PI

PIglide Motion Controller for 1, 2 or 4 Axes

For Stages with Direct Drive, TCP/IP Interface

A-81x

- 1, 2, & 4 motion axes

- Fully integrated closed-loop servo control, amplifier module, and power supplies

- For voice coil drives, DC motors and brushless 3-phase motors

- Quiet PWM drives

- Encoder inputs support sine/cosine and BiSS-C

- 5 A continuous current/10 A peak output current per axis

Overview

The A-81x motion controller series from PI offers a fully integrated electronics solution with controller, drives, and power supplies in a compact 19-inch rack unit. The A-81x controllers are designed and optimized for PIglide air bearing stages that are equipped with direct drive linear and rotation servo motors, and high-resolution encoders.

Standard options include inputs for incremental sine/cosine and absolute encoders that use the BiSS-C data protocol. Support for sine/cosine encoders has an integrated interpolation factor of 16384x. All controllers feature integrated flash memory for stored motion programs and parameters.

The A-81x controllers can be operated in stand-alone mode running stored programs, or controlled via an external PC. A PC is required for programming and startup. All software is supplied with the controller.

If the controller is purchased together with a PIglide air bearing stage or positioning system, PI will perform the servo tuning, startup of the controller, and error calibration, and supply a complete ready-to-use positioning system.

The A-81x motion controller features the state of the art ACS SPiiPlusEC motion controller and EtherCAT® master.

Options and Upgrades

- Absolute encoders or incremental encoders (can be combined individually according to customer specifications for all axes of the controller)
- G-Code programming
- Input shaping
- ServoBoost™ upgrade. Provides better, more consistent servo performance that is insensitive to noise or changes in the system.
- ServoBoost™ PLUS upgrade. Provides a higher position stability and velocity constancy.
- Additional control axes for external drives via EtherCAT®
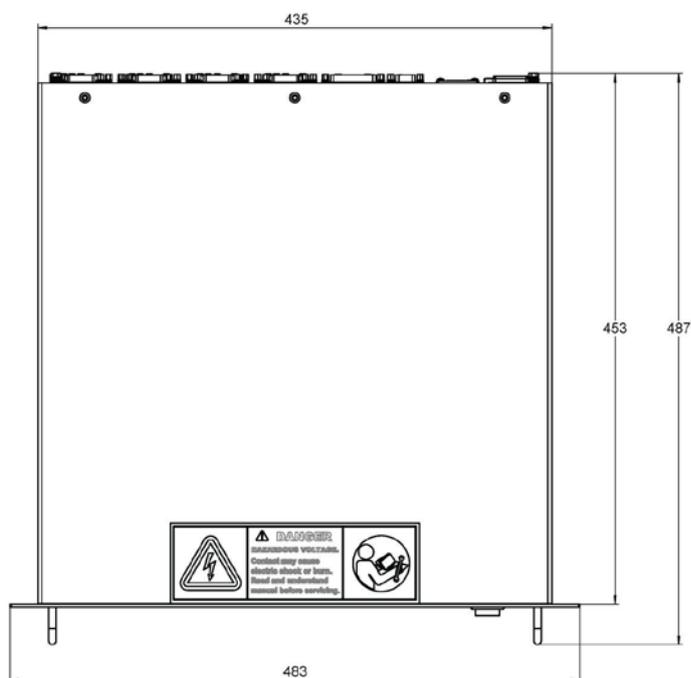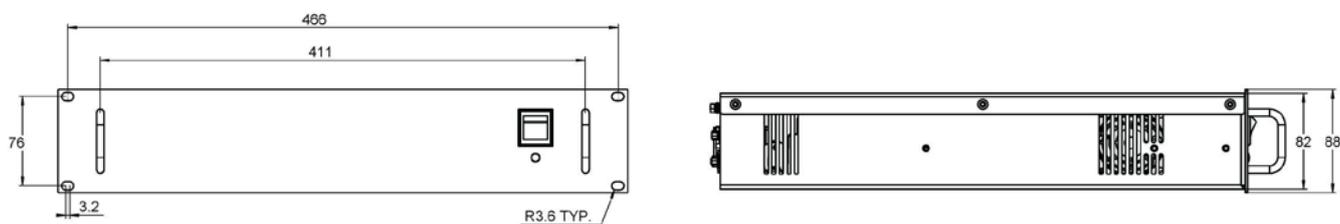- Alternative customized packaging for OEM setups

Specifications

	A-811.21x00	A-812.21x00	A-814.21x00
Number of axes	1	2	4
Controller type	Closed-loop servo control (PID), parameter changing during operation	Closed-loop servo control (PID), parameter changing during operation	Closed-loop servo control (PID), parameter changing during operation
Servo-frequency position control	10 kHz	10 kHz	10 kHz
Servo frequency current control	20 kHz	20 kHz	20 kHz
Trajectory profiles	Point-to-point, jog, s-curve	Point-to-point, jog, s-curve, interpolated coordinated multi-axis profiles	Point-to-point, jog, s-curve, interpolated coordinated multi-axis profiles
Cooling	Fan on the side (continuous operation, constant speed)	Fan on the side (continuous operation, constant speed)	Fan on the side (continuous operation, constant speed)
Drive type	PWM	PWM	PWM
Motor types	Voice coil Brushed DC motor Brushless 3-phase motor with sine commutation	Voice coil Brushed DC motor Brushless 3-phase motor with sine commutation	Voice coil Brushed DC motor Brushless 3-phase motor with sine commutation
Encoder options (factory default) (Can be configured individually for combinations according to customer specifications)	Incremental sine/cosine (1 V_{pp}) A/B quadrature (RS-422) (on request), Absolute encoder BiSS-C	Incremental sine/cosine (1 V_{pp}) A/B quadrature (RS-422) (on request), Absolute encoder BiSS-C	Incremental sine/cosine (1 V_{pp}) A/B quadrature (RS-422) (on request), Absolute encoder BiSS-C
Output current (per axis)	5 A continuous operation, 10 A peak	5 A continuous operation, 10 A peak	5 A continuous operation, 10 A peak

Interfaces	A-811.21x00	A-812.21x00	A-814.21x00
Communication	Ethernet: TCP/IP, 100/1000 Mbps Ethernet/IP Modbus	Ethernet: TCP/IP, 100/1000 Mbps Ethernet/IP Modbus	Ethernet: TCP/IP, 100/1000 Mbps Ethernet/IP Modbus
User I/O (without reference and limit switch)	2x digital input, 24 V DC, sink 2x digital output, 24 V DC, source 1x analog input, differential, 12 bit 1x analog output, differential, 10 bit 1x RS-422 high-speed output for position trigger (PEG)	2x digital input, 24 V DC, sink 2x digital output, 24 V DC, source 1x analog input, differential, 12 bit 1x analog output, differential, 10 bit 2x RS-422 high-speed output for position trigger (PEG)	4x digital input, 24 V DC, sink 4x digital output, 24 V DC, source 2x analog input, differential, 12 bit 2x analog output, differential, 10 bit 4x RS-422 high-speed output for position trigger (PEG)
Interlock / motion-stop	1x 24 V DC sink	1x 24 V DC sink	1x 24 V DC sink
Connector interface	Rear panel connectors Sub-D for motor and signal connections IEC 60320 type C14 for power supply	Rear panel connectors Sub-D for motor and signal connections IEC 60320 type C14 for power supply	Rear panel connectors Sub-D for motor and signal connections IEC 60320 type C14 for power supply

Miscellaneous	A-811.21x00	A-812.21x00	A-814.21x00
Power supply	120 - 240 V AC, single phase, 50-60 Hz (factory default), 600 W	120 - 240 V AC, single phase, 50-60 Hz (factory default), 600 W	120 - 240 V AC, single phase, 50-60 Hz (factory default), 600 W
Mass (approx.)	8.5 kg	8.5 kg	9.3 kg

Drawings / Images

466
411
76
3.2
R3.6 TYP.

82 88

435
453 487
483

A-81x, dimensions in mm

Ordering Information

One axis

A-811.21A00
PIglide motion controller, 19" rack unit, one axis, TCP/IP, encoder with sin/cos signal transmission

A-811.21B00
PIglide motion controller, 19" rack unit, one axis, TCP/IP, absolute encoder

Two axes

A-812.21A00
PIglide motion controller, 19" rack unit, two axes, TCP/IP, encoder with sin/cos signal transmission

A-812.21B00

PIglide motion controller, 19" rack unit, two axes, TCP/IP, absolute encoder

Four axes

A-814.21A00

PIglide motion controller, 19" rack unit, four axes, TCP/IP, encoder with sin/cos signal transmission

A-814.21B00

PIglide motion controller, 19" rack unit, four axes, TCP/IP, absolute encoder

Optional

A-810.SHP1

Factory option input shaping

A-810.GCD1

Factory option G-Code programming

A-810.SB1

Factory option ServoBoost™ upgrade for ACS-based controllers (4 axes)

A-810.SBP1

Factory option ServoBoost™ PLUS upgrade for ACS-based controllers (4 axes), includes ServoBoost™ upgrade

A-810.P4AX

Factory option 4 additional axes for SPiiPlus ACS controllers (no additional hardware, no additional drives)

A-810.UPGD

Further factory default options (additional axes, customized programming, ...). Contact PI for further information.