6.17.4 PCD3.H210, Motion control module for stepper motors

Application

The PCD3.H210 module provides fully autonomous control and monitoring of stepper motor travel, with run-up and braking ramps. The commands for stepper motor motion cycles are transmitted to the module by function blocks in the user program.

During motion, the SM processor monitors the frequency profile and the acceleration and braking ramps to move the axis to the destination position without loss of steps. Each module controls an independent axis. The module supplies a monophase pulse string which is conveyed to a suitable electronic drive. The module has 4 inputs and 4 outputs.

This I/O module cannot currently be used with the PCD3 RIO head station

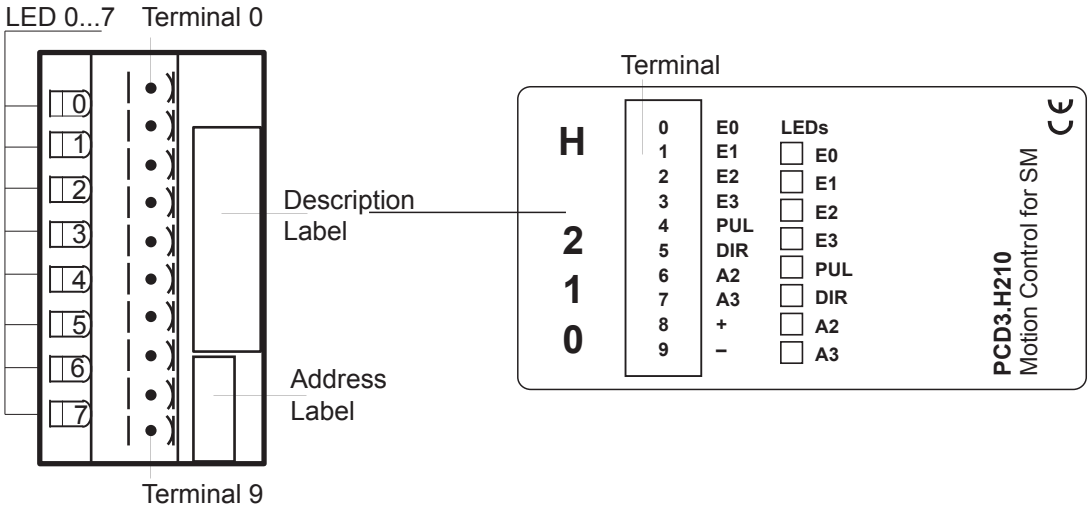
Technical data

Number of axes:	1
Positioning distance (counting range):	0…16,777,215 (24 bit)
Frequency ranges (selectable) *):	9.5…2,431 Hz 19…4,864 Hz 38…9,727 Hz 76…19,454 Hz
Acceleration *):	0.6…1224 kHz/s, non-linear range division, dependent on selected frequency range
Profile generator:	with symmetrical acceleration and braking ramps
Data protection:	All data in this module are volatile (non-volatile Saia PCD® registers are available).
Digital inputs	
Number of inputs: Terminal 0 = I0 Terminal 1 = I1 Terminal 2 = I2 Terminal 3 = I3	4 configurable as emergency stop or for general use configurable as limit switch LS1 or for general use configurable as reference switch or for general use configurable as limit switch LS2 or for general use
Nominal voltage:	24 VDC “low” range: –30…+5 V “high” range: +15…30 V for source operation only, for safety reasons, normally-closed contacts (negative logic) should be used
Input current:	typically 6.5 mA
Input filer:	< 1 ms
Circuit type:	electrically connected
Digital outputs	
Number: Terminal 4 O0: Terminal 5 O1: Terminal 6 O2: Terminal 7 O3:	4 Output “PUL” (pulses for motor) Output “DIR” (direction of motor rotation) programmable as required programmable as required
Switching capacity:	0.5 A each in the range 5…32 V, residual ripple max. 10%
Short circuit protection:	no
Electrical isolation:	no
Voltage drop:	max. 0.3 V at 500 mA

Output delay:	< 1 µs, (longer for inductive load because of protective diode).
Power supply	
Internal current consumption: (from +5 V bus)	85 mA
Internal current consumption: (from V+ bus)	0 mA
External current consumption:	max. 2 A (all outputs), residual ripple max. 10%
Operational conditions	
Ambient temperature	Operation: 0…+55°C without forced ventilation Storage: –25…+85°C
Noise immunity:	EC mark according to EN 50 081-1 and EN 50 082-2
Programming:	Based on Saia PCD® user program and pre-programmed function blocks (FB).
Terminals:	Plug-in 10-pole spring terminal block (4 405 4954 0) or pluggable 10-pole screw terminal block (4 405 4955 0), both for wires up to 2.5 mm²

***)** For further information, please refer to manual 26-760, "PCD2.H210 - motion control modules for stepper motors".

LEDs and connection terminals

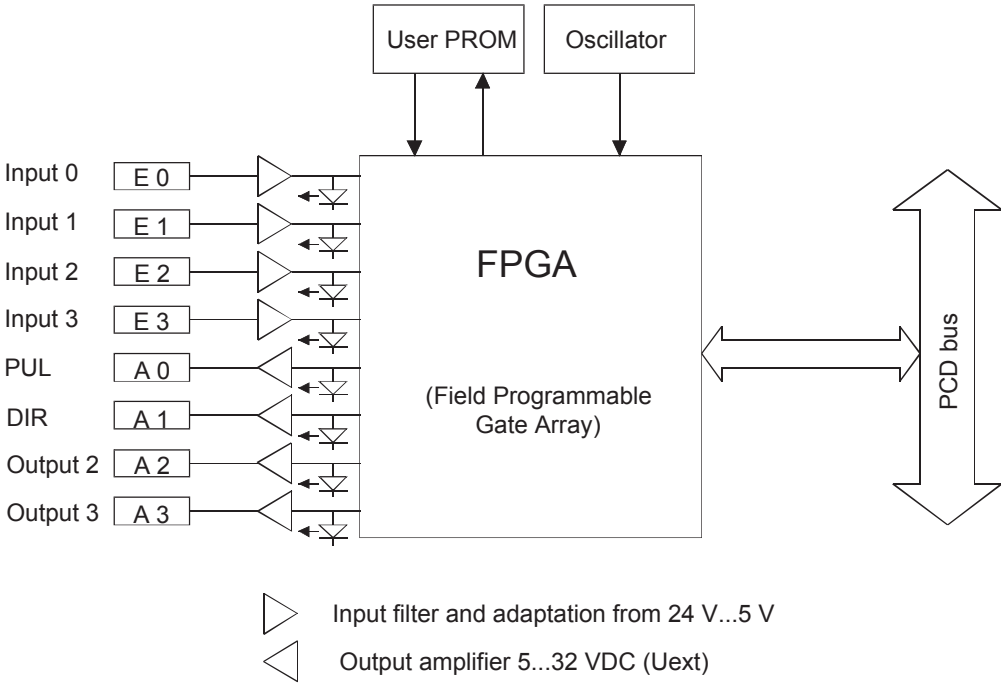


LED	In- / Outputs
0	I0
1	I1
2	I2
3	I3
4	O0/PUL
5	O1/DIR
6	O2
7	O2

LED 0: *) Voltage at input 0: (Emergency stop)
LED 1: *) Voltage at input 1: (LS1)
LED 2: *) Voltage at input 2: (REF)
LED 3: *) Voltage at input 3: (LS2)
LED 4: Voltage at output 0: PUL
LED 5: Voltage at output 1: DIR
LED 6: Voltage at output 2
LED 7: Voltage at output 3

*) status inverted when used as a limit switch

Block diagram



For further information, please refer to manual 26-760, "PCD2.H210 - motion control module for stepper motors"

Watchdog: This module can interact with the watchdog, if it is used on base address 240. In this case, the last input with address 255 cannot be used.
For details, please refer to the section A4 “Hardware Watchdog”, which describes the correct use of the watchdog in conjunction with PCD components.