

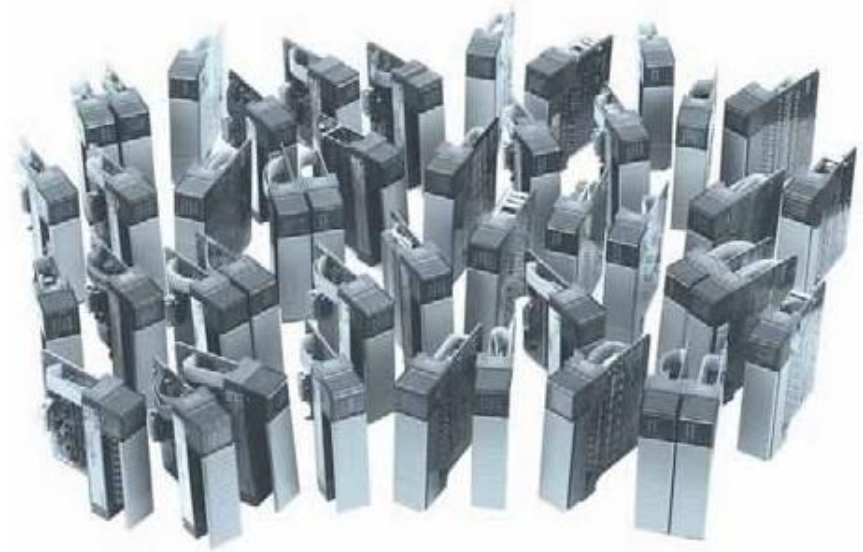
**Step 1 - Select:**

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 pre-wired cables (optional)

## Selecting 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, -OVP16, and -OAP12, have fused commons with a blown fuse LED indication. The 1746-OB16E, -OB6EI, and -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, -OBP8, -OAP12, 1746-IO12 are equipped with color-coded removable terminal blocks.

## Digital I/O Module Overview

Cat. No.	Voltage Category	I/O Points	Description	For Detailed Specifications, See
DC Modules				
1746-IB8	24V dc	8	Current Sinking DC Input Module	page 10 Sinking DC Input Modules
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	
1746-IV8	24V dc	8	Current Sourcing DC Input Module	page 10 Sourcing DC Input Modules
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	5V dc	16	Current Sourcing TTL Input Module	
1746-OB6EI	24V dc	6	Electronically Protected Isolated Sourcing DC Output Module	page 11 Sourcing DC Output Modules
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 *	24V dc	16	High Current Sourcing DC Output Module	page 11 Sinking DC Output Modules
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 *	24V dc	16	High Current Sinking DC Output Module	
1746-OG16	5V dc	16	Current Sinking TTL Output Module	
AC Modules				
1746-IA4	100/120V ac	4	120V ac Input Module	page 12 AC Input Modules
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	page 12 AC Output Modules
1746-OA16	120/240V ac	16	120/240V ac Output Module	
1746-OAP12 *	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	page 12 AC Input Modules
1746-OW4 *	ac/dc Relay	4	Relay (Hard Contact) Output Module	page 13 Relay Output Modules
1746-OW8 *	ac/dc Relay	8	Relay (Hard Contact) Output Module	
1746-OW16 *	ac/dc Relay	16	Relay (Hard Contact) Output Module	
1746-OX8 *	ac/dc Relay	8	Isolated Relay Output Module	
1746-IO4 *	120V ac (Inputs) 100/120V ac (Relay Contact Outputs)	2 In 2 Out	Combination Input/Output Module	page 14 Combination I/O Modules
1746-IO8 *	120V ac (Inputs) 100/120V ac (Relay Contact Outputs)	4 In 4 Out	Combination Input/Output Module	
1746-IO12 *	120V ac (Inputs) 100/120V ac (Relay Contact Outputs)	6 In 6 Out	Combination Input/Output Module	
1746-IO12DC‡	24V dc (Inputs) 100/120V ac (Relay Contact Outputs)	6 In 6 Out	Combination Input/Output Module	

\* Certified for Class 1, Division 2 hazardous location by C-UL only.  
Not CE marked.

## Sinking DC Input Modules

Specifications	1746-IB8	1746-IB16	1746-IB32	1746-IC16	1746-IH16	1746-ITB16
Number of Inputs	8	16	32	16	16	16
Points Per Common	8	16	8	16	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)	30...60V dc @ 55 °C (131 °F) 90...146V dc *		10...30V dc
Backplane Current (mA) at 5V	50 mA	50 mA	50 mA	50 mA		
Backplane Current (mA) at 24V	0 mA	0 mA	0 mA	0 mA	0 mA	0 mA
Voltage, Off-State Input, Max	5.0V dc			10.0V dc	20.0V dc	5.0V 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

\* Max. 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)

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.

## 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 *	10...30V dc		15...30V dc @ 50 °C (122 °F) 15...26.4V dc @ 60 °C (140 °F)	10...30V dc
Backplane Current (mA) at 5V	140 mA	50 mA	85 mA	50 mA	85 mA
Backplane Current (mA) at 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

\* 50 mV peak-to-peak ripple (max.)

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
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*	10...50V dc			
Backplane Current (mA) at 5V	180 mA	135 mA		5...50V dc	20.4...26.4V dc
Backplane Current (mA) at 24V	0 mA	0 mA	270 mA	190 mA	250 mA
Voltage Drop, On-State Output, Max		1.2V @ 1.0 A	0 mA	0 mA	0 mA
Load Current, Min.	0.15 mA	1 mA	1.2V @ 0.5 A	1.2V @ 0.5 A	1.0 V @ 1.0 A
Leakage Current, Off-State Output, Max	1 mA	1 mA	1 mA	1 mA	1 mA
Signal On Delay, Max (resistive load)	0.25 ms	0.1 ms	1 mA	1 mA	1 mA
Signal Off Delay, Max (resistive load)	50 ms	1.0 ms	0.1 ms	0.1 ms	0.1 ms
		8.0 A @ 30 °C (86 °F) 4.0 A @ 60 °C (140 °F)	1.0 ms	1.0 ms	1.0 ms
				8.0 A @ 0...60 °C (32...140 °F)	6.4 A @ 0...60 °C (32...140 °F)
Continuous Current per Module	N/A				
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)§	0.50 A @ 30 °C 0.25 A @ 60 °C	1.5 A @ 30 °C (86 °F) 1.0 A @ 60 °C (140 °F)►
Surge Current per Point for 10 ms	N/A	3.0 A		1.0 A @ 30 °C (86 °F) 1.0 A @ 60 °C (140 °F)	4.0 A

\* 50 mV peak to peak ripple (max).

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

‡ 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 turn-off modules OFF delay = 47 ms.

§ 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.

◆ 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 KΩ, 1/2 W resistor.

► 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.

Repeatability is once every 1 s @ 30 °C (86 °F). Repeatability is once every 2 s @ 60 °C (140 °F).  
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◆	1746-OBP16
Number of Outputs	6 Electronically	8	16	16 Electronically Protected	32	32 Electronically Protected		16
Points Per Common	Protected Individually	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) at 5V/46 mA	135 mA	280 mA	135 mA	190 mA	135 mA	250 mA		250 mA
Backplane Current (mA) at 24V0 mA	0 mA	0 mA	0 mA	0 mA	0 mA	0 mA		0 mA
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		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 *	0.1 ms	0.1 ms	1.0 ms *	0.1 ms	0.1 ms	0.1 ms *		0.1 ms *
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
	12.0 A @ 0...60 °C (32...140 °F)	8.0 A @ 30 °C (86 °F) 4.0 A @ 60 °C (140 °F)						6.4 A @ 0...60 °C (32...140 °F)
Continuous Current per Module				8.0 A @ 0...60 °C (32...140 °F)				
Continuous Current per Point	2.0 A @ 0...60 °C (32...140 °F)‡ 0.50 A @ 60 °C (140 °F)	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)	0.50 A @ 30 °C (86 °F) 0.25 A @ 60 °C (140 °F)	2.0 A @ 0...60 °C (32...140 °F)‡ 1.0 A @ 60 °C (140 °F)‡		1.5 A @ 30 °C (86 °F) 1.0 A @ 60 °C (140 °F)‡
Surge Current per Point for 10 ms	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		

\* Fast turn-off modules provide fast OFF delay for inductive loads. 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 turn-off modules OFF delay = 47 ms.

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

‡ 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.

§ 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 5.0 KΩ, 1/2 W resistor on 1746-OB8, 1746-OB16, and 1746-OB16E modules and a 5.6 KΩ, 1/2 W resistor on 1746-OB6EI, 1746-OBP8, 1746-OBP16 modules.

◆ An external fuse can be used to protect this module from short circuits. Recommended fuse is SANO MQ 4-3.15 A, 5x20 mm.

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