



## MPMS3 Application Note 1500-025

### Using the *Set fixed ULF.bas* script

This Application Note describes how to use a script (*.bas* file) to set a fixed field ( $\pm 25$  Oe) using the Ultra-Low Field (ULF) Option capabilities of the MPMS3. Note, the MPMS3 must have the ULF option to enable this functionality. This script file can be run independently or incorporated into conventional sequences by using the *Call Sequence* command.

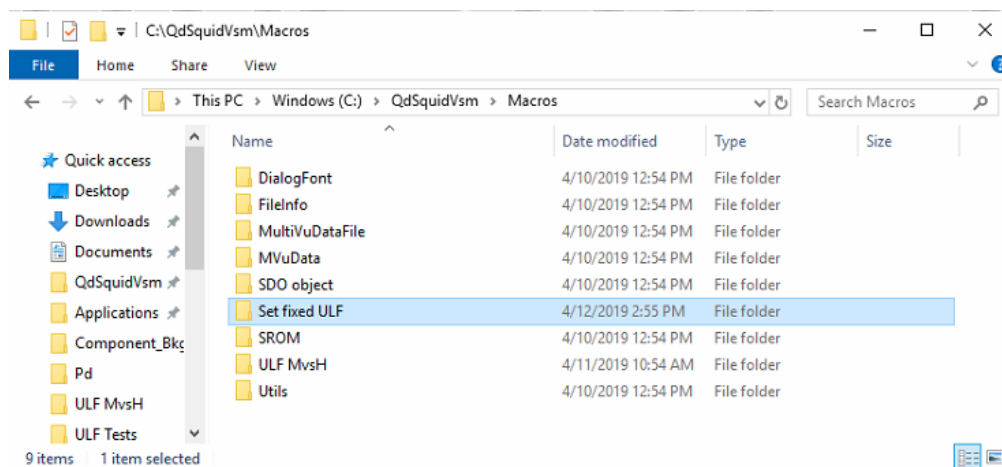
It is necessary to be running the latest version of MultiVu, release 2.3.4.15 or later. To upgrade to the latest version of MultiVu please contact your local service representative.

**Step 1:** Download the *Set fixed ULF.bas* file from *Pharos*

Download the *Set fixed ULF.bas* file from our online digital database *Pharos* under:

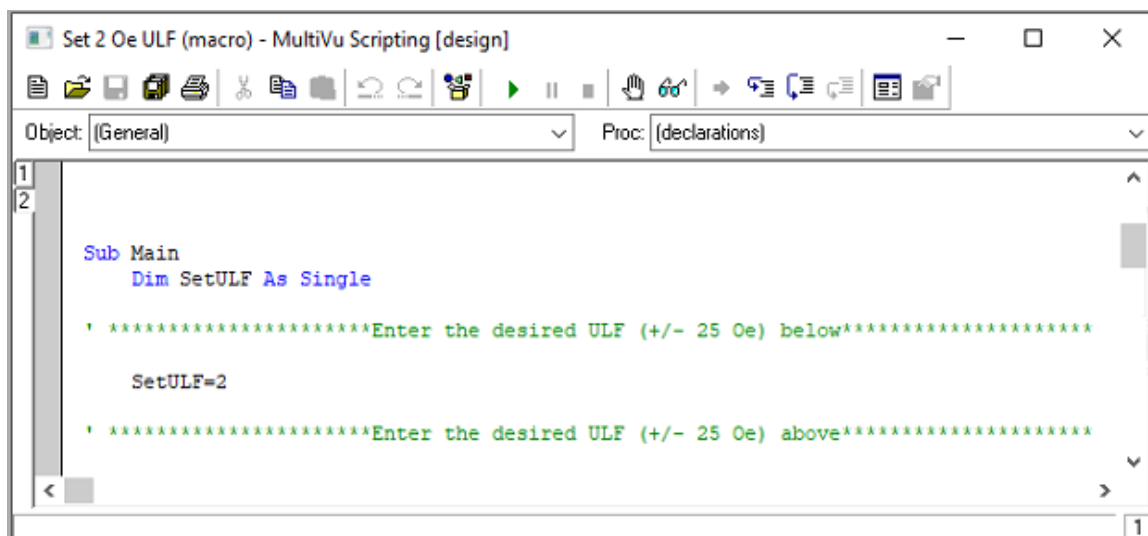
***Customer Area/MPMS3/Measurement App Notes/Set fixed ULF***

**Step 2:** Save the folder *Set fixed ULF* within the *C:\QdSquidVsm\Macros* directory



**Figure 1.** Save the *Set fixed ULF.bas* file in a dedicated folder within the *C:\QdSquidVsm\Macros* directory.

**Step 3:** You can edit the file *Set fixed ULF.bas* in any text editor of your choice or within MultiVu by selecting *Sequence*→*Advanced*→*Edit Macro* in the MultiVu Menu Bar. Then, to set the desired field by simply enter the desired field within the program command line **SetULF=X**, where the example below would set a field of X=2 Oe. Then make sure to save any changes made.



**Figure 2.** The set field can be altered by entering the desired field within the **SetULF=X** command line. The example above would set a field of X=2 Oe.

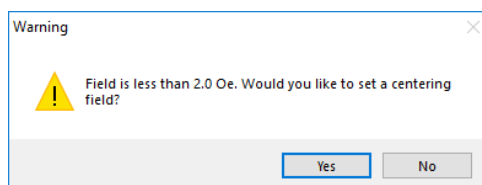
Note, you can save a separate and unique *.bas* file (e.g. *Set 10e ULF.bas*) for each field desired. This will make calling the individual *.bas* files within a sequence file easier.

**Step 4:** Complete the standard ULF Wizard to null the existing remanent field.

In order to compensate for the remanent field of the superconducting solenoid use the standard procedure as outlined in the ULF option manual (1505-550) to null the magnetic field to 0 Oe.

**Step 5:** Install your sample

Using the conventional *Sample Install Wizard* install and center your sample. However, if performing a centering scan, when warned and prompted to set a centering field, as shown below in Figure 3, choose **No**. If the superconducting solenoid is energized the field nulling performed in Step 4 will be compromised. If the sample does not have a strong enough signal to center at zero field, then simply manually center the sample, ideally at 66 mm.



**Figure 3.** Make sure to choose **No** centering field during the *Sample Install Wizard*.

**Step 6:** Utilize the *Set fixed ULF.bas* macro:

### (1) Standalone

The *Set fixed ULF.bas* macro can be run by simply going to *Sequence*→*Advanced*→*Run Macro* in the MultiVu Menu Bar.

## (2) Within a sequence

The *Set fixed ULF.bas* macros can be incorporated into sequences by using the *Call Sequence* command. Note, to select a *.bas* file make sure to select SAX Script Files (\*.bas).

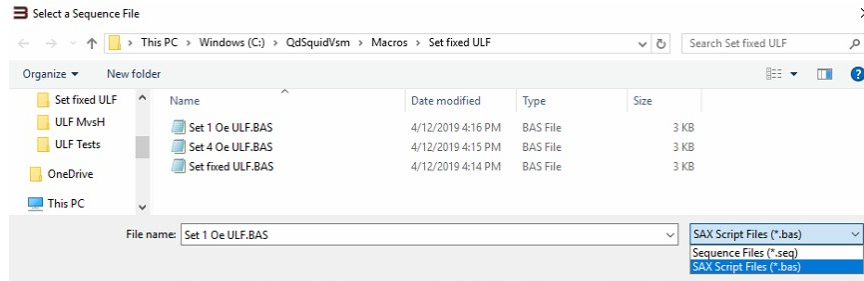


Figure 4. When incorporating *.bas* files into a sequence make sure to select SAX Script Files (\*.bas).

Figure 5, below, shows an example sequence utilizing the *Call Sequence* command.

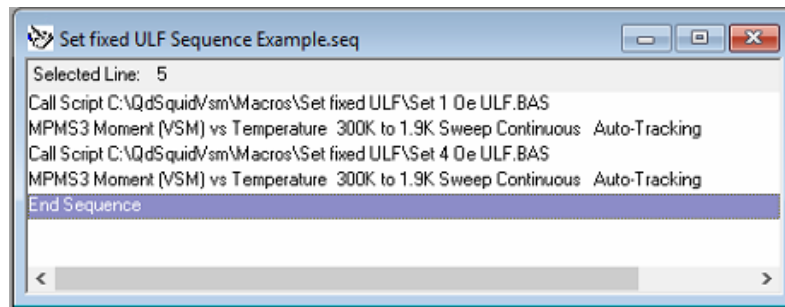


Figure 5. An example sequence using the *Call Sequence* capabilities.

### Additional Comments:

- (1) The compensation field will be continuously applied until reset by running the wizard or until set to zero by:
  - (i) Setting the system into standby
  - (ii) Shutting down MultiVu
  - (iii) Manually shutting the current drivers down: Utilities→Ultra Low Field→Current Driver Shutdown
  - (iv) Using the sequence command: Measurement Commands→ULF→Shutdown Drivers
  - (v) Energizing the main superconducting magnet with a normal *Set Field* command
- (2) Note, the ULF option is able to null the field within a  $\pm 10$  mm window, larger than the 8 mm maximum VSM vibration amplitude. A typical 30 mm DC scan would scan the sample outside of the uniform field window, and hence a DC scan is not recommended when using the ULF.

For questions contact [apps@qdusa.com](mailto:apps@qdusa.com)