

## SLC 500 Digital I/O Modules

**Input Catalog Numbers** 1746-IA4, 1746-IA8, 1746-IA16, 1746-IB8, 1746-IB16, 1746-IC16, 1746-IG16, 1746-IH16, 1746-IM4, 1746-IM8, 1746-IM16, 1746-IN16, 1746-ITB16, 1746-ITV16, 1746-IV8, 1746-IV16

**Output Catalog Numbers** 1746-OA8, 1746-OA16, 1746-OAP12, 1746-OB8, 1746-OB6EI, 1746-OB16, 1746-OB16E, 1746-OBP8, 1746-OBP16, 1746-OG16, 1746-OV8, 1746-OV16, 1746-OVP16, 1746-OW4, 1746-OW8, 1746-OW16, 1746-OX8

**Combination Input/Output Catalog Numbers** 1746-IO4, 1746-IO8, 1746-IO12, 1746-IO12DC

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## Replace Fuses

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**ATTENTION:** Never install, remove, or wire modules with power applied to chassis.

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1. Remove SLC 500 system power and correct the conditions causing the short circuit.
2. Remove the output module from the chassis.
3. Remove the fuse.
  - 1746-OBP16 and 1746-OVP16 modules: Use a wide-tipped, slotted-head screwdriver to remove the blown fuse. Slide the screwdriver tip under the fuse and use a twisting motion to pry the fuse from the fuse clip. Use care so that the printed circuit board and surrounding electronics are not damaged.
  - 1746-OAP12 module: A fuse holder is provided with each fuse. Simply grasp the fuse holder with needle-nose pliers, or your fingers, and pull it out.
4. Replace the fuse.
  - 1746-OBP16 and 1746-OVP16 modules: Center the replacement fuse over the fuse clip and press down. If you use a tool to press the fuse in place, apply pressure to the metal end caps only, not the center of the fuse.
  - 1746-OAP12 module: Insert a new fuse into the fuse holder, align the fuse holder on fuse clips, and press down.
5. Replace the output module in the chassis.
6. Restore SLC 500 system power.
7. Clear processor fault bits as indicated in the steps provided on [page 13](#).

## Electronically Protected Modules (1746-OB6EI and 1746-OB16E)

The electronic protection of the 1746-OB6EI and 1746-OB16E modules have been designed to provide protection for the modules from short circuit and overload current conditions. The protection is based on a thermal cut-out principle. In the event of a short circuit or overload current condition on an output channel, that channel will limit current within milliseconds after its thermal cut-out temperature has been reached. All other channels continue to operate as directed by the CPU (processor) module.

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**IMPORTANT**

The modules do not provide protection against reverse polarity wiring or wiring to ac power sources. Electronic protection is not intended to replace fuses, circuit breakers, or other code-required wiring protection devices.

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## Specifications – 1746-OA8, 1746-OA16, and 1746-OAP12

Attribute	Value		
	1746-OA8	1746-OA16 <sup>(5)</sup>	1746-OAP12 <sup>(5)(6)(7)</sup>
Load current, min	10 mA		
Continuous current per point <sup>(3)</sup>	1.0 A @ 30 °C (86 °F) 0.50 A @ 60 °C (140 °F)	0.50 A @ 30 °C (86 °F) 0.25 A @ 60 °C (140 °F)	2.0 A @ 30 °C (86 °F) 1.25 A @ 55 °C (131 °F) 1.0 A @ 60 °C (140 °F)
Continuous current per module, max	8.0 A @ 30 °C (86 °F) 4.0 A @ 60 °C (140 °F)	8.0 A @ 30 °C (86 °F) 4.0 A @ 60 °C (140 °F)	9.0 A @ 30 °C (86 °F) 6.8 A @ 55 °C (131 °F) 6.0 A @ 60 °C (140 °F)
On-state voltage drop, max	1.50V @ 1.0 A	1.50V @ 0.50 A	1.2V @ 2.0 A
Surge current per point <sup>(4)</sup> , max	10.0 A for 25 ms	10.0 A for 25 ms	17.0 A for 25 ms <sup>(8)</sup>

(1) Triac outputs turn on at any point in the AC line cycle, and turn off at AC line zero cross.

(2) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. For 120V AC operation, use a 15 K $\Omega$ , 2 W resistor. For 240V AC operation, use a 15 K $\Omega$ , 5 W resistor.

(3) Recommended surge suppression: For triac outputs when switching 120V AC inductive loads, use Harris Metal-Oxide Varistor, model number V220MA2A. Refer to the SLC 500 Modular Hardware Style User Manual, publication [1747-JM011](#), for more information on surge suppression.

(4) Repeatability is once every 1 s at 30 °C (86 °F). Repeatability is once every 2 s at 60 °C (140 °F).

(5) Removable terminal block.

(6) A fused common and blown fuse LED indicator are provided on this module. See Fuse Protection and Blown Fuse Diagnostics.

(7) Use ID Code 2803 when configuring your system with programming software or the HHT.

(8) Surge current = 35 A per common for 10 ms.

## DC Output Modules

### Specifications – 1746-OB8, 1746-OB16, and 1746-OB16E

Attribute	Value		
	1746-OB8	1746-OB16 <sup>(4)</sup>	1746-OB16E <sup>(4)(5)</sup>
Voltage category	24V DC Signal Output		
Number of outputs	8	16	16
Points per common	8	16	16
Voltage, operating (V DC)	10...50 (source)		10...30 (source)
Backplane current consumption	5V DC	0.135 A	0.280 A
	24V DC	0.0 A	
Signal delay, max resistive load	On = 1 ms Off = 1.0 ms	On = 0.1 ms Off = 1.0 ms	On = 1.0 ms <sup>(6)</sup> Off = 1.0 ms
Off-state leakage, max <sup>(1)</sup>	1 mA		
Load current, min	1 mA		

## Specifications – 1746-OB8, 1746-OB16, and 1746-OB16E

Attribute	Value		
	1746-OB8	1746-OB16 <sup>(4)</sup>	1746-OB16E <sup>(4)(5)</sup>
Continuous current per point <sup>(2)</sup>	1.0 A @ 30 °C (86 °F) 0.50 A @ 60 °C (140 °F)	0.50 A @ 30 °C (86 °F) 0.25 A @ 60 °C (140 °F)	1.0 A @ 30 °C (86 °F) <sup>(7)</sup> 0.50 A @ 60 °C (140 °F)
Continuous current per module, max	8.0 A @ 30 °C (86 °F) 4.0 A @ 60 °C (140 °F)	8.0 A @ 30 °C (86 °F) 4.0 A @ 60 °C (140 °F)	8.0 A @ 0...60 °C (32...140 °F)
On-state voltage drop, max	1.2V @ 1.0 A	1.2V @ 0.50 A	1.0V @ 0.50 A
Surge current per point <sup>(3)</sup>	3.0 A for 10 ms	3.0 A for 10 ms	2.0 A for 10 ms <sup>(8)</sup>

- (1) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. For transistor outputs 24V DC operation, use a 5 K $\Omega$ , 1/2 W resistor.
- (2) Recommended surge suppression: For transistor outputs when switching 24V DC inductive loads, use a 1N4004 diode reverse-wired across the load. Refer to the SLC 500 Modular Hardware Style User Manual, publication [1747-UM011](#), for more information on surge suppression.
- (3) Repeatability is once every 1 s at 30 °C (86 °F). Repeatability is once every 2 s at 60 °C (140 °F).
- (4) Removable terminal block.
- (5) Use the following ID Code when configuring your system with programming software or the HHT: 1746-OB16E = 2920.
- (6) Fast turn-off modules (1746-OB6EI, 1746-OBP8 Series B and later, 1746-OB16E Series B and later, 1746-OBP16, and 1746-OVP16) provide fast OFF delay for inductive loads. Comparative OFF delay times for 1746-OB8/1746-OV8 and fast turn-off modules, when switching Bulletin 100-B110 (24W sealed) contactor, are: 1746-OB8/1746-OV8 OFF delay = 152 ms; fast turn-off modules OFF delay = 47 ms.
- (7) Fast off delay for inductive loads is accomplished with surge suppressors on the 1746-OB6EI, 1746-OBP8 series B and later, 1746-OB16E series B and later, 1746-OBP16, and 1746-OVP16 modules. A suppressor at the load is not needed unless another contact is connected in series. If this is the case, a 1N4004 diode should be reverse wired across the load. This defeats the fast turn-off feature.
- (8) Surge current = 32 A per module for 10 ms.



**ATTENTION:** A transient pulse occurs in transistor outputs when the external DC supply voltage is applied to the output common terminals (for example, through the master control relay). This can occur regardless of the processor having power or not. For most applications, the energy of this pulse is not sufficient to energize the load.

Refer to the SLC 500 Modular Hardware Style User Manual, publication [1747-UM011](#), for more information on transient pulses and guidelines to reduce inadvertent processor operation.

## Specifications – 1746-OB6EI, 1746-OBP8, and 1746-OBP16

Attribute	Value		
	1746-OB6EI <sup>(5)(6)</sup>	1746-OBP8 <sup>(5)(6)(8)</sup>	1746-OBP16 <sup>(5)(6)(9)(10)</sup>
Voltage category	24V DC Signal Output		
Number of outputs	6	8	16
Points per common	Individually isolated	4	16

## Specifications – 1746-OB6EI, 1746-OBP8, and 1746-OBP16

Attribute		Value		
		1746-OB6EI <sup>(5)(6)</sup>	1746-OBP8 <sup>(5)(6)(8)</sup>	1746-OBP16 <sup>(5)(6)(9)(10)</sup>
Voltage, operating (V DC)		10...30 (source)	20.4...26.4 (source)	
Backplane current consumption	5V DC	0.046 A	0.135 A	0.250 A
	24V DC	0.0 A		
Signal delay, max resistive load		On = 1.0 ms <sup>(7)</sup> Off = 2.0 ms	On = 1.0 ms <sup>(7)</sup> Off = 2.0 ms	On = 0.1 ms <sup>(7)</sup> Off = 1.0 ms
Off-state leakage, max <sup>(1)</sup>		1 mA		
Load current, min		1 mA		
Continuous current per point <sup>(2)(3)</sup>		2.0 A @ 0...60 °C (140 °F)	2.0 A @ 0...60 °C (140 °F)	1.5 A @ 30 °C (86 °F) 1.0 A @ 60 °C (140 °F)
Continuous current per module		12.0 A @ 0...60 °C (140 °F)	8.0 A @ 0...60 °C (140 °F)	6.4 A @ 0...60 °C (32...140 °F)
On-state voltage drop, max		1.0V @ 2.0 A	1.0V @ 2.0 A	1.0V @ 1.0 A
Surge current per point <sup>(4)</sup>		4.0 A for 10 ms	4.0 A for 10 ms	4.0 A for 10 ms
Surge current per module <sup>(4)</sup>		24.0 A for 10 ms	32.0 A for 10 ms	32.0 A for 10 ms
Electronic protection		Yes	No	No

- (1) To limit the effects of leakage current through solid state outputs, a loading resistor can be connected in parallel with your load. For transistor outputs, 24V DC operation, use a 5.6 K $\Omega$ , 1/2 W resistor.
- (2) Recommended surge suppression: For transistor outputs when switching 24V dc inductive loads, use a 1N4004 diode reverse-wired across the load (also see footnote 3). Refer to the SLC 500 Modular Hardware Style User Manual, publication [1747-UM011](#), for more information on surge suppression.
- (3) Fast off delay for inductive loads is accomplished with surge suppressors on the 1746-OB6EI, 1746-OBP8 series B and later, 1746-OB16E series B and later, 1746-OBP16, and 1746-OVP16 modules. A suppressor at the load is not needed unless another contact is connected in series. If this is the case, a 1N4004 diode should be reverse wired across the load. This defeats the fast turn-off feature.
- (4) Repeatability is once every 1 s at 30 °C (86 °F). Repeatability is once every 2 s at 60 °C (140 °F).
- (5) Removable terminal block.
- (6) Use the following ID Code when configuring your system with programming software or the HHT: 1746-OB6EI = 2619, 1746-OBP8 = 2721 and 1746-OBP16 = 2921.
- (7) Fast turn-off modules (1746-OB6EI, 1746-OBP8 Series B and later, 1746-OB16E Series B and later, 1746-OBP16, and 1746-OVP16) provide fast OFF delay for inductive loads. Comparative OFF delay times for 1746-OB8/1746-OV8 and fast turn-off modules; when switching Bulletin 100-B110 (24V sealed) contactor, are: 1746-OB8/1746-OV8 OFF delay = 152 ms; fast turn-off modules OFF delay = 47 ms.
- (8) An external fuse can be used to protect this module from short circuits. Recommended fuse is SANO MQ4-3.15A, 5 x 20 mm.
- (9) A fused common and blown fuse LED indicator are provided on this module. See Fuse Protection and Blown Fuse Diagnostics.
- (10) Certified for Class 1, Division 2 hazardous location by CSA.

- (8) Fast turn-off modules (1746-OB6EI, 1746-OBP8 series B and later, 1746-OB16E series B and later, 1746-OBP16, and 1746-OVP16) provide fast OFF delay for inductive loads. Comparative OFF delay times for 1746-OB8/1746-QV8 and fast turn-off modules; when switching Bulletin 100-B110 (24Ws sealed) contactor, are: 1746-OB8/1746-QV8 OFF delay = 152 ms; fast turn-off modules OFF delay = 47 ms.
- (9) Fast off delay for inductive loads is accomplished with surge suppressors on the 1746-OB6EI, 1746-OBP8 series B and later, 1746-OB16E series B and later, 1746-OBP16, and 1746-OVP16 modules. A suppressor at the load is not needed unless another contact is connected in series. If this is the case, a 1N4004 diode should be reverse wired across the load. This defeats the fast turn-off feature.
- (10) Surge current = 32 A per module for 10 ms.



**ATTENTION:** A transient pulse occurs in transistor outputs when the external DC supply voltage is applied to the output common terminals (for example, via the master control relay). This can occur regardless of the processor having power or not. For most applications, the energy of this pulse is not sufficient to energize the load.

Refer to the SLC 500 Modular Hardware Style User Manual, publication [1747-UM011](#), for more information on transient pulses and guidelines to reduce inadvertent processor operation.

## Specifications – 1746-0G16

Attribute	Value <sup>(1)</sup>	
Voltage category	5V DC TTL Signal Input (sinking)	
Number of outputs	16	
Points per common	16	
Voltage, operating (V DC to DC COM)	4.5...5.5V DC <sup>(2)</sup> 50 mV peak to peak ripple, max.	
Backplane current consumption	5V DC	0.180 A
	24V DC	0.0 A
Signal delay, max resistive load	On = 0.25 mA Off = 0.50 mA	
Off-state voltage	4.5...5.5V DC	
Off-state leakage, max	0.1 mA	
Load current, min	0.15 mA	
Continuous current per point	24 mA	

<sup>(1)</sup> Removable terminal block.

<sup>(2)</sup> TTL outputs are inverted (0...0.4V DC = low voltage = True = ON). Use a NOT instruction in your ladder program to convert to traditional True = High logic.