

Power Budget Planning

Managing Power Resources

When determining the types and quantity of terminals you will be using, it is important to remember there is a defined amount of I/O Bus Current supplied from the Bus Coupler. There are also defined limits for each external source.

The chart on the next page indicates the power supplied and used by each Protos X component. The chart below shows an example of how to calculate the power used by your particular system. These charts should make it easy for you to determine if the devices you have chosen will operate within the power budget of your system configuration.

If the I/O terminals you have chosen exceed the maximum power available from the Bus Coupler, you may be able to resolve the problem by using expansion terminals.

Power Budget Example

The example below shows how to calculate the power budget for a typical ProtosX system. This example is constructed using a PX-MOD Bus Coupler and six I/O Terminals. It is recommended you construct a similar table for your system. Follow the steps below to determine your power budget.

A	Column 1	Column 2	Column 3
	<i>Terminal</i>	<i>Terminal Type</i>	<i>I/O Bus (from Coupler)</i>
B	CURRENT SUPPLIED		
	PX-MOD	Bus Coupler	1000mA
C	CURRENT REQUIRED		
	PX-144	4 pt DC Discrete Input	5mA
	PX-172-1	2 pt AC Discrete Input	3mA
	PX-322-1	2 ch RTD Input	60mA
	PX-312	2 ch DC Analog Input	65mA
	PX-244-1	4 pt DC Discrete Output	9mA
	PX-412	2 ch DC Analog Output	75mA
D	Maximum Current Required		217mA
E	Remaining Current Available		783mA

- Using a chart similar to this one, fill in columns 1 and 2.
- Using the tables on the next page enter the current supplied and current used by each device (column 3).
- Add together the current used by the system (row C) for column 3 and put the total in the row labeled "Maximum Current Required" (row D).
- Subtract the calculated "Maximum Current Required" (row D), from the "Current Supplied" and place the difference in the row labeled "Remaining Current Available" (row E).
- If "Maximum Current Required" is greater than "Current Supplied" in column 3, the power budget will be exceeded. It will be unsafe to use this configuration, and you will need to restructure your I/O configuration.

Power Requirements

Power Supplied and Consumed

These tables show the amount of power supplied by each of the Bus Couplers and the amount of power consumed by each I/O device. The Power Consumed chart lists how much power is drawn from the I/O Bus, Terminal Power Bus (externally supplied) and from the Load (when using output terminals). Use this information when calculating the power budget for your system.

Power Supplied	
Device	5V(mA) I/O Bus Supply
Coupler	
<i>PX-MOD</i>	1000 Max
<i>PX-TCP1</i>	1000 Max
<i>PX-TCP2</i>	1750 Max
<i>PX-EIP1</i>	1000 Max
Bus Expansion Coupler	
<i>PX-903</i>	400 Max

Power Consumed			
Device	5V(mA) from I/O Bus	(mA) from Terminal Power Bus	(mA) from Load
Discrete Input Terminals			
<i>PX-144</i>	5	5	N/A
<i>PX-148</i>	5	2 (plus load)	
<i>PX-149</i>	20	N/A	
<i>PX-172-1</i>	3	6	
<i>PX-172-2</i>	3	6	
Discrete Output Terminals			
<i>PX-244-1</i>	9	N/A	30
<i>PX-244-2</i>	9		30
<i>PX-248</i>	18		60 (plus load)
<i>PX-249</i>	45		35 (plus load)
Analog Input Terminals			
<i>PX-302</i>	60	N/A	N/A
<i>PX-304</i>	85	Load	
<i>PX-308</i>	105	Load	
<i>PX-312</i>	65	N/A	
<i>PX-314</i>	100	N/A	
<i>PX-318</i>	140	N/A	
RTD/Thermocouple Input Terminals			
<i>PX-322-1</i>	60	N/A	N/A
<i>PX-324-1</i>	60		
<i>PX-332-J</i>	65		
<i>PX-334-J</i>	75		
<i>PX-332-K</i>	65		
<i>PX-334-K</i>	75		
Analog Output Terminals			
<i>PX-402</i>	60	N/A	50 (plus load)
<i>PX-404</i>	20		60 (plus load)
<i>PX-408</i>	25		50 (plus load)
<i>PX-412</i>	75		50 (plus load)
<i>PX-414</i>	75		50 (plus load)
<i>PX-418</i>	20		20
Relay Output Terminals			
<i>PX-272-1</i>	10	ON resistance max 100mV (plus load)	N/A
<i>PX-272-2</i>	80		
Combination In/Out Terminals			
<i>PX-549</i>	25 (additional 3mA for inputs)	15 (plus load)	N/A