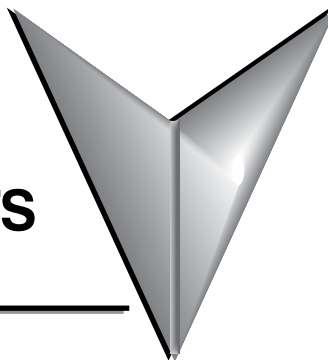


TABLE OF CONTENTS



In This Manual

User Caution	ii
Publication History.....	v
Chapter 1 - Getting Started.....	1-1
Introduction	1-2
Intended Use of This Product	1-2
Purpose of this Manual	1-3
Important Online Resources	1-3
Conventions Used.....	1-4
Key Topics for Each Chapter.....	1-4
Install Programming Software	1-5
Mounting Hardware.....	1-8
Power the System	1-9
Chapter 2 - Specifications	2-1
Overview	2-2
Right Side Expansion - Productivity1000 Input/output Modules.....	2-2
Left Side Expansion - Arduino MKR-compatible Shields	2-2
P1AM-100 Arduino Compatible CPU.....	2-3
P1AM-100 Module Faceplate Layout.....	2-4
P1AM-100 MicroB USB Programming Port	2-5
microSD Slot.....	2-6
P1AM-100 CPU Headers.....	2-7

Table of Contents

P1AM-200 Arduino Compatible CPU	2-8
P1AM-200 Module Faceplate Layout	2-9
P1AM-200 MicroB USB Programming Port	2-10
microSD Slot.....	2-11
P1AM-200 CPU Headers.....	2-12
Powering Your ProductivityOpen System	2-13
AutomationDirect Shields.....	2-14
Ethernet Communications Shield.....	2-14
Serial Communications Shield.....	2-16
Header Pin Breakout Module.....	2-17
Productivity I/O Modules Overview	2-19
Chapter 3 - Installation and Wiring	3-1
Safety Guidelines	3-3
Plan for Safety.....	3-3
Three Levels of Protection	3-4
System Power Disconnect.....	3-4
Emergency Stop Circuits.....	3-5
Introduction to the ProductivityOpen Mechanical Design.....	3-6
Typical P1AM-100.....	3-6
Dimensions and Installation	3-7
Basic Dimensions	3-9
Mounting Guidelines	3-12
Enclosures.....	3-12
Mounting P osition.....	3-12
Using Mounting Rails.....	3-12
Mounting Clearances.....	3-13
Temperature Considerations.....	3-13
Power Considerations	3-13
Grounding	3-14
Agency Approvals	3-14
DIN Rail Mounting P1AM-100 System	3-15
Surface Mounting P1AM-100 System	3-15
Connecting the I/O Modules.....	3-16

- Wiring Guidelines 3-17**
 - Power Supply Wiring.....3-17
 - Grounding3-17
 - Fuse Protection.....3-18
- I/O Module Wiring Options 3-19**
 - Hand Wiring System.....3-19
 - ZIPLink Wiring System.....3-20**
 - Terminal Block With Pigtail Cable3-20
 - Input and Output Module **ZIPLink** Selections3-21
 - Analog Modules ZIPLink Selections3-22
 - Removable Terminal Blocks (Optional)3-23
 - Terminal Block Installation3-24
 - Terminal Block Removal3-25
 - Planning the I/O Wiring Routes.....3-25
- System Wiring Strategies..... 3-26**
 - CPU Isolation Boundaries.....3-26
 - Sinking/Sourcing Concepts3-27
 - I/O "Common Terminal" Concepts3-28
 - DC Input Wiring Methods.....3-29
 - DC Output Wiring Methods.....3-29
 - CPU DC Sinking Output to Sinking Load Device.....3-30
 - Relay Outputs - Wiring Methods.....3-31
 - Types of Additional Transient Protection.....3-34
- Appendix A - Security Considerations for Controls Networks.....A-1**
 - Security Considerations for Control Systems Networks..... A-2