HPCAT REMOTE USER EXPERIMENT SINCE 2020-2

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16-BM-D REMOTE USER OPERATION GUIDE
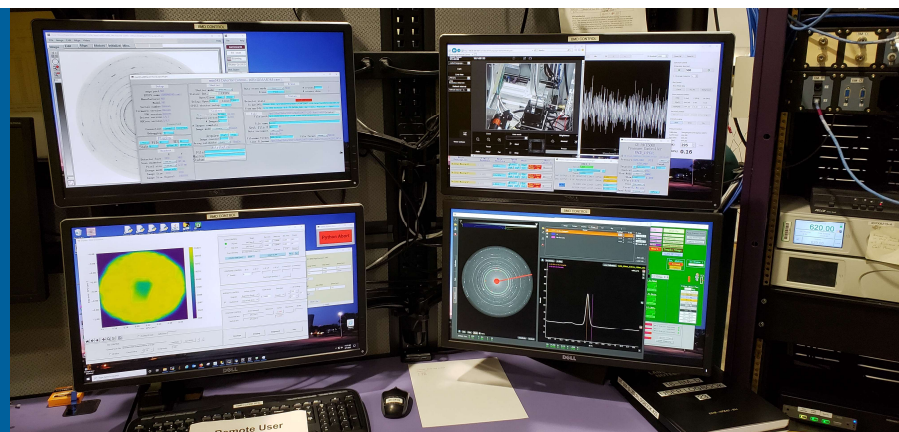
CHANGYONG PARK
HPCAT, X-ray Science Division
Argonne National Laboratory
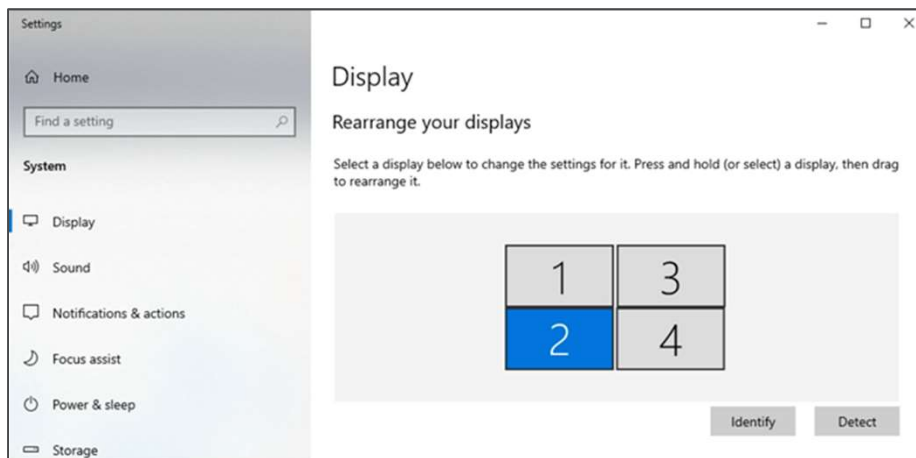
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September 3, 2021

NOMACHINE DISPLAY SETTING

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Beamline's Display:

## The Main Beamline Control Computer's Physical Display Setting

- Four physical screens with IDs
- 1920 x 1080 resolution for each screen

- Client NoMachine session best works when its screen resolution matches with the beamline's.

Note that beamline's EPICS GUI is based on a merged 4-screen coordination (3840x2160 pixel coordinates). Changing the resolution of any one of these 4 screens results in a modification of the screen coordinates and cause unexpected behaviors of the EPICS displays (e.g., disappearing from the screen).

NoMachine Display Setting:
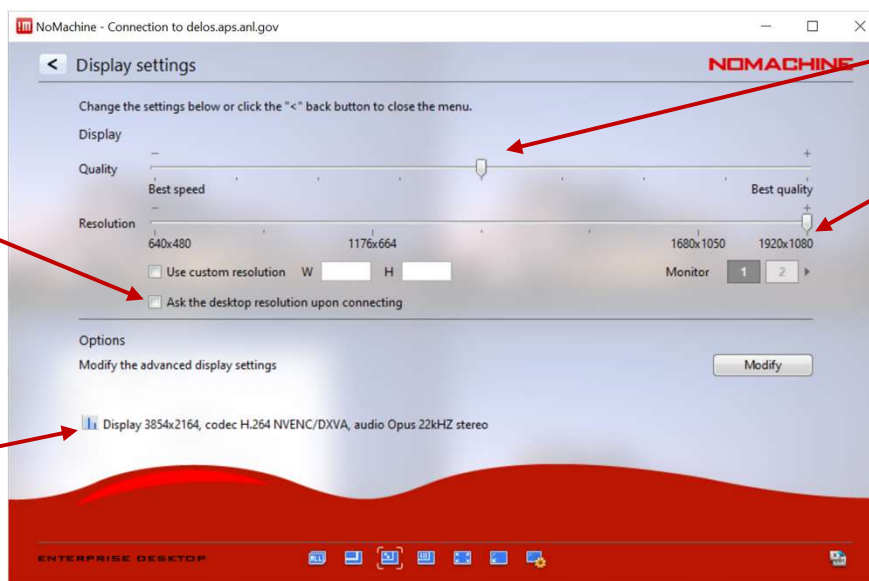## "Ctrl + Alt + 0" shortcut

Ctrl+Alt+0 → Display → Change settings
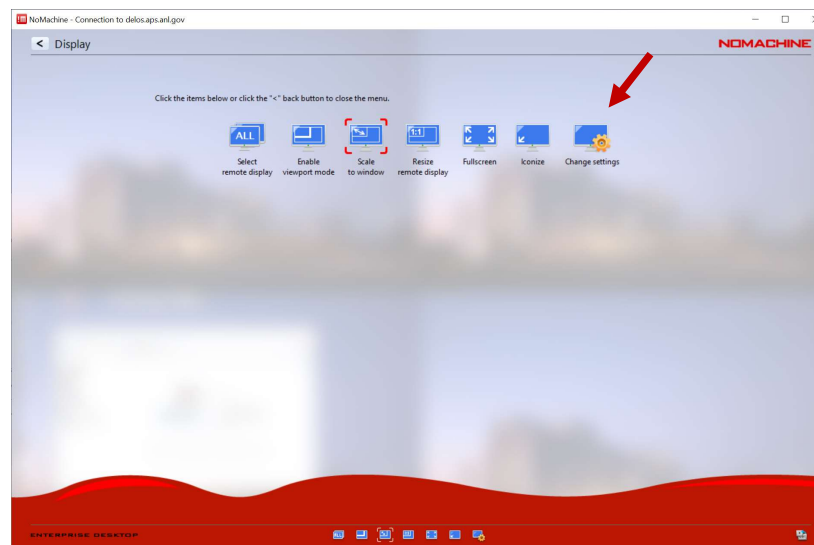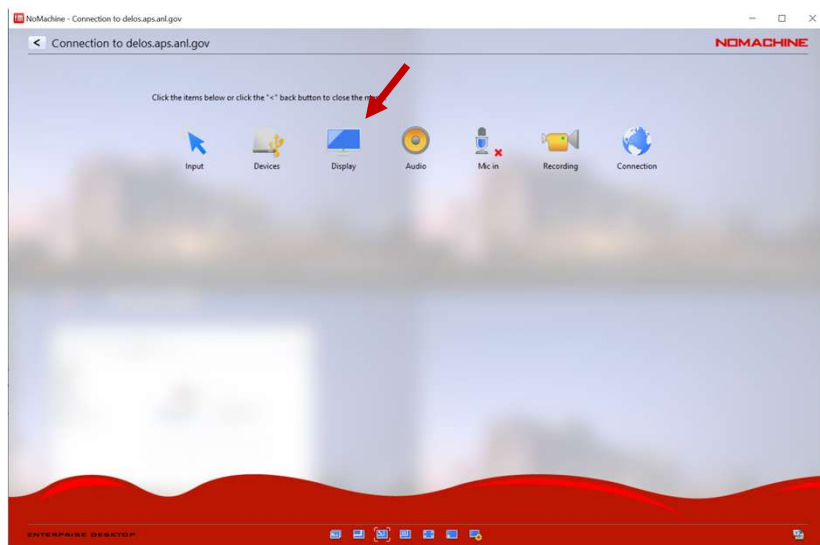
NoMachine Display Setting:

Balance between speed and quality, and be aware of a possible adverse effect on EPICS display by changing the resolution

The lower the quality, the faster the display update.

Match the resolution to the beamline's display resolution for all 4 monitors.

Uncheck this box

This can be (or has to be) customized to match client's best resolution (esp. for lower resolution monitors), but it will globally affect beamline's screen coordinates and may result in an adverse effect on the EPICS GUI. Inform other co-users if this setting is to be changed.

This is client's screen resolution (i.e., your computer screen)

NoMachine Display Setting:
For monitors with poor resolution

"Enable viewport mode" will allow to scroll the screen. This function will help to get better screen image on the client screen if the client resolution is poorer than the remote display.
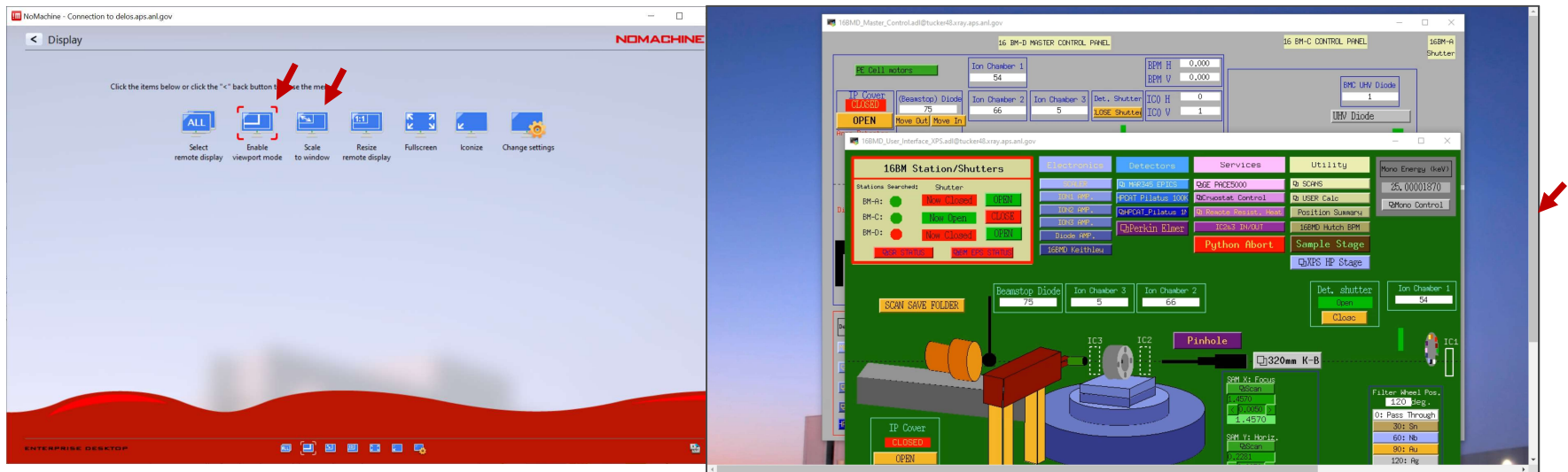
NoMachine Screen Navigation:

Shortcut keys (Windows and Linux):

- Ctrl + Alt + 0:   for settings, quick screen actions, and disconnection*

- Ctrl + Alt + 1,2,3, or 4:   for navigating the screens

- Ctrl + Alt + a: for showing all screens (useful to move windows across screens)

- Ctrl + Alt + f: for toggling to a full screen mode

- Esc: for escaping from the full screen mode

- Ctrl + Alt + i: for identifying the screens

- Ctrl + Alt + t: for disconnecting*

- Ctrl + Alt + End: "Ctrl + Alt + Del" for lock screen

- "Ctrl + Alt + 0" and "Connection" icon will bring a new screen showing the "Disconnect" button.

Tips for connection issues:
Commonly experienced

- Check the internet **bandwidth** - APS-IT recommends faster than **25 Mbps**.

- Internet speed may depend on your **device** too (pc, laptop, tablet, etc.) – check your device's speed.

- Avoid custom **proxy** setting on computer or browser. It may interfere the connection.

- Your organizational **firewall** may block the APS ip addresses.

- NoMachine **client software** is free. Give it a try, if browser-based connection has an issue.

- It shares the **resources;** therefore, multiple simultaneous connections are not always the best.

- For a blur screen, **hoover the mouse** and click

- For screen scroll, use "**Enable viewport mode**" option.

- For a locked screen, **disconnect and wait 5-10 minutes** and try to reconnect again.

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BEAMLINE EPICS MEDM WINDOWS

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MobaXterm:
SSH terminal and X11 tunneling for EPICS applications
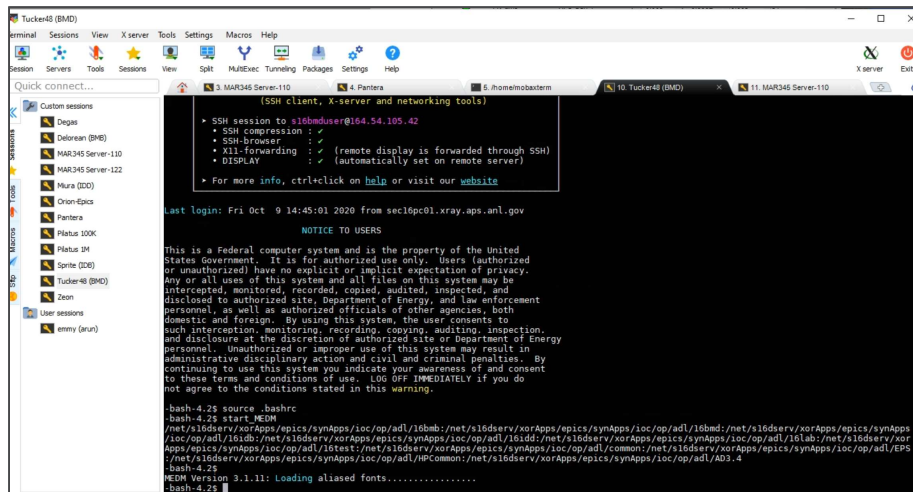
From the Use session tab
- s16bmdcontrol-2 (s16bmduser):
 - login: s16bmduser (password saved)
  - > start_MEDM_16bmd

- Mar345 Server (mar345):
  - login: mar345
  - > mar345dtb (start detector server)

  - duplicate the tab or open a new session
  - > start_epics (EPICS area detector controller)
  - Make sure the image mode is mar2300 (i.e., 150 µm pixel). If necessary, change the mode.

Keep this program running and never close.

16-BM-D Master Control
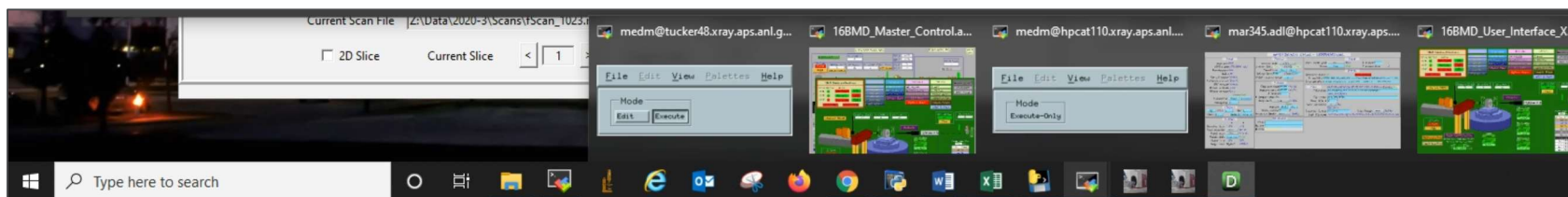## 16BMD_Master_Control to open 16BMD_HighPrecision interface
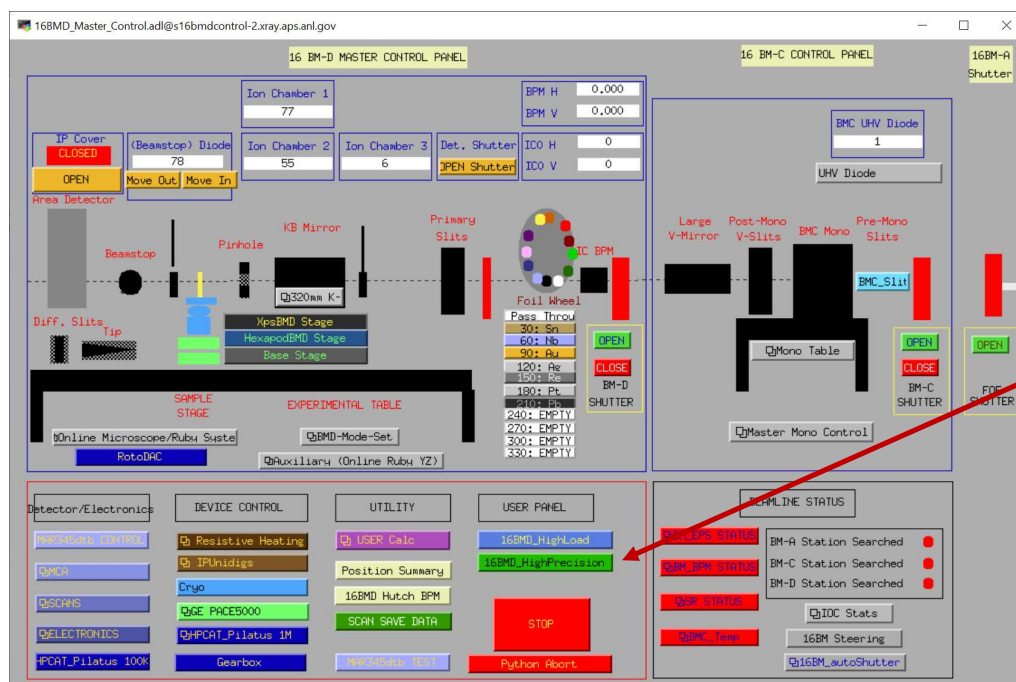
Open 16BMD user interface

- **16BMD_HighPrecision**
- For high-precision XPS sample stage (default)

- **16BMD_HighLoad**
- For high-load sample stage (for cryostat experiments)

16-BM-D User Interface (with High-precision XPS Stage)

Ion chambers and diode gain controls

PACE5000 membrane gas pressure control

Beamline shutter

Change X-ray energy (in keV)

Resistive heater control

Toggle between
- Sample Scan Mode
- Diffraction Mode
automatically cares of beam exposure to Mar345 IP by overriding the "Det. Shutter" and the "IP Cover" controls. It takes 12 seconds to complete the switch.

Pneumatic stage In/Out for IC2&IC3 or others

"Python Abort" for Diptera scan

Sample stage XYZ and Omega control

Online Ruby/Microscope Y-stage In/Out (by setting 120 mm relative motion)

Online Ruby/Microscope stage full control

Laser Power Control

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EPICS Windows on Desktop
Taskbar icon collections for the EPICS windows

MobaXterm XServer
(let the program keep
running undisturbed)

Collections of the EPICS windows
(Note the icons are identical to MobaXterm as they
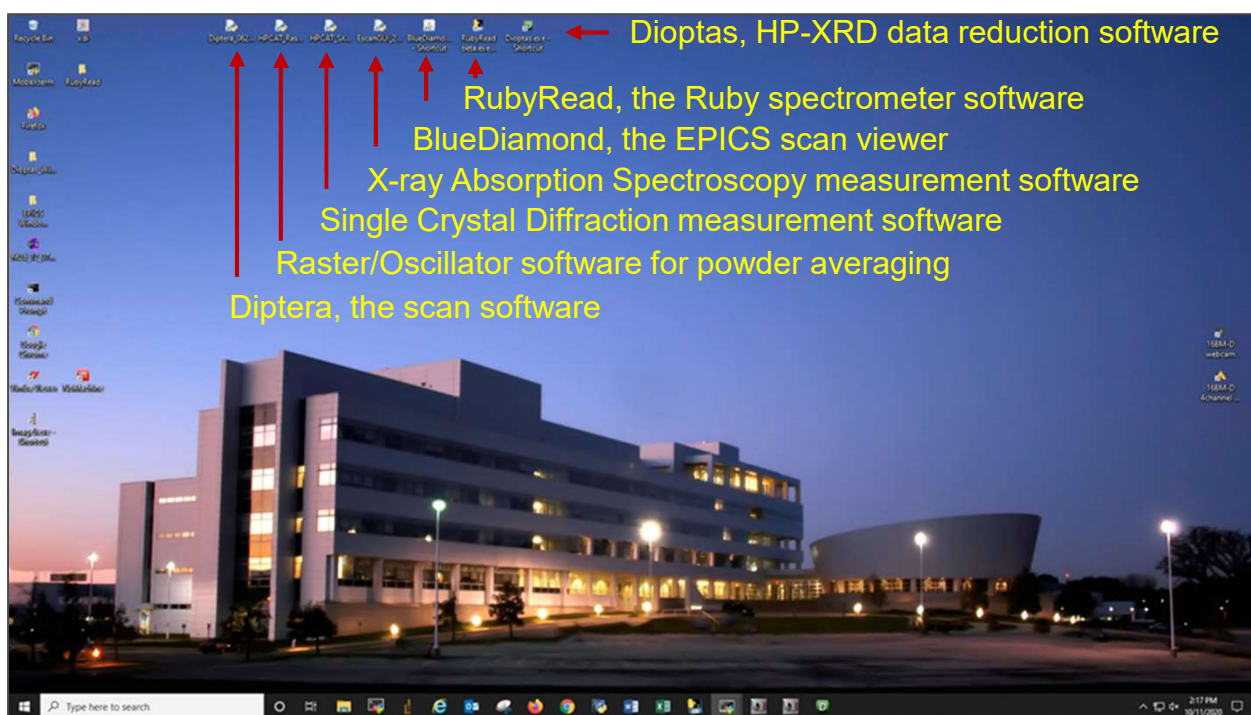are all tunneled through the MobaXterm XServer.)

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BEAMLINE SOFTWARE DESKTOP SHORTCUTS

Beamline Software:
Shortcuts for Beamline Software

Dioptas, HP-XRD data reduction software

RubyRead, the Ruby spectrometer software

BlueDiamond, the EPICS scan viewer

X-ray Absorption Spectroscopy measurement software

Single Crystal Diffraction measurement software

Raster/Oscillator software for powder averaging
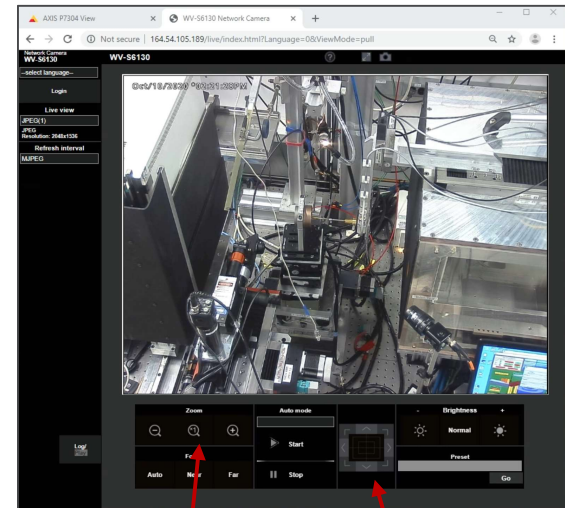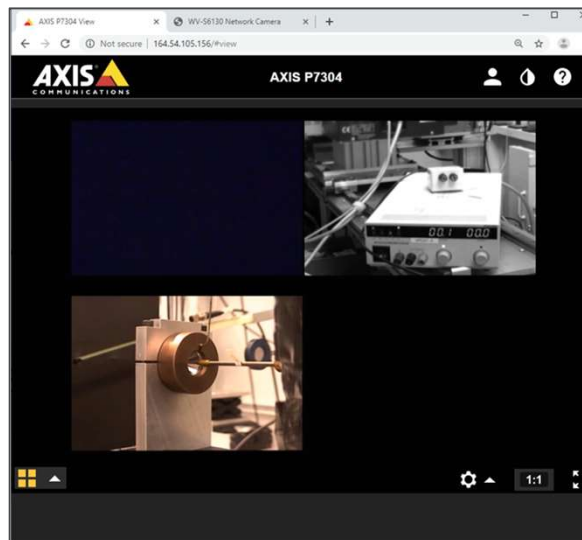
Diptera, the scan software

Web Camera and Quad-Channel Video
Visuals for inside of hutch and cameras

Web browser shortcuts for web camera and quad-channel videos

Channel selection

Zoom control

Camera pane angle

DIRECTORY AND FOLDER NAME CONVENTION

Directory and Folder Name Convention:

Beamline computer

- Mapped network drive: CurrentUser (\\s16data\16BMD) (Z:)

- User data folder: Z:\ESAFxxxxxx-<PI last name>

- Diptera scan save directory: Z:\scanDump or C:\HPCATSoftware\Diptera\ScanData\yyyy-n

- User support folder: Z:\support (e.g., user manual)

Globus online

- Endpoint: aps#data (needs APS User Authentication – d<badge> and password)

- Root path: /gdata/

- User data folder: /gdata/dm/HPCAT/16BMD/yyyy-n/s16bmd-<yyyymmdd>-e<xxxxxx>-<description>

- https://hpcat.aps.anl.gov/sites/hpc-aps-d8.aps.anl.gov/files/HPC/GlobusPersonalConnect%20for%20Users.pdf