Installation Instructions

Allen-Bradley

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

Table of Contents

Topic	Page
Important User Information	2
North American Hazardous Location Approval	3
Environment and Enclosure	4
Prevent Electrostatic Discharge	4
Install and Remove the Module	5
Octal Label Kit Installation (for PLC processors only)	6
Wiring Diagrams	17
Apply the Octal Filter Label	6
Apply the Octal Door Label	6
Removable Terminal Blocks	6
Recovery From Blown Fuse/Processor Fault/Processor Shutdown	13
Replacement Fuse Recommendations	13
Replace Fuses	14
Electronically Protected Modules (1746-OB6EI and 1746-OB16E)	14
Specifications	29

Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard and recognize the consequences.
	SHOCK HAZARD: Labels may be on or inside the equipment (for example, drive or motor) to alert people that dangerous voltage may be present.
	BURN HAZARD: Labels may be on or inside the equipment (for example, drive or motor) to alert people that surfaces may reach dangerous temperatures.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Overview

In addition to providing the module's electrical specifications, this document tells you how to:

- install the module into a chassis.
- wire the module's terminal block.
- install the Octal Filter Label.

North American Hazardous Location Approval

The following modules are North American Hazardous Location approved: 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, 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, 1746-IO4, 1746-IO8, 1746-IO12, 1746-IO12DC.

The following information applies when operating this equipment in hazardous locations:	**Informations sur l'utilisation de cet équipement en environnements dangereux:**
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.
EXPLOSION HAZARD • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of any component may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous.	**RISQUE D'EXPLOSION** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de tout composant peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

Environment and Enclosure

ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.

This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.
- NEMA Standard 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

Prevent Electrostatic Discharge

ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

Install and Remove the Module

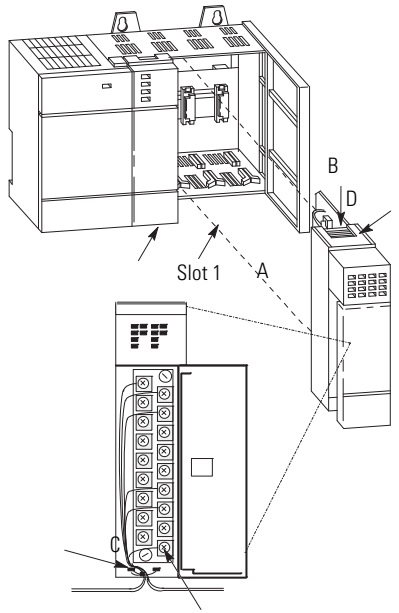
ATTENTION: Never install, remove, or wire modules with power applied to chassis.

IMPORTANT The first slot of the chassis is reserved for the processor or the 1747-ASB module.

Follow these steps to install the module:

1. Disconnect power.
2. Align the circuit board of module with the chassis card guide. (A)
3. Slide the module into the chassis until the bottom tabs lock into place. (B)
4. Route the wires down and away from the module, securing them with the wire tie. (C)
5. Cover all unused slots with Card Slot Filler, catalog number 1746-N2, to keep the chassis free from debris.
6. To remove the module, press and hold the module release located on each self-locking tab, and slide the module out of the chassis slot. (D)

Module Installation



Max 2 mm^2 (14 AWG)
Max 2 wires per terminal
Max torque: 0.9 Nm (8 lb-in.)

Octal Label Kit Installation (for PLC processors only)

The octal label kit consists of an octal filter label and a door label. Use these octal labels to replace the decimal labels that are attached to the I/O modules.

TIP The octal label kit can be obtained from your Allen-Bradley distributor. The octal kit is ordered based on the catalog number of the I/O module.

Please refer to the SLC 500 Modular Hardware Style User Manual, publication 1747-UM011, for a listing of octal label kit catalog numbers.

ATTENTION: Do not touch or remove the terminal block when the SLC 500 system is powered. Contact with AC line potential may cause injury to personnel.

Apply the Octal Filter Label

1. Remove the octal filter label from its paper carrier.
2. Align the octal filter label numbers horizontally to the module color bar and over the decimal filter numbers.
   Refer to Installing Octal Labels on page 7 for filter label placement.
3. Apply the octal label to the filter.
4. Press firmly to be sure that the label adheres properly.

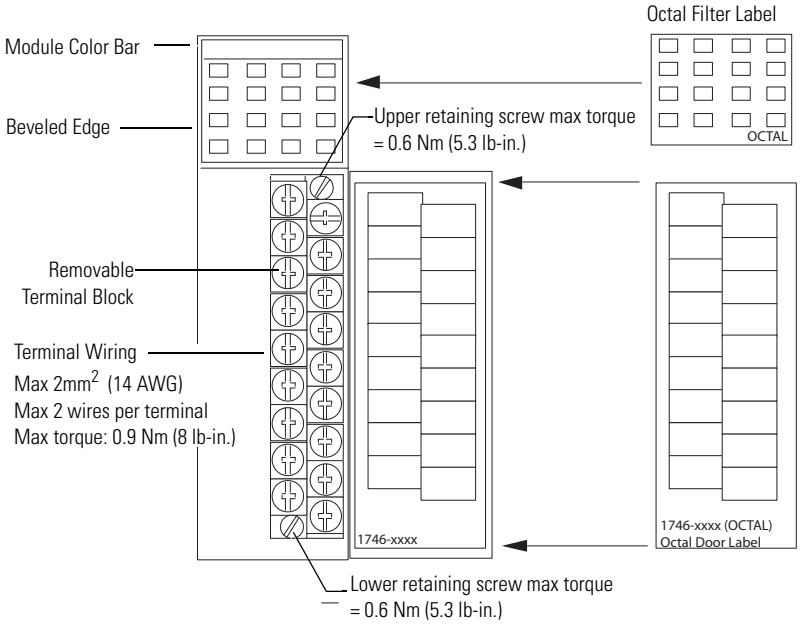
Apply the Octal Door Label

1. Remove the octal door label from its paper carrier.
2. Align the octal label directly over the decimal door label on the inside of the door.
   Refer to Installing Octal Labels on page 7 for door label placement.
3. Press firmly to be sure that the label adheres properly.

Removable Terminal Blocks

Colored terminal blocks are removable by loosening the upper and lower retaining screws. Black terminal blocks are not removable.

Installing Octal Labels



Fuse Protection and Blown Fuse Diagnostics

This section describes fusing characteristics for the following modules:

- 1746-OBP16
- 1746-OVP16
- 1746-OAP12

Fuse Protection (1746-OBP16 and 1746-OVP16 modules)

The fuse on the 1746-OBP16 and 1746-OVP16 modules (shown on Location of Jumpers and Fuses for 1746-OBP16 and 1746-OVP16 Modules on page 9) provides short-circuit protection for 13 mm^2 (16 AWG) or larger wiring to external loads. In the event of a short circuit on an output channel, it is likely that the transistor associated with that channel will be damaged. In this event, the module should be replaced or the load moved to a spare output channel.

The fuse does not provide overload protection. In the event of an overload on an output channel, it is likely that the fuse will not blow and the transistor associated with that channel will be damaged. To provide overload protection for your application, user-supplied fuses should be installed externally and properly sized to match your individual load characteristics.

Fuse Protection (1746-OAP12 modules)

A fuse is provided on each common of the 1746-OAP12 module (shown on Location of Jumpers and Fuses for 1746-OAP12 Module on page 10) for a total of two fuses. The fuses are designed to protect the module from short-circuit conditions. The fuse does not provide overload protection. In the event of an overload on an output channel, it is likely that the fuse will not blow and the output device associated with that channel will be damaged. To provide overload protection for your application, user-supplied fuses should be installed externally.

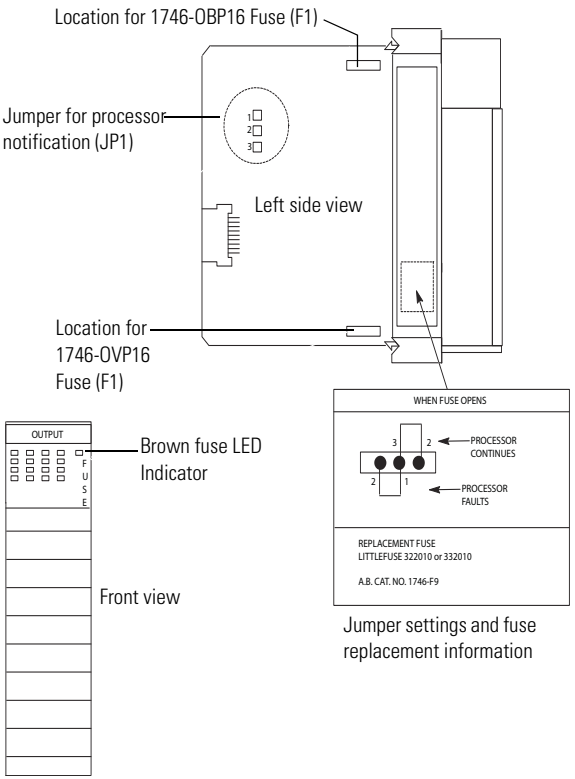
The recommended fuse for overload protection is SAN-O HT. Select the fuse rating according to your load. Do not use HT fuses rated higher than 2.0 Amps.

Blown Fuse Diagnostics

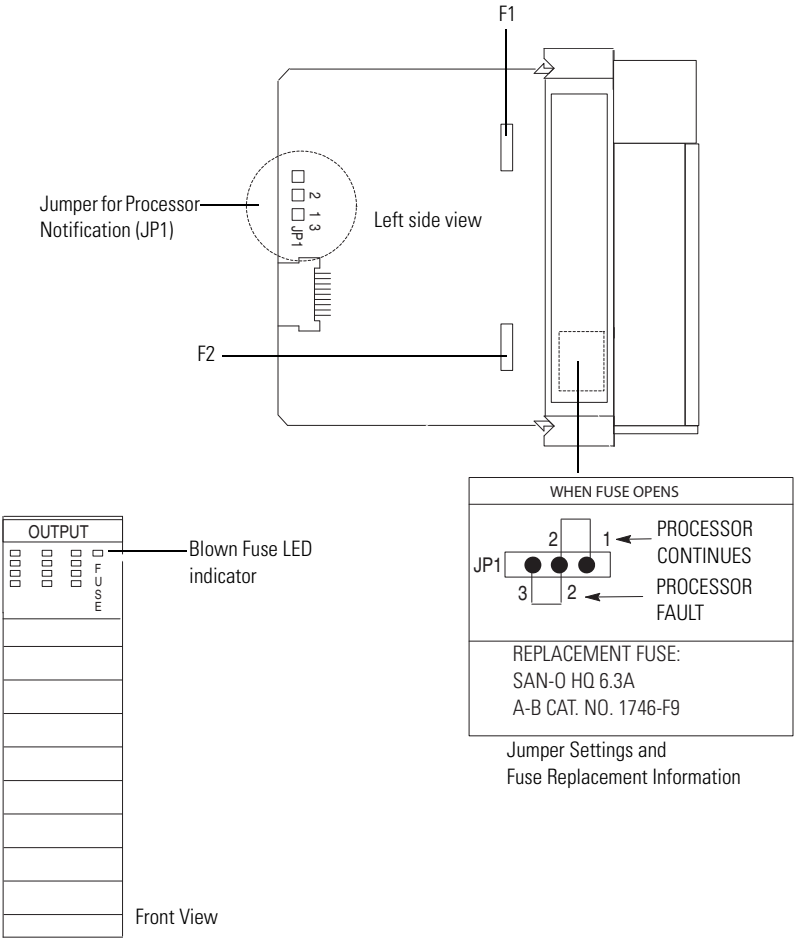
If the fuse blows on the 1746-OBP16, 1746-OVP16, or 1746-OAP12 module, the following occurs:

- The blown fuse LED indicator will illuminate, provided power (5V DC via backplane and load power via external supply) is applied to the module.
- A processor error will occur if JP1 connects pins 2 and 3. (See figures on page 9 and page 10.)

Location of Jumpers and Fuses for 1746-OBP16 and 1746-OVP16 Modules

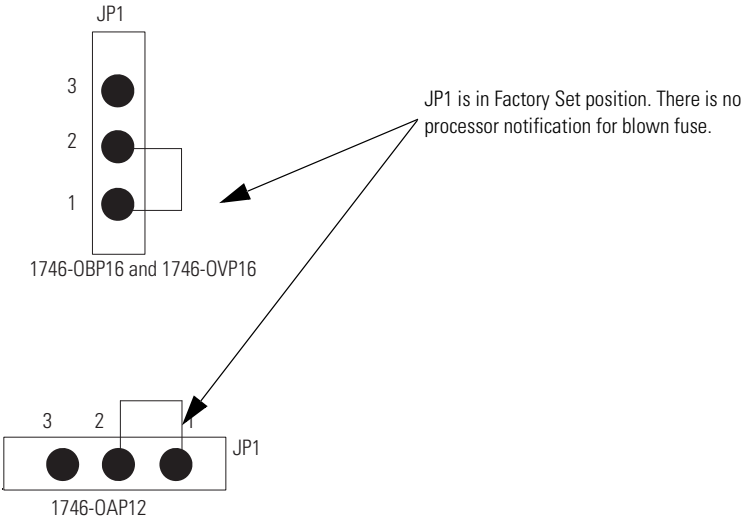


Location of Jumpers and Fuses for 1746-OAP12 Module



Processor Operation in Case of Blown Fuse – Processor Continues

The factory set position for JP1 is shown in the following diagram. For this JP1 configuration the processor operation will continue if the module fuse blows.

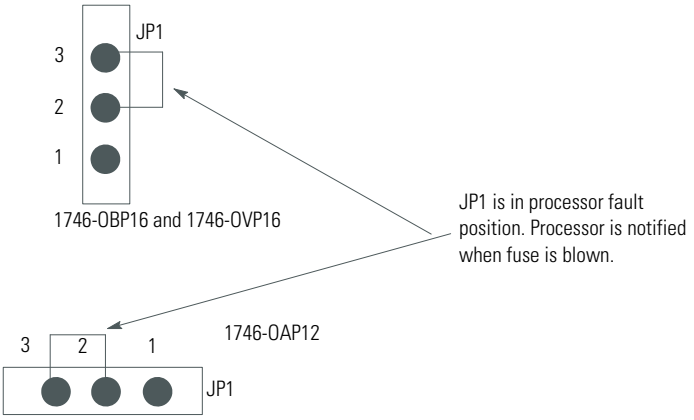


Processor Operation in Case of Blown Fuse – Processor Faults

The Processor Fault position for JP1 is shown on the following page. For this JP1 configuration, the processor generates a nonrecoverable error for all SLC 500 processors. For a nonrecoverable error, note the following:

- Processor operation halts and the processor fault light flashes.
- All outputs are reset to OFF.
- The processor major fault bit S:1/13 is set.
- Monitor processor status file word S:6 for error code xx58 for SLC 500, and SLC 5/01 processors, and error code xx60 for SLC 5/02 and later processors.

JP1 in Processor Fault Notification Position



IMPORTANT When using SLC 5/02 processor and later processors, a user-fault routine cannot be used to clear the major fault bit.

ATTENTION: For 1746-OBP16 and 1746-OVP16 modules, all outputs on the module are OFF if the fuse blows. For the 1746-OAP12 module, all outputs on the same common as the blown fuse are OFF. If processor operation is allowed to continue after a blown fuse, extreme care should be taken to be sure the safety of personnel and guard against equipment damage.

For additional information on processor fault codes and user-fault routines refer to the following publications:

- Your programming device's reference manual
- HHT User Manual, publication 1747-NP002:
  - Chapter 28, Troubleshooting Faults
  - Chapter 29, Understanding the Fault Routine

The following table defines operation of all SLC 500 processors in the case of a blown fuse in 1746-OBP16, 1746-OVP16, and 1746-OAP12 modules.

Processor Operation After a Blown Fuse (1746-OBP16, 1746-OVP16, and 1746-OAP12 modules)

JP1 Set to Processor Continues	JP1 Set to Processor Faults
No error. Processor continues with 1746-OBP16 and 1746-OVP16 outputs de-energized. 1746-OAP12 outputs, on the same common as the blown fuse, are de-energized.	Nonrecoverable error. Processor operations stop and all outputs reset to OFF.

Recovery From Blown Fuse/Processor Fault/Processor Shutdown

Processor operation will stop under the following conditions:

- The output module fuse blows due to a short circuit.
- JP1 is set to the Processor Faults position (pins 2 and 3 connected).

If the above conditions occur, the following procedures should be used for recovery.

1. Follow fuse replacement procedures described on page 14.
2. Clear the processor major fault bit S:1/13.
3. Clear processor status file S:6 major error code (optional).
4. Return the processor to Run mode.

For additional information on processor fault codes and clearing processor fault bits, refer to the following user manuals:

- Your programming device's reference manual
- HHT User Manual, publication 1747-NP002
  - Chapter 28, Troubleshooting Fault
  - Chapter 29, Understanding the Fault Routine

Replacement Fuse Recommendations

Use the following replacement fuses:

- 1746-OBP16 and 1746-OVP16 modules – Littelfuse #322010,10A or #332010,10A. This fuse is required to maintain UL/CSA rating. Replacement Fuse Kit is catalog number 1746-F8 (five fuses per kit).
- 1746-OAP12 module - Use SAN-O HQ 6.3A for replacement. This fuse is required to maintain UL/CSA rating. Replacement Fuse Kit is catalog number 1746-F9 (five fuses per kit).

Replace Fuses

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

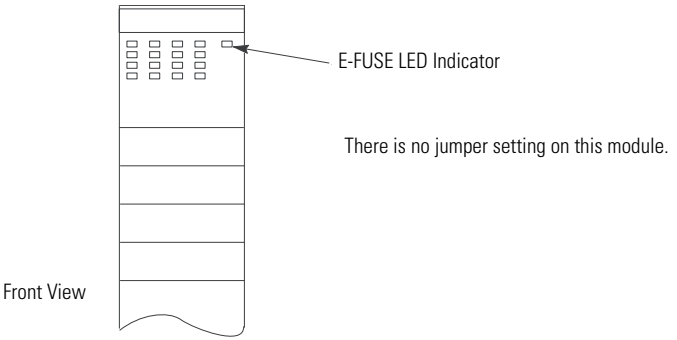
1. Remove SLC 500 system power and correct the conditions causing the short circuit.
2. Remove the output module from the chassis.
3. Remove the fuse.
   - 1746-OBP16 and 1746-OVP16 modules: Use a wide-tipped, slotted-head screwdriver to remove the blown fuse. Slide the screwdriver tip under the fuse 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.

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.

E-FUSE LED Indicator



Auto Reset Operation

IMPORTANT The 1746-OB6EI and 1746-OB16E modules perform auto-reset under overload conditions. When an output channel overload occurs, that channel will limit current within milliseconds after its thermal cut-out temperature has been reached. While in current limit, the output channel can cool below the thermal cut-out temperature allowing the module to auto-reset and resume control of the output channel as directed by the processor until the thermal cut-out temperature is again reached.

Removing power from an overloaded output channel would also allow the output channel to cool below the thermal cut-out temperature, allowing auto-reset to occur when power is restored. The output channel would operate as directed by the processor until the thermal cut-out temperature is again reached.

To avoid auto-reset of an output channel under overload conditions, an external mechanical fuse can be used to open the circuit when overloaded.

Short Circuit/Overload Current Diagnostics

If a short circuit or overload current condition occurs on an output channel:

- the E-FUSE LED indicator will illuminate provided that power is applied to the module. Power required: 5V DC via backplane and load power via an external supply.
- all other channels continue to operate as directed by the CPU (processor) module.

Recovery from Channel Shutdown

1. Remove the SLC 500 system power and correct the conditions causing the short circuit or overload current condition.
2. Restore the SLC 500 system power.

The module automatically resets and resumes control of the output channel and associated load.

Wiring Diagrams

The wiring diagrams in these installation instructions are examples only. It is not necessary to connect an I/O device to each and every I/O module terminal.

Labeling for SLC/PLC Systems

In this document, 16-point I/O module wiring diagrams include both decimal and octal numbers for I/O addressing and wire identification (see figure below). To wire your 16-point I/O module when used in a SLC system, use the decimal numbers in the upper left portion of each box. When used in a PLC system, use the octal numbers in the lower right portion of the box.

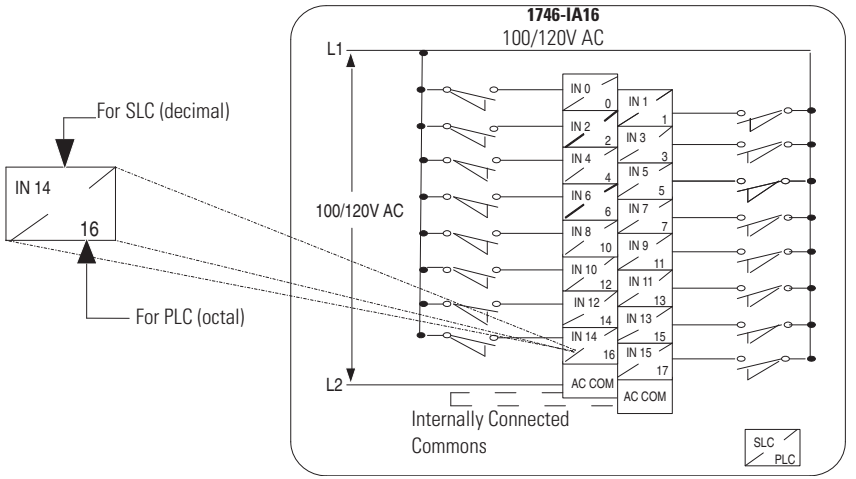
As shipped from the factory, the I/O module has a decimal address label on the inside of its door. A separate octal conversion kit can be ordered, to allow you to convert your module to the octal system.

TIP You can order the octal label kit from your Allen-Bradley Distributor. The octal kit is ordered based on the catalog number of the I/O module.

Please refer to the SLC 500 Modular Hardware Style User Manual, publication 1747-UM011, for a listing of octal label kit catalog numbers.

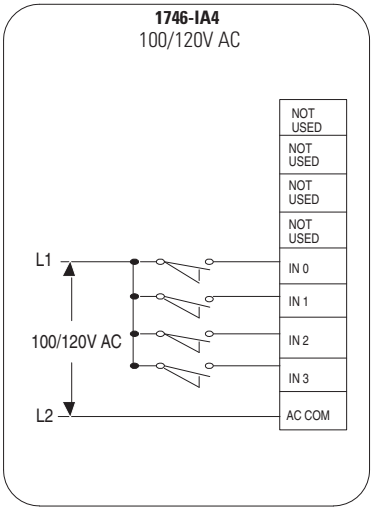
IMPORTANT Be sure the octal labels are used with your PLC system. Directions on how to install the labels are included with the kit and on page 6 of this document.

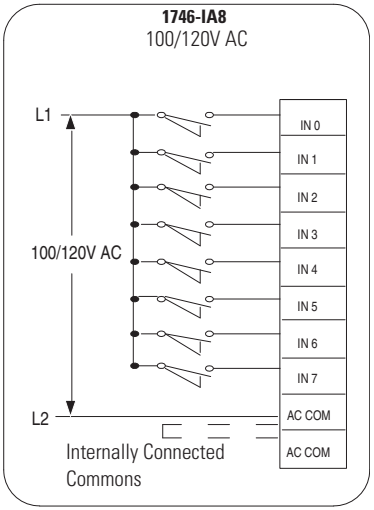
Decimal and Octal Labeling for 16-point I/O Modules

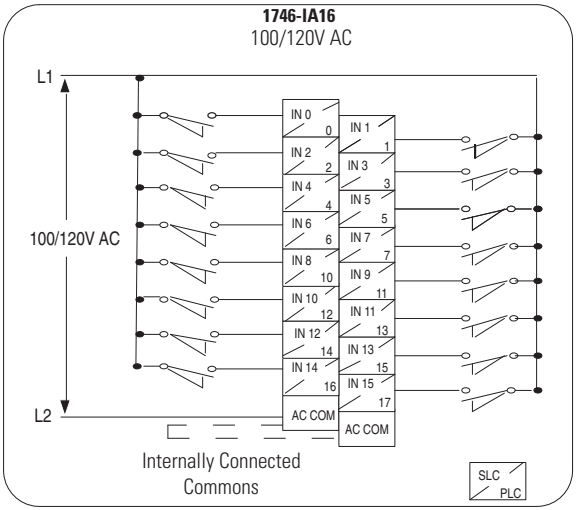


AC Input Modules Wiring Diagrams

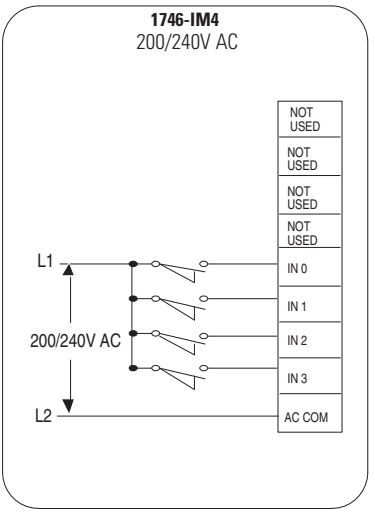
1746-IA4, 1746-IA8, 1746-IA16

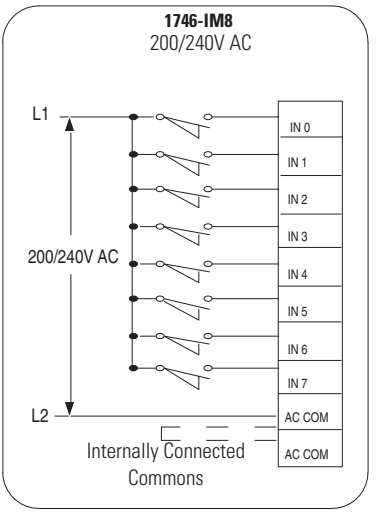


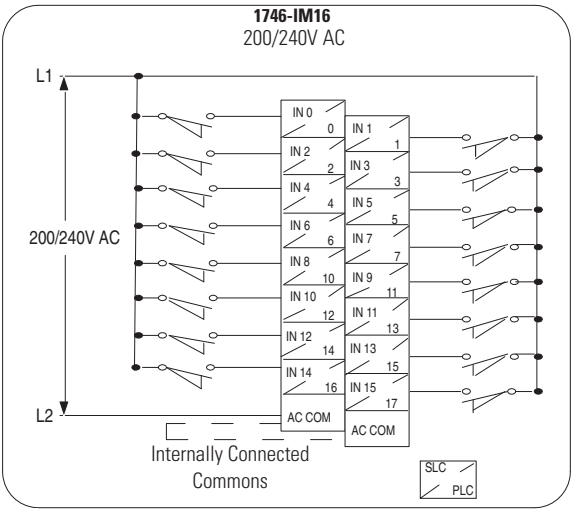




1746-IM4, 1746-IM8, 1746-IM16

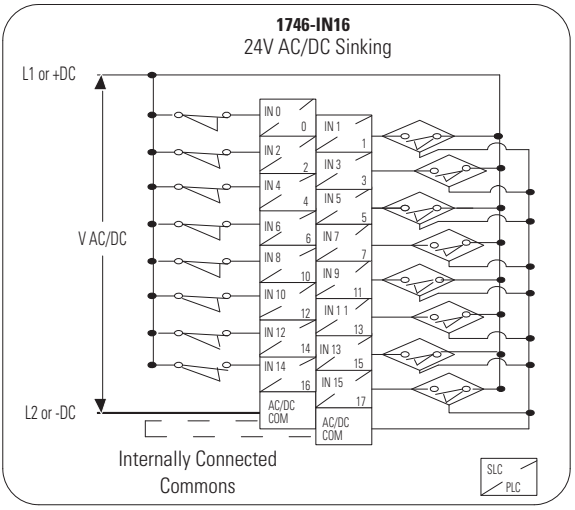




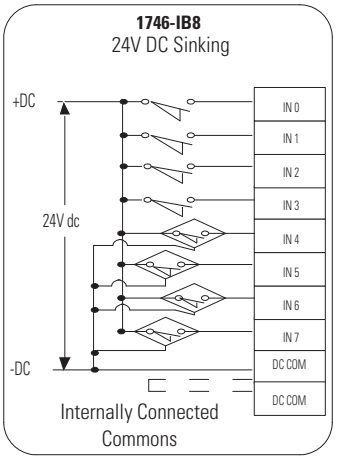


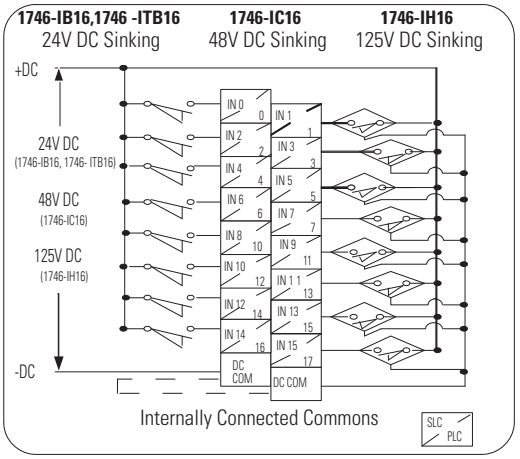
DC Input Modules Wiring Diagrams

1746-IN16

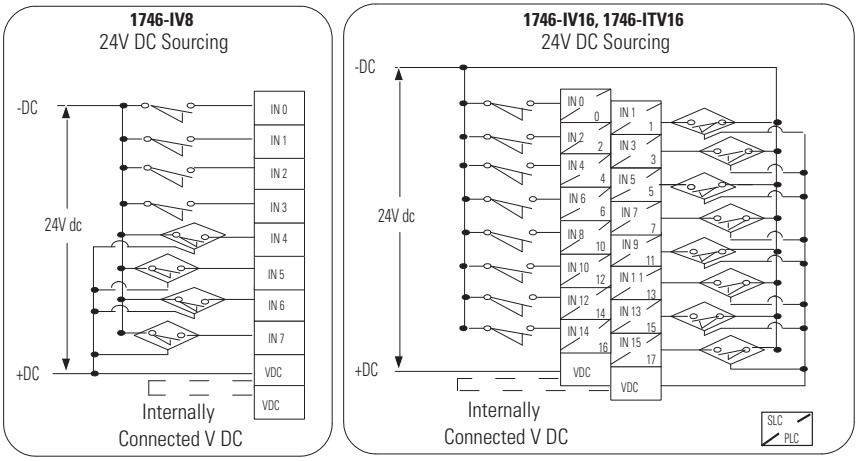


1746-IB8, 1746-IB16, 1746-ITB16, 1746-IC16, 1746-IH16

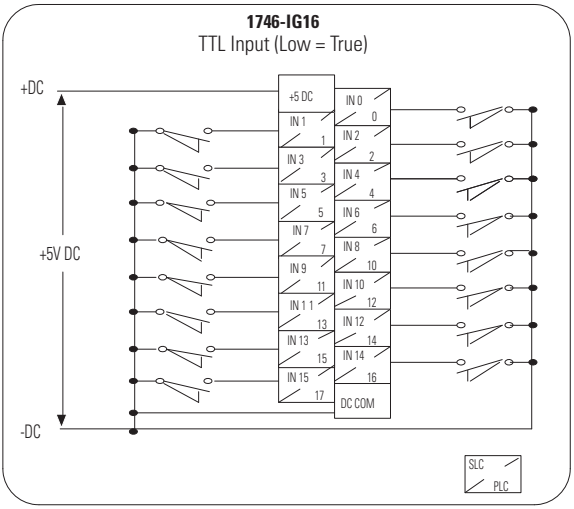




1746-IV8, 1746-IV16, 1746-ITV16

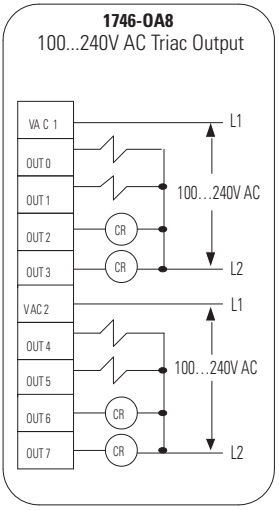


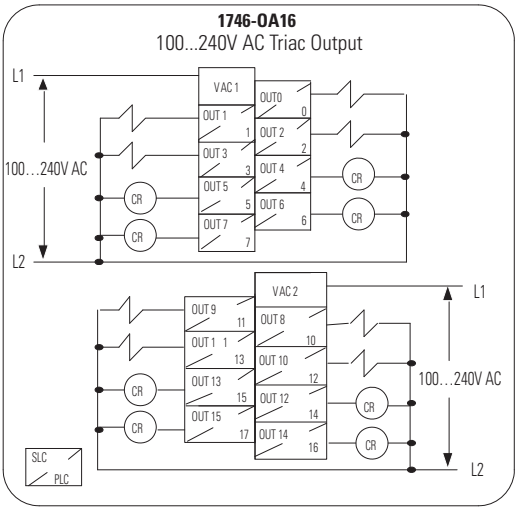
1746-IG16



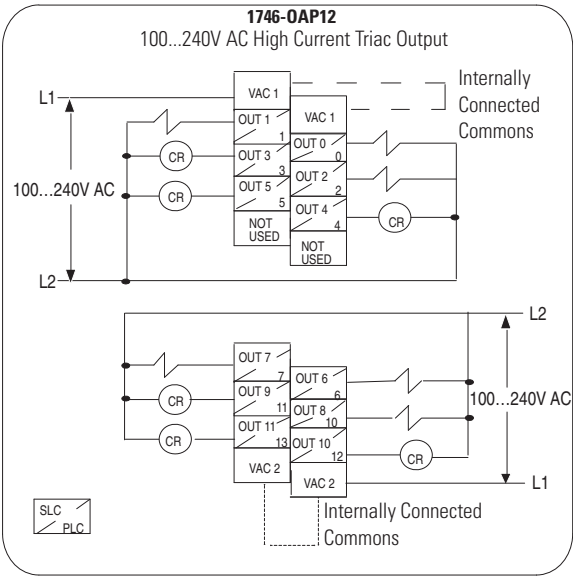
AC Output Modules Wiring Diagrams

1746-OA8, 1746-OA16

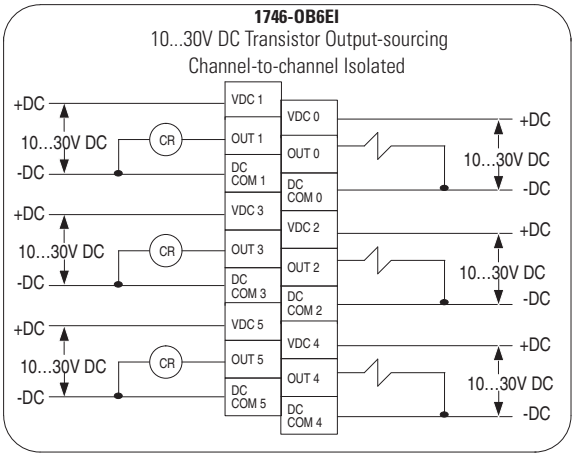




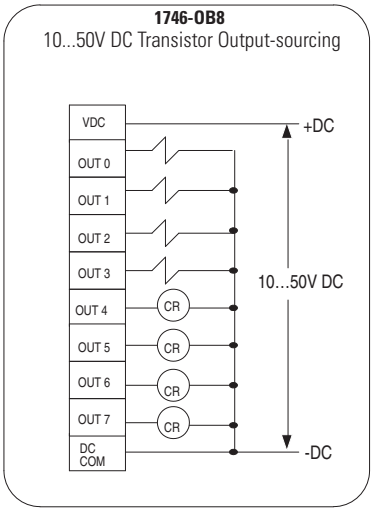
1746-OAP12

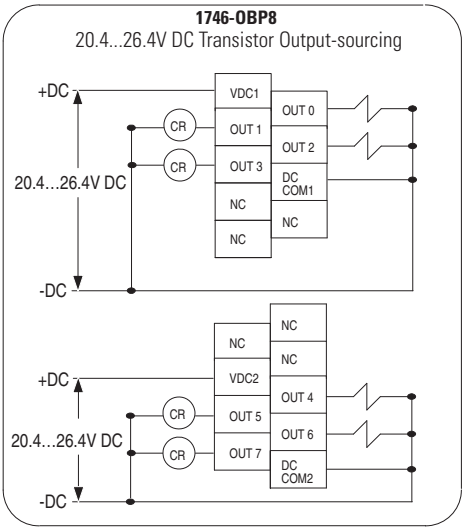


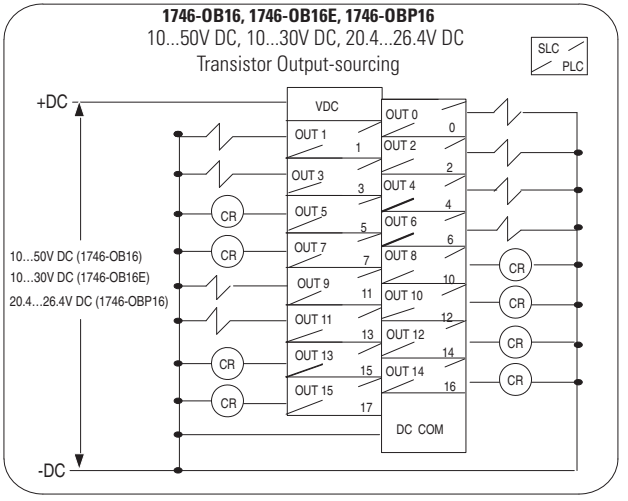
1746-OB6EI


1746-OB6EI
10...30V DC Transistor Output-sourcing
Channel-to-channel Isolated
+DC
10...30V DC
-DC
CR
VDC 1
OUT 1
DC COM 1
VDC 3
OUT 3
DC COM 3
VDC 5
OUT 5
DC COM 5
VDC 0
OUT 0
DC COM 0
VDC 2
OUT 2
DC COM 2
VDC 4
OUT 4
DC COM 4

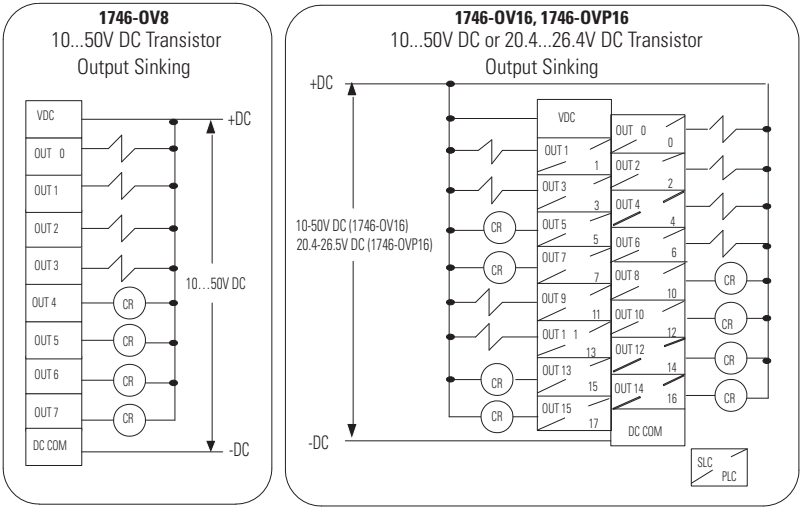
1746-OB8, 1746-OBP8, 1746-OB16, 1746-OB16E, 1746-OBP16



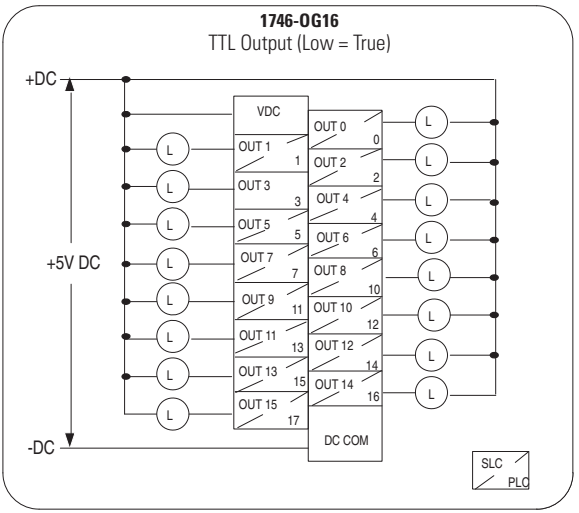




1746-OV8, 1746-OV16, 1746-OVP16

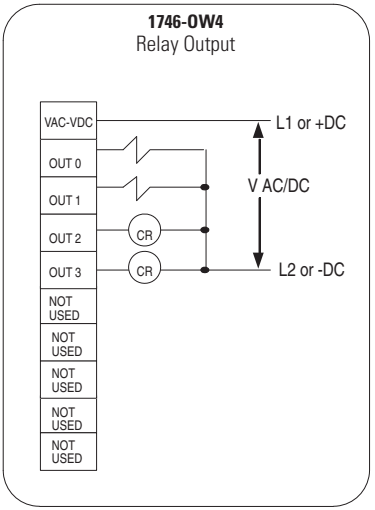


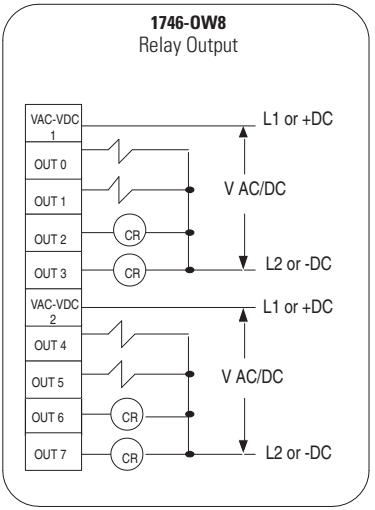
1746-OG16

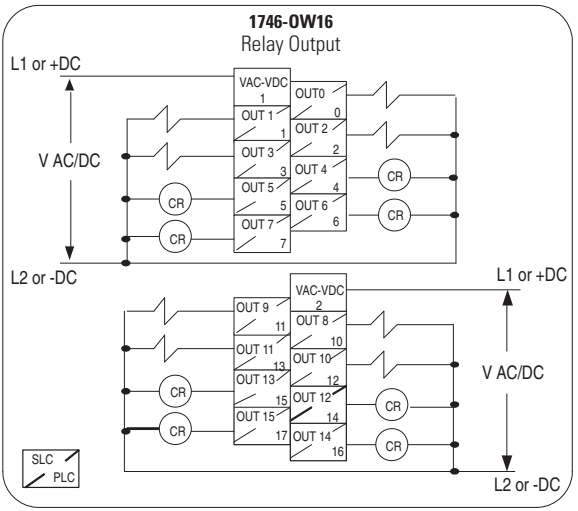


Relay Contact Output Modules Wiring Diagrams

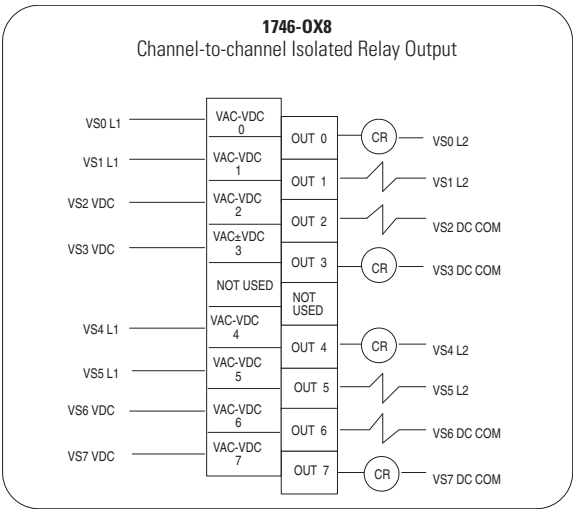
1746-OW4, 1746-OW8, 1746-OW16





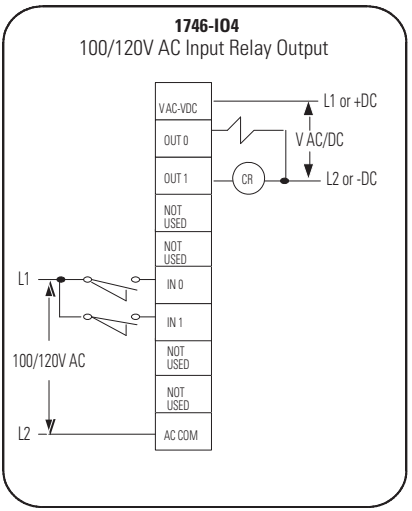


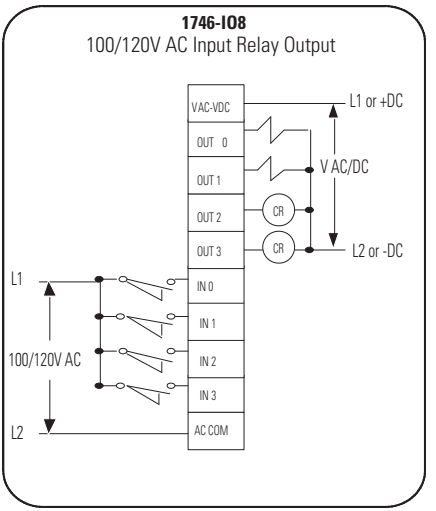
1746-OX8



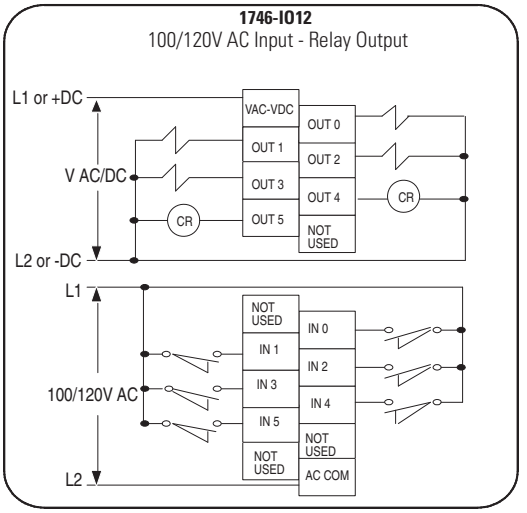
Combination Input/Output Modules Wiring Diagrams

1746-IO4, 1746-IO8

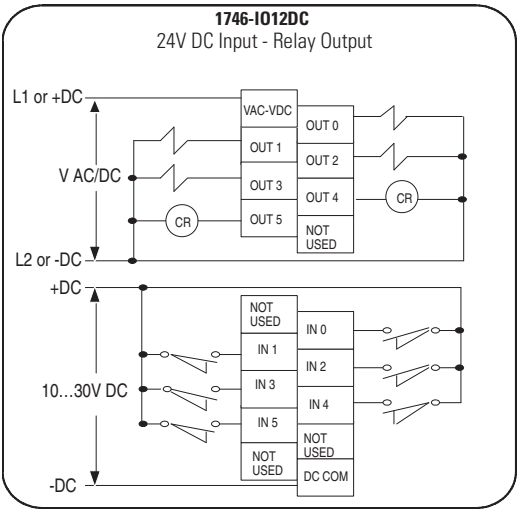




1746-IO12



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-OX8, 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

AC Input Modules

Specifications – 1746-IA4, 1746-IA8, and 1746-IA16

Attribute		Value		
		1746-IA4	1746-IA8	1746-IA16[2]
Voltage category		100/120V AC signal input		
Number of inputs		4	8	16
Points per common		4	8	16
Voltage, operating		85...132V AC @ 47...63 Hz		
Backplane current consumption	5V DC	0.035 A	0.050 A	0.085 A
	24V DC	0.0 A		
Signal delay, max		On = 35 ms Off = 45 ms		
Off-state voltage, max		30V AC		
Off-state current, max		2 mA		
Input current		12 mA @ 120V AC, nom		
Inrush current, max[1]		0.8 A		
Inrush current time duration, max		0.5 ms		

(1) An AC input device must be compatible with SLC 500 input circuit inrush current. A current limiting resistor can be used to limit inrush current; however, the operating characteristics of the AC input-circuit will be affected.

(2) Removable terminal block.

Specifications – 1746-IM4, 1746-IM8, and 1746-IM16

Attribute		Value		
		1746-IM4	1746-IM8	1746-IM16[2]
Voltage category		200/240V AC signal input		
Number of inputs		4	8	16
Points per common		4	8	16
Voltage, operating		170...265V AC @ 47...63 Hz		
Backplane current consumption	5V DC	0.035 A	0.050 A	0.085 A
	24V DC	0.0 A		
Signal delay, max		On = 35 ms Off = 45 ms		
Off-state voltage, max		50V AC		
Off-state current, max		2 mA		

Specifications – 1746-IM4, 1746-IM8, and 1746-IM16

Attribute	Value		
	1746-IM4	1746-IM8	1746-IM16[2]
Input current	12 mA @ 240V AC, nom		
Inrush current, max[1]	1.6 A		
Inrush current time duration, max	0.5 ms		

(1) An AC input device must be compatible with SLC 500 input circuit inrush current. A current limiting resistor can be used to limit inrush current; however, the operating characteristics of the AC input-circuit will be affected.

(2) Removable terminal block.

DC Input Modules

Specifications – 1746-IB8, 1746-IB16, 1746-ITB16, and 1746-IC16

Attribute		Value			
		1746-IB8	1746-IB16[1]	1746-ITB16[1]	1746-IC16[1] [3]
Voltage category		24V DC signal input (sinking)			48V DC signal input (sinking)
Number of inputs		8	16	16	16
Points per common		8	16	16	16
Voltage, operating		10...30V DC (sinking)			30...60V DC @ 55 °C (131 °F) sinking 30...55V DC @ 60 °C (140 °F) sinking
Backplane current consumption	5V DC	0.050 A			
	24V DC	0.0 A			
Signal delay, max		On = 8 ms Off = 8 ms	On = 8 ms Off = 8 ms	On = 0.3 ms Off = 0.5 ms[2]	On = 4 ms Off = 4 ms
Off-state voltage, max		5.0V DC			10.0V DC
Off-state current, max		1 mA	1 mA	1.5 mA	1.5 mA
Input current, nom		8 mA @ 24V DC			4.1 mA @ 48V DC

(1) Removable terminal block.

(2) Use ID Code 0509 when configuring your system with programming software or the HHT.

(3) Typical signal delay for these modules: ON = 0.1 ms, OFF = 0.25 ms @ 24V DC.

Specifications – 1746-IV8, 1746-IV16, and 1746-ITV16

Attribute		Value		
		1746-IV8	**1746-IV16(1)**	**1746-ITV16(1)**
Voltage category		24V DC signal input (sourcing)		
Number of inputs		8	16	16
Points per common		8	16	16
Voltage, operating		10...30V DC (sourcing)		
Backplane current consumption	5V DC	0.050 A	0.085 A	0.085 A
	24V DC	0.0 A		
Signal delay, max		On = 8 ms Off = 8 ms	On = 8 ms Off = 8 ms	On = 0.3 ms Off = 0.5 ms(2)
Off-state voltage, max		5.0V DC		
Off-state current, max		1 mA	1 mA	1.5 mA
Input current		8 mA @ 24V DC, nom		

(1) Removable terminal block.

(2) Typical signal delay for these modules: ON = 0.1 ms, OFF = 0.25 ms @ 24V DC.

Specifications – 1746-IG16

Attribute		Value(1)
Voltage category		5V DC TTL signal input (sourcing)
Number of inputs		16
Points per common		16
Voltage, operating +5V to DC COM		4.5...5.5V DC (sourcing) 50 mV peak to peak ripple (max)
Backplane current consumption	5V DC	0.140 A
	24V DC	0.0 A
Signal delay, max		On = 0.25 ms Off = 0.50 ms
Off-state voltage		2...5.5 V DC(2)
Off-state current, max		4.1 mA
Input current		3.7 mA @ 5V DC, nom

(1) Removable terminal block.

(2) TTL inputs are inverted (-0.2...0.8V 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 15 m (50 ft) per point for inputs in standard environments.

Refer to Allen-Bradley Programmable Controller Wiring and Grounding Guidelines, publication 1770-IN041, for complete information.

Specifications – 1746-IN16

Attribute		Value[1]
Voltage category		24V AC/DC Signal Input
Number of inputs		16
Points per common		16
Voltage, operating	DC	10...30V DC (sinking)
	AC	10...30V AC
Backplane current consumption	5V DC	0.085 A
	24V DC	0.0 A
Signal delay, max	DC	On = 15 ms Off = 15 ms
	AC	On = 25 ms Off = 25 ms
Off-state voltage, max	DC	3.0V DC
	AC	3.0V AC
Off-state current, max	DC	1 mA
	AC	1 mA
Input current, nom	DC	8 mA @ 24V DC
	AC	8 mA @ 24V AC
Input current		0.02 A (AC only)

(1) Removable terminal block.

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	0.370 A
	24V DC			
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 KΩ, 2 W resistor. For 240V AC operation, use a 15 KΩ, 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-UM011, 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	0.135 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 KΩ, 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 KΩ, 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-OBP12 = 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 (24W 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 KΩ, 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-OV8 and fast turn-off modules; when switching Bulletin 100-B110 (24Ws sealed) contactor, are: 1746-OB8/1746-OV8 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-OG16

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-OX8	K1…K8
1746-IO4	K1 and K2
1746-IO8	K1…K4
1746-IO12	K1…K6
1746-IO12DC	K1…K6
1746-OW4	K1…K4
1746-OW8	K1…K8
1746-OW16	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-OW4, 1746-OW8, 1746-OW16, and 1746-OX8

Attribute	Value			
	1746-OW4[2]	1746-OW8[2]	1746-OW16[2][3]	1746-OX8[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-OX8

Attribute		Value			
		1746-OW4[2]	1746-OW8[2]	1746-OW16[2][3]	1746-OX8[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.

Notes:

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://support.rockwellautomation.com, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://support.rockwellautomation.com.

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United States	1.440.646.3434 Monday – Friday, 8 a.m. – 5 p.m. EST
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Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 1746-IN027D-EN-P - December 2012 PN-185007

Supersedes Publication 1746-IN027C-EN-P - August 2008

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