

PL-1746-C01 Module Specifications

Electrical (The PL-1746 controller and PS-4108 rack are both UL and UL-C listed)

Input Power:	20-30 VDC. Keypad/display is powered from controller.
Backplane Power:	5VDC @ 500 mA max.
I/O Power:	20-30 VDC, 80 mA +150 mA per keyboard + 230 mA per rack. Example: Total = 840 mA with 2 keyboards and 2 racks. Certain types of power supplies employ a self protection feature called current fold back limiting. The inrush currents of the high efficiency switching regulators may cause power supplies to enter current limit mode. Power supplies with current fold back limiting should be sufficient to supply three times the steady state current of the system. Inrush current @ 30v, 40 amps max. for 600 μ s (2 keyboards, 2 racks).
Permanent Memory:	EEPROM (no battery required).

Environment

Operating Temp:	0° to 55°C (32° to 131°F).
Storage Temp:	-40° to 70°C (-40° to 160°F).
Humidity:	95% maximum relative non-condensing.
NEMA Rating:	Keypad/Display: NEMA 4.

Physical

Weight:	PLS Module: 0.5 lbs (0.2 kg). Keypad/Display: 0.5 lbs. (0.2 kg).
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Mounting

Controller:	Mounts in SLC-500 chassis.
Rack:	Brackets accept EN-50035 ("G" profile) or EN-50022 ("Top Hat" profile) DIN rail.
Keypad/Display:	Mounts up to 1000' from controller. Multiple keypads may be connected to one controller.

Inputs On Rack

DC Inputs:	8 sinking or sourcing DC inputs, optically isolated (first rack only).
Input ON State Voltage:	10-30 VDC.
Input Current:	11 mA @ 24 VDC.
Response:	2 μ s max.

Outputs On Rack

Real World Outputs:	Up to sixteen Slimline modules may be mounted on the rack. Modules may be any mix of AC, DC, and reed relay. All modules (except reed relay) are optically isolated.
Analog Output:	Up to two Slimline analog output modules may be mounted on the rack in addition to the sixteen digital modules.
Output Types:	4-20 mA or 0-10 VDC, proportional to RPM.
Resolution:	12 bit.
Update Frequency:	10 ms.
Linearity:	\pm 0.3% of full scale @ 25°C (77°F).
Set-up:	Offset and full scale RPM are programmable.

Operation

Scan Time:	Less than 1000 μ s typical (exact time determined by programming).
Position Resolution:	12 bits (4096 increments).
Speed Compensation:	Programmed in 0.1 msec steps. 16 individually compensated outputs max. Updated five times per second. Separate leading/trailing edge compensation standard.
Output Timeout:	1.0 ms time base (accuracy: +1, -0 ms).
Number of Timed Outputs:	Four maximum.
Multiple Programs:	48 programs standard.
Total Pulse Memory:	1252 pulses standard.
Pulses per Program:	512 maximum standard.
Pulses per Output:	512 maximum standard.
Maximum Speed:	3000 RPM, Note: Pulses generated with Pulse Train command are not included in pulses per program or pulses per output counts.

PL-1746-C02/C03 Module Specifications

Electrical (The PL-1746 controller is UL and UL-C listed)

Input Power:	20-30 VDC. Keypad/display is powered from controller.
Backplane Power:	5 VDC @ 500 mA max.
I/O Power:	20-30 VDC @ 90 mA max. plus 150 mA per PS-6400 keypad. Certain types of power supplies employ a self protection feature called current fold back limiting. The inrush currents of the high efficiency switching regulators may cause power supplies to enter current limit mode. Power supplies with current fold back limiting should be sufficient to supply three times the steady state current of the system.
Permanent Memory:	EEPROM (no battery required).

Environment

Operating Temp:	0° to 55°C (32° to 131°F).
Storage Temp:	-40° to 70°C (-40° to 160°F).
Humidity:	95% maximum relative non-condensing.
NEMA Rating:	Keypad/Display: NEMA 4

Physical

Weight:	PLS Module: 0.5 lbs (0.2 kg). Keypad/Display: 0.5 lbs. (0.2 kg).
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Mounting

Controller:	Mounts in SLC-500 chassis.
Keypad/Display:	Mounts up to 1000' from controller. Multiple keypads may be connected to one controller.

Inputs On Module

DC Inputs:	8 DC inputs, optically isolated, sinking or sourcing in banks of 4.
Input ON State Voltage:	20-30 VDC.
Input Current:	11 mA @ 24 VDC.
Response:	2 μ s max.

Outputs On Module

Real World Outputs: 6 DC outputs @ 1.5A each, 20-30 volts.

On the -C02 ALL outputs are SOURCING, on the -C03 ALL outputs are SINKING.

Analog Output:	Analog outputs accessible through backplane only; they are proportional to RPM.
Resolution:	12 bit.
Update Frequency:	10 ms.
Set-up:	Offset and full scale RPM are programmable.

Operation

Scan Time:	Less than 1000 μ s typical (exact time determined by programming).
Position Resolution:	12 bits (4096 increments).
Speed Compensation:	Programmed in 0.1 msec steps. 16 individually compensated outputs max. Separate leading/trailing edge compensation standard.
Timed Outputs:	1.0 ms time base (accuracy: +1, -0 ms).
Number of Timed Outputs:	4 maximum.
Multiple Programs:	48 programs standard.
Total Pulse Memory:	1252 pulses standard.
Pulses per Program:	512 maximum standard.
Pulses per Output:	512 maximum standard.
Maximum Speed:	3000 RPM.

PL-1746-C02/C03 Module Specifications (Cont'd)

On the -C02 ALL outputs are SOURCING, on the -C03 ALL outputs are SINKING.

Output Specifications

	Minimum	Typical	Maximum
Operating Voltage	20 V dc	24 V dc	30 V dc
Carry Current			1.5A dc
Leakage Current			150 μ A dc
Turn-On Time		10 μ s	50 μ s
Turn-Off Time		20 μ s	50 μ s

Input Specifications

	Minimum	Typical	Maximum
Absolute Maximum Voltage			30 V dc
Pickup Voltage		9.2 V dc	11.0 V dc
Dropout Voltage	7.0 V dc	9.2 V dc	
Current Draw		3.5 mA dc	20 mA dc

PL-1746-C04 Module Specifications

Electrical (The PL-1746-C04 controller is UL and UL-C listed)

I/O Power: 20-30 VDC @ 80 mA plus 150 mA per PS-6400 keypad (include power supply warming).
Backplane Power: 5VDC @ 500 mA max.
Permanent Memory: EEPROM (no battery required).

Environment

Operating Temp: 0° to 55°C (32° to 131°F).
Storage Temp: -40° to 70°C (-40° to 160°F).
Humidity: 95% maximum relative non-condensing.
NEMA Rating: Keypad/Display: NEMA 4

Physical

Weight: PLS Module: 0.5 lbs (0.2 kg). Keypad/Display: 0.5 lbs. (0.2 kg).

Mounting

Controller: Mounts in SLC-500 chassis.
Keypad/Display: Mounts up to 1000' from controller. Multiple keypads may be connected to one controller.

Operation

Scan Time: Less than 1000 μ s typical (exact time determined by programming).
For faster response, interrupt-driven versions available—consult factory.
Position Resolution: 12 bits (4096 increments).
Speed Compensation: Programmed in 0.1 msec steps. 16 individually compensated outputs max. Updated five times per second. Separate leading/trailing edge compensation standard.
Output Timeout: 1.0 ms time base (accuracy: +1, -0 ms).
Number of Timed Outputs: Four maximum.
Multiple Programs: 48 programs standard.
Total Pulse Memory: 1252 pulses standard.
Pulses per Program: 512 maximum standard.
Pulses per Output: 512 maximum standard.
Maximum Speed: 3000 RPM, Note: Pulses generated with Pulse Train command are not included in pulses per program or pulses per output counts.

Solid State Relay Specifications

Note: The maximum current rating for each module installed in the PS-4108 rack is as stated in the module's specifications, OR 1.5 amps, whichever is less.

AC Outputs

Part # EC-OAC240-3

Output Voltage:	24 VAC rms minimum 280 VAC rms maximum
Output Current:	30 mA rms minimum 3 amps rms maximum @/below 35°C (95°F). Above 35°C derate 50 mA/°C (27.8 mA/°F)
Input Voltage:	5 VDC nominal 8 VDC maximum
Turn On Time:	100 µs maximum @ 60 Hz
Turn Off Time:	8.3 ms maximum @ 60 Hz
Off State Leakage:	2 mA AC rms @ 120 VAC rms, 60 Hz
Operating Temp.	-30°C to +70°C (-22° to +158°F)

DC Output, 60 VDC

Part # EC-ODC060-3

Output Voltage:	0 to 60 VDC
Output Current:	3 amps DC @/below 35°C (95°F) Above 35°C derate 35.7 mA/°C (19.8 mA/°F)
Turn On Time:	50 µs maximum
Turn Off Time:	50 µs maximum
Off State Leakage:	1 µA DC maximum @ 24 VDC
Operating Temp.	-30°C to +70°C (-22° to +158°F)

DC Outputs, 200 VDC

Part # EC-ODC200-1 (Slimline)

Output Voltage:	0 to 200 VDC
Output Current:	1 amp DC @/below 45°C (113°F). Above 45°C derate 18 mA/°C (10 mA/°F)
Turn On:	50 µs maximum
Turn Off:	50 µs maximum
Off State Leakage:	1 µA maximum
Operating Temp.	-30°C to +70°C (-22° to +158°F)

Analog Output, 0-10 VDC

Part # EC-SANL-010V

Resolution:	12 Bits (4096 Increments)
Output Voltage:	0 to 10 VDC
Output Current:	10 mA maximum
Load Resistance:	1 K Ohm minimum
Linearity:	±0.3% full scale @ 25°C (77°F)

Analog Output, 4-20 mA

Part # EC-SANL-420M

Resolution:	12 Bits (4096 Increments)
Output Current:	4 to 20 mA DC
Load Resistance:	450 Ohm maximum
Linearity:	±0.3% full scale @ 25°C (77°F)

Reed Relays

EC-ORR000-0 (SLIMLINE)

Output Type:	N/O Reed Relay Contacts
Contact Rating:	10 VA maximum
Switching Voltage:	100 VDC or 130 VAC maximum
Switching Current:	0.5 A maximum
Carry Current:	1.5 A maximum
Turn On Time:	500 ms
Turn Off Time:	500 µs
Mechanical Life:	5 x 10 ⁶ cycles
Operating Temp:	-30 to +70°C (-22° to +158°F)

Module Factory Defaults

Analog Outputs	
Quantity:	0
Offset:	0
High RPM:	2000
Default Program:	0
Enable Codes	
Operator:	1
Setup:	2
Master:	3
Enable Options:	ON for all functions
Increasing Direction:	CCW
Input ANDing:	OFF
Keyboard Quantity:	1
Motion ANDing:	OFF
Motion Detection:	Lo 10 RPM, Hi 3000 RPM both levels
Machine Offset:	0
Per Channel Enable:	All channels ON
RPM Update:	1/s
Output Enable ANDing:	OFF
Speed Comp:	All channels 0
Toggle RPM:	20 RPM
Scale Factor	360
Speed Comp Mode:	L/T
Group Qty:	1
Group 0 Channel Qty:	32
Group 0 Mode:	1
Group Position Display:	Each
Group 0 Offset:	0
Rate Multiplier:	1
Rate Divisor:	1
Decimal Point Location:	0
Display Units:	RPM
Pulses Used:	0
Input File Mapping	
Registers:	Unmapped
Output File Mapping	
Registers:	Unmapped
Interrupt Levels:	Zero to one transition
Interrupt Enables:	Disabled

Resolver Specifications

Operating Temp:	-40° to 125°C (-40° to 257°F)
Storage Temp:	-40° to 125°C (-40° to 257°F)
Operating Humidity:	95% Relative non-condensing
NEMA Rating:	NEMA 4 NEMA 4X
Maximum RPM:	3000 RPM
Max Cable Length:	1000 Ft.
Type:	Single Turn - Brushless
Resolution (all):	12 Bits (4096 increments)
Linearity (standard):	+/-20 arc minutes (resolver only) (+/-30 arc minutes combined with R/D converter in controller)
Linearity (specials):	+/-3 to +/-10 arc minutes (resolver only) (+/-7 to +/-14 arc minutes combined with R/D converter in controller)

Note: A resolver's linearity errors are repeatable at all positions of its 360 degree rotation. Therefore, once appropriate setpoints are established, machine performance is consistent every cycle.