



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

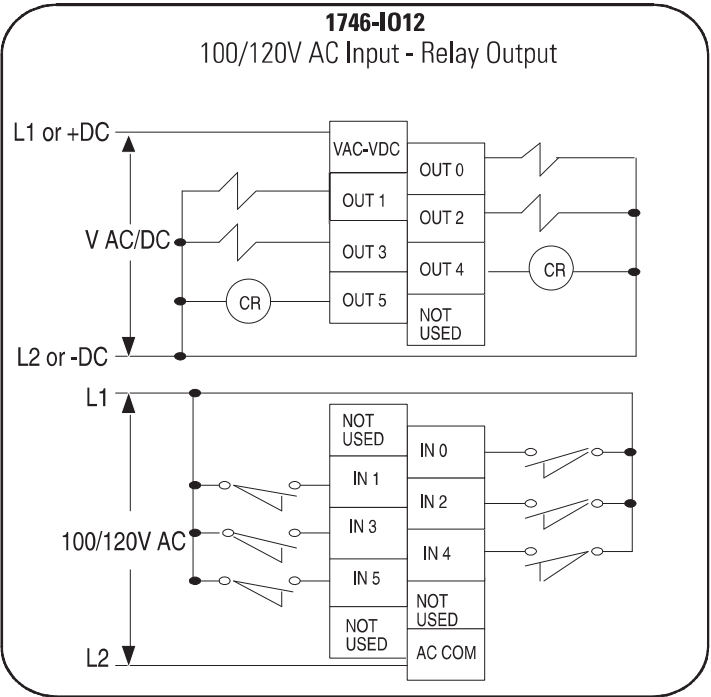
Combination Input/Output Catalog Numbers 1746-IO4, 1746-IO8, 1746-IO12, 1746-IO12DC

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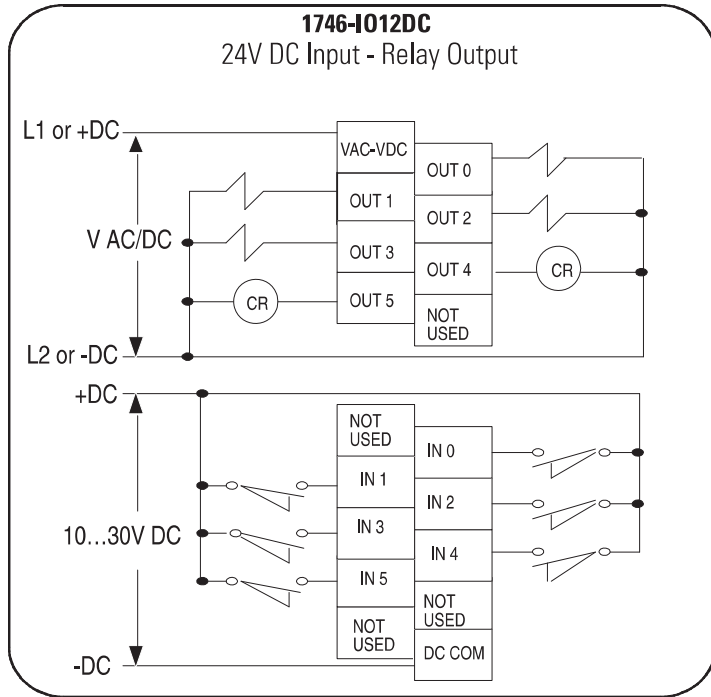
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1746-IO12



1746-IO12DC



Specifications

General Specifications

Attribute	Value
Temperature, operating	0...60 °C (32...140 °F) ⁽³⁾
Temperature, nonoperating	-40...85 °C (-40...185 °F)
Operating humidity	5...95% (noncondensing)
Noise immunity	NEMA standard ICS 2-230
Vibration, operating	Displacement 0.015 in. peak @ 5...57 Hz Acceleration 2.5 g @ 57...2000 Hz
Shock, operating	30 g (all modules except relay contact) 10 g (relay contact modules: 1746-OWx, 1746-0X8, and combination I/O modules)
Isolation ⁽¹⁾	1500V
Agency certification	UL listed CSA certified or C-UL approved as indicated by product marking CE compliant for all applicable directives when product or packaging is marked C-Tick marked for all applicable acts
Hazardous environment class ⁽²⁾	Class I, Division 2 Hazardous Environment UL-A196, CSA, C-UL

⁽¹⁾ Electro-optical isolation between I/O terminals and control logic.

⁽²⁾ Some modules are classified Class 1, Division 2 by CSA only or C-UL only as shown in the specification table for the respective module.

⁽³⁾ Temperature is for air surrounding the SLC 500 system. Temperature range exceptions are indicated with certain modules.

Heat Dissipation

The following tables contain values for the heat dissipated by each I/O module. Use them to calculate the total amount of heat dissipated by your SLC 500 control system. For details on how to calculate total heat dissipation, refer to the SLC 500 Modular Hardware Style User Manual, publication [1747-UM011](#). Please note the following definitions:

- Watts per point – the heat dissipation that can occur in each field wiring point when energized at nominal voltage.
- Minimum Watts – the amount of heat dissipation that can occur when there is no field power present.
- Total Watts – the Watts per point multiplied by the number of points, plus the minimum Watts (with all points energized).

Input Modules Heat Dissipation

Catalog Numbers	Watts per Point	Minimum Watts	Total Watts
1747-IA4	0.27	0.175	1.30
1746-IA8	0.27	0.250	2.40
1746-IA16	0.27	0.425	4.80
1746-IB8	0.20	0.250	1.90
1746-IB16	0.20	0.425	3.60
1746-IC16	0.22	0.425	3.95
1746-IG16	0.02	0.700	1.00
1746-IH16	0.32	0.217	5.17
1746-IM4	0.35	0.175	1.60
1746-IM8	0.35	0.250	3.10
1746-IM16	0.35	0.425	6.00
1746-IN16	0.35	0.425	6.00
1746-ITB16	0.20	0.425	3.60
1746-ITV16	0.20	0.425	3.60
1746-IV8	0.20	0.250	1.90
1746-IV16	0.20	0.425	3.60

Output Modules Heat Dissipation

Catalog Numbers	Watts per Point	Minimum Watts	Total Watts
1746-OA8	1.000	0.925	9.00
1746-OA16	0.462	1.850	9.30
1746-OAP12	1.000	1.850	10.85
1746-OB6EI	0.440	0.230	2.90
1746-OB8	0.775	0.675	6.90
1746-OB16	0.388	1.400	7.60
1746-OB16E	0.150	0.675	3.07
1746-OBP8	0.300	0.675	3.08
1746-OBP16	0.310	1.250	6.26
1746-OG16	0.033	0.900	1.50

Output Modules Heat Dissipation

Catalog Numbers	Watts per Point	Minimum Watts	Total Watts
1746-OV8	0.775	0.675	6.90
1746-OV16	0.388	1.400	7.60
1746-OVP16	0.310	1.250	6.26
1746-OW4	0.133	1.310	1.90
1746-OW8	0.138	2.590	3.70
1746-OW16	0.033	5.170	5.70
1746-OX8	0.825	2.590	8.60

Combination Input/Output Modules Heat Dissipation

Catalog Numbers	Watts per Point	Minimum Watts	Total Watts
1746-IO4	0.27 per input point 0.133 per output point	0.75	1.60
1746-IO8	0.27 per input point 0.133 per output point	1.38	3.00
1746-IO12	0.27 per input point 0.133 per output point	2.13	4.60
1746-IO12DC	0.20 per input point 0.133 per output point	1.84	3.90



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 – 1746-0X8

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			
Voltage, operating (inputs)		85...132V AC			
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.

Notes:

Notes:

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Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

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