D2-230/240 Key Features

D2-240 CPU

D2-240: for basic applications

The D2-240 provides a subset of the D2-250-1's capabilities. If you need a good CPU with multiple communications ports, and complex math or PID isn't required, then the D2-240 is the CPU for you!

Built-in memory

There is 2.5K of EEPROM program memory in the D2-240. No additional memory is required.

If you have critical data stored in the capacitor backed V-memory, simply purchase the optional lithium battery (D2-BAT) to permanently maintain these parameters as well.

Powerful instructions

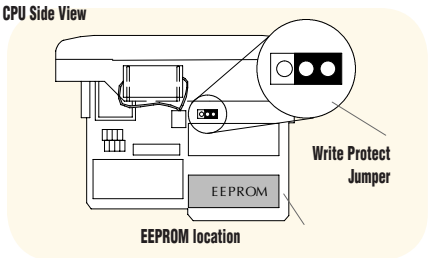
The D2-240 instructions cover most of the capability of our more powerful D2-250-1, and allow you to cover a wide variety of applications. Instructions include Boolean logic, data manipulation, integer math, interrupts, subroutines, FOR/NEXT loops, etc. For a complete list of instructions, see the back of this section.

Two built-in RS-232 communications ports

The D2-240 offers two communication ports. The top port can be used for a direct connection to a personal computer for programming, to our handheld programmer, C-more, or to the DV-1000. The bottom port is a slave-only port and supports our DirectNET™ or K-sequence protocol at speeds up to 19.2 Kbaud. If you're using an operator interface or if you plan on connecting the system to a network later on, then you can choose the D2-240. The D2-240 also supports the D2-DCM Data Communication Module and the H2-ECOM Ethernet Communication Modules.

DL205 spare EEPROM chips

There may be cases where you want to have a spare EEPROM chip available. For example, maybe you need to upgrade a customer's machine with your latest enhancements. You can purchase extra EEPROM chips (two per pack). These can be installed in the CPU (D2-230/D2-240 only) and programmed, or they can be programmed directly with the DL205 handheld programmer.



EEPROM	D2-EE-1	D2-EE-2
CPU	*D2-230*	*D2-240*
CPU Program Storage Capacity	2.0K	2.4K
Writing Cycle Life	10,000	10,000
Write Inhibit	CPU jumper	CPU jumper
Memory Clear Method	Electrical	Electrical

D2-230 CPU

D2-230: our lowest price DL205 CPU

The D2-230 is our most economical CPU in the DL205 product family. If you are looking at the DL205 primarily because of the size, or for other reasons that don't require lots of CPU horsepower, then give the D2-230 a try.

Built-in EEPROM memory

There is 2.0K of EEPROM program memory in the D2-230. No additional memory is required.

If you have critical data stored in the capacitor-backed V-memory, simply purchase the optional lithium battery (D2-BAT) to permanently maintain these parameters as well.

One built-in communications port

The D2-230 has only one communication port. If you are considering any network connections in the future, you will need the D2-240, D2-250-1 or D2-260 CPU. The extra port may be worth the cost, especially during machine startup or troubleshooting sessions. The D2-230 does not support the Ethernet or Data Communications modules.

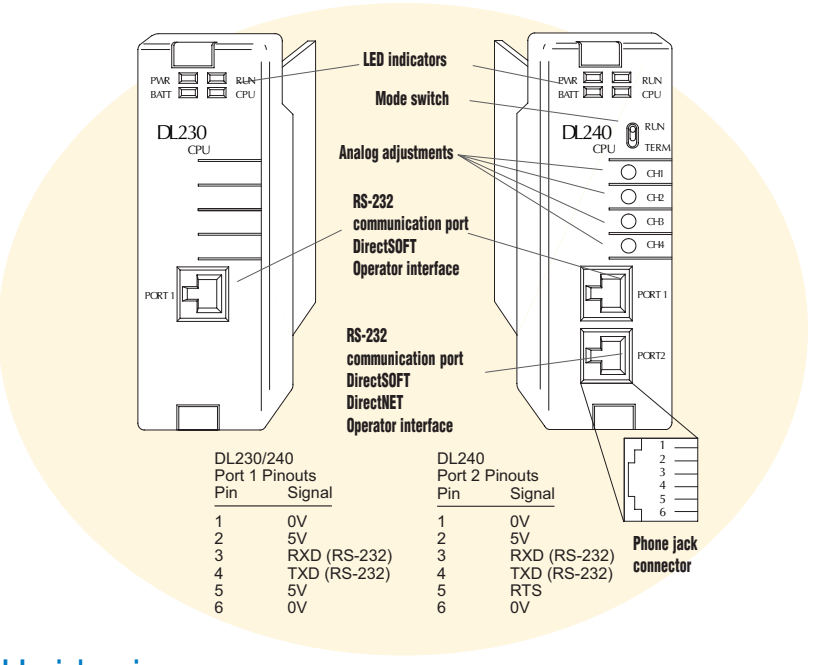
Basic instruction set

The D2-230 provides a subset of the D2-240's well-rounded instructions. The D2-230's instructions cover basic Boolean and simple integer math.

D2-230/240 Key Features

The diagram to the right shows the various hardware features found on the D2-230 and D2-240 CPUs.

CPU Status Indicators		
RUN	ON	CPU is in RUN mode
	OFF	CPU is in PROGRAM mode
BATT	ON	Battery backup voltage is low
	OFF	Battery backup voltage is OK or disabled
CPU	ON	CPU internal diagnostics detects error
	OFF	CPU is OK
PWR	ON	CPU power good
	OFF	CPU power failure
Mode Switch (D2-240 only)		
RUN		Puts CPU into RUN mode
TERM		Allows peripherals (HPP, *Direct*SOFT) to select the mode of operation
Port 1		
Protocols		K-sequence slave
Devices		Can connect w/HPP, *Direct*SOFT™, *C-more*, DV-1000
Specs.		6P6C phone jack connector RS-232 9,600 baud Fixed address Odd parity only 8 data bits, one start, one stop asynchronous, half-duplex, DTE
Port 2 (D2-240 only)		
Protocols		K-sequence slave, *Direct*NET slave
Devices		Can connect w/many devices, such as PCs running *Direct*SOFT, DSData, HMI packages, *C-more*, DV-1000, or any *Direct*NET master
Specs.		**6P6C phone jack connector 300/600/1200/2400/4800 9600/19.2k baud Odd or no parity Selectable address (1-90, HEX 1 – 5A) 8 data bits, one start, one stop Asynchronous, Half-duplex, DTE**
Battery (Optional)		
D2-BAT		CR14250SE
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.		



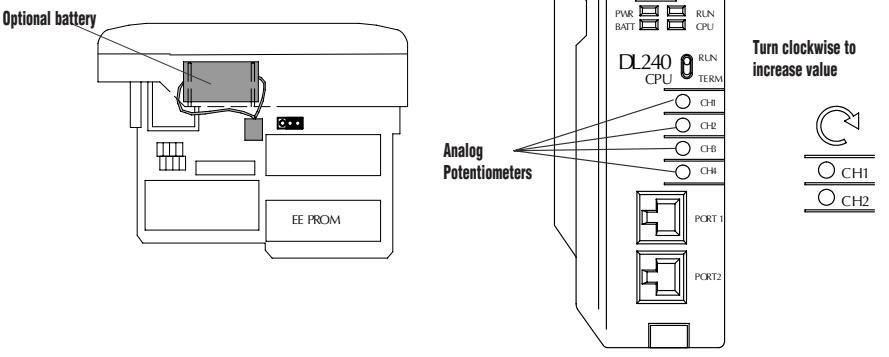
DL230/240 Port 1 Pinouts

Pin	Signal
1	0V
2	5V
3	RXD (RS-232)
4	TXD (RS-232)
5	5V
6	0V

DL240 Port 2 Pinouts

Pin	Signal
1	0V
2	5V
3	RXD (RS-232)
4	TXD (RS-232)
5	RTS
6	0V

CPU side view



Four external potentiometers for adjustments

There are four potentiometers on the face plate of the D2-240 CPU. They have a resolution of 256 steps and can be used to externally adjust four predefined V-memory locations inside the D2-240 CPU. You specify upper and lower limits for the values and the CPU takes care of the rest!

DL205 CPU Specifications

DL205 CPU Comparison

System Capacity	*D2-230*	*D2-240*	*D2-250-1*	*D2-260*
Total memory available (words)	2.4K	3.8K	14.8K	30.4
Ladder memory (words)	2048 EEPROM	2560 EEPROM	7680 Flash	15872 Flash
V-memory (words)	256	1024	7168	14592
Battery backup	Yes	Yes	Yes	Yes
Total CPU memory I/O pts. available *(actual I/O pts. depend on I/O configuration method selected)*	256	896 (320 X + 320 Y + 256 CR)	2048 *(512 X + 512 Y + 1024 CR)*	8192 *(1024 X + 1024 Y + 2048 CR + 2048 GX + 2048 GY)*
Local I/O (pts.)	256	256	256	256
Local Expansion I/O (pts.)	none	none	768 (2 exp. bases max) *(Including local I/O)*	1280 (4 exp. bases max.) *(Including local I/O)*
Serial Remote I/O (pts.)	N/A	896 max. *(Including local I/O)*	2048 max. *(Including local and exp.I/O)*	8192 max. *(Including local & exp. I/O)*
Remote I/O channels	N/A	2	8 (7+1 CPU port)	8 (7+1 CPU port)
I/O per remote channel	N/A	2048 *(limited to 896)*	2048	2048
Ethernet Remote I/O	N/A	Yes	Yes	Yes
Discrete I/O pts.	N/A	896 max. *(Including local I/O)*	2048 max. *(Including local and exp.I/O)*	8192 *(Including local and exp.I/O)*
Analog I/O channels	N/A	Map into V-memory	Map into V-memory	Map into V-memory
Remote I/O channels	N/A	Limited by power budget	Limited by power budget	Limited by power budget
I/O per remote channel	N/A	16,384 *(limited to 896)*	16,384 (16 fully expanded H4-EBC slaves using V-memory and bit-of-word instructions)	16,384 (16 fully expanded H4-EBC slaves using V-memory and bit-of-word instructions)
Performance				
Contact execution (Boolean)	3.3µs	1.4µs	0.61µs	0.61µs
Typical scan (1K Boolean)	4-6ms	10-12ms	1.9ms	1.9ms
Programming and Diagnostics				
RLL Ladder Style	Yes	Yes	Yes	Yes
RLL^{PLUS}/Flowchart Style (Stages)	Yes/256	Yes/512	Yes/1024	Yes/1024
Run time editing	Yes	Yes	Yes	Yes
Supports Overrides	No	Yes	Yes	Yes
Variable/fixed scan	Variable	Variable	Variable	Variable
Instructions	113	129	174	231
Control relays	256	256	1024	2048
Timers	64	128	256	256
Counters	64	128	128	256
Immediate I/O	Yes	Yes	Yes	Yes
Subroutines	No	Yes	Yes	Yes
For/Next loops	No	Yes	Yes	Yes
Timed Interrupt	No	Yes	Yes	Yes
Integer Math	Yes	Yes	Yes	Yes
Floating-point Math	No	No	Yes	Yes
Trigonometric functions	No	No	No	Yes
Table Instructions	No	No	No	Yes
PID	No	No	Yes, 4 loops	Yes, 16 loops
Drum Sequencers	No	No	Yes	Yes
Bit of Word	No	No	Yes	Yes
ASCII Print	No	No	Yes	Yes
Real-time clock/calender	No	Yes	Yes	Yes
Internal diagnostics	Yes	Yes	Yes	Yes
Password security	Yes	Multi-level	Multi-level	Multi-level
System and user error log	No	No	Yes	Yes
Communications				
Built-in ports	Port 1 RS-232	Port 1 RS-232 and Port 2 RS-232	Port 1 RS-232 and Port 2 RS-232/422	Port 1 RS-232 and Port 2 RS-232/422/485)
K-sequence (proprietary protocol)	Yes	Yes	Yes	Yes
*Direct*NET™	No	Yes	Yes	Yes
Modbus RTU master/slave	No	No	Yes	Yes
ASCII communications	No	No	OUT	IN/OUT
Maximum baud rate	9600	19.2K port 2	38.4K port 2	38.4K port 2