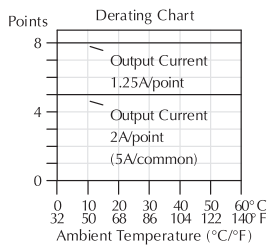


# DC Output Modules

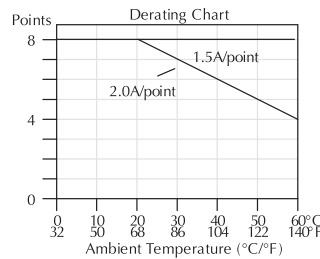
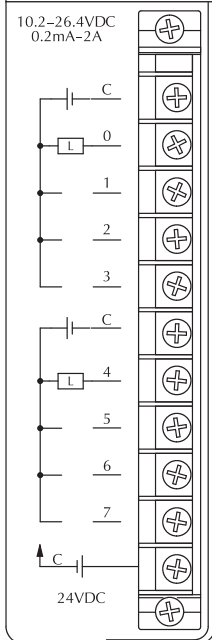
D4-08TD1 DC Output <--->	
<b>Outputs per Module</b>	8 (current sinking)
<b>Commons per Module</b>	2 internally connected
<b>Operating Voltage</b>	10.2-26.4VDC
<b>Output Type</b>	NMOS FET (open drain)
<b>Peak Voltage</b>	40VDC
<b>ON Voltage Drop</b>	0.5VDC @ 2A 0.2VDC @ 1A
<b>Max Current (resistive)</b>	2A/point 5A/common
<b>Max Leakage Current</b>	0.1mA @ 40VDC
<b>Max Inrush Current</b>	12A for 10ms 6A for 100ms
<b>Minimum Load</b>	0.2mA
<b>Base Power Required 5V</b>	150mA max
<b>External DC Required</b>	24VDC $\pm$ 10% @ 35mA
<b>OFF to ON Response</b>	1ms
<b>ON to OFF Response</b>	1ms
<b>Terminal Type (included)</b>	Removable (D4-8IOCON)
<b>Status Indicators</b>	Logic side
<b>Weight</b>	8.4oz. (240g)
<b>Fuses</b>	1 (7A) per common Non-replaceable

F4-08TD1S DC Output <--->	
<b>Outputs per Module</b>	8 (current sinking)
<b>Commons per Module</b>	4 (isolated, 8 terminals)
<b>Operating Voltage</b>	24-150VDC
<b>Output Type</b>	MOS FET
<b>Peak Voltage</b>	200VDC < 1ms
<b>ON Voltage Drop</b>	0.5VDC @ 2A
<b>Max Current (resistive)</b>	2A/point 4A/common
<b>Max Leakage Current</b>	5 $\mu$ A
<b>Max Inrush Current</b>	30A for 1ms 19A for 10ms
<b>Minimum Load</b>	N/A
<b>Base Power Required 5V</b>	295mA max
<b>External DC Required</b>	None
<b>OFF to ON Response</b>	25 $\mu$ s
<b>ON to OFF Response</b>	25 $\mu$ s
<b>Terminal Type (included)</b>	Removable (D4-16IOCON)
<b>Status Indicators</b>	Logic side
<b>Weight</b>	10oz. (282g)
<b>Fuses</b>	1 (3A) per output (see diagram) Non-replaceable



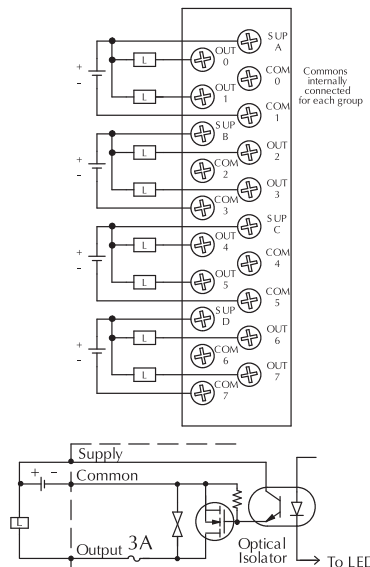
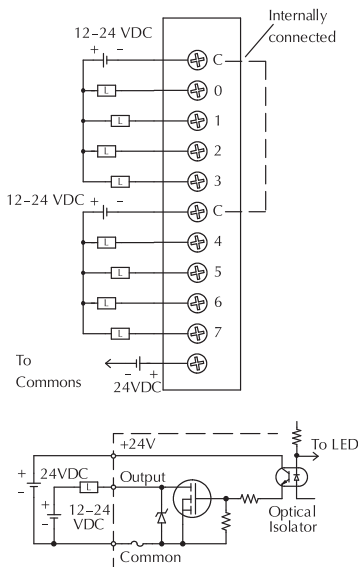
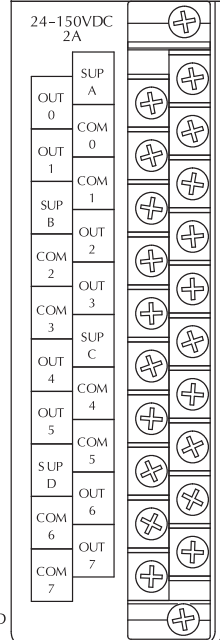
12-24VDC OUTPUT	
TB	FU
0	4
1	5
2	6
3	7

D4-08TD1



24-150VDC OUTPUT		OPEN FUSE	
TB	FU	TB	FU
0	4	0	4
1	5	1	5
2	6	2	6
3	7	3	7

F4-08TD1S



# 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 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	Device Type	5 VDC (mA)	External 24 VDC Power (mA)
0			
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		<b>2820</b>	<b>100</b>
F Remaining Current Available		<b>3700-2820=880</b>	<b>400-100=300</b>
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



Company Information

Systems Overview

Programmable Controllers

Field I/O

Software

C-more & other HMI

Drives

Soft Starters

Motors & Gearbox

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pressure Sensors

Temperature Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

Terminal Blocks & Wiring

Power

Circuit Protection

Enclosures

Tools

Pneumatics

Appendix

Product Index

Part # Index

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																								
<b>DC Input Modules</b>			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																										
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	Communications and Networking																										
F4-08NE3S	90	NONE	<table border="1"> <tr> <td>H4-ECOM100</td> <td>300</td> <td>NONE</td> </tr> <tr> <td>H4-ECOM-F</td> <td>670</td> <td>NONE</td> </tr> <tr> <td>D4-DCM</td> <td>500</td> <td>NONE</td> </tr> <tr> <td>F4-MAS-MB</td> <td>235</td> <td>NONE</td> </tr> <tr> <td>FA-UNICON</td> <td>NONE</td> <td>65</td> </tr> </table>			H4-ECOM100	300	NONE	H4-ECOM-F	670	NONE	D4-DCM	500	NONE	F4-MAS-MB	235	NONE	FA-UNICON	NONE	65									
H4-ECOM100	300	NONE																											
H4-ECOM-F	670	NONE																											
D4-DCM	500	NONE																											
F4-MAS-MB	235	NONE																											
FA-UNICON	NONE	65																											
DC Output Modules			CoProcessors																										
D4-08TD1	150	35	F4-CP128-1	305	NONE																								
F4-08TD1S	295	NONE	<table border="1"> <tr> <th colspan="3">Specialty Modules</th> </tr> <tr> <td>H4-CTRIO</td> <td>400</td> <td>NONE</td> </tr> <tr> <td>D4-INT</td> <td>100</td> <td>NONE</td> </tr> <tr> <td>D4-HSC</td> <td>300</td> <td>NONE</td> </tr> <tr> <td>F4-16PID</td> <td>160</td> <td>NONE</td> </tr> <tr> <td>F4-8MPI</td> <td>225</td> <td>170</td> </tr> <tr> <td>D4-16SIM</td> <td>150</td> <td>NONE</td> </tr> <tr> <td>F4-4LTC</td> <td>280</td> <td>75</td> </tr> </table>			Specialty Modules			H4-CTRIO	400	NONE	D4-INT	100	NONE	D4-HSC	300	NONE	F4-16PID	160	NONE	F4-8MPI	225	170	D4-16SIM	150	NONE	F4-4LTC	280	75
Specialty Modules																													
H4-CTRIO	400	NONE																											
D4-INT	100	NONE																											
D4-HSC	300	NONE																											
F4-16PID	160	NONE																											
F4-8MPI	225	170																											
D4-16SIM	150	NONE																											
F4-4LTC	280	75																											
D4-16TD1	200	125																											
D4-16TD2	400	NONE																											
D4-32TD1	250	140																											
D4-32TD1-1	250	140 (15V)																											
D4-32TD2	350	120 (4A max including loads)																											
D4-64TD1	800	NONE																											
AC Output Modules			Programming																										
D4-08TA	250	NONE	D4-HPP-1 (Handheld Prog.)	320	NONE																								
D4-16TA	450	NONE	Operator Interface																										
Relay Output Modules			DV-1000	150	NONE																								
D4-08TR	550	NONE	C-more Micro-Graphic	210	NONE																								
F4-08TRS-1	575	NONE	<table border="1"> <tr> <th colspan="3">Analog Modules</th> </tr> <tr> <td>F4-04AD</td> <td>85</td> <td>100</td> </tr> <tr> <td>F4-04ADS</td> <td>270</td> <td>120</td> </tr> <tr> <td>F4-08AD</td> <td>75</td> <td>90</td> </tr> </table>			Analog Modules			F4-04AD	85	100	F4-04ADS	270	120	F4-08AD	75	90												
Analog Modules																													
F4-04AD	85	100																											
F4-04ADS	270	120																											
F4-08AD	75	90																											
F4-08TRS	575	NONE																											
D4-16TR	1000	NONE																											

## Wiring Solutions using the ZIPLink 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 ZIPLink System ranging from PLC I/O-to-ZIPLink 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 ZIPLink modules are provided with ZIPLink cables. See the following solutions to help determine the best ZIPLink system for your application.

### Solution 1: DirectLOGIC, CLICK and Productivity3000 I/O Modules to ZIPLink Connector Modules

When looking for quick and easy I/O-to-field termination, a ZIPLink connector module used in conjunction with a prewired ZIPLink 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 ZIPLink Connector Modules selector tables located in this section,

1. Locate your I/O module/PLC.
2. Select a ZIPLink Module.
3. Select a corresponding ZIPLink Cable.

### Solution 2: DirectLOGIC, CLICK and Productivity3000 I/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 ZIPLink Pigtail Cables. ZIPLink 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 ZIPLink 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 ZIPLink 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 ZIPLink cable and other associated hardware.



## Solution 4: Serial Communications Cables

ZIPLink offers communications cables for use with *Direct*LOGIC, 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.

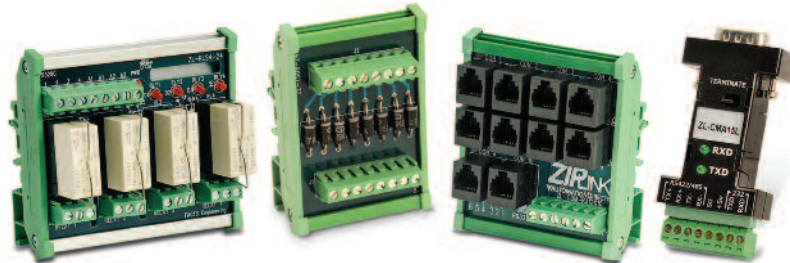


## Solution 5: Specialty ZIPLink Modules

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

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

1. Locate the type of application.
2. Select a ZIPLink 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 ZIPLink 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 ZIPLink Connector Modules - DL405



DL405 PLC Input Module ZIPLink Selector				
PLC		ZIPLink		
Input Module	# of Terms	Component	Module Part No.	Cable Part No.
D4-08ND3S	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
D4-16ND2	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
		Sensor	ZL-LTB16-24	ZL-D4-CBL20*
D4-16ND2F	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
		Sensor	ZL-LTB16-24	ZL-D4-CBL20*
D4-32ND3-1 <sup>2</sup>	40	Feedthrough	ZL-RTB40	ZL-D24-CBL40* ZL-D24-CBL40*X
		Sensor	ZL-LTB32-24	ZL-D24-CBL40*X
D4-32ND3-2 <sup>2</sup>	40	Feedthrough	ZL-RTB40	ZL-D24-CBL40* ZL-D24-CBL40*X
		Sensor	ZL-LTB32-24	ZL-D24-CBL40*X
D4-64ND2 <sup>1</sup>	40	Feedthrough	ZL-RTB40	ZL-D24-CBL40* ZL-D24-CBL40*X
		Sensor	ZL-LTB32-24	ZL-D24-CBL40*X
D4-08NA <sup>3</sup>	11	See Note 3		
D4-16NA	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
D4-16NA-1	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
D4-16NE3	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
		Sensor	ZL-LTB16-24	ZL-D4-CBL20*
F4-08NE3S	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*

DL405 PLC Analog Module ZIPLink Selector				
PLC		ZIPLink		
Analog Module	# of Terms	Component	Module	Cable
F4-04AD	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-04ADS	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-08AD	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-16AD-1	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-16AD-2	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-04DA-1	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-04DA-2	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-08DA-1	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-16DA-1	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-08DA-2	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-16DA-2	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-04DAS-1	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-04DAS-2	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-08THM <sup>3</sup>	T/C Wire Only	See Note 3		
F4-08THM-n <sup>3</sup>	T/C Wire Only	See Note 3		
F4-08RTD <sup>3</sup>	T/C Wire Only	See Note 3		

DL405 PLC Output Module ZIPLink Selector				
PLC		ZIPLink		
Output Module	# of Terms	Component	Module Part No.	Cable Part No.
D4-08TD1 <sup>3</sup>	11	See Note 3		
F4-08TD1S <sup>3</sup>	20	See Note 3		
D4-16TD1	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
		Fuse	ZL-RFU20 <sup>6</sup>	ZL-D4-CBL20*
D4-16TD2	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
		Fuse	ZL-RFU20 <sup>6</sup>	ZL-D4-CBL20*
D4-32TD1 <sup>2</sup>	40	Feedthrough	ZL-RTB40	ZL-D24-CBL40* ZL-D24-CBL40*X
		Fuse	ZL-RFU40 <sup>6</sup>	ZL-D24-CBL40*X
D4-32TD1-1	40	Feedthrough	ZL-RTB40	ZL-D24-CBL40* ZL-D24-CBL40*X
		Fuse	ZL-RFU40 <sup>6</sup>	ZL-D24-CBL40*X
D4-32TD2 <sup>2</sup>	40	Feedthrough	ZL-RTB40	ZL-D24-CBL40* ZL-D24-CBL40*X
		Fuse	ZL-RFU40 <sup>6</sup>	ZL-D24-CBL40*X
D4-64TD1 <sup>1</sup>	40	Feedthrough	ZL-RTB40	ZL-D24-CBL40* ZL-D24-CBL40*X
		Fuse	ZL-RFU40 <sup>6</sup>	ZL-D24-CBL40*X
D4-08TA <sup>3</sup>	11	See Note 3		
D4-16TA	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
		Fuse	ZL-RFU20 <sup>6</sup>	ZL-D4-CBL20*
D4-08TR <sup>3</sup>	11	See Note 3		
F4-08TRS-1 <sup>5</sup>	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
F4-08TRS-2 <sup>5</sup>	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
D4-16TR <sup>4</sup>	20	Feedthrough	ZL-RTB20	ZL-D4-CBL20*
		Fuse	ZL-RFU20 <sup>6</sup>	ZL-D4-CBL20*

\* Select the cable length by replacing the \* with: Blank = 0.5m, -1 = 1.0m, or -2 = 2.0m.

<sup>1</sup>The D4-64ND2 and D4-64TD1 modules have two 32-point connectors and require two ZIPLink cables and two ZIPLink connector modules.

<sup>2</sup>To make a custom cable for the 32 or 64-point modules, use: Ribbon-style Connector ZL-D24-CON-R, Solder-style 180° connector ZL-D24-CON or Solder-style 45° connector ZL-D24-CON-X

<sup>3</sup>These modules are not supported by the ZIPLink wiring system.

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

<sup>5</sup>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.

<sup>6</sup>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.



**NOTE: ZIPLINK CONNECTOR MODULES SPECIFICATIONS FOLLOW THE COMPATIBILITY MATRIX TABLES. ZIPLINK CABLES SPECIFICATIONS ARE AT THE END OF THIS ZIPLINK SECTION.**