Relay Output Modules

D4-08TR Relay Output $00c4x:	
Outputs per Module	8 relays
Commons per Module	2 (isolated)
Operating Voltage	5–30 VDC / 5–250 VAC
Output Type	Form A (SPST-NO)
Peak Voltage	30VDC / 256VAC
AC Frequency	47–63 Hz
ON Voltage Drop	N/A
Max Current	2A/point 5A/common
Max Leakage Current	0.1 mA @ 265VAC
Max Inrush Current	2A
Minimum Load	5mA
Base Power Required 5V	550mA max
External DC Required	None
OFF to ON Response	12ms
ON to OFF Response	12ms
Terminal Type (included)	Removable
Status Indicators	Logic side
Weight	9.1 oz. (260g)
Fuses	1 (8A) per common Non-replaceable

Typical Relay Life (Operations)			
Maximum Resistive or Inductive Inrush Load Current	Operating Voltage		
	30 VDC	120 VAC	250 VAC
2A resistive	100K	300K	200K
2A inductive	100K	80K	60K
0.5A resistive	800K	1M	800K
0.5A inductive	300K	300K	200K

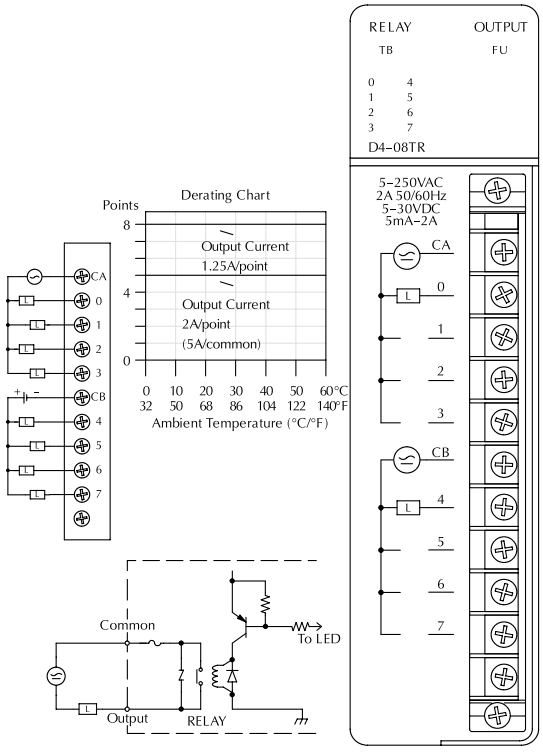
F4-08TRS-1 Relay Output $;00c4[:	
Outputs per Module	8 relays
Commons per Module	8 (isolated)
Operating Voltage	12–30 VDC/ 12–125 VAC *125–250 VAC
Output Type	4, Form C (SPST) 4, Form A (SPST-NO)
Peak Voltage	30VDC/ 250VAC @ 10A
AC Frequency	47–63 Hz
ON Voltage Drop	N/A
Max Current (Resistive)	10A/point 40A/module
Max Leakage Current	N/A
Max Inrush Current	10A
Minimum Load	100mA @ 12VDC
Base Power Required 5V	575mA max
External DC Required	None
OFF to ON Response	7ms
ON to OFF Response	9ms
Terminal Type (included)	Removable
Status Indicators	Logic side
Weight	13.2 oz. (374g)
Fuses	1 (10A) per common Non-replaceable

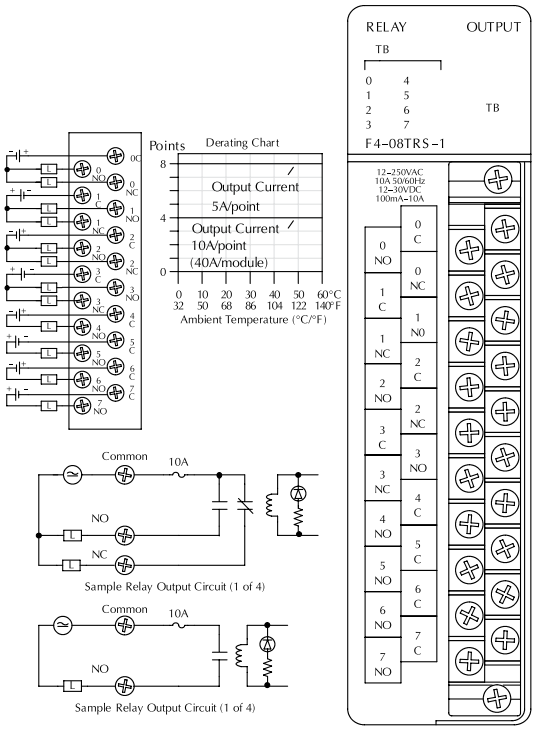
Maximum DC voltage rating is 120 VDC @ 0.5A @ 30,000 cycles typical. Motor starters up to and including NEMA size 4 can be used with this module.

Typical Relay Life (Operations)			
Maximum Resistive or Inductive Inrush Load Current	Operating Voltage		
	28 VDC	120 VAC	250 VAC
1/4HP		25K	
10.0A	50K	50K	
5.0A	200K	100K	
3.0A	325K	125K	50K
0.05A	>50M		

See Wiring Solutions for part numbers of *ZIP*Link 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 F4-08TRS-1 relay outputs are derated to 2 Amps per point and 4 Amps per common when used with the ZIPLink 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 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)***
B	***CURRENT SUPPLIED***			
	CPU/Expansion Unit /Remote Server	D4-454 CPU	3700	400
C	***CURRENT REQUIRED***			
	SLOT 0	D4-16ND2	+150	+0
	SLOT 1	D4-16ND2	+150	+0
	SLOT 2	F4-04DA-2	+90	+90
	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***		***2190***	***90***
F	***Remaining Current Available***		***3700-2190=1510***	***400-90=310***

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 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.

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 Server 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/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	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	F4-08DA-1	70	75+20 per circuit
DC Input Modules			F4-08DA-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.
			F4-08RTD	80	NONE
			F4-08THM-J(-n)	120	50
			F4-08THM	110	60
AC Input Modules			***Remote I/O***		
D4-08NA	100	NONE	H4-ERM100	320(300)	NONE
D4-16NA	150	NONE	H4-ERM-F	450	NONE
AC/DC Input Modules			D4-RM	300	NONE
D4-16NE3	150	NONE	***Communications and Networking***		
DC Output Modules			H4-ECOM100	300	NONE
D4-16TD1	200	125	D4-DCM	500	NONE
D4-16TD2	400	NONE	F4-MAS-MB	235	NONE
D4-32TD1	250	140	***CoProcessors***		
D4-32TD2	350	120 (4A max including loads)	F4-CP128-1	305	NONE
D4-64TD1	800	NONE	***Specialty Modules***		
AC Output Modules			H4-CTRIO	400	NONE
D4-08TA	250	NONE	D4-16SIM	150	NONE
D4-16TA	450	NONE	F4-4LTC	280	75
Relay Output Modules			***Programming***		
D4-08TR	550	NONE	D4-HPP-1 (Handheld Prog.)	320	NONE
F4-08TRS-1	575	NONE	***Operator Interface***		
F4-08TRS-2	575	NONE	***C-more*** Micro-Graphic	210	NONE
D4-16TR	1000	NONE			
Analog Modules					
F4-04AD	150	100			
F4-04ADS	370	120			
F4-08AD	75	90			