

Relay Output Modules

F4-08TRS-2 Relay Output <--->	
Outputs per Module	8 relays
Commons per Module	8 (isolated)
Operating Voltage	12-30VDC-12-250VAC
Output Type	4, Form C (SPDT) 4, Form A (SPST-NO)
Peak Voltage	30VDC/250VAC @ 5A
AC Frequency	47-63Hz
ON Voltage Drop	N/A
Max Current (Resistive)	5A/point 40A/module
Max Leakage Current	N/A
Max Inrush Current	10A
Minimum Load	100mA @ 12VDC
Base Power Required 5V	575mA max, 60mA/point
External DC Required	None
OFF to ON Response	7ms
ON to OFF Response	9ms
Terminal Type (included)	Removable (D4-16IOCON)
Status Indicators	Logic side
Weight	13.8oz. (390g)
Fuses 19379-K- Wickman	1 (10A 250V) per common User replaceable
Replacement Fuse	D4-FUSE-2 <--->

Maximum DC voltage rating is 120 VDC @ 0.5A @ 30,000 cycles typical. Motor starters up to and including NEMA size 3 can be used with this module.

See page 6-57 for part numbers of ZIPLink cables and connection modules compatible with this I/O module.

Typical Relay Life (Operations)	Operating Voltage		
	28 VDC	120 VAC	240 VAC
Maximum Resistive or Inductive Inrush Load Current			
5.0A	200K	100K	
3.0A	325K	125K	50K
0.05A	>50M		



Caution: the ZIPLink wiring system is rated at 2 Amps per I/O point and 4 Amps per common, therefore the F4-08TRS-2 relay outputs are derated to 2 Amps per point and 4 Amps per common when used with the ZIPLink wiring system.

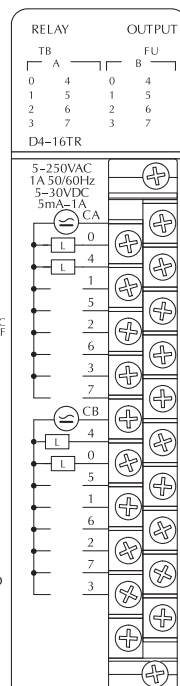
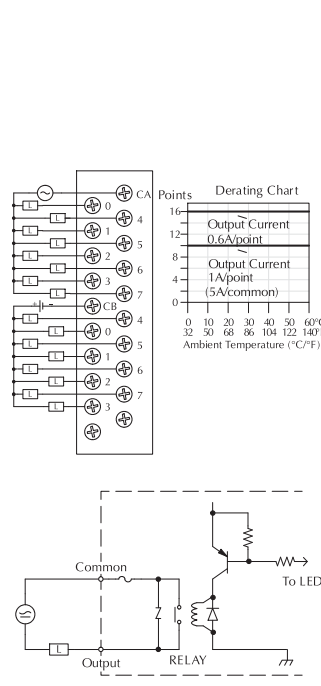
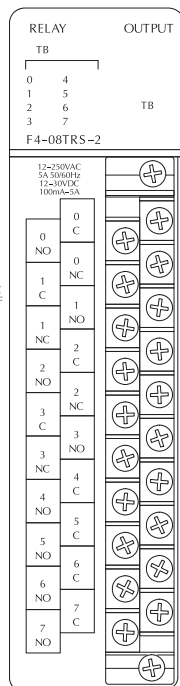
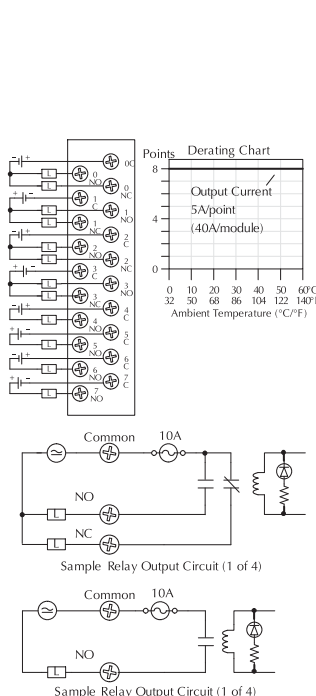
D4-16TR Relay Output <--->	
Outputs per Module	16 relays
Commons per Module	2 (isolated)
Operating Voltage	5-30VDC-5-250VAC
Output Type	Form A (SPST-NO)
Peak Voltage	30VDC/250VAC
AC Frequency	47-63Hz
ON Voltage Drop	N/A
Max Current (Resistive)	1A/point 5A/common
Max Leakage Current	0.1mA @ 265VAC
Max Inrush Current	4A
Minimum Load	5mA
Base Power Required 5V	1000mA max, 60 mA/point
External DC Required	None
OFF to ON Response	10ms
ON to OFF Response	10ms
Terminal Type (included)	Removable (D4-16IOCON)
Status Indicators	Logic side
Weight	10.9oz. (310g)
Fuses	1 (8A) per common (Non-replaceable)

See page 6-57 for part numbers of ZIPLink cables and connection modules compatible with this I/O module.



Caution: the ZIPLink wiring system is rated at 2 Amps per I/O point and 4 Amps per common, therefore the D4-16TR relay is derated to 4 Amps per common when used with the ZIPLink wiring system.

Typical Relay Life (Operations)	Operating Voltage		
	30 VDC	125 VAC	250 VAC
Maximum Resistive or Inductive Inrush Load Current			
1A resistive	>1M	500K	300K
1 A inductive	400K	200K	100K
0.5A resistive	>2M	800K	500K
0.5A inductive	>1M	300K	200K



Cut PLC wiring time to minutes instead of hours

The ZIPLink wiring system eliminates the normally tedious process of wiring PLC I/O to terminal blocks. Simply plug one end of a ZIPLink pre-wired terminal block cable into your I/O module and the other end into a ZIPLink connector module. It's that easy. ZIPLinks use half the space, at a fraction of the total cost of terminal blocks.

ZIPLinks are available in a variety of styles to suit your needs, including fused, relay and sensor/LED connector modules. ZIPLinks are available for all DL405 Series PLC discrete and analog input and output modules.

For complete information see ZIPLinks in the Terminal Blocks and Wiring Solutions section.



Specify your ZIPLink system

Use the Compatibility Matrix table below:

Step 1	Locate the I/O module part number.
Step 2	Locate Connector Module Type. (Feedthrough Module, Fuse Module, etc...)
Step 3	Select the cable length by replacing the # symbol with: Blank = 0.5m, -1 = 1.0m, -2 = 2.0m ¹
Note: Cable part number denotes compatibility between Connector Module and I/O Modules.	

ZipLink Wiring System Compatibility Matrix for DL405 PLCs										
Step 2: Connector Module Type		Feedthrough Modules		Fuse Modules		Relay Modules	Sensor Input Modules		Pigtail Cable	
Step 1: I/O Module	Number of Terminals	ZL-RTB20	ZL-RTB40	ZL-RFU20	ZL-RFU40	ZL-RR16-24	ZL-LTB16-24	ZL-LTB32-24		
Step 3: Cables										
Inputs										
I/O Module	D4-08ND3S	20	ZL-D4-CBL20#							
	D4-16ND2	20	ZL-D4-CBL20#				ZL-D4-CBL20#			
	D4-16ND2F	20	ZL-D4-CBL20#				ZL-D4-CBL20#			
	D4-32ND3-1	40		ZL-D24-CBL40#				ZL-D24-CBL40#	ZL-D24-CBL40#P	
	D4-32ND3-2	40		ZL-D24-CBL40#				ZL-D24-CBL40#	ZL-D24-CBL40#P	
	D4-64ND2*	40		ZL-D24-CBL40#				ZL-D24-CBL40#	ZL-D24-CBL40#P	
	D4-08NA**	11								
	D4-16NA	20	ZL-D4-CBL20#							
	D4-16NA-1	20	ZL-D4-CBL20#							
	D4-16NE3	20	ZL-D4-CBL20#					ZL-D4-CBL20#		
	F4-08NE3S	20	ZL-D4-CBL20#							
	Outputs									
	D4-08TD1**	11								
	F4-08TD1S**	20								
	D4-16TD1	20	ZL-D4-CBL20#		ZL-D4-CBL20#					
	D4-16TD2	20	ZL-D4-CBL20#		ZL-D4-CBL20#					
D4-32TD1	40		ZL-D24-CBL40#		ZL-D24-CBL40#				ZL-D24-CBL40#P	
D4-32TD1-1	40		ZL-D24-CBL40#		ZL-D24-CBL40#				ZL-D24-CBL40#P	
D4-32TD2	40		ZL-D24-CBL40#		ZL-D24-CBL40#				ZL-D24-CBL40#P	
D4-64TD1*	40		ZL-D24-CBL40#		ZL-D24-CBL40#				ZL-D24-CBL40#P	
D4-08TA**	11									
D4-16TA	20	ZL-D4-CBL20#		ZL-D4-CBL20#						
D4-08TR**	11									
F4-08TRS-1****	20	ZL-D4-CBL20#								
F4-08TRS-2****	20	ZL-D4-CBL20#								
D4-16TR***	20	ZL-D4-CBL20#		ZL-D4-CBL20#						

* The D4-64ND2 and D4-64TD1 modules have two 32-point connectors and require 2 ZIPLink cables and 2 ZIPLink connector modules.

** These modules are not supported by the ZIPLink wiring system.

*** Caution: The D4-16TR relay outputs are derated not to exceed 2 Amps per point and 4 Amps per common when used with the ZIPLink wiring system.

**** The F4-08TRS-1 and F4-08TRS-2 are derated not to exceed 2 Amps per point and 2 Amps per common when used with the ZIPLink wiring system.

ZIPLinks Connector Modules specifications begin on page 26-56

ZIPLinks Cables specifications begin on page 26-74

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 ZIPLinks 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 page 6-57 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	Device Type	5 VDC (mA)	External 24 VDC Power (mA)
B CURRENT SUPPLIED			
CPU/Expansion Unit /Remote Slave	D4-440 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	D4-08ND3S	+100	+0
SLOT 4	D4-08ND3S	+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	+80	+0
Handheld Programmer	D4-HPP	+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 3 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 24 VDC 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	125 VDC Powered Units
Part Numbers	D4-450, D4-440, D4-430, D4-EX (expansion base unit), D4-RS (remote slave unit)	D4-450DC-1, D4-440DC-1, D4-EXDC (expansion base unit), D4-RSDC (remote slave unit)	D4-450DC-2, D4-440DC-2
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 (110 range) 170-264 VAC (220 range)	20-28 VDC (24 VDC) with less than 10% ripple	90-146 VDC (125 VDC) with less than 10% ripple
Maximum Inrush Current	20 A	20 A	20 A
Maximum Power	50 VA	38 W	30 W

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	24VAux. Power Supplied in mA																								
D4-430 CPU	3700	400	D4-EX	4000	400																								
D4-440 CPU	3700	400	D4-EXDC	4000	NONE																								
D4-440DC-1 CPU	3700	NONE	D4-EXDC-2	3700	NONE																								
D4-440DC-2 CPU	3700	NONE	D4-RS	3700	400																								
D4-450 CPU	3100	400	D4-RSDC	3700	NONE																								
D4-450DC-1 CPU	3100	NONE	H4-EBC	3470	400																								
D4-450DC-2 CPU	3100	NONE	H4-EBC-F	3300	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+20per circuit																								
DC Input Modules			F4-04DA-2	90	90																								
			F4-04DAS-1	60	60 per circuit																								
			F4-04DAS-2	60	60 per circuit																								
			F4-08DA-1	90	100+20 per circuit																								
			F4-08DA-2	80	150																								
			F4-16DA-1	90	100+20 per circuit																								
			F4-16DA-2	80	25 max.																								
			F4-08RTD	80	NONE																								
			F4-08THM-n	120	50																								
			F4-08THM	110	60																								
AC Input Modules			Remote I/O																										
			Communications and Networking			CoProcessors																							
								Specialty Modules																					
D4-08NA	100	NONE	H4-ERM	320	NONE																								
D4-16NA	150	NONE	H4-ERM-F	450	NONE																								
AC/DC Input Modules			D4-RM	300	NONE																								
D4-16NE3	150	NONE	DC Output Modules																										
F4-08NE3S	90	NONE																											
DC Output Modules						Programming																							
D4-08TD1	150	35							Operator Interface																				
F4-08TD1S	295	NONE																											
D4-16TD1	200	125							D4-HPP-1 (Handheld Prog.)	320	NONE																		
D4-16TD2	400	NONE							Operator Interface																				
D4-32TD1	250	140																											
D4-32TD1-1	250	140 (15V)							DV-1000	150	NONE																		
D4-32TD2	350	120 (4A max including loads)							C-more Micro-Graphic																				
D4-64TD1	800	NONE																											
AC Output Modules			Operator Interface																										
D4-08TA	250	NONE				Operator Interface																							
D4-16TA	450	NONE																											
Relay Output Modules						Operator Interface																							
D4-08TR	550	NONE							Operator Interface																				
F4-08TRS-1	575	NONE																											
F4-08TRS	575	NONE							Operator Interface																				
D4-16TR	1000	NONE																											
Analog Modules									Operator Interface																				
F4-04AD	85	100										Operator Interface																	
F4-04ADS	270	120																											
F4-08AD	75	90	Operator Interface																										
Analog Modules												Operator Interface																	
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