

C-413

PIMag® Motion Controller

Control of Force, Position and Velocity



- 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

Digital motion controller for PIMag® Voice Coil drives

C-413.1: 1 motor channel, 2 sensor channels, for the V-275 and V-277 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, e.g., 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, commanding or position feedback

Related and Compatible Products

Related products

C-891 PIMag® Motion Controller

Suitable for the following mechanics

V-273 PIMag® Voice Coil Linear Actuator

V-275 PIMag® Voice Coil Linear Actuator

V-277 PIMag® High-Load Linear Actuator

V-522 • V-524 • V-528 High-Dynamics PIMag® Linear Stage

Specifications

	C-413.1G	C-413.20 / C-413.20A C-413.2G / C-413.2GA
Function	PIMag® motion controller for voice coil drives, 1 channel, housed device	PIMag® motion controller for voice coil drives, 2 channels C-413.20/.20A: OEM board C-413.2G/.2GA: Housed device
Motor channels	1	2
Sensor channels	2	4
Motion and control		
Servo characteristics	PID controller for force, position and velocity; parameter changing during operation	PID controller for force, position and velocity; parameter changing during operation
Servo cycle time	100 µs to 200 µs, selectable in 4 steps	100 µs to 200 µs, selectable in 4 steps
Profile generator	Trapezoid velocity profile, specification of the maximum velocity and acceleration	Trapezoid velocity profile, specification of the maximum velocity and acceleration
Encoder input	SPI sensor interface	SPI sensor interface
Reference point switches	2 × TTL, direction-sensing	4 × TTL, direction-sensing
Electrical properties		
Max. output voltage	24 V	24 V
Max. output current	±1.5 A (closed loop)	±1.5 A (closed loop)
Interfaces and operation		
Communication interfaces	TCP/IP	USB 2.0, real time SPI
Motor / sensor connection	Sub-D 9 (f) for motor, Sub-D 25 (f) for sensor	Sub-D 15 (f) combined for motor and sensor
I/O port	2 × analog output, -10 to 10 V, 17 bit, 1 kHz 4 × digital input, 24 V 6 × digital output, 24 V	2 × analog input, -10 to 10 V, 16 bit, 1 kHz (only .20A and .2GA) 2 × analog output, -10 to 10 V, 17 bit, 1 kHz (only .20A und .2GA) 6 × digital outputs (open collector, voltage range 5 V to 24 V, 33 kΩ internal

	C-413.1G	C-413.20 / C-413.20A C-413.2G / C-413.2GA
Command set	PI General Command Set (GCS)	pull-up to 5 V) 4 × digital input (5 V TTL level, to 24 V max. input voltage, 10 kΩ input resistance) PI General Command Set (GCS)
User software	PIMikroMove, PITerminal	PIMikroMove, PITerminal
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, function generator, auto zero, ID chip detection	Point-to-point motion, data recorder, wave generator, auto zero, ID chip detection
Miscellaneous		
Operating voltage	24 V DC from external power supply (included)	24 V DC from external power supply (included)
Max. current consumption	2 A	2 A
Operating temperature range	5 to 50°C	5 to 50 °C
Mass	0.3 kg	0.3 kg
Dimensions	210 mm × 28 mm × 105 mm	189 mm × 28 mm × 105 mm (.2G/.2GA) 160 mm × 18 mm × 100 mm (.20/.20A)

Ordering Information

C-413.1G

PIMag® Motion Controller, 1 Channel, Benchtop 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, Benchtop Device, Force Control Option

C-413.2GA

PIMag® Motion Controller, 2 Channels, USB Interface, Analog Inputs, Benchtop Device, Force Control Option

Ask about custom designs!