

Hardware Manual for FP4030MR Product

Ver.: 1.00

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PRECAUTIONS

This section provides general precautions for using the FP4030MR.

The information contained in this section is important for the safe and reliable application of the Unit. You must read this section and understand the information contained before attempting to set up or operate a unit.

1. Intended Audience
2. Purpose and Scope of this Manual
3. General Precautions
4. Safety Precautions
5. Caution

1. Intended Audience

A **Qualified Person** is one that has the skills and knowledge relating to the construction, installation, operation, and maintenance of the electrical equipment and has received safety training on the hazards involved (Refer to the latest edition for additional safety requirements).

Qualified Personnel shall:

- Have carefully read the entire operation manual.
- Be trained and authorized to safely energize, de-energize, ground, lockout and tag circuits and equipment, and clear faults in accordance with established safety practices.
- Be trained in the proper care and use of protective equipment such as safety shoes, rubber gloves, hard hats, safety glasses, face shields, flash clothing, etc., in accordance with established safety practices.
- Be trained in rendering first aid.

2. Purpose and scope of this Manual

Thank you for purchasing the FP4030MR product from Triangle Research International. The unit is configured with Microsoft Windows based software FlexiSoft.

This manual provides information on how to safely install, operate, and maintain your product.

Read the manual completely before installing, operating, or performing maintenance on this equipment.

This manual and the accompanying drawings should be considered a permanent part of the equipment and should be readily available for reference and review.

Triangle Research International reserves the right, without prior notice, to update information, make product changes, or to discontinue any product or service identified in this publication.

3. General Precautions

The user must operate the product according to the performance specifications described in the operational manual.

- The FP4030MR model is a general-purpose product. It is a system component and is used in conjunction with other items of industrial equipment such as PLCs, Loop Controllers, Adjustable Speed Drives, etc.
- **A detailed system analysis and job safety analysis should be performed by the systems designer or systems integrator before including the unit in any new or existing system.** Contact Triangle Research International for options availability and for application-specific system integration information if required.
- The product may be used to control an adjustable speed drive connected to high voltage sources and rotating machinery that is inherently dangerous if not operated safely. Interlock all energy sources, hazardous locations, and guards in order to restrict the exposure of personnel to hazards. The adjustable speed drive may start the motor without warning. Signs at the equipment installation must be posted to this effect. A familiarity with Auto-restart settings is a requirement when controlling adjustable speed drives. Failure of external or ancillary components may cause intermittent system operation, i.e., the system may start the motor without warning or may not stop on command. **Improperly designed or improperly installed system interlocks and permissives may render a motor unable to start or stop on command**
- Control through serial communications can fail or can also override local controls, which can create an unsafe condition. System safety features should be employed and designed into the integrated system in a manner such that system operation, even in the event of system failure, will not cause harm or result in personnel injury or system damage. Use of the built-in system protective features and interlocks of the equipment being controlled is highly recommended (i.e., emergency-off, overload protection, etc.)
- **Never use the FP4030MR unit to perform emergency stops.** Separate switches outside the product, the PLC, and the ASD should be used for emergency stops.

Changes or modifications to the unit program should not be made without the approval of the system designer or systems integrator. Minor changes or modifications could cause the defeat of safety interlocks and permissives. Any changes or modifications should be noted and included with the system documentation.



WARNING It is extremely important that the unit and other peripherals be used for the specified purpose and under the specified conditions, especially in applications that can directly or indirectly affect human beings.



WARNING Do not use input functions as PT touch switches for applications where danger to human life or serious damage is possible, or for emergency switch applications.

4. Safety Precautions

Please observe the following precautions when installing the unit. Failure to comply with these restrictions could result in loss of life, serious personal injury, or equipment damage.



WARNING Do not operate the unit in areas subject to explosion due to flammable gases, vapors, or dusts.



WARNING Do not connect the unit to an AC power source. You will cause permanent damage to the unit.



WARNING Do not attempt to use a DC power supply that does not meet unit power requirements. You may cause malfunction or permanent damage to unit.



WARNING Do not power the unit with a DC power supply used for inductive loads or for input circuitry to the programmable logic controller. Severe voltage spikes caused by these devices may damage the unit.

5. Caution



- Upon receipt of the equipment inspect the packaging and equipment for shipping damage.
- Carefully unpack the equipment and check for parts that were damaged from shipping, missing parts, or concealed damage. If any discrepancies are discovered, it should be noted with the carrier prior to accepting the shipment, if possible. File a claim with the carrier if necessary and immediately notify your factory / company representative.
- **DO NOT** install or energize equipment that has been damaged. Damaged equipment may fail during operation resulting in further equipment damage or personal injury.
- Check to see that the model number specified on the nameplate conforms to the order specifications.
- Modification of this equipment is dangerous and must not be performed except by factory trained representatives. When modifications are required contact your company representative.
- Inspections may be required before and after moving installed equipment.
- Keep the equipment in an upright position as indicated on the shipping carton.
- Contact your company representative for assistance if required.

Handling and Storage:

- Use proper lifting techniques when moving the product; including properly sizing up the load, and getting assistance if required.
- Store in a well-ventilated covered location and preferably in the original carton if the equipment will not be used upon receipt.

- Store in a cool, clean, and dry location. Avoid storage locations with extreme temperatures, rapid temperature changes, high humidity, moisture, dust, corrosive gases, or metal particles.
- Do not store the unit in places that are exposed to outside weather conditions (i.e., wind, rain, snow, etc.).

Disposal:

- Never dispose of electrical components via incineration. Contact your state environmental agency for details on disposal of electrical components and packaging in your area.

Installation Precautions:

- Location and Ambient Requirements
 - a) Adequate personnel working space and adequate illumination must be provided for adjustment, inspection, and maintenance of the equipment.
 - b) Avoid installation in areas where vibration, heat, humidity, dust, fibers, steel particles, explosive/corrosive mists or gases, or sources of electrical noise are present.
 - c) The installation location shall not be exposed to direct sunlight.
 - d) Allow proper clearance spaces for installation. Do not obstruct the ventilation openings. Refer to the recommended minimum installation dimensions as shown on the enclosure outline drawings.
 - e) The ambient operating temperature shall be between 0° and 50° C (32° and 122° F).
- Mounting Requirements
 - a) Only **Qualified Personnel** should install this equipment.
 - b) Install the unit in a secure upright position in a well-ventilated area.
 - c) A noncombustible insulating floor or mat should be provided in the area immediately surrounding the electrical system at the place where maintenance operations are to be performed.
- Conductor Routing and Grounding
 - a) Use separate metal conduits for routing the input power, and control circuits.
 - b) A separate ground cable should be run inside the conduit with the input power, and control circuits.
 - c) **DO NOT** connect control terminal strip return marked CC to earth ground.
 - d) Always ground the unit to prevent electrical shock and to help reduce electrical noise.

The Metal Of Conduit Is Not An Acceptable Ground.

INTRODUCTION

In this chapter. . . .

- ◆ Purpose of this Manual
 - Product Basics
 - Hardware Configuration

- ◆ FP4030MR Overview
 - What is FP4030MR
 - How does the unit work?

1.1 Purpose of this manual

Thank you for purchasing FP4030MR Products. FP4030MR Product is versatile operator interfaces with Microsoft® Windows based configuration Software.

This Manual explains the operation of the unit and how to implement available features using the FlexiSoft® Configuration Software. This manual will help you to install, configure and operate your FP4030MR product.

1.1.1 FP4030MR Basics

Operator Interface Terminals provide much more versatility than traditional mechanical control panels. A FP4030MR allows a plant floor operator to monitor current conditions of a control system and, if necessary, to initiate a change in the operation of the system. FP4030MR connect to programmable logic controllers (PLCs) typically through the serial communications port. The unit can be programmed to monitor and/or change current values stored in the data memory of the PLC.

FP4030MR is having graphics based displays with keypad having function keys. Thus FP4030MR provides much more flexibility in preparing application.

What is a *Project*?

A project is an user created application in FlexiSoft® Configuration Software. A project contains information such as model, Network Configuration, Screen information, Task information etc.

What is a *Screen*?

A screen is a visual representation of objects placed on the unit screen. Any partially sized window is usually referred to as a popup screen or window. The user can create his customized screen according to his requirements. Popup windows can also appear on the display by pressing buttons on the touch screen . The maximum number of screens in an application is only limited by the application memory size.

What is an *Object*?

An object placed on FP4030MR screen can perform actions such as displaying text messages, writing a value to a PLC register, or displaying an alarm. An object can be classified as a text or graphical object. A text object is used to display the text on the unit and can also used to perform some action. For example, a data entry object tells the unit to continuously monitor a PLC register and allows the user to change the value in the register. Some objects can display graphics whose shape depends on the value of a register. These objects may also change the value of a PLC tag. An example is a Bit Button Object that creates a graphic object on the FP4030MR unit. When pressed, it activates a bit in the PLC.

1.1.2 Hardware Requirements

The following basic PC hardware configuration is needed to configure and operate your FlexiSoft Configuration Software.

Minimal PC configuration for Windows2000 / XP:

DEVICE	RECOMMENDED
Processor	800MHz Pentium processor OR euivalent processor
Operating System	Microsoft Windows 2000 with SP4 Microsoft Windows XP Professional / Home Edition with SP2
RAM	256MB
Hard Disk Space	800MB (including 200MB for the .NET Framework Redistributable)
Display	1024 x 768 High Color 16-bit
Mouse/Keyboard	Required

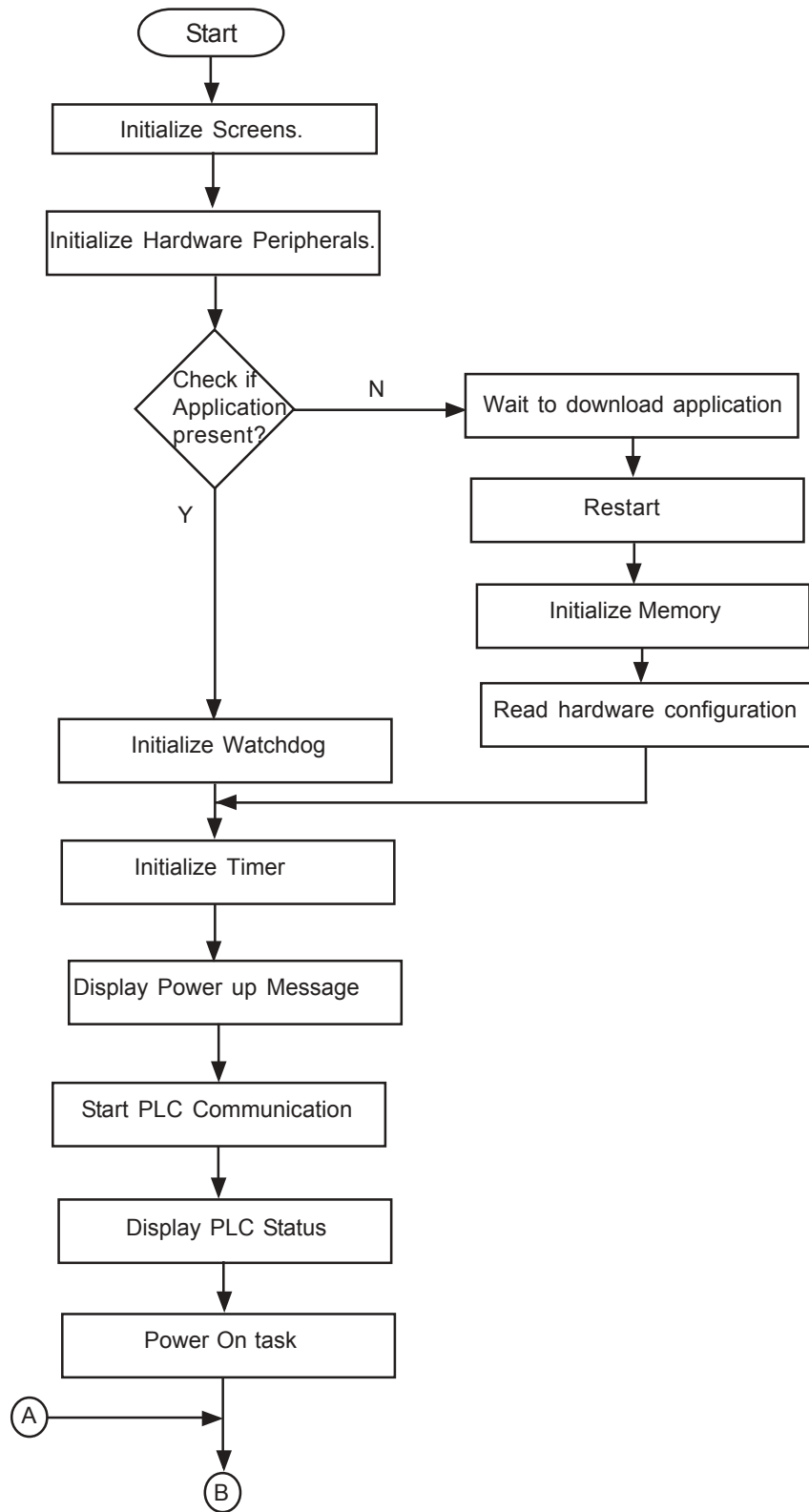
Minimal PC configuration for Vista:

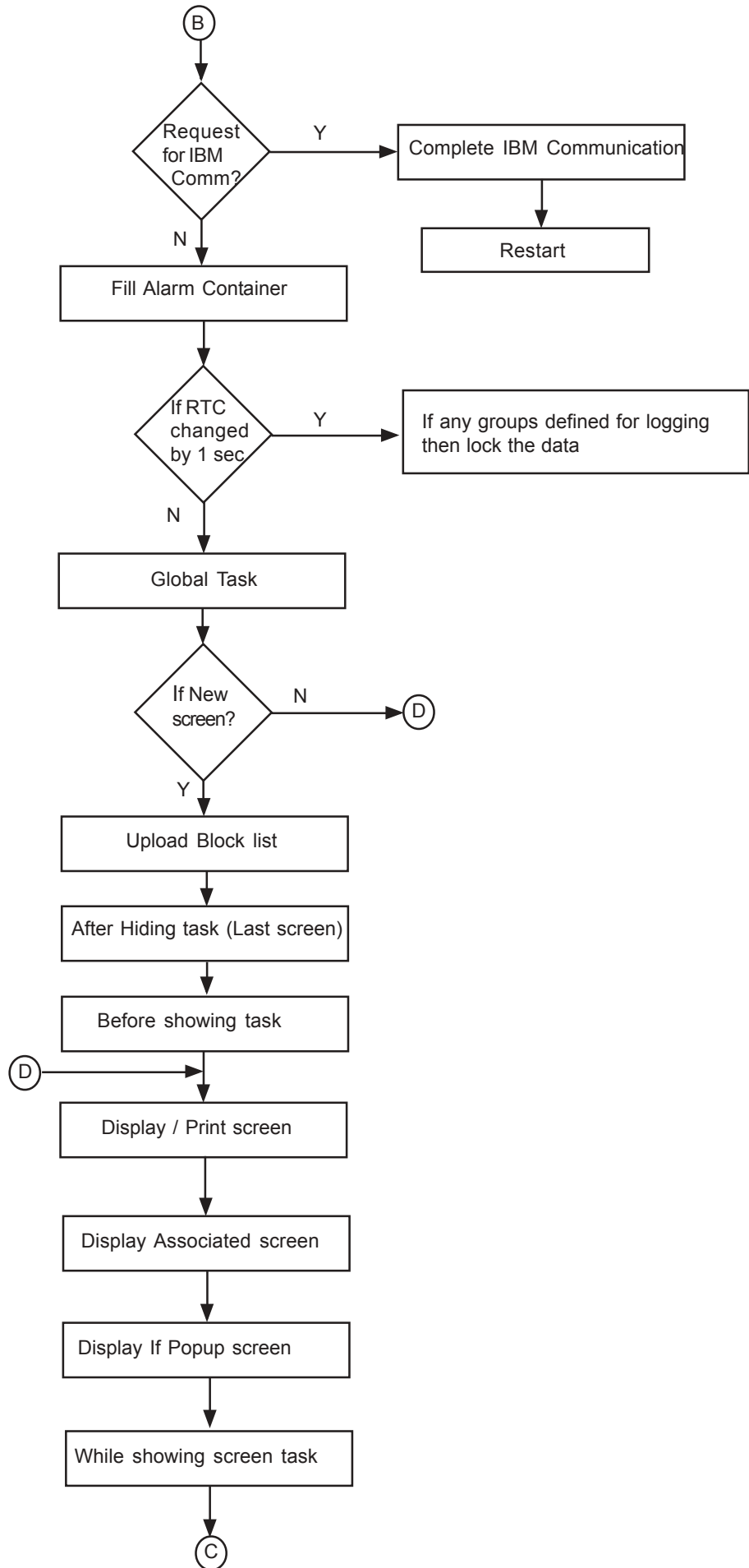
DEVICE	RECOMMENDED
Processor	1GHz Pentium processor or equivalent processor
Operating System	Microsoft Windows Vista Home and Vista Business edition
RAM	1GB
Hard Disk Space	800MB (including 200MB for the .NET Framework Redistributable)
Display	1024 x 768 High Color 16-bit
Mouse/Keyboard	Required

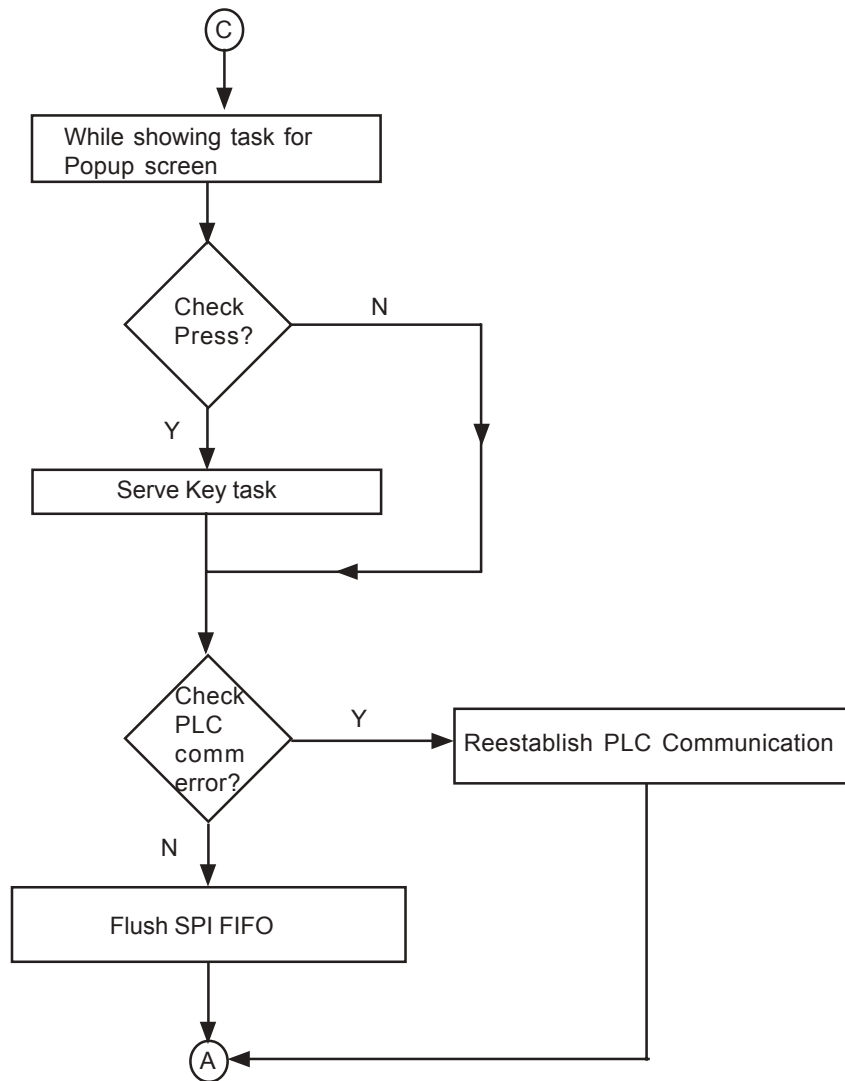
These are the minimum system requirements for a computer running the FlexiSoft Configuration software.

1.2.1 How the FP4030MR works?

The FP4030MR follows a specific sequence for performing the tasks defined by the user in the application. The sequence is as shown below:







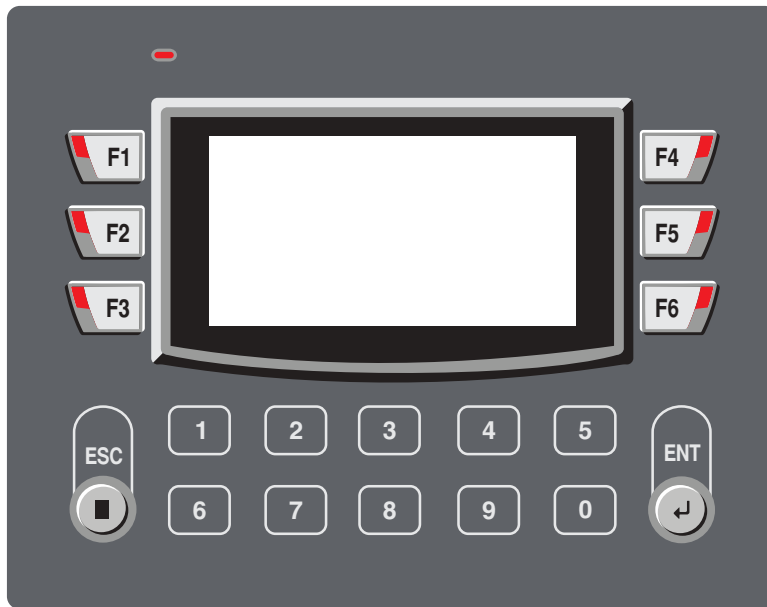
HARDWARE

In this chapter. . . .

- ◆ FP4030MR

- ◆ Installation Instructions
 - Panel cut-out
 - Communication Port

2.1 FP4030MR



Power Supply	24 VDC	Miscellaneous	
Voltage Rating	24 VDC +/-15%	External Dimension	128 H X 102 W X 45 D mm
Power Rating	2 Watt	Panel Cutout	119.00 mm x 93.00 mm
Approvals	CE, UL, RoHS	Weight	255 gm.
Bezel	IP65 Rated	Ambient Operating Temperature	0 °C to 50 °C
Memory		Mounting Method	Panel Mounting
Ladder Steps	10K Steps	Humidity	10% to 90% ^{#1} RH (Noncondensing) 10% to 85% ^{#2} RH (Noncondensing)
Application Memory	1MB	Immunity to ESD	Level as per IEC61000-4-2
Data Register	4096 Words	Immunity to Transients	Level as per IEC61000-4-4
Retentive Register	300 Words	Immunity to Radiated RF	Level as per IEC61000-4-3
System Register	256 Words	Immunity to CF	Level as per IEC61000-4-6
System Coil	100 points	Emission	EN61000-6-4
Internal Register	256 Words		
Input Register	400 Words / 6400 pts max*		
Output Register	400 Words / 6400 pts max*		
Timer Register	256 Words		
Counter Register	100 Words		
Configuration Register	1600 Words / 25600 pts max*		
Display			
Display Type	Multi-color		
Display Resolution	128 X 64 Pixels		
Communication			
Number of Ports	2		
Type	RS232/485/422 and USB Device port		
Expansion Ports	NA		

Note: #1 at 25° C

#2 85% at 40° C and above 40° C, the equivalent absolute humidity is less than 85% at 40° C

*: Depends upon I/O allocation.

2.2 Installation Instruction

The FP4030MR unit should be mounted on a panel. A sealing gasket and mounting clamps are provided with each FP4030MR unit for proper installation.

Environmental Considerations:

Make sure that the unit is installed correctly and that the operating limits are followed. Do not operate the FP4030MR unit in areas subject to explosion hazards due to flammable gases, vapors or dusts. A FP4030MR unit should not be installed where fast temperature variations are present. Highly humid areas are also to be avoided. High humidity causes condensation of water in the unit.

Location Considerations:

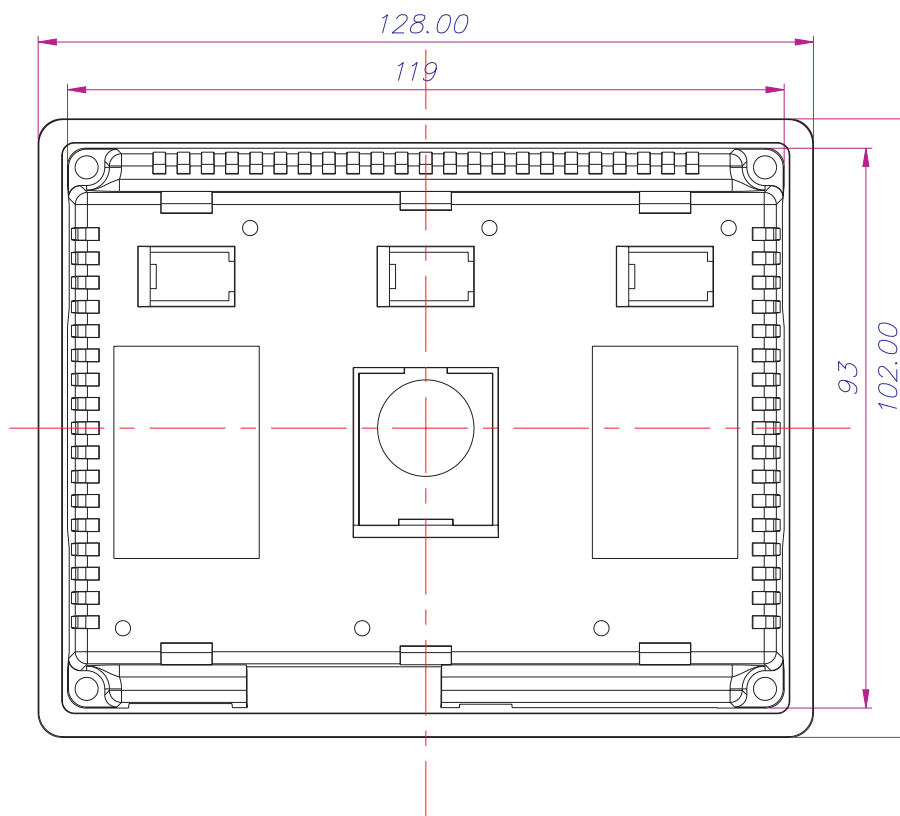
Care should be taken when locating equipment behind the unit to ensure that AC power wiring, PLC output modules, contactors, starters, relays and any other source of electrical interference are located away from the FP4030MR unit. Particular care should be taken to locate variable speed drives and switching power supplies away from the FP unit.

Panel Mounting

This section presents the dimensional sketch and panel cutouts for FP4030MR unit.
(All dimensions are in mm and drawing are not to scale.)

2.2.1 Panel cut-out and mouting

Panel cut-out:



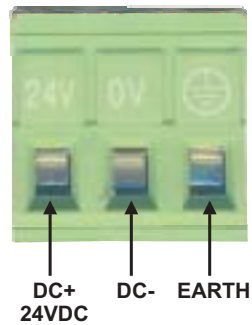
Note: Maximum panel thickness should be 6.5mm (Tolerance: +0.00mm).

2.3 Wiring Diagram

If wiring is to be exposed to lightening or surges, use appropriate surge suppression devices. Keep AC, high energy and rapidly switching DC wiring separate from signal wires.

Connecting high voltages or AC power mains to the DC input will make unit unusable and may create an electrical shock hazard to personnel. Such a failure or shock could result in serious personal injury, loss of life and/or equipment damage. DC voltage sources should provide proper isolation from main AC power and similar hazards.

Pin description of the power connector is as follows:

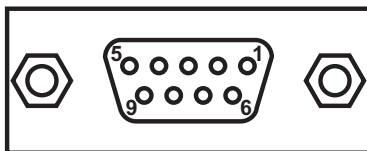


2.4 Communication Ports

a. Com 1 port

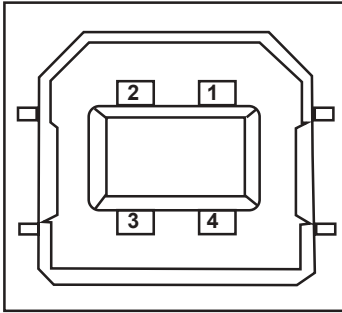
It is an integrated RS-232 and RS-485/RS422 communication port. It communicates with external peripherals at baud rate of 4800 - 115.2Kbps (For MPI PLCs 187.5Kbps is also supported) with None, Even or Odd parities. RS485/RS422 can be used in multi drop communication network.

Connector used: Standard D-Type 9-pin female connector



Pin number	Name	Description
1	TX+	RS485 transmit +
2	TXD	RS232 transmit
3	RXD	RS232 receive
4	RX+	RS485 receive +
5	GND	Ground
6	NC	No connection
7	NC	No connection
8	TX-	RS485 transmit -
9	RX-	RS485 receive -

- b. USB Device:
1. USB Device, compliant with USB 2.0 specification, self powered device.
 2. Connector used: Standard USB Type B Female connector.



Pin number	Name	Description
1	VBUS	+5V
2	D-	Data -
3	D+	Data+
4	GND	Circuit ground
shell		shield

REVISION HISTORY

A manual revision code appears to the bottom of this manual and on the front cover of the manual.

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The following table outlines the changes made to the manual during each revision. The page numbers of a revision refer to the previous version.

Revision code	Date	Revised content
1.00	18.10.12	First Draft.