

OPERATING INSTRUCTIONS

DS8 One-Dimensional Consolidation Software

27-1873

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1 System Requirement

PC Software	Windows 7 or Windows 10
Minimum Hardware Configuration on PC	Processor: 1 gigahertz (GHz) or faster. RAM: 1 gigabyte (GB) (32-bit) or 2 GB (64-bit). Free hard disk space: 16 GB.

Important Information:

Please read this entire manual before installing DS8 software on a PC.
Do not use or install this software in any manner other than that specified in this manual.

2 Product Overview

This software is used to run a one-dimensional consolidation test on a SoilTest PRO Automatic Consolidation Machine (ASC).

The ASC machines use an Ethernet interface to connect to the PC running the DS8 application. Please refer to 9901X0275_1 25-0500 Auto Soil Consolidator operating instructions for configuring ethernet connection on an ASC machine.

Once the connection has been established between the DS8 application and ASC machine, the user can:-

- a) Calibrate ASC Transducers.
- b) Calculate frame deformation.
- c) Run automatic one-dimensional consolidation test.
- d) Run manual one-dimensional consolidation test.
- e) Run free swelling test as part of the one-dimensional consolidation test.
- f) View real time data logging.
- g) Auto analysis test results.
- h) Generate test report.

3 Software Installation, Update and Activation

ELE will provide a data stick to install the DS8 application on your PC.

3.1 How to install DS8 application on PC

To install the DS8 application software on a PC; select setup.exe from the ELE data stick and execute. The user will need administrative rights to install this software on a PC. The DS8 application software will be located in the "C:\Program Files (x86)\DS8" folder and a shortcut will be created on the desktop.

3.2 How to update DS8 application software on PC

Copy DS 8.X.X Executable.zip to C:\Program Files (x86)\DS8. Extract all the files at C:\Program Files (x86)\DS8. Extracting to this folder will merge the new files into the existing folders.

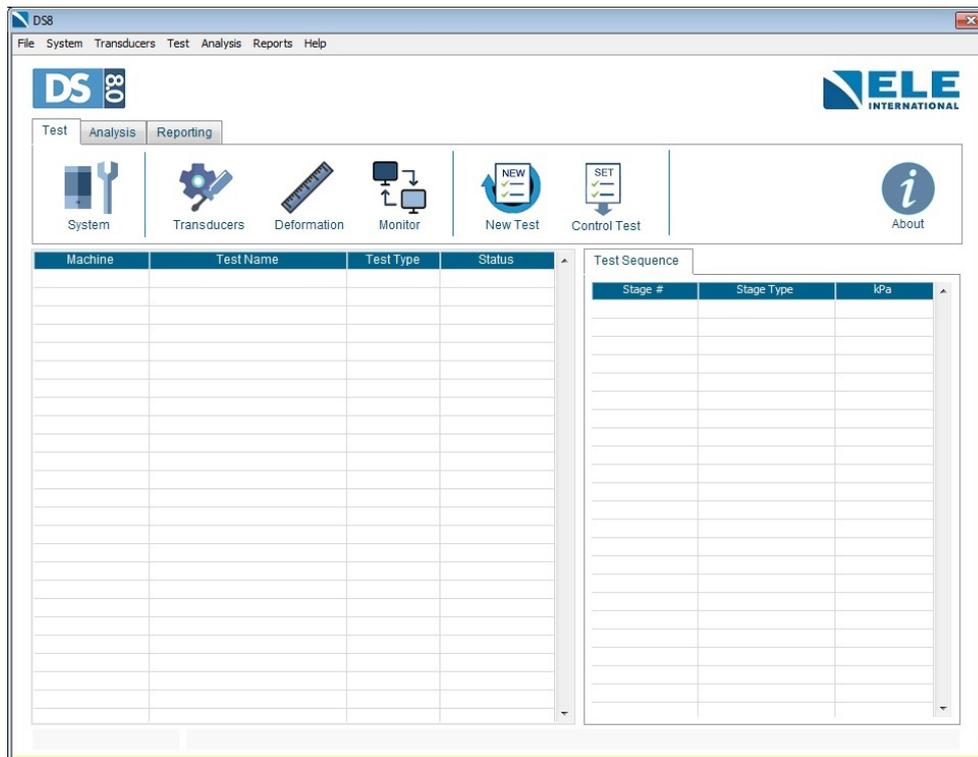
If asked, copy and replace the files with the same name.

3.3 How to connect an ASC machine to DS8 application software

Open the DS8 application software, the DS8 main screen will pop up.

Click on the Systems button to go to the system settings page.

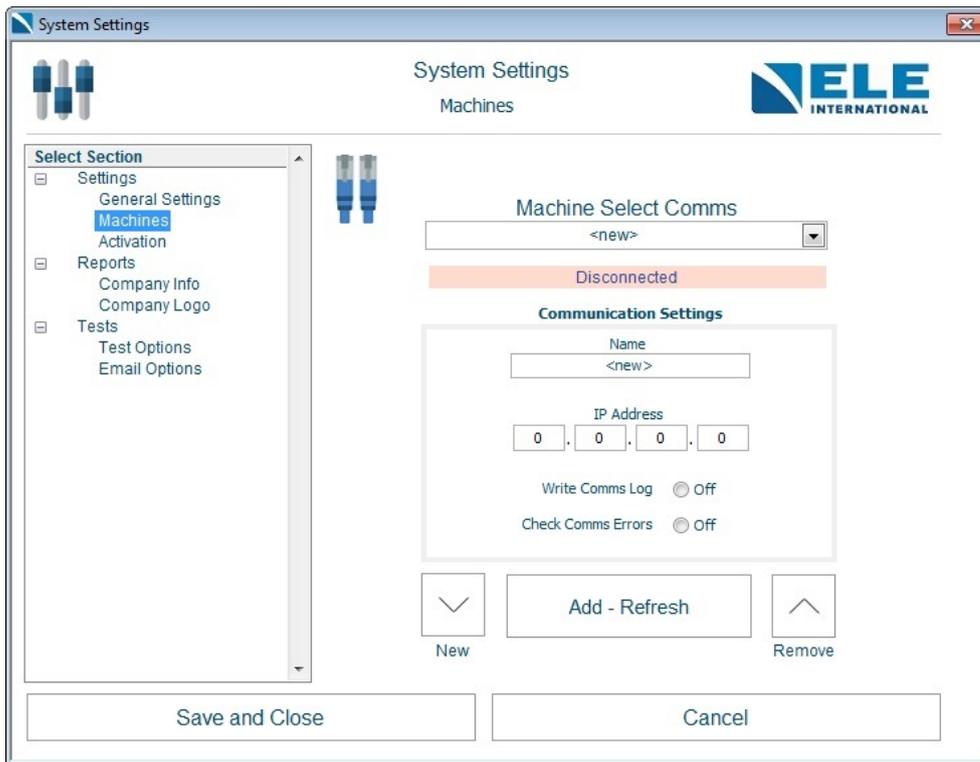
Alternatively, on the main menu, click on Systems->Comms Settings.



Click on Settings->Machines to enter the Communication Settings.

To add a new machine to the DS8 application software, click on the New [V] button. Enter Name and the IP-address for the ASC machine (check the Auto Consolidator Manual for details).

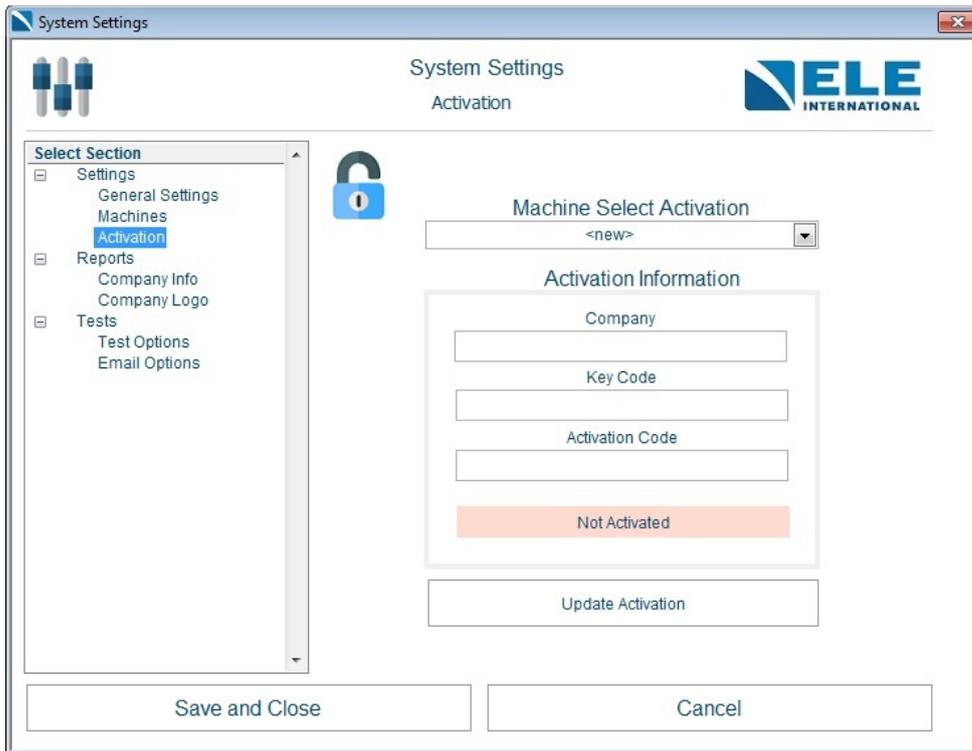
Click on Add- Refresh button to connect to the machine.



3.4 Activating the DS8 application software

Once the connection has been established, the next step is to activate the DS8 application software.

To activate the DS8 application software, in System Settings, click on Settings->Activation.



Select the machine name from the drop down menu and enter the activation information.

Key code: Once the connection is established between the DS8 application software and the ASC machine the key code will be generated automatically.

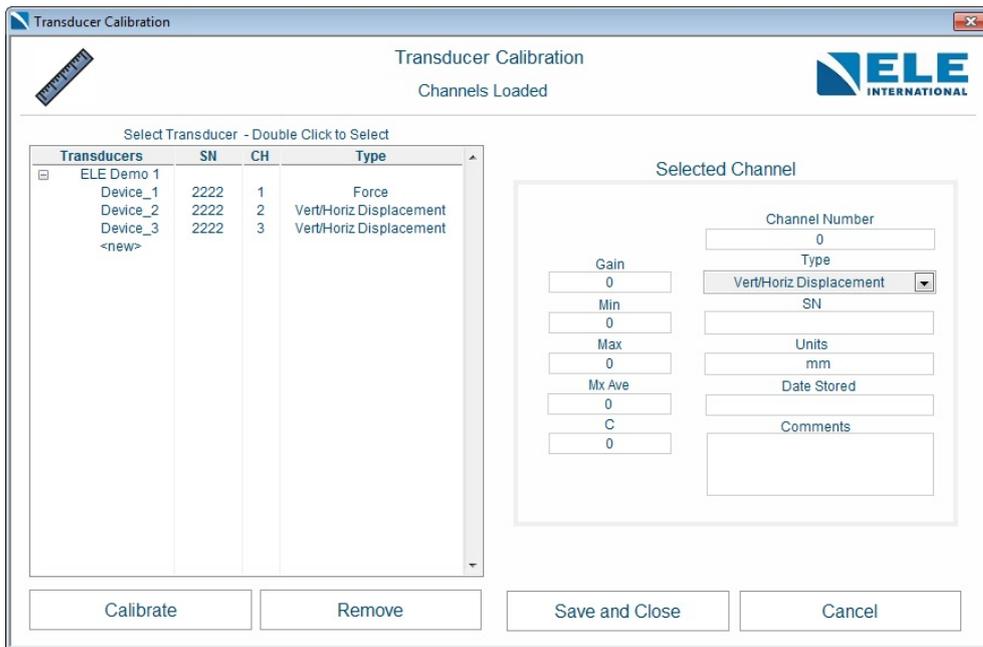
This key code should be provided to get a valid activation code. Once a valid activation code is entered, the DS8 application software will be activated and will be ready to use.

Click the Save and Close button to save the machine details.

4 Transducers Calibration

On the DS8 Main screen, click on the Transducer button to go to the transducer calibration page.

Alternatively, on the main menu, click on the Transducers>Calibration.



To add a new transducer calibration setting, click on the Calibrate button.

Select the machine from the drop-down menu.

Add the channel number, select type, enter range, add Serial Number (SN) and click on Next arrow button.

On the next page, choose the calibration method. There are two ways to calibrate transducers.

- a) Enter the calibration details: Enter the calibration details from the calibration certificate provided with transducer.
- b) Perform a 2 point calibration: To perform a 2 point calibration, follow the instructions on screen and obtain the calibration details.

Note: Please clear old calibration data from the machine to avoid overloading errors. To clear calibration data from the machine, go to scales, enter password, select Calibrate, Select Sensor, and select CLEAR.

Once the transducer calibration is complete, click on the Save and Close button.

5 Transducers Monitor

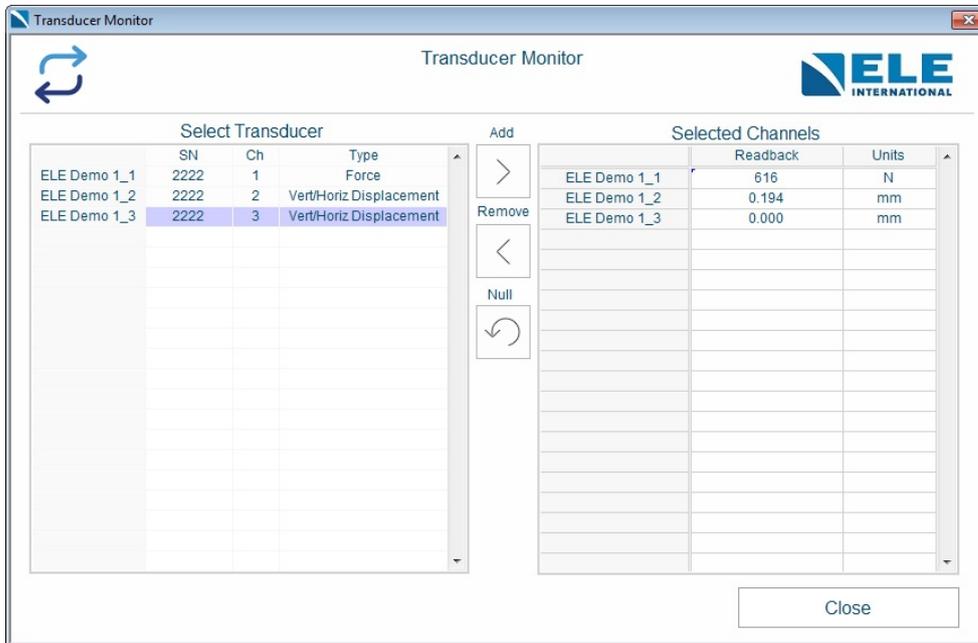
Once, the transducers are calibrated, they can be monitored using the Transducer Monitor feature.

On the DS8 Main screen, click on the Monitor button to go to the transducer monitor page.

Alternatively, on the main menu, click on Transducers>Monitor.

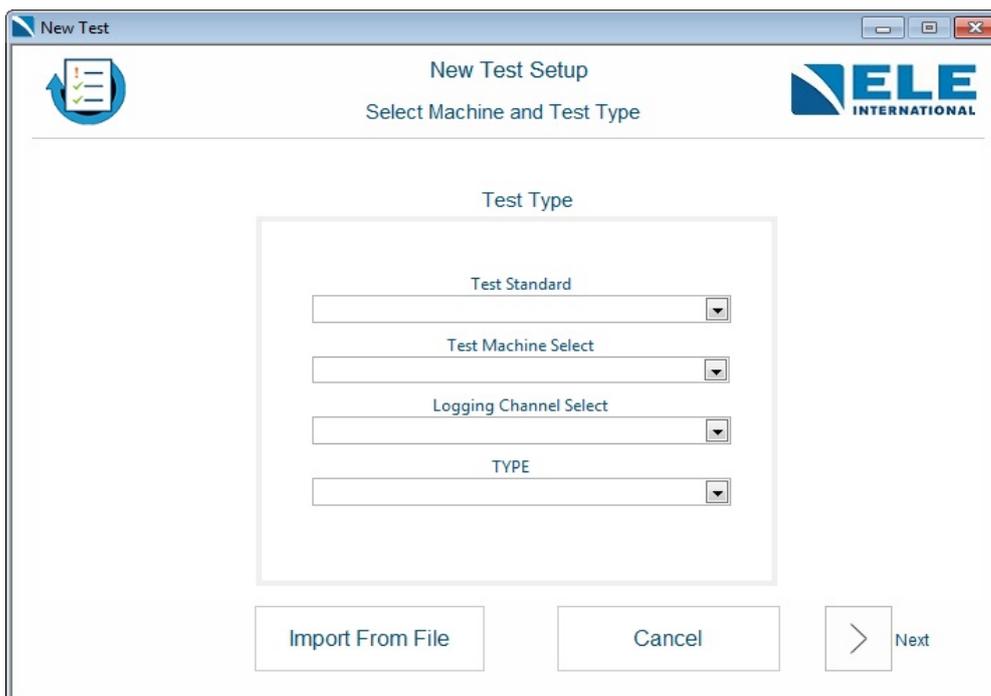
To monitor a transducer, select the transducer from the list and click the add button.

Live data for the selected transducer channel will be shown on screen.



6 Run New Test - Auto Soil Consolidation

On the DS8 main screen, click on the New Test button to go to the New Test Setup page. Alternatively, on the main menu, click on Test->New Test.



On this screen, select machine and enter the test details - Test Standard, Logging Channel and Test Type.

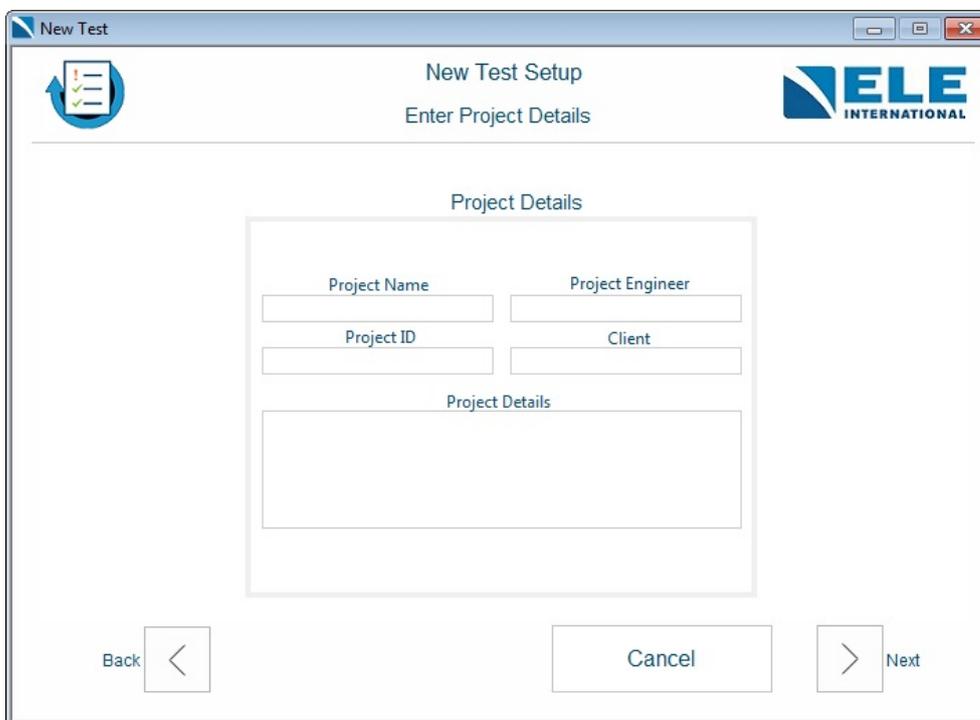
Previously Saved Test Setup information can be loaded by clicking the 'Import From File' button.

Select Auto Soil Consolidation from Test type drop down menu.

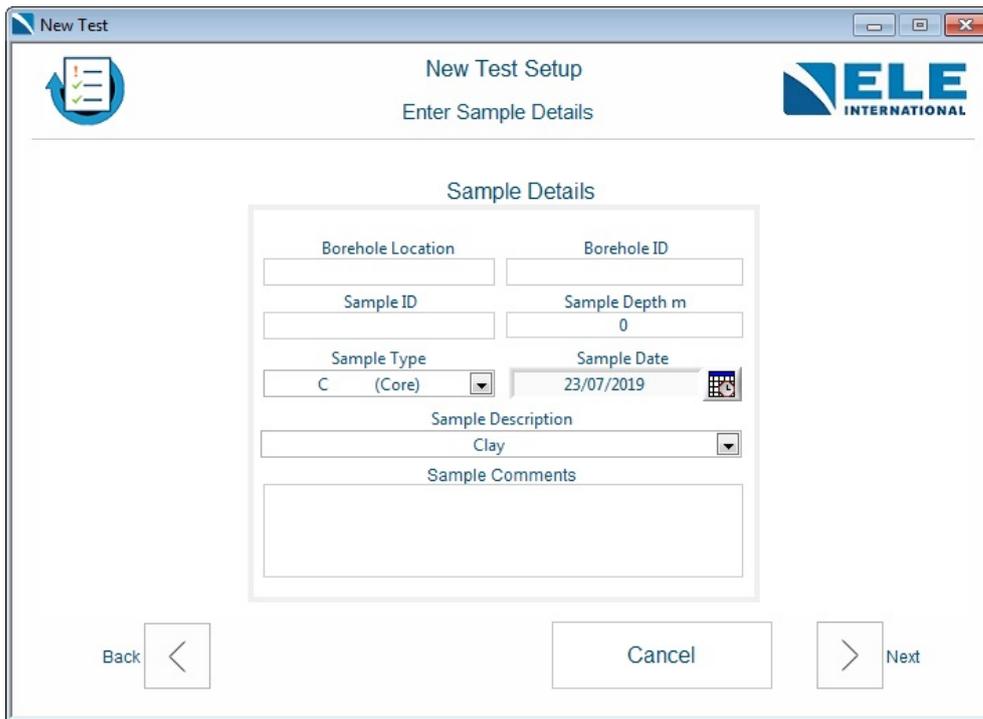
Note 1: The Test Type drop down menu will give different options but at this time only Auto Soil Consolidation and Manual One-Dimensional Soil Consolidation features are supported by the software.

Note 2: For the Auto Soil Consolidation Test type, the logging channel is always Channel 2.

Click on the Next arrow button and enter the project details.



Click on the Next arrow button and enter the sample details.

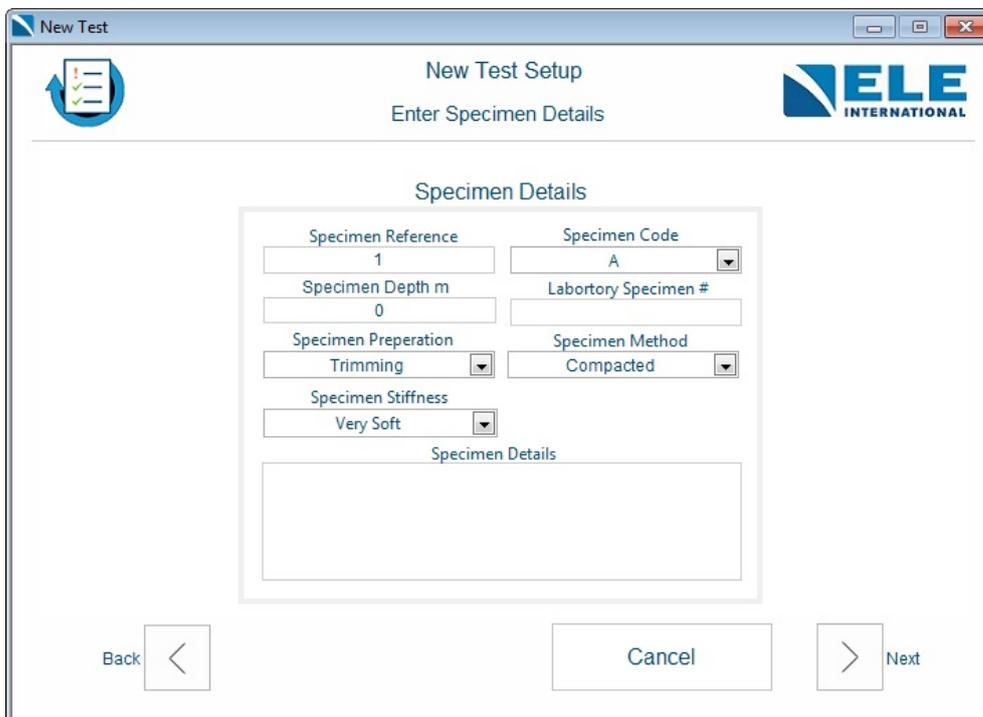


The screenshot shows a software window titled "New Test" with a sub-header "New Test Setup" and "Enter Sample Details". The "ELE INTERNATIONAL" logo is in the top right. The main content area is titled "Sample Details" and contains the following fields:

Borehole Location	Borehole ID
Sample ID	Sample Depth m 0
Sample Type C (Core)	Sample Date 23/07/2019
Sample Description Clay	
Sample Comments	

At the bottom, there are three buttons: "Back" with a left arrow, "Cancel", and "Next" with a right arrow.

Click on the Next arrow button and enter the Specimen Details.



The screenshot shows the same software window, but now titled "Enter Specimen Details". The "ELE INTERNATIONAL" logo is in the top right. The main content area is titled "Specimen Details" and contains the following fields:

Specimen Reference 1	Specimen Code A
Specimen Depth m 0	Laboratory Specimen #
Specimen Preparation Trimming	Specimen Method Compacted
Specimen Stiffness Very Soft	
Specimen Details	

At the bottom, there are three buttons: "Back" with a left arrow, "Cancel", and "Next" with a right arrow.

Note : The Specimen Stiffness drop down menu will give the following options:-

- Very Soft
- Soft
- Firm
- Stiff
- Very Stiff

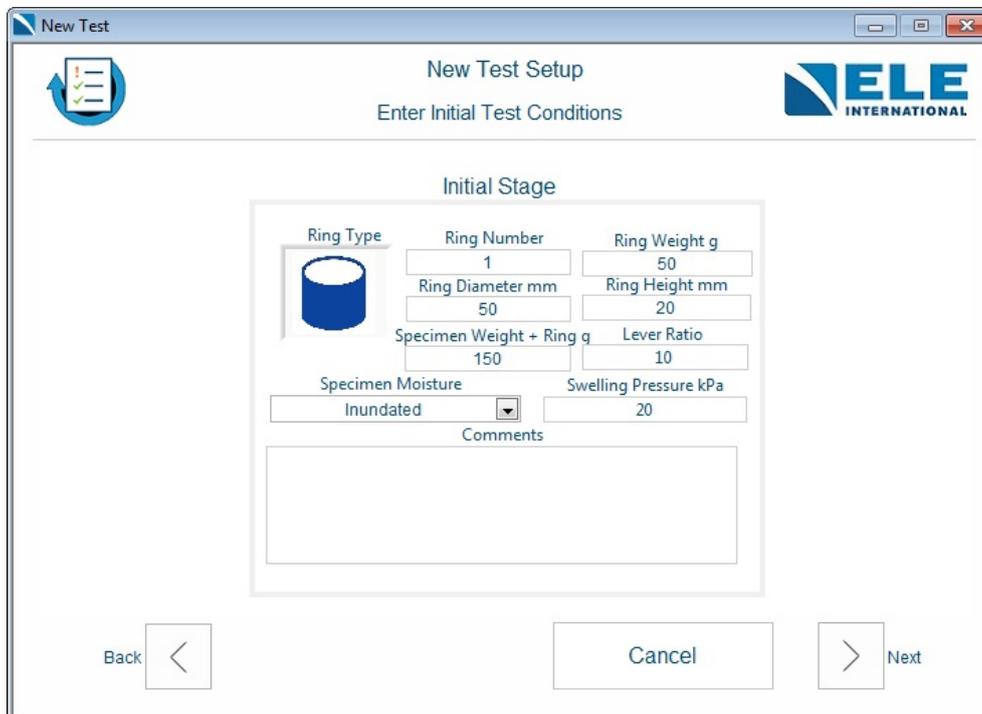
It is very important to select an appropriate specimen stiffness level in order to get smoother transition to applied load.

We recommend the use of the ELE pocket penetrometer (29-3729) to measure the stiffness level for the given specimen and use the following guideline table to select the Specimen Stiffness level.

Guidelines for selecting the specimen stiffness based on the penetrometer values:-

- Very Soft 0 - 0.25
- Soft 0.25 – 1
- Firm 1 – 1.75
- Stiff 1.75 – 3
- Very Stiff > 3

Click on the Next arrow button and enter the Initial Test Conditions Cell Details -Ring number, Ring Weight, Width and Height. Specimen Moisture and Swelling Pressure.



Ring Type	Ring Number	Ring Weight g
	1	50
	Ring Diameter mm	Ring Height mm
	50	20
	Specimen Weight + Ring g	Lever Ratio
	150	10
Specimen Moisture	Swelling Pressure kPa	
Inundated	20	

Comments

Back < Cancel > Next

Note :

The Specimen Moisture drop down menu will give the following options:-

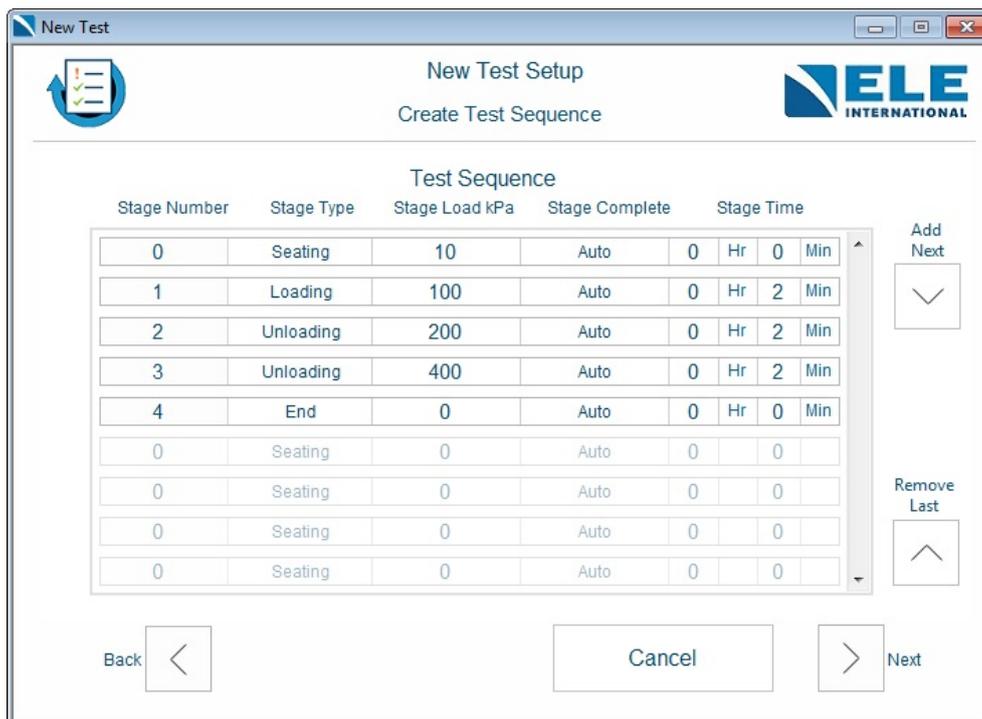
- Natural Content
- Inundated
- If the Specimen Moisture is selected as Natural Content, no swelling pressure will be added to the test stages.
- If the Specimen Moisture is selected as Inundated, swelling pressure will be added to each stage load during the test. User may enter swelling pressure value at this stage if known.

Click on the Next arrow button to set up a test sequence.

The test sequence starts form stage 0 which is the ‘Seating’ stage and ends with the ‘End’ stage. Stage time entered for these stages will not be taken into account by the software and no data logging will be done in these 2 stages.

Between ‘Seating’ and ‘End’, the user can program the loading/unloading stages. Up to a maximum of 15 stages can be programmed.

Creating a test Sequence:



Enter the seating load value.

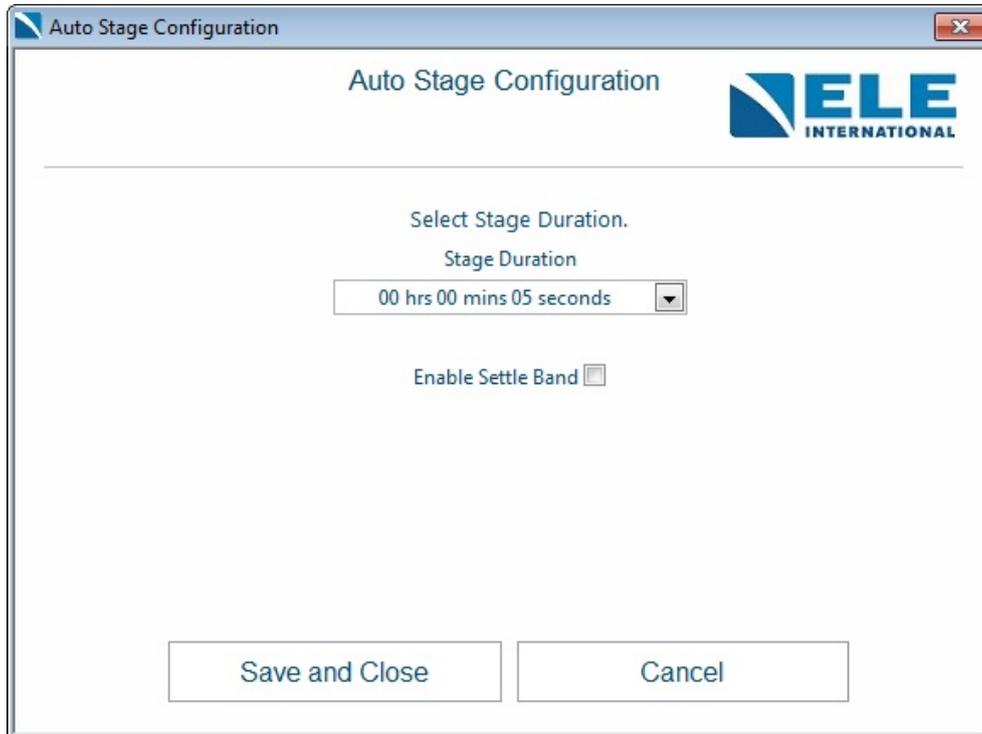
Add a new stage by clicking Add Next arrow button.

Select the stage type Loading/Unloading.

Enter the Stage load.

Select Stage Complete - Select Manual to set up the stage time as 3 days or Select 'Auto' from Stage Complete drop-down menu to select stage time from a drop-down menu.

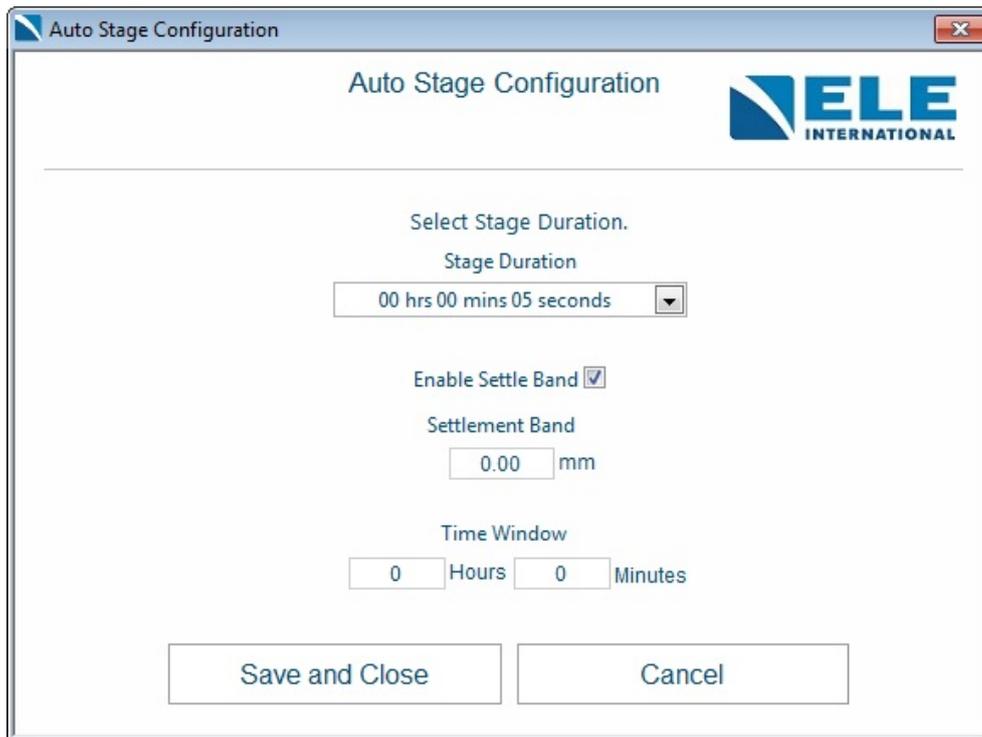
Click on Stage Time to select time and the 'Auto Stage Configuration' page will pop up.



Select Stage duration from the drop-down menu.

Select the option 'Enable Settle band' to program the settlement band and time window.

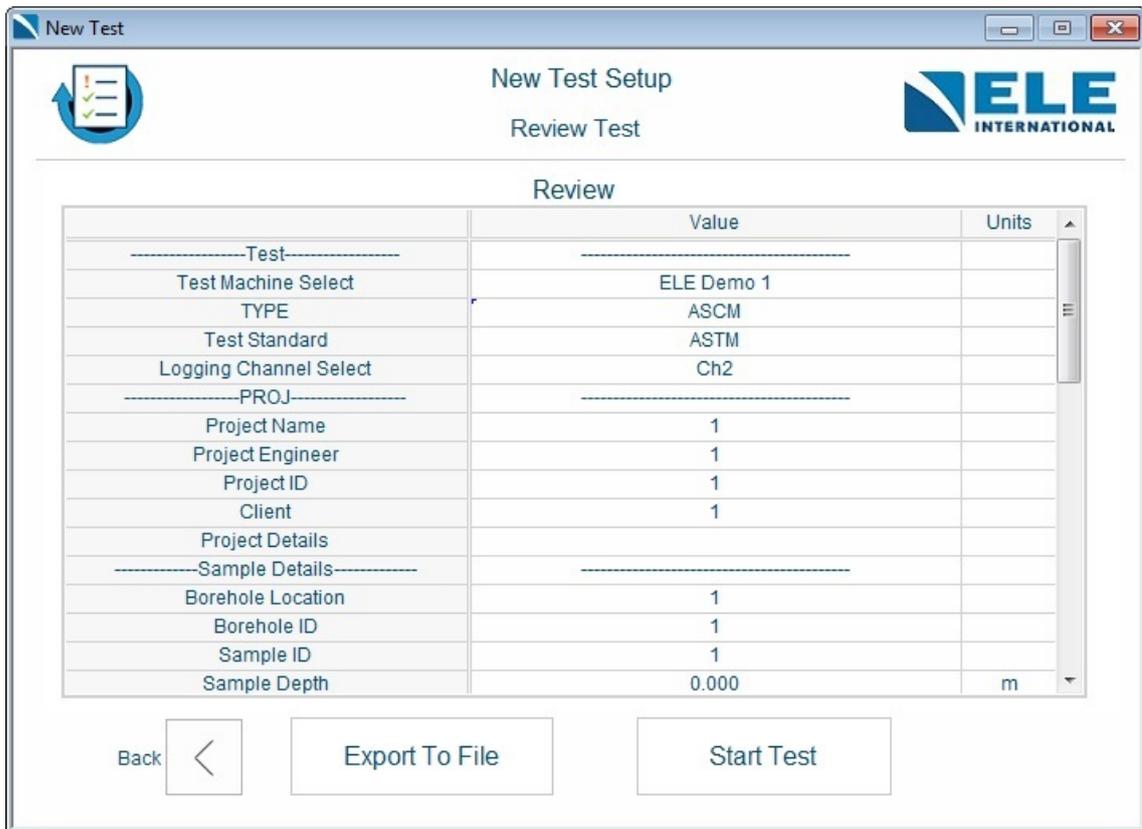
If displacement is not moved by mm value programmed into the Settlement band for Time programmed in Time Window, the software will automatically move to the next stage.



Click on Save and Close button to save Stage Time.

A User can create any loading and unloading sequence but the last stage before End should be unloading.

Once all the stages have been programmed, click on the Next arrow button to review the test setup.



This Test setup can be saved to a file for future use by clicking 'Export To File'. The test setup will be saved with the Project Name - Project ID-SP Ref-SP Code.atf file at location:-

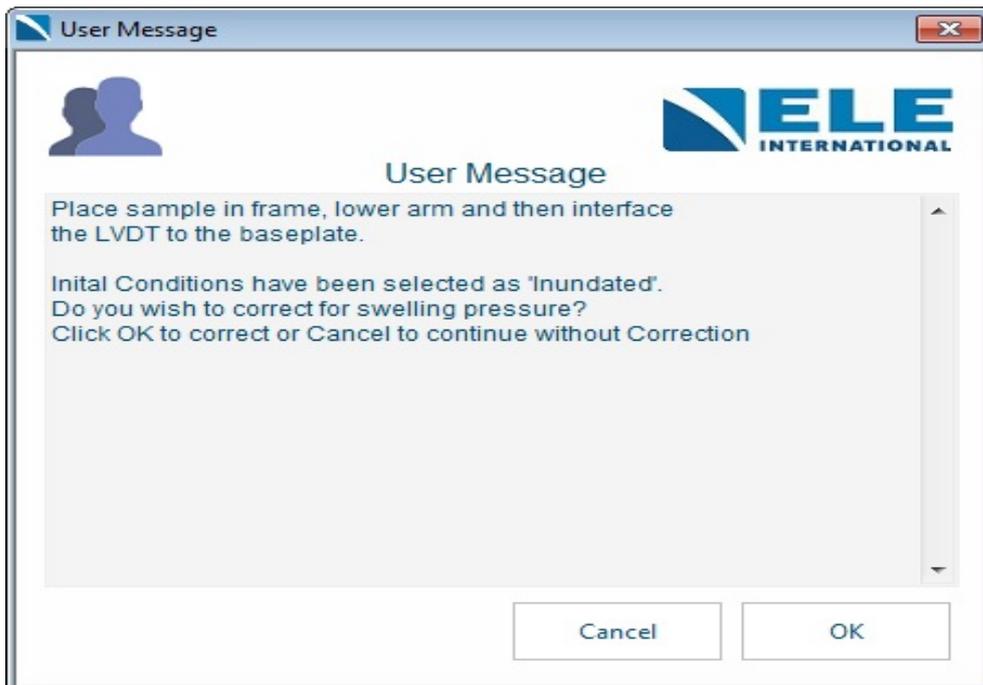
C:\Users\Public\Documents\ELE\Files\Tests.

Click on the Start Test button to start the test. Please refer to 9901X0275_1 25-0500 Auto Soil Consolidator operating instructions to set up a machine before starting the test.

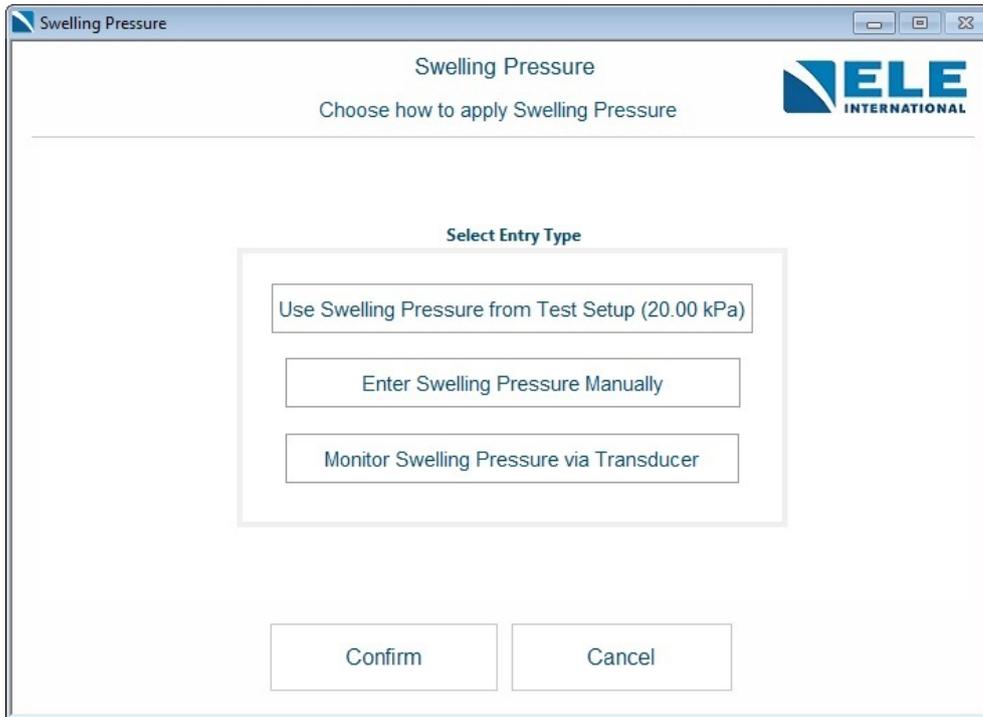
Software will null the transducers and a message will pop up.



Click on the Start Test Stage to start the test. Once the seating load is reached, the user will be prompted to choose options for entering the swelling pressure if, during the test setup, Specimen Moisture has been set as Inundated.



The user will be asked to select entry type for swelling pressure from the following options.



Monitor Swelling Pressure via Transducer will allow the user to carry out a free swelling test.

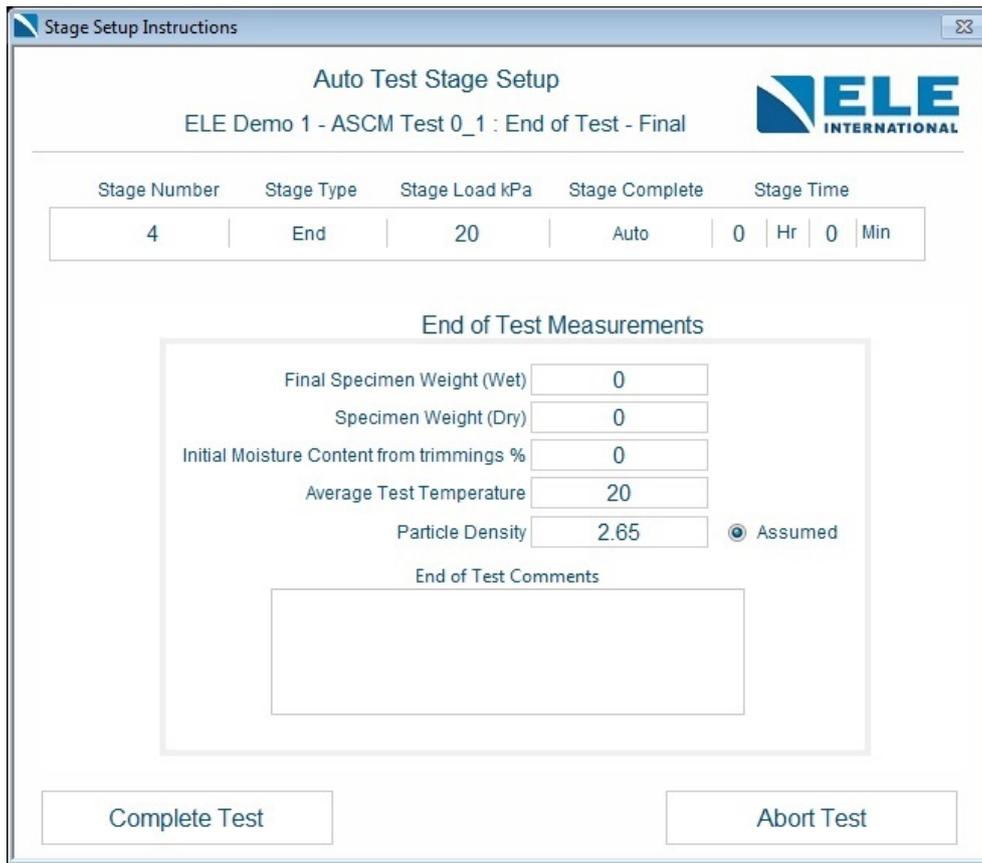
To run a free swelling test, bring the load cell slowly until it is just in contact with the cell cap (daylight close - ensure no load is applied). Add water into the cell and monitor the load. If swelling occurs, the load will then be gradually increased. This swelling pressure value will be monitored on the DS8 application software. Once settled, the load will stop increasing and the user can use the monitored value as a swelling pressure for the test by clicking on the Confirm button.

The swelling pressure value will be added to each stage pressure if selected.

Once complete, a message will pop up to start the test.

The DS8 application software will run through all the programmed stages for the test automatically. The user can skip or stop the running stage from the Control Test feature.

Once all the stages are finished the 'End of test' pop-up will appear on the screen.



Stage Number	Stage Type	Stage Load kPa	Stage Complete	Stage Time
4	End	20	Auto	0 Hr 0 Min

End of Test Measurements

Final Specimen Weight (Wet)

Specimen Weight (Dry)

Initial Moisture Content from trimmings %

Average Test Temperature

Particle Density Assumed

End of Test Comments

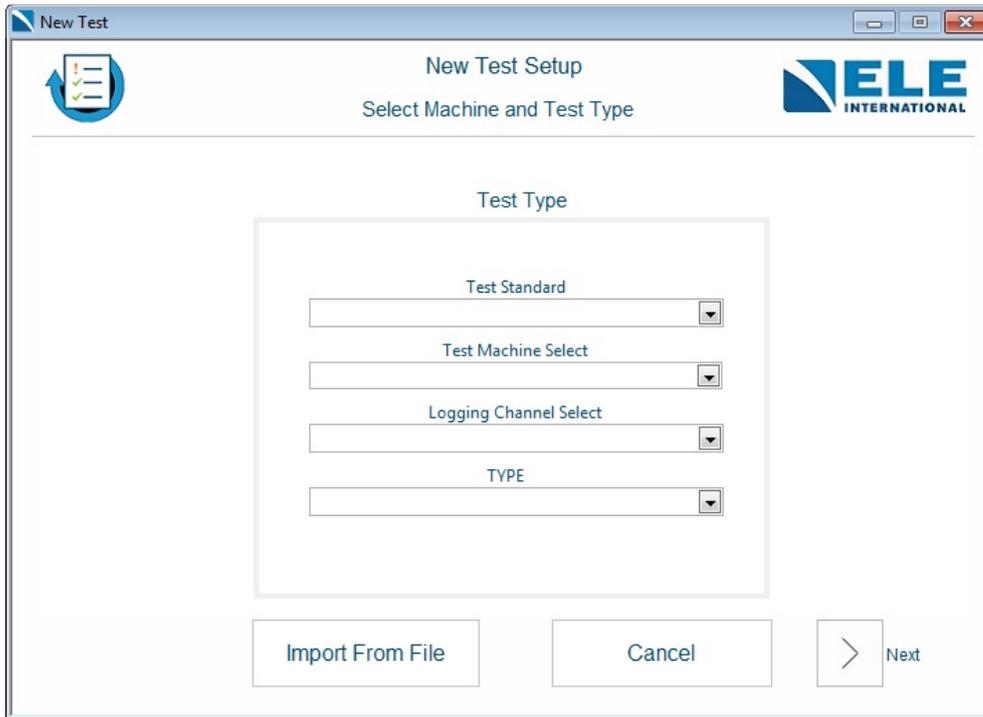
The user will be asked to enter the End of Test Measurements. Once complete, click on the 'Complete Test' button to finish the test.

Once the test is finished, a Raw data file will be generated and saved at the following location:-

C:\Users\Public\Documents\DS8 Data\test_name\Completed Tests.

7 Run New Test - Manual One-Dimensional Soil Consolidation

On the DS8 Main screen, click on the New Test button to go to the New Test Setup page. Alternatively, on the main menu, click on Test->New Test.

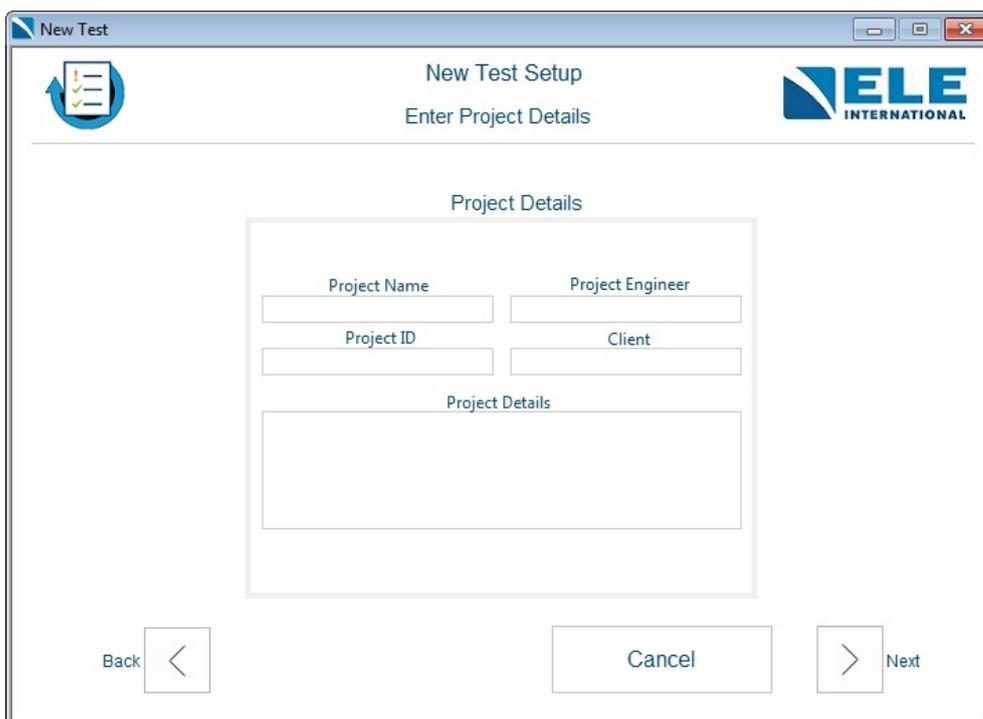


On this screen, select the machine and enter the test details - Test Standard, Logging Channel and Test Type.

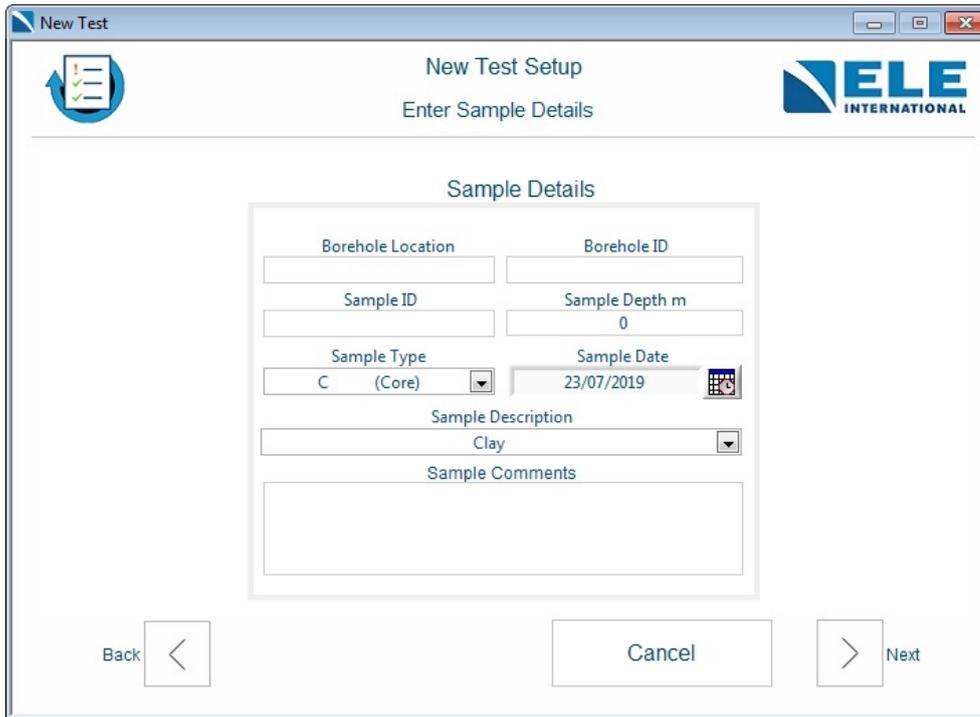
Previously Saved Test Setup information can be loaded by clicking 'Import From File' button.

From the Test Type drop down menu select Manual One-Dimensional Soil Consolidation.

Click on the Next arrow button and enter project details



Click on the Next arrow button and enter sample details.



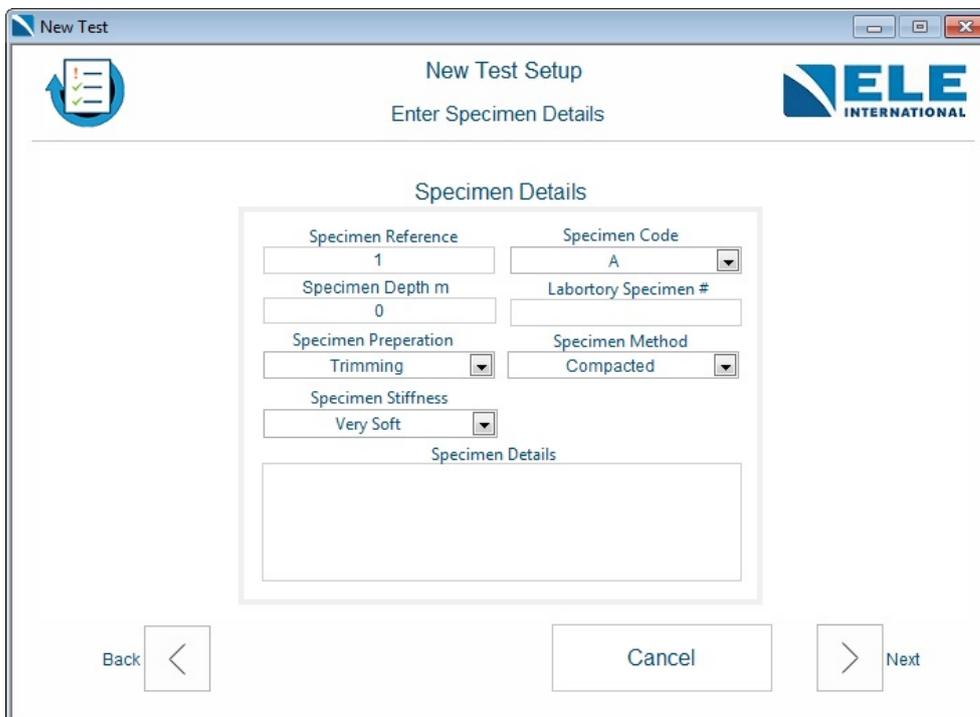
New Test Setup
Enter Sample Details

Sample Details

Borehole Location	Borehole ID
Sample ID	Sample Depth m 0
Sample Type C (Core)	Sample Date 23/07/2019
Sample Description Clay	
Sample Comments	

Back < Cancel > Next

Click on the Next arrow button and enter Specimen Details.



New Test Setup
Enter Specimen Details

Specimen Details

Specimen Reference 1	Specimen Code A
Specimen Depth m 0	Laboratory Specimen #
Specimen Preparation Trimming	Specimen Method Compacted
Specimen Stiffness Very Soft	
Specimen Details	

Back < Cancel > Next

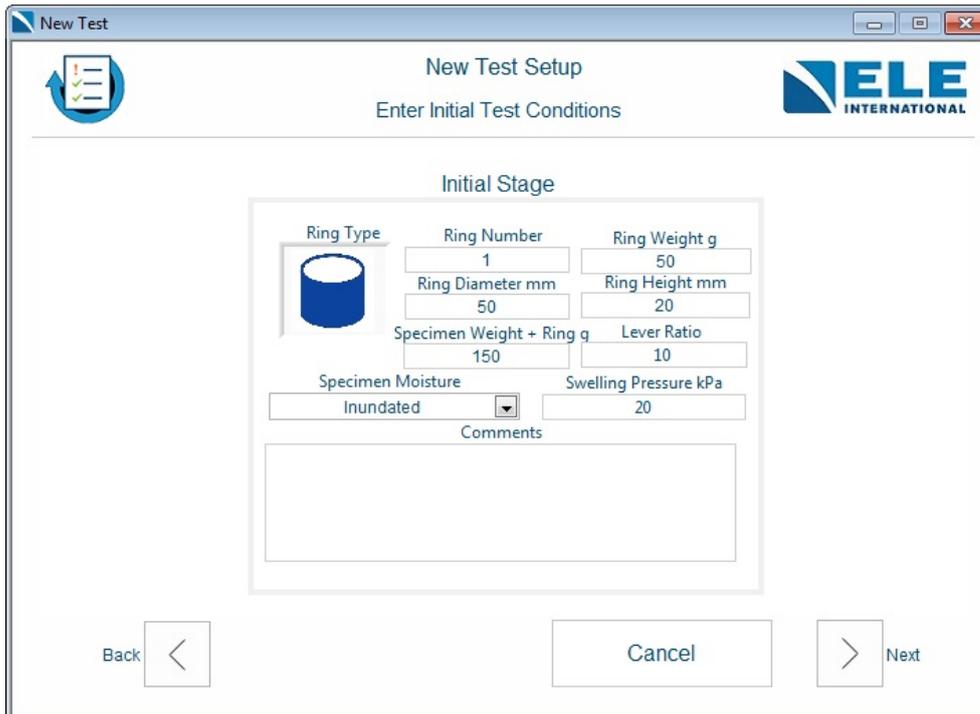
Note: the Specimen Stiffness drop down menu is only valid for the Auto Soil Consolidation test, for Manual One-Dimensional Soil Consolidation tests this is not taken into consideration.

Note: The appropriate level ratio must be selected for Manual One-Dimensional Soil Consolidation test.

Click on the Next arrow button and enter Initial Test Conditions Cell Details - Ring number, Ring Weight, Width and Height.

Select the Lever ratio.

Enter Specimen Moisture and Swelling Pressure.



Note: The Specimen Moisture drop down menu will give the following options:-

- Natural Content
- Inundated

If the Specimen Moisture is selected as Natural Content, no swelling pressure will be added to the test stages.

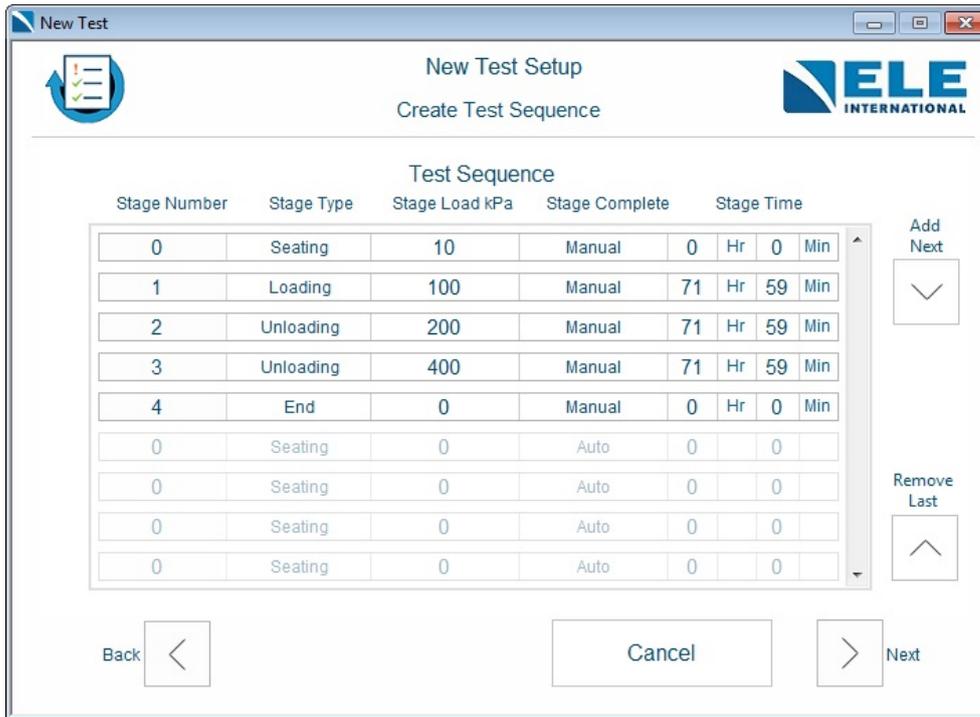
If the Specimen Moisture is selected as Inundated, swelling pressure will be added to each stage load during the test. User may enter swelling pressure value at this stage if known.

Click on the Next arrow button to set up a test sequence.

Test sequence starts form stage 0 which is 'Seating' stage and ends with the 'End' stage. Stage time entered for these stages will not be taken into account by software and no data logging will be done in these 2 stages.

Between 'Seating' and 'End', user can program loading/unloading stages. Maximum 15 stages can be programmed.

7.1 Creating a test sequence



New Test Setup
Create Test Sequence

Test Sequence

Stage Number	Stage Type	Stage Load kPa	Stage Complete	Stage Time			
0	Seating	10	Manual	0	Hr	0	Min
1	Loading	100	Manual	71	Hr	59	Min
2	Unloading	200	Manual	71	Hr	59	Min
3	Unloading	400	Manual	71	Hr	59	Min
4	End	0	Manual	0	Hr	0	Min
0	Seating	0	Auto	0		0	
0	Seating	0	Auto	0		0	
0	Seating	0	Auto	0		0	
0	Seating	0	Auto	0		0	

Buttons: Back, Cancel, Next, Add Next, Remove Last

Enter the seating load value.

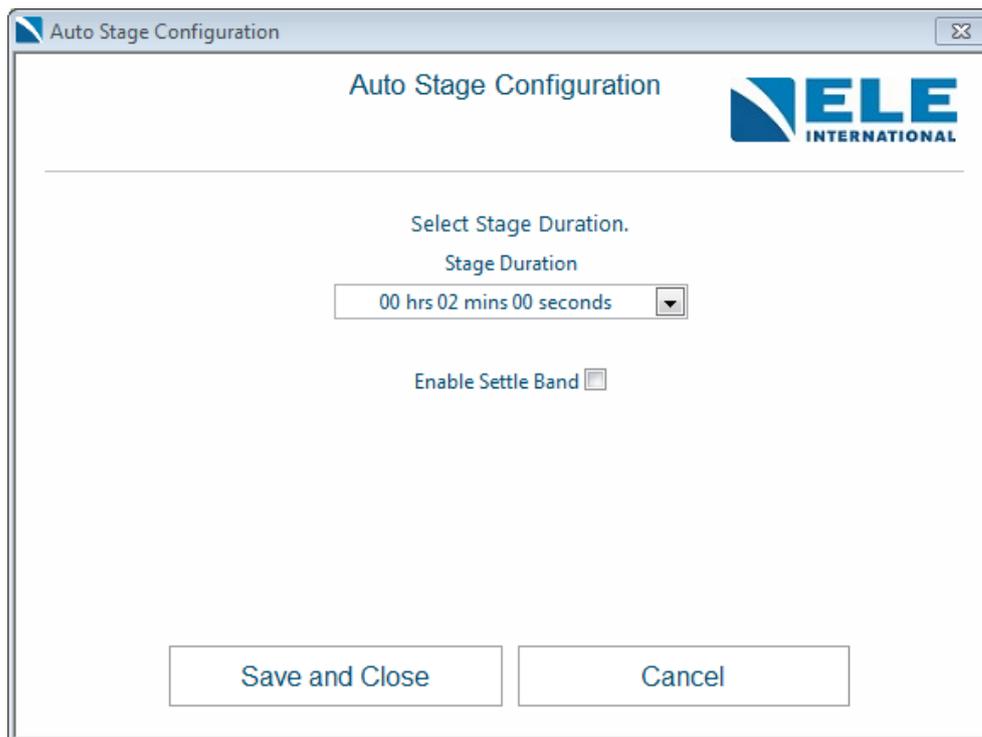
Add a new stage by clicking Add Next arrow button.

Select stage type Loading/Unloading.

Enter Stage load.

Select Stage Complete - Select Manual to set up the stage time as 3 days or Select 'Auto' from Stage Complete drop-down menu to select the stage time from a drop-down menu.

Click on Stage Time to select time and the 'Auto Stage Configuration' page will pop up.



Select Stage duration from the drop-down menu.

Untick the option 'Enable Settle band' for a manual test.

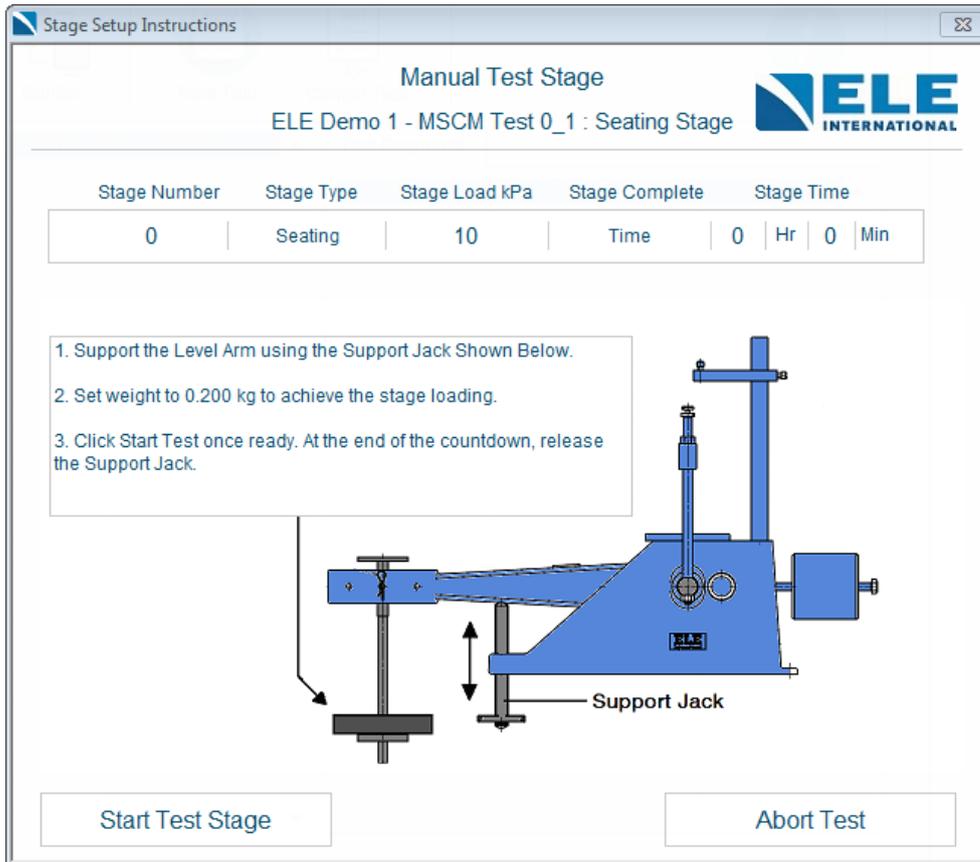
User can create any loading and unloading sequence but the last stage before the End should be unloading.

Once all the stages have been programmed, click on the Next arrow button to review the test set up.

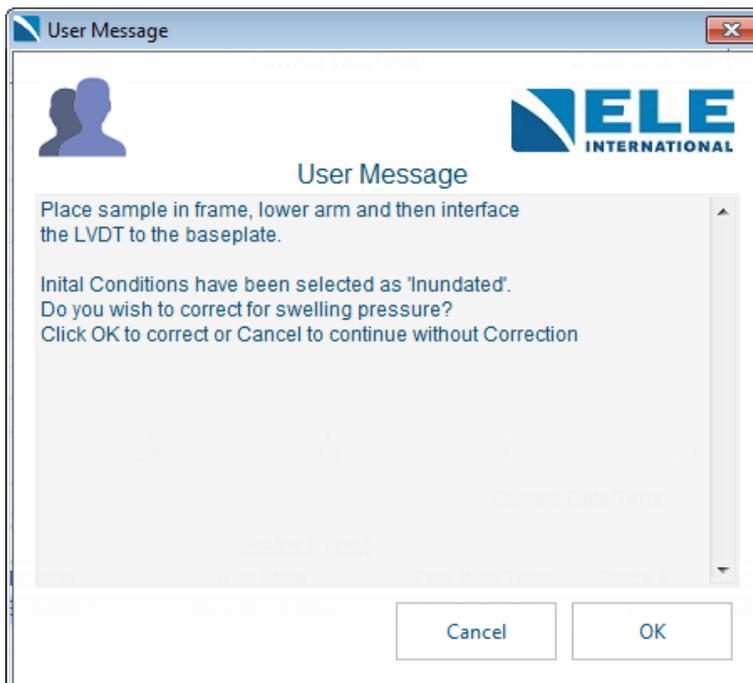
This Test set up can be saved to a file for future use by clicking Export To File. The test set up will be saved with Project Name - Project ID-SP Ref-SP Code.atf file at location:-

C:\Users\Public\Documents\ELE\Files\Tests.

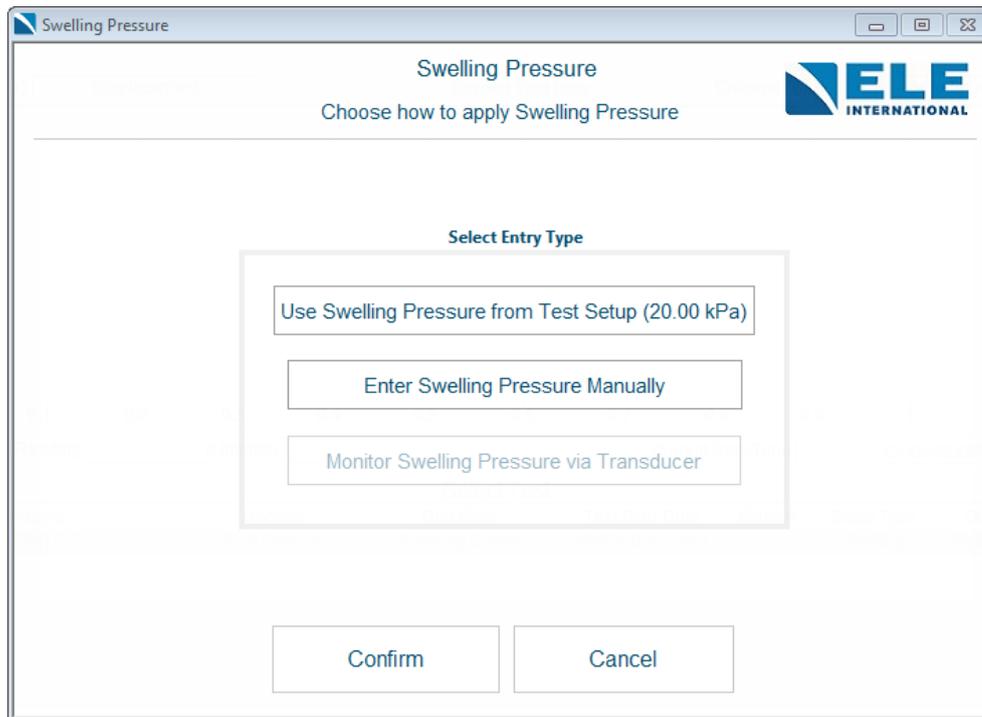
Software will null the transducers and a message will pop up.



Apply the seating load, click on the Start Test Stage and the user will be prompted to choose options for entering the swelling pressure if, during the test set up, the Specimen Moisture is selected as Inundated.



The user will be asked to select entry type for swelling pressure from the following options:-



Swelling pressure value should be added manually to each stage pressure if selected. Once complete, a message will pop up to start the test.

Apply the weight shown in the Stage Setup Instruction pop up manually and click on Start Test Stage.

Stage Setup Instructions

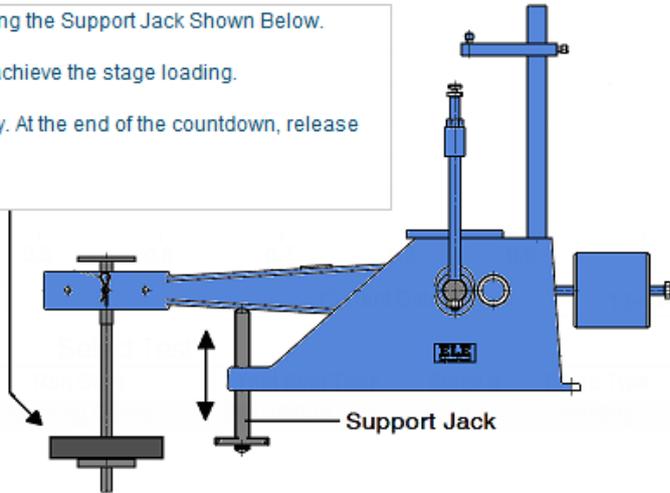
Manual Test Stage

ELE Demo 1 - MSCM Test 0_1 : Loading Stage



Stage Number	Stage Type	Stage Load kPa	Stage Complete	Stage Time
1	Loading	100	Time	71 Hr 59 Min

1. Support the Level Arm using the Support Jack Shown Below.
2. Set weight to 2.002 kg to achieve the stage loading.
3. Click Start Test once ready. At the end of the countdown, release the Support Jack.



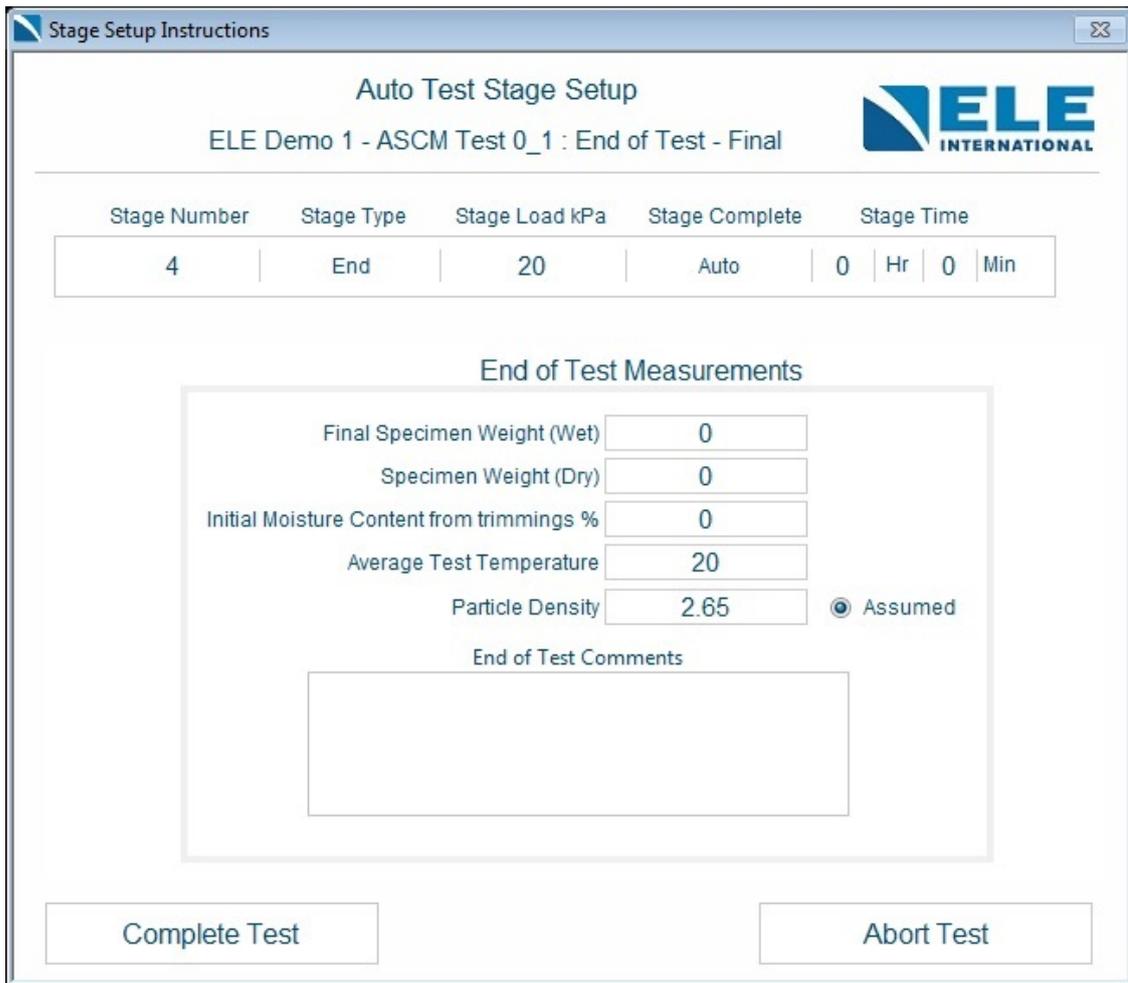
Support Jack

Start Test Stage

Abort Test

The user can skip or stop the running stage from the Control Test feature.

Once all the stages are finished an 'End of test' pop-up will appear on the screen.



Stage Setup Instructions

Auto Test Stage Setup

ELE Demo 1 - ASCM Test 0_1 : End of Test - Final

Stage Number	Stage Type	Stage Load kPa	Stage Complete	Stage Time
4	End	20	Auto	0 Hr 0 Min

End of Test Measurements

Final Specimen Weight (Wet)

Specimen Weight (Dry)

Initial Moisture Content from trimmings %

Average Test Temperature

Particle Density Assumed

End of Test Comments

The user will be asked to enter End of Test Measurements. Once complete, click on the 'Complete Test' button to finish the test.

Once the test is finished, Raw data file will be generated and saved at location:-

C:\Users\Public\Documents\DS8 Data\test_name\Completed Tests.

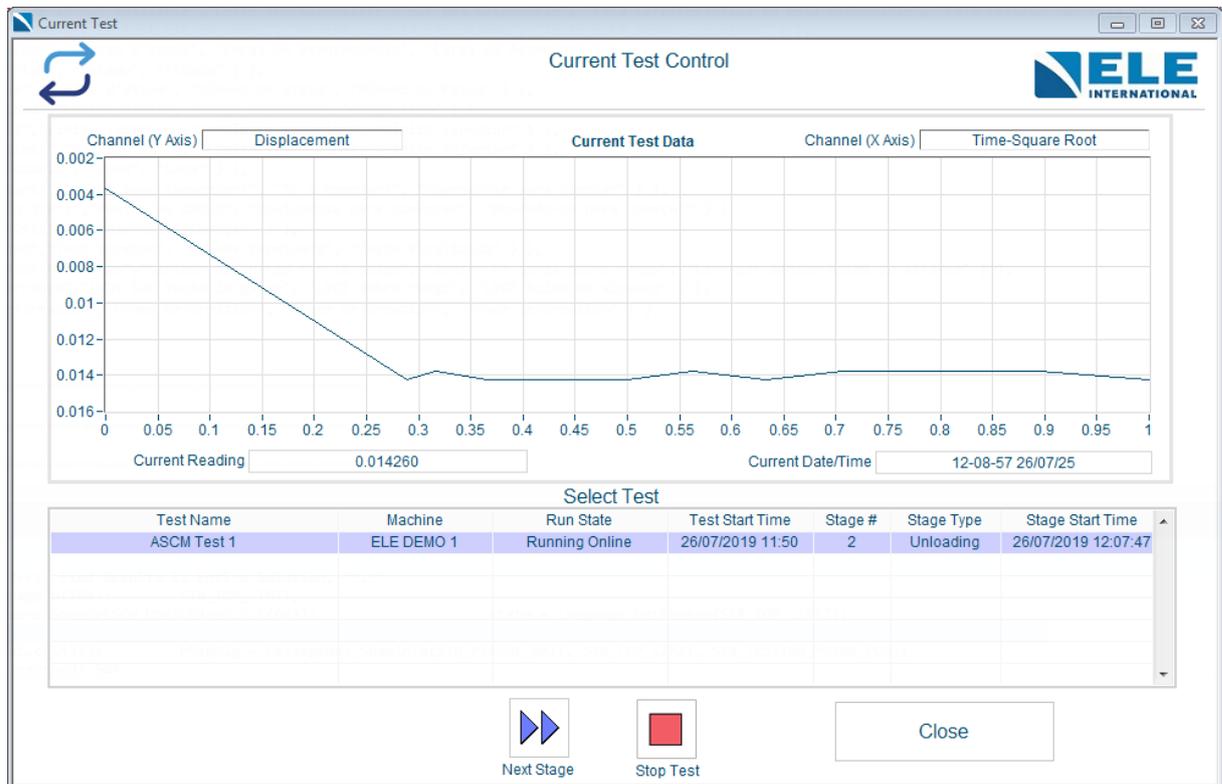
7.2 Add a second manual one-dimensional consolidation frame

On an ASC machine, one auto and two manual one-dimensional consolidation tests can be run at the same time. To add the second manual one-dimensional consolidation frame, add the transducers through the calibration screen. In the new test setup screen select the logging channel as the newly added transducer for the second consolidation frame. From the Test Type drop-down menu select Manual One-Dimensional Soil Consolidation and run the test as described in section 7, Run New Test - Auto Soil Consolidation.

8 Monitor Test

On the DS8 Main screen, click on the Control button to go to the Current Test Control page. Alternatively, on the main menu, click on Test->Control Test.

The Current Test Control page will show the status of all the tests running on the DS8 application software. Click on the test name to select the test and monitor live data.



Live test data can be viewed in 3 modes by selecting Channel (X Axis)

- Time-Square Root
- Log Time
- Real Time

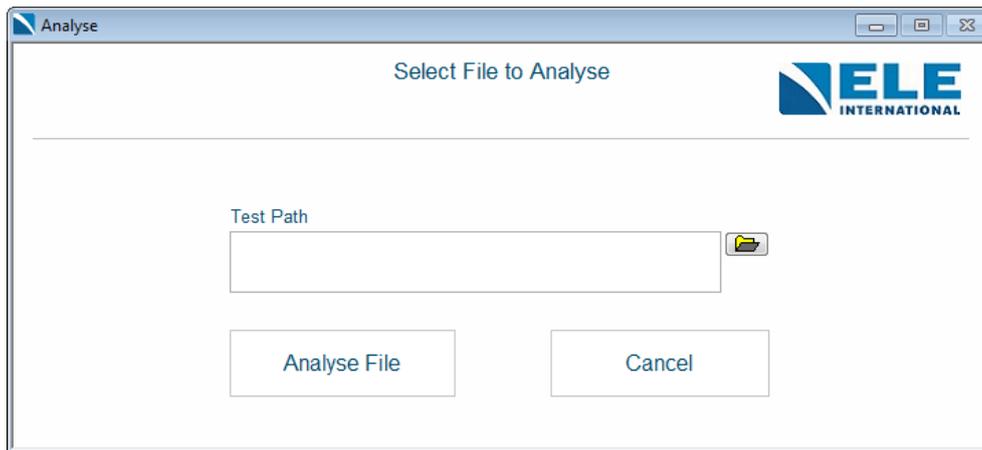
The user can go to the next stage or stop the selected test from the Current Test Control page.

9 Analysis

On the DS8 Main screen, select the Analysis tab, click on the Analyse button to go to the Analyse page. Alternatively, on the main menu, click on Analysis->Analyse Data.

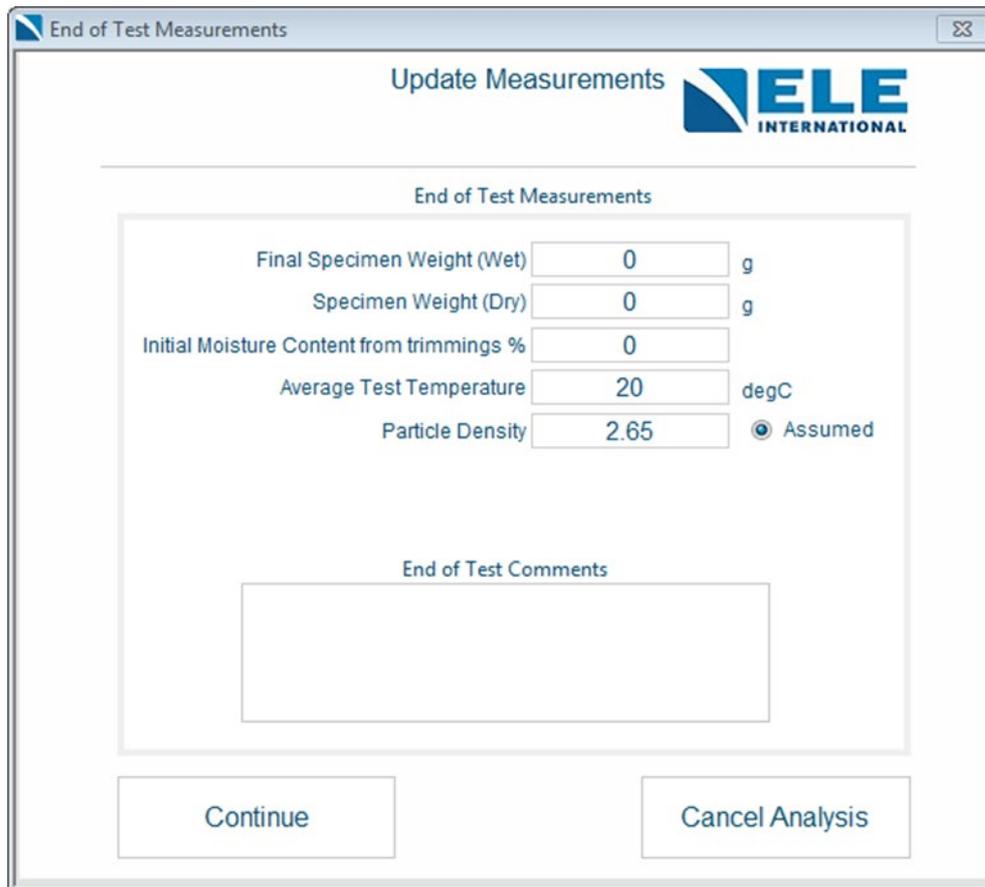
Raw data files for the completed test are stored at the following location:-

C:\Users\Public\Documents\DS8 Data\test_name\Completed Tests\test_name.txt.



Select the file to be analysed from the list of completed tests and click on the Analyse file button.

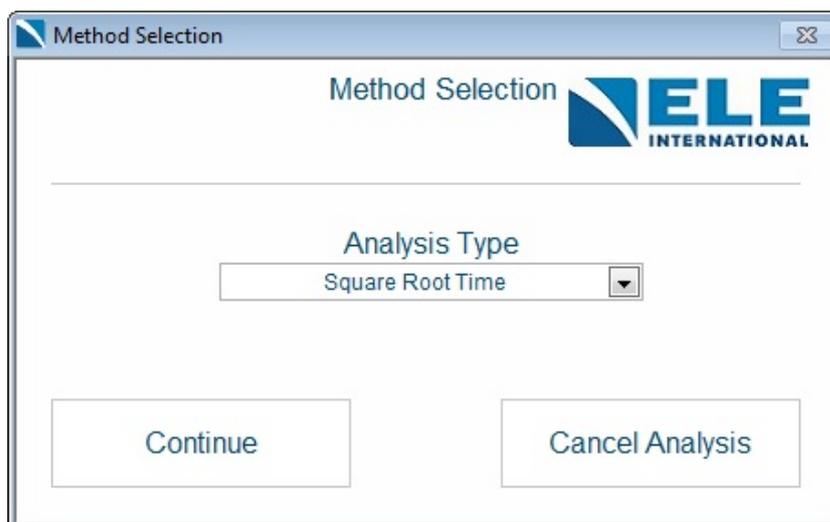
The 'Update Measurement' window will pop up. The user can update the 'End of Measurements' if needed before analysing the raw data file.



The dialog box titled "End of Test Measurements" contains the following fields and controls:

- Final Specimen Weight (Wet): g
- Specimen Weight (Dry): g
- Initial Moisture Content from trimmings %:
- Average Test Temperature: degC
- Particle Density: Assumed
- End of Test Comments:
- Buttons: Continue, Cancel Analysis

Click on the 'Continue' button to analyse selected raw data files.



The dialog box titled "Method Selection" contains the following controls:

- Analysis Type:
- Buttons: Continue, Cancel Analysis

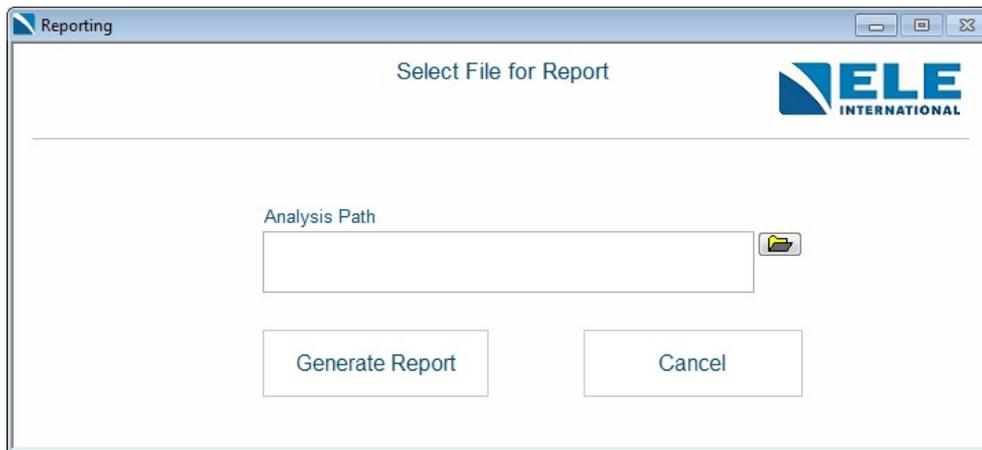
Select 'Method Selection' from the drop-down for the analysis and click on 'Continue' button.

10 Reporting

On the DS8 Main screen, select the Reporting tab, click on the Report button to go to the Reporting page. Alternatively, on the main menu, click on Reports->Generate Reports.

Analysed files for completed tests are stored at the following location:-

C:\Users\Public\Documents\DS8 Data\test_name\Completed Tests\test_name_analysed.txt.



Select the analysed file from the list of completed tests and click on the Generate Report button to create a report.

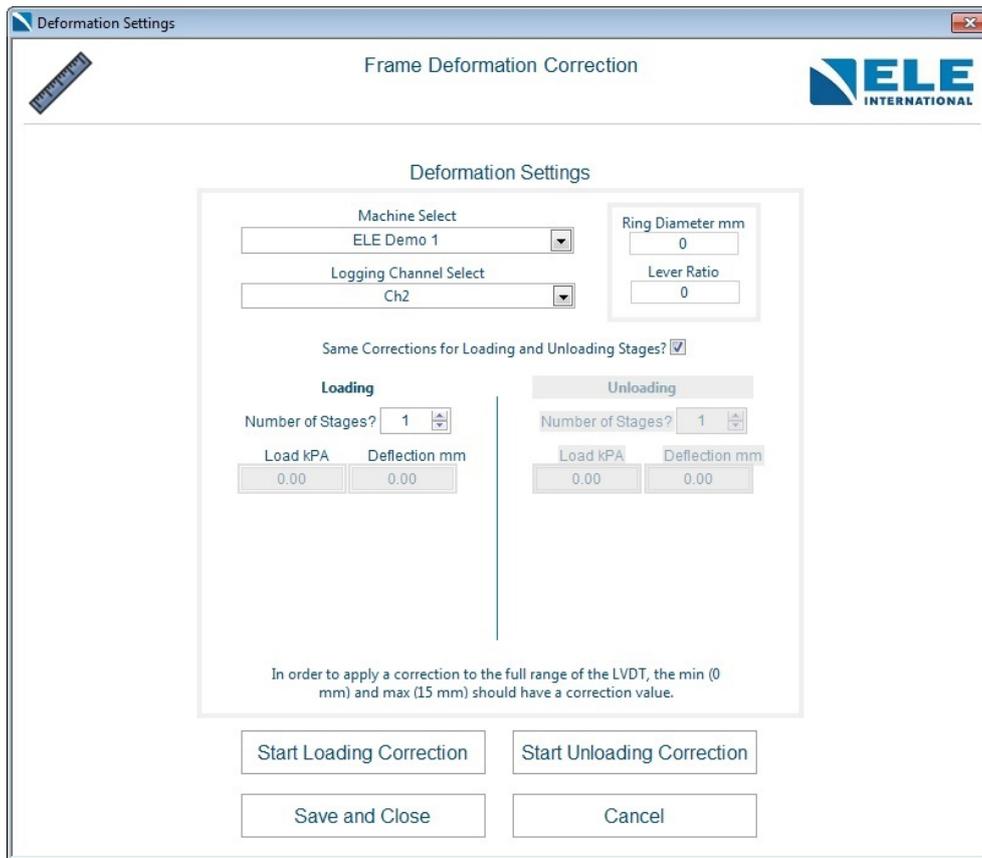
Note: Reports can be viewed with a pdf reader or with a web browser.

10.1 Customising a report

A company specific logo can be added to the reports. To add a new logo, on the DS8 Main screen, select the Test tab, click on the Systems button to go to the System Setting page. Click on Reports and select company logo. Alternatively, on the main menu, click on Systems->Company Logo. Click on the Import Logo button to add a new logo. The logo size will be automatically scaled to 250 x 150 (width x height).

11 Frame Deformation

On the DS8 Main screen, click on the Deformation button to go to the Frame deformation correction page.



Deformation Settings

Machine Select
ELE Demo 1

Logging Channel Select
Ch2

Ring Diameter mm
0

Lever Ratio
0

Same Corrections for Loading and Unloading Stages?

Loading

Number of Stages? 1

Load kPA 0.00 Deflection mm 0.00

Unloading

Number of Stages? 1

Load kPA 0.00 Deflection mm 0.00

In order to apply a correction to the full range of the LVDT, the min (0 mm) and max (15 mm) should have a correction value.

Start Loading Correction Start Unloading Correction

Save and Close Cancel

Move the ASC machine to the 'Start' position, please refer to 9901X0275_1 25-0500 Auto Soil Consolidator operating instructions to set up a machine before starting the deformation test.

Enter the Deformation settings, the number of stages, and the loading/unloading sequence for frame deformation.

Set the logging channel to 'Channel 2' for auto test or the channel with the LVDT connected for a manual test.

Click on the 'Start Loading Correction' button to start applying load. Live LVDT transducer data will be shown on the screen, once sensor data has settled the next load will be automatically applied. The user has the option to go to the next load from the screen. At the end of the correction load sequence the ASC machine will be moved to the Home position. Click on the 'Save and Close' button to save the correction data.