



Release guide  
LuciadLightspeed 2024.0

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# Release guide

LuciadLightspeed 2024.0

28 June 2024



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# About this release

The 2024.0 release of LuciadLightspeed includes a structurally revised radar video capability. We now support variations in resolution and rotation speed during radar operation.

LuciadLightspeed 2024.0 also strengthens the support for building information modeling (BIM) data. You can now handle Autodesk Revit data in addition to the exchange format Industry Foundation Classes (IFC).

In addition, this release combines an impressive number of specifically requested features. Developers will benefit from the raised minimal Java version and many security upgrades. Moreover, MBTiles and ECW format support have been extended. This document lists the most noteworthy improvements.

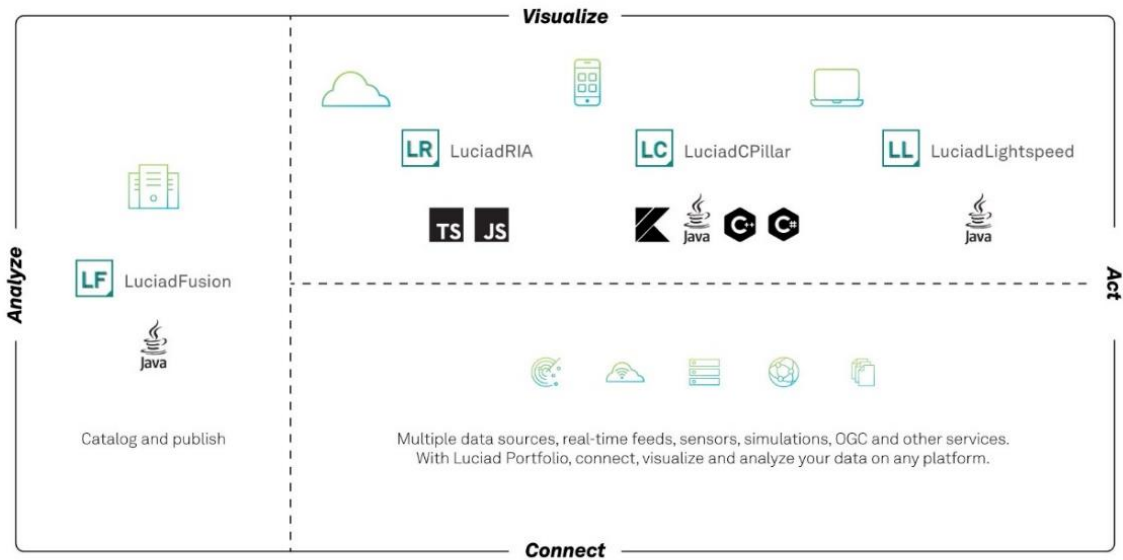


Figure 1: The Luciad portfolio

# Benefits of new features

## Upgraded support for radar video

LuciadLightspeed has offered a direct connection to radar video since version 2014. This includes a decoder for Asterix<sup>1</sup> Category 240 data. See Figure 2. Over time, this component was updated with additional configuration possibilities, up to adding your own custom radar feed. Recently, we learned that users have encountered increasing numbers of radar feeds that no longer comply with our previous assumption of a constant resolution for the input and rotation angle for a specific radar. We took our radar capability back to the lab and structurally changed our approach.

LuciadLightspeed can now connect to and visualize radar data with varying angular and radial resolution. It supports variable rotation speed of the sweep line, including when it remains fixed. These improvement results showed better performance in most cases. We kept the previous behavior so you can decide what fits best for your use case. Translated to API, this means TLspRadarVideoLayerBuilder now can work with radar feeds whose angular or radial resolution are variable over time. This requires the user to manually specify the resolution of the visualization, which is then effectively decoupled from that of the data. The new method `displayResolution()` on the layer builder is used to enable this behavior. If called, the radar video layer will be fully robust against all variations in resolution of incoming data.

This setting specifies the resolution and range of radar data that is visualized. Data that lies outside the specified distance and azimuth range will not be displayed, and incoming data will be resampled to match the requested radial and angular resolution. If this method is not called, the layer will infer the range and resolution of the radar feed by looking at data records, but this requires the feed resolution to be constant. The latter corresponds to the behavior of the radar video support in previous product versions.

## Sample code/documentation to get you started

The article “[Visualizing radar video](#)” has been updated. Please consult the section “Handling variable data resolutions” in the product documentation.

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[https://dev.luciad.com/portal/productDocumentation/LucidLightspeed/docs/articles/guide/asterix/decoding.html#\\_asterix\\_formats](https://dev.luciad.com/portal/productDocumentation/LucidLightspeed/docs/articles/guide/asterix/decoding.html#_asterix_formats)

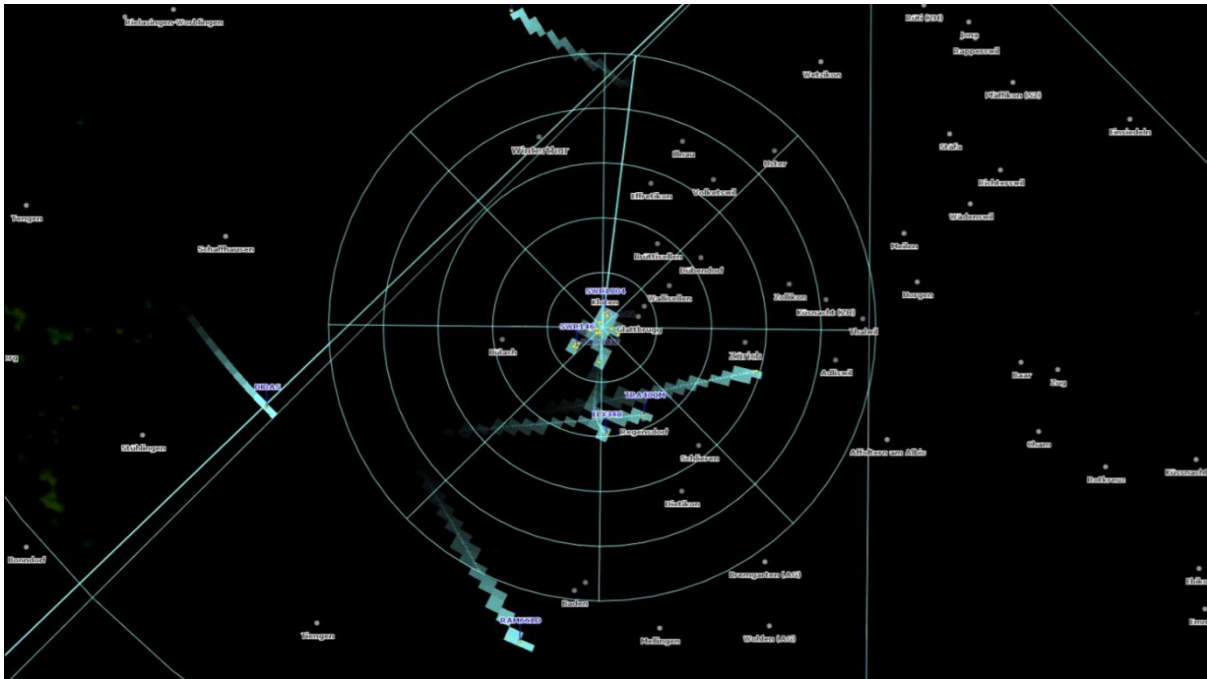


Figure 2: The Asterix Cat. 240 sample showing radar video data

## Support for Revit data

Revit<sup>2</sup> is a BIM software tool for architects, engineers and construction professionals to model shapes, structures and systems in 3D. It stores these 3D models in a proprietary RVT file format with the .rvt file extension.

These RVT files contain:

- A **geometry model** of a building or facility, including spatial elements, materials and shapes
- A **feature data model** describing typical BIM properties of that data, such as layer, material and more

**Note:** Revit data doesn't have a tiling structure. If you want to visualize large Revit datasets and maintain application performance, you must convert the Revit data to a tile structure. LuciadLightspeed can now convert Revit data to OGC 3D Tiles. This further extends LuciadLightspeed's renowned 3D tiling capability.

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<sup>2</sup> [www.autodesk.com/products/revit](http://www.autodesk.com/products/revit)



Figure 3: The visualization of a Revit file , after conversion to OGC 3D Tiles

## Sample code/documentation to get you started

The article “[Converting Revit data to OGC 3D Tiles](#)” explains how to get started. After the conversion, you can visualize the data in a Lightspeed view, as explained in the “[Visualize OGC 3D Tiles data on a Lightspeed map](#)” article.

## Java and security upgrades

### Java support

Up to and including LuciadLightspeed version 2023, the minimal required Java version was 8. This was based on customer demand. With all the changes introduced by Oracle over the past few years, we received explicit demands to continue supporting Java 8. In the meantime, priorities have shifted for us and our customers. One factor is that many third-party libraries have raised their minimal required Java versions. The LTS versions after Java 8 are 11 and 17. This past September, premier support for Java 11 ended<sup>3</sup>, so we decided to raise the minimal supported Java version on our side to Java 17. At the same time, we also made sure that LuciadLightspeed supports Java 21. The supported Java versions are documented within “Hardware and software requirements” in the product documentation; see also Figure 44.

The article “[Integrate LuciadLightspeed into your IDE](#)” has also been updated.

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<sup>3</sup> [www.oracle.com/be/java/technologies/java-se-support-roadmap.html](http://www.oracle.com/be/java/technologies/java-se-support-roadmap.html)

Luciad aims to support the latest Java LTS version in its latest releases. The minimum JDK/JRE requirements never change with a minor upgrade (an upgrade from 2022.0 to 2022.1, for instance) or a patch release of LuciadFusion.

Table 1. Supported Java versions

	OracleJDK	OpenJDK
LuciadFusion 2017 and earlier	8	not supported
LuciadFusion 2018 <sup>[1]</sup>	8, 11	11
LuciadFusion 2019	8, 11	11
LuciadFusion 2020	8, 11	11
LuciadFusion 2021 <sup>[2]</sup>	8, 11, 17	11, 17
LuciadFusion 2022	8, 11, 17	11, 17
LuciadFusion 2023	8, 11, 17	11, 17
LuciadFusion 2024	17, 21	17, 21

Figure 4: The supported Java versions are documented within the “Hardware and software requirements” section in the product documentation.

## Security updates

The 2024.0 release of LuciadLightspeed includes several security updates. The release notes provide full details on the updated, removed and added dependencies. Please check [“Upgrade considerations”](#) for security updates.

Various updates resulted in some upgrade considerations:

- The third-party library GDAL was updated to version 3.8.3. With this update, the TLcdGDALModelDecoder can no longer decode Arc/Info Export E00 GRID files. The GDAL library no longer offers supports for this format.
- The minimum supported glibc (GNU C Library) for Linux has been raised to 2.28. This means that Ubuntu 18 is no longer supported.
- This version of LuciadLightspeed no longer supports 32-bit Linux for the GXY view. For the full list, please consult the release notes.

## Improved vertical datum and reference support

The default behavior of many model decoders, used to decode elevation data, has been changed. We now enable support for vertical datums by default. Supporting vertical datums will cause the appropriate geoid elevation to be applied to data. This provides more accurate elevation values.

The affected elevation data formats are DEM, DMED/DTED, ETOPO, GeoTIFF, LAS/LAZ and SwissDHM.



After this change, the geoid elevation will be applied to your elevation data. Your elevation layers may be painted at a different height, which can cause data on your other layers to be misaligned with your terrain layer. You should check that your terrain layer is still properly aligned with your other layers, especially if you are using the Terrain Analysis (TEA) module.

If your data is misaligned after this change you can try to resolve it in the following ways:

- Update your other layers to use the same vertical datum reference as your elevation data
- Disable geoid support for a specific model decoder by calling the method `#setSupportGeoidDatums(boolean)`
- Disable geoid support for all model decoders by setting the system property `com.luciad.geodesy.geoidSupport.LEGACY` to true

In other situations, you want to influence the order in which the model reference decoders are tried to determine the model reference. You can now set a model reference decoder priority for model decoders supporting this feature. The priority decides which of the model reference decoders (EXTERNAL or EMBEDDED) are used first when both decoders can determine the model reference before falling back to the other in case of an error.

The following model decoders support this feature: `TLcdGeoTIFFModelDecoder`, `TLcdLASModelDecoder` and `tLcdE57ModelDecoder`

The article "[Setting model reference decoder priority](#)" summarizes this topic.

## Improved ECW<sup>4</sup> support

LuciadLightspeed users can now visualize ECW images with any number of bands and any bit depth. To support this, the previous libraries were replaced by the native libraries provided as part of ERDAS ECW JP2 SDK4 version 6.1.0.

As a result, you can now use image processing on ECW data. LuciadLightspeed's image processing framework allows you to access images built from raster data and enhance or highlight certain aspects of the raster data for display. You can make use of various image manipulation operations, including typical image operations to work with multiband images, high dynamic range (HDR) images and low-quality images.

**Note:** This improvement resulted in a few upgrade considerations. Please check the release notes for more details.

## Sample code/documentation to get you started

For information about handling raster data within LuciadLightspeed, refer to the documentation entry "Models: Handling raster data."

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<sup>4</sup> [https://bynder.hexagon.com/m/3dab4b4268e27bd6/original/Hexagon\\_GSP\\_ECW\\_JP2\\_SDK\\_Product\\_Sheet.pdf](https://bynder.hexagon.com/m/3dab4b4268e27bd6/original/Hexagon_GSP_ECW_JP2_SDK_Product_Sheet.pdf)



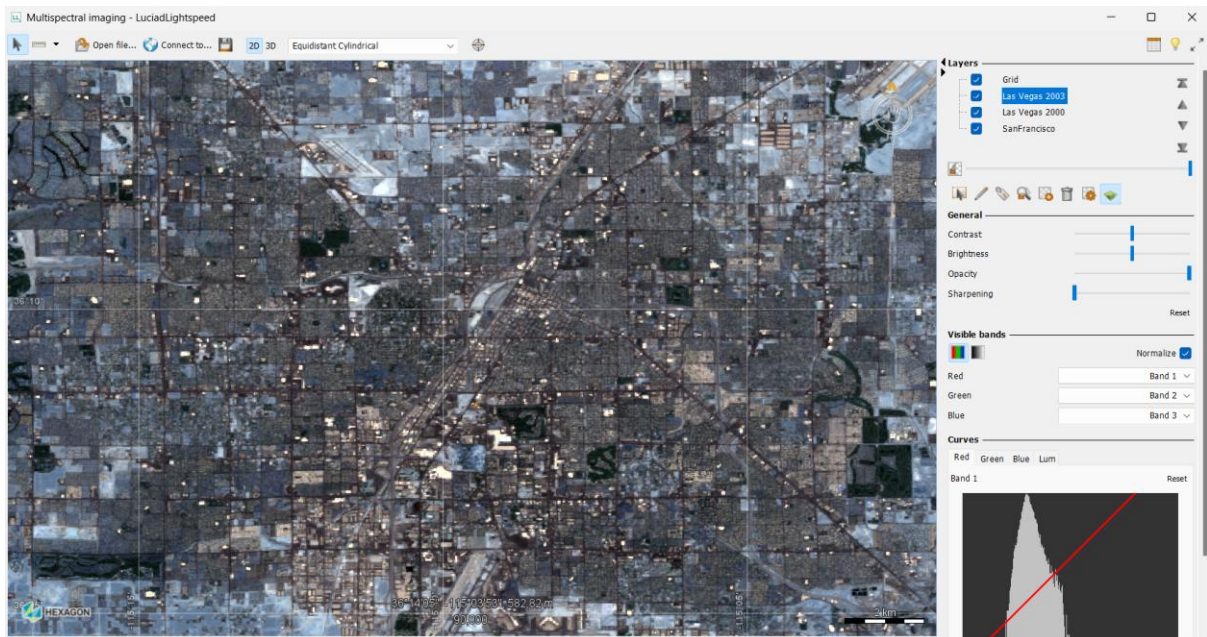


Figure 5: The “multispectral” sample illustrates how to work with multiband or HDR imagery.

## Upgrade considerations

This section lists some other noteworthy upgrade considerations:

- **Oracle** versions 8, 9i, 10g, 11g, 12c and 18c are no longer supported as a database by the TLcdOracleSpatialModelDecoder, TLcdOracleSpatialModelEncoder and TLcdOracleGeoRasterModelDecoder. These versions are no longer supported by Oracle; see the Oracle Lifetime Support Policy<sup>5</sup> document. It is advisable to upgrade to a newer version of Oracle database if you are still using any of these versions.
- **PostgreSQL** versions 8.x, 9.x, 10 and 11 are no longer supported as a database by the TLcdPostGISModelDecoder and TLcdPostGISModelEncoder. These versions are no longer supported by the PostgreSQL Global Development Group; see the PostgreSQL Versioning Policy page. It is advisable to upgrade to a newer version of PostgreSQL if you are still using any of these versions.
- **SQL Server** versions 2008 and 2012 are no longer supported by the TLcdMSSQLModelDecoder and TLcdMSSQLModelEncoder. It is advisable to upgrade to a newer version of SQL Server if you are still using version 2008 or 2012.

## Other improvements

- **Replace a color:** LuciadLightspeed now supports replacing one or more colors within an image. A common example is a satellite image that comes with black or white borders. You can use this new capability as follows:
  - Use the image processing API and rely on the newly introduced “tLcdPixelReplaceOp” operator

<sup>5</sup> [www.oracle.com/us/assets/lifetime-support-technology-069183.pdf](http://www.oracle.com/us/assets/lifetime-support-technology-069183.pdf)

- Use OGC SE/SLD, via a Luciad-specific option; for more information, please consult the new article [“How to replace a color”](#)
- **MBTiles decoder supports data from file and from service:** LuciadFusion now offers a new service type for serving MBTiles data, including both raster and vector MBTiles data. LuciadLightspeed can connect to these services, as well as to offline data sources.
- **The TLcdBinzModelDecoder is now more robust when encountering objects with an unknown type:** The unknown objects will be logged and skipped; the conversion will continue without them.
- **Defining extruded shapes using OGC SE/SLD:** You can now use SLD styles to style vector data containing height information with extruded shapes in a 3D view. To enable this, new vendor-specific options have been introduced that can be used inside a PolygonSymbolizer. For more info, refer to “How to style vector objects with an extruded shape in a 3D view.”

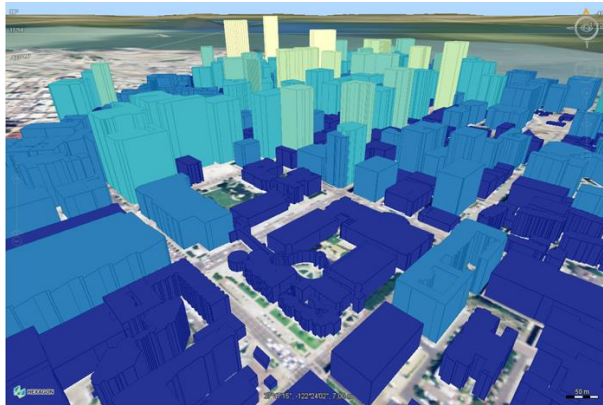


Figure 3: Building data styled with SLD, using extruded shapes and thematic fill and stroke styling based on building heights

- **Apply a color map on 2-band measurement data using OGC SE/SLD:** You can now use SLD styles with color maps to render dual-band raster data, such as wind or water velocity data decoded from OGC NetCDF files. Such data consists of a U and a V band that respectively represent a magnitude value parallel to the X and Y axis. The SLD rendering pipeline calculates the magnitude for a vector that combines the U and V bands where the color map is applied. See Figure 7. This improvement was already released as part of one of the 2023.1 patches.

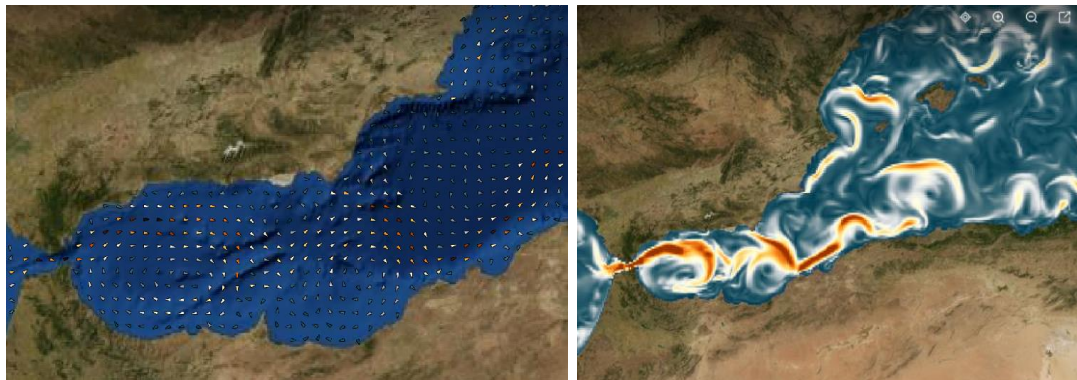


Figure 7: You can now apply a color map to dual band raster, like water current. The picture on the left depicts the previous solution; on the right you can see how the new color map capability provides a more intuitive view of the currents.



## 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.

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