

Analog I/O Module Overview

Catalog Number	Description	Voltage Category	For specifications, see
1746-NI4	High Resolution (4) Analog Input Module	-20...+20 mA (or) -10...+10V DC	page 19: General Input Specifications page 19: Current Loop Input Specifications page 20: Voltage Input Specifications
1746-NI8	High Resolution (8) Analog Input Module	-20...+20 mA (or) -10...+10V DC	page 22: General input specifications page 22: Input step response page 23: Current loop input specifications page 23: Voltage input specifications
1746-NI16 ⁽¹⁾	High Resolution (16) Analog Input Module	-20...+20 mA	page 25: General input specifications
1746-NI16V ⁽¹⁾	High Resolution (16) Analog Input Module	-10...+10V DC	page 26: Module update times
1746-NIO4I	High Resolution (2) Analog Input, (2) Analog Current Output Module	-20...+20 mA (or) -10...+10V DC (inputs) 0...20 mA (outputs)	page 19: General Input Specifications page 19: Current Loop Input Specifications
1746-NIO4V	High Resolution (2) Analog Input, (2) Analog Voltage Output Module	20...+20 mA (or) -10...+10V DC (inputs) -10...+10V DC (outputs)	page 20: Voltage Output Specifications
1746-FIO4I	(2) Fast Analog Input, (2) Analog Current Output Module	0...20 mA (or) 0...10V DC (inputs) 0...20 mA (outputs)	page 19: General Input Specifications page 19: Current Loop Input Specifications page 20: Voltage Input Specifications
1746-FIO4V	(2) Fast Analog Input, (2) Analog Voltage Output Module	0...20 mA	page 20: Output specifications
1746-NIO4I	(4) Analog Current Output Module	-10...+10V DC	page 20: Output specifications
1746-NIO4V	(4) Analog Voltage Output Module	0...20 mA	page 20: Output specifications
1746-NO8I	(8) Analog Current Output Module	-10...+10V DC	page 24: Output specifications
1746-NO8V	(8) Analog Voltage Output Module	-10...+10V DC	page 24: Output specifications

(1) Single-ended connections only.

4-Channel Analog I/O Modules**General Input Specifications for 4-Channel Modules**

Specification	1746-NI4	1746-NIO4I	1746-NIO4V	1746-FIO4I	1746-FIO4V
Backplane current (mA) @ 5V	25 mA	55 mA	55 mA	55 mA	55 mA
Backplane current (mA) @ 24V	85 mA	145 mA	115 mA	150 mA	120 mA
Number of inputs	4	2	2	2	2
Backplane isolation	500V AC and 710V DC withstand for 1 minute				
Step response	60 ms			100 μs	

Relay Master and Expander 40-Terminal XIMs

Description	Catalog Number	I/O Module Catalog Number 1746-				
		IB32	IV32	OB32	OB32E	OV32
Relay Master						
40-pin master with eight (8) 24V DC relays	1492-XIM4024-8R	–	–	H	H	–
40-pin master with sixteen (16) 24V DC relays	1492-XIM4024-16R	–	–	H	H	–
40-pin master with sixteen (16) 24V DC relays with fusing	1492-XIM4024-16RF	–	–	H	H	–
Relay Expander						
Expander with eight (8) 24V DC relays	1492-XIM24-8R	–	–	(1)	(1)	–
Expander with eight (8) 120V AC relays	1492-XIM120-8R	–	–	–	–	–
Expander with sixteen (16) 24V DC relays with fusing	1492-XIM24-16RF	–	–	(2)	(2)	–
Fusible Expander						
8-channel expander with 24V DC blown fuse indicators	1492-XIMF-F24-2	–	–	(1)	(1)	–
8-channel expander with 120V AC blown fuse indicators	1492-XIMF-F120-2	–	–	–	–	–
Feed-through Expander						
Expander with eight (8) feed-through channels 132V AC/DC max	1492-XIMF-2	–	–	(1)	(1)	–

(1) Two or three expanders can be connected to a master to provide a total of 32 outputs. An extender cable is included with each expander to connect it to the master.

(2) Can have one expandable module per master.

Pre-Wired Cables for 1746 Digital I/O Modules

These pre-wired cables have a pre-wired removable terminal block (RTB) on one end to connect to the front of a Bulletin 1746 digital I/O module and a connector on the other end to plug into a 20- or 40-terminal IFM/XIM. You must first select the IFM/XIM from one of the preceding selection tables.

Cable Catalog Number	Standard Cable Lengths	Build to Order Available	Number of Conductors	Mating I/O Module Catalog Number
1492-CABLE ⁽¹⁾ A	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-IA16, -IM16
1492-CABLE ⁽¹⁾ B	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-IB16, -IH16, -IN16, -ITB16, -ITV16
1492-CABLE ⁽¹⁾ C	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-OA16
1492-CABLE ⁽¹⁾ CR	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-OA16
1492-CABLE ⁽¹⁾ D	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-OW16, -OX8
1492-CABLE ⁽¹⁾ E	0.5, 1.0, 2.5, 5.0 m	Yes	20	1746-IG16, -OB16, -OB16E, -OBP16, -OG16, -OV16, -OVP16

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.

Power Supply Loading and Heat Dissipation

Use the values in the following tables to calculate the power supply loading for each chassis in your SLC modular application.

Processors

Catalog Number	Backplane Current (mA) @ 5V	Backplane Current (mA) @ 24V	Watts per point	Thermal dissipation, min.	Thermal dissipation, max.
1747-L511	90 mA	0 mA	N/A	1.75 W	1.75 W
1747-L514	90 mA	0 mA	N/A	1.75 W	1.75 W
1747-L524	350 mA	105 mA	N/A	1.75 W	1.75 W
1747-L531	500 mA	175 mA	N/A	1.75 W	1.75 W
1747-L532	500 mA	175 mA	N/A	2.90 W	2.90 W
1747-L533	500 mA	175 mA	N/A	2.90 W	2.90 W
1747-L541	1000 mA	200 mA	N/A	4.00 W	4.00 W
1747-L542	1000 mA	200 mA	N/A	4.00 W	4.00 W
1747-L543	1000 mA	200 mA	N/A	4.00 W	4.00 W
1747-L551	1000 mA	200 mA	N/A	4.00 W	4.00 W
1747-L552	1000 mA	200 mA	N/A	4.00 W	4.00 W
1747-L553	1000 mA	200 mA	N/A	4.00 W	4.00 W

Digital Input Modules

Catalog Number	Backplane Current (mA) @ 5V	Backplane Current (mA) @ 24V	Watts per point	Thermal dissipation, min.	Thermal dissipation, max.
1746-IA4	35 mA	0 mA	0.270 W	0.175 W	1.30 W
1746-IA8	50 mA	0 mA	0.270 W	0.250 W	2.40 W
1746-IA16	85 mA	0 mA	0.270 W	0.425 W	4.80 W
1746-IB8	50 mA	0 mA	0.200 W	0.250 W	1.90 W
1746-IB16	50 mA	0 mA	0.200 W	0.425 W	3.60 W
1746-IB32 ⁽¹⁾	106 mA	0 mA	0.200 W	0.530 W	6.90 W
1746-IC16	50 mA	0 mA	0.220 W	0.425 W	3.95 W
1746-IG16	140 mA	0 mA	0.270 W	0.700 W	1.00 W
1746-IH16	85 mA	0 mA	0.320 W	0.675 W	3.08 W
1746-IM4	35 mA	0 mA	0.350 W	0.175 W	1.60 W
1746-IM8	50 mA	0 mA	0.350 W	0.250 W	3.10 W
1746-IM16	85 mA	0 mA	0.350 W	0.425 W	6.00 W
1746-IN16	85 mA	0 mA	0.350 W	0.425 W	6.00 W
1746-ITB16	50 mA	0 mA	0.200 W	0.425 W	3.625 W