

1746-OB16E, 1746-OB6EI, and 1746-OB32E modules provide electronic protection from short circuit and overload conditions.

Wiring of 16 and 32-channel modules can also be accomplished with a bulletin 1492 interface module and pre-wired cable. All 16-channel I/O modules and catalog numbers 1746-OX8, 1746-OBP8, 1746-OAP12, 1746-IO12 are equipped with color-coded removable terminal blocks.

Digital I/O Module Overview

Catalog Number	Voltage Category	I/O Points	Description	For Detailed Specifications, See
DC Modules				
1746-IB8	24V DC	8	Current Sinking DC Input Module	Sinking DC Input Modules page 11
1746-IB16	24V DC	16	Current Sinking DC Input Module	
1746-IB32	24V DC	32	Current Sinking DC Input Module	
1746-ITB16	24V DC	16	Fast Response DC Sinking Input Module	
1746-IC16	48V DC	16	Current Sinking DC Input Module	
1746-IH16	125V DC	16	Current Sinking DC Input Module	Sourcing DC Input Modules page 12
1746-IV8	24V DC	8	Current Sourcing DC Input Module	
1746-IV16	24V DC	16	Current Sourcing DC Input Module	
1746-IV32	24V DC	32	Current Sourcing DC Input Module	
1746-ITV16	24V DC	16	Fast Response DC Sourcing Input Module	
1746-IG16 ⁽¹⁾	5V DC	16	Current Sourcing TTL Input Module	Sourcing DC Output Modules page 13
1746-OB6EI	24V DC	6	Electronically Protected Isolated Sourcing DC Output Module	
1746-OB8	24V DC	8	Current Sourcing DC Output Module	
1746-OB16	24V DC	16	Current Sourcing DC Output Module	
1746-OB16E	24V DC	16	Electronically Protected Current Sourcing DC Output Module	
1746-OB32	24V DC	32	Current Sourcing DC Output Module	
1746-OB32E	24V DC	32	Electronically Protected Current Sourcing DC Output Module	
1746-OBP8	24V DC	8	High Current Sourcing DC Output Module	
1746-OBP16 ⁽²⁾	24V DC	16	High Current Sourcing DC Output Module	Sinking DC Output Modules page 12
1746-OV8	24V DC	8	Current Sinking DC Output Module	
1746-OV16	24V DC	16	Current Sinking DC Output Module	
1746-OV32	24V DC	32	Current Sinking DC Output Module	
1746-OVP16 ⁽²⁾	24V DC	16	High Current Sinking DC Output Module	
1746-OG16 ⁽¹⁾	5V DC	16	Current Sinking TTL Output Module	
AC Modules				

Sinking DC Output Modules

Specifications	1746-OG16	1746-OV8	1746-OV16	1746-OV32	1746-OVP16 ⁽⁵⁾
Voltage drop, on-state output, max.	—	1.2V @ 1.0 A	1.2V @ 0.5 A	1.2V @ 0.5 A	1.0 V @ 1.0 A
Load current, min.	0.15 mA	1 mA	1 mA	1 mA	1 mA
Leakage current, off-state output, max	0.1 mA	1 mA ⁽³⁾	1 mA ⁽³⁾	1 mA ⁽³⁾	1 mA ⁽³⁾
Signal On Delay, max (resistive load)	0.25 ms	0.1 ms	0.1 ms	0.1 ms	0.1 ms ⁽⁶⁾
Signal Off Delay, max (resistive load)	0.50 ms	1.0 ms	1.0 ms	1.0 ms	1.0 ms
Continuous current per module	N/A	8.0 A @ 30 °C (86 °F) 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	24 mA	1.0 A @ 30 °C (86 °F) 0.5 A @ 60 °C (140 °F)	0.50 A @ 30 °C (86 °F) 0.25 A @ 60 °C (140 °F) ⁽⁴⁾	0.50 A @ 30 °C 0.25 A @ 60 °C	1.5 A @ 30 °C (86 °F) 1.0 A @ 60 °C (140 °F) ⁽⁷⁾
Surge current per point for 10 ms ⁽¹⁾	N/A	3.0 A		1.0 A @ 30 °C (86 °F) 1.0 A @ 60 °C (140 °F)	4.0 A ⁽⁸⁾

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

(2) 50 mV peak to peak ripple, max.

(3) To limit the effects of leakage current through solid-state outputs, a loading resistor can be connected in parallel with your load. For transistor outputs, 24V DC operation, use a 5.6 K Ω , 1/2 W resistor.

(4) 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.

(5) The 1746-OVP16 module features a fused common and blown fuse LED indicator.

(6) Fast turn-off modules provide fast OFF delay for inductive loads. Fast turn-off delay for inductive loads is accomplished with surge suppressors on this module. 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. Comparative OFF delay times for 1746-OB8, 1746-OV8 and fast turn-off modules, when switching Bulletin 100-B110 (24 W sealed) contactor, are: 1746-OB8 and 1746-OV8 modules OFF delay = 152 ms; fast turnoff modules OFF delay = 47 ms.

(7) Fast off-delay for inductive loads is accomplished with surge suppressors on the 1746-IB6EI and 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.

Sourcing DC Output Modules

Specifications	1746-OB6EI	1746-OB8	1746-OB16	1746-OB16E	1746-OB32	1746-OB32E	1746-OBP8 ⁽⁴⁾	1746-OBP16
Number of outputs	6 Electronically Protected	8	16	16 Electronically Protected	32	32 Electronically Protected	8	16 ⁽⁵⁾
Points per common	Individually isolated	8	16	16	16	16	4	16
Voltage category	24V DC							
Operating voltage range	10...30V DC	10...50V DC		10...30V DC	5...50V DC	10...30V DC	20.4...26.4V DC	
Backplane current (mA) @ 5V	46 mA	135 mA	280 mA	135 mA	190 mA		135 mA	250 mA
Backplane current (mA) @ 24V	0 mA	0 mA	0 mA	0 mA	0 mA	0 mA	0 mA	0 mA

Sourcing DC Output Modules

Specifications	1746-OB6EI	1746-OB8	1746-OB16	1746-OB16E	1746-OB32	1746-OB32E	1746-OBP8 ⁽⁴⁾	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 ⁽²⁾	0.1 ms	0.1 ms	1.0 ms ⁽³⁾	0.1 ms	1.0 ms	1.0 ms ⁽³⁾	0.1 ms ⁽³⁾
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) 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) ⁽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)	1.0 A @ 30 °C (86 °F) 0.50 A @ 60 °C (140 °F) ⁽⁴⁾	0.50 A @ 30 °C (86 °F) 0.25 A @ 60 °C (140 °F)		2.0 A @ 0...60 °C (32...140 °F) ⁽⁴⁾	1.5 A @ 30 °C (86 °F) 1.0 A @ 60 °C (140 °F) ⁽⁴⁾
Surge current per point for 10 ms ⁽¹⁾	4.0 A	3.0 A		2.0 A	1.0 A @ 30 °C (86 °F) 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-OBV8 and fast turn-off modules, when switching Bulletin 100-B110 (24 W sealed) contractor, are: 1746-OB8 and 1746-OBV8 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-IB6EI, 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) 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 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 3.0V AC

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
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)	—	—	—	—	—	—	—	—
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(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	—	—	—	—	—

LED Indicating 40-Terminal IFMs

Description	Catalog Number	I/O Module Catalog Number 1746-				
		IB32	IV32	OB32	OB32E	OV32
3-wire sensor with 24V AC/DC LEDs	1492-IFM40D24-3	H	H	—	—	—
16 Individually isolated with 24/48V AC/DC LEDs and four terminals/output	1492-IFM40DS24-4	—	—	—	—	—
16 Individually isolated with 24V AC/DC LEDs and four terminals/input	1492-IFM40DS24A-4	—	—	—	—	—
16 Individually isolated with 120V AC LEDs and four terminals/output	1492-IFM40DS120-4	—	—	—	—	—
16 Individually isolated with 120V AC LEDs and four terminals/input	1492-IFM40DS120A-4	—	—	—	—	—
16 Individually isolated with 240V AC LEDs and four terminals/input	1492-IFM40DS240A-4	—	—	—	—	—

Fusible 40-Terminal IFMs

Description	Catalog Number	I/O Module Catalog Number 1746-				
		IB32	IV32	OB32	OB32E	OV32
120V AC/DC with extra terminals for outputs	1492-IFM40F-F-2	—	—	H	H	H
Extra terminals with 24V AC/DC blown fuse indicators for outputs	1492-IFM40F-F24-2	—	—	H	H	H
Extra terminals with 120V AC/DC blown fuse indicators for outputs	1492-IFM40F-F120-2	—	—	—	—	—
16 Individually isolated with extra terminals for 120V AC/DC outputs	1492-IFM40F-FS-2	—	—	—	—	—
16 individually isolated with extra terminals and 24V AC/DC blown fuse indicators	1492-IFM40F-FS24-2	—	—	—	—	—
16 Individually isolated with 24V AC/DC blown fuse indicators and four terminals/output	1492-IFM40F-FS24-4	—	—	—	—	—
16 Individually isolated with extra terminals and 120V AC/DC blown fuse LED indicators	1492-IFM40F-FS120-2	—	—	—	—	—
16 Individually isolated with 120V AC/DC blown fuse indicators and four terminals/output	1492-IFM40F-FS120-4	—	—	—	—	—
16 Individually isolated with 240V AC/DC blown fuse indicators and four terminals/output	1492-IFM40F-FS240-4	—	—	—	—	—
16 Individually isolated with 24V AC/DC blown fuse indicators and four terminals/input	1492-IFM40F-FS24A-4	—	—	—	—	—
16 Individually isolated with 120V AC/DC blown fuse indicators and four terminals/input	1492-IFM40F-FS120A-4	—	—	—	—	—

Cable Catalog Number	Standard Cable Lengths	Build to Order Available	Number of Conductors	Mating I/O Module Catalog Number
1492-CABLE ⁽¹⁾ G	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-OA16
1492-CABLE ⁽¹⁾ H	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-IB32, -IV32, -OB32, -OB32E, -OV32
1492-CABLE ⁽¹⁾ N	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-OW16, -OX8
1492-CABLE ⁽¹⁾ S	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-OX8

(1) Cables are available in standard lengths of 0.5 m, 1.0 m, 2.5 m, and 5.0 m. To order, insert the code for the desired cable length into the cat. no. (005 = 0.5 m, 010 = 1.0 m, 025 = 2.5 m, and 050 = 5.0 m). Example: Cat. No. 1492-CABLE005N is for a 0.5 m cable that could be used to connect a catalog number 1492-IFM20D24N IFM to a Catalog Number 1746-OW16 I/O module. Build-to-order lengths are also available.

I/O Module-Ready Cables for 1746 Digital I/O Modules

The I/O module-ready cables have a pre-wired RTB on one end to plug onto the front of a Bulletin 1746 I/O module and 20 or 40 individually colored #18 AWG conductors on the other end. These cables provide the convenience of pre-wired connections at the I/O module end, while still allowing the flexibility to fieldwire to standard terminal blocks of your choice.

I/O Module-Ready Cables for 1746 Digital I/O Modules

Cable Catalog Number	Standard Cable Lengths	Build to Order Available	Number of Conductors	Mating I/O Module Catalog Number
1492-CABLE ⁽¹⁾ N3	1.0, 2.5, 5.0 m	Yes	40	1746-IB32, -IV32, -OB32, -OV32, -OB32E
1492-CABLE ⁽¹⁾ RTBB	1.0, 2.5, 5.0 m	Yes	20	1746-IB16, -IC16, -IG16, -IH16, -IN16, -ITB16, -ITV16, -IV16, -OB16, -OB16E, -OBP8, -OBP16, -OG16, -OV16, -OVP16
1492-CABLE ⁽¹⁾ RTBO	1.0, 2.5, 5.0 m	Yes	20	1746-OW16, -OX8
1492-CABLE ⁽¹⁾ RTBR	1.0, 2.5, 5.0 m	Yes	20	1746-IA16, -OA16, -OAP12, -IM16

(1) Cables are available in standard lengths of 0.5 m, 1.0 m, 2.5 m, and 5.0 m. To order, insert the code for the desired cable length into the cat. no. (005 = 0.5 m, 010 = 1.0 m, 025 = 2.5 m, and 050 = 5.0 m). Example: Cat. No. 1492-CABLE005N is for a 0.5 m cable that could be used to connect a catalog number 1492-IFM20D24N IFM to a Catalog Number 1746-OW16 I/O module. Build-to-order lengths are also available.

IMPORTANT The following I/O Modules do not have RTBs: 1746-IA4, 1746-IA8, 1746-IB8, 1746-IM4, 1746-IM8, 1746-IV8, 1746-OA8, 1746-OB8.

Digital Input Modules

Catalog Number	Backplane Current (mA) @ 5V	Backplane Current (mA) @ 24V	Watts per point	Thermal dissipation, min.	Thermal dissipation, max.
1746-ITV16	85 mA	0 mA	0.200 W	0.425 W	3.625 W
1746-IV8	50 mA	0 mA	0.200 W	0.250 W	1.90 W
1746-IV16	85 mA	0 mA	0.200 W	0.425 W	3.60 W
1746-IV32	106 mA	0 mA	0.200 W	0.530 W	6.90 W

(1) Power supply loading for series D and later modules.

Digital Output Modules

Catalog Number	Backplane Current (mA) @ 5V	Backplane Current (mA) @ 24V	Watts per point	Thermal dissipation, min.	Thermal dissipation, max.
1746-OA8	185 mA	0 mA	1.00 W	0.925 W	9.00 W
1746-OA16	370 mA	0 mA	0.462 W	1.85 W	9.30 W
1746-OAP12	370 mA	0 mA	1.00 W	1.85 W	10.85 W
1746-OB8	135 mA	0 mA	0.775 W	0.675 W	6.90 W
1746-OB16	280 mA	0 mA	0.338 W	1.40 W	7.60 W
1746-OB32 ⁽¹⁾	190 mA	0 mA	0.078 W	2.26 W	4.80 W
1746-OBP8	135 mA	0 mA	0.300 W	0.675 W	3.08 W
1746-OBP16	250 mA	0 mA	0.310 W	1.25 W	6.21 W
1746-OB16E	135 mA	0 mA	0.338 W	1.40 W	7.60 W
1746-OB32E	190 mA	0 mA	0.078 W	2.26 W	4.80 W
1746-OG16	180 mA	0 mA	0.033 W	0.90 W	1.50 W
1746-OV8	135 mA	0 mA	0.775 W	0.675 W	6.90 W
1746-OV16	270 mA	0 mA	0.338 W	1.40 W	7.60 W
1746-OV32 ⁽¹⁾	190 mA	0 mA	0.078 W	2.26 W	4.80 W
1746-OVP16	250 mA	0 mA	0.310 W	1.25 W	6.21 W
1746-OW4	45 mA	45 mA	0.133 W	1.31 W	1.90 W
1746-OW8	85 mA	90 mA	0.138 W	2.59 W	3.70 W
1746-OW16	170 mA	180 mA	0.033 W	5.17 W	5.70 W
1746-OX8	85 mA	90 mA	0.825 W	2.59 W	8.60 W

(1) Power supply loading for series D and later modules.