Artec 3D

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# Artec LEO/EVA

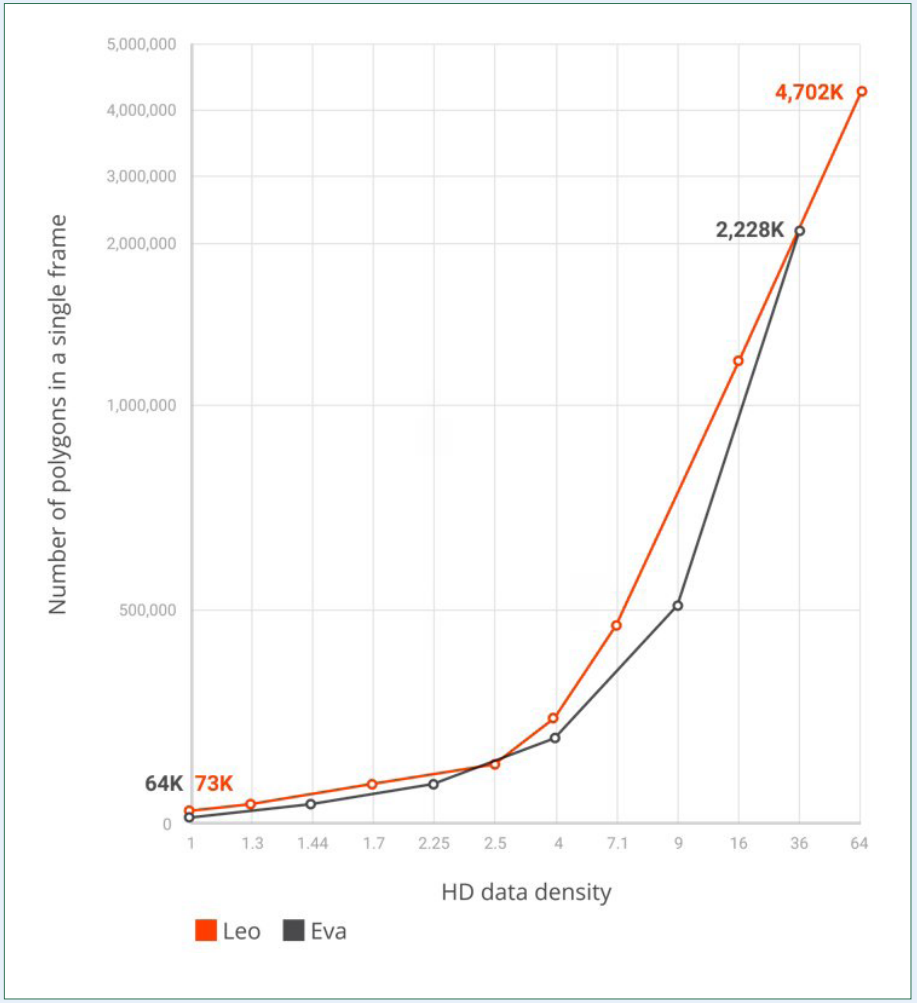
## HD Scanning with the Artec Leo and Artec Eva

**English**
Version 2025.05A

# HD Scanning
# with the Artec Leo and Artec Eva

### What is HD Scanning?

The HD mode is powered by **Artec AI**, an advanced neural engine. It is trained on hundreds of thousands of carefully selected examples. The neural network recognizes familiar patterns, surface details, and shapes, allowing your 3D scanner to reconstruct a much larger number of polygons per frame. This results in denser and **higher-quality 3D data.**



## Main Benefits of scanning in HD mode

### Clean data

Thanks to the Artec AI engine, the raw data contains little to no noise. This results in cleaner processed data and saves time when creating your final 3D model.

### Scanning hair

Hair is notoriously difficult to scan, but in HD-mode, it is captured more accurately than ever.

### Shiny and black surfaces

Scan dark or shiny surfaces in high resolution.

### Hard to reach surfaces

Easily capture hard-to-reach areas.

### Sharp edges

Fine, sharp edges are captured in high definition.

### Small elements

Smaller and thinner parts can be scanned in HD.

### High resolution

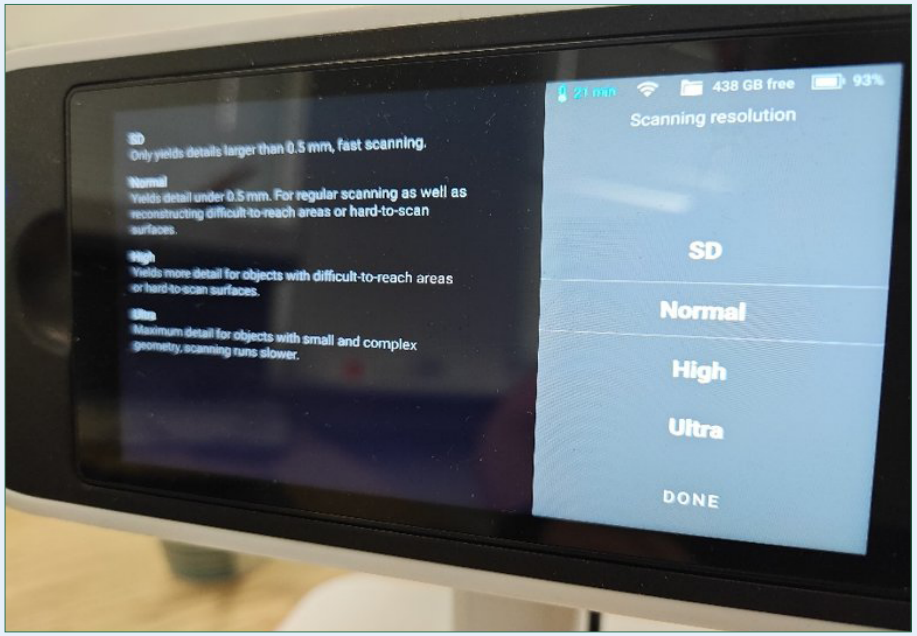
Much sharper scans with a resolution of up to **0.2 mm**.

## When to use HD Mode?

As the computers we use to process scan data and Artec Studio software have significantly improved in recent years, we notice that scanning in HD has become the standard. In most cases, it works better and faster than SD

### Example scanning with the Artec Leo

Scan on HD Ultra with the “Only HD frames” option enabled in Artec Studio and Point density set to Normal delivers nearly the same number of points and coverage as SD data, but with a better, cleaner, and sharper result. This will be further explained later in this document.




## Which HD resolution to use?

You can use the following HD resolutions on the Leo:

**Normal ›** Every 8 SD frames, the Leo captures 1 HD frame

**High ›** Every 4 SD frames, the Leo captures 1 HD frame

**Ultra ›** Every 2 SD frames, the Leo captures 1 HD frame

The resolution indicates how frequently HD frames are captured by the scanner during scanning.

HD data is stored as raw data. You can later decide how many frames you want to reconstruct. This means you can use fewer frames than originally captured if it better suits your computer's capacity or your project's requirements.

Therefor it is recommended to always scan in **Ultra**. This way, you always have the maximum number of HD frames available, and you can later **choose how many you want to use**.

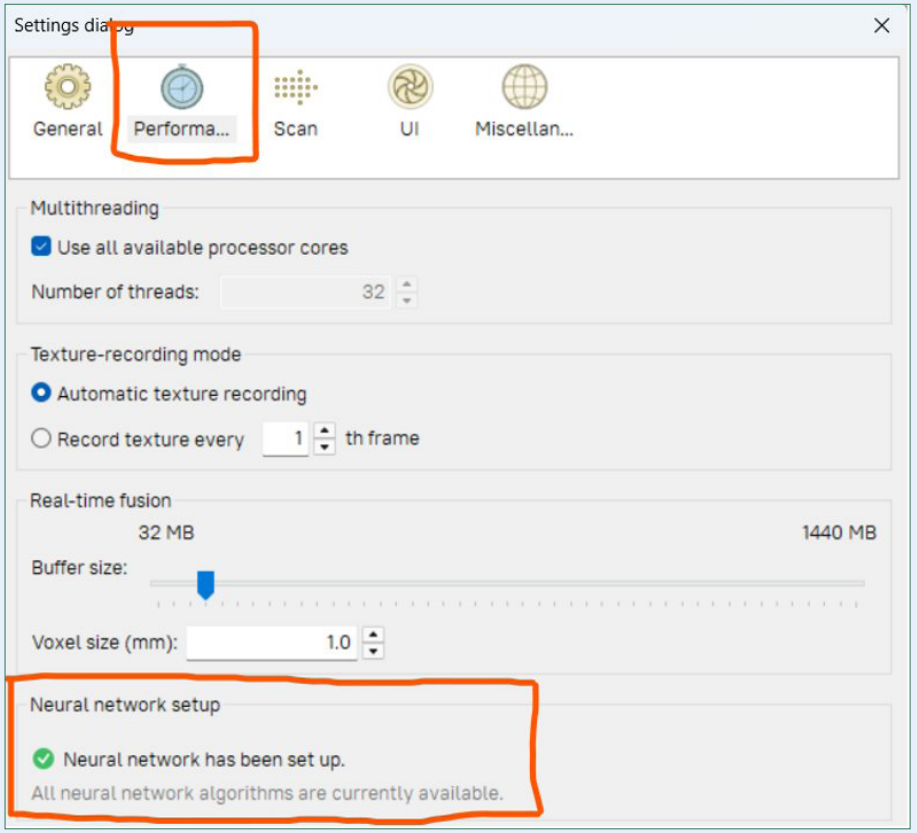
**Note**

That scanning in Ultra collects more data and, depending on scan duration and the object (if it's difficult to scan), the scanner might scan more slowly or lose tracking more easily. If this occurs, scan at a lower HD resolution —such as High or Normal.

## Neural Network setup

Before we can proceed with postprocessing the HD-data in Artec Studio, make sure you have done the calculation of the Neural Network Setup.

This needs to be done once and this can take approx. 20 minutes to finish. Go to **Settings** in Artec Studio. You will find the button under **Performance**.

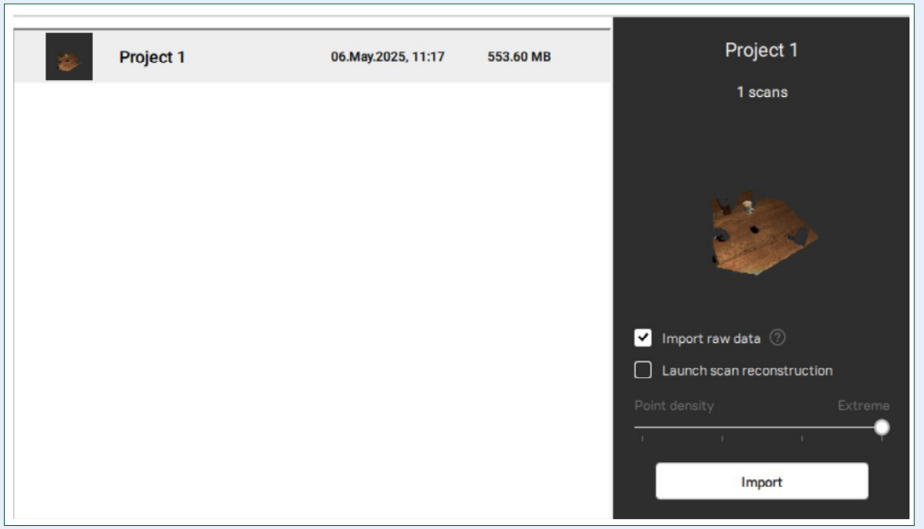



Also it is necessary for the calculations of HD-data to use an NVIDIA graphics card.

## Processing HD Data in Artec Studio

Import the project with the option: **Import raw data enabled**.

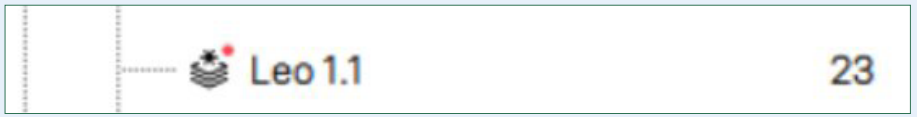
Turn off **Launch scan reconstruction.**



We now see two different files in Artec Studio:

**SD Data**


**RAW HD Data**

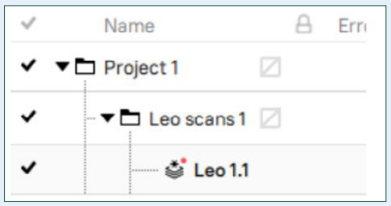



Select all SD data and create a **Group (CTRL+G)** or delete this SD-data (Del). Even when you scan in HD-resolution: **Normal**, you can delete the SD data. This is because the Artec Leo determines in a clever way when to create a frame (**optimize project setting enabled on Leo**). As a result, even in the lowest HD mode, the scan is complete and without holes.

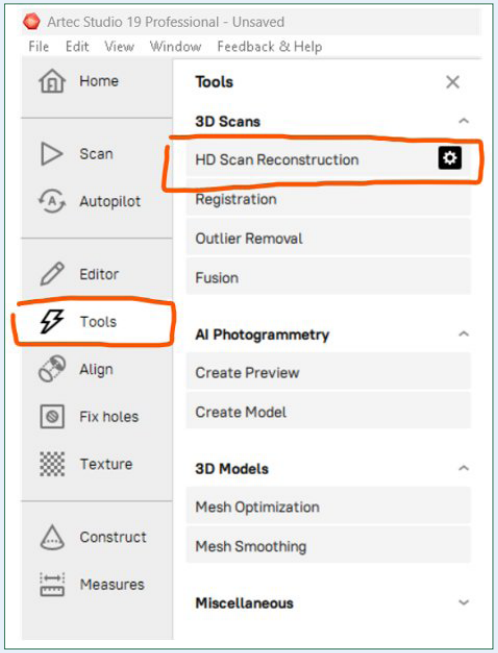
The Raw HD data is not yet visible when selected. We must first reconstruct this data.

## HD Reconstruction

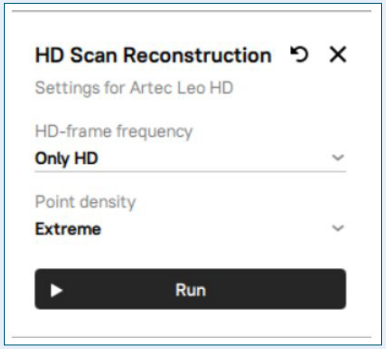
Select all the Raw HD Data you want to convert into usable data




Click on **Tools › HD Scan Reconstruction**




In the following screen, you have the following options:
**HD-Frame frequency** and **Point Density**



## HD-Frame frequency

This determines how many frames you want to keep.

> **Note**
> If you did **not scan in Ultra**, the number of frames is already reduced during scanning. When you choose to reduce even further, gaps may appear in the data.

The following options are available:
**Only HD ›** (keep all HD frames (100%) present in the raw data)
**Every 2nd frame ›** (keep half (50%) of the HD frames)
**Every 4th frame ›** (keep 1/4 (25%) of the HD frames)
**Every 8th frame ›** (keep 1/8 (12.5%) of the HD frames)

We recommend using **Only HD** so that as much data as possible is available. This ensures calculations like Global Registration are more accurate.

## Point Density

This sets how many points are present in each frame.

The following options are available:
**Normal 1X ›** When scanned in Ultra and "Only HD" is selected, this is comparable to the number of points in SD data. Best choice for large parts with few fine details. (Example: exterior of a car)

**High 2X ›** Denser point cloud for when fine details are present. (Example: car interior)

**Ultra 4X ›** Even denser point cloud for small to medium objects with finer details. (Example: technical part with small holes and threads / bicycle wheel with thin spokes)

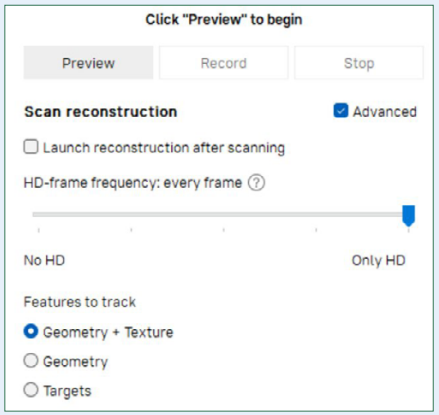
**Extreme 8X ›** Very hardware-intensive, only use for very small objects. (Example: small technical part with tiny holes and threads)

## HD scanning with Artec Eva

With the Artec Eva we can also scan in HD-mode.

Before you start scanning:

- In the scan options, enable **Scan reconstruction Advanced**.
- Disable **Launch reconstruction after scanning** (so we have more control over the data afterward).
- Set the **HD-frame frequency** to every frame (only HD).




After scanning, you'll get raw data:


This raw data must still be converted into usable scan data. Follow the instructions on the page: **HD Reconstruction**.

Have fun scanning with
**ARTEC LEO AND ARTEC EVA**

Artec 3D Ambassador

Artec 3D Gold Certified Partner

## 4C Creative Cad Cam Consultants

4C Creative CAD CAM Consultants is a company specialized in 3D technologies and is located in Emmen, Drenthe. 4C is your partner for delivering professional hardware and software for 3D scanning, reverse engineering, AR & VR and quality control.

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For more information, FAQ, updates, documents and videos about Artec Leo or Artec Eva **go to 4cccc.nl/kennisbank/artec-leo** or **4cccc.nl/kennisbank/artec-eva**

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