

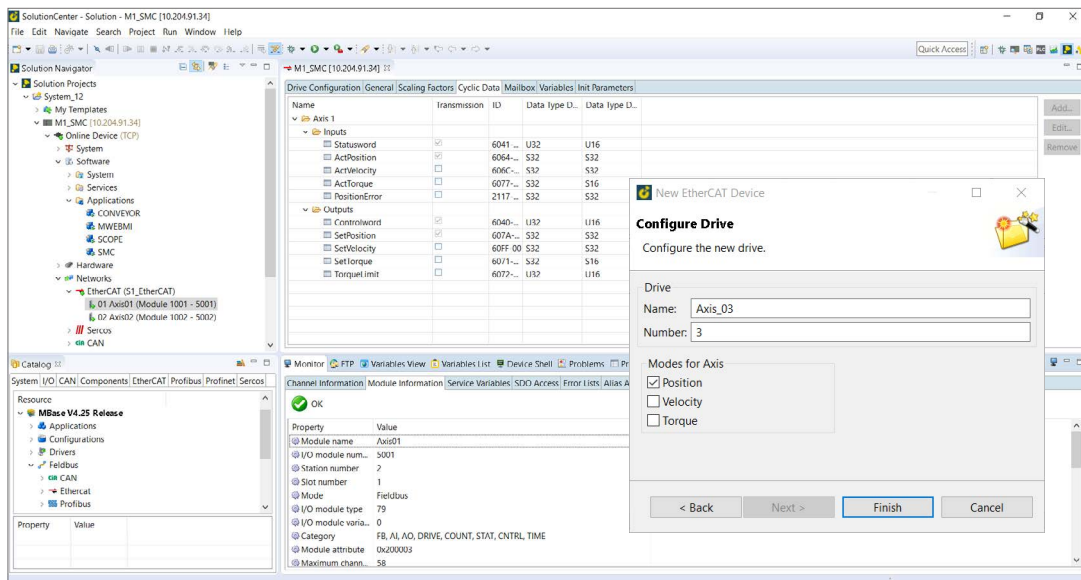


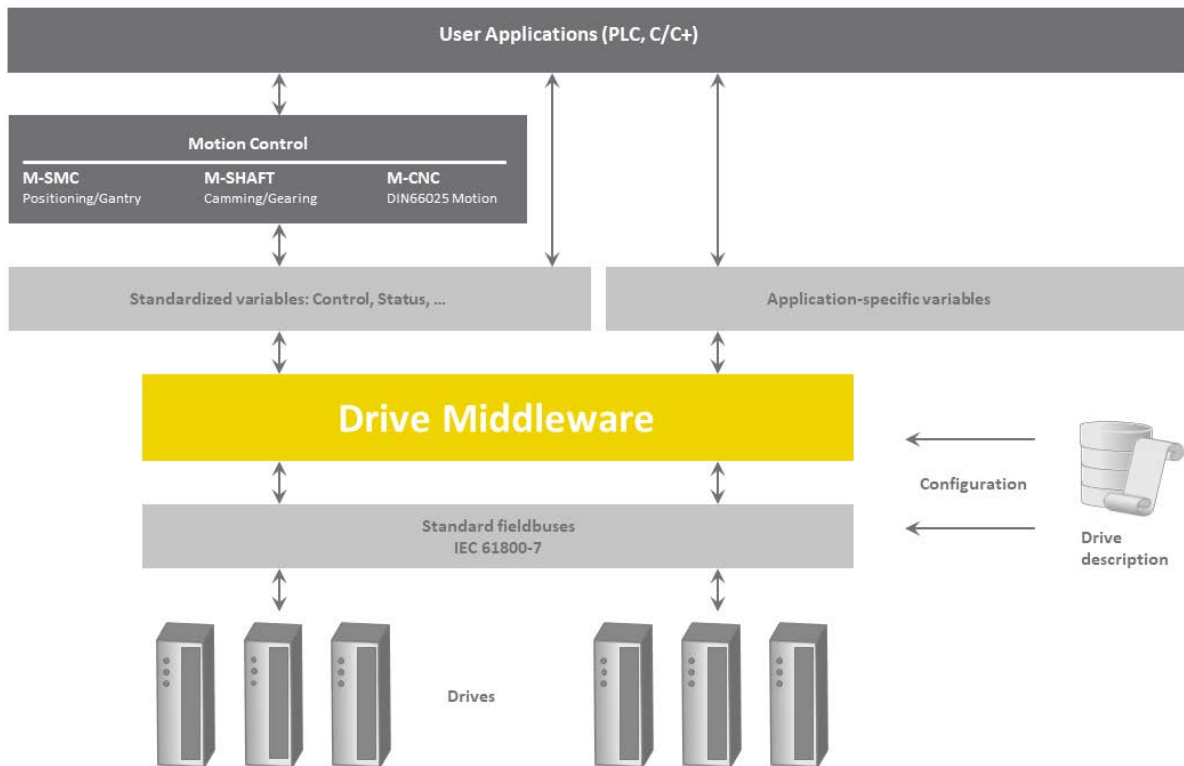
## Drive Middleware

Electrical drives are an essential part of several motion applications. Their rapid commissioning and straightforward interchangeability make it possible to adapt machinery easily to customer requirements.

This is made possible by the Drive Middleware (DMW). It communicates with drives over various fieldbus protocols and controls their status machine. The required logic is encapsulated in the DMW. Therefore, the interface to the application program is kept simple and constant.

- Uniform, manufacturer and fieldbus-independent programming of motion applications
- Rapid commissioning through ready-to-use drive descriptions
- Integration in the M-SMC, M-SHAFT and M-CNC Bachmann motion controllers
- Integration in M-Target for Simulink® enables model-based development





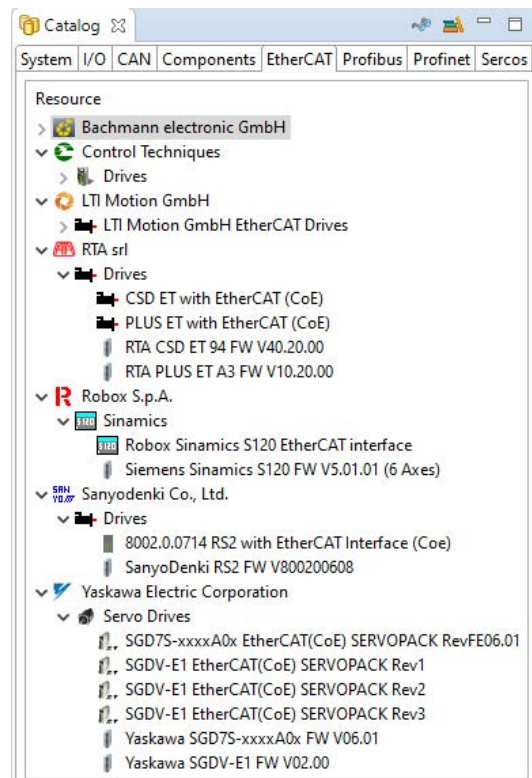
### Drive-independence application

Drive middleware provides a unified, abstracted drive interface for motion applications. The manufacturer-specific drive control logic is encapsulated in the DMW. Drives can therefore be easily adapted to customer requirements without application changes.

### Drive integration directly from the catalog

Drives are fully described via their DMW configuration file. It contains all information, e.g. about exchanged data or available operating modes. The DMW file is selected in the SolutionCenter and with that, the drive is already fully connected and operational.

New drives are being continuously added to the catalog. If a required file is not yet available, this configuration file can simply be added by users themselves.



Drive Middleware	
<b>General</b>	
System components	DMW is a driver of the M1 controller. The drive configuration is carried out in the SolutionCenter.
Configuration of the drives	SolutionCenter
Operation	<ul style="list-style-type: none"> <li>• By Bachmann motion controller</li> <li>• By customer specific applications programmed in IEC 61131-3, C/C++ or MATLAB®/Simulink®</li> </ul>
<b>Product Features</b>	
Abstraction of the drive includes	<ul style="list-style-type: none"> <li>• State machine</li> <li>• Error Handler</li> <li>• Field bus interface</li> </ul>
Drive description	Defined via a DMW configuration file The file can be adapted individually or created by the user.
Available operating modes	These are defined in IEC 61800-7-201 and CiA 402 and covers: <ul style="list-style-type: none"> <li>• Cyclical setpoint definition (cyclic sync position mode, cyclic sync velocity mode, cyclic sync torque mode)</li> <li>• Referencing (homing mode)</li> </ul>
<b>Functions</b>	
Cyclical data exchange	<ul style="list-style-type: none"> <li>• Control word, status word</li> <li>• Set and actual values for position, speed and torque</li> <li>• Additional signals can be added by the user as required.</li> </ul>
Acyclical data exchange	Data is configurable and is exchanged with service data objects (SDO) with the drive.
Initialization of drive parameters	Drive parameters can be set to the required values in different initialization steps. These are sent automatically via SDO.
Scaling of the data	Available for set and actual values
Inversion of the rotation direction	Available for set and actual values
Reference modes	All modes defined according to IEC 61800-7-201:2015
File over EtherCAT	Available depending on drive type
<b>Application Integration</b>	
Integrated in Bachmann motion controllers	<ul style="list-style-type: none"> <li>• M-SMC</li> <li>• M-CNC</li> <li>• M-SHAFT</li> </ul>
Customer-specific application	<ul style="list-style-type: none"> <li>• Applications programmed in IEC 61131-3 or C/C++ use DMW interface directly</li> <li>• Provided Simulink® blocks allow a model-based development with MATLAB®/ Simulink®</li> </ul>
<b>Drive Interface</b>	
Fieldbus	<ul style="list-style-type: none"> <li>• EtherCAT: Via IEC 61800-7 and CiA 402 profile</li> <li>• Sercos 2</li> </ul>
<b>System Requirements</b>	
M1 real-time system	Bachmann M1 processor modules of the series MH, MC, MX; M-Base from V3.95