EOSCONNECT Core

Overview program versions

Software	Edition 11.21	Edition 05.22
EOSCONNECT Core	1.6.792.0	1.7.920.0

Overview supported machines

Machine types:

- EOS M 290
- EOS M 300-4
- EOS M 400
- EOS M 400-4
- EOS P 396
- EOS P 500
- EOS P 770
- EOS P 810

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EOSCONNECT Core Edition 05.22 (1.7)

Solved Items

- Item 163118: The startup timing problem leading to the process states being always maintenance is now fixed.
- Item 163144: Documentation for endpoint /exposure/calibrations/ now states a correct list of supported machines.
- Item 163845: The property IsSetManual in the state object was misleading. Therefore, it is now marked as obsolete. There is now a new property called IsEnabled. Please use that one in future.
- Item 167022: The corrected value for dispenser fill level on EOS M 400 and EOS M 400-4 machines is now returned.
- Item 168259: Powderbed images can now be accessed for EOS M 290 machines, too.

New Functions

- Item 75998: We provide new data about the filter cleaning processes via all interfaces. There are three new data points:
  - How many cleanings have been executed since the last filter change?
  - How many cleanings are still to come, before the next filter change is recommended?
  - When have filter cleanings been executed?
- Item 98510: The set speed for the following axes is now provided via all interfaces:
  - Recoater axis
  - Dispenser rotary axis
  - Dispenser axis
  - Collector axis
  - Building platform axis
  - Please be aware, that not all axes exist on all machines. Please refer to the documentation for more details.
- 105314: There is a new endpoint in WebAPI (/tasks/configuration) to download a file containing all the configuration files needed to generate a task with EOSPRINT or the EOSPRINT SDK. With this new endpoint it is now possible to generate tasks on a remote system and then uploading it via EOSCONNECT Core.
- 125206: In order to simplify the access to user messages via OPC, we introduced a new node (Software.UserMessages.Last). This node can be used via the OPC DataAccess profile and always holds the last user message.
- 132115: User messages now provide a new field with additional diagnostic information. This information can be used by technicians to diagnose machine problems.
- 140219: There are new data points with information about the filter system. These data points are provided via all interfaces:
  - The flow of inert gas measured by RFS 2 and the set point the machine controls against.
  - The differential pressure at the filter in the filter system.
  - The amount of power that should be supplied by the turbine.
  - The flow set point at the turbine.
  - The differential pressure at the turbine and the set point the machine controls against.
  - Please be aware, that not all data exist on all machines. Please refer to the documentation for more details.
- 140662: There is a new endpoint at WebAPI (/diagnostics/opc) for diagnosing OPC connections. This endpoint returns the number of sessions and TCP connections and from where they are originating. This can help finding problems with connectivity, especially a not responding OPC interface in case it is spammed.
- 143119: Besides the already available building platform temperature, we are now providing the set point against which the machine controls, too. The data is provided at all interfaces.

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- 151551: There is new information about the job data files, stored on the machine. You can now access:
  - The size the file consumes on the disk.
  - Whether the file is corrupt.
  - The information is available under the /jobs endpoint of the Web API.
- 151552: We are now introducing minor versions for WebAPI. A new minor version is still compatible with all other major versions with the same number but provides new features.
- 153353: The thresholds for some datapoints have been improved to create less data while still storing the relevant information. This will lead to a reduced database size and the timeseries can now be analyzed more easily by analytics applications. The following data points have been adapted:
  - Recoater axis torque
  - Collector platform position
  - Turbine differential pressure
  - Filter differential pressure
  - Please refer to the documentation for the new values.
- 153741: There is a new endpoint (/diagnostics/logs) in the Web API, providing the log entries for all EOS software running on the machine. These log entries are supposed to help technicians to analyze problems at the machine.
- 153744: You can now download the logfiles of all EOS software via a new Web API endpoint (/diagnostics/logfiles).
- 153753: The installed licenses can now be queried using a new endpoint (/maintenance/licenses) in the Web API.
- 153755: It is now possible to apply new licenses using the Web API. For that, two new endpoints have been added:
  - /maintenance/licenses/request to retrieve a license request file. This can then be sent to EOS.
  - /maintenance/licenses/update to upload the license definition file you got from EOS.
- 156524: We now provide information about the resources used by the machine PC. You can query the following information via all interfaces:
  - Free hard drive memory of the data partition
  - Used memory
  - Total memory
  - CPU load
- 156718: The beam offset used in a job is now available via all interfaces.
- 156895: We introduced minor versioning for OPC (2.1) and Web API (6.1). In future there will be new interface versions with an increased minor version number if the version is still backwards compatible but holds new functionality. Using this policy, clients can identify what functionalities a certain machine supports.
- 157239: The MQTT default configuration changed. All topics are now under the root topic 'EOS-machine'.
- 157326: User messages can now be retrieved for all supported languages ('en', 'de', 'it' and 'fr') for the OPC and Web API interfaces.
- 159948: We now provide more information about a material set used for a build job. For example, the material name and whether the material was customized by the customer. Please refer to the documentation to find all properties now supported.
- Item 160924: EOSCONNECT Core is now using WIBU license runtime in the version 7.40.
- Item 161842: We provide data about the chambers of the dispenser of EOS M4x machines:
  - The chamber count that was calculated by the control software.
  - The chamber count that was used by the machine.

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Known Issues

- Item 165796: If messages with the same event ID are sent in succession at too short intervals, only the first one is transmitted. The next message with the same ID can be sent when the reception of the first one has been acknowledged by the OPC client.
- Item 168290: The OPC value for remoteControlAllowed is returning BadNotSupported on PSW machines. As this node is returning if remote commands are working it should always return a value either true or false. False in case of PSW.

Version 1.6.789.0

Solved Items

- Item 138434: O2 concentration of filter system now reports the correct value for EOS M 300-4.
- Item 138568: Web API endpoints that are not supported on PSW machines, now returning 404 (not
- found).
- Item 139119: Tasks now can be started via EOSCONNECT OPC commands while still being uploaded.
- Item 147201: The data point ProcessChamber/PressureRelative is still returning the absolute pressure for EOS P 500 systems. But it should not be used for this machine type anymore and will be disabled in future versions. You should now use the data point ProcessChamber/PressureAbsolute. Please refer to new functions item 154529.
- Item 152397: With this version, the correct machine state is always returned, no matter if OEE was activated or deactivated in EOSYSTEM.

New Functions

- Item 78479: The problems identified by EOSTATE PowderBed, Exposure OT or Meltpool are now accessible via the Web API. There are two new endpoints. One under /jobs where all problems found in a job can be downloaded as csv file. Another one under /layers where the problems per layer can be accessed.
- Item 100112: As MQTT is gaining more and more popularity, it is now possible to send data from the EOS machines to an MQTT server. The system allows configuration of custom messages, triggers when to send the messages and machine specific data. Please have a look at the documentation, to get familiar with the functionalities.
- Item 128548: The images taken by the EOSTATE Exposure OT and MeltPool systems can now be accessed via Web API. You can now choose the file type (jpg, png, tiff). With this the current endpoint /images, which is only returning EOSTATE PowderBed images, was marked as obsolete but is still working. Nevertheless, you should now use the new endpoints under /layers to access the images.
- Item 136614: For each command there is a new detailed state data point. It gives the cause, why a command might not be executable.
- Item 154529: There is a new data point to return the absolute pressure in the process chamber of EOS P 500 machines. This new datapoint is available via OPC UA, Web API and MQTT. This data is reported in mBar.

Known Issues

- Item 106780: The WIBU service, responsible for handling the licenses, cannot be restarted via the Codemeter Control Center does not work. In order to restart the service, please use the Service Management Console of Windows (Services.msc).:

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Version 1.5.663.0

Solved Items

- Item 120230: When querying the property 'starter' of a job, the user name the user logs on at the system is not returned. Instead the windows user name is returned, which is always the same.
- Item 121437: On some nodes reading an OPC node fails. Subscribing to it works flawlessly.
- Item 121455: The OPC datapoint Info.Material does not change immediatly when changing the material fo the machine. A restart of the machine is needed.
- Item 121690: The exposure unit temperature on M300-4 is logged with a sampling rate of 30s instead of its supposed 1s.
- Item 121973: Sometimes the softwareVersions in OPC server returned NULL.
- Item 123333: The names of fine filter and filter are swapped for P5 machines.
- Item 126033: If an empty password was choosen for Default Supervisor, it could not be used to change authentication settings on the Web UI.
- Item 127414: The material of the job was stating the material set name instead the name of the material.

New functions

- Item 98804: A job can now be started via OPC. An approriate command is now available. Please be aware, that commands are only working when authentication is enabled and with the license 'EOSCONNECT Core Control'. This is working for M300-4, M400(-4) Standalone and P500.
- Item 101801: There are new versions of Web API (V6) and OPC (V2). They hold numerous changes in the structure, but still hold all endpoints from previous versions. The new interface has the following advantages: It is now grouped into modules, so it is more easy to find values. We made both interfaces look as equal as possible, so developers can easily switch between them. With the new structure we are prepared for future developments, as it does not only allow sensor values to be added but configured and calculated ones, too. Further more the Web Api time series ids and tree structure can now be versioned and you can now easily access the current values of all time seriesItem 105505: The dosing factor per layer, set in EOSPRINT, is now available in Web API and OPC.
- Item 105505: The dosing factor per layer, set in EOSPRINT, is now available in Web API and OPC.
- Item 106756: If the machine is in service mode, the process state is now set to maintenance so it can be logged if the machine is being maintained.
- Item 110375: The authentication can now be enabled/disable without restarting the machine.
- Item 117834: The number of OPC connections allowed was increased to 15.
- Item 120189: We are now providing information about the inert gas flow (only EOS M 300-4) and valve.
- Item 120809: The exchange frame can now be loaded and unloaded via OPC. Appropriate commands are now available. Please be aware, that commands are only working when authentication is enabled and with the license 'EOSCONNECT Core Control'. This is working for M300-4, M400(-4) Standalone and P500.
- Item 122651: We are now providing offset and gain on exposure calibrations endpoint.
- Item 124778: The count of items that can be retrieved via Web APi is now available on all endpoints that support pagination (take and skip parameters).
- Item 126078: Information about job scalings configured via EOSPRINT are now available.

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- Item 127821: More detailed information about the machine state are now available. These information can be set via a user interface in EOSCADA and may be used to calculate the OEE of the machines in your factory.
- Item 132203: The layer specific dosage factor is now provided as a property when querying the /layers endpoint.
- Item 139203: In the previous version, only a maximum number of 150 parts could be supplied to parts report endpoint. This was due to the limited size of an URL. Therefore we decided to change the interface, so part ids can be supplied via the body of the request. Now an almost unlimited number of parts can be transmitted.

Known Issues

- Item 138434: O2 concentration of filter system reports 0% on machine EOS M 300-4.
- Item 139119: A task cannot be started via OPC command, while it is still downloaded to the machine.
- Item 138568: Web API endpoints that are not supported on PSW machines, throw an HTTP error 500 (internal error) instead returning 404 (not found).

Version 1.4.1162.0

Solved Items

- Item 129046: Within half an hour, the end point for retrieving images could only be accessed about 15 times.

New functions

General Improvements:

- Item 104064: There is a tool to diagnose common errors of EOSCONNECT Core. It can be started by putting the machine in service mode and starting it via Windows start menu.
- We use a new database system in the background, which boosts overall performance

Improvements Web API:

- Item 64358: The material that is currently in the machine is now accessible.
- Item 39770, 89523: Improvements /jobs endpoint:
  - When accessing the list of jobs ran on the machine, you will now receive more information without querying the details of a job.
  - The list of jobs can now be filtered by the time, it ran.
  - It is now possible to export a job. This can then be opened in EOSYSTEM SmartService.
- Item 89513: The endpoint /parts now provide more information. E.g. the exposure time per part.
- Item 89525: Changes /images endpoint:
  - Powderbed images are now available in high resolution at /images.
  - OT and MeltPool images are not available in this release.
- Item 96362, 112642, 117460: Improvements on sensor endpoints:
  - The humidity and relative pressure in the process chamber can now be accessed.
  - Filter pressures and 02 concentration of the filtering system are now available.

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- The dispenser fill level, inert gas pressure and dosage factor are now available.
- There is now a property which returns if the sensor value was recorded during a job run.
- The isError property does not exist anymore, as now values will be recorded, if the sensor is defect.
- The rate values are recorded is now higher.

➢ Item 98509, 118409: More information about exposure units is available:

- You can now access laser power measurements.
- You can now access scanner calibrations.

➢ Item 100232: There is an endpoint to upload tasks generated with EOSPRINT.

➢ Item 103616: Improvements /usermessages endpoint:

- More information is now provided. Layer height for example.
- The messages can now be filtered by time.
- The messages can now be translated.

➢ Item 108507: There is an endpoint to create reports for jobs, parts and events. A license is needed to make this work.

Improvements OPC UA:

➢ Item 64358: The material that is currently in the machine is now accessible via OPC and Web API.

➢ Item 96362, 117460: New data is available:

- The humidity and relative pressure in the process chamber are now available.
- Filter pressures and 02 concentration of the filtering system are now available.
- 02 concentration in the filtering system is now available.
- The dispenser fill level, inert gas pressure and dosage factor are now available.
- The process chamber door status is now available.

➢ Item 98509: The laser operating time, serial number and other information are available.

➢ Item 106494: Versioning was introduced for OPC so it stays downward compatible in future. All new features are now introduced under the new node v1. The datapoints BuildStart and CoolDownStart are not available anymore.

➢ Item 118913: The message security mode Basic256 of OPC is due to security issues no longer supported. Instead we provide the following: None, Basic256Sha256, Aes128Sha256RsaOaep, AES256Sha256RsaPss.

Known Issues

➢ Item 106780: The Wibu service cannot be restarted using CodeMeter Control Center. This has to be done via services console of Windows.

➢ Item 120230: When querying the property 'starter' of a job, the user name the user logs on at the system is not returned. Instead the windows user name is returned, which is always the same.

➢ Item 121455: The OPC datapoint Info.Material does not change immediatly when changing the material fo the machine. A restart of the machine is needed.

➢ Item 121690: The exposure unit temperature on M300-4 is logged with a sampling rate of 30s instead of its supposed 1s.

➢ Item 121965: The sensor description at Web API of Environment.Humidity states that the unit of the sensor is Ctd. Thats not the case. The values are delivered in %.

- Item 121973: After the first start after an installation or update not all software versions may be available at OPC Server. A restart of the machine solves the problem.
- Item 123058: When shutting down the DataService, an error is logged. This error can safely be ignored.
- Item 123333: The names of fine filter and filter are swapped for P5 machines

Version 1.3.491.0

Solved Items

- Item 98487: In some cases the self-signed certificate, created by EOSCONNECT Core, could not be updated automatically.
- Item 108542: In some cases the endpoint /usermessages was throwing an error.
- Item 112507: The WebAPI endpoint 'SenosorValues' did not work anymore, after to many sensor values were logged.
- Item 112508: The configuration of EOS Hub server was quite complicated. This was simplified. To configure the server, now only the following file has to be changed:
- Item117595: It was possible to edit the users of EOSCADA, by injecting SQL commands into the user name while authorizing for the AuthorizationSettings. %ProgramData%\EOS\EOSCONNECT\settings\ eos.connect.core.liveDataService.json
- Item 117945: In some rare cases the memory of EOSCONNECT continuously increases with decreasing. That is fixed now.

Version 1.3.402.0

Important information

With the next release, the versions V1 and V2 of WebAPI will not be available any longer. In this release they are still supported.

Solved items

- Item 52880: The LayerCount of the current job was too high, after the last layer was built.
- Item 91977: Previously the certificate generated and used by EOSCONNECT needed to be deleted after changing the hostname of the machine.
- Item 102555: When connecting to the machine via browser by using a FQDN (fully qualified domain name) like SI0001.company.de, it was not possible to login to the authorization settings. The login page did not load.

New functions

- Item 44988: There is now a documented and tested way to use caching for the OPC UA interface.
- Item 94995, 96362, 101730: There are new data points on WebApi.
  - The torque of recoater axis (EOSYSTEM, all machines)
  - Recoater position (EOS M300-4)
  - Fill level of dispenser (EOS M400-4)
  - Environment temperature and humidity (EOS M290, EOS M300-4, EOS M400, EOS M400-4)
  - O2 concentration in process chamber (EOS M300-4)

- O2 concentration on bottom of process chamber (EOS M300-4, EOS M400-4)
- Building platform position (EOS M400-4)
- Process chamber door opened (EOSYSTEM, all machines)
- Process chamber humidity (EOS M290, EOS M300-4, EOS M400, EOS M400-4)

➢ Item 94995, 96362: There are new data points on OPC UA.

- The torque of recoater axis (EOSYSTEM, all machines)
- Process chamber door opened (EOSYSTEM, all machines)
- Process chamber humidity (EOS M290, EOS M300-4, EOS M400, EOS M400-4)

➢ Item 96362: The paths of some data points are changed.

- The sensor value O2Concentration.Bottom is not supported anymore for EOS M 290, as there is no sensor.
- O2Concentration => O2ConcentrationTop
- O2Concentration.Top => O2ConcentrationTop
- O2Concentration.Bottom => O2ConcentrationBottom

➢ Item 98807: The running job can now be paused and resumed via OPC UA interface. The License EOSCONNECT Core Control is needed for that.

Known Issues

➢ Item 98487: The certificate generated by EOS on installation is valid for one year. It can happen, that the certificate is not regenerated after this time. To work around this problem you may apply your own certificate or start all EOSCONNECT services as user .\eosint.

➢ Item 103623: There are sensor values provided, that are not actually measured. This data points will be removed in one of the next versions:

- EOS.Machine.Sensors.Dispenser.Speed
- EOS.Machine.Sensors.BuildingPlatform.Speed
- EOS.Machine.Sensors.Recoater.Speed

➢ Item 106780: The WIBU service, responsible for handling the licenses, cannot be restarted via the Codemeter Control Center does not work. In order to restart the service, please use the Service Management Console of Windows (Services.msc).

Version 1.2.1110.0

Solved Items

➢ Item 67667: In some rare cases it could happen that the deletion algorithm of sensor values took too long causing a potential impact on available memory on disk.

➢ Item 69202: It was possible to create so many OPC Server queries per second that the CPU usage of the IPC can be driven to 100%. This is possible as the LiveDataService is currently not restricted to using only 1 core and its priority is set to normal, which is the same priority as HCS. .

➢ Item 74595: To be consistent with EOSYSTEM SmartService, EOSTATE Everywhere and the EOSTATE Job Quality Report, an EV_ID > 40000 will now be reduced by 40000 before it is displayed to the user.

➢ Item 97222: If a job on a M4x is paused by the machine because of an error and the user cancels the job, the OPC data points ProcessState, ProcessStateAM and ProcessStateEOS will keep its values forever. This condition can be changed by the following actions:

- Set the machine into maintenance mode.

- Open the Service Management Console (services.msc).
- Restart the EOSCONNECT Live Data Service.

New Functions

- Item 59144: The documentation on the UPC UA interface as well as the web API can be viewed from the machine PC using a browser connection.
- Item 61461: EOSCONNECT Core now supports several time-based values from our new machines of type EOS M 300-4 and EOS P 500. Detailed information can be found in the online documentation.
- Item 62679: The user can configure a password for data access via the EOSCONNECT interfaces.
- Item 67899: EOSCONNECT Core now supplies information on the software versions installed on the machine and additional machine information via the OPC UA and web API interfaces. Detailed information can be found in the online documentation.
- Item 66053: EOSCONNECT Core can now make available images and part information via the web API. Details on the information can be found in the online documentation.
- Item 61462: EOSCONNECT Core now supports additional time-based sensor values. Detailed information can be found in the online documentation.

Known Issues

- Item 91977: When using an EOSCONNECT generated certificate, this certificate has to be removed manually after renaming the machine hostname. Otherwise the authentication won't work anymore. In order to do so, follow these steps:

  - Put the machine into maintenance mode.
  - Open the Microsoft Management Console (mmc.exe) as Administrator. Click File > Add/Remove Snap-in and then add the Certificates Snap-in for Computer account (Local computer) into the console.
  - Select the folder Personal/Certificates in the certificate store and delete the EOSCONECT Core certificate. It will be recreated automatically later.

Version 1.1.19085.1

New Functions

- Item 60987: The following additional information is provided with version 2 of the WebAPI:
  - Access to the versions of the WebAPI supported by the machine
  - Access to additional information about the machine (model name, product name, host name, software versions)
  - Layer information for sensor values
  - Layer information has been expanded by layer count and absolute height
  - For improved security, TLS 1.1 and TLS 1.2 are now supported with this version.

Known Issues

- Item 97222: If a job on a M4x is paused by the machine because of an error and the user cancels the job, the OPC data points ProcessState and ProcessStateEOS will keep its values forever. This condition can be changed by the following actions:
  - Set the machine into maintenance mode.

- Open the Service Management Console (services.msc).
- Restart the EOSCONNECT Live Data Service.

Version 1.0.18311.2

General Information

- EOSCONNECT Core is released for the first time with Edition 10.18, therefore no previous version exists.
- EOSCONNECT Core works exclusively with EOSYSTEM greater / equal to Edition 04.18
- EOSCONNECT Core runs on the machine PC as a separate service.

Important Note

- For operation with EOSYSTEM Edition 04.18, the installation of DB2 V11 drivers is also required. These must be installed by running the file "PreInstall.bat" before installing the EOSCONENCT Core Setup (on the machine PC).

New Functions

- Item 58420: Via OPC UA Interface, live data can be requested from the machine.
- Item 58421: Machine events can be queried via the OPC UA interface.
- Item 58423: The documentation of the UPC UA interface as well as the Web API can be viewed by means of a browser connection to the machine PC.
- Item 58418: Historical data can be read from the machine via the Web API.
- Item 47246: Quality data of the machine can be read out via the Web API.

Known Issues

- Item 64792: In some cases, after acknowledging one or more errors reported on the machine, at the OPC UA interface the datapoints "ID" (JobID), "LayerThickness", "MaterialName", "OrderId" and "Starter" may deliver invalid values (GoodNoData), even if the datapoint "ProcessState" reports an ongoing build process.

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