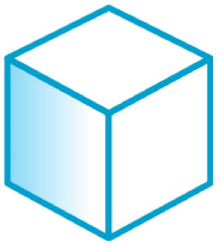
3/4/2024

Datasheet

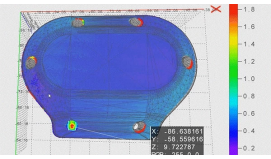
3D Bundle

Bundle of Open eVision 3D Libraries



- **Cost effective bundle** of eVision's 3D libraries
- Easy3D
- Easy3DLaserLine
- Easy3DObject
- Easy3DMatch

Main benefits



3D Viewer

Use the 3D Viewer class of Easy3D to create an interactive 3D display. The 3D Viewer can display point clouds and 3D objects. It uses the OpenGL interface and requires a compatible display device.

Compatibility with 3D sensors

The Easy3D library is able to import data from third-party 3D sensors from Automation Technology, Azure Kinect, Benano, Heliotis, IDS Ensenso, Intel Realsense, Lucid Helios, LMI Gocator, Mech-Mind, Nerian Ruby, Photoneo PhoXi, Shenzhen SinceVision (SSZN), Zivid and others. Point Clouds and ZMaps are managed efficiently and allow 3D processing and analysis to be performed.

Neo Licensing System

Neo is the new Licensing System of Euresys. It is reliable, state-of-the-art, and is now available to store Open eVision and eGrabber licenses.

Neo allows you to choose where to activate your licenses, either on a Neo Dongle or in a Neo Software Container. You buy a license, you decide later.

Neo Dongles offer a sturdy hardware and provide the flexibility to be transferred from a computer to another.

Neo Software Containers do not need any dedicated hardware, and instead are linked to the computer on which they have been activated.

Neo ships with its own, dedicated, Neo License Manager, which comes in two flavours: an intuitive, easy to use, Graphical User Interface and a Command Line Interface that allows for easy automation of Neo licensing procedures.

All Open eVision libraries are available for Windows and Linux

- Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture
- Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Specifications

Software

Host PC Operating System

Open eVision is a set of 64-bit libraries that require an Intel compatible processor with the SSE4 instruction set or an ARMv8-A compatible processor.

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Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Remote connections

Remote connections are allowed using remote desktop, TeamViewer or any other similar software.

Virtual machines

Virtual machines are supported. Microsoft Hyper-V, Oracle VirtualBox and libvirt hypervisors have been successfully tested.

Only the Neo Licensing System is compatible with virtualization.

Minimum requirements:

2 GB RAM to run an Open eVision application

8 GB RAM to compile an Open eVision application

Between 100 MB and 2 GB free hard disk space for libraries, depending on selected options.

APIs

Supported programming languages:

The Open eVision libraries and tools support C++, Python and the programming languages compatible with the .NET Framework (C#, VB.NET)

C++ requirements: A compiler compatible with the C++ 11 standard is required to use Open eVision

Python requirements: Python 3.11 or later is required to use the Python bindings for Open eVision

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Supported Integrated Development Environments:

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Microsoft Visual Studio 2019 (C++, C#, VB .NET, C++/CLI)

Microsoft Visual Studio 2022 (C++, C#, VB .NET, C++/CLI)

QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4185 Open 3D Bundle for USB dongle

PC4235 Open 3D Bundle for PAR dongle

PC4335 Open eVision 3D Bundle

Included libraries

3DStudio

Easy3D

Easy3DLaserLine

Easy3DMatch

Easy3DObject

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

Offices

- Europe, Middle East & Africa
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  Sensor to Image GmbH
  Contact support : support.europe@euresys.com

- China
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  Euresys Shenzhen Liaison Office
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- South Korea
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  Contact support : support.korea@euresys.com

- Asia (other countries)
  Euresys Pte. Ltd.
  Contact support : support.asia@euresys.com

- North, Central & South America
  Euresys Inc.
  Contact support : support.usa@euresys.com

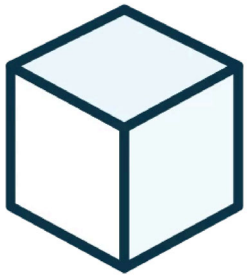
  TKH Vision Experience Center
  Contact support : support.usa@euresys.com

12/18/2023

Datasheet

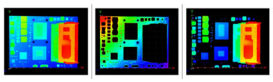
Easy3D

3D image processing library



- Point cloud processing and management
- Flexible ZMap generation
- 3D processing functions for cropping, decimating, fitting and aligning point clouds
- Compatible with many 3D sensors
- Interactive 3D display with the 3D Viewer

Main benefits

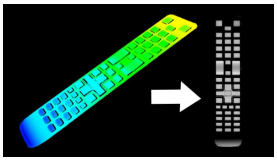


Point Cloud processing

After calibration, the 3D point cloud contains distortion-free data using a real-world 3D coordinate system. Process 3D point clouds using Easy3D functions such as coordinates transformation, point cloud cropping and decimation, plane finding and fitting or part alignment.

Compatibility with 3D sensors

The Easy3D library is able to import data from third-party 3D sensors from Automation Technology, Azure Kinect, Benano, Heliotis, IDS Ensenso, Intel Realsense, Lucid Helios, LMI Gocator, Mech-Mind, Nerian Ruby, Photoneo PhoXi, Shenzhen SinceVision (SSZN), Zivid and others. Point Clouds and ZMaps are managed efficiently and allow 3D processing and analysis to be performed.

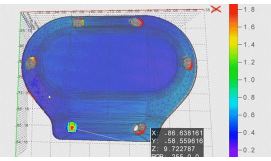


ZMap generation

A ZMap is the projection of a point cloud on a reference plane, where distances are stored as pixel gray scale values. ZMaps are distortion free, with a metric coordinate system. Easy3D provides functions to generate such ZMaps. More importantly, you can apply all Open eVision 2D processing functions to ZMaps: filtering and thresholding with EasyImage, blob analysis with EasyObject, sub-pixel measurement with EasyGauge, pattern matching with EasyFind and EasyMatch...

Photometric Stereo for 3D surface inspection

The Photometric Stereo function estimates the orientation and albedo of each point of a surface by acquiring several images of the same surface taken from a single viewpoint, but under illumination from different directions. The method is suitable for the inspection of details (defects or information) present on the surface of objects that cannot be seen by a single camera-light pair and reveals small variations in surface curvature or texture. It can be used as a preprocessing phase to other libraries, such as code reading (EasyMatrixCode, EasyQRCode or EasyBarcode), optical character recognition (EasyOCR), alignment (EasyMatch, EasyFind), measurement (EasyGauge) or defect detection (EasyObject or EasySegment). Photometric Stereo is available in the Easy3D library.



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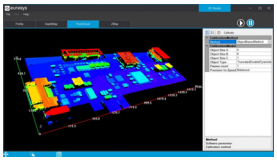

Open eVision 3D Studio

The Open eVision Studio application drastically simplifies the configuration of single and dual 3D laser line inspection systems using the Coaxlink Quad 3D-LLE frame grabber, as well as the Easy3D and Easy3DLaserLine libraries.

Open eVision Studio is free and does not require any license.

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QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4181 Open Easy3D for USB dongle

PC4231 Open Easy3D for PAR dongle

PC4331 Open eVision Easy3D

Included libraries

Easy3DLaserLine

Easy3DMatch

Easy3DObject

Related products

PC1637 Coaxlink Quad 3D-LLE

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

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  TKH Vision Experience Center
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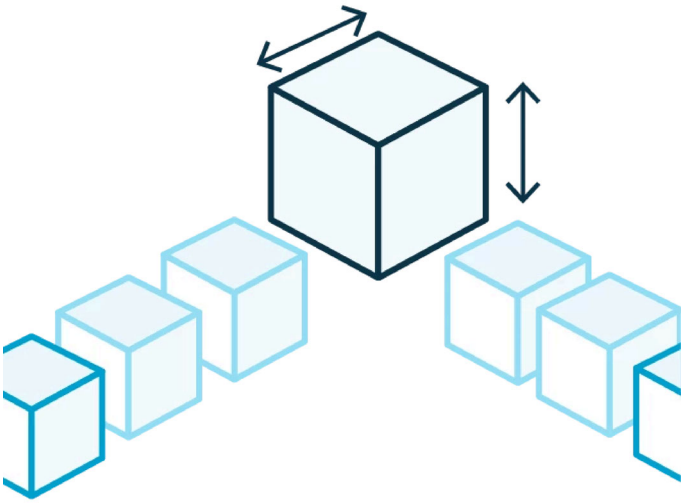
12/18/2023

Datasheet

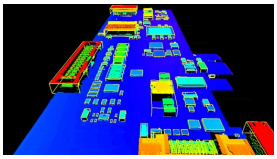
Easy3DObject

3D object extraction and measurement library



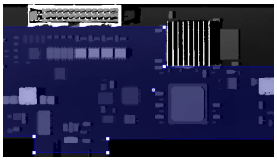
- Detection of 3D objects in point clouds or ZMaps
- Metric detection criteria
- Compatible with arbitrary regions
- Computation of precise 3D measurements, like size, orientation, area, volume...
- Automatic extraction of object local support plane
- 2D and 3D graphical display of the results
- Full-featured interactive demo application

Main benefits



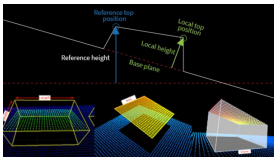
Detection of 3D objects in point cloud and ZMap

Easy3DObject uses an innovative algorithm to detect objects in Point Clouds or ZMaps. It is able to efficiently extract small and large objects, whatever their shape.



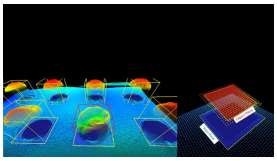
Compatible with arbitrary regions

The arbitrary region feature of eVision (ERegion) can be used with Easy3DObject to refine the domain of extraction. Rectangles, circles, ellipses, polygons or any arbitrary regions are available as an optional parameter to the extraction.



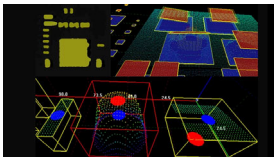
Compute precise 3D measurements, such as size, orientation, area, volume

For each object detected, Easy3DObject computes 3D geometric measurements. All measurements are expressed in real-world units (such as millimeters or microns). These values include the length, width and height of the object, the orientation and tilt angles, the area and the volume. These measurements can then be used to perform 3D inspection, for example by comparing the results with reference values.



Automatic extraction of object local supporting plane

For each object detected, Easy3DObject extracts the local supporting plane. It is then used as the reference for various calculations like height, top position or volume. Using only the area surrounding the object in this process makes Easy3DObject a powerful tool for the inspection of products with curved or non-flat support.

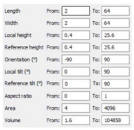


2D and 3D graphical display of the results

The resulting object list can be displayed in 2D and 3D graphical contexts. On an image, the objects can be shown with their bounding rectangle, average position or extracted pixels. On a 3D Viewer, the objects are displayed with their bounding boxes, planes or top positions. Display attributes like color or opacity are customizable.

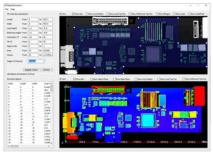
Compatibility with 3D sensors

The Easy3D library is able to import data from third-party 3D sensors from Automation Technology, Azure Kinect, Benano, Heliotis, IDS Ensenso, Intel Realsense, Lucid Helios, LMI Gocator, Mech-Mind, Nerian Ruby, Photoneo PhoXi, Shenzhen SinceVision (SSZN), Zivid and others. Point Clouds and ZMaps are managed efficiently and allow 3D processing and analysis to be performed.



Metric detection criteria

The 3D object detection algorithm uses several geometric criteria to focus only on the required objects. These criteria are the size (length, width and height), the angle (orientation and tilt), the aspect ratio, the area and the volume of the objects. These parameters are expressed in real-world coordinate units. Using these criteria, the user can limit the extraction to the objects relevant to the inspection.



Full featured interactive demo application

A demo application for Easy3DObject is provided with complete source code. Using that application, the user will be able to learn and experiment with all the features of the Easy3DObject library. Additionally, code snippets can be generated and integrated into their applications.

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QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4183 Open Easy3DObject for USB dongle

PC4233 Open Easy3DObject for PAR dongle

PC4333 Open eVision Easy3DObject

Included libraries

Easy3D

Easy3DObject

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

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12/18/2023

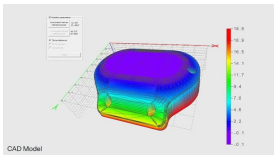
Datasheet

Easy3DMatch

3D alignment and inspection library

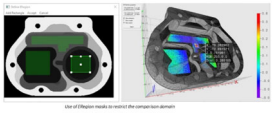
- Align a scanned 3D object with another scan or with a reference mesh
- Compute the local distances between 3D scans and a golden sample or reference mesh
- Detect anomalies such as misplaced features, geometric distortions, gaps, bumps,...
- Compatible with all 3D sensors that produce point clouds, depth maps or height maps

Main benefits



Anomaly detection by the comparison of 3D data against a reference model

After the alignment of the 3D data with the reference model, Easy3DMatch can search for local discrepancies, like holes, bumps, scratches, gaps... The list of detected anomalies is returned along with their individual position, distance and area. New point clouds with distances and colored data can be generated and displayed by the interactive Open eVision 3D viewer.



Support 2D and 3D subdomains of interest

Arbitrary 2D regions (on ZMaps) and 3D volumes (on point clouds) can be used to define subdomains of interest. In this case, the whole object is used during the alignment process, but only some parts are taken into account for comparison and anomaly detection.

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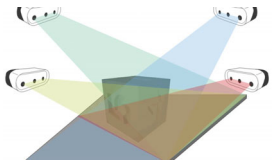
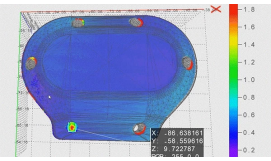


3DSensor Fusion

3DSensor Fusion is a functionality enabling the merger of point clouds of the same object's different faces. You can use a number of 3D sensors placed at multiple positions to acquire a complete object at once. The process is split between a calibration phase and a merging phase. As a result, the merger is fast and the calibration is independent of the objects you wish to acquire. Finally, this procedure produces optimized point clouds where duplicate points have been removed and all attributes (colors, normals,...) of the merged clouds are preserved.



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Software

Host PC Operating System

Open eVision is a set of 64-bit libraries that require an Intel compatible processor with the SSE4 instruction set or an ARMv8-A compatible processor.

Open eVision can be used on the following operating systems:

Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture

Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Remote connections

Remote connections are allowed using remote desktop, TeamViewer or any other similar software.

Virtual machines

Virtual machines are supported. Microsoft Hyper-V, Oracle VirtualBox and libvirt hypervisors have been successfully tested.

Only the Neo Licensing System is compatible with virtualization.

Minimum requirements:

2 GB RAM to run an Open eVision application

8 GB RAM to compile an Open eVision application

Between 100 MB and 2 GB free hard disk space for libraries, depending on selected options.

APIs

Supported programming languages:

The Open eVision libraries and tools support C++, Python and the programming languages compatible with the .NET Framework (C#, VB.NET)

C++ requirements: A compiler compatible with the C++ 11 standard is required to use Open eVision

Python requirements: Python 3.11 or later is required to use the Python bindings for Open eVision

.NET requirements: .NET Framework versions 4.8 or later are supported

Supported Integrated Development Environments:

Microsoft Visual Studio 2017 (C++, C#, VB .NET, C++/CLI)

Microsoft Visual Studio 2019 (C++, C#, VB .NET, C++/CLI)

Microsoft Visual Studio 2022 (C++, C#, VB .NET, C++/CLI)

QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4184 Open Easy3DMatch for USB dongle

PC4234 Open Easy3DMatch for PAR dongle

PC4334 Open eVision Easy3DMatch

Included libraries

Easy3D

Easy3DMatch

Easy3DObject

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

Offices

- Europe, Middle East & Africa
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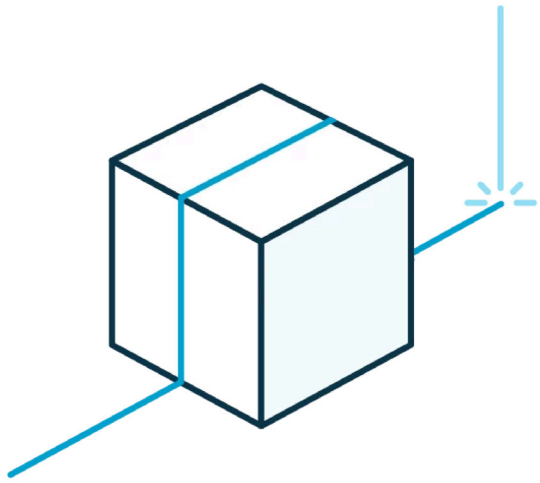
12/18/2023

Datasheet

Easy3DLaserLine

3D laser line extraction and calibration library

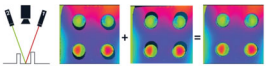


- Single and Dual Laser Line Extraction into a depth map
- Convenient and powerful 3D calibration for laser triangulation setups
- Compatible with the Coaxlink Quad 3D-LLE frame grabber

Main benefits

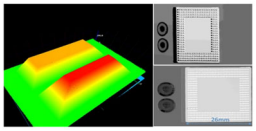
3D Laser Line Extraction into a depth map

Easy3D generates a depth map from a series of images that contain a laser line projected on the inspected object. Each pixel of the resulting depth map contains the position of the laser line in the image. Several extraction modes are supported as well as various filters. The software line extractor is fully compatible with the hardware implementation in the Coaxlink Quad 3D-LLE frame grabber.



Dual laser line extraction

Supported by software and hardware implementations, the dual laser line extraction process reduces the effect of occlusions. Occlusions occur when some parts of the objects are not lit by any laser. Using two lasers with different angles reduces these undefined areas. The object-based calibration included in Easy3DLaserLine allows combining the acquired data into a single calibrated point cloud.



Calibration

Some processing can be performed directly on a depth map. However, most 3D measurements need distortion-free data and metric representations, therefore calibrating the laser triangulation setup is required. Easy3D computes a calibration model applied to depth maps to transform them into calibrated 3D point clouds. This calibration model is based on the depth map of a reference object, acquired using the laser triangulation setup that requires calibration.

Neo Licensing System

Neo is the new Licensing System of Euresys. It is reliable, state-of-the-art, and is now available to store Open eVision and eGrabber licenses.

Neo allows you to choose where to activate your licenses, either on a Neo Dongle or in a Neo Software Container. You buy a license, you decide later.

Neo Dongles offer a sturdy hardware and provide the flexibility to be transferred from a computer to another.

Neo Software Containers do not need any dedicated hardware, and instead are linked to the computer on which they have been activated.

Neo ships with its own, dedicated, Neo License Manager, which comes in two flavours: an intuitive, easy to use, Graphical User Interface and a Command Line Interface that allows for easy automation of Neo licensing procedures.

All Open eVision libraries are available for Windows and Linux

- Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture
- Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Specifications

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Microsoft Visual Studio 2022 (C++, C#, VB .NET, C++/CLI)

QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4186 Open Easy3DLaserLine for USB dongle

PC4236 Open Easy3DLaserLine for PAR dongle

PC4336 Open eVision Easy3DLaserLine

Included libraries

Easy3D

Easy3DLaserLine

Easy3DObject

Related products

PC1637 Coaxlink Quad 3D-LLE

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

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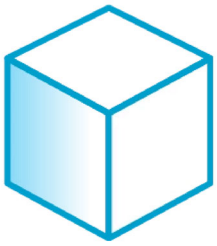
7/23/2024

Datasheet

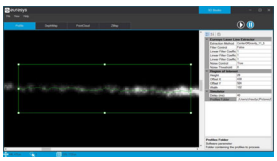
Open eVision 3D Studio

3D evaluation and prototyping application



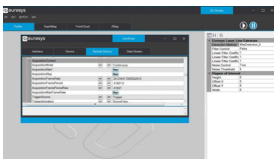
- Ease the configuration and the setup of a laser triangulation scanner using the Coaxlink Quad 3D-LLE
- Simplify the calibration procedure
- Display interactive Depth Maps, 3D Point Clouds and Zmaps
- Free of charge

Main benefits



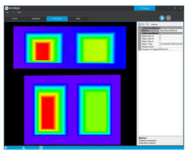
Display the extracted laser line

3D Studio displays the extracted laser line directly on live images. It is a very useful feature to tune the mechanical setup, the camera exposure, region of interest and other Coaxlink Quad 3D-LLE parameters.



GenICam parameters

The GenICam parameters of the Coaxlink Quad 3D-LLE are available in the 3D Studio. A subset can be selected to appear on the Profile or Depth Map panels, for a live tuning of the acquisition and extraction parameters.



3D data containers

Open eVision 3D Studio presents the Easy3D workflow in four control panels: from laser line profiles to depth maps, then to calibrated point clouds and finally to ZMaps. The object-based calibration of Easy3D is available and the resulting model can be saved.

Specifications

Software

Host PC Operating System

Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture

Minimum requirements:

- 8 GB RAM
- 400 MB free hard disk space

Related libraries

Easy3D

Easy3DLaserLine

Easy3DMatch

Easy3DObject

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