

Aadva™ Lab Scanner with the Unique Intuitive
Scanflows, Hybrid Scan and Smart Occlusion
Manual

Simplicity
Accuracy
Productivity



Software 1.5.2 issued on October 2023



Since 1921
100 years of Quality in Dental



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Congratulations on the purchase of your new **Aadva Lab Scanner 2 / 2+ / 3** from GC!
This industry-leading digital product will support you in your laboratory for many years to come.

In case you have questions or would like to receive any assistance, please don't hesitate to contact your GC Local contact (1st line support) or our GC Europe Digital Service Team (2nd Line Support)

Email: digitalservices.support@gc.dental

Office hours: 08:30h – 17:00h

We wish you much joy with your **Aadva ALS 2 / ALS 2+ / ALS 3 scanner!**

Your Aadva team

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Current documentation: www.smartoptics.de (download sections)

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Adesso Split, Artist/arTO - K. Baumann, DE-75210 Keltern
Artex - Amann Girrbach AG, AT-6842 Koblach
Baltic Denture System - Merz Dental GmbH, DE-24321 Lütjenburg
Denar - Whip Mix Corporation, Louisville, KY 40209, USA
exocad - exocad GmbH, DE-64293 Darmstadt
FlyCapture, UpdatorGUI - Point Grey Research, Inc.
Gamma - Gamma medizinisch-wissenschaftliche Fortbildungs-GmbH, A 3400 Klosterneuburg
Twin Tray - Klasse 4 Dental GmbH, DE-86159 Augsburg, DE
OnyxCeph3™ - Image Instruments GmbH, DE-09125 Chemnitz
PROTAR - KaVo Dental GmbH, DE-88400 Biberach/Riß
SAM - SAM Präzisionstechnik GmbH, DE-82131 Gauting
SILADENT, SilaPart® - SILADENT Dr. Böhme & Schöps GmbH, DE-38644 Goslar
Triple Tray - Premier Dental, Plymouth Meeting, PA 19462, US
Windows, .NET Framework, Visual C++ - Microsoft Corporation

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Table of contents

1.	About	6
1.1	Introduction	6
1.2	About Aadva Scan	8
2.	Basic operation	9
2.1.	User interface	9
2.1.1	Project info	9
2.1.2	2D viewer	10
2.1.3	3D viewer	10
2.1.4	Project management	10
2.1.5	Program window in the standby mode	11
2.2	Workflows	12
3	Project definitions	13
3.1	Basic data	13
3.2	Texture scan	14
3.3	Starting a project	15
3.4	Patient project definition	15
3.4.1	Indications for tooth positions in the upper and lower jaw	15
3.4.2	Scan modes of the "patient" project definition	17
3.4.3	Upper jaw/lower jaw presentation "patient" project definition	19
3.5	multiCase project definition	20
3.6	Universal project definition	20
3.7	Orthodontics project definition	20
3.7.1	Orthodontics project definition scan modes	20
4	Tab dialogs	21
4.1	General functions in the tab dialogs	21
4.2	Determination of the scan height	23
4.3	Inserting a jaw model	23
4.4	Inserting models in occlusion	23
4.4.1	Two models in occlusion	23
4.4.2	Articulator	24
4.4.3	Smart occlusion (Optional module)	24
4.5	Presentation segments (singleDie or secondDie)	25
4.6	Presentation segments (multiDie)	25
4.7	Inserting multiCase segments	25
4.8	Inserting an impression	25
4.9	Inserting a Triple Tray® impression	26
4.10	Insertion of a ^{BD} Key®	26
4.11	Inserting a Twin Tray model	26
4.12	Squeeze bite, gingiva, wax-up, situ, scanbody	27
4.13	Inserting a universal object	27
4.14	Inserting a correction model	27
5	Hybrid Scan	28

6	Workflow functions	29
6.1	2D scans for presentations	29
6.2	Registration and alignment	30
6.2.1	“Assignment” tabs for registration and alignment	31
6.2.2	Auto registration	31
6.2.3	Manual alignment	32
6.3	Presentation with multiDie	33
6.4	Presentation with multiDie / multieDie+	34
6.5	Matching and project finalization	36
6.5.1	Manual matching	36
6.5.2	Delete matching	36
6.5.3	Check matching (3D)	36
6.5.4	Finalizing the project	37
6.6	Replacing a scan	35
6.6.1	Replacing a vestibular scan	37
7	Mesh processing	38
7.1	Automatic cutting plane	38
7.2	Cutting	40
7.2.1	Cutting inside, cutting outside, cutting the surface	40
7.2.2	Cutting procedure	41
7.3	Rescan	41
7.3.1	Rescan procedure	41
7.4	Close holes	42
7.5	Correction scan	43
7.5.1	Correction scan procedure	43
8	Adding a scan	44
8.1	Procedure	44
8.2	Combine mesh	45
9	View	46
9.1	Perspective	46
9.2	Representation	46
9.3	Rotating, moving, zooming	46
9.3.1	Selecting the axis of rotation	46
9.3.2	Rotating the scan with the mouse	47
9.3.3	Moving the scan with the mouse	47
9.3.4	Zooming the scan with the mouse	48
10	Service position	49
11	Projects	50
11.1	New project	50
11.2	Load project	50
11.3	Save project as	50
11.4	Close project	51
11.5	Scanning with exocad® DentalCAD	51

12	Extras	53
	12.1 Calibration	53
	12.2 Adding an activation code	54
	12.3 Deleting old PCM data	55
	12.4 Info	55
13	Settings	56
	13.1 General	56
	13.1.1 Language	56
	13.1.2 Tooth numbering system	56
	13.1.3 Project mode	56
	13.1.4 Extended (general)	56
	13.2 Visualization	57
	13.2.1 Rendering	57
	13.2.2 Colors	58
	13.2.3 Extended (view)	59
	13.3 Scanning	61
	13.3.1 Presentation mode	61
	13.3.2 Plaster type	61
	13.3.3 Texture mode	61
	13.3.4 Extended (scanning)	62
	13.4 Processing	62
	13.4.1 Quality	62
	13.4.2 Cutting tools	62
	13.4.3 Extended (processing)	63
	13.5 Export	64
	13.5.1 Work folder	64
	13.5.2 Cache directory	64
	13.5.3 Data alignment	64
	13.5.4 Extended (export)	65
	13.5.5 Diagnosis data	65
	13.6 Restore default settings	66
14	Indexes	67
	14.1 Icons	67
	14.2 Menus and key combinations	69
	14.3 Glossary	70
	14.4 File Paths	70

1. About

Please read through this operating manual carefully.

GC accepts no liability for damages due to failure to comply with the operating manual.

1.1 Introduction

ALS 2 / ALS 2+ / ALS 3 combines unique scan features with robust scanning hardware that will simplify your daily lab work.



Twin Tray scan illustrations

The device and software images may differ from the actual systems. Screenshots show sample data.

Units of measurement and numbers

Units of measurement Units legally in force in Germany
 International System of Units (SI)
 Numbers Decimal system with decimal places

Measurement	Unit	Abbreviation
Mass/weight	Kilogram	kg
	Gram	g
Length	Meter	m
	Centimeter	cm
	Millimeter	mm
	Micrometer	μ
Angle	Degree	°
Time	Hour	h
	Minute	m
	Second	s
Electrical power	Watt	W
Electrical voltage	Volt	V
	Alternating current	AC
Electrical frequency	Hertz	Hz
	Gigahertz	Ghz
Electrical current	Ampere	A
Protection class	International Protection	IP
		1 st digit: solids protection; 2 nd digit: fluids protection
Temperature	Degree Celsius	°
Memory (PC)	Random-Access Memory	RAM
Data volume	Megabyte	MB
	Gigabyte	GB
CAD data format	Polygon file format	PLY
	Standard Triangulation Language	STL
	American Standard Code for Information Interchange	ASCII
	Mesh	MSH
	Point Cloud Measurement	PCM
Picture element	Pixel	Px (monitor)
		dpi (print)
	Megapixel	Mpx

1.2 About Aadva Scan

Aadva Scan is a software for GC 3D Aadva Scanners.

Aadva Scan scans jaw models and impressions according to dental specifications, orthodontic models and multiCase projects. Objects in the size of the scanner measuring field can be scanned by Aadva Scan in the universal mode, which is industry independent.

CURRENT VERSION AND MANUALS  Aadva Scan

www.smartoptics.de

The following can upgrade to Version 3.4:

- /// Vinyl series (Vinyl Open Air, Vinyl, Vinyl High Resolution),
- /// scanBox

CALIBRATION DATA  Initial installation

Calibration data are a prerequisite:

- /// to start Aadva Scan;
- /// to obtain correctly calculated measurements.

Every scanner requires individually adjusted calibration data.

- /// The calibration data are not transferable to a different scanner.
- /// The installation of Aadva Scan also includes the calibration data.

System requirements

ALS 2 / ALS 2+ / ALS 3	Windows 10/11 (64 Bit)	CPU i7 with 6 × 4.7 GHz	RAM 32 GB	Approx. 100 – 250 GB SSD	GPU 6 GB	USB 3.0
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Interfaces

You can link Aadva Scan to exocad® DentalCAD and OnyxCeph3™. All interfaces are available at no additional cost for all scanners.

The PC must comply with the system requirements of the third party systems. In case of different specifications, the highest requirements apply.

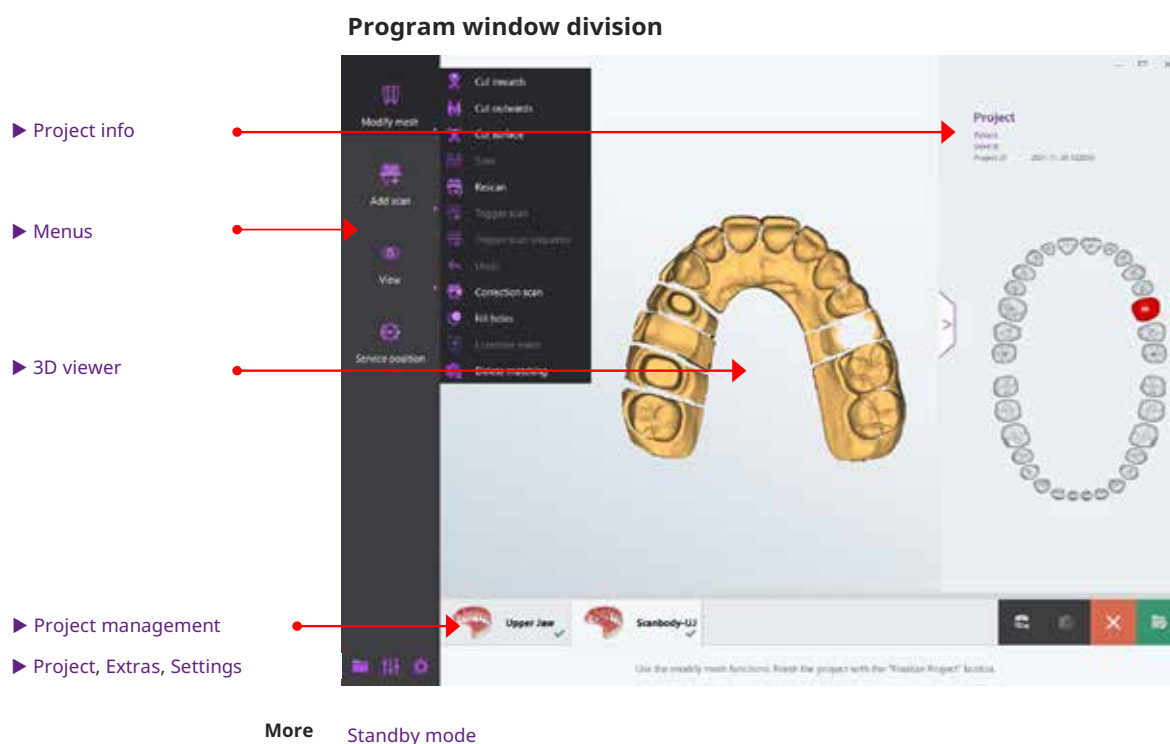
System requirements	
exocad® DentalCAD (dental CAD-System)*	wiki.exocad.com "Introduction"
OnyxCeph3™ (prosthetics software)	www.onyxceph.de "> Home OnyxCeph3™ About System Requirements"
Baltic Denture System®	www.baltic-denture-system.de Dental Lab > Requirements

* GC is a *reseller* of exocad GmbH. If you are interested in exocad® DentalCAD please contact your GC reseller.

2. Basic operation

2.1. User interface

Program window division



2.1.1 Project info

PROJECT DEFINITION INFORMATION DISPLAY:

Patient or project name

- /// In dental projects: first name and surname of the patient.
- /// In universal projects: project name.

Dentist

- /// Name of the dentist in a dental project started in Aadva Scan.
- /// Name of the customer in a dental project started in exocad®.
- /// Not used in universal projects.

Project ID (generated automatically)

- /// Aadva Scan projects: [YYYY]-[MM]-[DD]-[hhmmss]
- /// exocad® projects: [YYYY]-[MM]-[DD]-[exocad-ID]
e.g. 2021-09-28_00001-001.

Tooth chart

- /// Coloring of the tooth positions with defined reconstruction;
- /// Color codes according to Aadva Scan or exocad®.


Displaying and hiding



Click the arrow  at the project info.

The project info is hidden.



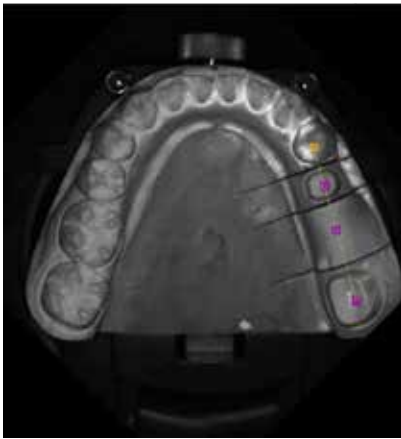
Click the arrow  at the edge of the program window.

The project info is displayed.

2.1.2 2D viewer

The 2D viewer:

- shows the jaw model in the scanner as a black and white photo;
- is intended for dental projects with secondDie presentation.
- provides exact marking of tooth positions.



TIP

2D images are displayed in the project status of exocad® DentalDB.

2.1.3 3D viewer

The 3D viewer:

- Shows the scans from all sides,
- is intended for the processing of workflows,
- is split horizontally for manual registrations/assignments.

2.1.4 Project management

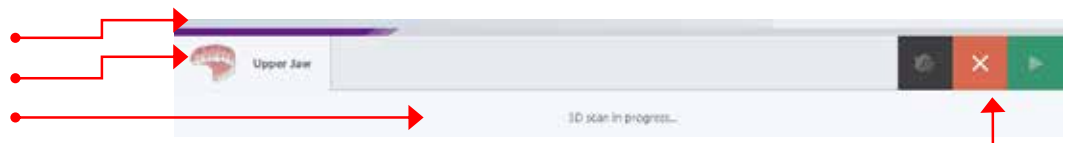
The project is managed via the horizontal bar below the 3D viewer:

Status bar

Tabs

Info line

Actions



Status bar

- It displays the current progress of the data processing.

Tabs

- One tab per scan (number according to the project definition).
- Some tabs are assigned to another tab at the end of the workflow (additional scan, correction scan, multiDie).

Info line

- Instructions for the next step,
- Orientation on the procedure.

Actions

- Possible alternatives to end the processing step (e.g. matching, next, cancel).

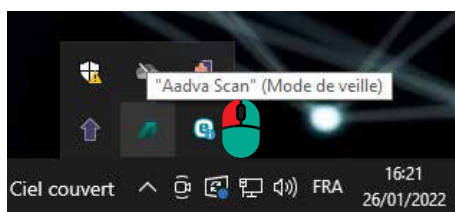
2.1.5 Program window in the standby mode


When a project is finalized/closed, Aadva Scan goes into the standby mode (background readiness).
Opening the program window in the standby mode


- LT Pro Double click the desktop icon of Aadva Scan.

OR:

- Open the program window from the Windows taskbar:



2. Click on  to open Aadva Scan.

1. Click on  to open the hidden icons again.

TIP

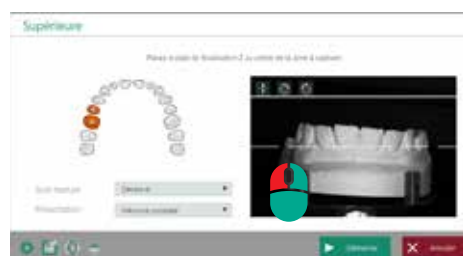
Opening from the taskbar is faster if you pin the icon of Aadva Scan to the taskbar in the Windows settings.



Allow
standby mode

Ending the standby mode

- Right click the icon of Aadva Scan for in the system tray.



- Select Close in the context menu.
 - ➔ Aadva Scan is closed.

2.2 Workflows

A workflow is a defined sequence of work steps (scans, matching and, if necessary, registrations) based on the project definition (divided into individual tabs in the project management).

Aadva Scan arranges the necessary tabs in a meaningful order according to the project settings.

Guided workflows

There is a guided workflow for every project. The work steps are processed and completed in a specified, meaningful sequence.

The guided workflow is mandatory for the following scan modes:
Baltic Denture, Triple Tray®, Twin Tray.

Free workflows ("IndepenDent mode")

Depending on the selected scan mode, a guided workflow ("IndepenDent") can be modified. A different scanning sequence is possible.

1. Click on the tab that you want to fill (even if only one is available, e.g. with multiCase).








2. Click on "Next".

➔ A tab dialog asks for the insertion of a scan object.

Tab processing symbol



- No symbol**  No scan data available
  Scan data available, but not matched
  Scan data available and matched

3 Project definitions

A project definition specifies what and how to scan.
Aadva Scan saves the data in the project management file (SOP):

- // **Patient**
 Comprehensive dental project definition for all indications (jaw models, impressions).
- // **multiCase**
 Dental project definition for individual stumps.
- // **Orthodontics**
 Dental project definition for orthodontic indications (jaw models).
- // **Universal**
 General project definition for many objects.
 The project definition Patient is proposed by default.
 The default value can be changed.



Alternatively, scan projects can be defined in a CAD system, e.g. exocad® DentalCAD.

3.1 Basic data

The basic data are entered when the project is set up and cannot be modified afterwards.

Basic data (dental)

Project definitions
Patient
multiCase
Orthodontics

Basic data from exocad

In Aadva Scan, the basic data of an exocad® project must remain unchanged to keep the consistency with the exocad® data.



Project ID

Aadva Scan automatically assigns a unique, non-changeable project ID.

Format



YYYY-MM-DD-hhmmss (time stamp consisting of year-month-day-time).

The project ID can be expanded to include the patient name or project name.

In exocad® projects, the exocad® ID is added instead of the time, e.g. **87612-001_Smith-John**.

Dentist and patient

In dental projects, dentist and patient are optional data used to assign the project to a treatment case.

The fields are not divided so that you can structure the names as you wish, e.g.:

■ [Title] [First name] [Surname].

■ [Surname] [First name].



Names from ® projects are adopted according to defaultsettingsDB.

Comment

The comment can contain discretionary processing instructions or additional information (≈ 30,000 characters).

Example multiCase project with tooth models belonging to several patients

Comment: Number-Name-Tooth position:



In the exocad® DentalDB, the corresponding field is called "Comments".

Project name (universal projects)

A project name must be entered (maximum 204 characters, letters, numbers, special characters).

3.2 Texture scan

Project definitions:
Patient
multiCase
Universal
Orthodontics

Texture scans are used to add markings to the surface of a scan object in a scan. A model cast prosthesis, for example, can be precisely designed along a scanned contour line using the SilaPart® CAD system.

Depiction of textures in the 3D viewer:

monochrome



colored



The monochrome or colored texture scan can be enabled in the project definition as a suggested value, as well as in the tab dialogs.



NOTICE

- ▷ Markings on preparation lines affect the measurement accuracy. Only place marks in areas that are not relevant to the fit.
- ▷ Optimized texture scans generally have the effect of smoothing the edges, for example of fissures and ridges. To obtain full edge definition, GC recommends non-optimised texture scans.

3.3 Starting a project

Before starting a scan, the project definition must be entered fully and correctly.

▶ Start

▷ Click on **Start**.

➔ The project definition can no longer be modified.

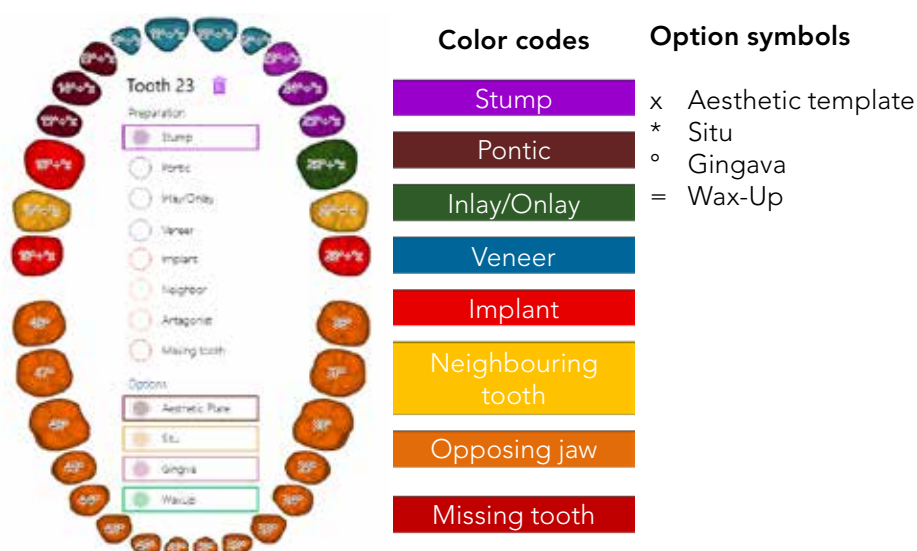
3.4 Patient project definition

The Patient project definition is suitable for all upper and lower jaw dental technical indications. It is characterized by the combination of indications for individual tooth positions, scan mode and presentation mode.

3.4.1 Indications for tooth positions in the upper and lower jaw

Dental indications are a prerequisite for the design of a dental prosthesis. You must select the preparations and options necessary for scanning.

Aadva Scan
color codes



The diagram shows a dental arch with various tooth positions color-coded according to their indication. A central window for 'Tooth 23' displays preparation and option settings. The legend defines the color codes and option symbols used in the software.

Color codes	Option symbols
Stump	x Aesthetic template
Pontic	* Situ
Inlay/Onlay	o Gingiva
Veneer	= Wax-Up
Implant	
Neighbouring tooth	
Opposing jaw	
Missing tooth	

Displaying and hiding

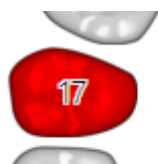
▷ Click on any tooth position/a place outside the tooth chart.

➔ **Preparations** and **Options** are alternatively displayed and hidden.

Assigning the indication to a tooth position

▷ Click on the tooth position to which you want to assign an indication and on the desired indication.

➔ The tooth position is colored in the color of the indication, e.g.:



▷ To initiate a scan of an aesthetic template, situation model, gingiva or wax-up, click on one or several options.

➔ The option symbols appear next to the position number, e.g.:

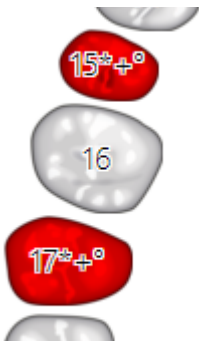


Individual copying of an indication

1. Assign an indication.
2. Hold the CTRL key.
3. Click on the next tooth position.



➔ The tooth position is colored and marked like the first one, e.g.:



Copying an indication to several positions

1. Assign an indication.
2. Hold the SHIFT key.
3. Click on the last tooth position in the series.

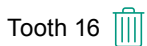


➔ All tooth positions in the series is colored and identified in the same way, e.g.:

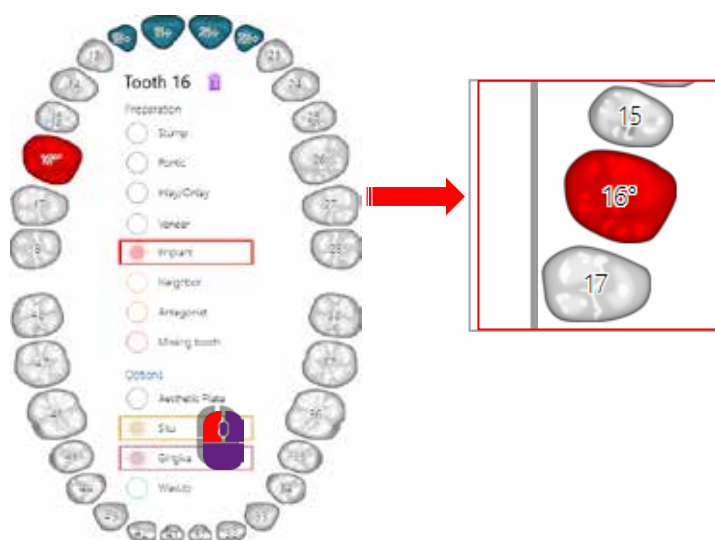


Deleting an indication

1. Click on the tooth position whose indication you wish to delete.
2. Click on the "Recycle Bin".
 - ➔ The indication and the options are deleted from the tooth position.
3. To delete only the indication and not the option (or the other way round), click on the current indication, e.g. "Implant", or on the option, e.g. "Situ".



Example: Deleting the "Situ" option from tooth position 16



- To delete the indication/option from another tooth position, hold the CTRL key and click on the next tooth position.



- To delete the indication/option from a series of tooth positions, hold the SHIFT key and click on the next tooth position in the series.

Modifying an indication

- Click on the tooth position.
- Click on the new indication.
 - ➔ The color and marking of the tooth position changes accordingly.
 - ➔ An option is adopted for the new indication.

If necessary, delete the option manually.

3.4.2 Scan modes of the “patient” project definition

The scan mode defines the workflow of the data to be recorded based on the indications.

Single model

Indications must exist for one jaw. The indication “Opposing Jaw” is possible for the other jaw to add a squeeze bite scan.

Two models in occlusion

Scan mode for models that are not articulated (vestibular scan without condylar reference).
Articulator [...]

An articulator can be used for the vestibular scan of articulated models. The scan mode must be suitable for the articulator. The scan of the physical articulator can be replaced by smart occlusion.

The following articulators are scanned with a condylar reference:

ARTEX®; ARTEX® CN; PROTAR®; SAM® 1+2; SAM® 3+NEO; REFERENCE®; ARTIST/ARTO®; DENAR®.

Those articulators that have been specifically configured for your system in Aadva Scan can be selected.

The scan mode “Articulator” (medium-quality scan) should be used for non-configured articulators.

To add an articulator, please contact your GC reseller.



NOTICE

- ▷ If the scan mode does not match the articulator, the results of the measurement is inaccurate. Select the articulator you are using or “Articulator” (medium-quality) as the scan mode.

Impression - two impressions in occlusion

The scan mode "Impression" is for single impressions; "Two impressions in occlusion" is for a workflow with a vestibular scan.

The "Impression" presentation mode must be assigned to at least one jaw.

An impression scan is not possible with the indication "Implant".



exocad® projects with indications in the posterior region and the scan mode "Digital impression" can be scanned in Aadv Scan with the scan modes "Impression" or "Triple Tray®".

Triple Tray® (impression)

The Triple Tray® module (activated) and the Triple Tray® impression holder are required.

An impression scan is not possible with the indication "Implant".

Indications (with the exception of Implant) can be for the posterior or anterior region. It is not possible to select a presentation mode

Twin Tray

Scan mode for Twin Tray models from the manufacturer Klasse 4 Dental® with an indication in the posterior region for the upper and lower jaw (maximum 5 positions, except for Implant).

You need the universal plate and the 4 teeth bar to isolate segments.

It is not possible to select a presentation mode. The upper and lower jaw as well as individual, presented segments are scanned in a single step.

Baltic Denture

www.baltic-denture-system.de

Scan mode for the production of full prostheses with the full solution Baltic Denture System®.

You need a BDKey® with press fastening (Baltic Denture accessory) and a BDKey® holder with a bottom impression holder (scanner accessory).

The indication "Missing Tooth" must be assigned to at least one tooth position in the upper and lower jaw. It is not possible to select a presentation mode.

The workflow with the scan mode **Baltic Denture** is not suitable for other full denture systems.



Design of a full dental prosthesis with the exocad® module Full Denture

▷ Combine the indication "Full Denture" with an articulator scan mode in exocad® DentalCAD.

The exocad scan modes "Two Plaster Models, in Occlusion" or "Digital Impression" are not suitable for exocad® Full Denture.

Note on Triple Tray®, Twin Tray and Baltic Denture




NOTICE

▷ The scan modes Triple Tray®, Twin Tray and Baltic Denture require a lot of computing power and memory. The PC must comply with the recommended system requirements for Aadv Scan.

Processing

IndepenDent Mode:  Not possible: Scans must be processed in the specified order.

Load project:  Not possible: Projects must be processed and finalized without interruption.

Automatic cutting plane:  Not possible, only manual cutting.

General note on full dentures

There is no scan mode available for full denture systems other than Baltic Denture. The following project definition is possible:

Preparation:	Missing tooth (one tooth suffices)
Option:	Aesthetic template (optional)
Scan mode:	<ul style="list-style-type: none"> /// Impression /// Jaw model /// Articulator /// Two impressions in occlusion /// Two models in occlusion

The option **Aesthetic template** changes the order in the guided workflow: Aesthetic template, vestibular scan, upper jaw, lower jaw.

3.4.3 Upper jaw/lower jaw presentation "patient" project definition

The presentation mode is the method with which individual segments from the upper and lower jaw are presented.

secondDie is suggested by default. The preferred presentation mode can be set and changed individually when a jaw model is inserted.

singleDie

- /// Presentation mode for each individual segment in the jaw model.
- /// Requires several scans.

secondDie

- /// Standard presentation mode in Aadva Scan.
- /// Scans every second segment in the jaw model.
- /// A maximum of two scans is required.
- /// With 2D scan.

multiDie

- /// Presentation mode for a maximum of 16 stumps per jaw (with two presentations).
- /// Scan of the segments without model base.
- /// Accessories: multiDie adapter.
- /// Activated module "multiDie/multiCase".

Complete jaw/complete jaw fast

- /// Presentation mode for jaw models without segment presentation.
- /// Suitable for opposing jaws, situ models, archiving.
- /// "Complete jaw fast": fewer single images (PCM), reduced quality, higher scanning speed.

Impression

- /// Special presentation mode for impressions.
- /// Expansion for the scan mode "Impression".

3.5 multiCase project definition

The multiCase project definition is used to scan individual segments without a model base. The segments (1 - 12) can belong to different treatment cases.

A multiDie adapter is required for multiCase projects. The "multiDie/multiCase" module must be activated. The slots of the multiDie adapter are numbered:



▷ Click on the slots that you want to occupy in whatever order you wish. You can click them again to clear a mark.

➔ The marked slots turn dark grey.



The following applies to exocad® projects:

- ✔ "multiDie Practice" is displayed in the field **Dentist**.
- ✔ No exocad® slot labels are displayed (data is saved in the project file (*.SOP)).

3.6 Universal project definition

The Universal project definition is intended for solid, opaque objects the size of the measuring field, e.g. tools, jewels, toys or figures.

Universal scans do not have a defined workflow. At least two scans are required for a complete 3D model (360° representation). Additional scans can be created individually and combined with the first scan.

3.7 Orthodontics project definition

The **orthodontics project definition** is intended for orthodontic indications and is therefore limited to complete jaw scans (individually or in occlusion).

Impressions cannot be scanned in orthodontics projects.

"Complete jaw" is specified as the presentation mode and cannot be changed in the project definition.

3.7.1 Orthodontics project definition scan modes

The scan mode determines an orthodontics project.

1. Start by selecting a button **Upper Jaw**, **Lower Jaw** or **Upper and Lower Jaw**.
2. For **Upper** and **Lower Jaw**: Specify the occlusion method in the **Scan Mode** field.

scanBox:
No option

Single model

- ✔ The only scan mode for **Upper Jaw** or **Lower Jaw** without occlusion.

Two models in occlusions

- ✔ Suggestion for Upper and Lower Jaw,
- ✔ Suitable for non-articulated models (without condylar reference).

Articulator [...]

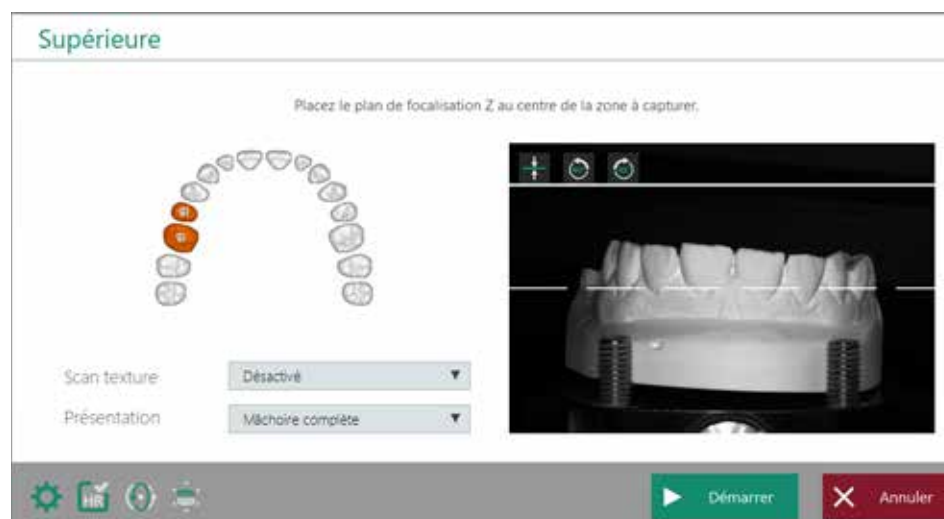
See "Patient" project definition, scan mode Articulator [...]

4 Tab dialogs

When starting a workflow or when selecting a tab ("IndepenDent Mode"), Aadva Scan asks you to insert a scan object into the scanner.

4.1 General functions in the tab dialogs

All tab dialogs have the same structure:



Glossary

1. **scan object:** What is to be scanned?
2. **Instruction:** What should you do with the scan object?
3. **Project information:** What indication was defined?
4. **Project properties:**
 - 4.1 Should textures be scanned on the scan object?
 - 4.2 How should the presentation be done?
5. **Determination of the scan height:**
What is the optimal height of the scan object in the measuring field?
6. **Scanner control:**
Settings, service position, global scan strategy, HR mode.
7. **Dialog control:** How do you wish to proceed?

Texture mode

- /// Suggested value adjustable, can be selected for each scan.
- /// Monochrome (single color) is always possible; Color (polychrome), texture scans with certain scanners.

Presentation

- /// Can be selected in dental tab dialogs.
- /// Scanning without presentation with "Complete Jaw" or "Complete Jaw Fast".

Settings



- /// Open the settings to change relevant values before the current scan, e.g. the type of plaster, the scan quality for a specific dental indication or the cutting filters.

Service position



- Execution of the "Service position" (resetting the axes) function. Globalscan strategy ("Enhanced mode")
Toggle switch in dental or orthodontic tab dialogs:
- determines the number and perspective of the camera images (PCM files)
- simple enhanced mode strategy ("OFF"), e.g. 13 images (PCM files) for a complete jaw,
- extended enhanced mode strategy ("ON"), e.g. 24 images (PCM files) for a complete jaw.
- Simple (OFF) is enabled by default.
- Extended (ON) is useful for complex scan object and dental indications.

Procedure



ON / OFF

- Click the OFF icon.
- Start the scan.
 - The scan is carried out once with an extended enhanced mode strategy. "ON" is not saved.

TIP

The file names in Aadva Scan projects indicate which Globalscan strategy was used to scan, e.g.: 2019-07-03-101351-upperjaw_#A190703101459_GlobalEnhanced_w90h-60.pcm

HR mode



ON / OFF

- ON / OFF
- Toggle switch, available on scanners with high-resolution cameras
- HR enabled (ON): highest resolution of the scanner camera, more precise results, longer scan times.

Procedure



- Click the OFF icon.
- Start the scan.
 - The scan is carried out once with a lower camera resolution and a shorter scan time. "OFF" is not saved.



NOTICE

The HR mode requires a lot of computing power and memory.

Use a PC that meets the recommended system requirements for Aadva Scan.

Start | Cancel

A tab dialog can be confirmed with Start or Next if the scan object is positioned inside the scanner and the settings are correct. The result is displayed in the 3D viewer of the tab.

A tab dialog can be cancelled without editing the task (scanning, presentation).

The tab remains empty.

You can cancel the scan if, for example, the project definition was created incorrectly.

Skip | Repeat scan | Check and rescan

Actions for singleDie and secondDie presentations:

- Proceed to the next step without presentation. This results in a lack of 3D data.
- Rescan the last scanned segments.
- View the last scanned segments in the 3D viewer and rescan if necessary.
- Not possible after the last presentation.

Skip

Repeat scan

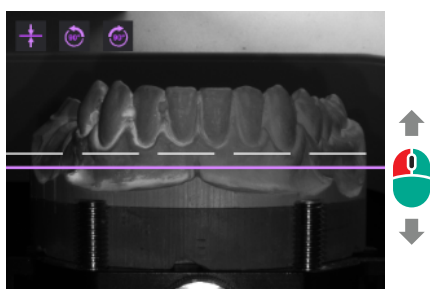
Check and rescan

4.2 Determination of the scan height

Scanners with automatic Z axis

The Z axis is moved to an average height depending on the object.
You can determine the scan height individually by means of the live image.
For ALS 3 the Z axis is adjusted automatically. A manual adjustment is also possible.
You can repeat the following process as often as you like:

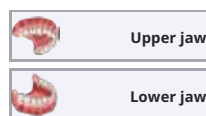
- In the live image, click on **Start scan height determination**.
 - The scanner moves the Z axis 45° towards the camera.
The live image now shows the front of the scan object.
A dashed white contour line marks the standard Z focus plane.
This line cannot be moved and always lies in the centre of the image.



- To change the scan height, move the mouse over the image.
 - A purple line follows the mouse. Outside of the measuring field, the line turns red (= position not possible).
- Click when the purple line is in the centre of the area to be scanned.
- The scanner moves the scan object to the new height.
The dashed white line now is at the desired height.
- To turn the scan object 90° to the left or right, click on the 90° icons.
 - The dashed white line must be perfectly centred in the area to be scanned.
- To reset the scan height to the default, click "Undo".



4.3 Inserting a jaw model



After selecting a tab, Aadva Scan asks you to insert the corresponding jaw model.
The tooth chart is displayed according to the project definition.

Information on inserting can be found in the Operating Manual.

4.4 Inserting models in occlusion

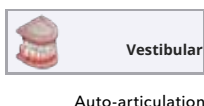
The tab dialog depends on the scan mode and the scanner.
A vestibular scan follows for bite registration purposes follows in all cases.

4.4.1 Two models in occlusion

Scan mode: "Two models in occlusion"

After selecting the tab, Aadva Scan asks you to insert the non-articulated models together.

Information on positioning can be found in the Operating Manual.



Auto-articulation

4.4.2 Articulator

Scan mode: "Articulator [...]"

The articulator scan with a physical articulator requires a scanner from the Vinyl series and achieves a result with a condylar reference.

The scan mode "Articulator" achieves an average-quality result.

TIP

A different articulator system than in the project definition can be selected in the tab dialog.

Insert the articulator

After selecting the tab, Aadv Scan asks you to insert the articulator.

Scanning

1. Follow the software instructions.
 - ➔ After the articulator scan, Aadv Scan asks you to remove the articulator.
2. Comply immediately with this instruction.



NOTICE

▷ Incorrectly positioned articulators can slip off the system plate and cause damage to the device or the scan object. Insert and remove the articulator immediately when prompted.

4.4.3 Smart occlusion (Optional module)

The smart occlusion is:

- // a calculation of the vestibular scan based on the scans of the upper and lower jaw
- // possible with models and full impressions
- // **Indications: single crown, facings, inlays, onlays, bridges up to 4 units implant or tooth born.**

The upper and lower jaw must have been scanned previously. A scan of the occlusal model or articulator is not necessary.

Prerequisites

Scans: The scan of the upper and lower jaw has been performed.
Occlusion: Occlusion is suitable for smart occlusion.

1. Start the smart occlusion.
 - ➔ Aadv Scan matches all tabs and calculates the occlusion.
2. Please check whether the occlusion was calculated correctly. If not, cancel the process and repeat the smart occlusion. A manual alignment is not possible.



Possible causes of errors

- // The occlusion is not suitable for smart occlusion. Carry out a vestibular scan (with an occlusal model or an articulator).
- // The wrong articulator was selected as scan mode. Define a new project.

4.5 Presentation segments (singleDie or secondDie)

A presentation of individual segments (including implant segments) is used to scan the interdental areas. The presentation starts automatically after the jaw scan or scan body scan.

singleDie: Scan of every single tooth position
 secondDie: Scan of every other tooth position, a maximum of two scans for one jaw



1. Remove any teeth that are not listed or color-coded.
2. With **Next**, the presented stumps is scanned and added to the scan of the jaw model.

4.6 Presentation segments (multiDie / multiDie+)

A presentation of individual segments is used to scan the interdental areas (not possible for scan body segments). The presentation starts automatically after the jaw scan.

multiDie

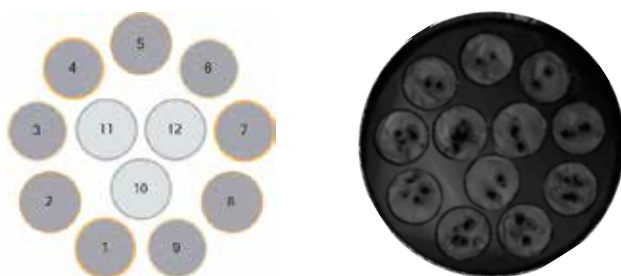
A new multiDie tab is displayed in the project.

Scanner accessories: multiDie adaptor.

- ▷ Insert the required segments into the multiDie adapter:
- ▀ 1 - 3 segments: Slots 2, 5 and 8
 - ▀ > 3 segments: You can select the slots freely

TIP

Recognizing the positions of the slots on the multiDie adapter:



4.7 Inserting multiCase segments

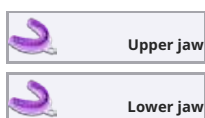
Insertion
of tooth models

When starting a multiCase project, Aadva Scan requests the insertion of the multiCase adapter. Insertion of tooth models

Scanner accessories: multiDie adapter

- ▷ Use the slots marked in dark grey. You can arrange the segments in any order you like. Leave space between the segments.
- ➔ Slots marked in light grey are not scanned.

4.8 Inserting an impression



Scan mode: "Impression"; "Two impressions in occlusion"

Presentation: "Impression" for one or both jaws

"Impression", "complete jaw" or "complete jaw fast" is possible for the opposing jaw. A jaw scan with the presentation of individual segments is not possible.

Scanner accessories: universal plate

After selecting the tab, Aadva Scan asks you to insert the universal plate.

Inserting
the impression

4.9 Inserting a Triple Tray® impression

When starting a project with the scan mode Triple Tray®, Aadv Scan asks you to insert the impression of the upper jaw.

Scanner accessories: Triple Tray® impression holder

1. Insert the requested impression facing up.
➔ The top is scanned.

For the opposing jaw, Aadv Scan asks for the other side of the Triple Tray® impression. The workflow is guided (predefined sequence, mandatory completion).



NOTICE

▶ The scan mode Triple Tray® requires a lot of computing power and memory. Use a PC that meets the recommended system requirements for Aadv Scan.

4.10 Insertion of a BDKey®

Inserting the BDKey

When starting a project with the scan mode Baltic Denture, Aadv Scan asks you to insert the BDKey®.

Scanner accessories: BDKey® holder, impression holder Triple Tray® (bottom part)

1. Attach the BDKey® with the BDKey® Lock (Baltic Denture accessory).
2. Fasten the BDKey® inside the BDKey® holder on the bottom part of the impression holder, with the upper jaw side up.
➔ The top is scanned.
3. When Aadv Scan asks for the lower jaw, turn the BDKey® holder. The workflow is guided (predefined sequence, mandatory completion).

4.11 Inserting a Twin Tray model

Inserting the impression

When starting a project with the scan mode Twin Tray, Aadv Scan requests the insertion of the closed twin tray model to proceed with the vestibular scan.

Inserting a Twin Tray Model

Scanner accessories: 4 teeth bar, universal plate

1. Fasten the Twin Tray model crosswise on the universal plate. This allows you to adjust the scan height better.
➔ After the vestibular scan, Aadv Scan requests the insertion of the open model and the segments.
2. Fasten all parts lengthways on the universal plate. Place the 4 teeth bar in the middle, even if there is no segment to be presented.

The workflow is guided (predefined sequence, mandatory completion). Rescans are possible, but cutting only after registration and matching.



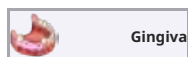
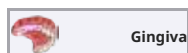
NOTICE

The scan mode Twin Tray requires a lot of computing power and memory. Use a PC that meets the recommended system requirements for Aadv Scan.



4.12 Squeeze bite, gingiva, wax-up, situ, scanbody

Project definition
Patient



Insertion
of tooth models

In addition to a jaw scan, further tabs are displayed in the project for the corresponding indications.

- // **Aesthetic template**
for toothless jaws
- // **Squeeze bite**
as a representative of the opposing jaw in the scan mode "Single Jaw"
- // **Gingiva, Wax-up and Situ**
for segments with the corresponding identification

After selecting the tab, Aadva Scan asks you to insert the jaw model with the appropriate addition.

Scanbody scans

For the preparation "Implant", Aadva Scan requests an additional jaw scan (with scan bodies) and a presentation of the implant segments with scan body.

- ▷ Attach the scan bodies according to the instructions of the manufacturer.

4.13 Inserting a universal object

Inserting Objects
(Universal Mode)

When starting a universal scan, Aadva Scan asks you to insert an object (item).
Title of the tab dialog = Project name

Scanner accessories: Universal plate

- ▷ Fasten the universal object securely and motionless on the universal plate.
- ➔ The universal object must lie completely within the measuring field, the side to be scanned facing up.

4.14 Inserting a correction model

When starting a correction scan, Aadva Scan asks you to insert a correction model.

- ▷ Remove all those segments that are not needed for the correction from the correction model.
 - ➔ The purpose of the correction scan is to replace defective parts of another scan.

5 Hybrid Scan

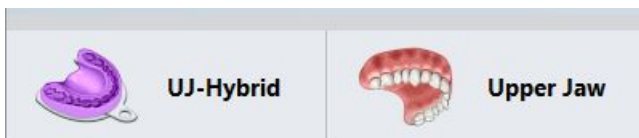
Model scanning tends to miss crucial areas of detail – typically the interproximal regions but also the retracted gingival sulcus around a crown preparation. To solve this, the model is physically trimmed and sectioned, allowing individual crown preparations to be scanned and re-aligned to the original model. However, model sectioning is undesirable as it adds time and cost and introduces errors such as shaving through contact points and loose pins in the model. It would be preferable to merge scans of the impression (scanned when received by the dental laboratory) and the subsequent scan of the poured model. This negates the need for model sectioning or trimming. For these reasons, the Hybrid scan was developed.



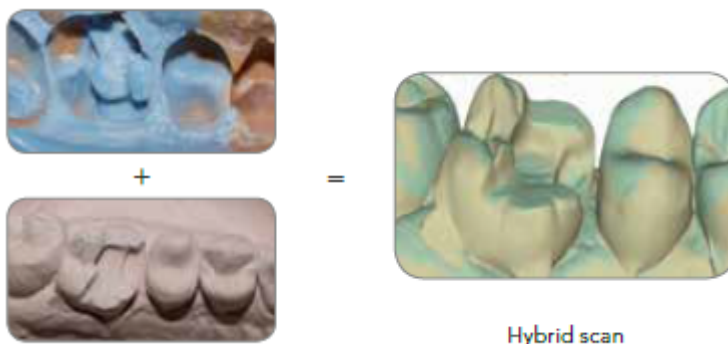
1. To start the hybrid scan, "one stone model" must be set as the scan mode. The "Hybrid Scan" option now appears as Presentation mode. Of course, this feature can be used for the upper and lower jaw at the same time.
Example for upper jaw:

Scan mode	One stone model ▼
Presentation upper jaw	Hybrid Scan ▼
Presentation lower jaw	▼
Texture scan	Disabled ▼

2. Start with the scan of the impression using the Triple Tray Impression Adaptor
3. Now cast the model and then scan it.



4. Manual positioning: Align both objects in identical viewing direction. Place one point per object at the same position with a "left click". Further points can be added with "Ctrl" + "left click". Click "Continue" to check the result.
5. Please verify the registration. In case of misalignment, click the impression to restart the registration process. Start the hybrid Scan Processing with the continue button.
6. Please review the result.



6 Workflow functions

6.1 2D scans for presentations

A 2D scan is a black and white photo seen from above. The 2D scan is used to mark the exact position of all indexed teeth. Aadva Scan requires a 2D scan for the preparation of 3D jaw scans (presentation mode secondDie, singleDie).

2D scan with markers

In the photo, boxes mark the estimated position (colors according to the indication, neighbouring segments connected by a line).



TIP

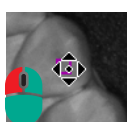
Allow the tooth numbers to be displayed as a guide. The boxes allow you to see which stump needs to be presented (filled = presented; not filled = not presented).



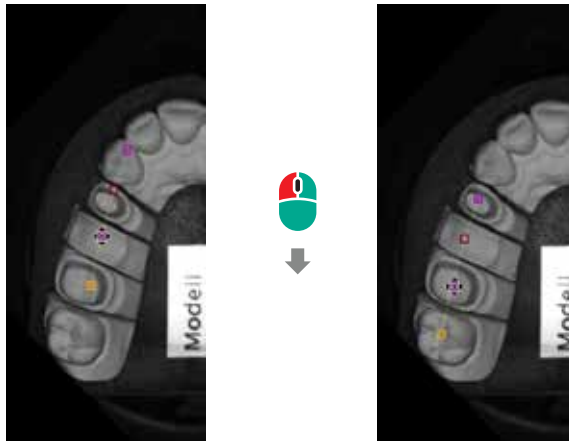
If you change the setting with the 2D viewer open, click the photo to refresh the view.

Moving all markers

This method is used for the rough alignment of the entire positioning.



1. Click with the right and left mouse button together on any box and keep both mouse buttons pressed.
2. Drag the markers to the correct position in the photo.



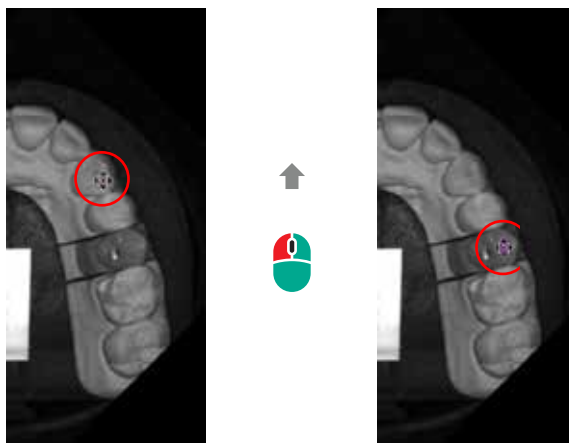
3. Release the mouse button when the target position has been reached.
 - ➔ All markers are moved.

Moving individual markers

This method is used for the precision alignment of individual markers.



1. Click with the left mouse button on a marker and keep it pressed.
2. Drag the marker to the correct position in the photo.



3. Release the mouse button when the marker in the photo is on the centre of the tooth.

6.2 Registration and alignment

Alignment (combination)

Several scans can be wholly or partially combined, e.g. a universal scan can be combined with an additional scan to form a complete 3D model.

Registration

The relative position of two scans to each other is determined, e.g. the position of the upper and lower jaw with a vestibular scan (bite registration).

Automatic calculation








If there is enough data available, Aadva Scan calculates the registration or alignment/assignment automatically.

Manual alignment

If there is not enough data available for an automatic calculation or if the automatic calculation needs to be corrected, manual alignment is carried out.

6.2.1 "Assignment" tabs for registration and alignment

Method
possible
not possible

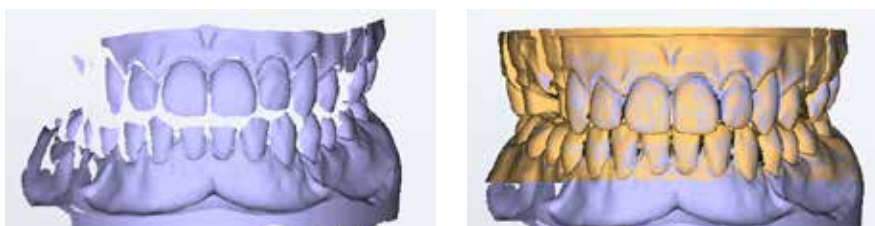
Tab	Function	Automatic	Manual
 Vestibular	Vestibular scan (bite)		
 Registration	Scan mode Baltic Denture (bite)		
 Registration	Scan mode Triple Tray®		
 Registration	Scan mode Twin Tray		
 multiDie	multiDie		
 Correction	Correction scan		
	Mesh combination (additional scan)		

6.2.2 Auto registration

All relevant scans of the project must be created in order to be able to start the auto registration, e.g. those of the upper and lower jaw in the vestibular scan (info line in the 3D viewer).

1. The scans are automatically registered with Next. A color pattern shows whether the auto registration was successful.

Example: Vestibular scan with and without single jaws



2. Check all sides
3. The auto registration is saved with Next. All scans are matched.

Error

The auto registration/assignment is incorrect if the preview shows an offset.

1. Correct it manually.
2. With vestibular scans you can repeat the auto registration (delete matching, then start again).

6.2.3 Manual alignment

Aadva Scan places both scans in the 3D viewer for manual alignment (assignment). Points common to both scans must be marked with a click of the mouse. After this, Aadva Scan recalculates the registration.

TIP

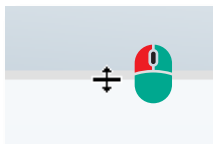


If the functions of the mouse buttons have been changed, the following applies: Double click instead of a single left click.

1. To correct an auto registration, left click on the scan in the preview (e.g. jaw in orange).
 - ➔ The 3D viewer is split horizontally.
The vestibular scan, for example, is displayed at the top, the jaw scan or the correction scan at the bottom.

TIP

You can enlarge the upper or lower area of the viewer by moving the dividing line while holding down the left mouse button.



2. Rotate the scans so that the perspectives match:



- /// both together via the View menu
- /// individually with the mouse (click next to the scan, not on it)



3. Mark the same point above and below with the left mouse button.
 - ➔ The points appear marked in color. Pay attention to precise positioning.
4. You can refine the alignment:



- /// CTRL key + left mouse button for further markings (maximum six in other colors)
- /// Click once on a position to move the closest marker there
- /// Press the DEL key to delete the mark

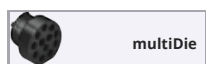


5. Click on Next.
 - /// After the calculation, the 3D viewer shows a two color preview.
Repeat the steps to make corrections.



6. Click on Next.
 - /// All scans in the project are matched and the result displayed.
The manual assignment is done.

6.3 Presentation with multiDie



multiDie

Aadva Scan requests the presentation after the jaw scan and temporarily adds the multiDie tab. Insert the segments into the adapter:

If more than twelve segments have to be presented, Aadva Scan requests two multiDie presentations, one after the other.

1. Insert the requested segments into the multiDie adapter:

2. Start the scan.

3. Check whether all segments were scanned correctly. If not, you can:



- /// make corrections (mesh processing functions)
- /// cancel and repeat the process.



4. Start the automatic alignment of the segments on the jaw model.

5. Check the result from all sides. Pay attention to the colors.



6. Make manual corrections if necessary.

7. The jaw scan is recalculated with Next. The multiDie is closed. The presentation is ready.

Manual registration multiDie presentation

Manual registration can improve the auto registration of the multiDie presentation per segment.

1. Click on the segment to be registered manually.

2. The 3D viewer is split (jaw scan above, segment below).

3. Rotate the jaw scan and the segment so that the perspectives match:



- /// both together via the View menu,
- /// individually with the mouse (click next to the scan, not on it).

4. Mark the same point above and below with the left mouse button.



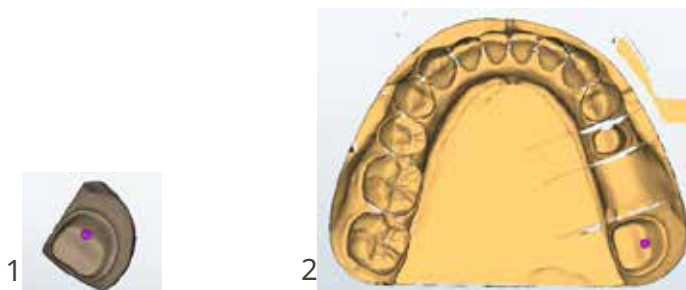
- /// The points appear marked in color. Pay attention to precise positioning.

5. You can refine the registration:



- /// CTRL key + left mouse button for further markings (maximum six in other colors),
- /// Click once on a position to move the closest marker there,
- /// Press the DEL key to delete the mark.

First marking in segment (1) and jaw scan (2):



▷ Confirm the registration by clicking on **Next**. You can:

- /// register the next presented segment manually,
- /// end the registration with **Next**.

6.4 Presentation with multiDie / multiDie+



multiDie

multiDie and multiDie+ are presentation modes, alternative to singleDie and secondDie. When isolating, the interdental areas of a jaw are scanned.

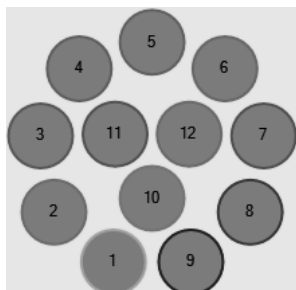
With multiDie and multiDie+, it is possible to isolate up to 16 segments (stumps) per jaw (in 2 presentations; one presentation allows to isolate up to 12 segments).

Prerequisites

- /// The multiDie/multiCase module is activated within the software.
- /// A multiDie adapter is available.
- /// The jaw model is segmented.

Procedure

1. Create the "Patient" project definition:
 - /// Mark at least one position for one or both jaws, e.g. as a stump.
 - /// All indications except opposing jaw and missing tooth are possible.
2. Select the presentation mode multiDie or multiDie+.
3. Start scanning. The jaw is scanned first. The presentation mode can still be changed at this time.
4. The jaw scan is followed by the multiDie scan.
 - /// 1 - 3 segments must be placed in slots 2, 5 and 8 in the multiDie adapter.
 - /// 4 - 12 segments can be distributed arbitrarily in the slots.



5. Occupy the slots:
 - /// Fill holes with adhesive pads, smooth the surface.
 - /// Insert segments into the putty material.
 - /// The area to be scanned must be visible.

6. Start multiDie.

7. Start the automatic registration.

✔ Wait for the calculation and check the result.

✔ Is something placed incorrectly?



Align the segment manually and start the process with a left click.

✔ Create up to 6 reference points on the jaw and the segment alternating left click and CTRL + left click.

8. Complete the multiDie scan with precision registration.

9. Wait for the calculation, the matching process and continue with the project.

Comparison multiDie - multiDie+

	multiDie+	multiDie
Calculation (data from jaw and segment scans)	Subtraction	Addition
Model types		
Saw cut model	✔	✔
Geller model	✔	—
Master model	✔	—
Model types		
Transitions	✔	—
Veneers	✔	—
Soft tissues	✔	—

Better quality

multiDie+ scans transitions and edges in a loss-free manner. The scope of application has been extended to master and Geller models.

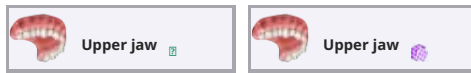
Time saving

When scanning Geller models, there is no need for an additional scan of a gingival mask.

Due to the identical way of proceeding, multiDie+ can be used immediately and without previous practice.

6.5 Matching and project finalization

Matching is a calculation that uses individual recordings and measured values to generate a data set in 3D data format. Matched scans display a green tick mark in the tab; unmatched scans display the matching icon.

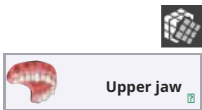


There are several setting options for matching. By default, all scans are automatically matched during scanning and when the project is finalized.

6.5.1 Manual matching

You can carry out all routine work without manual matching. For special work, e.g. an additional scan or a correction scan, you have to match the corresponding scan manually. In workflows with a vestibular scan, you can only match after the entire workflow has been completed. Then all scans are matched together.

1. Click on the tab whose scan you wish to match.
2. Click on "Matching" in the project control.
Upper jaw
➔ Matching is calculated and the result displayed in the 3D viewer. The tab gets a green tick.



6.5.2 Delete matching

You can undo the matching of individual scans in a project.

1. Select the tab whose matching you want to delete.
2. Click on **Edit mesh | Delete matching** (active if the selected scan is matched and deletion is allowed).
Upper jaw



- ➔ Now you are able to edit the unmatched data. Data that has been cut after matching is restored by Delete matching.
- ➔ You can repeat the registration in a dental project with a vestibular scan.

6.5.3 Check matching (3D)

At the end of the dental workflow (Patient project definition with option), you can visually check the result of several matching processes in the 3D viewer.



1. Click on "Show result" in the project control. The button is displayed when all scans have been matched.
 - ➔ The 3D viewer loads all results and displays them in contrasting colors. Vestibular scan and jaw scan are separated. The colors are configurable and indicate which scan the data originate from.
2. Check the results of the matching process from all sides.
3. To exit the checking view, click again on "Show result".
4. To change a matching, click on the relevant tab. Correct or replace the scan.
 - ➔ If everything is OK, you can finalize the project.



6.5.4 Finalizing the project



The completion of the project after a workflow completes all data for subsequent use in a CAD system, e.g. exocad® Dental CAD. Depending on the scan quality, the amount of data is reduced ("thinned").



1. Click on "Finalize the project".
 - ➔ If there are still unmatched scans, you will receive a message.
2. To finalize the project, click on Start matching and close the software. Start matching matches without completing the project.
 - ➔ All scans are matched, a 3D data file (PLY, STL (optional)) saved and the project closed. Aadva Scan goes into the standby mode.



If Aadva Scan is closed without completing the project, the scan data is not thinned. Matched data can still be used for a construction.

6.6 Replacing a scan

In free workflows, you can replace incorrect scans, e.g. a lower jaw on an upper jaw tab. All other scans are kept.

TIP

Replacement is not possible in guided workflows. The project has to be started anew. The scan modes affected are: Baltic Denture, Triple Tray®, Twin Tray (all "Patient" project definitions).

1. Click on:
 - ➔ the tab you wish to replace,
 - ➔ **Cancel** (project control),
 - ➔ **Yes** in the **Restart** message.
 - ➔ The existing scan is deleted. You cannot undo this action.
 - ➔ Aadva Scan asks you to insert the scan object.
2. Follow the instructions to replace the deleted scan.



6.6.1 Replacing a vestibular scan

In the case of a vestibular scan, the scan itself may be incorrect (e.g. due to a swapped model) or also the alignment of the jaw scan with the vestibular scan. Repeating the alignment



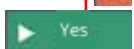
1. Click on **Cancel**:
 - ➔ after the automatic alignment,
 - ➔ after or during manual alignment.
 - ➔ The alignment is removed and the original vestibular scan displayed again.



2. To repeat the alignment, click on **Next**. Repeating a vestibular scan



1. Click on **Cancel** repeatedly until the message Restart is displayed.
2. The vestibular scan restarts when you click on **Yes**



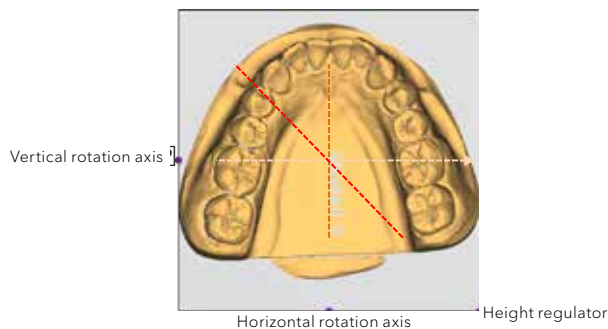
7 Mesh processing

The **Mesh processing** menu contains correction and cutting functions for editing the 3D data networks ("Mesh"). **Mesh processing** opens automatically at any point in time in a workflow. Appropriate functions are active, depending on the context.

7.1 Automatic cutting plane

In the case of dental models, the model base is also scanned; in the case of universal objects, the fastening material. These components are unnecessary and must be cut. The automatic cutting plane simplifies this process.

After scanning, the cutting plane is displayed as a frame with purple points and arrows.



Saving the cut

Before matching

Scan components below the cutting plane are hidden (not deleted).



The position of the cutting plane can be reset:
Press the CTRL key + the mouse wheel at the same time.

After matching

The cut components are automatically removed and cannot be restored.

Choosing a suitable perspective



The operation of the automatic cutting plane depends on the view in the 3D viewer. After scanning, the top of the scanned object is displayed (Top view).

Change the view so that the 3D viewer shows:

- the cutting plane as a trapezoid (oblique),
- the height regulator (arrows),
- the superfluous components.

Changing the cutting plane

After scanning, the automatic cutting plane cuts the model base horizontally. The lower part of the scan is hidden.

The automatic cutting plane can be:

- lifted (to cut more),
- Lowered (to cut less),
- rotated horizontally and vertically to change the angle of the cutting plane.

Keyboard operation

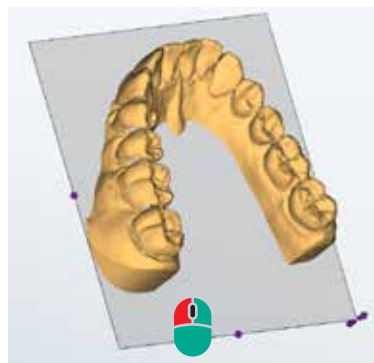
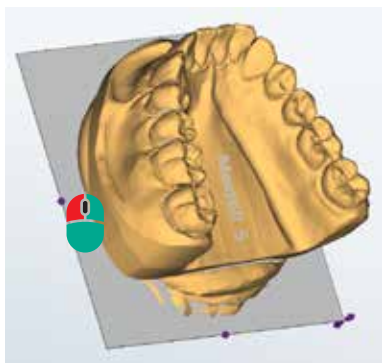


Press the arrow keys to move the cutting plane up or down.

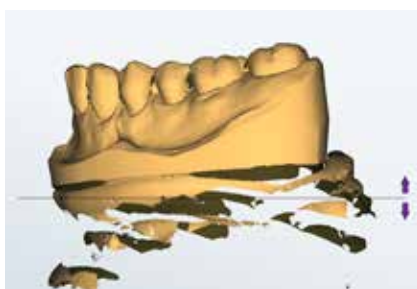
Mouse operation



1. Click the arrows. Hold the mouse button down.



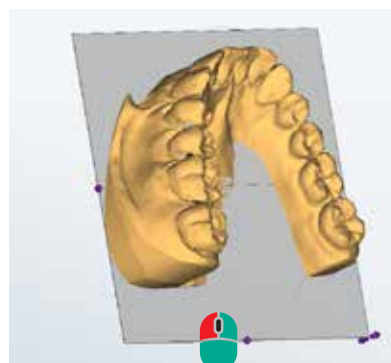
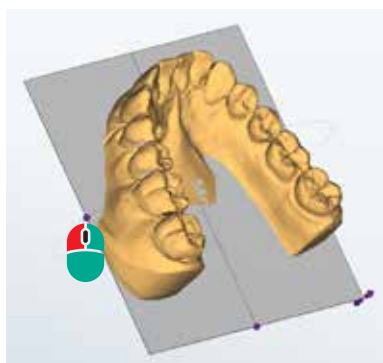
2. Move the mouse until the cutting plane is at the desired height.



Rotating the cutting plane

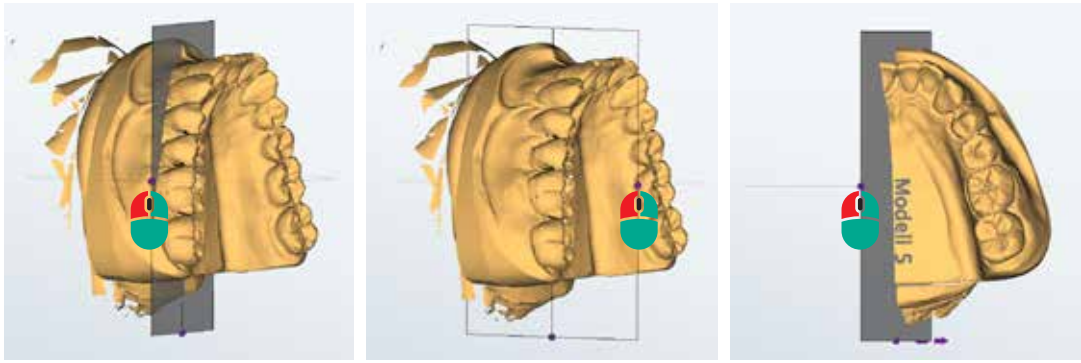
The cutting plane can be rotated vertically and horizontally. This allows you to straighten scans, e.g. if the model was mounted at an angle.

When the mouse hovers over a handle, the axes of rotation are displayed as circular auxiliary lines.



1. Click on the desired handle. Hold the mouse button down.
2. Move the mouse along the axis of rotation.
3. Release the mouse button when the cutting plane has been rotated sufficiently to cut the scan correctly. You can now change the height.

A scan can be divided by rotating the cutting plane, e.g. a whole jaw to a partial jaw.



TIP

CTRL + mouse wheel Reset the cutting plane to its initial position.

7.2 Cutting



Cutting scans:

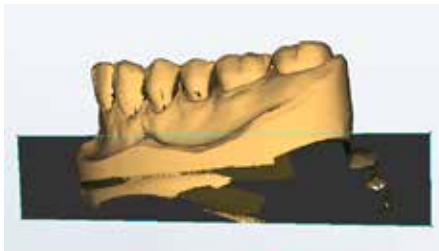
- removes unnecessary scan components,
- accelerates the processing time,
- reduces data size.

7.2.1 Cutting inside, cutting outside, cutting the surface



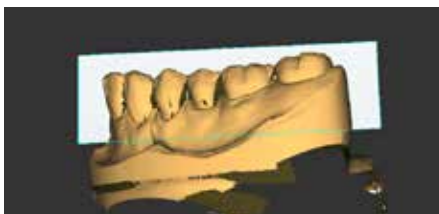
Cutting inside

- deletes all data inside the cutting line,
- through all levels (3D).



Cutting outside

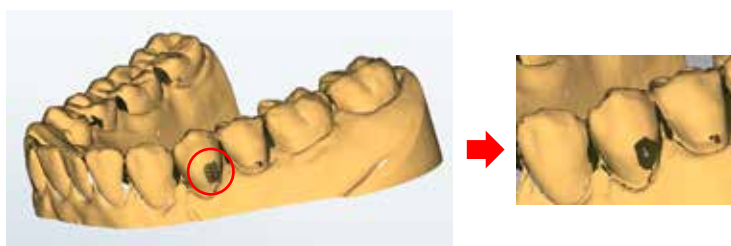
- deletes all data outside the cutting line,
- through all levels (3D).



Cutting the surface

- deletes surface data inside the cutting line,
- special application: preparation of a correction scan,

- lower levels (3D) remain in place.



7.2.2 Cutting procedure

1. Activate a cutting function.
2. Click around the desired area. The more often, the more precise is the cutting line:
 You can also hold the left mouse button and drag around the desired area.
3. Finish with the right mouse button.



"Lasso"



You can cut multiple areas, one after the other.

Saving is only necessary if:

- a rescan follows,
- the previous cuts should not be undone.

Additional functions:



- delete the cutting line with ESC.



- undo last action (possible several times).

7.3 Rescan

The **Rescan** correction function is used to "close holes" in scans. Holes appear because narrow points in the scan object (e.g. interdental spaces in jaw models) or reflective surfaces cannot be fully measured. The correction of holes is important for subsequent designs made in a CAD system.

TIP

The result is better if the neighbouring segments are removed before the rescan. The function **Close holes** suffices for the documentation of complete jaw models.

The appropriate moment for a rescan is:

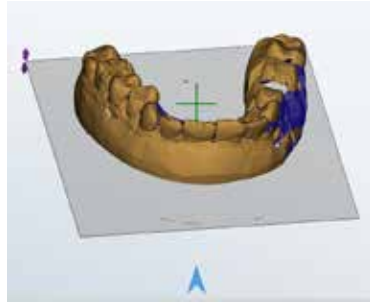
- previous to cutting (**Mesh processing** menu),
- previous to matching,
- previous to a correction scan.

7.3.1 Rescan procedure



The function includes **Rescan [activate]**, **Launch scan** and **Launch scan sequence**.

1. Select **Mesh processing | Rescan** to activate the function.
 - ➔ An arrow and a crosshair is displayed in the 3D viewer. Blue areas cannot be measured from the camera perspective.



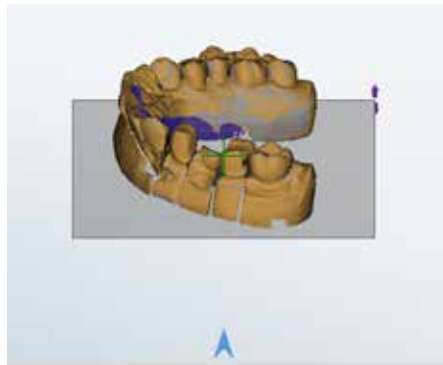
2. Rotate the scan until the desired perspective is reached (**View** menu, right mouse button). The crosshair turns red if a rescan is not possible in the displayed position.

- ➔ The rescan area must be visible (not invisible or blue).



3. Click on **Launch scan**, **Launch scan sequence** or **Rescan 360** (three images from a slightly offset perspective).

- ➔ The rescan starts (axis movement of the scanner). All visible, non-blue areas are measured.



The results of the rescan is displayed in color. The rescan mode remains active.

4. Repeat this process until all areas have been rescanned.



5. Click on **Rescan**.

- ➔ Scan and rescan data are combined.



6. To end this process and continue, click on **Next**.

Additional functions:



- ➔ Undo last action (possible several times).

7.4 Close holes

Narrow points in the scan object, interdental spaces in jaw models or reflective surfaces cannot be fully measured. Those areas not measured are displayed as "holes" in the 3D viewer.

The function **Close holes** fills small, flat areas in matched scans automatically. **Close holes** is suitable for low accuracy requirements, e.g. for documentation (not for designs with a CAD system).

Close holes procedure



1. Select **Mesh processing | Close holes** (active after matching).
2. Enter the maximum size of the holes to be filled in square millimetres (suggested value 10 mm²). The higher the value, the less precise the result.
 - ➔ All holes on flat surfaces up to the maximum size are closed.
 - Undoing is not possible. A changed value is saved until Aadv Scan is closed.

7.5 Correction scan

Subsequent changes to the indication or deficiencies in a scan object (e.g. bubbles, distortions) cause defective areas in a scan. Such errors cannot be corrected with the same scan object. The defective part can be replaced with a second scan object, e.g. a tooth position.

7.5.1 Correction scan procedure



1. Follow the original workflow. Match all tabs.



Cut the surface



2. Start the correction scan workflow in the corresponding tab with Mesh processing | Correction scan.

3. In the scan to be corrected, cut the surface of the defective area.



Correction

4. Start the scan of the correction model by clicking on Next.

➔ Aadva Scan adds a correction tab.

5. Cut the correction scan to fit the correction area and the neighbouring areas.



Cut outside/inside



6. When you click on Next, Aadva Scan splits the 3D viewer horizontally (scan to be corrected above, correction scan below).

➔ Aadva Scan requests a manual assignment so that the correction scan can be inserted into the scan to be corrected.

7. Rotate the scans so that the perspectives match:



- /// both together via the **View** menu,
- /// individually with the mouse (click next to the scan, not on it).



8. Mark the same point above and below with the left mouse button.

➔ The points appears marked in color. Pay attention to precise positioning.

9. You can refine the alignment:

- /// CTRL key + left mouse button for further markings (maximum six in other colors),
- /// click once on a position to move the closest marker there,
- /// press the DEL key to delete the mark.



10. Confirm the registration by clicking on Next.

➔ The **Correction scan** tab is closed. The original scan is corrected now.

8 Adding a scan

An additional scan is:

- a global scan,
- independent of the workflow.

In a project, the additional scan can:

- be left as is (additional tab),
- be combined with another scan.

Universal projects

In universal projects, additional scans are the only way to scan additional perspectives of the universal object. The combination of two scans creates a complete 3D model.


Patient and orthodontics projects

An alternative jaw model can be scanned in dental projects with a free workflow. An occlusion scan or an articulator scan can be completed.

Prerequisites

Universal project: The first scan has been created and matched.
 Dental project: All scans (workflow) were created and match.

Additional scan types

	Which object holder is necessary?	Can the additional scan be combined (scan from the workflow)?
Single object	Universal plate/object holder	Yes
Several objects	multiDie adapter	No
Occlusion	Object holder with knurled screw	No
Articulator	Articulator	No

TIP

Op Alternative methods:

- replace tab (scan again),
- correct (replace) a part of a scan. Enig from the taskbar is faster if you pin the icon of Aadv Scan to the taskbar in the Windows settings.

8.1 Procedure

1. Select the desired type from **Add scan**.

For all project types:

- Single object
- Multiple objects (with multiDie adapter)

For dental projects:

- Occlusion
- Articulator

2. A name is suggested: **[Type] #**. Add a meaningful, clear, short description.

3. Insert the scan object.

4. Click on Start.



- The scan object is scanned and the result is displayed in a new tab.



5. Edit the scan if necessary (Mesh Processing tools). Match manually.

- ➔ The additional scan is ready.

Now you can:

- // combine the additional scan with another scan,
- // finalize the project.

8.2 Combine mesh

A matched additional scan can be combined with another scan of the project if the following applies:

- // additional scan type: Single object;
- // the Aadva Scan itself does not consist of combined data such as a vestibular scan.

Combine mesh is also possible after loading a project.

1. Click on the Tab with the additional scan.
2. Select **Mesh Processing | Combine Mesh**.
3. In the Combine dialog, select the tab you wish to process. Only tabs that can be combined can be selected.

OK



4. Click on **OK**.
 - ➔ A tab with a split 3D viewer is displayed in the project (additional scan below, selected scan above).
5. Assign the scans manually.
6. Finally click on **Next**.
 - ➔ The scans are combined: they cannot be separated again. Aadva Scan calculates a complete 3D model.



TIP

- // Before combining: "Mesh Processing" (cutting, rescan).
- // Before the manual assignment: Rotate the scans
Dental projects: same perspective
Universal projects: mirrored (if the opposite side was scanned).

9 View

Under View, you find functions for controlling the view in the 3D viewer.

9.1 Perspective



The cube icons determine from which perspective the scan is displayed in the 3D viewer.

- The default is the **Top** perspective (bird's eye view).
- Other perspectives are temporarily activated and not saved.
- Changing the perspective is useful for visual control, cutting, and assigning.

9.2 Representation

The sphere icons determine the representation of the 3D data model.

- A change applies to all tabs as long as Aadva Scan is open or in standby mode.
- **Points** and **Triangles** show the geometric structures that make up the 3D representation. These representations help to analyse a 3D measurement.
- The best representation for scanning and editing is **Gouraud shading** (active by default when the software starts).

The geometric structures (points and triangles):

- are displayed correctly in matched scans, since Aadva Scan only calculates the 3D data model during matching,
- are very delicate and can only be seen with a high magnification (zoom).

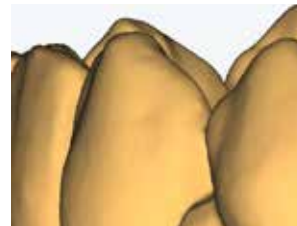
Points



Triangles (networks)



Gouraud shading (default)



9.3 Rotating, moving, zooming

You can use the mouse to move, rotate, and zoom scans for checking or editing them.

Movements are slightly faster if the 3D objects are displayed by pixels while they are being moved (setting). The functions of the mouse buttons can be changed.

9.3.1 Selecting the axis of rotation



Functions for determining the axis of rotation when the mouse is moved

- ▷ Select **View** and the desired axis of rotation.
X (longitudinal, horizontal, abscissa),
Y (perpendicular, vertical, ordinate),
Z axis (vertical relative to the X and Y axis, 3rd dimension, applicate).
- Scans are rotated via the activated axis (otherwise **All Axes**).

9.3.2 Rotating the scan with the mouse



1. Right click the central point of the planned rotation (inside or outside the scan).
2. Hold the mouse button down and move the mouse.
 - ➔ The scan rotates - depending on the central point - around the activated axis.
3. Release the mouse button to finish.
 - ➔ The rotation has finished.

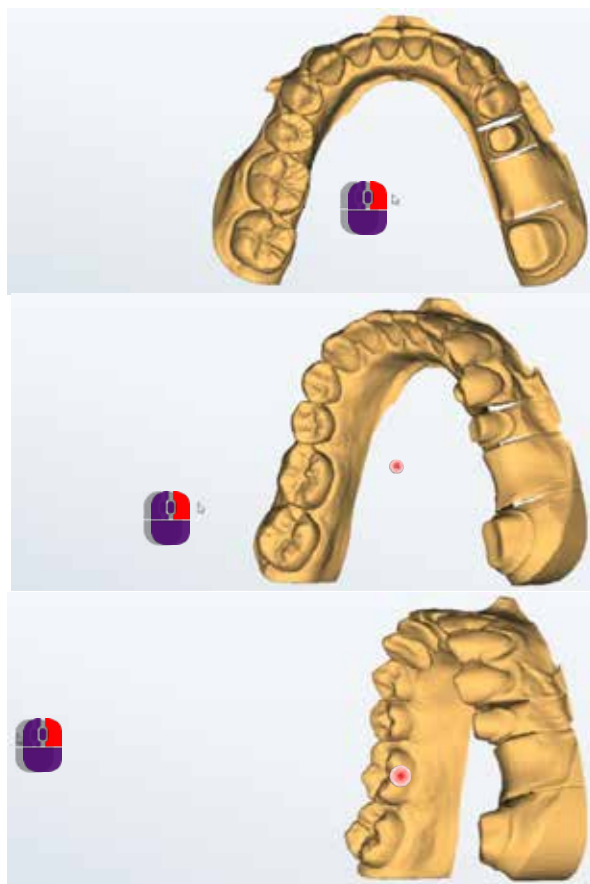


TIP

Free rotation (with standard mouse button assignment):

- SHIFT key + mouse click fastens the scan to the mouse.
- Release the SHIFT key, move the mouse (also zooming, moving)
- The scan rotates.
- Double click to finish.

Example: Rotation around the Y axis



9.3.3 Moving the scan with the mouse



1. Click with both mouse buttons on the starting point of the planned movement (inside or outside the scan).
2. Hold both mouse buttons down and move the mouse.
 - ➔ The scan follows the motion of the mouse.
3. Release the mouse buttons when the desired position has been reached.
 - ➔ The scan has been moved.

9.3.4 Zooming the scan with the mouse

You can zoom smoothly in and out up to a maximum or minimum size.

▷ Point the mouse to any area of the software window.



To enlarge:

▷ Turn the scroll wheel towards your hand.



To reduce:

▷ Turn the scroll wheel away from your hand.

➔ Release the mouse wheel when you reach the targeted size.

10 Service position



You find **Service position** in the menu bar and in the context, e.g. in the tab dialog when starting a scan.

When inserting or removing scan objects, the axes of the scanner can move or the position of the scan object inside the scanner can change. As a result of such movements, the actual position of the axes no longer corresponds to the position that was last saved by Aadva Scan.

Service position corrects the position of the axes and moves them to the home position.

11 Projects



Many files are part of a scan (together: project). Under Projects, you find functions for managing projects.

Projects are saved in the work folder: C:\Users\[Username]\Documents\3D-Scanner\Work\[year].

11.1 New project



After the standby mode or with the software open, a new project must be created manually. If a project is open, it is saved and closed when a new project is created.

When the software starts, Aadv Scan requests a new project.

15

11.2 Load project



Projects can be loaded and edited, e.g. to cut scans. Aadv Scan saves each project in a folder under the current work folder.

Folder and project names consist of the creation date and optionally the patient or project name.

▷ Open the desired project folder and then the project file (.SOP). Other file formats (e.g. .PCM) cannot be loaded.

➔ Aadv Scan asks whether work on the project should be resumed or restarted (depending on the project; dental projects with the scan modes Baltic Denture, Triple Tray® and Twin Tray must be restarted):

Resume

- ✓ All files are kept.
- ✓ Scans can be edited.

Restart

- ✓ All files except for the project file (.SOP) are deleted.
- ✓ All scans must be repeated.

Load exocad® project:

In Aadv Scan you can also load exocad® projects.

**Changes to the project are possible if you open it in exocad® DentalDB.
In most cases the scans have to be repeated.**

exocad® projects with scans contain two project files (.SOP and .dentalproject (exocad® project type)).

1. Open the exocad® folder, by default C:\CAD-Data, and then the project folder.
2. Select the desired file format (by default.dentalproject).
 - ➔ The scan data is loaded.

11.3 Save project as



Finalized projects can be archived as ZIP files.

1. Load the project that you want to archive. All scans must have been matched.
2. Select Save project as.
 - ➔ A ZIP file is saved in the project folder.
3. Check the ZIP file. You can then delete the the scan data (PCM) to free up disk space.

11.4 Close project



Projects can be closed while they are being processed. The current processing status is saved and Aadva Scan goes into the standby mode.

Dental projects with the scan modes Impression, Baltic Denture, Triple Tray® and Twin Tray cannot be resumed after closing them.

11.5 Scanning with exocad® DentalCAD

exocad® DentalCAD and Aadva Scan are connected by means of an interface. Scan projects are created and processed in the exocad® DentalDB application. The workflows of Aadva Scan are adapted to exocad® projects. exocad® projects are saved in the work folder of exocad® DentalCAD.

Up to version 2.2 Valletta:

C:\Program Files (x86)\exocadFramework\CAD-Data\

As of version 2.3 Matera:

C:\CAD-Data\

GC recommends installing exocad® Dental CAD with version 2.3 Matera or higher using the GC Setup.

Creating and loading an exocad® project

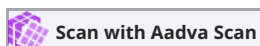


1. Create or edit your exocad® project in the DentalDB application ("exo"). Save the project.
2. Click on "Scan" to start Aadva Scan.
3. Follow the workflow. With existing projects, you can decide whether you want to resume or restart.
 - ➔ Aadva Scan loads the corresponding data.

Correcting exocad® indications in projects

exocad® projects use the exocad® color codes and also the option symbols. If you change the indications in an exocad® project, you have to scan again:

1. Correct the definition of the exocad® projects in the DentalDB application and save the project.
2. Click on **Scan** to start Aadva Scan.
3. Click on **Restart** in the first and second message Load Project.
 - ➔ Measurements based on the old indication are deleted.
4. Follow the workflow.



Correspondence of the scan modes of exocad® and Aadv Scan

exocad® DentalDB (since v.2.3 Matera)	Aadv Scan
Two plaster models, in occlusion	Two models in occlusion Options: Articulator Articulator Reference® Articulator Artist/Arto® Twin Tray
Two plaster models, in articulator Options:	
A	Articulator Artex®
S	Articulator SAM® 3
S (alt)	Articulator SAM® 1+2
P	Articulator PROTAR®
Denar	Articulator DENAR®
Bio-Art	Articulator*
Panadent PCH	Articulator*
Panadent PSH	Articulator*
AD2	Articulator*
Digital impression	Options: Triple Tray® Impression

* Data processing with medium quality articulation

12 Extras



Calibration and Settings are important extra features.

12.1 Calibration

Calibration is a prerequisite for performing correct measurements. Calibration is mandatory after installation or an upgrade.



Recommended repetitions:

- Once a month (with automatic reminder) with: constant, normal operating temperatures, normal production volumes.
- Once daily with: changing or high operating temperatures, high production volumes,
- after transporting the scanner.

You need:

- a 3D calibration model,
- the object holder recommended for your scanner.

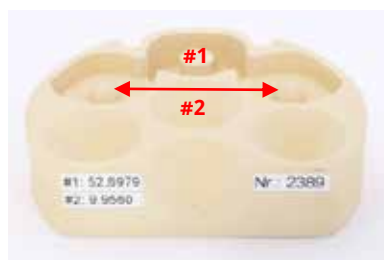
Insertion of
the Calibration Model

The principle of calibration

Every 3D calibration model is measured on a 3D coordinate measuring machine. The reference values are therefore very accurate.

Reference values in millimetres

- #1: Cylinder height (51.45 – 53.55)
- #2: Distance between the hemispheres (9.8 – 10.2)



Aadva Scan compares the values:

Measured values – Reference values = Correction values

The calibration is successful if the new measurement matches the reference values.

Procedure



NOTICE

- ▷ A calibration results in inaccurate measurements if the entered values do not belong to the 3D calibration model. Enter the digits as on the label, with commas and decimal places.



1. Confirm the binding instructions for calibration or select Calibration.
 - ➔ The **Calibration** dialog shows the last entered values and when the last calibration was performed.
2. Enter the values indicated on the label of the 3D calibration model into fields #1 and #2:
3. Click on Start.
 - ➔ Aadv Scan checks whether the entered values are permissible.
4. Wait for the process to finish.
 - ➔ You are advised of its completion. If successful, you can start scanning.

Error message	Possible cause
3D calibration failed.	<ul style="list-style-type: none"> ➤ The calibration was interrupted. ➤ There is no 3D calibration model inside the scanner. ➤ Incorrect values were entered. ➤ The axes were not in the service position.

What to do after a failed calibration

- ▷ Inaccurate measurement results are likely. Therefore, you should only scan for testing purposes.
- ▷ Restart Aadv Scan and the scanner and perform the calibration again.
- ▷ If it fails again: Have the scanner checked by a GC sales partner.

12.2 Adding an activation code

In addition to standard functions, Aadv Scan includes optional modules which can be activated:

- Virtual articulator (for the articulator scan),
- multiCase/multiDie,
- secondDie,
- Full Impression,
- Twin Tray Fastmode.

You can see the already activated modules or those included in the scope of delivery of your Aadv Scan version in the info dialog.

An activation code consists of numbers and letters, e.g.:
ABCD-EFG12-34H5

Each code applies individually to a specific module and a specific scanner. Activation codes are saved as part of the calibration data, in the file Scanner.xml.

Module activation

You receive the activation code from your GC reseller.



1. Start Aadv Scan.
2. Select **Extras | Add activation code**.
3. Enter the code.
4. Restart Aadv Scan.
 - ➔ The module is available for use.

Error message	Possible cause
Module not available after the code has been entered.	<ul style="list-style-type: none"> ➤ Wrong code entered. ➤ Softwarnoticee is not valid for the sensor number of the scanner*.
OK not active after the code has been entered.	➤ More activation codes entered than allowed*.

Please contact your GC reseller with the following information:
Aadv Scan version number, sensor number and version number of the scanner.

12.3 Deleting old PCM data



PCM files (single measurements) take up a lot of storage space in the work folder of Aadva Scan. Only the results of finalized projects are necessary (PLY, STL files). PCM files older than 30 days will be deleted automatically by Aadva Scan or they can be deleted immediately after finalizing a project.



NOTICE

PCM files belonging to exocad® projects are not deleted.

12.4 Info



Licence information and further information about your software version can be found in the info dialog. Important for support cases:

- external and internal version number,
- commit (version control),
- date and time of the version,
- Activated modules.

13 Settings



Settings can be found in context-related manner (bottom menu bar, project definition, tab dialogs). Most changes are effective immediately. Comprehensive changes such as the display language require a software restart.

TIP

After an upgrade or a new installation, you can continue to work with your personal settings.

13.1 General

13.1.1 Language

Concerns: Software texts (operating items, info line, messages).
Effect: Display in the selected language.
Comment: Changing the language requires the software to be restarted.

▷ Select language and restart Aadv Scan.

Default value: Windows language

13.1.2 Tooth numbering system

Concerns: "Patient" project definition
Effect: Labelling of the tooth chart:
// FDI (Europe),
// UNS (US).
Comment: The tooth numbering system of Aadv Scan can differ from the one in the CAD system.

▷ Select your preferred tooth numbering system (dental chart).

Default value: FDI (Europe)

13.1.3 Project mode

Concerns: Project definition
Effect: Suggested value for creating new projects:
Patient, Universal, multiCase or Orthodontics.
Comment: "Patient" stands for dental projects.

▷ Select the project mode that you use most often.

Default value: Patient

13.1.4 Extended (general)

Standby mode

Concerns: Standby mode
Effect: Standby after project completion (workflow) and Close project (function).
Comment: Standby speeds up the software restart.

▷ Disable if Aadv Scan should be closed after the project has been finalized.
Useful if you rarely use Aadv Scan.

Default value: - enabled

Go to the removal position

Concerns: Presentation (singleDie, secondDie)

Effect: The stump to be presented is moved to the removal position.

Comment: When disabled: Start at the service position.

Default value: - enabled

Use standard mouse button configuration

Concerns: 3D viewer

Effect: Moving, rotating and zooming the scan with the mouse.

Default value: - enabled

By default

Rotate the scan



Hold the right mouse button, move the mouse.

Move the scan



Hold both mouse buttons, move the mouse.

Assignment



Left click.

Zooming



Turn the mouse wheel.

When disabled

Rotate the scan



Hold the left mouse button, move the mouse.

Move the scan



Hold the right mouse button, move the mouse.

Assignment



Left double click.

Zooming

Turn the mouse wheel (no change).

13.2 Visualization

13.2.1 Rendering

Smoothing

Concerns: 3D viewer

Effect: Surface smoothing of the scan.

Comment: Optical effect, has no influence on the 3D measurement.



▷ Select a value between 0 - 100.

Default value: 0 (OFF)

Brightness reflection

Concerns: 3D viewer
Effect: Brightness of the light reflection on the scan.
Comment: Optical effect, has no influence on the 3D measurement.

▷ Select a value between 0 - 100.



Default value: 0 (OFF)

Reflectance

Concerns: 3D viewer
Effect: Intensity of the light reflection on the scan.
Comment: Optical effect, has no influence on the 3D measurement.



▷ Select a value between 0-100.

Default value: 0 (OFF)

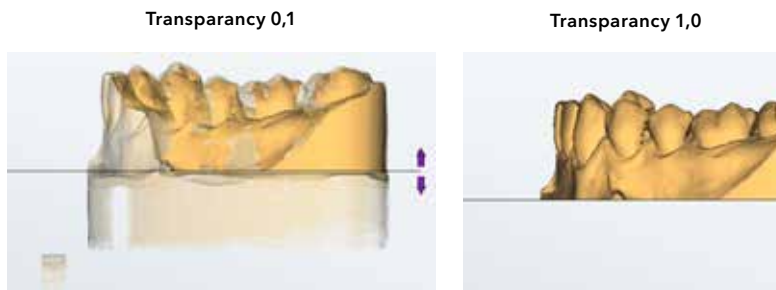


Transparency

Concerns: 3D viewer
Effect: Transparency effect of the scan.
Comment: Optical effect, has no influence on the 3D measurement.



▷ Select a value between 0.1 and 1.0.



Default value: 1.0

13.2.2 Colors

Object | multiDie/multiCase | Rescan object | Rescan shadow

Concerns: 3D viewer
Effect: Colors for a uniform, clear representation.

Option	All scans.
multiDie/multiCase	Single segments.
Rescan object	Newly scanned areas in the rescan.
Rescan shadows	Areas that cannot be scanned in the rescan.

Comment: Colors in the 3D viewer are not photorealistic and have no influence on the 3D measurement.

Texture scans change the color representation.

- ▀ **Shadow color:** helps to find the right perspective during the rescan.
- ▀ **Object color rescan:** applies to the following:

Rescan (after launching), correction, matching.

- ▷ Click on a color box and select a color from the Windows color scheme (please no dark or light colors, pay attention to the contrast to the background).

Comparison of display types (material: light brown)



Default values:



Option

RGB 251, 188, 94 | Color hue 24, saturation 228, brightness 162



multiDie/multiCase

RGB 205, 170, 125 | Color hue 22, saturation 107, brightness 155



Rescan object

RGB 192, 192, 192 | Color hue 160, saturation 0, brightness 181



Rescan shadows

RGB 0, 0, 102 | Color hue 160, saturation 240, brightness 48

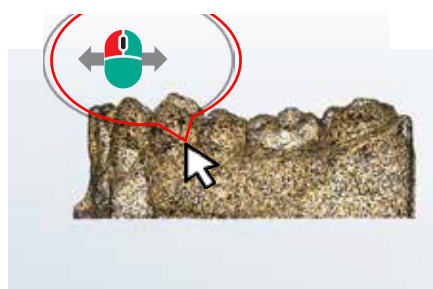
13.2.3 Extended (View)

Show point cloud when moving objects

Concerns: 3D viewer

Effect: Representation when moving the scan with the mouse.

Comment: Optimizes speed.



Default value: - enabled

Show point cloud in highest quality

Concerns: 3D viewer

Effect: Display in best resolution.

Comment: Optical effect, has no influence on the 3D measurement.

High performance of the graphics card is required.

- ▷ Disable if it causes problems.

Default value: - enabled

Show shadows in the rescan mode

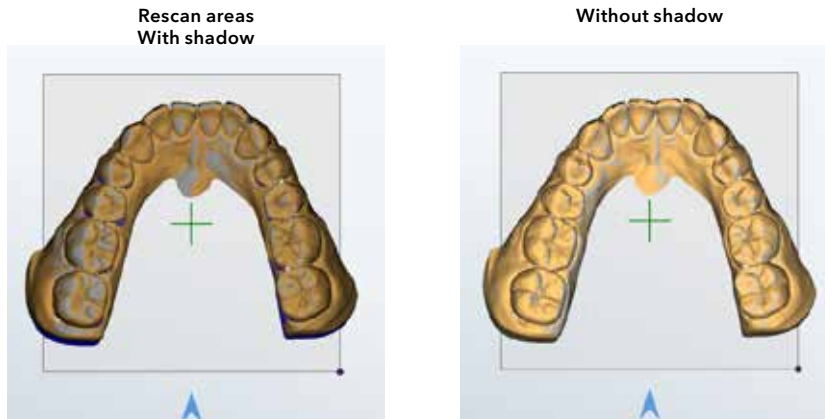
Concerns: Rescan mode.

Effect: Shadows to highlight those areas that cannot be rescanned.

Comment: ■ Shadow: blue (the color can be changed); it disappears by changing the perspective of the camera.

■ After rescanning: grey areas were rescanned (the color can be changed but not disabled).

Example:



▷ Disable if you don't need to highlight unscannable areas.

Default value: - enabled

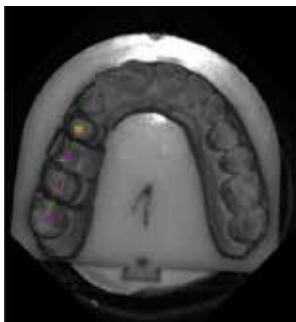
Show tooth numbers in the preview image

Concerns: 2D viewer

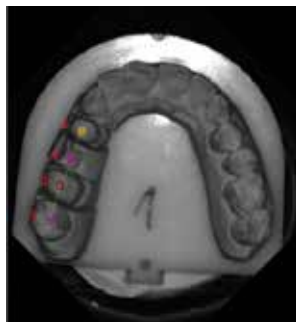
Effect: The tooth number is displayed next to the marking of a tooth position.

Comment: If a cutting radius is also defined, circular cutting lines in the size of the cutting radius are displayed in the 2D viewer.

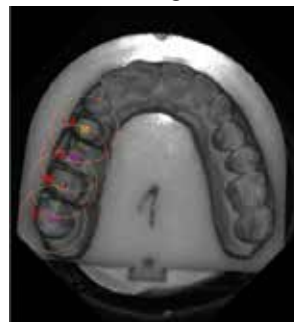
Simple position markers



UNS numbering



FDI numbering with a 12 mm cutting radius



▷ Enable tooth numbering as a guide.

Default value: - enabled

13.3 Scanning

13.3.1 Presentation mode

Concerns: Presentation of individual segments of a jaw model.

Effect: Suggested value for the presentation mode in new projects:

/// **singleDie**

Presentation of each individual tooth in the jaw model, one after the other,

/// **secondDie**

Presentation of every second tooth; reduces the scanning processes to a maximum of two,

/// **multiDie**

Presentation of all segments with the multiDie adapter.

Comment: /// The enabling of the presentation mode can also be done in the tab dialogs.

/// "Complete jaw" (no presentation) is not possible as a suggested value.

▷ Select the presentation mode that you use most often.

Default value: secondDie

13.3.2 Plaster type

Bright | medium | dark

Concerns: Color of the scan object

Effect: Light intensity of the sensor during the 3D measurement.

Comment: The scanner measures the brightness of colors differently than the human eye.

▷ Please test colorful materials before conducting productive scans.

▷ Black items must always be scanned with a scan spray.

Default value: Medium

13.3.3 Texture mode

Disabled | monochrome | color

Concerns: Markings on the surface of a scan object.

Effect: Scans with markings, e.g. contour lines for model cast prostheses (manufactured using SilaPart® from SILADENT (CAD system)).

Comment: /// Color texture scans show markings in different colors; otherwise they have the same information value.

/// The enabling of texture scans can also be done in the tab dialogs.

/// Single color (monochrome) texture scans are possible with all scanners.

▷ Select the suggested value Monochrome or Color to always start scans with texture scan.

Default value: Disabled

Optimization for markings (reduces edge sharpness)

Concerns: Markings on the surface of a scan object.

Effect: /// Optimizes texture scans to calculate marked contour lines in a particularly precise manner.

/// It is advantageous for the production of a model cast prosthesis.

Comment: Side effect: General smoothing of edges in the 3D data, e.g. also smoothing of fissures or sharp edges of the scan object.

▷ Enable if needed. Use texture scans without markings for full edge sharpness.

Default value: - enabled

13.3.4 Extended (scanning)

Switch to the rescan mode after each presentation



Concerns: Presentation of single segments.
Effect: Enables the rescan mode after a presentation.
Comment: Can be useful if presented segments have to be rescanned on a regular basis.

Default value: - enabled

13.4 Processing

13.4.1 Quality

Standard | opposing jaw | squeeze bite | impression scan | wax-up | gingiva | abutment | situ

Concerns: Dental indications, other scans (standard).
Effect: Sensor accuracy/resolution
Size of the 3D model dataset.
Comment: Four quality levels: Very high, high, normal, low.
The higher the resolution, the larger the data set.

▷ Select the appropriate quality level, e.g. "very high" for complex dental constructions, "low" for archiving.

Default value: High, impression scan: Very high

13.4.2 Cutting Tools

Enable the automatic cutting plane

Concerns: Automatic cutting plane.
Effect: Method to cut the model base.
Comment: The height of the cutting plane can be individually regulated;
areas below the cutting plane are deleted during matching.

▷ Disable if you do not use the cutting plane.

Default value: - enabled



Automatic cutting of the multiCase/multiDie adapter

Concerns: multiDie presentation mode
multiCase project definition.
Effect: Automatic cutting of the adapter and presentation of the segments.
Comment: Additional manual cutting is possible.

▷ Disable if you do not use multiCase/multiDie.

Default value: - enabled

Cutting radius for the stump

Concerns: Automatic cutting in dental projects.
Effect: Data in the radius around indexed tooth positions is saved, everything else is cut.
Comment:  2D viewer: The cutting radius becomes visible around the marked tooth positions
(size of the circles = cutting radius).
 Everything is scanned without a cutting radius.

Highest value	Lowest value	Default
200 mm	12 mm	200 mm



▷ Test the size with typical jaw models.

Default value: - enabled

13.4.3 Extended (Processing)

Start matching immediately after the scan

Concerns:  Automatic matching.

Effect: Forces matching directly after scanning; applies to suitable projects, e.g. complete jaws individually.

Comment: No pause in the workflow for manual mesh processing before matching; the cutting filters and the automatic cutting plane are taken into account.

▷ Enable if you don't need to manually edit scans.

Default value: - enabled

All tabs can be matched in a single step

Concerns:  Manual matching.

Effect: Matching is performed simultaneously on all unmatched tabs (otherwise individually).

Comment: Not relevant for vestibular scans (the following always applies for these: Matching in one step).


▷ Disable if you wish to always check the scan data before matching.


Default value: - enabled

Allow cutting of PCMs

Concerns: Manual cutting (Mesh processing).

Effect: Allows cutting of single images (PCM) instead of 3D data (PLY, STL).

Comment:  Accelerates subsequent processes.

 It has no influence on the automatic cutting plane.

▷ Disable if manual cutting should only be possible after matching.

Default value: - enabled

Background matching

Concerns:  Automatic matching.

Effect: Matching while the scanning process is running.

Comment: Accelerates the subsequent data processing.

▷ Disable if you wish to always check the scan data before matching.

Default value: - enabled

13.5 Export

13.5.1 Work folder

Concerns: Saving location.
Effect: Path specification for Aadv Scan projects.

Comment: The following applies to the [YYYY] subfolders:
✔ automatic change to the current year after a software upgrade,
✔ no automatic change at the turn of the year.
When scanning with a CAD system, its work directory applies.
For exocad®:
C:\CAD-Data (depending on the exocad® version).



▷ Change the path specification to organize the scan data (local shared folder, network path for shared use). Enter the path or select it from the folder structure using the ... button.

A cache directory can be useful for a network path.

Default value:
C:\Users\[Username]\Documents\3D-Scanner\Work\[YYYY]

13.5.2 Cache directory

Concerns: Network work directory.
Effect: Specifying the path to a fast cache directory results in scan projects being processed in the cache directory and loaded into the work directory when the project is finalized.
Comment: ✔ It makes sense if scan data is saved in the network and it takes too long to save/load data there.
✔ Must be located on a fast drive (SSD).

▷ Enter the path or select it from the folder structure using the ... button.

Default value: - enabled

When enabled C:\Users\[User]\AppData\Local\Temp\3D-Scanner\

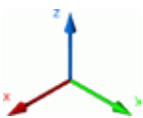
13.5.3 Data alignment

Save scan data with transformed coordinates

Concerns: Scan data
Effect: ✔ Transformation of the XYZ coordinates.
✔ Aadv Scan saves two PLY or STL files, one as "custom_transform", e.g. 2019-05-14-150913-upperjaw_custom_transform.ply
Comment: ✔ Each point of the scan data is located in the 3D data network using 3 coordinates (standard orthogonal coordinate system XYZ (latitude, longitude, height)).
✔ Aadv Scan and the CAD software must use the same coordinate system.

▷ Enable if an adjustment to the CAD software is necessary.
▷ Assign the X, Y and Z coordinates (positive or negative, i.e. mirror or rotate). Aadv Scan automatically corrects geometrically impossible combinations.

Default value: - enabled



13.5.4 Extended (export)

Also save the scan data in STL format

Concerns: Project completion
 Effect: Combination of all scan data (individual images in PCM format) to form an STL file (in addition to the standard PLY format).
 Comment: PLY: Polygon File Format (with texture information)
 STL: Standard Triangulation Language (without texture information)

▷ Enable if your CAD system requires data in STL format.



NOTICE

▷ If you close the project after matching all tabs, a PLY file is saved. End projects with "Finalize project" to create STL files.

Default value: - enabled

Additionally create vestibular mesh

Concerns: Vestibular scan.
 Effect: A 3D data file (PLY, STL - optional) is created for the vestibular scan.
 Comment: This setting is not required for vestibular scans that are created with **Add Scan**.

Default value: - enabled

Use patient names in the project name

Concerns: Project definition Project ID.
 Effect: Default naming (unique ID: Timestamp YYYY-MM-DD-hhmmss, e.g. **2019-05-10-135720**)
 Naming with patient or project names: The name is added, e.g. **2019-05-10-135720-Smith,Jane**

Comment: Project folders and project files are also named using the timestamp.

▷ Enable to generate names with patient or project names.

Default value: - enabled

13.5.5 Diagnosis data

Export stripe images (service folder)

Concerns: Technical support, **not for users.**
 Effect: Creation of stripe photos (black and white photos with the stripe projection of the scanner).
 Saving location: C:\ProgramData\3D-Scanner\DeviceCharacteristics\Service
 This setting is not saved.
 Comment: Stripe images are used to analyse technical problems.

▷ Enable in consultation with the technical support and scan immediately.

▷ Send the PGN files to the technical support.

Default value (cannot be changed): - enabled

Extended logging

Concerns: Technical support,
not for users.

Effect: Creation of log files.

Saving location:

C:\Users\[Name]\AppData\Local\3D-Scanner\Sessions

Subfolder with timestamp (project start and completion)

Comment: Log files are used to analyse technical issues. Enabling is saved until Aadv Scan is closed.

▷ Enable in consultation with the technical support, scan immediately and sent the log files to the technical support.

Default value: - enabled

13.6 Restore default settings

Aadv Scan saves:

- the default settings in the installation folder,
- a work copy in the local user folder:
C:\Users\[Username]\AppData\Local\3D-Scanner.

The file UserSettings.xml:

- contains the user settings (Settings dialog).
- It must be deleted to restore the default settings.

TIP




















Make a backup copy of the file UserSettings.xml so that you can restore your old personal settings if necessary.

1. Exit Aadv Scan.
 2. Open Windows Explorer
 3. Under View, activate the checkbox Hidden Elements.
 4. Open the folder:
C:\Users\[Username]\AppData\Local\3D-Scanner.
 5. Delete the file UserSettings.xml.
 6. Start Aadv Scan.
- ➔ The default settings apply again. Personal settings are saved in a new User Settings.xml file.

14 Indexes

14.1 Icons

Dialogs

Icon	Meaning	Page
	Show and hide info area	
	Matched scan	
	Unmatched scan	
	Delete an indication	
	Globalscan strategy ON/ OFF ("Enhanced mode")	
	Cancel	
	Start	
	HR mode ON/OFF	
	Skip scan	
	Repeat scan	
	Check scan and rescan	
	Smart occlusion	
	Determine starting scan height (with Z axis)	
	Rotate view (scan height) (Z axis)	
	Set scan height to default (Z axis)	
	Manual matching	
	Check matching (3D)	
	Service position	
	Settings	

Scan tabs

Icons	\Scans
	Aesthetic template
	Upper jaw, lower jaw (toothed or toothless)
	Vestibular, toothed - toothless Baltic Denture
	Wax-up of upper and lower jaw
	Situ of upper and lower jaw
	Scanbody in upper and lower jaw
	Gingiva of upper and lower jaw
	Squeeze bite of upper and lower jaw
	Triple Tray® impression of upper and lower jaw
	Impression of upper and lower jaw
	Twin tray upper and lower jaw, with and without occlusion
	Additional scan and mesh combination
	Correction scan
	multiCase/multiDie
	Calibration

14.2 Menus and key combinations

				NumLock	
Mesh processing		Add Scan	Visualization		Service position
Cut inside		Single object	Front		–
Cut outside		Several objects	Back		
Cut the surface		Occlusion	Left		
Save		Articulator	Right		
Rescan			Top		
Trigger scan			Bottom		
Trigger scan sequence					
Undo			Points		
Rescan, Cut			Triangles		
Correction scan			Gouraud shading		
Close holes			X Y Z		
Combine mesh			All axes		
Delete matching	 Project New project Load project Save project as Close project		 Extras Calibration Add an activation code Delete old PCM data Info		 Settings

14.3 Glossary

Definition of important terms	
Activation Code	Code to activate: <ul style="list-style-type: none"> ■ a chargeable module, ■ a free upgrade period (up to 3.4.2).
Work folder	Folder in which scan projects are saved.
Export data	3D data generated from the scan data. Basis for the CAD software, open file format (PLY, optionally STL) for many applications.
IndependDent mode	Any desired order of the scans in a project.
Calibration data	Data to perform the calibration of a scanner (specific). The sensor number of the scanner (type plate/sticker) matches the name of the calibration data folder (e.g. SO-20242.01-13-062).
Calibration	A metrological term: <ul style="list-style-type: none"> ■ Alignment of the scanner to the values of an industrially calibrated model. ■ Alignment of the motion axes based on the individual calibration data.
Matching	Calculation that generates a data set in PLY or STL format (3D model data set) based on individual images and measured values (scan data).
Scan	Measurement in 3D, based on individual images (PCMs), converted into a 3D model data set by means of matching.
Scan object	Object to be scanned: Universal object (item), dental model or dental impression.
Vestibular scan	Scan of jaw models in occlusion. <ul style="list-style-type: none"> ■ Its purpose is to align the upper and lower jaw scans. ■ It is the basis of an anatomically correct reconstruction in the CAD system.

14.4 File Paths

How to find protected Windows folders using a placeholder


- ▷ Replace unknown parts of a path with %.
The search terms are independent of the Windows language:

%appdata% → C:\Users\[Username]\AppData\Roaming
 %programfiles% → C:\Program Files
 %programdata% → C:\ProgramData

Default file paths

Folder	Path
Target folder (setup)	C:\Program Files\3D-Scanner\Aadva Scan
Work folder (standalone)	C:\Users\[Username]\Documents\3D-Scanner\Work\[YYYY]
Work folder (with exocad® v.2.3 Matera or higher)	C:\CAD-Data
Calibration data	C:\ProgramData\3D-Scanner\DeviceCharacteristics\Sensors
User settings, log files	C:\Users\[Username]\AppData\Local\3D-Scanner

Notes

 Manufacturer
GC Sensortechnik GmbH
Lise-Meitner-Allee 10
D-44801 Bochum, Germany

www.smartoptics.de
#smartOptics

Technical Specifications

Recommended computer specifications ALS 2 / ALS 2+ / ALS 3 and Aadva Scan:

Windows 10 or 11 64-bit
CPU i7 with 6× 4.7 GHz
32 GB RAM
USB 3.0 Port
100 – 250 GB SSD
Graphics card with 6 GB RAM



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