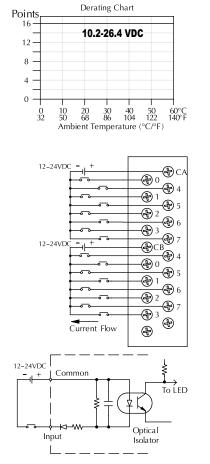
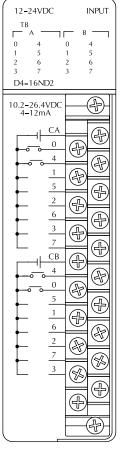
DC Input Modules

D4-16ND2 DC Ir	ıput \$184.00
Inputs per Module	16 (current sourcing)
Commons per Module	2 (isolated)
Input Voltage Range	10.2–26.4VDC
Peak Voltage	26.4 VDC
ON Voltage Level	>9.5 V
OFF Voltage Level	<4.0 V
Input Impedance	3.2 kq @ 12VDC 2.9 kq @ 24VDC
Input Current	3.8 mA @ 12VDC 8.3 mA @ 24VDC
Minimum ON Current	3.5 mA
Maximum OFF Current	1.5 mA
Base Power Required 5V	150mA max
OFF to ON Response	1–7 ms (2.3 typical)
ON to OFF Response	2–12 ms (4.6 typical)
Terminal Type (included)	Removable (D4-16ICON)
Status Indicators	Logic side
Weight	8.8 oz. (250g)

See Wiring Solutions for part numbers of Z/PLink cables and connection modules compatible with this I/O module.







www.automationdirect.com DL405 PLCs tDL4-45

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 ZipLink 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 ZipLink 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)			
В	CURRENT SUPPLIED						
	CPU/Expansion Unit /Remote Server	<u>D4-454</u> CPU	3700	400			
С		CURRENT REQU	JIRED				
	SLOT 0	<u>D4-16ND2</u>	+150	+0			
	SLOT 1	<u>D4-16ND2</u>	+150	+0			
	SLOT 2	F4-04DA-2	+90	+90			
	SLOT 3	<u>D4-08NA</u>	+100	+0			
	SLOT 4	<u>D4-08NA</u>	+100	+0			
	SLOT 5	<u>D4-16TD2</u>	+100	+0			
	SLOT 6	<u>D4-16TD2</u>	+100	+0			
	SLOT 7	<u>D4-16TR</u>	+1000	+0			
D	OTHER						
	BASE	<u>D4-08B-1</u>	+80	+0			
	Handheld Programmer	<u>D4-HPP-1</u>	+320	+0			
E	Maximum Current R	equired	2190	90			
F	Remaining Current Available 3700-2190 = 1510 400-90 = 3						
	1. Using a chart similar to the one above, fill in column 2.						

DL405 CPU power supply specifications and power requirements

Specification	AC Powered Units	24 VDC Powered Units		
Part Numbers	<u>D4-454,</u> <u>D4-EX</u> (expansion base unit), <u>D4-RS</u> (remote Server unit)	<u>D4-454DC-1</u> , <u>D4-EXDC</u> (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		

^{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 Server 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 Requirements

		Supplied	lied		
CPUs/RemoteUnits/ 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 D4-454DC-1	3100 3100	400 NONE	D4-EX D4-EXDC D4-RS H4-EBC	4000 4000 3700 3470	400 NONE 400 400
		Power C	onsumed		
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 D4-06B-1 D4-08B-1	80 80 80	NONE NONE NONE	F4-16AD-1 F4-16AD-2 F4-08DA-1 F4-08DA-2	75 75 70 90	100 100 75+20 per circuit 90
DC Input Modules			F4-04DAS-1 F4-08DA-1	60 90	60 per circuit 100+20 per circuit
D4-16ND2 D4-16ND2F D4-32ND3-1 D4-64ND2	150 150 150 300 max.	NONE NONE NONE NONE	F4-08DA-2 F4-16DA-1 F4-16DA-2 F4-08RTD F4-08THM-J(-n) F4-08THM	80 90 80 80 120	150 100+20 per circuit 25 max. NONE 50
			Remote I/O		
AC Input Modules D4-08NA D4-16NA AC/DC Input Modules	100	NONE NONE	H4-ERM100 H4-ERM-F D4-RM	320(300) 450 300	NONE NONE NONE
•			Communications and Netwo	rkina	
<u>D4-16NE3</u>	150	NONE	Communications and notific		
DC Output Modules D4-16TD1 D4-16TD2	200 400	125 NONE	H4-ECOM100 D4-DCM F4-MAS-MB	300 500 235	NONE NONE NONE
<u>D4-32TD1</u> D4-32TD2	250 350	140 120 (4A max	CoProcessors		
		including loads)			
D4-64TD1 AC Output Modules	800	NONE	<u>F4-CP128-1</u>	305	NONE
-	050	NONE	Cassista Madulas		
<u>D4-08TA</u> <u>D4-16TA</u>	250 450	NONE NONE	Specialty Modules		
Relay Output Modules			LIA OTRIO	400	NONE
D4-08TR F4-08TRS-1 F4-08TRS-2 D4-16TR	550 575 575 1000	NONE NONE NONE NONE	H4-CTRIO D4-16SIM F4-4LTC	400 150 280	NONE NONE 75
Analog Modules			Programming		
			D4-HPP-1 (Handheld Prog.)	320	NONE
<u>F4-04AD</u> F4-04ADS	150 370	100 120	Operator Interface		
F4-08AD	75	90	C-more Micro-Graphic	210	NONE

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Wiring Solutions

Wiring Solutions using the **ZIP**Link Wiring System

ZIPLinks eliminate the normally tedious process of wiring between devices by utilizing prewired cables and DIN rail mount connector modules. It's as simple as plugging in a cable connector at either end or terminating wires at only one end. Prewired cables keep installation clean and efficient, using half the space at a fraction of the cost of standard terminal blocks. There are several wiring solutions available when using the **ZIP**Link System ranging from PLC I/O-to-**ZIP**Link Connector

Modules that are ready for field termination, options for connecting to third party devices, GS, DuraPulse and SureServo Drives, and specialty relay, transorb and communications modules. Pre-printed I/O-specific adhesive label strips for quick marking of *ZIP*Link modules are provided with *ZIP*Link cables. See the following solutions to help determine the best *ZIP*Link system for your application.

Solution 1: DirectLOGIC I/O Modules to ZIPLink Connector Modules

When looking for quick and easy I/O-to-field termination, a **ZIP**Link connector module used in conjunction with a prewired **ZIP**Link cable, consisting of an I/O terminal block at one end and a multi-pin connector at the other end, is the best solution.

Using the PLC I/O Modules to **ZIP**Link Connector Modules selector tables located in this section,

- 1. Locate your I/O module/PLC.
- 2. Select a **ZIP**Link Module.
- 3. Select a corresponding **ZIP**Link Cable.



Solution 2: DirectLOGICI/O Modules to 3rd Party Devices

When wanting to connect I/O to another device within close proximity of the I/O modules, no extra terminal blocks are necessary when using the **ZIP**Link Pigtail Cables. **ZIP**Link Pigtail Cables are prewired to an I/O terminal block with color-coded pigtail with soldered-tip wires on the other end.

Using the I/O Modules to 3rd Party Devices selector tables located in this section,

- 1. Locate your PLC I/O module.
- 2. Select a **ZIP**Link Pigtail Cable that is compatible with your 3rd party device.



Solution 3: GS Series and DuraPulse Drives Communication Cables

Need to communicate via Modbus RTU to a drive or a network of drives?

ZIPLink cables are available in a wide range of configurations for connecting to PLCs and SureServo, SureStep, Stellar Soft Starter and AC drives. Add a **ZIP**Link communications module to quickly and easily set up a multi-device network.

Using the Drives Communication selector tables located in this section,

- 1. Locate your Drive and type of communications.
- 2. Select a **ZIP**Link cable and other associated hardware.





Wiring Solutions

Solution 4: Serial Communications Cables

ZIPLink offers communications cables for use with DirectLOGIC, CLICK, and Productivity3000 CPUs, that can also be used with other communications devices. Connections include a 6-pin RJ12 or 9-pin, 15-pin and 25-pin D-sub connectors which can be used in conjunction with the RJ12 or D-Sub Feedthrough modules.

Using the Serial Communications Cables selector table located in this section,

- 1. Locate your connector type
- 2. Select a cable.



Solution 5: Specialty ZIPLink Modules

For additional application solutions, **ZIP**Link modules are available in a variety of configurations including stand-alone relays, 24VDC and 120VAC transorb modules, D-sub, RJ12 and RJ45 feedthrough modules, communication port adapter and distribution modules, and SureServo 50-pin I/O interface connection.

Using the **ZIP**Link Specialty Modules selector table located in this section,

- 1. Locate the type of application.
- 2. Select a **ZIP**Link module.



Solution 6: ZIPLink Connector Modules to 3rd Party Devices

If you need a way to connect your device to terminal blocks without all that wiring time, then our pigtail cables with color-coded soldered-tip wires are a good solution. Used in conjunction with any compatible **ZIP**Link Connector Modules, a pigtail cable keeps wiring clean and easy and reduces troubleshooting time.

Using the Universal Connector Modules and Pigtail Cables table located in this section,

- 1. Select module type.
- 2. Select the number of pins.
- 3. Select cable.





PLC I/O Modules to *ZIP*Link Connector Modules - DL405

DL405 PLC Input Module ZIPLink Selector					
PLC		ZIPLink			
Input Module	# of Terms	Component	Module Part No.	Cable Part No.	
<u>D4-16ND2</u>	20	Con Note 2			
<u>D4-16ND2F</u>	20	See Note 3			
D4-32ND3-1 ²	40	Feedthrough	ZL-RTB40 (-1)	straight conn:	
<u> </u>		Sensor	ZL-LTB32-24-1	ZL-D24-CBL40 ZL-D24-CBL40-1	
		Feedthrough	ZL-RTB40 (-1)	ZL-D24-CBL40-1 ZL-D24-CBL40-2	
<u>D4-64ND2^{1,2}</u>			ZL-LTB32-24-1	45 deg conn: <u>ZL-D24-CBL40-X</u> <u>ZL-D24-CBL40-1X</u> <u>ZL-D24-CBL40-2X</u>	
D4-08NA	11				
<u>D4-16NA</u>	20	See Note 3			
<u>D4-16NE3</u>	20				

DL405 PLC Analog Module ZIPLink Selector						
PLC	ZIPLink					
Analog Module	# of Terms	Component	Module	Cable		
F4-04AD						
F4-04ADS						
F4-08AD						
F4-16AD-1						
F4-16AD-2						
F4-04DA-1	20					
F4-04DA-2	20	See Note 3				
F4-08DA-1						
F4-16DA-1						
F4-08DA-2						
F4-16DA-2						
F4-04DAS-1						
F4-08THM	T/C Wire					
F4-08THM-n	Only					
F4-08RTD	Matched Only					

		-1
//		-1
/ 1		=1

Note: ZIPLink Connector Module specifications follow the Compatibility Matrix tables in the **ZIP**Link section.

DL405 PLC Output Module <i>ZIP</i> Link Selector							
PLC	ZIPLink						
Output Module	# of Terms	Component	Module Part No.	Cable Part No.			
<u>D4-16TD1</u>	20		Con Note 2				
D4-16TD2	20	See Note 3					
D4-32TD1 ²	40	Feedthrough	Feedthrough <u>ZL-RTB40</u> (-1) Fused <u>ZL-RFU40</u> ⁴	straight conn:			
<u> </u>		Fuse		ZL-D24-CBL40 ZL-D24-CBL40-1 ZL-D24-CBL40-2			
D4-32TD2 ²		Feedthrough					
<u>U4-321U2</u>		Fuse					
		Feedthrough		45 deg conn: ZL-D24-CBL40-X			
<u>D4-64TD1</u> ^{1,2}		Fuse		ZL-D24-CBL40-1X			
				ZL-D24-CBL40-2X			
<u>D4-08TA</u>	11						
<u>D4-16TA</u>	20	See Note 3					
<u>D4-08TR</u>	11						
F4-08TRS-1							
F4-08TRS-2	20						
<u>D4-16TR</u>							

Tables Footnotes:

- 1. The <u>D4-64ND2</u> and <u>D4-64TD1</u> modules have two 32-point connectors and require two ZIPLink cables and two ZIPLink connector modules.
- To make a custom cable for the 32 or 64-point modules, use: Ribbon-style Connector <u>ZL-D24-CON-R</u>, Solder-style 180° connector <u>ZL-D24-CON</u> or Solder-style 45° connector <u>ZL-D24-CON-X</u>
- 3. These modules are not supported by the ZIPLink wiring system.
- 4. Note: Fuses (5 x 20 mm) are not included. See Edison Electronic Fuse section for (5 x 20 mm) fuse. S500 and GMA electronic circuit protection for fast-acting maximum protection. S506 and GMC electronic circuit protection for time-delay performance. Ideal for inductive circuits. To ensure proper operation, do not exceed the voltage and current rating of ZIPLink module. ZL-RFU20 = 2A per circuit; ZL-RFU40 = 400 mA per circuit.

