MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

Reference package for procurement and maintenance review

ALLEN-BRADLEY

## 1746-IM16

**16-POINT AC INPUT MODULE**

Used with the applicable SLC 500 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Rockwell 1746-IN027D, SLC 500 Digital I/O

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 Number**s 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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# Install and Remove the Module

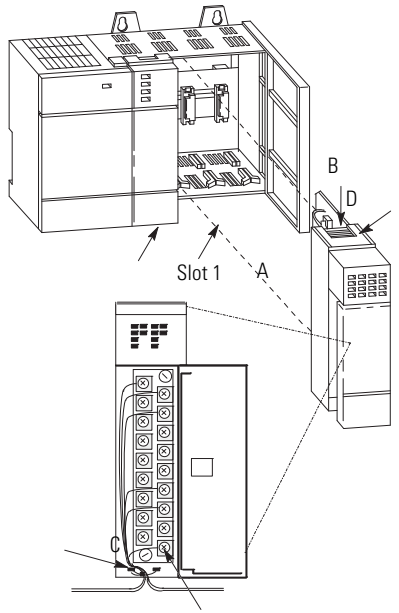
**ATTENTION:** Never install, remove, or wire modules with power applied to chassis.

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

Follow these steps to install the module:

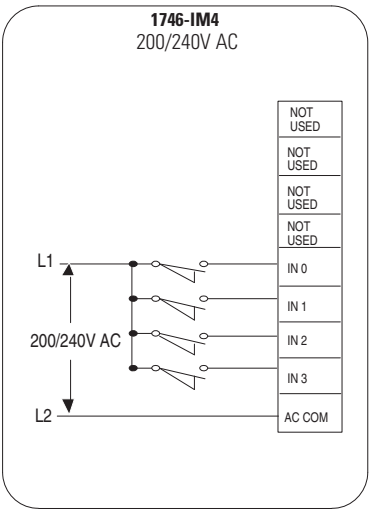
1. Disconnect power.
2. Align the circuit board of module with the chassis card guide. (A)
3. Slide the module into the chassis until the bottom tabs lock into place. (B)
4. Route the wires down and away from the module, securing them with the wire tie. (C)
5. Cover all unused slots with Card Slot Filler, 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)

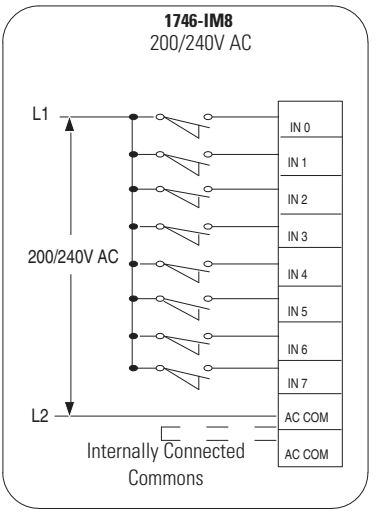
## Module Installation

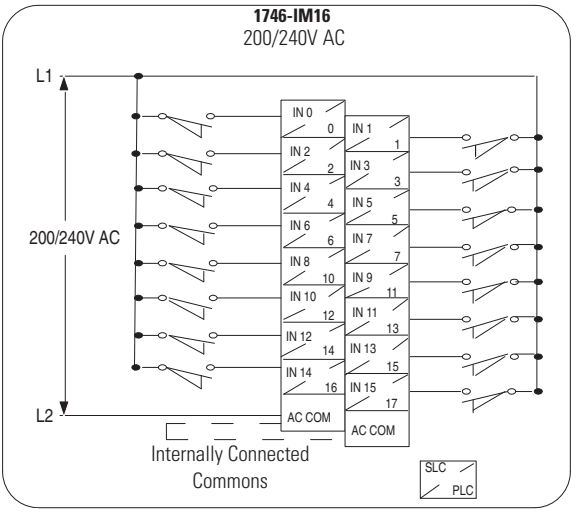



Max 2 $mm^2$ (14 AWG)
Max 2 wires per terminal
Max torque: 0.9 Nm (8 lb-in.)

### 1746-IM4, 1746-IM8, 1746-IM16



# 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<br>Acceleration 2.5 g @ 57...2000 Hz |
| Shock, operating | 30 g (all modules except relay contact)<br>10 g (relay contact modules: 1746-OWx, 1746-OX8, and combination I/O modules) |
| Isolation[1] | 1500V |
| Agency certification | UL listed<br>CSA certified or C-UL approved as indicated by product marking<br>CE compliant for all applicable directives when product or packaging is marked<br>C-Tick marked for all applicable acts |
| Hazardous environment class[2] | Class I, Division 2 Hazardous Environment<br>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 |

# 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<br>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<br>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<br>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<br>Off = 8 ms | On = 8 ms<br>Off = 8 ms | On = 0.3 ms<br>Off = 0.5 ms[2] | On = 4 ms<br>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.