

EM 253 POSITIONING MODULE

Overview

- Function modules for simple positioning tasks (1 axis)
- Stepper motors and servo motors from the Micro Stepper to the high-performance servo drive can be connected
- Flexible connection possibilities
- Full support from STEP 7-Micro/WIN with parameterization and startup



Application

The EM 253 is a function module for simple positioning tasks. It controls stepper motors and servo motors via a high-frequency pulse input.

Design

The EM 253 positioning module is mounted in the same manner as an expansion module and connected to the S7-200 expansion bus via the integrated connection cable. The configuration data are read out of the CPU automatically on connection.

The integrated inputs/outputs are connected via removable terminal blocks.

The module has the following features:

- 5 digital inputs for signals from the process
- 24 pulse outputs for direct activation of the drive (forwards/backwards or speed/direction)
- 2 control outputs (DIS; CLR).
- 12 status LEDs

Function

- Variable output frequency 12 to 200,000 Hz for controlling the axis
- Flexible output interface:
5 V DC or RS 422
- Absolute traverse:
Traverse the axis to a specified absolute position.
- Relative traverse:
Traverse the axis by a relative distance.
- Manual traverse:
Manual traversing of the axis, jog mode.
- Continuous control
- Max. 25 positioning profiles each with up to 4 speed changes can be loaded
- Integrated smoothing function for stepless changeover between 2 speeds (S Curve, jerk limitation)
- Backlash compensation for changes in direction
- Reference point approach (selection from 4 different modes)

Configuring

The EM 253 is configured using STEP 7-Micro/WIN V3.2. The integrated Wizard supports

- Convenient parameterization of the bus parameters, e.g.,
 - Number of pulses per revolution
 - Units for distance measurement, e.g., mm, degrees, etc.
- Creation of the traversing profiles
- Definition of the reference search mode

Effective support is also provided by the comprehensive commentary and a context-sensitive online Help. The respective command set is automatically generated following configuration and can be used in the PLC project without any restrictions.

Commissioning

A special startup tool is provided in STEP 7-Micro/WIN for easy startup. It supports, for example:

- Status monitoring
- Parameter optimization without program modifications
- Fine adjustment and system optimization
- Transfer of modified parameters (teach-in mode)
- With these functions, startup is completed in the shortest possible time.

Technical specifications

Technical specifications

6ES7 253-1AA22-0XA0	
Supply voltage	
permissible range, lower limit (DC)	11 V
permissible range, upper limit (DC)	30 V
Input current	
from backplane bus 5 V DC, max.	190 mA
from supply voltage L+, max.	300 mA; from 12 V DC, 130 mA from 24 V DC
Hardware configuration	
Number of modules per CPU	max. 5 with CPU 226/226XM, max. 3 with CPU 224, max. 1 with CPU 222
Digital inputs	
Number/binary inputs	5
Type	IEC Type 1, active-high
Functions	Stop (STP), reference point switch (RPS), upper limit switch (LMT+), lower limit

switch (LMT-), zero point (ZP)

Input voltage

- Rated value, DC

24 V

- for signal "0"

STP, RPS, LMT+, LMT- DC 5 V; ZP DC 1 V

- for signal "1"

STP, RPS, LMT+, LMT- DC 15 V; ZP DC 3 V

Input delay (for rated value of input voltage)

- for standard inputs

- Parameterizable

Yes; STP, RPS, LMT+, LMT- 0.2 to 12.8 ms; ZP min 2 μ s

Cable length

- Cable length, shielded, max.

100 m; STP, RPS, LMT+, LMT- 100 m, ZP 10 m

- Cable length unshielded, max.

30 m; STP, RPS, LMT+, LMT- 30 m, ZP not recommended

Encoder

Connectable encoders

- 2-wire BEROS

Yes

1 mA

- permissible quiescent current (2-wire

BEROS), max.

Drive interface

Signal output I

- Number 4; optionally RS 422/RS 485 or 5 V DC
- Type RS 422 / RS 485 (P0+, P0-, P1+, P1-)
- Differential output voltage, min. 2.8 V; $R_L = 200$ ohms
- Pulse frequency 200 kHz; (P0+, P0-, P1+, P1-, P0, P1)
- Cable length, max. 10 m; shielded; 1 m unshielded

Signal output III

- Type 5 V DC (P0, P1, DIS, CLR)
- Output voltage 30 V DC
- Output current 50 mA; output delay (DIS, CLR) max. 30 μ s

Galvanic isolation

Galvanic isolation digital inputs

- between the channels Yes
- between the channels, in groups of 1 (STP, RPS, ZP), 2 (LMT-, LMT+)

Dimensions

- Width 71.2 mm
- Height 80 mm
- Depth 62 mm

Weight

- Weight, approx. 190 g