PIglide Motion Controller for 4, 6 or 8 Axes

For Stages with Direct Drive and High Power Requirements, TCP/IP Interface

A-82x

- 4, 6 or 8 high-performance 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. Optional: NanoPWM high-performance drive module
- Encoder inputs support incremental (analog sine/cosine and RS-422) and absolute (BiSS-C, EnDat 2.1/2.2) encoder
- 10 A continuous current / 20 A peak output current per axis

Overview

The A-82x motion controller series from PI offers a fully integrated electronics solution with controller, drives, and power supplies in a compact 4-U-high 19-inch rack unit. The A-82x 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. The A-82x motion controller features the state-of-the-art ACS SPiiPlusEC motion controller and EtherCAT master.
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-82x 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 NanoPWM technology from ACS is integrated into the A-824.2Nx00 models. They offer the best possible solution for demanding positioning applications: Subnanometer position holding, tracking errors limited to a few nanometers, optimal velocity constancy. NanoPWM are a genuine alternative to linear drives: Comparable performance at a lower price with less space required for the overall system.

Options and Upgrades

- Absolute encoders or incremental encoders (can be combined 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 higher position stability and velocity constancy.

- Additional control axes for external drives via EtherCAT
- Alternative customized packaging for OEM setups

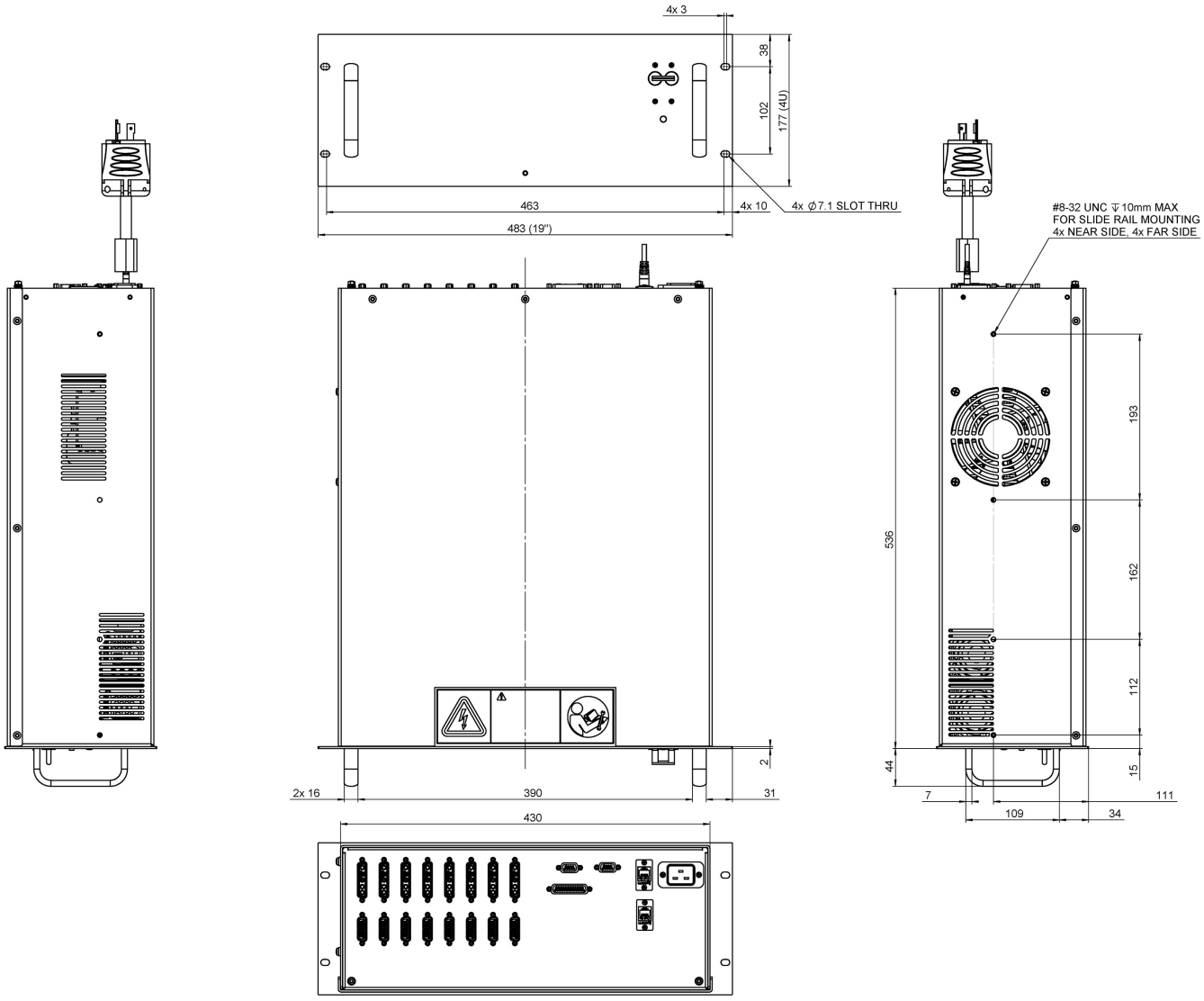
Specifications

	A-824.21x00	A-824.2Nx00	A-826.21x00	A-828.21x00
Number of drive axes	4	4	6	8
Number of controller axes	8	8	16	16
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	Closed-loop servo control (PID), parameter changing during operation
Servo-frequency position control	10 kHz	10 kHz	10 kHz	10 kHz
Servo frequency current control	20 kHz	20 kHz	20 kHz	20 kHz
EtherCAT cycle time, frequency profile generator	5 kHz	5 kHz	4 kHz	4 kHz
Trajectory profiles	Point-to-point, jog, s-curve, interpolated coordinated multi-axis profiles	Point-to-point, jog, s-curve, interpolated coordinated multi-axis profiles	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)	Fan on the side (continuous operation, constant speed)
Drive type	PWM	NanoPWM	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	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	Incremental sine/cosine (1 V_{pp}) A/B quadrature (RS-422) (on request), Absolute encoder BiSS-C
Interpolation factor sine/cosine encoder	4x to 16384x (can be adjusted by software)	4x to 65532x (can be adjusted by software)	4x to 16384x (can be adjusted by software)	4x to 16384x (can be adjusted by software)
Output voltage	72 V DC	96 V DC	72 V DC	72 V DC
Output current (per axis)	10 A continuous operation, 20 A peak (<1 s)	6.6 A continuous operation, 20 A peak (<1 s)	10 A continuous operation, 20 A peak (<1 s)	10 A continuous operation, 20 A peak (<1 s)
Output power (total)	1100 W continuous operation 2300 W peak	1500 W continuous operation 3000 W peak	1500 W continuous operation 3000 W peak	1500 W continuous operation 3000 W peak

Interfaces	A-82x.21x00	A-824.2Nx00
Communication	Ethernet: TCP/IP, 100/1000 Mbps Ethernet/IP	Ethernet: TCP/IP, 100/1000 Mbps Ethernet/IP
User I/O (without reference and limit switch)	4x digital input, 24 V DC, sink 3x 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)	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 input, 24 V DC	2x input, 24 V DC
Connector interface	Rear panel connectors D-sub for motor and signal connections IEC 60320 type C20 for power supply (power cord with NEMA L6-20P plug in the scope of delivery)	Rear panel connectors D-sub for motor and signal connections IEC 60320 type C20 for power supply (power cord with NEMA L6-20P plug in the scope of delivery)

Miscellaneous	A-824.2x00	A-824.2Nx00	A-826.21x00	A-828.21x00
Power supply	200 - 240 V AC, single phase, 50-60 Hz	200 - 240 V AC, single phase, 50-60 Hz	200 - 240 V AC, single phase, 50-60 Hz	200 - 240 V AC, single phase, 50-60 Hz
Mass (approx.)	13.6 kg	15.7 kg	14.4 kg	15.2 kg

Drawings / Images



A-82x, dimensions in mm. Note that a comma is used in the drawings instead of a decimal point.

Ordering Information

Four axes

A-824.21A00
Motion controller, high power output, 4 axes, 72 V DC output voltage, Ethernet, encoder with sin/cos signal transmission

A-824.21B00
Motion controller, high power output, 4 axes, 72 V DC output voltage, Ethernet, absolute encoder

A-824.2NA00
Motion controller, high power output, 4 axes, NanoPWM drive module, 96 V DC output voltage, Ethernet, encoder with sin/cos signal transmission

A-824.2NB00
Motion controller, high power output, 4 axes, NanoPWM drive module, 96 V DC output voltage, Ethernet, absolute encoder

Six axes

A-826.21A00
Motion controller, high power output, 6 axes, 72 V DC output voltage, Ethernet, encoder with sin/cos signal transmission

A-826.21B00
Motion controller, high power output, 6 axes, 72 V DC output voltage, Ethernet, absolute encoder

Eight axes

A-828.21A00
Motion controller, high power output, 8 axes, 72 V DC output voltage, Ethernet, encoder with sin/cos signal transmission

A-828.21B00
Motion controller, high power output, 8 axes, 72 V DC output voltage, Ethernet, absolute encoder

Optional

A-810.SHP1
input shaping upgrade for ACS-based controller

A-810.GCD1
G-Code programming

A-810.SB1
ServoBoost™ upgrade for ACS-based controllers (4 axes)

A-810.SBP1
ServoBoost™ PLUS upgrade for ACS-based controller (ServoBoost™ upgrade must have already been installed)

A-810.P4AX
Controller upgrade, 4 additional axes for ACS-based controllers

A-810.UPGD
Further factory default options (additional axes, customized programming, ...). Contact PI for further information.