


SoftMotion Drive Configuration

CoDeSys

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Training

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SoftMotion Drive Configuration

How to configure SoftMotion Drives

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After this module you will be …

- able to configure drives for SoftMotion

Agenda

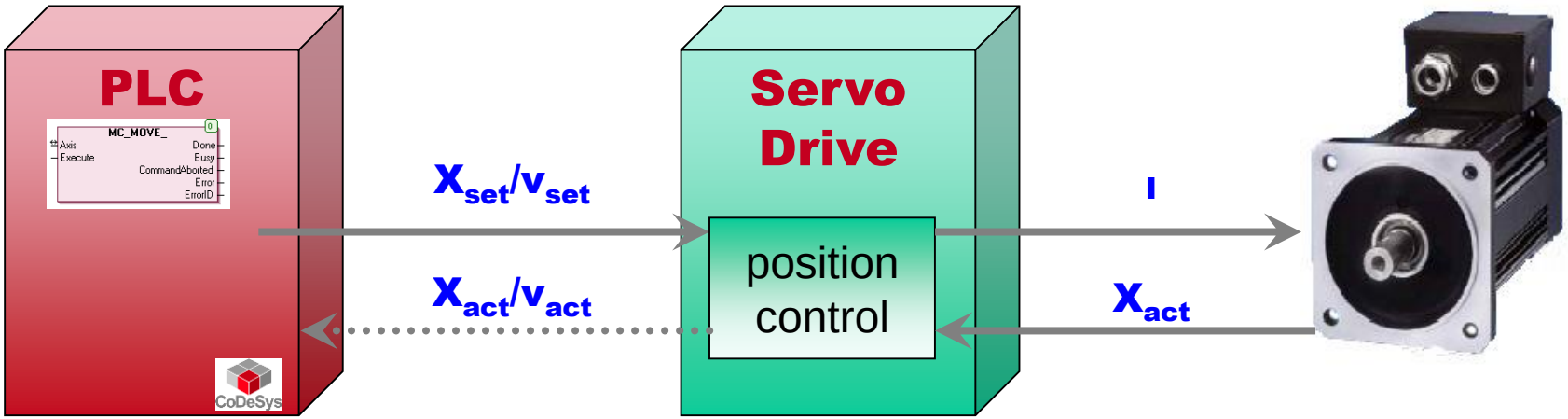
- General information
- Components of CoDeSys SoftMotion
- DriveInterface – interface between IEC program and drives
- Drive configuration

General information

- CoDeSys SoftMotion is based on PLCopen motion control.
- CoDeSys SoftMotion is only possible with a CoDeSys Motion Control PLC.
- The SoftMotion functionality is accessed by function blocks
  - FBs beginning with **'SMC_'** are **3S** specific implementations;
  - those starting with **'MC_'** are FBs according to the **PLCopen** MC specification

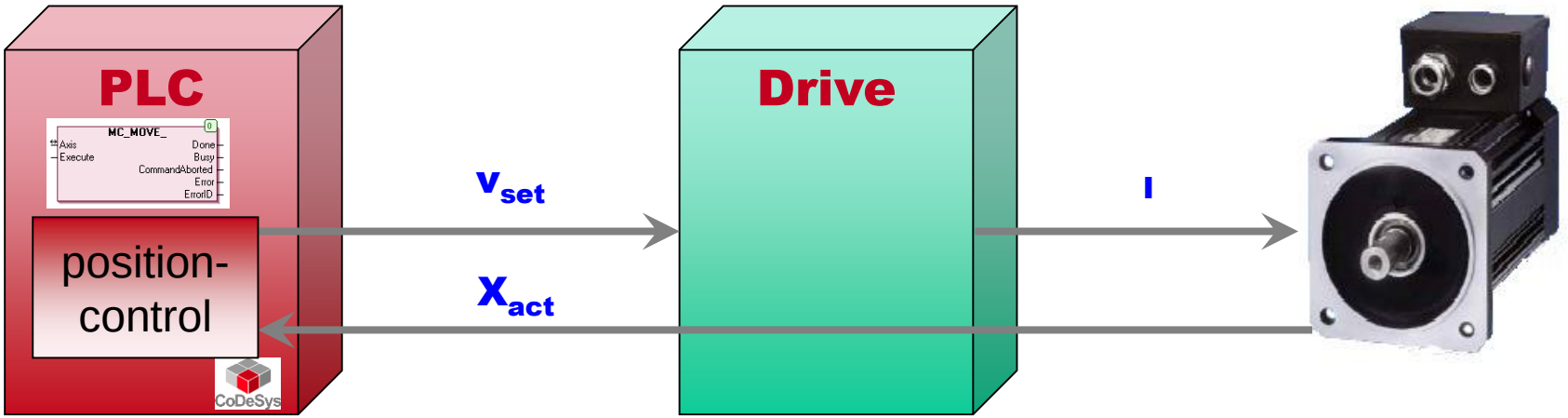
Servo Drive

- set values (pos, vel) calculated by SoftMotion FBs cyclically in PLC context (approx. every 1-10 ms)
- set values are carried out by the drive (closed loop control inside drive (typical cycle 100-250 µs))
- actual values are transferred from drive to PLC mainly for monitoring / HMI

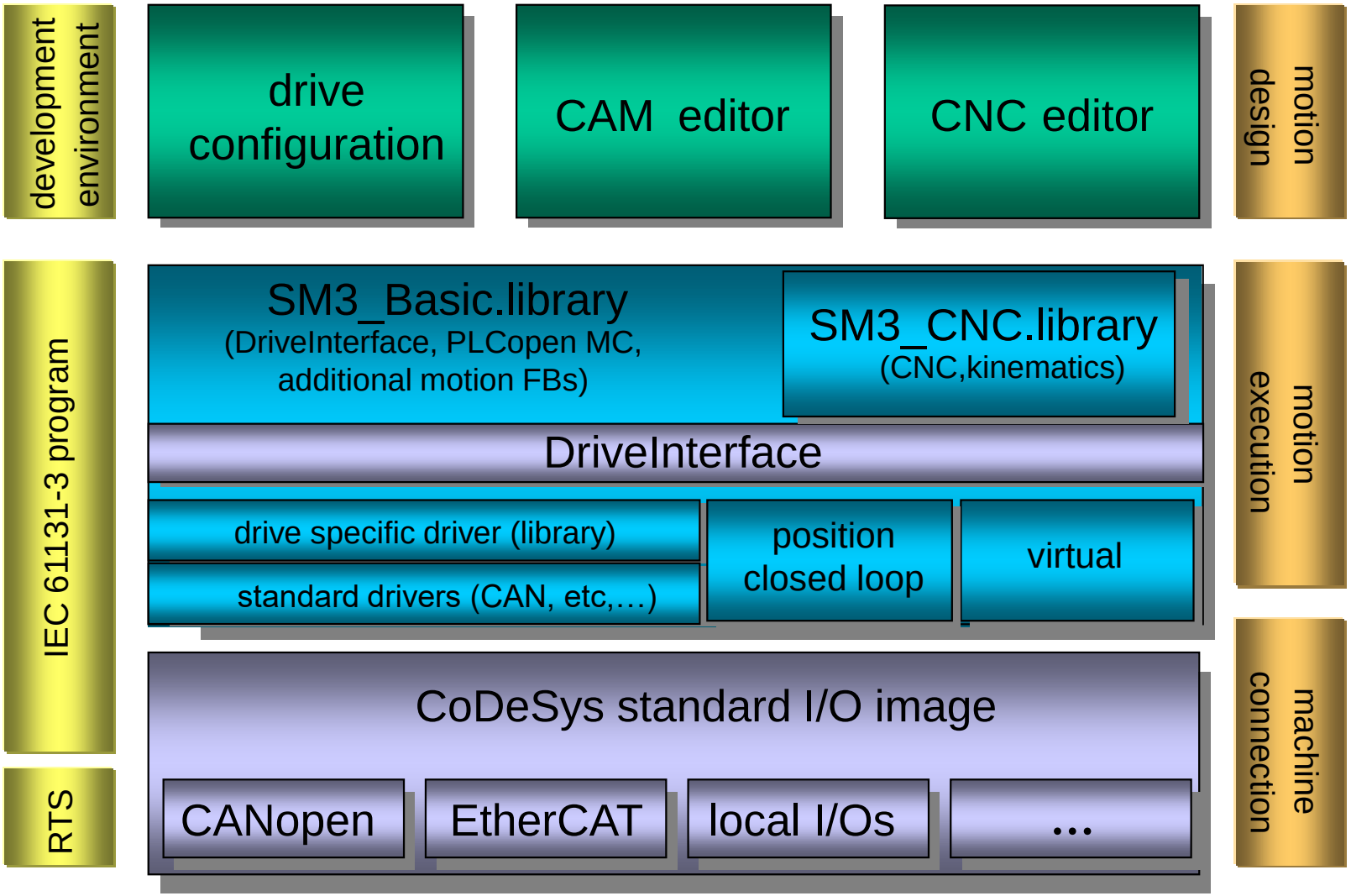


Analog / Stepper (PosControl)

- set values (pos, vel) calculated by SoftMotion FBs cyclically in PLC context (approx. 1-10 ms)
- control via set velocity
- position control loop closed inside PLC
- actual position value used for closed position control loop

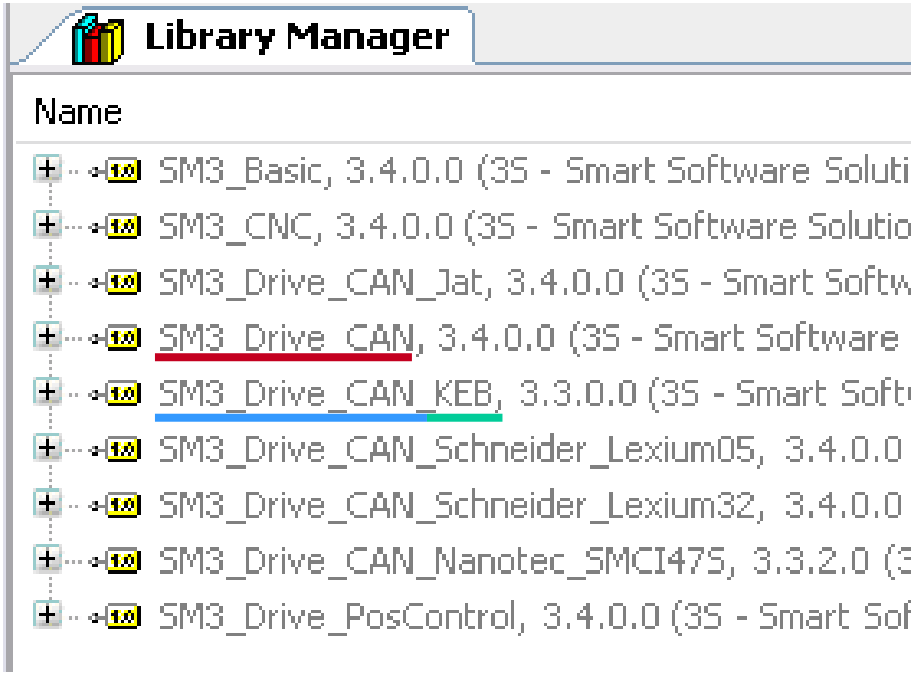


Components



Components

- **SoftMotion base libraries:**
  - **SM3_Basic.library**
  - **SM3_CNC.library**
- **Fielbus specific**
  - **SM3_Drive_CAN.library**
  - **SM3_Drive_ETC.library**
- **Drive specific libraries:**
  - **SM3_Drive_CAN_<xy>.library, SM3_Drive_ETC_<xy>.library,…**



Drive Interface (AXIS_REF)

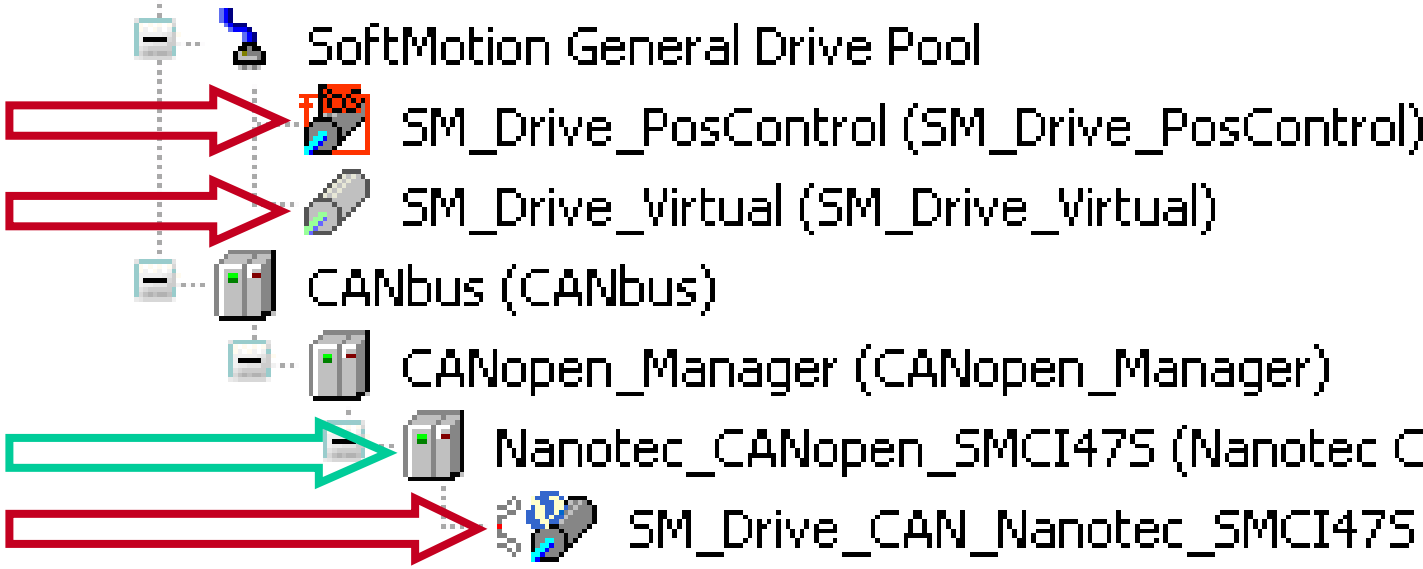
- is a function block
- uniform interface between PLC and drive (independent of field bus and drive) for:
  - configuration of drives (start-up)
  - cyclic communication
    - set values PLC → drive
    - actual values drive → PLC
    - supervising the communication
  - acyclic communication
    - read/write parameters

Drive Interface

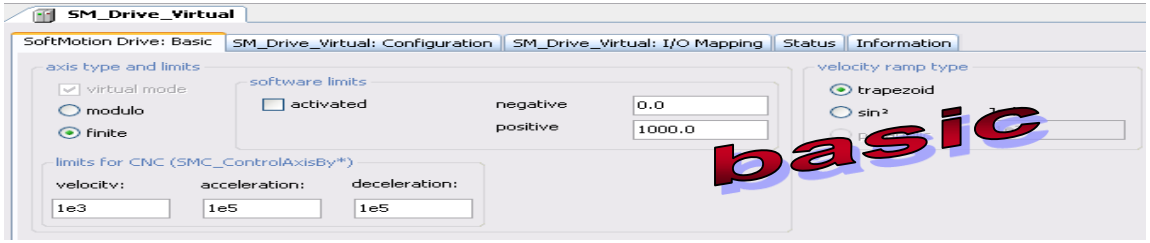
- When compiling, CoDeSys defines a function block instance with an AXIS_REF data structure which holds all necessary parameters/variables and which is identical for all drive types.
- AXIS_REF is defined in SM3_Basic.library.
- AXIS_REF can be extended by drive specific parameters and variables.

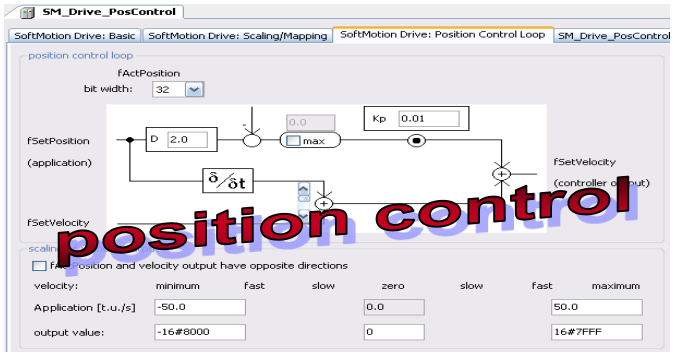
Device Configuration Elements

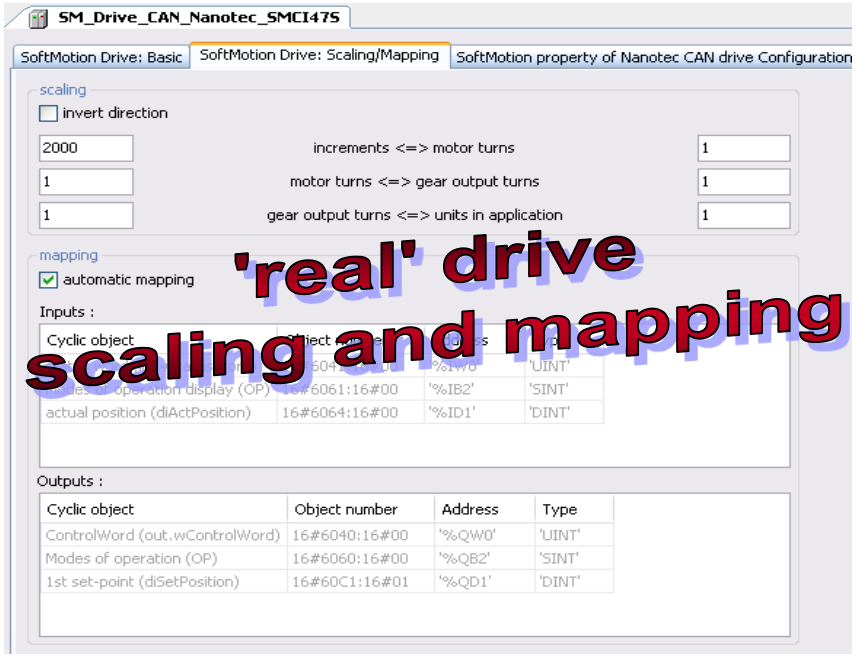
- drive
- fieldbus node



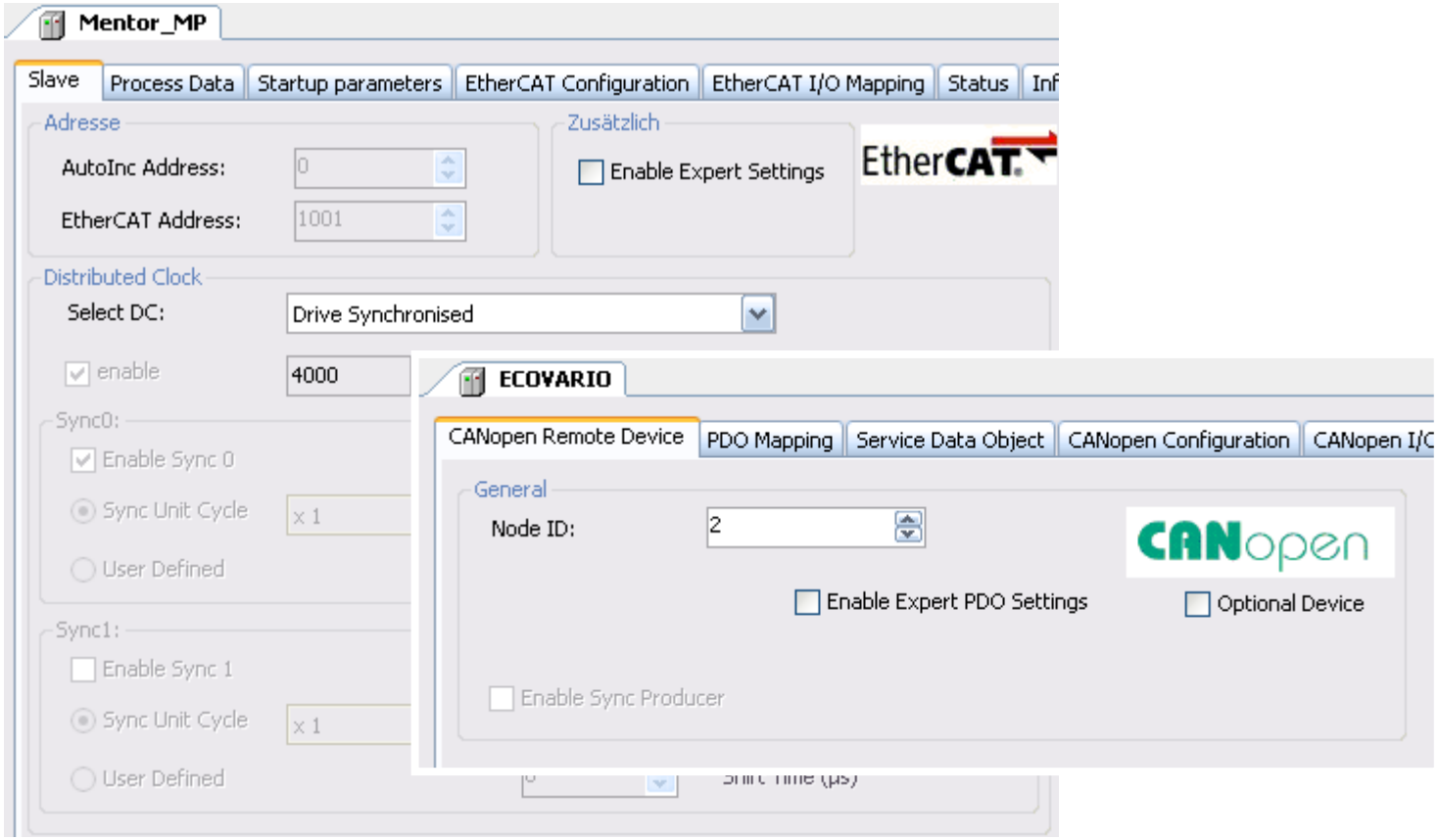
Drive dependent Configuration Tabs



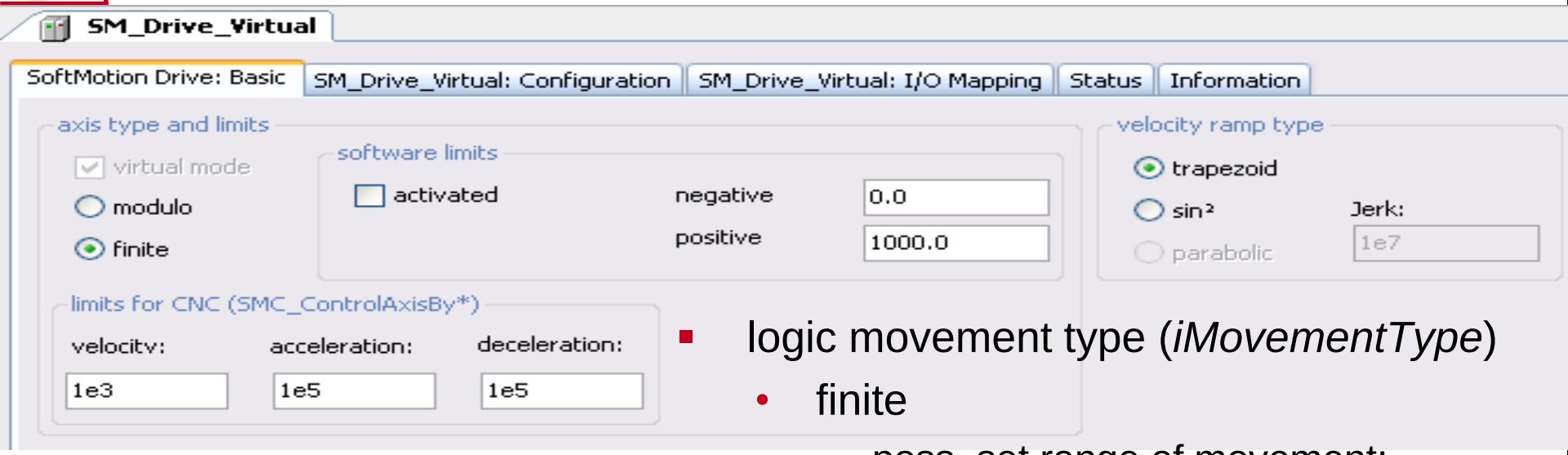




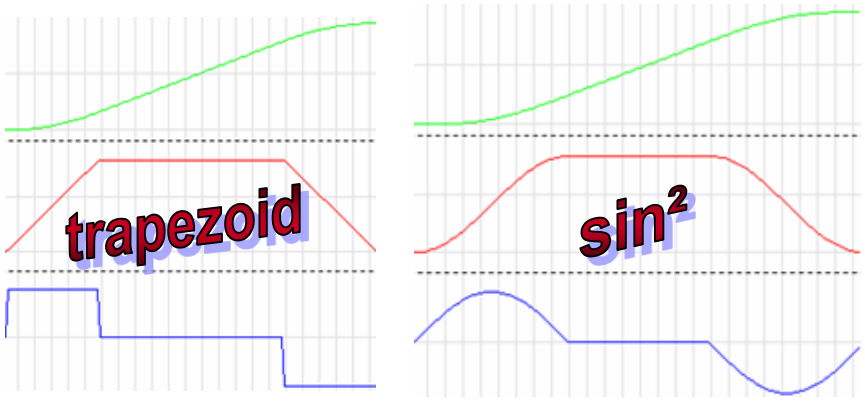
Standard Fieldbus Configuration Tabs



Configuration



- logic movement type (*iMovementType*)
  - finite
    - poss. set range of movement:
    - *bSWLimitEnable, bSWLimitNegative/Positive*
  - modulo
    - specify *fPositionPeriod*

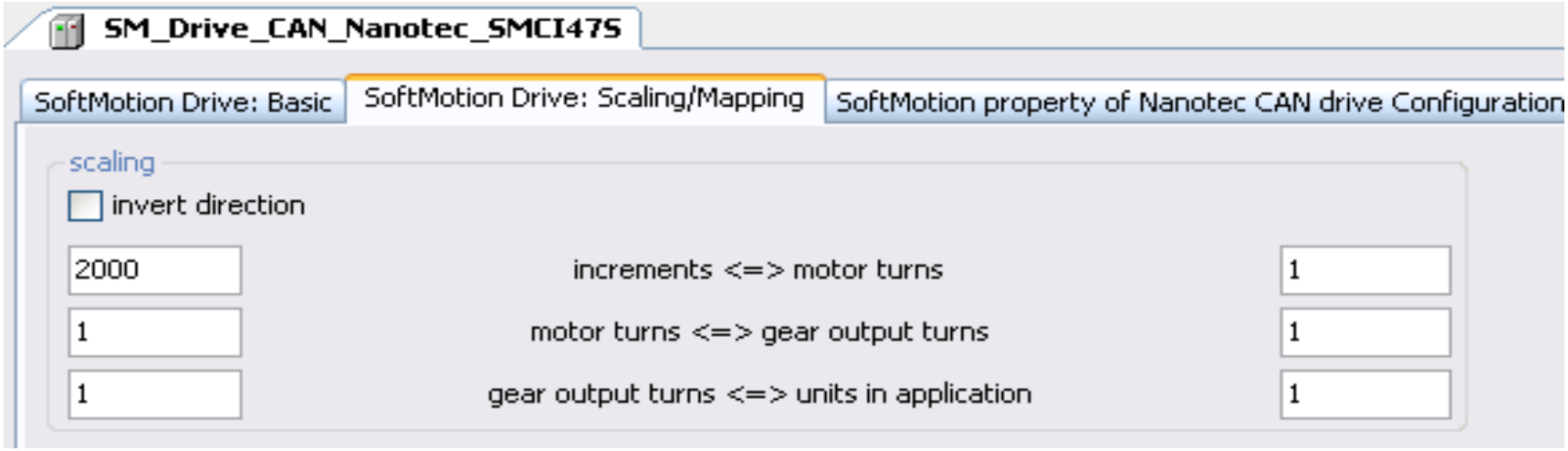


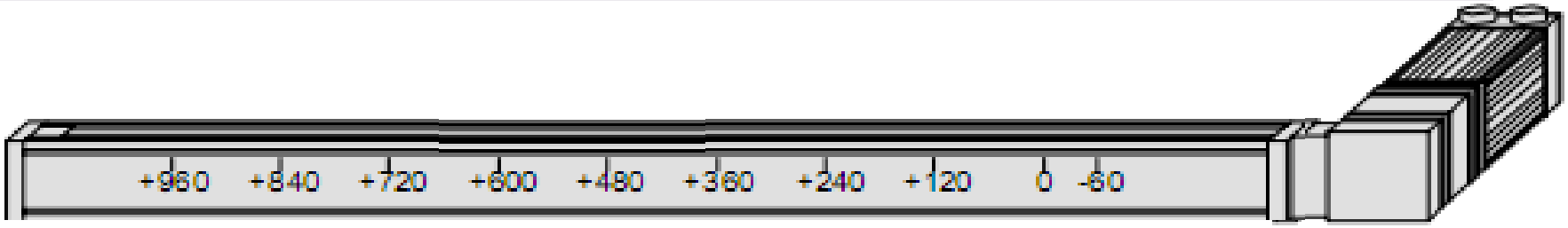
ramp type for PLCopen FBs

- trapezoid
- sin²

Configuration

- Scaling
  SoftMotion unit (used in PLC program) ⟷ increments

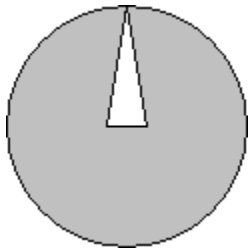




Visualization Templates – Drive

- SM3_Basic.library provides templates for CoDeSys visualization:
  - LinDrive

  - RotDrive



SM_Config_EX1

Configure two axes (virtual drives):
DriveA as a finite axis (range -100..400)
DriveB as a modulo axis (modulo value 360.0)

Summary

- Editors
  - drive configuration
  - CAM
  - CNC
- Drives
  - virtual
  - PosControl
  - „real“ drives
    - need a special device description and a driver library
- Same usage of all drives due to common drive interface

Thank you for your interest

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