Aeris Quick Start Guide

Aeris Start Up

The main power switch is on the rear lower right-hand side of the instrument. This can generally be left on. The unit is plugged into the UPS power box and that should remain on at all times. The vendor recommends we leave the entire instrument and X-ray key switch on all the time. If restarting is necessary to clear an error there is no need to toggle the key switch. Obviously for dry dock or when it's totally necessary we can shut everything down, but it's not good to be turned off and on often.
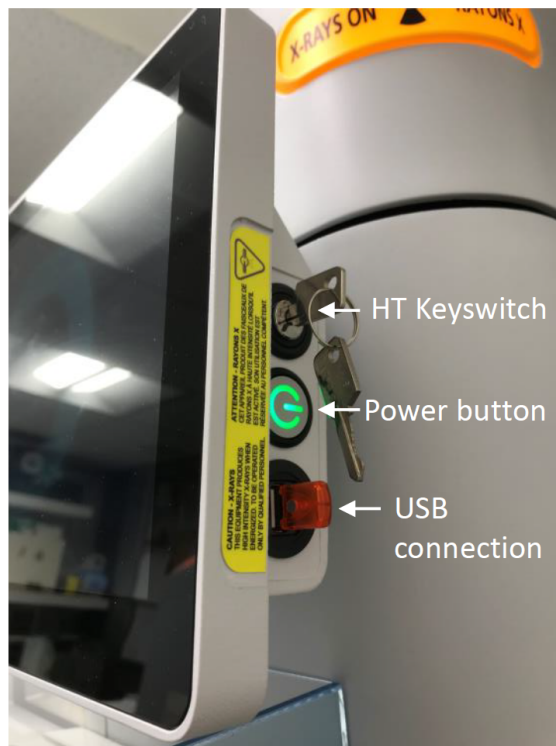
B.

A.

Figure 1. Turning on the Aeris XRD. A) Power switch in the back right of the instruments. B) Push the green Power button on the right of the screen to power on the screen. Turn HT keyswitch clockwise to start the X-ray generator (the key is vertical when it is ON).

Make sure at least one sample holder spot is empty before turning on (to allow the sample changer to zero itself).

Turn the front computer on by pressing the power button on the right side of the screen. Let it initialize. Sample changer arm should move and initialize.

Screen will prompt you to turn the key-switch, turn it clockwise and the "X-rays on" yellow lights around the instrument will light up. The screen goes to sleep when not in use, just move the mouse or touch the screen.

To turn off the instrument, press the power button on the side of the screen, and then toggle the key switch counter-clockwise.

Sample Preparation and Holders

Aeris sample holders cannot be interchanged with the Bruker sample holders. The size is slightly different and they are magnetic which lets the machine to know there is a sample in the slot.

Most common method is backloading. The sample holder is in two parts, the top ring (B) and the base (C) which the top ring clips into and is loaded using the sample table (A) which is the small device with a center platform and three round buttons around it (*Figure 2*).

Follow the steps below along with the figures below to pack and assemble the backloaded sample holders (*Figure 3*).

1) Place the top ring upside down on the sample prep table and clip it in by pressing the button on the side. Take care not to scratch the center platform.
2) Mound the powder up slightly in a conical shape.
3) With a blade or glass slide make chopping motions on the powder to help spread it out evenly. Press it down with the cylindrical press.
4) Scrape off the excess with a blade or glass slide.
5) Brush away excess powder so that the outer ring is clean for attaching the sample holder base.
6) Press and clip the sample holder base into the top ring. It should snap in cleanly and easily.
7) Turn the entire sample prep table upside down, resting the sample holder base on the countertop, and press the release button on the side to release the completed sample holder. Sample surface should be flat and flush with the edge of the holder. With the brush or kimwipe, clean any powder off the ring surface because that comes in contact with the sample spinner.

Tips:

If the powder sticks to the sample table when you flip it upside down to release, try it again with a piece of weighing paper placed on top of the platform and then clip the top ring in. If you don't have enough power to fill the sample holder, after pressing down with the cylindrical press add one of the cardboard spacers so that the cardboard spacer is flush with the ring top and then clip in the holder base. Also note that if there is too much sample the back of the holder will not attach.
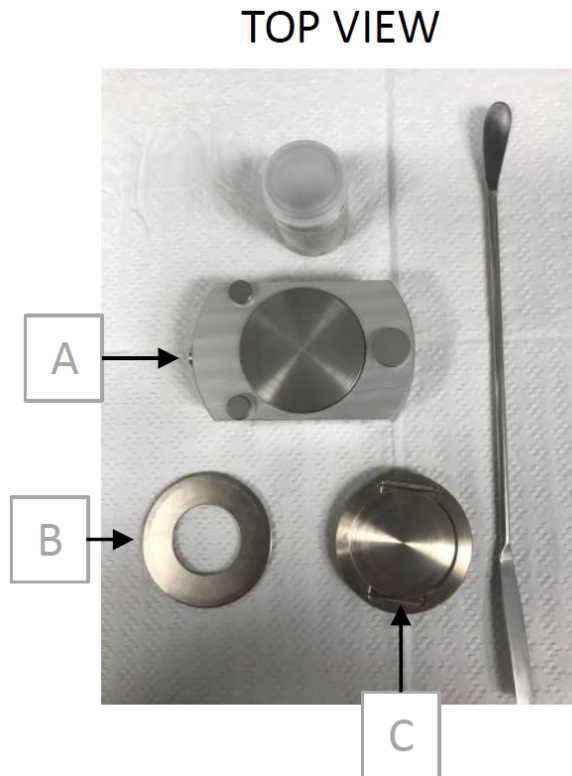
TOP VIEW

Figure 2. Backloading sample holder (view from the top). A) Sample preparation table, B) Top ring, C) Base which the top ring clips into.

1. Top ring upside down

2. Mound powder up

3. Spread sample out evenly and press it down
4. Scrap the excess

5. Brush away excess

6. Press and clip the base

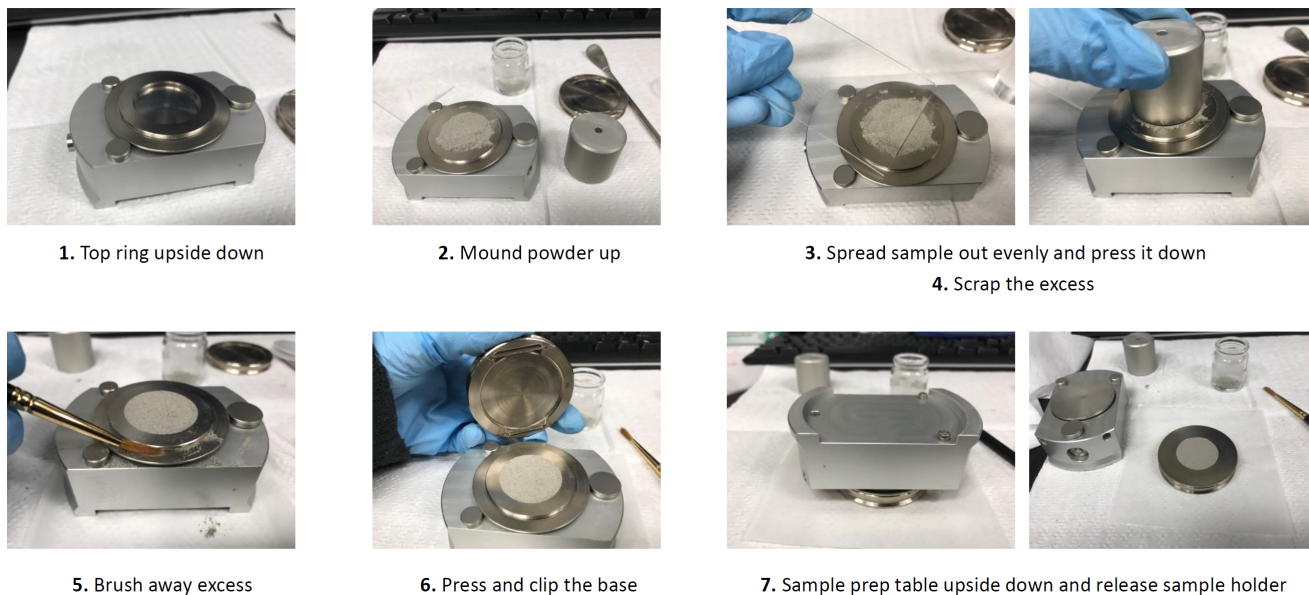**7.** Sample prep table upside down and release sample holder

Figure 3. Sample preparation for Aeris backloading sample holders.

Importing a new measurement program

1. Navigate to C:/ PANalytical/XRDMP Creator/ to open an existing file on the XRD computer to edit or rename by clicking OPEN. OR open the XRDMP creator software and open a previous parameter file. See '**Creating/Editing A New Measurement Program**' in the **Aeris Advanced User Guide**. Make any needed edits to the start and end angles and click 'Save As'. Rename for the current expedition.
2. Save the creator parameter file onto a USB drive. The USB can then be inserted into the side of the Aeris touchscreen.
3. Click on the **Menu** button ☰ and select '**Advanced Mode**'. The password is **panalytical**
4. Click on Menu again and select '**Data Management**' (*Figure 4*, arrow A). Select the '**Import Programs**' tab *(Figure 4)*
5. Source should auto populate as the USB drive (*Figure 4*, arrow B). Select the measurement program (arrow C), and then click '**Import Programs**' (arrow D)
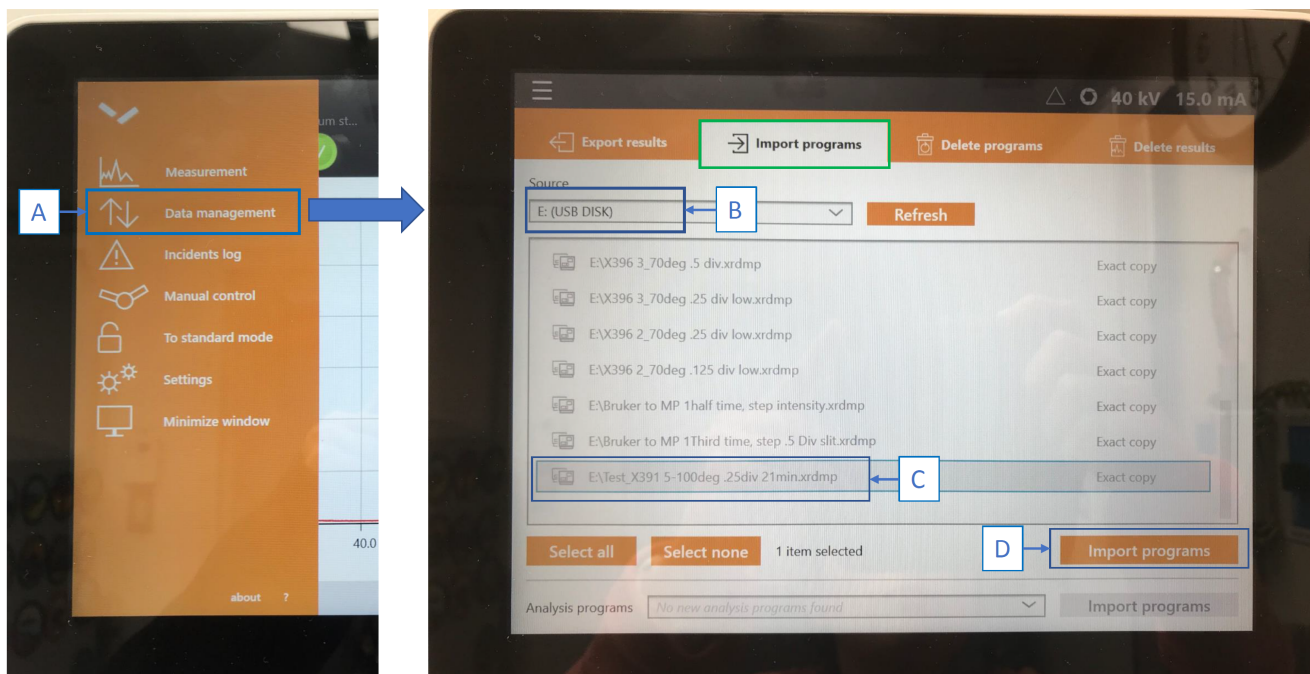6. Click **Menu** to return to Measurement screen.

Figure 4. Importing a program from a USB drive to the Aeris XRD.

Running a sample

Place sample into one of the six slots on the sample changer. Be careful not to touch the center arm that comes in and out of the shutter door.

Click on the MENU button in the top left of the screen and go to **Measurement** (_Figure 5,_ arrow A)**.**

The 6 circles along the top of the screen correspond to the six sample slots. Click on an active one (with a question mark) to get started. Select the appropriate measurement program in the dropdown menu (_Figure 5_, arrow B).

Use the barcode scanner (on the right side of the Aeris) to scan the sample ID label into the sample ID field, or type it in with the keyboard (_Figure 5_, arrow C). The file name will auto populate. Add any comments as necessary such as clay separation, heated, standard, test.

NOTE: If you are running clay samples you will end up with multiple runs that have the same sample info if you do not add extra info in the sample name. To make sure you can differentiate this in the database you must add extra text **before** the Text_ID so that it looks like the examples below. Do this step on the Aeris touch screen so that it gets included in the metadata of the file. MUT will recognize the files written this way as long as there is a **.xrdml and . jpg with matching file names**. There is a character limit on the Aeris so you may shorten the extra text to something like heat, or glyc. U1565A_1R1_3_4_clay_WDGE11053881.xrdml, U1565A_1R1_3_4_heated_WDGE11053881.xrdml, U1565A_1R1_3_4_glycolated_WDGE11053881. xrdml
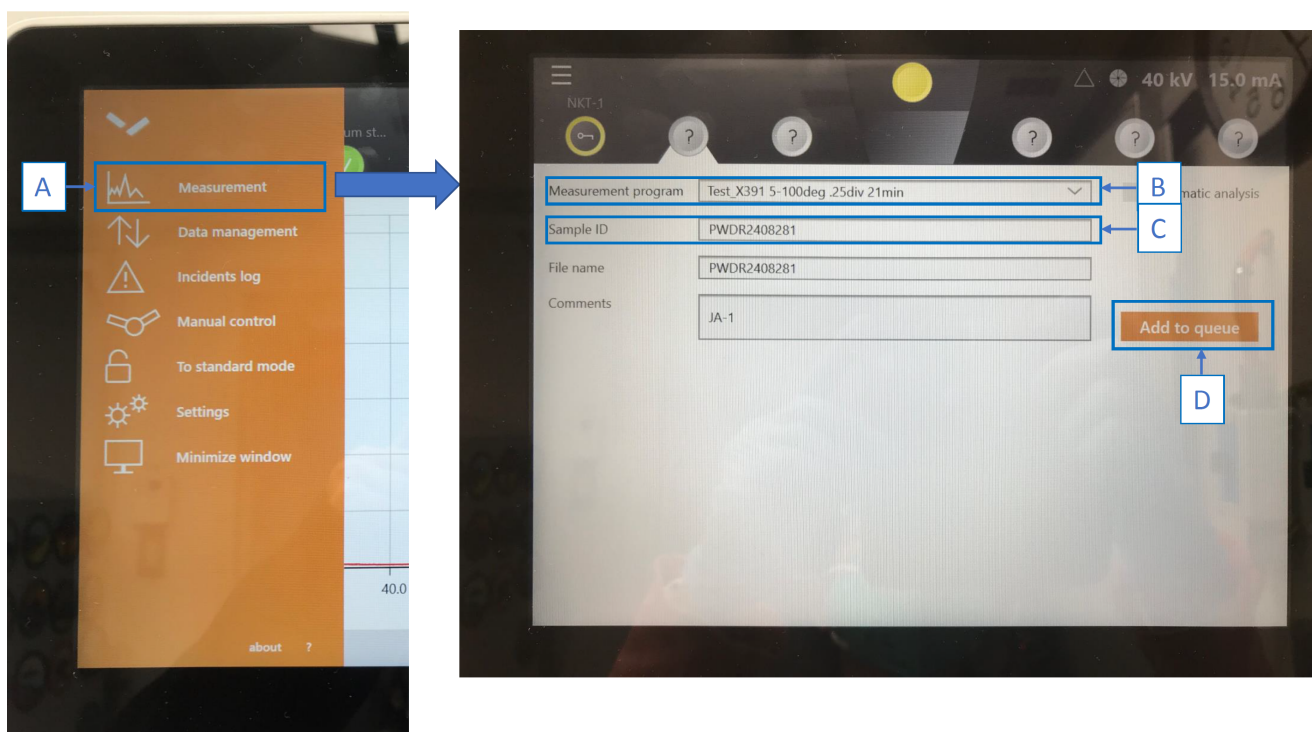

_Figure 5. Starting a scan on the Aeris XRD. Sample ID set up screen._

Uploading Data

Two file types, **.xrdml** and **.jpg**, are uploaded per sample. File name must be in the following format to be recognized by MUT and uploaded: U1536B_5H3_79_81_CYL19622183. The files are located in C:\XRD Data\XRD data or C:\DATA\IN.

To create a .jpg file, Double click on any .xrdml file to open **Data Viewer** . The diffractogram will open. This can be a quick and easy way to print

and save the raw image. You can open more files and view the scans on top of each other . Use the snipping tool to make a screenshot of the diffractogram. Save as **.**jpg with the same file name as the corresponding .xrdml file.
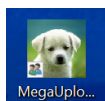
Upload files to the database through MUT ![MegaUplo...] . To be able to correctly upload the files to the database, make sure to have **both .xrdml and .jpg files** in MUT with matching file names. The valid files have a green check in the Status column (*Figure 6*). The files with a purple question mark have an error and cannot be uploaded. In *Figure 6*, the files in the purple box do not have the proper correct format. Select the correct project (*Figure 6*, arrow A) and upload to MUT (arrow B). Refresh when new samples are measured (arrow C).
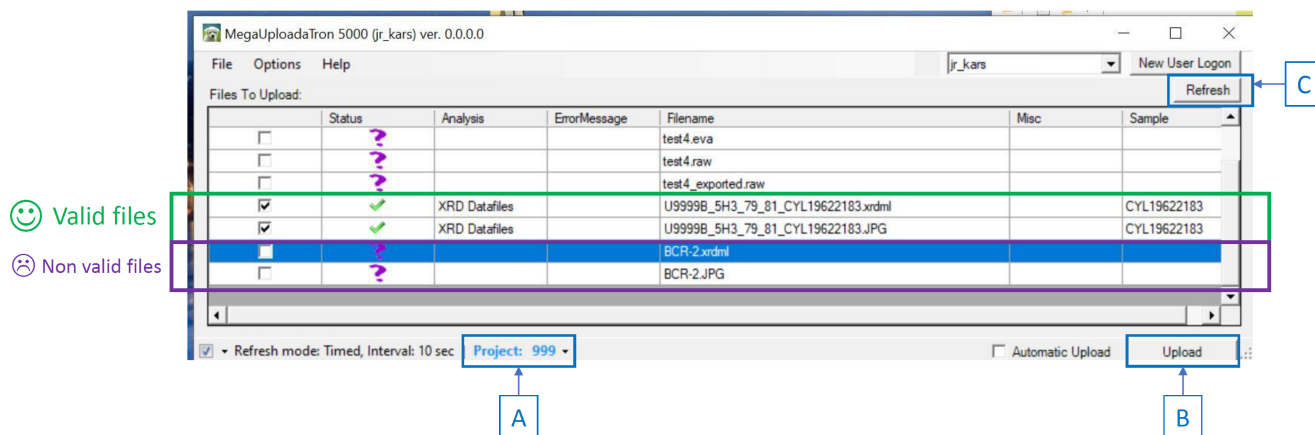

Figure 6. MUT window. Note the valid files with a green tick and non correct files with a purple question mark.

After uploading, MUT will transfer the files to either C:\XRD Data\archive or C:\DATA\ARCHIVE. Organize the archived files by Site and Hole. At the end of expedition copy these into DATA1 which is used as a database backup (speak to programmer if you cannot find DATA1).

As noted above: If you are running clay samples you will end up with multiple runs that have the same sample info. To make sure we can differentiate this in the database you must add extra text **before** the Text_ID so that it looks like the examples below. Do this step on the Aeris touch screen so that it gets included in the metadata of the file. MUT will recognize the files written this way as long as there is a .xrdml and .jpg with matching file names.

There is a character limit on the Aeris so you may shorten the extra text to something like heat, or glyc.

Examples: U1565A_1R1_3_4_clay_WDGE11053881.xrdml
U1565A_1R1_3_4_heated_WDGE11053881.xrdml
U1565A_1R1_3_4_glycolated_WDGE11053881.xrdml

Viewing and Analyzing Scans

When the scan is finished, the data file automatically transfers to the XRD lab computer. Open **Data Viewer** ![Data Viewer] . Click 'File', then 'Open'. Select the desired **.xrdml** file in C:\XRD Data\XRD data (default saving folder). Or double click on any .xrdml file and Data Viewer will open automatically. The diffractogram will open (*Figure 7*). This can be a quick and easy way to print and save the raw image. You can open more files and view the scans on top of each other.

Click on the page icon (circled in purple in *Figure 7*), to view the complete report of parameters used in the scan. Scientists may want this information for their methods.

Figure 7. Viewing diffractograms with Data Viewer and accessing report of scan parameters for a sample.

For peak identification and advanced processing use **HighScore** software. . *See the HighScore Quick Start Guide*.

HighScore is available via a Remote Desktop onboard. IP address is 165.91.150.141. PC is called PCV0001.

User name (login): daq

Password: daq