



Arcx Industrial μ P3000

Hardware Reference Guide



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Description

The uP3000 Web enabled Logic Controller is the third generation in a series of high performance highly integrated Logic Controllers designed to replace more expensive systems requiring a separate HMI, Processor, Network Interfaces and multiple I/O points. The high level of integration provides an HMI Interface, dozens of I/O points and a powerful processor to carry out the majority of Logic Control tasks with no additional hardware. The high performance screen and touch panel interface provide a top quality user experience and supports both Full Motion and Static high resolution color images in an optimal 7" display.

The compact design allows for the mounting of the unit within close proximity to an operator with minimal mounting hardware. Despite the rugged die cast aluminum enclosure the unit weighs a mere 7lbs (3.2Kg) which allows for a variety of low cost mounting solutions. Multiple power sources allow for supply from a Class II 24Vdc supply or via an Ethernet cable fed from a PoE isolated mid-span power source. Using PoE further reduces wiring requirements, system complexity, and cost.

The system employs the proven Linux Operating System, allowing for multiple programming languages and programming models such as simple web pages to more sophisticated C++ embedded applications. With the incorporation of Real Time Automation's Common Industrial Protocol (CIP™) stack and communication via industry standard protocols such as EtherNet/IP™ and DeviceNet™, the uP3000 offers reliable connection to a variety of industry standard PLC's and Automation equipment. Additionally, other protocols such as FLNet, ProfiBus and ModBus can be added to the system as an option.

Note: The uP3000 device family has several available I/O configurations. Using 19pin MDC Mini connectors, it is possible to connect to 2, 4, or 8 port 5pin field cables. This keeps cabling tight and offers a variety of industry standard wiring options. Alternatively, if your requirements do not require an IP65 rating, then Terminal block based solutions are available. This document covers the uP3000 family of products. Alternate I/O specifications can be found in the document Appendices.

Specifications

Device Specifications	
Dimensions (HWD):	10" x 6" x 3.5" (25.4 cm x 15.24 cm x 8.89 cm)
Weight:	7 lbs (3.18 Kg)
Power Requirement:	24VDC
Operating Temperature:	-10°C to +60°C
Storage Temperature:	-40°C to +85°C
Humidity:	40% non-condensing
Enclosure Type (with Screen):	IP61 (drip proof)
Enclosure Type (without Screen):	NEMA 4/IP65 (drip proof)
Vibration:	5-17Hz, 0.1" double amplitude displacement 17-640Hz 1.5G acceleration peak to peak
Shock:	10G (11mS) peak-to-peak acceleration
Memory:	64MB NAND flash, 2MB NOR flash 128 MB Low-power 266 MHz DDR SDRAM
Display:	800x480 16bits/pixel, contrast ratio 240, 320 nits Eight (8) Tri-Color LEDs Horizontally aligned Five (5) High Brightness LEDs Vertically aligned
HID:	Integrated HID® RFID Reader for Weigand badges
Inputs:	Sixteen (16) 24V NPN/PNP Inputs
Outputs:	Sixteen (16) 24V NPN/PNP Outputs
Serial:	Four (4) RS232 ports for Bar Code readers or auxiliary use
Isolated Auxiliary Inputs:	Two (2) Optically isolated inputs
Isolated Auxiliary Outputs:	Two (2) User definable Form C Dry Contact Relay Outputs

Accessories

Accessories	
AXM-UP2000-L000	3 Color Mini stack Light with integrated 5 pin Mini MDC connector
AXM-UP2000-L100	5 Color Mini stack Light with integrated 8pin Micro MDC connector
AXM-UP3100-B001	Strain relief kit
AXM-UP3100-B001	6-Hole Aluminum Mounting Plate

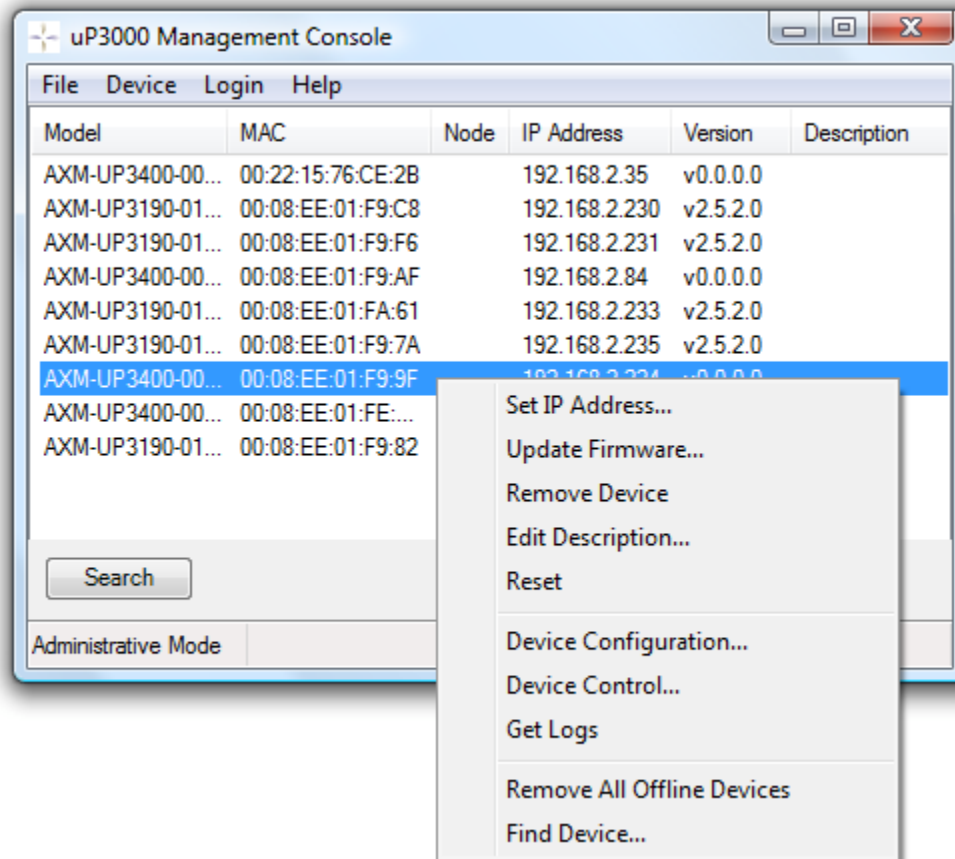
Fieldbus Options

Fieldbus Options	
EtherNet/IP (Industrial Protocol)	Included as standard option
DeviceNet	Included as standard option
FLNet	Available as optional secondary Fieldbus
ProfiBus	Available as optional secondary Fieldbus
ModBus	Available as optional secondary Fieldbus

AxMC

The AxMC software is the Management Console application used to test hardware, configure device attributes, and upgrade firmware on the μ P3000 family of devices. This program contains a detailed Help file which describes its various operations and functions.

In order to configure a device, it must be connected to a Windows PC via Ethernet, and the Windows PC must have the AxMC installed. The μ PMC can then be used to change IP settings on the device as well as configure DeviceNet properties. Please refer to the AxMC manual for more information.



AxMC Management Console

Web Automation Toolkit

Technology integrators and control systems developers are all faced with the need to develop compelling graphical user interfaces and implement complex business logic. The Archronix Web Automation Toolkit (WAT) eliminates the steep learning curve associated with proprietary PLC and HMI code and enables rapid user interface design and hardware control using off-the-shelf web development tools. Archronix aims to facilitate system development by allowing designers and programmers to devote their efforts to meeting project requirements without wasting valuable time dealing with the mechanics of proprietary PLC and HMI code.

The Web Automation Toolkit (WAT) architecture is built on an open platform and leverages the ever increasing FOSS (Free or Open Source Software) model. Our freely available WAT programming API allows for easy integration into HTML/JavaScript and more object oriented programming languages. No cost provided sample software and tools allows the developers to implement and test applications on a standard desktop PC with easy deployment to the unit for production in mere hours.

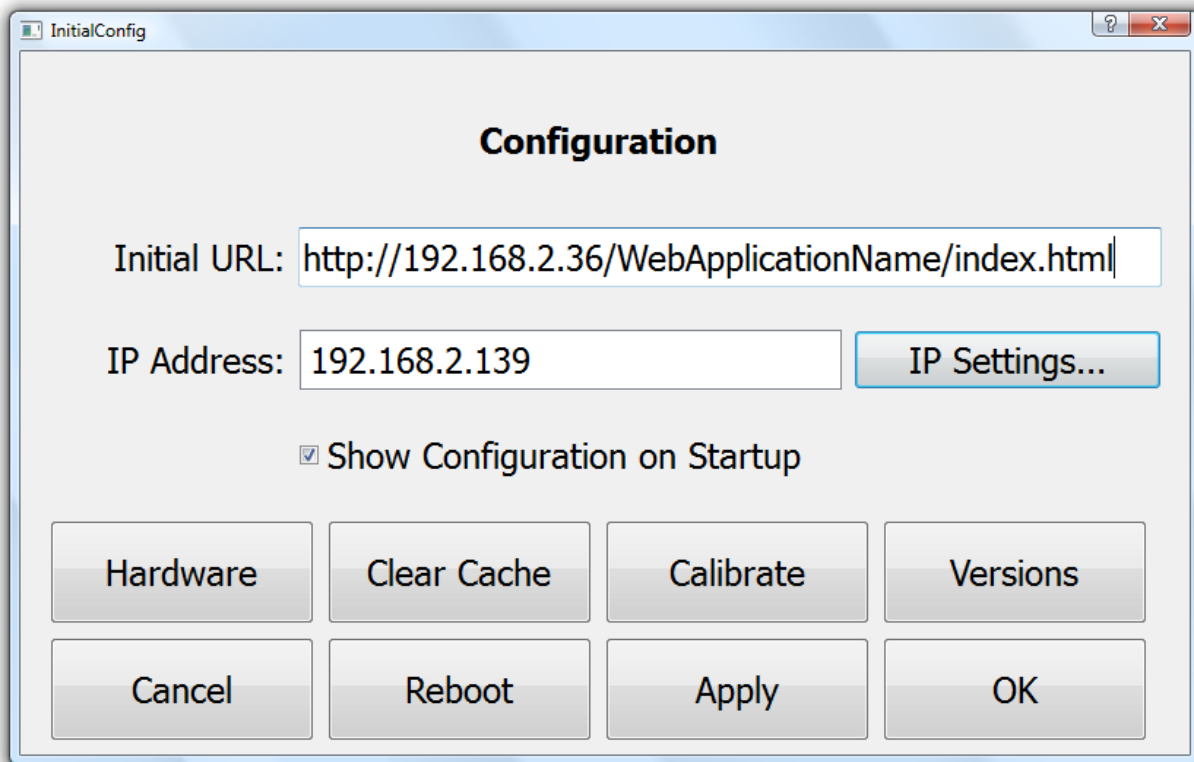
The Archronix Web Automation Toolkit SDK provides a framework for creating sophisticated control applications without relying on proprietary PLC and HMI development software. The use of common web technologies also creates several other advantages including: database interaction, ease of deployment, scalability, etc.

Please refer to the Web Automation Toolkit documentation for further information.

Installing the uP3000

Configuring the Device

The μ P3000 provides a simple configuration page on System Startup that provides access to configurations screens for Network Configuration, Hardware Testing, and Screen Calibration. The Show Configuration on Startup feature can be enabled or disabled via the configuration page.



Configuration Screen

Network Configuration

The μ P3000 can be configured with either a static or dynamic IP Address. The IP Settings button on the configuration screen provides access to IP Address configuration options. DHCP (Dynamic Host Configuration Protocol) is a networking protocol which dynamically distributes the IP address to the destination device. Selecting DHCP in the IP Settings screen will enable dynamic IP Addressing and will automatically configure your network settings. The Static IP Settings will be disabled when DHCP is enabled.

If the μ P3000 is configured with a static IP Address and you would like to use DNS services, you will need to include the IP Address of your DNS server in the DNS field. Your network administrator should be able to provide you with this information.

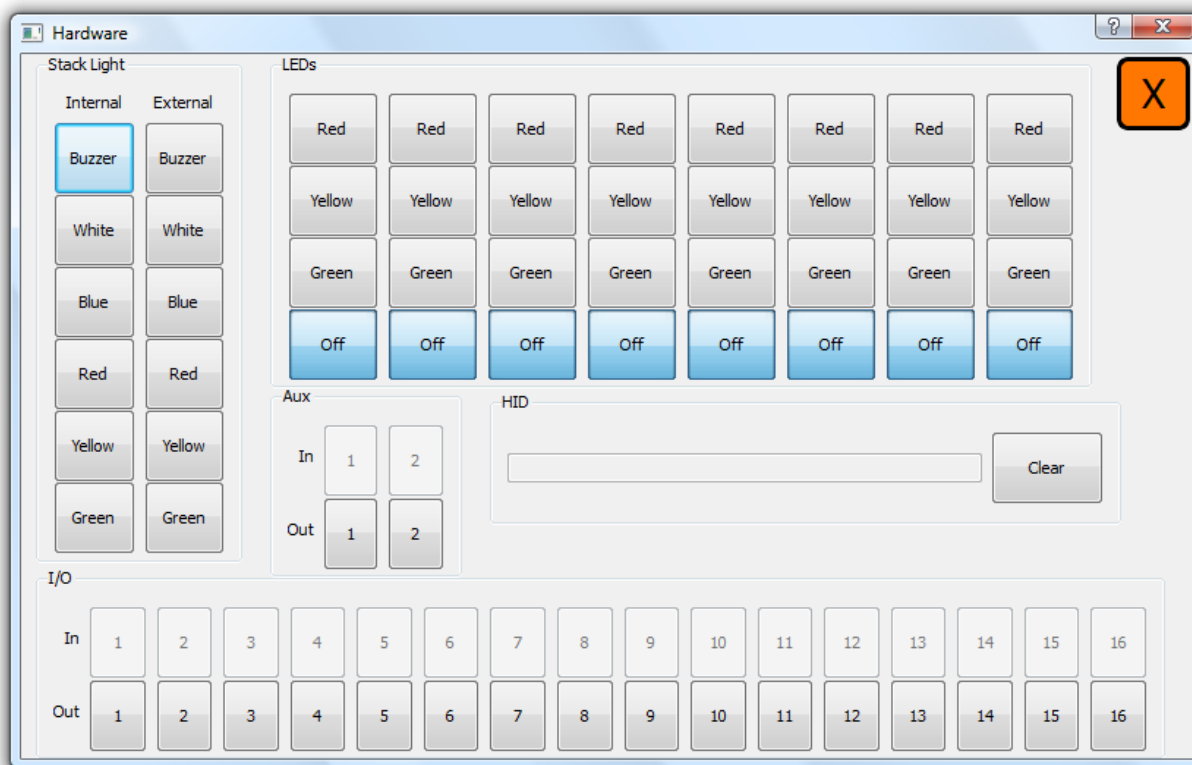
Initial URL: – This field is used to configure the application that will run on the device. Here you will need to enter the URL where the application is located. Valid protocols include: **http** and **file** (for

applications located on the local file system.) The μ P3000 also supports CIFS (Common Internet File System) protocol format for network file systems.

IP Address: – Displays the IP Address of the device.

Hardware Configuration

The Hardware Configuration page can be used to quickly test the device hardware as well as connected cables and accessories. The hardware setup page allows you to activate the LEDs, Stack Lights, and Outputs and displays data from the Inputs and the HID reader.



Hardware Configuration Screen

Clear Cache

If you are using a web application that utilizes the application cache, this option allows you to clear the cached data. A reboot is recommended after clearing the application cache.

Calibrate

The Calibration page is used to calibrate the LCD touch screen. Simply touch the center of each of the five crosshairs when prompted to calibrate the touch screen. After the screen has been calibrated, a test option is provided to validate touch screen operation. Calibrating the panel before its initial use and after completing a firmware download is highly recommended.

Versions

The Versions page displays device information including the MAC Address, IP Address, Linux Kernel version, as well as version numbers of the installed plugins.

Connections and Wiring

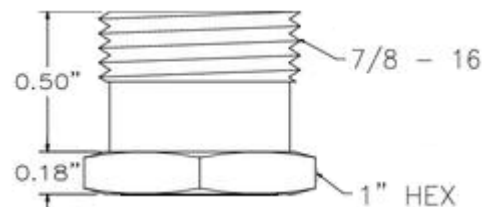
Power

Description

The μ P3000 supports two options for providing power. Power can be supplied via a Class II 24VDC supply. See Connection Details below for more information.

The μ P3000 also supports 802.3af PoE (Power over Ethernet) via the EtherNet port fed from a PoE isolated mid-span power source. See [EtherNet/IP Connection Details](#) for more information regarding this connector.

Connection Details



Manufacturer Part Number: Mencom MIN-4MR-1-18

Power Connector Wiring Specification		
Pin	Signal	Function
1	COM	Common
2	V+	+24VDC
3	COM	Common
4	CGND	Chassis Ground

Stack Light

Description

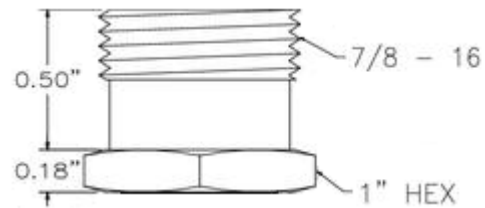
This connection supports an external Stack Light with three colors and a buzzer. Support for a five color external Stack Light with buzzer is also available.

AXM-UP2000-L000: 3 Color Mini Stack Light with integrated 5 pin Mini MDC connector.

AXM-UP2000-L100: 5 Color Mini Stack Light with integrated 8 pin Micro MDC connector.

See Connection Details below for more information.

Connection Details



Manufacturer Part Number: Mencom MIN-5FR-1-22

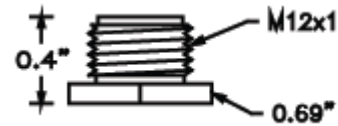
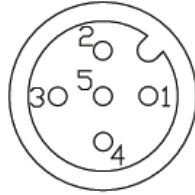
Stack Light Connector Wiring Specification			
Pin	Signal	Active H/L	Voltage (High)
1	Common	-	0V
2	Buzzer	H	15
3	Green Light	H	15
4	Amber Light	H	15
5	Red Light	H	15

DeviceNet

Description

DeviceNet is a communication protocol used in the automation industry to interconnect control devices for data exchange. It uses Controller Area Network (CAN) as the backbone technology and defines an application layer to cover a range of device profiles. The DNET LED on the device front panel will blink when there is a DeviceNet error. When solid, the DNET LED indicates a successful DeviceNet connection. See Connection Details below for more information.

Connection Details



Manufacturer Part Number: Mencom MDC-5MR-4

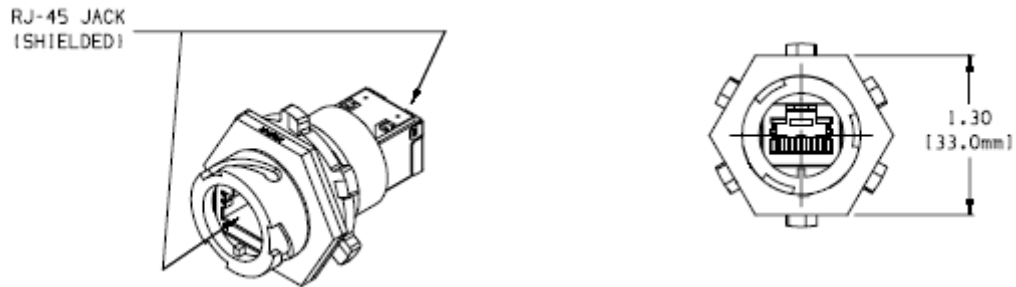
DeviceNet Connector Wiring Specification		
Pin	Signal	Voltage
1	Shield	-
2	DNET_PWR	24V
3	DNET_GND	0V
4	CAN_H	-
5	CAN_L	-

Fieldbus

Description

The μ P3000 offers an optional second Fieldbus connection. Available options include FLNet, Profibus, and Modbus. See Connection Details below for more information.

Connection Details



Manufacturer Part Number: Molex 847000001

FLNet Connector Wiring Specification	
Pin	Signal
1	TX (+)
2	TX (-)
3	RX (+)
4	-
5	-
6	RX (-)
7	-
8	-

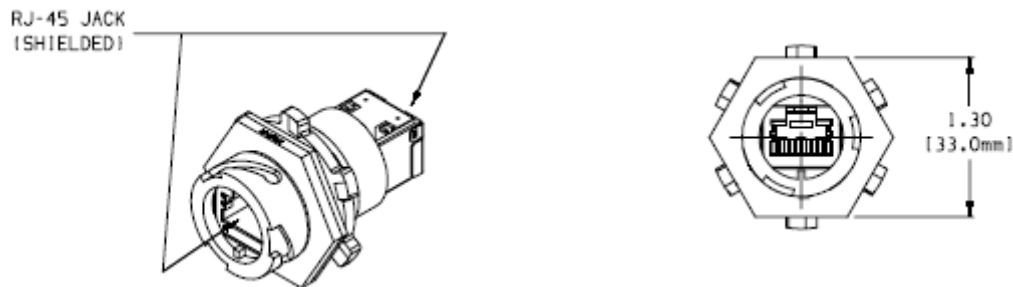
EtherNet

Description

EtherNet/IP (Industrial Protocol) is an open communications protocol designed for use in process control and other industrial automation applications. The ENET LED on the device front panel indicates a successful Ethernet/IP connection.

The μ P3000 Ethernet connector also supports 802.3af PoE (Power Over Ethernet). Power-over-Ethernet eliminates the need for a dedicated power outlet at each device installation point, resulting in an easier and less expensive installation. See Connection Details below for more information.

Connection Details



Manufacturer Part Number: Molex 847000001

Ethernet Connector Wiring Specification

Pin	Signal
1	TX (+)
2	TX (-)
3	RX (+)
4	POE IN 1
5	POE IN 1
6	RX (-)
7	POE IN 2
8	POE IN 2

Power Over Ethernet Specifications

Power Requirements	400mA @ 48V (802.3af)
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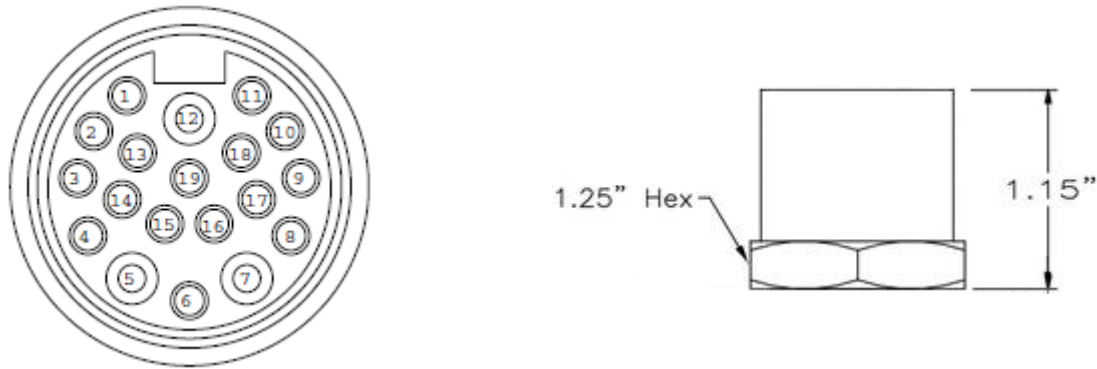
IO Ports

Description

The μ P3000 supports sixteen 24V NPN/PNP Inputs and sixteen 24V NPN/PNP Outputs. The inputs and outputs are configured for NPN mode at default. In this mode, to activate an input, you must tie it to common (0V) and the output goes to 0V when active. In PNP mode, to activate an input, you must tie it to PWR (+24V). The output goes to +24V when active.

Inputs 1-8 and Outputs 1-8 are located on IO Port 1 and Inputs 9-16 and Outputs 9-16 are located on IO Port 2. See Connection Details below for more information.

Connection Details



Manufacturer Part Number: Mencom MIN-19FR-1

IO Connector Wiring Specification		
Pin	Signal	Voltage
1	Output 8 (Output 16)	0-24V
2	Output 6 (Output 14)	0-24V
3	Output 4 (Output 12)	0-24V
4	Input 2 (Input 10)	0-24V
5	Common	-
6	Output 2 (Output 10)	0-24V
7	Power	24V
8	Input 3 (Input 11)	0-24V
9	Input 5 (Input 13)	0-24V
10	Input 7 (Input 15)	0-24V
11	Output 7 (Output 15)	0-24V
12	Chassis	-
13	Input 6 (Input 14)	0-24V
14	Input 4 (Input 12)	0-24V
15	Output 1 (Output 9)	0-24V
16	Output 3 (Output 11)	0-24V
17	Output 5 (Output 13)	0-24V
18	Input 8 (Input 16)	0-24V
19	Input 1 (Input 9)	0-24V

Auxiliary Isolated IO

Description

The μ P3000 Isolated Auxiliary IO port supports 2 optically isolated inputs and two Form C Dry Contact Relay outputs. To activate the auxiliary input, apply 24VDC across the two terminals. See Connection Details below for more information.

Connection Details



Manufacturer Part Number: Mencom MIN-10-MR-1-22

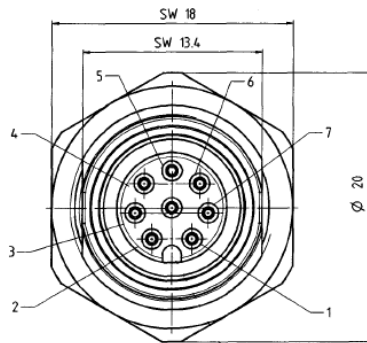
Aux Connector Wiring Specification	
Pin	Signal
1	Aux In 1 A
2	Aux In 1 B
3	Aux In 2 A
4	Aux In 2 B
5	Aux Out 1 NO
6	Aux Out 1 Com
7	Aux Out 1 NC
8	Aux Out 2 NO
9	Aux Out 2 Com
10	Aux Out 2 NC

Serial

Description

The μ P3000 supports four RS-232 serial ports. These ports support most standard RS-232 communications protocols for data transmission. The connector specification for the RS-232 Ports is shown below.

Connection Details



Manufacturer Part Number: Binder 09 3482 287 08

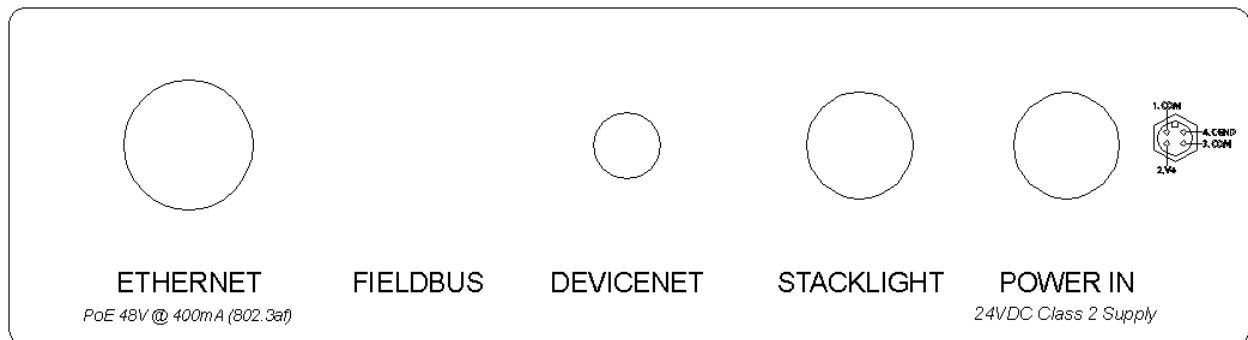
RS-232 Connector Wiring Specification		
Pin	Signal	Function
1	PWR	5/15/24VDC
2	RXD	Receive Data
3	TXD	Transmit Data
4	CTS	Clear To Send
5	GND	Ground
6	RTS	Request To Send
7	-	-
8	-	-

Appendix A - μ P3400 Option

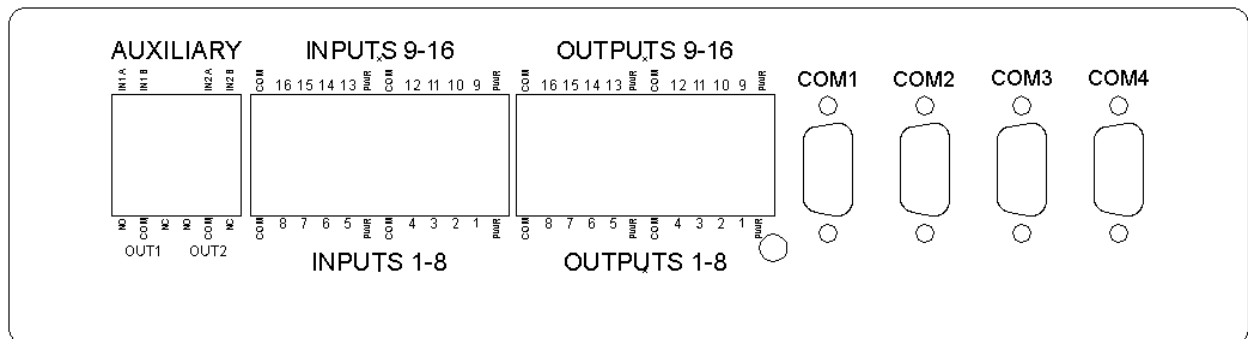
The μ P3400 option includes FLNet installed as a secondary Fieldbus as well as terminal block Input and Output connectors.



μ P3400 Option



μ P3400 Top Panel



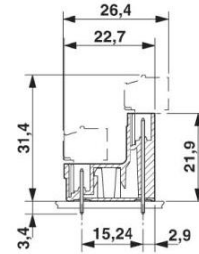
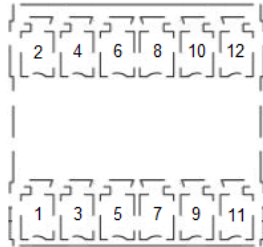
μ P3400 Bottom Panel

Auxiliary Isolated IO

Description

The µP3000 Isolated Auxiliary IO port supports 2 optically isolated inputs and two user definable Form C Dry Contact Relay outputs. See Connection Details below for more information.

Connection Details



Manufacturer Part Number: Phoenix 1830444

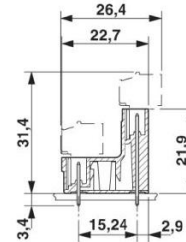
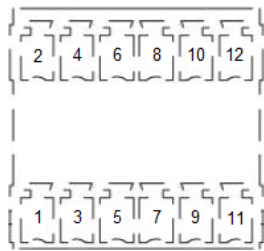
Auxiliary Isolated I/O Connector Wiring Specification	
Pin	Signal
1	Aux Out 1 NO
2	Aux In 1 A
3	Aux Out 1 Com
4	Aux In 1 B
5	Aux Out 1 NC
6	N/C
7	Aux Out 2 NO
8	N/C
9	Aux Out 2 Com
10	Aux In 2 A
11	Aux Out 2 NC
12	Aux In 2 B

Input Ports

Description

The μ P3400 supports sixteen 24V NPN/PNP Inputs. Each terminal block provides 4 inputs as well as Common and Power. See details below for more information.

Connection Details



Manufacturer Part Number: Phoenix 1830444

Inputs 13-16, 5-8 Connector Wiring Specification

Pin	Signal	Voltage
1	COM	0V
2	COM	0V
3	Input 8	0-24V
4	Input 16	0-24V
5	Input 7	0-24V
6	Input 15	0-24V
7	Input 6	0-24V
8	Input 14	0-24V
9	Input 5	0-24V
10	Input 13	0-24V
11	PWR	24V
12	PWR	24V

Inputs 9-12, 1-4 Connector Wiring Specification

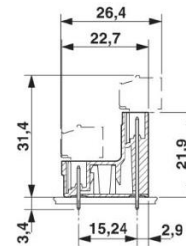
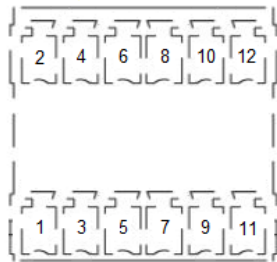
Pin	Signal	Voltage
1	COM	0V
2	COM	0V
3	Input 4	0-24V
4	Input 12	0-24V
5	Input 3	0-24V
6	Input 11	0-24V
7	Input 2	0-24V
8	Input 10	0-24V
9	Input 1	0-24V
10	Input 9	0-24V
11	PWR	24V
12	PWR	24V

Output Ports

Description

The µP3400 supports sixteen 24V NPN/PNP Outputs. Each terminal block provides 4 outputs as well as Common and Power. See details below for more information.

Connection Details



Manufacturer Part Number: Phoenix 1830444

Outputs 13-16, 5-8 Connector Wiring Specification

Pin	Signal	Voltage
1	COM	0V
2	COM	0V
3	Output 8	0-24V
4	Output 16	0-24V
5	Output 7	0-24V
6	Output 15	0-24V
7	Output 6	0-24V
8	Output 14	0-24V
9	Output 5	0-24V
10	Output 13	0-24V
11	PWR	24V
12	PWR	24V

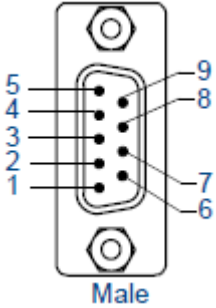
Outputs 9-12, 1-4 Connector Wiring Specification

Pin	Signal	Voltage
1	COM	0V
2	COM	0V
3	Output 4	0-24V
4	Output 12	0-24V
5	Output 3	0-24V
6	Output 11	0-24V
7	Output 2	0-24V
8	Output 10	0-24V
9	Output 1	0-24V
10	Output 9	0-24V
11	PWR	24V
12	PWR	24V

Serial

Description

The μ P3400 supports four RS-232 serial ports. These ports support most standard RS-232 communications protocols for data transmission. The connector specification for the RS-232 Ports is shown below.

Serial Connector Wiring Specification			
Diagram	Pin	Signal	Function
 Male	1	-	-
	2	RXD	Receive Data
	3	TXD	Transmit Data
	4	-	-
	5	GND	Ground
	6	-	-
	7	RTS	Request To Send
	8	CTS	Clear To Send
	9	-	-