SHMSL Quick Start Guide

Section-Half Multisensor Logger (SHMSL): Quick Start Guide

V2 - 2016. Edit - T. Cobb 368X

Introduction

The SHMSL is a multisensor logger that makes contact measurements of magnetic susceptibility and color reflectance on the split surface of cores. It also archives the laser profile of each section's surface for use in other applications such as routines to cull data from other loggers collected from voids.

Getting Started

Open the SHMSL application by double-clicking the IMS icon on the desktop (Figure 1). IMS will begin by initializing the Acuity AR700 laser, the Bartington MS2K point source susceptibility probe, and the Ocean Optics QE Pro spectrometer. Please ask the PP Tech for assistance in changing the instrument's measurement parameters. Once initialized, the logger is ready to measure a section.

Figure 1: IMS Icon

Making a Measurement

1. Place the archive section in the core tray with the blue endcap up against the benchmark (Figure 2).

Figure 2. Benchmark

2. Adjust the section so that it is as flat as possible with respect to the plane of the benchmark.
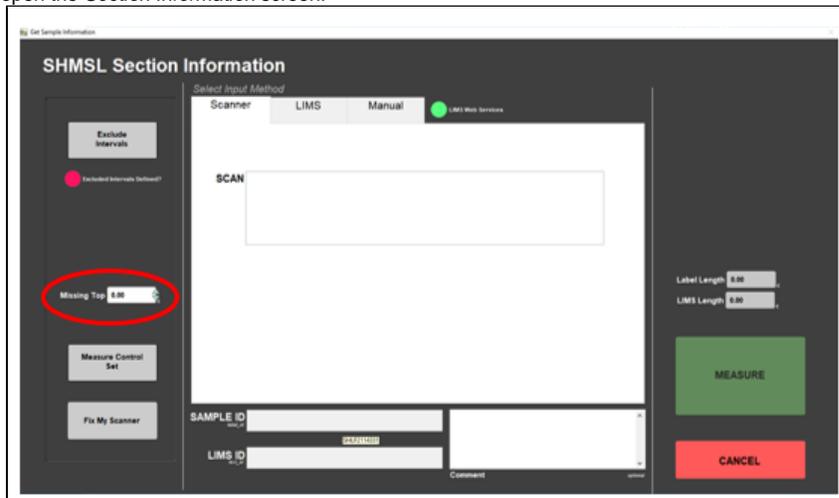3. Click the **Start** button to open the *Section Information* screen.

4. Place the cursor in the **SCAN** text field (center of Figure 3) and scan the section label, the information automatically fills for Expedition, Site, Hole, and so on.
5. Enter **Comments** (field is optional).
6. **Missing Top:** If a sample taken at top of section (material is missing), position the section half all the way up to the benchmark. Enter missing length, software will automatically adjust.
7. **Exclude Intervals:** enter section intervals to be excluded. **Specify Interval:** enter specific intervals to be measured. **Measure Control Set:** Measurement control for the QE Pro.
8. When ready, click the **Start Measurement** button. Double check to make sure the Label Length matches the LIMS Length. If the QE Pro does not require calibration (see QE Pro Calibration), proceed to the next step.
9. The sensor assembly moves down the track while the laser acquires a profile of the split surface of the section (Figure 4).
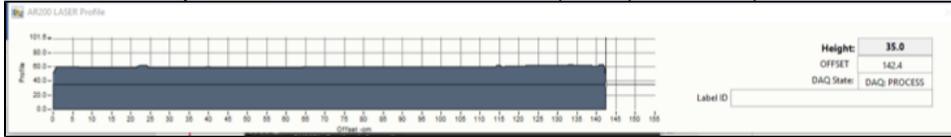

Figure 4. Laser Profile

10. After the surface profile is completed, the measured section length is displayed. Confirm length (Figure 5, below). Adjust if needed. Apply Glad Wrap to the surface of sediment cores. **Click GO!!!**
    IMPORTANT!!! Glad rap must have a good seal to the surface of the core; any bubbles or wrinkles will affect the measurement. Any mud that gets inside the integration sphere will ruin it!!!
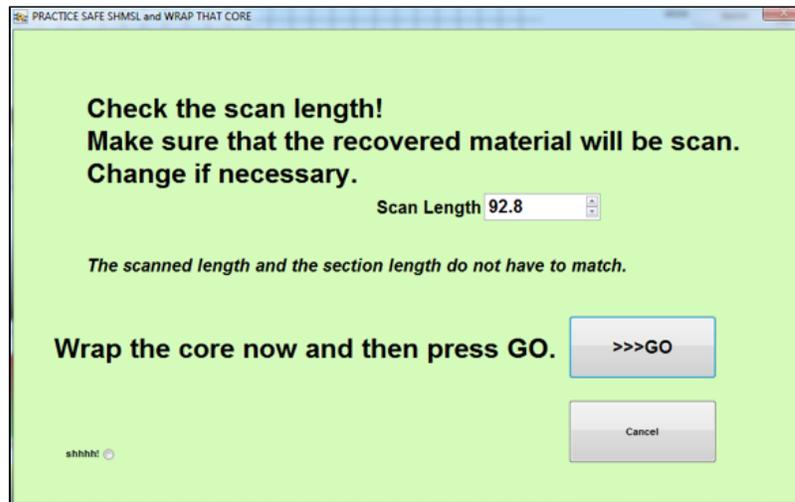11. **Click GO!**

Figure 5. Final Sample Preparation

12. The measurement sequence begins. For efficiency, measurements begin at the bottom of the section and move upcore. Results are displayed during acquisition on instrument graphs on screen as shown in Figure 6, below.
    Note that the QE Pro has several tabs that display different views of the color reflectance data. Tabs can be changed during the measurement sequence.
13. After the section has been measured, the logger takes measurements of the MS2K and white standards as verification.
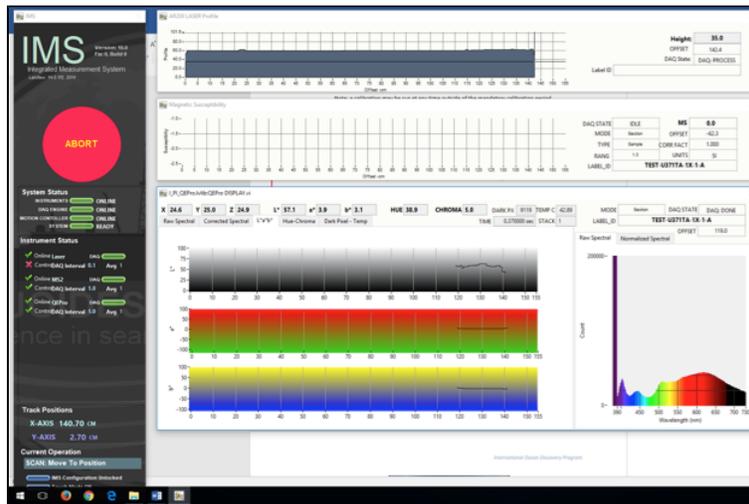
Figure 6. Data Acquisition Screen

Data Storage and Format

C:\data\IN

- Section half L* a* b* and XYZ data
- MS2K check standard result
- MS2K (MSPOINT) data file
- QE Pro white check standard result
- Laser profile pointer file

C:\AUX_DATA\PROFILE

- Laser profile data

C:\AUX_DATA\RSC\CALIB

- White and Dark calibration spectral data per wavelength (380–900 in 2 nm steps)

C:\AUX_DATA\RSC\CNTRL

- Raw spectra and normalized (% color reflectance) spectral data per wavelength (380–900 in 2 nm steps) for the white check standard at the end of a run

C:\AUX_DATA\RSC\RUN

- Raw spectra and normalized (% color reflectance) spectral data per wavelength (380–900 in 2 nm steps) for the measured section

Uploading Data to LIMS

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1.	Uploading SHMSL data to the LIMS database is executed via the MUT application. Click the MegaUploadaTron (MUT) Icon (Figure 7, below).
2.	Once the application is activated, it displays a table-like list of files in the *C:\DATA\IN* directory. Files are ready to be uploaded if they have a green check mark next to them as shown in Figure 8, below. Log into MUT using database credentials.
3.	Click Automatic Upload if you want files to upload automatically, or check each file individually and click upload.
4.	Please ask a technician for help if you see these indications: –Purple question marks on files in MUT indicates that MUT cannot identify them. –Red and white X icons on files in MUT indicate errors associated with the files.

Figure 7. Upload Icons
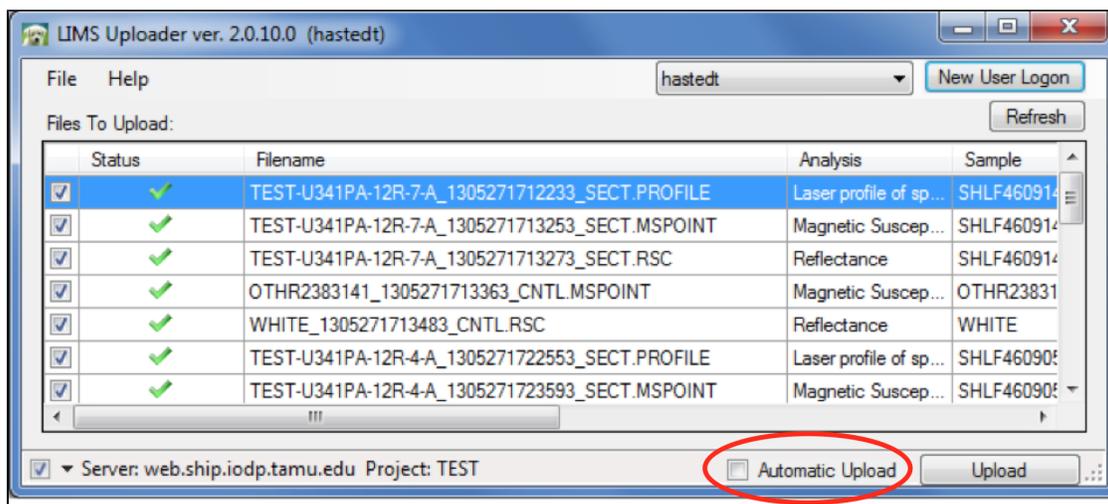
Figure 8. MUT Uploader

QE Pro Calibration

1.	If the QE Pro is out of calibration, the **Instrument Calibration** screen will appear.
2.	Click the **Calibrate Instruments** button to begin the calibration process. The logger moves the QE Pro integrating sphere over the white calibration standard and lowers it until it touches. It will take some preliminary measurements to establish the integrating time based on an 80% saturation level of the total response. These measurements take about 0.30–0.55 seconds for the current light and detector configuration. (Figure 9, below) **Note**: If integration times increase to more than 0.55 seconds, contact the PP tech. The halogen bulb or LED may need replacing.

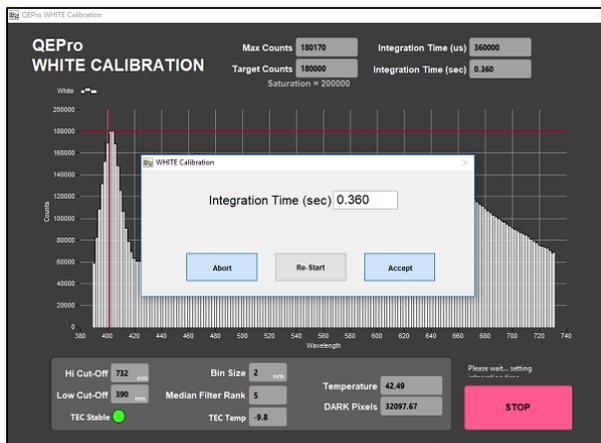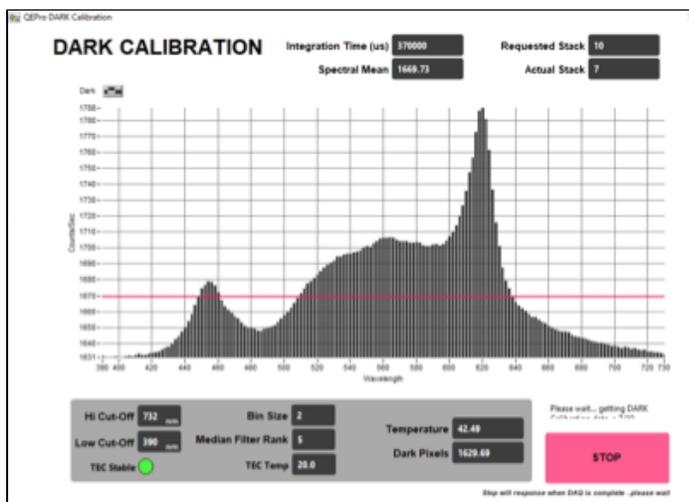|	
3.	Click **Accept** for the suggested integration time. The logger will then take 20 measurements of the white standard at the automatic integration time. *Figure 9. White Calibration* *Figure 10. Integration Time*
4.	After the white measurements are completed, the logger will raise the integrating sphere, position it over the dark standard, and lower it on the dark standard. The shutters on the light sources will close and the dark measurement will acquire 20 measurements, as above. When finished, Click Accept! *Figure 11. Dark Calibration*
5.	Figure 12 shows the normalization of spectra that will occur with the just-acquired calibration. **Note**: a calibration may be run at any time outside of the mandatory calibration period.
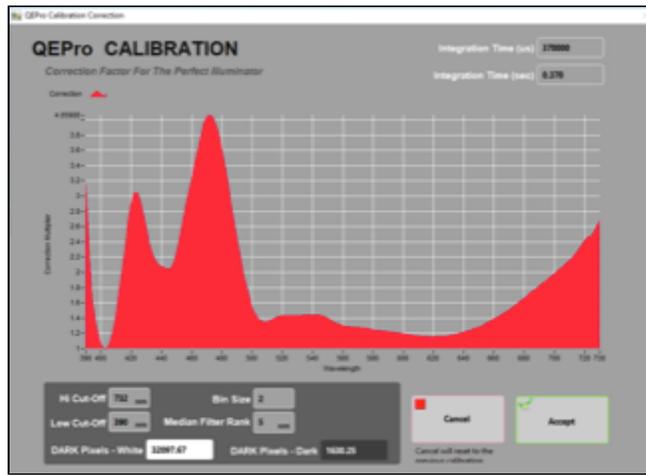
Figure 12. Calibration Normalization Factor