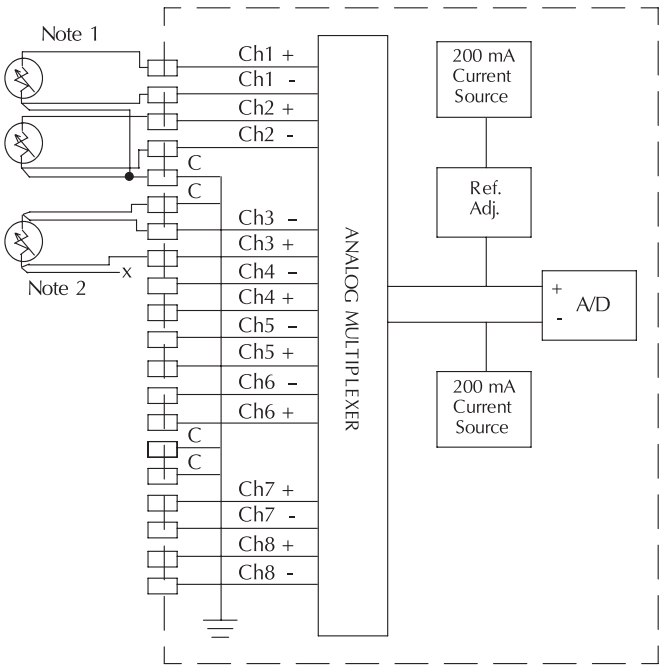
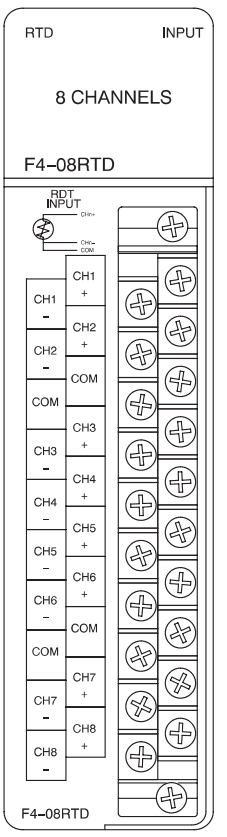
Temperature Input Modules

F4-08RTD 8-Channel RTD Input	
Number of Channels	8
Input Ranges	Type Pt100: -200/850°C, -328/1562°F Type Pt1000: -200/595°C, -328/1103°F Type jPT100: -38/450°C, -36/842°F Type CU-10/25W: -200/260°C, -328/500°F
Resolution	16 bit (1 in 65535)
Input Impedance	27kΩ
Display Resolution	± 0.1°C, ±0.1°F (±3276.7)
RTD Excitation Current	200µA
Input Type	Differential
Notch Filter	>100db notches at 50/60Hz -3db=13.1 Hz
Maximum Settling Time	100msec (full-scale step input)
Common Mode Range	0–5 VDC

Absolute Maximum Ratings	Fault protected inputs to ±50 VDC
Converter Type	Charge Balancing
Linearity Error	± 1°C maximum, ±.01°C typical
Full Scale Calibration Error	± 1°C
PLC Update Rate	1 ch. per scan min., 8 per scan max.
Digital Input Points Required	32 (X) input points (15 binary data bits, 3 channel ID bits, 1 sign bit, 8 fault bits)
Base Power Required 5V	80mA @ 5VDC
Terminal Type (included)	Removable
Operating Temperature	32° to 140°F (0 to 60°C)
Storage Temperature	-4 to 158°F (-20 to 70° C)
Relative Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304

Notes:
1. **the three wires connecting the RTD to the module must be the same type and length. Do not use the shield or drain wire for the third connection.**
2. **If an RTD sensor has 4 wires, the plus sense wire should be left unconnected as shown.**
3. **This module is not compatible with the *ZIP*Link wiring system.**





Check the Power Budget

Verify your power budget requirements

Your I/O configuration choice can be affected by the power requirements of the I/O modules you choose. When determining the types and quantity of I/O modules you will be using, it is important to remember there is a limited amount of power available from the power supply.

The chart on the opposite page indicates the power supplied and used by each DL405 device. The adjacent chart shows an example of how to calculate the power used by your particular system. These two charts should make it easy for you to determine if the devices you have chosen fit within the power budget of your system configuration.

If the I/O you have chosen exceeds the maximum power available from the power supply, you can resolve the problem by shifting some of the modules to an expansion base or remote I/O base (if you are using remote I/O).

Warning: It is extremely important to calculate the power budget correctly. If you exceed the power budget, the system may operate in an unpredictable manner which may result in a risk of personal injury or equipment damage.

Use *ZIP*Links to reduce power requirements

If your application requires a lot of relay outputs, consider using the *ZIP*Link AC or DC relay output modules. These modules can switch high current (10A) loads without putting a load on your base power budget. Refer to Wiring System for DL405 PLCs later in this section for more information.

This logo is placed next to I/O modules that are supported by the *ZIP*Link connection systems.

See the I/O module specifications at the end of this section.

Calculating your power usage

The following example shows how to calculate the power budget for the DL405 system. The example is constructed around a single 8-slot base using the devices shown. It is recommended you construct a similar table for each base in your system.

A				
	Base Number 0	***Device Type***	***5 VDC (mA)***	***External 24 VDC Power (mA)***
B	**CURRENT SUPPLIED**			
	CPU/Expansion Unit /Remote Slave	D4-454 CPU	3700	400
C	**CURRENT REQUIRED**			
	SLOT 0	D4-16ND2	+150	+0
	SLOT 1	D4-16ND2	+150	+0
	SLOT 2	F4-04DA	+120	+100
	SLOT 3	D4-08NA	+100	+0
	SLOT 4	D4-08NA	+100	+0
	SLOT 5	D4-16TD2	+100	+0
	SLOT 6	D4-16TD2	+100	+0
	SLOT 7	D4-16TR	+1000	+0
D	**OTHER**			
	BASE	D4-08B-1	+80	+0
	Handheld Programmer	D4-HPP-1	+320	+0
E	**Maximum Current Required**		***2820***	***100***
F	**Remaining Current Available**		***3700-2820=880***	***400-100=300***

1. Using a chart similar to the one above, fill in column 2.
2. Using the tables on the opposite page, enter the current supplied and used by each device (columns 3 and 4). Pay special attention to the current supplied by the CPU, Expansion Unit, and Remote Slave since they differ. Devices which fall into the "Other" category (Row D) are devices such as the Base and the Handheld programmer, which also have power requirements, but do not plug directly into the base.
3. Add the current used by the system devices (columns 3 and 4) starting with Slot 0 and put the total in the row labeled "maximum current required" (Row E).
4. Subtract the row labeled "Maximum current required" (Row E), from the row labeled "Current Supplied" (Row B). Place the difference in the row labeled "Remaining Current Available" (Row F).
5. If "Maximum Current Required" is greater than "Current Supplied" in either column 3 or 4, the power budget will be exceeded. It will be unsafe to use this configuration and you will need to restructure your I/O configuration. Note the auxiliary 24VDC power supply does not need to supply all the external power. If you need more than the 400mA supplied, you can add an external 24VDC power supply. This will help keep you within your power budget for external power.

DL405 CPU power supply specifications and power requirements

Specification	AC Powered Units	24 VDC Powered Units
Part Numbers	D4-454, D4-EX (expansion base unit), D4-RS (remote slave unit)	D4-454DC-1, D4-EXDC (expansion base unit)
Voltage Withstand (dielectric)	1 minute @ 1,500 VAC between primary, secondary, field ground, and run relay	
Insulation Resistance	> 10MΩ at 500VDC	
Input Voltage Range	85-132 VAC (110V range) 170-264 VAC (220V range)	20-28 VDC (24VDC) with less than 10% ripple
Maximum Inrush Current	20A	20A
Maximum Power	50VA	38W

Power Requirements

Power Supplied					
CPUs/Remote Units/ Expansion Units	***5 VDC Current Supplied in mA***	***24V Aux Power Supplied in mA***	***CPUs/Remote Units/ Expansion Units***	***5V Current Supplied in mA***	***24V Aux Power Supplied in mA***
D4-454 CPU	3100	400	D4-EX	4000	400
D4-454DC-1	3100	NONE	D4-EXDC	4000	NONE
			D4-RS	3700	400
			H4-EBC	3470	400
Power Consumed					
Power-consuming Device	***5V Current Consumed***	***External 24VDC Current Required***	***Power-consuming Device***	***5V Current Consumed***	***External 24VDC Current Required***
I/O Bases			***Analog Modules (continued)***		
D4-04B-1	80	NONE	F4-16AD-1	75	100
D4-06B-1	80	NONE	F4-16AD-2	75	100
D4-08B-1	80	NONE	F4-04DA-1	70	75+20 per circuit
DC Input Modules			F4-04DA-2	90	90
			F4-04DAS-1	60	60 per circuit
D4-16ND2	150	NONE	F4-08DA-1	90	100+20 per circuit
D4-16ND2F	150	NONE	F4-08DA-2	80	150
D4-32ND3-1	150	NONE	F4-16DA-1	90	100+20 per circuit
D4-64ND2	300 max.	NONE	F4-16DA-2	80	25 max.
AC Input Modules			F4-08RTD	80	NONE
			F4-08THM-n	120	50
D4-08NA	100	NONE	F4-08THM	110	60
D4-16NA	150	NONE	***Remote I/O***		
AC/DC Input Modules					
			H4-ERM100	320(300)	NONE
D4-16NE3	150	NONE	H4-ERM-F	450	NONE
DC Output Modules			D4-RM	300	NONE
			Communications and Networking		
D4-16TD1	200	125			
D4-16TD2	400	NONE	H4-ECOM100	300	NONE
D4-32TD1	250	140	D4-DCM	500	NONE
D4-32TD2	350	120 (4A max including loads)	F4-MAS-MB	235	NONE
D4-64TD1	800	NONE	***CoProcessors***		
AC Output Modules					
			F4-CP128-1	305	NONE
D4-08TA	250	NONE	***Specialty Modules***		
D4-16TA	450	NONE			
Relay Output Modules			H4-CTRIO	400	NONE
			D4-16SIM	150	NONE
D4-08TR	550	NONE	F4-4LTC	280	75
F4-08TRS-1	575	NONE	***Programming***		
F4-08TRS-2	575	NONE			
D4-16TR	1000	NONE	D4-HPP-1 (Handheld Prog.)	320	NONE
Analog Modules			***Operator Interface***		
			DV-1000	150	NONE
F4-04AD	150	100	C-more Micro-Graphic	210	NONE
F4-04ADS	370	120			
F4-08AD	75	90			