Soloist® Linear Series

Position Controller and Servo Amplifier – Linear

Single axis digital servo controller with integral power supply and amplifier

Advanced software architecture shortens customer development time; use .Net, C#, C, and LabVIEW® combined with our full IDE and multitasking operating system

Host-mode operation allows you to send commands with your PC via Ethernet or USB for immediate execution

Ethernet or USB permits networked Soloists for multi-axis sequenced motion and I/O passing

Ideal for simple applications with minimal setup or complex applications that use the full flexibility and scalability

Positioning control for brushless, DC brush-type, or stepping motors

Linear amplifier (HLe/ML) for low noise, ultra-high-performance applications

CE approved and NRTL safety certification; follows the 2011/65/EU RoHS 2 Directive

Allen-Bradley EtherNet/IP™ interface provides full integration with the Soloist; program the Soloist directly from RSLogix™ 5000

Output power range is 10 to 20 A peak with ±10 to ±80 VDC bus

Soloist HLe *Soloist ML*

Introduction

Aerotech's Soloist® linear series are single-axis servo controllers that combine a power supply, amplifier, and position controller in a single package. The Soloist can control up to five tasks simultaneously, as well as handle variables and manage I/O, making it well-suited for demanding production applications. The Soloist has high-speed position latch inputs and advanced data logging capabilities, making it ideal for laboratory and test instrument applications. The advanced software architecture shortens customer development time, while including support for C#, VB.Net, C, and LabVIEW®, combined with our full IDE and multitasking operating system. Host-mode operation allows you to send commands with your PC via Ethernet or USB for immediate execution.

The Soloist HLe/ML, with linear power stage, is available for low noise and ultra-high-performance applications. This controller is ideal for high bandwidth requirements and maintains superb linearity and zero crossover distortion. For example, applications that have many motion reversals and that require high position accuracy will benefit from using the Soloist linear series.

The Soloist ML provides a very small package linear power stage for high position-accuracy applications.

Motion Composer, the common integrated development environment for all Aerotech controllers, provides users with Windows®-based software with powerful diagnostic, debug, and analysis tools for OEMs and end users alike.

Allen-Bradley Interface

Combine proven PLC with proven motion control for easier integration, startup, and maintenance of medium- and high-end automation projects. The Aerotech EtherNet/IP™ interface enables AB PLCs (MicroLogix, CompactLogix™, or ControlLogix) to be integrated directly with the Soloist. Motion can be directly programmed in the RSLogix 5000 environment or separate programs can be written on the controller and triggered from the AB PLC. Aerotech has two interfaces: ASCII and Register. Choose the PLC, motion controller, and interface that best fits your application needs.

Soloist DESCRIPTION

Total Solution

The controllers are fully tested and ready to run right out of the box. Aerotech can integrate the Soloist into a complete motion system, removing the burden of parameter setup and axis tuning.

Practical Power

Each series is capable of driving a wide range of motors including brushless, DC servo, and microsteppers. Brushless motors are sinusoidally commutated to minimize torque ripple.

Using a digital servo loop with feedforward, the Soloist tightly tracks velocity and position trajectories with virtually zero error. On-board autotuning and built-in calculators make servo tuning simple.

Variables, Math and More

With variables and math capability, one program can be used to produce a variety of parts by simply prompting the user for new application data.

Application Versatility

The Soloist has other built-in features such as axis calibration and backlash compensation, so you can maximize your machine's accuracy and precision. The "user units" feature makes it easy to customize the Soloist to your specific machine, allowing custom units for both linear and rotary applications.

The controller is equipped with dual encoder inputs, so you can tackle master-slave applications or achieve higher accuracies with dual-loop control. Precise registration-based moves are also possible because of the fast 0.1 microsecond acknowledge time of the Soloist. The Soloist easily handles complex functions such as output-on-the-fly and velocity profiling.

Soloist Series COMPARISON

Soloist HLe
Width: 206.9 mm
Height: 234.3 mm

Soloist ML
Width: 41.1 mm
Height: 141.2 mm

Soloist Comparison Chart	Soloist HLe	Soloist ML
PC Interface	Ethernet TCP/IP or USB	Ethernet TCP/IP or USB
Current Output, Peak[1]	10-20 A[2]	10 A[2]
Current Output, Continuous[1]	5-10 A[2]	5 A[2]
Bus Voltage	±40-80 VDC[3]	±40 VDC[3]
Amplifier Type	Linear	Linear
Motor Supply Voltage	2 Phase AC	DC
Standard I/O[5]	4-DO/6-DI 1-AO/1-AI	1-AI
Expansion I/O[5] **(Additional to Base I/O)**	16-DO/16-DI 3-AO/3-AI	8-DO/8-DI 1-AO/1-AI
Single Axis PSO[6]	Yes	Yes
Dual Axis PSO[6]	Yes	No
Triple Axis PSO[6]	Yes	No
Ethernet Capable for Third-Party I/O	Optional	No

Notes:
1. Peak value of the sine wave; rms current for AC motors is 0.707 * A_{pk}.
2. Load dependent.
3. Output voltage is load dependent.
4. External transformer required.
5. DO = Digital Output; DI = Digital Input; AO = Analog Output; AI = Analog Input.
6. PSO not available on Soloist ML when using integral MXU.

Soloist HLe SPECIFICATIONS

Soloist HLe	Units	10-40	20-40	10-80
Motor Style		Brush, Brushless, Stepper, Voice Coil		
Motor Supply	VAC	115/230; 50/60 Hz; Factory Configured		
Control Supply(1)	VAC	85-240 VAC; 50/60 Hz		
Bus Voltage(2)	VDC	±40	±40	±80
Peak Output Current (1 sec)(3,4)	A_{pk}	10	20	10
Continuous Output Current(3,4)	A_{pk}	5	10	5
Digital Inputs		6 Optically Isolated (2 High Speed)		
Digital Outputs		4 Optically Isolated		
Analog Inputs		One 16-bit Differential; ±10 V		
Analog Outputs		One 16-bit Single-Ended		
Dedicated Axis I/O on Feedback Connector		Three Limit Inputs (CW, CCW, Home); Three Hall Effect Inputs (A, B, C); Three High-Speed differential Inputs (sin, cos, mkr for encoder); Motor Over-Temperature Input		
Dedicated I/O on Auxiliary Feedback Connector		sin, cos, mkr for Aux Enc; Aux Enc can be used for PSO Output		
I/O Expansion Board(5)		16/16 Digital Opto-Isolated; 3 Analog In (±10 V, 16-bit Differential); 3 Analog Out (±10 V, 16-bit)		
High Speed Data Capture		Yes (50 ns Latency)		
Automatic Brake Control		Standard; 24 V at 1 A		
Emergency Stop Sense Input (ESTOP)(6)		Standard; 24 V Opto-Isolated		
Position Synchronized Output (PSO)		Single Axis Standard, Two/Three Axis Optional		
Can Output Multiplied Encoder		Yes		
Can Output Square Wave Encoder		Yes		
Primary Encoder Input Frequency		32 MHz Square Wave Standard; 500 kHz Sine Wave (MXH)		
Secondary Encoder Input Frequency		32 MHz Square Wave		
Encoder Multiplication		Up to x65536 with Quadrature Output (MXH)		
Absolute Encoder		Renishaw Resolute BiSS; EnDat 2.1; EnDat 2.2		
Resolver Interface		Optional; 1 or 2 Channel; 16-bit		
Internal Shunt Resistor		N/A		
External Shunt		N/A		
Ethernet		Optional		
USB		No		
RS-232		Yes		
FireWire		No		
Fieldbus		Modbus TCP; Ethernet/IP		
Current Loop Update Rate	kHz	20		
Servo Loop Update Rate	kHz	10		
Power Amplifier Bandwidth	kHz	Selectable Through Software		
Minimum Load Inductance	mH	0		
Operating Temperature	°C	0 to 50		
Storage Temperature	°C	-30 to 85		
Weight	kg (lb)	10.36 (22.8)		
Standards		CE approved, NRTL safety certification, 2011/65/EU RoHS 2 Directive		

Notes:
1. "Keep Alive" supply.
2. Output voltage dependent upon input voltage.
3. Peak value of the sine wave; rms current for AC motors is 0.707 * A_{pk}.
4. Load dependent.
5. Requires I/O option.
6. Requires external relay to remove motor supply power.

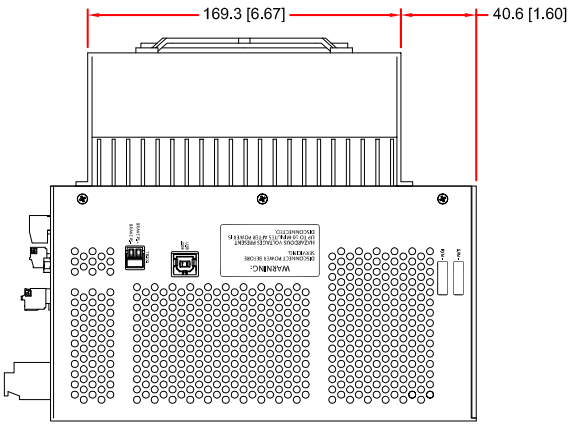
Soloist ML SPECIFICATIONS

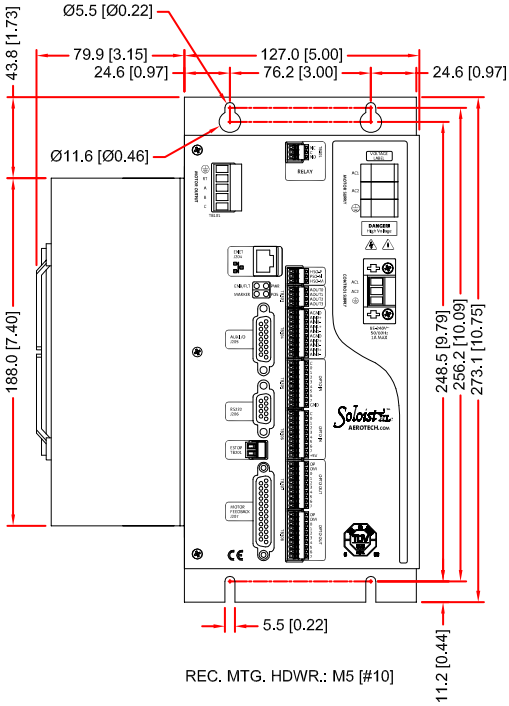
Soloist ML	Units	
Motor Style		Brush, Brushless, Stepper, Voice Coil
Motor Supply	VAC	±40 max
Control Supply(1)	VAC	18-36 VDC
Bus Voltage(2)	VDC	±40
Peak Output Current (1 sec)(3,4)	A_{pk}	10
Continuous Output Current(3,4)	A_{pk}	5
Digital Inputs		N/A
Digital Outputs		N/A
Analog Inputs		One 16-bit Differential; ±10 V
Analog Outputs		N/A
Dedicated Axis I/O on Feedback Connector		Three Limit Inputs (CW, CCW, Home); Three Hall Effect Inputs (A, B, C); Three High-Speed differential Inputs (sin, cos, mkr for encoder); Motor Over-Temperature Input
Dedicated I/O on Auxiliary Feedback Connector		sin, cos, mkr for Aux Enc; Aux Enc can be used for PSO Output
I/O Expansion Board(5)		8/8 Digital Opto-Isolated; 1 Analog In (±10 V, 16-bit Differential); 1 Analog Out (±5 V, 16-bit)
High Speed Data Capture		Yes (50 ns Latency)
Automatic Brake Control		Optional
Emergency Stop Sense Input (ESTOP)(6)		Standard; 24 V Opto-Isolated
Position Synchronized Output (PSO)		Single Axis Only
Can Output Multiplied Encoder		Yes (MXH Only)
Can Output Square Wave Encoder		Yes
Primary Encoder Input Frequency		32 MHz Square Wave Standard; 2 MHz Sine Wave (MXU or MXH)
Secondary Encoder Input Frequency		32 MHz Square Wave
Encoder Multiplication		Up to x4096 (MXU); Up to x65536 with Quadrature Output (MXH)
Resolver Interface		N/A
Internal Shunt Resistor		N/A
External Shunt		N/A
Ethernet		Yes
USB		No
RS-232		Yes
FireWire		No
Fieldbus		Modbus TCP; Ethernet/IP
Current Loop Update Rate	kHz	20
Servo Loop Update Rate	kHz	10
Power Amplifier Bandwidth	kHz	Selectable Through Software
Minimum Load Inductance	mH	0
Operating Temperature	°C	0 to 50
Storage Temperature	°C	-30 to 85
Weight	kg (lb)	0.45 (1.0)
Standards		CE approved, NRTL safety certification, 2011/65/EU RoHS 2 Directive

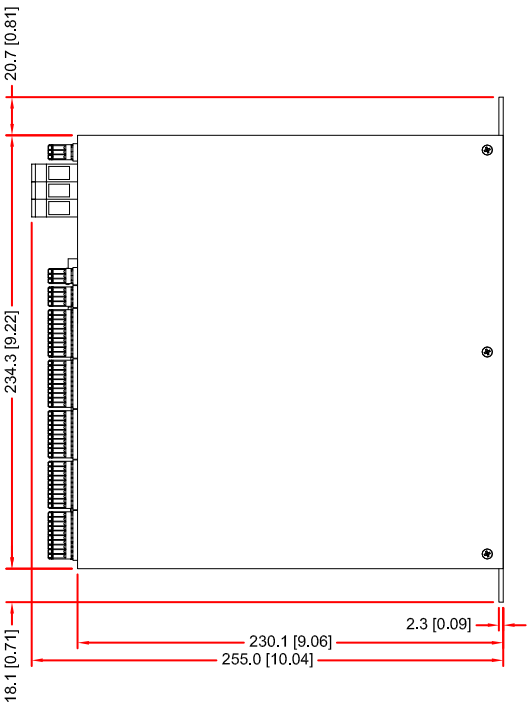
Notes:
1. "Keep Alive" supply.
2. Output voltage dependent upon input voltage.
3. Peak value of the sine wave; rms current for AC motors is 0.707 * A_{pk}.
4. Load dependent.
5. Requires I/O option.
6. Requires external relay to remove motor supply power.

Soloist HLe DIMENSIONS

Soloist HLe

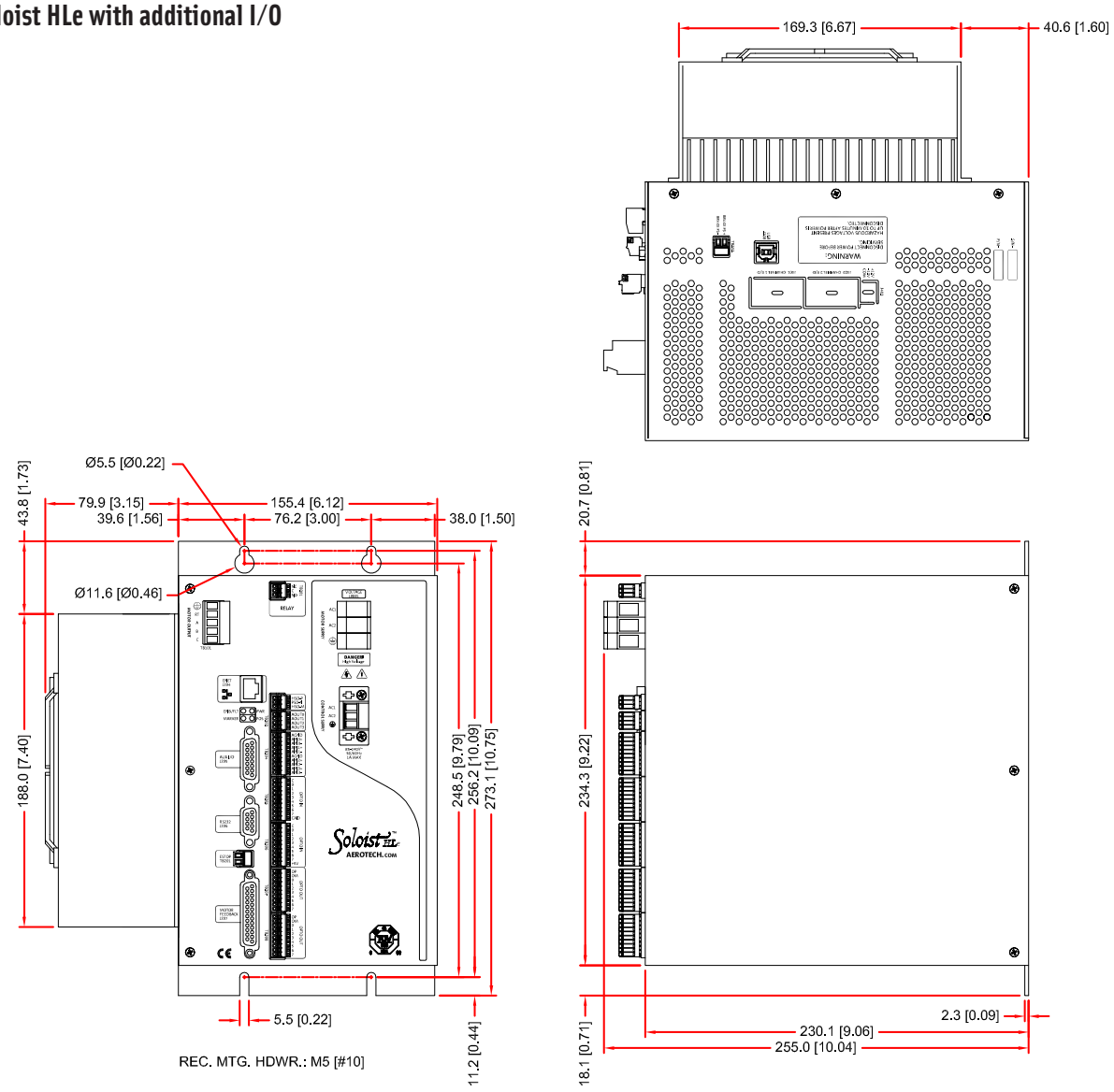






Soloist HLe DIMENSIONS

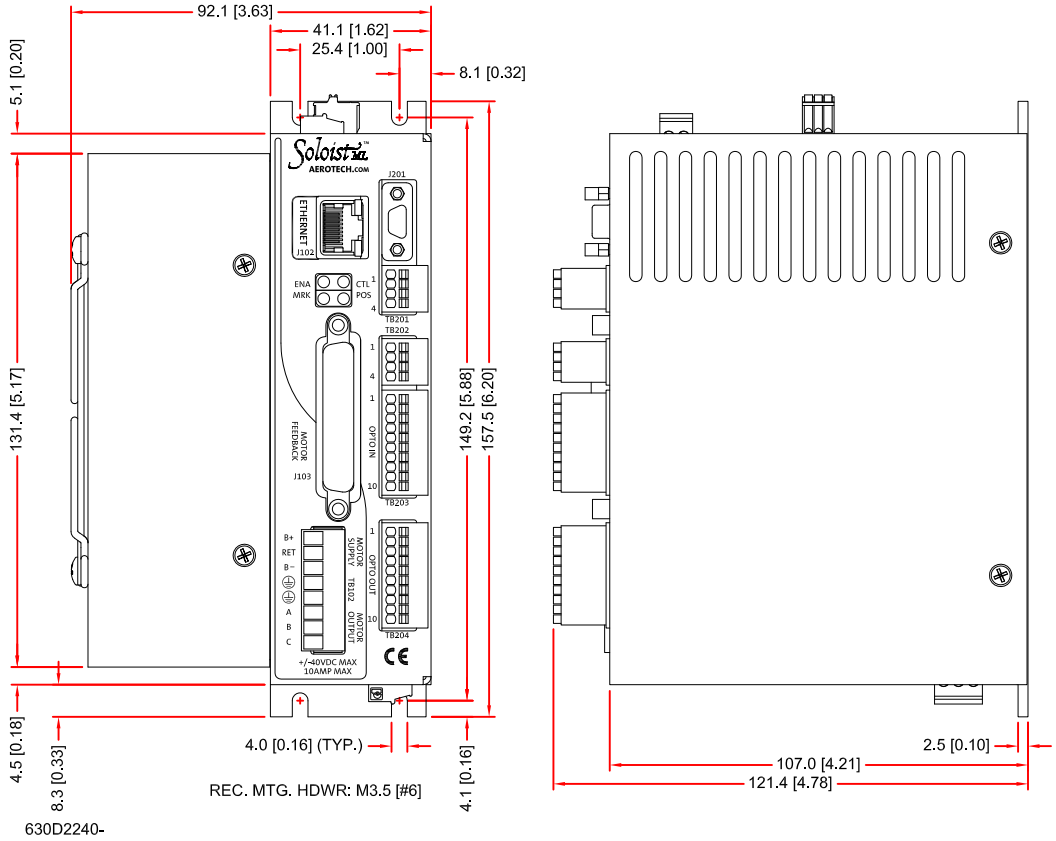
Soloist HLe with additional I/O



Soloist ML DIMENSIONS

Soloist ML with additional I/O

(Dimensions without optional I/O are identical)



Soloist Ordering Information

Visit Aerotech's website for complete ordering information.