

Specifications – 1746-IH16

Attribute		Value ⁽¹⁾⁽²⁾⁽³⁾	
Voltage category		125V DC signal input (sinking)	
Number of inputs		16	
Points per common		16	
Voltage, operating		Range: 90...146V DC	Points ON Simultaneously, max: 6 @ 146V DC and 30 °C (86 °F) 12 @ 146V DC and 50 °C (122 °F) 14 @ 132V DC and 55 °C (131 °F) 16 @ 125V DC and 60 °C (140 °F)
Backplane current consumption	5V DC	0.085 A	
	24V DC	0.0 A	
Signal delay, max		On = 9 ms Off = 9 ms	
Off-state voltage, max		20.0V DC	
Off-state current, max		0.8 mA	
Input current, nom		2.15 mA @ 125V DC	
		2.25 mA @ 132V DC	

⁽¹⁾ Removable terminal block.

⁽²⁾ Use ID Code 0507 when configuring your system with programming software or the HHT.

⁽³⁾ If the input module is connected in parallel with an inductive load, use surge suppression across the load to protect the input module from damage caused by reverse voltage. Refer to the SLC 500 Modular Hardware Style User Manual, publication [1747-UM011](#), for more information on surge suppression.

AC Output Modules

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

Attribute	Value		
	1746-OA8	1746-OA16 ⁽⁵⁾	1746-OAP12 ⁽⁵⁾⁽⁶⁾⁽⁷⁾
Voltage category	120/240V AC signal input		
Number of outputs	8	16	12
Points per common	4	8	6
Voltage, operating	85...265V AC @ 47...63 Hz		
Backplane current consumption	5V DC	0.185 A	0.370 A
	24V DC	0.370 A	
Signal delay, max resistive load ⁽¹⁾	On = 1 ms Off = 11.0 ms		
Off-state leakage, max ⁽²⁾	2 mA		

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

Attribute	Value		
	1746-OA8	1746-OA16 ⁽⁵⁾	1746-OAP12 ⁽⁵⁾⁽⁶⁾⁽⁷⁾
Load current, min	10 mA		
Continuous current per point ⁽³⁾	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 ⁽⁴⁾ , max	10.0 A for 25 ms	10.0 A for 25 ms	17.0 A for 25 ms ⁽⁸⁾

(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 Ω , 2 W resistor. For 240V AC operation, use a 15 K Ω , 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 ⁽⁴⁾	1746-OB16E ⁽⁴⁾⁽⁵⁾
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 ⁽⁶⁾ Off = 1.0 ms
Off-state leakage, max ⁽¹⁾	1 mA		
Load current, min	1 mA		

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

Attribute	Value		
	1746-OB8	1746-OB16 ⁽⁴⁾	1746-OB16E ⁽⁴⁾⁽⁵⁾
Continuous current per point ⁽²⁾	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) ⁽⁷⁾ 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 ⁽³⁾	3.0 A for 10 ms	3.0 A for 10 ms	2.0 A for 10 ms ⁽⁸⁾

- (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 Ω , 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 ⁽⁵⁾⁽⁶⁾	1746-OBP8 ⁽⁵⁾⁽⁶⁾⁽⁸⁾	1746-OBP16 ⁽⁵⁾⁽⁶⁾⁽⁹⁾⁽¹⁰⁾
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 ⁽⁵⁾⁽⁶⁾	1746-OBP8 ⁽⁵⁾⁽⁶⁾⁽⁸⁾	1746-OBP16 ⁽⁵⁾⁽⁶⁾⁽⁹⁾⁽¹⁰⁾
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 ⁽⁷⁾ Off = 2.0 ms	On = 1.0 ms ⁽⁷⁾ Off = 2.0 ms	On = 0.1 ms ⁽⁷⁾ Off = 1.0 ms
Off-state leakage, max ⁽¹⁾		1 mA		
Load current, min		1 mA		
Continuous current per point ⁽²⁾⁽³⁾		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 ⁽⁴⁾		4.0 A for 10 ms	4.0 A for 10 ms	4.0 A for 10 ms
Surge current per module ⁽⁴⁾		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 Ω , 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.



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-OV8, 1746-OV16, and 1746-OVP16

Attribute		Value		
		1746-OV8	1746-OV16 ⁽⁴⁾	1746-OVP16 ⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁷⁾
Voltage category		24V DC Signal Output		
Number of outputs		8	16	16
Points per common		8	16	16
Voltage, operating (V DC)		10...50 (sink)		20.4...26.4 (sink)
Backplane current consumption	5V DC	0.135 A	0.270 A	0.250 A
	24V DC	0.0 A		
Signal delay, max resistive load		On = 0.1 ms Off = 1.0 ms		On = 0.1 ms ⁽⁸⁾ Off = 1.0 ms
Off-state leakage, max ⁽¹⁾		1 mA		
Load current, min		1 mA		
Continuous current per point ⁽²⁾		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)	1.5 A @ 30 °C (86 °F) ⁽⁹⁾ 1.0 A @ 60 °C (140 °F)
Continuous current per module		8.0 A @ 30 °C (86 °F) 4.0 A @ 60 °C (140 °F)		6.4 A @ 0...60 °C (32...140 °F)
On-state voltage drop, max		1.2V @ 1.0 A	1.2V @ 0.5 A	1.0V @ 1.0 A
Surge current per point ⁽³⁾		3.0 A for 10 ms		4.0 A for 10 ms ⁽¹⁰⁾

⁽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 Ω , 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 9). 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⁾ A fused common and blown fuse LED indicator are provided on this module. See Fuse Protection and Blown Fuse Diagnostics.

⁽⁶⁾ Use the following ID Code when configuring your system with programming software or the HHT: 1746-OVP16 = 2922.

⁽⁷⁾ 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 ⁽¹⁾
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 ⁽²⁾ 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

⁽¹⁾ Removable terminal block.

⁽²⁾ 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.



ATTENTION: To avoid potential damage to TTL modules, handle them by the ends of the module, not metallic surfaces. Electrostatic discharges can damage the module. Take care to prevent exposure of terminals or components to electrostatic charges.

Careful wire routing within the enclosure helps cut down electrical noise between I/O lines. Refer to the SLC 500 Modular Hardware Style User Manual, publication [1747-UM011](#), for recommended wiring procedures for TTL modules.

Limit cable length to 3 m (10 ft) per point for outputs in standard environments.

Refer to Allen-Bradley Programmable Controller Wiring and Grounding Guidelines, publication [1770-IN041](#), for complete information.

Relay Contact Modules



WARNING: Exposure to some chemicals may degrade the sealing properties of materials used in the following devices: Relay Epoxy.

Catalog	Relay
1746-0X8	K1...K8
1746-I04	K1 and K2
1746-I08	K1...K4
1746-I012	K1...K6
1746-I012DC	K1...K6
1746-0W4	K1...K4
1746-0W8	K1...K8
1746-0W16	K1...K16

It is recommended that the user periodically inspect these devices for any degradation of properties and replace the module if degradation is found.

Specifications – 1746-0W4, 1746-0W8, 1746-0W16, and 1746-0X8

Attribute	Value			
	1746-0W4 ⁽²⁾	1746-0W8 ⁽²⁾	1746-0W16 ⁽²⁾⁽³⁾	1746-0X8 ⁽²⁾⁽³⁾
Voltage category	AC/DC Relay			
Number of outputs	4	8	16	8
Points per common	4	4	8	Individually isolated

Specifications – 1746-OW4, 1746-OW8, 1746-OW16, and 1746-OW8

Attribute		Value			
		1746-OW4 ⁽²⁾	1746-OW8 ⁽²⁾	1746-OW16 ⁽²⁾⁽³⁾	1746-OW8 ⁽²⁾⁽³⁾
Voltage, operating	5V DC	5...125			
	24V DC	5...265			
Signal delay, max resistive load		On = 10.0 ms Off = 10.0 ms			
Backplane current consumption	5V DC	0.045 A	0.085 A	0.170 A	0.085 A
	24V DC	0.045 A	0.090 A	0.180 A	0.090 A
Off-state leakage, max		0 mA			
Load current, min		10 mA @ 5V DC			
Continuous current per point ⁽¹⁾		See Relay Contact Ratings on page 43 .			
Continuous current per module		8.0 A AC 8.0 A /Common	16.0 A AC 8.0 A /Common	16.0 A AC 8.0 A /Common	⁽⁴⁾

⁽¹⁾ Recommended surge suppression: For relay contact outputs, refer to the SLC 500 Modular Hardware User Manual, publication [1747-UM011](#). Connecting surge suppressors across your external inductive load will extend the life of SLC 500 relay contacts.

⁽²⁾ Certified for Class 1, Division 2 hazardous location by CSA.

⁽³⁾ Removable terminal block.

⁽⁴⁾ The continuous current per module must be limited so the module power does not exceed 1440V A.

Relay Contact Ratings

Relay Contact Ratings – 1746-IO4, 1746-IO8, 1746-IO12, and 1746-IO12DC

Voltages		Amperes ⁽¹⁾		Amperes ⁽¹⁾ Continuous	Volt-Amperes	
		Make	Break		Make	Break
Volts (AC), max	120	15	1.5	2.5	1800	180
	240	7.5	0.75			
Volts (DC), max	125	0.22 ⁽²⁾		1.0	28	
	24	1.2 ⁽²⁾		2.0	28	

⁽¹⁾ The continuous current per module must be limited so the module power does not exceed 1440V A.

⁽²⁾ For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28VA by the applied DC voltage. For example, 28V A/48V DC = 0.58 A. For DC voltage applications less than 14V, the make/break ratings for relay contacts cannot exceed 2 A.

Relay Contact Ratings – 1746-OX8

Voltages		Amperes ⁽¹⁾		Amperes Continuous ⁽³⁾	Volt-Amperes	
		Make	Break		Make	Break
Volts (AC), max	120	30	3.0	5.0	3600	360
	240	15	1.5			
Volts (DC), max	125	0.22 ⁽²⁾		1.0	28	
	24	1.2 ⁽²⁾		2.0	28	

⁽¹⁾ Recommended surge suppression: For relay contact outputs, refer to the SLC 500 Modular Hardware User Manual, publication [1747-UM011](#). Connecting surge suppressors across your external inductive load will extend the life of SLC 500 relay contacts.

⁽²⁾ For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28V A by the applied DC voltage. For example, 28V A/48V DC = 0.58 A. For DC voltage applications less than 14V, the make/break ratings for relay contacts cannot exceed 2 A.

⁽³⁾ The continuous current per module must be limited so the module power does not exceed 1440V A.

Combination Input/Output Modules

Specifications – 1746-IO4, 1746-IO8, 1746-IO12, and 1746-IO12DC

Attribute	Value				
	1746-IO4 ⁽¹⁾⁽²⁾	1746-IO8 ⁽¹⁾⁽²⁾	1746-IO12 ⁽¹⁾⁽³⁾⁽⁴⁾	1746-IO12DC ⁽³⁾⁽⁵⁾⁽⁶⁾⁽⁷⁾	
Points per module	2 inputs 2 outputs	4 inputs 4 outputs	6 inputs 6 outputs	6 inputs 6 outputs	
Points per common	2	4	6	6	
Voltage category	120V AC			24V DC	
Voltage, operating (inputs)	85...132V AC			10...30V DC	
Voltage category (outputs)	100/120V AC Relay contact output				
Voltage, operating (outputs)	5...265V AC 5...125V DC				
Backplane current consumption	5V DC	0.030 A	0.060 A	0.090 A	0.080 A
	24V DC	0.025 A	0.045 A	0.070 A	0.060 A

⁽¹⁾ Certified for Class 1, Division 2 hazardous location by CSA.

⁽²⁾ See specifications for catalog numbers 1746-IA4 and 1746-OW4. Continuous Current per 1746-IO4 Module is 4.0 A. Continuous Current per 1746-IO8 Module is 8.0 A.

⁽³⁾ Removable terminal block.

⁽⁴⁾ See specifications for catalog numbers 1746-IA16 and 1746-OW16. Continuous Current per 1746-IO12 Module is 8.0 A.

⁽⁵⁾ See specification for catalog numbers 1746-IB16 and 1746-OW16. Continuous Current per 1746-IO12DC Module is 8.0 A.

⁽⁶⁾ Certified for Class 1, Division 2 hazardous location by C-UL.

⁽⁷⁾ Use the following ID Code when configuring your system with programming software or the HHT: 1746-IO12DC = 1512.

TIP For combination I/O modules 1746-IO4, 1746-IO8, 1746-IO12 and 1746-IO12DC):

The first several seconds of any powerup or when power is applied to a rack that is not under processor control, the output LED indicators of the combination input and output modules in the rack will be illuminated.

Racks are not under processor control if one of the following conditions exist:

- Modular Hardware Style (only): Processor is absent from the rack or the rack interconnect cable is not properly connected.
- Modular Hardware Style and Fixed Hardware Style: The processor does not have the firmware PROM installed or the processor is not functioning properly.