

PIMag® Motion Controller

CONTROL OF FORCE, POSITION AND VELOCITY



C-413

- + 1 or 2 motor channels
- + up to 4 sensor channels for 2 force and 2 position sensors each
- + Depending on version, TCP/ IP or USB interface for configuration and sending commands
- + Depending on version, real- time SPI interface for sending commands
- + Digital inputs and outputs
- + Optional analog inputs and outputs
- + Auto zero function for holding current
- + ID chip support
- + Extensive software support

Digital motion controller for PIMag® Voice Coil drives

C-413.1: 1 motor channel, 2 sensor channels, for the V-275 and V-275 linear actuators. C-413.2: 2 motor channels, 4 sensor channels. PID controller for force, position, velocity. Servo update rate selectable between 5 to 10 kHz

Force control

The force control allows operation of PIMag® drives and stages with a defined holding or feed force. The force and position sensors can be read simultaneously and the values processed. In addition to pure force control, subordinate position and velocity control is also an option. PI offers PIMag® actuators with a force sensor. The C-413.20A / .2GA models enable external force sensors to be read via analog inputs

Extensive functionality

Data recorder: recording of operating data such as motor current, velocity, position or position error. Wave generator: Saves and outputs periodical motion profiles. Auto- zero function defines the holding current, at which the drive outputs a force of 0 N in open- loop operation, e.g., for compensating the weight force. ID chip support: Identifies the connected stages and simplifies configuration and exchangeability. Supports direction- sensing reference point switches. Extensive software support, for example for LabVIEW, dynamic libraries for Windows and Linux

Interfaces

Depending on the version, commanding via TCP/ IP, USB 2.0, SPI. Digital inputs and outputs for automation. Optional analog inputs and outputs, e.g. for sensors, for sending commands or for position feedback

Specifications

Preliminary Data	C-413.1G	C-413.20 / C-413.20A C-413.2G / C-413.2GA	Unit
Function	PIMag® Motion controller for voice coil drives, 1 channel, cased device	PIMag® Motion controller for voice coil drives, 2 channelsC-413.20 / .20A: OEM boardC-413.2G / .2GA: cased device	
Motor channels	1	2	
Sensor channels	2	4	
Motion and Control			
Servo characteristics	PID controller for force, position and velocity; parameter change on- the- fly	PID controller for force, position and velocity; parameter change on- the- fly	
Servo cycle time	100 µs to 200 µs, selectable in 4 steps	100 µs to 200 µs, selectable in 4 steps	
Profile generator	Trapezoidal velocity profile, setting of maximum velocity and acceleration	Trapezoidal velocity profile, setting of maximum velocity and acceleration	
Encoder input	SPI sensor interface	SPI sensor interface	
Reference point switches	4 x TTL, direction- sensing	4 x TTL, direction- sensing	
Electrical properties			
Max. output voltage	24	24	V
Max. output current	±1.5	±1.5	A, regulated
Interfaces and operation			
Communication interfaces	TCP/ IP	USB 2.0, real time SPI	
Motor / sensor connection	Sub- D 9- pin (f) for motor, Sub- D 25- pin (f) for sensor	Sub- D 15- pin (f), combined for motor and sensor	
I/ O port	2 x analog outputs, -10 to 10 V, 17 bit, 1 kHz 4 x digital input, 24 V 6 x digital output, 24 V	2 x analog inputs, -10 to 10 V, 16 bit, 1 kHz (only C-413.20A and C-413.2GA) 2 x analog outputs, -10 to 10 V, 17 bit, 1 kHz (only C-413.20A and C-413.2GA) 6 x digital outputs (open collector, voltage range 5 V to 24 V, 33 k internal pull- up to 5 V) 4 x digital input (5 V TTL level, to 24 V max. input voltage, 10 k input resistance)	
Command set	PI General Command Set (GCS)	PI General Command Set (GCS)	
User software	PIMikroMove	PIMikroMove	
Software drivers	LabVIEW driver, dynamic libraries for Windows and Linux	LabVIEW driver, dynamic libraries for Windows and Linux	
Supported functions	Point- to- point motion, data recorder, wave generator, auto zero, ID chip detection	Point- to- point motion, data recorder, wave generator, auto zero, ID chip detection	
Miscellaneous			
Operating voltage	External power supply 24 V, included in scope of delivery	External power supply 24 V, included in scope of delivery	
Max. current consumption	2	2	A
Operating temperature range	5 to 50	5 to 50	°C
Max. mass	0.3	0.3	kg
Dimensions	210 x 28 x 105	189 x 28 x 105 (C-413.2G / .2GA) 160 x 18 x 100(C-413.20 / .20A)	mm

Order Information

C-413.1G

PIMag® Motion Controller, 1 Channel, Bench- Top Device, Force Control Option

C-413.20

PIMag® Motion Controller, 2 Channels, USB Interface, OEM Board, Force Control Option

C-413.20A

PIMag® Motion Controller, 2 Channels, USB Interface, Analog Inputs, OEM Board, Force Control Option

C-413.2G

PIMag® Motion Controller, 2 Channels, USB Interface, Bench- Top Device, Force Control Option

C-413.2GA

PIMag® Motion Controller, 2 Channels, USB Interface, Analog Inputs, Bench- Top Device, Force Control Option

Ask about custom designs!

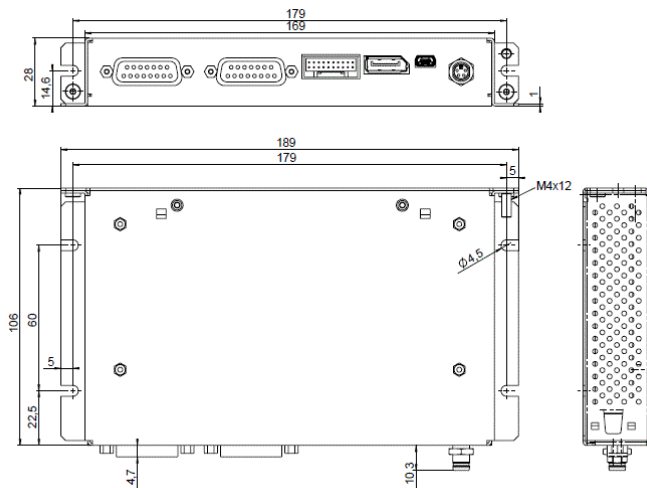
Related Products

- [V-273 PIMag® Voice Coil Linear Actuator](#)
- [V-275 PIMag® Voice Coil Linear Actuator](#)
- [V-277 PIMag® High- Load Linear Actuator](#)
- [V-900KPIC PIMag™ VC Vertical Linear Actuator](#)
- [C-891 PIMag® Motion Controller](#)

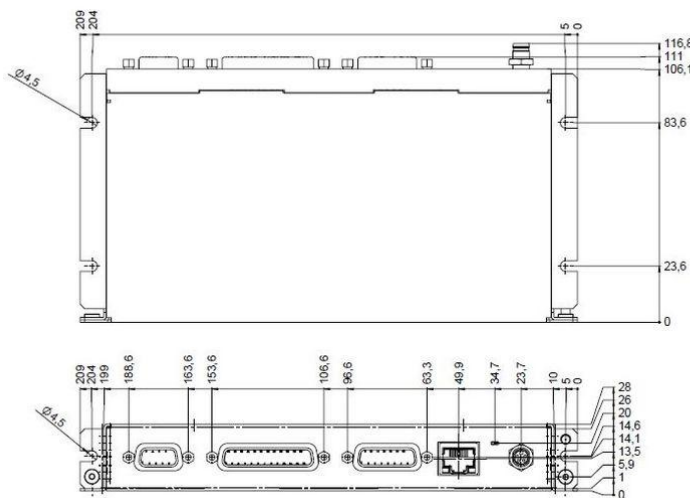
Technology

[PIMag® Magnetic Direct Drives](#) | In particular in terms of wear and dynamics, voice- coil actuators and magnetic linear drives offer advantages compared to common spindle- based technologies. [Learn more ...](#)

Drawings / Images



C-413 with case, dimensions in mm



C-413.1G, dimensions in mm