

# DL05/06 CoProcessor Module

## TRIPLE-PORT BASIC CoPROCESSOR

**F0-CP128 \$345.00**



### 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

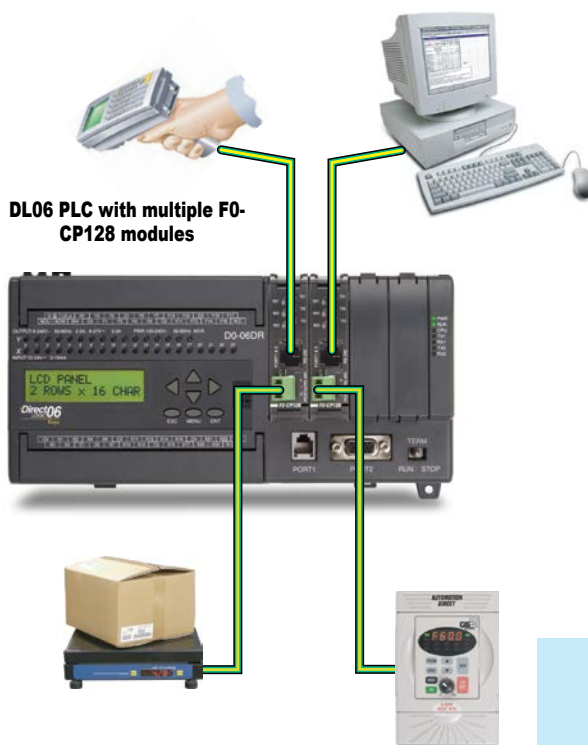
BASIC CoProcessors are designed for use with intelligent devices such as:

- 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 Client and Server 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



# DL05/06 CoProcessor Module

| Triple-Port BASIC CoProcessor Module Specifications        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Type</b>                                         | CoProcessor™, Intelligent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Modules per CPU</b>                                     | DL05: one; DL06: up to four                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Communication</b>                                       | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Clock Speed</b>                                         | 100MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>User Memory</b>                                         | 128K total (64K data, 64K program) non-volatile;<br>Real time battery backed calendar/clock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>F0-CP128 Ports</b>                                      | Port 1: RS-232 512K baud maximum<br>Port 2: RS-485, 512K baud maximum<br>Port3*: RS-232, 115.2K baud max.<br>* 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>ABM Commander for Windows (CD included with module)</b> | Standard programming/documentation software for IBM PCs is shipped with each coprocessor module<br>Key features include:<br><ul style="list-style-type: none"> <li>• Runs under Windows 98/ME/2000/XP</li> <li>• On-line full-screen BASIC program editing (similar to GW Basic, with industrial application enhancements added for easier programming) <ul style="list-style-type: none"> <li>• Internal Editor for block copy, block move, search and replace</li> <li>• Text upload and download BASIC programs on disk</li> </ul> </li> <li>• Binary upload and download BASIC programs and data on disk</li> <li>• Download control statement allows multiple programs to be downloaded and saved with one download file.</li> <li>• CD includes Modbus Client and Server BASIC programs and other application examples</li> </ul> |
| <b>Field Termination</b>                                   | One RJ12 jack: Port 1 and 3 RS-232;<br>One three-position removable terminal block: Port 2 RS-485                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Indicator LEDs</b>                                      | RX1, TX1, RX2, TX2, RX3 (CTS1), TX3 (RTS1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Power Consumption</b>                                   | 150mA @ 5VDC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Operating Environment</b>                               | 0°C - 60°C (32°F - 140°F), 5% to 95% humidity (non-condensing)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Manufacturer</b>                                        | FACTS Engineering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| CPU         | Firmware Required     | DirectSOFT Required            |
|-------------|-----------------------|--------------------------------|
| <b>DL05</b> | Version 5.00 or later | Version 3.0c or later          |
| <b>DL06</b> | 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        |