

# Verification and Validation Report: Measuring Microstructure Changes During Thermal Treatment

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# 1 Revision History

Date	Developer	Change
Date 1 Mar. 8, 2023	1.0 Joseph Braun	Notes Added Sections 5, 7, 8

## 2 Symbols, Abbreviations and Acronyms

symbol	description
T	Test

[symbols, abbreviations or acronyms – you can reference the SRS tables if needed —SS]

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### 3 Functional Requirements Evaluation

### 4 Nonfunctional Requirements Evaluation

#### 4.1 Usability

Usability Tests					
Requirement	Related Tests	Unit	Description	Expected Result	Result
Afghanistan	AF		AFG	004	
Aland Islands	AX		ALA	248	
Albania	AL		ALB	008	
Algeria	DZ		DZA	012	
American Samoa	AS		ASM	016	
Andorra	AD		AND	020	
Angola	AO		AGO	024	

#### 4.2 Performance

#### 4.3 etc.

### 5 Comparison to Existing Implementation

Below is an image of the existing implementation's GUI.

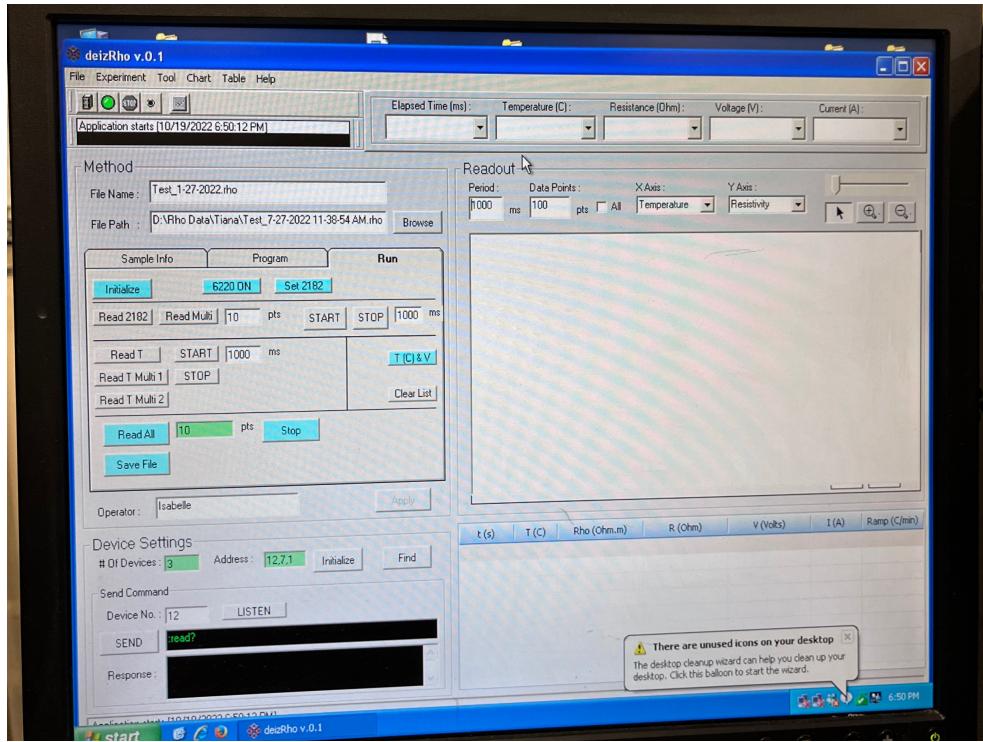


Figure 1: Previous software user interface design

The key elements of the existing implementation will also be included in our implementation. This is so that the application will be familiar to the user and as intuitive as possible. These elements are listed below:

- Method Panel: controls which device to read data from (temperature or voltage), and which file to save the data in
- Device Settings Panel: used to send SCPI commands directly to a device
- Readout: includes graphical output and listed output of relevant values (current, voltage, resistance, etc.)

The primary difference between the existing implementation and our implementation is the appearance of the GUI. The existing implementation was developed for Windows XP whereas our implementation is developed for Windows 10, which gives it an updated look.

## **6 Unit Testing**

## **7 Changes Due to Testing**

Test	Failure Observed	Change Made
Test 1	Failed	Change made to module
Test 2	Failed	Change made to module

## **8 Automated Testing**

We achieved automated unit testing through the use of the NUnit testing framework in Visual Studio. NUnit is one of the most popular test frameworks used for running tests on a .NET project.

NUnit tests are setup by first creating a new project file in Visual Studio and adding it to the solution file for your project (in our case, the application). In the new project file, a new class is created. Each unit test we want to carry out is written as a method of the test class. Since the project file for the test class is included in the same solution file as our application, we are able to call the test methods from our main application to run the tests.

## **9 Trace to Requirements**

## **10 Trace to Modules**

## **11 Code Coverage Metrics**

## **Appendix — Reflection**

The information in this section will be used to evaluate the team members on the graduate attribute of Lifelong Learning. Please answer the following questions:

1.

2.