

Mini-X2 Quick Start Guide

1 Equipment List

- Mini-X2 X-ray Tube Module
- Mini-X2 Controller Module
- X-ray tube to controller interconnect
- Mini-USB Cable
- +12 VDC supply
- Interlock connector
- Amptek installation CD
- A computer with Internet access, supplied by the user, with Windows XP Pro SP3 or higher

2 Warnings and precautions

The Mini-X2 is intended to generate X-ray radiation during normal operation. It includes a high voltage power supply, with voltages up to 70 KV, and has other potential hazards. These are described in the Mini-X2 User Manual. Please refer to this before using the Mini-X2.



Caution

This device produces X-RAYS when energized.



STOP: ONLY QUALIFIED PERSONNEL SHOULD PROCEED BEYOND THIS POINT.

3 Safety interlock

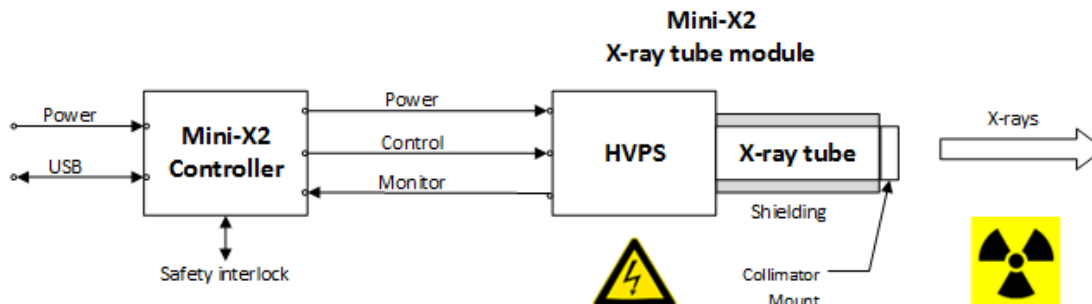
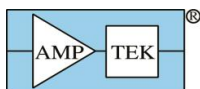
The Mini-X2 includes a safety interlock which must be used before the X-ray tube turns on and produces X-rays. This interlock, including the pinout of the interlock connector and the requirements on its wiring, are described in the Mini-X2 User Manual. Please refer to this and configure the interlock before using the Mini-X2.

4 Software Installation

1. Install the WINUSB driver. Please see the “WINUSB Driver Installation Instructions”, on your installation CD. We strongly recommend that you use Windows Update to install the USB driver!! If your computer is on the Internet, Windows will find the driver on its update site and install it.
2. Install the Mini-X2 control software. Locate the directly called “Mini-X2” on the Amptek Installation CD and run the setup program. The software can also be downloaded from www.amptek.com.

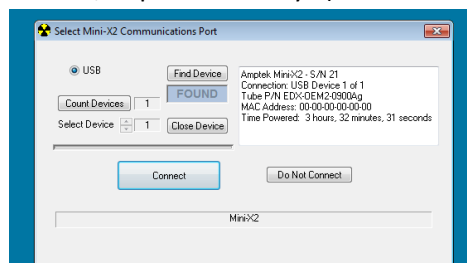
5 Mini-X2 Connection Instructions

1. Connect the Mini-X2 Controller to the computer with the USB cable.
2. Connect the AC power adapter to the Mini-X Controller and plug it into an appropriate 110/220 AC power outlet.
3. Connect the ten pin connector from the Mini-X2 Controller to the Mini-X2 X-ray tube module. Note that the connectors on each end are polarized and can only be inserted one way.



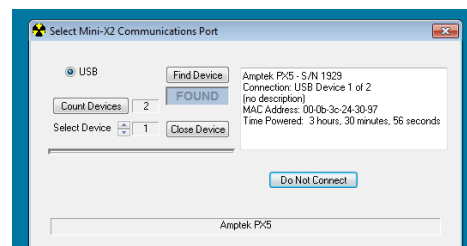
6 Quick Use of the Mini-X2

1. Remove the safety plug from the cover attached to the Mini-X2 X-ray tube. Either install the collimator into the cover or leave the cover empty. Re-attach the cover to the X-ray tube.
2. Make sure that you have verified the anticipated direction of the X-ray beam as described above.
3. The Mini-X2 Controller has a hardware interlock to prevent accidental radiation exposure. This interlock must be enabled, connected through a series resistance, to produce X-rays (as discussed in sections **Error! Reference source not found.** and **Error! Reference source not found.**). Install the interlock plug to produce X-rays.



4. Open the Amptek Mini-X Controller Software. It will appear as shown to the right.
5. If it displays the "Mini-X2" in the box, as shown, then click the "Connect" button.

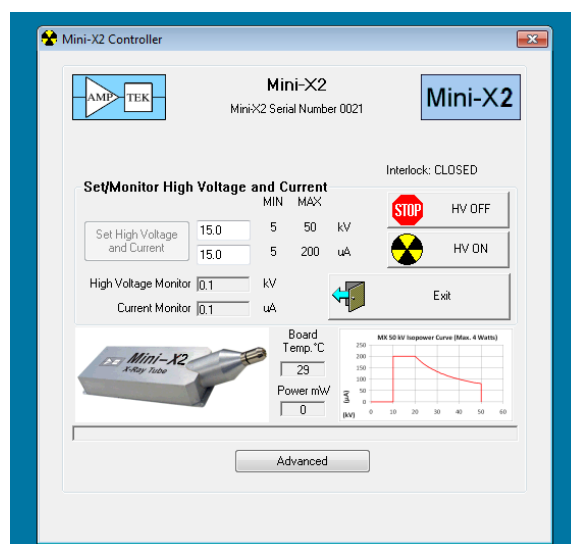
6. If you are operating another Amptek device, for example an X123 spectrometer, you will see a display like one on the right. The software has found the digital processor. The "count" is 2 and it not say Mini-X2 in the dialog. Increment "Select Device" to 2 and it should display the "Mini-X2" information. Then click "Connect".

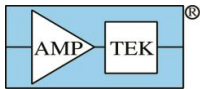


7. Now you will see the screen to the right. The software will display the serial number of the MX-50. It also displays the status of the Interlock; it must be "Closed" to enable the tube.

8. The software defaults to a setting of 15 kV and 15 μ A. To change the values, click into the appropriate text box and type in the desired number.

IMPORTANT: Do not enter a voltage higher than is rated for your unit. In addition, the total power is governed by the Isopower curve. Do not enter a current that exceeds the indicated value for that voltage. If a requested current is too high, the software will automatically adjust it to the maximum allowed value.





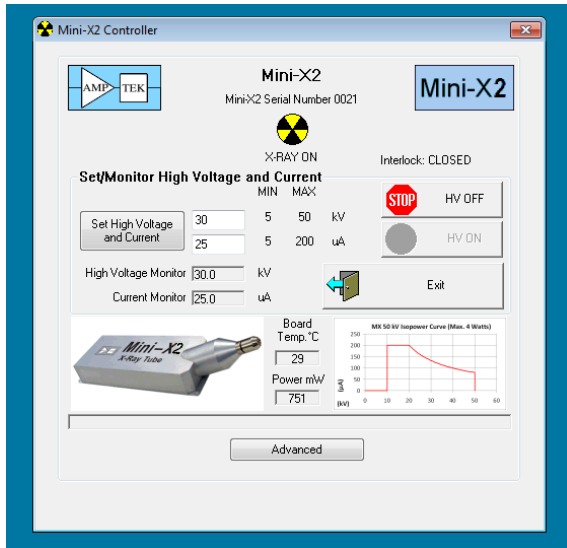
9. Click the HV ON button to turn on the tube. The software will ask you to confirm. Click Yes.



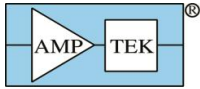
THE MINI-X2 IS NOW PRODUCING X-RAYS



10. The Mini-X2 will start to beep and the red LED on the end panel of the unit will flash. In addition the yellow and black “Radiation Symbol” will blink in the Mini-X Software and the words “X-Ray ON” will appear. Note: The LED indicates changes color and flashing to indicate system status, as described in section **Error! Reference source not found.**



11. The Voltage and Current monitors now show the actual X-ray tube condition. Although the values for Voltage and Current might be slightly different from the requested values, these are the actual values of the tube.
12. To change the high voltage and current, click into the appropriate text box and enter the number. Then click the Set High Voltage and Current button.
13. To turn off the Mini-X2 click the HV OFF button, then click the Exit button to exit the software. Always unplug the Mini-X-2, install the safety plug, and disable the interlock when not in use.



7 Troubleshooting the Mini-X2

If you cannot connect the software to the Mini-X2:

- Was the software correctly installed?
- Were the drivers correctly installed?
- Are all the cables connected?
- Is the Mini-X2 power plugged in?
- If you cannot get it to connect, then open the software and take a screen shot showing the software. Open device manager and take a screen shot showing the devices. Sent to Amptek, at the address below, an e-mail with both screen shots and the LED status (from table below).

What is the color of the LED:

Display	Meaning
Off	No power
Solid blue	Input power OK. Interlock not valid OR no communication interface
Flashing blue	Input power outside range
Solid red	Input power, interlock, communication all OK, but tube has not been enabled (no X-rays)
Flashing red	Tube operating (X-rays are ON)

If you cannot turn on the HV:

- Is the interlock closed? Check LED and software display.

If you turn on the HV but see no evidence of X-rays:

- Is the LED flashing red? If not, the tube is not actually enabled.
- Did you remove the safety plug from the collimator housing?
- Is your detector really on?

If you still are not able to make the Mini-X2 work:

- Click the “Advanced” Tab, then “View Mini-X2 Status”. A box will be populated with data. Click in the box, select the information, copy it, then paste it into a text file (e.g. with NotePad).
- Still in the “Advanced” Tab, click “View Fault Record”. New data will populate the box. Click in the box, select the information, copy it, then paste it into a new text file.
- Send an e-mail to amptek.sales@ametec.com containing a description of your setup and the two text files with diagnostic information.