature and temperature offset [47].

8.3.1 Viscosity Calibration:

The viscosity calibration screen will display three parameters: spindle selection, viscosity value, and delay time [48]. By clicking on each field, the user can input new values [49][50].

Spindle Selection: This is the unique spindle that will be calibrated, while the others will maintain the factory calibration.

Note: The spindles TL, TR, LCP and P are not included in the basic spindle pack.
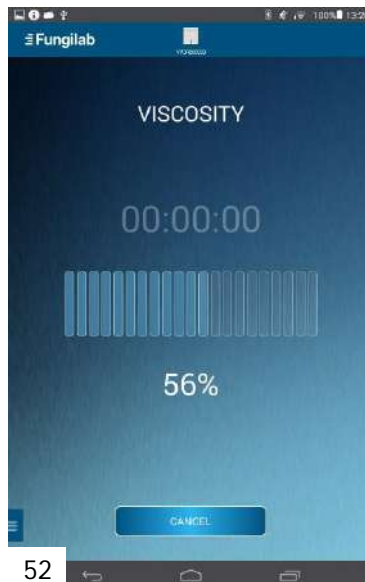
Viscosity: The known value of the liquid's viscosity at a specific temperature.

Time: A delay time in which the sample liquid is homogenized before the start of the parameter calibrations.

To proceed, press OK.

After pressing OK, an image will appear prompting the user to install the desired spindle and adjust the head to the correct vertical position (as denoted by the mark on the spindle) [51]. Press ENTER to initiate the calibration process. After the viscosity calibration is complete, the device will be ready to work.

Note: After these steps, the APP will show a deviation of the quality of the calibration. The permissible deviation should be less than 1.5% and as low as possible so that the inputted viscosity in within the calibration matches the real viscosity of the fluid [53].

8.3.2 Temperature Calibration
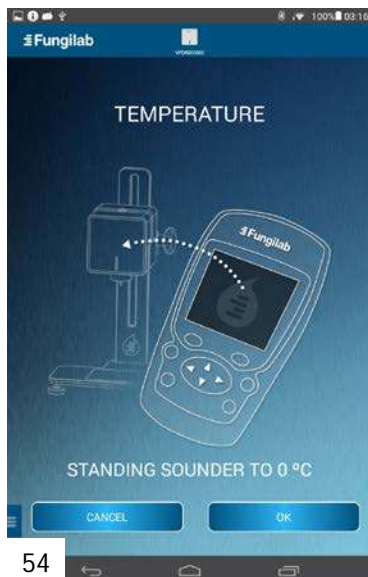
A temperature calibration requires a temperature simulator [54]. At each step of the calibration (0ºC, 100ºC and 200ºC), the simulator will indicate the temperature of the instrument.

VPAD Manual

8.3.3 Temperature Offset:

The temperature offset calibration screen displays a list with temperature deviations that the user can choose from. After selecting the desired value, press SET to complete the adjustment. The device will then be ready for testing.
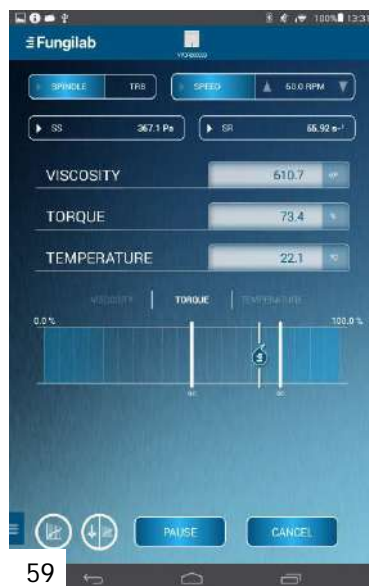
9. QC Limits

To set limits to the measuring range, select the QC LIMITS menu located in the slide-out menu bar.

58

59

Users can set limits for the following three parameters: torque, viscosity and temperature [58]. Simply click each field to open the keyboard and input the desired values. Once the limits are inputted correctly, the user must check off the checkbox of the corresponding field.

60

In order to view the QC Limits, the Y1 Axis must have the QC Limits functionality activated.

If the measured values are outside of the QC Limits range, a previously activated QC Limits alarm will sound. The QC Limits alarm can be activated in the SETTINGS menu (refer to Section 11.3).

These changes will also appear in the measuring screen of any future Quick-Start Measurements.

Note: It is important to choose a configuration (spindle/speed) that works within the selected QC Limits.

10. Data Storage

Users can access all recorded experiments in the DATA STORAGE menu located in the slide-out menu bar. The data storage screen will display a list of all previously saved tests [61]. Each experiment is labeled with a test name and the time and date the test was performed. Users can click on each experiment to view the results on a comprehensive data sheet. The results can also be edited and then exported in a PDF or CSV format.
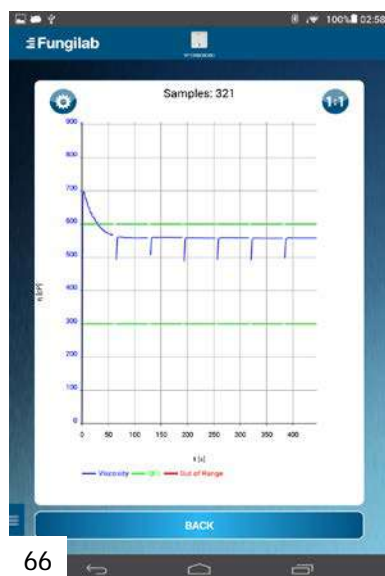

A button on the upper right corner allows the user to recover the program used to obtain these results. Users will also have the option to reproduce the experiment.

64

65
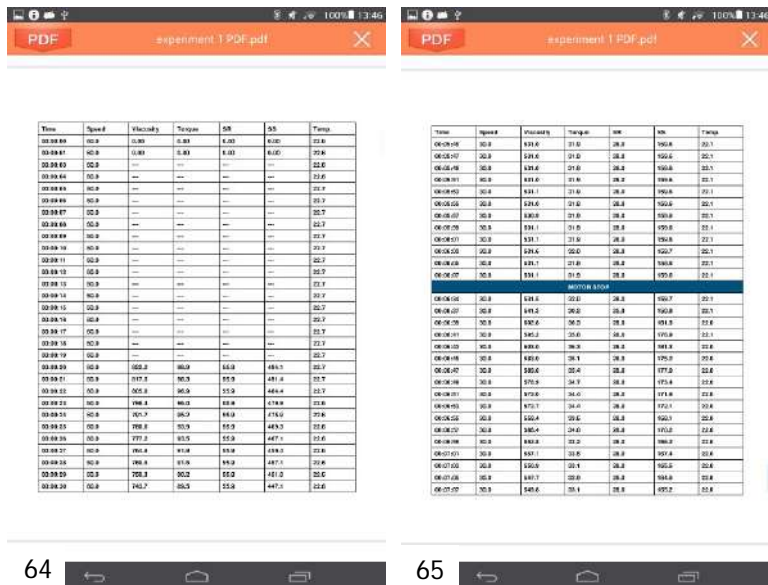
The exported PDF will also contain the same comprehensive data sheet found in the APP. The chart will include: time, speed, viscosity, torque, shear rate, shear stress and temperature values [64]. Any rotation interruptions during the test will also be shown [65].

66

67

Users can also click the GRAPH icon (located above the EXPORT TO PDF button) to plot and view the results on a clear graph [66]; edit each axis by clicking on the settings icon on the upper left corner of the graph [67]

Pinch and unpinch allows to the user to zoom in and out.
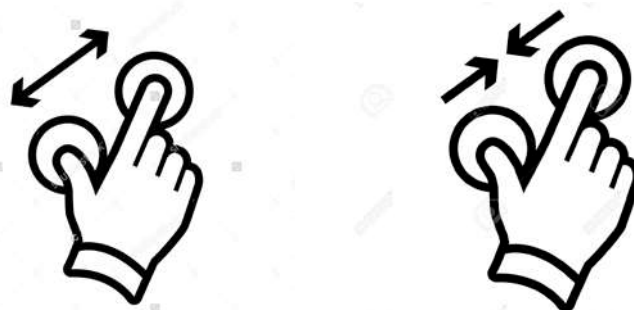
By clicking this icon the chart will return to the default view.

11. Settings

68

69

By selecting the SETTINGS icon on the slide-out menu bar, users can change the measuring units, custom speed values, activate the QC Limits alarm, customize each graph axis and input the desired sample frequency [69].

Note: A factory reset erases all modifications performed in the SETTINGS menu; all fields will return to the factory defaults.

11.1 Units

70

Viscosity units can be changed from millipascals per second (mPa·s) to centipoise (cP); Temperature units can be changed from Celsius to Fahrenheit [70].

Note:
mPa·s, Pa·s: SI (System International) measurement unit
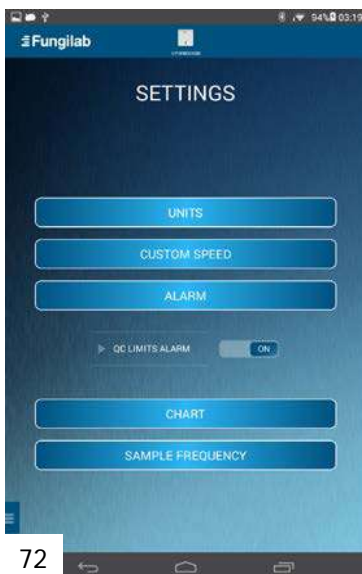cP, P: non-SI (non-System International) measurement unit

11.2 Custom Speed

71

In the CUSTOM SPEED menu, users can add and customize speed settings for future testing [71]. To delete a custom speed, long-click the desired speed and the speed will be deleted automatically. The speeds will also be reorganized automatically.
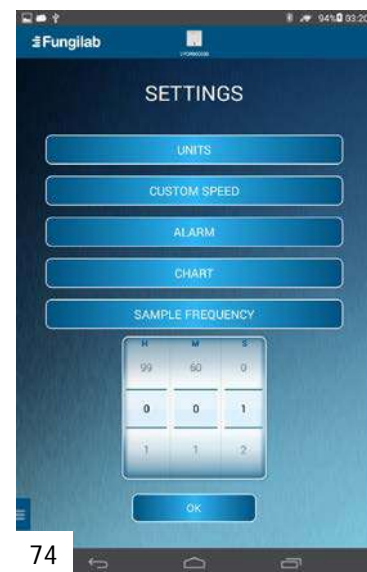
11.3 Alarm

72

In the ALARM menus, users can activate the QC Limits alarm. The audible alarm will warn the user when the measurement is outside of the QC Limits. [72].

11.4 Chart

73

In the CHART menu, users can set each axis value for the graphs as the default axis values. [73].

11.5 Sample Frequency

74

In the SAMPLE FREQUENCY menu, users can also set the frequency for data collection [74].

12. News

The NEWS menu will direct users to the Fungilab website where they can view the latest content and product updates [76][77].

13. Standards

78

In the STANDARDS menu, users can reference the various standards that the instrument conforms to [79][80][81].
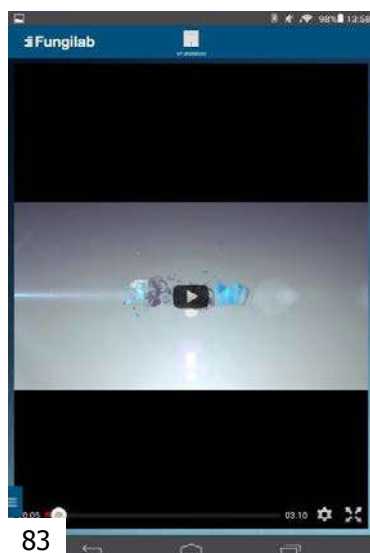

79

80

81

14. Videos

82

83

In the VIDEOS menu, users will find various Fungilab product tutorials, company information and product literature [83].

15. Info

84

85

The INFO menu will display the instrument's technical details [85]:

- Serial Number
- Firmware Version Code
- Android Version Number
- APP Version Number
- Device Number

In addition to the module on the slide-out bar, users can access the INFO button at any time by clicking on the icon located in the upper bar.
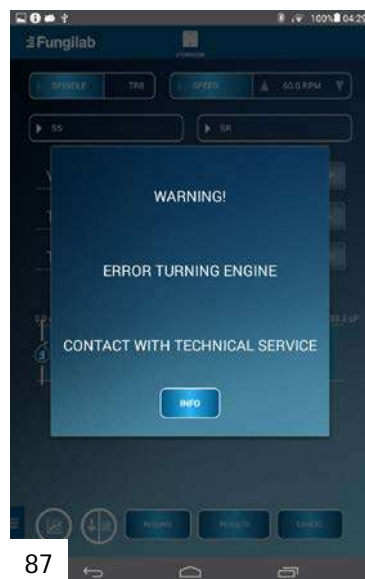

16. Error Messages

Users may experience the following error messages:
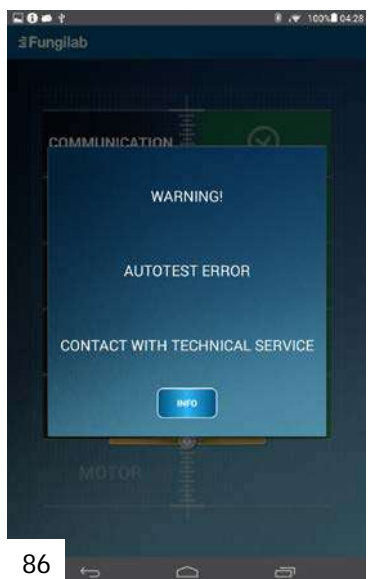
86

87

In case of an error message, contact technical service immediately. Always proceed with caution.

17. Language

For users requiring a different language than the default option (English), change the language in the settings menu of the tablet. The APP will detect the language of the tablet and change automatically. This change must be made when the APP is not active. If the selected language is not supported by the Fungilab APP, the APP will use the default language.