Arcx Industrial µP3040

Hardware Reference Guide

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Description

The uP3040 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. 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 uP3040 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.

Specifications

| Device Specifications	
Dimensions (HWD):	9¾" x 5" x 2.5" (25 cm x 13 cm x 6 cm)
Weight:	3 lbs (1.36 Kg)
Power Requirement:	24VDC
Operating Temperature:	-10ºC to +60ºC
Storage Temperature:	-40ºC to +85ºC
Humidity:	40% non-condensing
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:	Six (6) 24V NPN/PNP Inputs (Analog or Digital)
Outputs:	Two (2) 0-10V Analog Outputs
Serial:	Three (3) RS232 ports
Isolated Auxiliary Inputs:	Two (2) Optically isolated inputs
Isolated Auxiliary Outputs:	Three (3) User definable Form C Dry Contact Relay Outputs

Accessories

Accessories	
AXM-UP3100-	Mounting bracket

Fieldbus Options

Fieldbus Options	
EtherNet/IP (Industrial Protocol)	Included as standard option
DeviceNet	Included as standard option
FLNet	Included as standard option
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 µP3040 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 μPMC 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.
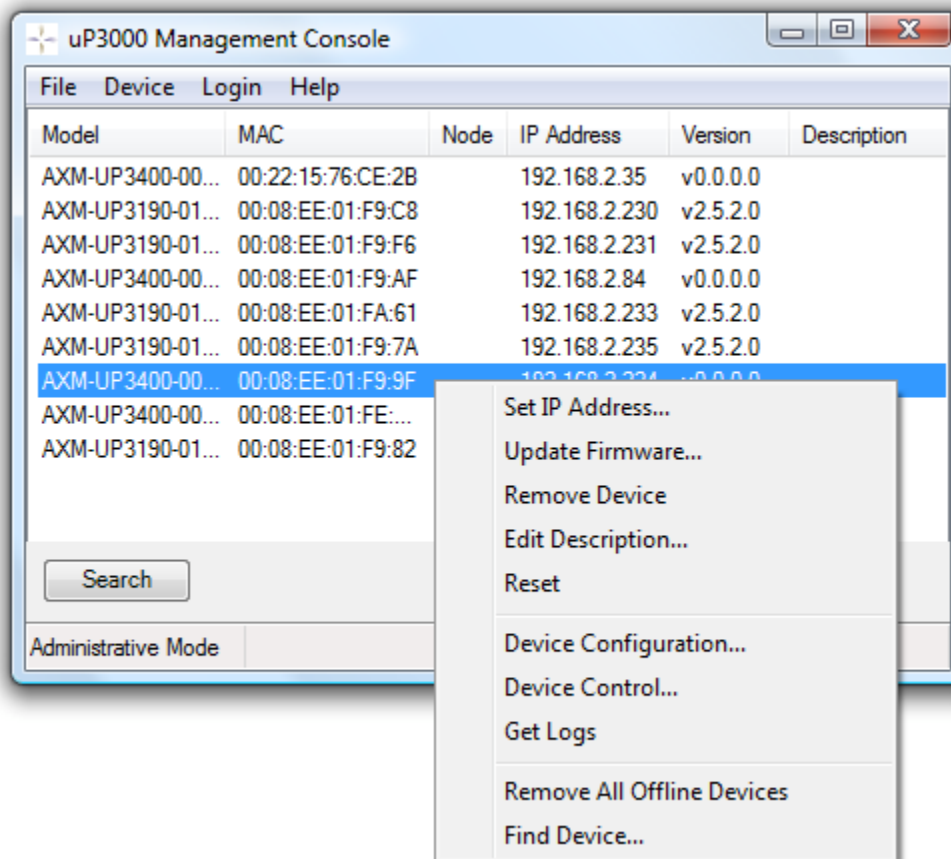
AxMC Management Console

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 uP3040

Configuring the Device

The µP3040 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.
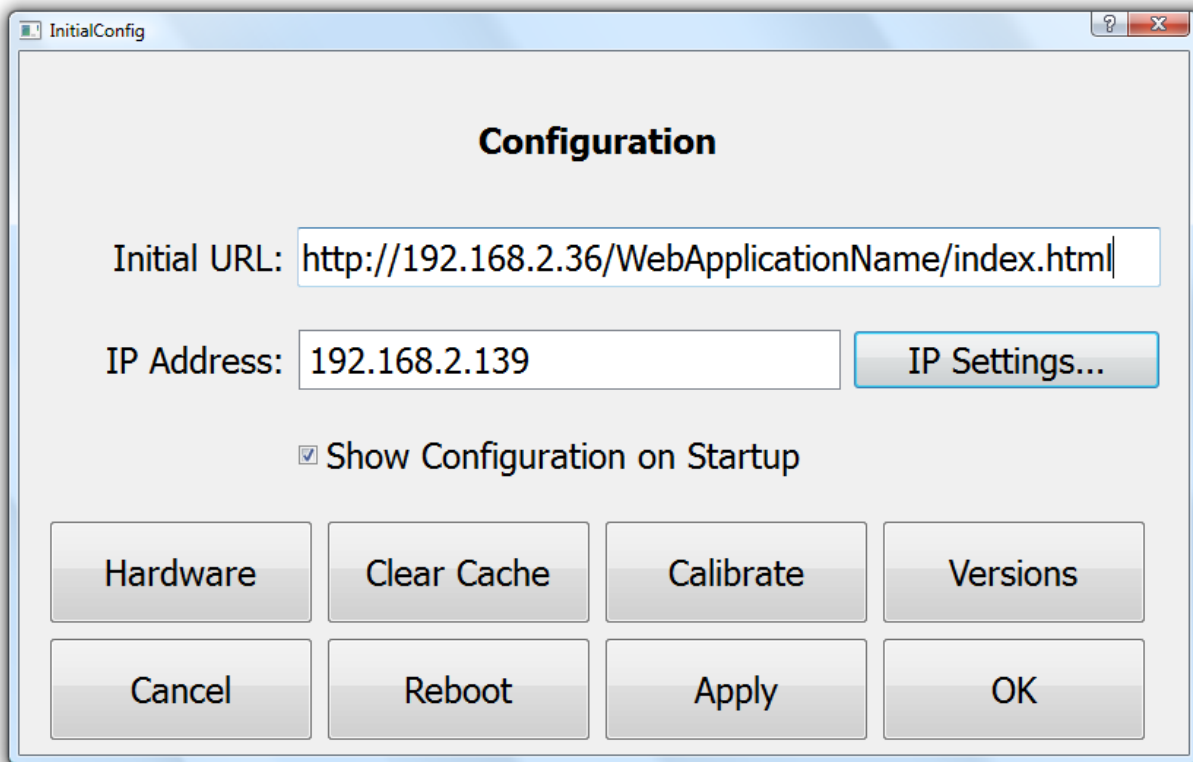
Configuration Screen

Network Configuration

The µP3040 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 µP3040 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 µP3040 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.
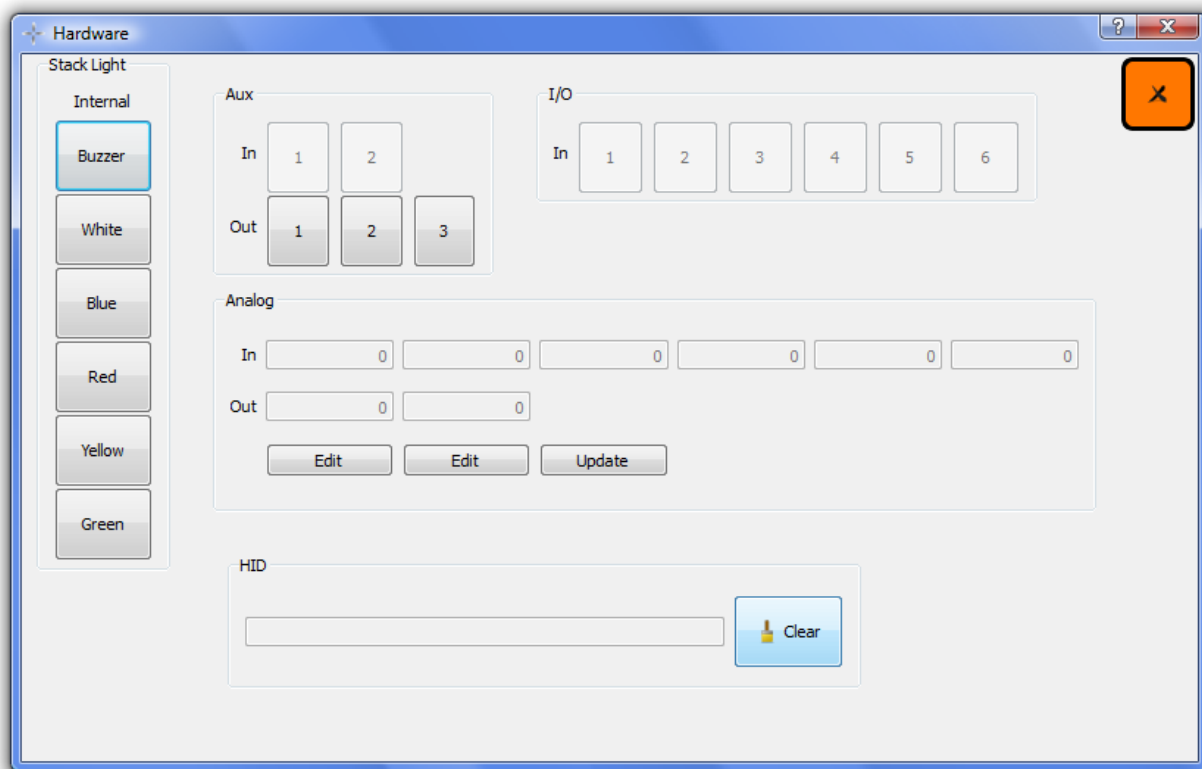
Hardware Configuration Screen

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 µP3040 supports two options for providing power. Power can be supplied via a Class II 24VDC supply. See Connection Details below for more information.

The µP3040 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
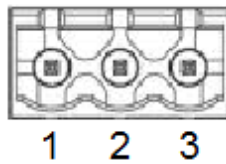

Manufacturer Part Number: Phoenix Contact 1757255

Power Connector Wiring Specification		
Pin	**Signal**	**Function**
1	24V	24V
2	COM	0
3	CHAS	-

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
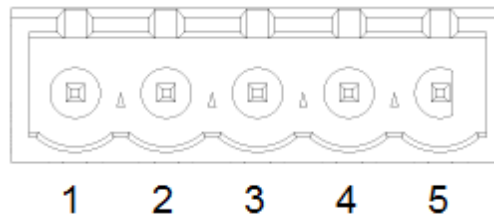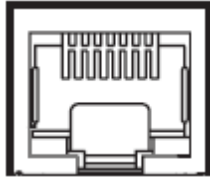

Manufacturer Part Number: Mencom MDC-5MR-4

DeviceNet Connector Wiring Specification		
Pin	**Signal**	**Voltage**
1	CAN-	0
2	CANL	-
3	SHLD	-
4	CANH	-
5	CAN+	24V

FLNet

Description

The μP3040 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

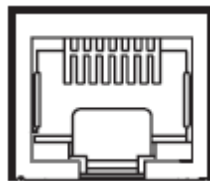| FLNet Connector Wiring Specification	
Pin	**Signal**
1	TX (+)
2	TX (-)
3	RX (+)
4	-
5	-
6	RX (-)
7	-
8	-

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 µP3040 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

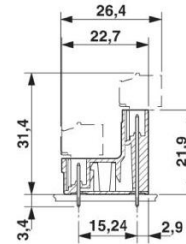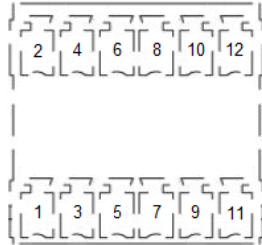| Ethernet Connector Wiring Specification	
Pin	Signal
1	TX (+)
2	TX (-)
3	RX (+)
4	POE IN 1
5	POE IN 1
6	RX (-)
7	POE IN 2
8	POE IN 2

Power Over Ethernet Specifications	
Power Requirements	400mA @ 48V (802.3af)

I/O Port 1

Description

The µP3040 supports six 24V NPN/PNP Inputs and two analog outputs. Four of the inputs can be configured as either analog or digital. When configured as an analog input, they can read a range from 0-10V. The remaining two are analog 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

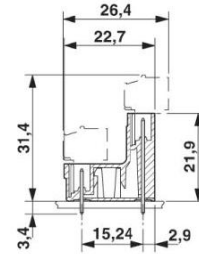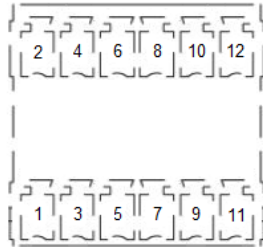| I/O Port 1 Connector Wiring Specification	
Pin	**Signal**
1	I/O Power (24VDC)
2	IN 1
3	IN 2
4	IN 3
5	IN 4
6	I/O COM (Ground)
7	I/O Power (24VDC)
8	ANLG IN 1
9	ANLG IN 2
10	ANLG OUT 1
11	ANLG OUT 2
12	I/O COM (Ground)

I/O Port 2

Description

The µP3040 supports two optically isolated inputs and three user definable Form C Dry Contact Relay outputs. See Connection Details below for more information.
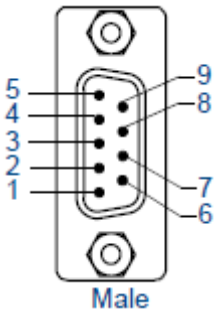
Connection Details

Manufacturer Part Number: Phoenix 1830444

| I/O Port 2 Connector Wiring Specification	
Pin	**Signal**
1	IN 1A
2	IN 1B
3	IN 2A
4	IN 2B
5	OUT 3 NO
6	OUT 3 COM
7	OUT 1 – NO
8	OUT 1 – COM
9	OUT 1 – NC
10	OUT 1 – NO
11	OUT 1 – COM
12	OUT 1 – NC

Serial

Description

The µP3040 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**
	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	-	-

Appendix A - Power Over Ethernet Guidelines

Connecting Devices to the Same PSE and to the same Power Supply
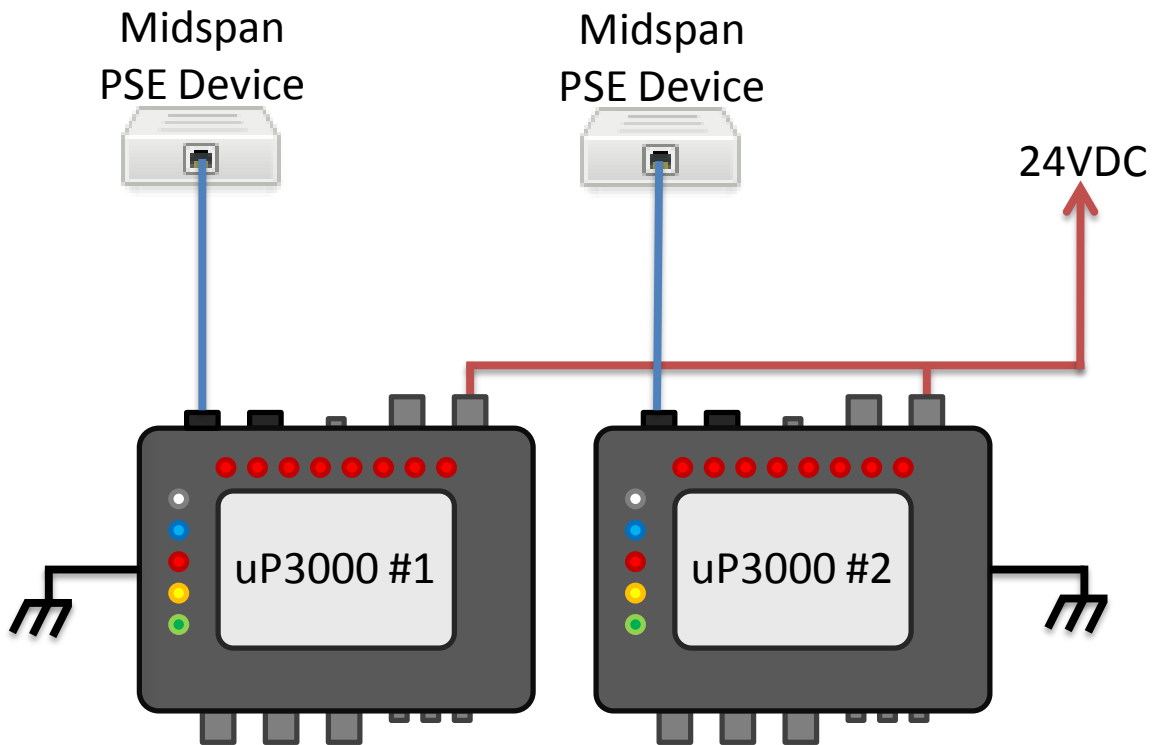
Tying together any of the two corresponding power supply wires between the two units (ie. Ground wires, Chassis wires, or 24V wires) will cause a reboot on the first device when the second device is powered on.
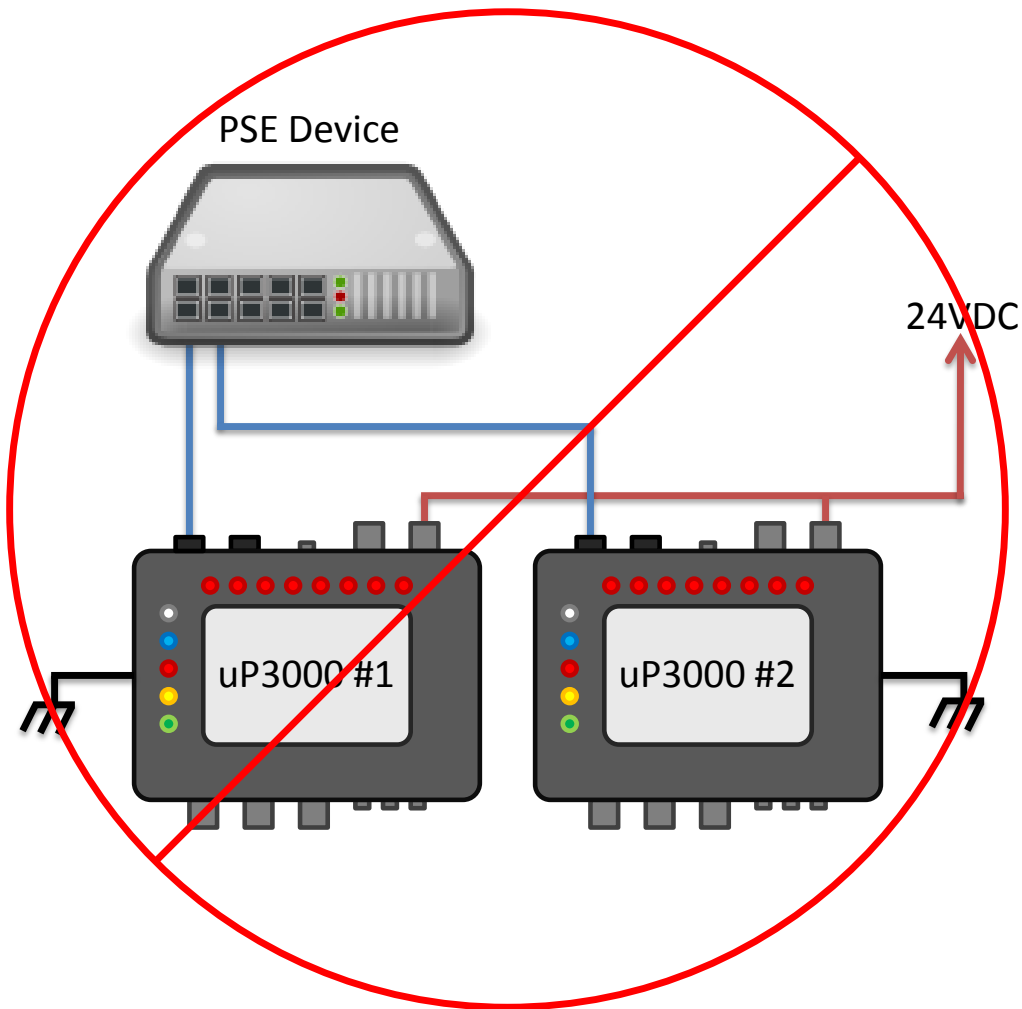
Two uP3040 Connected to The Same PSE and to the Same 24V Power Supply

## Connecting Devices to Different Midspan PSEs and to the same Power Supply

Tying together any of the two corresponding power supply wires between the two units (ie. Ground wires, Chassis wires, or 24V wires) will cause a reboot on the first device when the second device is powered on.

Two uP3040 Connected to Different Midspan PSEs and to the Same 24V Power Supply

Connecting Devices to the same PSE

Tying together any of the two corresponding power supply wires between the two units (ie. Ground wires, Chassis wires, or 24V wires) will cause a reboot on the first device when the second device is powered on.
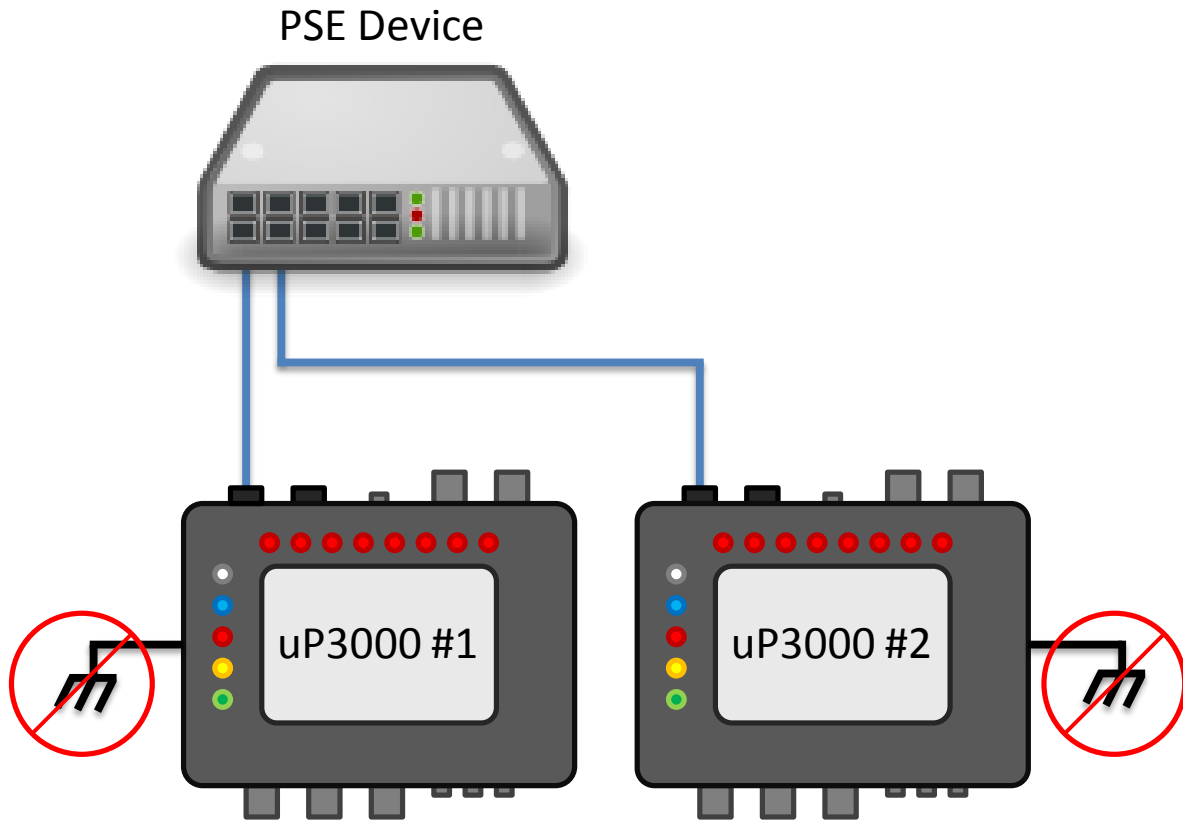
Two uP3040 Connected to the same PSE and Chassis wire disconnected