Select MicroLogix 1500 System Expansion Components

Step 13 - Select:

- I/O modules - digital, analog, temperature and high-speed counter
- communication modules - DPI SCANport and DeviceNet
- power supplies, cables and end caps
- perform system expansion calculations
- record your selections in the Selection Record (start on page 86)

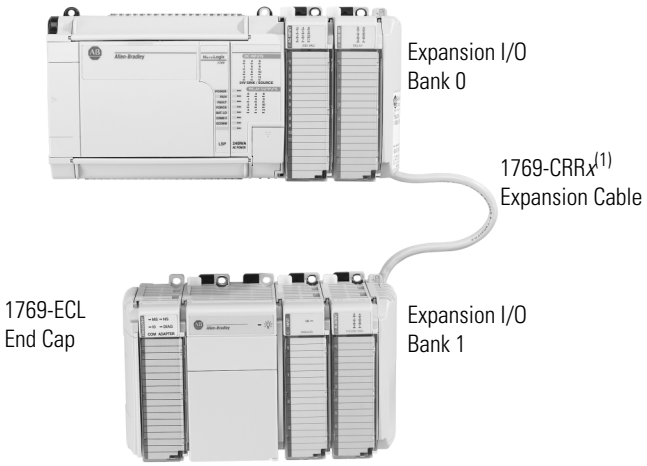
To increase your I/O options, you can connect an additional bank of I/O to your MicroLogix 1500 controller. An I/O bank is a group of I/O modules connected directly to one another. Banks are separated by cables.

In a MicroLogix 1500 system, a maximum of one 1769 Expansion cable can be used, allowing for two banks of I/O modules (one connected directly to the controller and the other connected via the cable). Each I/O bank requires its own power supply (Bank 0 uses the controller's embedded power supply).

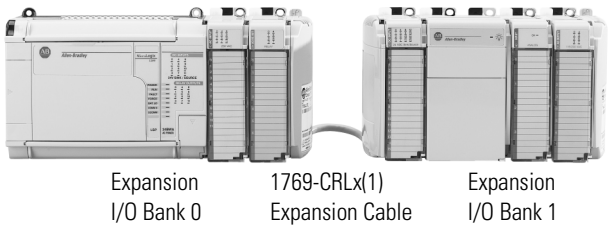
Only one power supply (embedded or expansion) can be used on an I/O bank. The expansion power supply cannot be connected directly to a controller. It must be connected by using one of the expansion cables.

Refer to the Compact I/O Selection Guide, publication 1769-SG002, to select the 1769 I/O modules and communication modules that you need. On the Internet, go to http://www.ab.com/micrologix and navigate to MicroLogix 1500 downloads.

Vertical Orientation



Horizontal Orientation



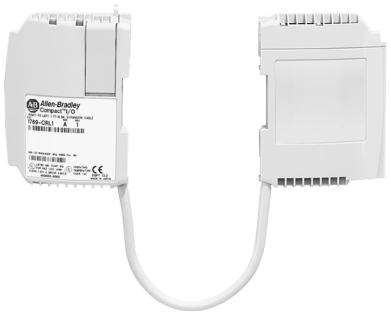
(1) The *x* in this catalog number can be either a 1 or a 3 representing the length of the cable: 1 = 1 ft (305 mm) and 3 = 3.28 ft (1 m).

The following section of this document, 1769 Compact Expansion I/O and Communication Modules, provides information for choosing Compact I/O expansion options.

Basically, you select the I/O options you need and then verify that the selections do not exceed the available power in the system. As shown above, the power can be provided from the Base Unit or an expansion power supply.

After reviewing the I/O options, use the worksheets in the Perform MicroLogix 1500 System Expansion Calculations section on page 78 to list your I/O choices and determine the system power requirements. The worksheets will let you know if the system is within allowable limits.

A download is also available for system validation. On the Internet, go to http://www.ab.com/micrologix and navigate to MicroLogix 1500 downloads.



Expansion Cables

Expansion cables are required when adding a second bank of I/O modules. They are connected from the right side of the controller bank to either the left or right side of the expansion bank.

1769 Compact Expansion Cables Selection Chart

Cable Type	Length	Cat. No.
right bank-to-right bank	305 mm (1 ft)	1769-CRR1
right bank-to-right bank	1 m (3.28 ft)	1769-CRR3
right bank-to-left bank	305 mm (1 ft)	1769-CRL1
right bank-to-left bank	1 m (3.28 ft)	1769-CRL3

End Caps

In every expansion I/O system, an end cap must be used to terminate the end of the serial communication bus. The end cap is connected to the last I/O module in the system.

1769 Compact End Caps Selection Chart

End Cap	Cat. No.
right end cap	1769-ECR
left end cap	1769-ECL

Verifying the Expansion Power Supply Loading

Using the values from SUBTOTAL2, verify that the system loading and I/O distribution are within the limits shown below. Consider future expansion when selecting a power supply.

Bank 1 Power Supply Loading - Verify the Current Limits

Attribute	Cat. No.	Calculated Current for System		24V DC User Output Capacity
		at 5V DC (mA)	at 24V DC (mA)	
Values from SUBTOTAL2 (on page 81):		(C)	(D)	
MAXIMUM CURRENT LIMIT	**1769-PA2**	**2000**	**800**	**250 mA**
	1769-PA4	**4000**	**2000**	**N/A**
	1769-PB2	**2000**	**800**	
	1769-PB4	**4000**	**2000**	
I/O Distribution - Distribute I/O modules such that the current consumed from either the left side or the right side of the power supply never exceeds the following values:	1769-PA2	2000	800	**250 mA**
	1769-PA4	2000	1000	
	1769-PB2	2000	800	
	1769-PB4	2000	1000	

Selecting Expansion Cables and End Caps

Any system using Compact I/O components must have an end cap. If I/O Bank 1 is used, an expansion cable is also required. Use the information on page 77 to make your selection from the table below.

Select End Cap and Expansion Cable

Type of System	Requirement	Cat. No. Selected
Base Unit with Compact I/O only	right end cap	1769-ECR
Base Unit with Compact I/O and Bank 1, horizontal orientation	right-to-left expansion cable	1769-CRL1, 1769-CRL3
	right end cap	1769-ECR
Base Unit with Compact I/O and Bank 1, vertical orientation	right-to-right expansion cable	1769-CRL1, 1769-CRL3
	left end cap	1769-ECL

Master List of Catalog Numbers

Cat. No.	Description	Quantity Selected
1764-MM2RTC	MicroLogix 1500 16 KB Memory Module with Real-Time Clock	
1764-M3	MicroLogix 1500 16 KB Memory Module	
1764-MM3RTC	MicroLogix 1500 16 KB Memory Module with Real-Time Clock	
1764-RTC	MicroLogix 1500 Real-Time Clock Module	
1769 Compact I/O Components		
1769-ADN	CompactLogix DeviceNet Adapter, series B	
1769-ASCII	Compact 2-channel ASCII Interface Module	
1769-BOOLEAN	Compact 24V I/O Boolean Control Module	
1769-CRL1	Compact I/O Right Bank-to-Left Bank 1-Foot Expansion Cable(1)	
1769-CRL3	Compact I/O Right Bank-to-Left Bank 3-Foot Expansion Cable(1)	
1769-CRR1	Compact I/O Right Bank-to-Right Bank 1-Foot Expansion Cable(1)	
1769-CRR3	Compact I/O Right Bank-to-Right Bank 3-Foot Expansion Cable(1)	
1769-ECL	Compact I/O Left End Cap	
1769-ECR	Compact I/O Right End Cap	
1769-HSC	Compact I/O High Speed Counter Module	
1769-IA16	Compact 120V AC Input Module	
1769-IA8I	Compact Individually Isolated 120V AC Input Module	
1769-IF4	Compact 1769-IF4 (series B or Later) Analog Input Module	
1769-IF4I	Compact 4-channel Isolated Analog Input Module	
1769-IF4XOF2	Compact 8-Bit Low Resolution Analog I/O Combination Module	
1769-IF4FXOF2F	Compact Combination Fast Analog I/O Module	
1769-IF8	Compact 8-channel Analog Input Module	
1769-IF16C	Compact High Density Analog Current Input Module	
1769-IF16V	Compact High Density Analog Voltage Input Module	
1769-IG16	Compact TTL Input Module	
1769-IM12	Compact 240V AC Input Module	
1769-IQ16	CompactLogix 24V DC 16-point Sink/Source Input Module	
1769-IQ16F	CompactLogix 24V DC 16-point High Speed Sink/Source Input Module	
1769-IQ32	CompactLogix 24V DC 32-point Sink/Source Input Module	
1769-IQ32T	Compact Current Sinking/Sourcing 24V DC Input Module	
1769-IQ6XOW4	Compact Combination 24V DC Sink/Source Input & AC/DC Relay Output Module	
1769-IR6	Compact I/O 1769-IR6 RTD/resistance Input Module	
1769-IT6	Compact I/O 1769-IT6 Thermocouple/mV Input Module	
1769-OA16	Compact 100 to 240V AC Solid State Output Module	
1769-OA8	Compact 100 to 240V AC Solid State Output Module	
1769-OB16	Compact Solid State 16-point 24V DC Source Output Module	
1769-OB16P	Compact Solid State 16-point 24V DC Source Output Module with Electronic Protection	
1769-OB32	Compact Solid State 32-point 24V DC Source Output Module	
1769-OB32T	Compact Current Solid-state Sourcing 24V DC Output Module	
1769-OB8	Compact Solid State 8-point 24V DC Source Output Module	
1769-OF2	Compact Analog Output Module	
1769-OF4	Compact Analog Output Module	
1769-OF4CI	Compact 4-channel Current Isolated Analog Output Module	