Hilitand FX1N-20MR

Hilitand FX1N-20MR Programmable Logic Controller User Manual

1. Introduction

This manual provides essential information for the safe and effective use of the Hilitand FX1N-20MR Programmable Logic Controller (PLC). The FX1N-20MR is a DC 24V industrial control board designed for programmable control applications, capable of executing a wide range of functions with stable and reliable performance. It features a built-in watchdog timer circuit to ensure continuous operation.
Please read this manual thoroughly before installation and operation to ensure proper functionality and to prevent damage to the device or injury to personnel.

2. Safety Information

Observe the following safety precautions to prevent electric shock, fire, or damage to the product:

- **Power Supply:** Ensure the power supply voltage is within the specified range of 10-28VDC. Incorrect voltage can damage the unit.
- **Wiring:** All wiring should be performed by qualified personnel. Ensure power is disconnected before making any connections.
- **Environment:** Do not expose the PLC to excessive moisture, dust, corrosive gases, or extreme temperatures. Operate within specified environmental conditions.
- **Grounding:** Proper grounding is essential for safety and to prevent electromagnetic interference.
- **Maintenance:** Only perform maintenance tasks as described in this manual. Refer servicing to qualified personnel.

3. Product Overview

The Hilitand FX1N-20MR is a compact industrial control board featuring multiple input/output terminals, a communication port, and a power input. Its design allows for integration into various automation systems.

Figure 3.1: Top view of the Hilitand FX1N-20MR Programmable Logic Controller, showing the main components and layout.

Key components include:

- **Terminal Blocks:** Screw terminals for connecting DC 24V power, digital inputs, and relay outputs.
- **DB9 Serial Port:** Used for programming and communication with a computer.
- **Run/Stop Switch:** Controls the operational state of the PLC program.
- **Backup Battery:** A small coin cell battery maintains the internal clock and program memory.

Figure 3.2: Close-up views of the DB9 communication port, backup battery, and input/output terminal blocks.

4. Specifications

Feature	Specification
Model	FX1N-20MR
Power Supply Voltage	DC 10-28V
Dimensions (L x W x H)	Approx. 86 x 73 x 20mm (3.4 x 2.9 x 0.7 inches)
Item Weight	0.12 Kilograms
Communication Port	DB9 Serial Port
Baud Rate	9600 bps
Control Type	Programmable Logic Control
Built-in Features	Watchdog timer circuit

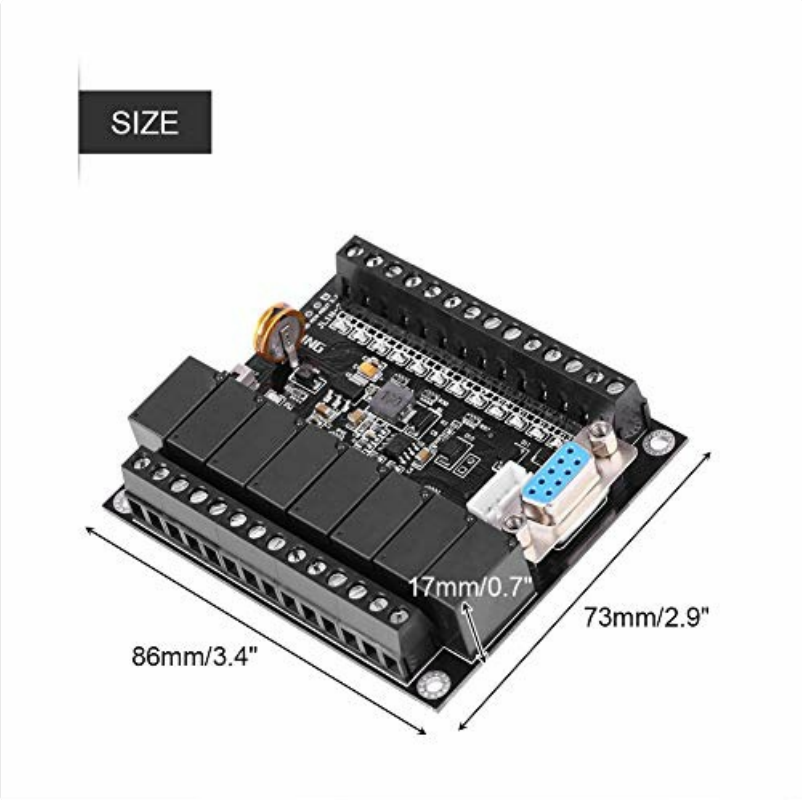

Figure 4.1: Physical dimensions of the FX1N-20MR PLC board, showing measurements in millimeters and inches.

5. Setup

5.1 Power Connection

Connect a DC power supply within the 10-28V range to the designated power input terminals. Observe polarity: connect the positive (+) lead to the V+ terminal and the negative (-) lead to the GND terminal. Ensure the power supply is stable and capable of providing sufficient current for the PLC and connected loads.

5.2 Input/Output Wiring

Connect your sensors, switches, and other input devices to the input terminals (e.g., X0, X1, etc.). Connect

your actuators, relays, and other output devices to the output terminals (e.g., Y0, Y1, etc.). Refer to the PLC's wiring diagram for specific terminal assignments. Ensure all connections are secure to prevent intermittent operation.

Figure 5.1: Detail of the screw terminal blocks for power, inputs, and outputs, highlighting connection points.

5.3 Programming Connection

To program the PLC, connect it to a computer using a compatible serial cable (typically a DB9 to USB converter) via the DB9 port on the PLC. Ensure your programming software is correctly configured for a baud rate of 9600 bps and the correct COM port.

Figure 5.2: Close-up of the DB9 serial port, used for connecting the PLC to a computer for programming.

6. Operating Instructions

6.1 Programming

The FX1N-20MR PLC is programmed using standard PLC programming software (e.g., GX Developer or compatible software). Develop your ladder logic or instruction list program on your computer, then download it to the PLC via the serial connection. Consult your programming software's documentation for detailed instructions on program creation and transfer.

6.2 Run/Stop Mode

The PLC features a physical Run/Stop switch. After downloading a program, switch the PLC to the **RUN** position to execute the program. To halt program execution for debugging or modification, switch it to the **STOP** position. Always ensure the PLC is in STOP mode before downloading new programs or making significant wiring changes.

6.3 Watchdog Timer

The built-in watchdog timer circuit monitors the PLC's operation. If the program execution deviates or hangs, the watchdog timer will reset the PLC to ensure system stability and prevent uncontrolled operation. This feature enhances the reliability of industrial control applications.

7. Maintenance

7.1 Cleaning

Periodically clean the PLC board to remove dust and debris. Use a soft, dry brush or compressed air. Do not use liquid cleaners or solvents, as they may damage components.

7.2 Battery Replacement

The PLC contains a small coin cell battery to retain program memory and the real-time clock (if used) during power loss. If the PLC loses its program or time settings after a power cycle, the battery may need replacement. Carefully replace the battery with an identical type, observing polarity. Disconnect power before replacing the battery.

Figure 7.1: Close-up of the coin cell battery holder, indicating the location for battery replacement.

7.3 Environmental Conditions

Ensure the PLC operates within its specified temperature and humidity ranges. Extreme conditions can shorten the lifespan of the device. Protect the unit from vibrations and mechanical shock.

8. Troubleshooting

This section provides solutions to common issues you might encounter with the FX1N-20MR PLC.

- **PLC does not power on:**
  - Check the DC 10-28V power supply connection and ensure correct polarity.
  - Verify the power supply is functioning correctly and providing the specified voltage.
- **Program does not run:**
  - Ensure the Run/Stop switch is in the **RUN** position.
  - Verify the program was successfully downloaded to the PLC.
  - Check for programming errors in your ladder logic or instruction list.
- **Communication error during programming:**
  - Confirm the serial cable is securely connected to both the PLC and the computer.
  - Check the COM port settings in your programming software match the port assigned by your operating system.
  - Ensure the baud rate is set to 9600 bps in the software.
  - Try restarting the programming software and the computer.
- **Outputs are not activating:**
  - Verify the input conditions are met according to your program.

- Check the wiring of the output devices.
- Ensure the output devices have their own power supply if required.

For issues not covered here, please contact customer support.

9. Warranty and Support

The Hilitand FX1N-20MR Programmable Logic Controller is manufactured by Hilitand. For warranty information, technical support, or service inquiries, please refer to the documentation provided at the time of purchase or contact your vendor. You may also visit the official Hilitand store or support channels for assistance.

Hilitand Store: Visit Hilitand Store on Amazon