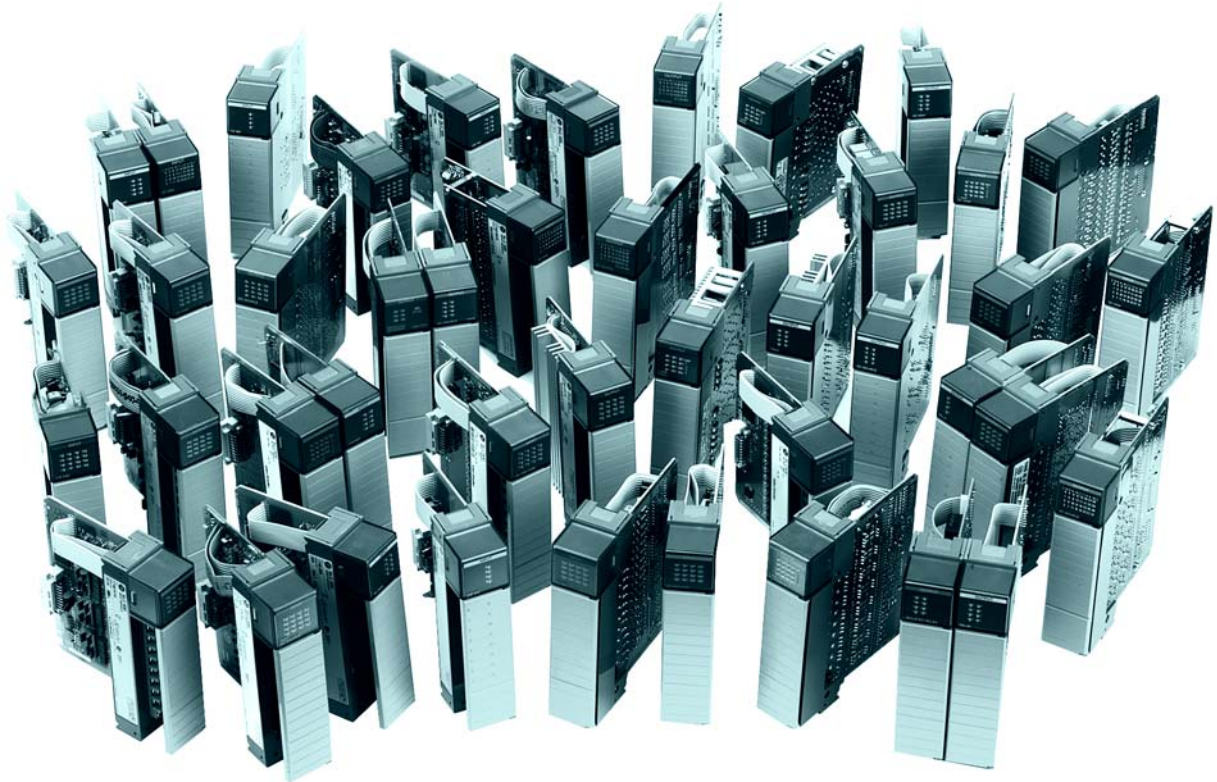


Step 1 - Select:

- *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 mm²) 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

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

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)	-	-	-	-	-	-	-	-
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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	–	–	–	–	–

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	1747-P7*	12V Input	2.0 A		
	24V input	3.6 A		24V Input	3.6 A		
Required Power Supply		1746-P1	Required Power Supply		1746-P4		

*See P7 current capacity chart on page 69.