CoProcessor Modules

BASIC CoProcessor Modules

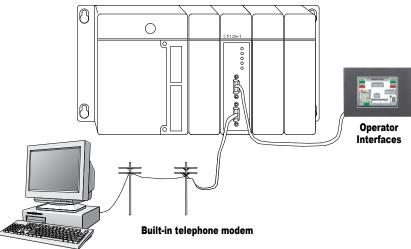**F4-CP128-1 $738.00**

Operator Interfaces

Built-in telephone modem

Overview

The FACTS CoProcessor Module interfaces the DirectLOGIC 405 family of programmable controllers with bar code readers, operator interface terminals, instrumentation equipment, computers, and other serial devices. The three ports offer a range of communication interfaces and baud rates. Please consult the port descriptions to see which module is best suited for your needs.

Features

• FACTS Extended BASIC and ABM Commander for Window software makes program development fast and simple. Allows ONLINE, full-screen BASIC program editing and the ability to save programs on disk (software on CD included with each module)

• Non-volatile memory of up to 128K bytes allows multiple program storage and execution, DL405 register expansion, and retentive data storage and retrieval

• 16 MHz or 26 MHz CoProcessor provides fast program execution independent of the DL405 CPU scan

• Three buffered ports permit communication from module to three or more external devices

• Programmable from either port for complete serial port utilization without having to switch cables

• A real-time clock/calendar maintains time/date with battery backup when power outages occur. Programmable time-based BASIC interrupts to .005 of a second

• Directly access up to 254 bytes of DL405 CPU memory per scan. No supporting ladder logic is required

• Floating point math solves complex formulas to eight significant digits

• Options include a built-in 300/1200/2400 baud telephone modem

• Includes Modbus Client/Server BASIC examples and other application examples on CD

CoProcessor Modules

Specifications	
Module Type	CoProcessor, intelligent
Modules per CPU	Eight maximum, any slot in CPU base
Communication	256 character type-ahead input buffer on all ports. Ports are independently programmed by software. Seven or eight data bits, 1 or 2 stop bits, even, odd or no parity. XON/XOFF software flow control and RTS/CTS handshake.
F4-CP128-1	128K bytes of battery-backed RAM. 26MHz clock rate. Runs BASIC programs two to three times faster than 16MHz CoProcessors. Port 1, RS232/422/485 selectable, maximum baud rate of 115.2 Kbaud. Port 2, RS232/422/485 selectable, maximum baud rate 57.6 Kbaud. Port 3, RS232, maximum baud rate of 19.2 Kbaud. Port 3 is available by using the RTS/CTS pins on Port 1. If you use these lines on Port 1, then Port 3 is not available.
ABM Commander for Windows (CD-ROM included with module)	Programming/documentation software for FACTS Engineering BASIC module. Key features include: Runs under Windows 95/98/2000 or Windows NT 3.51 or later. Command Mode allows the user to program and debug with a "Point and Click" or Command Line Interface. Uses standard Windows applications for off-line edited (Notepad) and terminal emulation (Hyperterminal) Text Upload and Download BASIC programs Binary Upload and Download BASIC programs Extensive help file contains full user manual information Includes Modbus Client and Modbus Server BASIC programs and other application examples
Field Termination	9 pin D-sub connectors for port 1 and port 2. Port 3 uses electrical connections from port 1.
Power Consumption	F4-CP128-1 — 305mA maximum at 5VDC, (supplied by base power supply)
Operating Environment	0°C–60°C (32°F–140°F), 5% to 95% humidity (non-condensing)

CoProcessor applications

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

- Barcode readers
- Welders
- Board level controllers
- Serial printers
- Intelligent sensors
- Almost any device with an RS-232/422/485 port

CoProcessors are also good solutions for applications requiring large amounts of complex math.

Check the Power Budget

Verify your power budget requirements

Your I/O configuration choice can be affected by the power requirements of the I/O modules you choose. When determining the types and quantity of I/O modules you will be using, it is important to remember there is a limited amount of power available from the power supply.

The chart on the opposite page indicates the power supplied and used by each DL405 device. The adjacent chart shows an example of how to calculate the power used by your particular system. These two charts should make it easy for you to determine if the devices you have chosen fit within the power budget of your system configuration.

If the I/O you have chosen exceeds the maximum power available from the power supply, you can resolve the problem by shifting some of the modules to an expansion base or remote I/O base (if you are using remote I/O).

Warning: It is extremely important to calculate the power budget correctly. If you exceed the power budget, the system may operate in an unpredictable manner which may result in a risk of personal injury or equipment damage.

Use *ZIP*Links to reduce power requirements

If your application requires a lot of relay outputs, consider using the ZipLink AC or DC relay output modules. These modules can switch high current (10A) loads without putting a load on your base power budget. Refer to Wiring System for DL405 PLCs later in this section for more information.

This logo is placed next to I/O modules that are supported by the ZipLink connection systems.

See the I/O module specifications at the end of this section.

Calculating your power usage

The following example shows how to calculate the power budget for the DL405 system. The example is constructed around a single 8-slot base using the devices shown. It is recommended you construct a similar table for each base in your system.

A				
	Base Number 0	Device Type	5 VDC (mA)	External 24 VDC Power (mA)
B	CURRENT SUPPLIED			
	CPU/Expansion Unit /Remote Server	D4-454 CPU	3700	400
C	CURRENT REQUIRED			
	SLOT 0	D4-16ND2	+150	+0
	SLOT 1	D4-16ND2	+150	+0
	SLOT 2	F4-04DA-2	+90	+90
	SLOT 3	D4-08NA	+100	+0
	SLOT 4	D4-08NA	+100	+0
	SLOT 5	D4-16TD2	+100	+0
	SLOT 6	D4-16TD2	+100	+0
	SLOT 7	D4-16TR	+1000	+0
D	OTHER			
	BASE	D4-08B-1	+80	+0
	Handheld Programmer	D4-HPP-1	+320	+0
E	Maximum Current Required		2190	90
F	Remaining Current Available		3700-2190=1510	400-90=310

1. Using a chart similar to the one above, fill in column 2.
2. Using the tables on the opposite page, enter the current supplied and used by each device (columns 3 and 4). Pay special attention to the current supplied by the CPU, Expansion Unit, and Remote Server since they differ. Devices which fall into the "Other" category (Row D) are devices such as the Base and the Handheld programmer, which also have power requirements, but do not plug directly into the base.
3. Add the current used by the system devices (columns 3 and 4) starting with Slot 0 and put the total in the row labeled "maximum current required" (Row E).
4. Subtract the row labeled "Maximum current required" (Row E), from the row labeled "Current Supplied" (Row B). Place the difference in the row labeled "Remaining Current Available" (Row F).
5. If "Maximum Current Required" is greater than "Current Supplied" in either column 3 or 4, the power budget will be exceeded. It will be unsafe to use this configuration and you will need to restructure your I/O configuration. Note the auxiliary 24VDC power supply does not need to supply all the external power. If you need more than the 400mA supplied, you can add an external 24VDC power supply. This will help keep you within your power budget for external power.

DL405 CPU power supply specifications and power requirements

Specification	AC Powered Units	24 VDC Powered Units
Part Numbers	D4-454, D4-EX (expansion base unit), D4-RS (remote Server unit)	D4-454DC-1, D4-EXDC (expansion base unit)
Voltage Withstand (dielectric)	1 minute @ 1,500 VAC between primary, secondary, field ground, and run relay	
Insulation Resistance	> 10MΩ at 500VDC	
Input Voltage Range	85-132 VAC (110V range) 170-264 VAC (220V range)	20-28 VDC (24VDC) with less than 10% ripple
Maximum Inrush Current	20A	20A
Maximum Power	50VA	38W

Power Requirements

Power Supplied					
CPUs/RemoteUnits/ Expansion Units	5 VDC Current Supplied in mA	24V Aux Power Supplied in mA	CPUs/Remote Units/ Expansion Units	5V Current Supplied in mA	24V Aux Power Supplied in mA
D4-454 CPU D4-454DC-1	3100 3100	400 NONE	D4-EX D4-EXDC D4-RS H4-EBC	4000 4000 3700 3470	400 NONE 400 400

Power Consumed					
Power-consuming Device	5V Current Consumed	External 24VDC Current Required	Power-consuming Device	5V Current Consumed	External 24VDC Current Required
I/O Bases			**Analog Modules (continued)**		
D4-04B-1 D4-06B-1 D4-08B-1	80 80 80	NONE NONE NONE	F4-16AD-1 F4-16AD-2 F4-08DA-1 F4-08DA-2 F4-04DAS-1 F4-08DA-1 F4-08DA-2 F4-16DA-1 F4-16DA-2 F4-08RTD F4-08THM-J(-n) F4-08THM	75 75 70 90 60 90 80 90 80 80 120 110	100 100 75+20 per circuit 90 60 per circuit 100+20 per circuit 150 100+20 per circuit 25 max. NONE 50 60
DC Input Modules					
D4-16ND2 D4-16ND2F D4-32ND3-1 D4-64ND2	150 150 150 300 max.	NONE NONE NONE NONE	**Remote I/O**		
AC Input Modules			H4-ERM100 H4-ERM-F D4-RM	320(300) 450 300	NONE NONE NONE
D4-08NA D4-16NA	100 150	NONE NONE	**Communications and Networking**		
AC/DC Input Modules			H4-ECOM100 D4-DCM F4-MAS-MB	300 500 235	NONE NONE NONE
D4-16NE3	150	NONE	**CoProcessors**		
DC Output Modules			F4-CP128-1	305	NONE
D4-16TD1 D4-16TD2 D4-32TD1 D4-32TD2 D4-64TD1	200 400 250 350 800	125 NONE 140 120 (4A max including loads) NONE	**Specialty Modules**		
AC Output Modules			H4-CTRIO D4-16SIM F4-4LTC	400 150 280	NONE NONE 75
D4-08TA D4-16TA	250 450	NONE NONE	**Programming**		
Relay Output Modules			D4-HPP-1 (Handheld Prog.)	320	NONE
D4-08TR F4-08TRS-1 F4-08TRS-2 D4-16TR	550 575 575 1000	NONE NONE NONE NONE	**Operator Interface**		
Analog Modules			**C-more** Micro-Graphic	210	NONE
F4-04AD F4-04ADS F4-08AD	150 370 75	100 120 90			