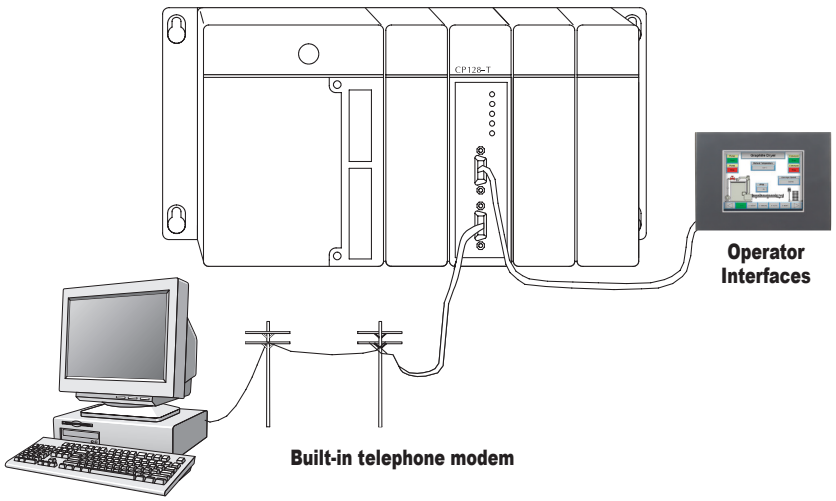
CoProcessor Modules

Basic CoProcessor Modules

F4-CP128-1 $710.00



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
D4-454 CPU	3100	400
D4-454DC-1	3100	NONE

CPUs/Remote Units/ Expansion Units	5V Current Supplied in mA	24V Aux Power Supplied in mA
D4-EX	4000	400
D4-EXDC	4000	NONE
D4-RS	3700	400
H4-EBC	3470	400

Power Consumed

Power-consuming Device	5V Current Consumed	External 24VDC Current Required
I/O Bases		
D4-04B-1	80	NONE
D4-06B-1	80	NONE
D4-08B-1	80	NONE
DC Input Modules		
D4-16ND2	150	NONE
D4-16ND2F	150	NONE
D4-32ND3-1	150	NONE
D4-64ND2	300 max.	NONE
AC Input Modules		
D4-08NA	100	NONE
D4-16NA	150	NONE
AC/DC Input Modules		
D4-16NE3	150	NONE
DC Output Modules		
D4-16TD1	200	125
D4-16TD2	400	NONE
D4-32TD1	250	140
D4-32TD2	350	120 (4A max including loads)
D4-64TD1	800	NONE
AC Output Modules		
D4-08TA	250	NONE
D4-16TA	450	NONE
Relay Output Modules		
D4-08TR	550	NONE
F4-08TRS-1	575	NONE
F4-08TRS-2	575	NONE
D4-16TR	1000	NONE
Analog Modules		
F4-04AD	150	100
F4-04ADS	370	120
F4-08AD	75	90

Power-consuming Device	5V Current Consumed	External 24VDC Current Required
Analog Modules (continued)		
F4-16AD-1	75	100
F4-16AD-2	75	100
F4-08DA-1	70	75+20 per circuit
F4-08DA-2	90	90
F4-04DAS-1	60	60 per circuit
F4-08DA-1	90	100+20 per circuit
F4-08DA-2	80	150
F4-16DA-1	90	100+20 per circuit
F4-16DA-2	80	25 max.
F4-08RTD	80	NONE
F4-08THM-J(-n)	120	50
F4-08THMF4-08THM	110	60
Remote I/O		
H4-ERM100	320(300)	NONE
H4-ERM-F	450	NONE
D4-RM	300	NONE
Communications and Networking		
H4-ECOM100	300	NONE
D4-DCM	500	NONE
F4-MAS-MB	235	NONE
CoProcessors		
F4-CP128-1	305	NONE
Specialty Modules		
H4-CTRIO	400	NONE
D4-16SIM	150	NONE
F4-4LTC	280	75
Programming		
D4-HPP-1 (Handheld Prog.)	320	NONE
Operator Interface		
C-more Micro-Graphic	210	NONE