MINX V4.1 for Mac OS X, Windows and Linux

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Contact for Help:

Go to the MINX page on Github (https://github.com/NASA/MINX), click on the "Issues" tab, and start a new issue with your question or problem report. We will respond as soon as possible.

System Requirements:

Platform - MINX 4.1 has been tested on Macintosh Intel computers running OSX 10.14, on Windows 10, and on Linux using CentOS 7. It may run on other platforms as well. Four or more GBytes of memory are strongly recommended. Graphic display resolution should be at least 1280 x 1024. Multiple CPUs and a capable graphics processor are highly desirable.

Mac only - You will need the Mac X11/XQuartz application to run IDL and MINX. You can obtain this software online at https://www.xquartz.org/

Linux only - MINX requires a full set of X11 fonts. Red Hat-based Linux distributions such as RHEL and Fedora may not install the full set of fonts by default.
Users without all the required fonts installed may see messages in the MINX console window such as "Warning: Cannot convert string "-adobe-helvetica-medium-r-normal-*-*-120-75-75*"
On Red Hat you can obtain the full set of fonts by issuing the following command:
yum install xorg-x11-fonts-100dpi xorg-x11-fonts-75dpi xorg-x11-fonts-ISO8859-1-100dpi xorg-x11-fonts-ISO8859-1-75dpi

Downloading MINX:

Several version of MINX are available that correspond to different operating systems:

MINX_V4.1.dmg - Disk Image for **Mac OS X** containing:

- MINX – A folder that contains the Mac MINX executable files
- README_V4.1.pdf - this file.

MINX_V4.1Win.zip - Installer for **Windows** containing:

- MINX4.exe – The MINX Windows executable launcher.
- README_V4.1.pdf - this file.

MINX_V4.1.tar.gz – Tar Archive for **Linux** containing:

- ./MINX – Shell script launcher for MINX
- README_ V4.1.pdf - this file.

Installing and Running MINX:

Installing MINX on the Mac:

To install MINX, mount the disk image "MINX_V4.1.dmg" that you downloaded by double clicking it in Finder. In the windows that opens, drag the MINX4 folder to the "Applications" folder (/Applications).

Running MINX on the Mac:

To run MINX, double-click the MINX icon in the MINX4 folder (/Applications/MINX4 by default), then click anywhere inside the IDL virtual machine (VM) banner to show the MINX main menu.

Installing MINX on Windows:

MINX for Windows is portable which means all it takes to "install" MINX is to extract the file "MINX_V4.1Win.zip" you downloaded to a convenient location.

Running MINX on Windows:

To run MINX, double-click MINX4.exe in the MINX4 folder within the extracted location, then click anywhere inside the IDL virtual machine (VM) banner to show the MINX main menu.

Installing MINX on Linux:

To install MINX:

1. Open an X terminal window.
2. cd to the directory where you downloaded the file "MINX_V4.1.tar.gz".
3. Enter the following at the Linux command line: tar -zxvf MINX_V4.1.tar.gz

Note that MINX should be installed and run on a workstation. Installing on a networked server and running from a connected workstation can be extremely slow because of the heavy graphics load.

Running MINX on Linux:

To run MINX:

1. Open an X terminal window.
2. cd to the directory where you installed MINX.
3. Enter the following at the Linux command line: ./MINX
4. Click anywhere inside the IDL virtual machine (VM) banner to show the MINX main menu.

Documentation:

In MINX V4.1, documentation is provided in two forms.

First, a series of 6 PDF files consisting of PowerPoint slides plus one PowerPoint file containing MINX camera animations (MPG movies) are available on the Open Channel website. Individual files can be downloaded as needed, independent of the MINX program files.

- MINX_Doc1.pdf: MISR - the Instrument, its Orbit and Data Products
- MINX_Doc2.pdf: Tools for Ordering and Viewing MISR Data
- MINX_Doc3.pptx: Overview and Plume Case Studies
- MINX_Doc4.pdf: Basic Features
- MINX_Doc5.pdf: Measuring Aerosol Height and Motion
- MINX_Doc6.pdf: Handling Complexities in Height Retrievals
- MINX_Doc7.pdf: Managing Large Smoke Plume Projects

Second, 12 PDF files consisting of PowerPoint slides are included in the MINX installation programs and are available as "context sensitive" help while running MINX. They can be accessed by clicking the "PDF Help" buttons at various places in MINX as indicated by this functional hierarchy. These files have been extracted from the documents MINX_Doc4.pdf and MINX_Doc7.pdf above.

- MINXdoc_MainMenu.pdf
  - MINXdoc_ShowOrbitLocation.pdf
  - MINXdoc_FindOverpasses.pdf
  - MINXdoc_ShowCameraImage.pdf
  - MINXdoc_CompareDataProducts.pdf
  - MINXdoc_AnimateCameras.pdf
    - MINXdoc_AnimationWindow.pdf
      - MINXdoc_TaskMenu.pdf
        - MINXdoc_DigitizeDialog.pdf
  - MINXdoc_PlumeProjectPreferences.pdf
  - MINXdoc_PlumeUtilities.pdf

- MINXdoc_ProcessPlumeProject.pdf

New Features and Changes:

V4.1:

- General
  - Added digitization support for the new NetCDF4 based 4.4km V23 AS Aerosol products

V4.0:

- General
  - This version of MINX has undergone the most extensive testing to date, and many bugs have been fixed.
  - MINX now includes the IDL Virtual Machine as part of the distribution. You no longer need to download IDL or the IDL VM from the Exelis website.
  - Added a MINX_preferences.sav file that automatically saves file and directory names and certain user parameters between MINX sessions.
  - Added a dialog box at initial startup to allow the user to specify a Working directory where much of his output will be directed.
  - Added a "Plume Project Preferences" option to the main menu that allows the user to modify the Working directory as well as a Plume Project directory and several URLs that are used in the Plume Utilities options.
  - Updated to April, 2015, the MISR orbit reference table that provides adjustments for drift in the TERRA orbit as a function of time.
  - Updated AeroNet site locations.
- Animate Cameras option:
  - Rewrote the code for retrieving heights and winds from image matcher disparities to use an inverse solution rather than forward modeling resulting in slightly more accurate heights and faster execution.
  - Modified the retrieval algorithm so the along-track and across-track directions are parallel and perpendicular to the diagonal swath edge on MISR images.
  - Enabled both red-band and blue-band height retrievals to be performed on each plume using the same digitized polygon and direction line with no additional intervention by user. When the two-band retrieval option is selected, the digitized region image, the MP4 animation and the aerosol histogram are saved only for the red band to avoid storing redundant data.
  - Implemented an improved automatic quality flag.
  - Enabled the animation window to be resized.
  - Added a toggle on the animation window to overlay cultural outlines and a geographic grid separately.
  - Added a toggle on the animation window to turn on and off the display of terrain "holes" in MISR terrain-referenced images.
  - Added code to determine which of 7 pre-defined geographic regions (Africa, Australia, Boreal Eurasia, North America, South America, South Asia and Southwest Eurasia) each digitized plume belongs to.

- Added an option to load a MODIS IGBP global vegetation classification grid, to overlay it on a MISR image and to extract the classification at each smoke plume's fire location for output to the raw text file.
- After digitizing each plume, the plume and aerosol histograms are instantly removed from the screen after their images are written to disk.
- Added text to each profile plot showing maximum and median height estimates, automatic retrieval quality, geographic coordinates of origin of plume and fire total radiative power when MODIS fire power is loaded.
- Added 5 accelerator keys to enable changing digitizing modes: digitize (CNTL-D), delete (CNTL-R), cancel (CNTL-C), set plume overlay options (CNTL-O) and laod fire pixels (CNTL-F). Also added 3 accelerator keys for other functions: correct misregistration (CNTL-W), select color palette (CNTL-P) and set swath display options (CNTL-S).
- Added feedback on digitizing state by changing cursors: arrow cursor = null state; crosshair cursor = digitizing state; large "X" cursor = delete state.
- Added a flashing polygon to indicate which plume region the user has selected to delete.
- Improved the image quality of camera animations by changing from MPG tp MP4 format. (You need an IDL license to enable the MP4 feature.)
- Replaced the "NIR in Green" color slider with a Contrast slider and modified the brightness slider.
- Added an option to the Task Menu to enable the user to change color palettes and changed the default palette.
- Added an option to the Task Menu to enable the user to scale the colors on full swath images of MISR standard data products and to manipulate the location of color bars. The dialog persists and can be accessed via accelerator key for ease of use.
- When the two-band retrieval option is selected, the user can choose whether to show the red or blue retrieval values or both in the "Select Digitized Region Display Options" dialog accessed from the "Task Menu". Both is the default. The dialog was made to persist and can be accessed via accelerator key for ease of use.
- Added two items to the message box presented after digitizing each plume is completed: "Does this plume include a pyrocumulus cloud?" and "Describe exceptional features:". These items are recorded as new parameters in the output text file for each plume.
- Added 5 parameters to output text files for digitized plumes describing options used: "Min ht > terrain (km)", "Max ht > sea level (km)", "Sample spacing (km)", "Registration corrected" and "Image color equalized".
- Added or modified 9 parameters in output text files for describing the results of height retrievals: "Geographic region", "Biome IGBP name, class", "Red/blue band better", "Fire elev. (m > sea level)", "Median ht (m > fire)", "Max ht (m > fire)", "Ht local variation (m)", "Plume has pyro-cumulus" and "Comments by digitizer".
- Added the biome file to the list of files used by MINX in output text files.
- Populated the field in the Results table of the output text file named "Fltrd" with smoothed heights.
- No longer compute ToA albedos and removed their data from output text files.
- Removed MODIS reflectance and brightness temperature data from the output text files, leaving only the fire radiative power.

- Digitizing dialog box:

- Redesigned the dialog box to avoid overlapping controls in some MS Windows versions.
- Removed the "Show ToA albedo results" button.
- Added a "Write info on maps" button that, when checked, writes a header on all saved MISR image files that includes orbit number, date acquired, camera captured and geographic coordinates of the first point in a plume.
- Removed the three "… retrieval precision" radio buttons and replaced them with a check box to "Relax retrieval thresholds".
- Changed the "Max height above sea level" filter to also control the maximum height displayed in height and wind profile plots.
- Added a "Match twice: w/ red and blue" button to the options used for retrieving heights and winds and made it the default.
- Added a reset button to return all controls to their defaults.

- Plume Utilities:
  - Reorganized and fixed the Plume Utilities options to conform to new Reverb website requirements for downloading MODIS thermal anomaly granules.
  - Enabled L1B2 files stored in 9 camera subdirectories named DF, CF, BF, AF, AN, AA, BA, CA and DA to be found when checking if MISR products have been retrieved by specifying only the AN camera.
  - Modified plume utilities to more accurately report the results of filtering smoke plumes.
  - Many other enhancements and modifications.

V3.0:

- Replaced 'C' libraries with native IDL code to provide platform independence – MINX now works with Linux as well as OS X and Windows (and possibly others OS's). Also optimized MINX to provide slightly better performance than with 'C' code.
- Added 11 PDF documentation files inside MINX where they are most needed, accessed by clicking buttons named "PDF Help".
- Added 3 new graphics formats for saving images to file:
  - GeoTiff geo-referenced image
  - PNG/KML for overlay on Google Earth
  - Red/blue images for use with 3D glasses
- Added a button on the Animation window to toggle on/off the overlay of geographic features including coastlines and rivers, country and state outlines and a geographic grid.
- Added additional MISR data fields that can be displayed in the "Compare Data Products" option and in the data overlay feature in the Animation window.
- Reworked the code that generates fire pixel data from MODIS thermal anomaly granules (MOD14) to be more robust and less confusing.

V2.0:

- Added a separate version of MINX that uses IDL version 8.1 so the more reliable MP4 movie format can be used in generating MINX animations for those who have an IDL license and IDL V8.1.
- Added a Compare Data Products feature to the main menu that allows users to load and display data swaths (e.g. L1 radiance, terrain height, camera zenith angles, stereo height, aerosol optical

depth, ….) from multiple MISR standard data products side-by-side at the same scale and to query the data values at clicked points.

- Removed the Load Documentation option from the main menu. MINX now has a series of PDF files in PowerPoint format that describe the program and how to use it. You should download these separately.
- Animate Cameras option on main menu:
  - Made GRP_TERRAIN the default L1B2 data to load in file selection dialog box.
  - Changed the format of the MINX session .sav files that contain all the information needed to restore an animation session later. **Consequently, .sav files created in earlier versions of MINX will not work with V2.0.**
  - Added a check box on the main animation window to toggle between a per-camera color scaling and a "true color" scaling. Also increased default image brightness.
  - Added radio buttons on the main animation window for selection of the MISR band to display in gray-scale imagery as well as the standard RGB imagery.
  - Changed the dialog box for selecting the directory for reading marker pixels. It's now accessed with the Post Marker Pixels from File … option on the Select Task to Perform menu button. Use radio buttons to choose Aeronet or Volcanos or Other and allow Other to find a custom file anywhere on disk. Also allow deleting current markers so others can be loaded.
  - Added a Select Data Overlay Options choice on the menu displayed by the Select Task to Perform menu button. This shows a dialog box that allows changing the type of retrieved data to display inside digitized plume polygons (e.g. image matcher disparities, zero-wind heights, wind speeds). It also provides choices for displaying a color key for the selected data type.
  - Added a Select MISR Data to Show button on the main animation window for selection of MISR data (terrain elevation, camera geometry, SVM masks, ….) to load and display in the OP window. User can quickly toggle back-and-forth between MISR imagery and the selected imagery.
  - BRF Analysis option on main animation window:
    - Cleaned up BRF plots window – added device fonts, fixed 2-orbit plotting, fixed zoom window size and cursor position and changed window text.
    - Added feature to save an MPEG file of the 64x64-pixel zoom window.
    - Added option to print out table of radiances and geometry at clicked point.
    - Changed display of 1.1 km channels to show at true resolution.
    - Removed brightest 5% of pixels from calculation of max brightness for scaling purposes.
  - Changed the format of ASCII output files automatically written for each plume:
    - Renamed and reordered some of the parameters in the header section.
    - Added Date digitized to the header section.
      - Added several retrieval parameter values to the header section that were selected by the user in the Digitizing Options dialog box.
    - Added POLYGON and DIRECTION tables that describe the coordinates of points on digitized plume polygon and plume direction lines.
    - Added names for the tables including RESULTS for the point data table.
    - Added the number of points in each table to the table name line.
    - Added 2 columns to the RESULTS table – Fltrd height and Total windspeed.
    - Allow the user to exclude columns from the RESULTS table for groups of parameters

(aerosol, albedo and fire pixels) if the corresponding checkboxes were not selected in the Digitizing Options dialog box.

- Extensively modified the Digitizing Options dialog box with changes to existing controls and functionality and additions of user-selectable controls and functionality:
  - All buttons show context-sensitive help when the cursor hovers over the control. IDL text boxes do not have this capability.
  - All values used in the current session are restored to dialog box whenever it is reentered.
  - Renamed the Object Type group to Aerosol Type
  - Changed the items in the Aerosol Type group to physical types: Dust, Smoke, Volcanic ash, Cloud/Snow, Contrails and Other aerosol.
  - Moved and changed the Display Options group:
    - Removed SVM mask option and moved to Select MISR Data to Show.
    - Removed Show Stereo Results – height/wind results are always shown.
    - Renamed Show Albedo Results and Show Aerosol Results.
    - Added Compare heights w/ PGE8a to allow displaying results from the MISR standard stereo product on the height/wind profile plots for comparison purposes.
    - Added a Publication qual plots checkbox that, if checked:
      - Height/wind profile plots are produced extra-large for best quality.
      - Non-essential clutter in height/wind profile plots is removed.
      - MISR imagery is saved to file without the camera names (e.g. An) written in red in the lower left corners.
  - Replaced the Processing Parameters group with Wind Correction Filters, Sample Spacing and Retrieval Options groups.
- Wind Correction Filters group:
  - Changed name of Terrain Ht Mask text box to Min hght above terrain.
  - Changed name of Maximum Height text box to Max hght above sea level. Entered value now acts as a filter that prevents retrieval of any wind-corrected heights value above this level. Zero-wind heights are not affected.
  - Changed name of Maximum Wind text box to Max retrieved wind.
  - Changed height units from meters to kilometers.
- Sample Spacing group:
  - Removed Plume Point Grid and Cloud/Land Grid text boxes that require entry of grid spacing values and replaced them with a group of radio buttons representing the allowable values.
- Retrieval Options group:
  - Created a new pair of alternatives to specify how digitizing will work: Retrieve along line or Retrieve inside polygon. This replaces the old distinction between Plume Lines and other Object Type choices.
  - Created a new pair of alternatives to replace the distinction between Plumes and Clouds in the old Object Type group: Use no wind direction and Provide wind direction.
  - Created a checkbox option to allow Bi-directional wind. If checked, the user-specified wind-direction and the direction 180 degrees opposite will be used in the retrieval.

- Added a new section of 5 radio buttons to allow selection of the MISR band to use in height retrievals. Red is still the preferred band, but blue often provides superior results for low optical density plumes over bright terrain. Match w/ Blue (land) and Red (water) automatically switches bands depending on the underlying surface.
- Added Match selected band w/ An blue band. This uses the band you choose for all cameras except An, for which the blue band is used.
- Added 4 radio buttons to allow selecting the size of the reference camera image matcher to use, which significantly affects processing time.
- Added 3 radio buttons to allow selecting the precision of the retrieval process, which significantly affects retrieval coverage.
- Added 5 radio buttons to allow selecting which combinations of comparison cameras to use with the An reference camera.
- Replaced the single letter (P, S, V) in MINX digitized region names describing the region type with 4 letters:
  - Letter 1 - D = dust, S = smoke, V = volcanic ash, W = water.
  - Letter 2 - L = line, P = polygon.
  - Letter 3 - N = no wind provided, W = wind provided.
  - Letter 4 - R = red band, G = green band, B = blue band, N = near IR band, C = red + blue band.
- Changed the colors and symbols for different plume types in animation window.
- Changed the colors for point symbols in the height and wind profile plots.
- Changed text fonts to True Type to produce more presentable graphics in height/wind plot, height/wind histogram and aerosol histogram.
- Changed wind direction vector so directions are interpolated by spline between control points.
- When drawing heights on animation imagery along digitized lines rather than in polygons, use the same color scale as in polygons.
- Adjusted the size of images written to file during digitizing so they are at least some minimum size.
- Added hourglass cursor to several operations.
- Exclude obvious outlier points in the calculation of maximum height to display on height profiles.

- Plume Utilities option on main menu:
  - Added the ability to process MODIS MOD14 thermal anomaly granules directly for use in plume digitizing without having to download and process ModVolc data first.
- Process Plume Project option on main menu:
  - Changed the format of the input PlumeProjOrbitList.txt file to allow greater flexibility in specifying L1 terrain-projected and ellipsoid-projected radiance files. Now either 1 or 2 pathnames can be entered on the first line: if 1, it specifies the location where both L1 file types will be found; if 2, the first specifies the location of terrain-projected files, and the second specifies the location of the ellipsoid-projected files.
  - The PlumeProjOrbitList.txt file can now include blank separator lines

V1.2:

- Changed the format of the .sav files MINX writes from the Animation window that contain all the information needed to restore a session later. Consequently, .sav files created in earlier versions of MINX will not work with V1.2.
- Changed the format of the file that contains the most recently visited directory for each of several MISR options. Consequently, the /<home_directory>/MINX_dflt_path.sav file created in earlier version of MINX will not work with V1.2. A message will be displayed asking the user to delete the old file before running certain MINX options.
- Added two sliders to the Animation window that support rescaling the image brightness and the NIR content of the green band.
- Added an option to the main menu to determine which MISR orbits overpass a user-supplied set of geographic coordinates at a user-supplied set of times.
- Added an option to the Animation window menu that enables a file containing geographic coordinates, symbols and names to be read and posted on the image. A new button allows posted symbols and names to be turned off and on. An additional data file is located in the MINX program directory containing over 791 Aeronet site locations with names and elevations that can be read and posted on MINX images.
- Added a checkbox to the Digitizing dialog box to allow user to choose not to load the SVM masks from Classifier files.
- Added a text entry box to the Digitizing dialog box to allow specification of a height above terrain below which any wind-corrected heights will be considered blunders.

V1.1:

- Added support for Windows: added new 'C' libraries, backslash directory delimiters, GUI tweaks, Plume Utility ftp files, etc.
- Added calculation of plume quality flag as well as other parameters to write to output text file. E.g. number of pts in table, area per point, standard deviation metric, wind direction relative to along direction, etc.
- Added all the input/output files and directories in Plume Utilities to the list of directories to save between sessions so user doesn't need to reenter them each time MINX is loaded.
- Changed animation code for generation of MPEG. When no IDL license is available and capturing digitized region, 9 JPEGs are created instead.
- Added ability to display 4-bands of data in BRF plot utility rather than only the red-band.
- Added ability to use MISR block-subsetted files in "Process Plumes" and "Animate Cameras" options.

V1.0:

- This was the initial delivery of MINX.

Resolved Issues:

V4.1:

- Fixed bugs related to orbits >= 99999 (6-digit orbits).

V4.0:

- Documentation has been updated.
- MINX crashed or behaved erratically when red system “close window” buttons were clicked on certain windows or when the cancel button was clicked.
- MINX crashed when two orbits were first loaded, then the user exited and loaded a single orbit.
- MINX went into an infinite loop if MOD14 files could not be found for MODVOLC entries
- MINX could not process currently MODVOLC alert files with broken UNIX time.
- Enabled MINX on OSX to read text files written on Windows.
- Fixed a problem when MINX attempted to open a MISR HDF file that was corrupt or empty.
- Clicking KML files created for Google Earth did not load, because the path name was absolute and could not be found.
- Fixed a profile plot display problem when very large values of zero-wind height were retrieved.

V3.0:

- Performed extensive code cleanup and reorganization of portions of the code.
- Fixed numerous small bugs and irregularities.

V2.0:

- Performed a major cleanup and reorganization on portions of the code.
- Fixed the 2-orbit save image option so the correct orbit of the two is plotted and is named correctly.
- When a .sav file containing a MINX session is saved by one user and later restored by a different user, MINX no longer crashes.
- When an orbit number had 4 digits (9999 or smaller), the delete plume function couldn't find the correct subdirectory. A '0' is now prefixed to the orbit directory name to prevent this.
- In dialog boxes where a directory is selected for writing, e.g. in OverpassFinder, if the dialog box is closed with an entry in only the top text box, then data were not written to the correct location. This has been fixed.
- Fixed the arrowhead on wind direction vectors.
- Corrected the values of RMS errors reported in text window after camera co-registration correction.

V1.2:

- Removed the requirement to right-click to exit a map window in the Show Orbit Location option, in favor of a new button on the window that can be clicked with the left button.
- Moved the Exit button on the Animation window from the top control panel to the bottom coordinate panel to reduce window width on low-resolution graphic displays.
- Adjusted the size of the MPEG window created during digitizing to properly contain the characters identifying the camera and increased the MPEG resolution and quality.

- Fixed a bug that prevented retrieved points from being printed to text output if the zero-wind height was below 0.0 and no aerosol data was available. Now allow printing if wind-corrected height is above 0.0.
- Rewrote the method for assigning colors to TOA BRF data in animation windows.
- Fixed a MINX failure when Modvolc fire pixel data were used to create a fire pixel file directly instead of using MODIS data.
- Fixed an occasional MINX failure when drawing height/wind histograms.
- Converted most of the variables in COMMON blocks to system global variables.

V1.1:

- Fixed zero-wind height retrieval problem when terrain is higher than 2500 meters.
- Fixed bug that caused crash when large height or wind range produced more than 60 bins in height/wind histogram.
- Fixed a crash when Restoring a Saved session and there are 2 orbits loaded.
- Set the "2 Orbits" button and made it insensitive along with BlkBeg and BlkEnd text controls.
- Fixed a bug in the plume utility that reports available MISR products. It previously reported a product file was available if it contained the SCF .subset… string.
- Fixed bug that reset region type to smoke plume whenever a plume being digitized was canceled.
- Fixed bug that created black histogram window if there were no zero-wind heights less than the maximum specified height.
- Fixed bug that caused failure when fire pixels were loaded under IDL 7.0. Added a message to make it clear when a L1B2 file is corrupted and needs to be reordered.
- Changed plume utility that reports on available MISR orbits so that all products with version number >= the template value will be reported on.
- Changed maximum absolute wind speed in height/wind retrieval to 75 m/s.
- Fixed MPEG animation when grayscale images are selected.

V1.0:

- This was the initial delivery of MINX.

Known Problems:

- IDL does not follow symbolic links unless the files pointed to by the links are on local disks or are on auto-mounted networked disks. If the disks containing the files MINX needs to read are manually mounted, the solution is ask your system administrator to auto-mount them.

- MP4 animation is no longer supported since is not supported in the IDL Virtual Machine
  Users wishing to animate their images into an mpeg may install ffmpeg and run:
  ffmpeg -framerate 4 -pattern_type glob -i '<prefix>_PlumeAnimation*.jpg' -vf "scale=trunc(iw/2)*2:trunc(ih/2)*2" -c:v libx264 <prefix>_PlumeAnimation.mp4
  Where <prefix> is the plume prefix (e.g. ffmpeg -framerate 4 -pattern_type glob -i 'O044077-

B049-SPWR01_PlumeAnimation*.jpg' -vf "scale=trunc(iw/2)*2:trunc(ih/2)*2" -c:v libx264 O044077-B049-SPWR01_PlumeAnimation.mp4)

- MINX will fail to start on OS X if X11/XQuartz is not installed
- MINX will fail to start on Linux if the libXp library is not available
- MINX will fail to start on Windows if the IDL system libraries are not installed.
- MINX will not render fonts correctly on Linux if a full set of fonts is not installed
- MINX may render windows or buttons off-screen or in unreachable locations if users have resolutions below 1280x1024.