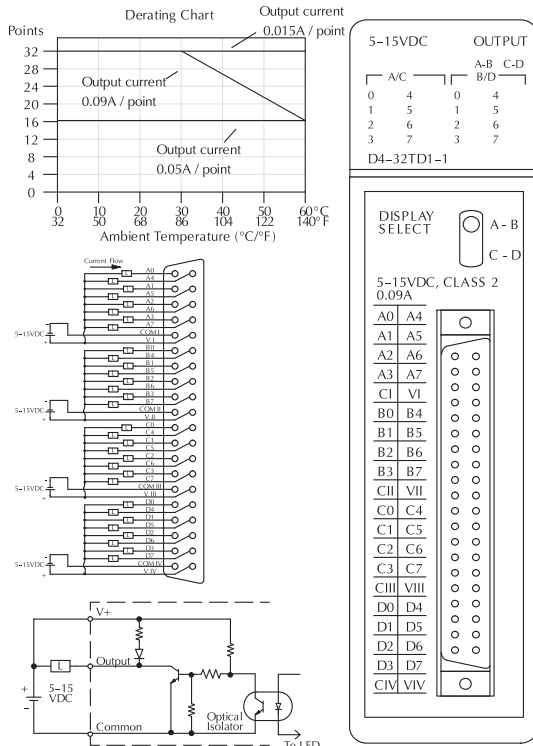


DC Output Modules

| D4-32TD1-1 DC Output <---> | |
|---|---|
| Outputs per Module | 32 (current sinking) |
| Commons per Module | 4 (isolated) |
| Operating Voltage | 5-15VDC |
| Output Type | NPN Open Collector (with pull-up) |
| Peak Voltage | 16.5VDC |
| ON Voltage Drop | 0.4VDC @ 0.1A |
| Max Current (resistive) | 0.09A/point 0.72A/common 2.88A/module |
| Max Leakage Current | 0.01mA @ 16.5VDC |
| Max Inrush Current | 0.5A for 10ms 0.2A for 100ms |
| Minimum Load | 0.15mA |
| Base Power Required 5V | 250mA max |
| External DC Required | 5-15VDC ± 10%, 150mA max |
| OFF to ON Response | 0.1ms |
| ON to OFF Response | 0.1ms |
| Terminal Type (See ZIPlinks note below) | Connectors sold separately. See page 6-19. |
| Status Indicators | Logic side |
| Weight | 6.7oz. (190g) |
| Fuses | None |

Only 16 status points can be displayed at one time on the front of the module.
In the A - B position, the status of the first group of 16 output points (A0-A7, B0-B7) is displayed.
In the C - D position, the status of the second group of 16 output points (C0-C7, D0-D7) is displayed.
This module operates on reverse logic -
(voltage present when output is OFF, no voltage when output is ON).

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

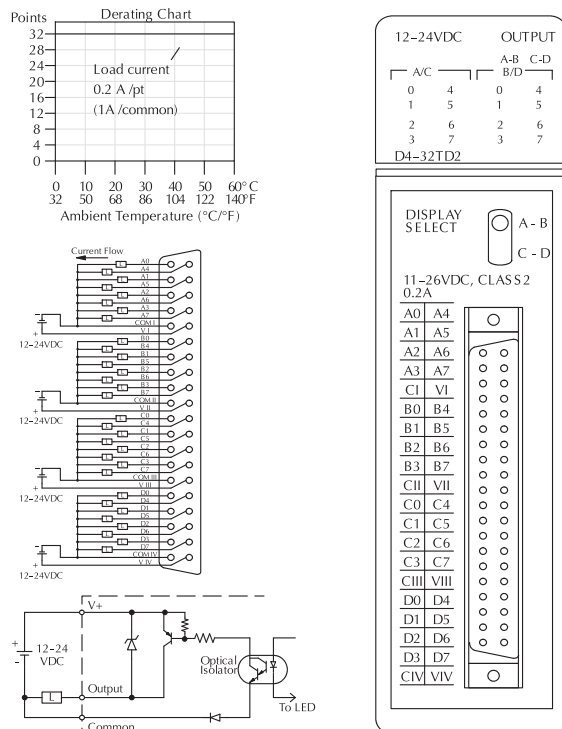


| D4-32TD2 DC Output <---> | |
|---|---|
| Outputs per Module | 32 (current sourcing) |
| Commons per Module | 4 (isolated) |
| Operating Voltage | 10.8-26.4VDC |
| Output Type | PNP Open Collector |
| Peak Voltage | 30VDC |
| ON Voltage Drop | 0.6VDC @ 0.2A |
| Max Current (resistive) | 0.2A/point 1.0A/common 4.0A/module |
| Max Leakage Current | 0.01mA @ 26.4VDC |
| Max Inrush Current | 500mA for 10ms |
| Minimum Load | 0.2mA |
| Base Power Required 5V | 350mA max |
| External DC Required | 10.8-26.4VDC 1A/common including load |
| OFF to ON Response | 0.2ms |
| ON to OFF Response | 0.2ms |
| Terminal Type (See ZIPlinks note below) | Connectors sold separately. See page 6-19. |
| Status Indicators | Logic side |
| Weight | 6.7oz. (190g) |
| Fuses | None |

Only 16 status points can be displayed at one time on the front of the module.
In the A - B position, the status of the first group of 16 output points (A0-A7, B0-B7) is displayed.
In the C - D position, the status of the second group of 16 output points (C0-C7, D0-D7) is displayed.

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

Note: When used with the ZIPLink wiring system, relay outputs are derated not to exceed 2 Amps per point max.



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-RRL16-24 | 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 D4-08ND2 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 | | |
| 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 | H4-ECOM100 | 300 | NONE |
| DC Output Modules | | | H4-ECOM | 530 | NONE |
| D4-08TD1 | 150 | 35 | H4-ECOM-F | 670 | NONE |
| F4-08TD1S | 295 | NONE | D4-DCM | 500 | NONE |
| D4-16TD1 | 200 | 125 | F4-MAS-MB | 235 | NONE |
| D4-16TD2 | 400 | NONE | FA-UNICON | NONE | 65 |
| D4-32TD1 | 250 | 140 | CoProcessors | | |
| D4-32TD1-1 | 250 | 140 (15V) | F4-CP128-1 | 305 | NONE |
| D4-32TD2 | 350 | 120 (4A max including loads) | Specialty Modules | | |
| D4-64TD1 | 800 | NONE | H4-CTRIO | 400 | NONE |
| AC Output Modules | | | D4-INT | 100 | NONE |
| D4-08TA | 250 | NONE | D4-HSC | 300 | NONE |
| D4-16TA | 450 | NONE | F4-16PID | 160 | NONE |
| Relay Output Modules | | | F4-8MPI | 225 | 170 |
| D4-08TR | 550 | NONE | D4-16SIM | 150 | NONE |
| F4-08TRS-1 | 575 | NONE | F4-4LTC | 280 | 75 |
| F4-08TRS | 575 | NONE | Programming | | |
| D4-16TR | 1000 | NONE | D4-HPP-1 (Handheld Prog.) | 320 | NONE |
| Analog Modules | | | Operator Interface | | |
| F4-04AD | 85 | 100 | DV-1000 | 150 | NONE |
| F4-04ADS | 270 | 120 | C-more Micro-Graphic | 210 | NONE |
| F4-08AD | 75 | 90 | | | |