

Notes:

Digital I/O Module Overview

Catalog Number	Voltage Category	I/O Points	Description	For Detailed Specifications, See
1746-IA4	100/120V AC	4	120V AC Input Module	AC Input Modules page 14
1746-IA8	100/120V AC	8	120V AC Input Module	
1746-IA16	100/120V AC	16	120V AC Input Module	
1746-IM4	200/240V AC	4	240V AC Input Module	
1746-IM8	200/240V AC	8	240V AC Input Module	
1746-IM16	200/240V AC	16	240V AC Input Module	
1746-OA8	120/240V AC	8	120/240V AC Output Module	AC Output Modules page 15
1746-OA16	120/240V AC	16	120/240V AC Output Module	
1746-OAP12 ⁽²⁾	120/240V AC	12	High Current 120/240V AC Output Module	

AC/DC Modules

1746-IN16	24V AC/DC	16	24V AC/DC Input Module	AC Input Modules page 14
1746-OW4 ⁽²⁾	AC/DC Relay	4	Relay (Hard Contact) Output Module	Relay Output Modules page 16
1746-OW8 ⁽²⁾	AC/DC Relay	8	Relay (Hard Contact) Output Module	
1746-OW16 ⁽²⁾	AC/DC Relay		Relay (Hard Contact) Output Module	
1746-OX8 ⁽²⁾	AC/DC Relay	8	Relay (Hard Contact) Output Module	
1746-IO4 ⁽²⁾	120V ac (Inputs) 100/120V AC (Relay Contact Outputs)	2 In 2 Out	Combination Input/Output Module	Combination I/O Modules page 17
1746-IO8 ⁽²⁾	120V AC (Inputs) 100/120V AC (Relay Contact Outputs)		Combination Input/Output Module	
1746-IO12 ⁽²⁾	120V AC (Inputs) 100/120V AC (Relay Contact Outputs)	4 In 4 Out	Combination Input/Output Module	
1746-IO12DC	24V DC (Inputs) 100/120V AC (Relay Contact Outputs)	6 In 6 Out	Combination Input/Output Module	

(1) Not CE marked.

(2) Certified for Class 1, Division 2 hazardous location by C-UL only.

Sinking DC Input Modules

Specifications	1746-IB8	1746-IB16	1746-IB32	1746-IC16	1746-IH16 ⁽¹⁾	1746-ITB16
Number of Inputs	8	16	32	32	16	16
Points Per Common	8	16	8	8	16	16
Voltage Category	24V DC			48V DC	125V DC	24V DC
Operating Voltage Range	10...30V DC		15...30V DC @ 50 °C (122 °F) 15...26.4V DC @ 60 °C (140 °F)	30...60V DC @ 55 °C (131 °F) 30...55V DC @ 60 °C (140 °F)	90...146V DC ⁽²⁾	10...30V DC
Backplane Current (mA) @ 5V	50 mA	50 mA	50 mA	50 mA		
Backplane Current (mA) @ 24V	0 mA	0 mA	0 mA	0 mA	0 mA	0mA

Sinking DC Input Modules

Specifications	1746-IB8	1746-IB16	1746-IB32	1746-IC16	1746-IH16 ⁽¹⁾	1746-ITB16
Voltage, Off-State Input, max.	5.0V DC			10V DC	20V DC	5V DC
Nominal Input Current	8 mA @ 24V DC		5.1 mA @ 24V DC	4.1 mA @ 48V DC	2.15 mA @ 125V DC 2.25 mA @ 132V DC	8 mA @ 24V DC
Current, Off-State Input, Max.	1 mA		1.5 mA		0.8 mA	1.5 mA
Signal On Delay, Max	8 ms max		3 ms max	4 ms max	9 ms max	0.30 ms max
Signal Off Delay, Max	8 ms max		3 ms max	4 ms max	9 ms max	0.50 ms max

- (1) 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.
- (2) Maximum Points ON Simultaneously: 16 @ 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).

Sourcing DC Input Modules

Specifications	1746-IG16	1746-IV8	1746-IV16	1746-IV32	1746-ITV16
Number of inputs	16	8	16	32	16
Points per common	16	8	16	8	16
Voltage category	5V DC	24V DC	24V DC	24V DC	24V DC
Operating voltage range	4.5...5.5V DC ⁽¹⁾	10...30V DC		15...30V DC @ 50 °C (122 °F) 15...26.4V DC @ 60 °C (140 °F)	10...30V DC
Backplane current (mA) @ 5V	140 mA	50 mA	85 mA	50 mA	85 mA
Backplane current (mA) @ 24V	0 mA	0 mA	0 mA	0 mA	0 mA
Voltage, off-state input, max.	2...5.5V DC	5.0V DC	5.0V DC	5.0V DC	5.0V DC
Nominal input current	3.7 mA @ 5V DC	8 mA @ 24V DC		5.1 mA @ 24V DC	8 mA @ 24V DC
Current, off-state input, max.	4.1 mA	1 mA		1.5 mA	1.5 mA
Signal on delay, max	0.25 ms max	8 ms max		3 ms max	0.30 ms max
Signal off delay, max	0.50 ms max	8 ms max		3 ms max	0.50 ms max ⁽²⁾

(1) 50 mV peak-to-peak ripple (max.)

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

Sinking DC Output Modules

Specifications	1746-OG16	1746-OV8	1746-OV16	1746-OV32	1746-OVP16 ⁽⁵⁾
Number of outputs	16	8	16	32	16
Points per common	16	8	16	16	16
Voltage category	5V DC	24V DC			
Operating voltage range	4.5...5.5V DC ⁽²⁾	10...50V DC		5...50V DC	20.4...26.4V DC
Backplane current (mA) @ 5V	180 mA	135 mA	270 mA	190 mA	250 mA
Backplane current (mA) @ 24V	0 mA	0 mA	0 mA	0 mA	0 mA

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	—	—	—	—	—

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	—	—	—	—	—

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 Total Current .		0.905 A	0.190 A	2. Add loading currents of all system devices at 5 and 24V dc to determine Total Current .		0.830 A	1.220 A
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
Add the Watts values to determine Total Power (cannot exceed 70 W)			21.085 W	Add the Watts values to determine Total Power (cannot exceed 70 W)			45.43 W
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	0.46 A	1747-P7*	12V Input	2.0 A	0.46 A
	24V input	3.6 A	0.87 A		24V Input	3.6 A	0.87 A
Required Power Supply		1746-P1		Required Power Supply		1746-P4	

*See P7 current capacity chart on page 69.