Hexapod Motion Controller

Compact benchtop device for controlling 6-axis parallel kinematics

PI

C-887.52x

- Sophisticated controller using vector algorithms
- Commanding in Cartesian coordinates
- Easy customization of coordinate systems by command
- High-resolution analog inputs and motion stop as an option
- Extensive Software Package

Digital controller for 6-axis parallel kinematics

High-performance digital controller for controlling hexapods (6-axis parallel kinematics). Supports various drive types as the controller only provides the control signals, whereas the motor drivers are located in the hexapod or in a separate driver box. In addition, the motor drivers for two further single axes can be controlled.

Functions

The position is entered in Cartesian coordinates from which the controller calculates the control of the kinematics. To simplify integration of the hexapod, the coordinate systems (Work, Tool) can be changed. The pivot point can be freely defined. A data recorder can record operating data, e.g., motor control, velocity, position, or position error. The execution of macros and Python scripts on the controller enables stand-alone operation. The controller supports all currently available standard hexapods from PI and, in addition, customer-specific parallel kinematics.

Interfaces

TCP/IP for network-based control and maintenance. RS-232. USB port for manual control unit.

Additional interfaces (depending on version):

- High-resolution and extremely fast analog inputs which are ideal for fast alignment routines
- Connection for a motion stop button that activates/deactivates the 24 V output for the hexapod

Optional

- Control via manual control unit
- In case of restricted movement space: Collision check with PIVeriMove software. Executable as a simulation and directly on the controller

Extensive software support

For example, PIMikroMove user software enables fast alignment routines to be depicted graphically. GCS 2.0 command set for PI positioning systems. Extensive set of drivers, e.g., for use with NI LabVIEW, MATLAB, and Python. PIHexapodEmulator for virtual startup and operation without hardware.

Scope of delivery

The scope of delivery includes the controller, a software package, and a power adapter for the power supply. It is recommended to order the hexapod mechanics and a suitable cable set together with the controller so that the components can be adapted to each other.

| Basics			C-887.52	C-887.521	C-887.522	C-887.523
Axes/channels			6	6	6	6
Additional axes			2 single axes	2 single axes	2 single axes	2 single axes
Processor			Intel Atom dual core (1.8 GHz)	Intel Atom dual core (1.8 GHz)	Intel Atom dual core (1.8 GHz)	Intel Atom dual core (1.8 GHz)
Application-related functions			Controller macros GCS, Controller macros PIPython, Data recorder, Scan procedures, Startup macro	Controller macros GCS, Controller macros PIPython, Data recorder, Fast alignment, Scan procedures, Startup macro	Controller macros GCS, Controller macros PIPython, Data recorder, Scan procedures, Startup macro	Controller macros GCS, Controller macros PIPython, Data recorder, Fast alignment, Scan procedures, Startup macro
ID chip detection			ID chip 2.0	ID chip 2.0	ID chip 2.0	ID chip 2.0
Configuration management			reading the ID chip, manual parameter input	reading the ID chip, manual parameter input	reading the ID chip, manual parameter input	reading the ID chip, manual parameter input

Motion and Servo Controller	Unit		C-887.52	C-887.521	C-887.522	C-887.523
Supported sensor signal			A/B quadrature, RS-422, BiSS-C	A/B quadrature, RS-422, BiSS-C	A/B quadrature, RS-422, BiSS-C	A/B quadrature, RS-422, BiSS-C
Closed-loop values			Position	Position	Position	Position
Maximum control frequency (servo cycle)	Hz		10000	10000	10000	10000
Motion types			Point-to-point motion with profile generator, Cyclic transfer of target positions, Area scan routines, Gradient search routines, Wave generator	Point-to-point motion with profile generator, Cyclic transfer of target positions, Area scan routines, Gradient search routines, Wave generator	Point-to-point motion with profile generator, Cyclic transfer of target positions, Area scan routines, Gradient search routines, Wave generator	Point-to-point motion with profile generator, Cyclic transfer of target positions, Area scan routines, Gradient search routines, Wave generator
Motion coordination			Coordinated multi-axis motion, User-defined coordinate systems, Work-and-tool coordinate systems	Coordinated multi-axis motion, User-defined coordinate systems, Work-and-tool coordinate systems	Coordinated multi-axis motion, User-defined coordinate systems, Work-and-tool coordinate systems	Coordinated multi-axis motion, User-defined coordinate systems, Work-and-tool coordinate systems
Reference switch input			TTL	TTL	TTL	TTL
Limit switch input			TTL	TTL	TTL	TTL

Interfaces and Operation			C-887.52	C-887.521	C-887.522	C-887.523
Communication interfaces			RS-232, TCP/IP, USB (only for manual control units)	RS-232, TCP/IP, USB (only for manual control units)	RS-232, TCP/IP, USB (only for manual control units)	RS-232, TCP/IP, USB (only for manual control units)
On/off switch			Hardware switch on/off	Hardware switch on/off	Hardware switch on/off	Hardware switch on/off
Display and indicators			Status LED, Error LED, Power LED, Macro LED	Status LED, Error LED, Power LED, Macro LED	Status LED, Error LED, Power LED, Macro LED	Status LED, Error LED, Power LED, Macro LED
Manual control(s)			Manual control unit with USB interface	Manual control unit with USB interface	Manual control unit with USB interface	Manual control unit with USB interface
Command set			GCS 2.0	GCS 2.0	GCS 2.0	GCS 2.0
User software			PIMikroMove	PIMikroMove	PIMikroMove	PIMikroMove
Software - APIs			MATLAB, NI LabView, Python	MATLAB, NI LabView, Python	MATLAB, NI LabView, Python	MATLAB, NI LabView, Python
Analog input signal			4 x -10 to 10 V, 12 bit	2 x -5 to 5 V, 16 bit, 5 kHz bandwidth; 4 x -10 to 10 V, 12 bit	4 x -10 to 10 V, 12 bit	2 x -5 to 5 V, 16 bit, 5 kHz bandwidth; 4 x -10 to 10 V, 12 bit
Digital inputs			4	4	4	4
Digital input signal			TTL	TTL	TTL	TTL
Digital outputs			4	4	4	4
Digital output signal			TTL	TTL	TTL	TTL
Motion-dependent inputs and outputs			Digital trigger input, Digital trigger output, Analog sensor input	Digital trigger input, Digital trigger output, Analog sensor input	Digital trigger input, Digital trigger output, Analog sensor input	Digital trigger input, Digital trigger output, Analog sensor input

Electrical Properties	Unit		C-887.52	C-887.521	C-887.522	C-887.523
Output voltage	V		24	24	24	24
Peak output current	mA		7000	7000	7000	7000

Miscellaneous	Unit		C-887.52	C-887.521	C-887.522	C-887.523
Connector hexapod power supply			M12 4-pole (f)	M12 4-pole (f)	M12 4-pole (f)	M12 4-pole (f)
Connector hexapod data transmission			HD D-sub 78 (f)	HD D-sub 78 (f)	HD D-sub 78 (f)	HD D-sub 78 (f)
Connector additional axes			D-sub 15 (f)	D-sub 15 (f)	D-sub 15 (f)	D-sub 15 (f)
Connector analog input			HD D-sub 26 (f)	BNC, HD D-sub 26 (f)	HD D-sub 26 (f)	BNC, HD D-sub 26 (f)
Connector digital input			HD D-sub 26 (f)	HD D-sub 26 (f)	HD D-sub 26 (f)	HD D-sub 26 (f)
Connector digital output			HD D-sub 26 (f)	HD D-sub 26 (f)	HD D-sub 26 (f)	HD D-sub 26 (f)
Connector TCP/IP			RJ45 socket, 8P8C	RJ45 socket, 8P8C	RJ45 socket, 8P8C	RJ45 socket, 8P8C
Connector RS-232			D-sub 9 (m)	D-sub 9 (m)	D-sub 9 (m)	D-sub 9 (m)
Connector for supply voltage			M12 4-pin (m)	M12 4-pin (m)	M12 4-pin (m)	M12 4-pin (m)
Operating voltage	V		24 (ext. power adapter included)	24 (ext. power adapter included)	24 (ext. power adapter included)	24 (ext. power adapter included)
Maximum current consumption	A		8	8	8	8
Operating temperature range	°C		5 to 40	5 to 40	5 to 40	5 to 40
Overall mass	g		2800	2800	2800	2800

Drawings / Images
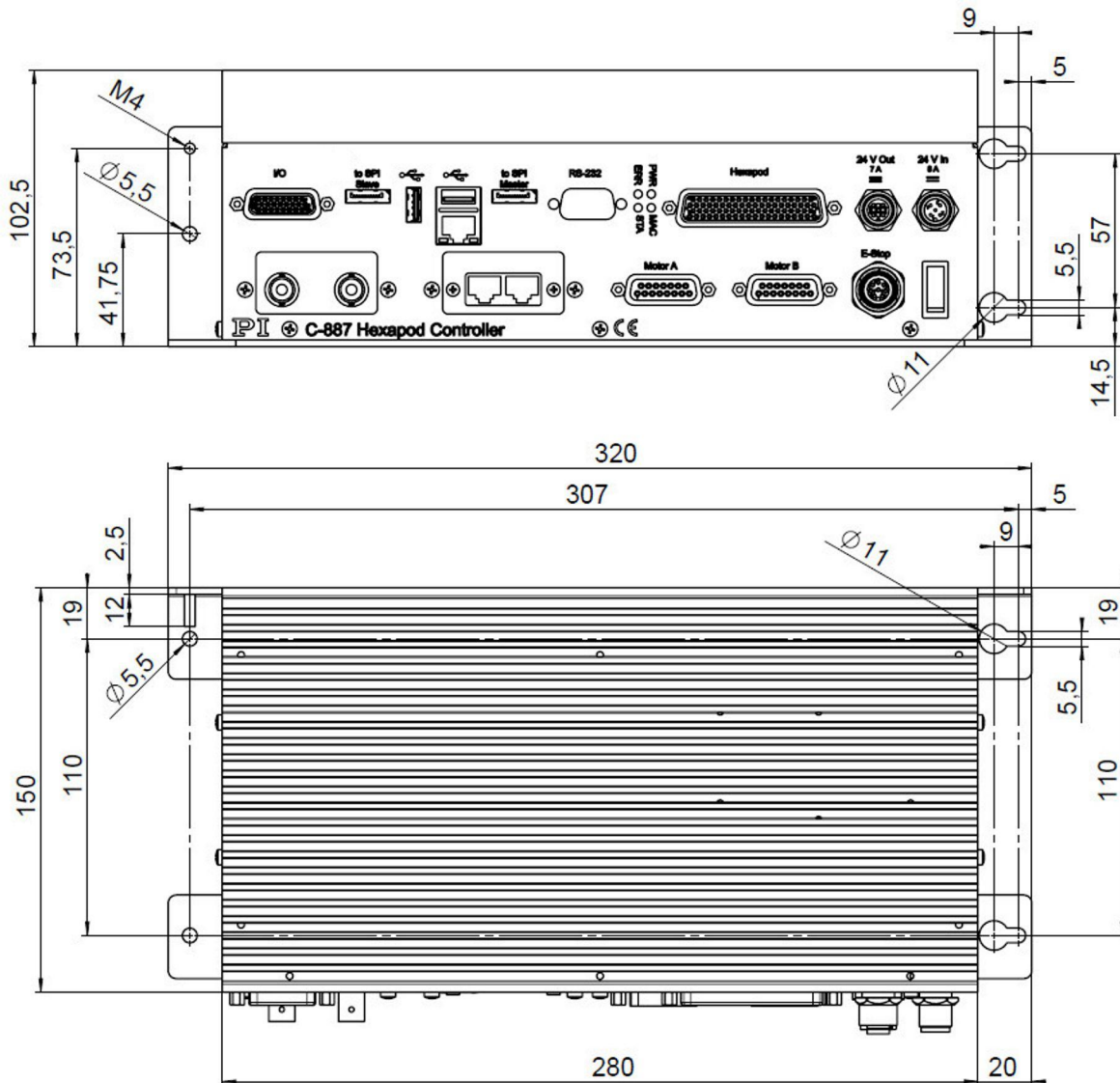
C-887.5xx, dimensions in mm. Version-dependent interfaces

Order Information

C-887.52
6-axis controller for hexapods, TCP/IP, RS-232, benchtop device, incl. control of two additional axes

C-887.521
6-axis controller for hexapods, TCP/IP, RS-232, benchtop device, incl. control of two additional axes, analog inputs

Order Information

C-887.522
6-axis controller for hexapods, TCP/IP, RS-232, benchtop device, incl. control of two additional axes, motion stop

C-887.523
6-axis controller for hexapods, TCP/IP, RS-232, benchtop device, incl. control of two additional axes, motion stop, analog inputs