



WVU Shared Research Facilities

















Bruker D8 Discover XRD Troubleshooting Guide

X-rays Off Due to Safety Interlock Alarm







1. Check that the doors are properly closed.
2. Close XRD Commander software. Open D8 Tools software. The two programs cannot be opened at the same time.
3. In D8 Tools program, select **Online Status**.
4. Press the  icon in the top menu bar to obtain the current system configuration.
5. On the Content side-bar, select the following: **X-Ray Generator → X-Ray Software Safety Circuit Capture Register**. The right or left door should be in alarm and the X-ray Generator OFF will also be in alarm.
6. On the drop down menu, select: **Utilities → X-Ray → Reset X-Ray Software Safety Circuit Capture Register**.
7. On the drop down menu select: **Utilities → X-Ray → Reset X-Ray Hardware Capture Register** to reset the system configuration.
8. Turn on the HV by turning the HV knob on the right control panel CLOCKWISE.
9. If the HV could not be turned on after multiple attempts, shut down the power of the system by pressing the red button on the right control panel.
10. Wait for a minute and restart the system power by pressing the green button on the right control panel.
11. Open the doors and then close them.
12. Turn on the HV by turning the HV knob on the right control panel CLOCKWISE.
13. Initialize all the drives by following the Stage Initialization Procedure in the next section.
14. If the tool has been off for more than an hour, the optics need to be warmed up. This is done by increasing the voltage and current by increments of 5kV and 5mA and waiting five minutes. Once the tool is at 40kV and 40mA, it is ready for use.

Stage Initialization Procedure

1. Check that the doors are properly closed.
2. Close XRD Commander software and then open D8 Tools software. The two programs cannot be open at the same time.
3. In D8 Tools program, select **Online Status**. Press the  icon in the top menu bar to obtain the current system configuration.

4. At **Positioning Drives** page, select **2-Theta** stage. (If Theta or 2-Theta stage is in alarm, refer to the 2-Theta/Theta Collision procedure in the next section).
5. Find the reference up by using the  icon. The 2-Theta stage will move upward to find the reference position.
6. The drive value will be displayed as a value (23°) and a Home Mark number.
7. Fine tune the drive position by pressing the  icon. The drive should read a definitive value (23.2591).
8. Check the Home Mark number next to the position reading. If the stage is at Home Mark #1, Select the  icon and set the drive to 90° position. Otherwise, follow the steps next.
9. If the 2-Theta stage is at Home Mark #2 (around 75°), select  icon and set the drive to 0° position. Then find the reference down by using the  icon. The drive should find the Home Mark #1 at 23°. Fine tune the drive position by pressing the  icon. Select the  icon and set the drive to 90° position.
10. If the 2-Theta stage is at Home Mark #3 (around 110°), select the  icon and set the drive to 0° position. Find the reference down by using the  icon. The drive should find the Home Mark #2. Fine tune the drive position by pressing the  icon. Then find the reference down by using the  icon. The drive should find the Home Mark #1. Fine tune the drive position by pressing the following  icon. Select the  icon and set the drive to 90° position.
11. Select the **Theta** stage.
12. Find the reference up by using the icon . The stage will rotate to find the reference point.
13. The drive value will be displayed as a value (37°) and a Home Mark number (#1).
14. Fine tune the drive position by pressing the  icon. The drive should read a definitive value (37.878).
15. Select the  icon and set the drive to zero position.
16. Repeat steps 12-14 for the **Phi, Chi, X-Drive, Y-Drive, and Z-Drive**. Set the positions to zero.
17. Repeat steps 12-14 for **RotaryAbsorber** and set Rotary Absorber to 1.
18. Repeat steps 12-14 for **LynxIris** and set LynxIris to 13.
19. Close the D8 Tools program. Open the XRD Commander program.
20. Move the **2-Theta** stage to zero position and the **Chi** stage to 90° position.

2-Theta/Theta Collision Procedure

1. Close XRD Commander and open the D8 Tools Software.
2. Under “Instrument Status”, choose the **Theta** drive that is in alarm (red).
3. Continuously press the STEP DOWN icon -  - until the drive turns green. This will move the drive off of the safety switch.
4. Under “Instrument Status” choose the **2-Theta** drive and choose the  icon. Move the drive to 60°.
5. Under “Instrument Status” choose the **Theta** drive and then press the find reference down icon , which will move the Theta drive to its reference position (37°).
6. Fine tune the reference position with  icon.
7. Choose the  icon and set the drive back to zero.
8. Under the “Instrument Status”, choose **2-Theta**. Select the  icon and set the drive to zero position.
9. Close D8 Tools program and open the XRD Commander.
10. Set the voltage to 20 kV and the current to 5 mA. Press SET.
11. Warm up the X-ray generator following the procedure in the SOP if the tool has been down for more than an hour.

Communication or Configuration Issue

1. Turn off the Lynx-Eye Bias.
2. Power off the Lynx Eye detector (located on power supply in rear)
3. Press RED off button to power down the D8 Discover.
4. Restart the PC.
5. Restart the D8 Discover program.
6. Restart the Lynx Eye detector.
7. Wait 30 seconds and turn on BIAS.
8. Enter D8 Configuration – PW= DIFFRAC.
9. Go through sidebar menu and click OK to all and Skip to last.
10. Download configuration by pressing CNF icon. At pop-up window check all boxes and press OK.
11. Initialize drives in D8 tools by following the stage initialization procedure in previous section.
12. Run test in XRD Commander.