

# EOSINARE PIANS

Software and Processes for EOS Metal Systems

## **EOS Plans**

## Software and Processes for EOS Metal Systems

EOS offers a complete solution for additive manufacturing: industrial 3D printers equipped with industryleading technologies, proven processes, consulting services and software solutions to prepare, optimize, control and monitor the various aspects of the additive manufacturing process.

With a subscription-based license model, EOS Plans offer a flat rate of validated and ready-to-use processes for first-time-right exposure, as well as an automatic in-situ process control for reduced supports and increased productivity.

Take control of your machine park, offering deep insight into machine-generated data for improved machine utilization.

Per Site	Per System

#### **EOS Build**

Assigning and optimization of process parameters including ready to use EOS **Materials Sets** 

10x EOSPRINT

**Editing and Optimizing Process Parameters** 

Validated EOS Materials Sets

EOS Hub - Dashboard for machine state and performance

**EOS Cost & Carbon Calculator** 

Process Science and Engineering for Metal Additive Manufacturing Training

#### **EOS Smart Monitoring**

Quality assurance and automatic process control to push the limits of AM

Exposure OT\*

**Smart Fusion** 

E-Learnings & Expert Sessions



# Why an annual plan or subscription?

Flat rate of EOS material sets with predictable costs  EOS Plans provide customers with flexible access to all available EOS material sets, without the need to commit and stick to a single material. This material sets flat rate empowers customers to quickly adapt to changing market requirements, without incurring additional investments.
Flexibility is the key  The EOS Plans' pay-per-usage model offers exceptional flexibility in tailoring software usage to match your production requirements on a yearly base. This results in a cost-efficient, adaptable, and predictable method of accessing precisely what you need.
Pay per usage  EOS Build require only a one-year commitment to enjoy their various advantages, while EOS Smart Monitoring has a two-year minimum. After the initial period passes, customers can renew or switch to "inactive" mode if they need to scale down. Some core functions of each plan will still be available to inactive customers, who can resume whenever they wish.
Shift costs from CAPEX to OPEX  The subscription model of EOS Plans frees customers from the rigidity of a "perpetual," prepaid-license purchase structure requiring a high upfront investment. Users pay a fixed subscription fee, which allows easier budgeting due to its predictability. It also shifts this cost from a capital expense (CAPEX) to an operating expense (OPEX), which make the budget planning much easier.
Latest innovations and training included  Meanwhile, regular updates to the software keep its functionality at the leading edge and facilitate AM innovation. Additionally, the included training resources ensure that your engineers can always build — or expand — their AM knowledge.

## **EOS Build**

EOS Build delivers the key features of the data preparation and job optimization software EOSPRINT. Multiple users can optimize process parameters and manage material usage across the organization. The plans provide customers with flexible flat rate access to all available validated and proven EOS material sets.

EOS Hub comes with EOS Build and shows the machine data (machine state) and machine utilization (performance) remotely in a web application.

EOS Build is licensed per site, which means you purchase it once for the entire machine park.

#### Key features of EOS Build

10 licenses of EOSPRINT (per site)

Regular software updates with innovative features

Parameter editing capabilities allow customers to optimize parameters to create high-quality parts and increase productivity (e.g., laser power, scan speed, hatch distance, laser assignment, minimum exposure time, layer thickness, load balancing for the EOS M 300)

Advanced exposure algorithms including Pulsed Wave Emission and Laser Centered Dependent Exposure Strategy (LCDS), to achieve precise and consistent results

Validated, high-quality EOS material sets for the M 290, M 300-4, M 400 and M 400-4

EOS advanced material sets, including-80µm high-productivity processes and material sets with low-angle buildability options; all designed for optimized performance in the first run

Material set management to track and manage material sets across your organization

Advanced previewing and visualization capabilities

Access to training: "Process Science and Engineering for Metal Additive Manufacturing Certificate Program" (for up to 4 users)

Access to the cloud-based dashboard EOS Hub including Machine State and App Machine Performance App

**EOS Cost & Carbon Calculator** 

EOSPRINT Software Development Kit (SDK) for automation purposes

#### EOS Hub\* is part of EOS Build

EOS Hub offers insights into machine performance, either individually or as a whole park of devices. As a web-based subscription platform, it's available on-premises or via the cloud, with a UI for desktop and mobile devices.

#### Key features of EOS Hub

Machine State App: With a comprehensive dashboard, the app provides real-time insights on the status of your machines, including all system messages, graphs of the sensor data for quick error analysis. The App offers remote control capabilities, allowing you to stop or pause a build job from anywhere using your mobile device.

Machine Performance App is focused on monitoring the utilization and uptime of machines. The App allows users to make data-driven decisions that can drive operational efficiencies and strengthen overall performance.

Open API for EOS Hub



<sup>\*</sup>requires EOS Systems Suite or EOSCONNECT Core and EOSTATE PowderBed

#### **EOS Cost & Carbon Calculator**

Gain full transparency and control over your application costs and environmental impact with our Cost & Carbon Analytics Tool. This intuitive solution provides a customizable breakdown of costs per part, covering every aspect from system usage and services to materials, post-processing, overheads, and consumables.

Key features of EOS Cost & Carbon Calculator
Cost & carbon scenario analysis
Visual analytics
Cost & carbon scenario analysis
Cost sensitivity analysis
Report generation
Data-driven design to match cost & carbon targets
Customized cases for customer pricing

## **EOS Smart Monitoring**

EOS Smart Monitoring\*\* uses Exposure OT to make build monitoring and analysis more thorough and cost-effective — but doubles down on the cutting edge with Smart Fusion. This automated power adjustment tool operates in close conjunction with Build to ensure heat never exceeds standards established in the parameter set.

- A high-resolution near-infrared camera records and measures the energy input in real time regardless of part size. The long exposure time of the camera facilitates better analysis of the build's individual layers
- Based on analysis algorithms (uniquely adjustable to meet individual project requirements), EOSTATE Exposure OT provides a toolbox to determine process flaws
- This allows you to forgo destructive testing and is less expensive than other non-destructive testing methods, such as X-ray and CT scanning. Thus, you can eliminate the need for costly downstream quality assurance and can ultimately reduce your scrap rate and percentage of build failures
- Insights derived from EOSTATE Exposure OT are important for future production cycles and to speed up product development
- Smart Fusion: A Game-Changer in Additive Manufacturing. The automated feature adjusts laser power levels to match the standards established in pre-processing, making corrections during the build as needed. Exposure OT's heat distribution monitoring is critical to the process, as its data informs Smart Fusion's power corrections during the build. Smart Fusion reduces the likelihood of overheating and helps ensure fewer part iterations. AM designers who know Smart Fusion, can craft part designs optimized for supportless building.

<sup>\*\*</sup> requires EOS Build

# **EOS Software Plans**

## Comparison sheets



	EOS Build Basic	EOS Build+	Launch date
EOS Material Sets			
EOS ADVANCED Material Sets	1 material only	,	
Newer high productive and/or application specific material sets: e.g. low angle buildability optimized, etc.	1 material only	•	
Material Set Upgrades	Х	✓	
Software Upgrades	Х	✓	
EOSPRINT Users	1	10	
Online Training	х	Access to training: "Process Science and Engineering for Metal AM" (for up to 4 users)	Nov 23 (2.15)
Access to EOS Hub Machines State App	X	✓	May 24 (2.16)
Access to EOS Hub Performance State App	X	✓	May 24 (2.16)
Cost per Part and Carbon Calculator	X	✓	Nov 24 (2.17)

#### **EOSPRINT**

	EOS Build Basic	EOS Build+	Launch date
General			
Automatic Assignment of Exposure Sets	✓	✓	May 20 (2.8)
EOS Soft Dongle (on request)	✓	✓	May 23 (2.14)
Export/Import of Machine Connections (Configurations)	✓	✓	Nov 20 (2.9)
Export SLI-files	✓	✓	
Support of 3MF file format (import)	✓	✓	May 22 (2.12)
Support of 3MF Volumetric Extension version 1.0	✓	✓	Nov 24 (2.17)
Job file Recovery	✓	✓	May 22 (2.12)
Load nTop Implicit Files from nTop Plugin for EOSPRINT	✓	✓	May 23 (2.14)
Build Job Flag for accurate OEE measurement	✓	✓	Nov 23 (2.15)
Material Set Configurator (additional training required)	(✓)	(✓)	Nov 22 (2.13)
Upwards (and downwards) compatibility with EOSYSTEM	✓	✓	Nov 22 (2.13)
Beam Shaping for AMCM GmbH machines with nLIGHT Laser	(✓)	(✓)	Nov 22 (2.13)
Collision Detection	✓	✓	
Generate Test Series - Design of Experiments (DoE)	✓	✓	
Part Specific Hatching	✓	✓	Nov 20 (2.9)
Shrinkage and Beam Compensation	✓	✓	
Process Settings			
Recoating	✓	✓	
Atmosphere & Powder	✓	✓	
Recirculating Filter System	✓	✓	
Platform	✓	✓	

Seponsire	Dispenser	<b>✓</b>	✓	
Improved Powder Dosage Algorithm (selectable)  Security		<u> </u>		
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Load Balancing (EOS M 300)  x  Nov 21 (2.11)  Smart Fusion  x  May 23 (2.14)  Replay of Smart Fusion  x  May 24 (2.16)  Change Layer Thickness  Time Optimized Support & Contour (reduced jumps)  Time Optimized Hatch Sorting in Infill, Downskin and Upskin (only with "no pattern")  Energy Input Homogenization (Min Vector Time, Power Reduction)  Combination of Power Reduction and Minimum Vector Time  x  May 22 (2.12)  Laser Center Optimized Vector Scanning (LCDS)  Change Edge Definition (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  x  Nov 21 (2.11)  Defocus (M290)  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  x  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  x  May 22 (2.12)  Nov 20 (2.9)  Laser Power and Scan Speed Visualization  y  Nov 20 (2.9)  Laser Power and Scan Speed Visualization  y  May 21 (2.11)  Animated Scan Speed Visualization  y  May 22 (2.12)  May 22 (2.12)  May 23 (2.14)  Nov 24 (2.17)  Chers  Mesh Error Detection & Visualization  y  May 24 (2.16)  May 25 (2.16)  May 26 (2.17)  May 27 (2.17)  May 28 (2.17)  May 29 (2.18)  May 29 (2.19)  May 29 (2.19)  May 20 (2.19)  May 20 (2.19)  May 21 (2.10)  May 21 (2.10)  May 22 (2.12)  May 22 (		Х	✓	
Smart Fusion		Х	✓	
Replay of Smart Fusion  Change Layer Thickness  Time Optimized Support & Contour (reduced jumps)  Time Optimized Support & Contour (reduced jumps)  Time Optimized Hatch Sorting in Infill, Downskin and Upskin (only with "no pattern")  Energy Input Homogenization (Min Vector Time, Power Reduction)  Combination of Power Reduction and Minimum Vector Time  Laser Center Optimized Vector Scanning (LCDS)  Laser Center Optimized Vector Scanning (LCDS)  X  May 22 (2.12)  Fulsed Wave Emission  X  Nov 21 (2.11)  Pofocus (M290)  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  X  May 22 (2.12)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  X  Nov 24 (2.17)  Others  Mesh Error Detection & Visualization  We Analy (A.0.)  May 24 (2.16)  May 22 (2.12)  May 23 (2.13)  May 24 (2.16)  May 25 (2.16)  May 26 (2.17)  Others  Mesh Error Detection & Visualization  V  May 21 (2.16)  May 22 (2.16)  May 22 (2.17)  May 24 (2.17)  May 25 (2.18)  May 26 (2.17)  May 27 (2.18)  May 28 (2.18)  May 29 (2.19)  May 29 (2.19)  May 29 (2.10)  Ma		Х	✓	
Change Layer Thickness  Time Optimized Support & Contour (reduced jumps)  X  May 20 / May 21  Time Optimized Hatch Sorting in Infill, Downskin and Upskin (only with "no pattern")  Energy Input Homogenization (Min Vector Time, Power Reduction)  Combination of Power Reduction and Minimum Vector Time  Laser Center Optimized Vector Scanning (LCDS)  Change Edge Definition (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  Defocus (M290)  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  Y  May 22 (2.12)  May 22 (2.12)  May 22 (2.12)  Animated Scan Path Preview  X  Y  May 22 (2.12)  Animated Scan Path Preview  X  Y  Nov 24 (2.17)  Others  Mesh Error Detection & Visualization  W  May 20 (2.12)  May 22 (2.12)  May 2	Replay of Smart Fusion	Х	✓	-
Time Optimized Support & Contour (reduced jumps)  Time Optimized Hatch Sorting in Infill, Downskin and Upskin (only with "no pattern")  Energy Input Homogenization (Min Vector Time, Power Reduction)  Combination of Power Reduction and Minimum Vector Time  Laser Center Optimized Vector Scanning (LCDS)  Change Edge Definition (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  Defocus (M290)  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  x May 22 (2.12)  Animated Scan Path Preview  x May 22 (2.12)  Animated Scan Speed Visualization in Scan Paths  Wesh Error Detection & Visualization  What 24 (2.12)  May 24 (2.17)  May 24 (2.17)  May 25 (2.16)  May 26 (2.17)  May 27 (2.17)  May 27 (2.17)  May 28 (2.18)  May 29 (2.19)  May 29	_ · ·		<b>√</b>	
Time Optimized Hatch Sorting in Infill, Downskin and Upskin (only with "no pattern")  Energy Input Homogenization (Min Vector Time, Power Reduction)  Combination of Power Reduction and Minimum Vector Time  Laser Center Optimized Vector Scanning (LCDS)  Change Edge Definition (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  X  Nov 21 (2.12)  Animated Scan Path Preview  X  Nov 21 (2.11)  X  May 22 (2.12)  Nov 21 (2.11)  X  May 22 (2.12)  X  May 22 (2.12)  X  May 22 (2.12)  X  Nov 21 (2.11)  X  May 22 (2.12)  X  May 22 (2.12)  X  May 22 (2.12)  X  Nov 21 (2.11)  X  May 22 (2.12)  Animated Scan Path Preview  X  Nov 20 (2.9)  Laser Power and Scan Speed Visualization in Scan Paths  X  Mesh Error Detection & Visualization  X  May 24 (2.17)  May 24 (2.17)			✓	May 20 / May 21
Energy Input Homogenization (Min Vector Time, Power Reduction)  Combination of Power Reduction and Minimum Vector Time Laser Center Optimized Vector Scanning (LCDS)  Change Edge Definition (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  Energy Input Homogenization (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  Energy Input Homogenization (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  Energy Input Homogenization (Edge Offset, Edge Factor, Threshold, May 22 (2.12)  Visuals Wave Emission  Energy Input Homogenization (Edge Offset, Edge Factor, Threshold, May 22 (2.11)  Energy Input Homogenization (Edge Offset, Edge Factor, Threshold, May 22 (2.12)  Nov 21 (2.11)  Energy Input Homogenization (Edge Offset, Edge Factor, Threshold, May 22 (2.12)  Nov 21 (2.11)  Energy Input Homogenization (Edge Offset, Edge Factor, Threshold, May 22 (2.12)  Energy Input Homogenization (Minimum Vector Time Available Avai	Time Optimized Hatch Sorting in Infill, Downskin and Upskin		✓	<u></u>
Combination of Power Reduction and Minimum Vector Time  Laser Center Optimized Vector Scanning (LCDS)  Change Edge Definition (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  X  Nov 21 (2.11)  Defocus (M290)  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  May 22 (2.12)  May 22	Energy Input Homogenization (Min Vector Time, Power	Х	✓	
Laser Center Optimized Vector Scanning (LCDS)  Change Edge Definition (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  X  Nov 21 (2.11)  Defocus (M290)  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  Visualization of Laser Utilization (multi laser machines)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  Laser Power and Scan Speed Visualization in Scan Paths  Mesh Error Detection & Visualization  Mesh Error Detection & Visualization  May 22 (2.12)  May 24 (2.17)  May 24 (2.17)		Х	✓	May 22 (2.12)
Change Edge Definition (Edge Offset, Edge Factor, Threshold, Min Radius Factor)  Pulsed Wave Emission  x  Nov 21 (2.11)  Defocus (M290)  x  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  X  May 22 (2.12)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  Laser Power and Scan Speed Visualization in Scan Paths  Others  Mesh Error Detection & Visualization  V  May 24 (2.17)  May 25 (2.17)  May 26 (2.17)  May 27 (2.17)  May 27 (2.17)	Laser Center Optimized Vector Scanning (LCDS)		✓	
Pulsed Wave Emission  Defocus (M290)  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  X  May 22 (2.12)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  X  Nov 20 (2.9)  Laser Power and Scan Speed Visualization in Scan Paths  Mesh Error Detection & Visualization  Mesh Error Detection & Visualization  Mesh Error Detection & Visualization  V  May 21 (2.10)  Mesh Error Detection & Visualization		х	✓	
Defocus (M290)  Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  X  May 22 (2.12)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  X  Nov 20 (2.9)  Laser Power and Scan Speed Visualization in Scan Paths  Mesh Error Detection & Visualization  Mesh Error Detection & Visualization  Mesh Error Detection & Visualization  V  May 22 (2.12)  Animated Scan Speed Visualization in Scan Paths  V  Mov 24 (2.17)  Others		Х	✓	Nov 21 (2.11)
Control Skywriting, Flow Optimization (stripes against the flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  X  May 22 (2.12)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  Animated Scan Path Preview  Laser Power and Scan Speed Visualization in Scan Paths  Mesh Error Detection & Visualization	Defocus (M290)		✓	
Flow), Double exposure  Preview Features  Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  X  May 22 (2.12)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  Animated Scan Path Preview  Laser Power and Scan Speed Visualization in Scan Paths  Mesh Error Detection & Visualization				
Scan Path Preview (Exposure Order and Types, Jumps,)  Preview of Jumps  X  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  X  May 22 (2.12)  Visualization of Exposure Time per Layer  X  May 22 (2.12)  Animated Scan Path Preview  X  Nov 20 (2.9)  Laser Power and Scan Speed Visualization in Scan Paths  X  Nov 24 (2.17)  Others  Mesh Error Detection & Visualization  V  May 22 (2.12)  Animated Scan Path Preview  X  Mov 20 (2.9)  Animated Scan Path Preview  X  Mov 24 (2.17)  Others		Х	<b>√</b>	
Preview of Jumps  X  May 22 (2.12)  Visualization of Laser Utilization (multi laser machines)  X  May 22 (2.12)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  X  Nov 20 (2.9)  Laser Power and Scan Speed Visualization in Scan Paths  Mesh Error Detection & Visualization  Build File Integrity Check  A  May 22 (2.12)  X  Nov 24 (2.17)  Visualization of Exposure Time per Layer  X  Nov 20 (2.9)  Nov 24 (2.17)  Visualization of Exposure Time per Layer  X  Nov 20 (2.9)  Nov 24 (2.17)  Visualization of Exposure Time per Layer  X  Nov 20 (2.9)  Nov 24 (2.17)	Preview Features			
Visualization of Laser Utilization (multi laser machines)  Visualization of Exposure Time per Layer  Animated Scan Path Preview  Laser Power and Scan Speed Visualization in Scan Paths  Others  Mesh Error Detection & Visualization  Build File Integrity Check   May 22 (2.12)  X  May 22 (2.12)  X  Nov 20 (2.9)  Nov 24 (2.17)  V  May 21 (2.12)  Animated Scan Path Preview  X  V  Nov 20 (2.9)  V  Animated Scan Speed Visualization in Scan Paths  X  V  Nov 24 (2.17)  Others	Scan Path Preview (Exposure Order and Types, Jumps,)	✓	✓	
Visualization of Laser Utilization (multi laser machines)       x       ✓       May 22 (2.12)         Visualization of Exposure Time per Layer       x       ✓       May 22 (2.12)         Animated Scan Path Preview       x       ✓       Nov 20 (2.9)         Laser Power and Scan Speed Visualization in Scan Paths       x       ✓       Nov 24 (2.17)         Others       ✓       ✓       ✓         Mesh Error Detection & Visualization       ✓       ✓         Build File Integrity Check       ✓       ✓	Preview of Jumps	Х	✓	May 22 (2.12)
Animated Scan Path Preview  Animated Scan Path Preview  Laser Power and Scan Speed Visualization in Scan Paths  Wesh Error Detection & Visualization  Build File Integrity Check  Animated Scan Path Preview  Nov 20 (2.9)  Nov 24 (2.17)  Animated Scan Path Preview  Nov 20 (2.9)  Nov 24 (2.17)	Visualization of Laser Utilization (multi laser machines)	Х	✓	May 22 (2.12)
Animated Scan Path Preview  Laser Power and Scan Speed Visualization in Scan Paths  Nov 24 (2.17)  Others  Mesh Error Detection & Visualization  Build File Integrity Check  Available Company Company  Available Company  Ava	Visualization of Exposure Time per Layer	Х	✓	
Others  Mesh Error Detection & Visualization  Build File Integrity Check	Animated Scan Path Preview	Х	✓	
Mesh Error Detection & Visualization  ✓ ✓  Build File Integrity Check  ✓ ✓  **CORPORATE (ACTIVATE)	Laser Power and Scan Speed Visualization in Scan Paths	Х	✓	Nov 24 (2.17)
Build File Integrity Check  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓  ✓	Others			
Build File Integrity Check	Mesh Error Detection & Visualization	✓	✓	
FOCODINITIES (DETA)	Build File Integrity Check	✓	✓	
	EOSPRINT Server (BETA)	Х	✓	May 21 (2.10)

EOSPRINT SDK for automation purposes	Х	✓ (EDN optional)	
Material Set Cloud (synchronize & share material sets)	Х	✓	May 23 (2.14)

## **EOS Material Sets**

EOS system	EOS Material Set	EOS Build Basic ***	EOS Build+	date
EOS M 290	1.2709_040_HiPerM291_1xx	selectable	✓	June 2023
EOS M 290	17-4PH_020_FlexM291_1xx	selectable	✓	June 2023
EOS M 290	17-4PH_040_StainlessM291_1xx	selectable	✓	June 2023
EOS M 290	20MnCr5_040_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	254_040_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	254_060_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	316LVPro_060_HiProM291_1xx	selectable	✓	June 2023
EOS M 290	316L_020_SurfaceM291_1xx	selectable	✓	June 2023
EOS M 290	316L_040_080_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	316L_040_FlexM291_1xx	selectable	✓	June 2023
EOS M 290	Al2139AM_060_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	AIF357_030_M291_1xx	selectable	✓	June 2023
EOS M 290	AlSi10Mg_030_FlexM291_2xx	selectable	✓	June 2023
EOS M 290	AlSi10Mg_060_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	Cu_020_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	CX_030_HiPerM291_1xx	selectable	✓	June 2023
EOS M 290	HX_020_SurfaceM291_1xx	selectable	✓	June 2023
EOS M 290	HX_040_PerformanceM291_2xx	selectable	✓	June 2023
EOS M 290	IN625_020_SurfaceM291_1xx	selectable	✓	June 2023
EOS M 290	IN625_040_PerformanceM291_1xx	selectable	✓	June 2023
EOS M 290	IN625_040_PerformanceM291_2xx	selectable	✓	June 2023
EOS M 290	IN718_020_SurfaceM291_1xx	selectable	✓	June 2023
EOS M 290	IN718_040_PerformanceM291_2xx	selectable	✓	June 2023
EOS M 290	IN939_040_HiPerM291_1xx	selectable	✓	June 2023
EOS M 290	MP1_020_SurfaceM291_1xx	selectable	✓	June 2023
EOS M 290	MP1_040_PerformanceM291_1xx	selectable	✓	June 2023
EOS M 290	MS1_020_SurfaceM291_1xx	selectable	✓	June 2023
EOS M 290	MS1_040_PerformanceM291_2xx	selectable	✓	June 2023
EOS M 290	MS1_050_SpeedM291_2xx	selectable	✓	June 2023
EOS M 290	PH1_020_SurfaceM291_2xx	selectable	✓	June 2023
EOS M 290	Ti64ELI_030_PerformanceM291_1xx	selectable	✓	June 2023
EOS M 290	Ti64Grade23_040_HiPerM291_1xx	selectable	✓	June 2023
EOS M 290	Ti64Grade23_080_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	Ti64Grade5_040_HiPerM291_1xx	selectable	✓	June 2023
EOS M 290	Ti64Grade5_080_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	Ti64_030_PerformanceM291_1xx	selectable	✓	June 2023
EOS M 290	Ti64_060_SpeedM291_1xx	selectable	✓	June 2023
EOS M 290	TiCP_030_FlexM291_1xx	selectable	✓	June 2023
EOS M 290	CM55_Ar_040_080_CoreM291_1xx	selectable	✓	June 2023

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EOS M 290	CM55_N2_040_080_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	Haynes282_040_080_CoreM291_1xx	selectable	✓	June 2023
EOS M 290		selectable	✓	June 2023
EOS M 290	SuperDuplex_040_080_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	IN625_040_080_HiProM291_1xx	selectable	✓	June 2023
EOS M 290	17-4PH_040_080_CoreM291_1xx	selectable	✓	June 2023
EOS M 290	17-4PHAccel_040_080_M291_1xx	selectable	✓	June 2023
EOS M 290	MS1Accel_040_080_M291_1xx	selectable	✓	June 2023
EOS M 290	IN718Accel_040_080_M291_1xx	selectable	✓	June 2023
EOS M 290	316LAccel_040_080_M291_1xx	selectable	✓	June 2023
EOS M 290	316LAccelN2_040_080_M291_1xx	selectable	✓	June 2023
EOS M 290	Al5X1_040_CoreM291_1xx	selectable	✓	December 2023
EOS M 290	PH1_040_080_CoreM291_1xx	selectable	<b>√</b>	December 2023
EOS M 290	CuNi30_060_CoreM291_1xx	selectable	✓	June 2024
EOS M 290	CX_040_080_CoreM291_1xx	selectable	✓	June 2024
EOS M 290	CXN2_040_080_CoreM291_1xx	selectable	✓	June 2024
EOS M 290	20MnCr5_040_080_CoreM291_1xx	selectable	✓	June 2024
EOS M 290	MS1_040_080_CoreM291_1xx	selectable	✓	December 2024
EOS M 290	K500_060_CoreM291_1xx	selectable	✓	December 2024
EOS M 290-2	1.2709_040_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	316L_040_080_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	CM55Ar_040_080_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	CM55N2_040_080_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	HX_040_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	IN625_040_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	IN718_040_080_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	IN718_040_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	MS1_040_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	Ti64_060_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	AlSi10Mg_030_CoreM293_1xx	selectable	✓	June 2024
EOS M 290-2	17-4PH_040_CoreM293_1xx	selectable	✓	June 2024
EOS M 290 1 kW	CuCP_040_CoreM294_1xx	selectable	✓	June 2024
EOS M 290 1 kW	CuCrZr_040_CoreM294_1xx	selectable	✓	June 2024
EOS M 290 1 kW	IN718_040_PerformanceM294_1xx	selectable	✓	December 2024
EOS M 290 1 kW	MS1_050_SpeedM294_1xx	selectable	✓	December 2024
EOS M 300-4	17-4PH_040_CoreM304_1xx	selectable	✓	June 2023
EOS M 300-4	316L_040_080_CoreM304_1xx	selectable	✓	June 2023
EOS M 300-4	AlSi10Mg_060_CoreM304_1xx	selectable	✓	June 2023
EOS M 300-4	IN625_040_CoreM304_1xx	selectable	✓	June 2023
EOS M 300-4	IN718_040_CoreM304_1xx	selectable	✓	June 2023
EOS M 300-4	MS1_050_CoreM304_1xx	selectable	✓	June 2023
EOS M 300-4	Ti64_060_CoreM304_1xx	selectable	✓	June 2023
EOS M 300-4	IN718_080_HiProM304_1xx	selectable	✓	June 2023
EOS M 300-4	MP1_040_CoreM304_1xx	selectable	✓	June 2024
EOS M 300-4	Ti64Grade23_040_CoreM304_1xx	selectable	✓	June 2024
EOS M 300-4	Ti64Grade5_040_CoreM304_1xx	selectable	✓	June 2024
EOS M 300-4 1kW	CuCP_040_CoreM314_1xx	selectable	✓	June 2024
				,

EOS M 300-4 1kW	AlSi10Mg_080_HiproM314_1xx	selectable	✓	December 2024
EOS M 300-4 1kW	Ti64Grade5_040_CoreM314_1xx	selectable	✓	December 2024
EOS M 300-4 1kW	IN625_040_CoreM314_1xx	selectable	✓	December 2024
EOS M 300-4 1kW	MS1_050_CoreM314_1xx	selectable	✓	December 2024
EOS M 400	AlF357_060_FlexM400_1xx	selectable	✓	June 2023
EOS M 400	AlSi10Mg_090_FlexM400_1xx	selectable	✓	June 2023
EOS M 400	CuCrZr_080_CoreM400_1xx	selectable	✓	June 2023
EOS M 400	IN718_040_FlexM400_1xx	selectable	✓	June 2023
EOS M 400	MS1_050_FlexM400_1xx	selectable	✓	June 2023
EOS M 400	Ti64ELI_030_FlexM400_1xx	selectable	✓	June 2023
EOS M 400	Ti64_030_FlexM400_1xx	selectable	✓	June 2023
EOS M 400	316L_040_080_CoreM400_1xx	selectable	✓	June 2023
EOS M 400	CuCrZr_080_CoreM400_2xx	selectable	✓	December 2023
EOS M 400	CuNi30_060_CoreM400_1xx	selectable	✓	June 2024
EOS M 400-4	20MnCr5_040_CoreM404_1xx	selectable	✓	June 2023
EOS M 400-4	316L_040_080_CoreM404_xx	selectable	✓	June 2023
EOS M 400-4	316L_040_FlexM404_1xx	selectable	✓	June 2023
EOS M 400-4	Al2139AM_050_CoreM404_1xx	selectable	✓	June 2023
EOS M 400-4	AlSi10MgAr_040_CoreM404_1xx	selectable	✓	June 2023
EOS M 400-4	AlSi10Mg_030_FlexM404_1xx	selectable	✓	June 2023
EOS M 400-4	AlSi10Mg_080_HiProM404_1xx	selectable	✓	June 2023
EOS M 400-4	HX_040_FlexM404_1xx	selectable	✓	June 2023
EOS M 400-4	IN718_040_FlexM404_1xx	selectable	✓	June 2023
EOS M 400-4	IN939_040_CoreM404_1xx	selectable	✓	June 2023
EOS M 400-4	MS1_040_FlexM404_1xx	selectable	✓	June 2023
EOS M 400-4	Ti64Grade23_040_080_CoreM404_1xx	selectable	✓	June 2023
EOS M 400-4	Ti64Grade5_040_080_CoreM404_1xx	selectable	✓	June 2023
EOS M 400-4	Ti64_060_FlexM404_1xx	selectable	✓	June 2023
EOS M 400-4	TiCP_030_FlexM404_1xx	selectable	✓	June 2023
EOS M 400-4	Haynes282_040_080_CoreM404_1xx	selectable	✓	June 2023
EOS M 400-4	IN718_040_080_HiProM404_1xx	selectable	✓	June 2023
EOS M 400-4	17-4PHAccel_040_080_M404_1xx	selectable	✓	December 2023
EOS M 400-4	MS1Accel_040_080_M404_1xx	selectable	✓	December 2023
EOS M 400-4	316LAccel_040_080_M404_1xx	selectable	✓	December 2023
EOS M 400-4	316LAccelN2_040_080_M404_1xx	selectable	✓	December 2023
EOS M 400-4	IN625_040_080_HiProM404_1xx	selectable	✓	December 2023
EOS M 400-4	PH1_040_080_CoreM404_1xx	selectable	✓	December 2023
EOS M 400-4	CuNi30_060_CoreM404_1xx	selectable	✓	June 2024
EOS M 400-4	CX_040_080_CoreM404_1xx	selectable	✓	June 2024
EOS M 400-4	CXN2_040_080_CoreM404_1xx	selectable	✓	June 2024
EOS M 400-4	20MnCr5_040_080_CoreM404_1xx	selectable	✓	June 2024
EOS M 400-4	17-4PH_040_080_CoreM404_1xx	selectable	✓	June 2024

<sup>\*\*\*</sup> EOS Build customers, which cancel the EOS Build subscription will get EOS Build Basic and can continue printing with frozen material sets of one selected material. The ability to work with frozen material sets will be finally implemented in Software Edition 11.25. Please contact your account manager, if you plan to cancel your subscription earlier than November 2025.



## EOS Hub

	EOS Build Basic	EOS Build+
EOS Hub – Platform features		
Open API for EOS Hub	Х	✓
User permission management	Х	✓
Machine specific permission management	Х	✓
Get notifications in the app or as email	Х	✓
Language selection, German, English	Х	✓
EOS Hub - Machine State		
Overview of multiple systems: M 290, M 300-4, M 400-4, P 396, P 500, P 770, P3 NEXT are supported	х	✓
Display machine information (type, SI number, loaded material)	х	✓
Display current job status with remaining build time	X	✓
Remote control machines (pause, stop, resume jobs)	X	✓
Display user messages (search and filter)	Х	✓
Get notified on certain user messages	Х	✓
Display last jobs built on the machine (search and filter)	Х	✓
Define limits for sensor values	Х	✓
Display measured and calculated data in real time as a list or as graphs	х	✓
Get notified when a measured or calculated value exceeds limits	х	✓
Layer Information (including PowderBed images)	Х	✓
EOS Hub - Machine Performance		
Overview of multiple systems	X	✓
Details on the utilization of a single machine and a machine park	х	✓
Display availability of a single machine and a machine park	X	✓
Change the time span to measure	X	✓
Manually edit the machine states	X	✓

## EOS Cost & Carbon Calculator

EOS system	EOS Build Basic (Polymer)	EOS Build Polymer Plan
cost estimation	X	✓
cost simulation	Х	✓
consulting support	Х	✓
carbon emissions estimation	Х	✓
cost scenario analysis	Х	✓
cost sensitivity analysis	X	<b>√</b>
report generation	X	<b>√</b>



## EOS Smart Monitoring Plan

	EOS Smart	EOS Smart
	Monitoring Basic	Monitoring
Hardware		
High-resolution camera for the near-infrared range, incl. optics	✓	✓
EOS M 300-4, EOS M 400-4 Integrated system computer (Monitoring IPC) for data processing	✓	✓
EOS M 290 Monitoring-IPC is placed in a separate control terminal besides the machine	✓	✓
EOSTATE Exposure OT Software Software Use Cases		
Online Use Case EOSTATE Exposure OT Software, Database and System Service on the Monitoring-IPC for image acquisition, data collection, storage and analytics calculations	✓	<b>√</b>
Offline Use Case EOSTATE Exposure OT Software and Database are installed on a local PC for data storage and analytics calculations (No connection to a Machine/Monitoring System needed)	<b>✓</b>	<b>√</b>
Remote Use Case EOSTATE Exposure OT Software, Database and System Service on the Monitoring-IPC for image acquisition, data collection, storage and analytics calculations. EOSTATE Exposure OT Software is also installed on a local PC to connect with a Machine/Monitoring System	✓	✓
Parallel installation of several software versions	✓	✓
Base functionality and Job Handling		
Live View of progress during acquisition and display of completely acquired monitoring images as well as irregularities in the current or the last building task (Remote Use Case and Online Use Case)	<b>√</b>	<b>√</b>
Check the acquisition state (data storage, background service and sensor	✓	✓
Record OT images during a build job	✓	✓
Build jobs with Smart Fusion	Х	✓
Import/Export of acquisition data as an *.eosot file for local analysis	✓	✓
Export single or of all images as *.raw (uncalibrated) or *.TIFF	✓	✓
Setting Channels ("integral gray value", "Maximum gray value", "Smart Fusion)	✓	✓
Setting different color maps for optimal visualization		
Loading and display of the acquisition data for a completed building task	✓	✓
Automatically exporting monitoring data	✓	✓
Deletion of data records acquired	✓	✓
Addition and editing of comments	✓	✓
Parallel installation of several software versions	✓	✓
Analysis		•
Various analysis operations are available:  • Three different Indications Detectors for detecting hotspots or cold spots  • A Part Statistic operation enables graphical representation and comparison of the gray values and anomalies of the parts built in a job.		
Create and change analysis profiles	✓	<b>✓</b>
Changing and approval of analysis parameters	✓	✓

Apply analysis profiles to recorded jobs (offline analyses)  Apply analysis profile to a running job  Searching and categorization of irregularities and anomalies identified  Export part statistics & indications for subsequent processing as a *.csv file  Calibration  Calculation and activation/deactivation of geometric corrections  Verify geometric correction  Calculation and activation/deactivation of process intensity corrections (only EOS M 290)  Settings  Change credentials  Changing Language (English, German)  Changing Machine Connection/Database Connection  Verify storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Valuation and activation/deactivation of process intensity corrections (only Valuation)  Valuation and activation/deactivation of process intensity corrections (only Valuation)  Valuation and activation/deactivation of process intensity corrections (only Valuation)  Valuation and activation/deactivation of geometric corrections  Valuation  Valu			
Searching and categorization of irregularities and anomalies identified  Export part statistics & indications for subsequent processing as a *.csv file  Calibration  Calculation and activation/deactivation of geometric corrections  Verify geometric correction  Calculation and activation/deactivation of process intensity corrections (only COS M 290)  Settings  Change credentials  Changing Language (English, German)  Changing Machine Connection/Database Connection  Verify geometric corrections  Verify geometric c	Apply analysis profiles to recorded jobs (offline analyses)	✓	✓
Export part statistics & indications for subsequent processing as a *.csv file  Calibration  Calculation and activation/deactivation of geometric corrections  Verify geometric correction  Calculation and activation/deactivation of process intensity corrections (only cost of the process of the process intensity corrections (only cost of the process intensity correc	Apply analysis profile to a running job	✓	✓
Calculation and activation/deactivation of geometric corrections  Verify geometric correction  Calculation and activation/deactivation of process intensity corrections (only EOS M 290)  Settings  Change credentials  Changing Language (English, German)  Changing Machine Connection/Database Connection  Define Storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Searching and categorization of irregularities and anomalies identified	✓	✓
Calculation and activation/deactivation of geometric corrections  Verify geometric correction  Calculation and activation/deactivation of process intensity corrections (only EOS M 290)  Settings  Change credentials  Changing Language (English, German)  Changing Machine Connection/Database Connection  Define Storage Limits  V  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  V  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Export part statistics & indications for subsequent processing as a *.csv file	✓	✓
Verify geometric correction  Calculation and activation/deactivation of process intensity corrections (only EOS M 290)  Settings  Change credentials  Changing Language (English, German)  Changing Machine Connection/Database Connection  Pefine Storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Calibration		
Calculation and activation/deactivation of process intensity corrections (only EOS M 290)  Settings  Change credentials  Changing Language (English, German)  Changing Machine Connection/Database Connection  Define Storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Calculation and activation/deactivation of geometric corrections	✓	✓
Settings  Change credentials  Changing Language (English, German)  Changing Machine Connection/Database Connection  Define Storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Verify geometric correction	✓	✓
Change credentials  Changing Language (English, German)  Changing Machine Connection/Database Connection  Define Storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	· · · · · · · · · · · · · · · · · · ·	✓	✓
Changing Language (English, German)  Changing Machine Connection/Database Connection  Define Storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Settings		
Changing Machine Connection/Database Connection  Define Storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Change credentials	✓	✓
Define Storage Limits  Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Changing Language (English, German)	✓	✓
Database Maintenance via Customer Tools (Scripts)  Database Management (create, remove, backup and restore)  ✓ ✓ ✓  Database backup (system database only)  Uninstall database server  ✓ ✓  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Changing Machine Connection/Database Connection	✓	✓
Database Management (create, remove, backup and restore)  Database backup (system database only)  Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Define Storage Limits	✓	✓
Database backup (system database only)  Uninstall database server  ✓  ✓  ✓  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Database Maintenance via Customer Tools (Scripts)		
Uninstall database server  Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Database Management (create, remove, backup and restore)	✓	✓
Database update (system database only)  Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Database backup (system database only)	✓	✓
Training & Consulting  EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Uninstall database server	✓	✓
EOSTATE Exposure OT and Smart Fusion for Metal AM Certificate Program	Database update (system database only)	✓	✓
Y	Training & Consulting		
		Х	✓



	EOS M 290	EOS M 300-4 EOS M 400 EOS M 400-4
Print Domain Machine License		
Ability to share process parameters within the machine park	✓	✓
EOSTATE PowderBed Imaging		
Record images of the powder bed before and after recoating	✓	✓
Live view	✓	✓
Save images as RAW, TIFF, JPEG	✓	✓
Save images as video (MPEG4)	✓	✓
Manage job images (import, export, delete)	✓	✓
User & role Management	✓	✓
Changing Language (English, German)	✓	✓
Remote connection to a machine	✓	✓
EOSTATE Quality Reports		
Job quality & part quality report as PDF	✓	✓
Automated export of reports (via EOSCONNECT Core)	✓	✓
User & role Management	✓	✓
Language Selection (English, German)	✓	✓
EOSCONNECT Core		
Access to machine data via OPC UA	✓	✓
Access to machine data via MQTT	✓	✓
Access to machine data via Web API	✓	✓
EOSCONNECT Core Control		
Control a job via OPC UA (Start/Stop/Pause)	✓ (stop & pause)	√ (start needs docking station)
Load and unload an exchange frame	х	✓ (needs docking station)