Analog Output Modules

F3-04DAS Retired 4-Channel Isolated Analog Output				
	Solated Allalog Output			
Number of Channels	4			
Output Ranges	±5V, ±10V, 0– 5 V, 0–10 V, 1–5V 0–20 mA, 4–20 mA			
Channels Individually Configurable	Yes			
Resolution	12-bit (1 in 4096)			
Output Type	Isolated, 750VDC channel-to-channel 750VDC channel-to-logic			
Output Current	±5mA voltage output			
Short-circuit Current	±20mA typical, voltage output			
Capacitive Load Drive	0.1 µF typical, voltage output			
Load Impedance	470Ω maximum, current output $2k\Omega$ minimum, voltage output			
Isolation Mode Rejection	140dB at 60Hz			
Linearity Error	±1 count (±0.03% maximum)			
Calibration Error	±0.15% typical, ±0.75% max. of span ±10 ppm/°C maximum of full scale			

Calibrated Offset Error	±1 count maximum, current output ±5mV typical, ±50mV max., voltage out ±0.2 mV typical /°C
Conversion Time	30µs maximum, 1 channel/scan
Power Budget Requirement	154mA @ 9V, 145mA @ 24V
External Power Supply	None required
Operating Temperature	32° to 140°F (0° to 60°C)
Storage Temperature	-4° to 158°F (-20° to 70°C)
Relative Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	MIL STD 810C 514.2
Shock	MIL STD 810C 516.2
Noise Immunity	NEMA ICS3-304

See page tDL3-26 for part numbers of Z/PLink cables and connection modules compatible with this I/O module.



Note 1: Shields should be connected to the respective channel's – V terminal of the module.

Note 2: Each isolated output channel may have either a voltage or current load, but not both. Note 3: An external 0.31 Amp fast-acting fuse in series with the isolated +I terminal (+15VDC) is recommended to protect against accidental shorts to the –V terminal (15VDC common).

Note 4: Do not attempt to source more than 20mA from any one of the four isolated 15VDC power supplies.





Power Budget

Managing your power resource

The I/O configuration depends on your choice of I/O modules, bases and I/O location. When determining the types and quantity of I/O modules you will be using, it's important to remember there is a limited amount of power available from the power supply.

The chart on the next page indicates the power supplied and used by each DL305

Example: How to calculate your power usage

The following example shows how to calculate the power budget for the DL305 system. The examples are constructed around a single 5-slot base using the devices shown. It is recommended you construct a similar table for each base in your DL305 system.

- 1. Using a chart similar to the one below, fill in column 2.
- Using the tables on the opposite page, enter the current supplied and used by each device (columns 3, 4, and 5). Devices which fall into the "Other" category (Row D) are devices such as the Handheld Programmer or a Data Communication Unit, which also have power requirements, but do not directly plug into the base.

Use **ZIP**Links to reduce power requirements

If your application requires a lot of relay outputs, consider using the **ZIP**Link 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 the Wiring Solutions section in this catalog 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.



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

- 3. Add the current used by the system devices (columns 3, 4, and 5), starting with Slot 1, then 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" (Row F).
- 5. If "Maximum Current Required" is greater than "Current Supplied" in columns 3, 4 or 5, the power budget will be exceeded. It will be unsafe to use this configuration and you will need to restructure your I/O configuration.

supply, you can resolve the problem by shifting some of the modules to an expansion base.

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.

Example of System Power Requirements Calculation

A	Column 1	Column 2	Column 3	Column 4	Column 5		
	Base # 0	Device Type	5 VDC (mA)	9VDC (mA)	24V(mA)		
B	B Current Supplied						
	5-slot Base	D3-05BDC	1400	800	500		
C		Cı	ırrent Required				
	CPU Slot	<u>D3-350</u>	500	0	0		
	Slot 0	D3-16NE3	0	130	0		
	Slot 1	<u>D3-16NE3</u>	0	130	0		
	Slot 2	F3-08TAS-1	0	160	0		
	Slot 3	F3-08TAS-1	0	160	0		
D	O Other						
	Handheld prog D2-HPP		200	0	0		
Ε	Maximum Current Required		700	580	0		
F	Remaining Current		700	220	500		

DL305 Power Requirements

This section shows the amount of power supplied by the base power supplies and the amount of power used by each DL305 device. Note the base power supplies provide three internal voltages (5V, 9V, 24V). The chart shows how much power from each of these power sources is required for each DL305 device. Use this information when calculating the power budget for your system.

In addition to the three internal power sources, the DL305 bases provide an external power connection. There is 24VDC available from the 24VDC output terminals on the bases (except D3-05BDC and D3-10BDC).

The 24VDC can be used to power external devices or DL305 modules that require external 24VDC. The power used from this external 24VDC output reduces the internal system 24VDC that is available to the modules by an equal amount. When using the 24VDC output at the base terminal, it is recommended that 100mA not be exceeded.

Power Consumed						
Device	5V(mA)	9V(mA)	24V(mA)	Ext req.		
	C	PUs				
<u>D3-350</u>	500	0	0	0		
	DC Inpu	ıt Modules	;			
<u>D3-08ND2</u> F3-16ND3F	0 0	10 148	112 68	0 0		
	AC Inpu	t Modules				
<u>D3-08NA-2</u>	0	10	0	0		
	AC/DC In	put Modul	es			
<u>D3-16NE3</u>	0	130	0	0		
	DC Output Modules					
<u>D3-08TD1</u> <u>D3-08TD2</u>	0 0	20 30	24 0	0 0		
AC Output Modules						
<u>F3-08TAS-1</u> <u>D3-16TA-2</u>	0 0	200 400	0 0	0 0		

Power Supplied					
Device	5V(mA)	9V(mA)	24V(mA)	24 V (mA)	
<u>D3-05BDCD3-</u> <u>10BDC</u>	900 900	2000 2000	500 500	None None	
	/	Power Con	sumed		
Device	5V(mA)	9V(mA)	24V(mA)	External required	
	Re	lay Output	Modules		
<u>F3-08TRS-1</u> <u>F3-08TRS-2</u> <u>D3-16TR</u>	0 0 0	296 296 480	0 0 0	0 0 0	
Analog	g Tempera	ture and Ti	hermocouple	e Modules	
<u>F3-04ADS</u> <u>F3-08AD-1</u> F3-08THM-n <u>F3-04DA-1</u> <u>F3-04DA-1</u> <u>F3-04DAS</u>	0 0 0 0 0	183 45 50 55 144 154	50 55 34 65 108 145	0 0 0 0 0 0	
	Commun	ications a	nd Networkii	ng	
		Programi	ning		
D2-HPP	200	0	0	0	
Specialty CPUs					
<u>F3-0MUX-1</u> * <u>F3-0MUX-2</u> <u>F3-PMUX-1</u>	409 262 455	0 0 0	0 150 0	0 0 0	
Operator Interface					
C-more Micro-Graphic	210	0	0	0	

* F3-OMUX-1 -As of 3/2021 CPU is no longer available.

Wiring Solutions

VAUTOMATION DIRECT 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 **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: DirectLOGIC 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 **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.



1-800-633-0405



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, 15pin 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 and RJ12 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 colorcoded 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 ZIPLink Connector Modules - DL305

DL305 PLC Input Module ZIPLink Selector					
PI	PLC ZIPLink				
Input Module	# of Terms	Component	Module Part No.	Cable Part No.	
<u>D3-08ND2</u>	10				
<u>F3-16ND3F</u>	18	See Note 1			
<u>D3-08NA-2</u>	10				

DL305 PLC Analog Module ZIPLink Selector					
PL	PLC ZIPLink				
Analog Module	# of Terms	Component	Module	Cable	
<u>F3-04ADS</u>	18				
F3-08AD-1	18				
<u>F3-16AD</u>	18	See Note 2			
F3-04DA-1	18				
F3-04DAS	18				
<u>F3-08THM-J</u>	T/C Wire Only				

DL305 PLC Output Module ZIPLink Selector				
PLC		ZIPLink		
Output Module	# of Terms	Component	Module Part No.	Cable Part No.
<u>D3-08TD1</u>	10	See Note 1		
<u>D3-08TD2</u>	10	See Note 1		
<u>F3-08TAS-1</u>	18			
<u>D3-16TA-2</u>	18	See Note 2		
<u>D3-16TR</u>	18			
F3-08TRS-1	18			
F3-08TRS-2	18			

1These I/O modules have non-removable terminal blocks which can be terminated using the <u>ZL-CBL24-1P</u> or 2P pigtail cable and the <u>ZL-RTB20</u> module of the ZIPLink wiring system. 2 Module is not supported by the ZIPLink wiring system



Note: See the Compatibility Matrix tables under the **ZIP**Link Connector Modules catalog section.





ZL-CBL24-1P