

# PROGRAMMABLE LOGIC CONTROLLERS

## DL05 : Offers incredible



### Features

The DL05 series PLC offer with features you won't find in most bricks-six I/O combinations of AC,DC and realy I/O, and advance programming function such as PID and drum sequencing.

- Eight input and six output
- 2K program memory
- 4K data memory
- Two communication ports
- 129-instruction,including four PID loops
- Removable terminal block
- Window-based programming software for an additional \$99.00
- 12 / 24VDC powered versions
- Discrete and analog I/O option modules
- Memory cartridge / real-time clock option module
- DeviceNet™ slave option module

## DL06 : Mighty micro with 36 I/O and four expansion slots



### Features

Our new DL06 is our first micro PLC to combine its fixed I/O of 20 input and 16 output with four option card slots for expansion (discrete, analog, communication modules), all in the same package. With the DL06, you can use the same PLC panel layout for all applications from 36 to 100 I/O.

- 20 input and 16 output
- 7.5K program memory
- 7.3K data memory
- Two communication ports,including built-in RS232 / RS422 / RS485 port
- 299 instructions, including eight PID loops and ASCII
- Removable terminal blocks
- Windows-based programming software for an additional \$149.00
- Built-in 3A 24VDC auxiliary power supply for field device
- 12/24VDC powered versions
- Built-in real-time clock/calendar
- Discrete and analog I/O option module
- DeviceNet slave option module
- Optional plug-in LCD display

## DL305 : Stay ahead by building on the past



### Features

The DL305 series is a small modular PLC that has been marketed by various name brand PLC manufacturers for over 19 years. This Koyo design revolutionized the small PLC market, and is still a good performer and great value.

- Three standard CPUs, including the D3-350 with PID control and two communication ports
- Five, eight and 10 slot bases
- 110 / 220VAC or 24 VDC power supply
- AC, DC inputs
- AC, DC and relay outputs
- Eight or 12-bit analog input / output
- Specialty modules include ASCII / BASIC module, high-speed counter,and communication interface module

## DL405 : Our most powerful PLC family



### Features

The DL405 product line packs a lot of power for its size and price. It has the widest variety of I/O modules and configurations of all our PLCs.

Three CPUs from 6.5K memory with 1.664 possible I/O to 30.8K memory with 16.384 possible I/O.

Three base sizes with built-in power supply,including 12/24 VDC,110/220VAC and 125VDC powered bases.

- AC/DC in/out, up to 64 points
- Ten amp realy out
- 12-bit and 16-bit analog input and outputs
- Thermocouple and RTD inputs
- Data communications, including serial and Ethernet modules
- Counter input
- Remote I/O master and slave modules
- Ethernet I/O master and salve modules
- New high-speed counter modules
- 16 PID loops built in, up to 96 with option modules

# PROGRAMMABLE LOGIC CONTROLLERS

## DL205 : The world's most powerful mirco-modular PLC with powerful I/O and communication modules



Four CPUs from 2.4K memory with 128 possible I/O to 30.4K memory with 16,384 possible I/O.  
Four base sizes with built-in power supply, including 12/24 VDC, 110/220VAC and 125VDC powered bases.

### Features

If your application requires the flexibility of a modular control system, a DL205 PLC in the lowest cost, most versatile solution you'll find. Check out all our modules, bases and communication options.

- AC/DC in/out, up to 32 points
- Ten amp realy out
- 12-bit and 16-bit analog input and output
- Temperature inputs (t/c and RTD)
- Data communications, including serial and Ethernet modules
- Counter input / pulse output
- Remove I/O master and slave
- H2-CTRIO, 4-channel high speed counter / pulse output
- H2-EBC, Ethernet slave base controller
- H2-SERIO, triple port serial module for WinPLCs and more!

### Reviewing PLC Capabilities

The following functionality tables (A,B and C) provide an overview of the capabilities of our various *DirectLOGIC* PLC families. When you have identified the type and quantity of I/O devices required by your application, the I/O Availability table shows you which family or families will meet those specifications.

#### A) I/O Availability Check the I/O types supported by the DirectLOGIC PLC families

DL family	CPU / Device	Capacity			Discrete											Analog													
		Local I/O	Mix of I/O (inputs / outputs)	Total possible I/O	DC in / Relay out	DC in / DC out	DC in / AC out	AC in / Relay out	AC in / DC out	AC in / AC out	DC sink / Source in	DC sink in	DC source in	TTL in	DC sink out	DC source out	AC / DC in	AC in / AC out	AC triac out	AC / DC relay out	AC / DC isol. relay out	High speed in	Pulse out	Analog 4-20 in or volt in	Analog isol. in	Analog 4-20 or volt isol out	Analog 4-20 out or volt out	Temperature in	
DL05	DO-05DR	14	8 in/6 out	30	✓									✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-05DD	14	8 in/6 out	30		✓								✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-05DA	14	8 in/6 out	30			✓							✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-05AR	14	8 in/6 out	30				✓						✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-05AD	14	8 in/6 out	30					✓					✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-05AA	14	8 in/6 out	30						✓				✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
DL06	DO-06DD1	36	20in/16out	100		✓								✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-06DD2	36	20in/16out	100			✓							✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-06DR	36	20in/16out	100	✓									✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-06AA	36	20in/16out	100						✓				✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-06DA	36	20in/16out	100			✓							✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	DO-06AR	36	20in/16out	100				✓						✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
DL205	D2-230	256	128in/128out	256	✓									✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	D2-240	256	Any mix	896	✓									✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	D2-250(-1)	256	Any mix	2048	✓									✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
	D2-260	256	Any mix	16,384	✓									✓	✓				✓	✓			✓	✓	✓	✓	✓	✓	✓
DL305	D3-330	168	Any mix	168							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D3-330P	168	Any mix	168							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D3-340	168	Any mix	184							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D3-350	368	Any mix	880							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DL405	D4-430	640	320in/320out	1152							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D4-440	640	320in/320out	1664							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D4-450		1024in/1024out	16,384							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

# PROGRAMMABLE LOGIC CONTROLLERS

## Reviewing PLC Capabilities

The communications table list all the supported protocols and which PLC can communicate using that protocol. You can also see which families support remote I/O, ethernet communications and ASCII coprocessing. Many CPUs and our fixed I/O base units have communications ports built in. The DL 205 family also has a wide variety of Fieldbus slave controllers to integrate our I/O with popular networks such as DeviceNet and Profibus.

### B) Communications

Check the communications types supported by the DirectLOGIC PLC families

Family	CPU	CPU Ports								Specialty Modules																
		K-sequence slave	DirectNet master	DirectNet slave	MODBUS RTU master	MODBUS RTU slave	ASCII out (print)	ASCII in / out	Rs485	Remote I/O master	ETHERNET	SDN	RS232	RS422	ASCII coprocessor	Remote I/O master	Remote I/O slave	Slice I/O master	slice I/O slave	DirectNet master / slave	MODBUS RTU slave	Device net slave	Profibus slave	SDS slave		
DL05	All DL05 models	✓	✓	✓	✓	✓	✓	✓	✓																✓	
DL06	All DL06 models	✓	✓	✓	✓	✓	✓	✓	✓																✓	
DL205	D2-230	✓								✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	*
	D2-240	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	*
	D2-250(-1)	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	*
	D2-260	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*	*	*
DL305	D3-330			✓								✓	✓	✓	✓											
	D3-330-P			✓								✓	✓	✓	✓											
	D3-340		✓	✓		✓						✓	✓	✓	✓											
	D3-350	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓	✓						✓	✓				
DL405	D4-430	✓		✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D4-440	✓		✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D4-450	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

\* These slave modules take the place of a DL205 CPU in any DL205 base populated with i/O, for use with Fieldbus networks.

## Reviewing PLC Capabilities

The Programming table provides a listing of the major program functions. It also shows the amount of memory and instruction capability for each CPU. The programming description below explain the various programming tools that can be used to configure the CPUs.

### C) Programming

Check the programming instructions supported by the DirectLOGIC PLC families

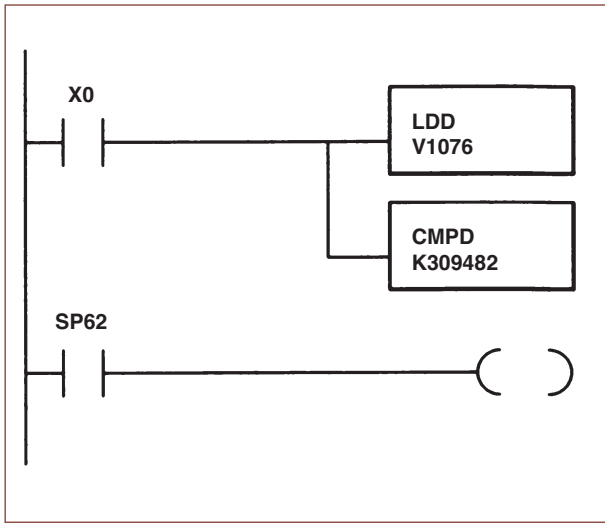
Family	CPU	Instructions														Tools									
		Total Memory	Max. Instructions	Max. Variables	Battery Backup	Run-Time Edit	RLL Plus	Control Relays	Timer / Counters	Immediate I/O	Drums	Subroutines	For / Next Loops	Floating Point Math	PID	Clock / Calendar	Trigonometric Instructions	Full Program PC-PGMSW	Single Family PGM	Site License	OEM License	Handheld Programmer			
DL05	All DL05 models	6.0K	2048	4096	✓*	✓	✓	512	128/128	✓	✓	✓	✓	✓	✓*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DL06	All DL06 models	14.8K	7.5K	7.3K	✓	✓	✓	1024	256/128	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DL205	D2-230	2.4K	2048	256	✓	✓	✓	256	64/64	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D2-240	3.8K	2560	1024	✓	✓	✓	256	128/128	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D2-250 (-1)	14.8K	7680	7168	✓	✓	✓	1024	256/128	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D2-260	30.4K	15.8K	14.6K	✓	✓	✓	2048	256/256	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DL305	D3-330	3.8K	3.7K	128	✓			140	64									✓	✓	✓	✓	✓	✓	✓	✓
	D3-330P	3.8K	3.7K	128	✓		✓	140	64									✓	✓	✓	✓	✓	✓	✓	✓
	D3-340	3.9K	3.7K	192	✓			196	64									✓	✓	✓	✓	✓	✓	✓	✓
	D3-350	14.8K	7680	7168	✓	✓	✓	1024	256/128	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DL405	D4-430	6.5K	3.5K	3.0K	✓	✓	✓	480	128/128	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D4-440	22.5K	15.5K	7.0K	✓	✓	✓	1024	256/128	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	D4-450	30.8K	15.5K*	15.3K	✓	✓	✓	2048	256/256	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

\*Required optional memory card



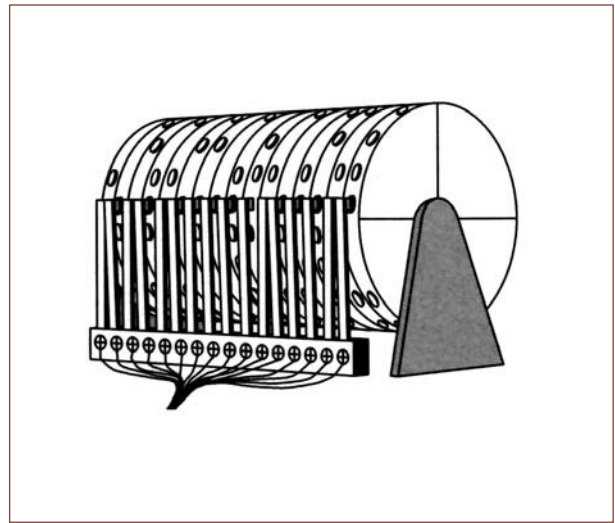
# PROGRAMMABLE LOGIC CONTROLLERS

## Standard RLL Programming



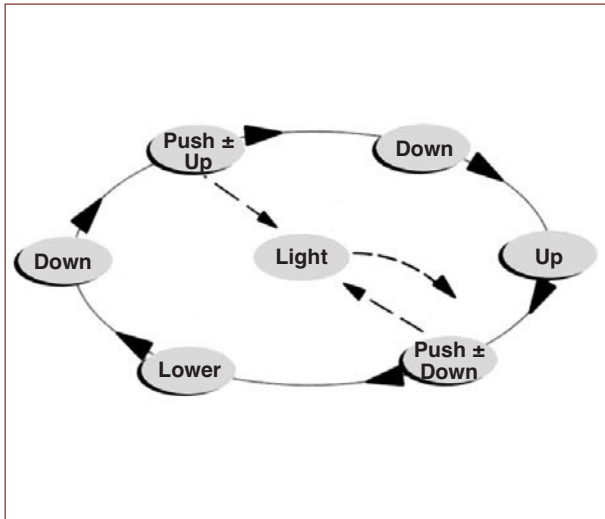
RLL (Relay Ladder Logic) diagram-style programming is the best tool for solving boolean logic and general CPU register / accumulator manipulation. It includes dozens of instructions, which will augment drums, stages, and loops.

## Timer / Event Drum Sequencer



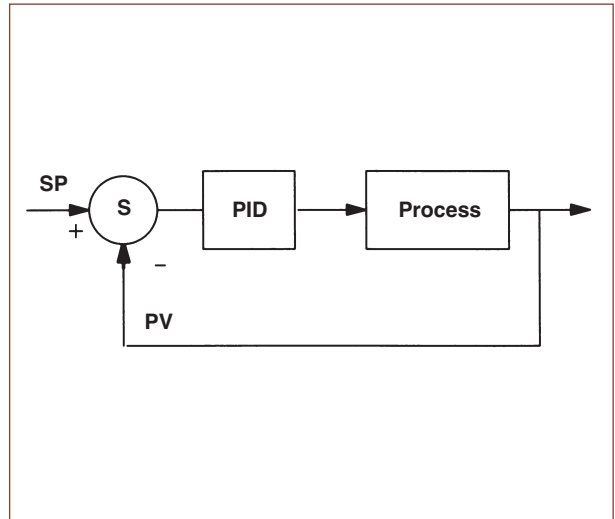
There are four timer / event drum types, each with up to 16 steps. They offer both time and / or event-based step transitions. Drums are best for a repetitive process based on a single series of steps.

## Stage Programming



Stage programming (also called RLL Plus) is based on state-transition diagrams. Stages divide the ladder program into sections which correspond to the states in a flow chart of your process.

## PID Loop Operation



The PID loop operation uses setup tables to configure the loops. Features include : auto tuning, alarms, SP ramp / soak generation, and more.

# PROGRAMMABLE LOGIC CONTROLLERS

## Part Numbering System

### Our brand name - DirectLOGIC

We use the brand name "DirectLOGIC" for all of our PLC products. Many first time customers get confused by our use of the brand name abbreviation "DL". This is especially true when we're making product family or CPU references such as "DL205 System". We'll use the term "DL205" as a generic term for the DL205 family of products.

### DL05, DL06

These families use a part numbering scheme that is very similar to our other products. However, since that I/O points in the base unit are always fixed, we do not include this information in our part number. The table below will help you understand the numbering scheme used for the DL05, DL06 families.

<b>Product Family</b>		D0-	06DR	-D
Product family is:	D0 (DL05 or 06)			
<b>CPU</b>				
Type of CPU is:	05, 06,			
<b>Input Type</b>				
AC	A			
DC	D			
<b>Output Type</b>				
AC	A			
DC	D			
Relay	R			
<b>Power Supply Type</b>				
AC	No suffix used			
DC	D			

### DL205, DL305 and DL405

Our modular product families offer a considerable number of products and therefore use a slightly more complex part numbering system (see table at right). Our part numbering scheme may help you quickly identify key product characteristics just by examining the part number. This may also help you to find the products you need in the price list, or in the PLC technical sections of this desk reference.

<b>CPUs - Specialty CPUs</b>									
Product family	D2/F2/H2 D3/F3 D4/F4/H4								
Class of CPU/abbreviation	230...330...430...								
Denotes a differentiation between similar modules	-1, -2, -3, -4								
<b>Bases</b>									
Product family	D2 D3 D4								
Number of slots	##B								
Type of base	DC (blank for AC)								
Denotes a differentiation of voltage or features	-1, -2								
<b>Discrete I/O</b>									
Product family	D2/F0 D2/F2 D3/F3 D4/F4								
Number of points	04/08/12/16/32/64								
Input	N								
Output	T								
Combination	C								
AC	A								
DC	D								
Either	E								
Relay	R								
Current sinking	1								
Current sourcing	2								
Current sinking/sourcing	3								
High current	H								
Isolation	S								
Fast I/O	F								
Denotes a differentiation between similar modules	-1, -2, -3, -4								
<b>Analog I/O</b>									
Product family	F0 D2/F2 D3/F3 D4/F4								
Number of channels	02/04/08/16								
Input (analog to digital)	AD								
Output (digital to analog)	DA								
Isolated	S								
Denotes a differentiation between similar modules	-1, -2, -3, -4								
<b>Communications / Networking, Special I/O and Devices Programming</b>									
Product family	D0 D2/F2/H2 D3/F3 D4/F4/H4								
Name abbreviation	See examples at right								
<b>CoProcessors and ASCII BASIC Modules</b>									
Product family	D2/F2 D3/F3 D4/F4								
CoProcessor	CP								
ASCII BASIC	AB								
64K memory	64								
128K memory	128								
512K memory	512								
Telephone modem	T								

D4 440DC -1

D2 06B DC -1

D4- 16 N D 2 F

D3- 16 N D 2 F -1

F3- 04 AD S -1

F3- 08 THM -0

D4- DCM  
D3- HSC  
H2- ECOM

F4- CP 128 -T

Alternate example of analog I/O using abbreviations. Note: Replace -n with their respective couple types: J, K, T, R, S or E

Examples:  
HSC (High Speed Counter)  
DCM (Data Communication Module)  
ECOM (Ethernet Communications Module)



# PROGRAMMABLE LOGIC CONTROLLERS

## Micro PLCs With Incredible Features

### Both The DL05 and DL06 features:

#### Discrete on / off control

- AC,DC sink/source and realy I/O available
- 16 model total, in both AC and DC-powered units
- Panel mount and DIN-rail mounting for all units
- Removable terminal blocks (standard)
- Built-in high-speed I/O for simple single axis motion applications

#### Analog control

- Four choices of analog I/O option cards compatible or both DL05 and DL06
- PID with auto-tune (standard on all models)
- Analog I/O is jumper range selectable
- Removable terminal blocks for easy wiring and setup

#### Communication and networking

- Two serial communication ports (standard on all model)
- Modbus master / slave (standard on Port 2 of all models)
- DeviceNet slave option card (\$75.00) compatible with all models

The DL06 includes 36 integrated discrete I/O points (20 inputs / 16 outputs). Four option card slots support up to 24 analog channels or up to 64 additional discrete points. It also includes high-speed counting, pulse output and RS232 / 422 / 485 communication on MODBUS RTU Master / Slave, or use the powerful ASCII In / Out instruction, 8 PID loops, and more.

The DL05 includes 14 integrated discrete I/O points (8 inputs / 6 outputs). One option card slot can support an analog module, discrete module, memory cartridge or DeviceNet Slave module. It also includes integrated features like high-speed counting, pulse output, two communication ports for Modbus RTU Master / Slave, 4 PID loops, and more.

## Option cards expand your I/O count and your choices

The DL05 can expand up to 30 I/O points and the DL06, up to 100 I/O points.

#### Option include :

- Nine discrete I/O cards : DC in, DC out, DC in/out, relay out
- Four analog I/O cards : four channel current in, two channel in / two channel out voltage, four channel in / two channel out current and four channel in / two channel out voltage
- All modules have removable terminal blocks
- 16-pt. modules are ZIPLink compatible (SeeZIPLink section for our "five-second wiring solution".)



The DL05 and the new DL06 are a family of micro PLCs designed to fit more application that any other PLC family in their class.

Starting with the DL05 at 8 input / 6 output,all the way up to the fully expanded 100 I/O DL06, these PLCs are a standard that can grow with the changing needs of your machine or process control application.

