pXRF Quick Start Guide

Table of Content

Introduction

The Handheld XRF gun makes contact elemental measurements on section halves and prepared powder mounts. The XRF emits a primary X-Ray beam that bombards the material and excites electrons. The movement of electrons emits secondary fluorescent radiation that is measured in the gun. These energy patterns are characteristic to elements and determine what is present.

The Handheld XRF can be run either independently or through an attached computer monitor. The Innov-x-Delta Advanced PC Software is available on both the gun and computer, and functions the exact same. However, layout and presentation of the software is different.

Point of Interest

The Handheld XRF can run independently. Meaning that measurements can be made using either the gun or the attached computer system. The two systems are independent, and do not communicate to each other when connected. Thus it is important to stay consistent in method choice. Either you use the gun or the computer system, without switching back and forth.

The reason being is that the gun writes one file per day containing all the measurements taken in that 24-hour period. For example: if measurements are taken using the computer system, the gun is then detached, and measurements are then taken using the gun, if you re-attach the gun to the computer system (to export data) you will only be able to retrieve the data attached to the gun. Measurements taken earlier that day while attached to the computer system will have been overwritten and lost.

If using the computer system method: do not un-plug the gun, turn off or exit the program, or turn off the gun prior to exporting data. If you do so, there is a possibility you will lose data.

Getting Started

Turn on the pXRF by pressing the power button for located on top of the machine (*Figure 1*). When the button turns green the pXRF is powered on.
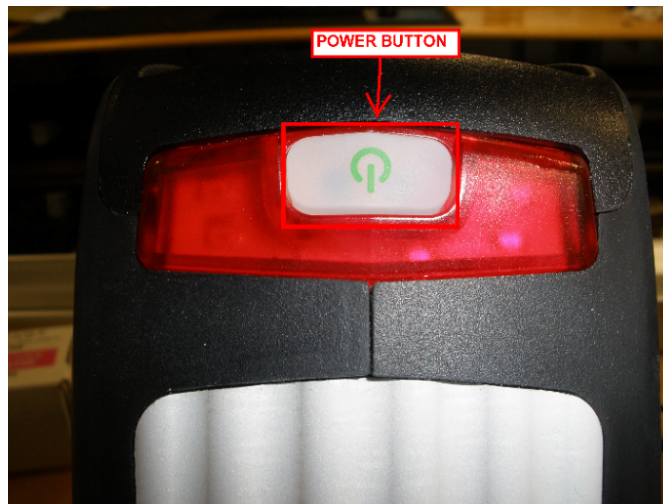

Figure 1. Power button to pXRF

Connect the Gun to the computer through the Micro USB cable.
Click on the "Innov-x Delta Advanced PC Software" icon on the desktop (*Figure 2*).
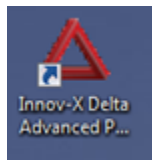
Figure 2. XRF Software Icon

You will see this initial startup window (*Figure 3*). Click on the 'Import Data Only' Button. This allows data storage on the computer. **Do NOT click 'Import to PC' as this removes all configurations from the gun.**
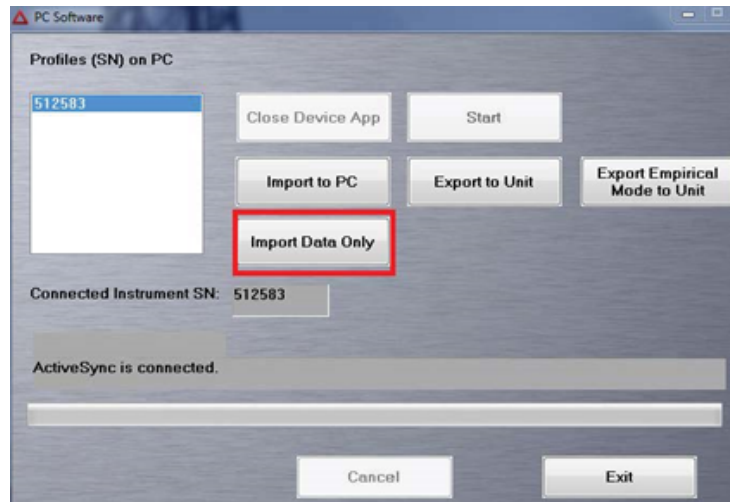

Figure 3. Initial Startup Window. The 'Import Data Only' Button is outlined in red.

Then Click the 'Start' button. This brings up a login screen where you will enter the following information and then click 'Login' (*Figure 4*):
User Name: innovx
Password: 1776

Figure 4. The Login Screen. Login Button is outlined in red

This takes you into the main software page.

Setting Parameters

You are now in the main measurement window. First set the Mode to measure in. The gun has a Geochemical and Soil Mode. Each mode has different scanning parameters which preferentially pick up some elements better than others. The gun will remember the chosen mode and does not have to be chosen each time a new measurement is taken or the Gun is turned off/on.

- To access the Modes click on 'Mode' at the top of the screen (*Figure 5*). This directs you to the 'Mode' Screen and in the left panel you can choose between the Geochemistry and Soil modes. Click on each to see the features of each Mode and select the one best for your analysis.
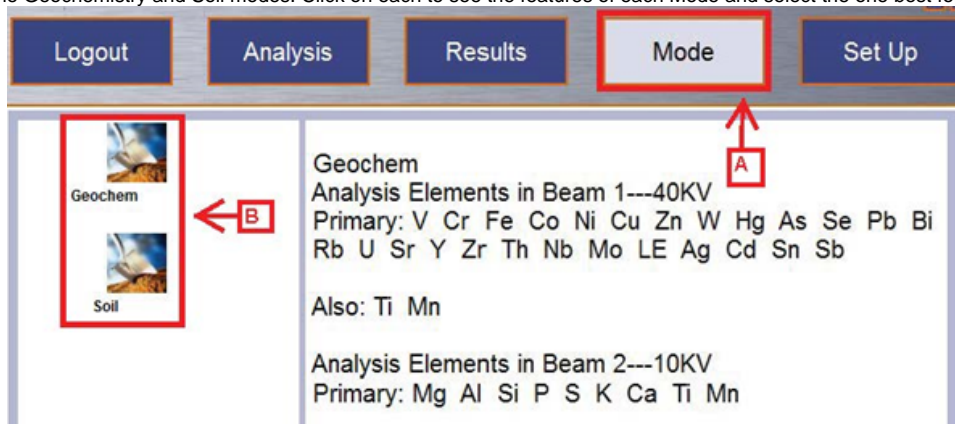

Figure 5. Mode Window. A. Mode Button to access the screen. B. Geochemistry and Soil Modes

- Now that the Mode is set, establish the measuring time for each beam. Each Mode has preset measuring times but these are changeable. To access the Measurement Time click on the 'Setup' Button at the top of the screen (*Figure 6*). Then in Left Panel click on 'Test Condition.' This brings up a screen that shows the Minimum and Maximum time currently set for each beam. Adjust the settings to your liking and click 'Save'.
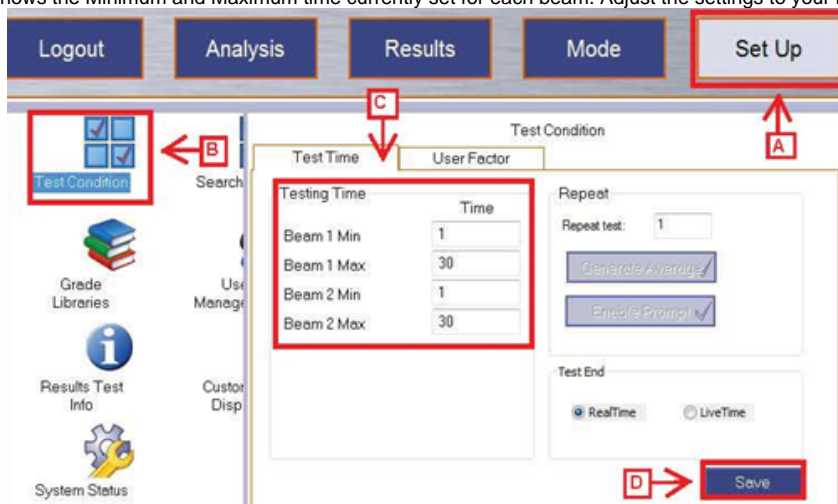

Figure 6. Test Condition Window. A. 'Setup' Button on the top right of the screen. B. 'Test Condition' Option in the Left Panel. C. Minimum and Maximum Time Settings for each beam. D. 'Save Button

Note: If the minimum time is set to 1 and the maximum to 30, if the gun determines it has a good profile in less than 30 seconds it will stop actively measuring. If you want to ensure it measures for the full time, set the minimum and maximum time to the same number. Ex: Minimum 30s and Maximum 30s

Making a Measurement

When you turn on the gun for the first time you need to make a 'Cal Check' before any other measurements are taken. Place the gun in its stand as shown in *Figure 7*.

Figure 7. Handheld XRF Gun resting in stand.

Then click on the blue 'Cal Check' button on the bottom left of the screen (*Figure 8*). This tells the gun to measure the stainless steel disk located in the stand. This is an internal calibration which ensures the gun is measuring properly.

Figure 8. Cal Check Indications. A. Cal Check Measurement Button. B. Message to perform Cal Check. C. Disabled Start Button

This measurement is taken when the gun is turned on and every 10 hours. When a Cal Check is needed the white bar will say 'Perform a Cal Check' and the 'Start' button will gray out and be disabled until the Cal Check is completed (*Figure 8*).

Naming a Measurement

In the Analysis Window, click the blue button with three dots in the upper left corner (*Figure 9*). The white bar shows the current run number.
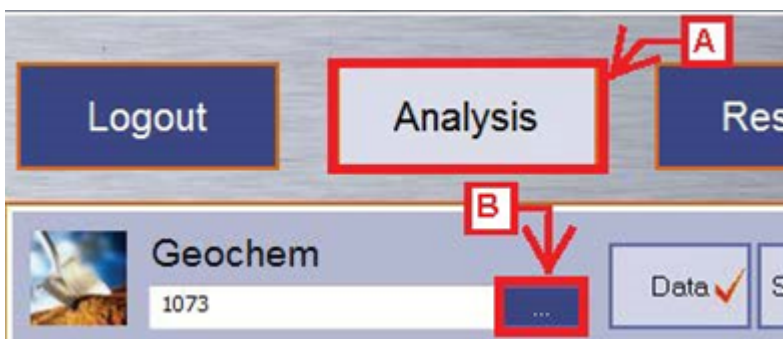

Figure 9. Analysis Window A. Analysis Window Button to display measurement B. Blue button to name measurement.

Now you are in the measurement naming window (*Figure 10*). Enter sample information here.
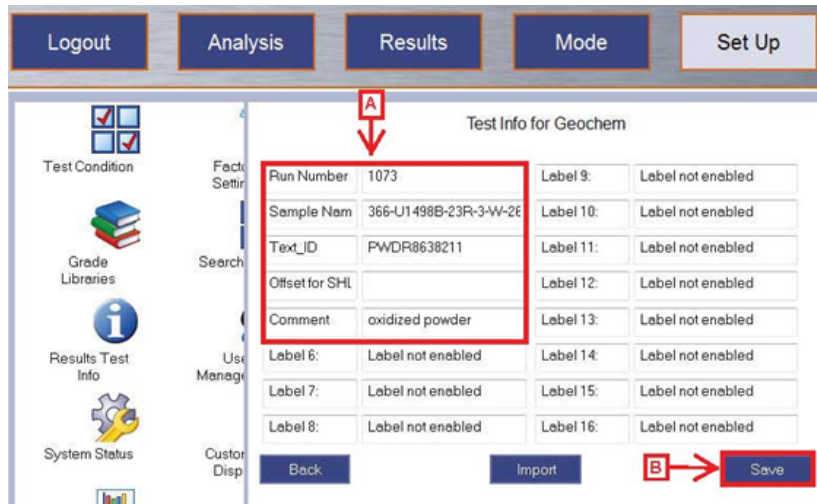
Figure 10. Test Information Window. A. Editable fields for each measurement: Run Number, Sample Name, Text_ID, Offset for SHLF, Comment. B. Save Button

Editable fields are as follows: Run Number, Sample Name, Text ID, SHLF Offset, and Comment (optional field).
Run Number: A sequential number increased by +1 with every measurement, ex: 1, 2, 3… This number will start at 1 for the measurement of the expedition.
Sample Name: Sample Name according to the sample or section half label. Ex: 366-U1234A-20F1-W
Text ID: Unique 11 digit ID for each sample or section half located under the barcode on the label.
Offset for SHLF: The point where a measurement is made on a section half, measured as distance from the top of the section. This field will only have a value for section half measurements.
Comment: A brief description of the measurement. An optional field.

Enter the run number. Then in the 'Sample Name' field scan your label. For a section half use the end cap label and the scanner labeled 'SECTION HALF'. For a powder mount scan the label on the mount with the scanner labeled 'POWDER'. This populates the 'Sample Name' and 'Text_ID' Fields. If measuring a section half enter in the offset, for all other measurements leave the offset field blank. You may enter a brief description of the measurement in the 'Comment' Field.

Click 'Save' in the lower right portion of the screen. If you do not click save the information will revert back to the prior run and there will be two measurements with the same name. The measurements are parsed by time so measurements will not overwrite one another there will just be multiple measurements with the same information.

Now that a Cal Check has been performed and the sample information is updated you can start measuring.
Take the gun out of the stand and either attach it to the FlexStand for powder measurements or screw it into the leaded shielding drape for section half measurements (*Figure 11*).
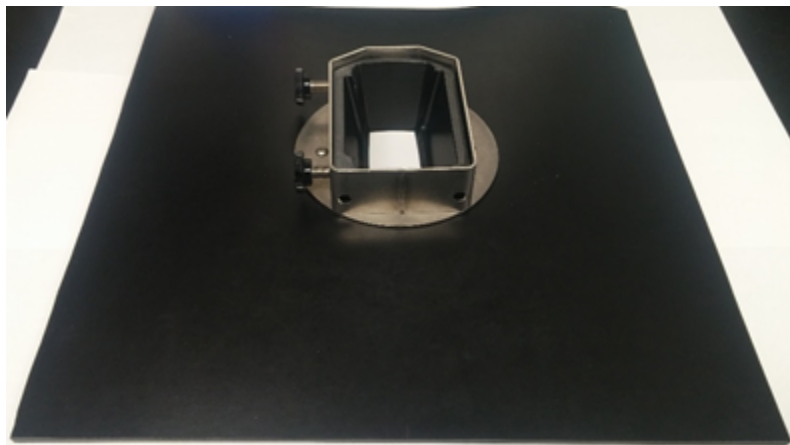

Figure 11. Leaded Shielding for Section Half measurements. The Nose of the gun goes into the opening and is tightened with the side screws.

Press the green 'Start' Button in the bottom left of the screen to start the measurement (*Figure 12*).

Figure 12. Start Button

This can be done while in the 'Test Information' window or you may click 'Back' to go back to the Analysis page and then click 'Start'.

Record each measurement taken on the paper log sheets provided by the technician.

Exporting Files

The gun writes one file per day that contains all the measurements taken in that 24 hour period. Until that file is exported the measurements are not permanently attached to the file. If files have not been exported do not disconnect the gun, turn off the software, or turn off the gun otherwise those un-exported measurements will be lost.

To export a file go the 'Set Up' in the top right and then click 'Data Management' in the left panel (*Figure 13*).
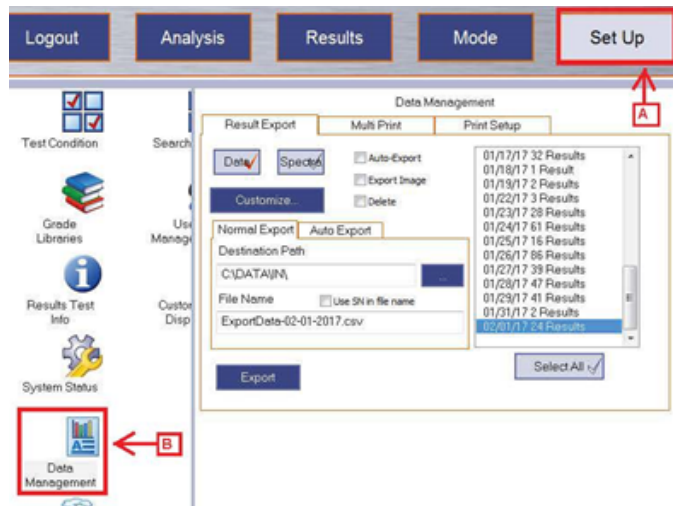

Figure 13. Data Management Window. A. Set Up Button B. Data Management Button

The Data Management Screen is now up and files can be exported. First select the date file you want to upload in the right panel (Figure 14). A 'Data' and 'Spectra' file need to be exported per file. The active filetype has the red check highlighted in the type Box. In the Figure below, the Data filetype has the red check so it is the active file-type. The Filename for each file needs to be the same. The file extension for the data file is ".csv" and the file extension for the spectra file is ".spm". Follow this naming convention: "MM-DD-YYYY"

Example: Data File: 03-17-2020.csv
Spectra File: 03-17-2020.spm

Note: If you would like a different data file-type let the technician know
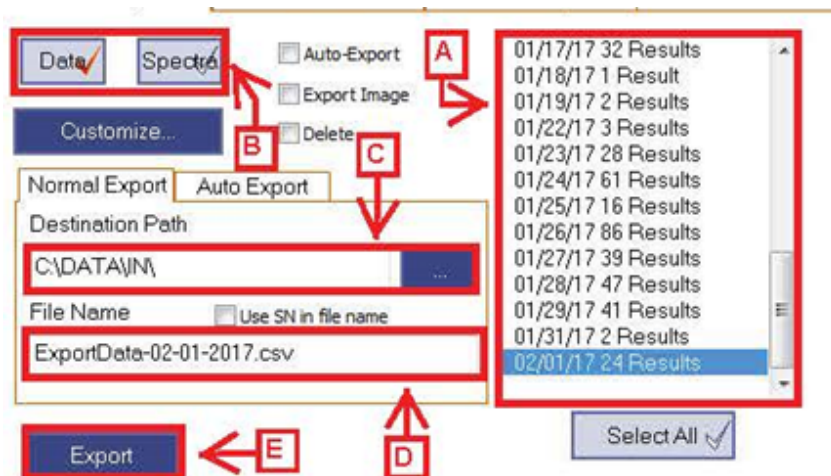
Figure 14. Export a file. A. Panel listing files available files. B. Data and Spectra File Types C. Bar displaying the Path files save to. D. Filename E. Export Button

Click the 'export' button for the data file and then repeat for the spectra file and click 'export'. After the files have been exported the measurements are attached to the file. Multiple exports can be done in the same day however the measurements will still be written to the same date file.

For example: 10 measurements are exported at 11:00 on 03-15-2017. Then 5 new measurements are taken and exported at 15:00 on 03-15-2017. The 03-15-2017 file now has 15 measurements that are exported in spite of 10 measurements being exported earlier in the day.

Credits

This document originated from Word document XRF_QSG_374 (see Archived Versions below for a pdf copy) that was written by N. Lawler and A. Armstrong. Credits for subsequent changes to this document are given in the page history.

Archived Versions

XRF_QSG_374.pdf