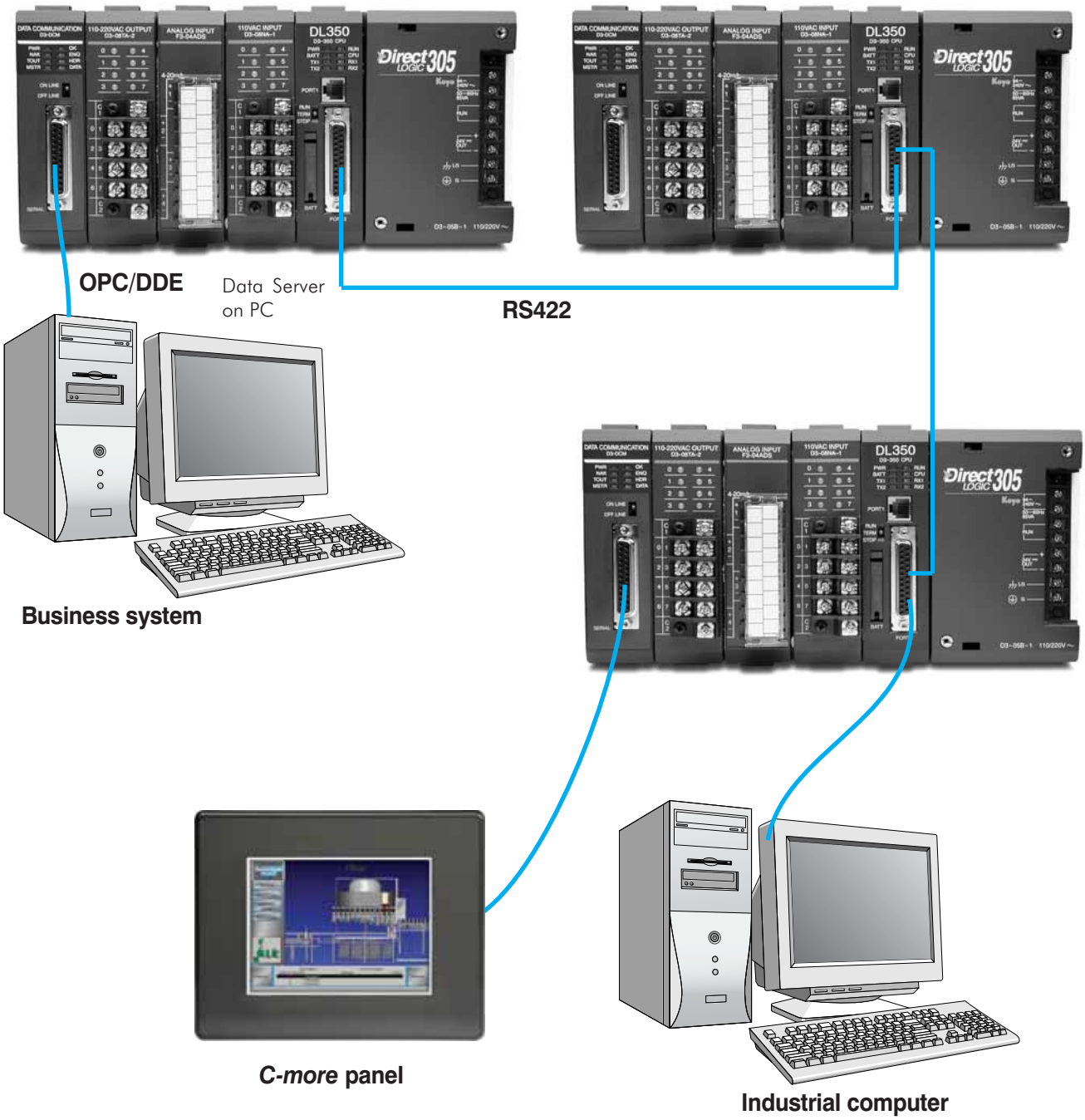
DL305 Family of Products

DL305 system example with serial communications network and operator interface



DL305 Family of Products

The following is a quick summary of the DL305 family of products. The DL305 products have been sold by previous vendors under a wide variety of part numbers. A complete list of product offerings with vendor cross-reference is available in the DL305 price list.

CPUs

D3-350 –14.8K total memory
2 communication ports
4 PID loops
MODBUS Master/Slave
Remote I/O
Floating point math

D3-340 – 3.7K total memory
2 communication ports

D3-330 – 3.7 K total memory

Specialty CPUs

F3-0MUX-1
Serial interface to Optomux host
2 communication ports
(RS232C/422/485) selectable

F3-0MUX-2
Serial interface to Optomux host
2 communication ports
(RS422/485)

F3-PMUX-1
Parallel interface to Pamux host

Bases

5-slot local or expansion base
Built-in 110/220 VAC power supply

5-slot local or expansion base
Built-in 24 VDC power supply

8-slot local base
(exp. base w/350 CPU)
Built-in 110/220 VAC power supply

10-slot local or expansion base
Built-in 110/220 VAC power supply

10-slot local or exp. base
Built-in 24 VDC power supply

Discrete input modules

DC Input
8-pt. 24VDC source
16-pt. 5V/12-24VDC (sink/source,1ms response)
16-pt. 24VDC source (0.8ms response)

AC Input
8-pt. 110/220VAC
16-pt. 110 VAC

AC/DC Input
8-pt. 24VAC/DC
16-pt. 24VAC/DC

Discrete output modules

DC Output
4-pt. 5-24VDC sink
8-pt. 5-24VDC sink
8-pt. 5-24VDC source
16-pt. 5-24VDC sink
16-pt. 5-24VDC source

AC Output
4-pt. 110-220VAC isolated
8-pt. 110VAC isolated
8-pt. 110-220VAC isolated
16-pt. 15-220VAC

RELAY Output
8-pt. 5.0A/pt
8-pt. 4.0A/pt isolated
8-pt. 10.0A/pt isolated
16-pt. 2A/pt

Analog modules

4 Channel IN, 12 bit, isolated
8 Channel IN, 12 bit
8 Channel thermocouple
16 Channel IN, 12 bit
4 Channel OUT 12 bit
4 Channel OUT 12 bit (isolated)

Specialty modules

8 pt. Input Simulator
Filler Module

Programming

D3-HP Handheld Programmer for D3-330/D3-340

D2-HPP Handheld Programmer with built-in RLL^{PLUS} for D3-350

DIN rail mounted terminal blocks

See the Connection Systems section for over 200 available options.

Communications

Data Comm Unit (RS232C), 330/340 CPUs only
Data Comm Unit (RS422), 330/340 CPUs only
Data Comm Module, 350 CPU only

Operator panels

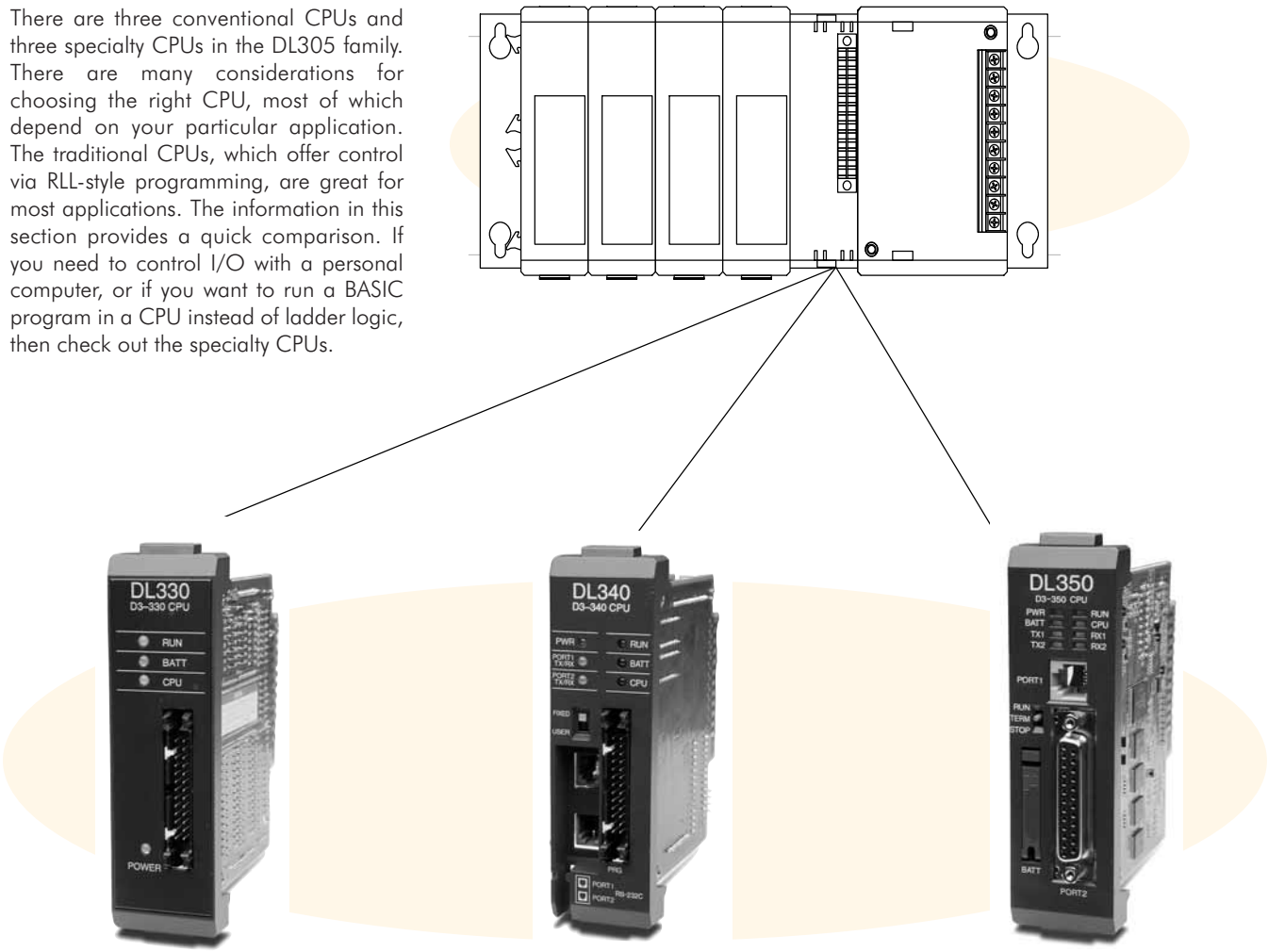
See the Operator Interface section for a complete listing of all types of panels and software.

Connection systems

See the Wiring Solutions section in this catalog for information on **DIN***nector* terminal blocks, ***ZIP***Link connection systems and other connection accessories for use with the DL305 system.

DL305 CPUs

There are three conventional CPUs and three specialty CPUs in the DL305 family. There are many considerations for choosing the right CPU, most of which depend on your particular application. The traditional CPUs, which offer control via RLL-style programming, are great for most applications. The information in this section provides a quick comparison. If you need to control I/O with a personal computer, or if you want to run a BASIC program in a CPU instead of ladder logic, then check out the specialty CPUs.



D3-330 — The D3-330 design has been very popular for many years. It offers the lowest-cost solution in the DL305 family. It is great for machines that need little (if any) communications between the CPU and other devices.

D3-340—The D3-340 offers a faster scan rate, two RS232C ports (one with built-in Modbus RTU slave) and additional I/O points. Need RS422? Simply add an FA-ISOCON converter to one of the ports. If you need built-in communications, or even just an extra 16-point I/O card, the D3-340 offers the lowest-cost solution. This CPU allows you to make the most of your investment in a DL305 (or compatible) system.

D3-350—The D3-350 is the most powerful DL305 CPU. It is a spin-off of the D4-450 and D2-250(-1). It is plug-compatible with older bases, as well as analog and discrete I/O modules. The instruction set and I/O numbering scheme are similar to our DL05, DL06, DL105, DL205 and DL405 PLCs. The communications capabilities have also been greatly enhanced to include RS422 Remote I/O, MODBUS Master and Slave protocols, as well as our own *Direct*Net and K-Sequence protocols. When the D3-350 is installed in a -1 base, even more features are available. These bases allow for greater I/O expansion capabilities and for intelligent I/O modules.

NOTE: D3-330 and D3-340 programs cannot be downloaded into the D3-350 CPU. The D3-350's instruction set is based on the DL205/DL405 instruction set. If an existing D3-330 or D3-340 system is upgraded to a D3-350 CPU, the RLL program must be re-written for the D3-350 CPU.

CPU Specifications

DL305 CPU Specifications			
System Capacity	***D3-330***	***D3-340***	***D3-350***
Total memory (K words)	3.91	3.98	14.8
Ladder memory (K words)	3.7	3.7	7.6
User data memory	116 bytes	172 bytes	7.1K words
CMOS RAM	Yes	Yes	No
UVPROM	Opt.	Opt.	No
EEPROM	No	Opt.	Flash
Total I/O points using:			
Local I/O	128	136	144
Local and Expansion I/O	176	184	368
Remote I/O[1]	N/A	N/A	512
I/O point density	8/16	8/16	8/16
Slots per base (CPU requires 1 slot)	5/8/10	5/8/10	5/8/10
Performance			
Contact execution (boolean)	6.6µs	.87µs	.61µs
Typical scan (1K boolean)[2]	15ms	4-5ms	5-6ms
Programming & Diagnostics			
RLL ladder style	Yes	Yes	Yes
RLL^{PLUS} (stage)	No	No	Yes
RunTime Editing	No	No	Yes
Supports Overrides	No	No	Yes
Variable/fixed scan	variable	variable	either
Handheld programmer port	Yes	Yes	Yes
Built-in RS232C ports	No[3]	2	2
Real-time clock/calendar	No	No	Yes
Instructions	61	63	129
Control relays(CR)	140	196	1024
Shift register bits	128	128	use CRs
Stages (RLL^{PLUS} only)	N/A	N/A	1024
Timers/counters	64	64	256/128
Immediate I/O	No	No	Yes
Subroutines	No	No	Yes
For/Next Loops	No	No	Yes
Timed interrupt	No	No	Yes
Integer math	Yes	Yes	Yes
Floating point math	No	No	Yes
PID	No	No	Yes
Drum sequence	No	No	Yes
Bit of word	No	No	Yes
ASCII print	No	No	Yes
Data registers	128	192	7168
Internal diagnostics	Yes	Yes	Yes
Password security	Yes	Yes	Multi-level
Battery backup	Yes	Yes	Yes
Communications			
Built-in ports[3]	No	Yes	Yes
*Direct*NET master	No	Yes	Yes
*Direct*NET slave	w/DCU	Yes	Yes
MODBUS RTU master	No	No	Yes
MODBUS RTU slave	No	Yes	Yes
Data communications unit	Yes	Yes	N/A
Specialty modules			
Thermocouple	Yes	Yes	Yes
Analog Input (#channels max.)	112	128	368
Analog output (#channels max.)	28	32	48
High-speed counter (10KHz)	Yes	Yes	No

1. ***The D3-350 bottom port supports DL205 remote I/O.***
2. ***1K program includes contacts, coils, and scan overhead. If you compare to other products, make sure to include their scan overhead.***
3. ***The D3-330 requires a Data Communications Unit (DCU) for programming with Direct*SOFT *software.***

D3-350 CPU

D3-350 <--->

Our most powerful DL305 CPU

The D3-350 combines the power, speed and ease of the D2-250-1 CPU with existing DL305 I/O modules and bases.

*Direct*SOFT Programming Software Release V2.3 or higher is required to program the D3-350. For existing license holders, an upgrade package is available. If you are using a handheld programmer (D2-HPP, release 1.8 or lower), a new release of handheld programmer firmware will also be required.

Four PID loops and auto-tuning

The D3-350 CPU can process up to four PID loops directly in the CPU. Select from various control modes, including automatic, manual and cascade control. There are a wide variety of alarms including Process Variable, Rate of Change and Deviation. The loop operation parameters (Process Variable, Setpoint, Setpoint Limits, etc.) are stored in V-memory, which allows easy access from operator interfaces or HMIs.

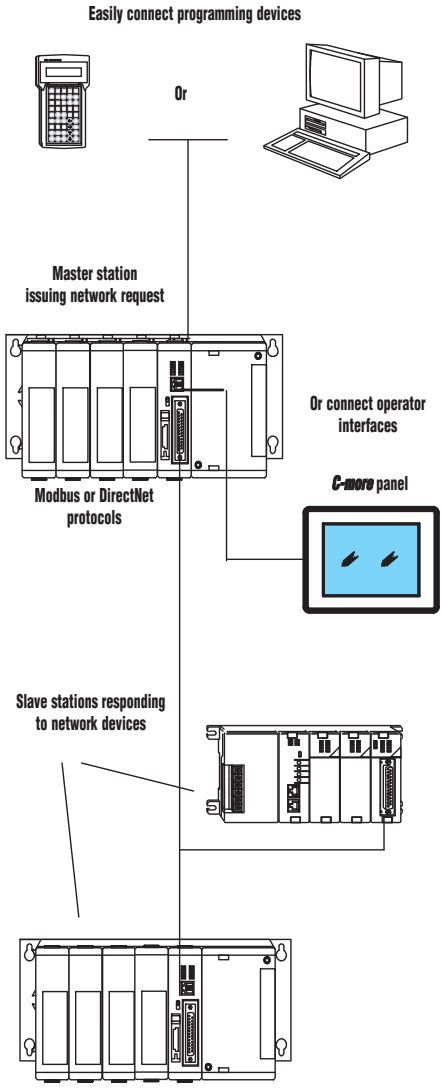
Setup is accomplished with easy-to-use setup menus and monitoring views in our *Direct*SOFT Programming Software.

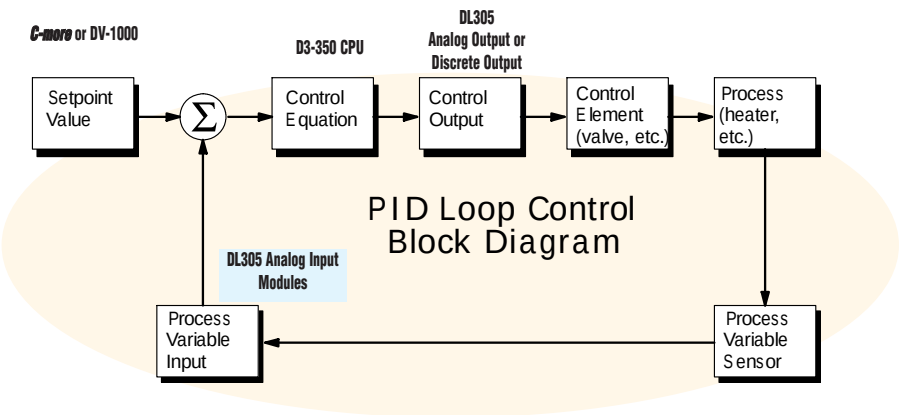
The auto-tuning feature is also easy to use and can reduce setup and maintenance time. The CPU uses the auto-tuning feature to automatically determine near optimum loop settings.

Note: D3-330 and D3-340 programs cannot be downloaded into the D3-350 CPU. The D3-350's instruction set is based on the DL205/DL405 instruction set. If an existing D3-330 or D3-340 system is upgraded to a D3-350 CPU, the RLL program must be re-written for the D3-350 CPU.

Powerful built-in CPU communications

The D3-350 offers two communication ports that provide a vast array of communication possibilities. The top RS232C port is for programming, a DV-1000 connection, a connection to our operator interface panels, or a K-sequence/*Direct*NET slave port. The 25-pin bottom port can use RS232C or RS422. This port offers several different protocol options, such as K-sequence protocol, *Direct*NET Master/-Slave, Modbus Master/-Slave, and even a direct connection to DL205 remote I/O. The ability to select these features is provided via software so you can choose the best combination for the application.





D3-350 Key Features

The D3-350 supports over 130 instructions. These include:

- Four types of drum sequencers
- Leading and trailing edge triggered one-shots
- Bit of word manipulation
- Floating point conversions
- Print instruction to send ASCII data through the bottom CPU port

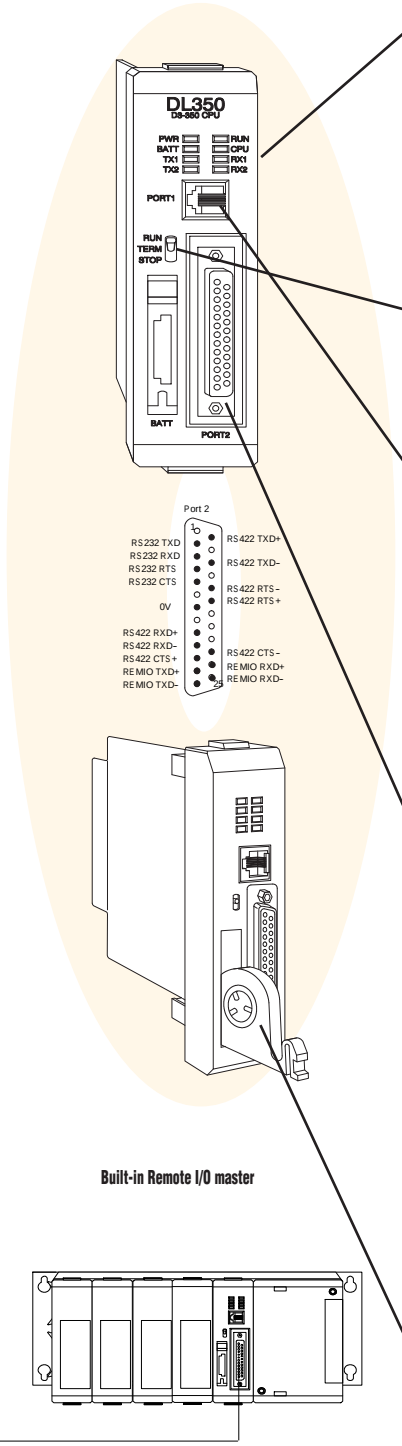
For a complete list of instructions supported by the D3-350 CPU, see the end of this section.

On-board flash memory

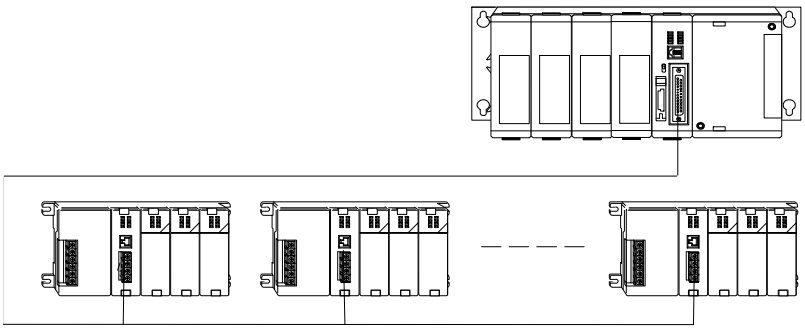
The D3-350 has 7.6 K of flash memory on board. With flash memory, you don't have to worry about losing the program due to a bad battery. If you have critical data stored in V-memory, like PID loops, simply purchase the optional lithium battery to maintain these parameters as well.

Built-in remote I/O connection

The bottom port on the D3-350 can also be used as a master for a remote I/O network. If you need extra I/O at some remote distance from the CPU, use this port to add up to seven DL205 remote slave stations. (See the DL205 section for D2-RSSS information.)



Built-in Remote I/O master



...allows you to connect up to seven DL205 remote slaves!

CPU Status Indicators		
RUN	ON OFF	CPU is in RUN mode CPU is in Program mode
BATT	ON OFF	Battery backup voltage is low Battery backup voltage is OK or disabled
CPU	ON OFF	CPU internal diagnostics has detected an error CPU is OK
PWR	ON OFF	CPU power good CPU power failure
Mode Switch		
RUN	Forces CPU into Run Mode	
TERM	Allows peripherals (HPP, *Direct*SOFT and operator interface panels) to write to the CPU.	
STOP	Forces CPU out of RUN mode	
Port 1		
Protocols	K-sequence slave *Direct*NET slave	
Devices	Can connect w/HPP, *Direct*SOFT, DV-1000, *C-more* Panels, or any *Direct*NET Master	
Specs.	6P6C phone jack connector RS232C 9600 baud Odd parity Fixed station address 1 8 data bits 1 start, 1 stop bit Asynchronous, half-duplex, DTE	
Port 2		
Protocols	K-sequence slave *Direct*NET Master/slave MODBUS RTU Master/slave Remote I/O Master	
Devices	Can connect w/many devices, such as PCs running *Direct*SOFT, KEP*direct* for PLCs Server, HMI packages, DV-1000, *C-more* panels, or any *Direct*NET or MODBUS RTU master or slave	
Specs.	25-pin D-shell connector RS232C/RS422 300/600/1200/2400/4800/9600 19.2K/38.4K Baud Odd, even or no parity Selectable address (1-90, HEX 1-5A) 8 data bits-1 start, 1 stop bit Asynchronous,half-duplex,DTE	
Batteries (optional)		
D2-BAT-1	D3-350 only, coin type 3.0V Lithium battery, 560mA battery # CR2354	

Note: Batteries are not needed for program backup. However, you should order a battery if you have parameters in V-memory that must be maintained in case of a power outage, such as PID loops.

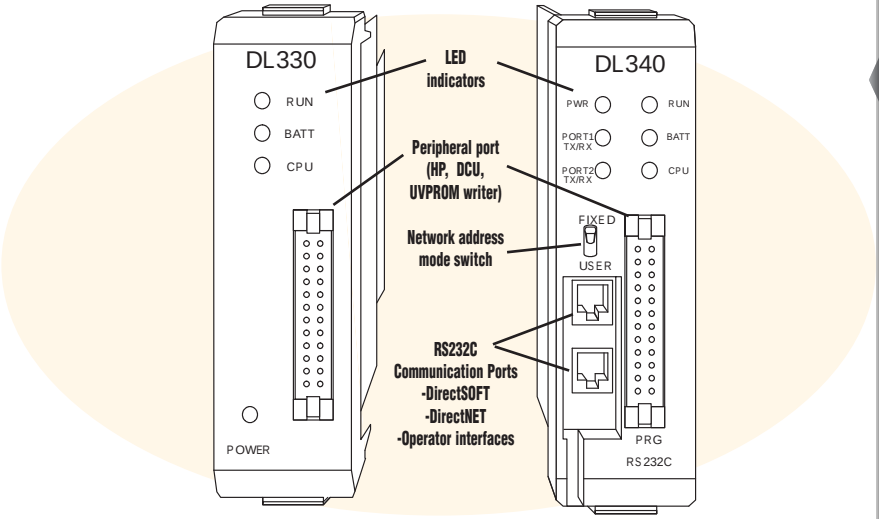
D3-350 PID Loop Specifications

PID Loop Specifications and Key Features	
Number of Loops	Selectable, four maximum
CPU V-Memory Required	32 V-memory locations per loop selected (additional 32 V-memory locations per loop required if using Ramp/Soak)
PID Algorithm	Position or velocity form of the PID equation. direct or reverse acting, square root of the error and error squared control.
Auto Tuning	Open-loop step response method and closed-loop limit cycle method.
Sample Rate	Specify the time interval between PV samples, 0.05 to 99.99 seconds. Smallest sample rate is limited to either 0.05 seconds or (PLC scan time x number of loops).
Loop Operation Modes	Loops can be in automatic control, manual (operator) control, or cascade control. PV alarm monitoring continues when loops are in manual mode.
Ramp/Soak	Up to 16 steps (8 ramp, 8 soak) per loop, with indication of ramp/soak step.
Square Root PV	Specify a Square root of the PV for a flow control application.
Limit SP	Specify a maximum and minimum value for allowable setpoint changes.
Limit Output	Specify a maximum and minimum value for the output range.
Gain	Specify proportional gain of 0.01 to 99.99.
Reset	Specify integral time of 0.1 to 999.8 in units of seconds or minutes.
Rate	Specify the derivative time, 0.00 to 99.99 seconds.
Rate Limiting	Specify a derivative gain limiting coefficient to filter the PV used in calculating the derivative term (0 to 20).
Bumpless Transfer I	Bias and setpoint are initialized automatically when the module is switched from manual to automatic. This provides for a bumpless transfer, which reduces the chance of sharp changes in the output as a result of entering automatic mode.
Bumpless Transfer II	Bias is set equal to the output when the module is switched from manual to automatic. This allows switching in and out of automatic mode without having to re-enter the setpoint.
Error Deadband	Specify an incremental value above and below the setpoint in which no change in output is made.
Error Squared	Squaring the error minimizes the effect a small error has on the Loop output, however both Error Squared and Error Deadband control may be enabled.
Alarm Specifications	
Deadband	Specify 0.1% to 5% alarm deadband on all alarms except rate of change.
PV Alarm Points	Specify PV alarm settings for low-low, low, high, and high-high conditions. You can also specify a deadband to minimize the alarm cycles when the PV approaches alarm limits.
PV Deviation	Specify alarms to indicate two ranges of PV deviation from the setpoint value (yellow and red deviation).
Rate-of-Change	Specify a rate-of-change limit for the PV.

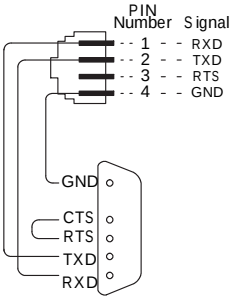
D3-330 and D3-340 Key Features

D3-330 <---> D3-340 <--->

The diagram to the right shows the various hardware features found on the D3-330 and D3-340 CPUs.



CPU Status Indicators		
RUN	ON OFF	CPU is in RUN mode CPU is in Program mode
BATT	ON OFF	Memory backup voltage low Memory backup voltage good
CPU	ON OFF	CPU failure CPU is good
PWR (Power)	ON OFF	CPU power good CPU power failure
Port1 RX/TX (D3-340)	RED GREEN	Flashing red indicates the CPU port is receiving data Flashing green indicates the CPU port is sending data
Port2 RX/TX (D3-340	RED Green	Flashing red indicates the CPU port is receiving data Flashing green indicates the CPU port is sending data



D3-340 RS232C Communication Port Specs	
Protocol	***DirectNET***
Connector	RJ11(handset connector)
Network address	01 to 90
Baud rate	38400, 19200, 9600, 4800, 2400, 1200, 600, 300
Parity-	None or odd
Transfer mode	HEX/ASCII Half-duplex Asynchronous
Data bits	8
Start bits	1
Stop bits	1
Turn around delay	0 to 1980 in 20ms intervals (preset with R777)

EEPROM and UVPROM chips

The DL305 CPUs come with on-board RAM and a battery. If you need additional program security, you may want to choose the EEPROM or UVPROM memory.

D3-CPU-UV <---> Optional

UVPROM memory. Four chips per pack. (Only one chip is required for the CPU.) A D3-PWU Prom Writer Unit is required for programming.

D3-340-EE <--->

Optional EEPROM memory for the D3-340 only. Four chips per pack. (Only one chip is required for the CPU.) No additional programming device is necessary.

D3-D4-BAT <--->

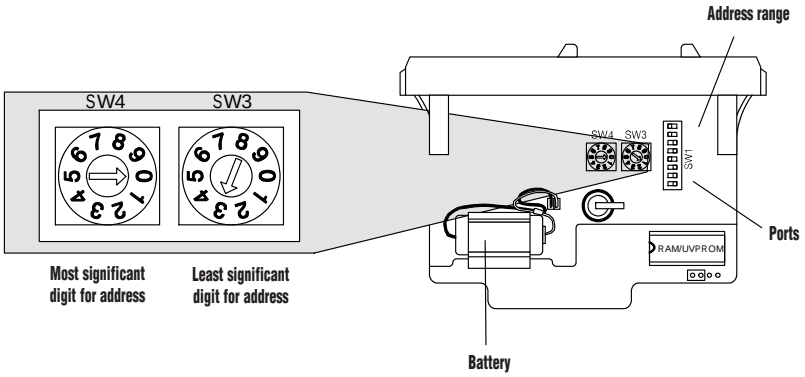
Spare battery (lithium 3.0V). Also used for D4-430 and D4-440 CPUs.

Hardware switches

Below is a side view of a D3-340 CPU that shows several types of hardware switches.

The D3-330 has a 2-position dipswitch for selecting retentive memory and jumpers for selecting UVPROM and RAM options.

The D3-340 has a jumper switch for selecting UVPROM, EEPROM and RAM options, two rotary switches to select network addresses and an eight-position dipswitch for selecting baud rates (300 to 38.4K baud), communication mode (slave, master, Modbus RTU) and memory options.



DL305 Specialty CPUs

Your application may require an unconventional PLC solution. For instance, you may need computer-controlled I/O (the PLC I/O is controlled directly by your personal computer), or maybe you would like a PLC that executes a control program written entirely in BASIC instead of RLL. AUTOMATIONDIRECT offers three specialty CPUs that provide solutions for each of these applications.

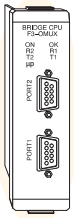
Computer I/O CPUs

Three CPUs are available for the DL305 family that allow DL305 I/O (with DL305 bases) to function as computer-controlled I/O. These CPUs (F3-OMUX-1, F3-OMUX-2 and the F3-PMUX-1) are similar in functionality, but offer different communication options. Each CPU allows DL305 modules of most types (see restrictions on types) to be interfaced with a host computer. The entire control program for the DL305 I/O is executed on the host computer, which uses an OPTOMUX or PAMUX driver.

I/O module restrictions

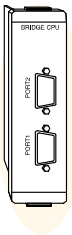
The specialty CPUs can make use of almost all DL305 modules, but they do not support the D3-HSC, or D3-02DA modules. These modules can only be used with the regular CPUs (D3-330 and D3-340).

F3-OMUX-1 <---> F3-OMUX-2 <--->



The F3-OMUX (-1, -2) CPU plugs into the first slot of a DL305 base. It acts as a serial interface to the control program in the host computer and up to 184 DL305 I/O per CPU. Multiple CPUs can be daisy-chained together to increase I/O count. The host computer must use an OPTOMUX serial communication driver. The host can execute a custom program or use a standard software package that supports OPTOMUX drivers such as Intouch-Wonderware, Iconics-Genesis, U.S. Data FactoryLink, Metra-Skyhawk Lt, etc.

General Specifications



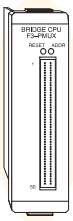
- Two serial ports that support the OPTOMUX protocol

F3-OMUX –1
RS232C/RS422/RS485

F3-OMUX-2
RS422/RS485 (isolated)

- Max of 184 I/O points per CPU (with expansion base unit)
- Scan time is dependent on the communication speed, number of commands sent, type of commands sent, the size of the response and the speed of the host computer.

F3-PMUX-1 <--->



The F3-PMUX is similar in operation to the F3-OMUX (-1, -2). It uses a parallel interface instead of serial interface. As a result, it requires the host computer to use a PAMUX communication board (OPTO 22 part number AC28 or equivalent). With this board, you can use PAMUX communication drivers in your host software. Scan time constraints are similar to the OMUX units.

The –1 version has a 26Mhz processor and replaces the F3-PMUX CPU.

The following charts show the various features found on the DL305 specialty CPUs:

F3-OMUX-n

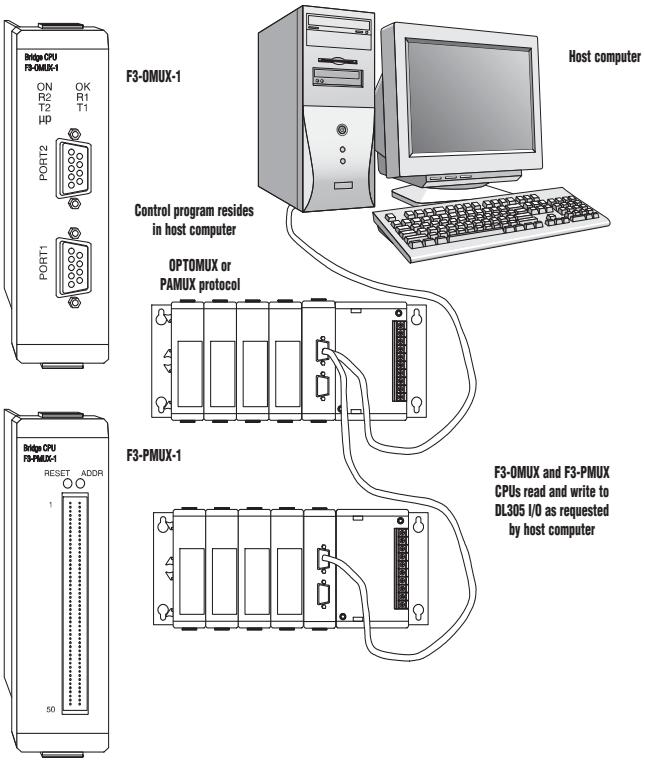
Communication port specifications

Interface	F3-OMUX-1: RS232C/422 F3-OMUX-2: RS422/485 (isolated)
Connector	Two 9-pin D-sub sockets (female)
Baud Rate	Port 1: 300, 1200, 2400, 4800, 9600, 9200, 38400, 57600, 115200 Port 2: 9600
Protocol	OPTO 22 serial communications

F3-PMUX-1

Communication port specifications

Interface	Parallel
Connector	50-pin ribbon cable connector
Protocol	OPTO 22 parallel communications



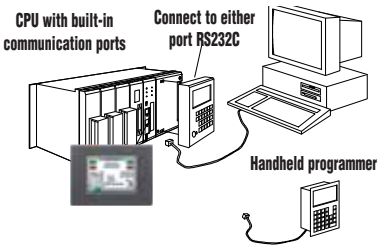
Communications

Determine your communications requirements

The choice of CPU can have a big impact on your communications capabilities in the DL305 family. If you are considering doing any communications, you should use the D3-340 or the D3-350 CPUs. You can communicate with the D3-330 CPU, but you have to add a DL305 Data Communications Unit to connect any device other than a handheld programmer. The Data Communications Unit has only one port.

D3-340 RS232C Communication Port Specifications

Protocol	*DirectNET*
Connector	RJ11(handset connector)
Network address	01 to 90
Baud rate	38400, 19200, 9600, 4800, 2400, 1200, 600, 300
Parity-	None or odd
Transfer mode	HEX/ASCII Half-duplex Asynchronous
Data bits	8
Start bits	1
Stop bits	1
Turn around delay	0 to 1980 in 20ms intervals (preset with R777)



Network Addresses

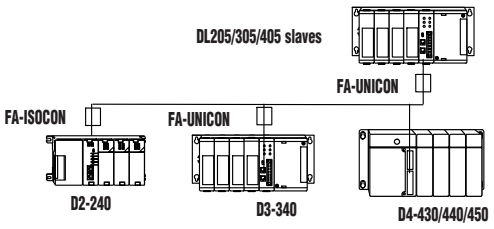
Port	*Protocol*	*Range*
1	Slave	1-90
2	Slave	1-90
	Master	0
	MODBUS/RTU	1-247

Standard communications

The D3-340 and D3-350 CPUs offer two built-in RS232C communication ports. Operator interfaces and *Direct*SOFT can be connected to either port. On the D3-340 CPU, the handheld programmer is attached directly or with a cable to the parallel port adjacent to the two serial communication ports. On the D3-350 CPU, the handheld programmer is attached to Port 1. The handheld programmer can be operated simultaneously with the communication ports. The D3-340 baud rate and network addresses are set by hardware dipswitches and rotary switches for Port 1. Port 2 uses internal registers that can be changed with a handheld programmer or *Direct*SOFT. Port 1 on the D3-350 is fixed. Port 2 can be configured using the handheld programmer or *Direct*SOFT.

DL305 as a slave on a network

Both ports on the D3-340 and the D3-350 CPUs can serve as slave ports for *Direct*NET. The bottom ports offer additional flexibility in that they can serve as a slave on a Modbus RTU network. The D3-350 even supports RS422, so no RS232-to-RS422 converter is needed. No programming is required in these CPUs for them to act as slave ports.



DL305 as a network master

The bottom built-in communication port of the D3-340 and D3-350 CPUs can serve as a Network Master for *Direct*NET. Up to 90 slave stations can be addressed. The D3-350 can also serve as a MODBUS RTU Master; up to 247 slave stations can be addressed. DL405, DL305 and DL205 controllers can be used as slave stations. *(Please note there are certain restrictions pertaining to valid DL205 and DL405 memory types that the D3-340 master can read and write.)*

Custom drivers

The DL305 product family supports the *Direct*NET protocol. However, in some applications you may have a need to connect to a device that does not support this protocol. If so, the ASCII/BASIC modules also allow you to write your own custom communication drivers (in BASIC) to connect to special devices. These high-speed modules offer communication rates up to 115.2K baud on RS232C, RS422, and RS485. With 128K of memory, there is ample program or data storage space. (These modules are not supported by the D3-350.)

I/O Selection

Choose your I/O modules

There are three major factors to consider when choosing an I/O module:

Environmental specifications:

What environmental conditions will be present?

Hardware specifications:

Does this product have the right features, performance and capacity to adequately serve the application?

Field termination:

How does this module connect to field devices? For DC modules, is a sinking or sourcing module required?

Environmental specifications

The adjacent table lists the environmental specifications that globally apply to the DL305 system (CPU, Bases, and I/O modules). Be sure the modules you choose are operated within these environmental specifications.

Review I/O hardware specifications

The hardware specifications for every DL305 module are listed with each module. Discrete module specifications are shown in a format similar to the example to the right. Take time to understand the specification chart, the derating curve and the wiring diagram.

Specialty module specifications are shown in a format that is relevant for each particular module. These module specifications should help you determine if this module is right for your application.

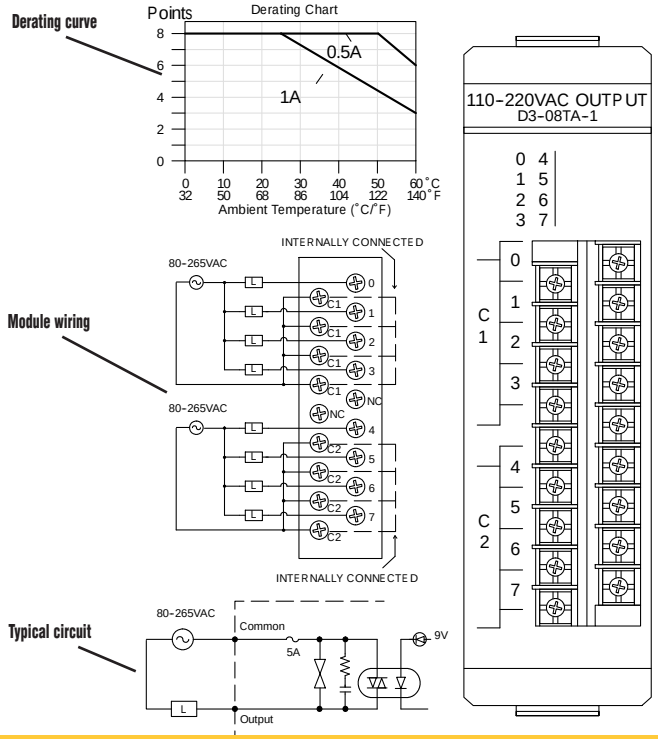
General I/O module specifications

Specification	Rating
Storage temperature	-4°F – 158°F (-20°C to 70°C)
Ambient operating temperature	32°F – 140°F (0° to 60°C)
Ambient humidity	5% - 95% relative humidity (non-condensing)
Vibration resistance	MIL STD 810C, Method 514.2
	Shifting: 0.075mm 10~57Hz 3 Axes
	Acceleration: 9.8 m/s² 57-150Hz 3 Axes
	Sweeping: 810C, Method 516.2
Peak accel.	147 m/s² 11ms, 3 Axes
Noise immunity	NEMA (ICS3-304)
Atmosphere	No corrosive gases

Discrete module specifications sheet example

D3-08TA-1 AC Output	
Outputs per module	8
Commons per module	2 (isolated)
Operating voltage	80-265VAC
Output type	TRIAC
Peak voltage	265VAC
AC frequency	47-63Hz
ON voltage drop	1.5 VAC @ 1A
Max current	1A/point 3A/common
Max leakage current	1.2mA @ 220VAC 0.52mA @ 110VAC
Max inrush current	10A for 16ms 5A for 100ms
Minimum load	25mA
Base power required	9V 20mA/ON pt. (160 MA Max) 24V N/A
OFF to ON response	1ms Max
ON to OFF response	8.33ms Max
Terminal type	Removable
Status indicators	Logic Side
Weight	7.4oz. (210g)
Fuses	2 (one 5A per common) Non-replaceable

Specifications



I/O Selection

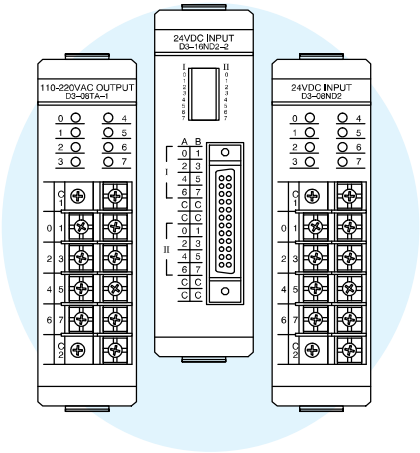
Factors affecting field termination

Sinking and sourcing for DC field devices: If you are using a DC type of field device, then you should consider whether the device is a sinking or sourcing configuration. This may affect your module selection since it determines the manner in which the device must be wired to the module. (Both sinking and sourcing modules are available.) Refer to the sinking/sourcing section of the Appendix for a complete explanation of how this could affect your system.

Physical wire terminations: In general, DL305 modules use five types of field terminations. They include: removable terminal blocks (included on most 8 and 16-point modules), fixed terminal blocks; specialty D-sub connectors (used on a few 16-point modules), standard D-sub connectors (used on most specialty intelligent modules), and phone jack style (used on the D3-340 CPU, some specialty modules and the universal cable kit). The module descriptions indicate the connector type that is on the module. The following illustrations shows these types of connectors. You can also use our DIN rail-mounted terminal blocks, DINnectors, or *ZIP*Link cables as a field termination interface to the PLC and I/O modules.

Choose your modules

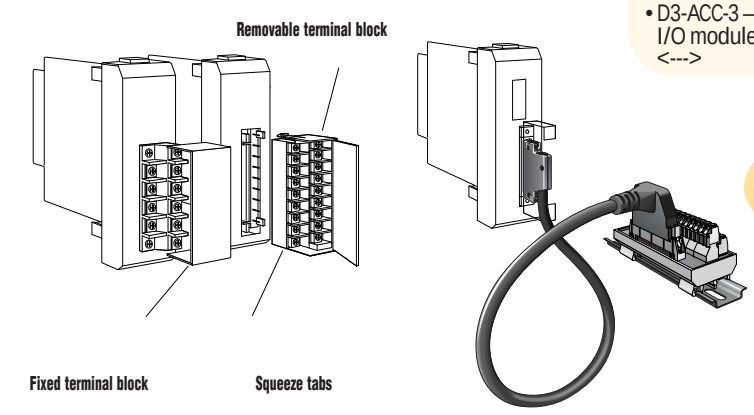
Now that you understand the factors that affect your choice of an I/O module, it's time to choose ones that best suit your needs. When you have selected the modules, proceed to the next section to choose an I/O configuration scheme that best suits your application.



*ZIP*Link Connection System

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 Terminal Blocks and Wiring Solutions section in this catalog for more information.

This logo is placed next to the I/O modules that are supported by the *ZIP*Link connection systems. See the I/O module specifications at the end of this section.



Extra connectors or spare fuses

There are several types of spare parts that may be useful. A filler module provides a quick and easy way to cover empty slots. Or, it is sometimes helpful to have extra I/O module connectors or spare fuses. Also, keep in mind the DIN*nector* family which provides DIN rail-mounted terminal blocks for simplifying and organizing your wiring needs.

- F3-FILL-CB – Filler module for empty slots <--->
- D3-16IOCON – 16pt. I/O terminal blocks <--->
- D3-8IOCVR – 8pt. I/O terminal plastic covers <--->
- D3-16IOCVR – 16pt. I/O terminal plastic covers <--->
- D3-IODSHEL – 24-pin D-shell connectors <--->
- D3-FUSE-1- Fuses for D3-05B, D3-08B, and D3-10B <--->
- D3-FUSE-2 – Fuses for D3-04TAS <--->
- D3-FUSE-3 – Fuses for D3-05BDC and D3-10BDC <--->
- D3-FUSE-4 – Fuses for D3-08TAS, D3-08TAS-1, F3-16TA-1 and F3-16TA –2 <--->
- D3-FUSE-5 – Fuses for D3-08TR <--->
- D3-FUSE-6 – Fuses for F3-08TRS-2 <--->
- D3-ACC-1 – Base power terminal strip screws <--->
- D3-ACC-2 – Spare terminal screws for 8pt. I/O modules <--->
- D3-ACC-3 – Spare terminal screws for 16pt. I/O modules <--->

*ZIP*Links eliminate the tedious process of wiring PLC I/O terminal blocks.

DL305 I/O Configuration

Local I/O – Local I/O are the modules that reside in the same base as the CPU. The status of each I/O point is updated on each I/O scan of the CPU.

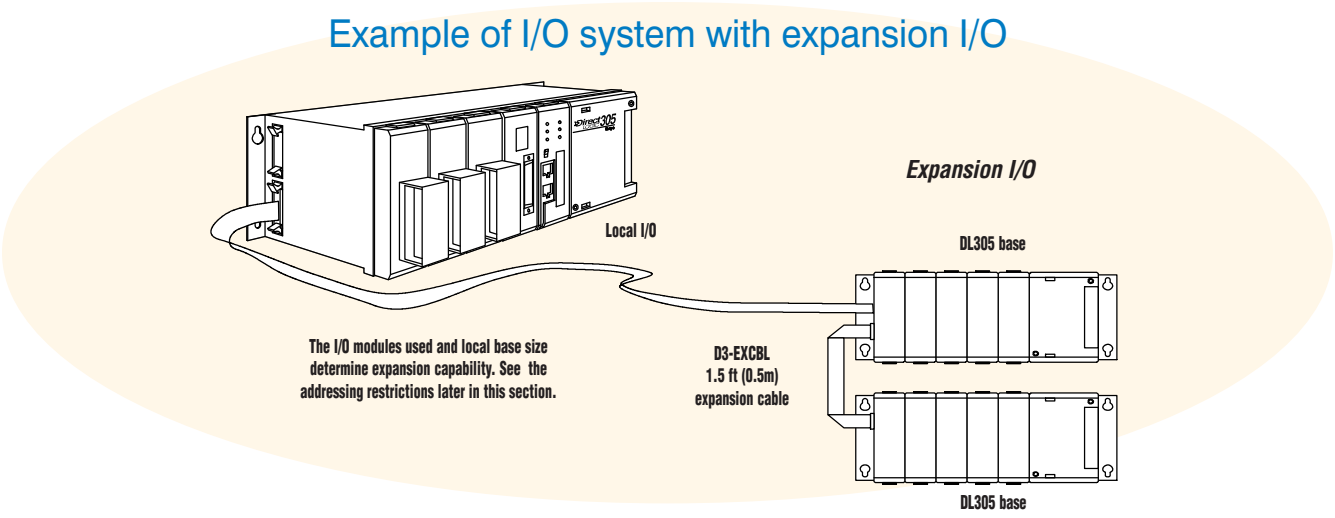
Local expansion I/O – Most local CPU bases can be expanded to include expansion I/O. Local expansion is commonly used when there are not enough I/O points available in the existing base configuration or the power budget maximum for the existing base will be exceeded with the addition of I/O. This configuration requires an additional base(s) and an I/O expansion cable(s). The CPU treats the expanded I/O in the same manner as local I/O, with updates every CPU I/O scan. There are certain addressing restrictions that are related to expansion I/O.

Remote I/O – (D3-350 CPU only) – Remote I/O is used when you need to place I/O bases at some remote distance from the CPU base. There are certain restrictions that are related to remote I/O. Check the catalog section on DL205 Remote I/O for examples and additional information.

I/O Configuration Limitations	D3-330	D3-340/ D3-350	D3-350 with -1 bases *(AC powered only)*
5-slot Local CPU Base System	64 I/O max	64 I/O max	64 I/O max
5-slot Local CPU Base System with a 5-slot Expansion Base	120 I/O max	128 I/O max	144 I/O max
5-slot Local CPU Base System with two 5-slot Expansion Bases	120 I/O max	128 I/O max	224 I/O max
8-slot Local CPU Base System	112 I/O max	112 I/O max	112 I/O max
8-slot Local CPU Base System with a 5-slot Expansion Base	152 I/O max	152 I/O max	192 I/O max
8-slot Local CPU Base System with an 8-slot Expansion Base	N/A	N/A	240 I/O max
8-slot Local CPU Base System with an 8-slot Expansion Base & 5-slot Expansion Base	N/A	N/A	320 I/O max
8-slot Local CPU Base System with two 8-slot Expansion Bases	N/A	N/A	368 I/O max
10-slot Local CPU Base System	128 I/O max	136 I/O max	144 I/O max
10-slot Local CPU Base System with a 5-slot Expansion Base	168 I/O max	176 I/O max	224 I/O max
10-slot Local CPU Base System with a 10-slot Expansion Base	176 I/O max	184 I/O max	304 I/O max

Note: The 16-point modules must be in the first eight slots adjacent to the CPU, rolling over into an expansion base if necessary.

Example of I/O system with expansion I/O



I/O Module Locations

The design of the DL305 has a successful 29-year history. Each time the product family has grown or been enhanced, compatibility with the earlier products has been preserved to protect customer investments. This has resulted in an I/O numbering system and I/O location scheme that has some special requirements.

The Module Placement Guideline table explains the rules that pertain to module location. Some specialty modules have additional requirements. These are explained in their respective module data sheets. Remember that the power budget will limit the location where some modules can be placed in a base.

Module Placement Guidelines	
Device	***Placement***
CPU	• The CPU must reside in the first slot of the local CPU base (closest to the power supply). • The CPU slot does consume an I/O slot. For example, a D3-05B-1 5-slot base has a slot for the CPU and 4 slots for I/O modules.
16 Point I/O Modules	A maximum of eight 16-point modules may be installed in a system. However, the actual number allowed depends on the type of CPU you are using. **D3-330**- maximum of seven 16-pt. modules **D3-340/350** - maximum of eight 16-pt. modules **D3-350** - w/-1 base can have 16-pt. modules in all available slots
Note: some specialty modules, such as the High Speed Counter and Thumbwheel Interface Unit, require 16 points and are treated as 16-point modules.The 16-point modules must be in the first 8 slots adjacent to the CPU. They may roll over into an expansion base if necessary. If any of the 8 slots adjacent to the CPU are not used for 16-point modules, they can be used for 8-point modules.	
Analog	Analog modules must reside in any valid 16-point I/O module slot.
ASCII BASIC Modules	ASCII BASIC modules can be placed in any valid 16-point I/O slot. (D3-350 does not support these modules)
High Speed Counter	A High-Speed Counter must be used in the first four I/O module slots in the local CPU base. (D3-350 does not support these modules)

I/O Points Usage Table for Modules

The following table indicates the number of I/O points that are used by each module. Use this information to ensure your I/O configuration stays within the valid I/O count of your chosen CPU.

DC Input		***DC Output***		***Relay Output***	
D3-08ND2	8	D3-04TD1	4	D3-08TR	8
D3-16ND2-1	16	D3-08TD1	8	F3-08TRS-1	8
D3-16ND2F	16	D3-08TD2	8	F3-08TRS-2	8
D3-16ND3	16	D3-16TD1-1	16	D3-16TR	16
AC Input		D3-16TD2	16	***Specialty Modules***	
D3-08NA-1	8	***AC Output***		D3-08SIM	8
D3-08NA-2	8	D3-04TAS	4	D3-DCM	0*
D3-16NA	16	F3-08TAS-1	8	***Analog***	
AC/DC Input		D3-08TA-1	8	F3-04ADS	16
D3-08NE3	8	D3-08TA-2	8	F3-08AD-1	16
D3-16NE3	16	F3-16TA-1	16	F3-08THM-n	16
		F3-16TA-2	16	F3-16AD	16
				F3-04DA-1	16
				F3-04DAS	16

*Use only with D3-350 CPU, "-1" base, not in slot 8.

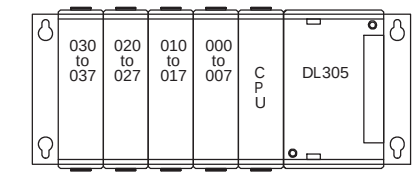
DL305 Addressing

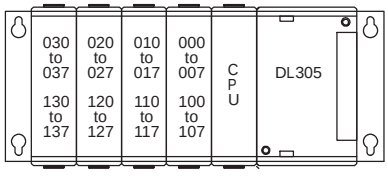
D3-330/340

Like the DL205 and DL405 products, the DL305 uses octal addressing. That is, the I/O point addressing does not include any "8s" or "9s" . The DL305 is primarily different in that it uses slot addressing. The addresses are assigned to the I/O slots and do not depend on the type of module installed (input vs. output). Also, the addresses are not sequential on 16-point modules. For example, a 16-point module in slot 0 (the first I/O slot) would have I/O addresses 000-007 for the first eight points and 100-107 for the next eight points.

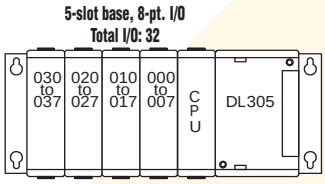
There are also certain restrictions to consider when designing your system. Most of these situations arise when 16-point modules are used, or when expansion bases must be added to the system.

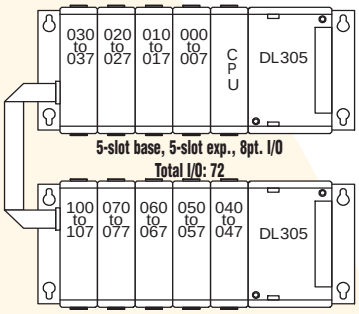
The diagrams on this and the following page illustrate the I/O base/addressing combinations that are possible when designing a system.

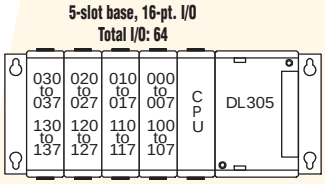


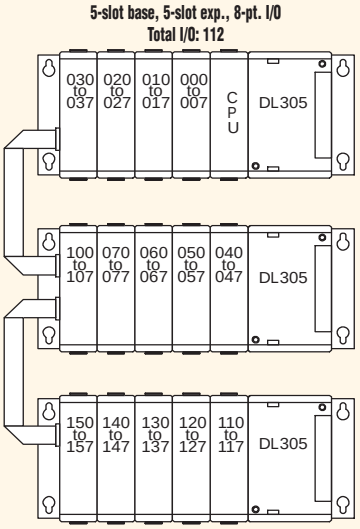


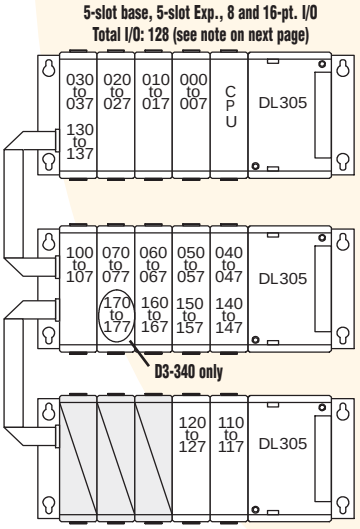
5-slot base example configurations

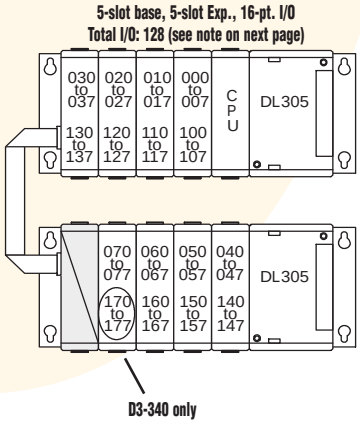








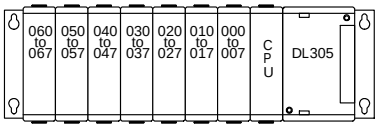




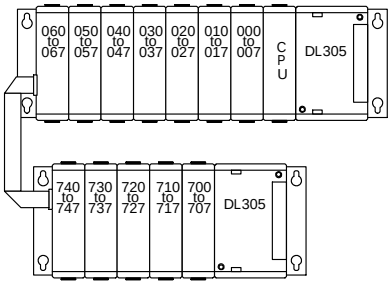
DL305 Addressing

8-slot base example configurations (D3-330/340)

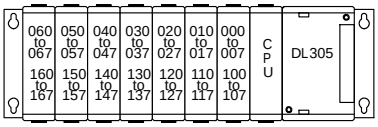
8-slot base, 8-pt. I/O
Total I/O: 56



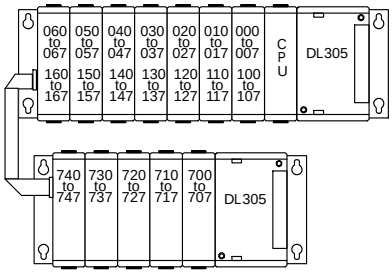
8-slot base, 5-slot expansion, 8-pt. I/O
Total I/O: 96



8-slot base, 16-pt. I/O
Total I/O: 112



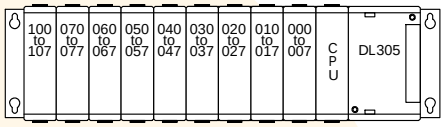
8-slot base, 5-slot expansion, 16-pt. I/O
Total I/O: 156



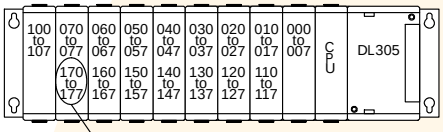
NOTE: Regardless of base size, if a 16-pt. module is used in Slot 6 for the D3-330 CPU, 160 through 167 will not be available for control-ready assignments. If a 16-pt. module is used in Slot 6 and/or Slot 7 for a D3-340 CPU, 160-167 and/or 170-177 are not available for control relay assignments.

10-slot base example configurations

10-slot base, 8-pt. I/O
Total I/O: 72

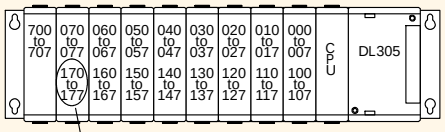


10-slot base, 8-pt. and 16-pt. I/O
Total I/O: 128 (see note)



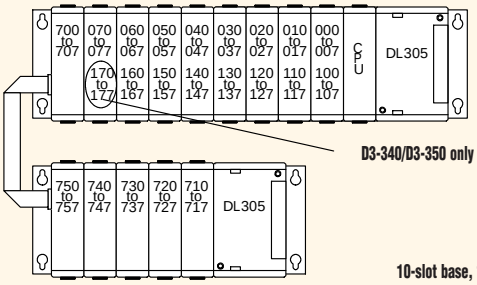
D3-340/D3-350 only

10-slot base, 8-pt. and 16-pt. I/O
Total I/O: 136 (see note)



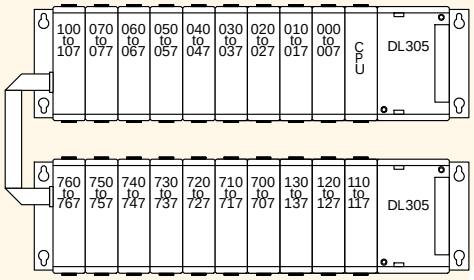
D3-340/D3-350 only

10-slot base, 5-slot expansion, 8-pt. and 16-pt. I/O
Total I/O: 176 (see note)

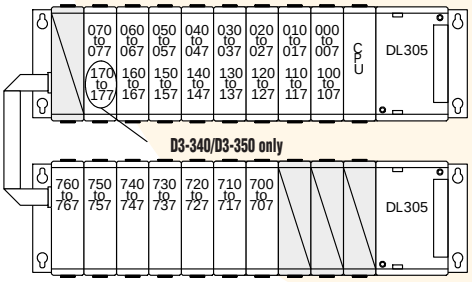


D3-340/D3-350 only

10-slot base, 10-slot expansion, 8-pt. I/O
Total I/O: 152



10-slot base, 10-slot expansion, 8-pt. and 16-pt. I/O
Total I/O: 184 (see note)



D3-340/D3-350 only

D3-350 Addressing

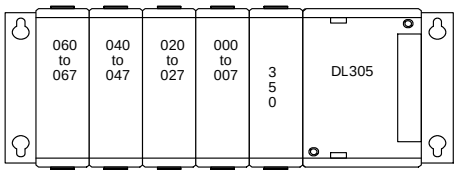
Using "-1" bases

The D3-350 CPU can be installed in legacy DL305 bases or the "-1" bases. When installed in one of the legacy bases, or if the bases are mixed, the addressing scheme and module placement restrictions follow that of the D3-340 CPU. Refer to the previous pages for more detailed information. Note: These I/O addressing configurations are for the latest style bases (-1 on the end of the part number). If you are using an older series base, refer to the User's Manual appendix for correct addressing.

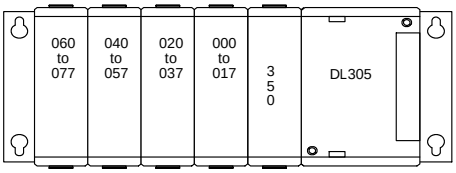
I/O addressing

When the D3-350 CPU is installed in a "-1" base and all expansion bases are also "-1" bases, the addressing scheme is very simple. 16 I/O points are assigned to each slot. This applies even if the slot contains an 8-point module or if the slot is empty. Expansion base addresses follow in succession from the previous base. Input modules are assigned addresses X0 through X777. Output modules are assigned address Y0 through Y777.

D3-05B-1 base using 8-pt. I/O modules



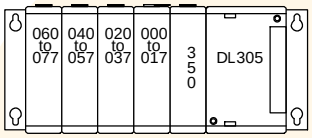
D3-05B-1 base using 16-pt. I/O modules



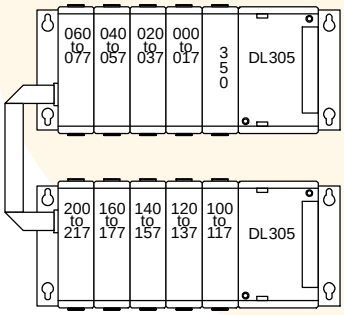
5-slot base example configurations

-1 bases

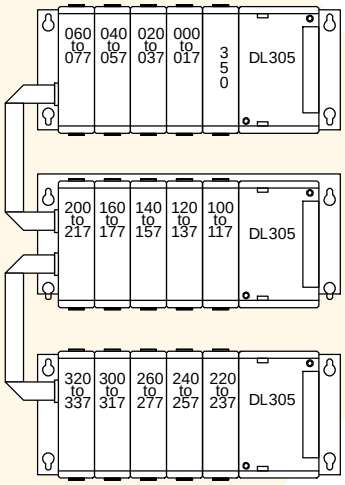
5-slot local
Total I/O: 64



5-slot local and 5-slot expansions
Total I/O: 144



5-slot local and two 5-Slot expansions
Total I/O: 224

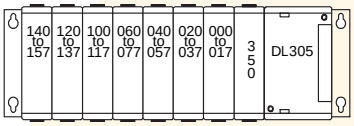


D3-350 Addressing

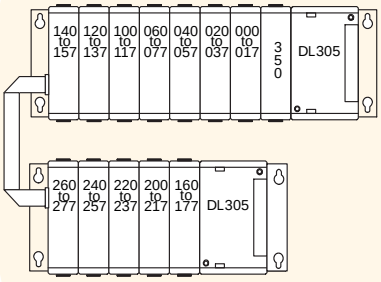
8-slot base example configurations

-1 bases

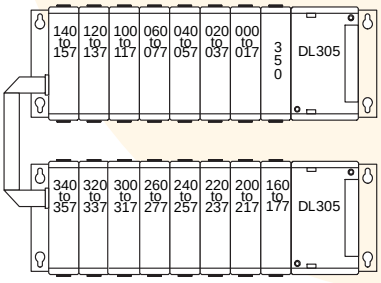
8-slot local
Total I/O: 112



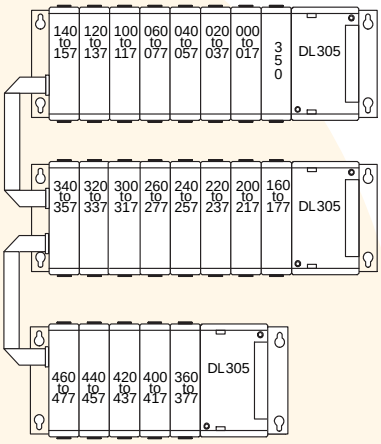
8-slot local and 5-slot expansion
Total I/O: 192



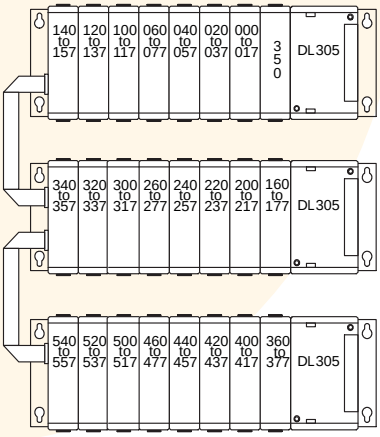
8-slot local and 8 slot expansion
Total I/O: 240



8-slot local, 8-slot and 5-slot expansions
Total I/O: 320



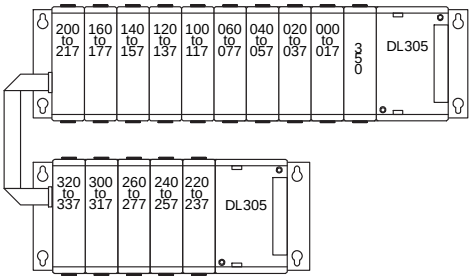
8-slot local and two 8-slot expansions
Total I/O: 368



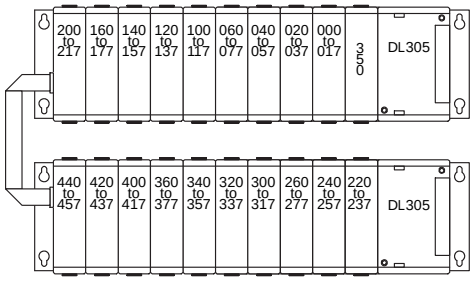
10-slot base example configurations

-1 bases

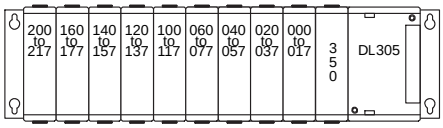
10-slot local and 5 slot expansion
Total I/O: 224



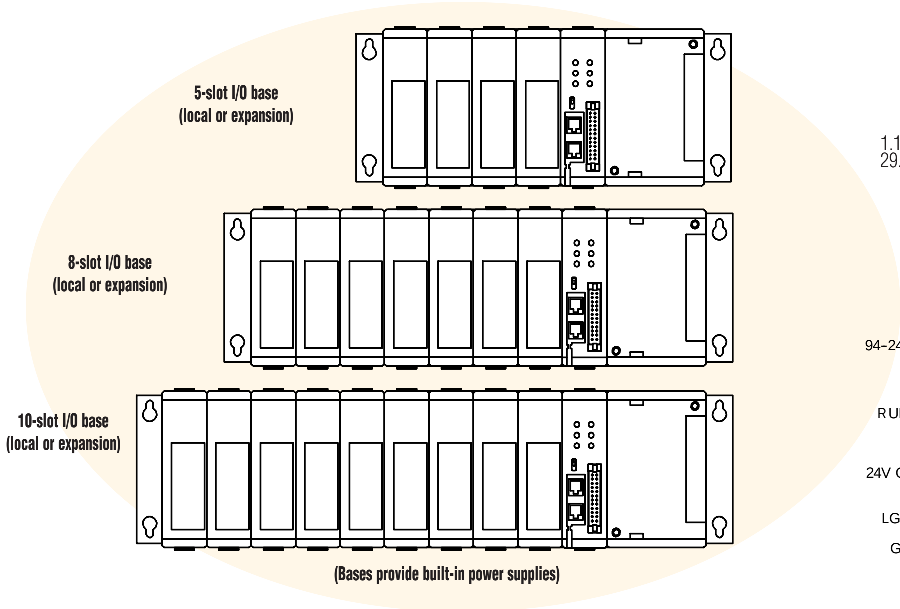
10 slot local and 10 slot expansion
Total I/O: 304

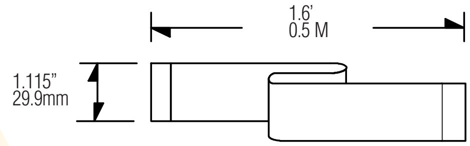


10 slot local
Total I/O: 144

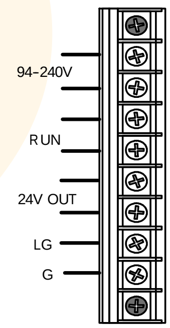


DL305 Base Specifications





I/O Expansion Cable (D3-EXCBL)



94-240 VAC Terminal Strip

	D3-05B-1 <--->	D3-05BDC <--->	D3-08B-1 <--->	D3-10B-1 <--->	D3-10BDC <--->
Number of Slots	5	5	8	10	10
Local CPU Base	Yes	Yes	Yes	Yes	Yes
Expansion Base	Yes CPU base and two expansion bases. If CPU base is 5-slot, then the expansion bases must be 5-slot also.	Yes CPU base and two expansion bases. If CPU base is 5-slot, then the expansion bases must be 5-slot also.	Yes (D3-350 only) CPU base and two expansion bases. If CPU base is 8-slot, then the expansion bases must be 8-slot or 5-slot	Yes CPU base and one expansion bases. If CPU base is 10-slot, then the expansion bases must be 10-slot or 5-slot	Yes CPU base and one expansion bases. If CPU base is 10-slot, then the expansion bases must be 10-slot or 5-slot.
Input Voltage Range	85-264VAC 47-63Hz	20.5-30VDC <10% ripple	85-264VAC 47-63Hz	85-264VAC 47-63Hz	20.5-30VDC <10% ripple
Base Power Consumption	85 VA Max	48 Watts	85VA Max	85VA Max	65 Watts
Inrush Current Max.	30A 1ms	30A	30A 1ms	30A 1ms	30A
Dielectric Strength	1500VAC for one minute between terminals of AC P/S, run output, common, 24VDC	1500VAC for one minute between 24VDC input terminals and run output	1500VAC for one minute between terminals of AC P/S, run output, common, 24VDC	2000VAC for one minute between terminals of AC P/S, run output, common, 24VDC	1500VAC for one minute between 24VDC input terminals and run output
Insulation Resistance	>10Mohm at 500VDC	>10Mohm at 500VDC	>10Mohm at 500VDC	>10Mohm at 500VDC	>10Mohm at 500VDC
Power Supply Output (Voltage Ranges and Ripple)	(5VDC) 4.75-5.25V 5% ripple (9VDC) 8.5-10V 5% ripple (24VDC) 20-28V 5% ripple	(5VDC) 4.75-5.25V 5% ripple (9VDC) 8.5-10V 5% ripple (24VDC) 20-28V 5% ripple	(5VDC) 4.75-5.25V 5% ripple (9VDC) 8.5-10V 5% ripple (24VDC) 20-28V 5% ripple	(5VDC) 4.75-5.25V 5% ripple (9VDC) 8.5-10V 5% ripple (24VDC) 20-28V 5% ripple	(5VDC) 4.75-5.25V 5% ripple (9VDC) 8.5-10V 5% ripple (24VDC) 20-28V 5% ripple
5 VDC Current Supplied	.7A	1.4A	1.0A	1.0A	1.4A
9 VDC Current Supplied	2.0A	0.8A	2.0A	2.0A	1.7A
24 VDC Current Supplied	0.5A	0.5A	0.5A	0.5A	0.5A
Auxiliary 24 VDC Output	100mA max	None	100mA max	100mA max	None
Run Relay	250VAC 4A (resistive load)	250VAC 4A (resistive load)	250VAC 4A (resistive load)	250VAC 4A (resistive load)	250VAC, 4A (resistive load)
Fuses	2A (250V) Non-replaceable	4A (250V) User-replaceable D3-FUSE-3 <--->	2A (250V) Non-replaceable	2A (250V) Non-replaceable	4A (250V) User-replaceable D3-FUSE-3 <--->
Dimensions W/H/D	11.42x4.85x4.41 in. (290x123x112 mm)	11.42x4.85x4.41 in. (290x123x112 mm	15.55x4.85x4.41 in. (395x123x112 mm)	18.3x4.85x4.41 in. (465x123x112 mm)	18.34x4.85x4.41 in. (465x123x112 mm)
Weight	37oz. (1050g)	34oz. (964g)	44oz. (1250g)	51.1oz. (1450g)	50.5oz. (1432g)

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 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.

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: 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.
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.
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.

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 ***ZIP***Link connection systems. See the I/O module specifications at the end of this section.

A	Column 1	Column 2	Column 3	Column 4	Column 5
	Base # 0	Device Type	5 VDC (mA)	9VDC (mA)	24V(mA)
B	***Current Supplied***				
	5-slot Base	D3-05BDC	1400	800	500
C	***Current Required***				
	CPU Slot	D3-330	300	50	0
	Slot 0	D3-16NE3	0	130	0
	Slot 1	D3-16NE3	0	130	0
	Slot 2	D3-08TA-1	0	160	0
	Slot 3	D3-08TA-1	0	160	0
D	***Other***				
	Handheld prog D3-HPP		50	50	0
E	***Maximum Current Required***		360	680	0
F	***Remaining Current***		1040	120	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 24 VDC available from the 24 VDC output terminals on the bases (except D3-05BDC and D3-10BDC).

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

Power Consumed

Device	5V(mA)	9V(mA)	24V(mA)	Ext req.
CPUs				
D3-330	300	50	0	0
D3-340	300	20	0	0
D3-350	500	0	0	0
DC Input Modules				
D3-08ND2	0	10	112	0
D3-16ND2-1	0	25	224	0
D3-16ND2F	0	25	224	0
F3-16ND3F	0	148	68	0
AC Input Modules				
D3-08NA-1	0	10	0	0
D3-08NA-2	0	10	0	0
D3-16NA	0	100	0	0
AC/DC Input Modules				
D3-08NE3	0	10	0	0
D3-16NE3	0	130	0	0
DC Output Modules				
D3-04TD1	0	12	5	0
D3-08TD1	0	20	24	0
D3-08TD2	0	30	0	0
D3-16TD1-1	0	40	96	0
D3-16TD2	0	180	0	0
AC Output Modules				
D3-04TAS	0	12	0	0
F3-08TAS-1	0	200	0	0
D3-08TA-1	0	160	0	0
D3-08TA-2	0	160	0	0
F3-16TA-2	0	250	0	0
D3-16TA-2	0	400	0	0

Power Supplied

Device	5V(mA)	9V(mA)	24V(mA)	24 V (mA)
D3-05B-1	900	2000	500	100
D3-08B-1	900	2000	500	100
D3-10B-1	900	2000	500	100
D3-05BDC	900	2000	500	None
D3-10BDC	900	2000	500	None
D3-05B-NR	900	2000	500	100
D3-08B-NR	900	2000	500	100
D3-05BDC-NR	900	2000	500	None

Power Consumed

Device	5V(mA)	9V(mA)	24V(mA)	External required
Relay Output Modules				
D3-08TR	0	360	0	0
F3-08TRS-1	0	296	0	0
F3-08TRS-2	0	296	0	0
D3-16TR	0	480	0	0
Analog Temperature and Thermocouple Modules				
F3-04ADS	0	183	50	0
F3-08AD-1	0	45	55	0
F3-08THM-n	0	50	34	0
F3-16AD	0	55	65	0
F3-04DA-1	0	144	108	0
F3-04DAS	0	154	145	0
Communications and Networking				
D3-232 DCU	500	0	0	Optional 5V@500mA
D3-422 DCU	500	0	0	Optional 5V@500mA
FA-UNICON	0	0	0	24V or 5V@ 100mA
D3- DCM	0	300	0	0
Specialty Modules				
D3-08SIM	0	10	112	0
D3-HSC	0	70	0	0
D3-TCSU	40	5	0	0
Programming				
D3-HP	50	50	0	0
D3-HPP	50	50	0	0
D2-HP	200	0	0	0
Specialty CPUs				
F3-0MUX-1	409	0	0	0
F3-0MUX-2	262	0	150	0
F3-PMUX	455	0	0	0
F3-RTU	416	0	0	0
Operator Interface				
DV-1000	150	0	0	0
C-more Micro-Graphic	210	0	0	0

Dimensions and Installation

It is important to understand the installation requirements for your DL305 system. This will help ensure that the DL305 products operate within their environmental and electrical limits.

Plan for safety

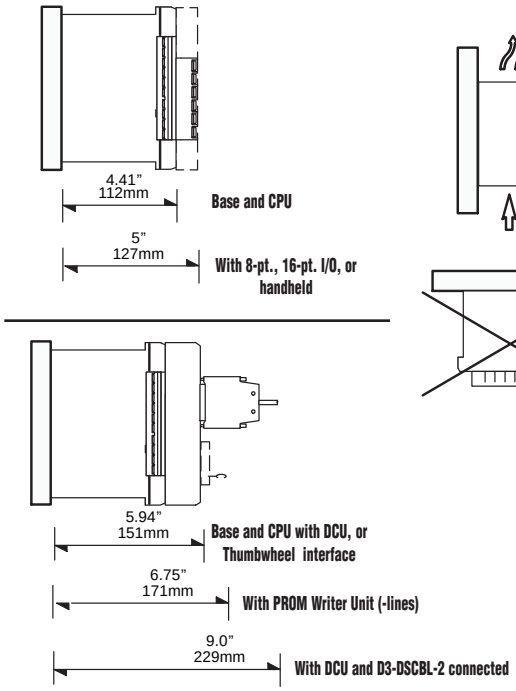
This catalog should never be used as a replacement for the user manual. The user manuals, D3-USER-M and D3-350-M (available for download from our web site), contain important safety information that must be followed. The system installation should comply with all appropriate electrical codes and standards.

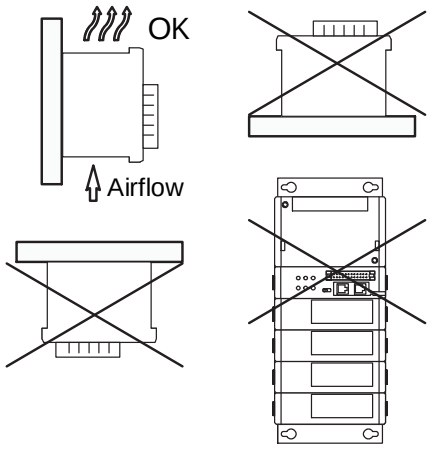
Base dimensions and mounting orientation

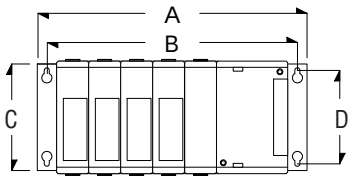
Use the diagrams to the right to make sure the DL305 system can be installed in your application. DL305 bases must be mounted horizontally to ensure proper airflow for cooling purposes. It is important to check these dimensions against the conditions required for your application. For example, it is recommended that you leave 1.5" depth for ease of access and cable clearance. However, your distance may be greater or less. Also, check the installation guidelines for the recommended cabinet clearances.

Specification	Rating
Storage Temperature	-4°F - 158°F (-20°C to 70°C)
Ambient Operating Temperature	32°F - 131°F (0° to 55°C)
Ambient Humidity	30% - 95% relative humidity (non-condensing)
Vibration Resistance	MIL STD 810C, Method 514.2
Shock Resistance	MIL STD810, Method 516.2
Noise Immunity	NEMA (ICS3-304)

DL305 mounting depths







Base	Price	A		B		C		D	
D3-05B-1	<--->	11.41"	290mm	10.63"	270mm	4.84"	123mm	3.54"	90mm
D3-08B-1	<--->	15.55"	395mm	14.76"	375mm	4.84"	123mm	3.54"	90mm
D3-10B-1	<--->	18.30"	465mm	17.51"	445mm	4.84"	123mm	3.54"	90mm

See the Enclosures section in this catalog for an enclosure that may be suitable for your application