DL05/06 CoProcessor Module

Triple-port BASIC CoProcessor
F0-CP128

Overview

The BASIC CoProcessor Module interfaces the DL05/06 family of programmable controllers with bar code readers, operator interface terminals, instrumentation equipment, computers and other serial devices.

BASIC CoProcessor applications

BASIC CoProcessors are designed for use with intelligent devices such as:

- Bar code readers
- Welders
- Board level controllers
- Serial printers
- Intelligent sensors
- Almost any device with an RS-232 or RS-485 port

They are also good solutions for applications requiring complex math, such as floating point math, sine, cosine, tangent, exponential, square roots, etc.

Features

- FACTS Extended BASIC and ABM Commander for Windows software for IBM PCs makes program development fast and simple. (The software is included with the CoPro module on CD-ROM). It allows online, full-screen BASIC program editing and the ability to upload/download programs on disk. The included CD has Modbus master and slave BASIC programs and other application examples.
- Non-volatile memory of up to 128K allows multiple program storage and execution, DL05/06 register expansion, and retentive data storage and retrieval.
- 100 MHz BASIC CoProcessor provides fast program execution independent of the CPU scan.
- Three buffered ports permit communication from the module to three external devices.
- The module is programmable from port 1 or 3 for complete serial port utilization without switching cables.
- A real-time clock/calendar maintains time/date with battery backup when power outages occur.
- Programmable time based BASIC interrupts to 5ms.
- Direct access of up to 256 bytes of DL05/06 CPU memory per scan is possible. No supporting ladder logic is required.
- Floating point math solves complex formulas to eight significant digits.
- An RJ12 Port 1 and Port 3 splitter, included with the module, provides easy connection of RS-232 cables to both Port 1 and Port 3. (If you are using RTS1 and CTS1 for port 1, then port 3 is not available.)

Included with CoPro

The following items are included with the F0-CP128 module:

- ABM Commander CD-ROM
- 7 ft. 6P6C-to-6P6C cable (phone-style RJ12 connectors)
- 9-pin D-sub connector (9-pin female to RJ12) to adapt to PC comm port
- RJ12 port splitter
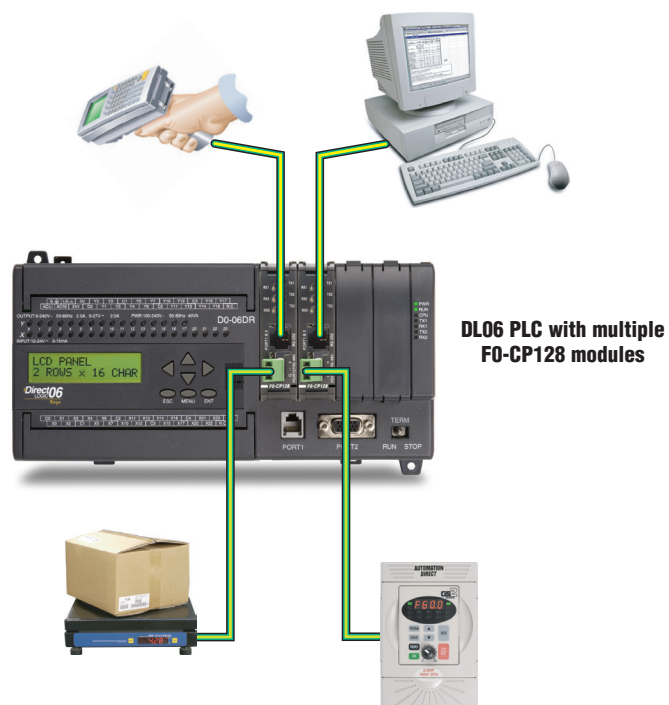
DL06 PLC with multiple F0-CP128 modules

DL05/06 CoProcessor Module

Triple-Port BASIC CoProcessor Module Specifications	
Module Type	CoProcessor™, Intelligent
Modules per CPU	DL05: one; DL06: up to four
Communication	256 character type-ahead input buffer on all ports. Ports are independently programmed by software. Seven or eight data bits, one or two stop bits, even, odd, or no parity. XON/XOFF software flow control and RTS/CTS handshake.
Clock Speed	100MHz
User Memory	128K total (64K data, 64K program) non-volatile; Real time battery backed calendar/clock
F0-CP128 Ports	Port 1: RS-232 512K baud maximum Port 2: RS-485, 512K baud maximum Port3*: RS-232, 115.2K baud max. ***Port 3 physically located in the same RJ12 jack as Port 1 (RS-232). Port 3 uses the RTS1/CTS1 pins on that jack. If you use these lines for other purposes (e.g. hardware handshaking on Port 1), then Port 3 cannot be used.**
ABM Commander for Windows (CD included with module)	Standard programming/documentation software for IBM PCs is shipped with each coprocessor module Key features include: • Runs under Windows 98/ME/2000/XP • On-line full-screen BASIC program editing (similar to GW Basic, with industrial application enhancements added for easier programming) • Internal Editor for block copy, block move, search and replace • Text upload and download BASIC programs on disk • Binary upload and download BASIC programs and data on disk • Download control statement allows multiple programs to be downloaded and saved with one download file. • CD includes Modbus master and slave BASIC programs and other application examples
Field Termination	One RJ12 jack: Port 1 and 3 RS-232; One three-position removable terminal block: Port 2 RS-485
Indicator LEDs	RX1, TX1, RX2, TX2, RX3 (CTS1), TX3 (RTS1)
Power Consumption	150mA @ 5VDC
Operating Environment	0ºC - 60ºC (32ºF - 140ºF), 5% to 95% humidity (non-condensing)
Manufacturer	FACTS Engineering

CPU	Firmware Required	DirectSOFT Required
DL05	Version 5.00 or later	Version 3.0c or later
DL06	Version 1.90 or later	Version 4.0, Build 16 or later

Power Budgeting for the DL06

The DL06 has four option module slots. To determine whether the combination of modules you select will have sufficient power, you will need to perform a power budget calculation.

Power supplied

Power is supplied from two sources: the internal base unit power supply and, if required, an external supply (customer furnished). The D0-06xx (AC powered) PLCs supply a limited amount of 24VDC power. The 24VDC output can be used to power external devices.

For power budgeting, start by considering the power supplied by the base unit. All DL06 PLCs supply the same amount of 5VDC power. Only the AC units offer 24VDC auxiliary power.

Be aware of the trade-off between 5VDC power and 24VDC power. The amount of 5 VDC power available depends on the amount of 24VDC power being used, and the amount of 24VDC power available depends on the amount of 5VDC power consumed. Determine the amount of internally supplied power from the table to the right.

Power required by base unit

Because of the different I/O configurations available in the DL06 family, the power consumed by the base unit itself varies from model to model. Subtract the amount of power required by the base unit from the amount of power supplied by the base unit. Be sure to subtract 5VDC and 24VDC amounts.

Power required by option modules

Next, subtract the amount of power required by the option modules you are planning to use. Again, remember to subtract both 5VDC and 24VDC.

If your power budget analysis shows surplus power available, you should have a workable configuration.

DL06 Power Supplied by Base Units

Part Number	5 VDC (mA)	24 VDC (mA)
D0-06xx	1500mA	300mA
	2000mA	200mA
D0-06xx-D	1500mA	none

DL06 Base Unit Power Required

Part Number	5 VDC (mA)	24 VDC (mA)
D0-06AA	800mA	none
D0-06AR	900mA	none
D0-06DA	800mA	none
D0-06DD1	600mA	280mA*
D0-06DD2	600mA	none
D0-06DR	950mA	none
D0-06DD1-D	600mA	none
D0-06DD2-D	600mA	none
D0-06DR-D	950mA	none

* Only if auxiliary 24VDC power is connected to V+ terminal.

DL06 Power Consumed by Other Devices

Part Number	5 VDC (mA)	24 VDC (mA)
D0-06LCD	50mA	none
D2-HPP	200mA	none
DV-1000	150mA	none
C-more Micro-Graphic	210mA	none

Power Budgeting Example

Power Source		5VDC power (mA)	24VDC power (mA)
D0-06DD1 (select row A or B)	A	1500mA	300mA
	B	2000mA	200mA
Current Required		**5VDC power (mA)**	**24VDC power (mA)**
D0-06DD1		600mA	280mA*
D0-16ND3		35mA	0
D0-10TD1		150mA	0
D0-08TR		280mA	0
F0-4AD2DA-1		100mA	0
D0-06LCD		50mA	0
Total Used		1215mA	280mA
Remaining	A	285mA	20mA
	B	785mA	note 1

* Auxiliary 24 VDC used to power V+ terminal of D0-06DD1 sinking outputs.

Note 1: If the PLC's auxiliary 24 VDC power source is used to power the sinking outputs, use power choice A, above.

DL05/06 Power Consumed by Option Modules

Part Number	5 VDC (mA)	24 VDC (mA)
D0-07CDR	130mA	none
D0-08CDD1	100mA	none
D0-08TR	280mA	none
D0-10ND3	35mA	none
D0-10ND3F	35mA	none
D0-10TD1	150mA	none
D0-10TD2	150mA	none
D0-16ND3	35mA	none
D0-16TD1	200mA	none
D0-16TD2	200mA	none
F0-04TRS	250mA	none
F0-08NA-1	5mA	none
F0-04AD-1	50mA	none
F0-04AD-2	75mA	none
F0-08ADH-1	25mA	25mA
F0-08ADH-2	25mA	25mA
F0-04DAH-1	25mA	150mA
F0-08DAH-1	25mA	220mA
F0-04DAH-2	25mA	30mA
F0-08DAH-2	25mA	30mA
F0-2AD2DA-2	50mA	30mA
F0-4AD2DA-1	100mA	40mA
F0-4AD2DA-2	100mA	none
F0-04RTD	70mA	none
F0-04THM	30mA	none
D0-DEVNETS	45mA	none
H0-CTRIO2	250mA	none
H0-ECOM100	300mA	none
F0-08SIM	1mA	none
D0-DCM	250 mA	none
F0-CP128	150 mA	none
F0-08SIM	1 mA	none