FMD88-10 PLC

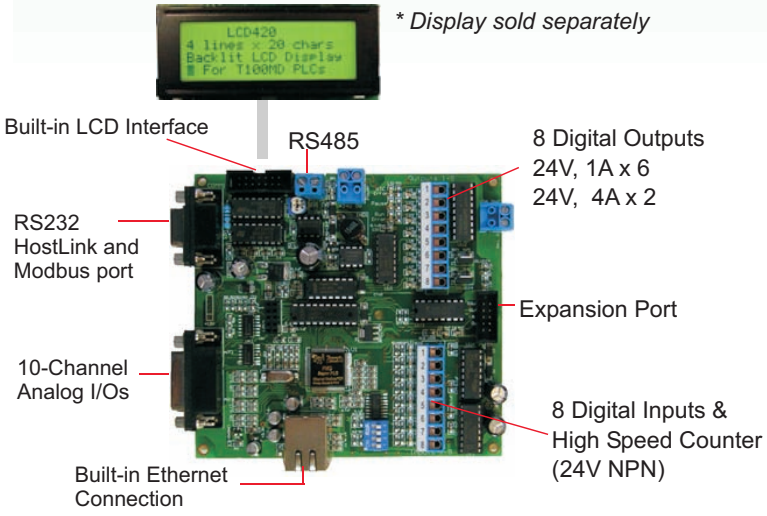
FMD-series : Ethernet, Modbus TCP/IP, Stepper Motor Drive, +Analog I/O, LCD port, RS232, RS485, Internet-TRiLOGI Ladder+Basic

Product Description

The FMD88-10 PLC is an upgrade version of the T100MD888 model, bringing its built-in capabilities very much in line with that of the super F-series PLCs. With the inclusion of an onboard Ethernet port, a faster CPU, more analog I/Os and program memory, the FMD88-10 provides great enhancement opportunities for applications currently using the T100MD888. However, if preferred, the FMD88-10 can also, in most cases, work simply as a drop-in replacement for the T100MD888 PLC.

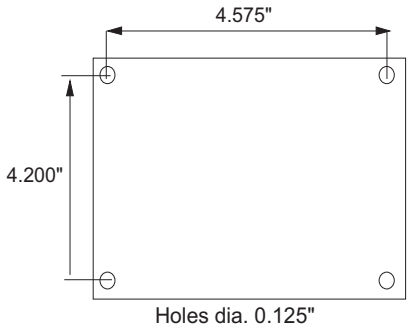
Built into the FMD88-10 PLC are 8 digital inputs (includes 2 high speed encoders and 4 interrupts), 8 digital outputs (supports 4 PWM channels and 2 stepper motor pulse/direction controls) and 10 analog I/Os. Digital I/O capacity can be expanded to 120 digital inputs and 120 digital outputs using Triangle Research expansion boards EXP1616R or EXP4040. Analog I/O expansion modules which connect to the FMD88-10's RS485 port are also readily available. Like all 'super' PLCs in Triangle Research's line-up, the FMD88-10 is designed with ready connectivity to many peripheral device types. With the built-in Ethernet port and the iTRiLOGI client/server software, the FMD88-10 is fully accessible for machine monitoring and OEM troubleshooting/reprogramming over the INTERNET. Built-in RS232 and RS485 connections and support of MODBUS protocols also makes the FMD88-10 easy to integrate into mixed-brand PLC environments and networks.

As for all the super PLCs from Triangle Research, programming of the FMD88-10 PLC is simplified with the powerful iTRiLOGI Ladder+BASIC software that is shipped with the starter kit. Similarly, as for all Triangle Research PLCs, the FMD88-10 PLC incorporates a program code security feature in the interest of Automation OEMs' program protection.



Mounting

(a) Hole Mounting Locations for direct panel mount.



(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*
- *MMI6050 : 4.3`Color Graphics Touch Panel HMI*
- *I/O Expansion : Exp4040 or Exp1616R (16 Opto-isolated Digital Inouts, 16 Relay Outputs)*
- *FRAM RTC : Battery-Backed Real Time Clock plus Program/Data Memory Expansion*
- *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	**12 to 24V** DC (+/- 5%)	
Digital Inputs	**8** (24V npn) with LED indicators. Expandable to **120**	
	Encoder Inputs	- **2** x 32-bit High Speed Counter (quadrature: 2 D/Is per channel)
	Interrupts	- **4** x user-defined interrupt (latency < 0.5ms, +ve or –ve edge triggered)
Digital Outputs	**8** (24V npn) with LED Indicators. Expandable to **120**	
	24V NPN. Output current 4A peak, 2A continous, Driver Type : N-channel MOSFET	
	PWM (current)	- **4** x PWM; shares with D/O #5 to #8 (continuous frequencies, 0.1% duty cycle resolution)
	Stepper Motor Control	- **3** x stepper motor control pulse/direction outputs (2 D/Os per stepper output)
Analog I/O	**10**	
	- Input Interface	**8** x AI -12 bit, 0-5V
	- Output Interface	**2** x AO - 12 bit, 0-5V or 0-10V (Software selectable!). Expandable to **4** channels (0-5V) with FRAM-RTC-256 or I2C-FRTC
Processing	I/O Scan time = 0.6ms (can be interrupted by input interrupts), Program Scan time = 2.5µs per step	
High-Speed Counter	**2**x high-speed counters, **4**x 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	Standard : Real Time Clock and Calendar (Year, Day, Month, Hours, Min, Sec, day-of-week) - no battery backup Optional FRAM-RTC-0/256 : Real Time Clock and Calendar (Year, Day, Month, Hours, Min, Sec, day-of-week) - battery backup	
PID	Built-in **16** channels PID Computation function (Proportional, Integral, Derviative digital control)	
Connection Ports	- RS232	**1** x (DB9 Female Socket)
	- RS485	**1** x (two-pin screw terminals)
	- Ethernet	**1** x RJ45
	- Analog I/Os	**1** x DB-15 female socket for Analog Inputs and Outputs
	- LCD	**1** (IDC 14-pin)
	- Others	**2** x 8 way detachable screw terminals (5mm pitch) for digital inputs and outputs
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 - Supports web query. Enterprise Database or MS Excel software can log PLC data directly via the Internet.
	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	Standard - Program	**8K** words (16-bit) of program memory stored in flash memory.
	- Data	**A to Z** (32-bit Integer)**, A$ to Z$** (ASCII strings) **DM[1]** to **DM[1000]** (16-bit integer array) **1K Words** (16-bit) additional non-volatile Flash memory for integer and string storage
	With FRAM-RTC-0/256 - Program	**16K** words (16-bit) of program memory stored in flash memory.
	- Data	**A to Z** (32-bit Integer)**, A$ to Z$** (ASCII strings) **DM[1]** to **DM[4000]** (16-bit integer array) - configurable to non-volatile. **11K Words** (16-bit) non-volatile Ferromagnetic RAM memory for integer and string storage.
Programming Lang. / Env.	**iTRiLOGI Version 6.xx** (Ladder+Basic) / Windows	
Dimensions / Weight	4.825"(L) x 4.45"(W) x 0.8"(H) / 4.9 oz (140 gms)	
I/O Expansion (Digital)	Expandable to **120** D/I and **120** D/O using EXP4040, EXP2424 and EXP1616R.	
I2C Interface (Future)	Optional I2C-FRTC module provides I2C interface and 256K bytes EEPROM. (To Be Announced)	

PLC Environmental Specs (Temperature and Vibration)

Operating Temperature	- Operating -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 Inputs	7V
Analog outputs (low) (High)	-0.3V AO_{max} + 0.3V