# MOTION CONTROLLERS CATALOG


May 2025

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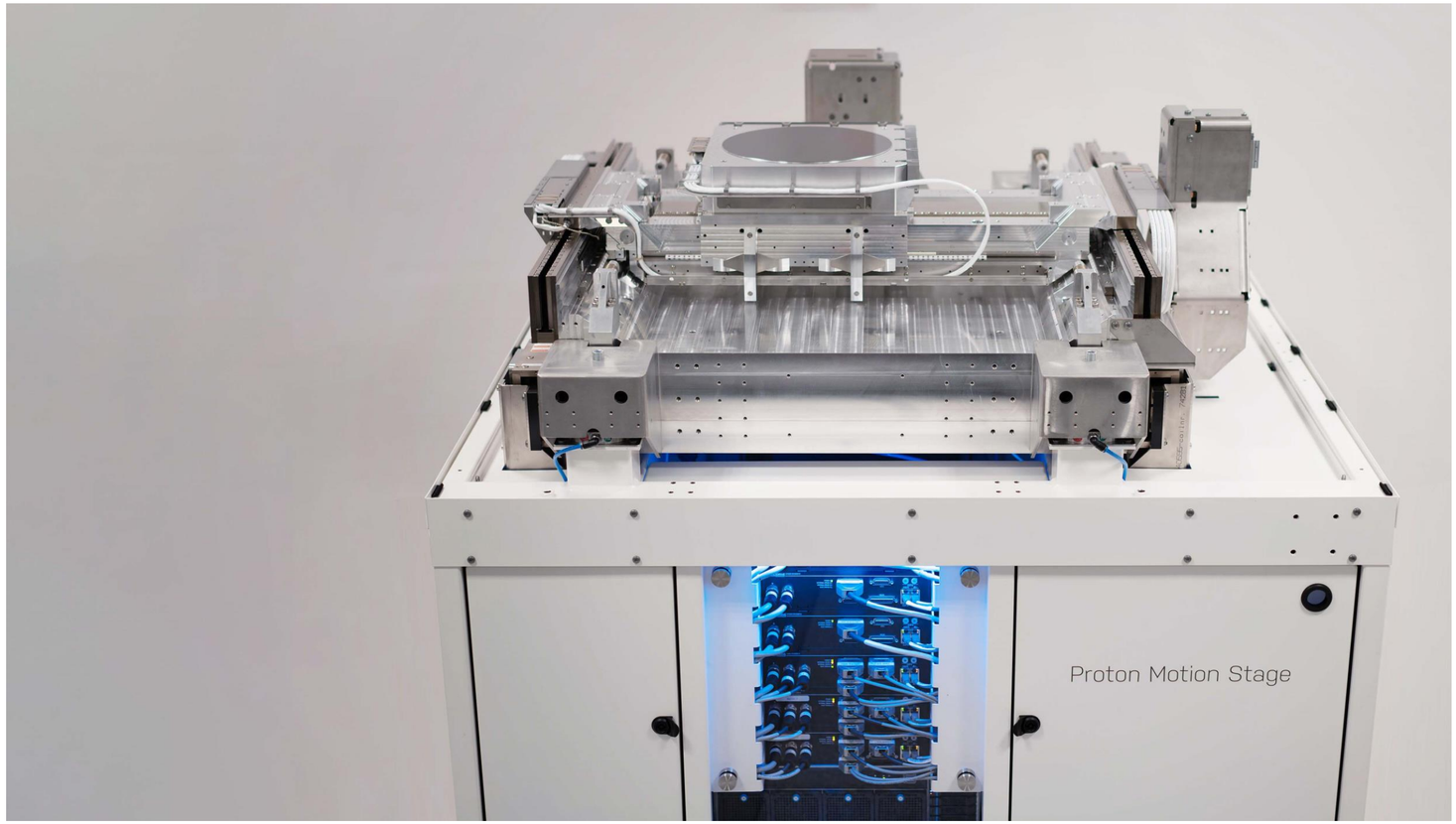



Motion stage for wafer inspection, controlled by a Poseidon

# CREATING MEANINGFUL TECHNOLOGIES THAT MAKE THE WORLD WORK

## Knowledge

Engineering excellence is the driving force behind servo drive innovation in both design and manufacturing. Prodrive has a highly skilled group of electrical, mechanical and software engineers capable of customizing drive technology towards your needs.

## Quality

Quality is in the DNA of Prodrive Technologies. With a long history in electronics manufacturing, Prodrive continues in this area with the same philosophy and processes, setting a new standard within the servo drive market.

## Automation

Design for manufacturing is key to reduce cost and guarantee quality. Circuit board manufacturing, testing and assembly are highly automated processes which guarantee a constant quality at minimum cost.

## Time to market

Due to the agility of Prodrive Technologies' large development department, customization can be performed in a very short time, providing a short time to market for challenging mechatronic applications.


Prodrive Technologies HQ Campus, The Netherlands

# OVERVIEW – MOTION CONTROLLERS


## Arcas

ARM-based embedded control solution for EtherCAT®[1] motion control networks with up to 12 axes at 10kHz.


## Poseidon EGS

x86-based powerful control solution for EtherCAT®[1] based motion control networks with up to 28 axes at 20kHz for the base variant. Higher peformance variants available on request.

Note 1: EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

# ARCAS

Introducing the Arcas Motion Controller — a beacon of exceptional performance seamlessly packed into a compact form factor. Designed to meet the demands of motion-intensive applications, this controller excels with precision, offering control for up to 12 axes at an impressive 10kHz.

Setting new standards, the Arcas motion controller effortlessly supports high-performance EtherCAT® drives, ensuring a seamless integration into advanced motion systems.

Built to endure, the Arcas stands out as the ideal choice for applications demanding longevity. With a robust commitment to support, it boasts an extended lifecycle of over 10 years, guaranteeing reliability and continuity for your evolving needs. Elevate your motion control experience with the unparalleled capabilities of the Arcas motion controller.

- Quad-core ARM processor @ 1.5GHz
  - Up to 12 axes @ 10kHz
  - More axes at lower update frequencies

- Connectivity
  - 1x Gigabit Ethernet host interface
  - 1x EtherCAT® MDevice bus

- I/O
  - 4x 24V digital inputs
  - 4x 24V digital outputs
  - 2x High-speed differential outputs for position based triggering

- Panel or DIN rail mounting


Arcas motion controller

# ARCAS – CONFIGURATIONS


Arcas motion controller

**PMP-Arcas-5EG-AA**

Storage configuration:
- A 1x 512Mb flash memory

Memory configuration:
- A 1x 8Gb LPDDR4

Processor type:
- 5EG Xilinx Zynq UltraScale+

Controller series

| Configuration | Prodrive Product Number |
|---|---|
| PMP-Arcas-5EG-AA | 6001-2011-2501 |

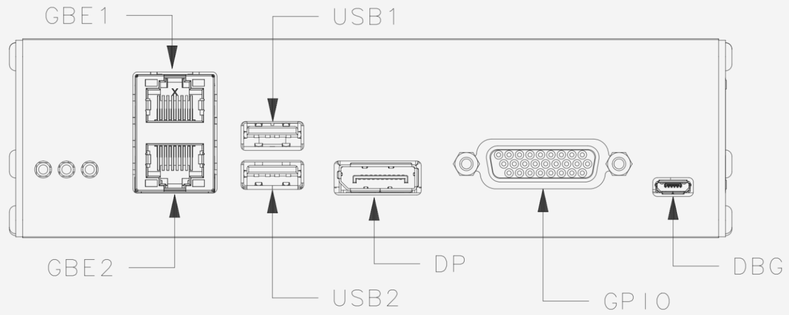
Arcas order information

# ARCAS – INTERFACE SPECIFICATIONS

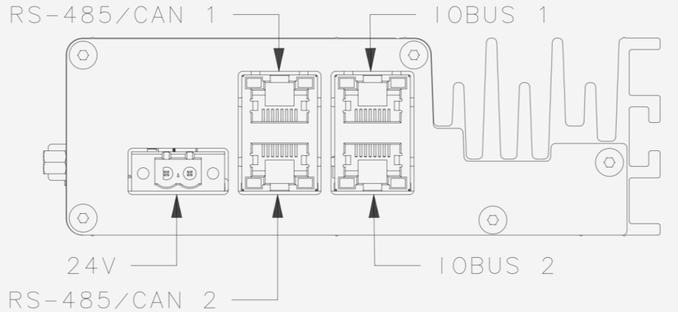
| | Parameter | Symbol | Unit | Arcas 5EG | Remark |
|---|---|---|---|---|---|
| GBE1 | Interface specification | - | - | Host interface | |
| GBE1 | Speed | - | Mbps | 10/100/1000 | |
| GBE2 | Type | - | - | EtherCAT® MDevice interface | |
| GBE2 | Speed | - | Mbps | 10/100/1000 | Set to 100Mbps for EtherCAT® communication |
| USB | Number of interfaces | - | - | 2 | |
| USB | Type | - | - | USB 3.0 | Used for mass storage devices |
| USB | Rated current | - | A | 2 | Combined for both USB interfaces |
| RS485 | Number of interfaces | - | - | 2 | Used for position based triggering |
| RS485 | Interface specification | - | - | TIA/EIA-485A | |
| RS485 | Communication speed | - | Mbps | up to 50 | |
| GPIO | Isolated digital inputs | - | - | 4 x 24V | ($V_{IH}$≥11V, $V_{IL}$≤5V, $I_{IN}$<15mA) |
| GPIO | Non-isolated digital outputs | - | - | 4 x 30V / 500mA | |
| GPIO | Electrical isolation | - | V | 60 | |
| microSD | Number of interfaces | - | - | 1 | High Speed mode supported |
| 24V | Supply input voltage | $V_{SUPPLY}$ | V | 12 - 24 | |
| 24V | Supply input voltage, abs. max | $V_{SUPPLY\_ABS\_MAX}$ | V | 28 | |
| 24V | Idle power | $P_{SUPPLY\_IDLE}$ | W | 7 | |
| 24V | Maximum input power | $P_{SUPPLY\_MAX}$ | W | 35 | |

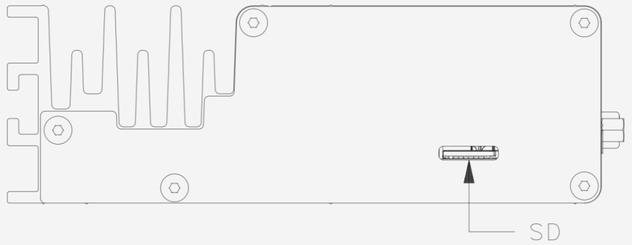
Note: CAN, IOBUS, DisplayPort and DBG are intended only for Prodrive Technologies proprietary usage

## Arcas front view




## Arcas side views

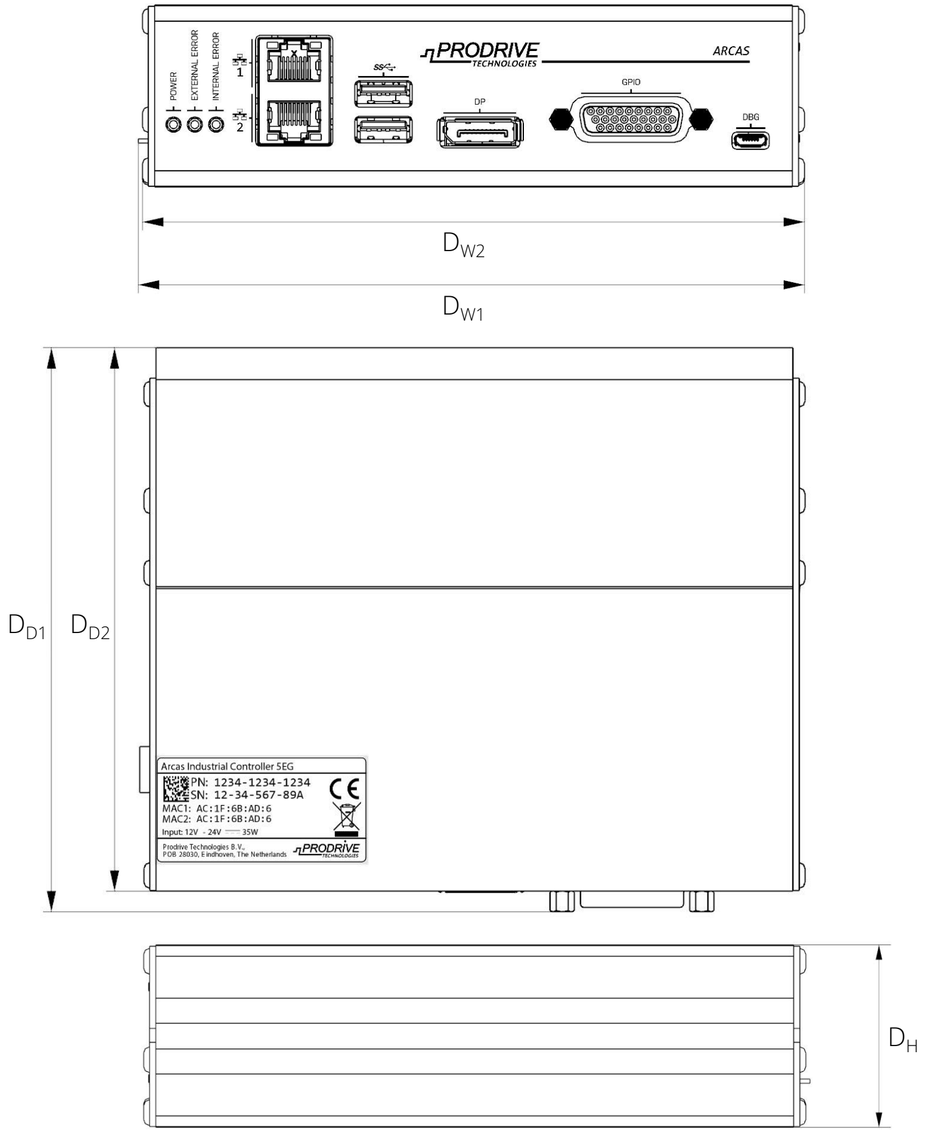


# ARCAS – MECHANICAL & ENVIRONMENTAL SPECIFICATIONS

| | Parameter | Symbol | Unit | Arcas 5EG | Remark |
|---|---|---|---|---|---|
| Mechanical | Width | $D_{W1}$ | mm | 158.80 | MicroSD card connected |
| | | $D_{W2}$ | mm | 157.80 | |
| | Depth | $D_{D1}$ | mm | 134.55 | Including GPIO connector |
| | | $D_{D2}$ | mm | 129.65 | |
| | Height | $D_H$ | mm | 43.40 | |
| | Mass | mass | kg | 0.83 | |
| Environmental | Ambient temperature during operation | $T_{Ambient, operating}$ | °C | 0 - 45 | Note 1, 2 ,3 |
| | Ambient temperature during storage | $T_{Ambient, storage}$ | °C | -25 - 70 | |
| | Relative humidity during operation | $RH_{Ambient, operating}$ | % | 10 - 90 | Non-condensing |
| | Relative humidity during storage | $RH_{Ambient, storage}$ | % | 10 - 95 | Non-condensing |
| | Altitude during operation | $Alt_{operating}$ | m | 0 - 5000 | |
| | MTBF | MTBF | kHrs | >1000 | Steady state mean time between failures |
| Directives | Electromagnetic Compatibility | - | - | EMC Directive 2014/30/EU | |
| | Low Voltage | - | - | LV Directive 2014/35/EU | |
| | Restriction of Hazardous Substances | - | - | RoHS Directive 2011/65EU | |
| | Waste Electrical and Electronic Equipment | - | - | WEEE Directive 2012/19/EU | |
| | Registration, Evaluation, Authorisation and Restriction of Chemicals | - | - | REACH EC 1907/2006 | |
| Standards | Safety | - | - | IEC 62368-1 | DEKRA certified<br>Includes national deviations for EU, US/Canada and China |
| | Electromagnetic Compatibility (Immunity) | - | - | IEC 60001-6-1 | |
| | Electromagnetic Compatibility (Emissions) | - | - | EN 55011 | |
| | Shock & Vibration | - | - | IEC 60068-2-27 | |

Note 1: Operating temperature derating is reduced by 1[°C]/300m above 1000m



# POSEIDON EGS

Introducing the Poseidon EGS Motion Controller series — a peak of unparalleled performance designed to master the challenges of the most demanding motion applications.

The Poseidon EGS facilitates synchronized control across all available EtherCAT® buses, offering the flexibility to allocate individual buses for distinct sections of a single machine or to enable low-latency control of individual connected EtherCAT® devices.

Tailored to meet the stringent requirements of the medical and semiconductor industries, the Poseidon EGS Motion Controller stands out with its extended lifecycle support, ensuring reliability and continuity for applications with enduring demands. Elevate your precision control experience with the Poseidon EGS — a testament to exceptional performance and longevity.

- 4 core x86 processor @ 2.4GHz[1]
  - Up to 28 axes @ 20kHz
  - Up to 70 axes @ 10kHz
  - More axes at lower update frequencies

- Connectivity
  - 1x Gigabit Ethernet host interface
  - Up to 16 synchronized EtherCAT® MDevice buses

- 19” rack mounting

- Rear connectivity

Poseidon EGS motion controller

Note 1: Higher core counts and core frequencies on request

# POSEIDON EGS – CONFIGURATIONS

Poseidon EGS motion controller, 1U with rear side connectivity

| Configuration | Prodrive Product Number |
|---|---|
| PMP-Poseidon-EGS-4510-AAA-1UR-CA-B | 6001-2501-5200 |

Poseidon EGS order information for preferred configurations. Other configurations are possible with longer leadtime.

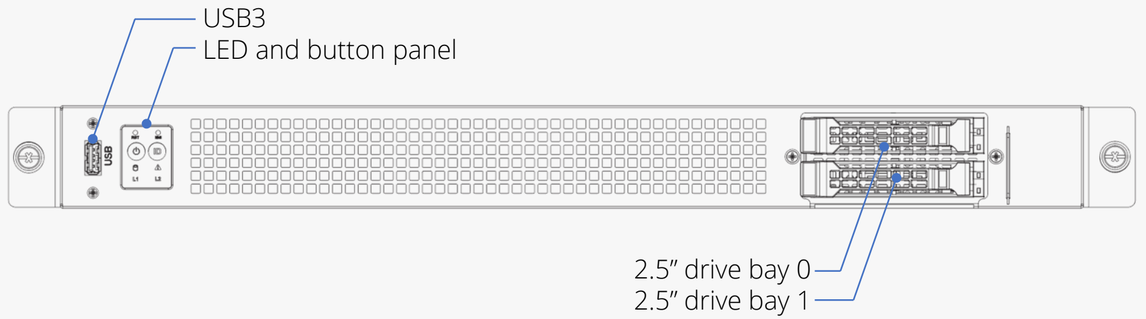
**PMP-Poseidon-EGS-4510-AAA-1UR-CA-B**

- Power supply
  - B — Redundant supplies
- PCIe slot configuration:
  - A — No add-in cards
  - C — 2x Intel i350-T4
- OCP 3.0 slot configuration:
  - C — 2x Intel i350-T4
- Housing form-factor:
  - 1UR — 19” 1U Rear side connectivity
- Front panel storage:
  - A — No front panel storage
- Storage configuration:
  - A — 1x 480/500/512GB M.2 SSD
- Memory configuration:
  - A — 2x 16GB ECC DDR5
- Processor type:
  - 4510 — Intel® Xeon® Silver 4510
- Controller series

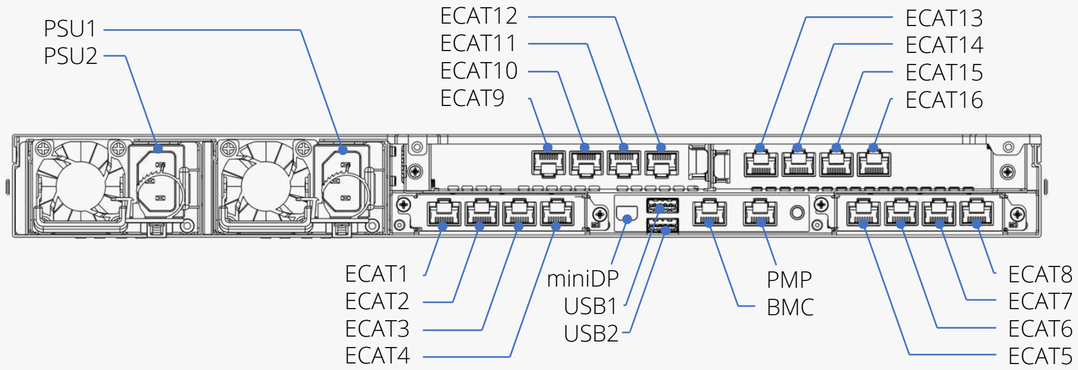
# POSEIDON EGS – INTERFACES SPECIFICATIONS

| | Parameter | Symbol | Unit | Poseidon EGS | Remark |
|---|---|---|---|---|---|
| PMP | Type | - | - | PMP host interface | |
| | Speed | - | Mbps | 10/100/1000 | |
| BMC | Type | - | - | Management interface | |
| | Speed | - | Mbps | 10/100/1000 | |
| ECAT | Interface 1 - 16 | | | | ECAT 9-16 only available for PCIe option C |
| | Type | - | - | EtherCAT® MDevice interface | |
| | Speed | - | Mbps | 10/100/1000 | |
| USB | Interface 1 - 2 | | | | |
| | Type | - | - | USB 3.2 Gen 1 | Not available in PMP |
| | Rated current | - | A | 1.8 | Per 2x USB 3.2 ports |
| | Interface 3 | | | | |
| | Type | - | - | USB 3.2 Gen 1 | Not available in PMP |
| | Rated current | - | A | 1.8 | |
| Storage | Interface 1 - 2 | | | | |
| | Form factor | - | - | 2.5" drive bay | Not available in PMP |
| | Size | - | Gb | - | Can be configured on request |
| miniDP | Compatibility | - | - | DisplayPort 1.1a | Not available in PMP |
| | Resolution | - | - | 1920x1200 | Max |
| | Frequency | - | Hz | 60 | Max |
| PSU | Type | - | - | 1+1 800W AC redundant | 80 PLUS Platinum |
| | Input voltage low | $V_{IN\_LOW}$ | V | 100 - 127 | |
| | Input voltage high | $V_{IN\_HIGH}$ | V | 200 - 240 | |
| | Input frequency | $F_{IN}$ | Hz | 50 - 60 | |
| | Input current low | $I_{IN\_LOW}$ | A | 10 | Max current for low input voltage (110V) |
| | Input current high | $I_{IN\_HIGH}$ | A | 4 | Max current for high input voltage (230V) |

## Poseidon EGS 1UR – front




## Poseidon EGS 1UR – rear

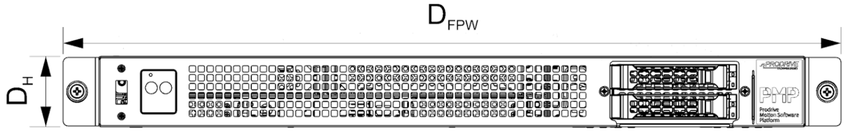



PMP-Poseidon-EGS-4510-AAA-1UR-CC-B with 16 EtherCAT ports

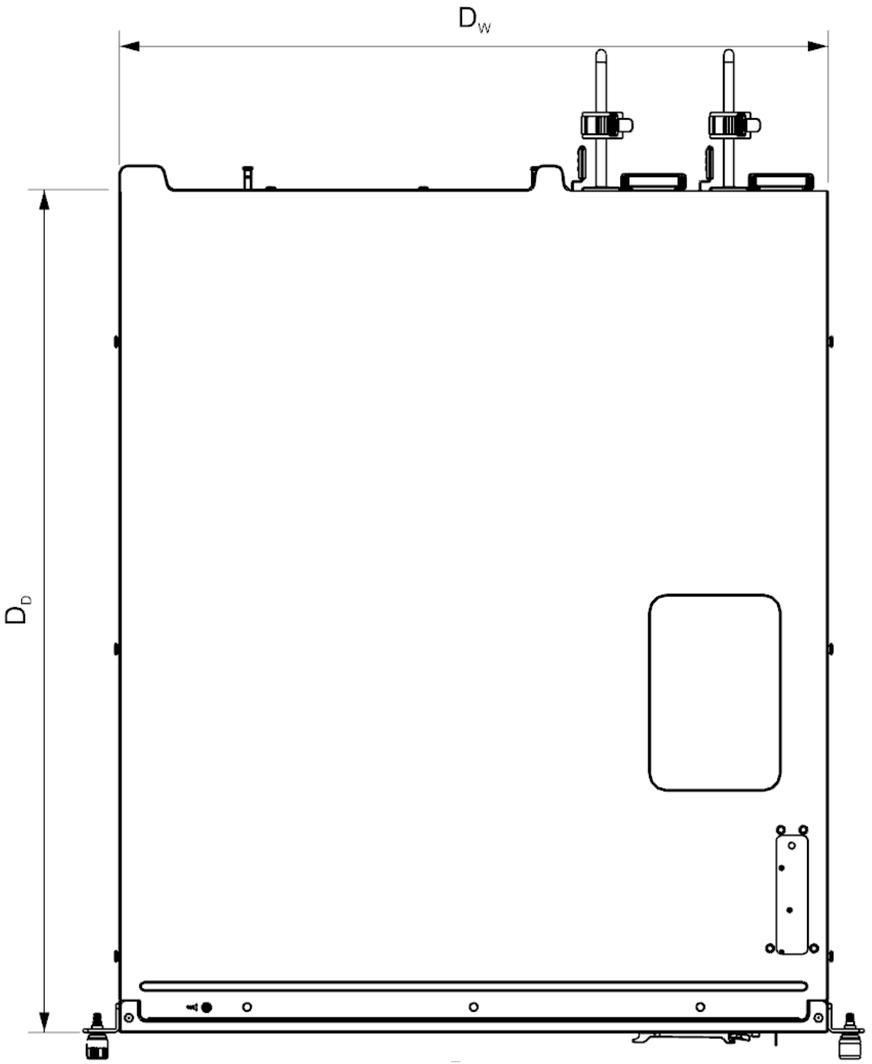
# POSEIDON EGS – MECHANICAL & ENVIRONMENTAL SPECIFICATIONS

| | Parameter | Symbol | Unit | Poseidon EGS | Remark |
|---|---|---|---|---|---|
| Mechanical | Height | $D_H$ | mm | 45.00 | |
| | Front panel width | $D_{FPW}$ | mm | 482.00 | |
| | Width | $D_W$ | mm | 438.00 | |
| | Depth RIO | $D_D$ | mm | 538.00 | |
| Environmental | Ambient temperature during operation | $T_{Ambient, operating}$ | °C | 10 - 35 | Note 1 |
| | Ambient temperature during storage | $T_{Ambient, storage}$ | °C | -40 - 60 | |
| | Relative humidity during operation | $RH_{Ambient, operating}$ | % | 8 - 80 | Non-condensing |
| | Relative humidity during storage | $RH_{Ambient, storage}$ | % | 20 - 95 | Non-condensing |
| | Air pressure at fan inlet | $P_{Air,inlet}$ | kPa | 70 - 120 | |
| | Altitude during operation | $Alt_{operating}$ | m | 0 - 5000 | |
| Directives | Electromagnetic Compatibility | - | - | EMC Directive 2014/30/EU | |
| | Low Voltage | - | - | LV Directive 2014/35/EU | |
| | Restriction of Hazardous Substances | - | - | RoHS Directive 2011/65EU | |
| | Waste Electrical and Electronic Equipment | - | - | WEEE Directive 2012/19/EU | |
| | Registration, Evaluation, Authorisation and Restriction of Chemicals | - | - | REACH EC 1907/2006 | |

Note 1: Operating temperature derating is reduced by 1[°C]/300m above 1000m




Poseidon EGS 1UR front view




Poseidon EGS 1UR top view

# SOFTWARE

All Prodrive motion controllers operate using the powerful and versatile **Prodrive Motion software Platform** (PMP). PMP is our real-time software, developed from years of experience in motion control across various industries and customer applications. Many players in the motion industry have recognized this platform's capabilities, using it to elevate their motion solutions.

What sets PMP apart from other motion software systems is its reliable **real-time performance** for **centralized, distributed, and hybrid control** of motion systems. It features multiple parallel EtherCAT® buses with **frequencies up to 20kHz**.

We also offer extensive opportunities for **control structure optimization** and tuning. Our **MATLAB® Simulink®** code generation and C++ toolchains allow for seamless integration of custom algorithms into our controllers.

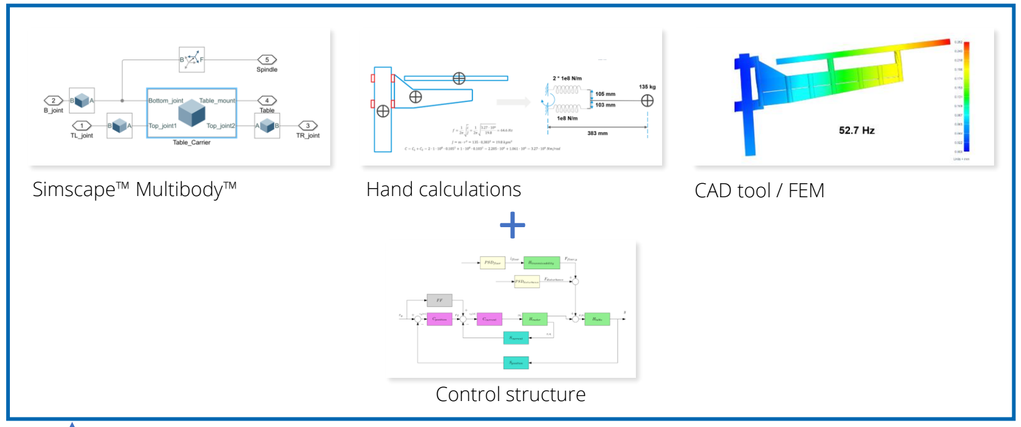
Our comprehensive API is available in **C++ and C#**. Through .NET integration, it can also be utilized in **Python.NET™ and MATLAB ®**. Additionally, we provide a software simulator that runs on both **Windows® and Debian™ Linux®**, allowing users to start development without requiring physical hardware controllers.

The motion platform is completed by our **tool suite** for initial integration and debugging the system without the need to write a single line of code. This tool suite fully supports our API, from data acquisition to command queueing.

PMP Prodrive Motion Software Platform

Debug & integration tool suite

# SOFTWARE – CONTROL STRUCTURE CUSTOMIZATION




While conventional motion platforms impose fixed control structures, our PMP controllers offer a groundbreaking **blank canvas approach**. With PMP, users are not constrained by pre-defined configurations; instead, you have the freedom to **deploy any control structure you envision**.

The PMP software empowers users to design and implement custom control structures using **Simulink® code generation** or handwritten **C++.** This allows people to (re)use any control IP that has been developed in the past.

Our intuitive code generation toolchain facilitates the creation of binary files directly from these Simulink® models or handwritten C++. These binaries files can be seamlessly uploaded to our controllers, or to the Windows and Debian Linux simulator, ensuring smooth integration into the workflow.

For axes that do not require special control structures, we also provide pre-configured **default control networks and processing blocks**. From feedforward to advanced feedback control systems, our comprehensive library of processing blocks supports a wide range of applications.

The generated binaries typically run synchronously within the isochronous sample loop to minimize I/O delay. However, if computationally heavy code is required, it can be run **asynchronously** at a lower frequency compared to the rest of the system.

Explore our documentation for control loop customization and processing blocks to unlock the full potential of your motion platform.

# SOFTWARE – CONTROL TOPOLOGIES

We provide seamless interoperability with 3rd party EtherCAT® drives. For each axis of a CiA402 SubDevice, a physical axis control is automatically instantiated on our motion controller, offering a range of powerful features:

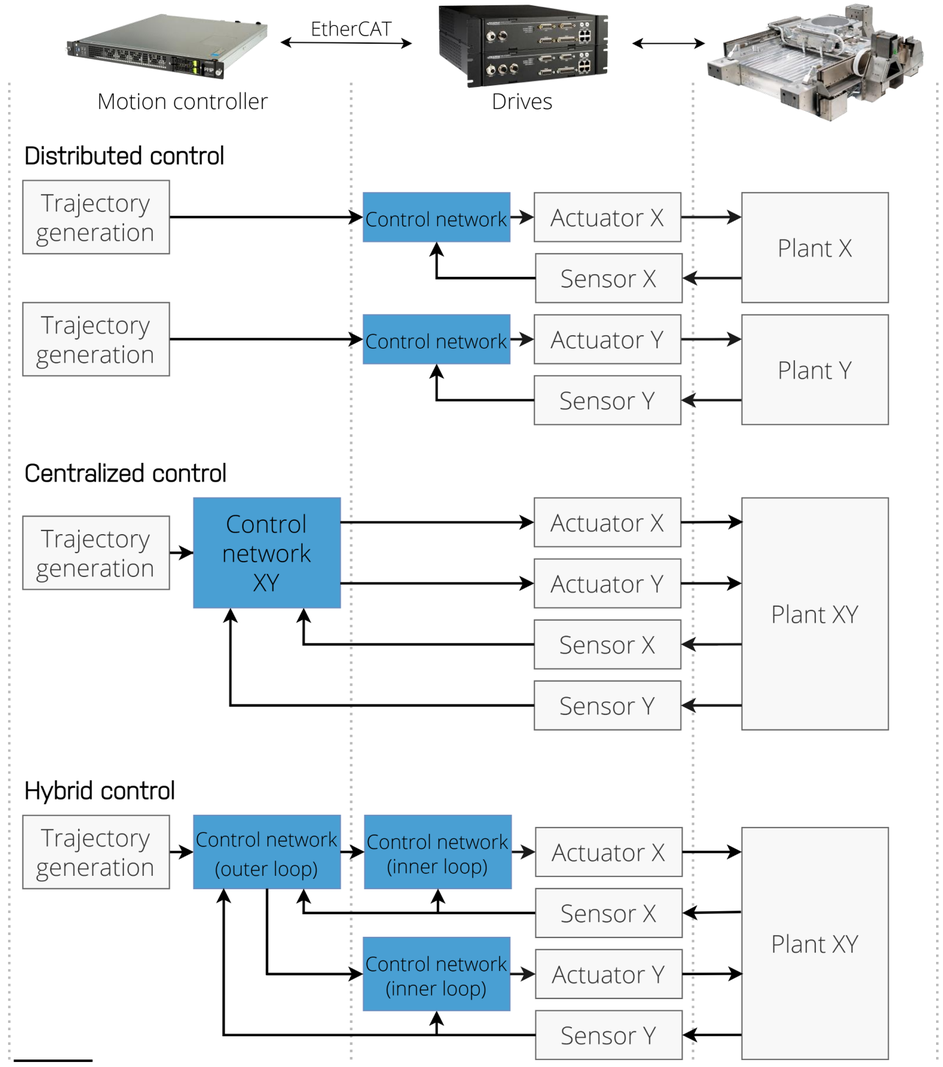
- **State machine:** Directly linked to the actuator's CiA402 state.
- **Command queue:** Enables real-time execution of commands.
- **Trajectory generator** and interpolator: **Facilitates** smooth and efficient motion.
- **Event responders**: Allows autonomous actions on the motion controller.
- Advanced **homing and alignment** methods: Ensures precise positioning and efficient control.

PMP offers the flexibility to choose the control strategy that best fits your application.

- **Distributed control**: The control loops are run on the SubDevices. This method achieves the highest possible sample frequency and lowest IO delay but is typically suitable only for SISO (single input single output) systems. It is commonly used for stages with positioning accuracy greater than 1µm or for systems with axes.

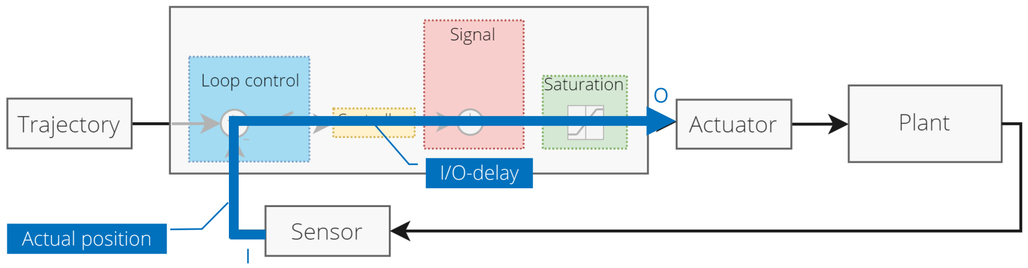
- **Centralized control**: All control loops are run on the motion controller, while the SubDevices handle only IO tasks. Required to get the best performance for systems with any coupling between axes, for example when moving one axis causes vibrations in another axis. This method requires high communication bandwidth, typically has a higher I/O delay, and needs a powerful motion controller to run multiple control loops at high sample frequencies. It is typically used for stages with sub-100nm positioning accuracy, where all axes have some coupling.

- **Hybrid control**: Allows performance of distributed control for axes that are/can be fully decoupled and centralized control for axes that require it. This is typically used for cascaded control, such as a position outer loop combined with a velocity inner loop.

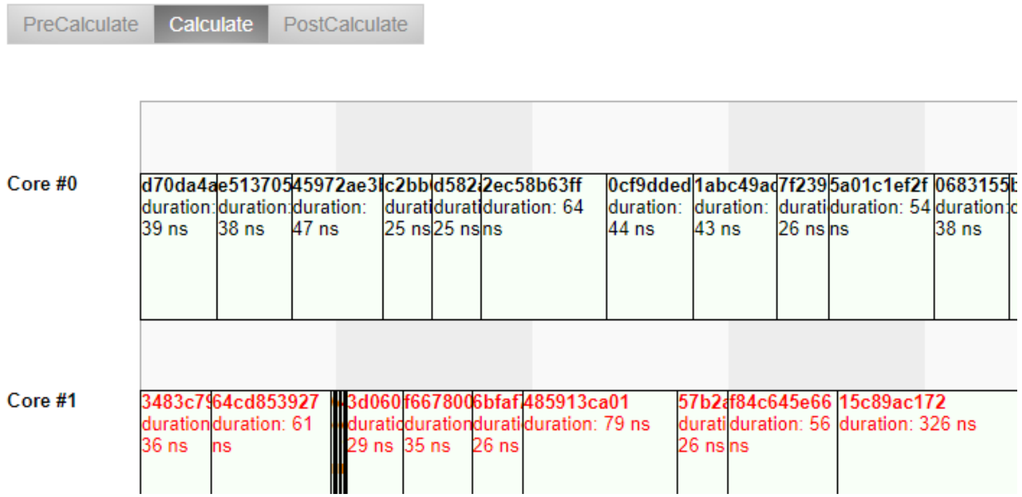



Distributed vs centralized vs hybrid control topology

# SOFTWARE – HIGH LEVEL CONFIGURATION




I/O delay is the time between reading sensors and actuation




Multi core schedule overview for the calculate phase of core #0 and #1

When deploying a complex control structure, you expect nothing less than peak performance. Our controllers are built to deliver precision, offering configurable sample frequencies ranging from 200 Hz to 20 kHz. The maximum feasible frequency depends on a few factors, such as the controller's performance, the number of connected EtherCAT® devices, PDO data, and the complexity of the control structure. Our hardware provides a range of options to match users' desired performance and budget.

However, performance is more than just numbers – it is about optimization. Our control structure deployment is engineered for maximum efficiency and minimal I/O delay.

How do we achieve this? Through advanced techniques such as:

- Multi-core task scheduling: Our controllers intelligently distribute the workload across all available real-time cores, ensuring optimal resource utilization.
- Automatic calculation order determination: By automatically determining the calculation order based on input connections, our controllers streamline operations and eliminate unnecessary delays.
- Automatically PDO data determination, optimizing system performance without compromising functionality. Based on input connections, this function streamlines operations and reduces unnecessary overhead.
- Time-critical distinction: We prioritize time-critical calculations, reducing I/O critical time and ensuring smooth operation, even under demanding conditions.

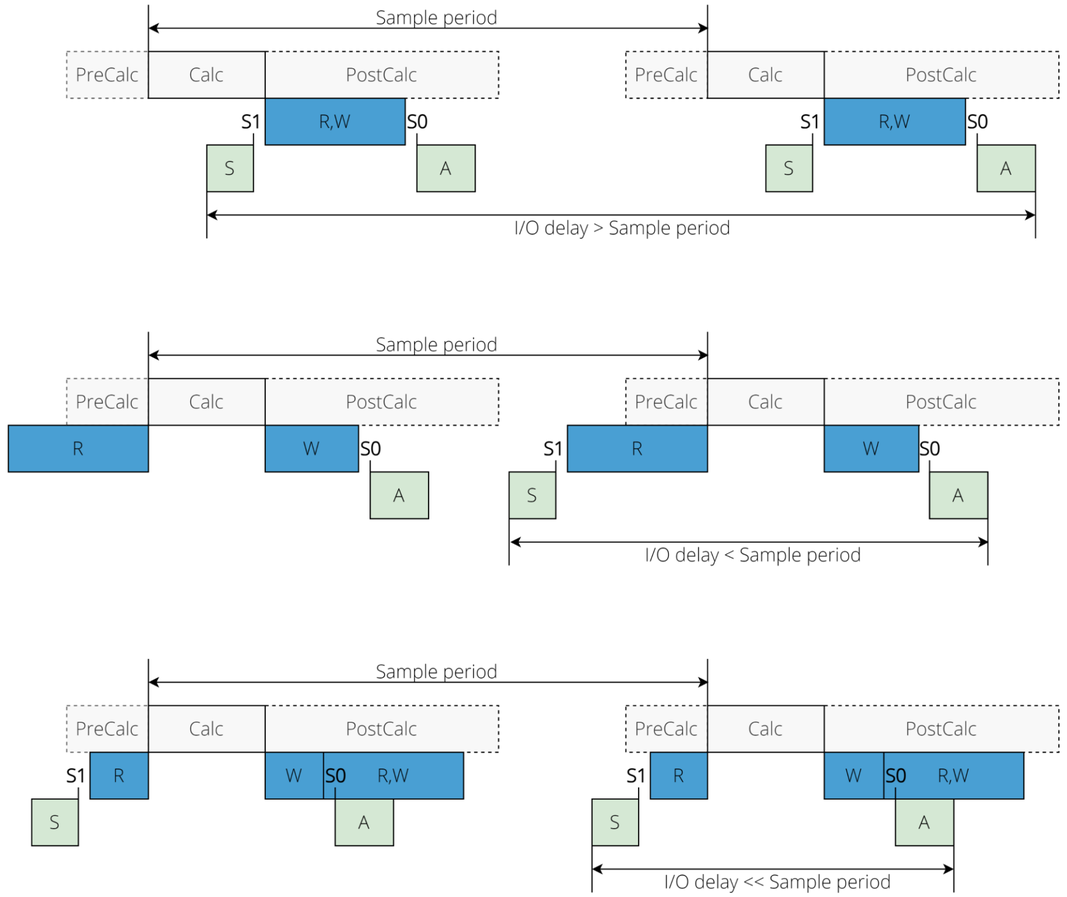
Once an optimal configuration is found, it can be downloaded and deployed on other controllers. With PMP controllers, users don't just get high performance, they get performance optimized to perfection.

# SOFTWARE – ETHERCAT® MULTIPLE PACKET MODES

Minimizing I/O delay is crucial in centralized control, and that's where we excel. Our team specializes in maximizing EtherCAT ® potential to deliver performance that exceeds expectations. With bus frequencies ranging from 200 Hz to 20 kHz, our motion controllers provide unparalleled speed and responsiveness, ensuring seamless operations.

To further reduce I/O delay, we offer **multiple packet modes** tailored to users' specific needs:

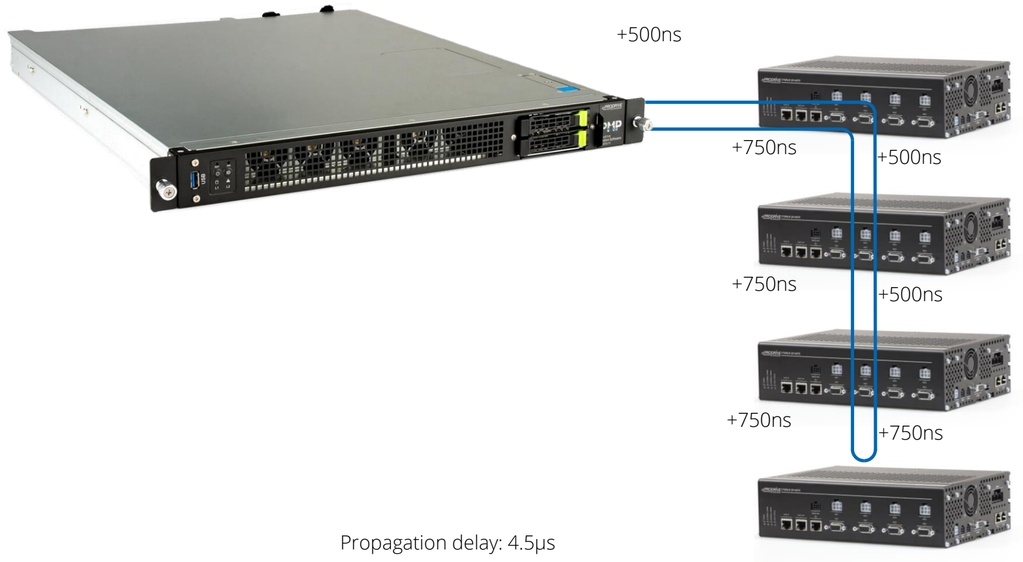
- **Standard** (1 packet): Combines read and write packets for traditional operations.
- **Read/write separated** (2 packets): Separates read and write packets to minimize I/O delay.
- **Critical I/O prioritized** (3 packets): Prioritizes critical I/O data over other data for peak performance.



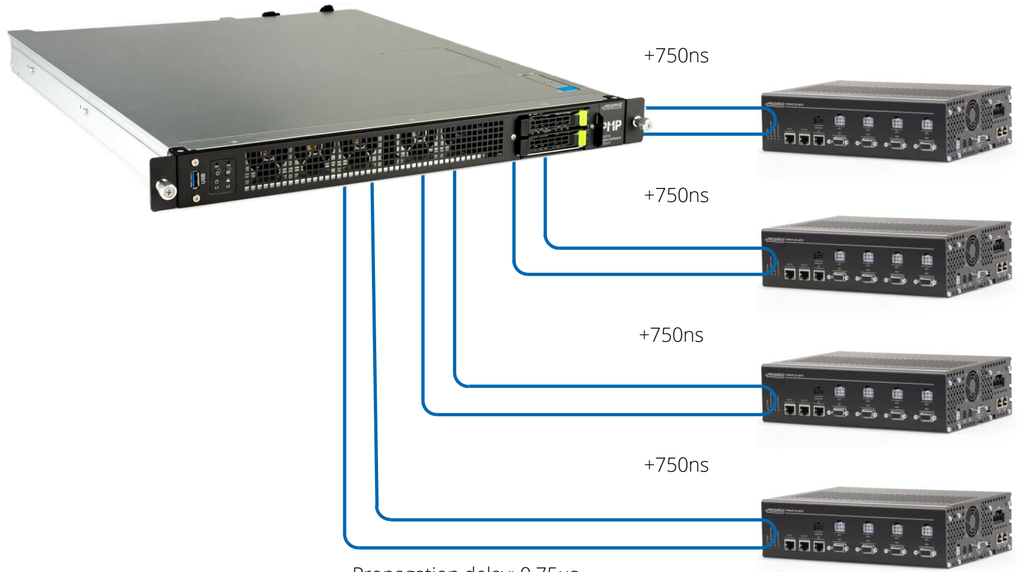

Supported packet modes (top: standard, center: read/write separated, bottom: critical I/O prioritized)

# SOFTWARE – PARALLEL ETHERCAT® BUSES

Another way to reduce I/O delay is by using multiple EtherCAT® buses. The Poseidon series motion controllers supports **multi-bus operation and synchronization**, allowing up to 12 parallel buses at 20 kHz. This means higher data bandwidth, reduced I/O delay, lower propagation delay per chain, and shorter bit times per chain – leading to unparalleled control performance.




Propagation delay: 4.5µs




Propagation delay: 0.75µs
Bit time: ~40% of original
Makes it possible to run SubDevices at 20kHz

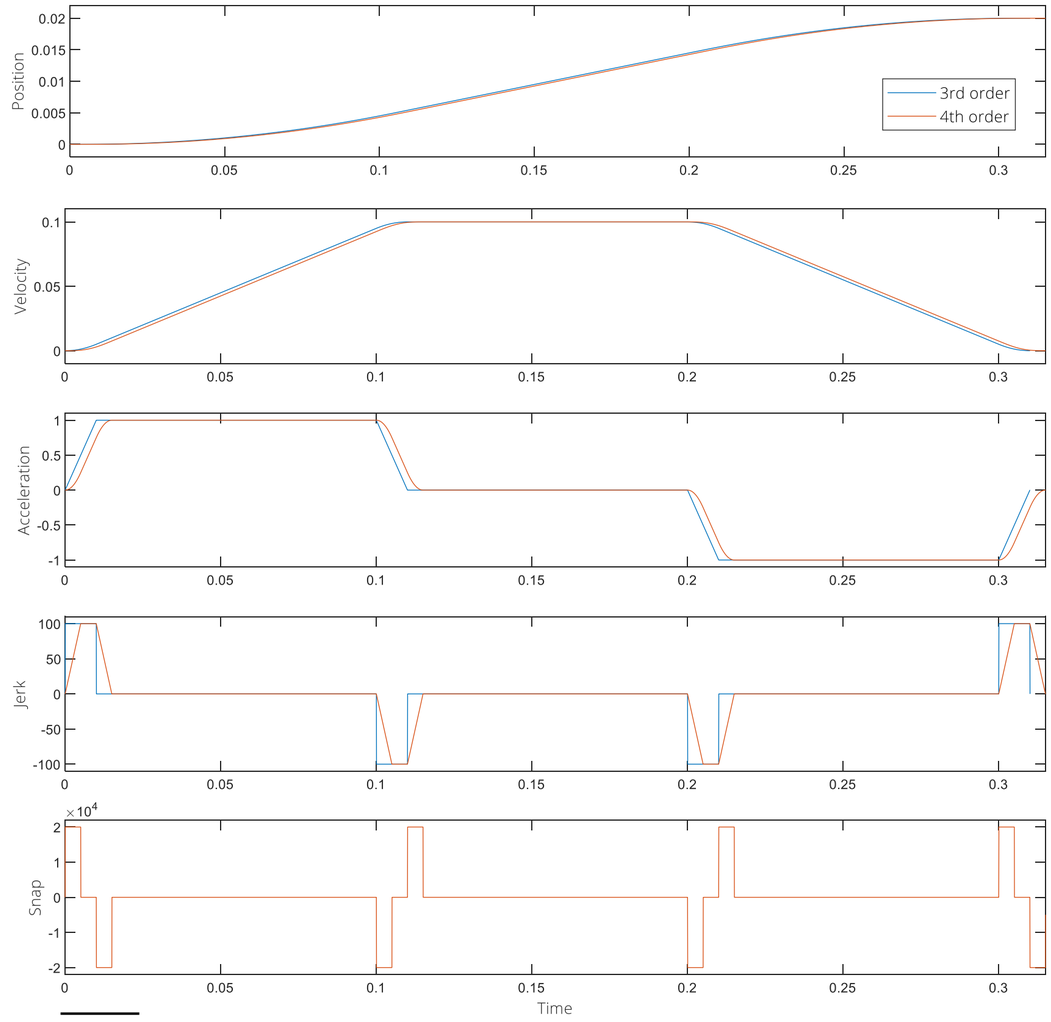
Standard connectivity vs.. multiple buses results in a lower I/O delay

# SOFTWARE – TRAJECTORY GENERATION

All motion controllers come with **3rd order trajectory generators** for all axes by default. These generators create smooth trajectories suitable for most motion control applications. Maximum velocity, acceleration, and jerk can be configured, based on these parameters the generator determines the **time-optimal trajectory** to the desired end-point.

The 3rd order trajectory generator supports **point-to-point movement with or without end velocity**, jogging, and smooth stopping. We also offer the option to **lock the ratio** between velocity, acceleration, and jerk, which can **improve settling behavior** for small moves by avoiding mechanical resonances at undesired frequencies.

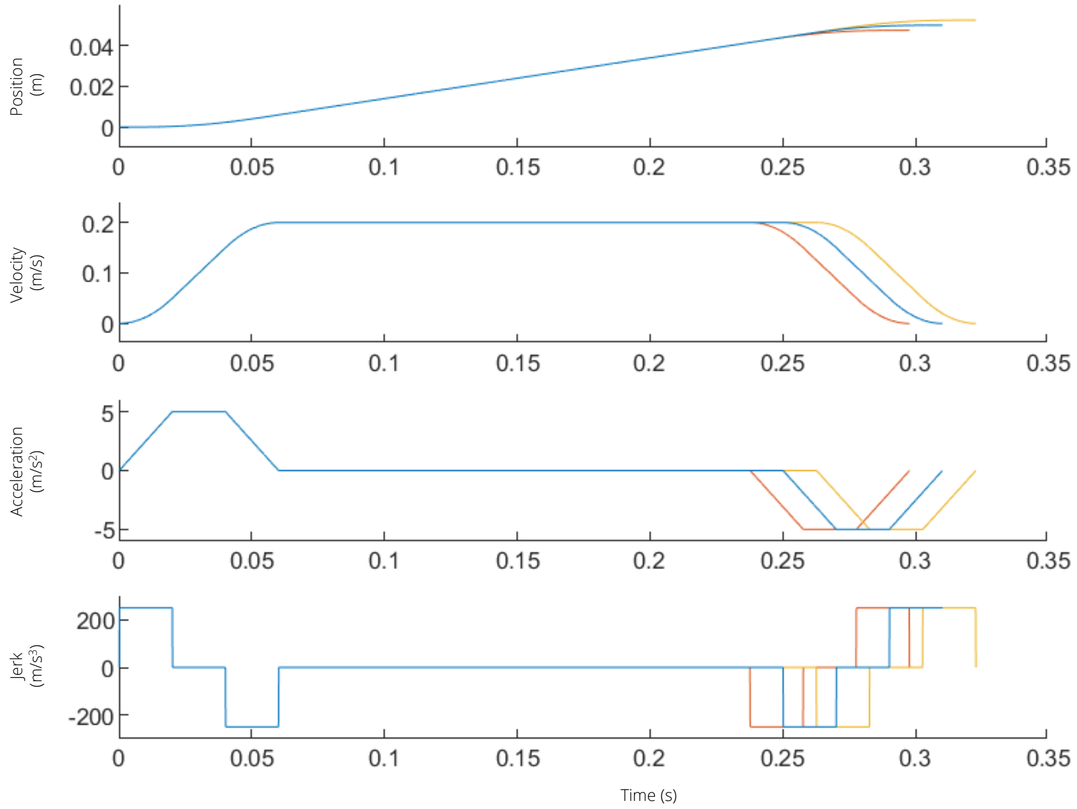
For point-to-point applications requiring reduced settling, we offer a **4th order trajectory generator** for even smoother movement with less excitation of mechanical resonances. The maximum snap can also be limited, which causes a slightly longer move time, but results in better tracking during movement and faster settling after a move or when reaching constant velocity - improving overall system efficiency and throughput.

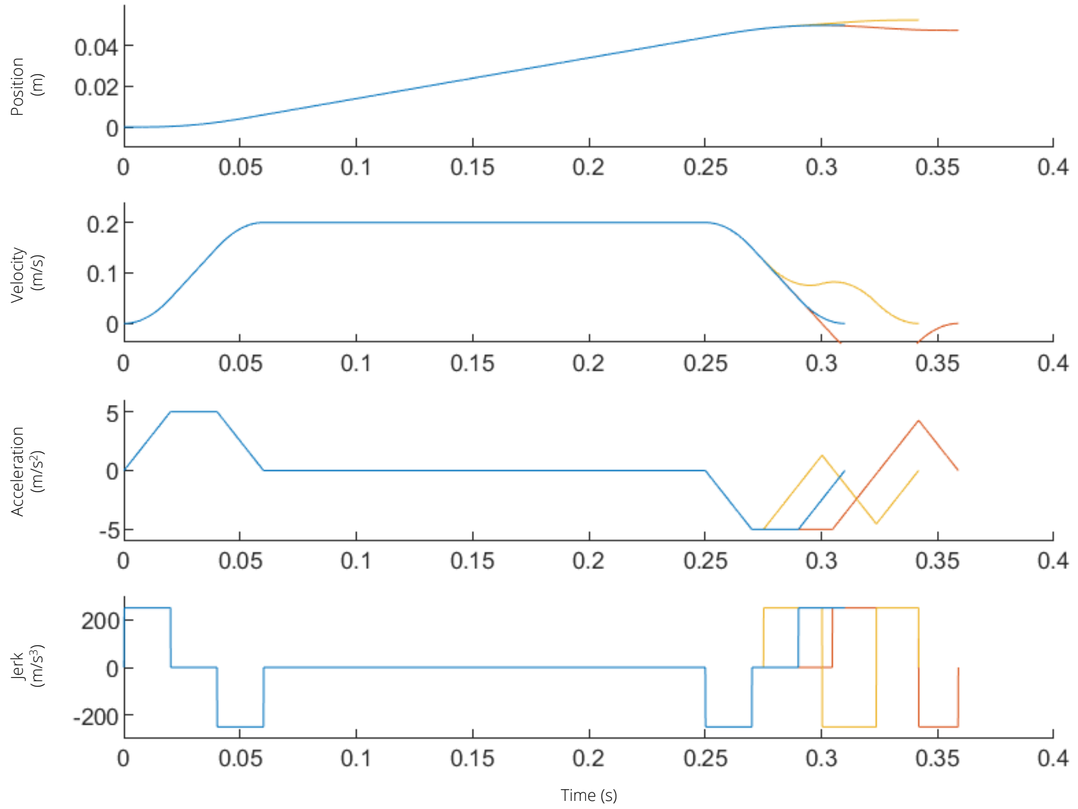



Difference between 3rd and 4th order trajectory

# SOFTWARE – TRAJECTORY END-POINT CORRECTION

Sometimes the exact end position is not known at the start of a move, for example when camera input is required to measure the exact end position. Instead of relying on multiple moves, our 3rd order trajectory generator allows updating the end position and velocity while the trajectory is being executed. This process, known as **end-point correction** or **on-the-fly move update**, helps to increase throughput where it is most critical.



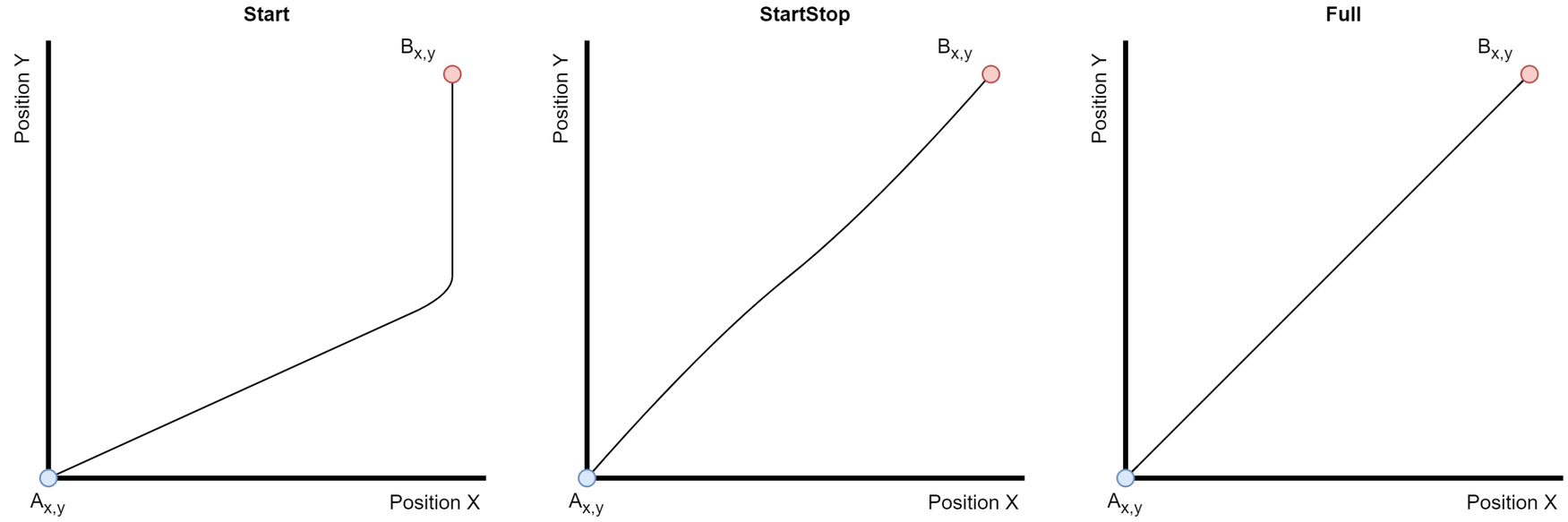




End-point correction with target position: 50mm ± 5%, Maximum VAJS: 0.2m/s, 5m/s$^2$, 250m/s$^3$

# SOFTWARE – TRAJECTORY SYNCRONIZATION

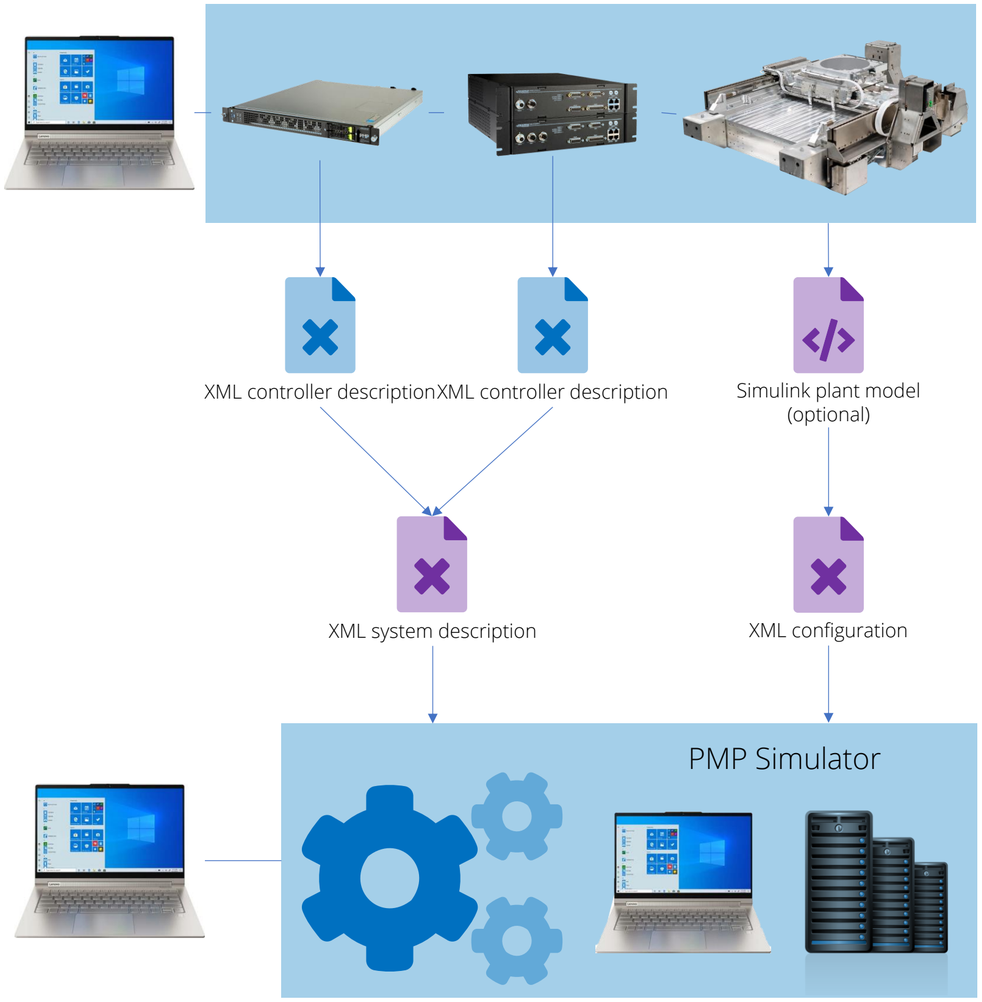
For advanced control needs, it is possible to synchronize axes setpoints through trajectory synchronization on axis control groups. This ensures coordinated and **synchronized motion across multiple dimensions**, optimizing system performance, functionality, and safety.

The following multi-dimensional synchronization modes are supported:
- **Start**: trajectories start simultaneously
- **StartStop**: trajectories start and stop simultaneously; velocity, acceleration, and jerk (VAJ) of faster-moving axes are adjusted to match move duration
- **Full**: trajectories start and stop simultaneously; all move segments matched to achieve a perfect straight line




Move synchronization options

# SOFTWARE – SIMULATOR



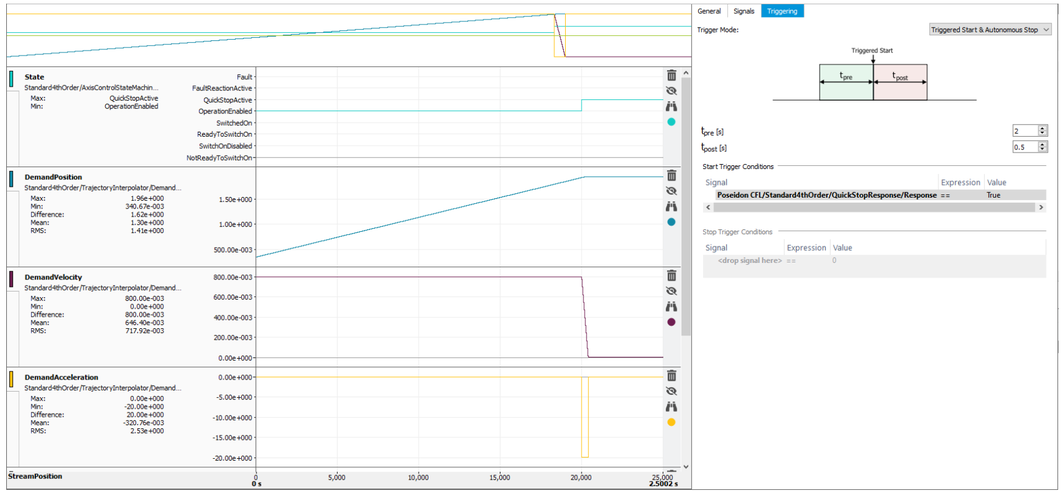

Simulating a system via the PMP simulator

When developing a new system, it is important to start integration as early as possible to **mitigate risks** and reduce hardware dependencies, ultimately **saving costs**. Our software simulator allows users to simulate their entire system on **Windows®** or **Debian™ Linux®**, minimizing the need for additional hardware and mechanical systems.

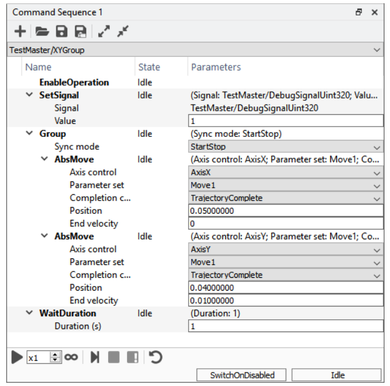
The simulator **covers the entire API** and simulates the logic of our motion controllers and drives. Prodrive provides the simulator executable through the PMP installer, along with XML controller descriptions for Prodrive motion controllers and drives, which include all supported functionality and interfaces. Interfaces for 3rd party devices are also supported. Simply specify the system topology using an XML system description or the API, start the simulator, and begin the development process.

With our simulator, users can run **custom C++ or Simulink®-generated code** just as users would on our actual motion controllers. The system can be configured identically to the actual hardware via configuration files. Similarly, simulated plants can be instantiated to replicate complete system behavior based on users' design parameters, saving significant time during development and integration phase.

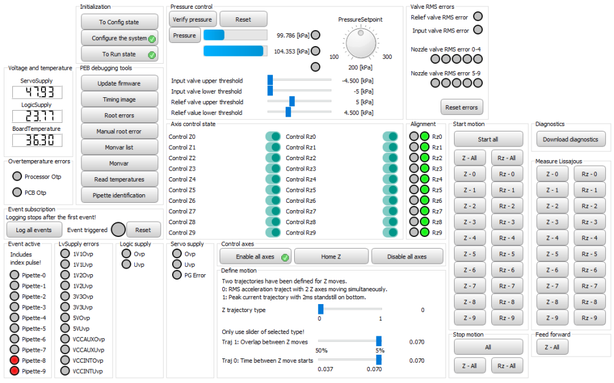
# SOFTWARE – DEBUG & INTEGRATION TOOL SUITE




Scope view with triggered acquisition settings




Command sequence view




HMI view

We understand that users want to start integrating as soon as they receive our motion controller. With our debug and integration tool suite, users can get started without writing a single line of code. The entire PMP API is accessible through this tool suite.

All available objects are displayed in a **tree view**, providing a clear overview of every component, including their configuration. The system can be configured manually by setting parameter values via the **signal view** or by loading **configuration files**.

All signals in the system can be read asynchronously or traced at any desired sample rate using the **powerful built-in scope view**. Use manual or **triggered acquisition** with autonomous start/stop to capture traces precisely when it is needed. **Continuous tracing** is also possible, allowing users to monitor the system behavior in real-time without waiting for acquisition completion. All traces can be saved manually or automatically in .msf[1], .csv or .png format.

Axes can be enabled via a clear **state machine view,** and commands can be queued through the **command sequence view**. Users can check diagnostics using the **log and event views**. If the predefined views do not meet users' needs, users can create a custom **HMI view** tailored to the system.

# SOFTWARE – PERFORMANCE COMPARISON

| | Parameter | Unit | Arcas 5EG | Poseidon EGS |
|---|---|---|---|---|
| | Architecture | - | ARM v8a | x86 |
| | Amount of cores | # | 4 | 4 (up to 12 on request[2,3]) |
| Axis control | Axis controls performance[1] | # | 12 @ 10kHz | 70 @ 10kHz, 28 @ 20kHz<br>(more on request[2,3]) |
| Axis control | Supported trajectory generators | - | Standard3rdOrder | Standard3rdOrder<br>FixedRatios3rdOrder[2]<br>Standard4thOrder[2]<br>FixedRatios4thOrder[2] |
| Axis control | Trajectory interpolator | - | Standard3rdOrder | Standard3rdOrder<br>Standard4thOrder[2] |
| Axis control | Parameter sets | # | 120 | 250 |
| EtherCAT | EtherCAT buses | # | 1 | 8 (up to 16 on request[3]) |
| EtherCAT | Bus frequency | Hz | 200 - 10k | 200 - 20k[2] |
| EtherCAT | PDO modes | - | Standard (1 packet) | Standard (1 packet)<br>Read/write separated (2 packets)[2]<br>Critical I/O prioritized (3 packets)[2] |
| Control | Maximum number of axis control groups | # | 10 | 10 |
| Control | Maximum amount of axis controls per group | # | 10 | 10 |
| Control | Maximum commands | # | 1000 | 10000 |
| Control | Memory for processing blocks/updatables/FoE | MiB | 66 | 1000 |
| Control | Asynchronous processing blocks support | - | No | On request[2] |
| Acquisition | Max acquisition instances | # | 16 | 32 |
| Acquisition | Max acquisition signals | # | 250 | 250 |
| Acquisition | Maximum super sample frequency | Hz | 100k | 400k |
| Acquisition | Maximum data rate | samples/sec | 500k | 2M |
| Acquisition | Acquisition buffer size | MiB | 32 | 64 |

Note 1: Number of axes based on PositionControlSimple (standard PID feedback control) with Feedforward
Note 2: Licensed feature
Note 3: Dependent on hardware configuration

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