

# I/O Selection

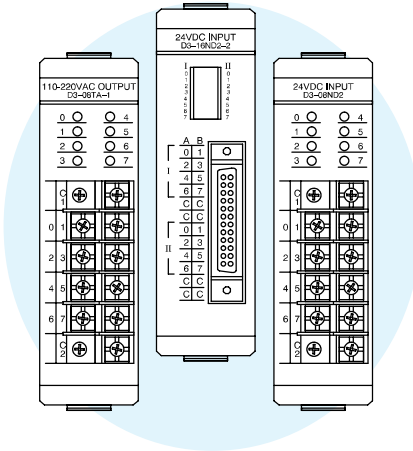
## Factors affecting field termination

**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 ZIPLink cables as a field termination interface to the PLC and I/O modules.

## Choose your modules

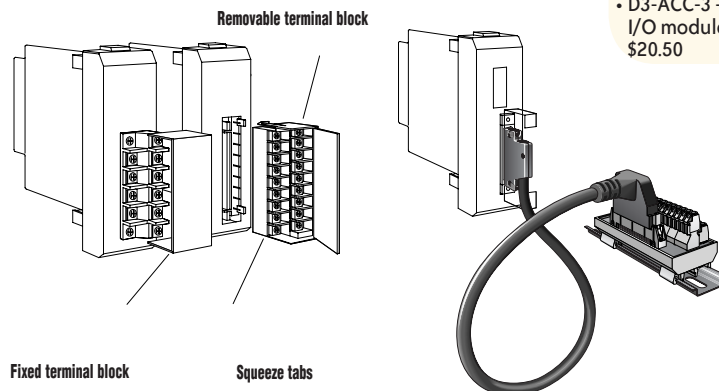
Now that you understand the factors that affect your choice of an I/O module, it's time to choose ones that best suit your needs. When you have selected the modules, proceed to the next section to choose an I/O configuration scheme that best suits your application.



## ZIPLink Connection System

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 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 ZIPLink connection systems. See the I/O module specifications at the end of this section.



ZIPLinks eliminate the tedious process of wiring PLC I/O terminal blocks.

## 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 DINnectors family which provides DIN rail-mounted terminal blocks for simplifying and organizing your wiring needs.

- F3-FILL-CB – Filler module for empty slots \$29.00
- D3-16IOCON – 16pt. I/O terminal blocks \$91.00
- D3-8IOCVR – 8pt. I/O terminal plastic covers \$14.00
- D3-16IOCVR – 16pt. I/O terminal plastic covers \$20.50
- D3-10DSHEL – 24-pin D-shell connectors \$32.50
- D3-FUSE-1- Fuses for D3-05B, D3-08B, and D3-10B \$22.00
- D3-FUSE-2 – Fuses for D3-04TAS \$3.25
- D3-FUSE-3 – Fuses for D3-05BDC and D3-10BDC \$27.50
- D3-FUSE-4 – Fuses for D3-08TAS, D3-08TAS-1, F3-16TA-1 and F3-16TA –2 \$14.00
- D3-FUSE-5 – Fuses for D3-08TR \$45.00
- D3-FUSE-6 – Fuses for F3-08TRS-2 \$14.00
- D3-ACC-1 – Base power terminal strip screws \$20.50
- D3-ACC-2 – Spare terminal screws for 8pt. I/O modules \$20.50
- D3-ACC-3 – Spare terminal screws for 16pt. I/O modules \$20.50

# 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.

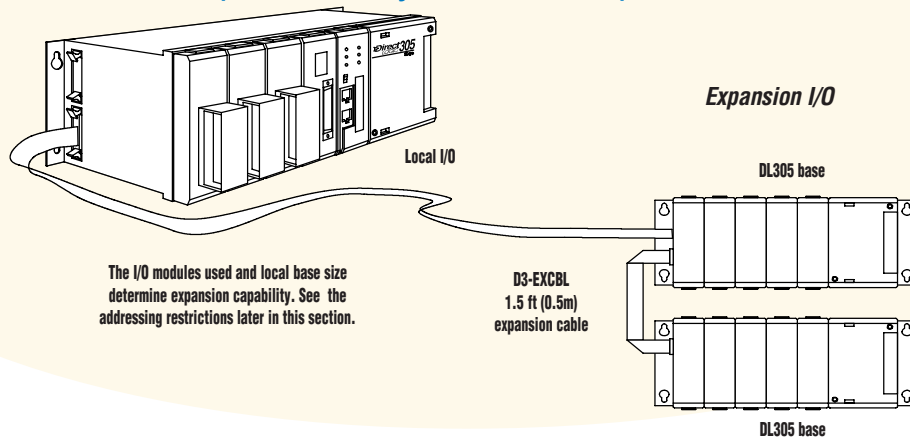
**Local expansion I/O** – Most local CPU bases can be expanded to include expansion I/O. Local expansion is commonly used when there are not enough I/O points available in the existing base configuration or the power budget maximum for the existing base will be exceeded with the addition of I/O. This 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)
<b>5-slot Local CPU Base System</b>	64 I/O max	64 I/O max	64 I/O max
<b>5-slot Local CPU Base System with a 5-slot Expansion Base</b>	120 I/O max	128 I/O max	144 I/O max
<b>5-slot Local CPU Base System with two 5-slot Expansion Bases</b>	120 I/O max	128 I/O max	224 I/O max
<b>8-slot Local CPU Base System</b>	112 I/O max	112 I/O max	112 I/O max
<b>8-slot Local CPU Base System with a 5-slot Expansion Base</b>	152 I/O max	152 I/O max	192 I/O max
<b>8-slot Local CPU Base System with an 8-slot Expansion Base</b>	N/A	N/A	240 I/O max
<b>8-slot Local CPU Base System with an 8-slot Expansion Base &amp; 5-slot Expansion Base</b>	N/A	N/A	320 I/O max
<b>8-slot Local CPU Base System with two 8-slot Expansion Bases</b>	N/A	N/A	368 I/O max
<b>10-slot Local CPU Base System</b>	128 I/O max	136 I/O max	144 I/O max
<b>10-slot Local CPU Base System with a 5-slot Expansion Base</b>	168 I/O max	176 I/O max	224 I/O max
<b>10-slot Local CPU Base System with a 10-slot Expansion Base</b>	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
<b>CPU</b>	<ul style="list-style-type: none"> <li>The CPU must reside in the first slot of the local CPU base (closest to the power supply).</li> <li>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.</li> </ul>
<b>16 Point I/O Modules</b>	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
<b>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.</b>	
<b>Analog</b>	Analog modules must reside in any valid 16-point I/O module slot.
<b>ASCII BASIC Modules</b>	ASCII BASIC modules can be placed in any valid 16-point I/O slot. (D3-350 does not support these modules)
<b>High Speed Counter</b>	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
F3-16ND3F	16	D3-08TD2	8	F3-08TRS-2	8
		D3-16TD1-1	16	D3-16TR	16
<b>AC Input</b>		D3-16TD2	16	<b>Specialty Modules</b>	
D3-08NA-1	8	<b>AC Output</b>		D3-08SIM	8
D3-08NA-2	8	D3-04TAS	4	D3-DCM	0*
D3-16NA	16	F3-08TAS-1	8	<b>Analog</b>	
<b>AC/DC Input</b>		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.

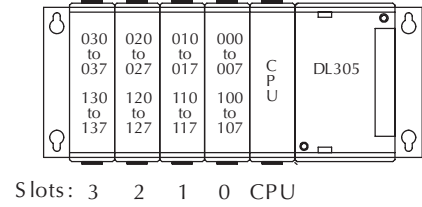
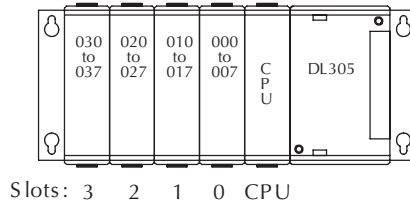
# DL305 Addressing

## D3-330/340

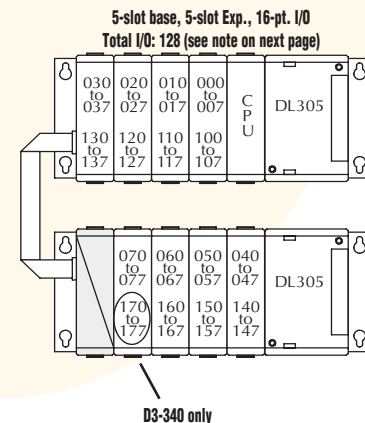
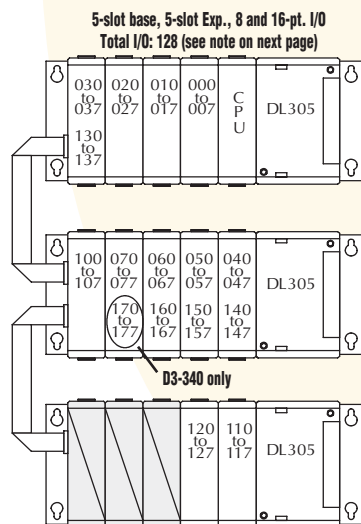
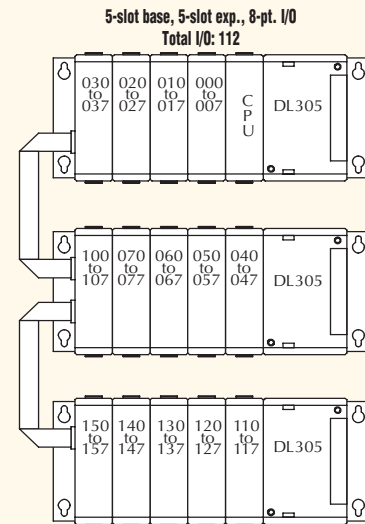
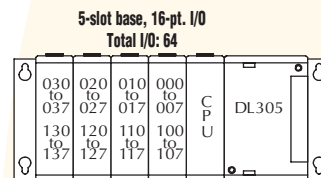
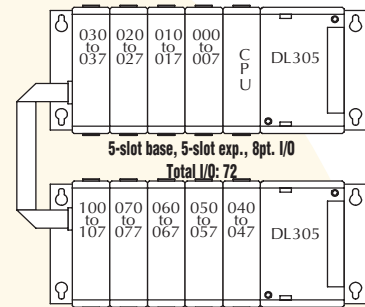
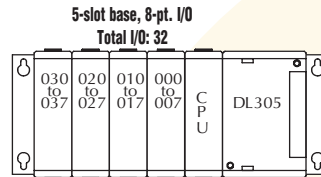
Like the DL205 and DL405 products, the DL305 uses octal addressing. That is, the I/O point addressing does not include any "8s" or "9s". The DL305 is primarily different in that it uses slot addressing. The addresses are assigned to the I/O slots and do not depend on the type of module installed (input 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.



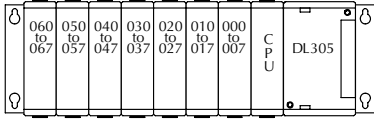
## 5-Slot Base Example Configurations



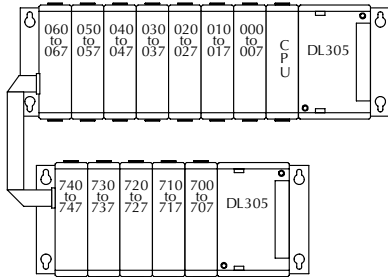
# DL305 Addressing

## 8-slot Base Example Configurations (D3-330/340)

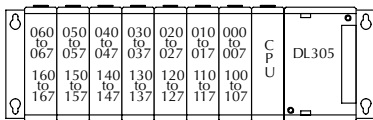
8-slot base, 8-pt. I/O  
Total I/O: 56



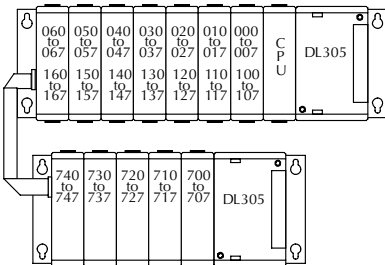
8-slot base, 5-slot expansion, 8-pt. I/O  
Total I/O: 96



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



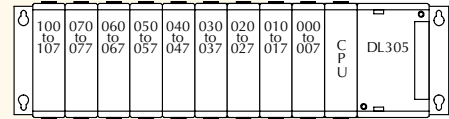
8-slot base, 5-slot expansion, 16-pt. I/O  
Total I/O: 156



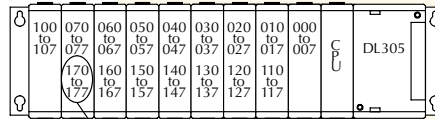
**\*NOTE:** Regardless of base size, if a 16-pt. module is used in Slot 6 for the D3-330 CPU, 160 through 167 will not be available for control-ready assignments. If a 16-pt. module is used in Slot 6 and/or Slot 7 for a D3-340 CPU, 160-167 and/or 170-177 are not available for control relay assignments.

## 10-Slot Base Example Configurations

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

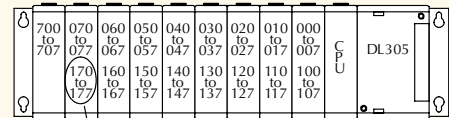


10-slot base, 8-pt. and 16-pt. I/O  
Total I/O: 128 (see note)



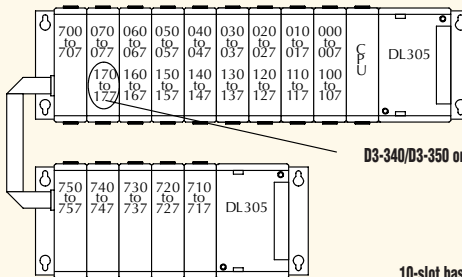
D3-340/D3-350 only

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



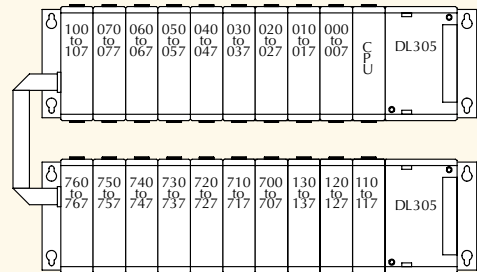
D3-340/D3-350 only

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

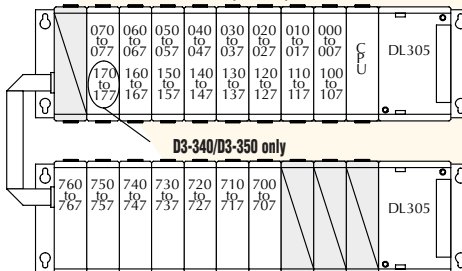


D3-340/D3-350 only

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

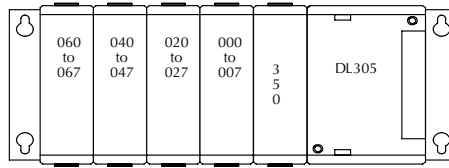
## Using “-1” bases

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.

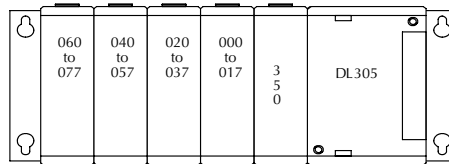
## I/O addressing

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



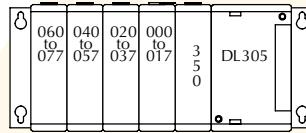
D3-05B-1 base using 16-pt. I/O modules



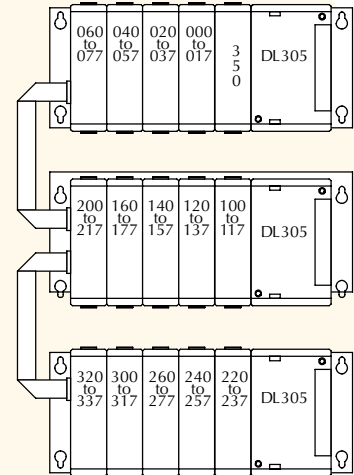
## 5-Slot Base Example Configurations

### -1 bases

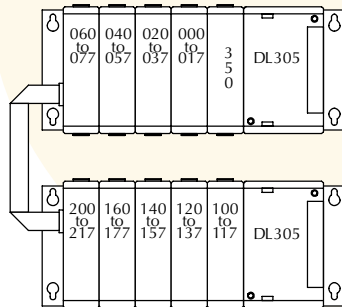
5-slot local  
Total I/O: 64



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

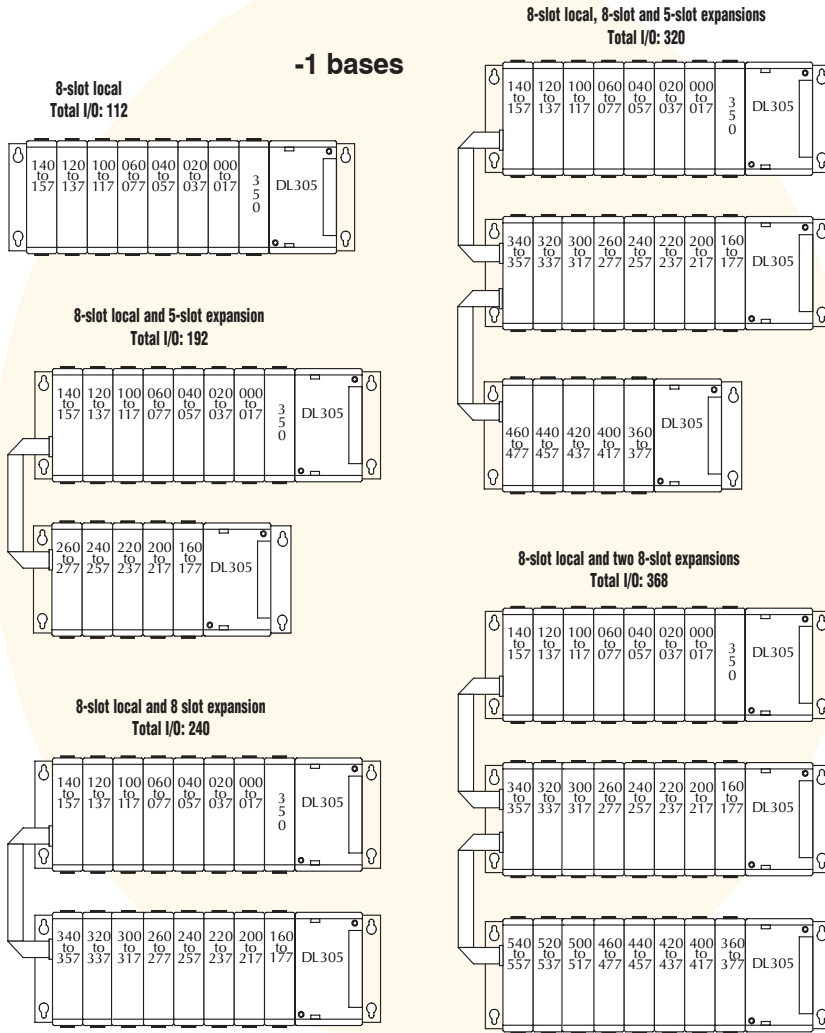


5-slot local and 5-slot expansions  
Total I/O: 144

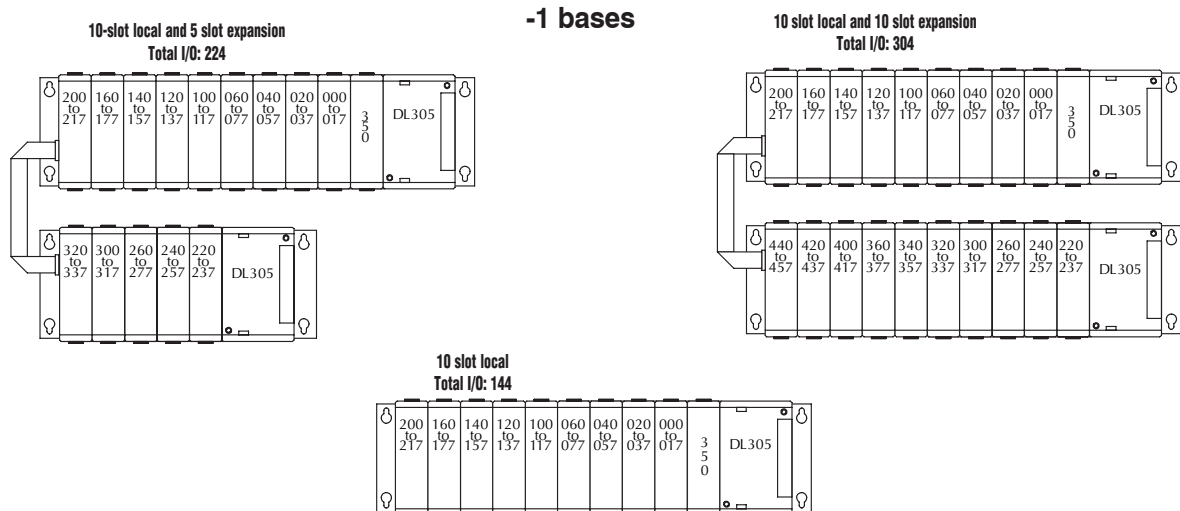


# D3-350 Addressing

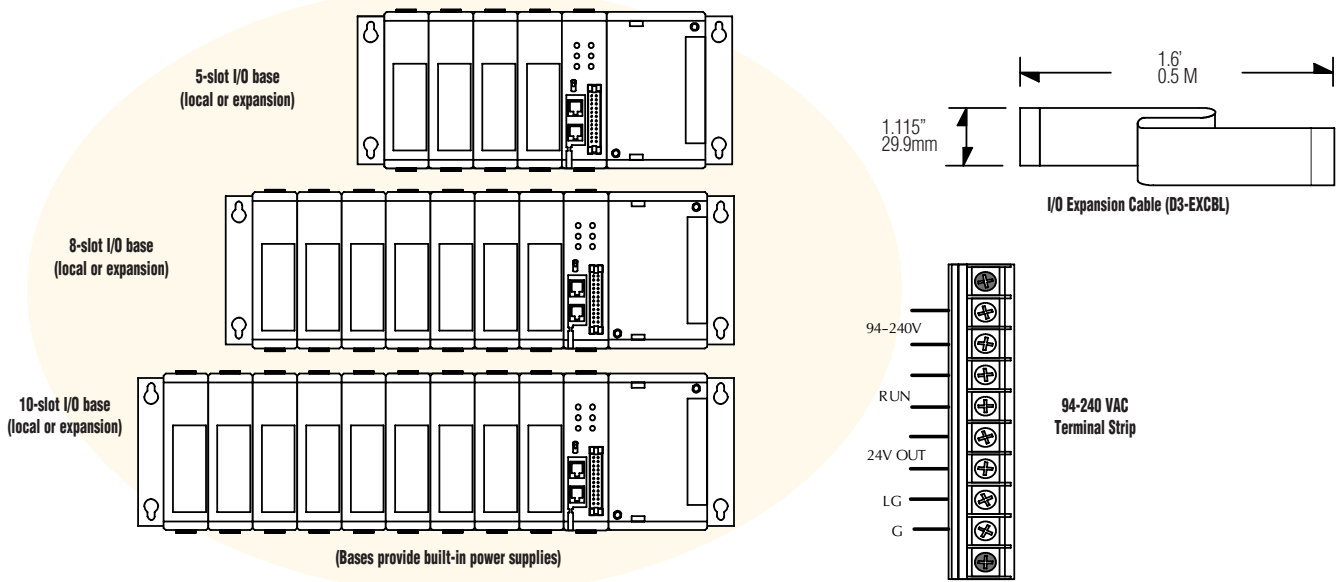
## 8-Slot Base Example Configurations



## 10-Slot Base Example Configurations



# DL305 Base Specifications



	<b>D3-05B-1 \$309.00</b>	<b>D3-05BDC \$332.00</b>	<b>D3-08B-1 \$375.00</b>	<b>D3-10B-1 \$505.00</b>	<b>D3-10BDC \$422.00</b>
<b>Number of Slots</b>	5	5	8	10	10
<b>Local CPU Base</b>	Yes	Yes	Yes	Yes	Yes
<b>Expansion Base</b>	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.
<b>Input Voltage Range</b>	85-264VAC 47-63 Hz	20.5-30VDC <10% ripple	85-264VAC 47-63 Hz	85-264VAC 47-63 Hz	20.5-30VDC <10% ripple
<b>Base Power Consumption</b>	85 VA Max	48 Watts	85VA Max	85VA Max	65 Watts
<b>Inrush Current Max.</b>	30A 1ms	30A	30A 1ms	30A 1ms	30A
<b>Dielectric Strength</b>	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
<b>Insulation Resistance</b>	>10Mohm at 500VDC	>10Mohm at 500VDC	>10Mohm at 500VDC	>10Mohm at 500VDC	>10Mohm at 500VDC
<b>Power Supply Output (Voltage Ranges and Ripple)</b>	(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
<b>5 VDC Current Supplied</b>	.7A	1.4A	1.0A	1.0A	1.4A
<b>9 VDC Current Supplied</b>	2.0A	0.8A	2.0A	2.0A	1.7A
<b>24 VDC Current Supplied</b>	0.5A	0.5A	0.5A	0.5A	0.5A
<b>Auxiliary 24 VDC Output</b>	100mA max	None	100mA max	100mA max	None
<b>Run Relay</b>	250VAC 4A (resistive load)	250VAC 4A (resistive load)	250VAC 4A (resistive load)	250VAC 4A (resistive load)	250VAC, 4A (resistive load)
<b>Fuses</b>	2A (250V) Non-replaceable	4A (250V) User-replaceable D3-FUSE-3 \$27.50	2A (250V) Non-replaceable	2A (250V) Non-replaceable	4A (250V) User-replaceable D3-FUSE-3 \$27.50
<b>Dimensions W/H/D</b>	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)
<b>Weight</b>	37oz. (1050g)	34oz. (964g)	44oz. (1250g)	51.1oz. (1450g)	50.5oz. (1432g)