M.App X

Product description

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About M.App X

M.App X provides tools to exploit imagery and create imagery-derived information products and reports, deployed in an enterprise platform for system integrators. All users can create and share information across the enterprise using the rich, web-based client application. Built on decades of experience providing image analysis capabilities, M.App X contains industry-specific tools and workflows for the GEOINT community and security organizations.

- Includes top features users of geospatial data require to view, analyze and report geospatial information
- Simplified data access and defense workflows
- Can be hosted on-premises, including private cloud) or on a public cloud
- Centralized storage and computation
- All software managed in one place, greatly simplifying version management
- Includes rich, web-based client application for all users
- Supports modern browsers
- Works on desktops and laptops

Key client-side features

Smart Bar

Basic control of the view

- About
- Preferences (for personalization)
- Help (complete online reference)
- View Mode (Image, Map or 3D)
- Location Menu (control of coordinate format and Drive to Coordinate)
- Scale Menu (control pixel zoom, map scale, display of zoom and scale)
- Orientation Menu (rotate to fixed angles, user-specified angles, computed angles such as Up Is Up and interactively)
- Terrain Menu (control elevation display units and elevation source)
- Pointer Tool

- Auto Pan Tool
- Zoom to Area Tool
- Feature Attributes Tool
- Metadata Explorer
- Auto Roam Toolbar
- Transitions Toolbar
- Report Layout
- Overview
- Snail Trail Menu (Show/Hide Coverage Track, Clear Coverage Track, Save and Load Coverage Track)
- Screen Refresh
- Screen Clear
- Split Screen
- Dual Screen
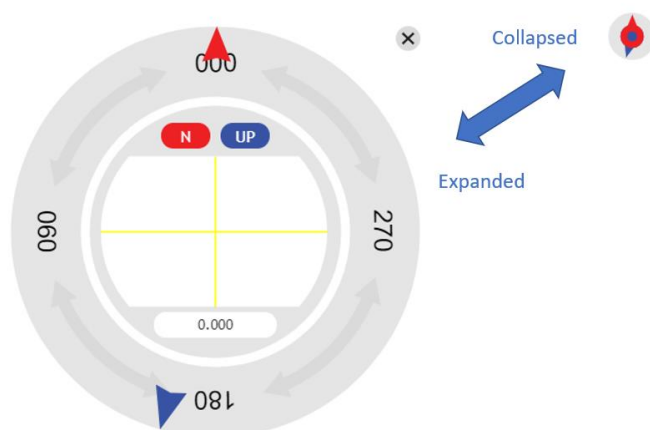- Link Screens
- Log Out

Zoom Palette
- Floating in the corner
- Four most common zoom controls (Zoom In, Zoom Out, 1 to 1 and Fit to Frame)
- Can be turned on or off and configured in preferences

Rotation Tool
- Collapsed
  - Indicates direction to north and direction of sensor look angle (Up Is Up)

- Expanded
  - Grab to rotate image around center point
  - Enter precise angle of rotation

Automatic Pattern Roaming Tool

- Automatic roam over the entire image
- Selectable roaming direction
- Adjustable speed

Transitions Tool

- Quick image compare
- Up/down or right/left swipe
- Blending
- Flickering of top image

Fast Image Display

- Display images in image space
- Display images in map space
- Display images in anaglyph stereo
- Display images in 3D (optionally use LuciadFusion as the terrain server)
- Geometric and radiometric image adjustments are applied on the fly, preserving image integrity

Overview Window

- Shows full extent and orientation of image
- Current area of view in red indicator box
- Indicator box can be moved for quick access to area of the image

Split Screen, Dual Screen and Link

- Multiple views within the same tab, or in different tabs
- Use multiple screens to see more
- Link views to facilitate image-to-image comparison

Image Information and Status Information

- Image information displays in a label when metadata is available
- Coordinates, scale, geometric model, elevation source, elevation and orientation also display

Panels

Panels provide focused sets of tools

- Can be collapsed to provide maximum image viewing space
- Functional areas include:
  - Data management (Shoebox)
  - Map management (Contents)
  - Image display quality (Image Adjustment)
  - Precise measurements (Measure)
  - Flexible markup (Annotation)
  - Feature collection and editing
  - Extensible geoprocessing

Contents – Manage Map Layers

Manage the order of map layers

- Turn layers on and off
- Remove layers
- Adjust the transparency of a layer to see the layer beneath
- Control styling of vectors
- Swipe, blend or flicker layers for interactive change detection
  - Swipe moves a split right/left or up/down
  - Blend fades between the top layer and those below
  - Flicker turns the top layer off and on

Smart Data Management

A Shoebox is a list of all the working data associated with your open project or projects. The data can be organized by specific groups or images and can be focused on accomplishing a task. Shoeboxes contain references (or links) to data. They do not contain the actual data.

- Manages and organizes the data per user
- Each user can create one or more Shoeboxes
- Shoeboxes can be shared for collaboration
- Shoeboxes manage:
  - Images
  - Feature sets and collections*
  - Point clouds*
  - Terrains
  - Annotations
  - Stereo pairs
  - Other documents

Requires a LuciadFusion installation

HEXAGON

☀ Dynamically Adjust Imagery

Each image is adjusted using a variety of image processing algorithms, collectively referred to as image chains. Depending upon the type of image, more than one image chain could be applicable.

- Applied to images on the fly by the server
- Typical image processing chains are offered -- TrueColor, Panchromatic, Shaded Relief, Thematic and Pseudocolor
- Processing chains compliant with NGA SIPS standards are offered – SIPS Single Band, SIPS Multiple Band (SIPS is the Softcopy Image Processing Standard of the United States National Geospatial-Intelligence Agency, or NGA)
- Based on image statistics
- Interactive histogram adjustments
- Five image resampling methods supported, including LaGrange

⬛ Precise Mensuration

Measurements are made by collecting points in image space and using precise elevation and sensor position information to compute the actual ground locations from which the measurements are derived.

Measure in 2D:

- Point
- Azimuth
- Angle
- Height from displacement
- Length
- Polygon area and perimeter
- Rectangle from three points
- Circle from center and edge
- Circle from three points on the edge
- Ellipse from center and three points on the edge
- Ellipse from four points on the edge

Measure in 3D:
- Point
- Azimuth
- Height
- Distance
- Polygon area and perimeter

A Annotation

Create geospatially anchored annotation elements in a map with rich styling using symbols, lines, brushes, polygons and text.

- Rich styling for lines and fills, including color picker

- Extensible symbol sets (PNG files)
- Annotation coordinates are reported and stored in map space to facilitate overlay on other imagery
- Text can have callout box
- Text can create sequences and coordinate information macros
- Annotation files can be named and saved in current Shoebox

Reports

Reports are generated from the current view using selectable templates.

- Templates are HTML with replaceable tags for the various map elements
- Metadata fields are definable and editable in the right-hand panel
- Report is dynamic
- Map can be scaled, panned and rotated within the report layout window
- Text fields can be edited and are updated immediately
- Scale Bar and North Arrow update appropriately
- Print to PDF or save the map as a PowerPoint or Geospatial PDF file

Feature Collection

Display, query, update, extract and delete features in a feature data set from a WFS-T service.

- Collect 2D or 3D coordinates using Coordinate Bar toolset
- Collect in image space and use the sensor model to extract precise ground coordinates
- Edit attributes on one or many features
- Create and manage multipart geometries

Stereo Display and Point Measurement

Create epipolar stereo pairs.

- Manage stereo pairs in the Shoebox
- Adjust stereo display
- Make stereo point measurements using the cursor

Coordinate System Selection

In various geoprocessing panels and elsewhere in the system, the user is required to enter a coordinate reference system (CRS) code.

- Type in the known EPSG code
- Search for EPSG codes and supported coordinate systems using the Coordinate System Explorer
- Browse through Geographic Coordinate System list (300-plus entries) and Projected Coordinate System list (3,400-plus entries)

- 3D coordinate systems are supported

Geoprocessing

Extensible set of geoprocessing tools, including:

- Adjust Georeferencing 2D and 3D
- Automatic Point Measurement
- Chart to Chart Change Detection
- Chip to NITF
- Chip to non-NITF
- Classify Point Cloud
- Contour Generation
- Create Aspect Map
- Create KML Track – 3D Google Earth KML file
- Create Slope Map
- Create Stereo Pair Data Triangulation
- Detect Vertical Obstruction
- Distance from Signature
- Edge Matching
- Generate missing NITF reduced resolution data sets (RSETs)
- Geodetic Reproject Raster
- Helicopter Landing Zone
- Image-to-Image Change Detection
- Line of Sight
- Mosaic images
- Orthorectify imagery
- Radar Level Slice
- Raster Expurgation
- Remove Elevation Spikes
- Smooth Elevation Values
- Terrain Profile
- Terrain Extraction

Drag and drop models into the Geoprocessing panel of the Admin Console to share with M.App X users. The shared models are presented in the Custom category. The User Interface is automatically generated for Custom models, allowing the addition of new geoprocesses without any custom code development.

Process Status Reporting

Check the status of processes running in the current session and the state of current and previous processes, or cancel a process that is running. Error messages are also reported.

Interactive Line of Sight

Create Line of Sight maps showing only those areas visible (or invisible) from a specified point.

- User-selectable terrain source

- User-defined observer and target heights
- Green indicates visible
- Red indicates not visible

2D and 3D Georeferencing

Assign map coordinates to image data and resample the pixels of the image to conform to the map projection grid.

- Collect points using one screen or two
- Use automated point matching to find tie points
- Use 2D models with least squares adjustment
- Use 3D models with bundle adjustment
- Match image to image
- Reference scanned map to image

Spatial Modeler SDK (SMSDK)

C/C++ toolkit for building, modifying and running workflows on geospatial data

- Extensible via a plugin mechanism
- Used to build add-ons for the Spatial Modeler/Recipe Engine

Supported raster formats

Data format	Direct read	Direct write (CREATABLE)
ADRG Image (.img)	●	
ADRG Legend (.igg)	●	
ADRG Overview (.ovr)	●	
Alaska SAR Facility (.L)	●	
ALOS AVNIR-2 JAXA CEOS	●	
ALOS PALSAR ERSDAC CEOS	●	
ALOS PRISM JAXA CEOS	●	
ALOS PRISM JAXA CEOS IMG	●	
ArcInfo and Space Imaging BIL, BIP and BSQ	●	
ASRP or USRP (.img)	●	
ASTER EOS-HDF	●	

Data format	Direct read	Direct write (CREATABLE)
AVIRIS	●	
Bitmap (.bmp)	●	
CADRG, CIB (RPF)	●	
Capella (prototype GEO)	●	
Cloud Optimized GeoTIFF (COG)	●	
COSMO-SkyMed	●	
Defense Gridded Elevation Data (DGED)	●	
Maxar DigitalGlobe TIL (.til) (e.g., WorldView, QuickBird, Legion)	●	
DTED (.dt2, .dt1, .dt0)	●	
ECRG, ECIB	●	
ECRG, ECIB TOC (.xml)	●	
ENVI / AISA (.hdr)	●	
ENVISAT ASAR	●	
Enhanced Compressed Wavelet (.ecw)	●	●
Enhanced Compressed Wavelet Protocol (.url)	●	
ERDAS ER Mapper Algorithm (.alg)	●	
ERDAS ER Mapper (.ers)	●	
ERDAS ER Mapper Virtual Dataset (.ers)	●	
ERDAS GIS (.gis)	●	
ERDAS IMAGINE (.img)	●	●
ERDAS LAN (.lan)	●	
EROS-A1 Level 1A (ImageSat)	●	
ERS-1 in ENVISAT format (ASAR) for E2 SLC product	●	
Esri® ArcSDE Raster (.sdi)	●	
Esri ArcInfo BIL, BIP, BSQ, HDR	●	

Data format	Direct read	Direct write (CREATABLE)
Esri ASCII Raster	●	
Esri Geodatabase Raster	●	
Esri GRID and GRID Stack	●	●
FIT	●	
FORMOSAT-2 DIMAP (.dim)	●	
Generic Binary (Raw Raster BIL, BIP, BSQ)	●	
GeoPackage (Raster)	●	
GeoTIFF	●	●
GIF (.gif)	●	
Göktürk-1	●	
HDF-EOS 5	●	
HDF Raster	●	
HDF4 Raster and Scientific	●	
HDF 5	●	
HRE (High Resolution Elevation)	●	
HYDICE (.cub)	●	
Hyperion	●	
ICEYE	●	
Intergraph CCITT Group 4 (.cit)	●	
Intergraph COT	●	
JFIF (JPEG) (.jpg)	●	
JPEG 2000 including GeoJP2 and GMLJP2 (.jp2, .j2k, .j2c, .jpc, .jpx, .jpf)	●	●
KazEOSat-1 DIMAP	●	

Data format	Direct read	Direct write (CREATABLE)
KazEOSat-2 DIMAP	●	
KOMPSAT	●	
Leica ADS40, ADS80, ADS100, RCD 30 (.ads, .sup)	●	
Leica ALS60, ALS70 (.las)	●	
Luciad Terrain Service (.lts)	●	
MrSID (Generation 2) (.sid)	●	
MrSID (Generation 3 – Geo Express) (.sid)	●	
MrSID (Generation 4) (.sid)	●	
NetCDF	●	
NLAPS DEM	●	
NLAPS Multispectral Imagery	●	
Neva Ridge PAR binary (.par)	●	
NITF 1.1	●	
NITF 2.0 and 2.1	●	●
NSIF 1.0	●	●
Oracle® GeoRaster (.ogr)	●	
OSDDEF	●	
PAZ (PAZ*.xml)	●	
PCI Geomatics PCIDISK (*.pix)	●	
PCX raster	●	
PeruSAT-1 DIMAP	●	
PlanetScope (.xml)	●	
Pleiades DIMAP, DIMAP v2 (.xml)	●	

Data format	Direct read	Direct write (CREATABLE)
Pleiades Neo, DIMAP v2 (.xml)	●	
PNG (.png)	●	
PRISMA	●	
RADARSAT-2 (product.xml)	●	
RADARSAT Constellation Mission (RCM)	●	
RapidEye (.xml)	●	
Raw (.raw)	●	
RISAT CEOS	●	
RPF CADRG and CIB	●	
RPF Frame and Product	●	
RPF Overview	●	
RPF TOC (.toc)	●	
SICD	●	
Sentinel-1 SAFE	●	
Sentinel-2 SAFE 1C and 2A	●	
Sentinel-3 SAFE	●	
SNIP NITF	●	
SOCET SET Support (.sup)	●	
SPOT DIMAP	●	
SPOT 6, 7 DIMAP v2	●	
Sub-Image (.sbi)	●	
SuperView	●	
Surfer Grid	●	

Data format	Direct read	Direct write (CREATABLE)
Targa	●	
TanDEM-X (TDX1*.xml)	●	
TerraSAR-X (TSX1*.xml)	●	
THEOS DIMAP	●	
TIFF (including GeoTIFF and TIFF World), also known as TIFF32	●	●
TIFF64 (including BigTIFF, BigGeoTIFF)	●	●
Unrestricted Access Image (*.uai)	●	
URI Proxy File (*.uri)	●	
USGS DEM (*.dem)	●	
USGS DOQ (*.doq)	●	
USGS SDTS DEM (*CATD.DDF)	●	
USRP (.img)	●	
View (.vue)	●	
VITEC (.vit)	●	
Virtual Mosaic (.vmc, .vmcx)	●	
Virtual Stack (.vsk)	●	
VNREDSat-1 DIMAP	●	
Web Coverage Service (.wcs)	●	
Web Mapping Service (.wms)	●	
ZiYuan-3 (ZY-3)	●	

Administration

M.App X has an administration console that is used to manage and control the server-side of the product. The administrative tasks are divided among Usage, Users, Roles and Geoprocessing.

Usage management

Usage management is used to upload licenses and to view the current usage status of the system. The number of hours consumed on a monthly basis can be monitored as well as the total number users on a monthly basis.

User management

M.App X can use either Active Directory or its own user authentication scheme to authenticate users. User accounts can be created, edited and deleted.

Active Directory

If Microsoft's Active Directory is used to manage user accounts in the local domain, then M.App X can be configured to use this service to authorize users, instead of consulting its own set of local user profiles. In addition to authorizing users, M.App X roles can be assigned to Active Directory groups, which allows a specific role to be selected for a user upon login.

Local user profiles

A user profile establishes information about users, including username and password which are to be used to log into M.App X. This is typically used if the organization is not using Active Directory.

Roles management

M.App X is delivered with two roles: User and Admin. The User role has access to the whole M.App X client interface, but cannot access the Admin console. The Admin role has access to the whole M.App X client interface and has access to the M.App X Admin console. Additional roles can be created with specifically selected, reduced sets of functionality that allows the creation of roles with a reduced or focused application.

Geoprocessing management

Geoprocessing provides monitoring of the geoprocessing worker nodes, the running processing tasks and spatial model publishing. The number of worker nodes is visible and information about the configuration of each node can be viewed and modified (in a limited fashion). All running processes are displayed, along with the current progress. In addition, processes can be canceled. Custom spatial models created with ERDAS IMAGINE or GeoMedia can be published (uploaded) to M.App X. These models will then be accessible by the M.App X client.

Server-side overview

M.App X is installed onto a server – no software is installed on the client systems. Instead, M.App X provides a lightweight client that runs in a modern HTML 5 browser.

For a single-node environment

For a single-node environment, a minimum configuration (6-8 users) would include:

Hardware
- Quad-core Xeon processor, 2.9 GHZ or better
- 16GB RAM or better
- 60GB system disk or better
- 300GB data disk or better (depends on the amount of data)
- GB network connectivity software
- Windows Server 2016, 2019 or 2022

For a clustered environment

The software can be configured and installed in a multinode environment. The design of that environment depends on factors such as number of users, type of processing to be done and amount and type of data to be served.

Integration, configuration and customization

- Report Templates: Defined using HTML 5-based templates
- Symbols: Add additional PNG symbols to the provided set, or plug in a custom symbol service
- Cursors: Add new cursor shapes
- CSM: Add and configure Community Sensor Models (CSM)
- Elevation Source: Define the elevation source to be used for measurements
- Geoprocessing: Add new geoprocessing panels through custom code extension or using drag and drop
- Preferences: Configure site preferences for many different aspects of the system

About Hexagon

Hexagon is the global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Safety, Infrastructure & Geospatial division improves the resilience and sustainability of the world's critical services and infrastructure. Our solutions turn complex data about people, places and assets into meaningful information and capabilities for better, faster decision-making in public safety, utilities, defense, transportation and government.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 24,000 employees in 50 countries and net sales of approximately 5.2bn EUR. Learn more at hexagon.com and follow us @HexagonAB.