SCAPS

scanner application software

SAM
SAM Light
SAM Options

SCAPS

Product Overview

Our hardware and software product range covers all features for various kinds of scanner applications.

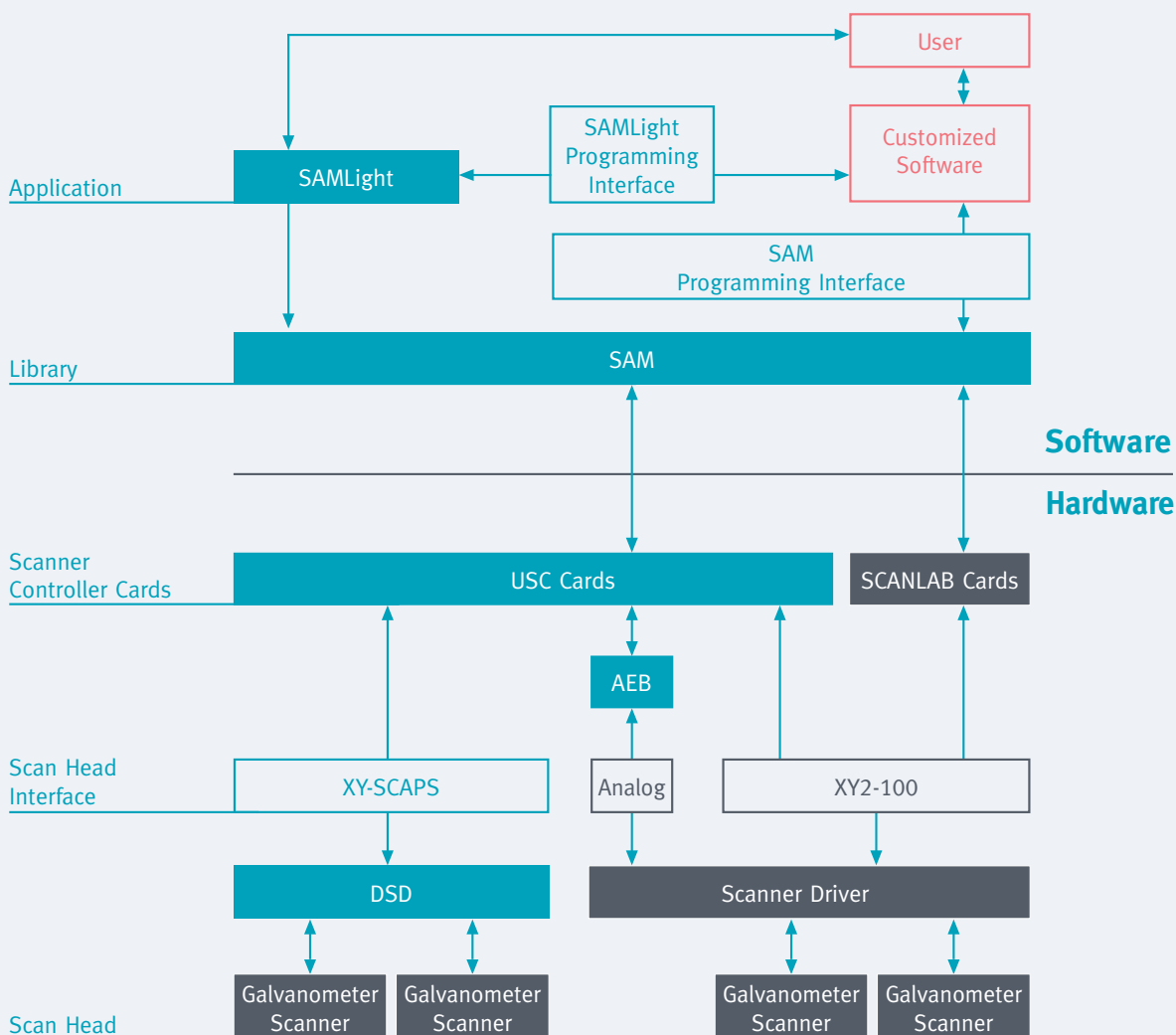SAM is our powerful programming library.

The laser marking software SAMLight provides the functionality for many industrial applications as well as for job shops.

Different software and hardware options are available for enhanced features.

The USB Scanner Controllers USC-1, USC-2 and USC-3 are SAM compatible hardware modules to drive a 2- or 3-axis laser scanner system.

Flash option for building flexible and fast standalone systems is available.

The Digital Servo Driver DSD can be used for realizing highly integrated and powerful scanning solutions.

				User
Application	SAMLight	SAMLight Programming Interface		Customized Software
		SAM Programming Interface		
Library		SAM		

Software

Hardware

Scanner Controller Cards	USC Cards		SCANLAB Cards
		AEB	
Scan Head Interface	XY-SCAPS	Analog	XY2-100
	DSD		Scanner Driver
Scan Head	Galvanometer Scanner	Galvanometer Scanner	Galvanometer Scanner	Galvanometer Scanner

SAM *Wide*

Enhancement of the working area can be achieved by splitting of objects which are bigger than the working area or by the option MOTF or MultiHead.

MOTF

MOTF is a USC option designed for marking on moving targets.

1D MOTF Splitting
- fixed size splitting
- entity based splitting
- advanced bitmap mode
- debug tools (overflow detection)

Endless Loop and Endless Cut
- for marking of large objects without splitting

Large Job Marking on Moving Target

Splitting

Several planar and angular splitting modes are available for marking of objects which are larger than the working area. For all modes, fixed or adaptable split sizes can be used. Between two split parts, SAMLight manages the movement of the axes automatically.
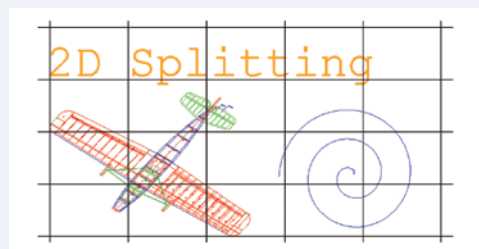
1D Planar Splitting
- splits the current job in one direction
- fixed size splitting
- entity or character based splitting

2D Planar Splitting
- splits the current job in two directions
- fixed size splitting
- shows total working area
- entity based splitting

Angular and Ring Splitting
- angular splitting for marking on round objects
- ring splitting for marking on top and inside of a ring
- fixed size splitting
- entity or character based splitting
- bitmap splitting

2D Planar Splitting

Ring Splitting

Angular Splitting on a Cylinder

MultiHead

MutliHead is a SAM option designed for simultaneous marking of a single job on up to six heads.
- each head can process completely different data
- data can be assigned manually or generated by an automatic splitting tool

MultiHead

SAM

The Programming Library

The SAM (Scanner Application Modules) library is an ActiveX and COM based component set offering functionality for all kind of scanner applications. By employing this proven technology, users can optimize their process of software development and focus on their core competencies.
This leads to shorter „time-to-market" cycles and higher product quality.
SAM was introduced in the market in 1998. The functionality grew with the requirements of many OEM customers worldwide.
The SAM ActiveX and COM component set consists of a complete group of hierarchically organized objects for scanner applications and provides interfaces for all common programming tools under Windows. Sample applications written in different programming languages are available. These applications can be used as a starting point for customizing the software.
The functions within the SAM library range from very basic to very powerful. It is possible to change marking parameters, generate texts, fill objects, change drawing colors, cut objects etc.
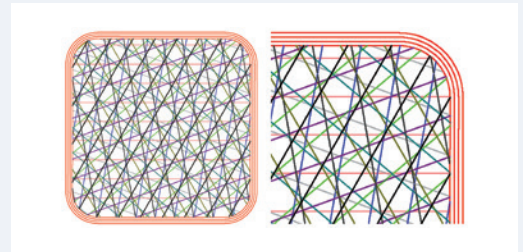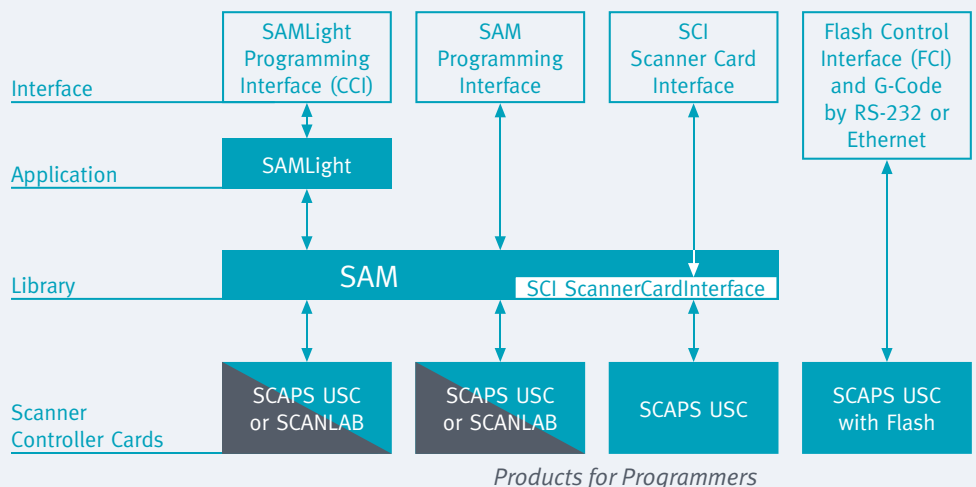
Different subsets of the SAM library are available.

SAM Standard Components
The SAM Standard Components contain all common functions for a perfect starting point for developing fully customized powerful applications.

SCI Scanner Card Interface
The Scanner Card Interface (SCI) is a SAM subset that offers access to the functionality of USC cards through a low level interface.

Hatches

Barcodes

```
sc_sci_set_device_delay(scComStandardDeviceStyleIDMarkDelay, 50);
sc_sci_set_device_delay(scComStandardDeviceStyleIDPolyDelay, 20);
sc_sci_set_device_speed(scComStandardDeviceStyleIDMarkSpeed, 20000);
sc_sci_set_move_laser_state(0);                 // laser Off
sc_sci_move_abs(-15000.0, -15000.0);
sc_sci_set_move_laser_state(1);                 // laser On
sc_sci_move_abs(15000.0, -15000.0);
sc_sci_move_abs(15000.0, 15000.0);
sc_sci_set_move_laser_state(0);                 // laser Off
...
```

Client Control Interface (CCI) Program Commands

Interface	SAMLight Programming Interface (CCI)	SAM Programming Interface	SCI Scanner Card Interface	Flash Control Interface (FCI) and G-Code by RS-232 or Ethernet
Application	SAMLight			
Library	SAM	SCI ScannerCardInterface		
Scanner Controller Cards	SCAPS USC or SCANLAB	SCAPS USC or SCANLAB	SCAPS USC	SCAPS USC with Flash

Products for Programmers

SAM*Light*

SAMLight is based on the technology of SAM and provides the functionality for many industrial applications as well as for job shops.

The Laser Marking Software

User Interface
- operates on MS Windows 11, 10, 8, 7
- English, German and Chinese version available, customized translation possible
- customized installer and GUI
- password protected user levels
- easy accessible debug / backup tool

File Formats
- SCAPS Job Format (SJF) with fast preview capabilities
- many bitmap and vector import and export formats (bmp, png, jpg, plt, dxf, ai, svg, cnc, txt, etc.)

Job Editor
- fast rendering of graphical data
- transformation of data with mouse and keyboard input
- functions for comfortable alignment and spacing
- property page concept
- transformation of point items
- entity list for defining the order of marking

Automation
- different control objects (wait, timer, I/Os etc.)
- remote control via Ethernet or direct program calls (CCI)
- special sequence jobs (pre- / post mark processing etc.)
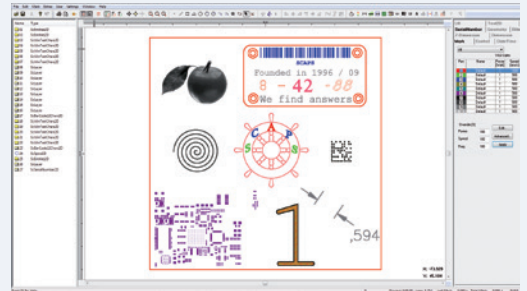- counter mode
- JobIOSelect mode

Optic
- variable adjustment of laser and scanner parameters
- easy management of multiple optic settings
- scanner movement preview
- laser power save and shutter control
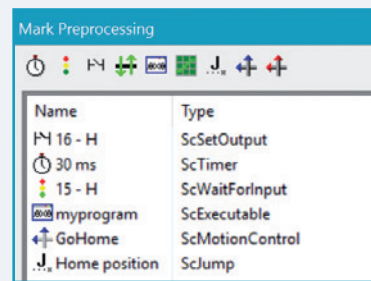- background camera integration

Pens
- copy option for pen settings
- perforation tool for cutting
- advanced wobble shapes following marking direction (USC-3)
- point to geometry mode for drilling
- power and speed ramping
- SkyWriting
- combination of pens and hatches to styles
- ParameterFinder for easy optimization of pen and hatch parameters

Hatcher
- 10 hatches, each loopable with angle
- filling of 2D polygon lines and layer structures with various styles
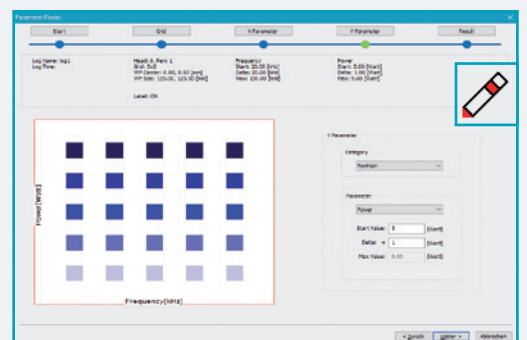- beam compensation of closed polygon lines during hatching

User Interface

Special Sequence Job

```
m_client.ScLoadJob("testjob.sjf", 1 , 1 , 1);
m_client.ScChangeTextByName( "textfield" , "Hello World" );
m_client.ScMarkEntityByName("textfield");
```

Client Control Interface (CCI) program commands

ParameterFinder Wizard

Beam Compensation

Barcode
- generation of different 1D and 2D barcodes (EAN 128, Code 128, DataMatrix, QR etc.)
- DataMatrix dot generation
- QR code with logo

Serial Numbers and Date / Time Objects
- customized serial number objects
- customized date/time objects
- file serialization (csv, txt, xls, xlsm, xlsx)
- time shift, year, month and day mapping

Text and Fonts
- fast font preview
- radial text
- ttf, otf and laser fonts
- font editor for defining customized laser fonts

Bitmaps
- b&w and grayscale bitmaps
- improved and easy bitmap handling
- automatic exchange of bitmaps in job
- improved grayscale to power mapping
- conversion of vector to bitmap

Motion Control
- for driving up to 6 axes
- direct motion control and job control objects
- homing procedure
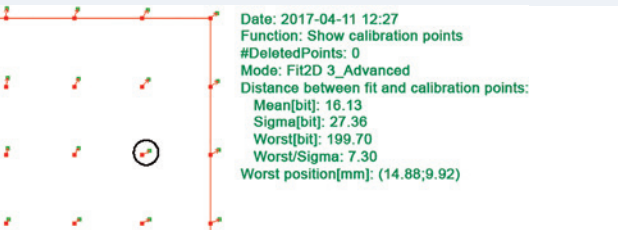- GUI for easy setup
- step and repeat functionality

Flash Compatible Mode
- check of settings and jobs
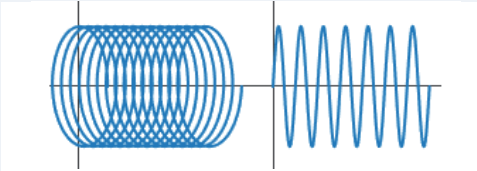- assistance through supported objects and features
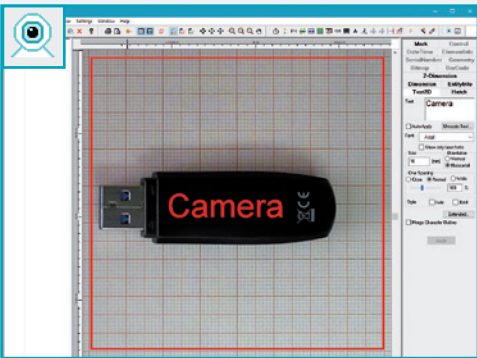
Sc_corr_table
- edit USC Correction File (UCF) which compensates scan head specific optical distortions
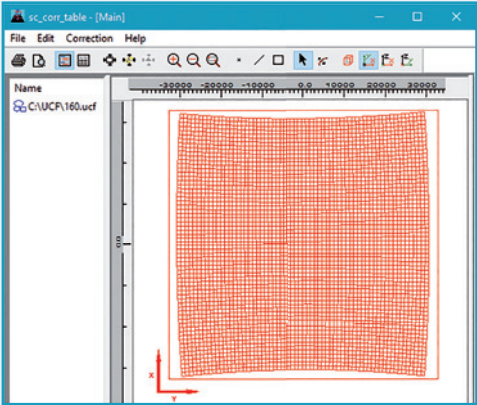- convert correction file formats into UCF
- create and improve UCF

Wobble: Ellipse and Sinus Shape
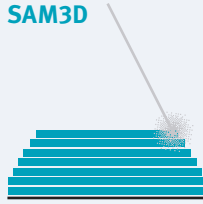

Background Camera

Grayscale Scanner Bitmap

Date: 2017-04-11 12:27
Function: Show calibration points
#DeletedPoints: 0
Mode: Fit2D 3_Advanced
Distance between fit and calibration points:
Mean[bit]: 16.13
Sigma[bit]: 27.36
Worst[bit]: 199.70
Worst/Sigma: 7.30
Worst position[mm]: (14.88;9.92)

Handling of Calibration Points

User Interface of Sc_corr_table
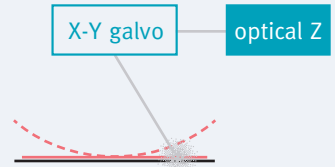
3D *Options*

Optic3D

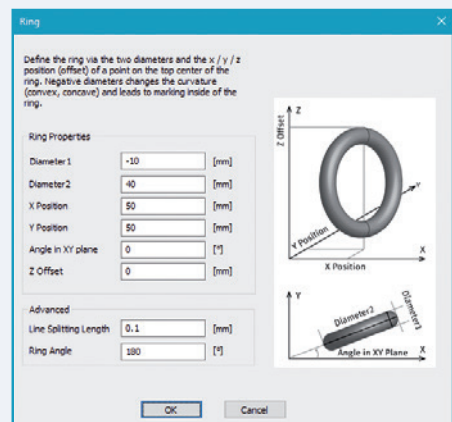**SAM3D**

USC FlatLense

X-Y galvo — optical Z

Optic3D

Optic3D is a SAM option designed for marking on real 3D surfaces. For this option, an optical Z-axis is required. Supported features are:
- marking of 3D lines with suitable hardware
- import of 3D DXF data
- transformation of 3D lines
- bending of 2D job on predefined 3D surface
- projection of 2D job on customized STL surface
- deep engraving
- drilling of 3D point clouds (txt)

Optic3D

Predefined 3D Surface

SAM3D

SAM3D is a SAM option designed for visualization and manipulation of 3D data. Input data formats are STL (triangle based description of faceted elements) and CLI or SLC (2 ½ D element description). Common applications are deep engraving and rapid prototyping.

TriaMesh
- triangle based 3D element

LayerSolid
- 2 ½ D element consisting of a group of layers with an additional Z-component
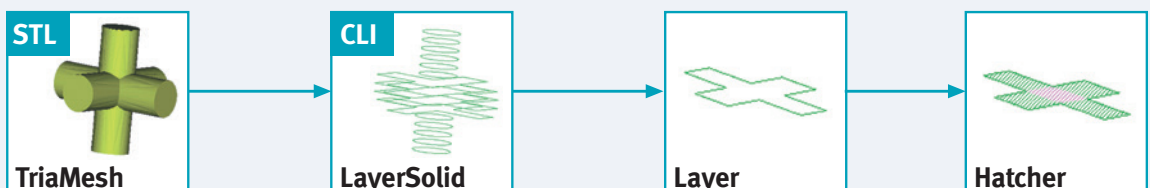
Hatcher
- filling of layers with various hatch styles
- beam compensation
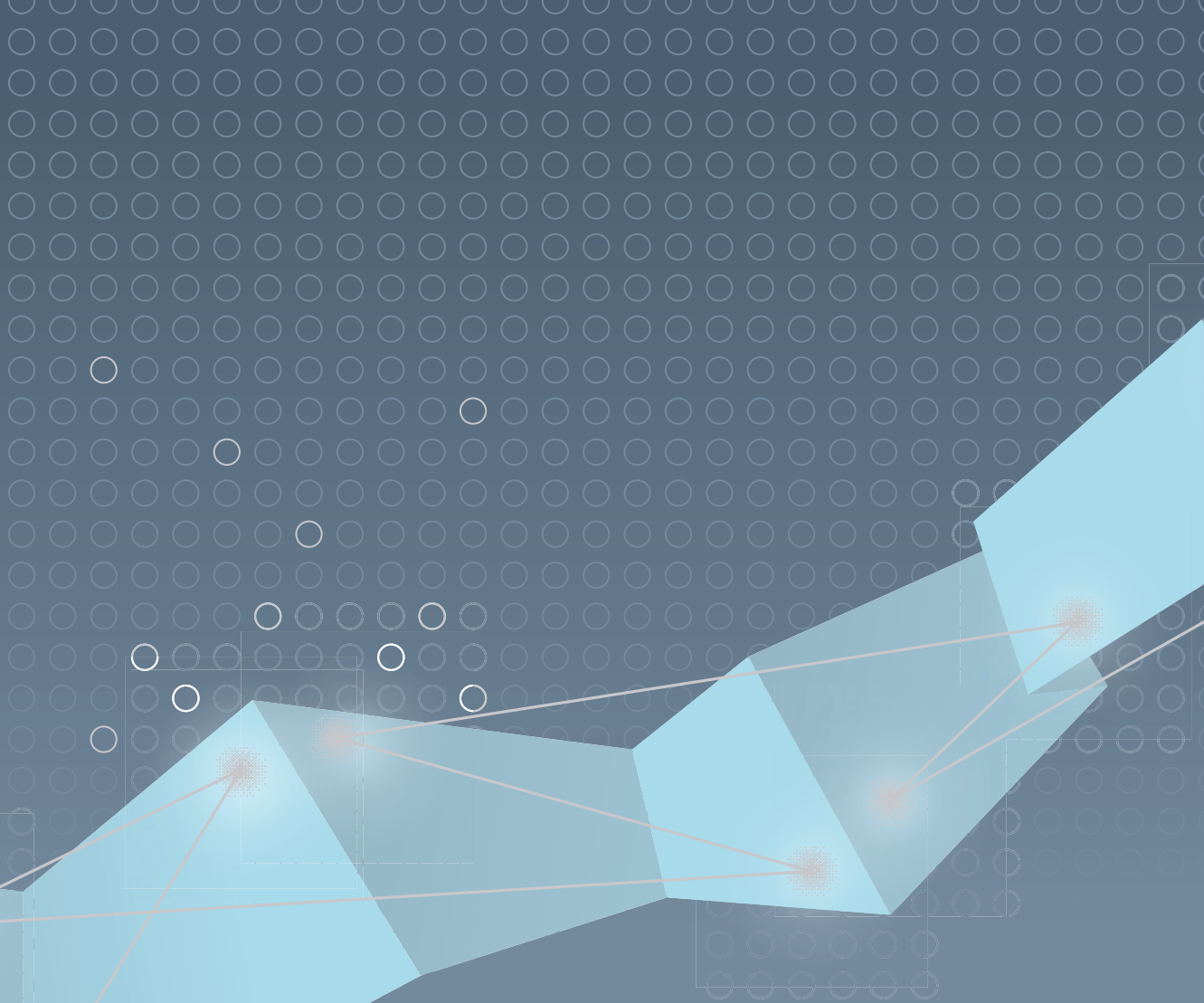- up-/downskin for advanced hatching

View3D
- display of the SCAPS 3D and 2 ½ D entities
- transformation of entities like scale, translate and rotate

Slicer
- slicing of MeshSolid into a LayerSolid
- optionally closing of open layers if triangles have open edges

STL / **TriaMesh** → **CLI** / **LayerSolid** → **Layer** → **Hatcher**

SAM3D Data Flow

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