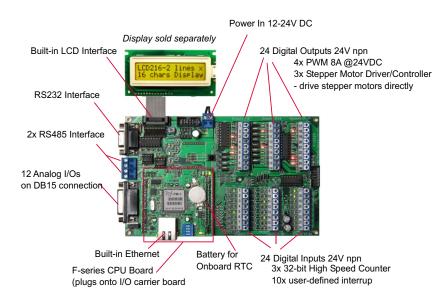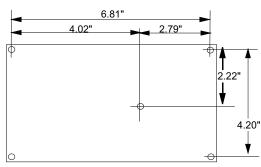# F2424 PLC

Product Description

The F2424 PLC is part of Triangle Research's top-line F-series PLC family - it is a highly geared-up version of the M-series (T100MD and T100MX models) range of Super PLC with more capabilities, features and communication readiness built in to support current technology and automation needs. Featuring a built-in Ethernet interface, the F2424 is readily programmable over the Internet using our proprietary i-TRiLOGI programming/monitoring software. As the PLC hosts both a PLC webserver and a Modbus/TCP server, it allows up to 6 simultaneous connections with i-TRiLOGI, ExcelLink, SCADA, HMI and MS-Excel's web query software as well as other enterprise database softwares. The F2424 is also able to perform machine-to-machine (M2M) communication, send dynamic content to any email address based on specified events, as well as open client connections and communicate with other network devices over the Internet.

An F2424 PLC has 24 digital inputs, 24 digital outputs and 12 analog I/Os built-in and is expandable up to 256 digital I/Os. It is capable of controlling and/or driving up to 3 stepper motors directly with up to 4A per phase @24VDC. Its high speed digital inputs allow up to 3 quadrature encoders which may be connected to provide both position and speed information of moving devices. With 1 RS232 port and 2 RS485 ports and all of them supporting Modbus ASCII/RTU protocols, the F2424 is fully equipped for connectivity to a whole range of peripheral devices. Furthermore, each F2424 comes equipped with an IR remote control receiver for contactless data entry, and supports an optional ZigBee wireless radio module - XBee supplied by Digi International Inc. This highly flexible product is certainly poised for applications in factory, home and building automation. The F-series PLC price to performance profile is positioned as much for the mid to high-end OEM machine builder and factory/plant system integrators as it is for the building automation designer. For the user who needs the integrated features and connectivity of a PLC, the F-series is the perfect choice.

Power In 12-24V DC
Display sold separately
Built-in LCD Interface
RS232 Interface
2x RS485 Interface
12 Analog I/Os on DB15 connection
24 Digital Outputs 24V npn
4x PWM 8A @24VDC
3x Stepper Motor Driver/Controller - drive stepper motors directly
Built-in Ethernet
Battery for Onboard RTC
F-series CPU Board (plugs onto I/O carrier board
24 Digital Inputs 24V npn
3x 32-bit High Speed Counter
10x user-defined interrup

Mounting

(a) Hole mounting locations for direct panel mount

6.81"
4.02"   2.79"
2.22"
4.20"

Holes dia. 0.125"

(b) Optional Din-Rail mounting kit available for installation on din-rails

Accessories

- LCD Displays : LCD216 (2 lines x 16 char.), LCD420 (4 lines x 20 char.)
- Networked Display : MDS100-BW for multiple displays application or for extended mounting of display
- MD-HMI : 16-key pad with 8 LED and 4x20 LCD; plugs into LCD and expansion ports
- I/O Expansion : Exp4040 or Exp1616R (16 Opto-isolated Digital Inouts, 16 Relay Outputs)
- Auto485 : RS232 to RS485 converter
- Analog Expansion : I-7000 series Analog I/O Expansion Modules
- USB-RS232 Interface : for connection to USB port on PC
- Din Rail Mounting : Din-Kit-2

Operating Voltage		Input **12** to **24V DC** (jumper not required)		
Digital Inputs		**24** (24V npn) with LED indicators		
	Encoder Inputs	- 3 x 32-bit High Speed Counter (quadrature: 2 D/Is per channel)		
	Interrupts	- 10 x user-defined interrupt (latency < 0.5ms, +ve or –ve edge triggered)		
Digital Outputs		**24** (24V npn) with LED Indicators		
		#5 to #16 : 24V, Max 8A npn, Continuous Output Current 4A, Driver Type : N-Channel power MOSFET with low r_{DS} = 0.05 Ω		
		#1 to #4 & #17 to #24: 24V, Max.1A npn, Continuous Output Current 350mA. Driver type : N-chanel power MOSFET IC		
	PWM (current)	- 4 x PWM 8A @24VDC (continuous frequencies, 0.1% duty cycle resolution)		
	Stepper Motor Control	- 3 x stepper motor control pulse/direction outputs (2 D/Os per stepper output), or		
		3 x unipolar stepper motor DRIVER outputs (4 D/Os per stepper driver).		
Analog I/Os		**12**		
	- Input Interface	8 x AI -12 bit, 0-5V		
	- Output Interface	4 x AI -10 bit, 0-5V		
Processing		I/O Scan time = 0.5ms (can be interrupted by input interrupts), Program Scan time = 2us per step		
High-Speed Counter		3x high-speed counters, 6x pulse measurement channels (frequency, period and width)		
		- simultaneous position and speed measurement on each channel.		
Counters		**64**		
Internal Relays / Timers		**512** internal relays, **64** timers (any one or all can be configured as "HighSpeed" timers)		
Sequencers		**8** with 32 steps (step# 0 - # 31)		
Real-Time Clock		Real Time Clock and Calendar (Year, Day, Month, Hours, Min, Sec, day-of-week)		
		- Lithium CR1632 battery-backed (runs up to 5 years without ext.l power or 10 years if powered off only 1/2 of the time)		
		- Real Time Clock can be updated with Atomic clock data from NIST time server if PLC is connected to the Internet		
PID		Built-in 16 channels PID Computation function (Proportional, Integral, Derviative digital control)		
Connection Ports	- RS232	**1** (DB9 female connector , DCE)		
	- RS485	**2 x** (two-pin screw terminals)		
	- Ethernet	**1** RJ45		
	- LCD	**1** (IDC 14-pin)		
	- I/O Expansion	**1** (IDC 10-pin)		
	- Infra Red Remote Control	**1** (38 KHz carrier) IR Remote control sensor. May be used as contactless data entry. Learn IR remote commands of AV and HVAC and regen. with IR LEDs (not included)		
	- Others	1x 2-pin screw terminal for DC power, 1 x 10-pin IDC header (reserved)		
Communicatons	Ethernet	- Direct connection to LAN or Internet for programming, monitoring and Remote Control - Support both Modbus/TCP Server (5 simult. connections) and Modbus/TCP Client - Extremely easy Peer-to-peer (or machine-to-machine) PLC communication. - TCP connection to any Server IP address:port number (e.g. to NIST Timer Server) - Event-driven Emailing. Create and save data file on a networked PC's hard disk - Excel spreadsheet Data Logging using TRi-ExcelLink software		
	RS232 / RS485	Supported Protocols : Native ASCII Host Link Commands (programming/monitoring) MODBUS RTU, MODBUS ASCII, OMRON C20H Host Link Commands Default COM speed 38,400 bps, may be set from 1200 to 115.2K & 230.4K bps		
Memory Storage	- Program	**16K** words (16-bit) of program memory stored in flash memory.		
	- Data	**A to Z** (32-bit Integer), **A$ to Z$** (ASCII strings) [2]**DM[1]** to **DM[4000]** (16-bit integer array) **6K Words** (16-bit) additional non-volatile [1]**FRAM** memory for integer and string storage		
Programming Lang. / Env.		**iTRiLOGI Version 6.xx** (Ladder+Basic) / Windows		
Dimensions / Weight		· 7.05."(L)x 4.45"(W) x 1.5"(H) / 0.53 lbs (0.24 Kg)		
I/O Expansion (Digital)		Expandable to 128 D/I and 128 D/O using EXP4040 and EXP1616R.		

PLC Environmental Specs (Temperature and Vibration)

Operating Temperature	- Operating 0 to 70 deg C (32 to 158 deg F)
	- Storage -20 to +85 deg C (-4 to 185 deg F)
Operating Humidity	10% - 90% Rel. Humidity, non condensing
Electrical Noise Resistance	IEC801-4 (Fast transient) - 2KV to power supply, 50 microsecond pulse width, 1 min. 1KV to I/O by capacitive coupling, 50 microsecond pulse width.
Vibration resistance	IEC 68-2-6/1980 Vibration 1.6mm - 25Hz to 100Hz - Amplitude = +1. - Acceleration = + 4.0g

Absolute Max. Rating

Power Supply Input	30V
Digital Inputs	30V
Digital Outputs	30V
Analog Channels (0 to 5V)	7V

[1]**FRAM:** State-of-The-Art, Ferro Magnetic RAM. No battery required. Unlimited read/write cycles

[2]**DM[ ]:** DM[301]-DM[4000] automatically backup in FRAM and are therefore non-volatile.

RoHS	Compliant