

**Notes:**

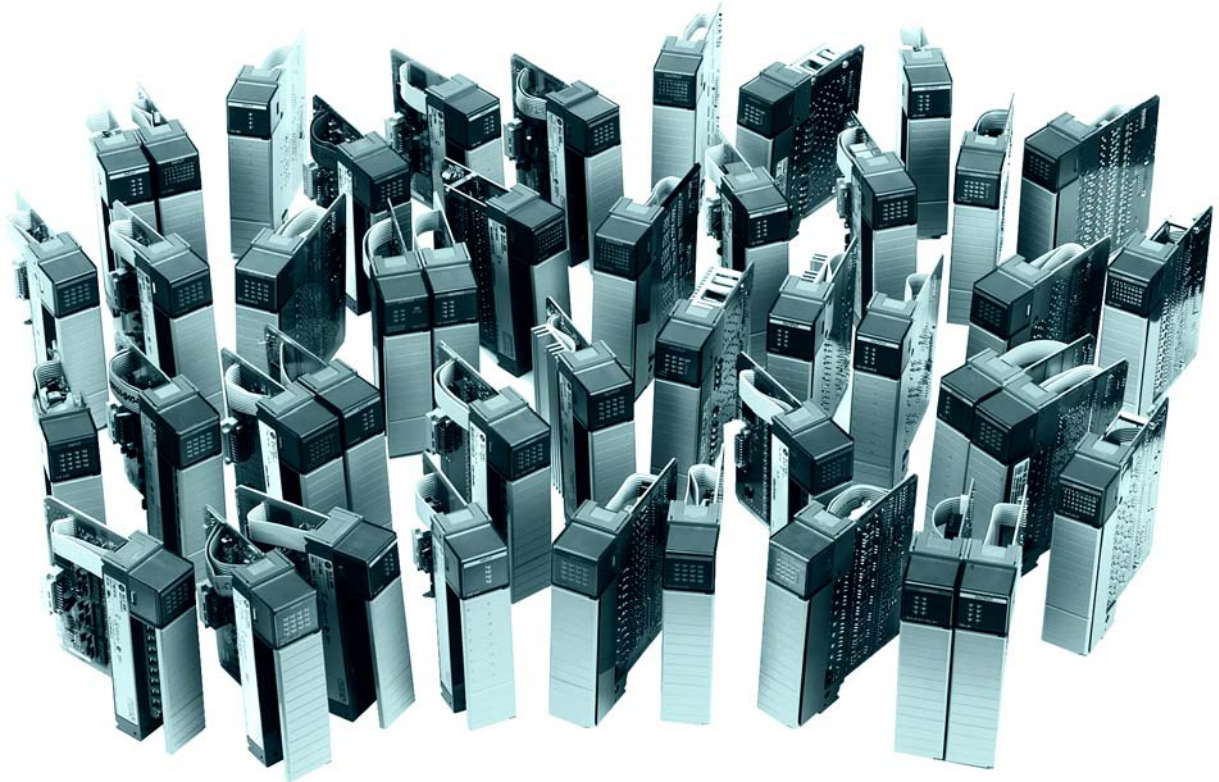
# Allen-Bradley 1746-OX8

**Step 1 - Select:**

- *I/O modules – available in a variety of densities and voltage options. Some modules have diagnostic features, individually isolated inputs/outputs or electronic protection.*
- *interface modules (IFMs) or prewired cables (optional)*

## Select SLC 500 I/O Modules

Digital I/O modules, analog I/O modules, and specialty temperature, counting, process control, and BASIC language modules are available to help you create a custom solution for your application.



### 1746 Digital I/O modules

Digital I/O modules are available with 4, 8, 16, or 32 channels and in a wide variety of I/O voltages (including AC, DC, and TTL). Combination modules with 2 inputs/2 outputs, 4 inputs/4 outputs, and 6 inputs/6 outputs are also available.

Terminals on the 4, 8, 12, and 16-channel modules have self-lifting pressure plates that accept two 14 AWG (2 mm<sup>2</sup>) wires. LED indicators on the front of each module display the status of each I/O point.

32-channel I/O modules are equipped with a 40-pin, MIL-C-83503 type header and a removable wiring connector (1746-N3). The connector can be assembled with the wire type and length of your choice.

Output modules are available with solid-state AC, solid-state DC, and relay contact type outputs. High current solid-state output modules, catalog numbers 1746-OBP16, 1746-OVP16, and 1746-OAP12, have fused commons with a blown fuse LED indication. The

### Sourcing DC Output Modules

| Specifications                                   | 1746-OB6EI                                       | 1746-OB8   | 1746-OB16   | 1746-OB16E  | 1746-OB32   | 1746-OB32E | 1746-OBP8 <sup>(4)</sup>                       | 1746-OBP16   |
|--|--|--|---|---|---|------------|--|--|
| Voltage drop, on-state output, max.              | 1.0V @ 2.0 A                                     | 1.2V @ 1.0 A                                     | 1.2V @ 0.5 A                                      | 1.0V @ 0.5 A  | 1.2V @ 0.5 A                                      |            | 1.0V @ 2.0 A                                   | 1.0V @ 1.0 A   |
| Load current, min.                               | 1 mA   | 1 mA   | 1 mA  | 1 mA  | 1 mA  | 1 mA       | 1 mA   | 1 mA   |
| Leakage current, off-state output, max           | 1 mA   | 1 mA   | 1 mA  | 1 mA  | 1 mA  | 1 mA       | 1 mA   | 1 mA   |
| Signal on delay, max (resistive load)            | 1.0 ms <sup>(2)</sup>                            | 0.1 ms   | 0.1 ms  | 1.0 ms <sup>(3)</sup>   | 0.1 ms  | 1.0 ms     | 1.0 ms <sup>(3)</sup>                          | 0.1 ms <sup>(3)</sup>  |
| Signal off delay, max (resistive load)           | 2.0 ms   | 1.0 ms   | 1.0 ms  | 1.0 ms  | 1.0 ms  | 2.0 ms     | 2.0 ms   | 1.0 ms   |
| Continuous current per module                    | 12.0 A @ 0...60 °C (32 °...140 °F)               | 8.0 A @ 30 °C (86 °F)<br>4.0 A @ 60 °C (140 °F)  |   | 8.0 A @ 0...60 °C (32...140 °F)                                 |   |            |  | 6.4 A @ 0...60 °C (32...140 °F)                                |
| Continuous current per point                     | 2.0 A @ 0...60 °C (32 °...140 °F) <sup>(3)</sup> | 1.0 A @ 30 °C (86 °F)<br>0.50 A @ 60 °C (140 °F) | 0.50 A @ 30 °C (86 °F)<br>0.25 A @ 60 °C (140 °F) | 1.0 A @ 30 °C (86 °F)<br>0.50 A @ 60 °C (140 °F) <sup>(4)</sup> | 0.50 A @ 30 °C (86 °F)<br>0.25 A @ 60 °C (140 °F) |            | 2.0 A @ 0...60 °C (32...140 °F) <sup>(4)</sup> | 1.5 A @ 30 °C (86 °F)<br>1.0 A @ 60 °C (140 °F) <sup>(4)</sup> |
| Surge current per point for 10 ms <sup>(1)</sup> | 4.0 A  | 3.0 A  |   | 2.0 A   | 1.0 A @ 30 °C (86 °F)<br>1.0 A @ 60 °C (140 °F)   |            | 4.0 A  |  |

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

(2) Fast turn-off modules provide fast OFF delay for inductive loads. Comparative OFF delay times for 1746-OB8, 1746-OB16 and fast turn-off modules, when switching Bulletin 100-B110 (24 W sealed) contractor, are: 1746-OB8 and 1746-OB16 modules OFF delay = 152 ms; fast turn-off modules OFF delay = 47 ms.

(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-OBP16 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) An external fuse can be used to protect this module from short circuits. Recommended fuse is SANO MQ 4-3.15 A, 5 x 20 mm.

(5) The 1746-OBP16 module features a fused common and blown fuse LED indicator.

### AC Input Modules

| Specifications                | 1746-IA4                  | 1746-IA8 | 1746-IA16 | 1746-IM4                   | 1746-IM8 | 1746-IM16 | 1746-IN16                  |
|-------------------------------|---------------------------|----------|-----------|----------------------------|----------|-----------|----------------------------|
| Number of inputs              | 4                         | 8        | 16        | 4                          | 8        | 16        | 16                         |
| Points per common             | 5                         | 8        | 16        | 4                          | 8        | 16        | 16                         |
| Voltage category              | 100/120V AC               |          |           | 200/240V AC                |          |           | 24V AC/DC                  |
| Operating voltage range       | 85...132V AC @ 47...63 Hz |          |           | 170...265V AC @ 47...63 Hz |          |           | 10...30V AC<br>10...30V DC |
| Backplane current (mA) @ 5V   | 35 mA                     | 50 mA    | 85 mA     | 35 mA                      | 50 mA    | 85 mA     | 85 mA                      |
| Backplane current (mA) @ 24V  | 0 mA                      | 0 mA     | 0 mA      | 0 mA                       | 0 mA     | 0 mA      | 0 mA                       |
| Voltage, off-state input, max | 30V AC                    |          |           | 50V AC                     |          |           | 3.0V DC<br>3.0V AC         |

Allen-Bradley 1746-0x8

### BASIC Language Modules Catalog Numbers and Specifications

| Attribute                      |   | 1746-BAS  | 1746-BAS-T |
|--------------------------------|---|---|------------|
| Maximum communication distance | RS-232 (300...19200 bps)  | 15 m (50 ft)  |            |
|                                | RS-423 (300 bps)  | 1230 m (4000 ft)  |            |
|                                | RS-423 (600 bps)  | 920 m (3000 ft)   |            |
|                                | RS-423 (1200 bps)   | 770 m (2500 ft)   |            |
|                                | RS-423 (4800 bps)   | 245 m (800 ft)  |            |
|                                | RS-423 (9600 bps)   | 120 m (400 ft)  |            |
|                                | RS-423 (19200 bps)  | 60 m (200 ft)   |            |
|                                | RS-422 (300...19200 bps)  | 1230 m (4000 ft)  |            |
|                                | RS-485 (300...19200 bps)  | 1230 m (4000 ft)  |            |
| Data Transfer                  | SLC 5/01  | 8 input words (SLC input image table)<br>8 output words (SLC output image table)  |            |
|                                | SLC 5/02 and higher   | 8 input words (SLC input image table)<br>8 output words (SLC output image table)<br>64 input and 64 output words (SLC M0/M1 file) |            |
| Data Rates                     | 300...19,200 baud   |   |            |
| Modem support                  | DF1 half-duplex slave or full duplex                                    |   |            |
| Clock/calendar accuracy        | ±1 minute/month @ 25 °C (77 °F)<br>0, -6 minutes/month @ 60 °C (140 °F) |   |            |

- (1) If the BASIC Module DH-485 channel is connected to a 1747-AIC Link Coupler, add 0.085 A to the BASIC module's power supply loading value @ 24V DC.
- (2) If the BASIC Module is connected to any device (for example, DTAM) either directly or through a 1747-AIC Link Coupler, add the appropriate current loading for the device to the BASIC module's power supply loading value @ 24V DC.

### Windows-compatible BASIC Module Interface Software (1747-WINBAS)

BASIC Software is a terminal emulation program specifically written for you to interface to a Rockwell Automation 1746-BAS, 1746-BAS-T, or 1771-DB BASIC module. BASIC software simplifies the uploading and downloading of BASIC module programs, as well as backing up and restoring complete module images. BASIC software also provides debugging tools to aid in troubleshooting BASIC programs while online.

As a terminal emulation program, BASIC software requires either one RS-232 serial COM port or a DH-485 interface (1784-PCMK, 1784-PKTX, 1784-PKTXD, or 1747-UIC converter) be available on the personal computers. Bridging to the DH-485 network from other networks is not supported.

BASIC software works on personal computers with Windows 98, 2000, NT, and XP operating systems. RSLinx Classic OEM software must be installed on the personal computer to communicate to the 1746-BAS module via the DH-485 interface.

## Relay Master and Expander 20-Terminal XIMs

| Description                            | Cat. No.        | I/O Module Catalog Number 1746- |       |       |       |       |       |       |        |        |       |       |       |        |        |       |       |        |       |     |
|--|-----------------|---------------------------------|-------|-------|-------|-------|-------|-------|--------|--------|-------|-------|-------|--------|--------|-------|-------|--------|-------|-----|
|  |                 | IA 16                           | IB 16 | IC 16 | IG 16 | IH 16 | IM 16 | IN 16 | ITB 16 | ITV 16 | IV 16 | OA 16 | OB 16 | OB 16E | OBP 16 | OG 16 | OV 16 | OVP 16 | OW 16 | OX8 |
| Expander with eight (8) 24V DC relays  | 1492-XI M24-8R  | -                               | -     | -     | -     | -     | -     | -     | -      | -      | -     | -     | (1)   | (1)    | (1)    | -     | -     | -      | -     | -   |
| Expander with eight (8) 120V AC relays | 1492-XI M120-8R | -                               | -     | -     | -     | -     | -     | -     | -      | -      | -     | (1)   | -     | -      | -      | -     | -     | -      | -     | -   |

## Fusible Expander

|   |                   |   |   |   |   |   |   |   |   |   |     |     |     |     |   |   |   |   |   |
|---|-------------------|---|---|---|---|---|---|---|---|---|-----|-----|-----|-----|---|---|---|---|---|
| 8-channel expander with 24V DC blown fuse indicators  | 1492-XI MF-F24-2  | - | - | - | - | - | - | - | - | - | -   | (1) | (1) | (1) | - | - | - | - | - |
| 8-channel expander with 120V AC blown fuse indicators | 1492-XI MF-F120-2 | - | - | - | - | - | - | - | - | - | (1) | -   | -   | -   | - | - | - | - | - |

## Feed-through Expander

|  |              |   |   |   |   |   |   |   |   |   |     |   |   |   |   |   |   |   |   |
|--|--------------|---|---|---|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|
| Expander with eight (8) feed-through channels 132V AC/DC max | 1492-XI MF-2 | - | - | - | - | - | - | - | - | - | (1) | - | - | - | - | - | - | - | - |
|--|--------------|---|---|---|---|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|

(1) One expander is connected to a master to provide a total of 16 outputs. An extender cable is included with each expander to attach it to the master.

## 40-Terminal IFMs and XIMs for 1746 Digital 32-Point I/O Modules

## Feed-through 40-Terminal IFMs

| Description                                    | Catalog Number | I/O Module Catalog Number 1746- |      |      |       |      |
|--|----------------|---------------------------------|------|------|-------|------|
|  |                | IB32                            | IV32 | OB32 | OB32E | OV32 |
| Standard 132V AC/DC max                        | 1492-IFM40F    | H                               | H    | H    | H     | H    |
| Extra terminals (2 per I/O) 132V AC/DC max     | 1492-IFM40F-2  | H                               | H    | H    | H     | H    |
| 3-wire sensor type input devices 60V AC/DC max | 1492-IFM40F-3  | H                               | H    | -    | -     | -    |

## LED Indicating 40-Terminal IFMs

| Description                                    | Catalog Number    | I/O Module Catalog Number 1746- |      |      |       |      |
|--|-------------------|---------------------------------|------|------|-------|------|
|  |                   | IB32                            | IV32 | OB32 | OB32E | OV32 |
| Standard with 24V AC/DC LEDs                   | 1492-IFM40D24     | H                               | H    | H    | H     | H    |
| 24V AC/DC LEDs and extra terminals for outputs | 1492-IFM40D24-2   | -                               | -    | H    | H     | H    |
| 24V AC/DC LEDs and extra terminals for inputs  | 1492-IFM40D24A-2  | H                               | H    | -    | -     | -    |
| 120V AC LEDs and extra terminals for outputs   | 1492-IFM40D120-2  | -                               | -    | -    | -     | -    |
| 120V AC LEDs and extra terminals for inputs    | 1492-IFM40D120A-2 | -                               | -    | -    | -     | -    |

## Power Supply Worksheet Example

| Procedure  |                           |                  |                              |  |                |                  |                |
|--|---------------------------|------------------|------------------------------|--|----------------|------------------|----------------|
| 1. For each slot of the chassis that contains a module, list the slot number, catalog number of module, and its 5 V and 24 V maximum currents. Also include the power consumption of any peripheral devices that may be connected to the processor other than a DTAM, HHT, or PIC - the power consumption of these devices is accounted for in the power consumption of the processor. |                           |                  |                              |  |                |                  |                |
| Chassis Number 1   |                           | Maximum Currents |                              | Chassis Number 2   |                | Maximum Currents |                |
| Slot Number  | Cat. No.                  | 5V dc            | 24V dc                       | Slot Number  | Cat. No.       | 5V dc            | 24V dc         |
| 0  | 1747-L511                 | 0.350 A          | 0.105 A                      | 0  | 1747-L514      | 0.350 A          | 0.105 A        |
| 1  | 1746-IV8                  | 0.050 A          | —                            | 1  | 1746-OW16      | 0.170 A          | 0.180 A        |
| 2  | 1746-OB8                  | 0.135 A          | —                            | 2  | 1746-NO41      | 0.055 A          | 0.195 A        |
| 3  | 1746-OA16                 | 0.370 A          | —                            | 3  | 1746-NO41      | 0.055 A          | 0.195 A        |
|  |                           |                  |                              | 4  | 1746-NO41      | 0.055 A          | 0.195 A        |
|  |                           |                  |                              | 5  | 1746-NO41      | 0.055 A          | 0.195 A        |
|  |                           |                  |                              | 6  | 1746-IO12      | 0.090 A          | 0.070 A        |
| Peripheral Device  | 1747-AIC                  |                  | 0.085 A                      | Peripheral Device  | 1747-AIC       |                  | 0.085 A        |
| Peripheral Device  |                           |                  |                              | Peripheral Device  |                |                  |                |
| 2. Add loading currents of all system devices at 5 and 24V dc to determine <b>Total Current.</b>   |                           | <b>0.905 A</b>   | <b>0.190 A</b>               | 2. Add loading currents of all system devices at 5 and 24V dc to determine <b>Total Current.</b> |                | <b>0.830 A</b>   | <b>1.220 A</b> |
| 3. For 1746-P4 power supplies, calculate total power consumption of all system devices. If not using a 1746-P4, go to step 4.  |                           |                  |                              |  |                |                  |                |
| Current  |                           | Multiply By      | =Watts                       | Current  |                | Multiply by      | = Watts        |
| Total Current at 5V dc   | 0.905 A                   | 5V               | 4.525 W                      | Total Current at 5V dc   | 0.830 A        | 5V               | 4.15 W         |
| Total Current at 24V dc  | 0.190 A                   | 24V              | 4.56 W                       | Total Current at 24V dc  | 1.220 A        | 24V              | 29.28 W        |
| User Current at 24V dc   | 0.500 A                   | 24V              | 12.00 W                      | User Current at 24V dc   | 0.500 A        | 24V              | 12.00 W        |
| <b>Add the Watts values to determine Total Power (cannot exceed 70 W)</b>  |                           |                  | <b>21.085 W</b>              | <b>Add the Watts values to determine Total Power (cannot exceed 70 W)</b>                        |                |                  | <b>45.43 W</b> |
| 4. Choose the power supply from the list of catalog numbers below. Compare the Total Current required for the chassis with the Internal Current capacity of the power supplies. Be sure the Total Current consumption for the chassis is less than the Internal Current Capacity for the power supply, for both 5 V and 24 V loads.  |                           |                  |                              |  |                |                  |                |
| Catalog Number   | Internal Current Capacity |                  | Catalog Number               | Internal Current Capacity  |                |                  |                |
|  | 5V dc                     | 24V dc           |                              | 5V dc  | 24V dc         |                  |                |
| 1746-P1  | 2.0 A                     | 0.46 A           | 1746-P1                      | 2.0 A  | 0.46 A         |                  |                |
| 1746-P2  | 5.0 A                     | 0.96 A           | 1746-P2                      | 5.0 A  | 0.96 A         |                  |                |
| 1746-P3  | 3.6 A                     | 0.87 A           | 1746-P3                      | 3.6 A  | 0.87 A         |                  |                |
| 1746-P4 (See step 3)   | 10.0 A                    | 2.88 A           | 1746-P4 (see step 3)         | 10.0 A   | 2.88 A         |                  |                |
| 1746-P5  | 5.0 A                     | 0.96 A           | 1746-P5                      | 5.0 A  | 0.96 A         |                  |                |
| 1746-P6  | 5.0 A                     | 0.96 A           | 1746-P6                      | 5.0 A  | 0.96 A         |                  |                |
| 1747-P7*   | 12V input                 | 2.0 A            | 1747-P7*                     | 12V Input  | 2.0 A          |                  |                |
|  | 24V input                 | 3.6 A            |                              | 24V Input  | 3.6 A          |                  |                |
| <b>Required Power Supply</b>   |                           | <b>1746-P1</b>   | <b>Required Power Supply</b> |  | <b>1746-P4</b> |                  |                |

\*See P7 current capacity chart on page 69.