

DL405 Family of Products

This page provides an overview of the variety of products found in the DL405 family.

CPUs

D4-454 – 110/220 VAC P/S

D4-454DC-1 – 24 VDC P/S
30.8K total memory
16 PID loops with auto-tune

D4-450 – 110/220 VAC P/S

D4-450DC-2 – 125 VDC P/S
30.8K total memory
(7.5K built-in flash program memory or use optional memory cartridge)
16 PID loops with auto-tune

D4-440 – 110/220 VAC P/S
22.5K total memory
(memory cartridge required)

D4-440DC-1 – 24 VDC P/S
22.5K total memory
(memory cartridge required)

Memory cartridges

UVPROM - 15.5K (D4-UV-2)

EEPROM - 15.5K (D4-EE-2)

Programming

DirectSOFT Programming for Windows
(PC-DSOFT6)
Handheld programmer (D4-HPP-1)

Bases

4-slot base (D4-04B-1)

6-slot base (D4-06B-1)

8-slot base (D4-08B-1)

Local expansion base power supplies

110/220 VAC P/S (D4-EX)

24 VDC P/S (D4-EXDC)

Discrete input modules

DC input

8-point 24-48 VDC (D4-08ND3S)

16-point 12-24 VDC (D4-16ND2)

16-point 12-24 VDC (1 ms response)
(D4-16ND2F)

32-point 24 VDC (D4-32ND3-1)

64-point 20-28 VDC (D4-64ND2)

AC input modules

8-point 110/220 VAC (D4-08NA)

16-point 110 VAC (D4-16NA)

AC/DC input modules

8-pt 90-150 VAC/DC (isolated)
(F4-08NE3S)

16-pt 12-24 VAC/DC (D4-16NE3)

Discrete output modules

DC output modules

8-point 24-150 VDC (F4-08TD1S)

16-point 5-24 VDC (D4-16TD1)

16-point 12-24 VDC (D4-16TD2)

32-point 5-15 VDC (D4-32TD1-1)

32-point 5-26 VDC (D4-32TD1)

32-point 12-24 VDC (D4-32TD2)

64-point 5-26 VDC (D4-64TD1)

AC output modules

8-point 18-220 VAC (D4-08TA)

16-point 18-220 VAC (D4-16TA)

Relay output modules

8-point 2A (D4-08TR)

8-point 5A/pt (isolated)
(F4-08TRS-2)

8-point 10A/pt (isolated)
(F4-08TRS-1)

16-point 1A/pt (D4-16TR)

Analog modules (12-bit)

Analog input

4-channel in, current/voltage (F4-04AD)

4-channel in, current/voltage (isolated)
(F4-04ADS)

8-channel in, current/voltage (F4-08AD)

16-channel in, current (F4-16AD-1)

16-channel in, voltage (F4-16AD-2)

Analog output

4-channel out, current (F4-04DA-1)

4-channel out, voltage (F4-04DA-2)

8-channel out, current (F4-08DA-1)

8-channel out, voltage (F4-08DA-2)

16-channel out, current (F4-16DA-1)

16-channel out, voltage (F4-16DA-2)

Temperature Input

8-channel in, type J thermocouple
(F4-08THM-J)

8-channel in, type K thermocouple
(F4-08THM-K)

8-channel in, type T thermocouple
(F4-08THM-T)

Analog modules (16-bit)

Temperature Input

8-channel in, RTD (F4-08RTD)

8-channel in, thermocouple (F4-08THM)

Analog output

4-channel out, current (isolated)
(F4-04DAS-1)

4-channel out, voltage (isolated)
(F4-04DAS-2)

Communications/networking modules

Ethernet communications
[H4-ECOM100]

Data communications (D4-DCM)

Modbus master (F4-MAS-MB)

Specialty modules

8-point interrupt input (D4-INT)

High-speed counter I/O (H4-CTRIO)

8-point magnetic pulse input (F4-8MPI)

16-loop PID (w/ software) (F4-16PID)

8/16 channel input simulator (D4-16SIM)

4-loop temperature controller (F4-4LTC)

BASIC CoProcessor module

128K triple port (F4-CP128-1)

CPU-Slot slave controllers

Ethernet base controller (H4-EBC)

Remote I/O modules

Ethernet

Ethernet remote Master Module
(H4-ERM100)

Ethernet base Controller (Slave)
(H4-EBC)

Remote I/O protocol (serial)

Remote I/O Master Module (D4-RM)

Remote I/O Slave 110/220VAC (D4-RS)

Remote I/O Slave 24VDC (D4-RSDC)

DL405 CPUs

System capacity

System capacity is the ability of the CPU to accommodate a variety of applications. Here are a few key considerations when determining system capacity:

How much memory do you need?

Consider both ladder memory and data registers (V-memory). For ladder memory, most boolean instructions require one word. Some other instructions, such as timers, counters, etc., require two or more words. Our V-memory locations are 16-bit words and are useful for data storage, etc.

What type of memory do you need? The D4-440 requires a memory cartridge, and you have a choice of several sizes and memory types. The D4-450 has 7.5K of built-in flash ladder memory, but you can also use a memory cartridge instead of the built-in memory. The D4-454 has 15.5K of built in M-RAM ladder memory and no memory cartridge is needed.

How many I/O points are required?

You will need to know how many field devices are required. Each CPU supports a different amount of local, expansion, and remote I/O. Check the Specifications tables on the next page to determine which CPU meets your application requirements.

Are there any remote I/O points? In many applications, the wiring cost of bringing the individual control wiring back to the PLC control panel can be reduced by the use of remote I/O. All DL405 CPUs can support remote I/O. The D4-454 and D4-450 CPUs have built-in serial remote I/O connections on the bottom 25-pin port; or use Ethernet Remote I/O for fast and easy set-up and communications.

Performance

If you have a time-critical application where every millisecond is important, then choose the CPU with the fastest overall scan time. For applications that only require boolean instructions (contacts and coils), the D4-440 is the fastest. However, if you use a few simple math or data instructions, then choose the D4-454 or D4-450. The D4-454 and D4-450 are considerably faster at performing even the most basic of math or data instructions and will provide a faster overall scan time.

Programming and diagnostics

Our CPUs offer a wide array of instructions and diagnostic features that can save you many hours of program and debug time. From basic boolean contact logic to PID and floating point math, we have it covered! For D4-454 and D4-450 CPUs, IBox programming instructions simplify complex tasks with instructions such as Memory, Discrete Helper, Analog Helper, Math, Communications, and CTRIO. The chart on the next page lists the instructions by category and identifies which CPUs support each group. Beginning on page tDL4-82, you will find a detailed list showing the name and function of each instruction.

Built-in CPU communications

Every DL405 CPU provides at least two built-in communications ports. Each DL405 CPU supports our *DirectNET* protocol on the bottom port for easy, economical networking. Need Modbus RTU? Then, check our D4-454 or D4-450 CPUs, which have built-in Modbus RTU Master and Slave capability. Of course, we also offer a wide array of communications, such as our Ethernet Communications Module, Data Communications Module and Modbus Master module.

Specialty I/O modules

In addition to our cost-effective discrete and analog I/O, we also offer specialty modules to solve the really tough applications. The D4-440 only supports specialty modules in the local base (CPU base). Our D4-454 and D4-450 CPUs support specialty modules in the local CPU base, and they can also support selected specialty modules in expansion bases.

D4-450 and D4-454 Differences		
Differences	D4-450	D4-454
Total Memory	22.8K/30.8K	46.8K
Ladder Memory	7.5K/15.5K	31.5K
DirectSOFT	Yes	Yes, version 6.1 or later
Memory Cartridge	Yes	No, (same amount of memory as the largest memory cartridge)
Battery	D3-D4-BAT	D2-BAT-1 (CR2354)
Mode Switch	Keyswitch	Toggle Switch (Same position/function)
Port 1 and 3 Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400	2400, 4800, 9600, 19200, 38400
Port 1 and 3 Settings	8 data bits, 1 start bit, 1 stop bit, Odd, Even or No parity 7 data bits, 1 start bit, 1 stop bit, No parity	8 data bits, 1 start bit, 1 stop bit, Odd, Even or No parity
Port 2 Protocol	DirectNet (master/slave), K-sequence, Non-procedure	DirectNet (master/slave), K-sequence, Non-procedure, Modbus RTU (master/slave)
Firmware Update	Port 1 only	Supported from all ports

D4-454 Unsupported Modules Table	
Bases	Retired
D4-04B, D4-04BNX	Yes
D4-06B, D4-06BNX	Yes
D4-08B, D4-08BNX	Yes
Input Modules	
D4-32ND3-2	Yes
D4-16NA-1	Yes
Output Modules	
D4-08TD1	Yes
Comm Modules	
H4-ECOM	Yes
Remote I/O Modules	
D4-ERM	Yes
D4-ERM-F	—
Specialty Modules	
D4-PULS	Yes
D4-INT	Yes
F4-CP128-R	Yes
F4-CP512-1	Yes