



# Materialise Control Platform

"We, at Sentrol, greatly appreciate and value our partnership with Materialise because it provides us with build processing and control solutions that are customized for our products. This in turn enables us to offer optimal and complete hardware and software solutions to our own customers."

**Casey HJ Kim**  
Vice President, Sentrol Co., Ltd.

## Control and Steer Your Machine

The Materialise Control Platform is a modular, software-driven, embedded hardware solution, that allows you to take full control over your laser-based AM machine. It embeds a large amount of AM specific R&D opportunities leading to a fast time-to-market and a great control over quality and process repeatability. In addition, it is fully compatible with the Materialise Magics 3D Print Suite.



- Specifically developed for AM
- Enables to extend your IP
- Shortens the lead time of new machines
- Numerous research applications
- Integrated end-to-end platform

# Materialise Control Platform Empowers

## Machine Development & Control

- Fast time-to-market with an off-the-shelf controller
- Build your own IP and build on top of Materialise know-how
- Easily expand, modify and develop new versions of the AM machine
- Easily migrate from your R&D platform to market
- Experiment with and finetune your toolpath strategies using the Build Processor

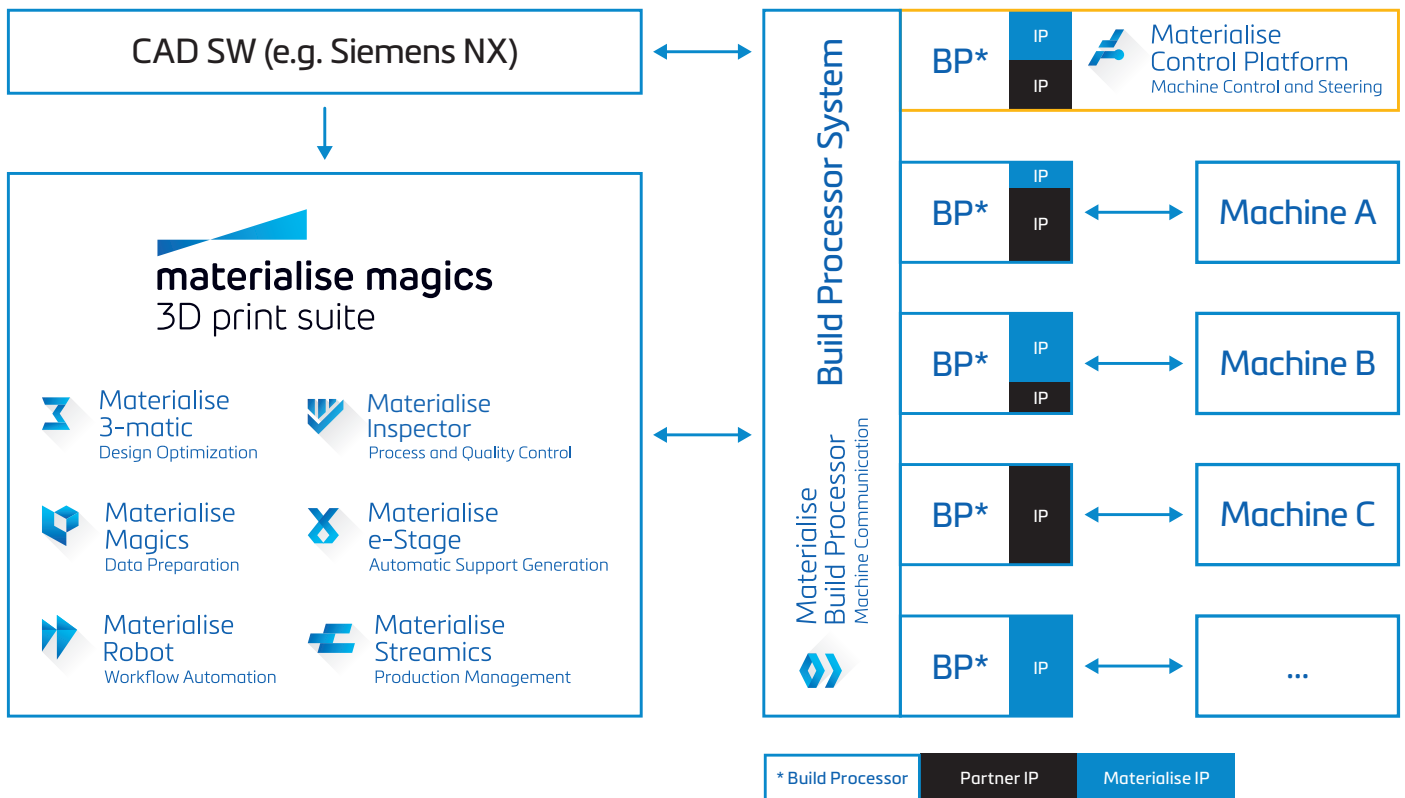
## R&D Applications

- Examine the AM process
- Adapt the AM process to your needs
- Monitor and log data in real time
- Benefit from real-time closed loop data processing

## Process-Controlled Production

- Track & trace the complete production process in combination with Materialise Streamics
- Connect to your machine and extract data using standard protocols at real time

## An Integrated Platform



## Hardware

### SUPPORTED COMMUNICATION PROTOCOLS

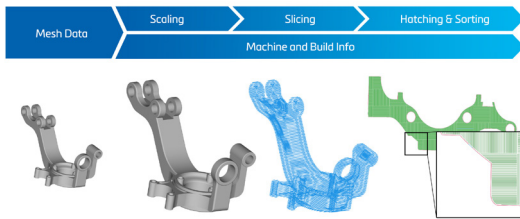
- XY2-100
- SL2-100
- PWM, Frequency, Analog Laser interfaces
- Analog and Digital I/O
- Stepper interface
- RS232

- RS485
- USB
- Modbus (RS485 and TCP/IP)
- Profibus
- OPC-UA
- and many more...

# Software

## BUILD PROCESSOR

Fine-tune your research process



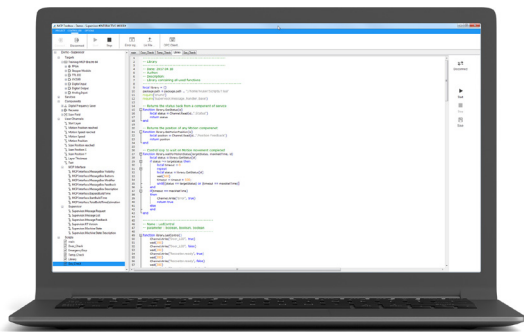
The Machine Control Platform comes with its own dedicated Build Processor\* for doing research and defining the optimal parameters for your process. It offers access to more than 250 parameters and you can experiment with different zones and patterns of the Material Development Module.

- It processes and transfers the build data to your controller without any human interaction.
- It automatically reads out your controller configuration in order to stay within the physical limits of your machine.
- It's compatible with multi-optics machines
- It allows you to generate different build styles

\* Build Processor for Laser Sintering, Laser Melting and Stereolithography technology.

## TOOLBOX

Easily configure and set up your machine control system

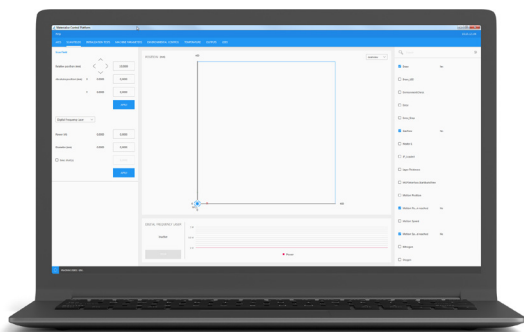


With this toolbox, you can easily communicate with your hardware components.

- Configure your hardware devices via easy tree structures
- Write your scripts in a Lua embedded environment with parallel processing
- Set up the correct communication services
- Rely on an integrated debugging feature
- Calibrate your entire optical set-up

## INTERFACE

Directly interact with your machine in an intuitive way

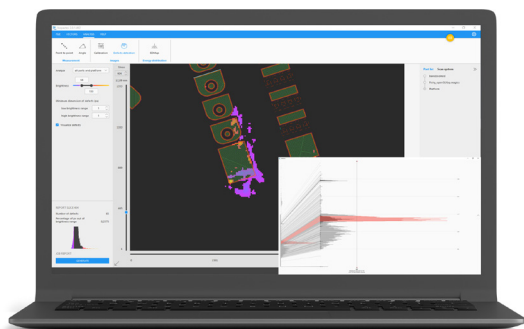


The interface allows you to operate the AM machine and monitor the build status from anywhere on your network.

- Start or stop your build
- Run your custom scripts
- Manually control your hardware components
- Adapt the interface to the controller configuration
- Monitor the control system parameters

## INSPECTOR

Speed up quality control based on build images



You have the option to include Materialise Inspector. This software can process large amounts of images and apply this for accurate quality inspection.

- Increase your process understanding
- Parameterize error detection
- Analyze big data faster than before

# Datasheet

- Machine type: laser-based powder/resin systems (Stereolithography, Laser Sintering and Laser Melting)
- Recommended power supply: 100 W, 24 VDC
- Temperature limits: 0 to 40°C
- International Protection Rating: IP20
- Size single rack: 481.9 x 241 x 132.5 mm
- Size double rack: 481.9 x 241 x 266 mm
- Weight: 1-rack: 8-10 kgs, 2-rack: 12-15 kgs
- OS: real time Linux/x64

Hardware Modules	Description	Info
Controller	cRIO 1,33 GHz – NI 9035	Dual-Core CPU, 70T FPGA, 1 GB DDR3 memory, 4 GB storage, equipped with 32 GB SD card
	cRIO 1,91 GHz – NI 9039	Quad-Core CPU, 325T FPGA, 2 GB DDR3 memory, 16 GB nonvolatile storage, equipped with 32 GB SD card
Motion	Modbus TCP/IP - RS485	Via ethernet connection or RS485
	Stepper	SISU-1004 module support
	Profibus	Comsoft Profibus Master support
Scanning	SL2 – 100	Supporting SL2-100 protocol (preferred protocol), steers Scanhead + Z – Axis
	XY2 – 100	Supporting XY2-100 protocol, steers Scanhead + Z – Axis
Laser	Digital Laser – NI 9401	8 DO high speed TTL for up to 4 lasers
AO	Analog Laser	4 Analog Output signals, V
Sensors	Digital Input - NI 9425	32 Digital Input connection points, 24VDC input
	Digital Output - NI 9477	32 Digital Output connection points, sinking to ground (60 VDC max)
	Analog Input - NI 9205	32 Analog Input : 16 V (+/- 10 V), 16 A (+/-20 mA) or V (+/- 10V)
	Analog Output - NI 9263	4 Analog output signals, +/- 10V
General	General Purpose	RS232, RS485, 2 USB, 2 Gigabit Ethernet
Embedded Software Services	Lua script Service	Embedded Lua environment, Script editor, debugger, example codes
	OPC-UA Service	Freely configurable, pre-configuration included
	Modbus API/Service	Modbus RS485 and TCP-IP are supported in Lua
Scanning	Scanning Technology	Microvectoring, laser gating (hardware and software gating), calibration
	Scanfield Technology	1 scanfield is single optics, more scanfields are multioptics
	Calibration IP	Cubic calibration interpolation algorithms
Toolbox	I/O Interface (Lua and OPC-UA)	Memory table of input/output data, accessible via Lua/OPC-UA
	MCP Toolbox	Toolbox for complete configuration, scripting and software updates
Standard Services	Pre-Configuration	All I/O's, OPC-UA and standard components are preconfigured
	Burn-in Testing	Complete software and hardware testing by Materialise
Services	Description	Info
Training & consultancy	Offered trainings and consultancy	Basic training for MCP, machine set-up and calibration service, scripting service

## Powered by Materialise

The 'Powered by Materialise' program unites leaders of the 3D printing industry into Materialise's extensive eco-system of partners, and allows them to exchange their knowledge, share ideas and bring the 3D printing experience of the AM community to the next level.

For more information, contact us at: [software@materialise.be](mailto:software@materialise.be)  
or visit our website [materialise.com/en/software/control-platform](http://materialise.com/en/software/control-platform)

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