EasyRoll+ User Manual

Version 1 — 14 November 2025

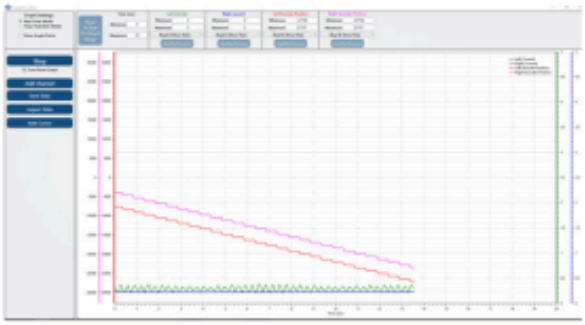


Table of Contents

Applicable Products Using EasyRoll+

Applicable Products Using EasyRoll+

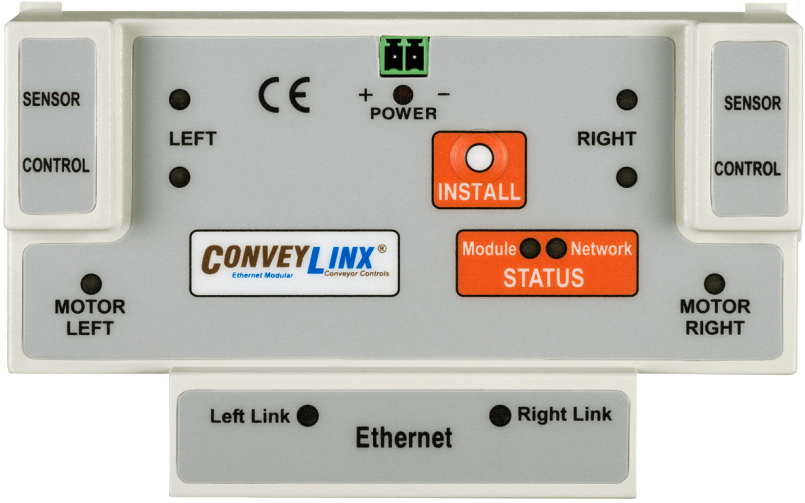
Products Compatible with EasyRoll+

Conve
Ai2
All Ar
Numb
3022-x

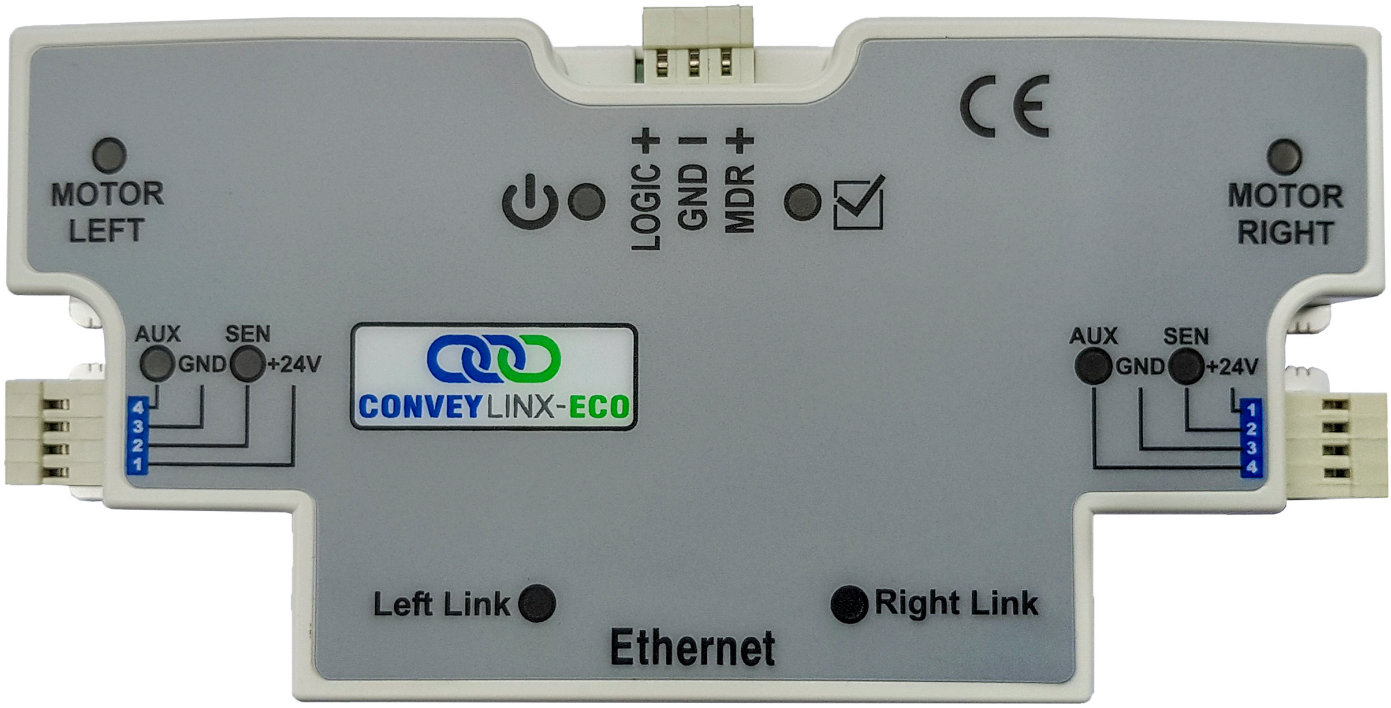
Conve
Ai2-48
All Ar
Numb
3042-x

Conve
Ai3-24
All Ar
Numb
3023-x

Conve
Ai3-48
Articl
Numb
3043-x



Conve
All Ar
Numb
3010-x



Conve
ECO
All Ar
Numb
3030-x

About This Manual

Applicable Products Using EasyRoll+ /

About This Manual

Symbol Conventions

! This symbol indicates that special attention should be paid in order to ensure correct use as well as to avoid danger, incorrect application of product, or potential for unexpected results

* This symbol indicates important directions, notes, or other useful information for the proper use of the products and software described herein

Important User Information

! Modules contain ESD (Electrostatic Discharge) sensitive parts and components. Static control precautions are required when installing, testing, servicing or replacing these modules. Component damage may result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference any applicable ESD protection handbook. Basic guidelines are:

- Touch a grounded object to discharge potential static
- Wear an approved grounding wrist strap
- Do not touch connectors or pins on component boards
- Do not touch circuit components inside the equipment
- Use a static-safe workstation, if available
- Store the equipment in appropriate static-safe packaging when not in use

! Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes, and standards

! The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Pulseroller does not assume responsibility or liability (to include intellectual property liability) for actual use based on the examples shown in this publication

Not Included in this Manual

! Because system applications vary; this manual assumes users and application engineers have properly sized their power distribution capacity per expected motor loading and expected operational duty cycle. Please refer to conveyor equipment and/or motor roller manufacturer's documentation for power supply sizing recommendations

How to Contact Us

Technical Support North & South America: support@pulseroller.com
Sales Support North & South America: sales@pulseroller.com
Technical Support Global: global_support@pulseroller.com
Sales Support Global: global_sales@pulseroller.com
Web Site: www.pulseroller.com

Glossary of Terms

Applicable Products Using EasyRoll+ /

Glossary of Terms

Term	Definition
Carton	A separate (usually wrapped or boxed) object to be transported by the conveyor. The terms tray, tote, load, or product may also be used interchangeably in this document.
ConveyLinx	Conveyor controls architecture based upon modular distributed devices connected via Ethernet network.
ConveyLinx-Ai / ConveyLinx-Ai2 / ConveyLInx-Ai3	Conveyor control module that is part of the ConveyLinx family. Each module can accommodate up to 2 MDR conveyor zones. The modules allow connection for Senergy-Ai platform motor rollers and gear drives. The term Module will be used within this document and will refer to the ConveyLinx-Ai2 device
DHCP	Dynamic Host Configuration Protocol A protocol for assigning IP addresses to devices on a network from a pool of available IP's. A dynamic IP address changes each time the device connects to the network
ERSC	Ethernet Roller Speed Control module – Conveyor control module that is part of the ConveyLinx family. Each ERSC can accommodate up to 2 MDR conveyor zones. In this document the term module will be synonymous with ERSC
ERSC-SE4	Designed to "break-out" the RJ11 connection for easy installation. The module has an amplifier to the output giving it up to 100mA output capabilities. Configurable diodes for the inputs to minimize leakage current to and from the ERSC. Module also allows for external power source connection for auxiliary devices.
Hall Effect	Special sensor embedded within the brushless DC motor of an

Sensor	MDR used to provide motor rotor position feedback to the motor controller
IP54	The IP Code (International Protection Marking) specifies the device's degree of resistance to intrusions, dust and water. IP54 certified device must be fully protected from splashed water, dust particles and completely protected from contact
JST	This is the name of a particular connector manufacturer that produces a specific plug/socket arrangement for MDR connection to control cards. This name is accepted within the conveyor and MDR industry as a simple description of the particular socket style used on ERSC hardware.
LED	Light Emitting Diode – In the context of this document, LED's are used on the ConveyLinx-Ai2 to provide visual indication of module status
Light / Dark Energized	Term used to describe how the signaling output circuit of a photo-sensor is configured when it detects its reflected light. A photo-sensor that is light energized will activate its output circuit when it detects its reflected light. A dark energized photo-sensor will activate its output circuit when it does not detect its reflected light
M8	This is the type of a connector, which has four connector pins and is used on the ConveyLinx Ai2 modules for both sensor connectors and MDR connectors
MDR	Motorized Drive Roller or Motor Driven Roller – Brushless DC motor and gearbox assembly integrated into a single conveyor roller
Normally Open / Normally Closed	Control logic terminology to define the state of the output of a Boolean "on" or "off" device. The term specifically describes the state of the output circuit when the device's sensing circuit is un-energized. In the context of photo-sensors; a normally open wired sensor would have its output circuit energized when it detected its reflected light and its output circuit would be de-energized when it did not detect its reflected light. Conversely a photo-sensor wired normally closed would energize its output circuit when it did not see its reflected light and it

	would de-energize its output circuit when it did detect its reflected light
NPN / PNP	Electronics term that indicates the type of transistor circuit used for a logical input or output for controllers. NPN devices will provide a common or ground connection when activated and a PNP device will provide a logic voltage connection when activated
Photo-sensor	A device, mounted near the end of the conveyor zone to sense the presence of a carton on the zone
PLC	Programmable Logic Controller – A wide variety of industrial computing devices that control automatic equipment
PWM	Pulse Width Modulation – a control scheme that utilizes high speed switching transistors to efficiently deliver power in a controlled fashion from the ConveyLinx controller to MDR
Retro-reflective / Reflex	Term used to describe the two basic types of photo-sensors. Retro-reflective photo-sensors utilize a reflective target that must be aligned with the photo-sensor such that the light emitted by the photo-sensor is reflected back to it. 'Reflex (or sometimes known as proximity) type photo-sensors emit light to be reflected back from an object located sufficiently close to the sensor. 'For both types of photo-sensors, when they detect their reflected light source, their signaling output circuit changes state.
RJ-11 / RJ-12	Registered Jack Style 11 / 12 – Standard connector / receptacle format utilizing 4 or 6 pin connections. The typical standard connection for telephones. RJ-11 utilizes 4 pins and RJ-12 utilizes 6 pins but both styles use the same physical size.
RJ-45	Registered Jack Style 45 – Standard connector / receptacle format utilizing 8 pin connections. The typical standard for computer network cable connections
Senergy-Ai	PulseRoller brand proprietary motor control platform that provides electronic intelligence inside the motor that can be read by ConveyLinx-Ai Family and MotionLinx-Ai Family control modules. The connection from the motor to the controller is via 4-Pin M8 style connector

Singulation Release	Conveyor control method for zoned controlled conveyor that dictates that when a zone is discharging its carton, the upstream carton waiting to enter must wait until the discharged carton is completely clear before it is allowed to enter
Slave Rollers	A set of non-motorized conveyor rollers mechanically linked to an MDR. The MDR and slave rollers make up a physical zone. All of the slave rollers in a zone rotate at the same speed and direction as the MDR because of their mechanical linkage
TCP/IP	Transport Control Protocol / Internet Protocol – IP is the protocol which oversees the transmission of information packets from device to device on an Ethernet network. TCP makes sure the packets have arrived and that the message is complete. These two protocols are the basic language of the Internet and are often referred to together as TCP/IP.
Train Release	Conveyor control method for zone configured conveyor that dictates that when a zone is discharging, the upstream zone's carton can move in unison with the discharging carton.
Zone	A basic (linear or curved) cell of the conveyor consisting of a set of slave rollers driven by one or more MDR's and a single photo-sensor.
ZPA	Zero Pressure Accumulation – Term that describes the conveyor controls and mechanical scheme that will cause loads to queue on a conveyor in discrete zones such that loads do not touch each other

Installing EasyRoll+

Installing EasyRoll+

- *EasyRoll+* works for **both 24V** based and **48V** based ConveyLinx controllers

- *EasyRoll+* is **required** for **any 48V** based ConveyLinx controller

- *EasyRoll+* will support a mix of 24V and 48V ConveyLinx controllers on the same network

EasyRoll+ provides all of the functionality of EasyRoll with some added features and a more intuitive user interface.

EasyRoll+ Features:

- Offline configuration of ConveyLinx Networks
- Support for PCs with more than one NIC
- Data point watch and capture including visual graphing
- Support for ConveyLinx 48V based controllers
- Power Management and control for 48V based controllers

Download *EasyRoll+*

! Please note that some anti-virus and/or security updates block the usage of WinPcap

utility which is used by ***EasyRoll+***. It is recommended that when you run “Setup.exe” that you “**Run as Administrator**”

! If your PC is using a USB to to Ethernet adapter please ensure it is connected prior to beginning your work. If the adapter is not connected from start up, the service will ignore the adapter until you restart the PC again.

Connecting Your PC to the Network

Installing EasyRoll+ /

Connecting Your PC to the Network

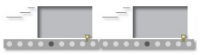
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

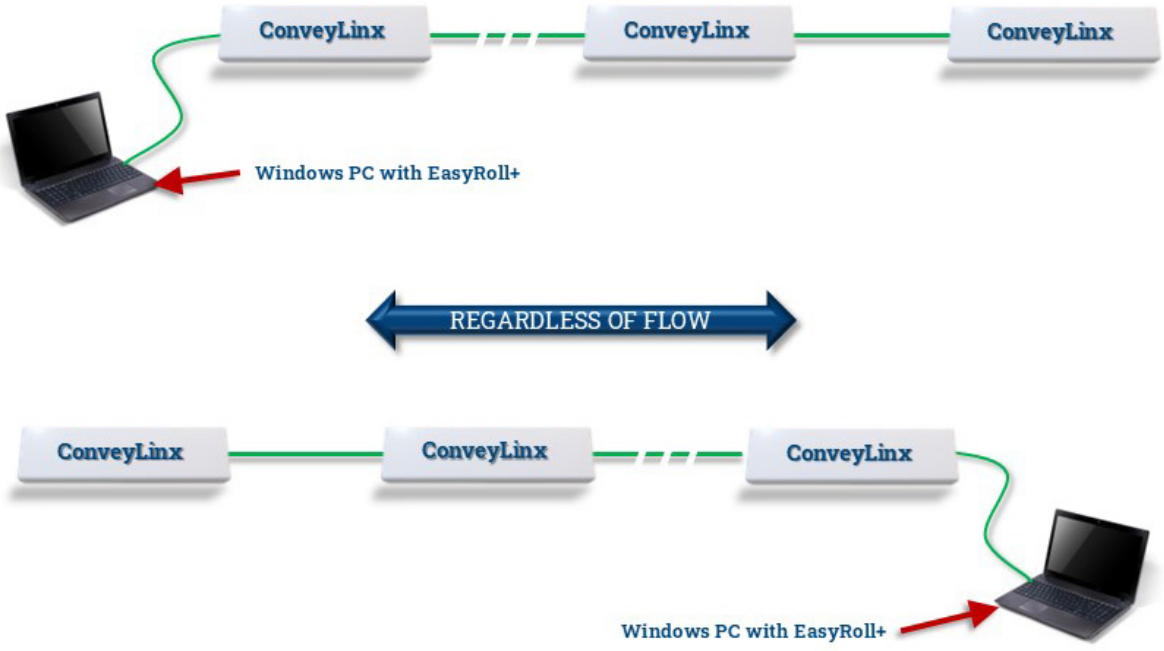
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

You can connect your PC to a ConveyLinx network with a standard RJ-45 Ethernet cable at either end of the string of modules.



! It is highly recommended to connect the PC directly to the ConveyLinx network. Avoid trying to connect via Ethernet switches or wireless router/switches. If a wireless

switch is not setup properly then the Discover Feature will not work. Also ensure that network firewall is turned off for proper discovery

Offline System

Offline System

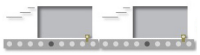
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

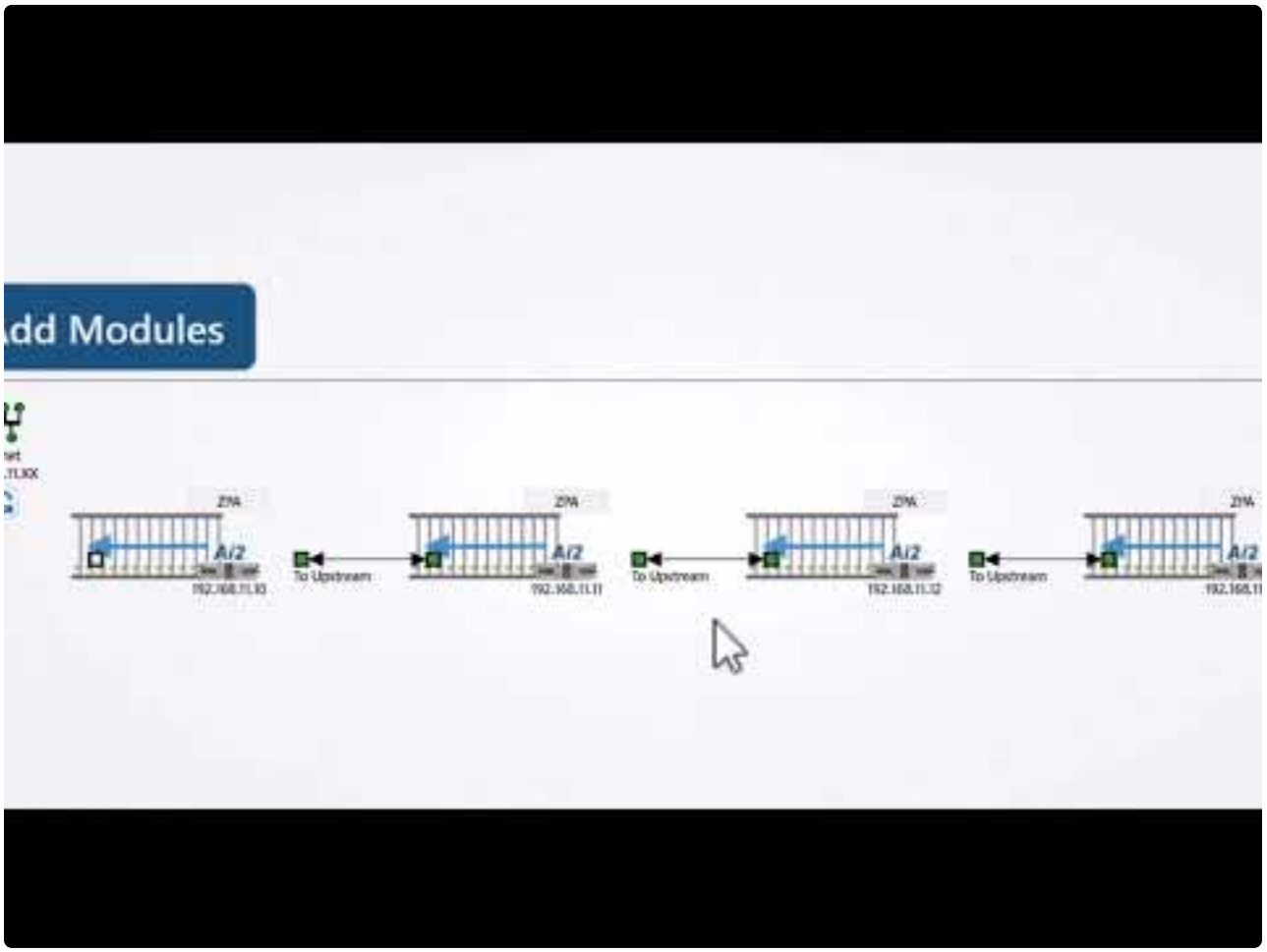
ConveyLinx-ECO ?

ZPA Mode ?

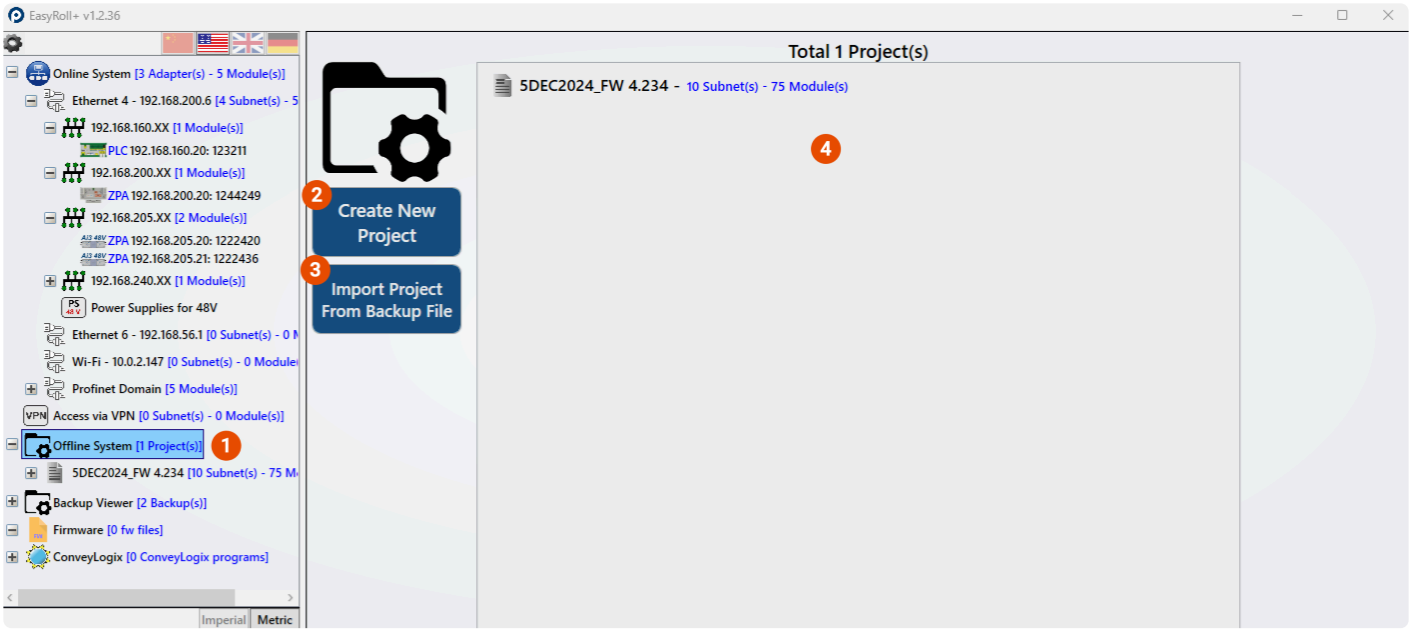


PLC I/O Mode ?

The below tutorial video walks you through creating offline projects, creating and altering offline subnets, configuring the network and more.



https://www.youtube.com/embed/U-CM-U67Rg8?rel=0



The above is one example of an offline system, but your screen will vary per your application

Item	Function	Description
1	Offline System	• *The tree can be expanded to show the projects within the Offline System portion of **EasyRoll+*** • *Expanding the projects will show the subnets, and the subnets' modules, within the project just like in the online system*
2	Create New Project	• *A box will pop up for you to name your new Offline project, which starts from scratch* • *In a new offline project you'll be able to add new subnets, rename, set configurables on the modules, and more*
3	Import Project From Backup File	• *Opens a File explorer dialog to locate a backup file* • *Saved Project files open only in **EasyRoll+** and are not compatible with **EasyRoll***
4	Total Project(s)	• *The offline projects will be listed here and include the number of subnets and modules within each of them*

Learn More:

Projects

Subnets

Projects

Offline System /

Projects

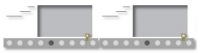
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

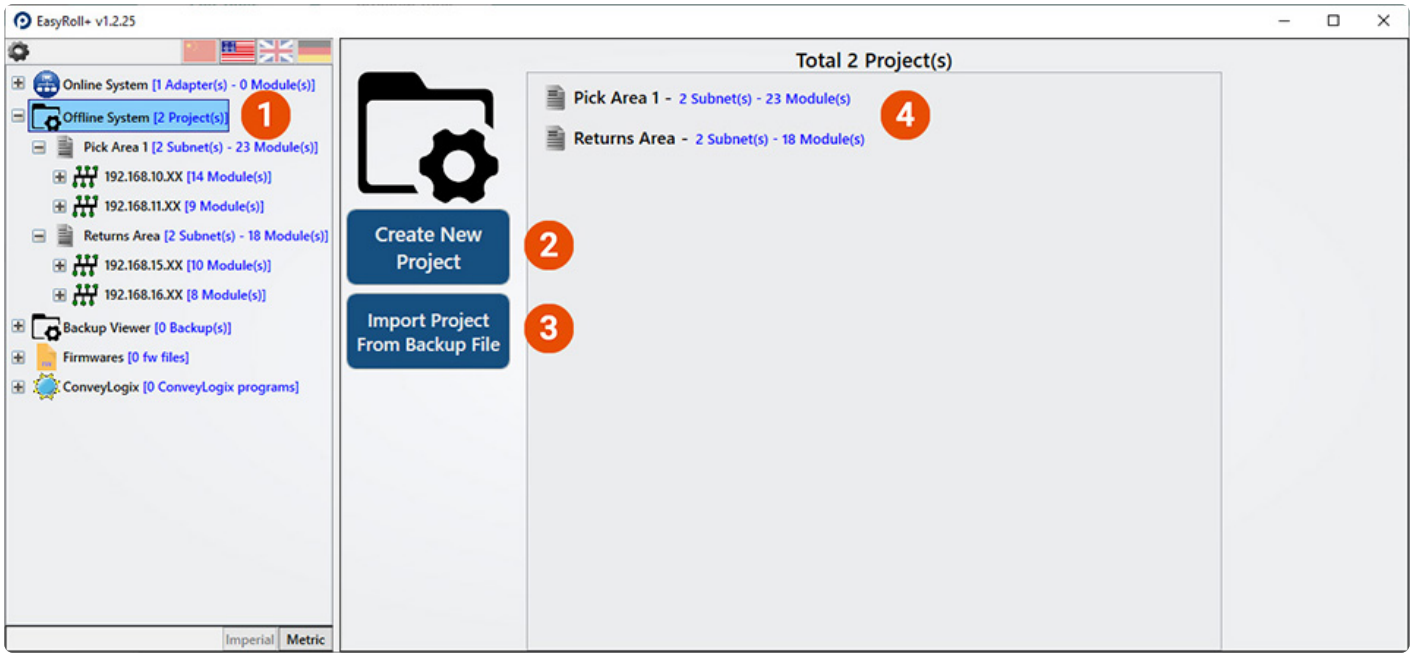
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The top level of the ***Offline System*** in ***EasyRoll+*** is the ***Projects*** screen. From here you can view all saved offline projects as well as create new projects.



Item	Function	Description
1	Offline Main Tree	• *Double click to open the Projects screen* • *Tree expands to show all projects currently saved on your PC*

2	Create New Project Button	• *Opens dialog for you to enter a name for the new project* • *Project names must be unique on the same PC*
3	Import Button	• *Opens a File Open dialog to select an existing EasyRoll+ backup file* • *Allows you to import a project created by someone else or from a different PC*
4	Saved Projects	• *List of currently saved projects on your PC* • *Displays quantity of subnets and total ConveyLinx modules in each project* • *Double click a project to open the Subnets screen for that project*

Subnets

Offline System /

Subnets

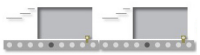
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

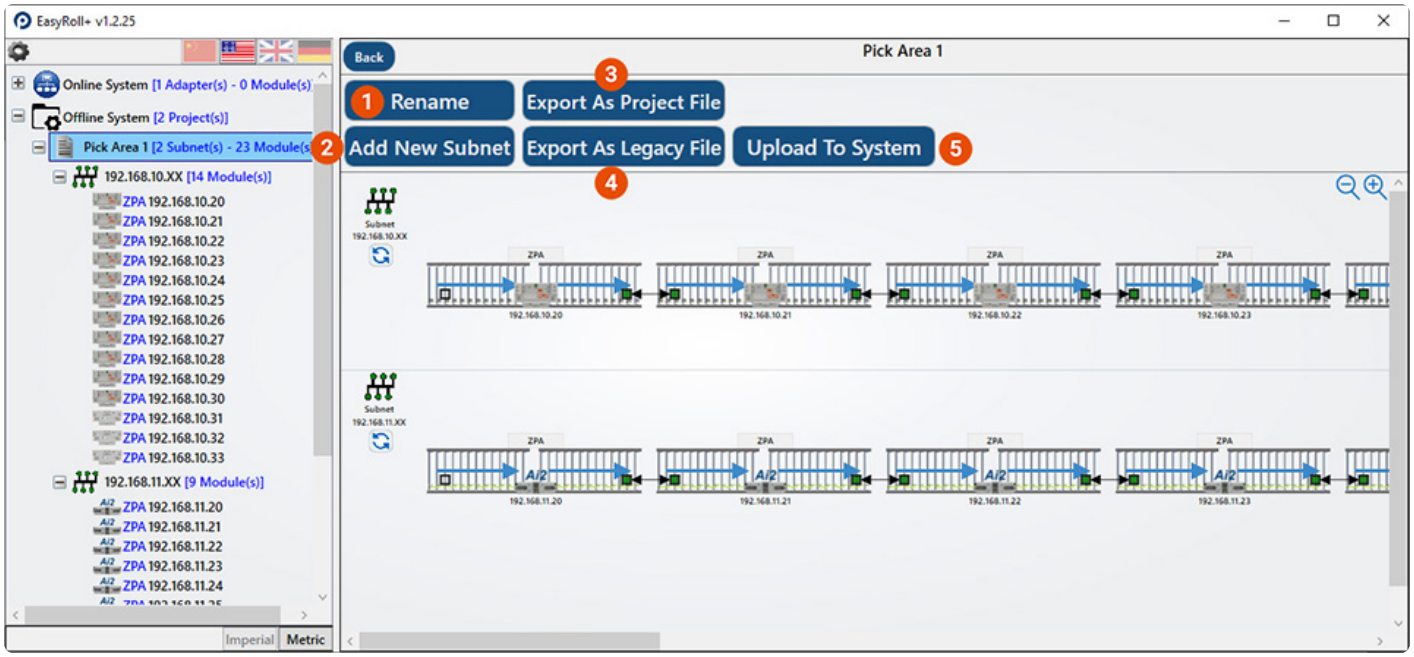
ZPA Mode ?



PLC I/O Mode ?

Each project will contain at least one subnet, and follow network logic to build out one or more systems. These projects can be exported, expanded upon, and configured to suit your online projects, experiment without affecting a live system, and set a static reference for your system.

Each subnet that has been created is drawn below, and each module within the subnet is shown with the piece of conveyor it controls. The subnet image shows the product flow, merges, angles, the module type, and the IP Address of each module.



Item	Function	Description
1	Rename	• *Enter meaningful descriptive name for the selected subnet* • *Each subnet name must be unique*
2	Add New Subnet	• *Opens for you to enter the first 3 Octets for your new subnet* • *Each Subnet's first 3 Octets must be unique*
3	Export As Project File	• *Opens a File Save dialog to enter a filename for your **EasyRoll+** backup file* • *Saved Project files open only in **EasyRoll+** and are not compatible with **EasyRoll***
4	Export As Legacy File	• *Opens a File Save dialog to enter a filename for your legacy **EasyRoll** backup file* • *This file format can be opened by both **EasyRoll+** and **EasyRoll***
5	Upload To System	• *Opens the Upload Dialog* • *Upload Window shows all Discovered modules* • *Drag and Drop your Offline modules to the Discovered modules* • *Error detection for module mismatch*

✻ Configuring your system while unconnected here, and then using the produced offline project subnets to Commission the online system once you're ready can be extremely handy if time in-field is limited or less-efficient.

Access via VPN

Access via VPN

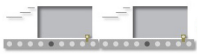
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

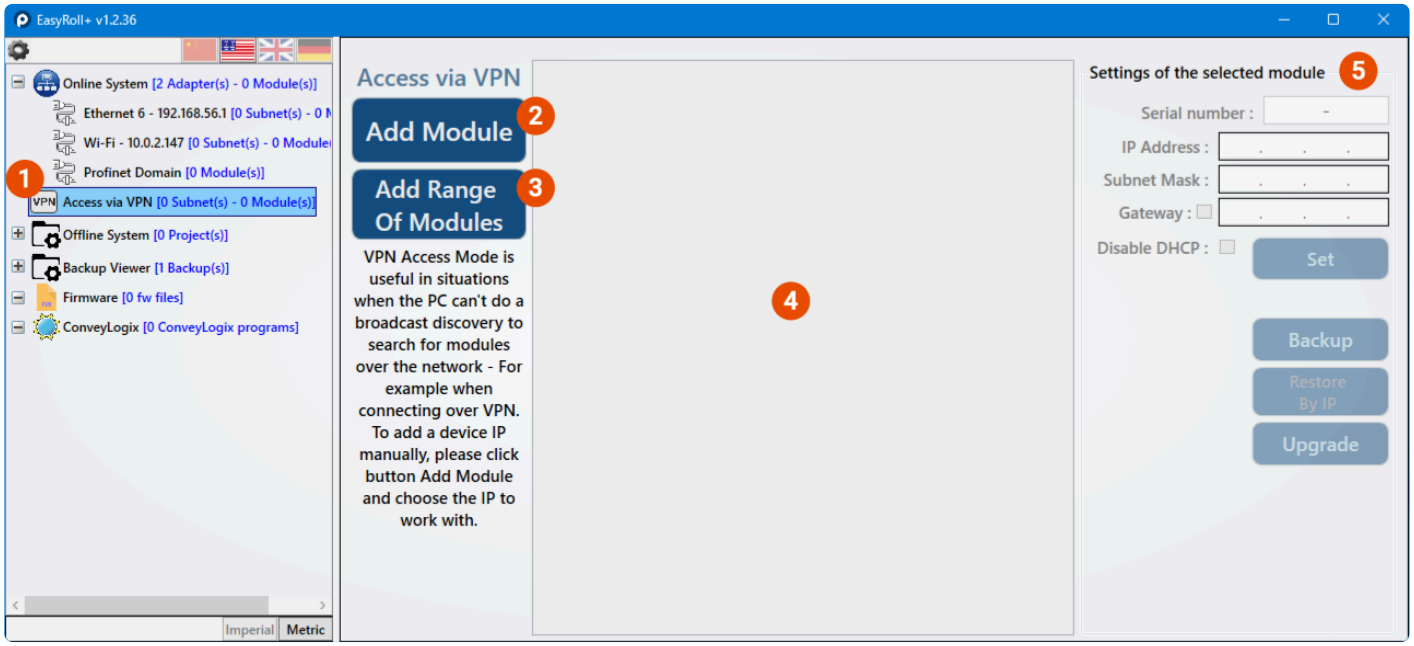
ZPA Mode ?



PLC I/O Mode ?

Selecting the ***Access via VPN*** from the Online System tree presents the below screen. From here you may connect, configure and diagnose ConveyLinx devices remotely via a pre-configured VPN server. It is useful when the user is wants to work with VPN connected devices, or if the internal network and firewalls is very limiting in regard to the network

traffic but needs to configure or diagnose a system. Pre-configuring the VPN server is a responsibility to the interested party's network administrator and is not part of this guide. Once you have modules added here they will not need to be added again unless specifically removed.



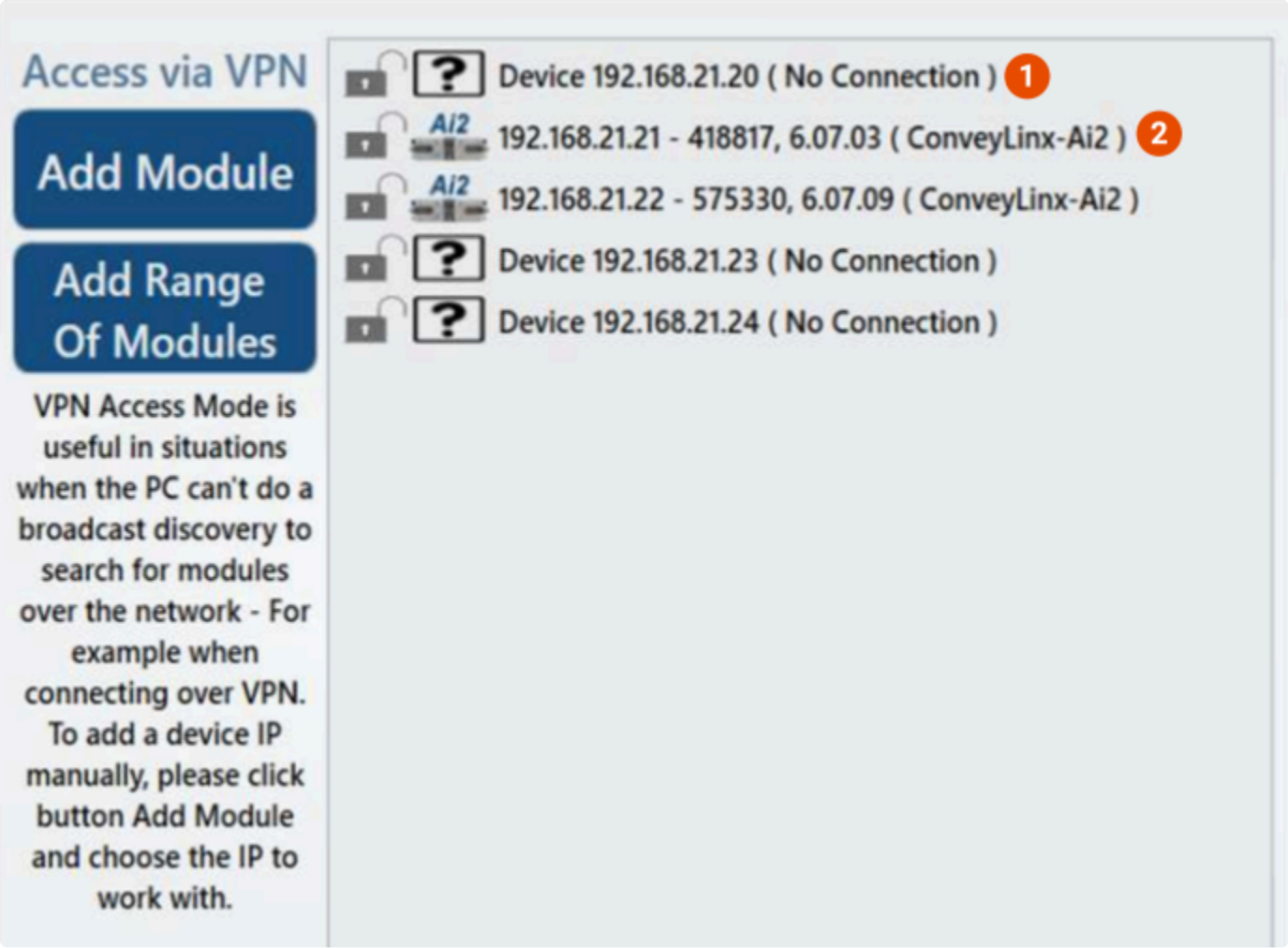
Item	Function	Description
1	Access via VPN	• *Right clicking opens a context menu with "Add Module", and "Add Range" which is a range of modules within a subnet*
2	Add Modules	• *Clicking will bring up a window to input the IP address* ● *Adding modules to the network while connecting over VPN requires this manual entry since the otherwise available "Discover" functionality does not work in this case*
3	Add Range of Modules	• *Click to include multiple modules at once, by specifying the range of their IP addresses*
4	Modules	• *Displays the added modules of the VPN connected network and their type, serial number, and firmware version* • *Right clicking provides an option to remove a module from the VPN Access*
5	Settings of the Selected Module	• *Shows existing configuration for the selected module, be cautious when changing the information for a module since it is dangerous and errors can result in the module and your subnet and any connected modules relying on the one affected* • *Allows you to Set new settings, Backup the configured module settings, Restore previous settings, Restore the module by its IP address, and to upgrade the selected module*

✻ As no network broadcasts and discovery services are available via VPN connection, there are certain limitatons when working over VPN, that the user must be aware of. The most important one is that ConveyLinx devices can't be discovered over VPN. For this reason, the user must have prior knowledge of the network topology and IPs of the ConveyLinx devices.

! The following operations are not available over VPN access: AutoConfig, AutoReplace and SetDefaults

✻ To add a logical connection between 2 modules, both modules must be added

After adding modules they will appear in the list:



Item	Function	Description
1	Unidentified Modules	• *The first module listed has **NOT** been properly associated with the Ip address entered, so it shows no information since it was unable to find a module by that identifier*
2	Identified Modules	• *The second module listed has been properly associated with the Ip address entered, and thus shows details of the module*

Module Configuration Screen Tabs

Module Configuration Screen Tabs

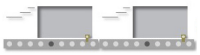
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

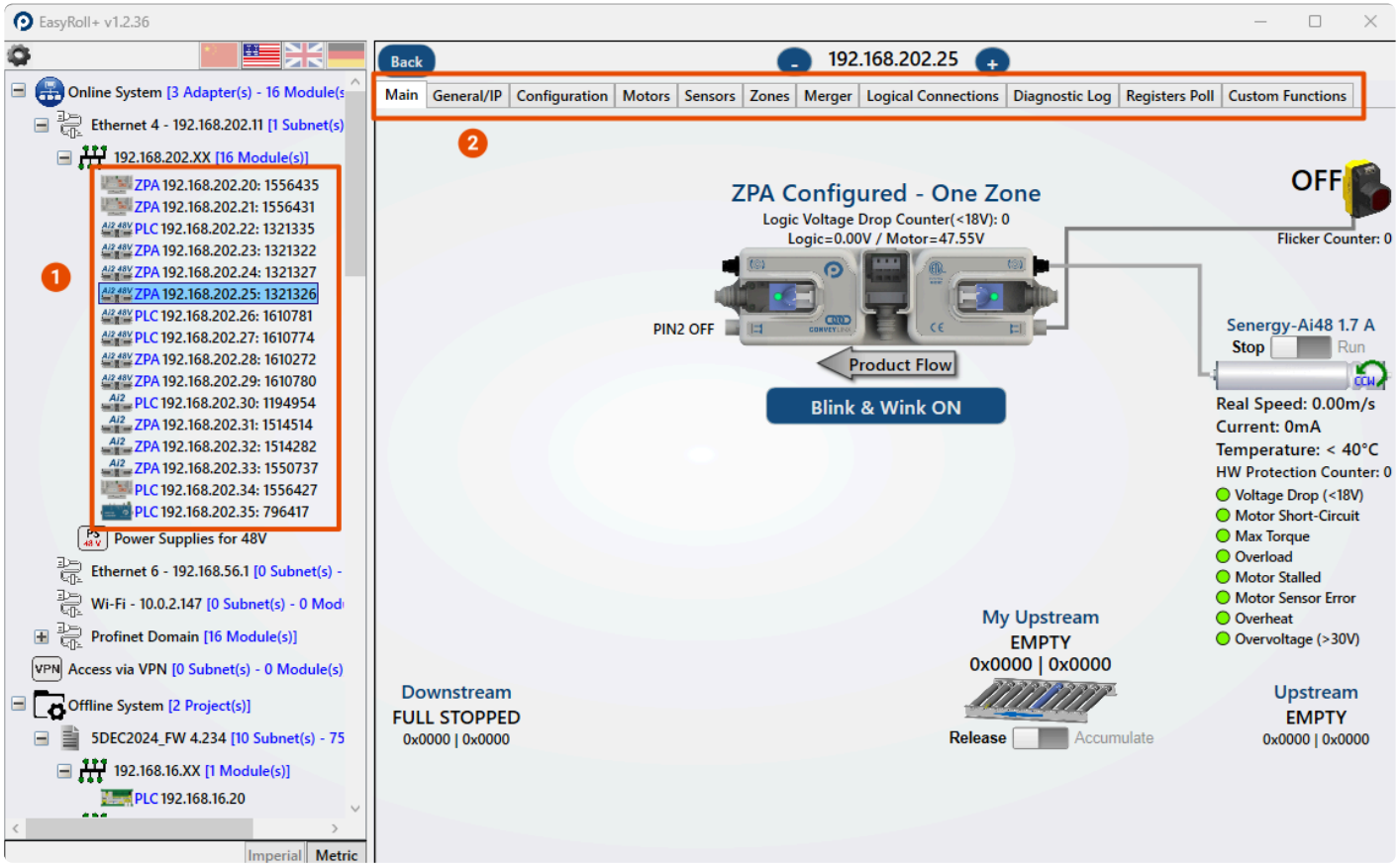
ZPA Mode ?



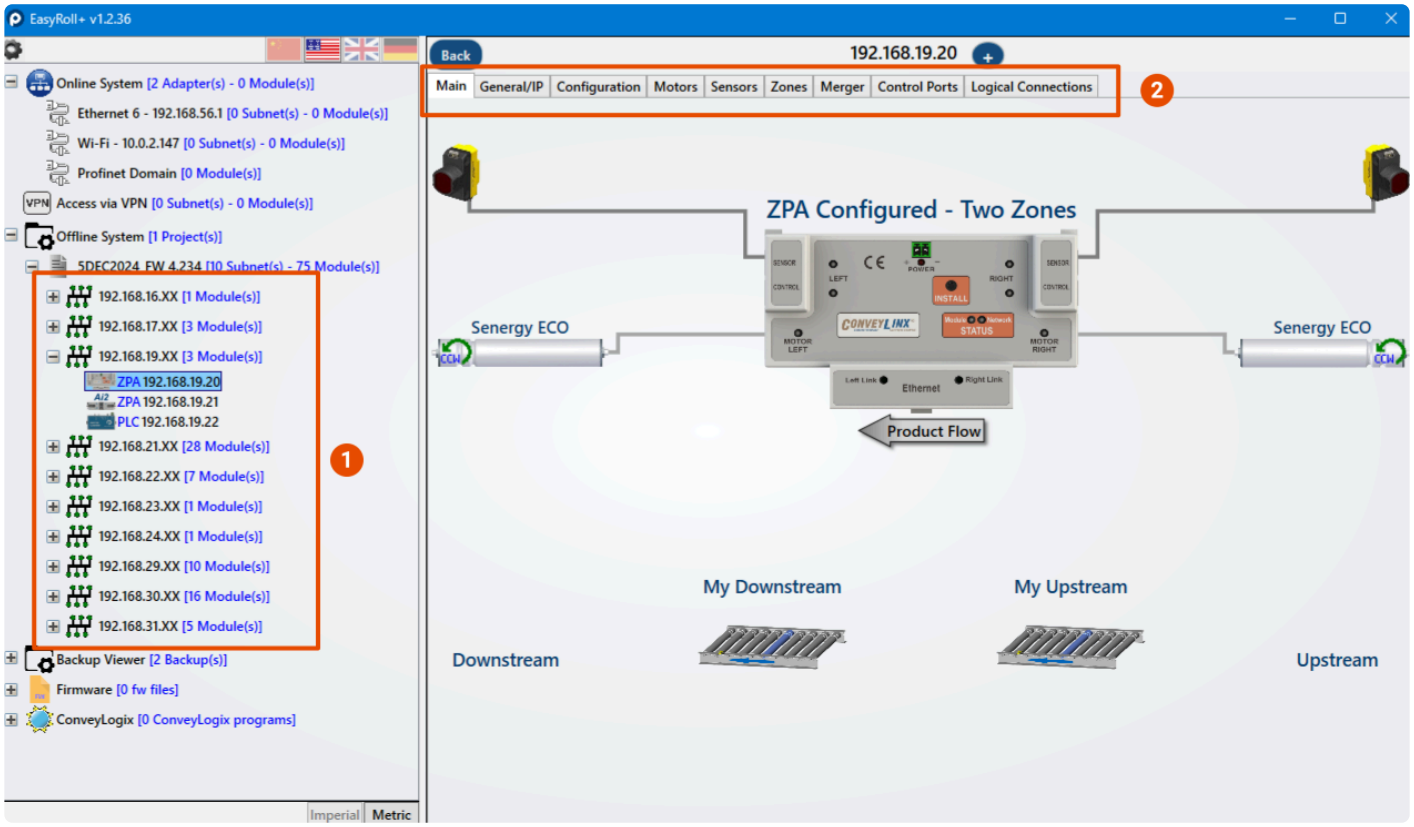
PLC I/O Mode ?

Module Configuration Tabs are present for each and every module online and offline. Tabs will appear and disappear based on module type, firmware, and more. Below examples are a general layout of how to get to the tabs. Selecting any module will open the Main tab.

Online System



Offline System



Item	Function	Description
1	Network Tree	• *Displays address of networks' subnets, expand to view the individual modules* • *Selects the module in the subnet tree that you'd like to configure*
2	Module Configuration Tabs	• *Select the Tab you'd like to configure* • *Tabs will vary based on the particular module you've selected and the way it has been configured and networked*

Learn More:

Main

Main

Module Configuration Screen Tabs /

Main

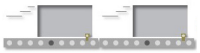
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The ***Main*** tab screen shows a graphical image of the selected control module along with its current configuration.

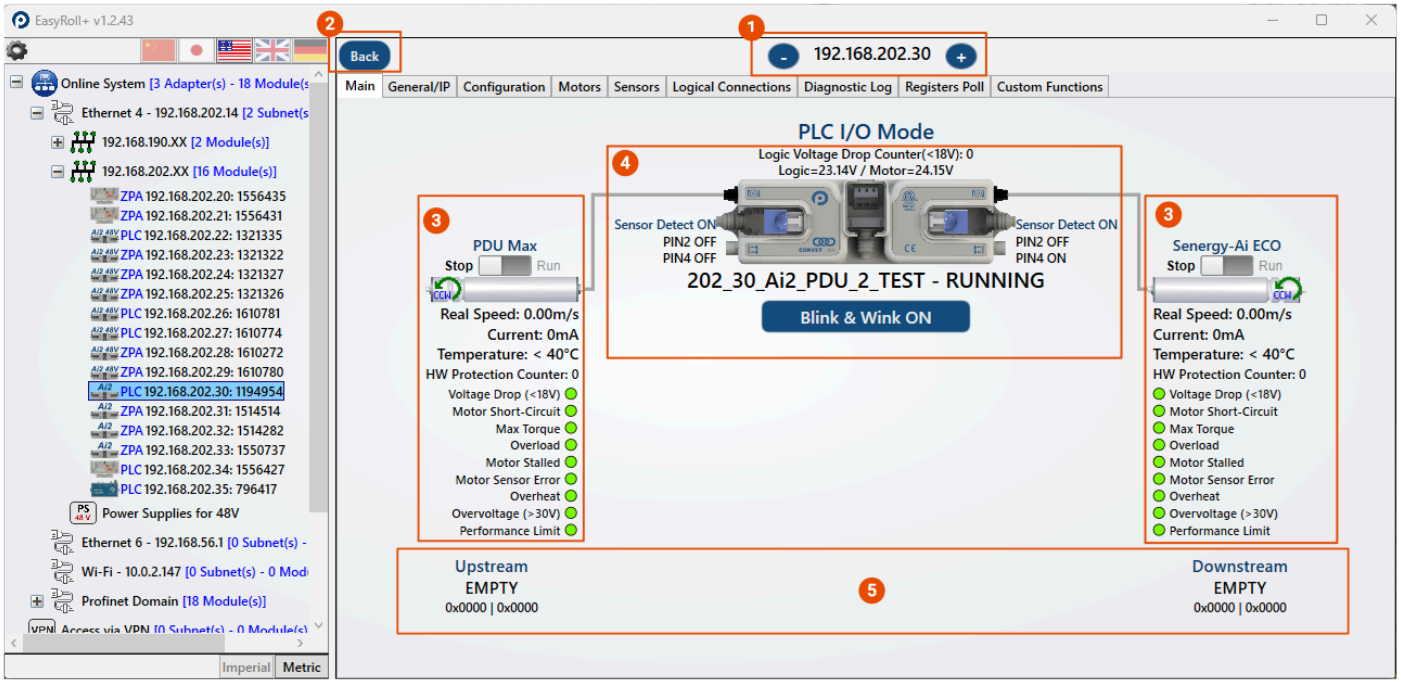
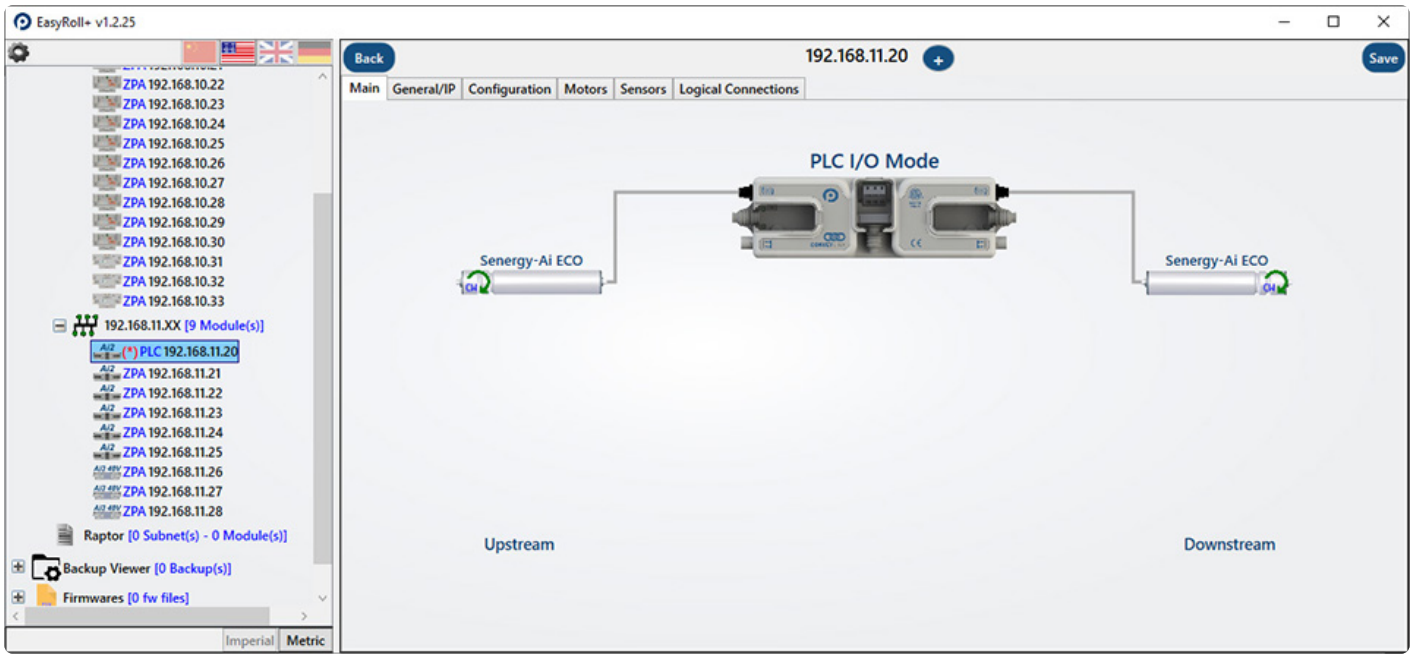


Image graphic depicts ConveyLinx-Ai2 module in PLC I/O mode. See below for example of other ConveyLinx Modules, we do not have all modes for all modules documented here.

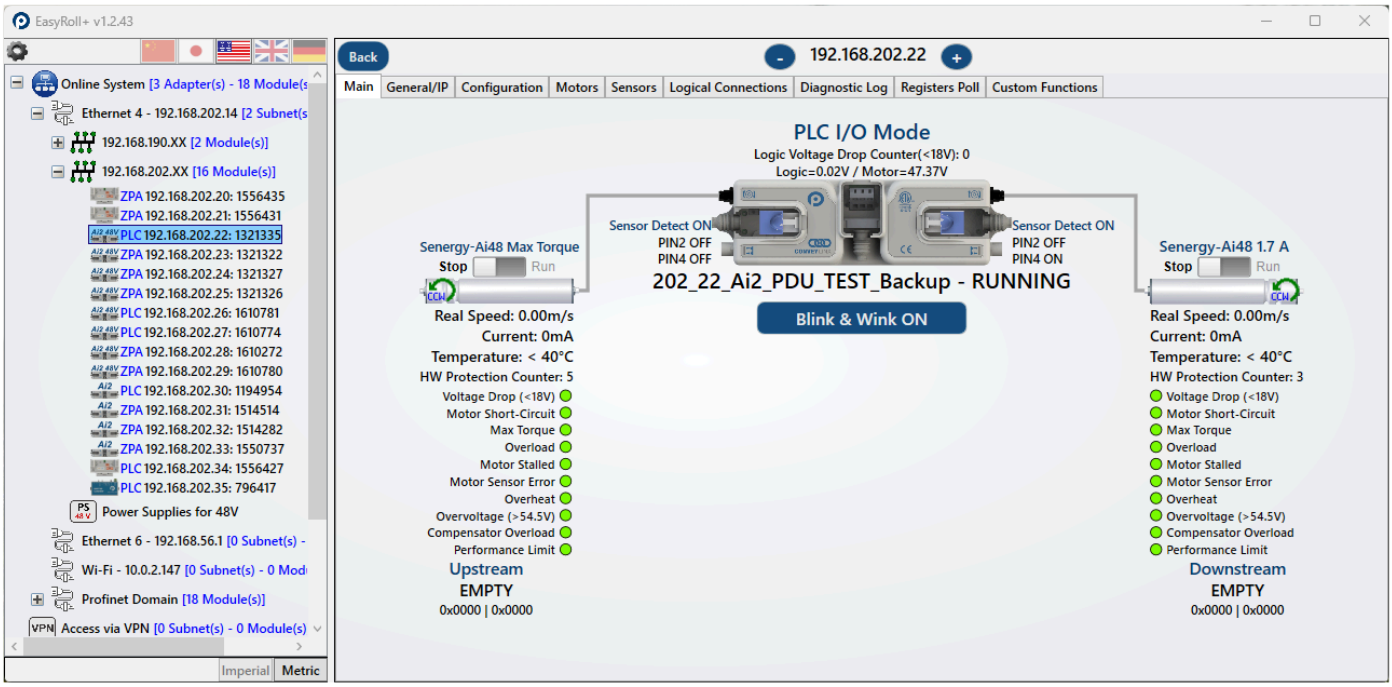
Item	Function	Description
1	Next/Previous Selector	• *Displays IP address of currently selected module* • *+ button selects the next module in the subnet tree* • *– button selects the previous module in the subnet tree*
2	Back Button	• *Selects the root subnet for the currently selected module* • *Screen tabs will be replaced with the subnet screen*
3	Module Motor Connections	• *Displays information about the module's motors and their state* • *Shows the mode and configuration currently saved in the offline file for the module or currently present online* • *Graphic changes based on online status, errors and statuses*
4	Configuration Status	• *Displays information about the voltage being received by the module, the sensors connected, the PIN2 and PIN4 settings, sometimes will display product flow direction, Blink & Wink On / OFF state, and circumstantially more*
5	Module Connections	• *Displays information about the module's upstream and downstream connections* • *Shows the mode and configuration currently saved in the offline file or currently present online* • *Graphics change based on conveyor presence, module presence, and more*

Screenshots Showing More Conveylinx Module Examples

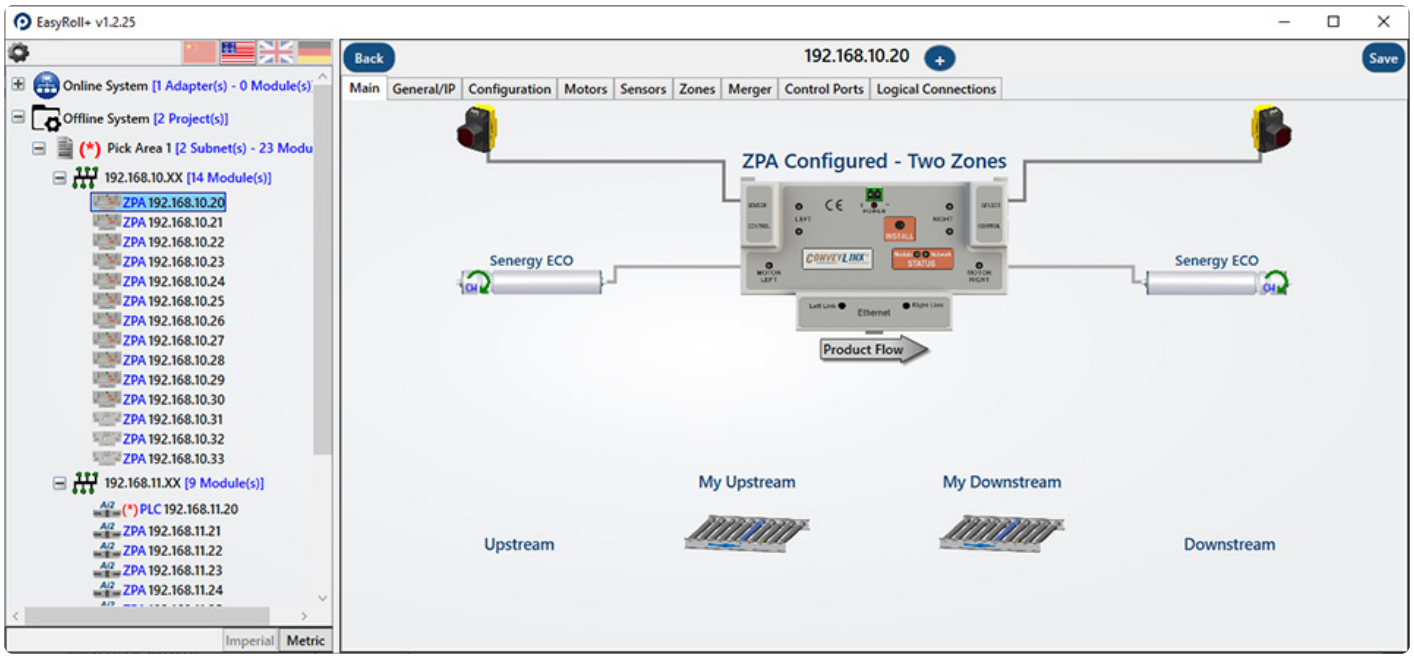
ConveyLinx-Ai2 Offline

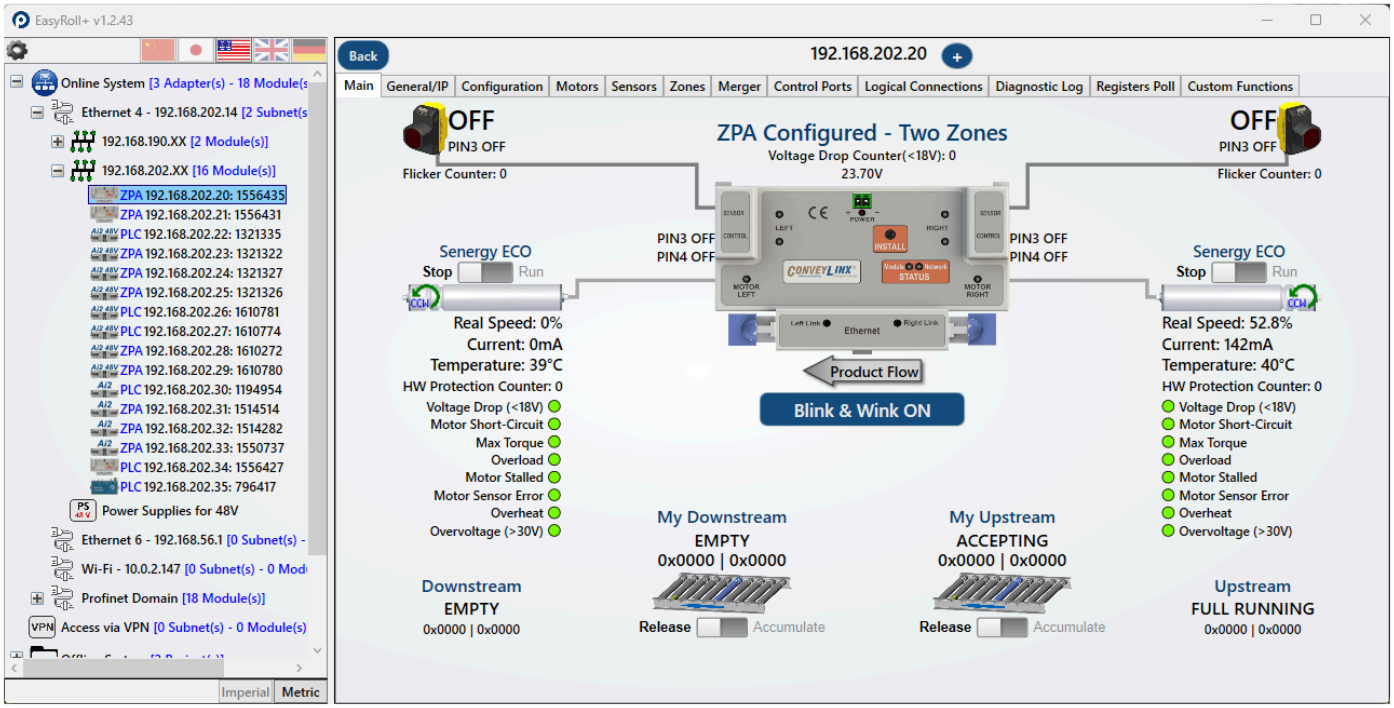


ConveyLinx-Ai2 48V Online

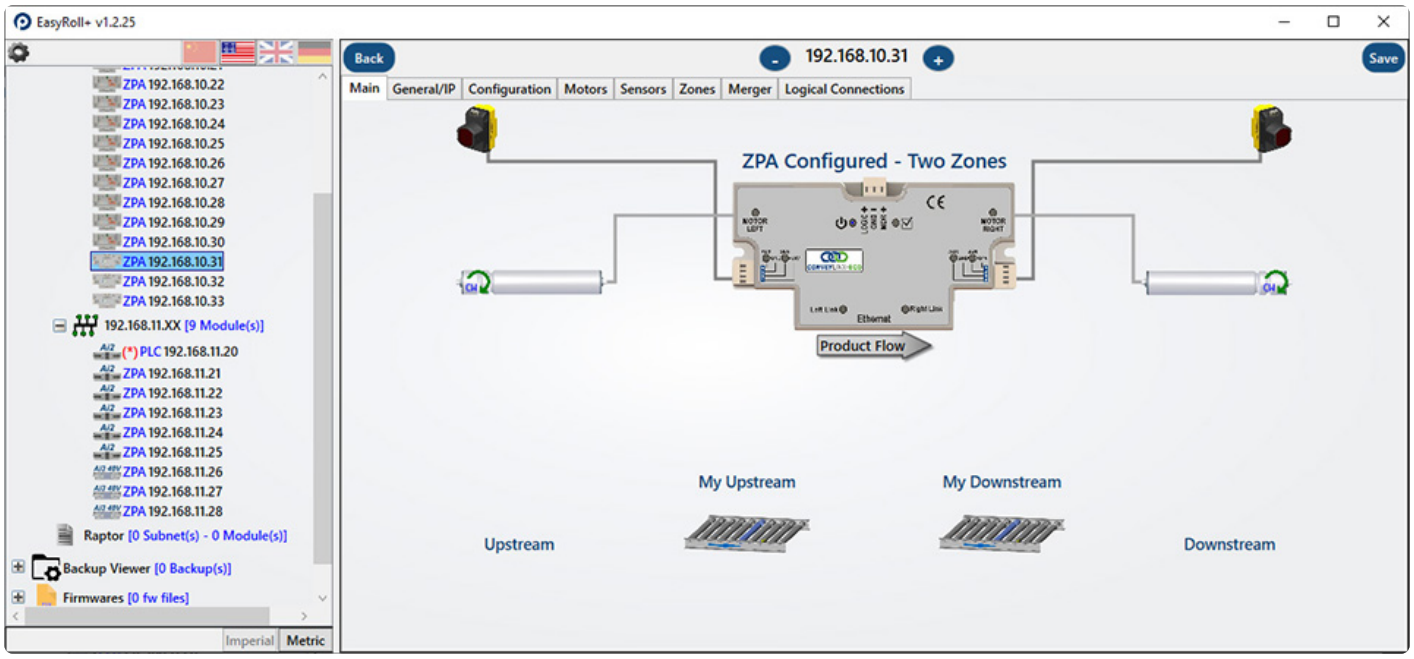


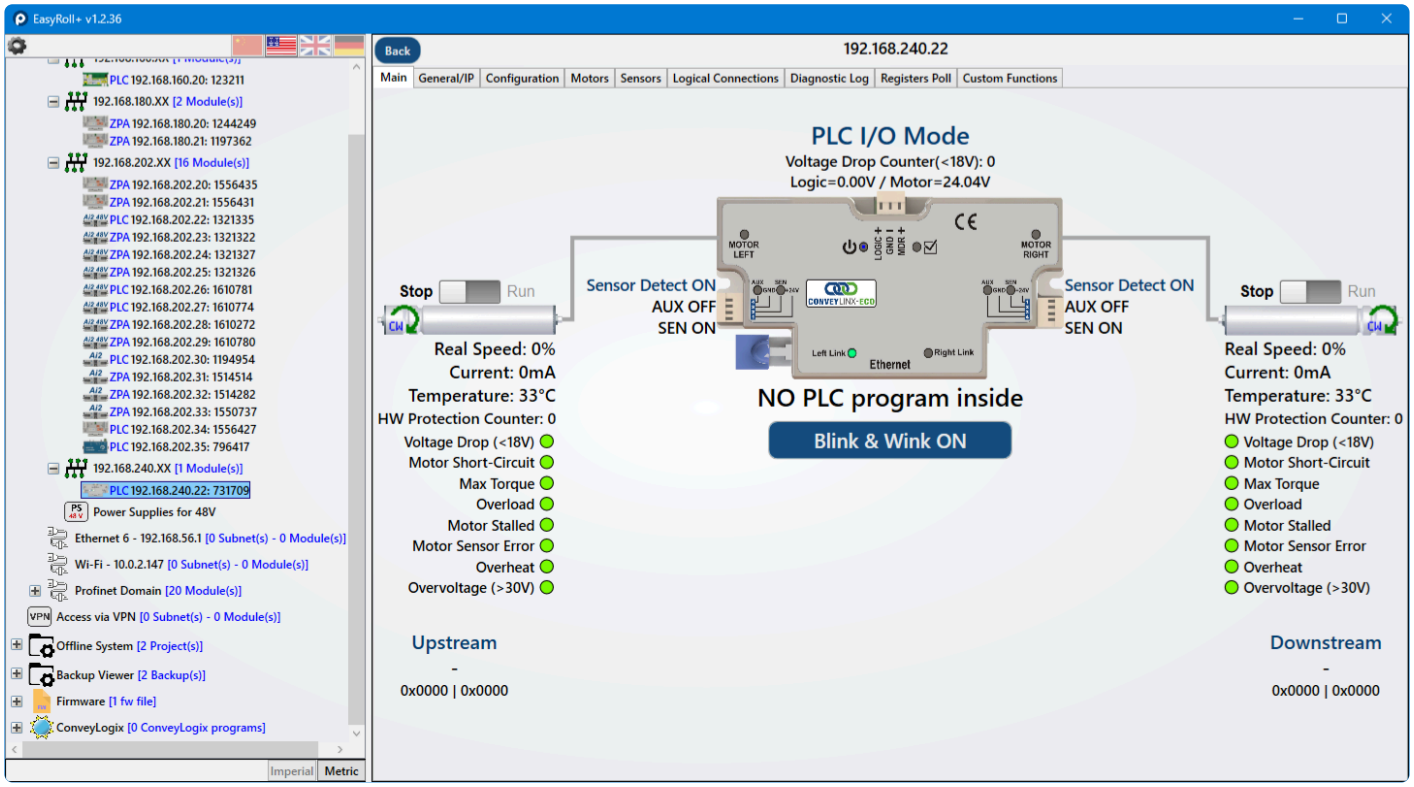
ConveyLinx-ERSC Offline & Online





ConveyLinx-ECO Offline & Online





Motor Info Tool Tip

Module Configuration Screen Tabs / Main /

Motor Info Tool Tip

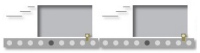
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

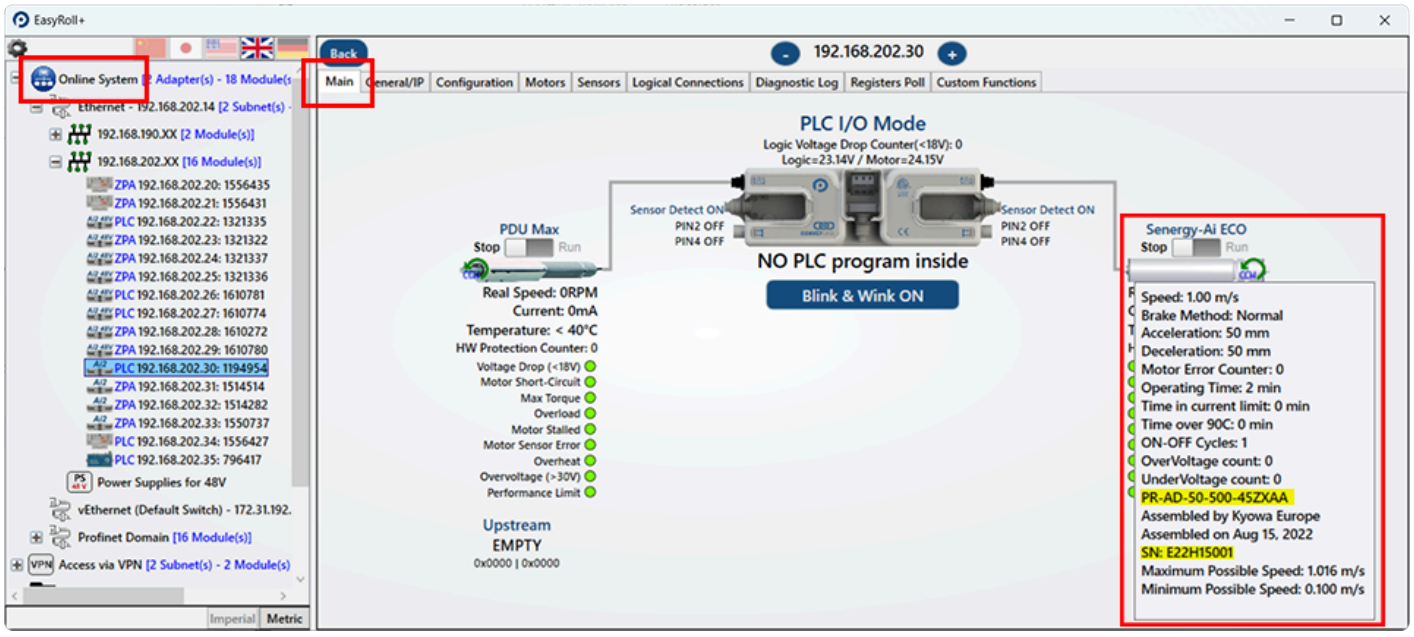


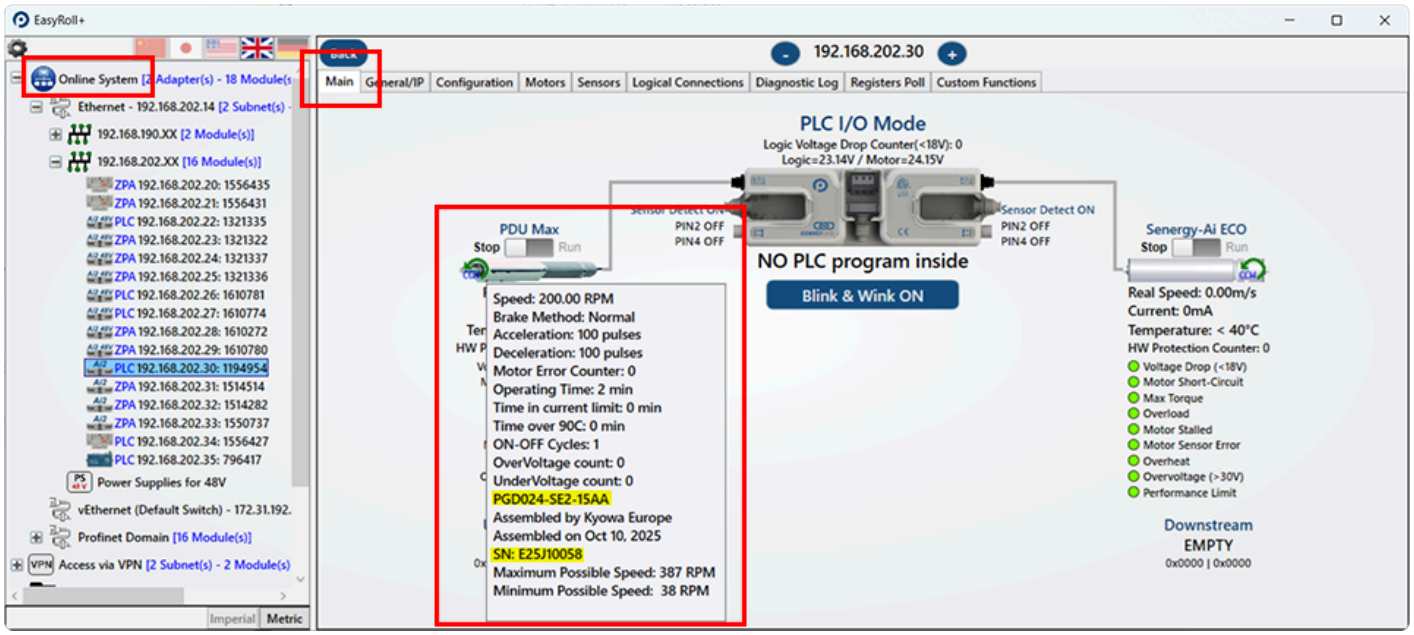
PLC I/O Mode ?

When you are ***Online*** with a **ConveyLinx module**; on the ***Main*** Tab you can hover your mouse over the graphic of a motor (Left or Right) and a ***Tool Tip*** will display showing the available motor information. Depending on the **ConveyLinx module** type, the amount of motor information displayed will vary.

ConveyLinx-Ai/Ai2/Ai3 24V and 48V Family

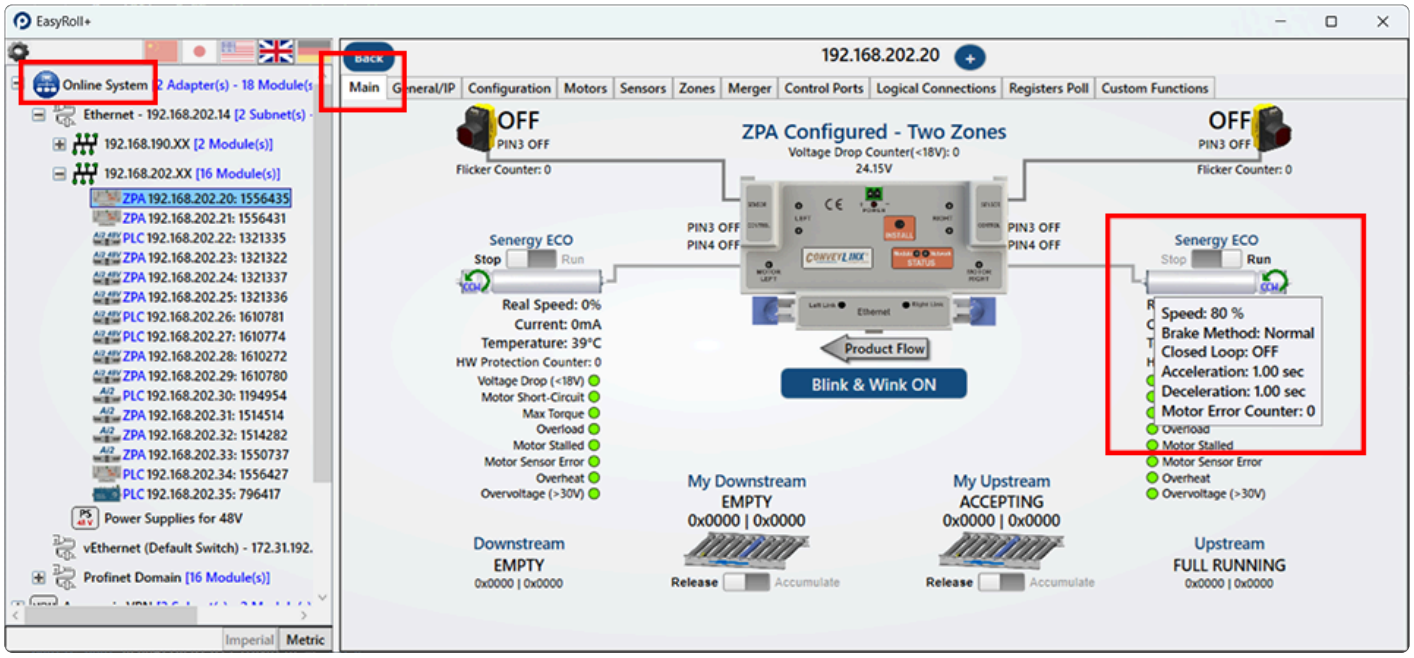
Please note that for ***Senergy-Ai*** series motors, the **ConveyLinx module** motor Tool Tip will display the ***Part Number*** and ***Serial Number*** of the connected Pulseroller drive.





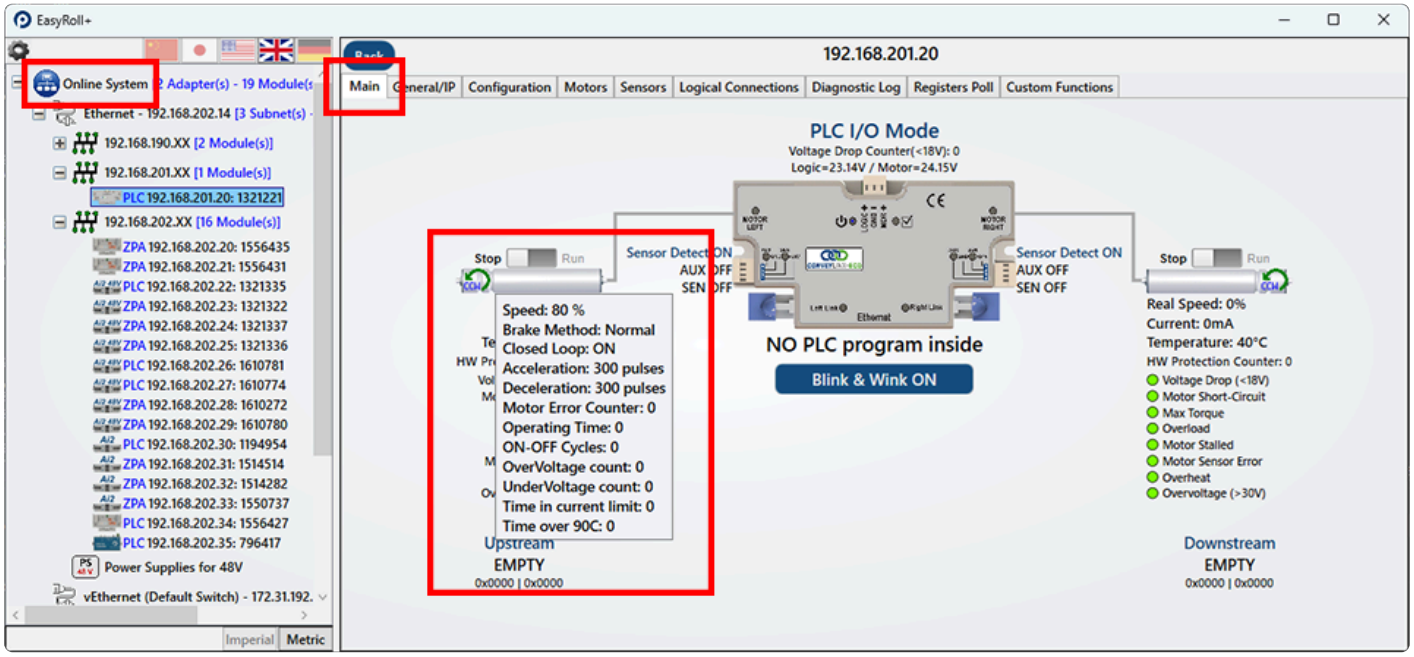
ConveyLinx-ERSC Family

> ✻ Any ***non-Senergy-Ai*** motor unit does not have the ability to provide the Part Number or Serial Number data



ConveyLinx-ECO

> ✻ Any ***non-Senergy-Ai*** motor unit does not have the ability to provide the Part Number or Serial Number data



General I/P

Module Configuration Screen Tabs /

General I/P

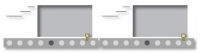
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

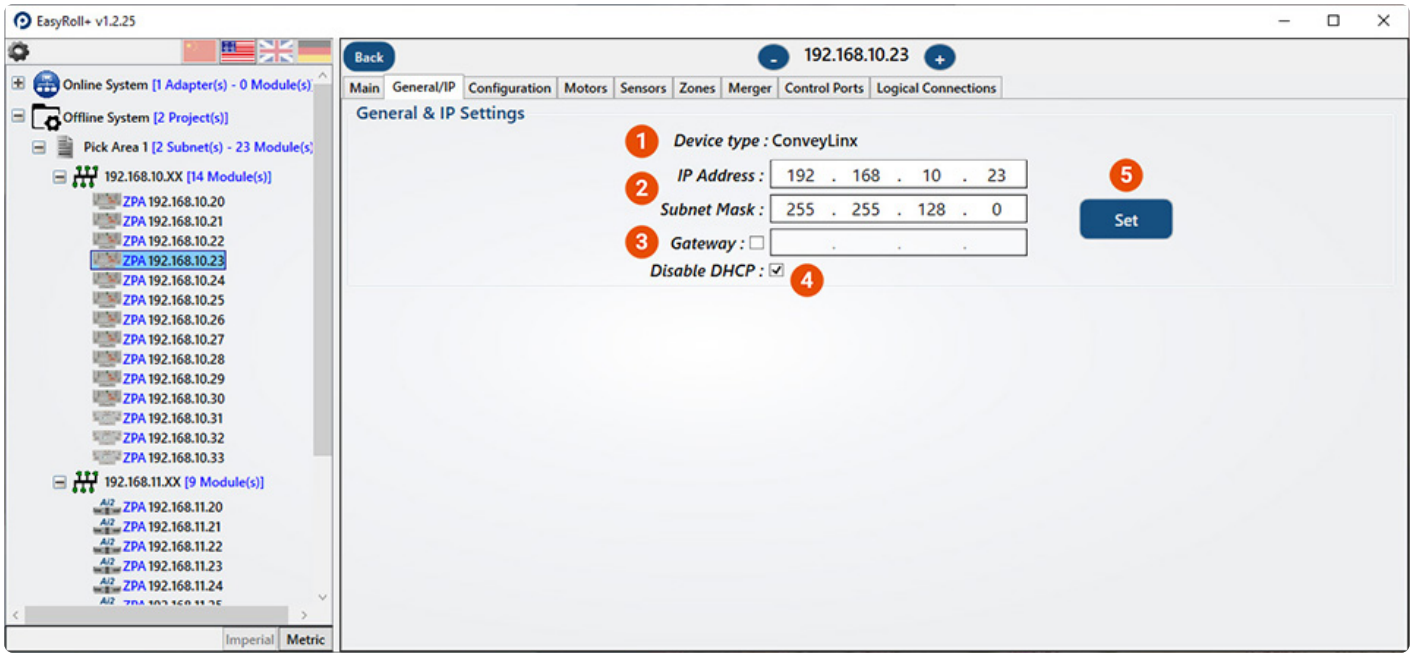
The *General I/P* screen tab provides the place to create or change the assigned IP Address parameters for the selected module.

Example of an Online Module's General IP page

Item	Function	Description
1	Serial Number	• *Displays Serial Number for the currently selected module*

2	Mac Address	• *Your module's unique identifier assigned to a network interface controller (NIC) for use as a network address in communications within a network segment*
3	Device Name	• *Displays the device name*
4	Profinet Name	• *Displays the name given to the individual module for Profinet use*
5	Hardware Revision	• *The version of hardware that applies to this module*
6	Software Revision	• *The version of software that applies to this module*
7	IP Address Subnet Mask Gateway	• *Provides data entry fields for the currently selected module* • *Values do not update until **Set** button is clicked* • *Clicking checkbox enables the Gateway address data entry* • *Use of Gateway id purely optional*
8	Set Button	• *Click to update any changes made to the data entry fields or checkboxes*
9	Disable DHCP	• *A DHCP server is automatically enabled on modules with IP Addresses xxx.xxx.xxx.20* • *Selecting the checkbox disables the DHCP from activating when going on line*

Example of an Offline Module's General IP page



Item	Function	Description
1	Device Type	• *Displays module type text for the currently selected module*
2	IP Address & Subnet Mask	• *Provides data entry fields for the currently selected module* • *Values do not update until **Set** button is clicked*
3	Gateway	• *Clicking checkbox enables the Gateway address data entry* • *Use of Gateway id purely optional*
4	Disable DHCP	• *A DHCP server is automatically enabled on modules with IP Addresses xxx.xxx.xxx.20* • *Selecting the checkbox disables the DHCP from activating when going on line*
5	Set Button	• *Click to update any changes made to the data entry fields or checkboxes*

Configuration

Module Configuration Screen Tabs /

Configuration

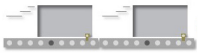
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

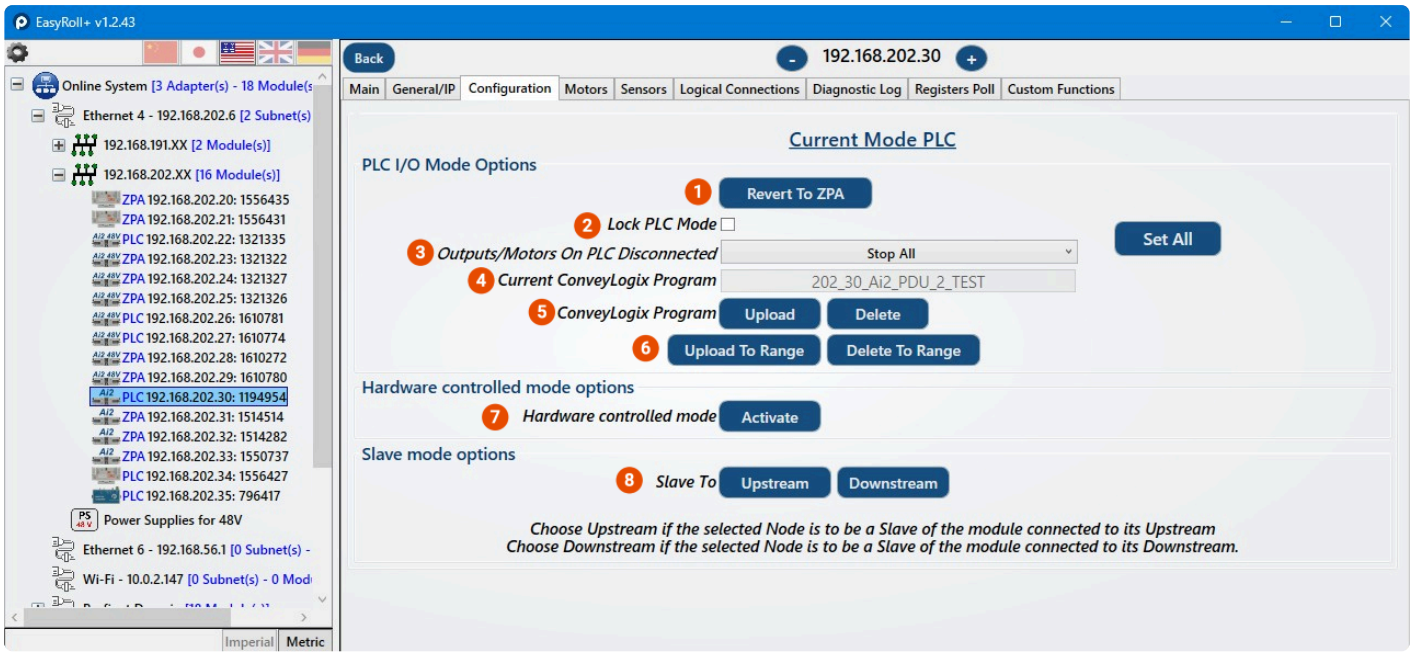
ZPA Mode ?



PLC I/O Mode ?

This screen allow you to view and change the module's operational configuration.

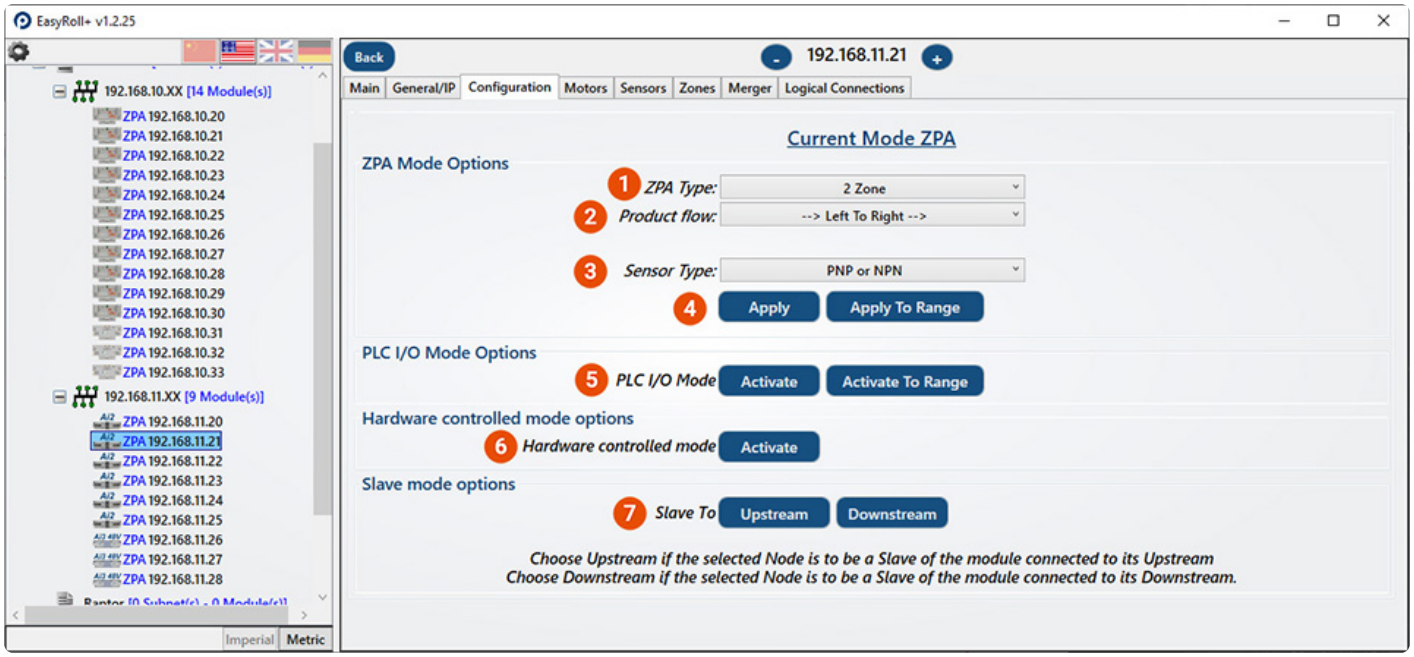
When Current Mode is PLC – Online



Item	Function	Description
1	Revert To ZPA	• *Changes the PLC mode to ZPA mode*

2	Lock PLC Mode	• *Box will have to be unchecked again to change the mode for this module*
3	Outputs/ Motors on PLC Disconnected	• *The drop down includes options: Stop All, and Don't Change. This instructs the motors and outputs on a potential disconnect to either hault or continue their last instruction*
4	Current ConveyLogix Program	• *Shows the ConveyLogix Program that is currently uploaded onto this module*
5	ConveyLogix Program	• *Upload or Delete a ConveyLogix Program from this module*
6	Upload to Range, Delete To Range	• *Allows uploading ConveyLogic programs to multiple modules at once, or deleting the program from multiple modules at once*
7	Hardware Controlled Mode	• *You can activate the module itself taking control back from the ZPA, PLC, ETC mode here*
8	Slave To:	• *You can assign the current module to Slave Mode. The Master module can be set as the module upstream or downstream*

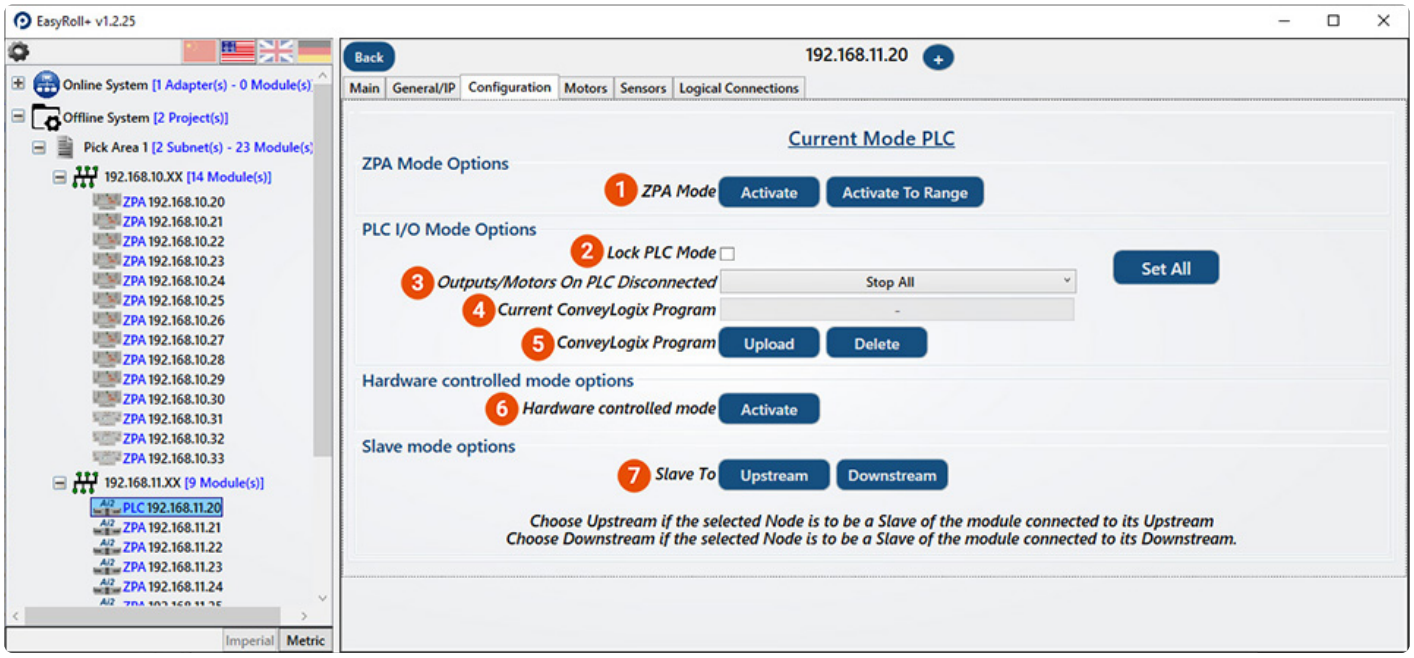
When Current Mode is ZPA – Offline



Item	Function	Description
1	ZPA Type	• *Displays drop down selector for ZPA type* • *Choices are 2 Zone, 1 Zone, and 1 Zone Belted*
2	Product Flow	• *Dropdown to select flow direction* • *Choices are Left to Right or Right to Left* • *Direction based upon viewing the front of the module*
3	Sensor Type	• *Dropdown to select hardware connection option for the sensor ports* • *PNP or NPN utilizes the PNP/NPN auto sensing circuit* • *Push-Pull configures the sensor circuit to inhibit the auto sensing function and accept push pull type sensors* • *Push Pull type sensors will not work if PNP or NPN is selected* • *Push / Pull Configuration only available for AI Family*
4	Apply Buttons	• *Click Apply to update the current module with any changes to the ZPA selections* • *Click Apply to Range to show module selection dialog to select other modules to use the selected changes*
5	PLC I/O Mode	• *Click Activate to change the current module to PLC I/O*

		Mode • *Click Activate to Range to show module selection dialog to select other modules to change to PLC I/O Mode*
6	Hardware Controlled Mode	• *Click to change the current module to Hardware Controlled Mode*
7	Slave Mode	• *Click Upstream to configure the current module be controlled by its upstream neighbor* • *Click Downstream to configure the current module be controlled by its downstream neighbor* • *Extending the effects of an upstream sensor to a downstream slave and more is possible by thoughtful assignment here in the Configuration tab*

When Current Mode is PLC I/O Mode – Offline



Item	Function	Description
1	ZPA Mode	• *Click Activate to change the current module to ZPA Mode* • *Click Activate to Range to show module selection dialog*

		to select other modules to change to ZPA Mode
2	PLC Lock Mode	• *Click to enable the lock feature for the current module* • *Lock Mode keeps the module in PLC I/O Mode during any subsequent Auto-Configurations*
3	PLC Disconnect	• *Dropdown to select action to be taken for outputs if PLC communications are lost* ● *Selection affects both motors and any digital output signals*
4	ConveyLogix Program	• *Read only display of the filename of the currently installed ConveyLogix program* • *Display will be blank if no ConveyLogix program is installed*
5	Load ConveyLogix	• *Click Upload to open file select dialog for the desired ConveyLogix program to install* • *Click Delete when you want to delete an installed program and return the module to strict remote PLC control*
6	Hardware Controlled Mode	• *Click Activate to change the current module to Hardware Controlled Mode*
7	Slave Mode	• *Click Upstream to configure the current module be controlled by its upstream neighbor* • *Click Downstream to configure the current module be controlled by its downstream neighbor**

When Current Mode is Hardware Controlled – Offline

Item	Function	Description
1	ZPA Mode	• *Click Activate to change the current module to ZPA Mode* • *Click Activate to Range to show module selection dialog to select other modules to change to ZPA Mode*
2	PLC I/O Mode	• *Click Activate to change the current module to PLC I/O Mode* • *Click Activate to Range to show module selection dialog to select other modules to change to PLC I/O Mode*
3	Slave Mode	• *Click Upstream to configure the current module be controlled by its upstream neighbor* • *Click Downstream to configure the current module be controlled by its downstream neighbor*

Motors

Module Configuration Screen Tabs /

Motors

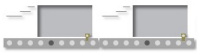
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

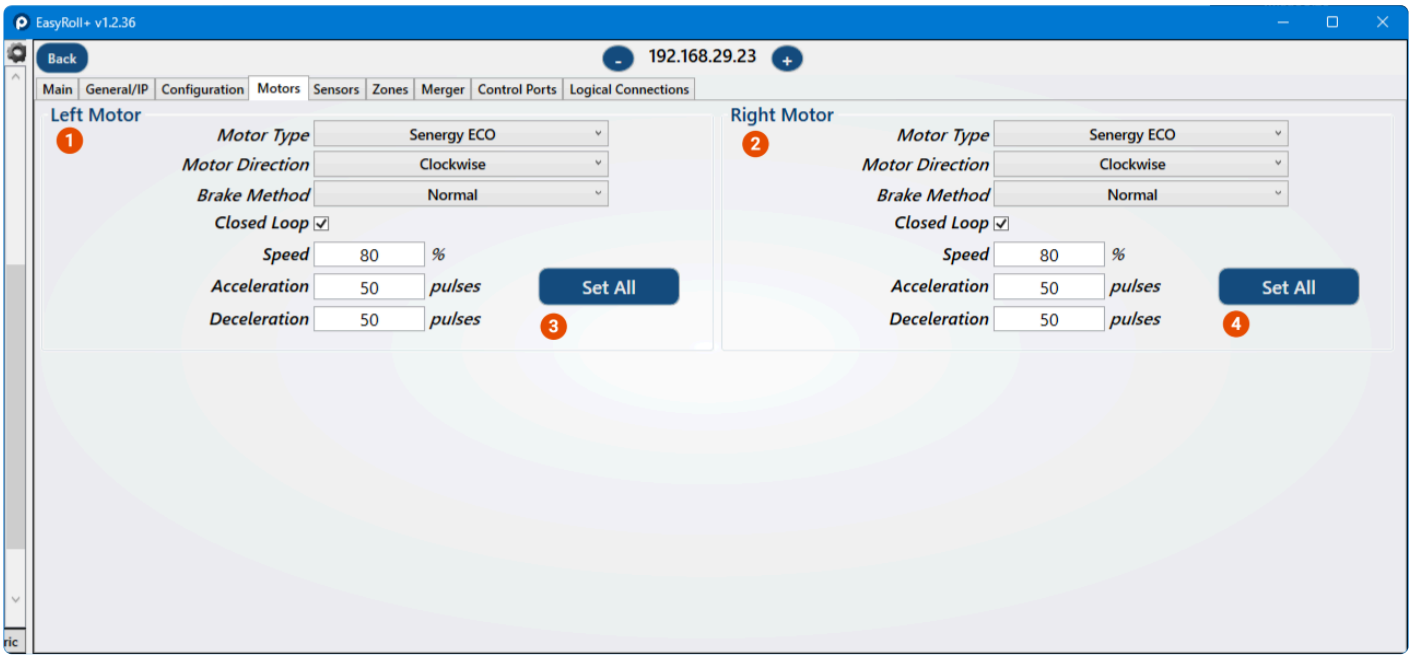
ZPA Mode ?



PLC I/O Mode ?

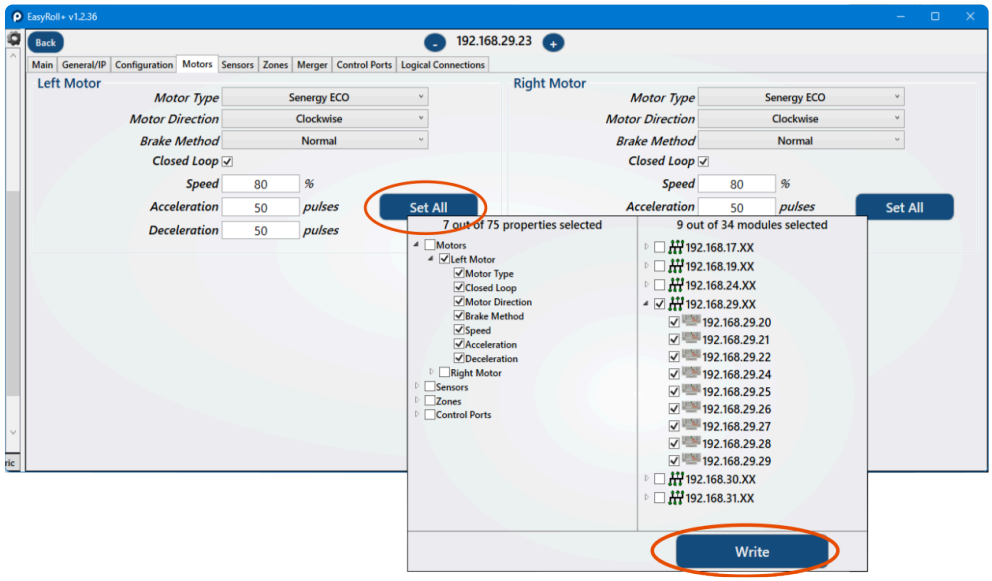
This screen allows motor configuration and troubleshooting. When the system is powered on, the motors connected are automatically detected and displayed here with defaults. Here we show an online and an offline example.
Please also view the applicable model of your ConveyLinx module's page for specific motor information. Links are listed at the bottom of this page.

Here is an offline motor tab



Item	Function	Description
1	Left Motor	• *Motor Types, Motor Direction, Brake Method, Closed Loop, Speed, Acceleration, Deceleration*
2	Right Motor	• *The Right side configures the motors on the right side of the ConveyLinx module*
3	Set All Left	• *Click the Set All button on the left to set more than one setting at a time, checking the box for all of the left motor settings and setting it for left motors is the default behavior* • *It is possible to set all motor settings for left motors all across the network, or select more checkboxes to set the settings for right motors, sensors, zones, and more* • *Each Conveylinx module that you'd like to be affected should be checked, they all appear as their Ip addresses with an image of the particular model within their subnet*
4	Set All Right	• *Set All Right defaults to setting the right motor settings across as many modules as you'd like, but can set left and right motors and/or zone settings, sensor settings*

The Set All pop-up window



Here is an online motor tab

While online you can view additional configuration items and statuses for the motor, the below is an example of this but does not cover all possibilities. This particular ConveyLinx module also has two motors, and as a ConveyLinx module with two motors and one sensor it has a dropdown to configure the Motor Slave Option. ConveyLinx Ai2 and ConveyLinx Ai3 modules automatically assign the motor without the sensor to be the slave, and modules with two motors that have either both sensors or neither sensors do not provide the Motor Slave Option.

Item	Function	Description
1	Left and Right Motor	• *These configurables are the same as the offline, however they affect an online module so be aware of the changes you're making and heed any warnings*
2	Force Belted MDRs run	• *Stop and Run toggle*

3	Slave Motor State	• *Stop and Run toggle*
4	Motor Errors	• *Green light indicates no errors present for each potential motor error* • *Potential Errors include Voltage Drop under 18 Volts, Motor Short-Circuiting, Max Torque Reached, Overloaded, Motor Stalled, Motor Sensor Error, Overheating, Overvoltage which is over 30 Volts*
5	Motor Values	• *Motor Error Counter, Real Speed Percentage of Maximum Speed available to the detected motor, Current in milliamperes, Motor Temperature in degrees Celsius, Module Temperature in degrees Celsius, and Operating Time*
6	Reset Operating Time	• *Reset the timer to zero, helpful for troubleshooting time-sensitive processes*
7	Clear Short-Circuit Errors	• *Clears any Short-Circuit Errors which may have occured* • *The green "light" above will have indicated a Short-Circuit error*
8	Motor Slave Option	• *The drop down provides options for the Slave Motor's Behavior*

Learn More:

ConveyLinx-ERSC Family

ConveyLinx-Ai/Ai2/Ai3 24V Family

Conveylinx-Ai2/Ai3 48V Family

ConveyLinx-ECO

ConveyLinx-ERSC Family

Module Configuration Screen Tabs / Motors /

ConveyLinx-ERSC Family

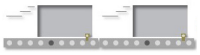
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

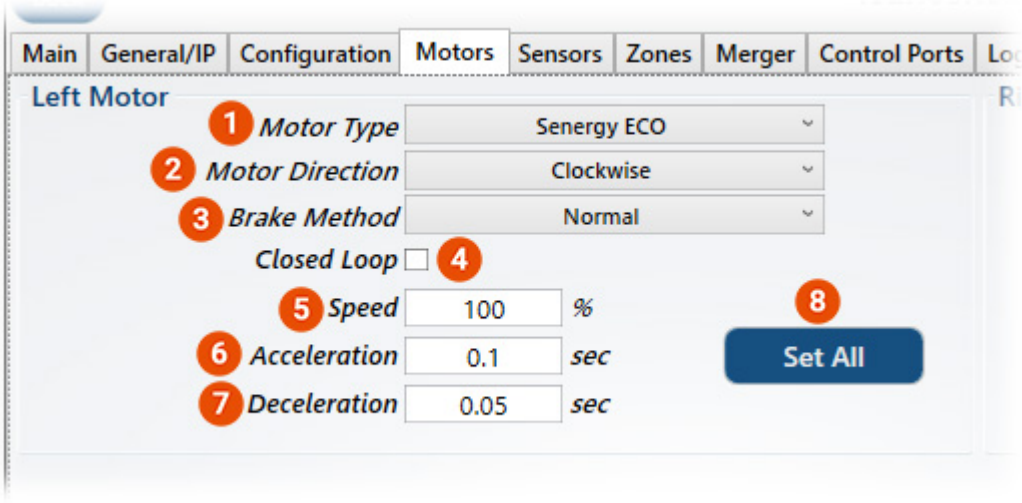
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Open Loop Speed Control Option

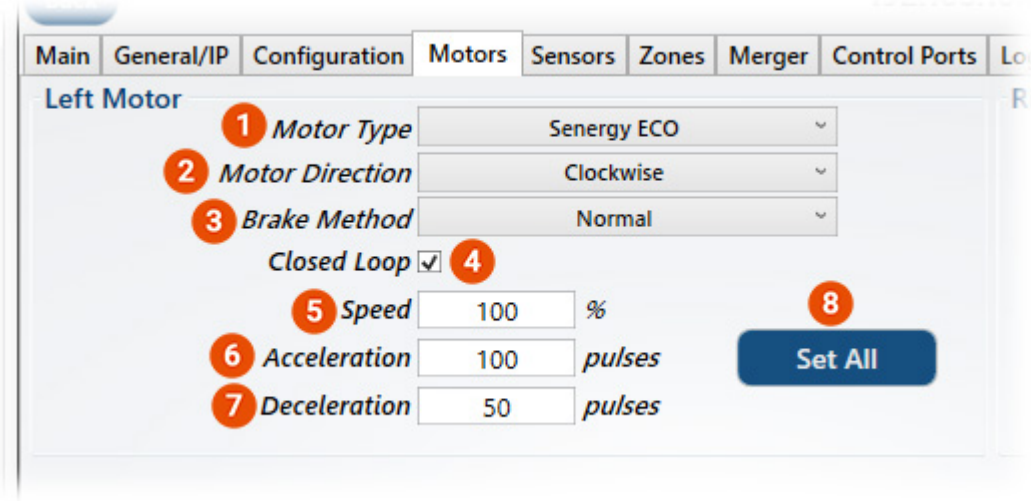


This image shows the Closed Loop Checkbox as **UNCHECKED**, so this means the controller will utilize its **Open Loop** motor speed control algorithm.

Note that this image shows the Left Motor Settings. The same selections apply for the Right Motor Settings

Item	Function	Description
1	Motor Type	• *Dropdown of Motor Types* • *Each type is related to motor performance* • *List shows only types available for the controller being viewed*
2	Motor Direction	• *Selects either Clockwise or Counterclokwise* • *See Motor Rotation in Appendix for more information*
3	Brake Method	• *Dropdown of Holding Brake Methods* • *List shows only types available for the controller being viewed*
4	Closed Loop Checkbox	• *When checked, motor speed control is closed loop* • *It is UNCHECKED in this section which means controller is in Open Loop speed control*
5	Speed	• *Value input box to enter desired speed* • *Motor speed value is in percent of maximum speed of motor/gearbox being controlled* • *100 is the maximum value*
6	Acceleration	• *Value input box to enter desired acceleration value* • *Because this section is for **OPEN LOOP** control; the value is in **seconds*** • *Value range is from 0 to 10 seconds*
7	Deceleration	• *Value input box to enter desired deceleration value* • *Because this section is for **OPEN LOOP** control; the value is in **seconds*** • *Value range is from 0 to 10 seconds*
8	Set All	• *Click button to apply these settings to a range of modules.* • *Pop-up dialogue box will provide list of other controllers to apply the settings to* • *Settings will only apply to the side of the controller (Left or Right) for which you are changing settings*

Closed Loop Speed Control Option



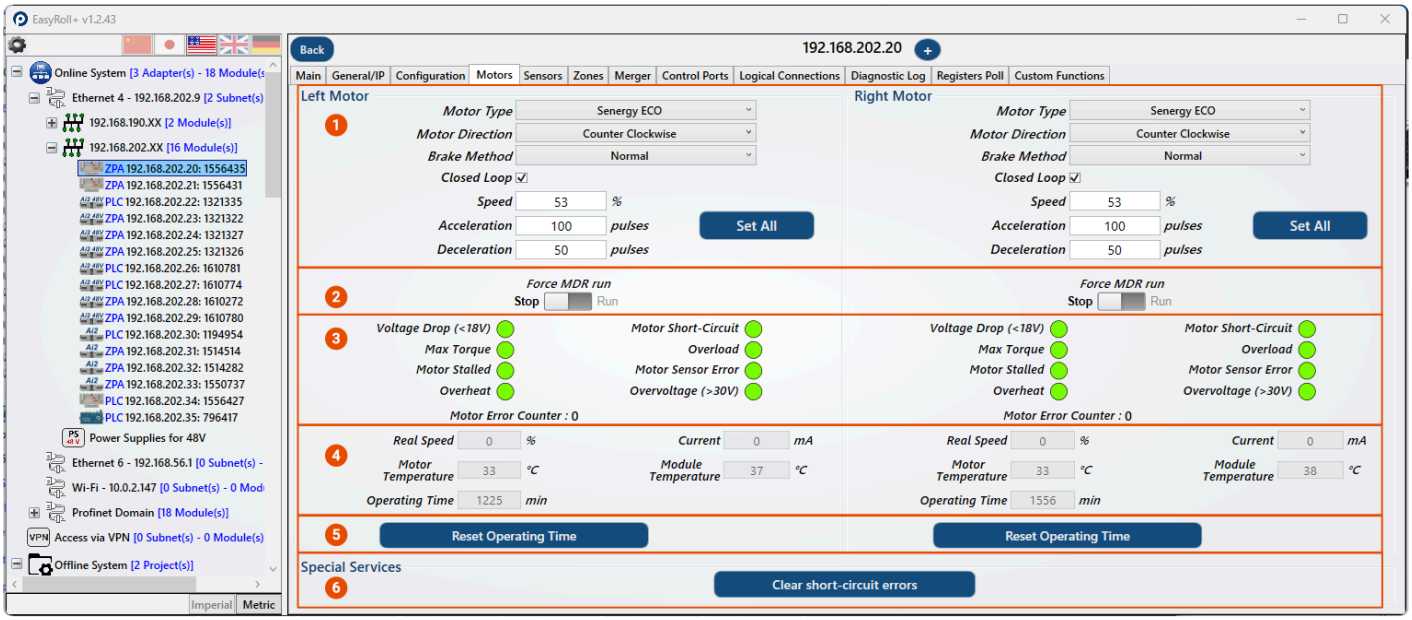
This image shows the Closed Loop Checkbox as **CHECKED**, so this means the controller will utilize its **Closed Loop** motor speed control algorithm.

Note that this image shows the Left Motor Settings. The same selections apply for the Right Motor Settings

Item	Function	Description
1	Motor Type	• *Dropdown of Motor Types* • *Each type is related to motor performance* • *List shows only types available for the controller being viewed*
2	Motor Direction	• *Selects either Clockwise or Counterclokwise* • *See Motor Rotation in Appendix for more information*
3	Brake Method	• *Dropdown of Holding Brake Methods* • *List shows only types available for the controller being viewed* • *See Brake Method in Appendix for more information*
4	Closed Loop Checkbox	• *When checked, motor speed control is closed loop* • *It is CHECKED in this section which means controller is in Closed Loop speed control*

5	Speed	• *Value input box to enter desired speed* • *Motor speed value is in percent of maximum speed of motor/gearbox being controlled* • *100 is the maximum value*
6	Acceleration	• *Value input box to enter desired acceleration value* • *Because this section is for **CLOSED LOOP** control; the value is in **motor pulses*** • *Value range is from 0 to 10,000 pulses*
7	Deceleration	• *Value input box to enter desired deceleration value* • *Because this section is for **CLOSED LOOP** control; the value is in **motor pulses*** • *Value range is from 0 to 10,000 pulses*
8	Set All	• *Click button to apply these settings to a range of modules.* • *Pop-up dialogue box will provide list of other controllers to apply the settings to* • *Settings will only apply to the side of the controller (Left or Right) for which you are changing settings*

Online Motor Page of the ConveyLinx-ERSC module



Item	Function	Description
1	Motor Settings	• *Includes Motor Type drop down, Motor Direction drop down, Brake Method drop down, Closed Loop checkbox, Speed textbox, Acceleration textbox, Deceleration textbox, and the Set All button.* • *The Set All button provides the ability to make a setting apply to multiple motors in one or more subnets* • *This section of the image is the only portion that is available when online AND offline*
2	Force MDR Run	• *When toggled the motor will run, great for trouble shooting*
3	Motor Errors & States	• *Potential motor errors include Voltage Drop (<18V), Motor Short-Circuit, Max Torque, Overload, Motor Stalled, Motor Sensor Error, Overheat, and Overvoltage* • *At the end of this section shows the number of Motor Errors that have been counted by the module*
4	Motor Readings	• *Includes Real Speed, Current, Motor Temperature, Module Temperature, and Operating Time* • *Each represented data point will change as the reading changes when online, these values are not represented when offline*
6	Reset Operating Time	• *Sets the Operating Time back to zero. Helpful when trying to pinpoint specific events/errors/etc in your application's process*
7	Special Services	• *Clear short-circuit errors on both connected motors by clicking this button*

✻ More information on the motors themselves can be found in their respective manuals on our website

ConveyLinx-Ai/Ai2/Ai3 24V Family

Module Configuration Screen Tabs / Motors /

ConveyLinx-Ai/Ai2/Ai3 24V Family

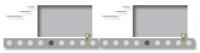
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

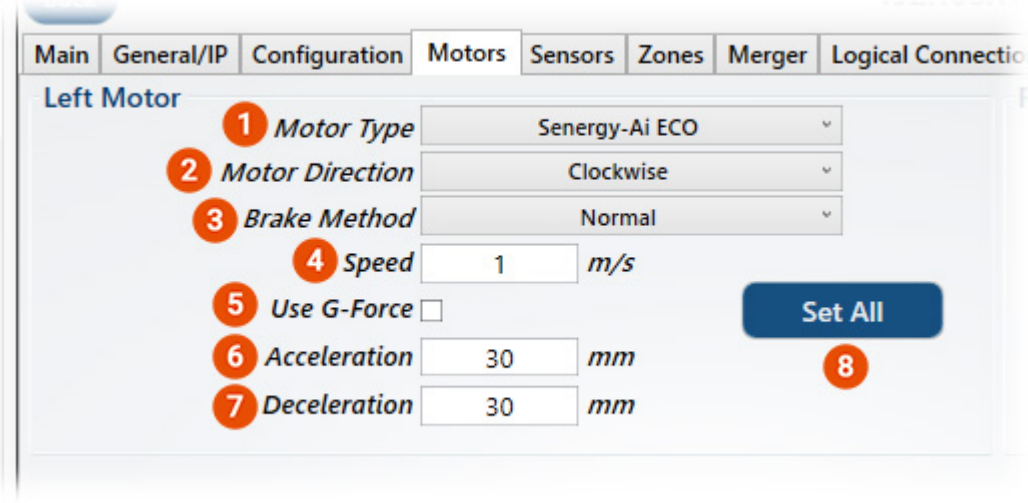
ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?



✻ Note that this image shows the Left Motor Settings. The same selections apply for the Right Motor Settings

Item	Function	Description
1	Motor Type	• *Dropdown of Motor Types* • *Each type is related to motor performance* • *List shows only types available for the controller being viewed*
2	Motor	• *Selects either Clockwise or Counterclokwise*

	Direction	• *See Motor Rotation in Appendix for more information*
3	Brake Method	• *Dropdown of Holding Brake Methods* • *List shows only types available for the controller being viewed*
4	Speed	• *Value input box to enter desired speed* • *Motor speed value is in percent of maximum speed of motor/gearbox being controlled* • *100 is the maximum value*
5	Use G-Force	• *When checked, motor accel / decel is based upon constant G-force* • *With this setting enabled the accel time and distance is variable*
6	Acceleration	• *Value input box to enter desired acceleration value* • *When Use G-Force is unchecked, the value is distance in mm* • *When Use G-Force is checked, the value is in m/sec²*
7	Deceleration	• *Value input box to enter desired deceleration value* • *When Use G-Force is unchecked, the value is distance in mm* • *When Use G-Force is checked, the value is in m/sec²*
8	Set All	• *Click button to apply these settings to a range of modules.* • *Pop-up dialogue box will provide list of other controllers to apply the settings to* • *Settings will only apply to the side of the controller (Left or Right) for which you are changing settings*

Online Motor Page of the ConveyLinx-Ai/Ai2/Ai3 24V module

Item	Function	Description
1	Motor Settings	• *Includes Motor Type drop down, Motor Direction drop down, Brake Method drop down, Speed textbox, Use G-Force checkbox, Acceleration textbox, Deceleration textbox, and the Set All button.* • *The Set All button provides the ability to make a setting apply to multiple motors in one or more subnets* • *This section of the image is the only portion that is available when online AND offline*
2	Force MDR Run	• *When toggled the motor will run, great for trouble shooting*
3	Motor Errors & States	• *Potential motor errors include Voltage Drop (<18V), Motor Short-Circuit, Max Torque, Overload, Motor Stalled, Motor Sensor Error, Overheat, Overvoltage, Performance Limit* • *At the end of this section shows the number of Motor*

		Errors that have been counted by the module
4	Motor Readings	• *Includes Real Speed, Current, Motor Temperature, Module Temperature, and Operating Time* • *Each represented data point will change as the reading changes when online, these values are not represented when offline*
5	Read Motor Port History	• *Shows the information for motors that have been connected to the left motor port for the left, and right motor port for the right.* • *Please note that this may display testing / factory data on new modules, so seeing Japan or Europe on this log is normal.*
6	Additional Roller Diameter	• *If the Roller has a greater diameter due to the circumstance of your application (coatings, etc), this should be entered and accounted for so that the system can accurately track the roller* • *Diameter must be in millimeters*
7	Special Services	• *Clear short-circuit errors on both connected motors by clicking this button*

✻ More information on the motors themselves can be found in their respective manuals on our website

Conveylinx-Ai2/Ai3 48V Family

Module Configuration Screen Tabs / Motors /

Conveylinx-Ai2/Ai3 48V Family

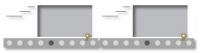
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

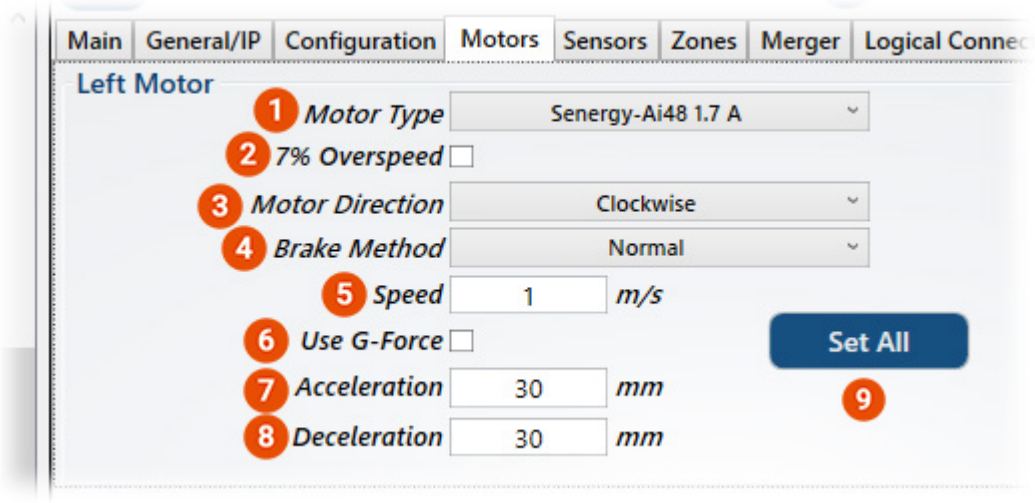
ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?



✻ Note that this image shows the Left Motor Settings. The same selections apply for the Right Motor Settings

Item	Function	Description
1	Motor Type	• *Dropdown of Motor Types* • *Each type is related to motor performance* • *List shows only types available for the controller being viewed*
2	7% Overspeed	• *Checkbox to enable the speed to be 7% faster than the*

		configured speed setting
3	Motor Direction	• *Selects either Clockwise or Counterclokwise* • *See Motor Rotation in Appendix for more information*
4	Brake Method	• *Dropdown of Holding Brake Methods* • *List shows only types available for the controller being viewed*
5	Speed	• *Value input box to enter desired speed* • *Motor speed value is in m/sec* • *Valid max and min speeds are encoded into the motor roller and read by the ConveyLinx module*
6	Use G-Force	• *When checked, motor accel / decel is based upon constant G-force* • *With this setting enabled the accel time and distance is variable*
7	Acceleration	• *Value input box to enter desired acceleration value* • *When Use G-Force is unchecked, the value is distance in mm* • *When Use G-Force is checked, the value is in m/sec²*
8	Deceleration	• *Value input box to enter desired deceleration value* • *When Use G-Force is unchecked, the value is distance in mm* • *When Use G-Force is checked, the value is in m/sec²*
9	Set All	• *Click button to apply these settings to a range of modules.* • *Pop-up dialogue box will provide list of other controllers to apply the settings to* • *Settings will only apply to the side of the controller (Left or Right) for which you are changing settings*

Online Motor Page of the ConveyLinx-Ai2/Ai3 48V module

Item	Function	Description
1	Motor Settings	• *Includes Motor Type drop down, 7% Overspeed checkbox, Motor Direction drop down, Brake Method drop down, Speed textbox, Use G-Force checkbox, Acceleration textbox, Deceleration textbox, and the Set All button.* • *The Set All button provides the ability to make a setting apply to multiple motors in one or more subnets* • *This section of the image is the only portion that is available when online AND offline*
2	Force MDR Run	• *When toggled the motor will run, great for trouble shooting*
3	Motor Errors & States	• *Potential motor errors include Voltage Drop (<18V), Motor Short-Circuit, Max Torque, Overload, Motor Stalled, Motor Sensor Error, Overheat, Overvoltage, Compensator Overload, Performance Limit*

		• *At the end of this section shows the number of Motor Errors that have been counted by the module*
4	Motor Readings	• *Includes Real Speed, Current, Motor Temperature, Module Temperature, and Operating Time* • *Each represented data point will change as the reading changes when online, these values are not represented when offline*
5	Read Motor Port History	• *Shows the information for motors that have been connected to the left motor port for the left, and right motor port for the right.* • *Please note that this may display testing / factory data on new modules, so seeing Japan or Europe on this log is normal.*
6	Additional Roller Diameter	• *If the Roller has a greater diameter due to the circumstance of your application (coatings, etc), this should be entered and accounted for so that the system can accurately track the roller* • *Diameter must be in millimeters*
7	Special Services	• *Clear short-circuit errors on both connected motors by clicking this button*

✻ More information on the motors themselves can be found in their respective manuals on our website

ConveyLinx-ECO

Module Configuration Screen Tabs / Motors /

ConveyLinx-ECO

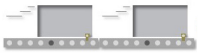
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

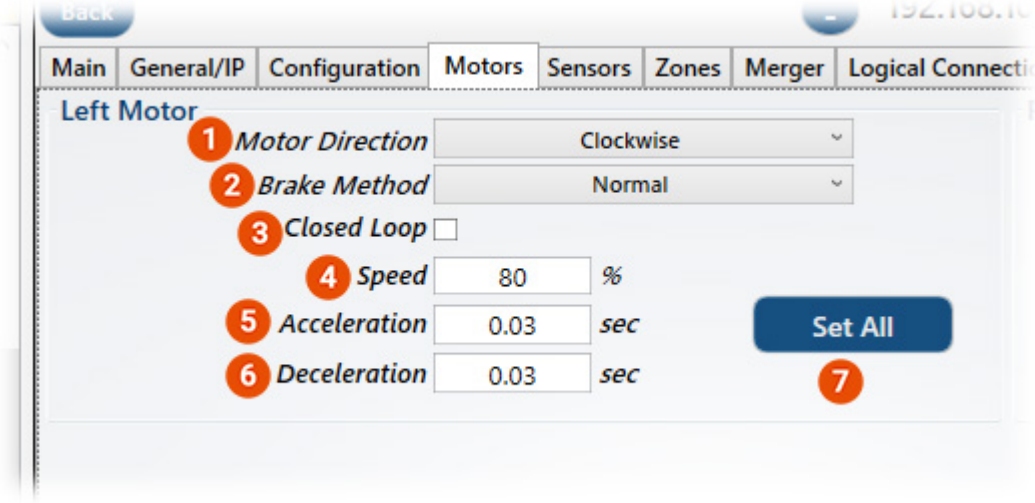
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Open Loop Speed Control Option

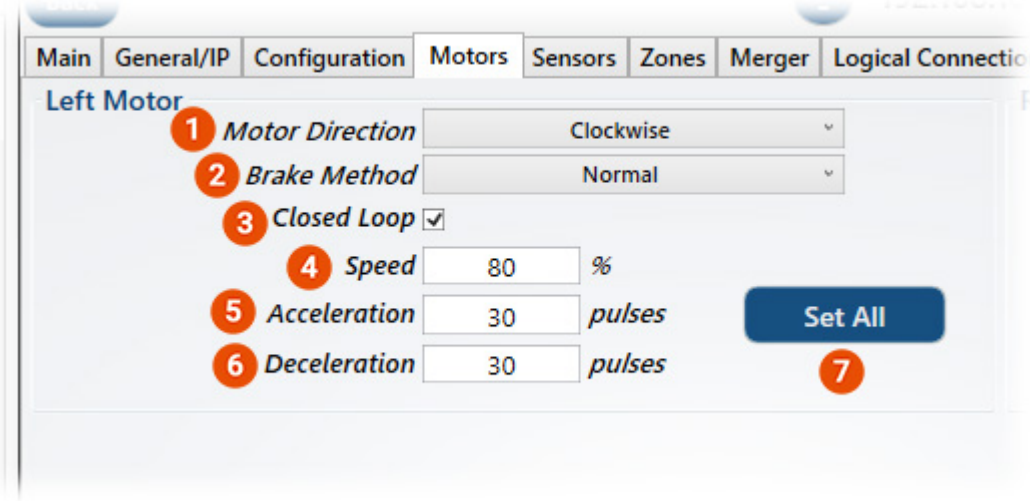


✻ This image shows the Closed Loop Checkbox as **UNCHECKED**, so this means the controller will utilize its **Open Loop** motor speed control algorithm.

✻ Note that this image shows the Left Motor Settings. The same selections apply for the Right Motor Settings

Item	Function	Description
1	Motor Direction	• *Selects either Clockwise or Counterclokwise* • *See Motor Rotation in Appendix for more information*
2	Brake Method	• *Dropdown of Holding Brake Methods* • *List shows only types available for the controller being viewed*
3	Closed Loop Checkbox	• *When checked, motor speed control is closed loop* • *It is UNCHECKED in this section which means controller is in Open Loop speed control*
4	Speed	• *Value input box to enter desired speed* • *Motor speed value is in percent of maximum speed of motor/gearbox being controlled* • *100 is the maximum value*
5	Acceleration	• *Value input box to enter desired acceleration value* • *Because this section is for **OPEN LOOP** control; the value is in **seconds*** • *Value range is from 0 to 10 seconds*
6	Deceleration	• *Value input box to enter desired deceleration value* • *Because this section is for **OPEN LOOP** control; the value is in **seconds*** • *Value range is from 0 to 10 seconds*
7	Set All	• *Click button to apply these settings to a range of modules.* • *Pop-up dialogue box will provide list of other controllers to apply the settings to* • *Settings will only apply to the side of the controller (Left or Right) for which you are changing settings*

Closed Loop Speed Control Option



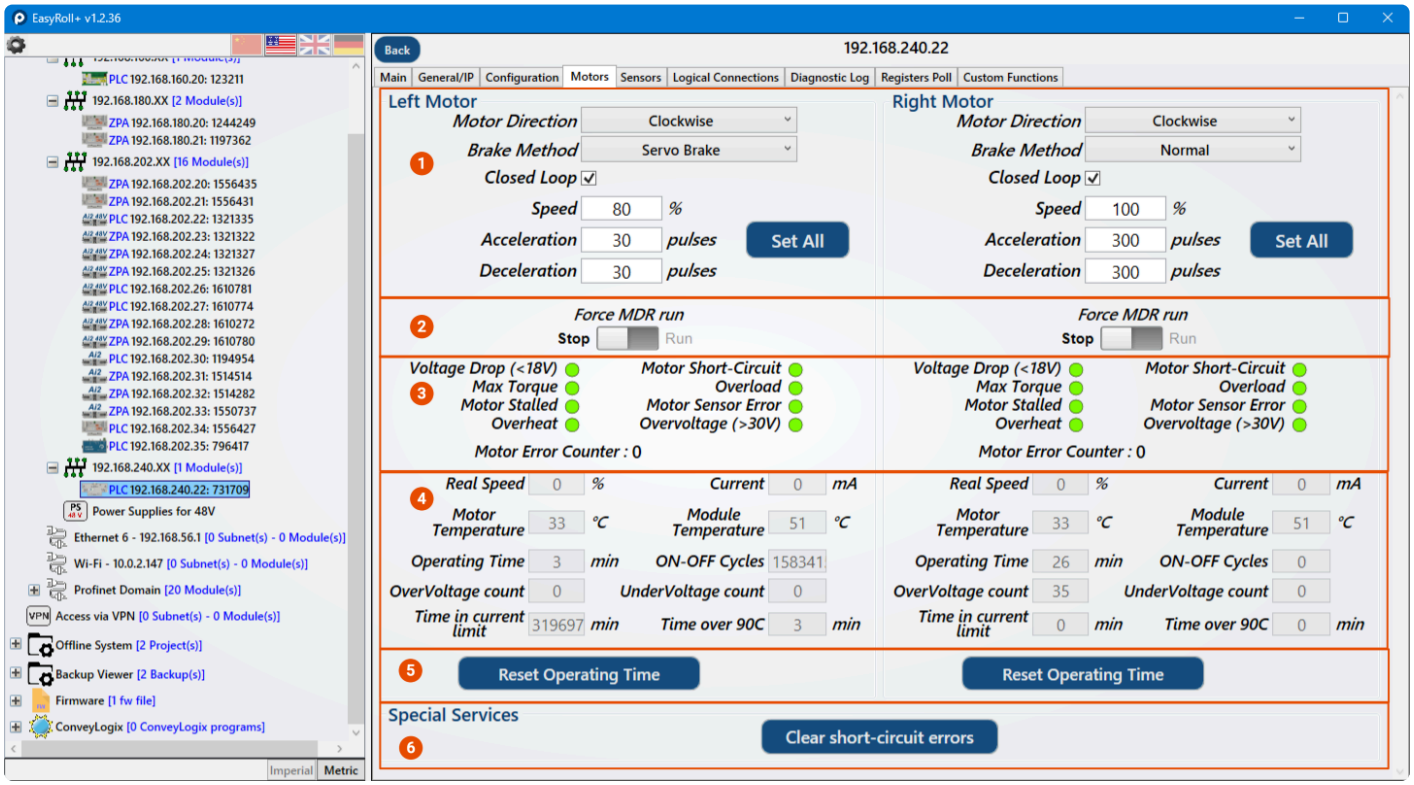
✻ This image shows the Closed Loop Checkbox as **CHECKED**, so this means the controller will utilize its **Closed Loop** motor speed control algorithm.

✻ Note that this image shows the Left Motor Settings. The same selections apply for the Right Motor Settings

Item	Function	Description
1	Motor Direction	• *Selects either Clockwise or Counterclokwise* • *See Motor Rotation in Appendix for more information*
2	Brake Method	• *Dropdown of Holding Brake Methods* • *List shows only types available for the controller being viewed* • *See Brake Method in Appendix for more information*
3	Closed Loop Checkbox	• *When checked, motor speed control is closed loop* • *It is CHECKED in this section which means controller is in Closed Loop speed control*
4	Speed	• *Value input box to enter desired speed* • *Motor speed value is in percent of maximum speed of motor/gearbox being controlled* • *100 is the maximum value*

5	Acceleration	• *Value input box to enter desired acceleration value* • *Because this section is for **CLOSED LOOP** control; the value is in **motor pulses*** • *Value range is from 0 to 10,000 pulses*
6	Deceleration	• *Value input box to enter desired deceleration value* • *Because this section is for **CLOSED LOOP** control; the value is in **motor pulses*** • *Value range is from 0 to 10,000 pulses*
7	Set All	• *Click button to apply these settings to a range of modules.* • *Pop-up dialogue box will provide list of other controllers to apply the settings to* • *Settings will only apply to the side of the controller (Left or Right) for which you are changing settings*

Online Motor Page of the ConveyLinx-ECO module



Item	Function	Description
1	Motor Settings	• *Includes Motor Direction drop down, Brake Method drop down, Closed Loop Checkbox, Speed textbox, Acceleration textbox, Deceleration textbox, and the Set All button.* • *The Set All button provides the ability to make a setting apply to multiple motors in one or more subnets* • *This section of the image is the only portion that is available when online AND offline*
2	Force MDR Run	• *When toggled the motor will run, great for trouble shooting*
3	Motor Errors & States	• *Potential motor errors include Voltage Drop (<18V), Motor Short-Circuit, Max Torque, Overload, Motor Stalled, Motor Sensor Error, Overheat, Overvoltage* • *At the end of this section shows the number of Motor Errors that have been counted by the module*
4	Motor Readings	• *Includes Real Speed, Current, Motor Temperature, Module Temperature, and Operating Time* • *Each represented data point will change as the reading changes when online, these values are not represented when offline*
5	Reset Operating Time	• *Resets the clock back to 0 for the operating time and will begin again. Helpful when trying to get specific time information on your system's process*
6	Special Services	• *Clear short-circuit errors on both connected motors by clicking this button*

✻ More information on the motors themselves can be found in their respective manuals on our website

Sensors

Module Configuration Screen Tabs /

Sensors

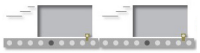
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

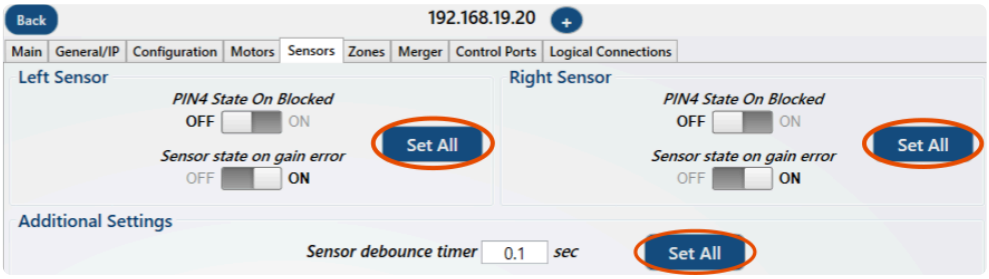
ZPA Mode ?



PLC I/O Mode ?

The ***Sensors*** tab displays the status of how the two sensor signals were configured during the Auto Configuration Procedure. If for some reason one or more of the sensors was not configured properly during the Auto Configuration Procedure, the ***Sensors*** Tab will allow you to change the sensor's configuration without re-performing the ***Auto Configuration Procedure*** again for the entire subnet. For example: the sensors were not aligned with their reflector, or there was an obstruction blocking the sensor at the time the procedure was performed.

Note that you can make the same change for a group of modules by clicking the ***Set All*** button



Additionally, if all the sensors on the system are light energized normally open, then the corresponding zone's sensor graphic on this tab will show *Off Blocked*. Click the appropriate icon to change either or both sensor's blocked signal state.

Learn More:

ConveyLinx-ERSC Family

ConveyLinx-Ai2/Ai3 Family

ConveyLinx-ECO

ConveyLinx-ERSC Family

Module Configuration Screen Tabs / Sensors /

ConveyLinx-ERSC Family

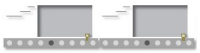
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

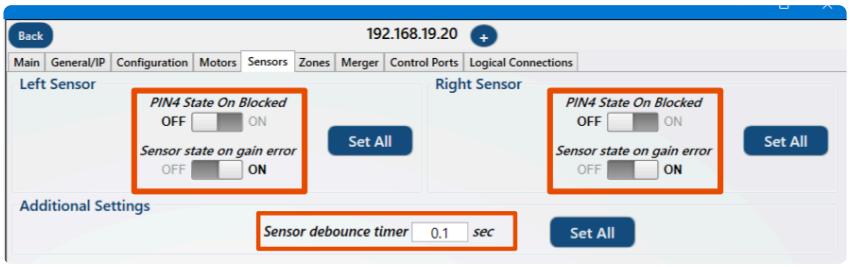
ZPA Mode ?



PLC I/O Mode ?

The ***ConveyLinx ERSC Family*** modules display the status of how the two sensor signals were configured during the Auto Configuration Procedure. They have the below settings available for configuration. The right sensor will handle the right side of the module, and the left sensor will handle the left side of the module.

Click the appropriate icon to change either or both sensor's blocked signal state, or their Sensor state on gain error, or their sensor debounce timer. Note that you can make the same change for a group of modules by clicking the ***Set All*** button



Control Ports

Module Configuration Screen Tabs /

Control Ports

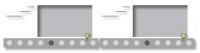
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

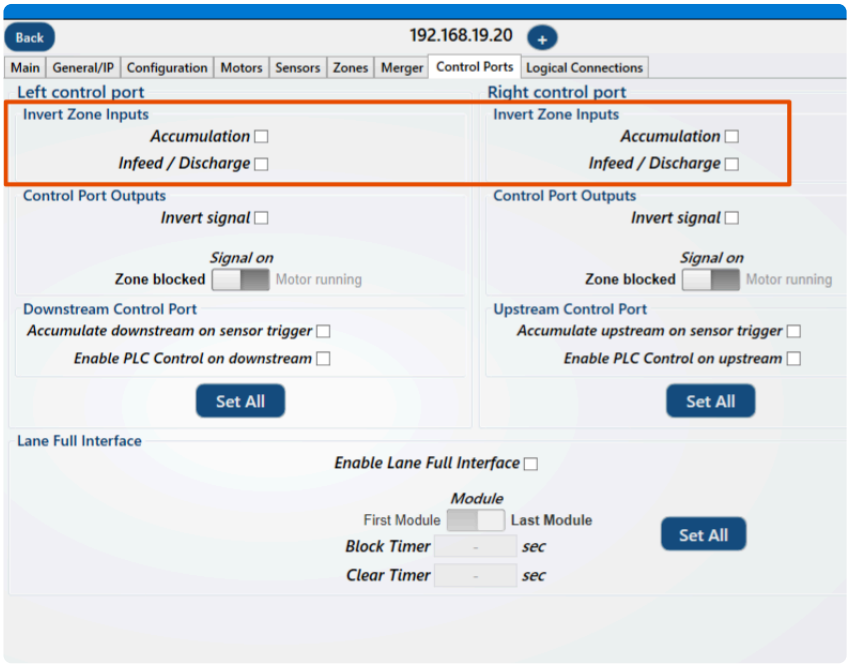


PLC I/O Mode ?

Control Port Inputs

The Control Port tab is only available on ConveyLinx-ERSC modules. Each of the two *Control Ports* on the module has a 2 input signals: *Local Accumulation* and *Infeed/ Discharge* Interlock. Each of these inputs has a default logical state (on or off) that enables the function. The ***Control Port Inputs*** area contains check boxes to invert the logical state of these inputs to accommodate your particular needs. Please note that these checkboxes are for **Left** and **Right** ports on the module and **not** the logical **Upstream** or **Downstream** zones

By default, the module interprets the *Infeed/ Discharge* input signal (Interlock Pin 4 on RJ-12 Control Port or P4 on a ***SE Breakout Module***) when energized or ON to mean a logical "1". By clicking the check box to invert the *Infeed/Discharge* input signal, a de-energized or "OFF" condition will mean a logical "1" to the module for the Interlock Pin 4 *Control Port* signal.



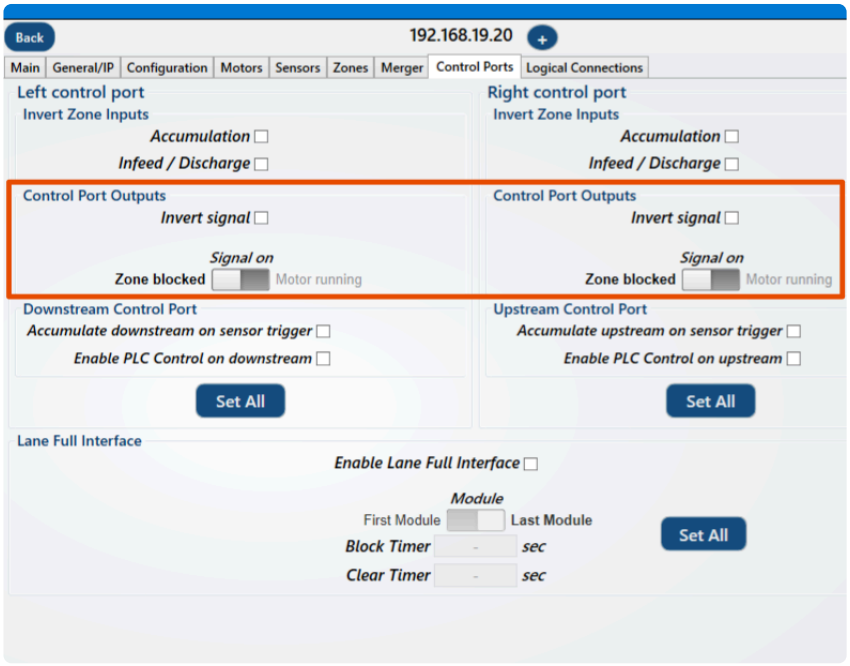
By default, the module interprets the *Accumulation* input signal (Pin 3 on RJ-12 Control Port or P3 on a ***SE Breakout Module***) when energized or ON to mean a logical "1". By clicking the check box to invert the *Accumulation* input signal, a de-energized or "OFF" condition will mean a logical "1" to the module for the Pin 3 *Control Port* signal

[Learn More about SE Breakout Module]

Control Port Outputs

! Control Port outputs are very low power. You need to use an ***SE Module*** to connect your external device.

The default ***Control Port Output*** configuration signal is “ON” or logical “1” to indicate to external controls that it is associated zone is occupied. By clicking the associated ***Invert*** check box, the module will make the output “OFF” or logical “0” when its associated zone is occupied.



The default operation of each ***Control Port Output*** signal is to indicate whether the zone is blocked. You can change this operation to indicate that the motor is running instead of zone blocked by toggling the ***Zone Blocked / Motor Running*** setting. Please note that the ***Invert*** function applies to this option as well

! Please note that if you select the *Motor Running* option on a module that is a *Slave* of another module, the Control Port Output will not energize. The *Motor Running* output only energizes on the module with the zone that is controlling the *Slave*. See the Configuration Tab topic for more details.

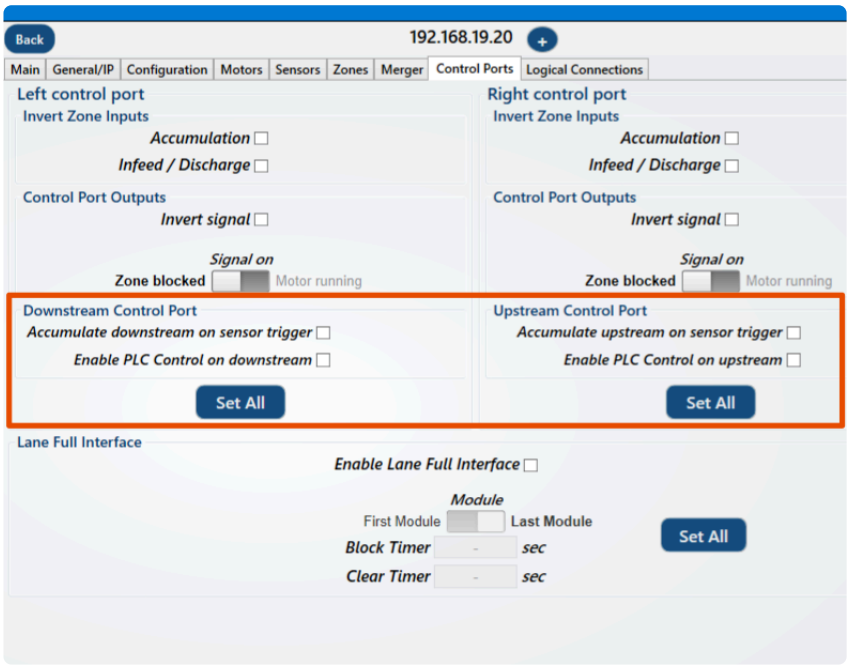
Upstream / Downstream Accumulation

One of the *Control Port* input signals previously mentioned above is the Local Accumulate signal (Pin 3 on RJ-12 Control Port or P3 on a ***SE Breakout Module***). By default, this signal causes the local zone to accumulate when its zone sensor is blocked. If this signal is removed when a carton is blocking the sensor, the carton will discharge to the next downstream zone (if of course it is clear). While the carton is discharging and still blocking the zone sensor, if the Accumulate signal is re-energized, the zone will stop.

Accumulate on Sensor Trigger

In situations (like an operator workstation) where you for example want every carton to accumulate upon its arrival, you would leave the Accumulate signal energized all the time and then have an operator momentarily de-energize the signal to cause the carton to discharge. In this situation you probably do not want the operator to have to watch and wait for the carton to fully discharge from the zone in order for them to re-energize the Accumulate signal so that the next carton will stop at the zone. The ***Accumulate on Sensor*** Trigger checkboxes for the Upstream and Downstream zones allow you to tell either or both the Upstream or Downstream zones on the module to remember that the Accumulate signal was momentarily de-energized so the carton will discharge without any further operator intervention and automatically know to accumulate the zone upon the arrival of the next carton.

Click the ***Accumulate on Sensor Trigger*** checkbox so that a momentary removal of the ***Pin 3*** signal will release the carton from the zone. If the ***Pin 3*** signal comes back on and the sensor is still blocked, the control will still release the carton and will not accumulate again until the sensor becomes clear and then blocked again

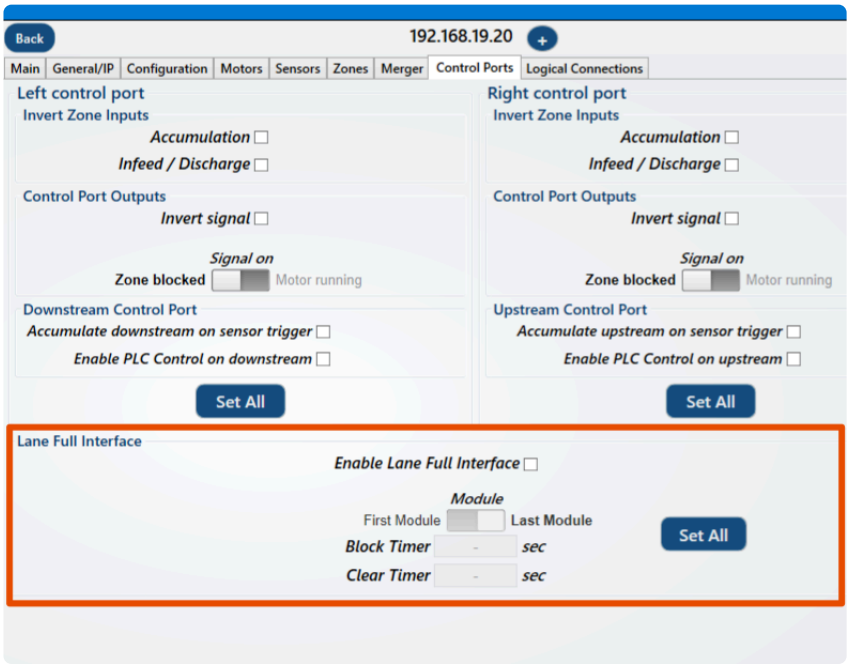


Lane Full Interface

Learn more details about Lane Full Interface functionality

✻ The ***Lane Full Interface*** *Block and Clear Timer* capability is designed so you can plug a Sensor direct into the *Control Port*

When a sensor is plugged into the **downstream** Control Port, you can check the ***Lane Full Interface*** checkbox. This will cause the zone to no longer require a downstream arrival interlock (i.e. *Ignore Arrival Jam*) and use the sensor signal to stop and start releasing from the zone. You may wish to toggle the Module setting, to affect the First or the Last module. ***Block and Clear Timers*** are provided to adjust the behavior of product flow based upon the blocking and clearing of the sensor.



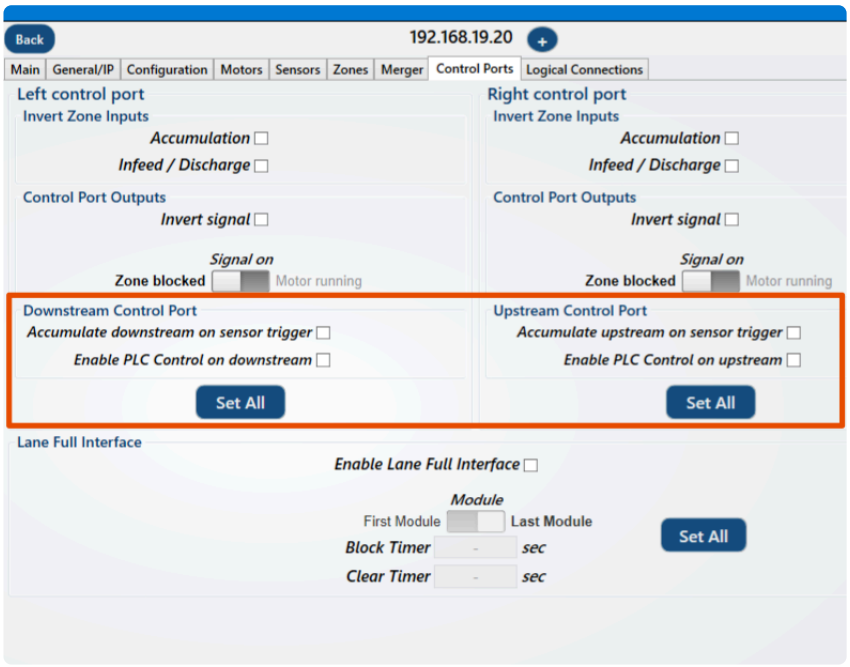
✻ If you enter 0 seconds for the Block and Clear Timers, the Lane Full Interface AUX Input signal essentially turns into an “on/off” switch for allowing release from the most downstream zone

---

PLC Control of Control Ports

If you have a PLC connected to a module while it is in ZPA mode, you have the option of disabling the default ZPA functionality of either *Control Port* (or both) and allow your external PLC to access the 2 input signals and the one output signal available on each port. This means that when selected for a given zone's *Control Port*; energizing either input signal will not indicate Local Accumulation or Infeed/Discharge Interlock functions and the output signal will not become energized when the zone is occupied. Your PLC program will have access to these inputs and output to use as remote I/O over the ConveyLinx Ethernet network

You can select either or both the Upstream and/or Downstream Control Ports to be controlled by your remote PLC over the ConveyLinx Ethernet network. Checking the appropriate checkbox will immediately make the change. If a checkbox is already checked, unchecking it will return the associated port back to its ZPA functionality



ConveyLinx-Ai2/Ai3 Family

Module Configuration Screen Tabs / Sensors /

ConveyLinx-Ai2/Ai3 Family

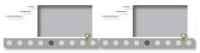
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

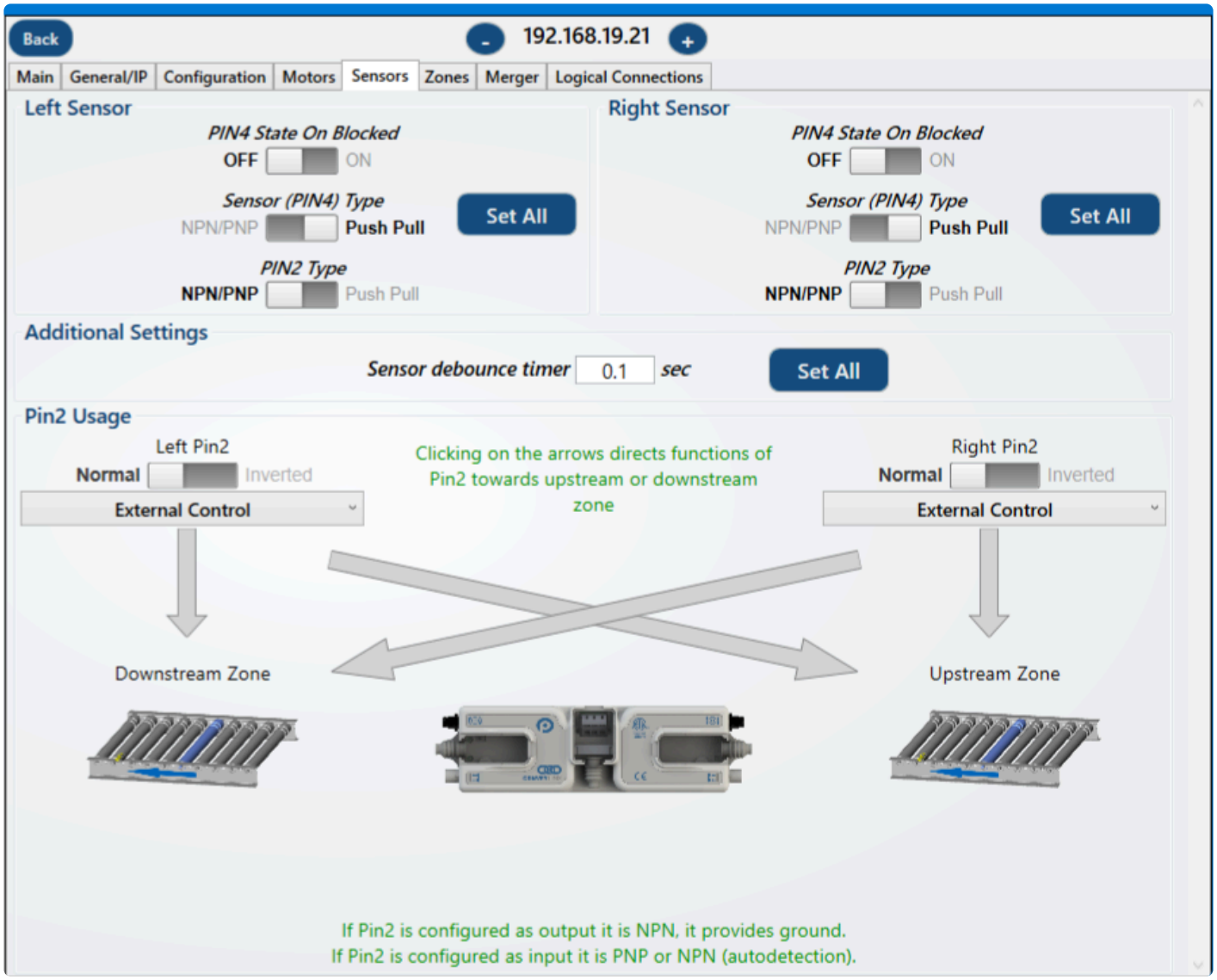
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The ConveyLinx-Ai2 and ConveyLinx-Ai3 modules provide an additional configuration option. Pin 2 on each of the two Sensor ports' M8 connector on the Module can function as either an input or an output. The default "out-of-the-box" usage for Pin 2 is "None" or "External Control". Depending on how the module is configured, the ports can be assigned the following functions independently of each other. Using the Pin 2 Usage section of the Sensors page allows you to select one of the following functions for each zone on the module:



Aux IO Signal Chart

Functionality	Signal	Description
External Control	Input or Output	Signal does not affect ZPA control and is configurable and accessible by external PLC control
Accumulate (DI)	Input	Used to cause local ZPA zone to accumulate
Wake-up (DI)	Input	Used to cause causes local zone to wake-up and run its motor to accept a product
Wake-up with	Input	Same as Wake-up (DI) except the running zone

Timeout (DI)		will stop after a timeout, timeout time is approximately four times the jam time, if signal remains on
Lane Full Interface (DI)	Input	Used to operate the Lane Full Interface discharge control function
Module Error Output (DO)	Output	Energizes when there is a module error condition active
Product on Zone (DO)	Output	Energizes when the local ZPA zone is occupied
Sensor Error (DI)	Input	Used for sensors equipped with a health or error output signal
Mirror Pin4 (DI)	Input	
As Sensor in Reverse Dir. (DI)	Input	Used to when reverse direction sensor is connected for reversing operation

Learn More:

Downstream Accumulate-AI

Most Upstream Zones

Accumulate Intermediate Zones

Lane Full Interface

Most Upstream Zones Handshake Interlock

Most Downstream Zones Handshake Interlock

Inverting the Pin 2 Signal

IOX-2 Interface Module

Downstream Accumulate

Module Configuration Tabs / Sensors / ConveyLinx-Ai Family /

Downstream Accumulate

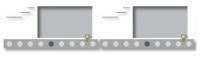
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

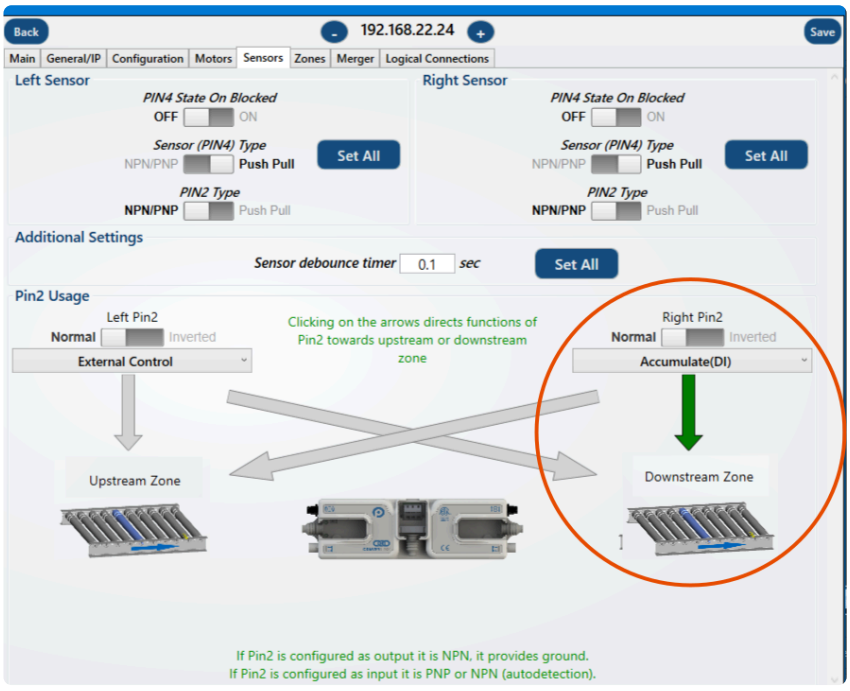


PLC I/O Mode ?

Please note that by default and without any intervention, the most downstream zone will always try to discharge product. To control this, you need to utilize the Aux I/O Pin 2 signal for the most downstream zone as an ***Accumulate*** input.

> ✻ More information on downstream behavior can be found in the Downstream Interlock topic

Assuming the most downstream zone is connected to the right side of the module; we set the Right Aux I/O Pin 2 to ***Accumulate*** from the drop-down box and make sure we click the "DOWN" arrow to indicate that the Right Pin 2 signal is to be associated with the Downstream Zone. When the Right Pin 2 signal is energized, the downstream zone will stop when an item



arrives on its sensor

Most Upstream Zones

Module Configuration Tabs / Sensors / ConveyLinx-Ai Family /

Most Upstream Zones

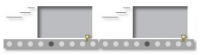
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

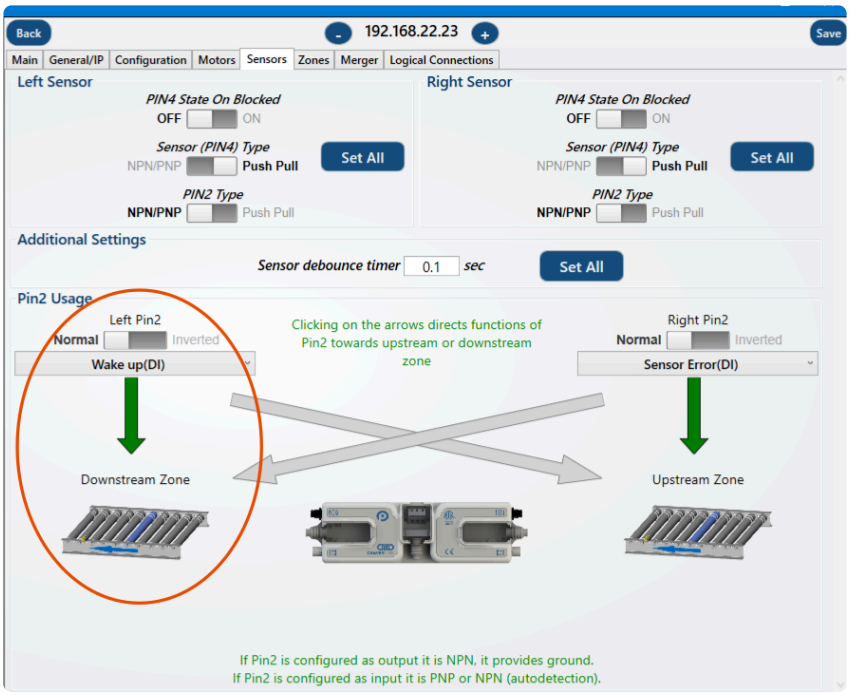


PLC I/O Mode ?

By default and without any intervention, the most upstream zone will never turn on to accept new product. To cause the most upstream zone to run to accept an item with a wired signal, you need to utilize the Aux I/O Pin 2 for the upstream zone as a ***Wake-up*** input.

> ✻ More information on upstream behavior can be found in the Upstream Interlock topic

Assuming the most upstream zone is connected to the left side of the module; we set the Left Pin 2 to ***Wake up*** from the drop-down box and make sure we click the UP arrow to indicate that the Left Pin 2 signal is to be associated with the Upstream Zone. When the Left Pin 2 signal is energized, the upstream zone will run to accept an item



Accumulate Intermediate Zones

Module Configuration Tabs / Sensors / ConveyLinx-Ai Family /

Accumulate Intermediate Zones

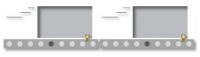
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

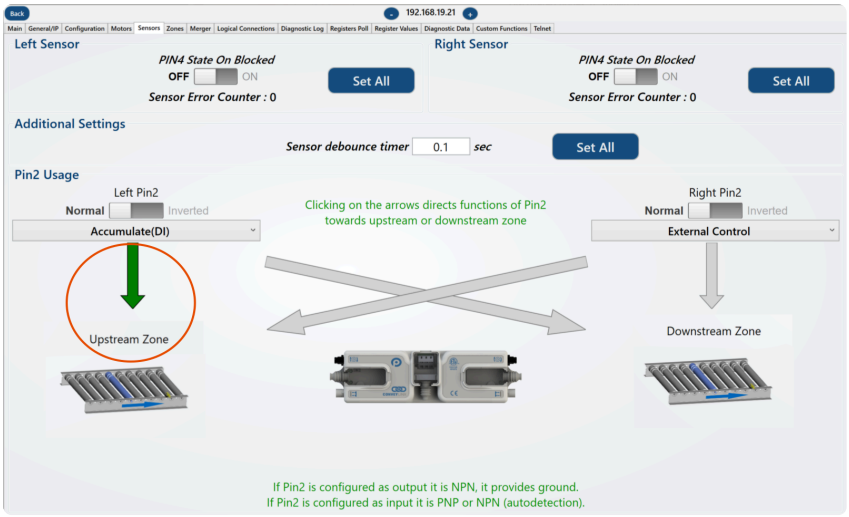
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

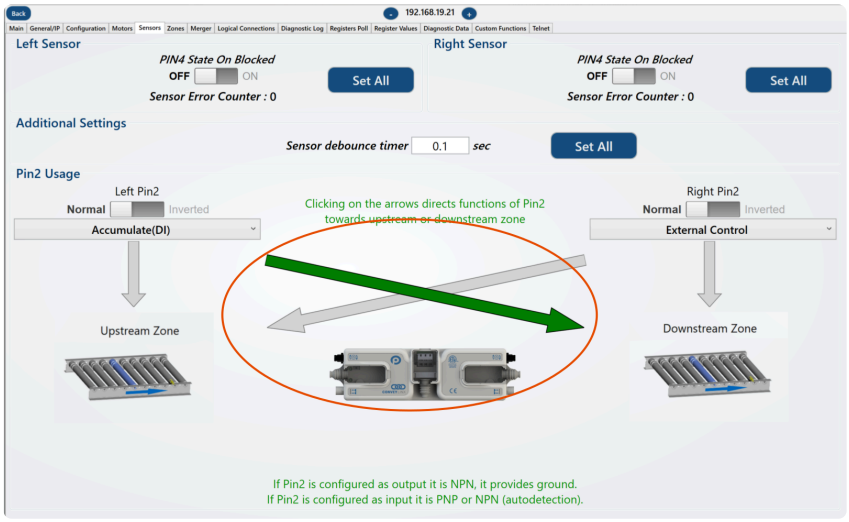
Assuming the intermediate zone we want to accumulate is the upstream zone and the upstream zone is connected to the Left side of the module; we set the Left Aux I/O Pin 2 to ***Accumulate*** from the drop down box and make sure we click the “UP” arrow to indicate that the Left Pin 2 signal is to be associated with the Upstream Zone. When the Left Pin 2 is energized, the upstream zone will accumulate the next item that arrives



How to change the zone where the PIN 2 signal is used

The PIN 2 signal does not have to be associated with the zone being controlled by the side of the module where you want to connect the signal. The diagonal arrows shown below the drop-down boxes all you to route the particular PIN 2 signal to the opposite zone.

For example we want to use the **Left PIN 2** signal to accumulate the **downstream zone** which happens to be connected to the **Right side** of the module. We set the **Left PIN 2** to ***Accumulate(DI)*** from the drop down box and make sure we click the diagonal arrow to point to the **Downstream** zone on the module. When the **Left AUX** is energized, the **downstream zone** will accumulate the next item that arrives



Learn More About Intermediate Zone Accumulate

Lane Full Interface

Module Configuration Tabs / Sensors / ConveyLinx-Ai Family /

Lane Full Interface

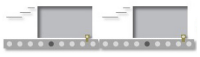
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

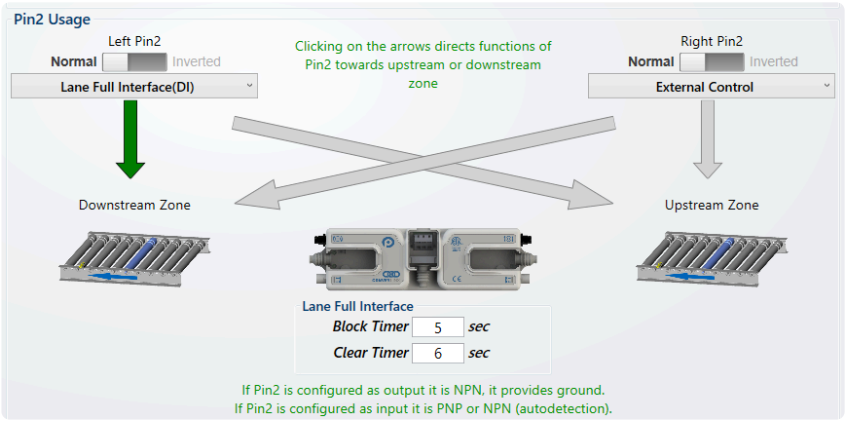
ZPA Mode ?



PLC I/O Mode ?

Learn more details about Lane Full Interface functionality

Assuming the most downstream zone is connected to the Left side of the module; we set the Left Aux I/O Pin 2 to ***Lane Full Interface*** from the drop-down box and make sure we click the “DOWN” arrow to indicate that the Left Pin 2 signal is to be associated with the Downstream Zone. The signal must be energized for the Block time period before cartons will stop and accumulate and the signal must be de-energized for the Clear time period before



cartons will be allowed to release. In this example, we entered 5 seconds for the Block Time and 6 seconds for the Clear Time

✻ If you enter 0 seconds for the Block and Clear Timers, the Lane Full Interface AUX Input signal essentially turns into an “on/off” switch for allowing release from the most downstream zone

Most Upstream Zones Handshake Interlock

Module Configuration Tabs / Sensors / ConveyLinx-Ai Family /

Most Upstream Zones Handshake Interlock

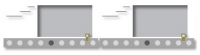
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

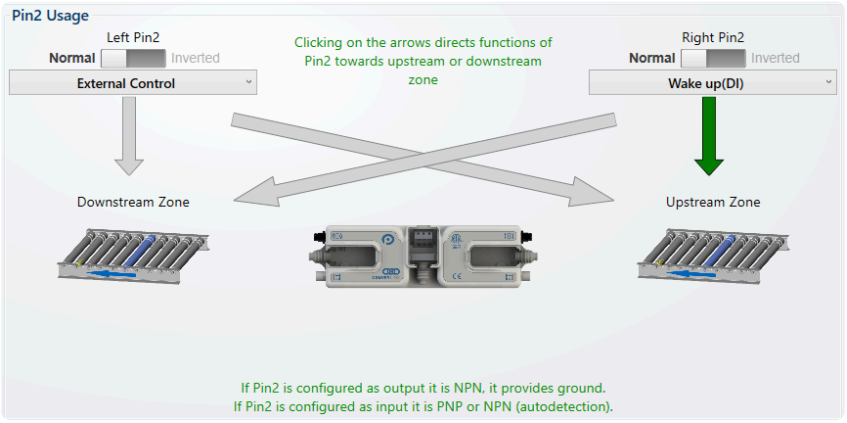
ZPA Mode ?



PLC I/O Mode ?

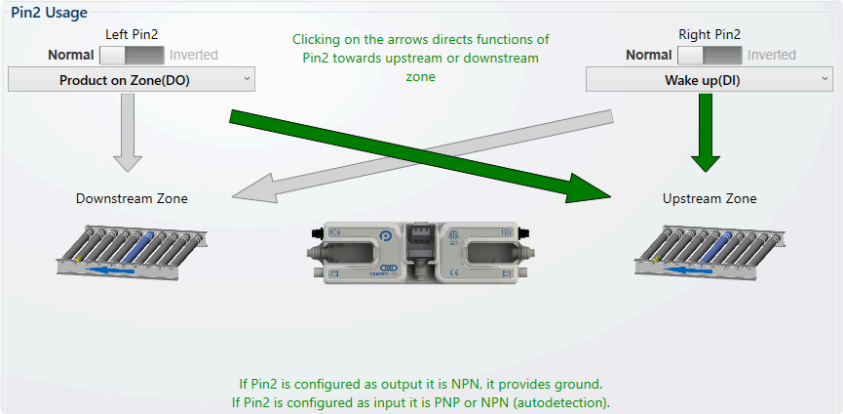
In applications where the equipment feeding the most upstream zone of ConveyLinx controlled conveyor requires a handshake interlock to know when the most upstream zone of the ConveyLinx controlled conveyor is empty and ready to accept a new item, this can be achieved by utilizing both the Left and Right Aux I/O Pin signals. One of the Aux I/O Pin 2 signals needs to be set as an input to ***Wake Up*** the zone and the other signal needs to be configured as an output to indicate whether there is ***Product on Zone***. When this ***Product on Zone*** output is energized, then the feeding equipment knows that the most upstream zone is occupied and is not ready to accept a new item.

Assuming the most upstream zone is connected to the Right side of the module; we set the Right Pin 2 to ***Wake up*** from the drop-down box and make sure we click the arrow to indicate that the Right Pin 2 signal is to be associated with the Upstream Zone. When the Right Pin 2 signal is energized, the upstream zone



will run to accept an item

Then we select ***Product on Zone*** for the Left Pin 2 signal and click the diagonal arrow to indicate that this signal is to reflect the status of the Upstream zone



Most Downstream Zones Handshake Interlock

Module Configuration Tabs / Sensors / ConveyLinx-Ai Family /

Most Downstream Zones Handshake Interlock

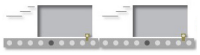
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

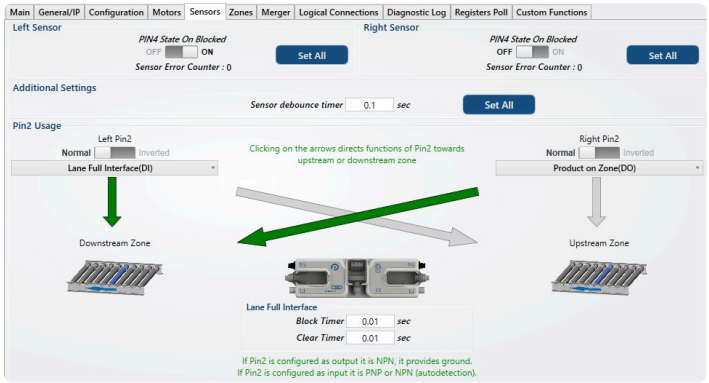
ZPA Mode ?



PLC I/O Mode ?

In applications where the equipment accepting product from the most downstream zone of ConveyLinx controlled conveyor requires a handshake interlock to know when the most downstream zone of the ConveyLinx controlled conveyor is occupied and ready to discharge the item, this can be achieved by utilizing both the Left and Right Aux I/O Pin signals. One of the Aux I/O Pin 2 signals needs to be set as an input to ***Lane Full*** the zone and the other signal needs to be configured as an output to indicate whether there is ***Product on Zone***. When this ***Product on Zone*** output is energized, then the accepting equipment knows that the most downstream zone is occupied and is ready to discharge the item.

Assuming the most downstream zone is connected to the Left side of the module; we set the Left Pin 2 to ***Lane Full Interface*** from the drop-down box and make sure we click the “DOWN” arrow to indicate that the Left Pin 2 signal is to be associated with the Downstream Zone. Similarly, we select ***Product on Zone*** for the Right Pin 2 signal and click the diagonal arrow to indicate



that this signal is to reflect the status of the Downstream zone

Inverting the Pin 2 Signal

Inverting the Pin 2 Signal

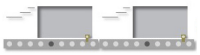
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

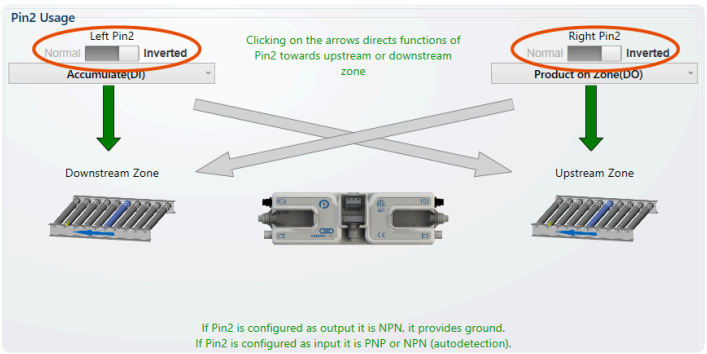
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

On this dialog, you can also invert the meaning of the electrical signal by checking the Invert box for either or both Pins. In this example, because we have the ***Invert*** box checked for both Pin signals, their respective functions will be activated when their signal is electrically OFF. Note that the ***Invert*** function works similarly for the output signals. If Product on Zone is selected as a function, with the Invert box checked when the zone is occupied, the electrical signal will be OFF. With the Invert box checked, when the zone is clear, the electrical signal will be ON



ConveyLinx-ECO

Module Configuration Screen Tabs / Sensors /

ConveyLinx-ECO

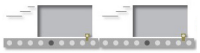
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

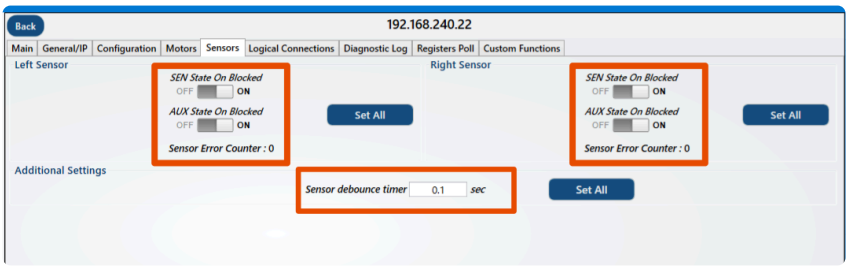
ZPA Mode ?



PLC I/O Mode ?

The ***ConveyLinx ECO Family*** modules display the status of how the two sensor signals were configured during the Auto Configuration Procedure. They have the below settings available for configuration. The right sensor will handle the right side of the module, and the left sensor will handle the left side of the module.

Click the appropriate toggle to change either or both sensor's blocked signal state, or their Aux State on Blocked. View their Sensor Error Counter, or their Sensor Debounce Timer. Note that you can make the same change for a group of modules by clicking the ***Set All*** button



Downstream Accumulate

Module Configuration Tabs / Sensors / ConveyLinx-ECO /

Downstream Accumulate

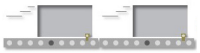
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

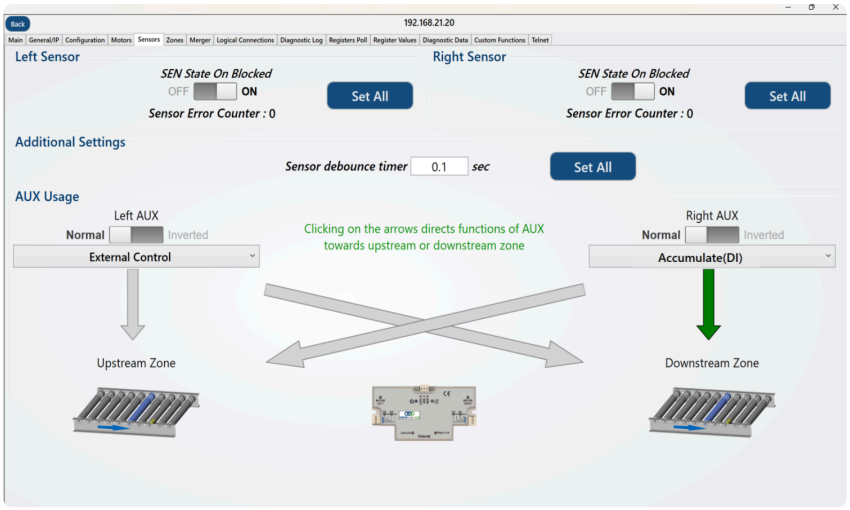


PLC I/O Mode ?

Please note that by default and without any intervention, the most downstream zone will always try to discharge product. To control this, you need to utilize the Aux I/O Pin 2 signal for the most downstream zone as an ***Accumulate*** input.

> ✻ More information on downstream behavior can be found in the Downstream Interlock topic

Assuming the most downstream zone is connected to the right side of the module; we set the Right Aux I/O Pin 2 to ***Accumulate*** from the drop-down box and make sure we click the "DOWN" arrow to indicate that the Right Pin 2 signal is to be associated with the Downstream Zone. When the Right Pin 2 signal is energized, the downstream zone will stop when an item arrives on its sensor



Most Upstream Zones

Module Configuration Tabs / Sensors / ConveyLinx-ECO Family /

Most Upstream Zones

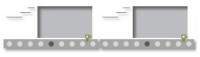
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

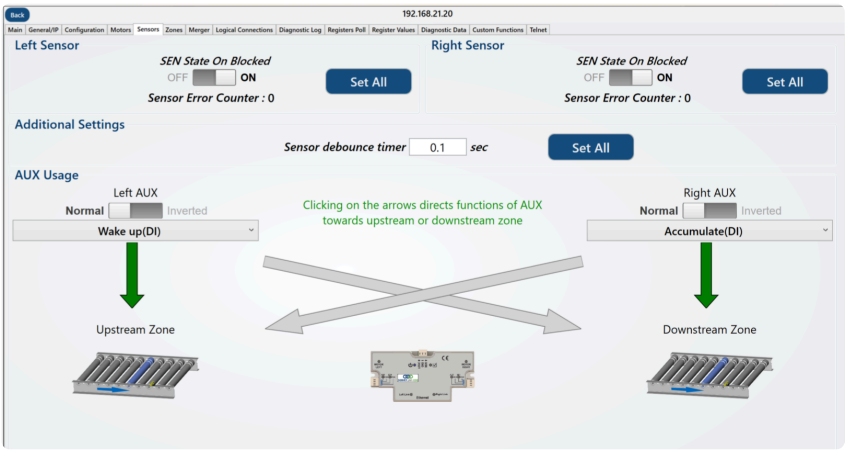


PLC I/O Mode ?

By default and without any intervention, the most upstream zone will never turn on to accept new product. To cause the most upstream zone to run to accept an item with a wired signal, you need to utilize the Aux I/O Pin 2 for the upstream zone as a ***Wake-up*** input.

> ✻ More information on upstream behavior can be found in the Upstream Interlock topic

Assuming the most upstream zone is connected to the left side of the module; we set the Left Pin 2 to ***Wake up*** from the drop-down box and make sure we click the UP arrow to indicate that the Left Pin 2 signal is to be associated with the Upstream Zone. When the Left Pin 2 signal is energized, the upstream zone will run to accept an item



Please note that as long as the most upstream zone is empty and you continue to apply the **Wake up(DI)** signal on the most upstream zone AUX input, the most upstream zone will continue to run as long as the signal is on. If you select **Wake up with timeout (DI)** from the dropdown, if the AUX signal is on for 8 seconds with no arrival in the zone, the motor will automatically shut off. To re-initialize the wake up function, the AUX signal must turn off and then back on again.

Accumulate Intermediate Zones

Module Configuration Tabs / Sensors / ConveyLinx-ECO Family /

Accumulate Intermediate Zones

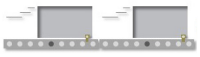
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

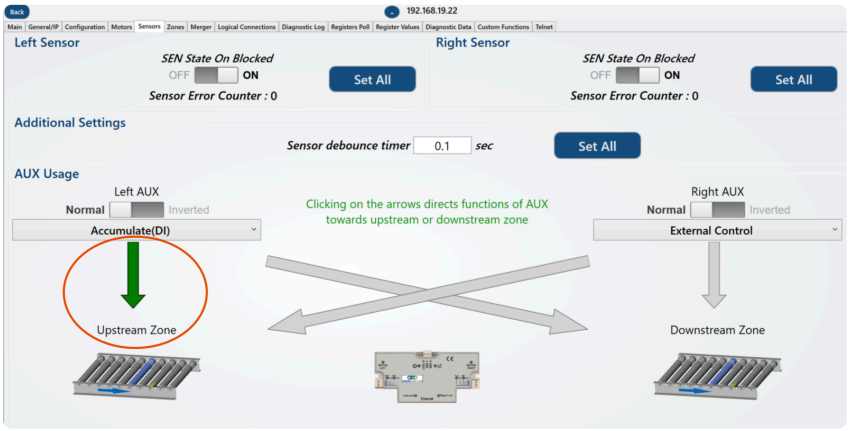
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

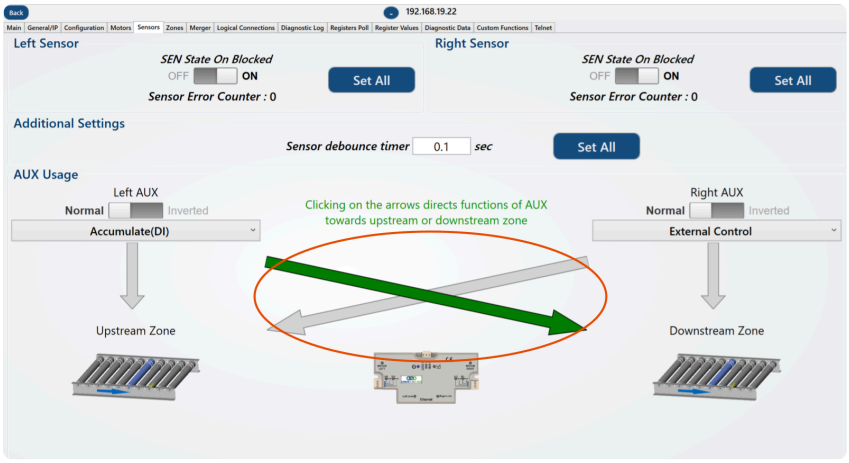
Assuming the intermediate zone we want to accumulate is the upstream zone and the upstream zone is connected to the Left side of the module; we set the Left Aux to ***Accumulate*** from the drop down box and make sure we click the "UP" arrow to indicate that the Left Aux signal is to be associated with the Upstream Zone. When the Left Aux is energized, the upstream zone will accumulate the next item that arrives



How to change the zone where the AUX signal is used

The AUX signal does not have to be associated with the zone being controlled by the side of the module where you want to connect the signal. The diagonal arrows shown below the drop-down boxes all you to route the particular AUX signal to the opposite zone.

For example we want to use the **Left AUX** signal to accumulate the **downstream zone** which happens to be connected to the **Right side** of the module. We set the **Left AUX** to ***Accumulate(DI)*** from the drop down box and make sure we click the diagonal arrow to point to the **Downstream** zone on the module. When the **Left AUX** is energized, the **downstream zone** will accumulate the next item that arrives



Learn More About Intermediate Zone Accumulate

Lane Full Interface

Module Configuration Tabs / Sensors / ConveyLinx-ECO Family /

Lane Full Interface

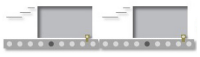
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

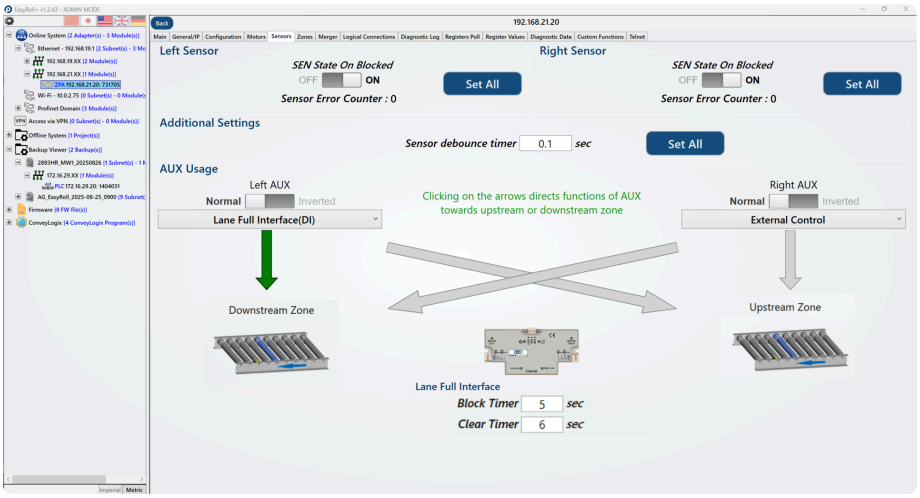
ZPA Mode ?



PLC I/O Mode ?

Learn more details about Lane Full Interface functionality

Assuming the most downstream zone is connected to the Left side of the module; we set the Left Aux I/O Pin 2 to ***Lane Full Interface*** from the drop-down box and make sure we click the "DOWN" arrow to indicate that the Left Pin 2 signal is to be associated with the Downstream Zone. The signal must be energized for the Block time period before cartons will stop and accumulate and the



signal must be de-energized for the Clear time period before cartons will be allowed to release. In this example, we entered 5 seconds for the Block Time and 6 seconds for the Clear Time

✻ If you enter 0 seconds for the Block and Clear Timers, the Lane Full Interface AUX Input signal essentially turns into an “on/off” switch for allowing release from the most downstream zone

Most Upstream Zones Handshake Interlock

Module Configuration Tabs / Sensors / ConveyLinx-ECO Family /

Most Upstream Zones Handshake Interlock

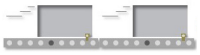
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

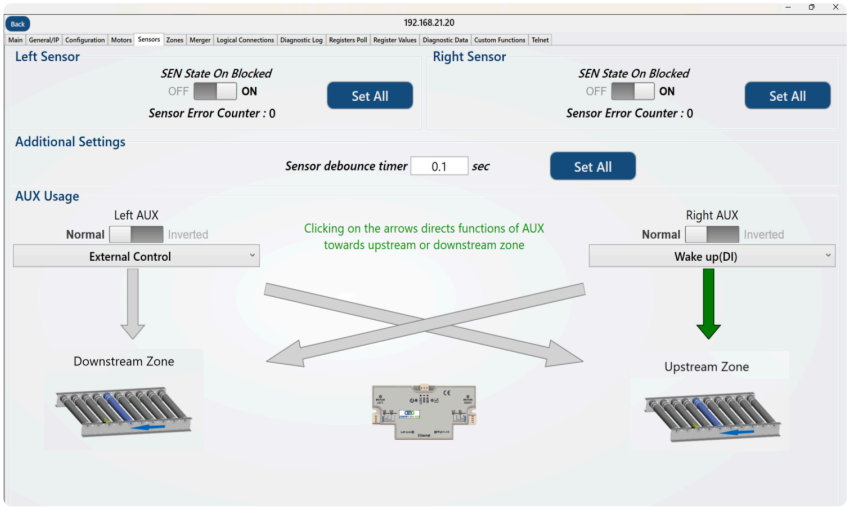
ZPA Mode ?



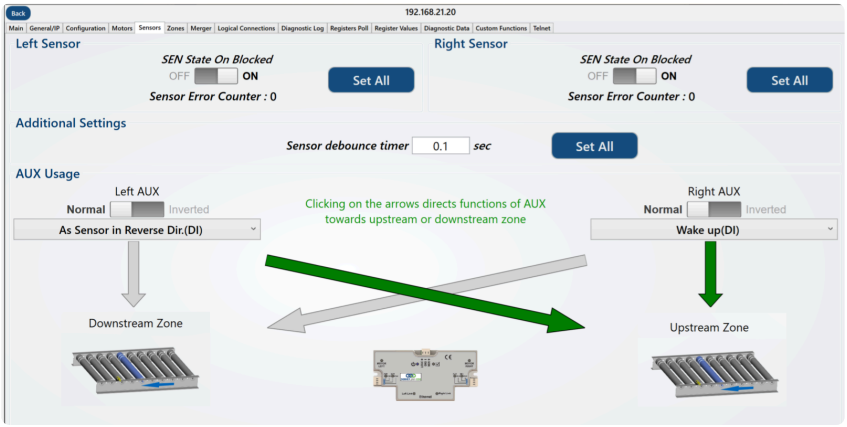
PLC I/O Mode ?

In applications where the equipment feeding the most upstream zone of ConveyLinx controlled conveyor requires a handshake interlock to know when the most upstream zone of the ConveyLinx controlled conveyor is empty and ready to accept a new item, this can be achieved by utilizing both the Left and Right Aux I/O Pin signals. One of the Aux I/O Pin 2 signals needs to be set as an input to ***Wake Up*** the zone and the other signal needs to be configured to indicate ***As Sensor in Reverse Dir***.

Assuming the most upstream zone is connected to the Right side of the module; we set the Right Pin 2 to ***Wake up*** from the drop-down box and make sure we click the arrow to indicate that the Right Pin 2 signal is to be associated with the Upstream Zone. When the Right Pin 2 signal is energized, the upstream zone will run to accept an item



Then we select ***As Sensor in Reverse Direction*** for the Left Pin 2 signal and click the diagonal arrow to indicate that this signal is to reflect the status of the Upstream zone



Most Downstream Zones Handshake Interlock

Module Configuration Tabs / Sensors / ConveyLinx-ECO Family /

Most Downstream Zones Handshake Interlock

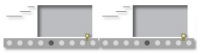
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

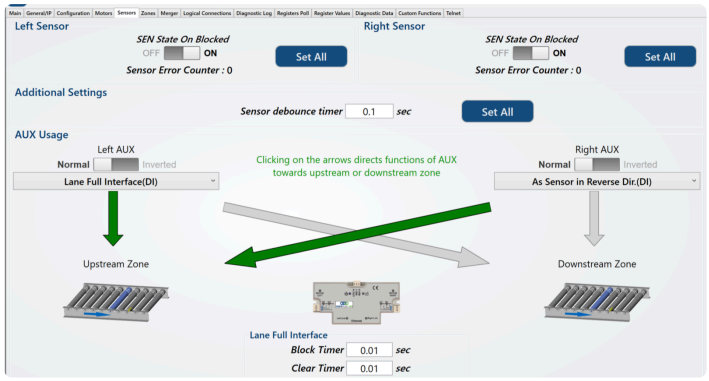
ZPA Mode ?



PLC I/O Mode ?

In applications where the equipment accepting product from the most downstream zone of ConveyLinx controlled conveyor requires a handshake interlock to know when the most downstream zone of the ConveyLinx controlled conveyor is occupied and ready to discharge the item, this can be achieved by utilizing both the Left and Right Aux I/O Pin signals. One of the Aux I/O Pin 2 signals needs to be set as an input to ***Lane Full*** the zone and the other signal needs to be configured to indicate ***As Sensor in Reverse Dir***.

Assuming the most downstream zone is connected to the Left side of the module; we set the Left Pin 2 to ***Lane Full Interface*** from the drop-down box and make sure we click the “DOWN” arrow to indicate that the Left Pin 2 signal is to be associated with the Downstream Zone. Similarly, we select ***As Sensor in Reverse Dir*** for the Right Pin 2 signal and click the diagonal arrow to indicate that this signal is to reflect the status of the Downstream zone



Inverting the Pin 2 Signal

Module Configuration Tabs / Sensors / ConveyLinx-ECO Family /

Inverting the Pin 2 Signal

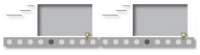
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

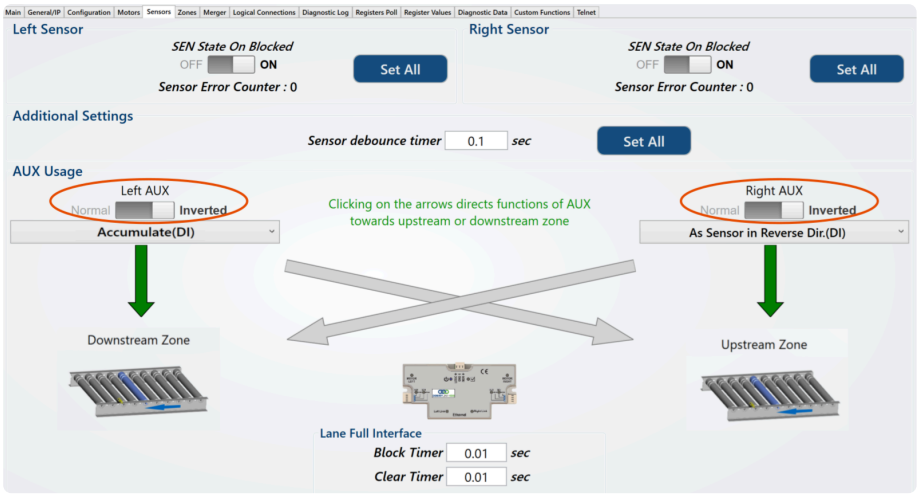
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

On this dialog, you can also invert the meaning of the electrical signal by checking the Invert box for either or both Pins. In this example, because we have the ***Invert*** box checked for both Pin signals, their respective functions will be activated when their signal is electrically OFF. With the Invert box checked, when the zone is clear, the electrical signal will be ON



Zones

Module Configuration Screen Tabs /

Zones

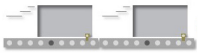
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The topics in this section apply to **ZPA Mode** only

Learn More:

- ZPA Mode
- Look Ahead
- Jam & Auto Clear
- Run After & Induct
- Additional Settings

ZPA Mode

Module Configuration Screen Tabs / Zones /

ZPA Mode

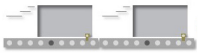
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

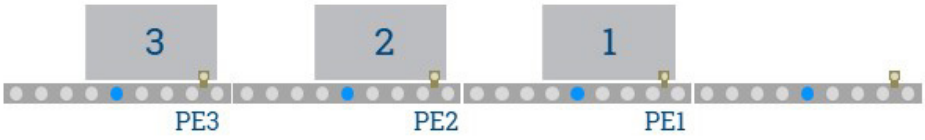


PLC I/O Mode ?

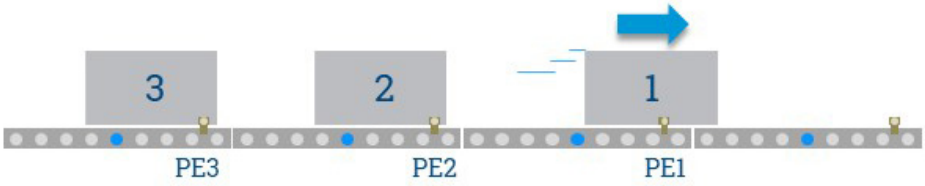
Singulation Release (Default)

Singulation Release is the mode where the **ConveyLinx module** requires that its neighboring downstream zone must be clear before it releases an item.

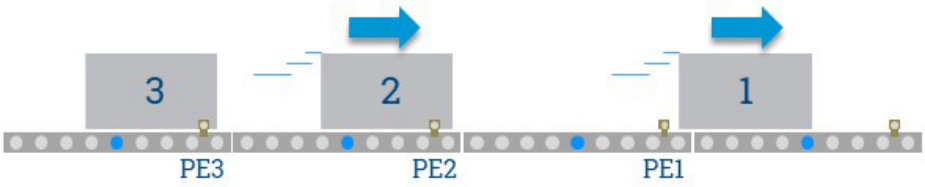
All 3 Cartons are accumulated



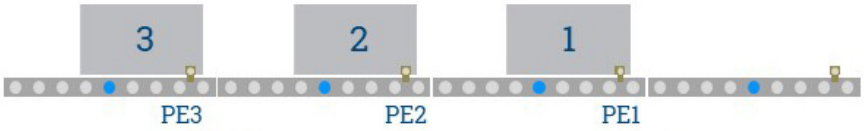
Carton 1 releases – Cartons 2 and 3 remain accumulated



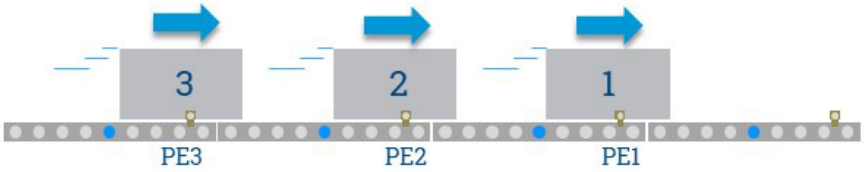
When Carton 1 clears PE1 then Carton 2 releases



Train Release

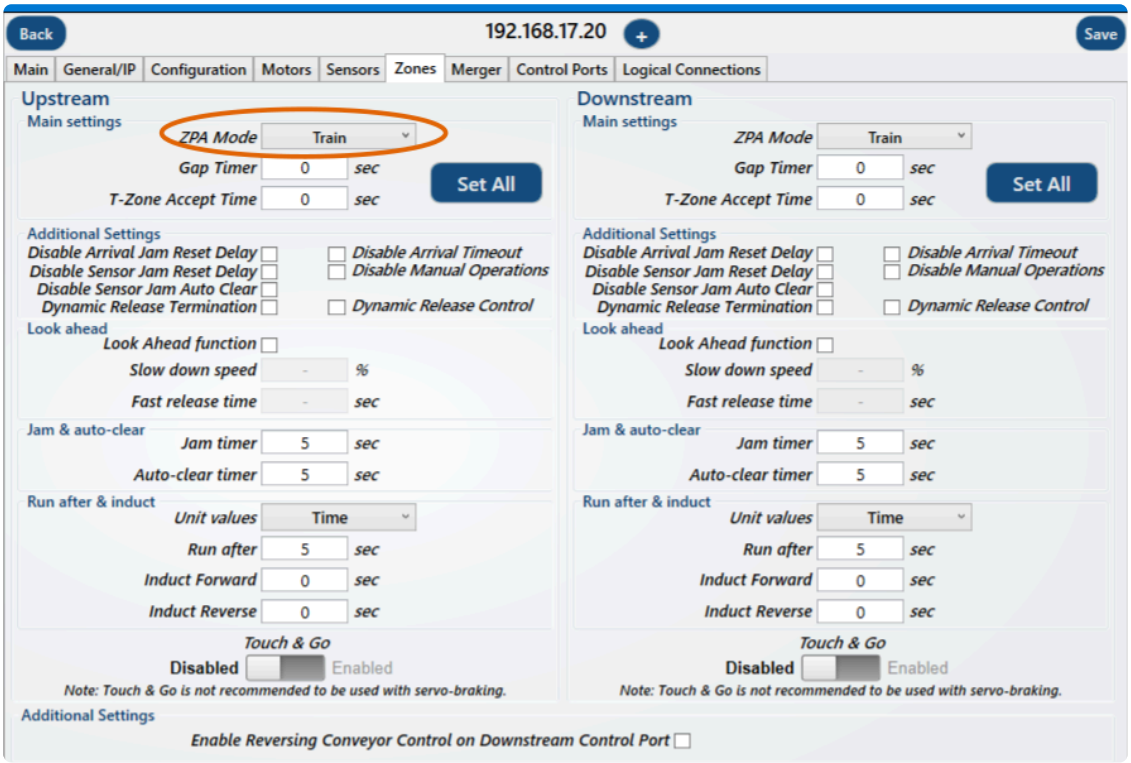


All 3 Cartons are Accumulated



When Carton 1 releases – Cartons 2 and 3 also release at the same time

Select *Train* from the pull-down box for *Train Mode*

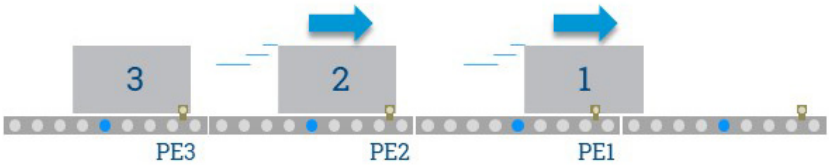


! Please note that starting many zones in Train Release mode particularly with heavy loads can cause voltage drops on your power supplies. Be sure to take care in sizing your power supply needs. You should consider adding a **GAP Timer** value if power supply sizing is a concern

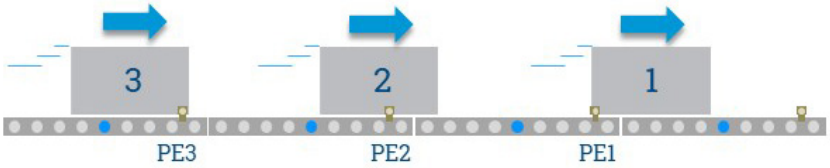
GAP Train Release

All 3 Cartons are Accumulated

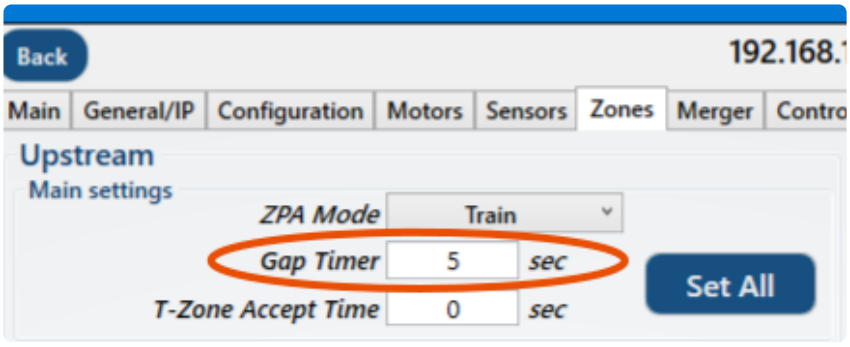
When Carton 1 releases and Zone 2's GAP time has expired, Carton 2 will begin to release. Carton 3 remains accumulated



When Carton 2 releases and Zone 3's GAP timer has expired, Carton 3 will begin to release



For *GAP Train* mode, select Train from the ZPA Mode drop-down box; then fill in a value in the *Gap Timer* data entry box and then click the *Set* button. Simply enter the desired time value and click the *Set* button to update the value in the selected Module.



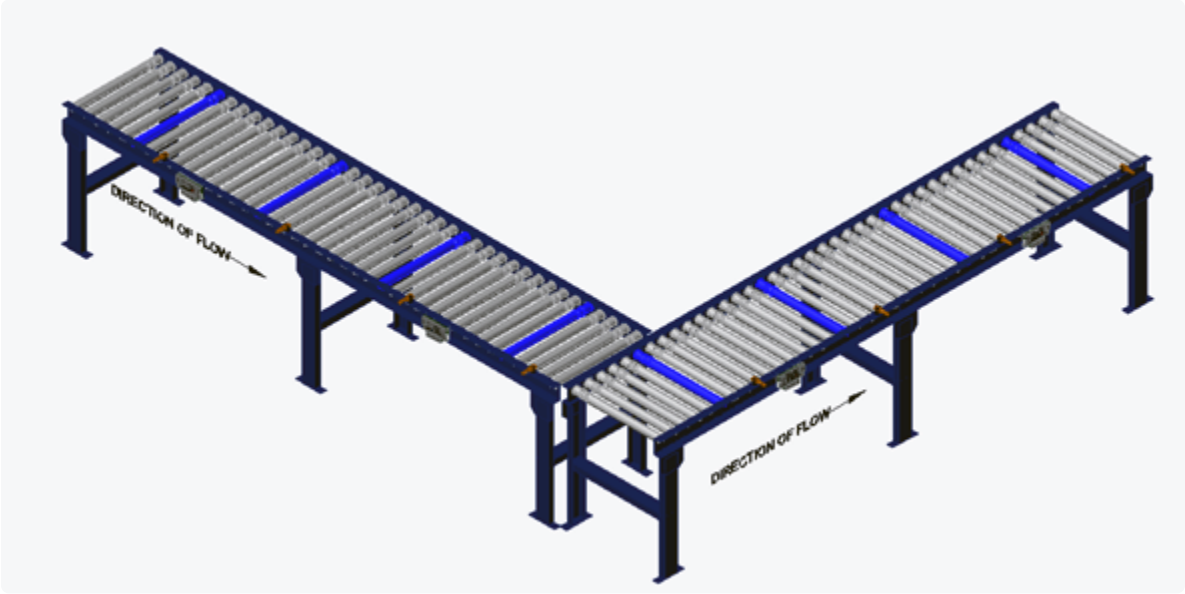
In this example we entered
0.35 seconds

! Please note the GAP time does not create a gap or cause any delay when items are in transportation. The Gap timer is only activated when a given zone accumulates an item and then it is allowed to release

* If more than one consecutive zone is configured as ***Gap Train***; then each of these zones will in turn require that their respective gap timers expire. If the time value is long enough, the result may appear to be ***Singulation Release*** mode or even Singluation Release with extra time delay. 0.2 to 0.3 seconds are typical values used when you want to help balance the loading on your power supplies but still have the operation be very close to ***Train Release Mode***

T-Zone

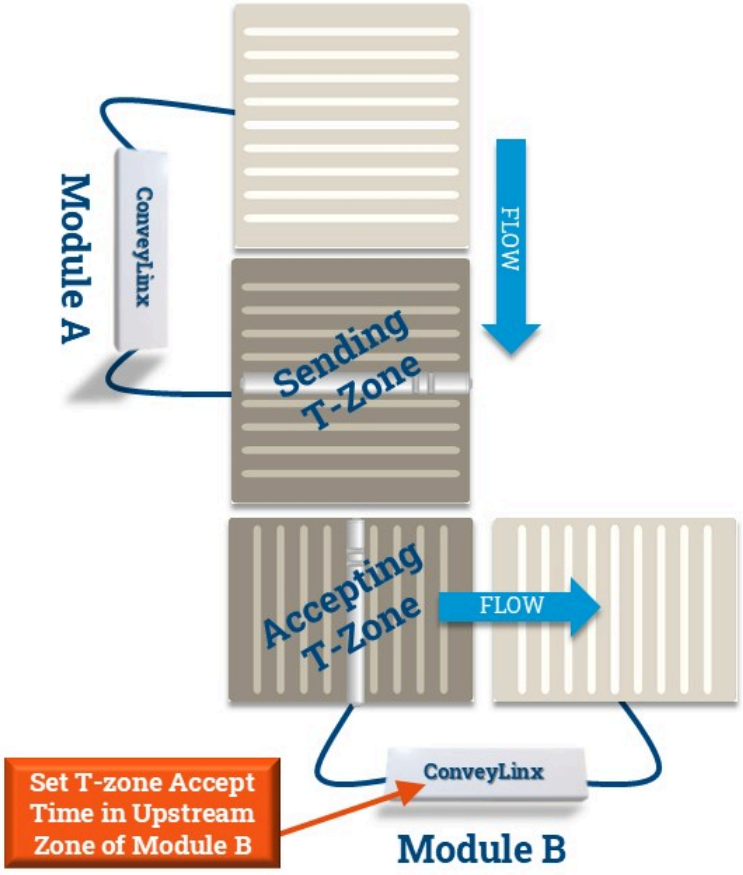
In conveyor applications, transferring a carton at a right angle from one conveyor to another often requires special lifting and lowering mechanisms. In certain applications, one conveyor can simply drive its carton off of its downstream zone directly onto the upstream zone of another conveyor that is perpendicularly oriented. This type configuration is commonly defined as a ***T-Zone*** arrangement. ConveyLinx contains the logic to control a T-Zone arrangement without requiring any external control interface or programming.



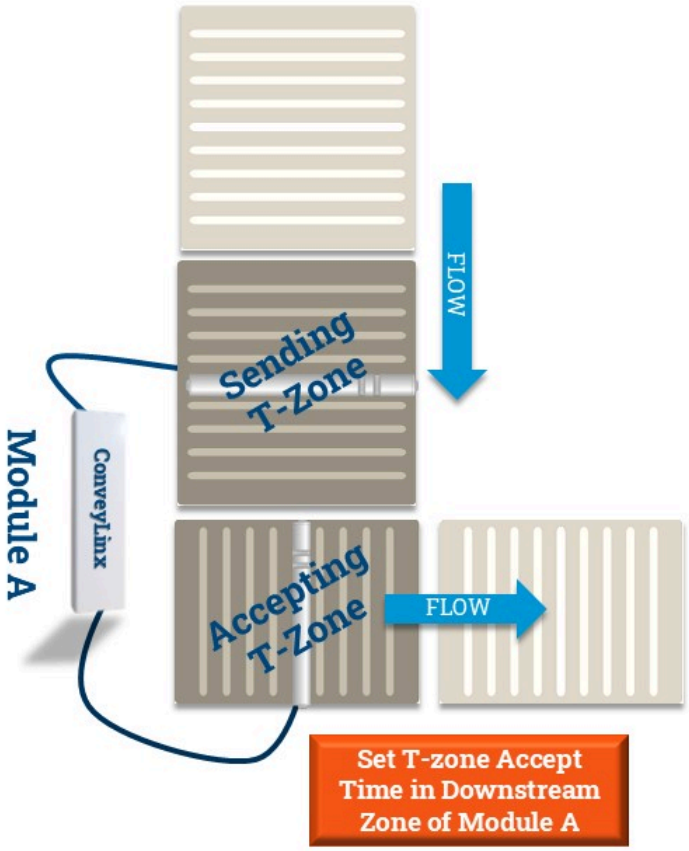
! Material handling considerations such as discharge conveyor speed and load weight have to be analysed prior to implementing a T-Zone configuration. Be sure to verify your mechanical design and carton characteristics before utilizing a T-Zone arrangement.

The T-Zone Accept Time is the amount of time between the leading edge of the Accepting Zone's Sensor becoming blocked and the starting of the Accepting Zone's motor. This time delay allows the Sending Zone enought time to fully transfer the item into the Accepting Zone.

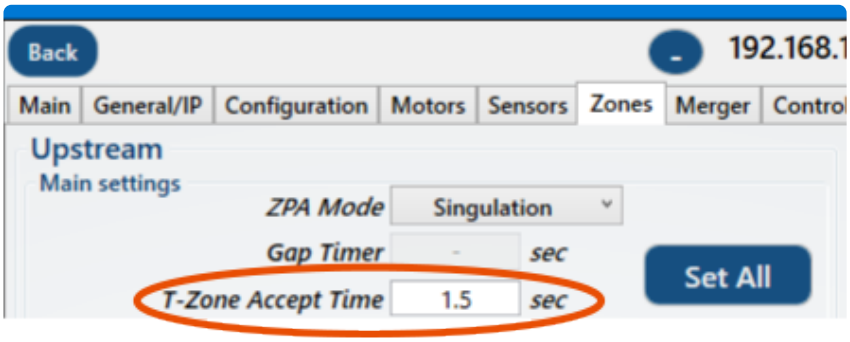
T-Zone Between 2 Separate Modules



T-Zone on a Single Module



Enter the value and click the Set button. In this example we entered 1.5 seconds. Whether to change the Upstream Zone or Downstream Zone value on the main screen is dependent upon which zone is the **accepting zone**



! The T-zone Accept time is always applied to the accepting zone

Look Ahead

Module Configuration Screen Tabs / Zones /

Look Ahead

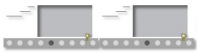
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

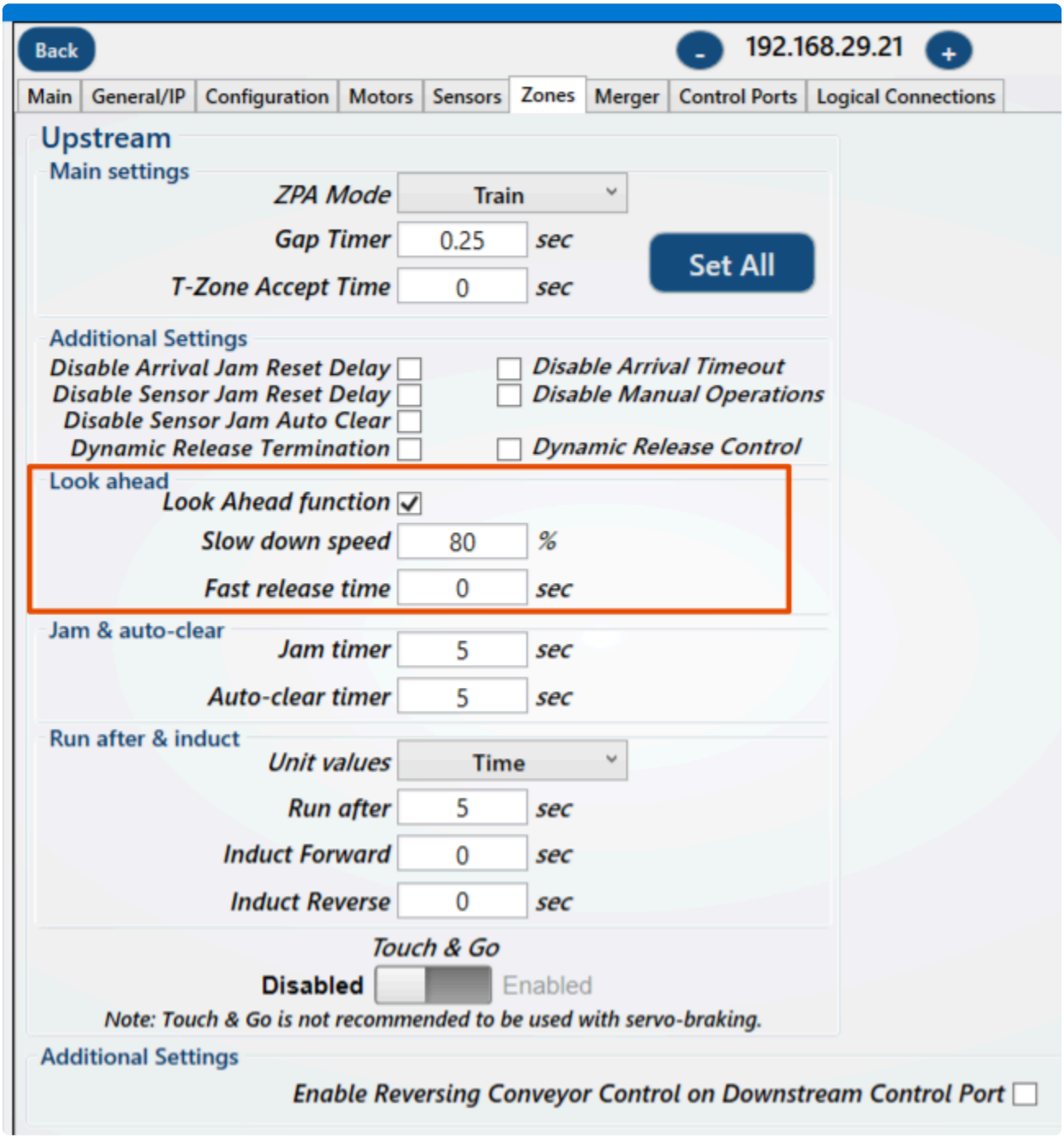
ZPA Mode ?



PLC I/O Mode ?

The ***Look Ahead*** feature configures the logic to “look ahead” to its next downstream zone and if it is occupied when a carton is entering its zone, the module will dynamically adjust the MDR to the selected speed. This feature in intended to be used in higher speed applications were increased stopping distance is required to keep cartons from over-travelling their stop positions. This function can be applied per zone or for multiple zones

> The below image shows you where in the Zones tab to turn on this Look Ahead function, to set your Slow down speed percentage, and to set your Fast release time.



Learn More About Look Ahead Slowdown

Jam & Auto Clear

Module Configuration Screen Tabs / Zones /

Jam & Auto Clear

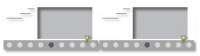
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

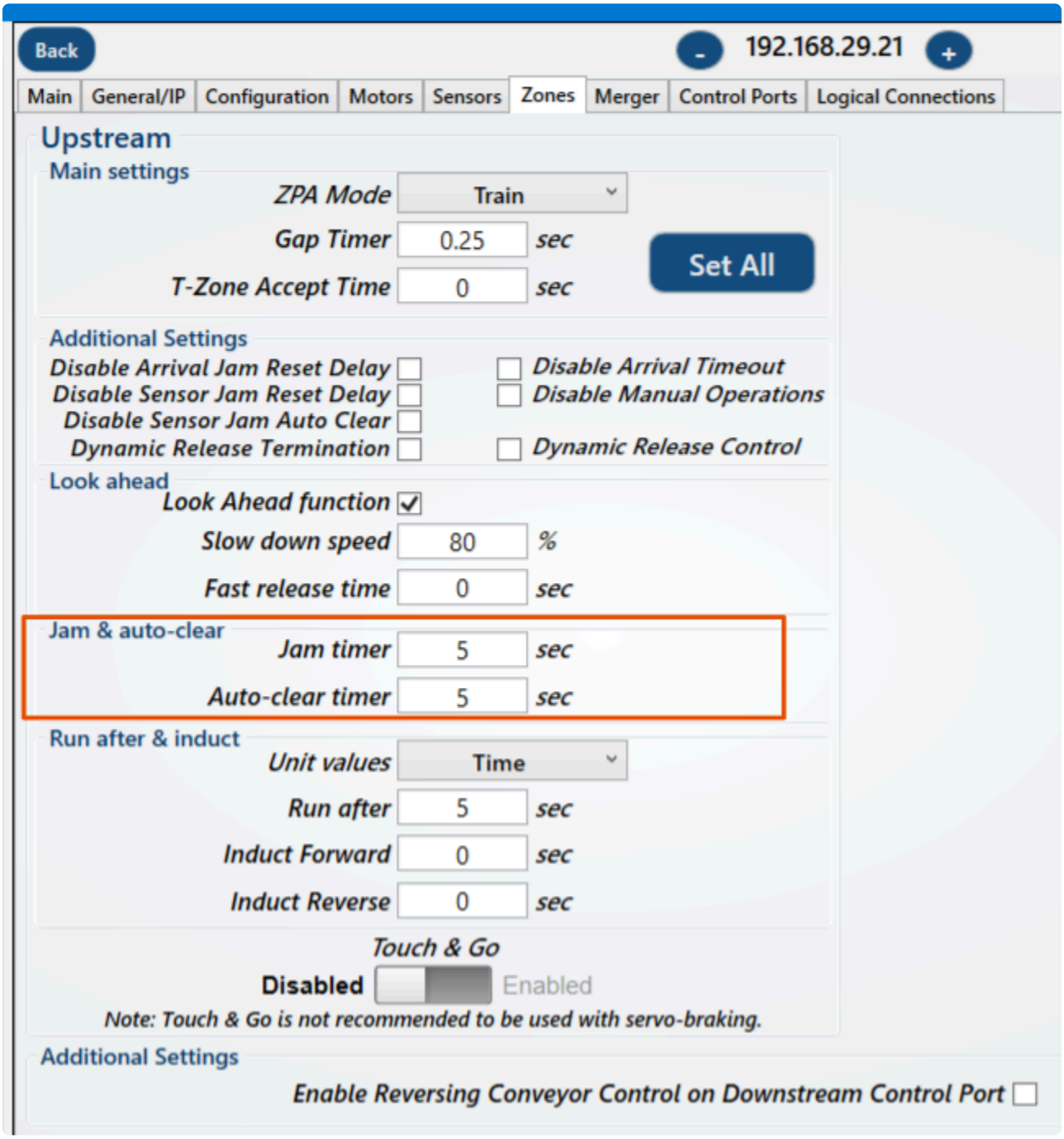


PLC I/O Mode ?

The *Jam Timer* for a given Upstream or Downstream zone is used for both detecting an **Arrival Jam** and a **Sensor Jam**. The *Jam Timer* should be set as the maximum expected time it takes for a carton to travel from one zone to the next plus a small addition to prevent nuisance jam occurrences. The default value for the Jam Timer is 5 seconds and the valid range of values is from 1 seconds to 65 seconds.

The *Auto Clear Timer* is the amount of time that the logic maintains the jam condition before auto resetting the jam. The default value for the Auto Clear Timer is 5 seconds and the valid range of values is from 0 seconds to 65 seconds.

The below image shows you where in the Zones tab to adjust your Jam and Auto-Clear Timers



Learn More About Jam Conditions

Run After & Induct

Module Configuration Screen Tabs / Zones /

Run After & Induct

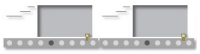
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The ***Run After*** time value is used by the logic for normal zone discharge. This is the amount of time the zone's MDR will continue run after its photo-sensor has been clear when discharging to the next downstream zone.

> ✻ Please note that Run After does not affect throughput rate. A longer Run After time will not prevent an upstream item from entering the zone.

Learn More About Run After Settings

Learn More About Induct Settings

Additional Settings

Module Configuration Screen Tabs / Zones /

Additional Settings

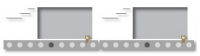
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Both the ***Upstream*** and ***Downstream*** ZPA Zones have Settings check boxes to allow you to customize some of the ZPA behavior. These settings can apply to only the zone you are connected to and viewing or you can apply the same settings to multiple modules in a range of module nodes.

Learn More:

Disable Reset Delays

Disable Sensor Jam Auto Clear

Disable Arrival Timeout

Disable Manual Operation

Disable Reset Delays

Module Configuration Screen Tabs / Zones / Additional Settings /

Disable Reset Delays

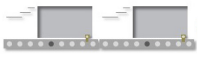
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Any individual zone or group of zones can be configured to ignore the Auto Clear Time delay for either or both the **Arrival Jam** and **Sensor Jam**.

Clicking either or both check-boxes will cause the zone's logic to ignore the ***Auto Clear Time*** delay for the particular jam condition

! Selecting either of these options will not eliminate the detection of the particular jam condition; it simply eliminates the default ***Auto Clear Time*** delay the logic utilizes before automatically clearing the condition.

Disable Sensor Jam Auto Clear

Module Configuration Screen Tabs / Zones / Additional Settings /

Disable Sensor Jam Auto Clear

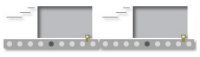
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

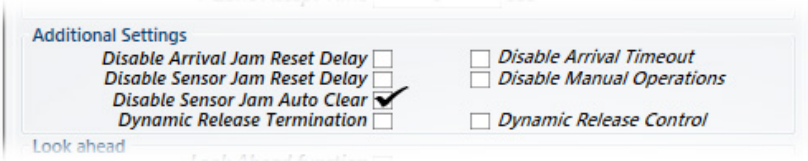
ZPA Mode ?



PLC I/O Mode ?

Sensor Jam Auto Clear Procedure describes how the logic will make 3 attempts to clear a Sensor Jam if one occurs. There may be instances at specific zones or range of zones where you do not want this functionality to happen. There is a check box that allows you to disable this functionality

Clicking the ***Disable Sensor Jam Auto Clear*** check box will disable the 3 attempts to clear the ***Sensor Jam*** and will cause the zone to remain in the jam state until the sensor is cleared manually



You can also attempt to clear a ***Sensor Jam*** using the ***Clear*** button for the Zone

Disable Arrival Timeout

Module Configuration Screen Tabs / Zones / Additional Settings /

Disable Arrival Timeout

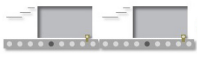
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

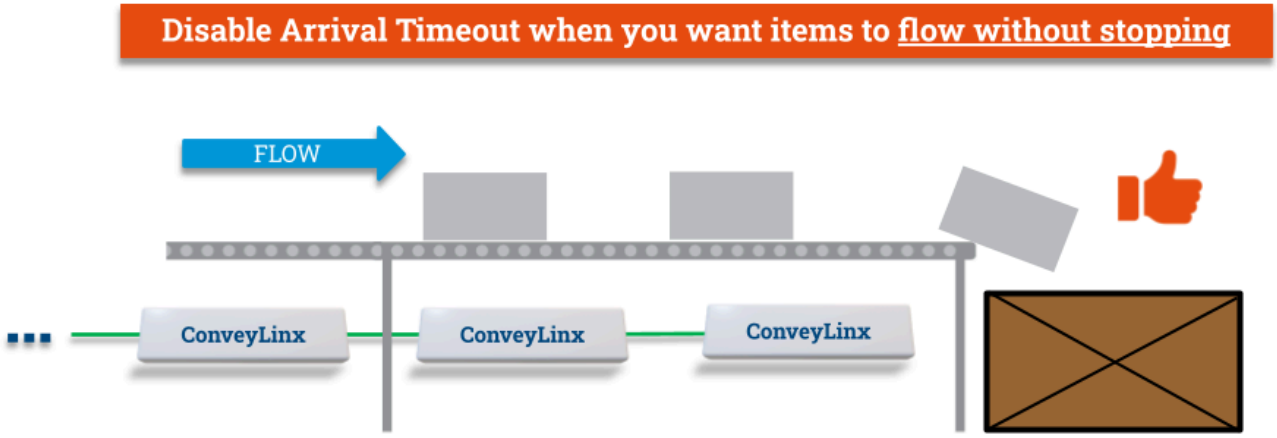
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Arrival Jam describes how default zone to zone logic utilizes the Jam Time value for the discharging zone to wait for the accepting zone to indicate successful arrival of the carton into the accepting zone. In certain applications for a given zone, you may want to disable this functionality



Clicking the ***Disable Arrival Timeout*** check box will prevent the discharging zone from registering an ***Arrival Jam*** condition.

Disable Manual Operation

Module Configuration Screen Tabs / Zones / Additional Settings /

Disable Manual Operation

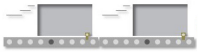
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

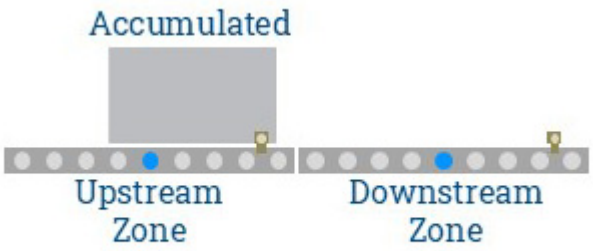


PLC I/O Mode ?

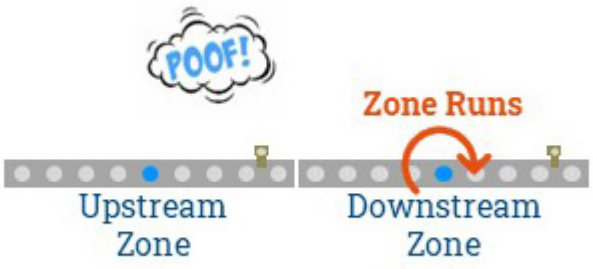
In normal ZPA operation, if a zone is in Accumulation (either by external device or if Aux I/O Pin 2 is set to Accumulate) and the carton is subsequently manually removed from the conveyor; the zone downstream of the accumulated zone will run in an attempt to “find the lost carton”. In certain applications or situations where manually removing cartons from accumulated zones is expected; you can disable the running of the downstream zone to “find the lost carton”

Without Disable Manual Operations box checked

Carton accumulated in Upstream Zone by Accumulate signal or external network signal



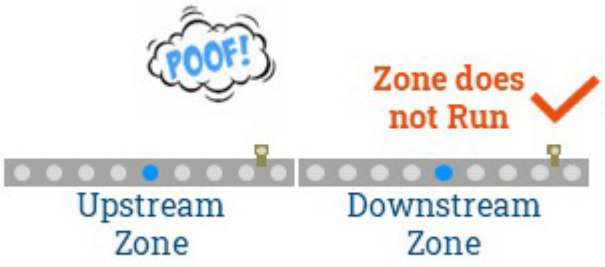
If carton is removed from Upstream Zone, the Downstream Zone will run to "find the missing carton". Run time is the duration of the Jam Timer setting (5 sec. by default)



With Disable Manual Operations box checked

You first navigate the main screen to the *zone you want to prevent from running* when it's upstream neighboring zone has its carton removed. Clicking the ***Disable Manual Operations*** check box will prevent this zone from running when its upstream neighbor has an accumulated carton manually removed

When you check the *Disable Manual Operations* check-box for the Downstream Zone, then it will not run when upstream carton is removed



Merger

Module Configuration Screen Tabs /

Merger

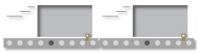
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

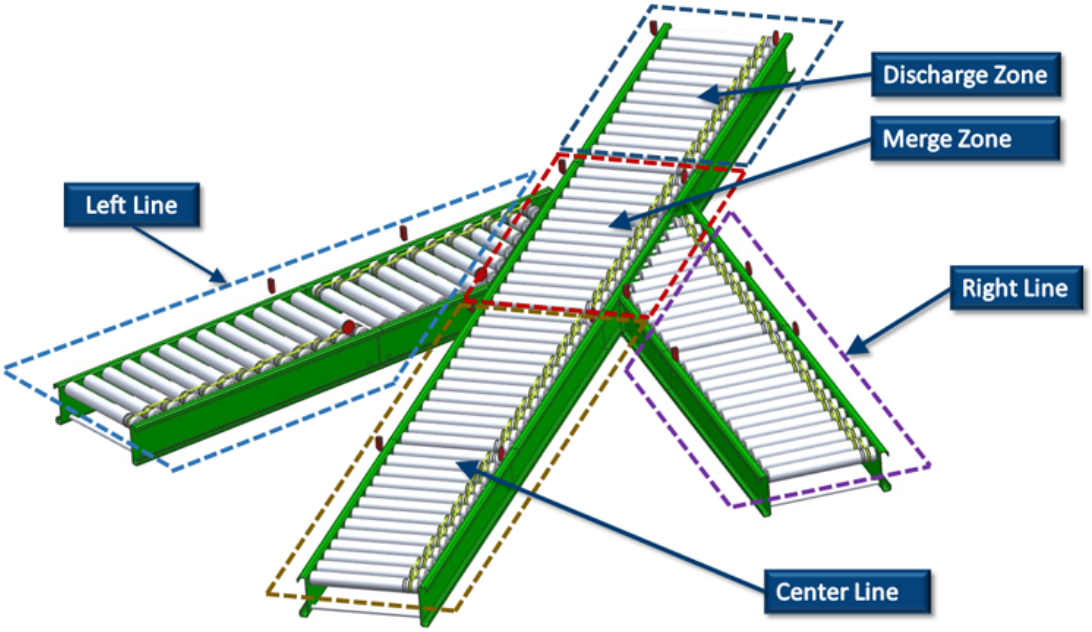
✻ ***Merger*** is available on all ConveyLinx and ConveyLinx-Ai Family controllers. Check all prerequisites here

! This Merger tab used to be called ConveyMerge in previous software. When included in EasyRoll+ the name has been changed to Merger

Merger is an optional functionality layer built on top of ***ConveyLinx's ZPA*** logic. Users can enable and configure it using ***EasyRoll*** or ***EasyRoll+*** software. ***Merger*** behaves the same as ZPA logic, but allows you to define a special ***Merge Zone*** that can have up to three upstream zones connected to it. ***Merger*** also has simple priority schemes for the multiple upstream zones as well as the ability to dynamically change those priorities on-the-fly by utilizing the ***Merge Line Full*** option. It also takes care of passing tracking information properly and has *Jam Condition* detection.

Merger Components

Merger can accommodate product merge control from one or two conveyor paths onto a single take-away conveyor path as shown:



Component	Description
Merge Zone	Powered conveyor section that accepts an item from any one of the 3 possible upstream sources
Main Line	Term to describe the 3 in-line conveyor sections – ***Center Line***, ***Merge Zone*** and ***Discharge Zone***
Center Line	Part of ***Center Line*** that is one of three possible sources of items that can flow into the ***Merge Zone***. This term is used in the configuration screen of ***EasyRoll*** to designate the network that serves as the trunk line that contains the ***Merge Zone***
Discharge Zone	Part of the ***Center Line*** that is downstream of the ***Merge Zone***. This conveyor section accepts the item from the ***Merge Zone***
Left Line	One of the three possible conveyor sections that can discharge items into the ***Merge Zone***
Right Line	One of the three possible conveyor sections that can discharge items into the ***Merge Zone***

Learn More:

Merger Prerequisites and Requirements

Merger Prerequisites and Requirements

Module Configuration Screen Tabs / Merger /

Merger Prerequisites and Requirements

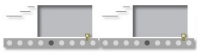
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Please Note – Merger works for ALL ConveyLinx Family Modules

Module	Firmware
ConveyLinx-ERSC	4.25 and later
ConveyLinx-HTF	4.25 and later
ConveyLinx-Ai2	4.20 and later
ConveyLinx-Ai3-24-xx	4.20 and later
ConveyLinx-Ai2-48	Any
ConveyLinx-Ai3-48-FC	Any
ConveyLinx-ECO	Any

The following items are the prerequisites and constraints required to provide a fully functioning automatic conveyor merge:

- ***EasyRoll*** version 4.3 or greater or ***EasyRoll+*** version 1.2.9 or greater (***EasyRoll+*** is required for any **48V** based ConveyLinx controller)
- Only (1) one ***Merge Zone*** is allowed for any given single module
- ***Merge Zone*** cannot have any **Slaved zones**

- ***Merge Zone*** must be in ***ZPA*** mode. ***Left Line*** discharge, ***Right Line*** discharge, and ***Center Line*** discharge can be in either ***ZPA*** mode or ***PLC I/O*** mode
- Left, Right, and Center Lines discharges cannot also be included in another instance of ***Merger***

If ***Left Line*** discharge, ***Right Line*** discharge, or ***Center Line*** discharge modules are in PLC I/O mode, you are responsible for programming logic to recognize and respond to ZPA zone status values between the ***Merge Zone*** module for proper jam free singulation control

Network Architecture

Module Configuration Screen Tabs / Merger /

Network Architecture

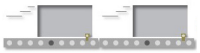
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

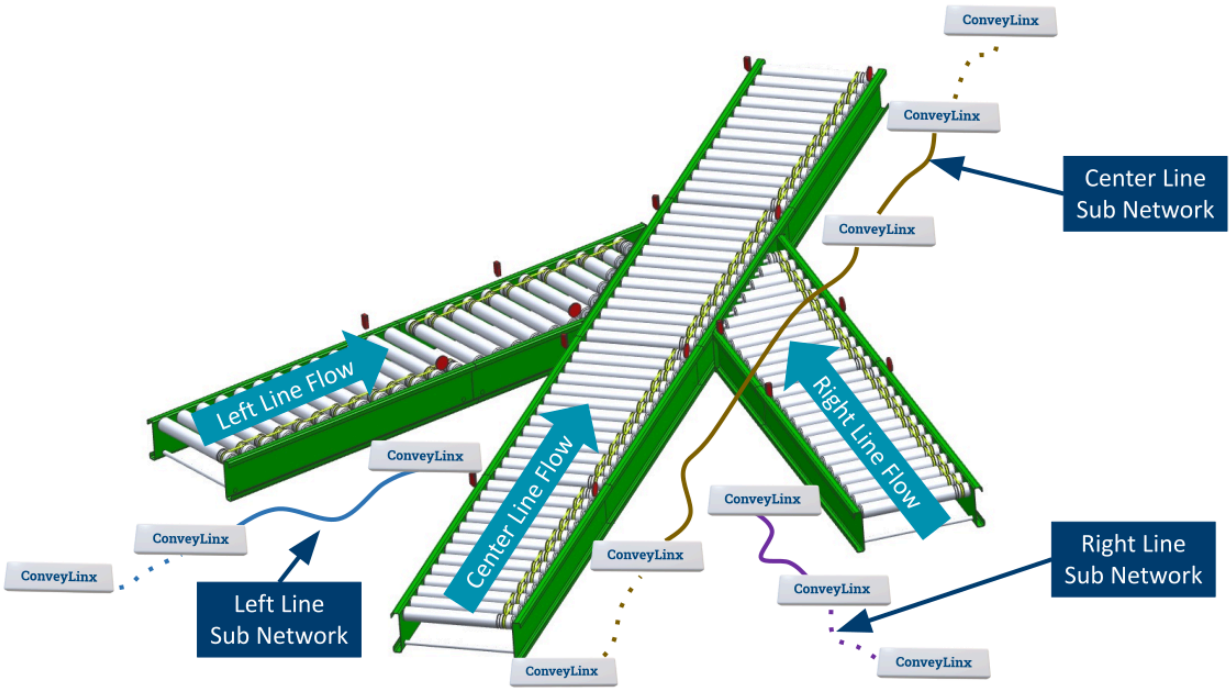


PLC I/O Mode ?

All lines (***Center***, ***Left***, and ***Right***) should be on separate ***subnets*** of modules, as shown. Each ***subnet*** should be ***Auto-Configured*** separately and then connected together with an Ethernet switch. Keep in mind that the separate ***subnets*** will have to be able to communicate with each other so special care must be taken when setting up the ***IP Network Mask*** before performing the ***Auto-Configuration Procedure***.

✻ A good starting point is the default mask of 255.255.128.0. With this setting you can vary the third octet in the ranges 0-127 and 128-254 and all three lines will be able to communicate with each other as long as the third octets of their IP addresses are in the same range (either 0-127 or 128-254).

✻ Even though ***Merger*** can work with all lines being in the ***same subnet***, care must be taken during ***Auto-Configuration*** to assure proper zone flow for all lines. We recommend ***separate subnets*** in order to assure proper zone flow for all lines.



Architecture Summary

- The ***Center Line*** is a separate ***subnet*** of modules that have been ***Auto-Configured***. The ***Merge Zone*** and the ***Discharge Zone*** are part of this ***subnet***. The ***Center Line*** can consist of any number of ***ConveyLinx Modules*** and the actual position of the ***Merging Zone*** can be on any **ConveyLinx module** within the ***subnet***
- The ***Discharge Zone*** has to be the zone immediately downstream of the ***Merge Zone***. However, the ***Discharge Zone*** can be on either the same **ConveyLinx module** as the ***Merge Zone*** or on the adjacent downstream **ConveyLinx module** from the ***Merge Zone's*** **ConveyLinx module**
- The ***Left Line*** is a separate ***subnet*** of modules and its most downstream zone has to physically discharge on to the ***Merge Zone***
- The ***Right Line*** is a separate_* subnet*_ of modules and its most downstream zone has to physically discharge on to the ***Merge Zone***
- All three ***subnets*** must be connected to a common Ethernet switch only after each ***subnet*** has been ***Auto-Configured***.

Sensor Placement

Module Configuration Screen Tabs / Merger /

Sensor Placement

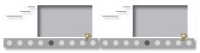
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

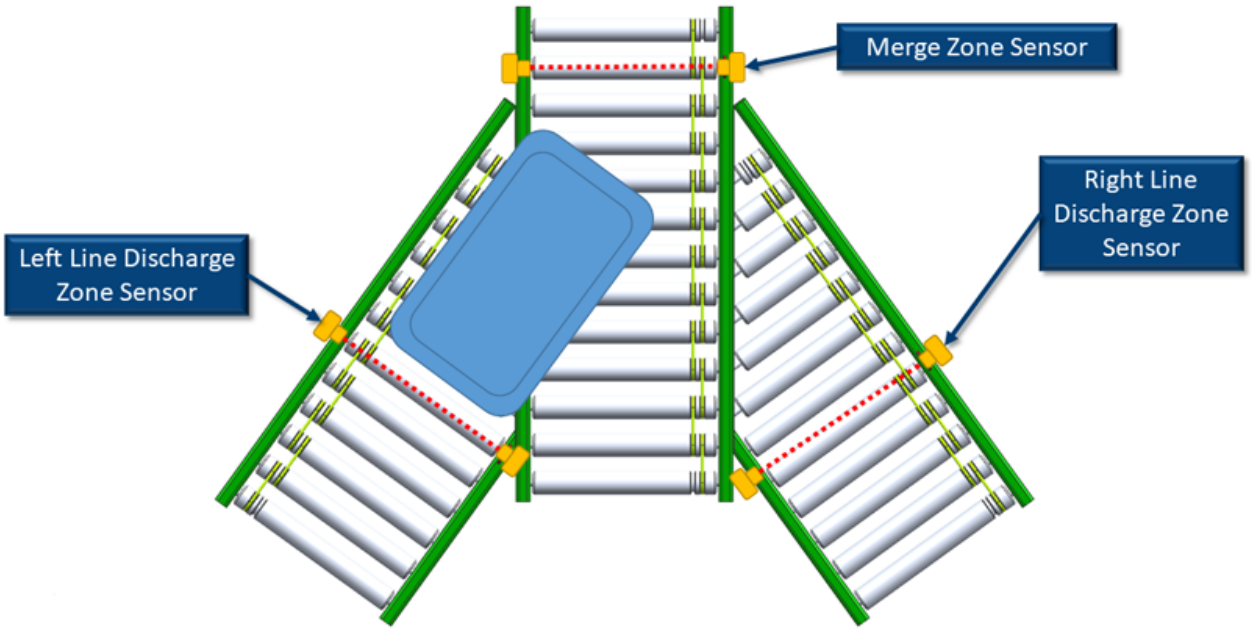
ZPA Mode ?



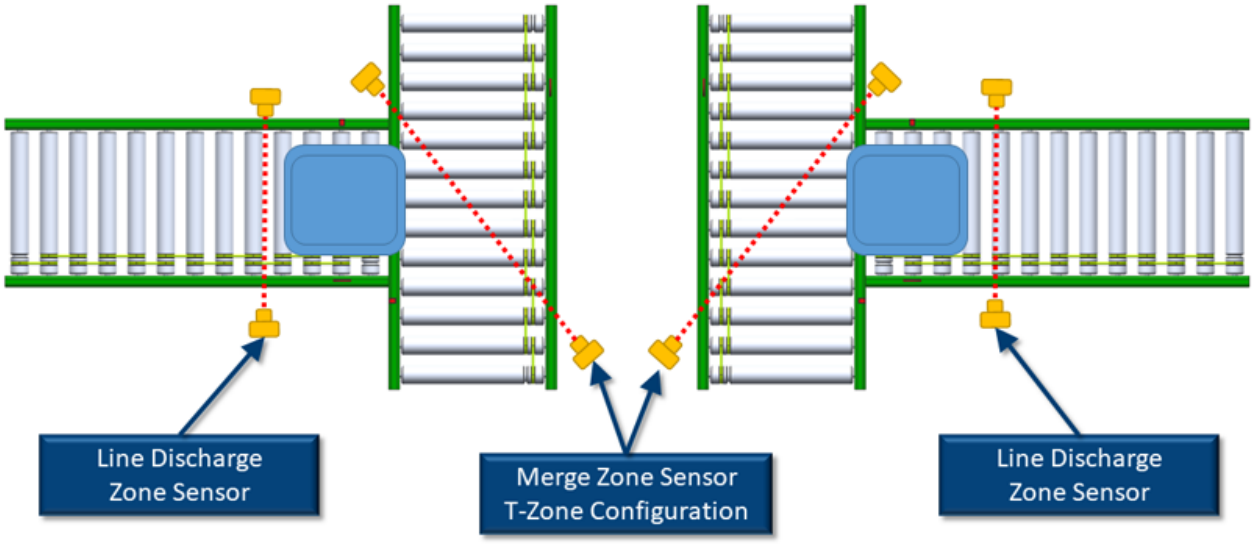
PLC I/O Mode ?

! It is very important for the internal *Merger* logic, that the product is seen by only one sensor at a time

Conventional Spur Merge Sensor Placement



90° T-Merge Sensor Placement



Merging Lines

Module Configuration Screen Tabs / Merger /

Merging Lines

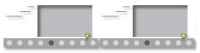
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

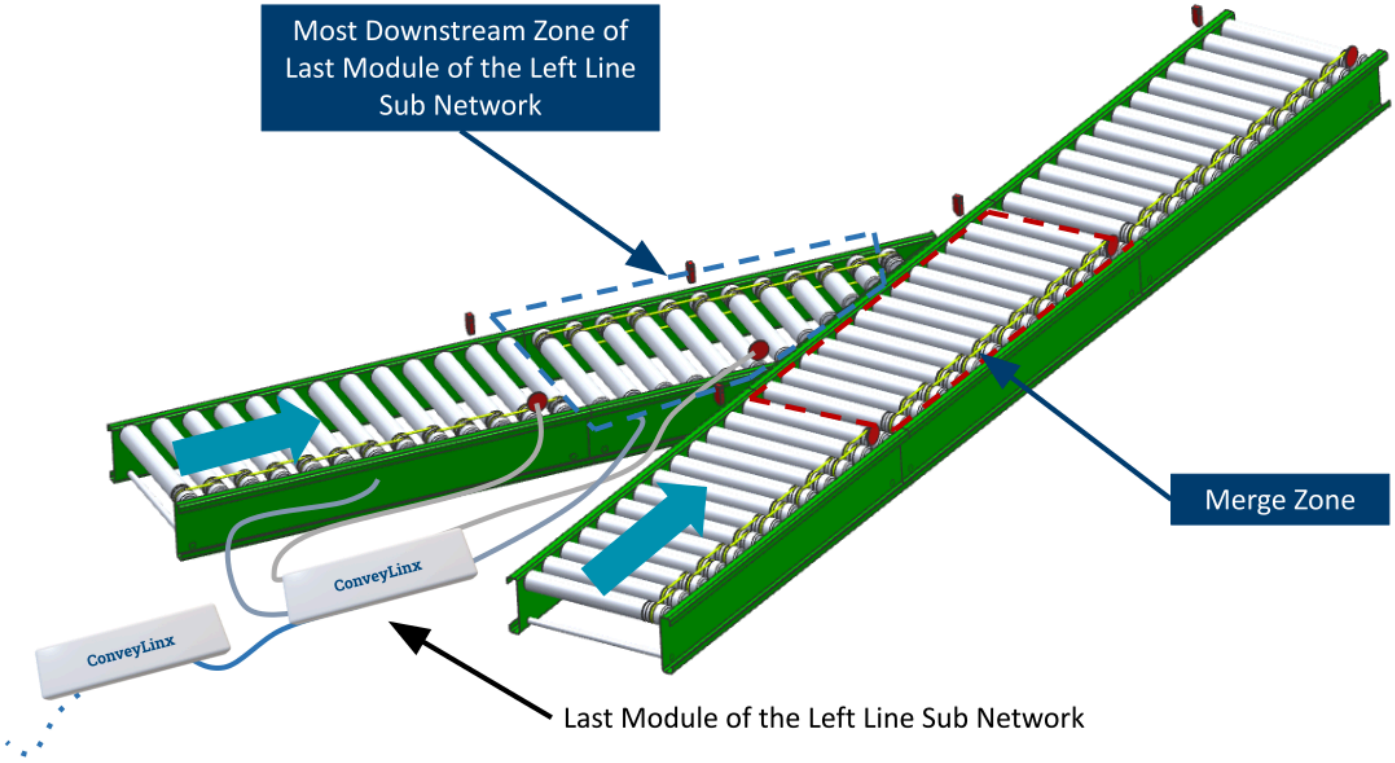
ConveyLinx-ECO ?

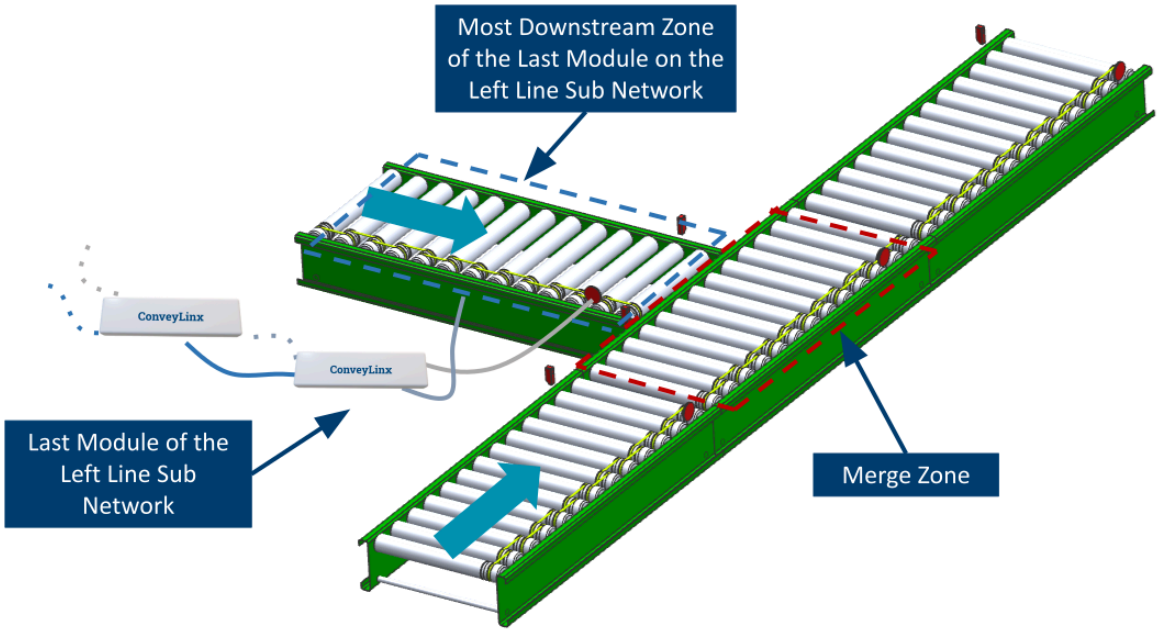
ZPA Mode ?



PLC I/O Mode ?

The ***Left Line*** and ***Right Line*** are set up in a similar fashion to the ***Center Line***. Each of these lines are in their own separate ***subnet*** that is both different from each other and different from the ***Center Line***. Regardless of whether these merging lines are an Conventional Spur arrangement or a 90˚ T-Merge arrangement; the conveyor zone that discharges product onto the ***Merge Zone*** must be the most downstream zone if its particular subnet. The following figures illustrate this for an ***Conventional*** Spur Left Line and a 90˚ ***T-Merge*** Left Line respectively. The same would apply if these were ***Right Line*** examples as well.


Most Downstream Zone of Last Module of the Left Line Sub Network
Merge Zone
ConveyLinx
ConveyLinx
Last Module of the Left Line Sub Network


Most Downstream Zone of the Last Module on the Left Line Sub Network
ConveyLinx
ConveyLinx
Last Module of the Left Line Sub Network
Merge Zone

Merge Configurations

Module Configuration Screen Tabs / Merger /

Merge Configurations

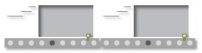
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The ***Merge Configurations*** available from within in ***EasyRoll*** and ***EasyRoll+*** are:

- ***Left Line*** Only with either ***Conventional*** (spur discharge) or ***T-Merge*** (90˚ discharge)
- ***Right Line*** Only with either ***Conventional*** (spur discharge) or ***T-Merge*** (90˚ discharge)
- Both ***Left*** and ***Right*** Lines with either ***Conventional*** (spur discharge) or ***T-Merge*** (90˚ discharge) for each

Merge Priority

Module Configuration Screen Tabs / Merger /

Merge Priority

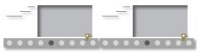
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

EasyRoll and ***EasyRoll+*** each provides the ability to adjust which of the merging lines receives priority.

Priority Selection	Description
First Come First Served	The logic monitors the arrival status in each of the zones that discharge in to the ***MergeZone***. The first product that arrives at any of these lines will be allowed to convey into the ***MergeZone***. When the ***MergeZone*** is clear, the next line that has had a product arrive will be allowed to convey into the ***MergeZone***
Center Line Priority	The ***Center Line*** will be allowed to release as long as product arrives at the ***Center Line's*** zone sensor prior to the previously released product having not cleared the ***MergeZone***. When the ***Merge Zone*** is clear and if there is no product sensed on the center line zone; then the ***Left*** and/or ***Right Lines*** will be allowed to release if product has arrived at their respective sensors. As long as no product is arriving on the ***Center Line***, if ***Left*** and ***Right Lines*** are enabled, these will operate as ***First Come First Served*** between them
Left Line Priority	The ***Left Line*** will be allowed to release as long as

	product arrives at the ***Left Line's*** most downstream sensor prior to the previously released product having not cleared the ***MergeZone***. When the ***Merge Zone*** is clear and if there is no product sensed on the ***Left Line's*** most downstream sensor; then the ***Center*** and/or ***Right Line*** will be allowed to release if product has arrived at their respective sensors. As long as no product is arriving on the ***Left Line***, if the ***Right Line*** is enabled, the ***Center*** and ***Right*** will operate as ***First Come First Served*** between them
Right Line Priority	The ***Right Line*** will be allowed to release as long as product arrives at the ***Right Line's*** most downstream sensor prior to the previously released product having not cleared the ***MergeZone***. When the ***Merge Zone*** is clear and if there is no product sensed on the ***Right Line's*** most downstream sensor; then the ***Center*** and/or ***Left Line*** will be allowed to release if product has arrived at their respective sensors. As long as no product is arriving on the ***Right Line***, if the ***Left Line*** is enabled, the ***Center*** and ***Left*** will operate as ***First Come First Served*** between them

T-Merge Settings

Module Configuration Screen Tabs / Merger /

T-Merge Settings

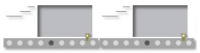
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

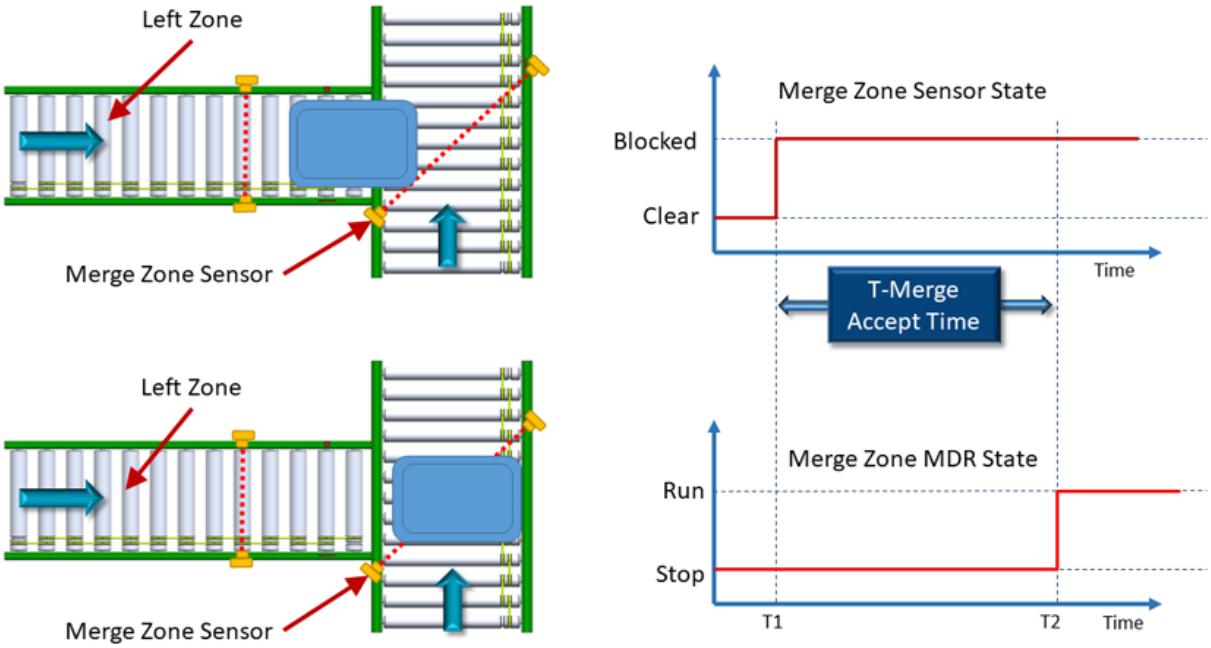


PLC I/O Mode ?

For a ***T-Merge***, the discharging conveyor is arranged perpendicular to the ***Merge Zone*** and this discharging conveyor needs to "throw" the product across the Merge Zone's rollers. In order to mitigate carton alignment issues, the logic controls need to make sure that it keeps the ***Merge Zone's*** rollers stopped until the discharging conveyor has completely finished "throwing" the product onto the ***Merge Zone***. In order to accommodate various conveyor speeds and material handling situations; ***EasyRoll*** and ***EasyRoll+*** each provides some timer adjustments to facilitate proper ***T-Merge*** functionality.

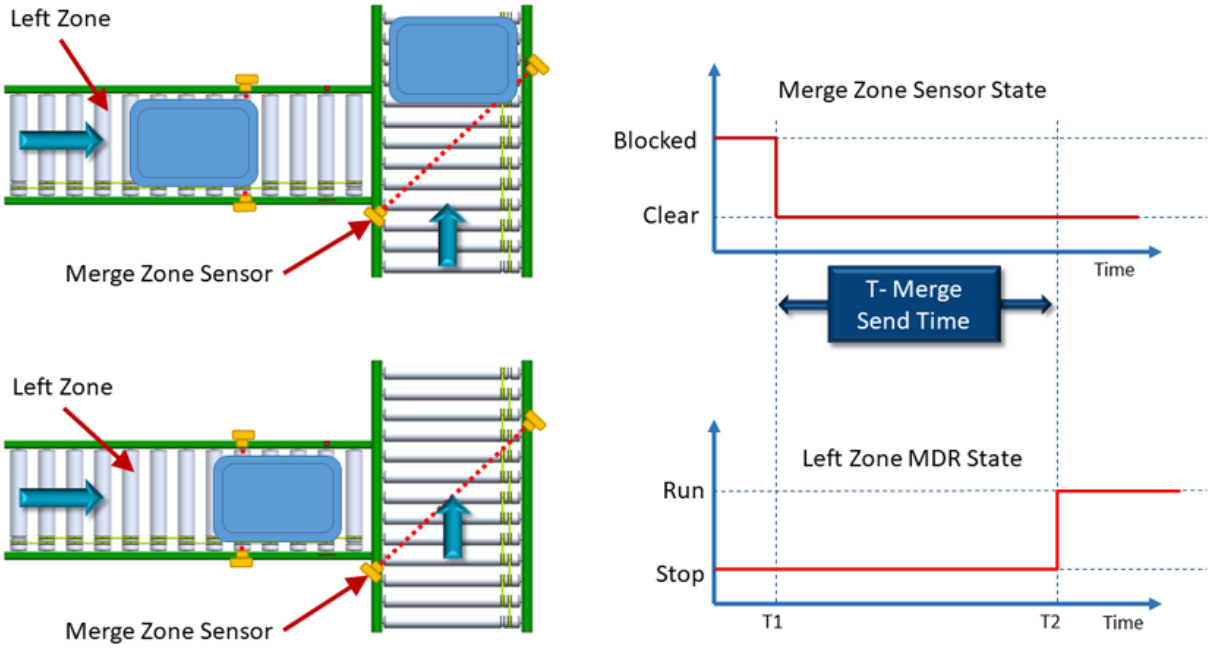
Accept Timeout

This timer specifies how much time the ***Merge Zone*** will wait after its sensor is blocked until the logic allows it's motor to run. Once the timer has expired, the Merge Zone's motor will be allowed to run. Keep in mind that conditions downstream of the ***Merge Zone*** also dictate if the motor is allowed to run.



Send Timeout

This timer specifies how much time the discharging zone has to wait after the ***Merge Zone*** sensor is clear before it is allowed to release the next product into the ***Merge Zone***. This timer helps ensure that the ***Merge Zone*** is clear when sensor placement cannot guarantee that the zone is clear.



Configuring Dynamic Priority Release

Module Configuration Screen Tabs / Merger /

Configuring Dynamic Priority Release

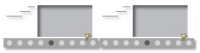
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

In situations where the full status of a given merge line needs to determine merge priority, ***Merger*** provides the ability to monitor the status of one or all merging lines and base the release priority accordingly. ***EasyRoll*** and ***EasyRoll+*** each provides the option to select a given upstream zone on a given line as the ***Monitor Zone***. When the ***Monitor Zone*** becomes occupied for a given time value; its line will be given release priority into the ***Merge Zone***. There are two adjustable time values for this function:

EasyRoll Selection	Description
Block Timeout	Specified the amount of time the ***Monitor Zone*** must be occupied before the Monitor Zone's line will receive priority to release into the ***Merge Zone***. This timer starts when the ***Monitor Zone*** first becomes accumulated (sensor blocked and motor stopped) and continues to time as long as the ***Monitor Zone*** stays accumulated
Clear Timeout	Specified amount of time that the priority release will continue to be active once the priority release has begun. When this time value expires, the priority setting will return to its original ***EasyRoll*** configured setting

✻ If multiple lines are configured for ***Dynamic Priority*** and each of their respective ***Block***

Timers have expired; ***Merger*** logic will revert to the ***First Come First Serve*** release mode until one or more of the releasing lines' ***Clear Timer*** has expired

Dynamic Priority Release Example

Please refer to Figure A and Figure B below. In ***EasyRoll*** / ***EasyRoll+***, Module 2 upstream zone of the ***Center Line*** has been selected as the ***Merge Zone*** and the merge type is Up Left. The ***EasyRoll*** / ***EasyRoll+*** setting for priority is ***Center Line Priority***. Also in ***EasyRoll*** / ***EasyRoll+***, the ***Merge Line Full*** function has been enabled as assigned to Module 3 downstream zone of the ***Left Line***.
With the ***Merge Line Full*** feature enabled on the ***Left Line***; once Left Line Module 3 downstream zone remains accumulated for the ***Block Timer's*** timeout (Figure A); priority will dynamically change to the ***Left Line***. This Left Line priority will remain in effect until the ***Clear Timer's*** timeout has expired (Figure B). When this occurs, the priority will automatically revert to the configured priority line (***Center Line*** in this example).

In this example, if we did not enable the ***Merge Line Full*** function for the ***Left Line*** and if there was a steady flow of product on the ***Center Line***; the ***Left Line*** would never be able to release because the default priority was set to ***Center Line***.

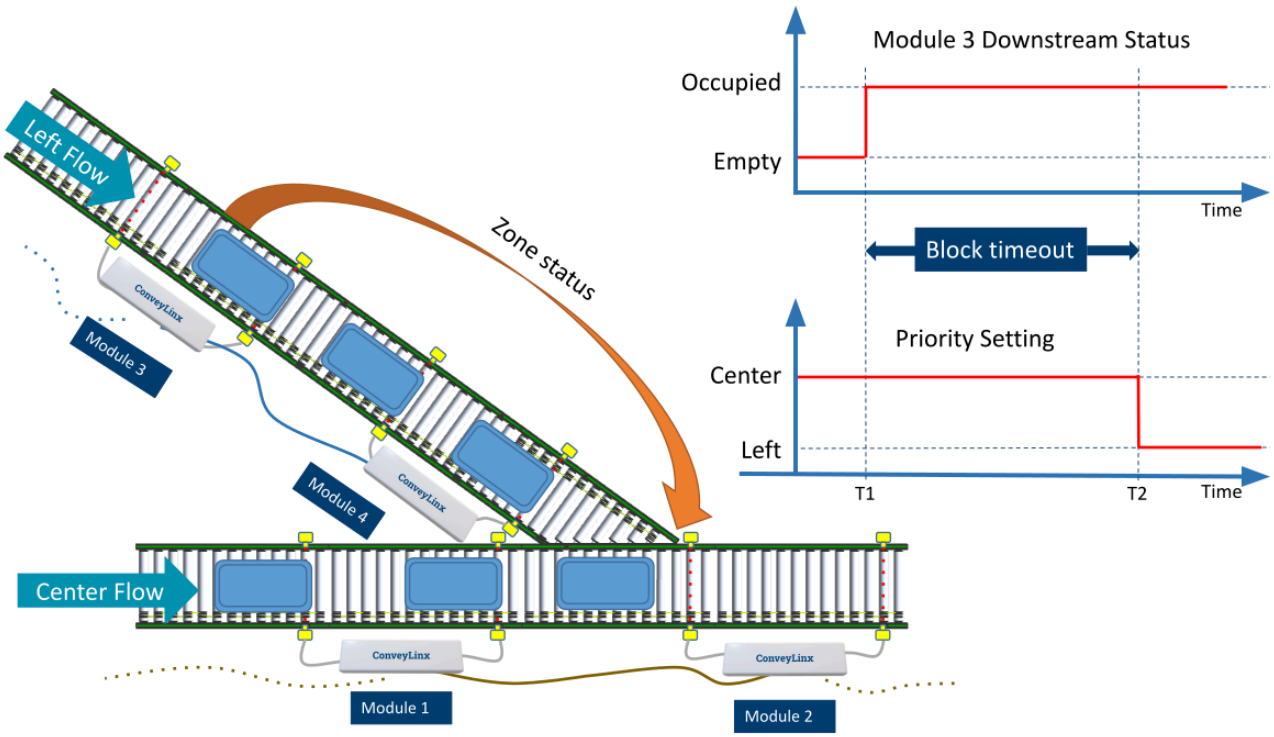


Figure A – Merge Line Full Block Timer

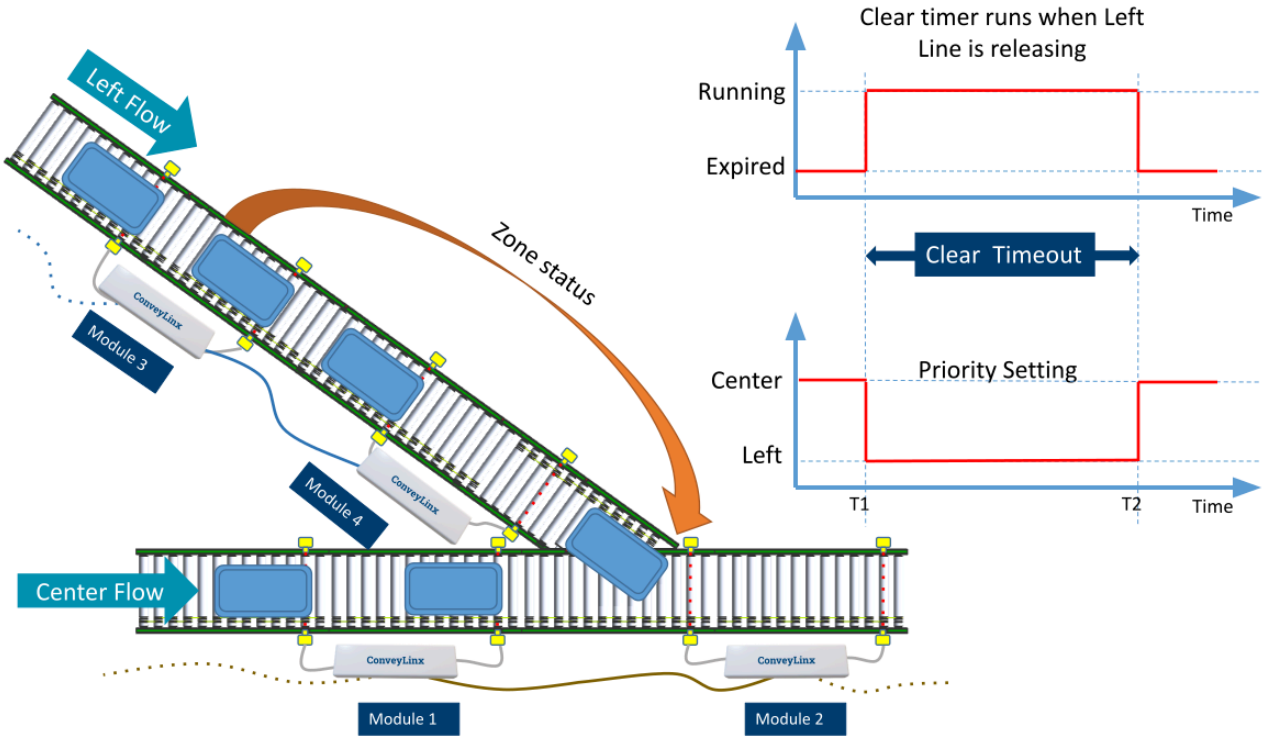


Figure B – Merge Line Full Clear Timer

Enabling ConveyMerge from EasyRoll+

Module Configuration Screen Tabs / Merger /

Enabling ConveyMerge from EasyRoll+

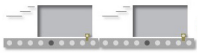
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

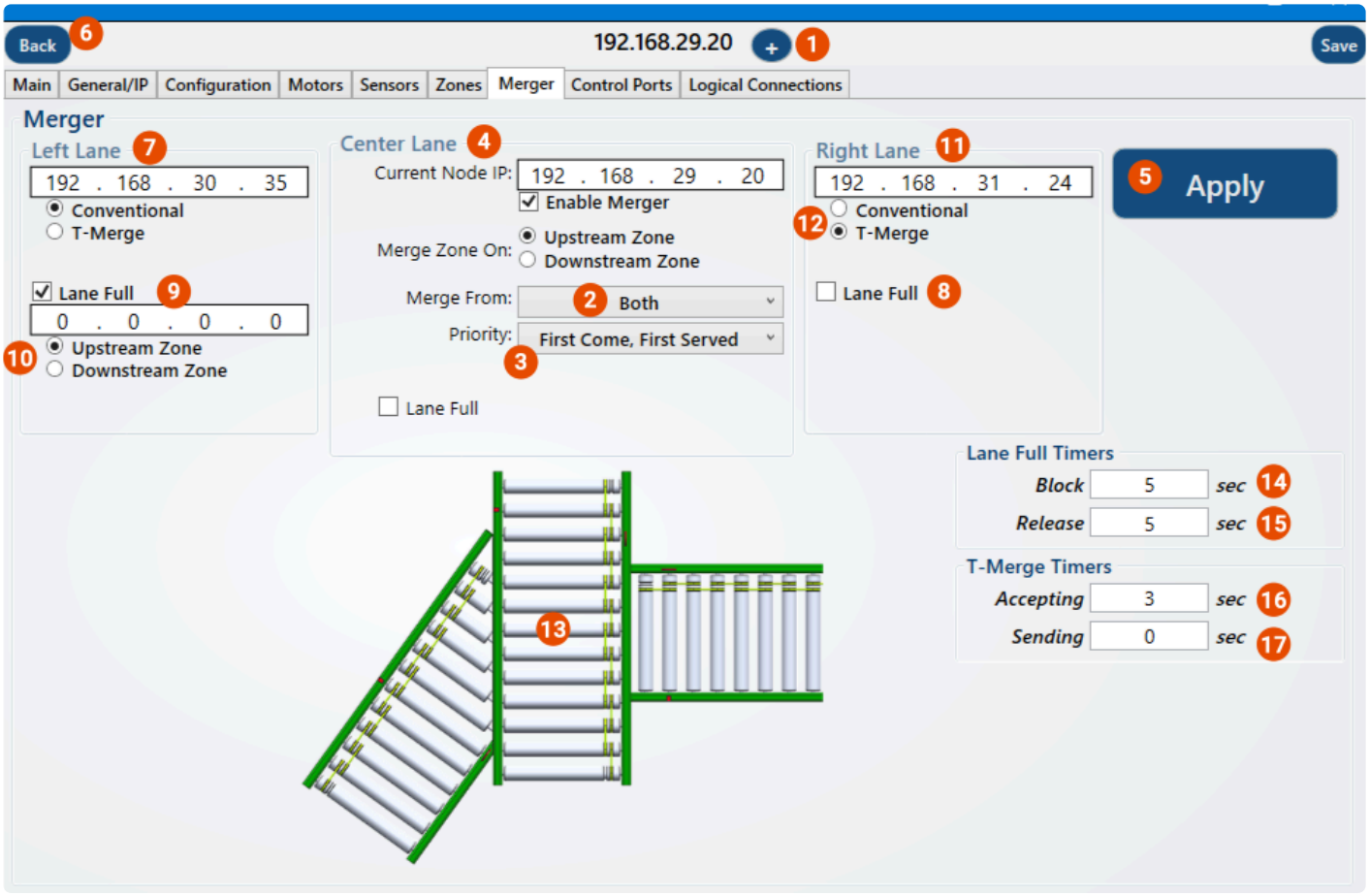
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

- Open *EasyRoll* or *EasyRoll+*
- Connect and navigate to the **ConveyLinx module** that will control the *Merge Zone*.
- For *EasyRoll* Press *CTRL+SHIFT+M* to open the *ConveyMerge Configuration Screen*
- For *EasyRoll+* Select the *Merger* tab to open the *Merger Configuration Screen*



Item	Description
1	Navigation Buttons for module selection
2	Drop down selector for ***Merge Type*** – Left, Right, or Both
3	Drop down for ***Merge Priority***
4	Display of IP Address for the **ConveyLinx module** selected that will contain the ***Merge Zone***
5	User button to click to apply the settings to the affected modules
6	User button to cancel any changes made and close the screen
7	Field to enter the IP Address of the ***Left Line's*** most downstream **ConveyLinx module**
8	Checkbox to enable ***Merge Line Full*** functions

9	IP Address of the **ConveyLinx module** that contains the zone being defined as the ***Monitor Zone*** for the ***Merge Line Full*** function
10	Radio buttons to select whether the upstream or downstream zone of the **ConveyLinx module** identified in Item 9 will be used as the ***Monitor Zone***
11	Field to enter the IP Address of the ***Right Line's*** most downstream **ConveyLinx module**
12	User checkbox to select ***T-Merge*** type
13	Graphical representation of the merge. Please note this will update and change as settings and configuration is modified
14	***Merge Line Full Block Timer*** preset value
15	***Merge Line Full Clear Timer*** preset value
16	***T-Merge Accept Timer*** preset value
17	***T-Merge Send Timer*** preset value

Conventional Spur Merge Example

Module Configuration Screen Tabs / Merger /

Conventional Spur Merge Example

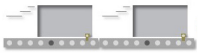
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

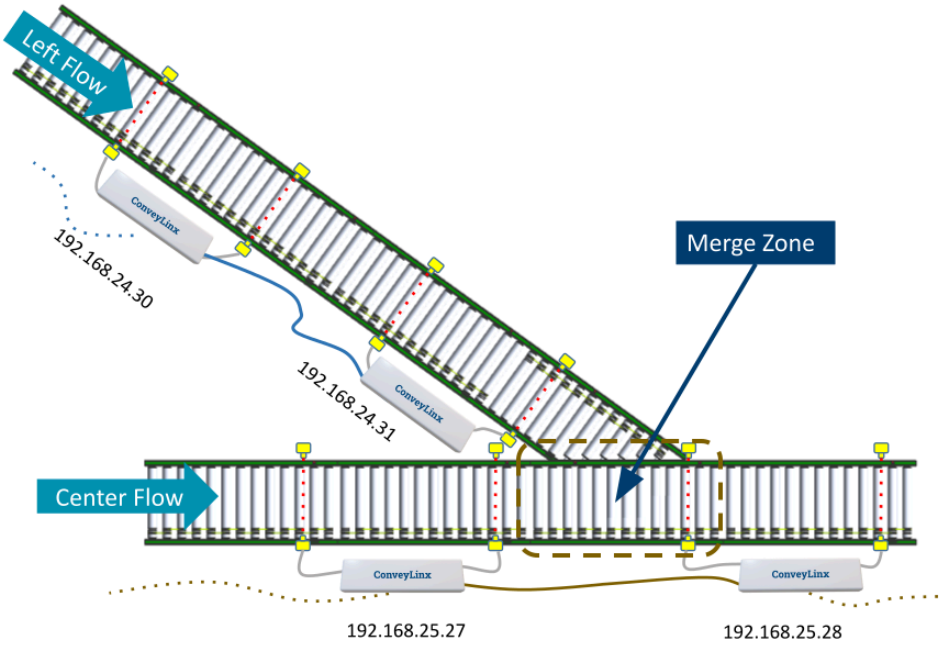
ConveyLinx-ECO ?

ZPA Mode ?

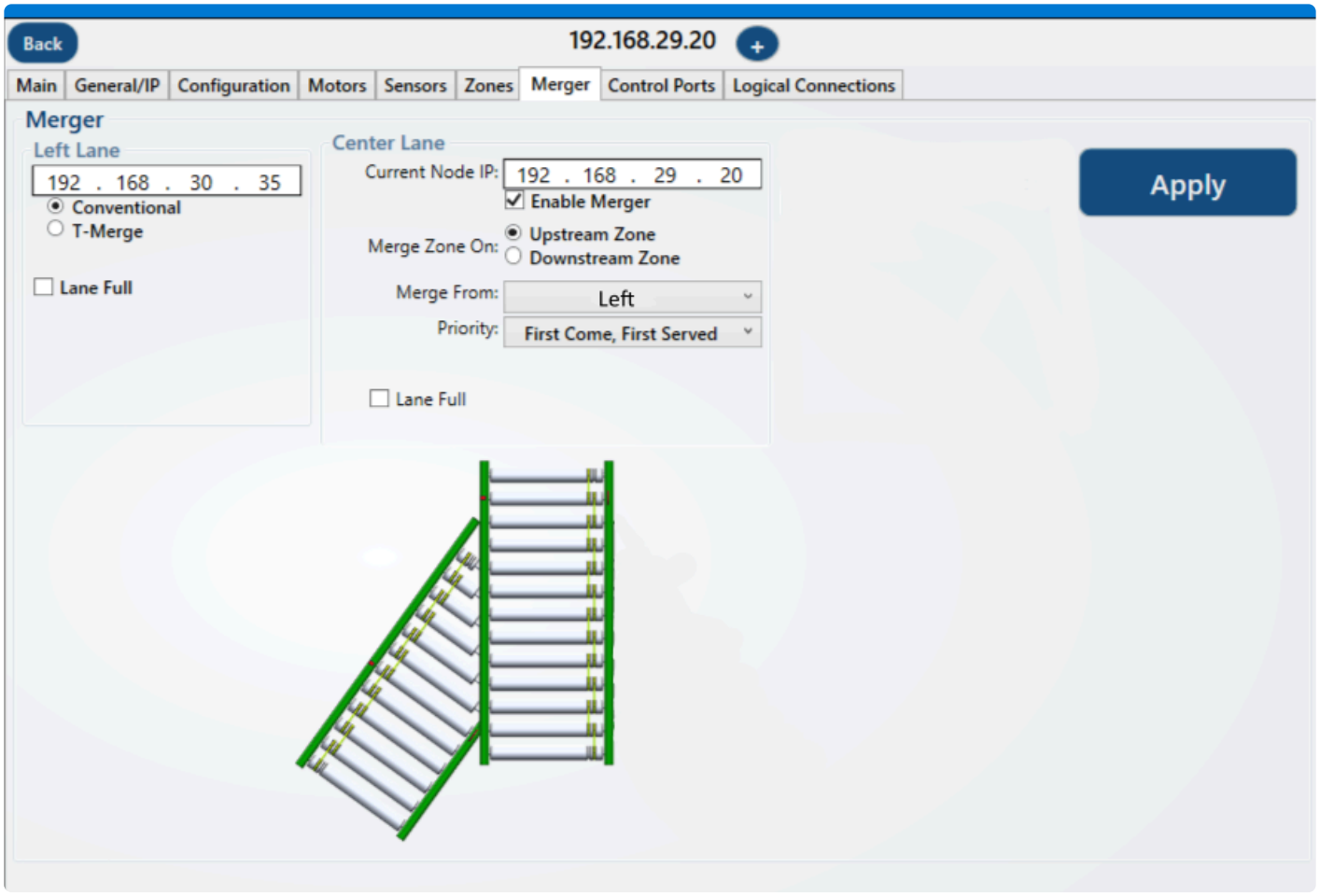


PLC I/O Mode ?

In this example we are going to configure the ***Left Line*** to be standard spur angle merge onto the ***Center Line*** and we will set the ***Merge Priority*** to be ***First Come First Served***



The ***Merge Zone*** is the upstream zone of the module at 192.168.25.28 and the most downstream **ConveyLinx module** for the ***Left Line*** is at 192.168.24.31. Here is the ***Merger Configuration Screen*** with these values entered



The last step is to click the ***Apply*** button to send the changes to the affected **ConveyLinx module**

> ✻ Please note that after clicking the “Apply” button, if the configuration has changed, the affected modules will reboot. It will take a few seconds for the reboot to finish and some or all of the affected zones may briefly run their motors

T-Merge Example

Module Configuration Screen Tabs / Merger /

T-Merge Example

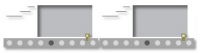
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

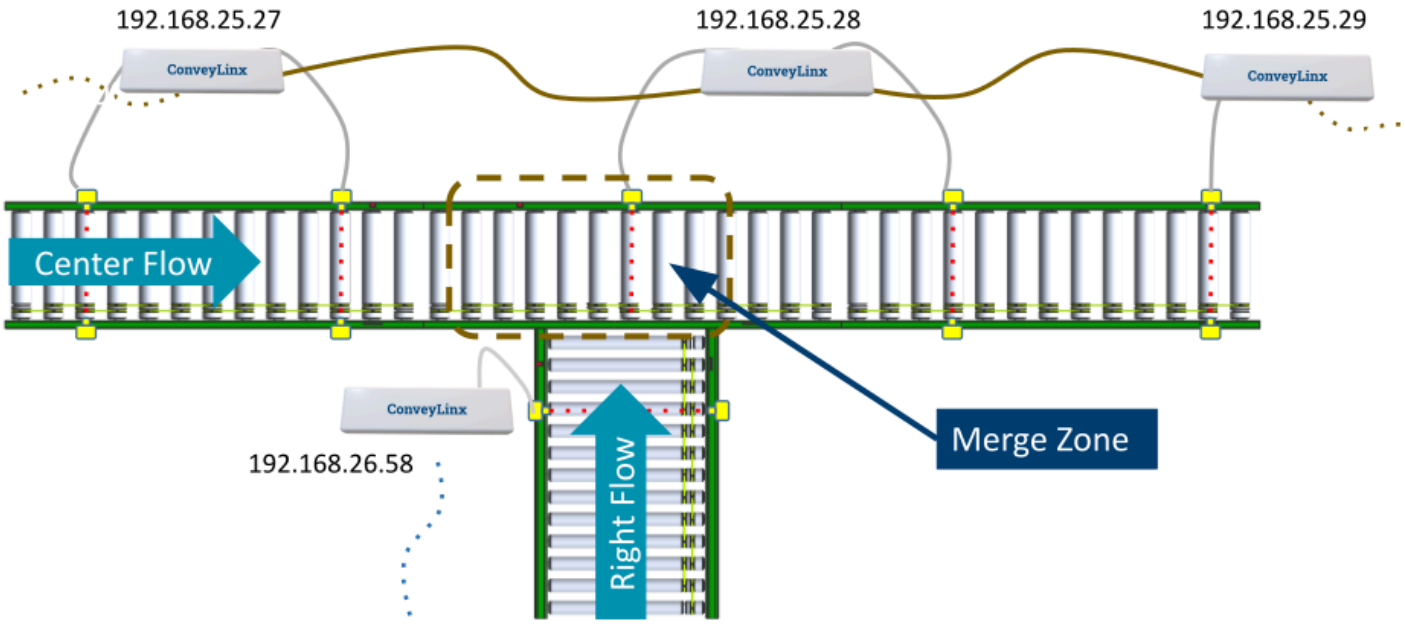
ConveyLinx-ECO ?

ZPA Mode ?

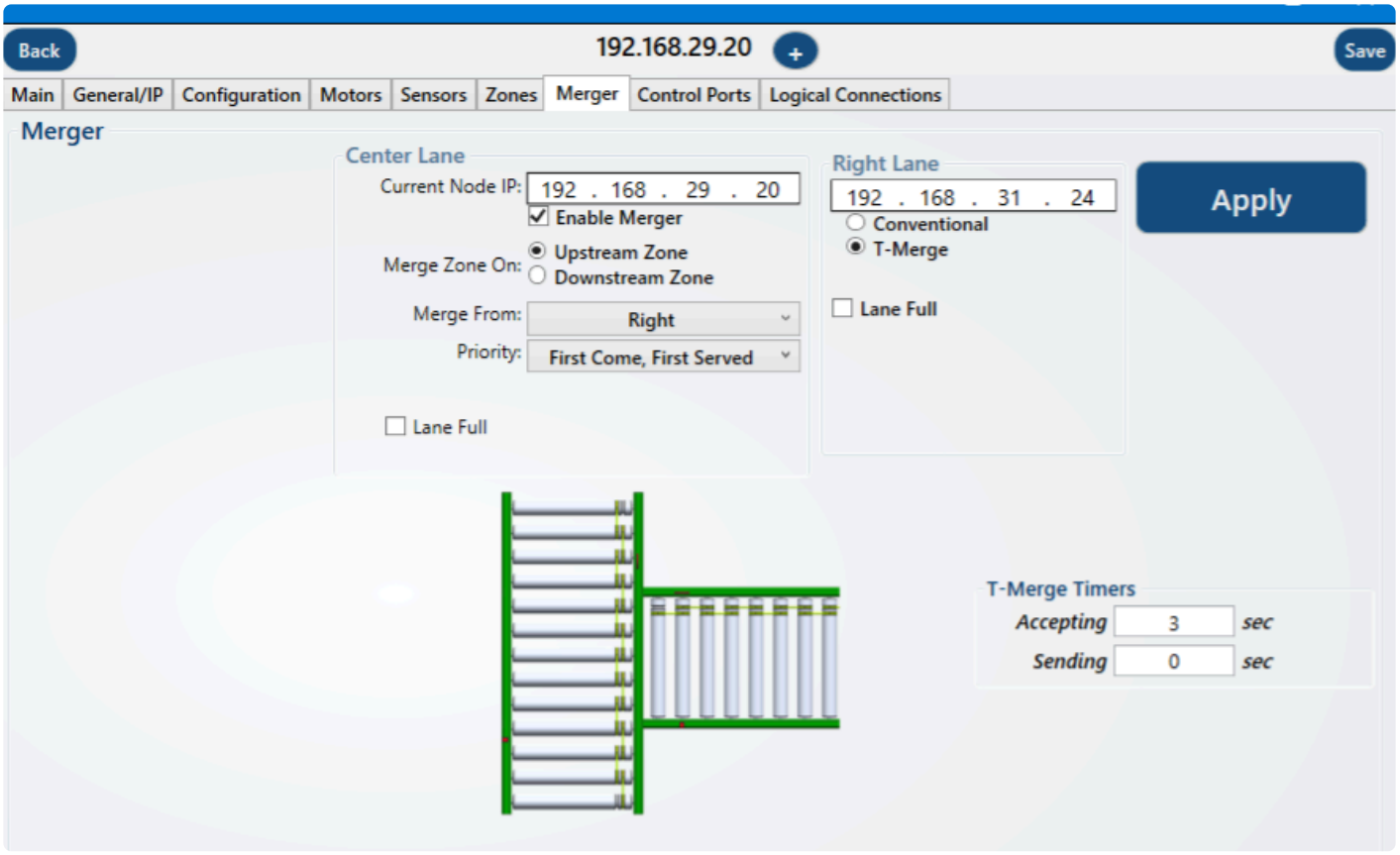


PLC I/O Mode ?

In this example we are going to configure the ***Right Line*** to be a ***T-Merge*** onto the ***Center Line*** and we will set the ***Merge Priority*** to be ***First Come First Served***



The ***Merge Zone*** is the upstream zone of the module at 192.168.29.20 and the most downstream **ConveyLinx module** for the ***Right Line*** is at 192.168.31.24. Here is the ***Merger Configuration Screen*** with these values entered


Back
192.168.29.20
Save
Main
General/IP
Configuration
Motors
Sensors
Zones
Merger
Control Ports
Logical Connections
Merger
Center Lane
Current Node IP:
192 . 168 . 29 . 20
Enable Merger
Merge Zone On:
Upstream Zone
Downstream Zone
Merge From:
Right
Priority:
First Come, First Served
Lane Full
Right Lane
192 . 168 . 31 . 24
Conventional
T-Merge
Lane Full
Apply
T-Merge Timers
Accepting
3
sec
Sending
0
sec

Merge Line Full Example

Module Configuration Screen Tabs / Merger /

Merge Line Full Example

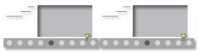
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

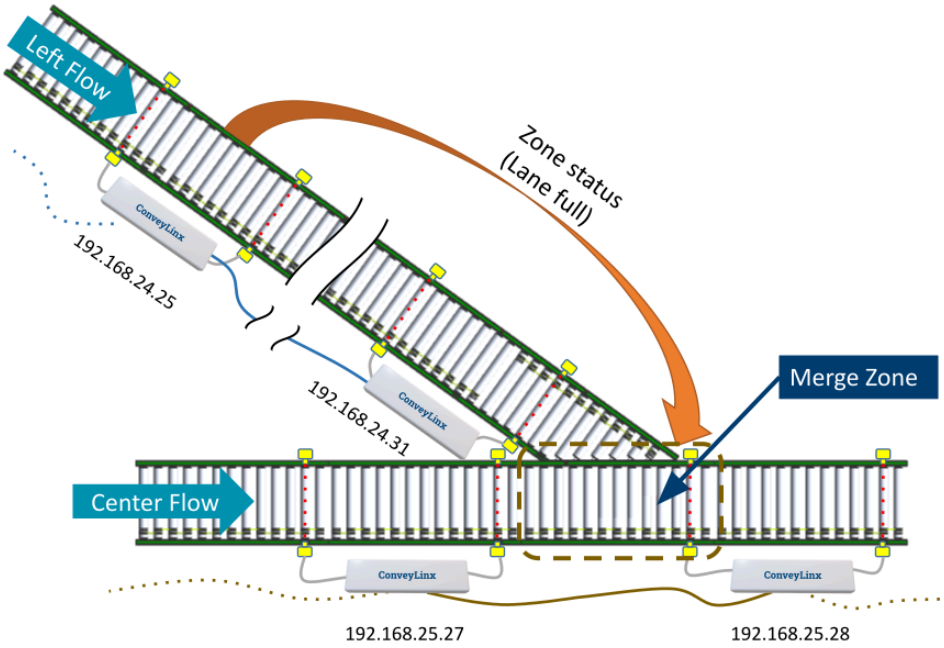
ConveyLinx-ECO ?

ZPA Mode ?



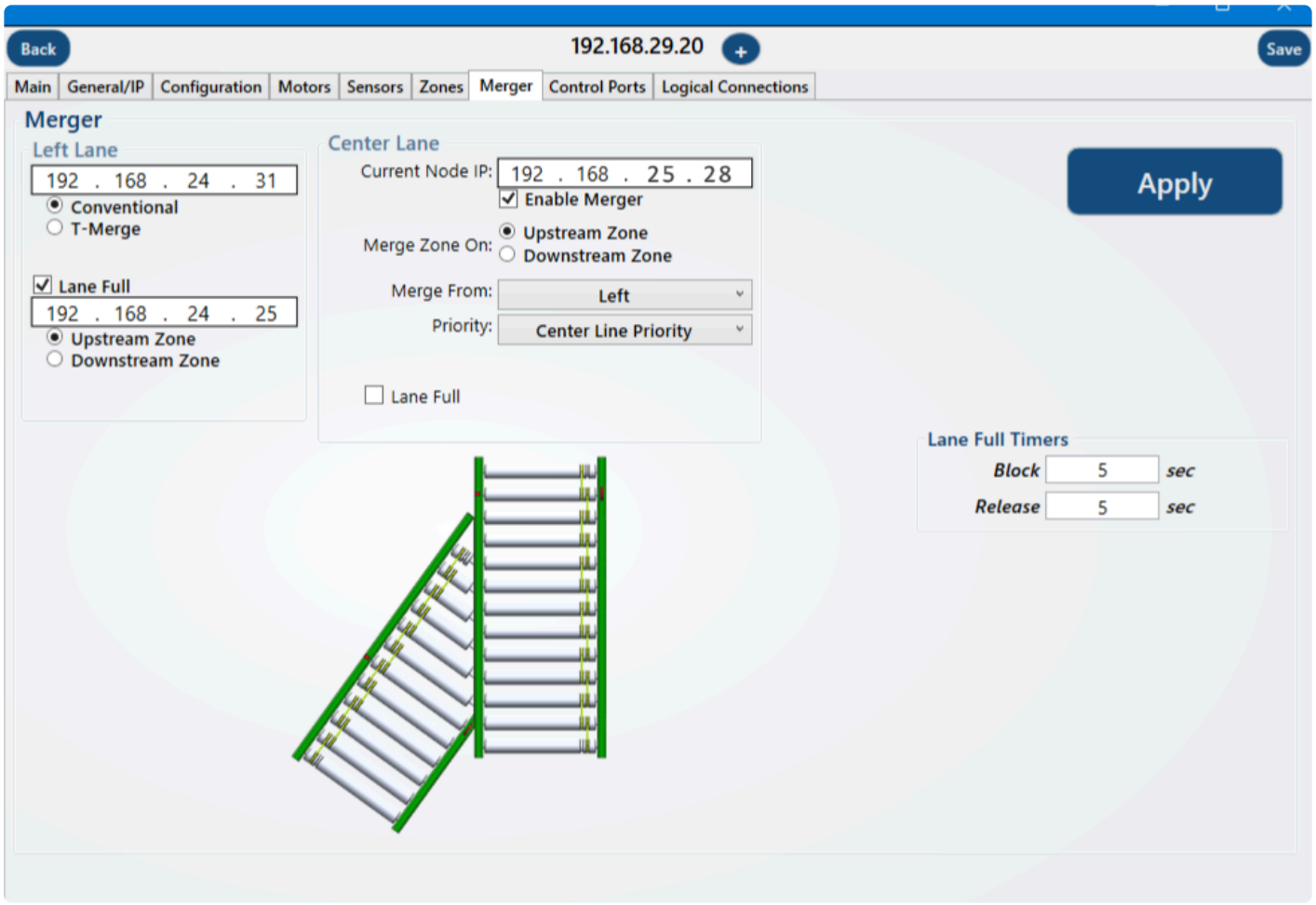
PLC I/O Mode ?

In this example we have the ***Left Line*** configured as standard spur angle merge and the ***Merge Priority*** to be ***Center Line***



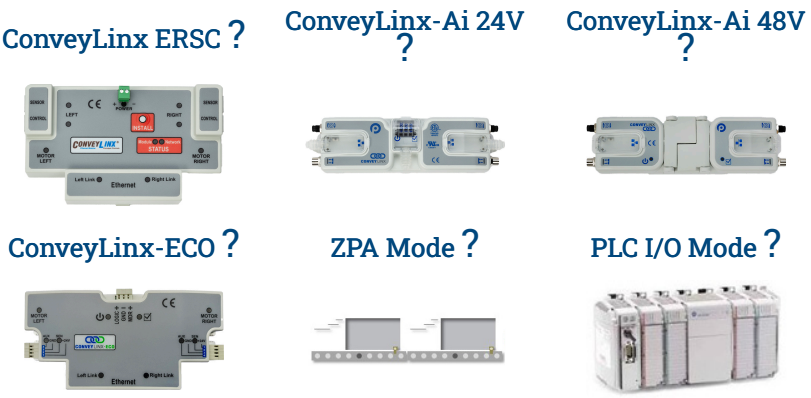
The ***Merge Zone*** is the upstream zone of **ConveyLinx module** 192.168.25.28 and the ***Left Lane's*** most downstream module is 192.168.24.31 and we want this line to have the ***Merge Lane Full*** function enabled. On the ***Left Lane***, we would like for the upstream zone of

ConveyLinx module 192.168.24.25 to be the Merge Lane Full function's ***Monitor Zone***. We would also like that once the ***Monitor Zone*** has been accumulated (or blocked) for 5 seconds, we want the ***Left Lane*** to release for 5 seconds and then return the priority to the Center Lane. Here is the ***Merger Configuration Screen*** with the values entered for this example:



Logical Connections

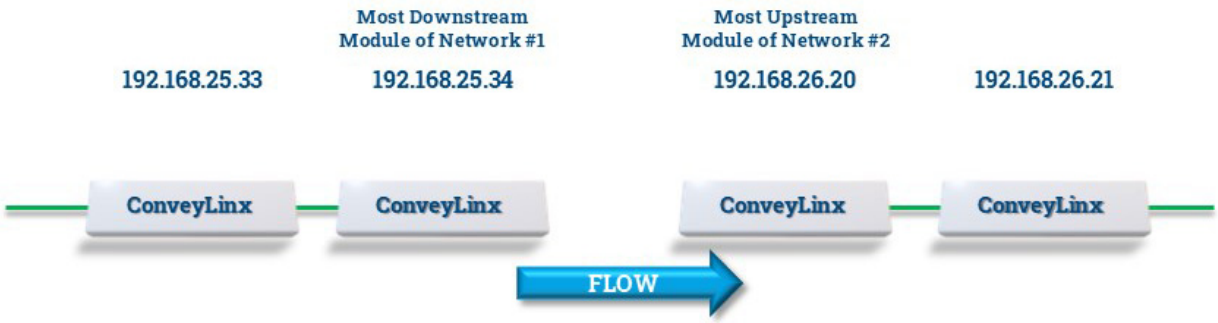
Module Configuration Screen Tabs /



The *Connections* utility uses *EasyRoll* to instruct a given module to make a logical connection to another module that it otherwise would not have made during the *Auto-Configuration Procedure*. For applications where you have more than one *Subnet*, this would be the way to logically connect the most downstream moduleof one *Subnet* to the most upstream module of another *Subnet*

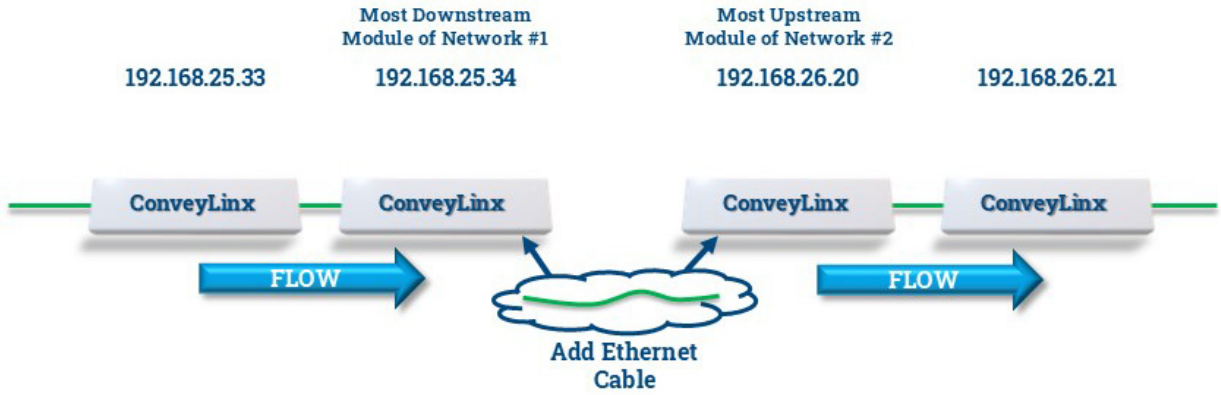
Connecting Two Subnets Together

Here is a typical boundary between two *Subnets*. The most downstream module of the first *Subnet* has an I.P. address of 192.168.25.34 and the most upstream module of the second *Subnet* has an I.P. address of 192.168.26.20.



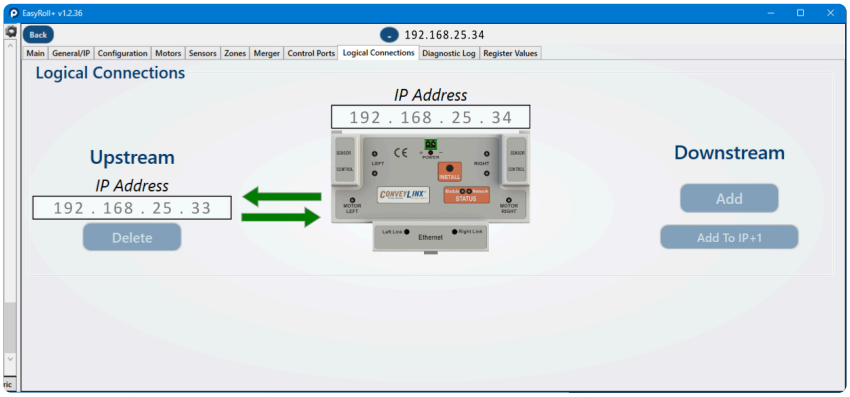
By simply connecting an Ethernet cable between these two boundary modules and then using *EasyRoll* to establish the “logical” connection between the two *Subnets*; you can achieve seamless flow between the two networks. The procedure requires that you have

to instruct module at 192.168.25.34 to convey cartons to module at 192.168.26.20, and likewise you have to instruct module at 192.168.26.20 to accept cartons from module at 192.168.25.34

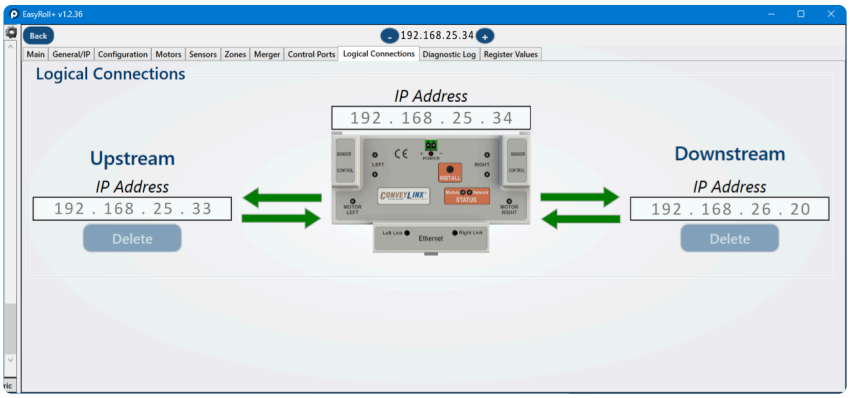


This process, as seen below, is the same for all ConveyLinx modules.

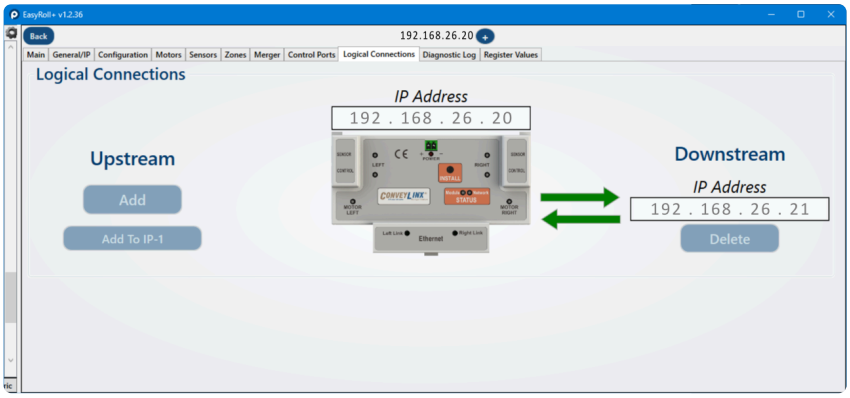
Navigate to the most downstream module of the 192.168.25 subnet (i.e. 192.168.25.34). Notice that the module's network data appears in the center. Also notice that the Downstream connection for this module is blank since there is no module more downstream in the network



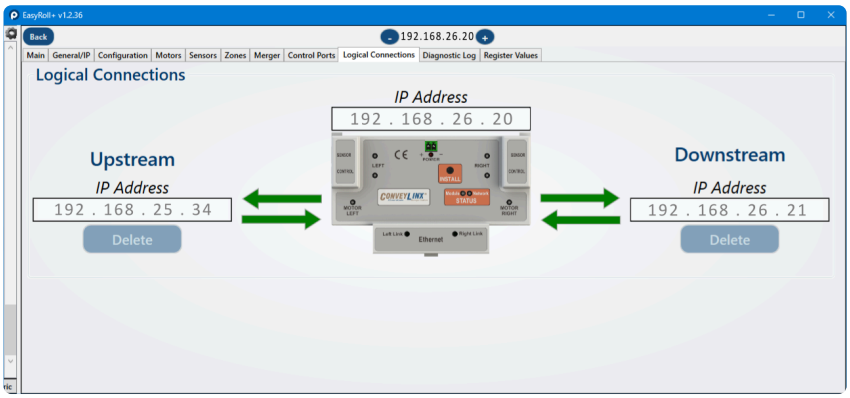
Click the Add button and enter *192.168.26.20* as the I.P. address for module 4's new Downstream connection. Please note that it will take a few seconds for this to complete. Now you can see a module more downstream since the connection has been made



Navigate to module 1 of the 192.168.26 subnet (i.e. 192.168.26.20). Notice that the module's network data appears in the center. Also notice that the Upstream connection for this module is blank since there is no module more upstream in the network



Click the Add button and enter *192.168.25.34* as the I.P. address for module 1's new Upstream connection. Please note that it will take a few seconds for this to complete. Now you can see a module more upstream since the connection has been made



Registers Poll

Module Configuration Screen Tabs /

Registers Poll

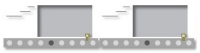
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

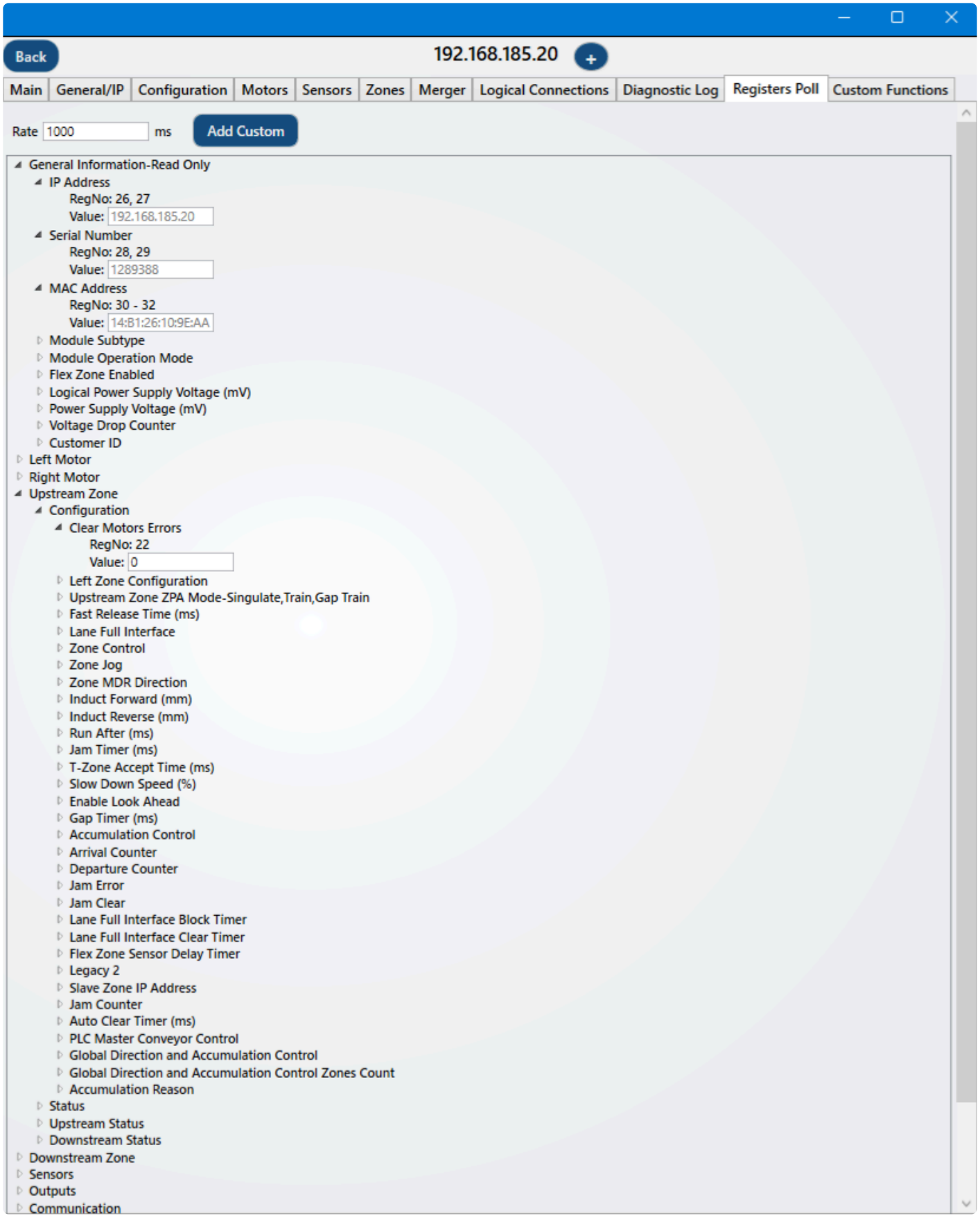


PLC I/O Mode ?

Registers Poll Tab

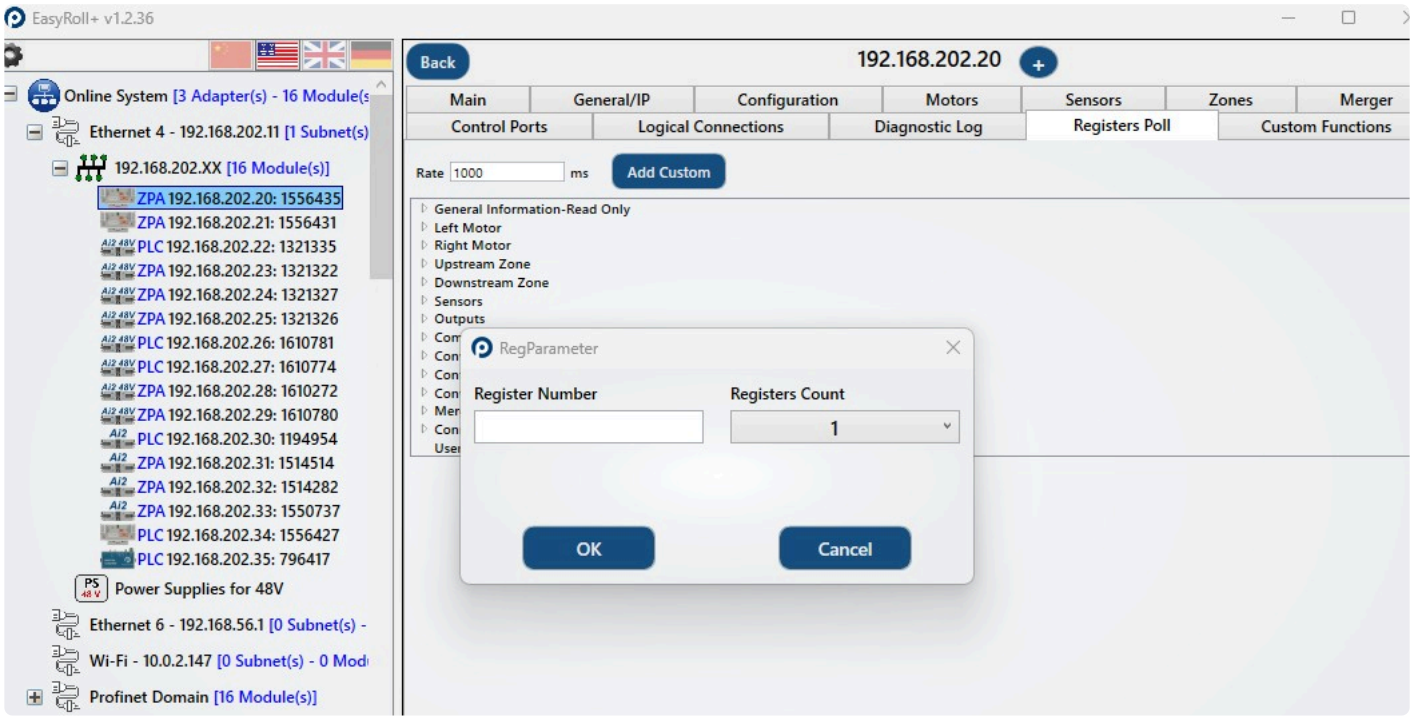
The “Registers Poll” tab shows the registers and the information polled from them. The registers and available data will vary with firmware and module type. You can view the registers and their values (values are dynamic if the system is online) as well as add a Custom register. Please refer to the Developers Guide of your module to find information on additional registers.

Below some of the content has been expanded to display the values and registers, expanding any of these will show this information.


Back
192.168.185.20
Main
General/IP
Configuration
Motors
Sensors
Zones
Merger
Logical Connections
Diagnostic Log
Registers Poll
Custom Functions
Rate 1000 ms
Add Custom
General Information-Read Only
IP Address
RegNo: 26, 27
Value: 192.168.185.20
Serial Number
RegNo: 28, 29
Value: 1289388
MAC Address
RegNo: 30 - 32
Value: 14:B1:26:10:9E:AA
Module Subtype
Module Operation Mode
Flex Zone Enabled
Logical Power Supply Voltage (mV)
Power Supply Voltage (mV)
Voltage Drop Counter
Customer ID
Left Motor
Right Motor
Upstream Zone
Configuration
Clear Motors Errors
RegNo: 22
Value: 0
Left Zone Configuration
Upstream Zone ZPA Mode-Singulate,Train,Gap Train
Fast Release Time (ms)
Lane Full Interface
Zone Control
Zone Jog
Zone MDR Direction
Induct Forward (mm)
Induct Reverse (mm)
Run After (ms)
Jam Timer (ms)
T-Zone Accept Time (ms)
Slow Down Speed (%)
Enable Look Ahead
Gap Timer (ms)
Accumulation Control
Arrival Counter
Departure Counter
Jam Error
Jam Clear
Lane Full Interface Block Timer
Lane Full Interface Clear Timer
Flex Zone Sensor Delay Timer
Legacy 2
Slave Zone IP Address
Jam Counter
Auto Clear Timer (ms)
PLC Master Conveyor Control
Global Direction and Accumulation Control
Global Direction and Accumulation Control Zones Count
Accumulation Reason
Status
Upstream Status
Downstream Status
Downstream Zone
Sensors
Outputs
Communication

Custom Registers

After clicking “Add Custom” button, you can arrange for an additional specific register to be polled. Be aware of the number of bits that the data takes and assign it the correct number of registers. The custom data will appear at the very end of the Registers list under “User Registers”



Diagnostic Log

Module Configuration Screen Tabs /

Diagnostic Log

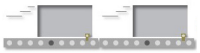
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

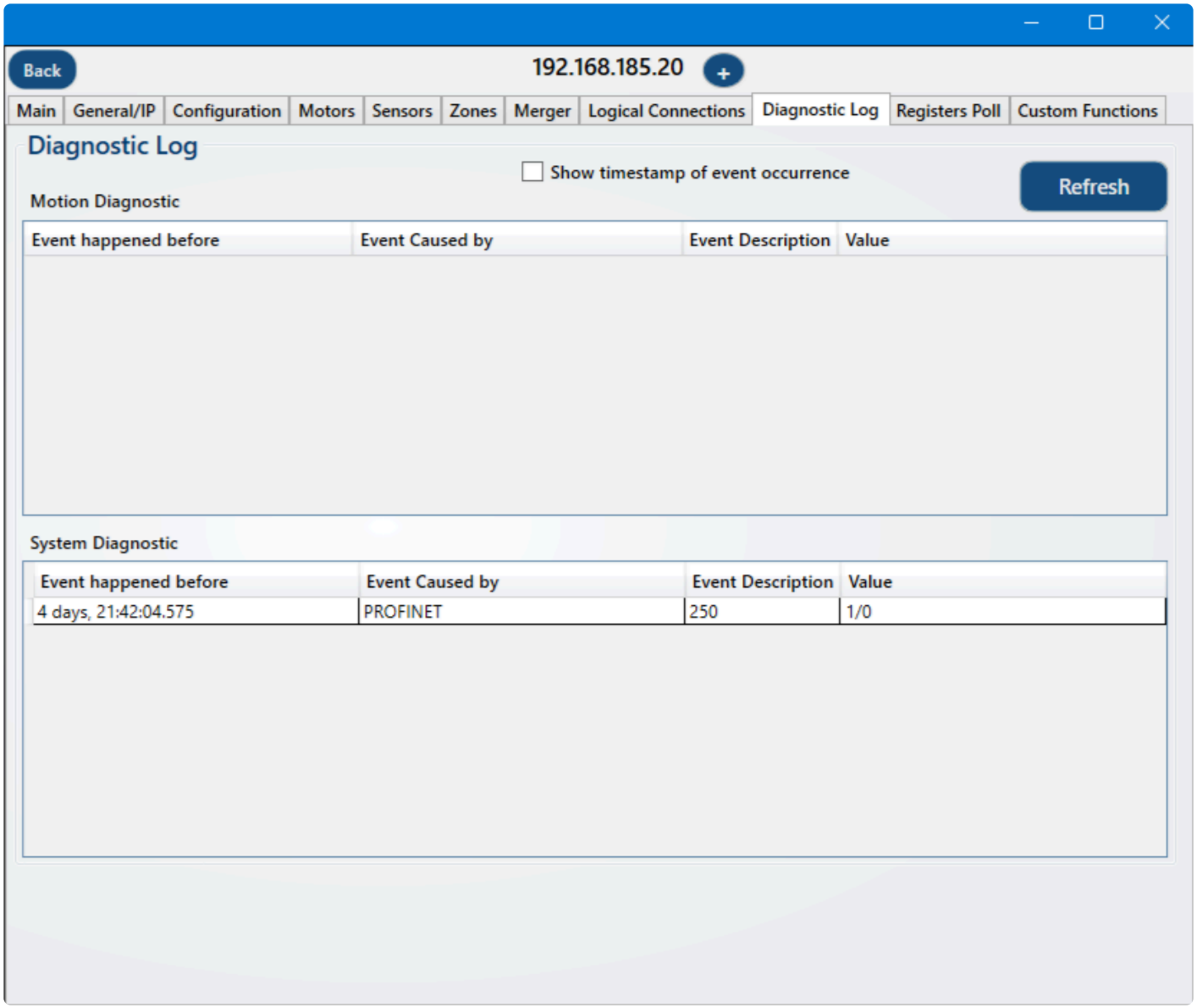
ZPA Mode ?



PLC I/O Mode ?

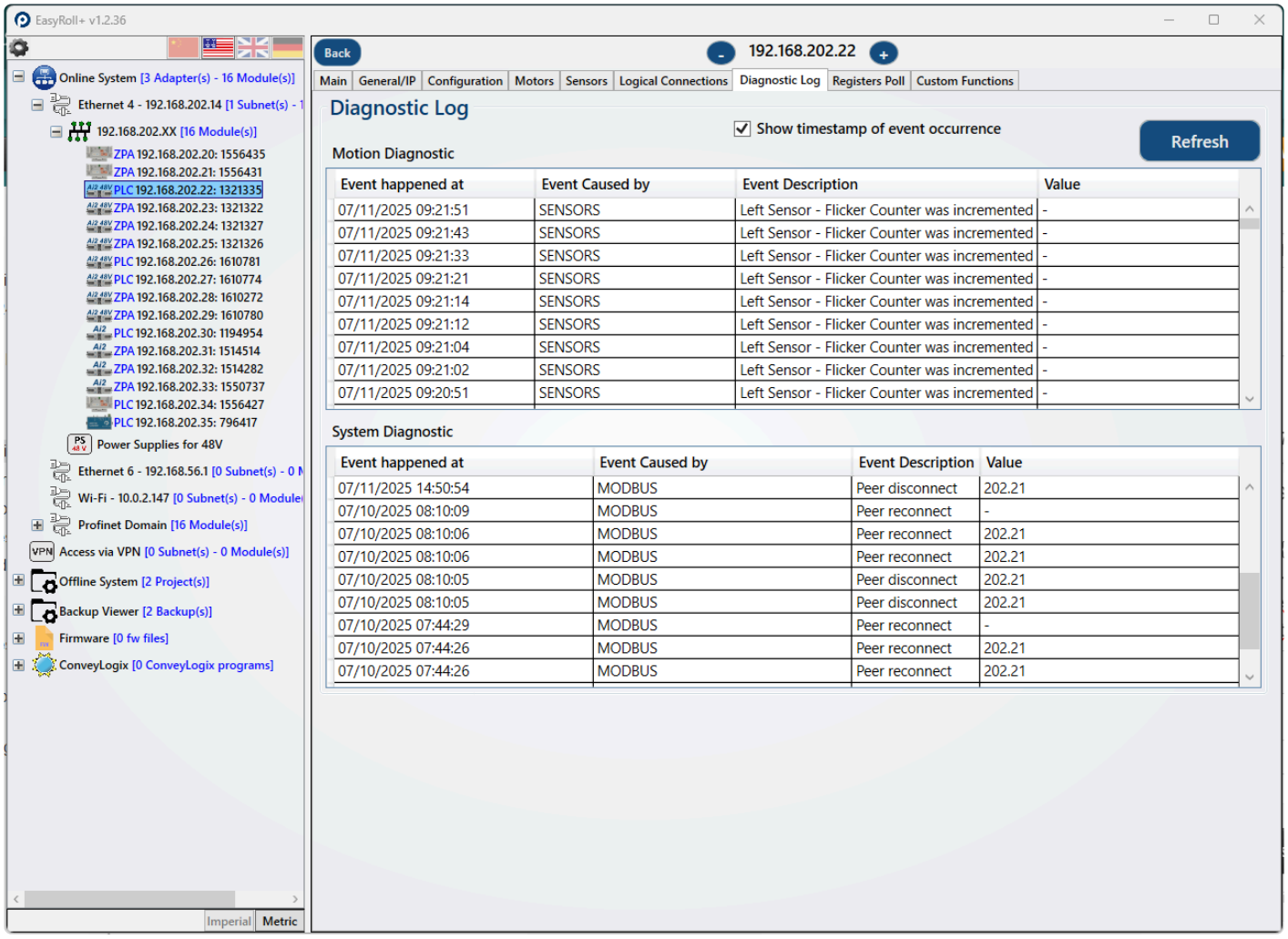
Diagnostic Main Screen without Timestamps

The “Diagnostics Log” tab shows both the Motion and System separately. You may choose to see the timestamp on each event, or to refresh the log. Not all events are necessarily negatively impactful.



Diagnostic Main Screen with Timestamps

This example shows a fuller log with timestamps, note the scroll bar on the right of each window



Some log items are normal circumstantially, consider the sensor flicker above. If you observe the sensor being triggered when nothing appears to be triggering it, you may need to reevaluate what the sensor can “see” or how well connected the sensor is to the system. Other items like miniscule peer reconnects over modbus are unlikely to be negatively impactful unless the time span of disconnection is concerning.

Please reach out to Support if you are unable to successfully resolve an issue.

Custom Functions

Module Configuration Screen Tabs /

Custom Functions

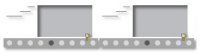
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

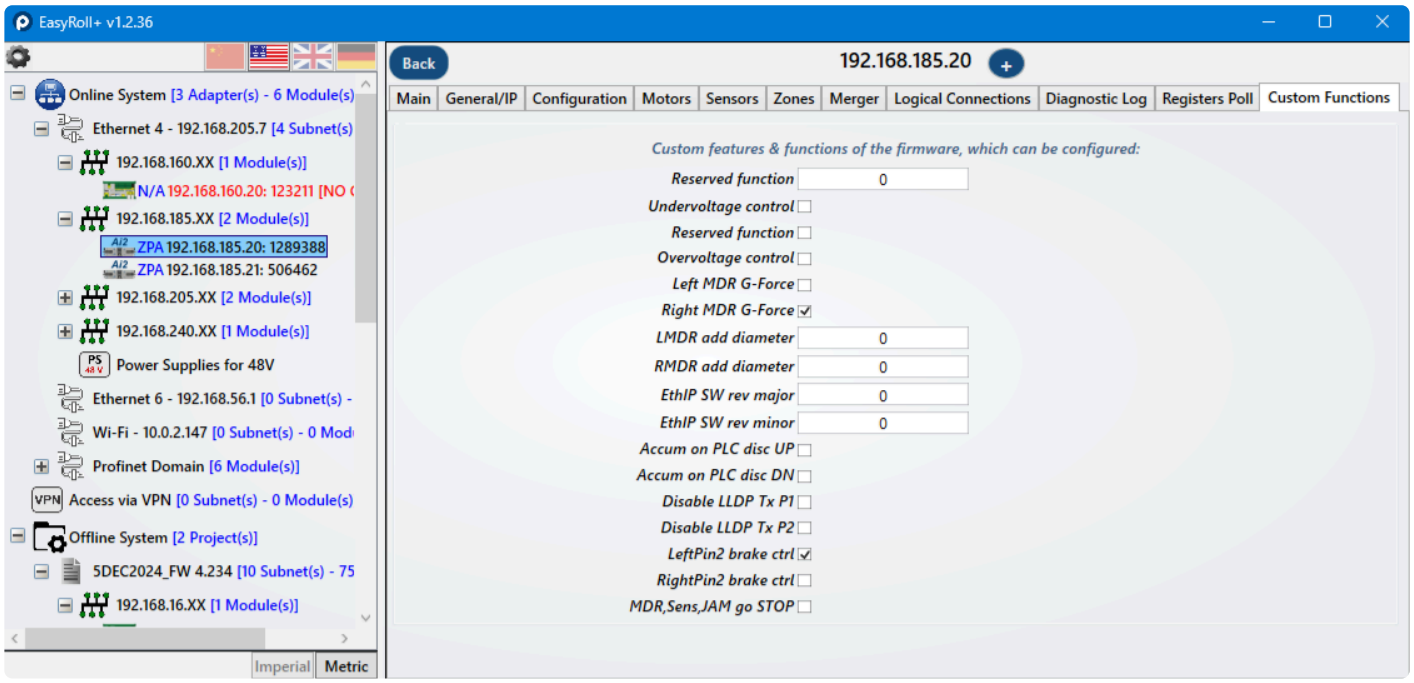
ZPA Mode ?



PLC I/O Mode ?

The “Custom Functions” tab is now accessible with version 6.7.0 or later of the module’s firmware. Available functions listed below may vary with firmware and module type.

! Please make note of any functions you choose to use and mention them if ever reaching out to support.



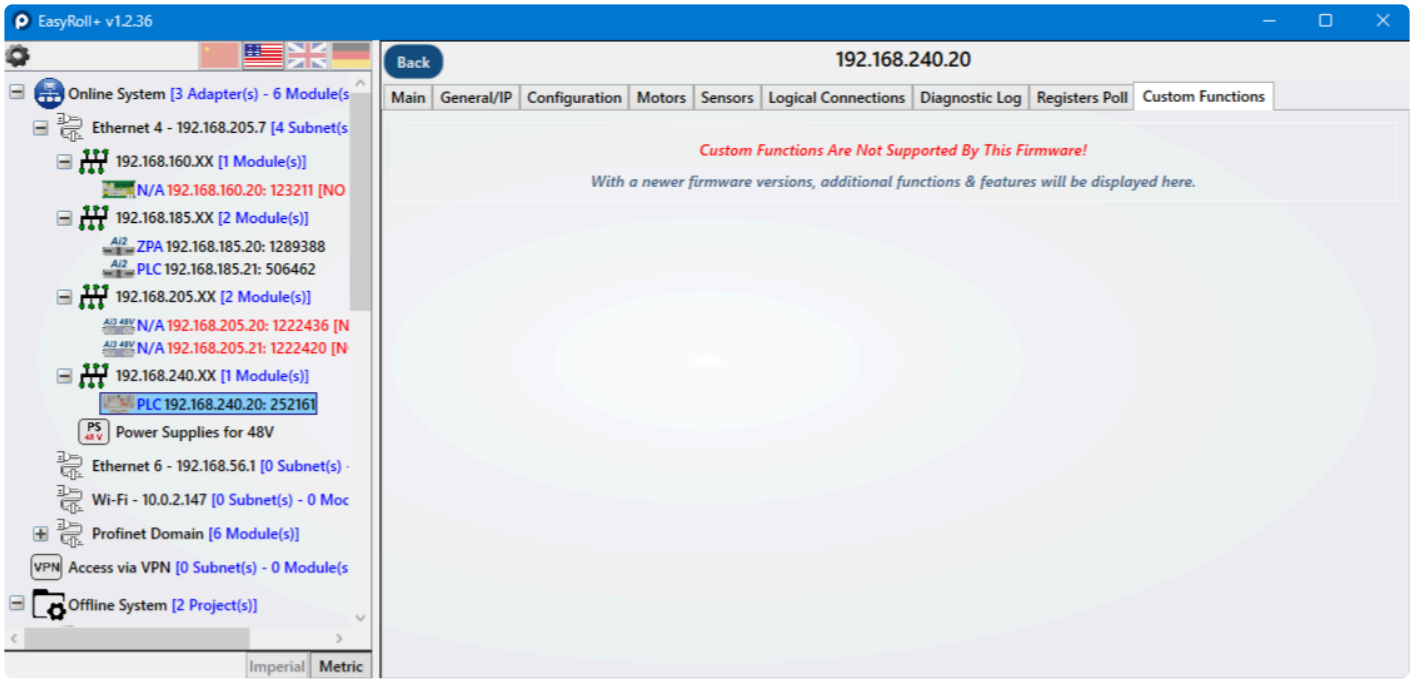
Function	Description

Reserved Function	• *Should not be activated as they are not applicable to customer use*
Undervoltage Control	• *This function will alter the behavior of the controller when the voltage starts to drop. The standard behavior is to maintain full motor operation until 18V and then to brake. The recovery is at 21V.* • *When the undervoltage control is activated, the module will begin to decrease the current limit when the voltage falls below 21V. The decrease is gradual. If the logic voltage is stable, the motor will run with some capacity down to 11V. The function is patented. The idea is that the current is limited proportionally the voltage drop in order to try and not go into hard stop.* • *While this functionality was available in earlier firmware versions, it was added to the Custom Functions tab in firmware v6.7.0*
Reserved Function Checkbox	• *Should not be activated as it is not applicable to customer use*
Overvoltage Control	• *Modifies the behavior of the module when the voltage rises more than 1.2V over the voltage level recorded at the motor run command. When such an event is registered, the motor commutation will switch to a special one. The controller will inject current into the current motor coil, that is “at rest” in the current phase. This alters the force vector and dissipates energy in the motor. Slightly more heat goes in the motor, but the voltage is very well controlled without the need of a VC2. We have measured the temperature saturation for ECO mode, 2 motors together stopping with 20kg equivalents and run – stop cycles of 3 seconds on/1 seconds off. When the Overvoltage control was active, the saturation temp was 3 degrees Celsius higher. This function eliminates the need for an external energy absorbing device like VC2.* • *While this functionality was available in earlier firmware versions, it was added to the Custom Functions tab in firmware v6.7.0*

Left MFR G-Force (Same for Right)	• *Switches the Acceleration and Deceleration from distance (mm) to g-force(mm/s2). Due to fluctuations of the real speed, using G-force deceleration may result in different total deceleration distances.* • *Added in firmware v6.7.0*
Left MDR Add Diameter (Same for Right)	• *Allows the setting of additional diameter of the tube to cover the cases, where a sleeve of some kind is used. This extra diameter is then used by the controller in its calculation of the tube surface speed.* • *Added in firmware v6.7.0*
EthIP SW rev major	• *Low BYTE* • *Specifies if a different version than the actual software version should be reported to EthernetIP PLCs. refers to the x position of the version: x.7.3* • *This setting is useful for new replacement controllers for an already running system. The PLC may refuse a connection if the firmware revision is too new/different. The backward compatibility of the ConveyLinx firmware allows the new firmware revisions to work with old systems without issues.* • *Supported since firmware v6.7.3.*
EthIP SW rev minor	• *High BYTE* • *Same as EthIP SW rev major, but refers to the x position of the version: v6.x.3*
Accum on PLC disc UP (Same for DOWN)	• *If activated, when the module wakes up, it will accumulate a product on its upstream/downstream zone. Also, the ConveyLinx will accumulate immediately upon PLC disconnect. This function is only useful for systems configured by EasyRoll or EasyRoll+. This accumulation is immediately removed, when a PLC connects.* • *Supported since firmware v6.7.9*
Disable LLDP Tx P1 (Same for Port 2)	• *When no managed switches are used in a system, the LLDP messages should be disabled on the ports, which are connected to the system switches.* • *Supported since firmware v6.8.0*

LeftPin2 brake ctrl (Same for Right)	• *Non-MDR rollers with a built-in mechanical brake can be attached to empty motor ports and will be controlled automatically. Note – this wastes a free motor port. It is also possible to provide the control signal for the brake roller from the Pin2 output.* • *A separate device must be connected between the Pin2 output and the brake roller with the following parameters:* *Must have one Input for an NPN output (Pin2 signal), Must control the brake roller with a PNP 24V output, Must be separately powered and be able to provide at least 250mA of current to the brake roller, Must have a quick reaction time to ensure the brake is released when the motor is started* • *Supported since firmware v6.8.0*
SensorJAM causes Estop	• *When the ConveyLinx is part of a ConveyStop group, this function allows addition of the Sensor (FullRun) JAM error to the list of triggers that activate the ConveyStop. As long as the zone sensor on which the JAM has occurred is blocked, the stop mode cannot be cleared* • *Supported since firmware v6.9.0*

The tab will be empty when controllers have firmware that is too old and the below message will be displayed


EasyRoll+ v1.2.36
Online System [3 Adapter(s) - 6 Module(s
Ethernet 4 - 192.168.205.7 [4 Subnet(s
192.168.160.XX [1 Module(s)]
N/A 192.168.160.20: 123211 [NO
192.168.185.XX [2 Module(s)]
ZPA 192.168.185.20: 1289388
PLC 192.168.185.21: 506462
192.168.205.XX [2 Module(s)]
N/A 192.168.205.20: 1222436 [N
N/A 192.168.205.21: 1222420 [N
192.168.240.XX [1 Module(s)]
PLC 192.168.240.20: 252161
Power Supplies for 48V
Ethernet 6 - 192.168.56.1 [0 Subnet(s)
Wi-Fi - 10.0.2.147 [0 Subnet(s) - 0 Moc
Profinet Domain [6 Module(s)]
Access via VPN [0 Subnet(s) - 0 Module(s
Offline System [2 Project(s)]
Imperial
Metric
Back
192.168.240.20
Main
General/IP
Configuration
Motors
Sensors
Logical Connections
Diagnostic Log
Registers Poll
Custom Functions
Custom Functions Are Not Supported By This Firmware!
With a newer firmware versions, additional functions & features will be displayed here.

Auto-Configuration Procedure

Auto-Configuration Procedure

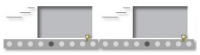
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

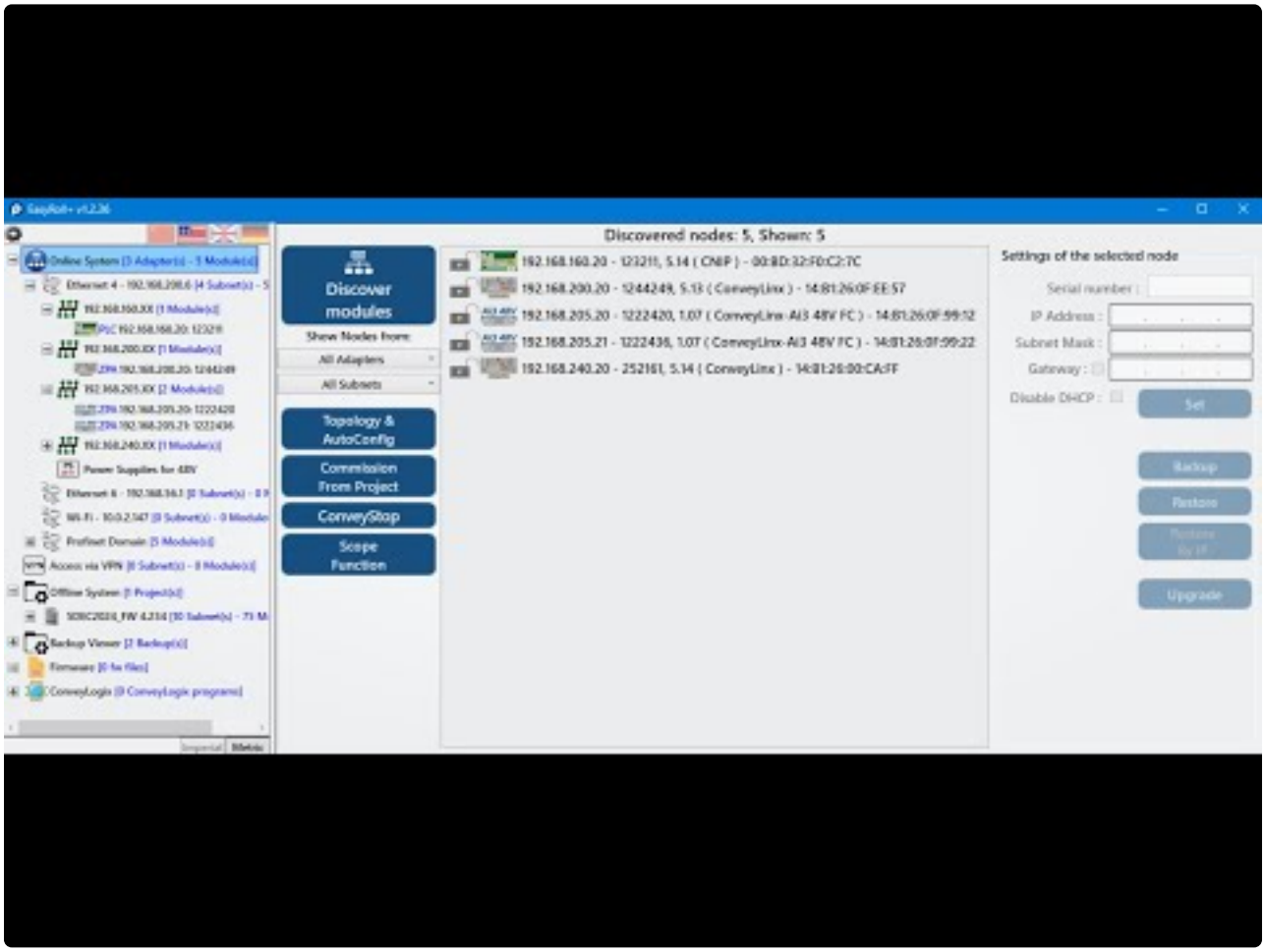
ZPA Mode ?



PLC I/O Mode ?

The Auto-Configuration procedure is initiated from the Auto-Configuration Module. Because of its physical location on the conveyor path and physical location in the Ethernet connection chain; the Auto-Configuration Module will automatically connect to all downstream modules and set their I.P. address for communication. Please note that a temporary pause to your system will take place during this procedure, be cautious. Once complete auto config will have the topology of your system drawn, set sequential IP Addresses starting from the most upstream module, and all of the settings which have been configured previously will be accessible to the EasyRoll+ software (sensor placement, order of modules, and more).

The below tutorial video walks you through the auto configure process.



https://www.youtube.com/embed/jtadRzZELkM?rel=0

Before You Begin

- All sensors should be clear. ***Auto-Configuration*** assumes that state of the sensor is the “zone empty” state
- Make sure you have no more than 221 ***ConveyLinx modules*** connected. ***Auto-Configuration*** will not configure past 221 ***ConveyLinx modules*** in one network
- Make sure that there are no other Ethernet devices or switches connected in your string of ***ConveyLinx modules***. After ***Auto-Configuration*** is complete and successful, you can interrupt the Ethernet string with other devices and/or switches

For Auto-Configuration – make sure all modules are connected without any other devices

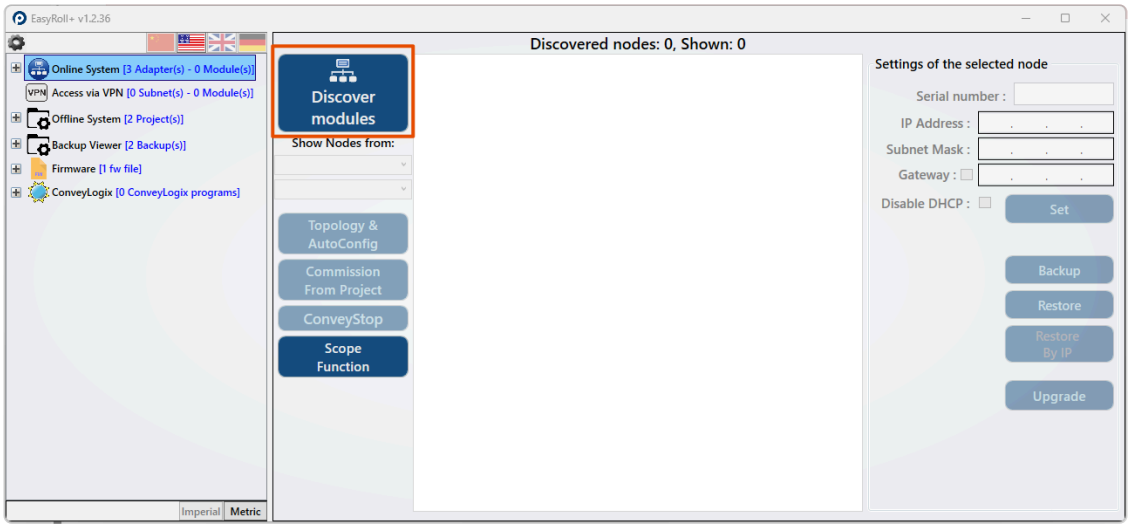
Once Auto-Configuration is complete – you can insert Switches and connect devices as needed

The direction of flow of the conveyor dictates where to begin the ***Auto-Configuration Procedure***. The **ConveyLinx module** located at the most upstream or in-feed end of the conveyor is the module where the procedure must be initiated.. Because of its physical location on the conveyor path and physical location in the Ethernet connection chain; the most upstream **ConveyLinx module** will automatically connect to all downstream ***ConveyLinx modules*** and set their I.P. address for communication. Then the routine automatically sets the direction of flow.

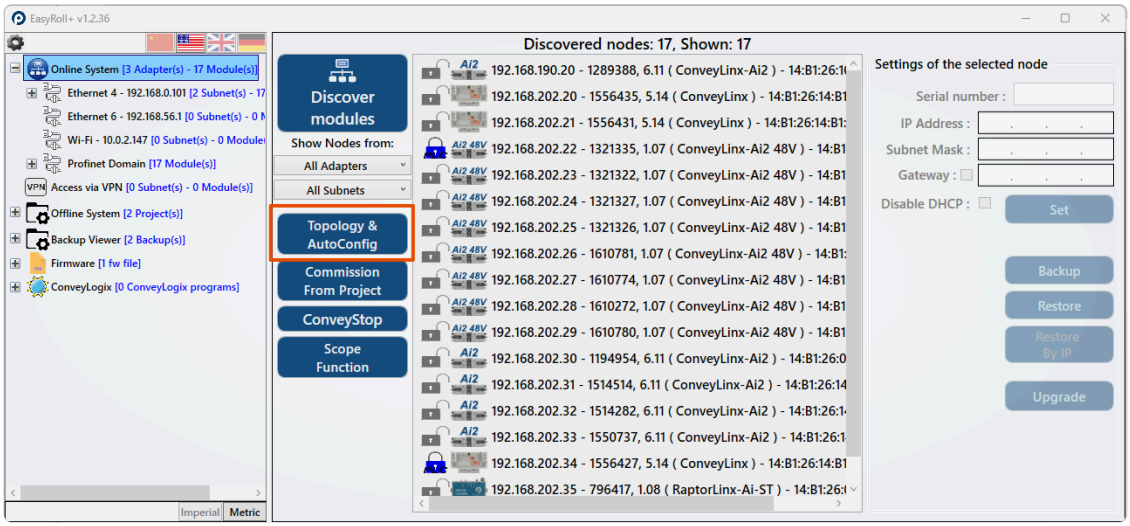
! For the Auto-Configuration to work properly, all loads, totes, product, containers, cartons, etc. must be removed from the entire conveyor path and all photo-sensors must be aligned and adjusted so that none are detecting that their respective zone is occupied. Failure to meet these conditions will produce unexpected results

Auto-Configuration Procedure

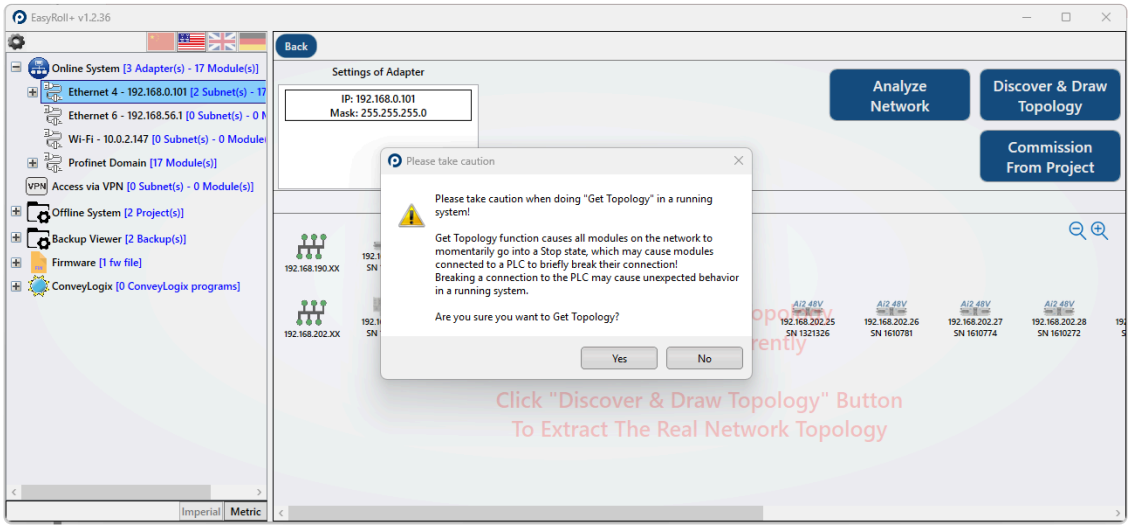
Start EasyRoll+. In the left panel select *Online System* and click *Discover Modules*



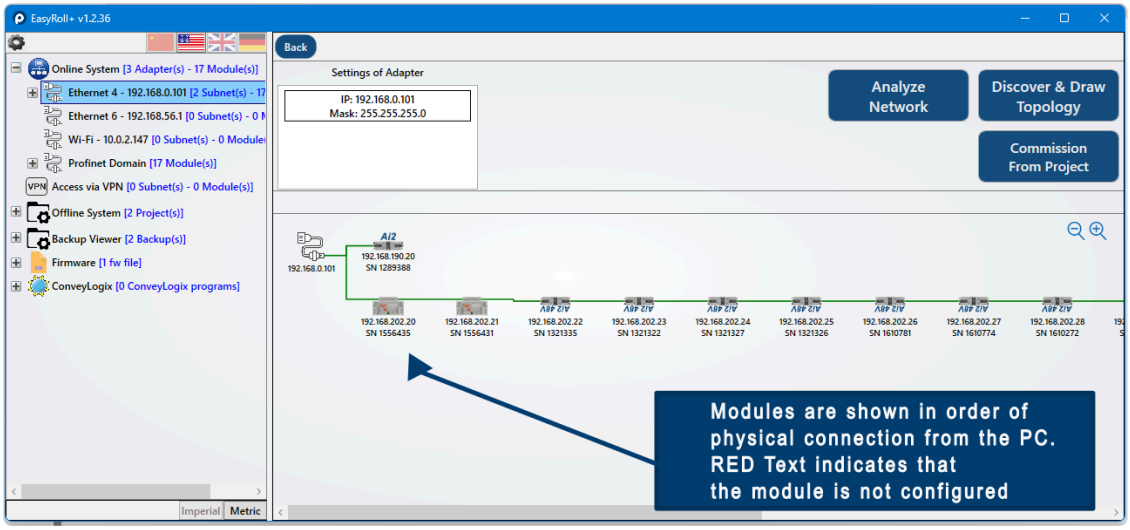
After a few seconds, the discovered Modules appear in the module table, click the *AutoConfig* button



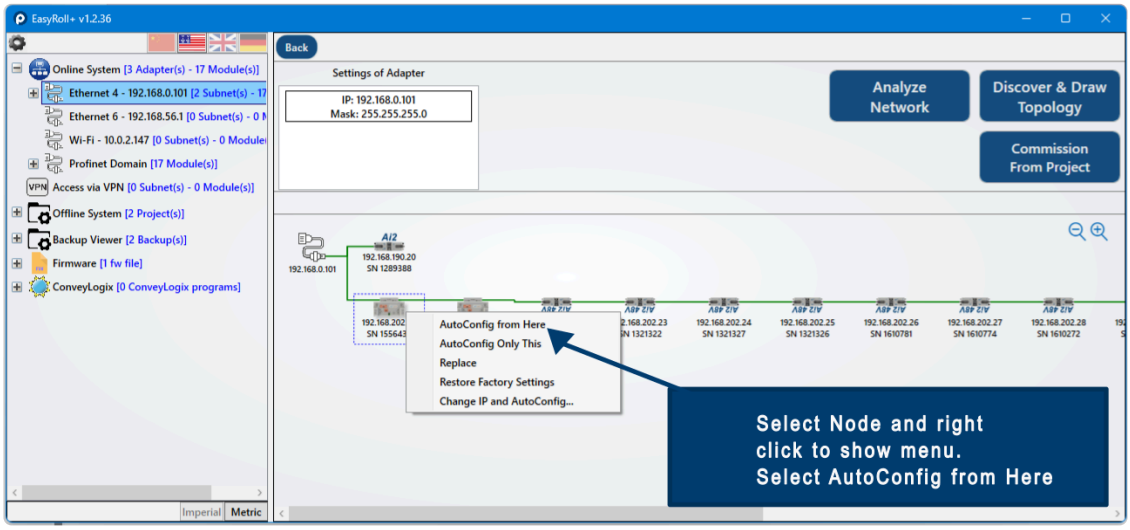
Clicking the Topology & Auto Config button will prompt this message. Please read it before continuing



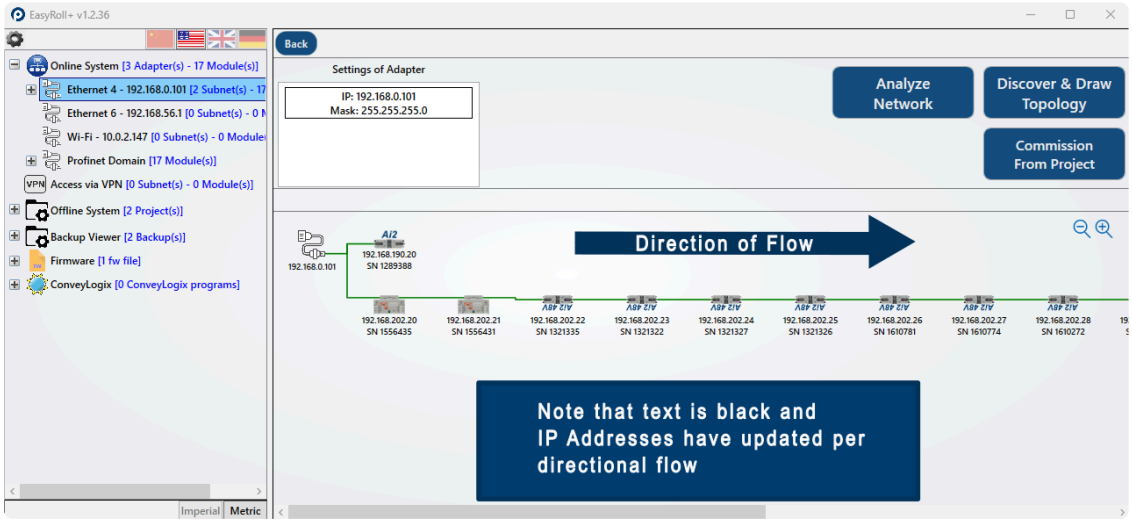
After a few seconds each Module is shown in physical topology order from the PC



If the most upstream module is the one closest to the PC, select it, then right click and select *AutoConfig from Here*. This will start the procedure.



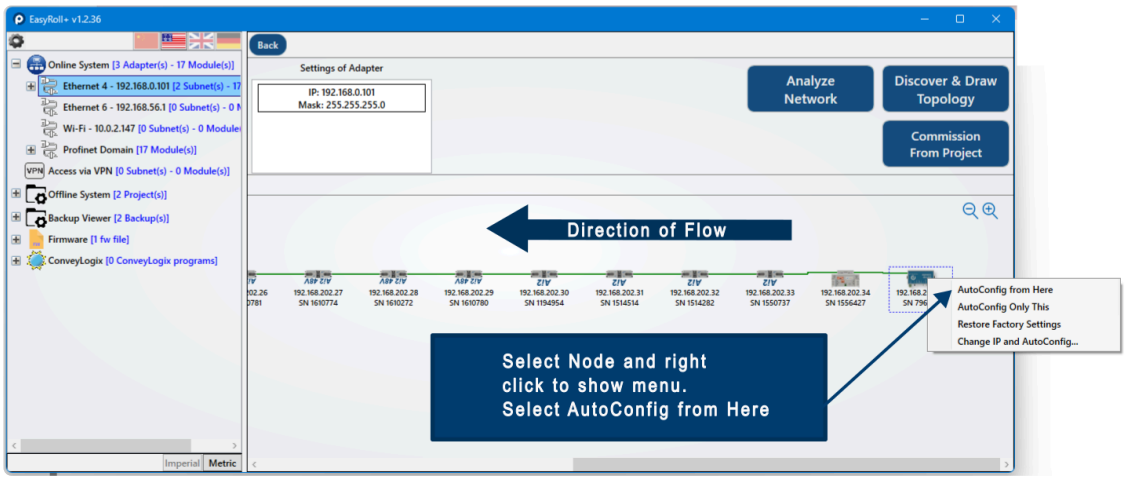
When the procedure is done, you will see the text go from red to black and you will notice that the I.P. addresses have updated per the direction of



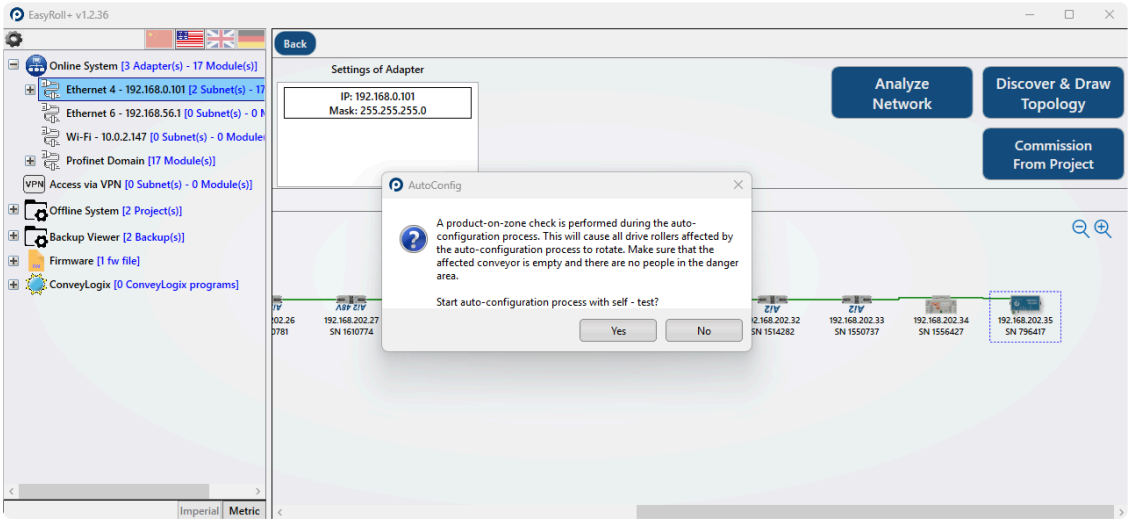
flow

To Change the Direction of Flow – Select the Module at the Opposite End of the Network

If the most upstream module is the one farthest from the PC, select it, then right click and select *AutoConfig from Here*. This will start the procedure.



Once again a message will be triggered, please read it and check your system, them proceed. When the procedure is done, you will see the text go from red to black and you will notice that the I.P. addresses have updated the direction



of flow

> Please note that the time to complete the ***Auto-Configuration Procedure*** is dependent on the number of modules being configured. Larger networks will take more time than smaller networks

Online System

Online System

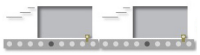
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

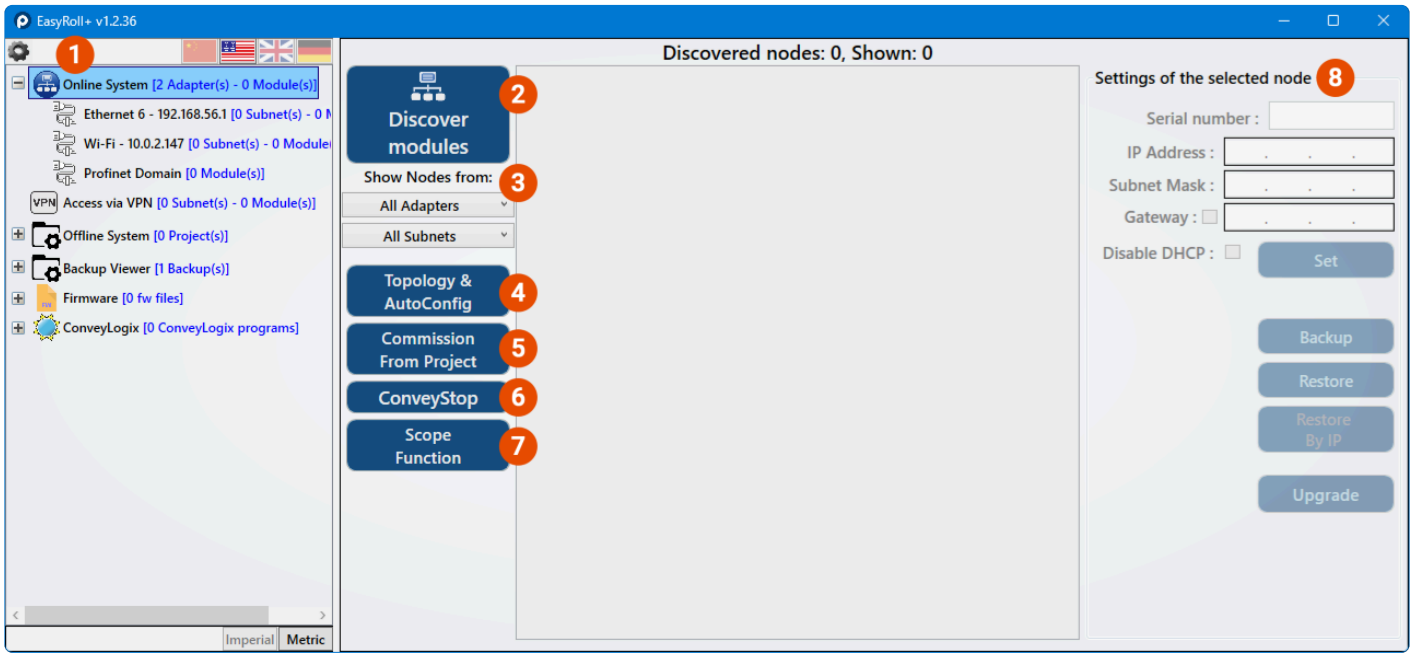
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The top level of the ***Online System*** presents the below screen. From here you may interact with many aspects of the Online System.



Item	Function	Description
1	Online System	• *Click to open the Online System screen* • *Tree expands to show all Online System options* • *Right clicking allows you to Discover Modules on the network without navigating to the Import Backup button*

2	Discover Modules	• *Discover modules from the network, presents you a list of all found modules* • *Allows you to find and interact with specific modules in your system*
3	Show Nodes from:	• *Click "All Adapters" drop down to select between the Adapter Ethernet 6 and the Adapter Wifi* • *Click on "All Subnets" to specify a particular subnet on your network*
4	Topology & AutoConfig	• *Click this to open a topology view of all modules on the network* • *AutoConfig results in all modules having been configured to the same Subnet and Subnet Mask*
5	Commission From Project	• *Configured settings can be transferred from an offline project onto an online project by using the "Commission from Project" feature* • *Make setting up a system easy by creating an offline version of it in your office, then using it to configure the online application in the field*
6	ConveyStop	• *Click to configure the group of modules for ConveyStop* • *Make sure to have a new project saved as you are beginning to use **EasyRoll+** for your ConveyStop needs*
7	Scope Function	• *Allows you to trouble shoot particular instances of your process by graphing data either in Real Time or by Traces* • *Graph multiple data points, choose the parameters within which you gather the data, and then save the produced files to review or compare later*
8	Settings of the selected node	• *Shows existing configuration for the selected module* • *Allows you to Set new settings, Backup the configured module settings, Restore previous settings, Restore the module by its IP address, and to upgrade the firmware of the selected node*

Learn More:

Network Adapters

ConveyStop

Scope Function

ProfiNet Domain

Network Adapters

Online System /

Network Adapters

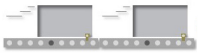
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

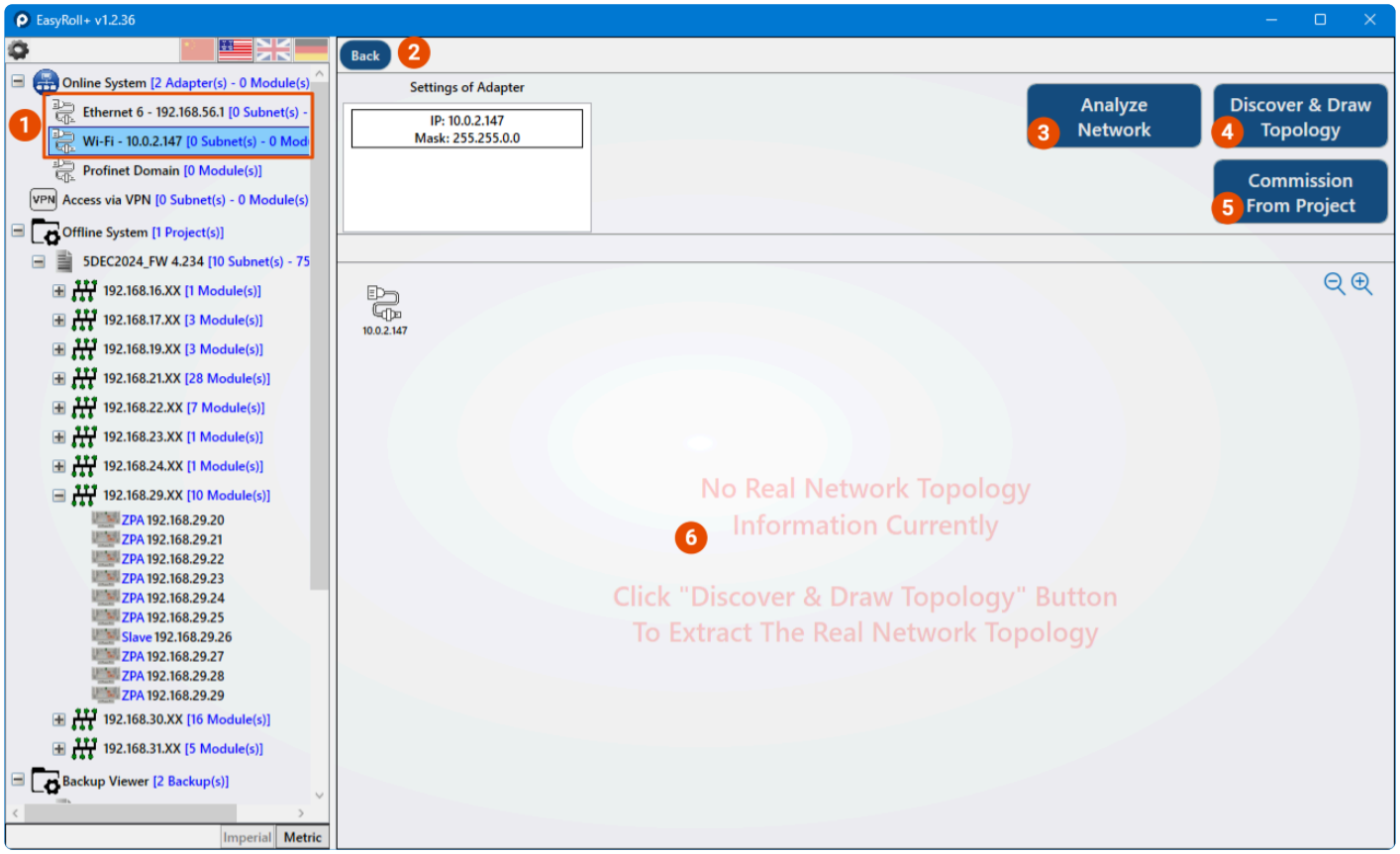
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Selecting one of the ***Network Adapters*** from the Online System tree presents the below screen. From here you may interact with many aspects of the adapter.



Item	Function	Description

1	Adapter	• *Other adapters will be shown in this tree just as Wi-Fi, Ethernet 6, etc. is* • *Right clicking opens a context menu with "Discover & Draw Topology", "Disable", and "Reorder IPs"*
2	Back	• *Return to the Online System Screen*
3	Analyze Network	• *Click to view the settings within which the network is analyzed* • *Adjust criteria such as Motors, Zones and Sensors before continuing to "Save & Analyze"*
4	Discover & Draw Topology	• *Click to discover all of the connected modules and their location on the network* • *Please use caution when connected to a network with a running system, as this procedure temporarily Stops the system and breaks PLC connection*
5	Commission From Project	• *Transfer settings and Ip Addresses configured on offline projects onto online projects* • *Helpful for working on a system in the office then going to the floor to implement the configuration.*
6	Network Topology	• *Here you can see the Ethernet adapter's IP address* • *Modules found within the Networks Topography will be displayed here after "Discover & Draw Topography" has been run*

If changing protocols, please be sure to either complete the Auto Configuration procedure again or revert to default factory settings to ensure

Learn More:

Discover & Draw Topology

Analyze Network

Commission from Project

Discover & Draw Topology

Online System / Network Adapters /

Discover & Draw Topology

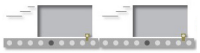
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

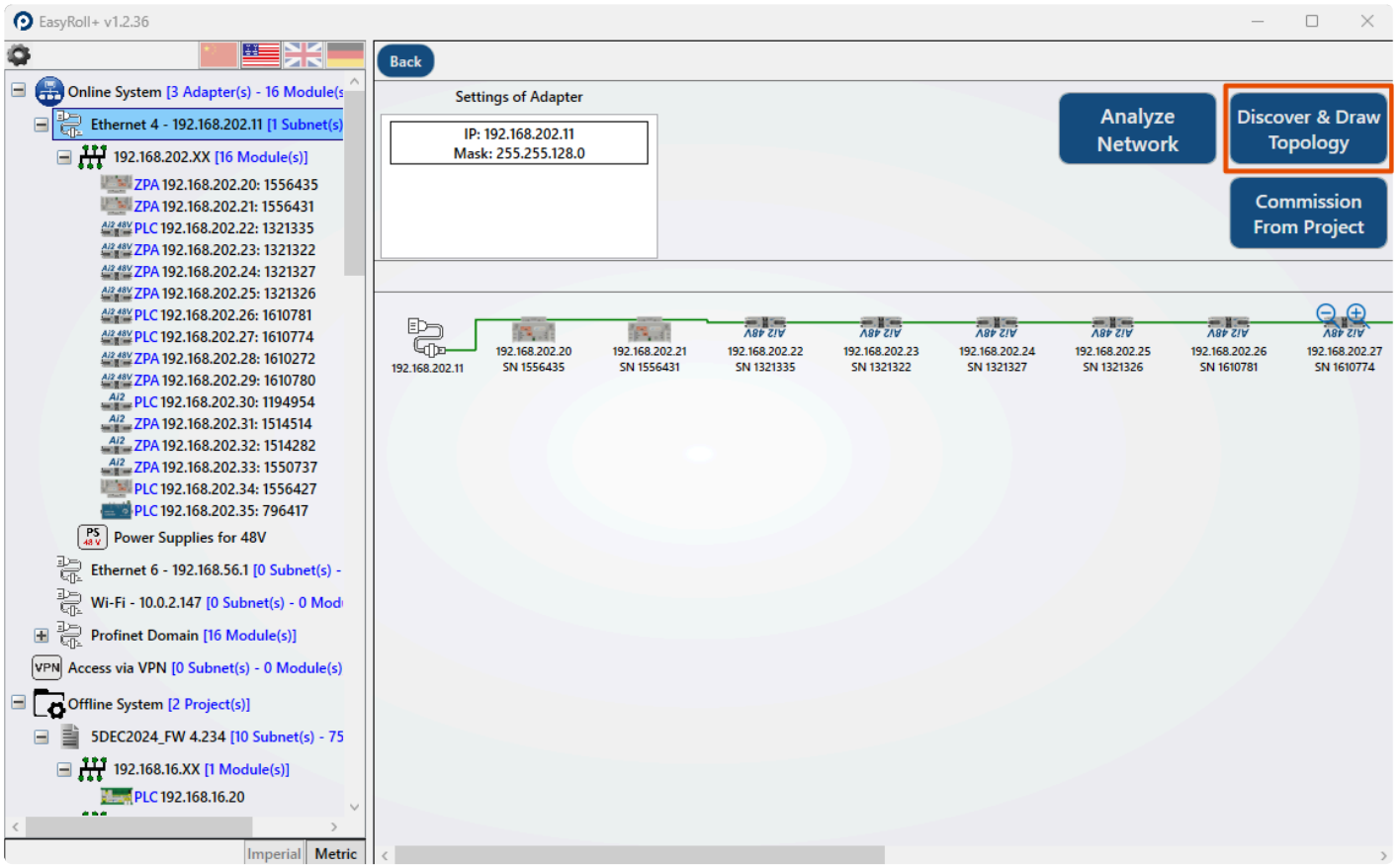
ZPA Mode ?



PLC I/O Mode ?

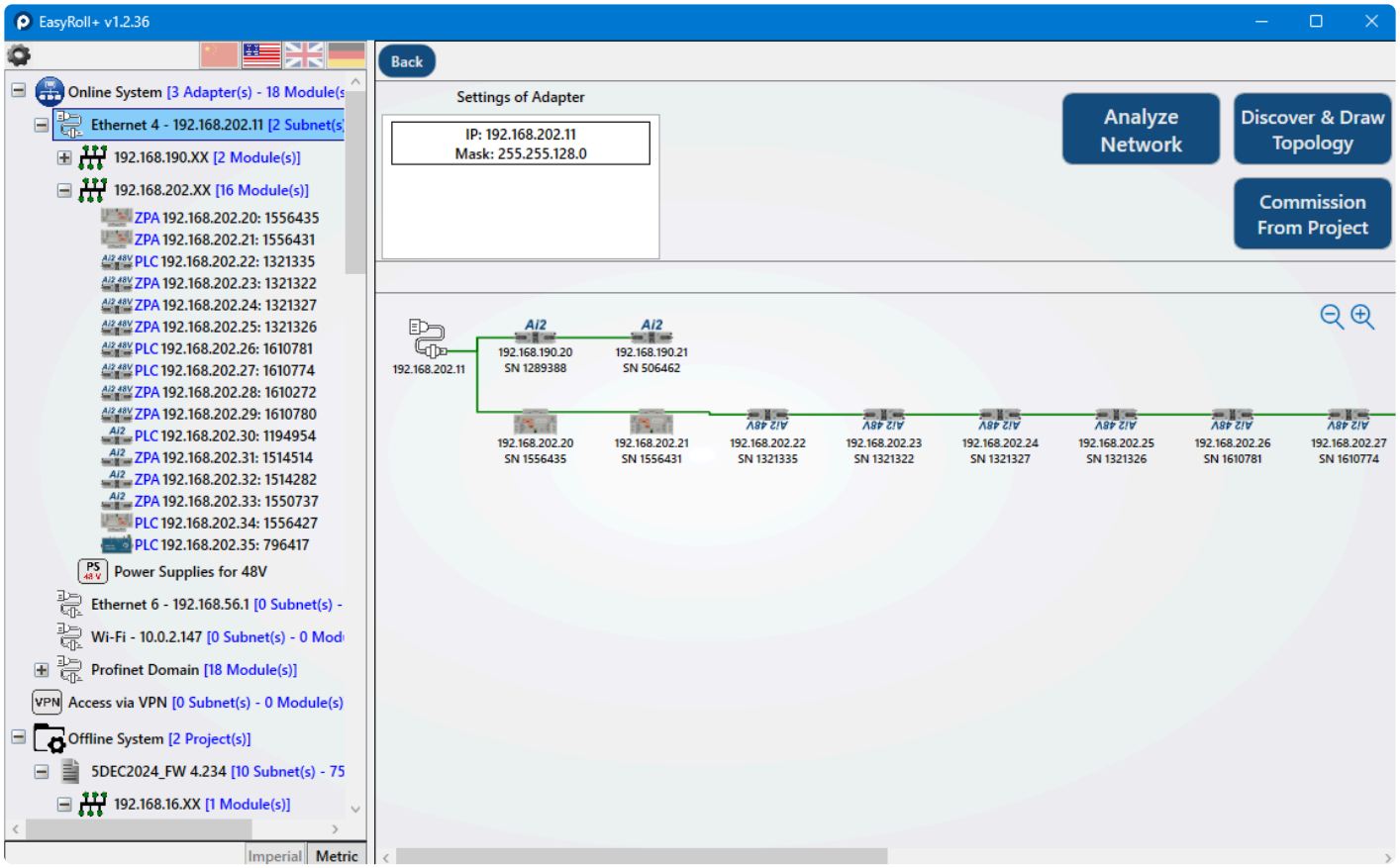
Discover and Draw Topology Button

This example is an Ethernet Adapter but it works the same for others. Click the button to ***Discover*** all modules on the network and view the ***Topology*** of how each module is connected to the network in relation to the next.



Resulting Discovered and Drawn Image

After utilizing the Discover and Draw Topology the resulting image will appear below. There are two subnets that are connected here, 192.168.190.xx, and 192.168.202.xx, they show all modules with their IP Address and Serial Numbers as well as the orientation of the modules. Modules appearing upside down are this way because of the Network Adapter being on the left, causing the flow to begin on the left where the Network Adapter is illustrated and go to the right.



This illustration does not determine product flow, nor does it replace the Auto Configuration functionality.

Analyze Network

Online System / Network Adapters /

Analyze Network

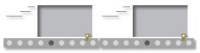
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

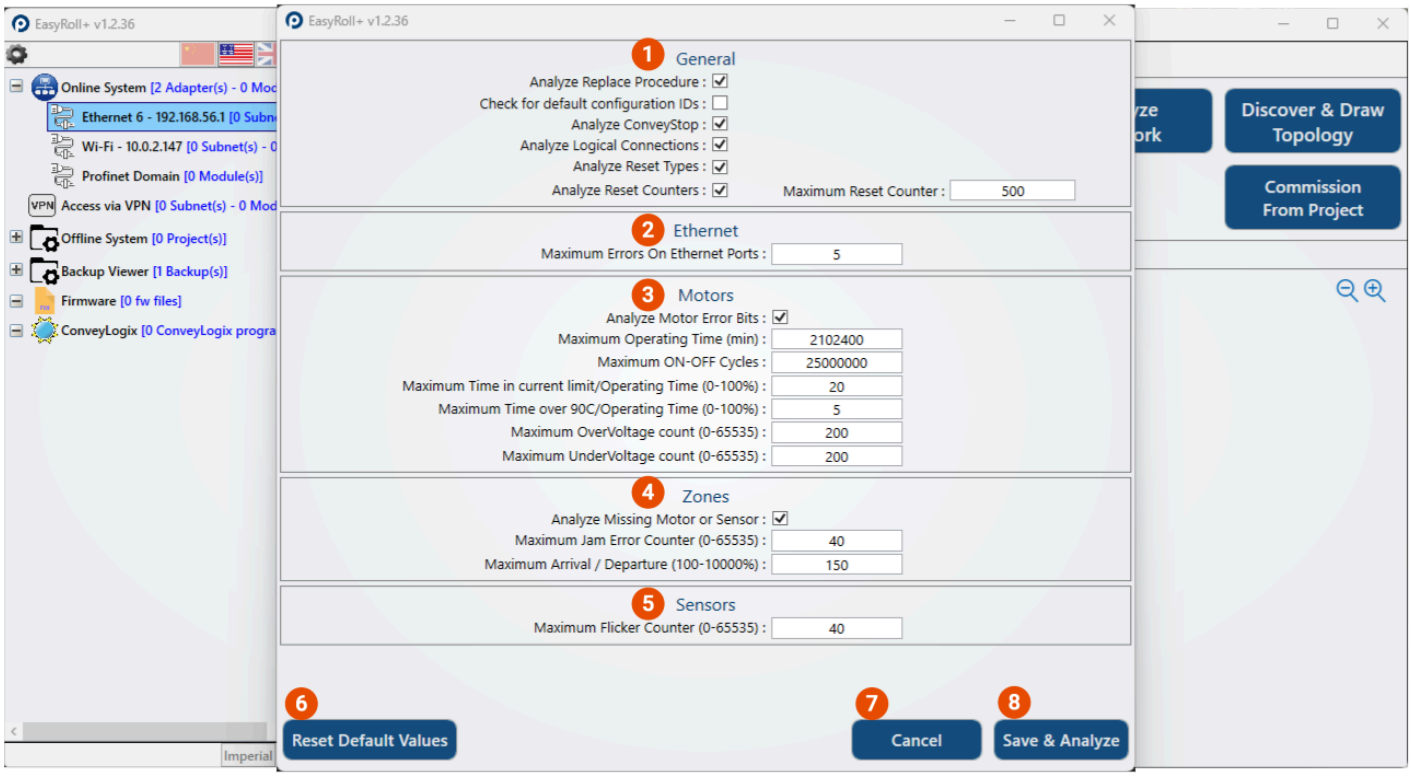
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Analyze one of the ***Network Adapters*** from the Online System. From here you may configure your criteria before continuing to analyze the network and its settings. This is a helpful tool in debugging and troubleshooting, as well as establishing norms for the system.

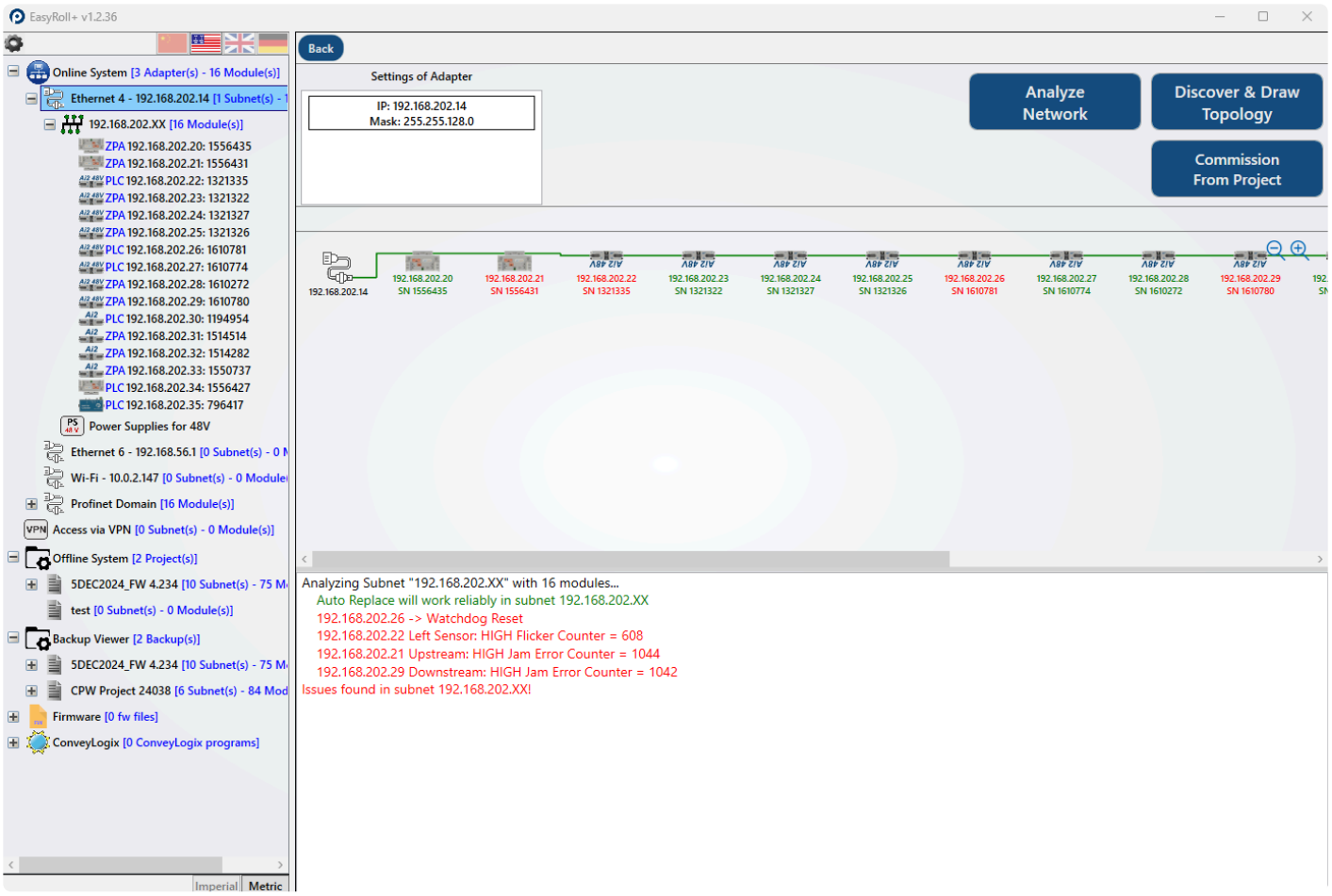


Item	Function	Description
1	General	• *Analyze Replace Procedure, Check for default configuration IDs, Analyze ConveyStop, Analyze Logical Connections, Analyze Restart Types, Analyze Reset Counters, and Set the Maximum Reset Counter* • *These general criteria for analysis may be necessary to analyze after initial configuration, when changes are made to an applicable criteria, when troubleshooting or other situations*
2	Ethernet	• *The maximum number of errors on ethernet ports may change based on many factors, the size of your system, the number of errors the users are comfortable with, the risk tolerance of the application, and more*
3	Motors	• *Analyze Motor Error Bits, Maximum Operating Time (min), Maximum On-Off Cycles, Maximum Time in current limit/ Operating Time(0-100%), Maximum Time over 90C Operating Time (0-100%), Maximum OverVoltage Count (0-65535), Maximum UnderVltage count (0-65535)*
4	Zones	• *Analyze Missing Motor or Sensor, Maximum Jam Error Counter (0-65535), Maximum Arrival / Departure (100-1,0000%)*
5	Sensors	• *Maximum Flicker Counter (0-65535)*
6	Reset Default Values	• *Click to restore the default values as pictured above*
7	Cancel	• *Click to return to the Analyze Network page*
8	Save & Continue	• *Click to confirm the settings and analyze the system*

Analyzed Network Results

Once you click “Analyze Network” and set to the parameters, both an image and log will

result. The image here in the middle of the page depicts each module, their Serial Number and IP Address, where they are in relation to the system, and their color coding. Red modules may have an error or simply have values outside of your set parameters from when you chose how to analyze. Green modules have no errors and all of their values fall within the parameters given. The log at the bottom third of the screen alerts you to what data has triggered the analyzer, and provides you with the IP Address of the offending module.



Commission from Project

Online System / Network Adapters /

Commission from Project

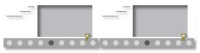
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

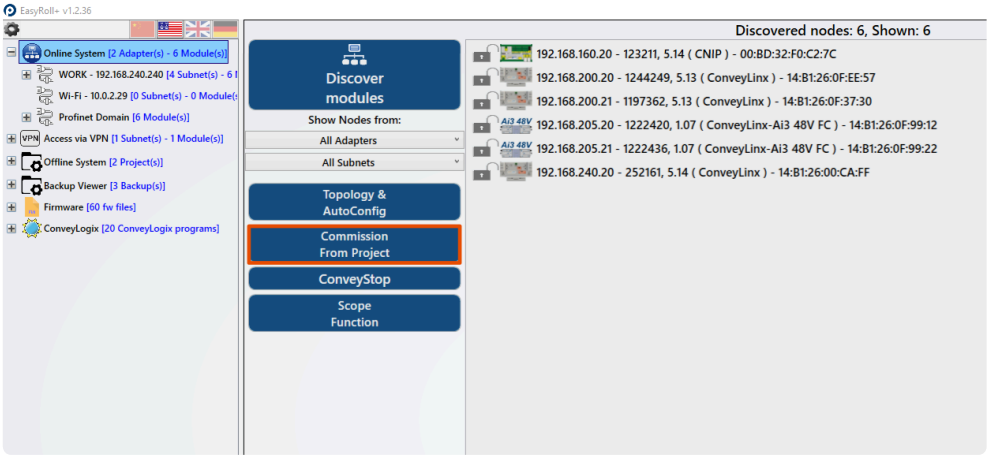
ZPA Mode ?



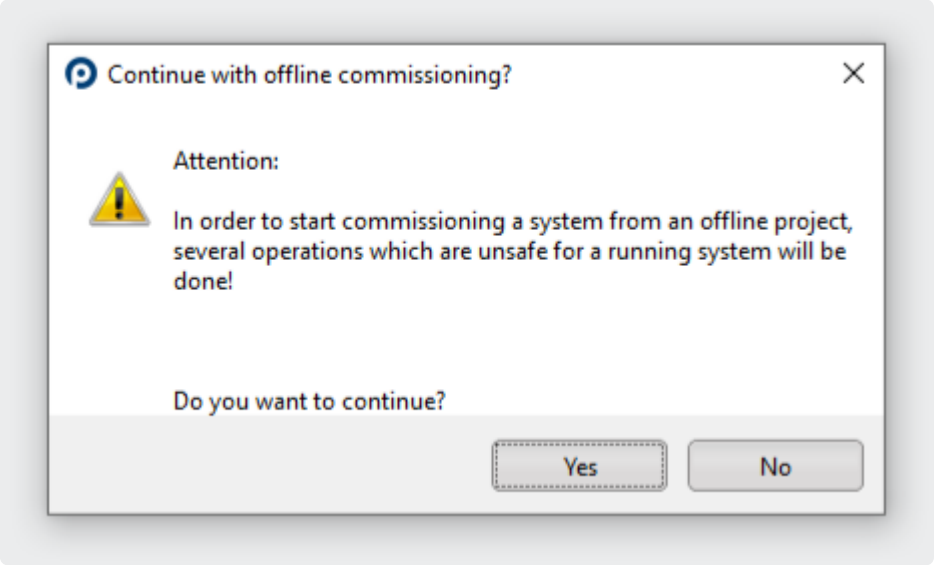
PLC I/O Mode ?

Configured network settings and procedural/behavioral settings can be transferred from an offline project onto an online project by using the “Commission from Project” feature.

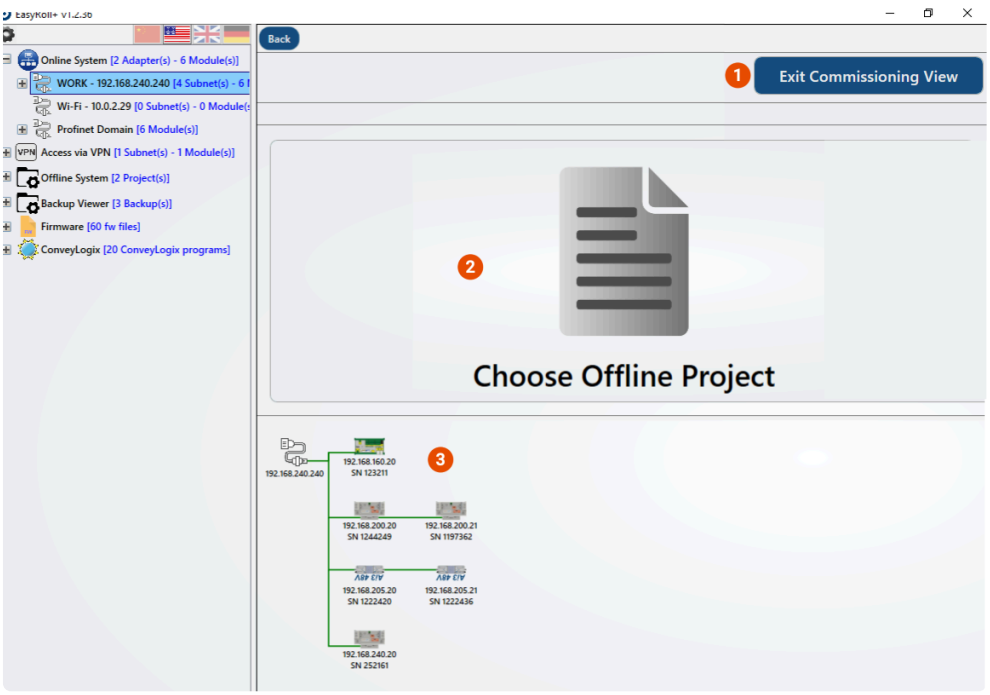
Step One: Click Commission Project Button



Step Two: Confirm that your system is prepared to have its connection altered and is stopped in a safe way



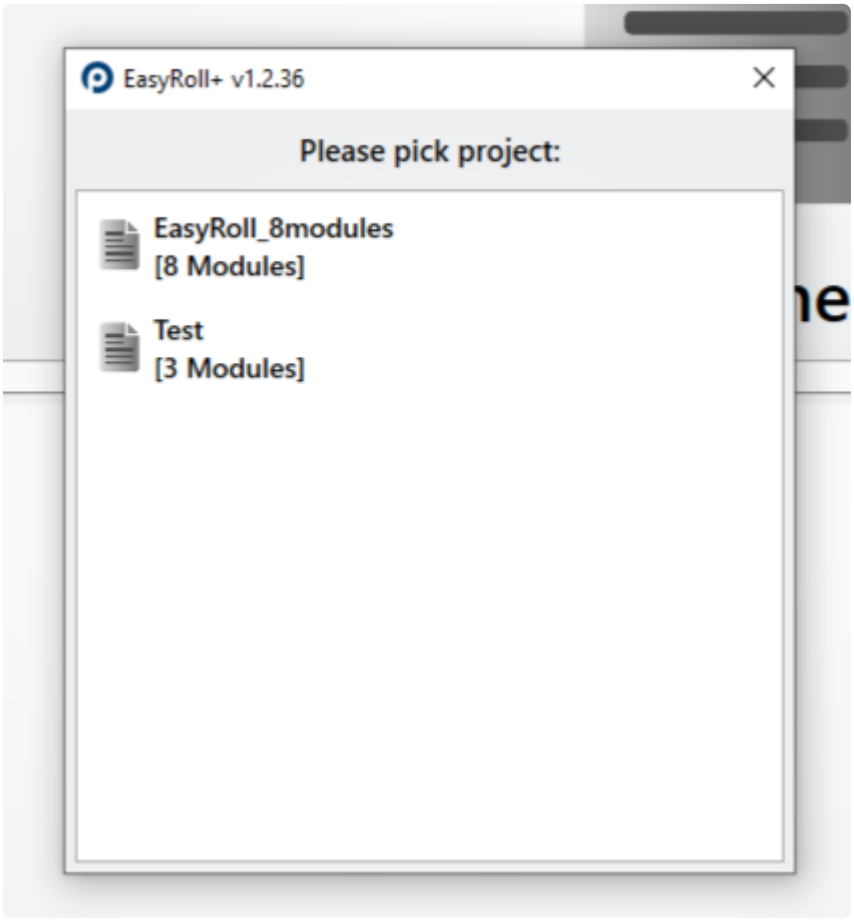
Step Three: Click Choose Offline Project to select which project you'd like to use the configured information from



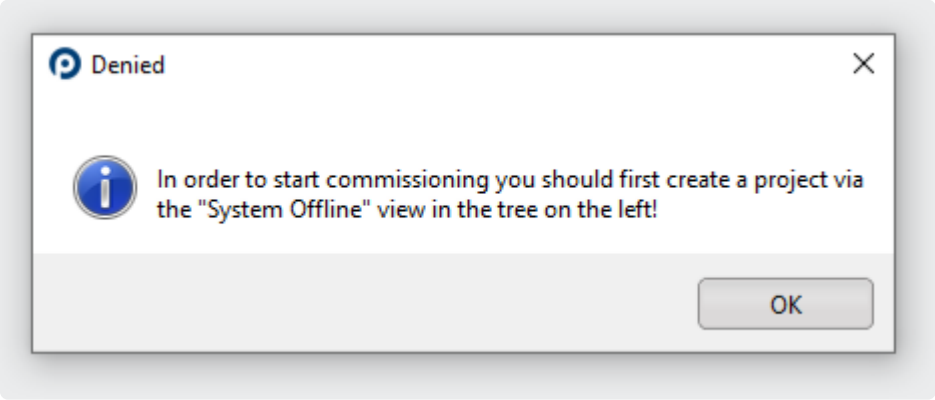
Item	Function	Description
1	Exit Commissioning View	• *Go back to the Online screen, perhaps you're done or need to create a new offline project with adjusted details*
2	Choose Offline Project	• *A dialog box will pop up with all of your existing Offline projects. Choose one to continue*

3	Topology	• *Shows the selected Network Adapter's online system*

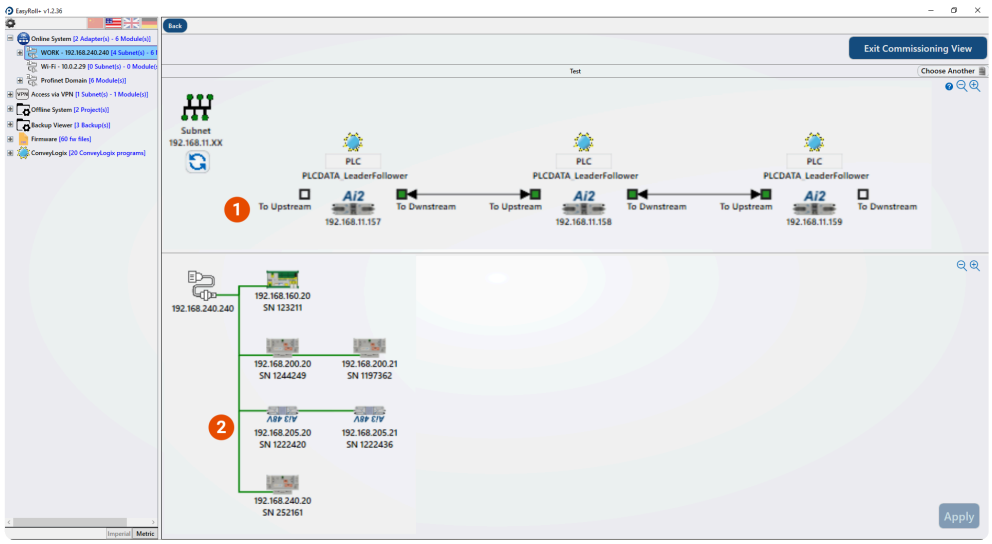
Step Four: Select the offline project you'd like to use



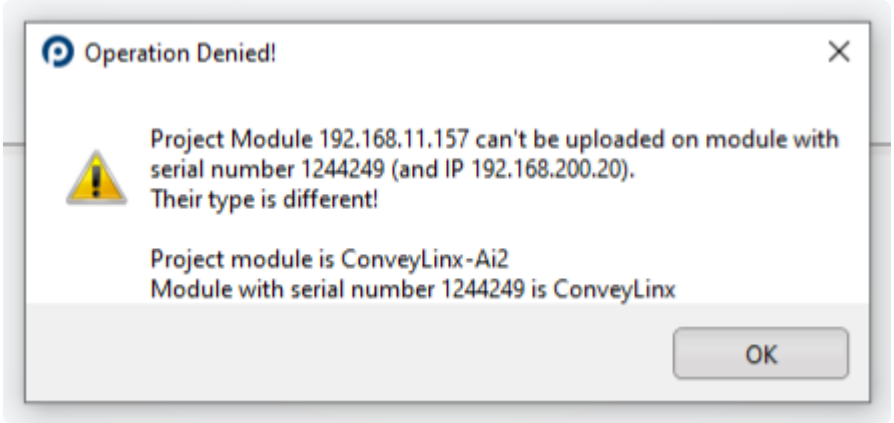
Note: You must have an offline project in the offline project section of EasyRoll+ in order to use the commission from project feature. This warning will show if you do not have one ready



Step Five: Drag and drop a module from the system in part 1 onto a module from the system in part 2. The module that you drop has the attributes that will be transferred to the module you drop onto.



Note: You must drag and drop modules of the same type onto each other. Trying to put different types of modules together will result in this warning



ConveyStop

Online System / Network Adapters /

ConveyStop

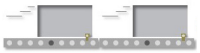
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

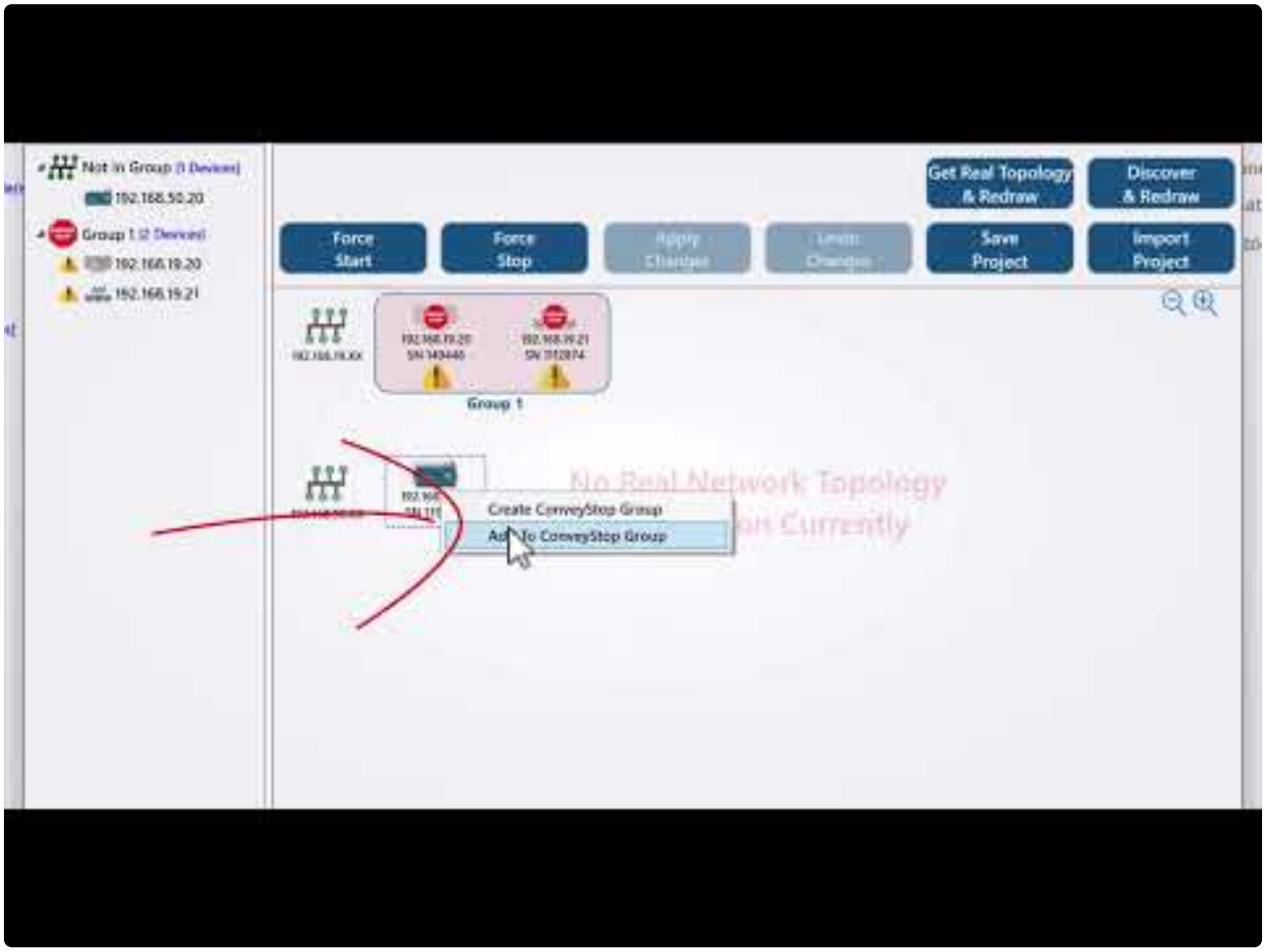
ConveyLinx-ECO ?

ZPA Mode ?



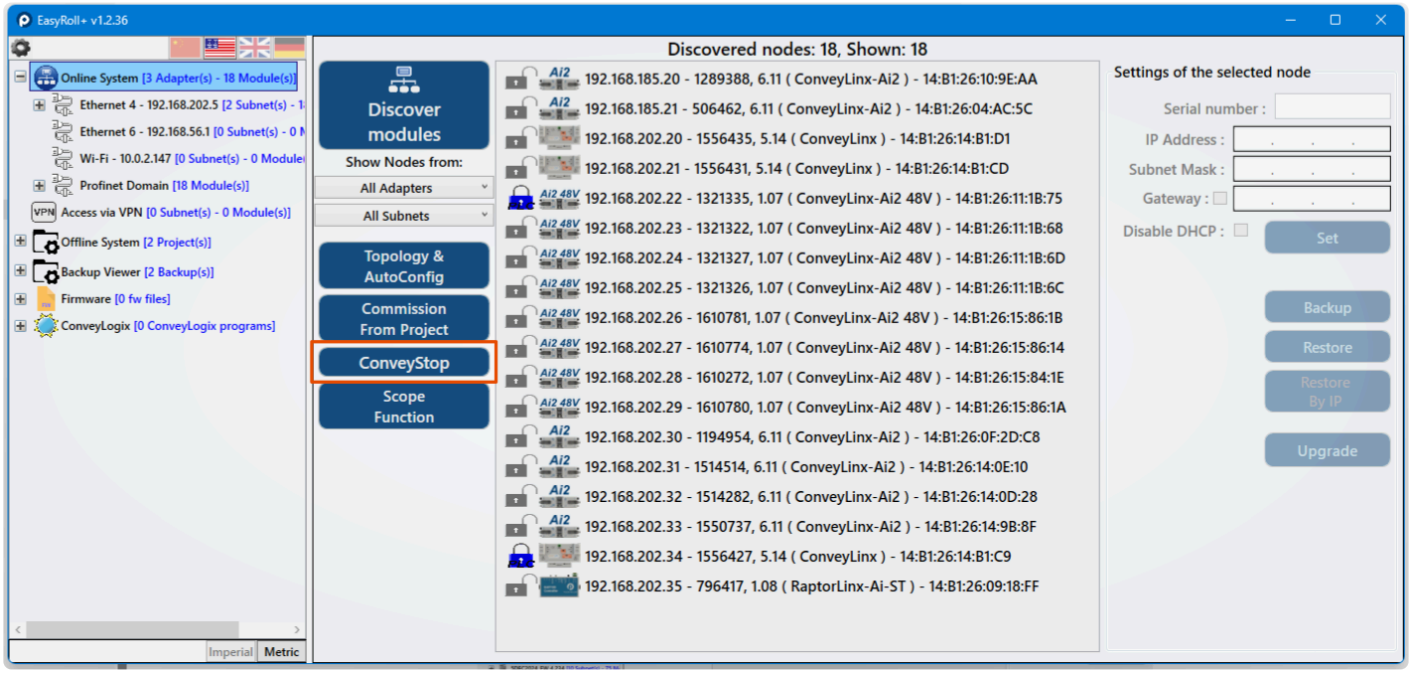
PLC I/O Mode ?

The below tutorial video walks you through creating and altering Stop Groups in ConveyStop.

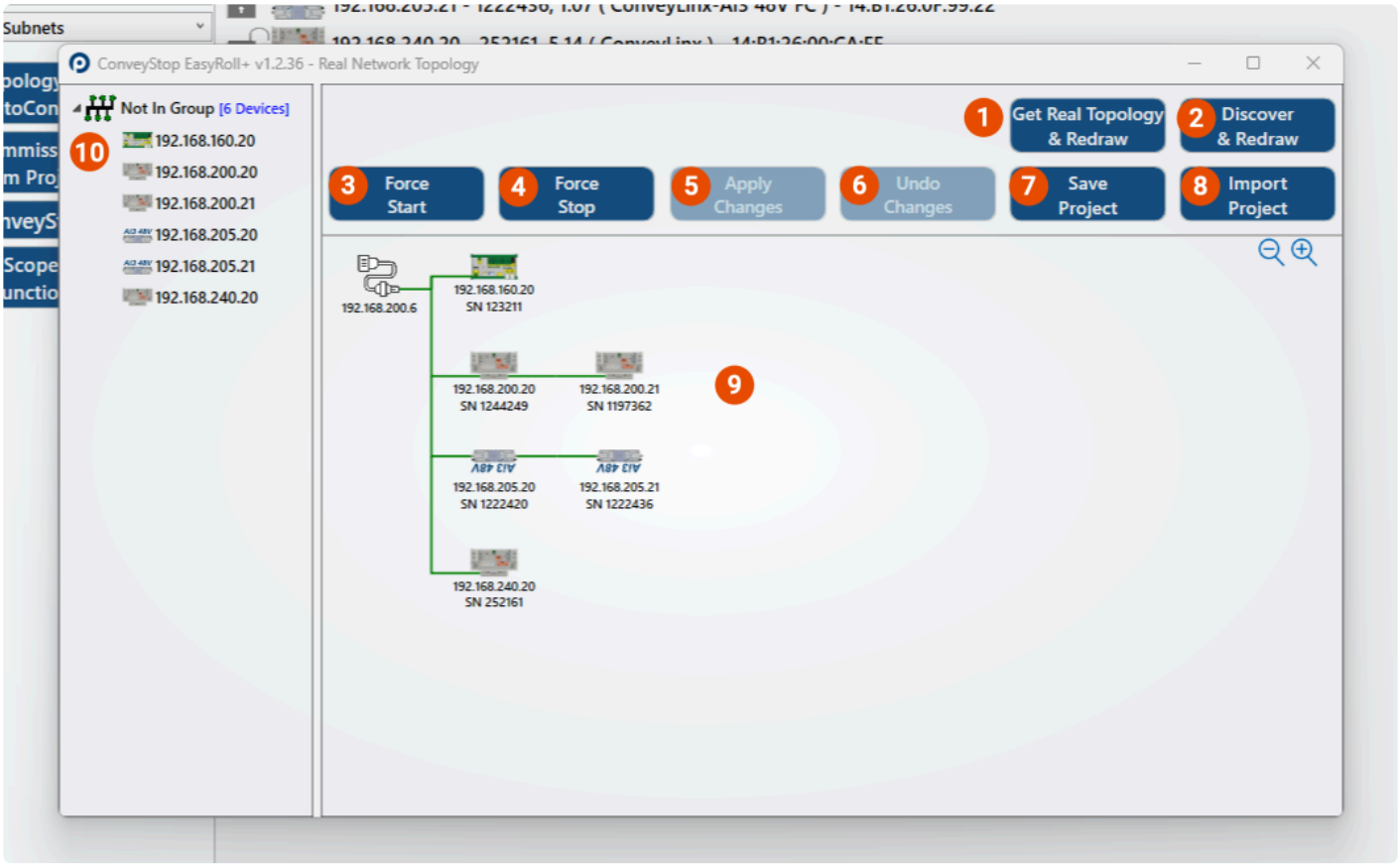


https://www.youtube.com/embed/R1jPkFlepZc?rel=0

The below image shows you how to navigate to the ConveyStop page from the Online System page



Configure your Stop Groups. Create and modify groupings to be controlled by the start and stops. Force starting and stopping of the selected group.



Item	Function	Description
1	Get Real Topology & Redraw	• *Draw how each module is connected to each other in real time, this includes orientation, upstream downstream, the types of modules, their serial numbers and Ip addresses* • *May be helpful if any changes have been implemented to redraw the system before continuing*
2	Discover & Redraw	• *Discover modules on the network and display their individual Ip Addresses, module types and Serial Numbers.* • *Draws the relationships that each of the discovered modules have to each other*
3	Force Start	• *Start the system as it is*
4	Force Stop	• *Halt the system in (approximate) place*
5	Apply	• *Applies the changes you have made to the applicable*

	Changes	*modules and groups*
6	Undo Changes	• *Cancels most recent changes made to relevant modules and groups*
7	Save Project	• *Save your project before exiting*
8	Import Project	• *Import a project which has been created in EasyRoll+*
9	Topology & Groupings	• *Shows the relationships of any connected modules in the system as well as their current groupings* • *Right click on a module to add or remove it to a group, or select multiple modules to add or remove them to groups, or to create a new group. Additionally right clicking an individual module can add a "Left Start", "Left Emergency", "Right Start", or "Right Emergency"*
10	All Devices	• *This list shows all discovered modules and whether or not they are grouped* • *Grouped and ungrouped modules have the same right click options as they do in the Topology & Groupings section*

How to Make a module the PLC Informer

Assign which module should be the one for inform the PLC about which module has triggered a stop.

Step One:

First click "Get Real Topology & Redraw", confirm and wait for updated image of the system

Step Two:

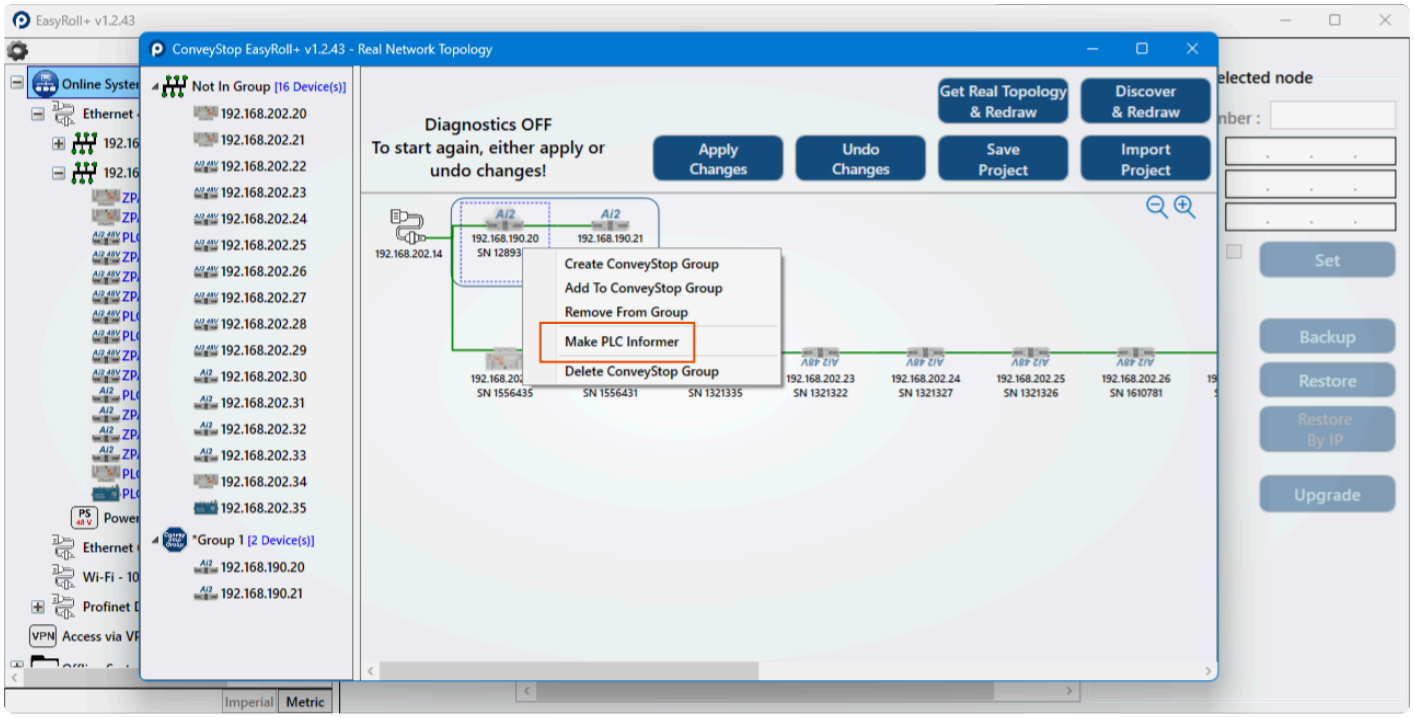
Group desired modules by clicking and dragging across all of the modules, then right click on them and choose "Create ConveyStop Group"

Step Three:

Right click on the module that you would like the assign the informer role, and click the option for “Make PLC Informer”

Step Four:

Click “Apply Changes”



Scope Function

Online System / Network Adapters /

Scope Function

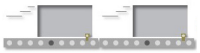
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

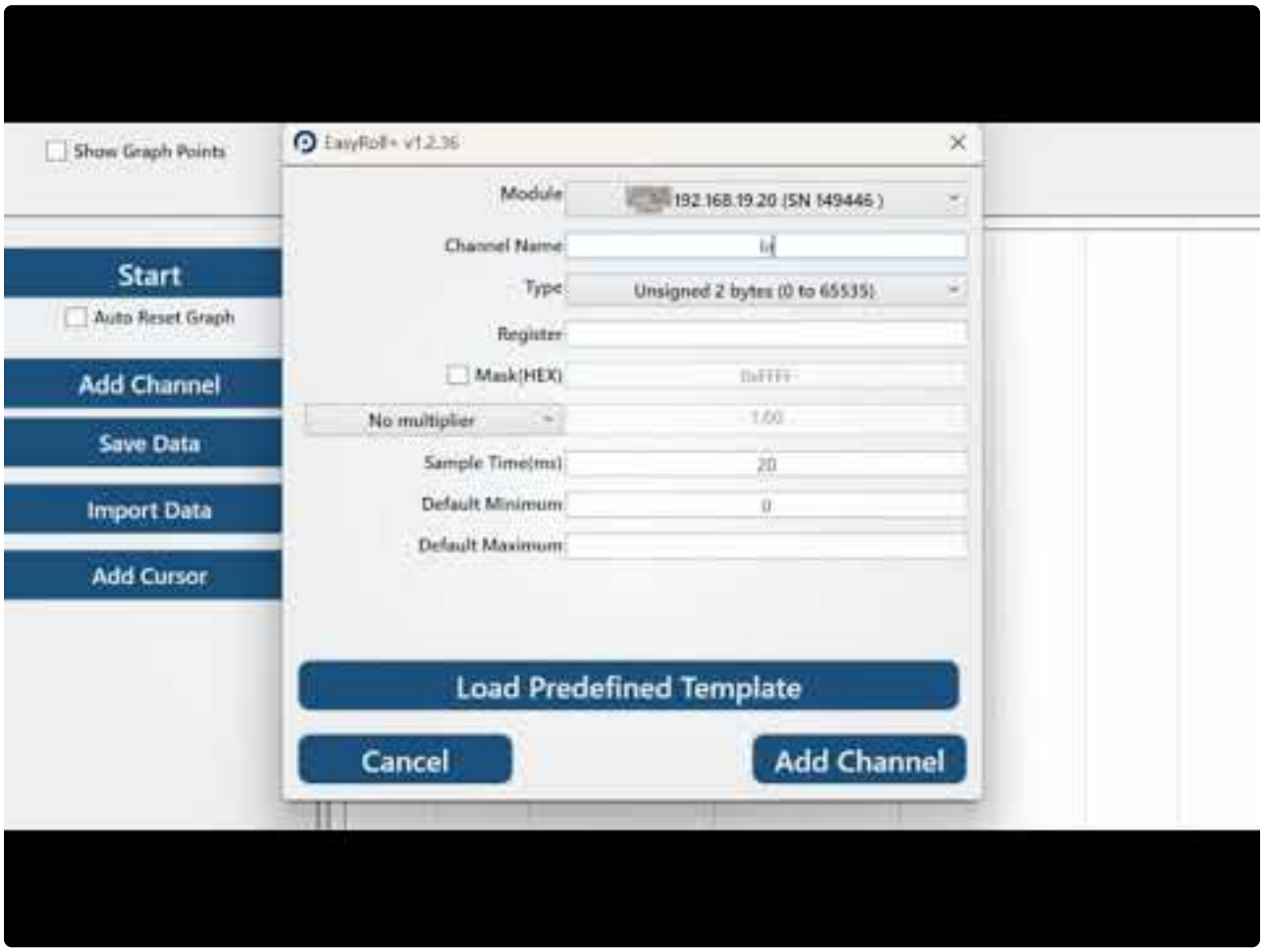
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

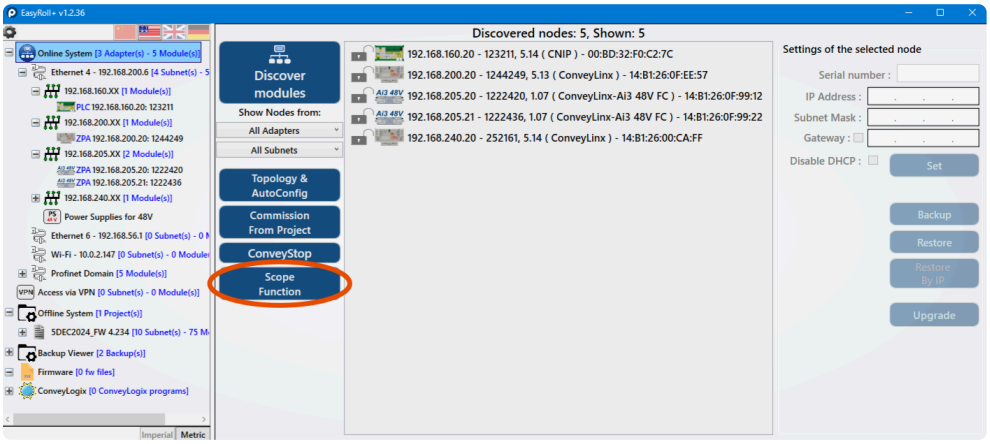
The below is a video tutorial for the Scope Function



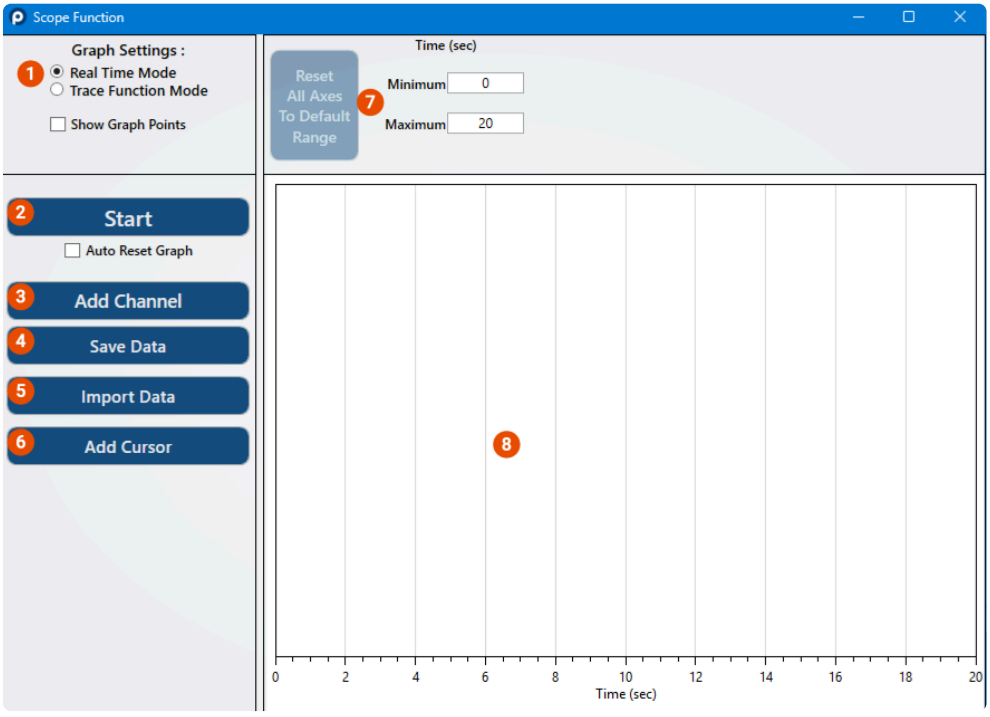
https://www.youtube.com/embed/ruZ0if6u0WM?rel=0

The Scope Function graphs user-chosen data points across a user-chosen amount of time, on a user-chosen ConveyLinx module. Provides the ability to help troubleshoot and test, as charting a graph of chosen data points can help you make evidence data-based adjustments to your system.

Navigating to the Scope Functionality: Click Scope Function button from the Online System



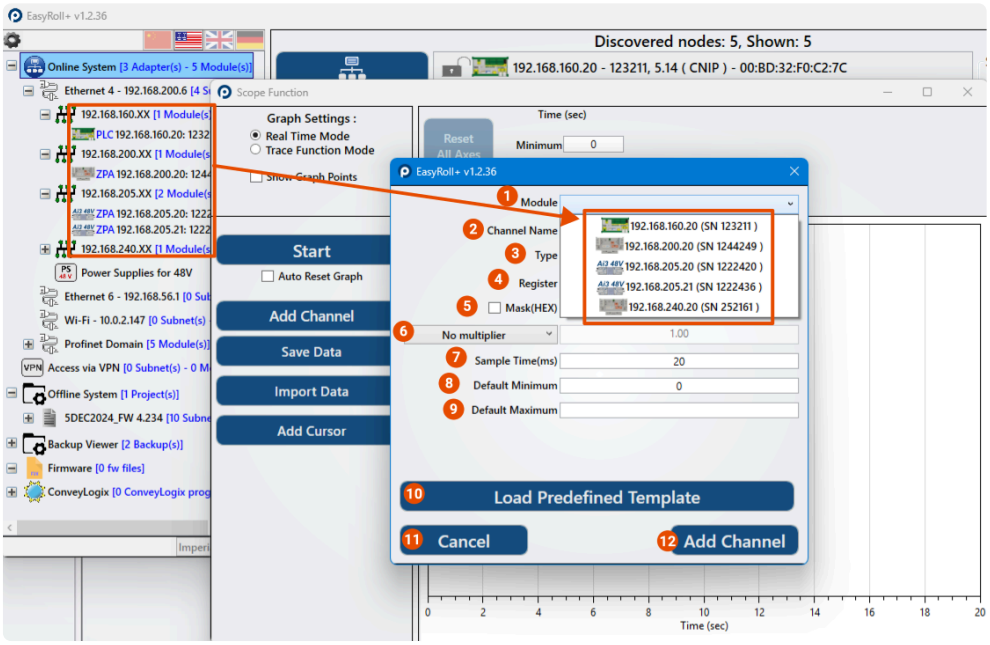
Scope Function's Main Screen:



Item	Function	Description
1	Graph Settings	• *Real Time Mode provides all of the functionality you*

		need to gather data from the module and is the most commonly used setting • *Trace Functionality Mode provides intricate detail, primarily used by our internal teams and not generally recommended to be used by customers*
2	Start	• *Begins the recording period, starts graphing the configured channels for the configured amount of time*
3	Add Channel	• *Opens up the dialog box to establish the settings for your new channel, includes what module you'd like to record information from, which data you'd like to be charted and more*
4	Save Data	• *If you'd like to save the findings for future use, be sure to Save the Data before closing the program. It will be saved as a bin file*
5	Import Data	• *Launches a dialog box to access previously saved data from your computer*
6	Add Cursor	• *Adds a line on the x-axis to provide additional context or helpful timeline markers to the graph*
7	Axis Configuration	• *The default range of the axes are 0 to 20 seconds, which is what resetting would return the values to*
8	Graph	• *Here is where each cursor, channel, and the channel key will be. Each channel is a different color and the key shows you each color*

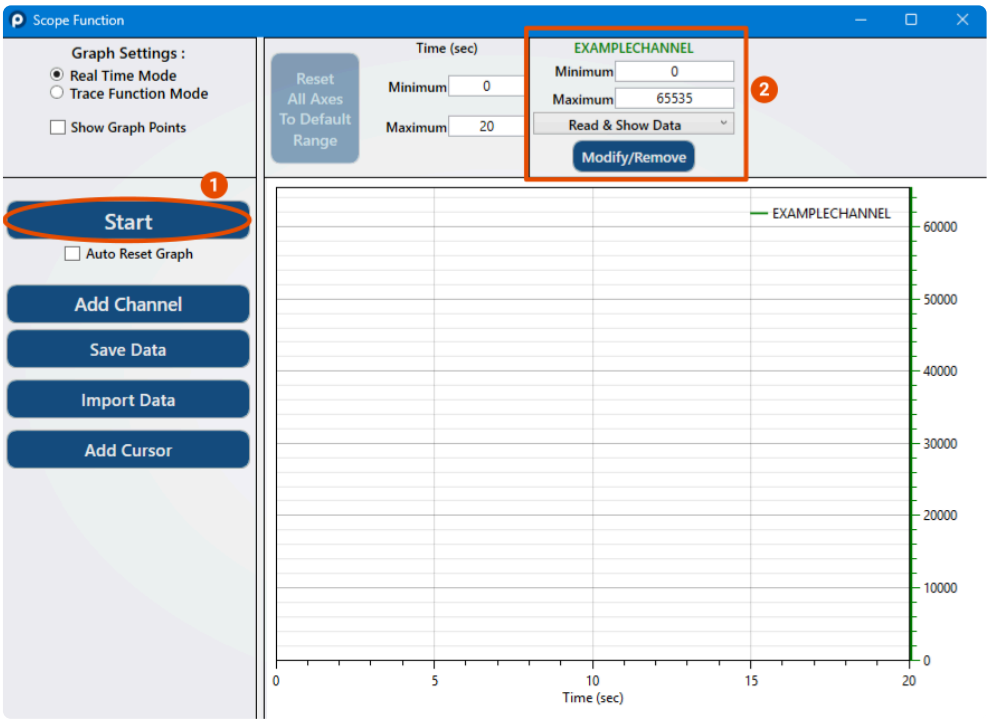
Adding a Channel: Configure your new channel(s)



Item	Function	Description
1	Module	• *This drop down will show all of the available modules, exactly as you see in the Online System tree on the left* • *Select the module that you'd like to analyze*
2	Channel Name	• *Choose a meaningful name for this channel, keeping in mind other channels you may add*
3	Type	• *Unsigned 2 bytes (0 to 65535), Signed 2 bytes (-32768 to + 32767), Unsigned 4 bytes, Signed 4 bytes*
4	Register	• *You must select the register to pull the correct data, for example the Left Encoder Position will require Register 62.* • *In order to determine which register you will need to use, please refer to the Developers Guide* • *The register is module specific, so be conscious of what data you'd like to pull from which module in your system*
5	Mask (HEX)	• *It may be necessary to have all of your data returned as positive values, default is 0xFFFF, but you can adjust it to suit your bit needs*

6	Multiplier	• *Choose to use No Multipler, Multiplier, and Divider. You can choose how much to multiply or divide the values by in order to have the graph points appear more or less salient, or to work with a specific data analysis strategy you may have*
7	Sample Time(ms)	• *The amount of time that the data is recorded for*
8	Default Minimum	• *The default minimum value of the recorded data, this is automatically set when you determine the data & data type you'll be recording but can be adjusted to suit your requirements*
9	Default Maximum	• *The default maximum value of the recorded data, this is automatically set when you determine the data & data type you'll be recording but can be adjusted to suit your requirements*
10	Load Predefined Template	• *Preconfigured Templates will include any channels you've already added* • *Default Templates include Left Motor Speed (mm/s), Right Motor Speed (mm/s), Left Encoder Position, Right Encoder Position, Left Motor Servo Command, Right Motor Servo Command, Left Motor Servo Status, Right Motor Servo Status*
11	Cancel	• *Go back to the Scope Function main page and cancel adding a channel*
12	Add Channel	• *Confirms all of the settings in the form and creates the channel*

Begin graphing the data



Item	Function	Description
1	Start	• *Begins graphing all of your existing channels*
2	Existing Channel	• *This minimum and maximum are preconfigured when you set the channel up but can be edited here* • *Removing or Modifying the channel is possible before starting the session* • *You may wish to alter a channel's reporting ability without removing or editing it. Your options are Read & Show Data, Hide Data From Graph, Deactivate Data (Don't Read), Deactivate & Hide Data*

ProfiNet Domain

Online System /

ProfiNet Domain

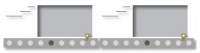
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

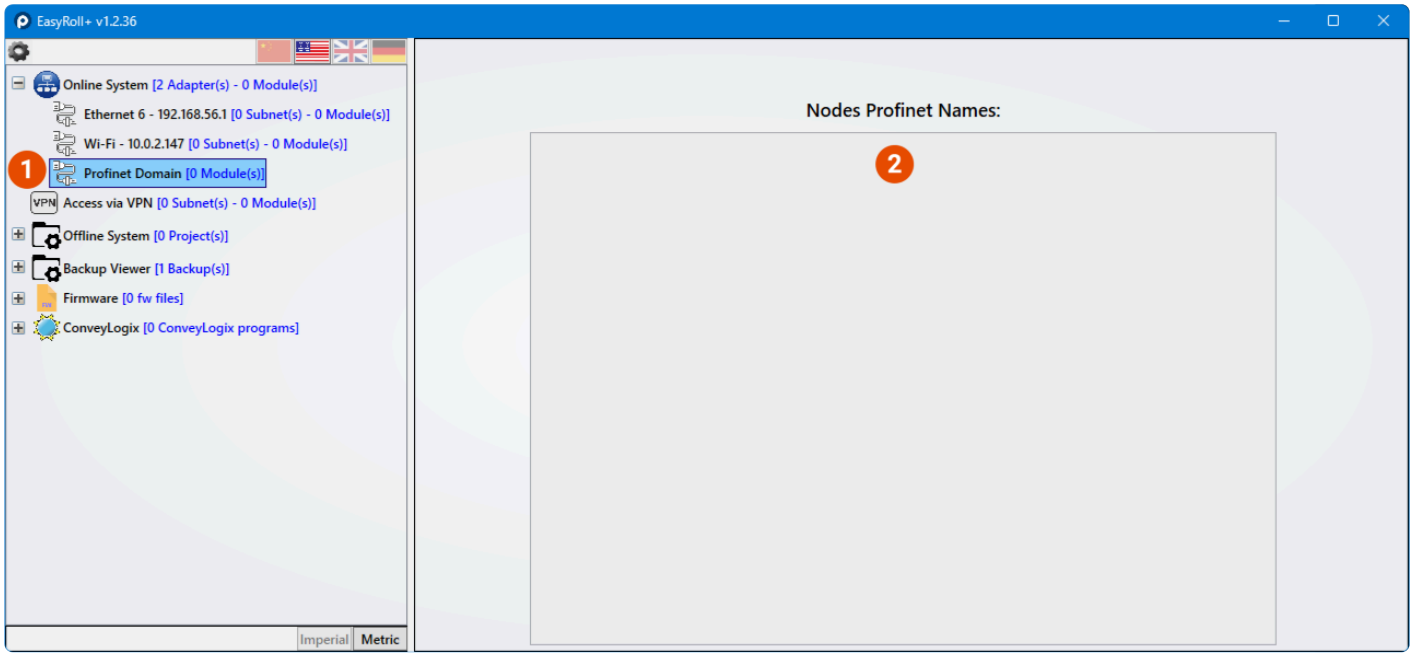
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

Selecting the ***ProfiNet Domain*** from the Online System tree presents the below screen. From here you may interact with the Modules communicating over the PROFINET protocol.



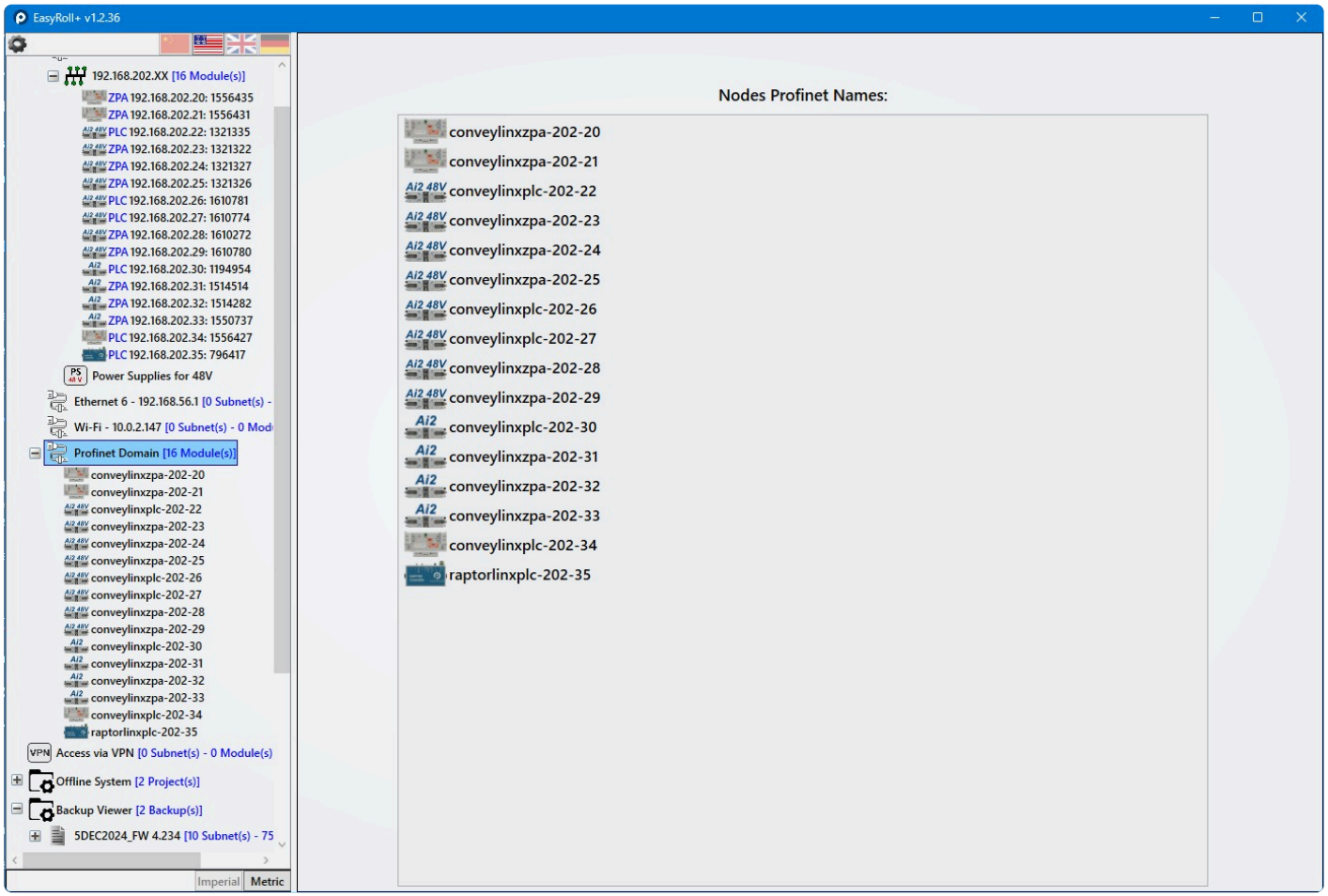
Item	Function	Description
1	ProfiNet Domain	• *Modules connected to the system through ProfiNet connection*

2 Nodes Profinet Names

- *All modules will be displayed here with their individual applicable information*

If changing protocols, please be sure to either complete the Auto Configuration procedure again or revert to default factory settings

Below is an image of the ProfiNet Domain Network with modules and their names on the ProfiNet Domain Network.



Reset To Factory Defaults

Online System /

Reset To Factory Defaults

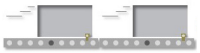
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

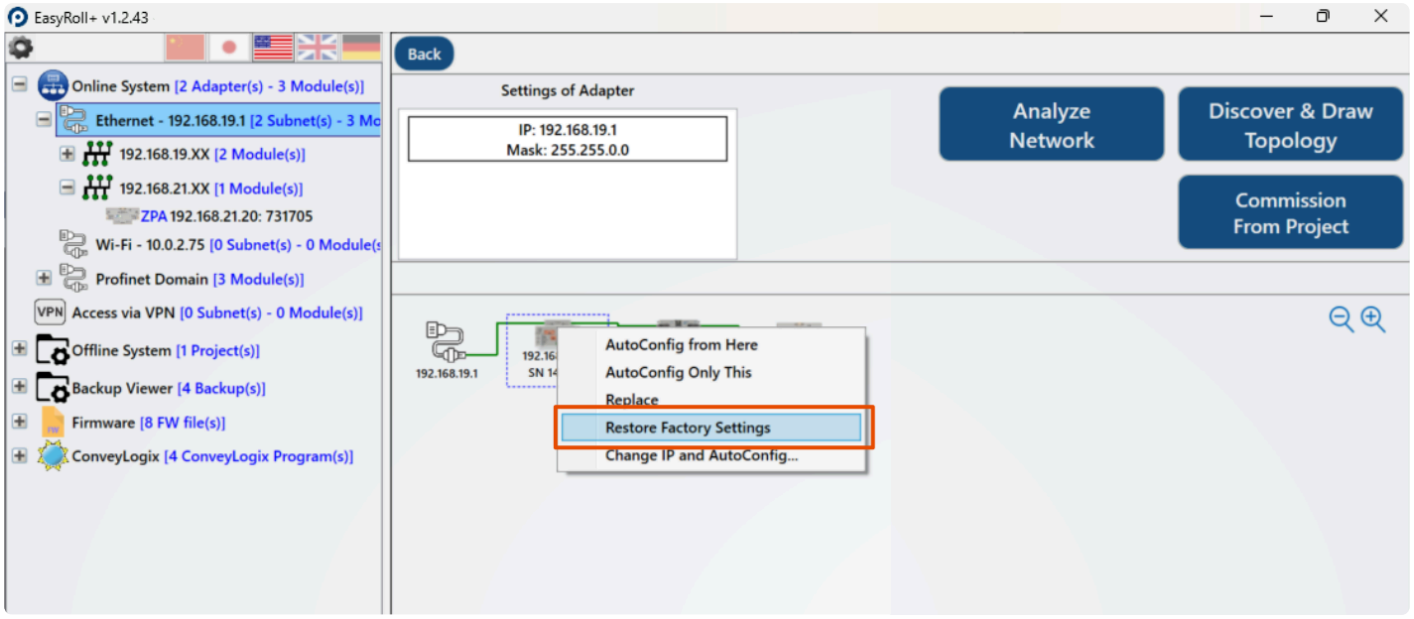


PLC I/O Mode ?

The ConveyLinx-ERSC and the ConveyLinx-ECO can be factory reset through EasyRoll+

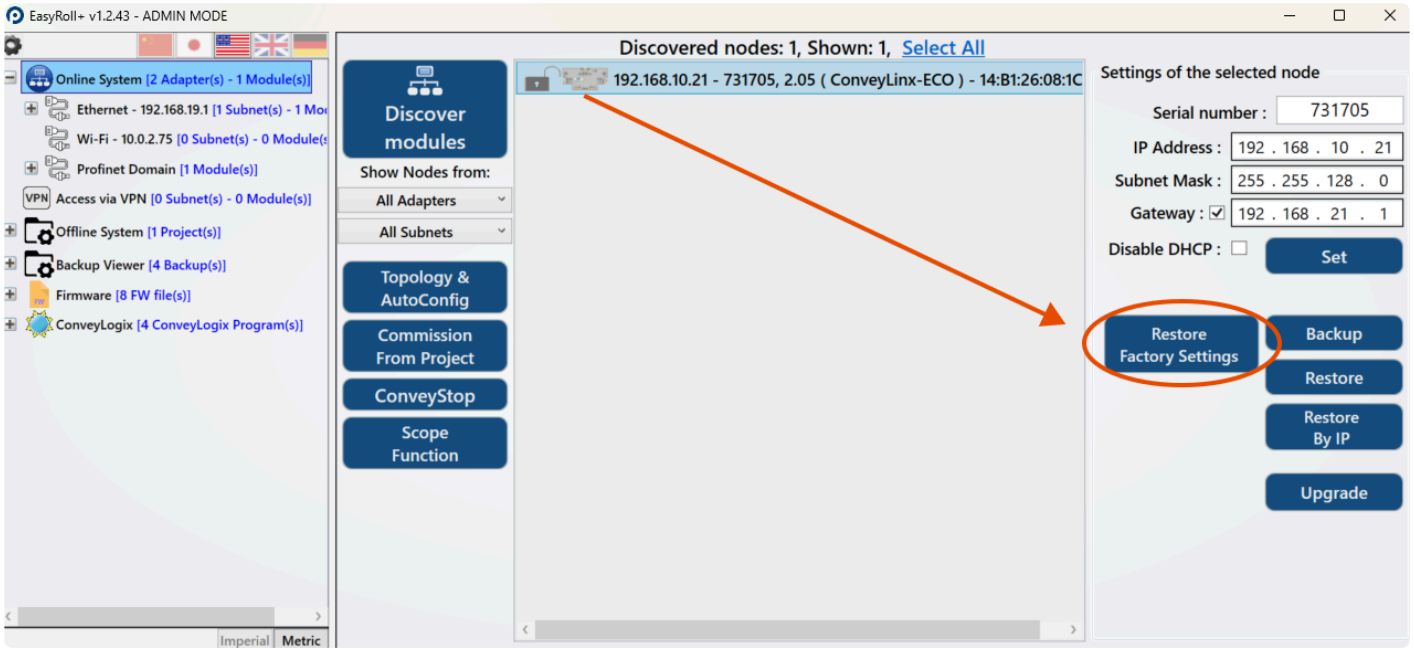
Factory Resetting the ConveyLinx-ERSC

Navigate to the Online Systems page, then click “Topology and AutoConfig” and acknowledge the warning message, then identify the module that you’d like to reset and right click it, then you’ll see the option to reset the module as displayed below



Factory Resetting the ConveyLinx-ECO

Navigate to the Online Systems page, then identify the module that you'd like to reset and click it, then you'll see the option to reset the module as displayed below



Backup Viewer

Backup Viewer

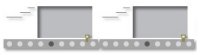
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

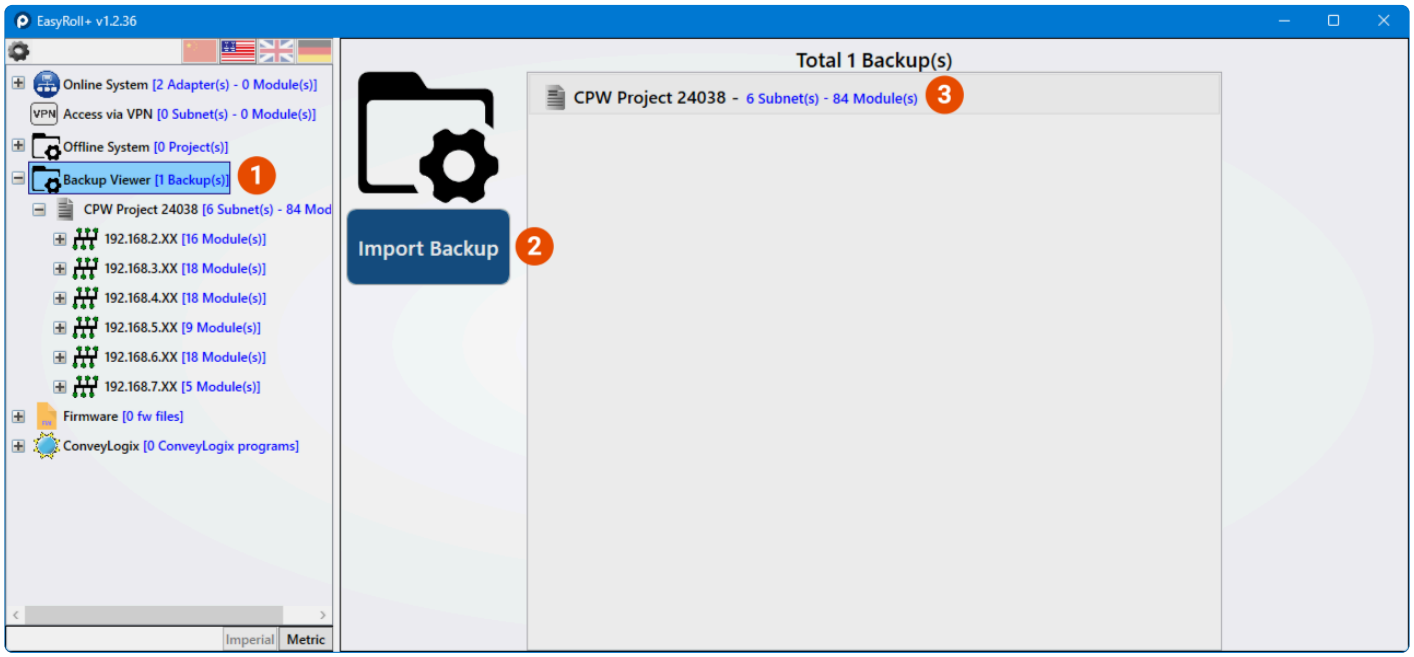
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The top level of the ***Backup Viewer*** in ***EasyRoll+*** is the ***Total Backup(s)*** screen. From here you can view all backed up projects as well as create new project back ups.



Item	Function	Description
1	Backup Viewer	• *Click to open the Backup Viewer screen* • *Tree expands to show all backups currently saved from your PC* • *Right clicking allows you to add backups without navigating to the Import Backup button*

2	Import Backup Button	• *Opens dialog for you to select a backup from your PC* • *Project names must be unique and should be meaningful*
3	Backups	• *List of currently saved backups on your PC* • *Displays quantity of subnets and total ConveyLinx modules in each project backup* • *Double click a project to open the **Subnets** screen for that project*

Backup Project

Backup Viewer /

Backup Project

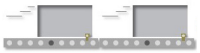
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

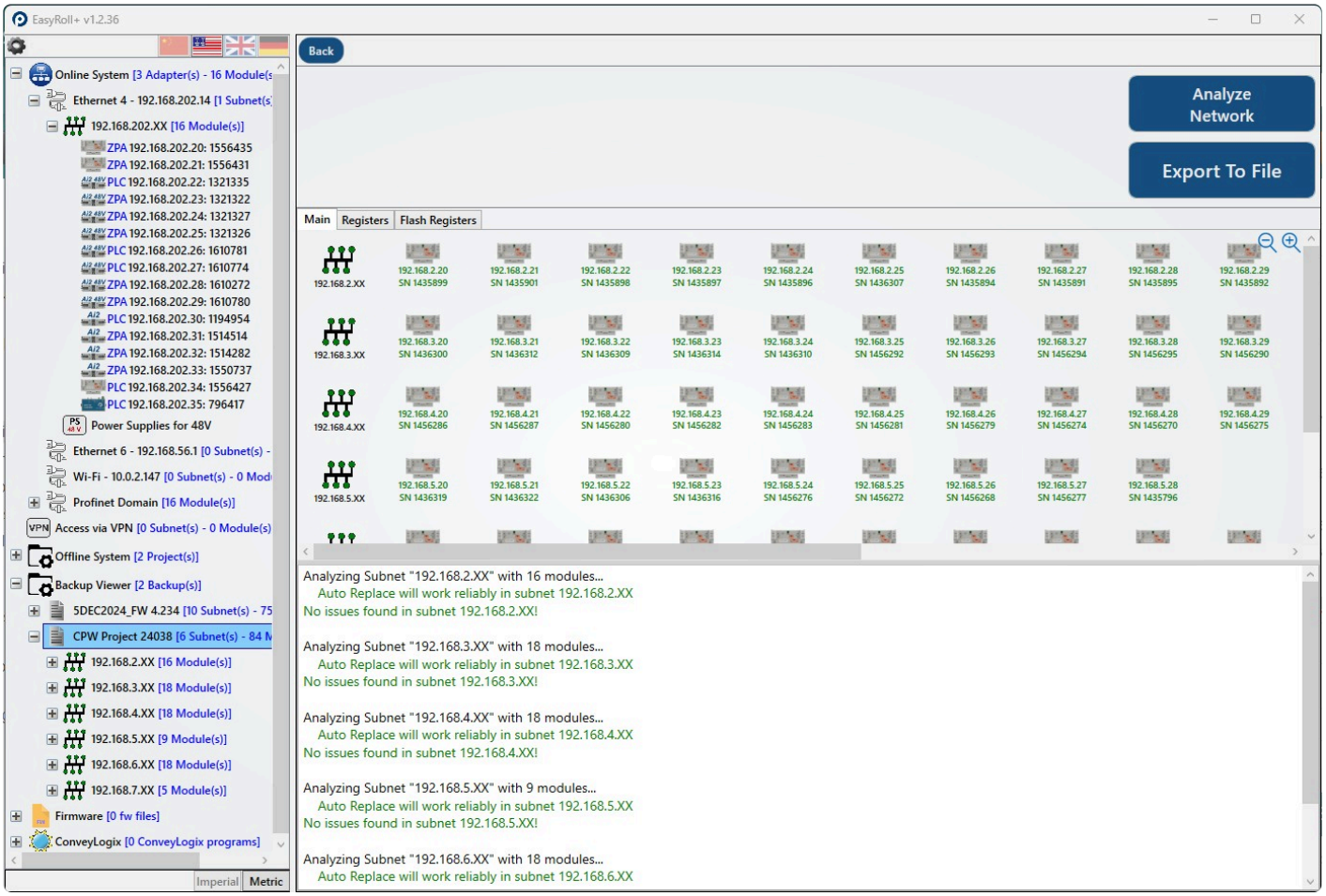
ZPA Mode ?



PLC I/O Mode ?

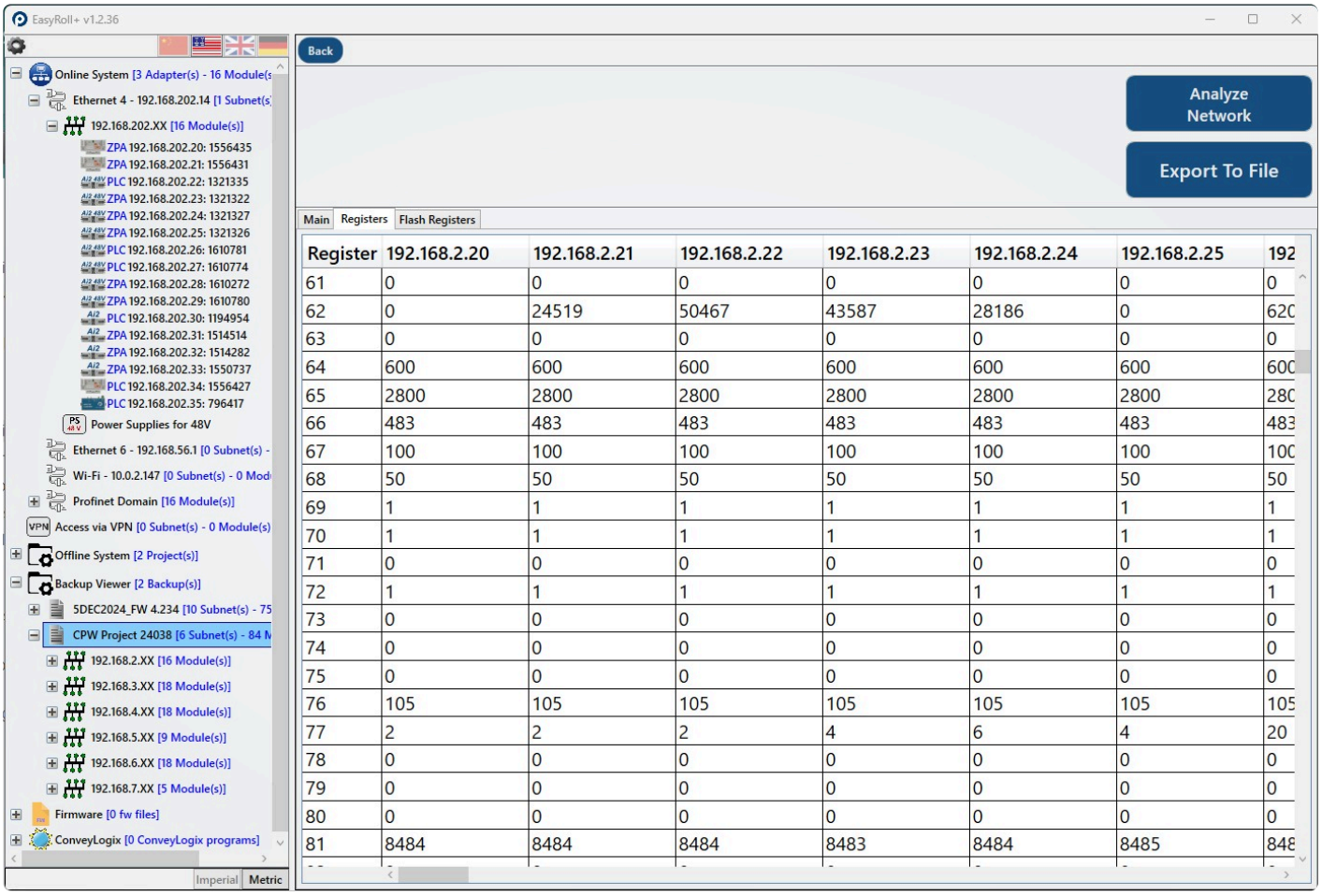
Project's Main Screen

When viewing a particular backup, each subnet will be listed with each individual module. Each module will have its Serial Number and IP Address listed with it, and analyzing the network will provide the notes you see in black and green on the third portion of the screen.



Project's Registers Screen

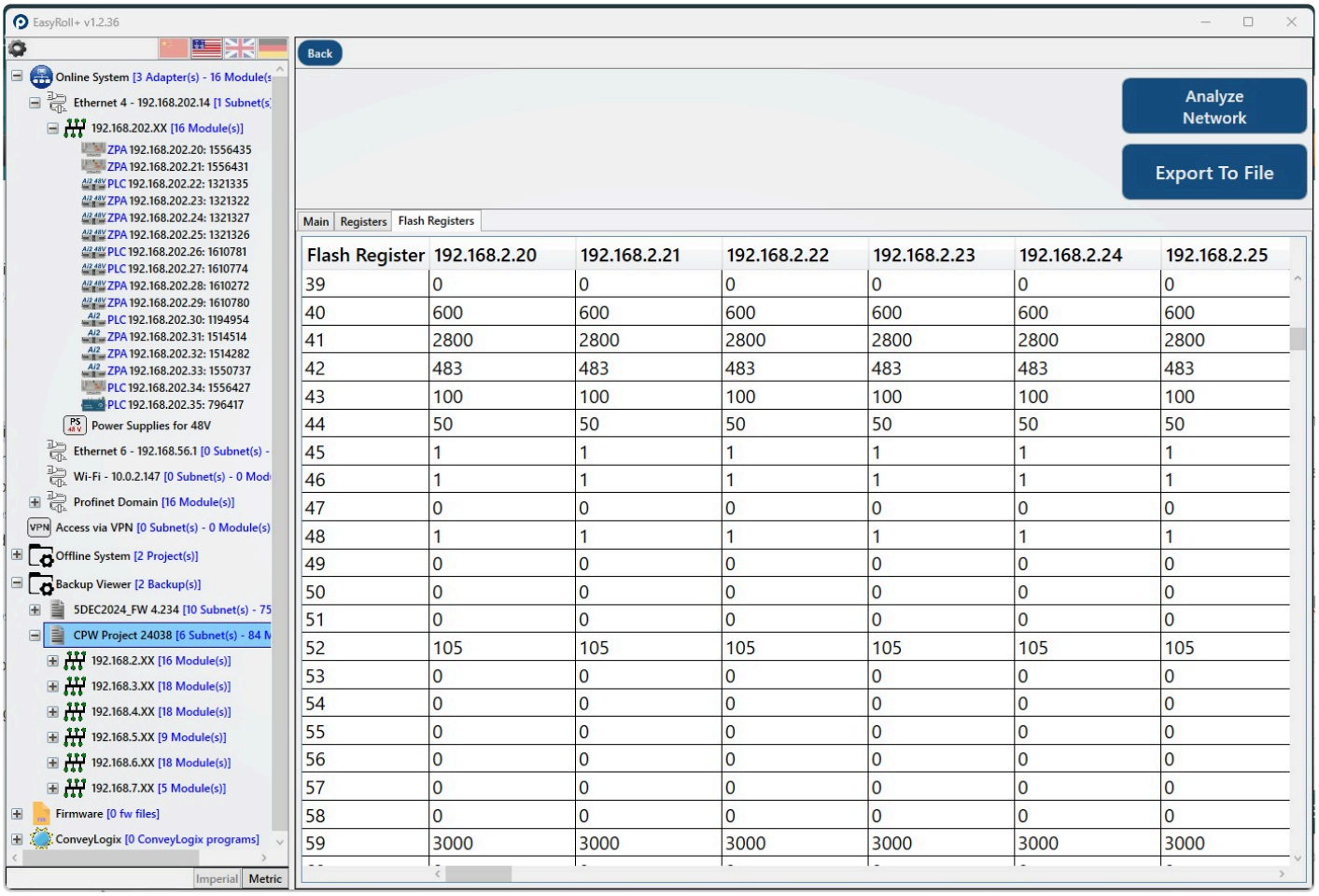
Please refer to the Registers Poll tab or the Developer's Guide for your particular module's registers. The sheet shows each module and their values for each register, each module is noted on the sheet by IP Address. These are volatile values saved in the RAM, this is a snapshot of the backup projects' values at the time of saving them.



Register	192.168.2.20	192.168.2.21	192.168.2.22	192.168.2.23	192.168.2.24	192.168.2.25	192
61	0	0	0	0	0	0	0
62	0	24519	50467	43587	28186	0	620
63	0	0	0	0	0	0	0
64	600	600	600	600	600	600	600
65	2800	2800	2800	2800	2800	2800	280
66	483	483	483	483	483	483	483
67	100	100	100	100	100	100	100
68	50	50	50	50	50	50	50
69	1	1	1	1	1	1	1
70	1	1	1	1	1	1	1
71	0	0	0	0	0	0	0
72	1	1	1	1	1	1	1
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	105	105	105	105	105	105	105
77	2	2	2	4	6	4	20
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	8484	8484	8484	8483	8484	8485	848

Project's Flash Registers Screen

Please refer to the Registers Poll tab or the Developer's Guide for your particular module's registers. The sheet shows each module and their values for each register, each module is noted on the sheet by IP Address. These are more stable values saved in the Flash, this is a snapshot of the backup projects' values at the time of saving them.



Flash Register	192.168.2.20	192.168.2.21	192.168.2.22	192.168.2.23	192.168.2.24	192.168.2.25
39	0	0	0	0	0	0
40	600	600	600	600	600	600
41	2800	2800	2800	2800	2800	2800
42	483	483	483	483	483	483
43	100	100	100	100	100	100
44	50	50	50	50	50	50
45	1	1	1	1	1	1
46	1	1	1	1	1	1
47	0	0	0	0	0	0
48	1	1	1	1	1	1
49	0	0	0	0	0	0
50	0	0	0	0	0	0
51	0	0	0	0	0	0
52	105	105	105	105	105	105
53	0	0	0	0	0	0
54	0	0	0	0	0	0
55	0	0	0	0	0	0
56	0	0	0	0	0	0
57	0	0	0	0	0	0
58	0	0	0	0	0	0
59	3000	3000	3000	3000	3000	3000

Firmware

Firmware

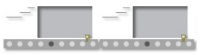
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

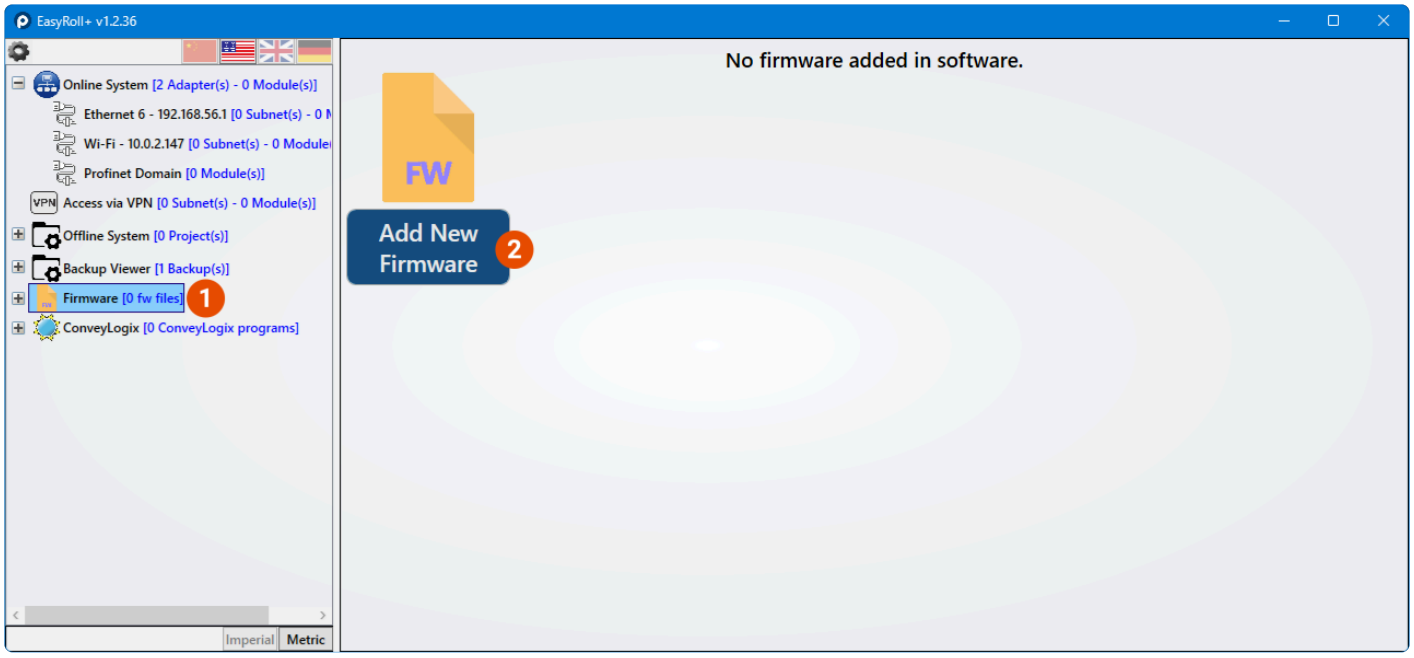
ZPA Mode ?



PLC I/O Mode ?

The ***Firmware*** screen displays all Firmware that has previously been added, and allows you to add any additional Firmware.

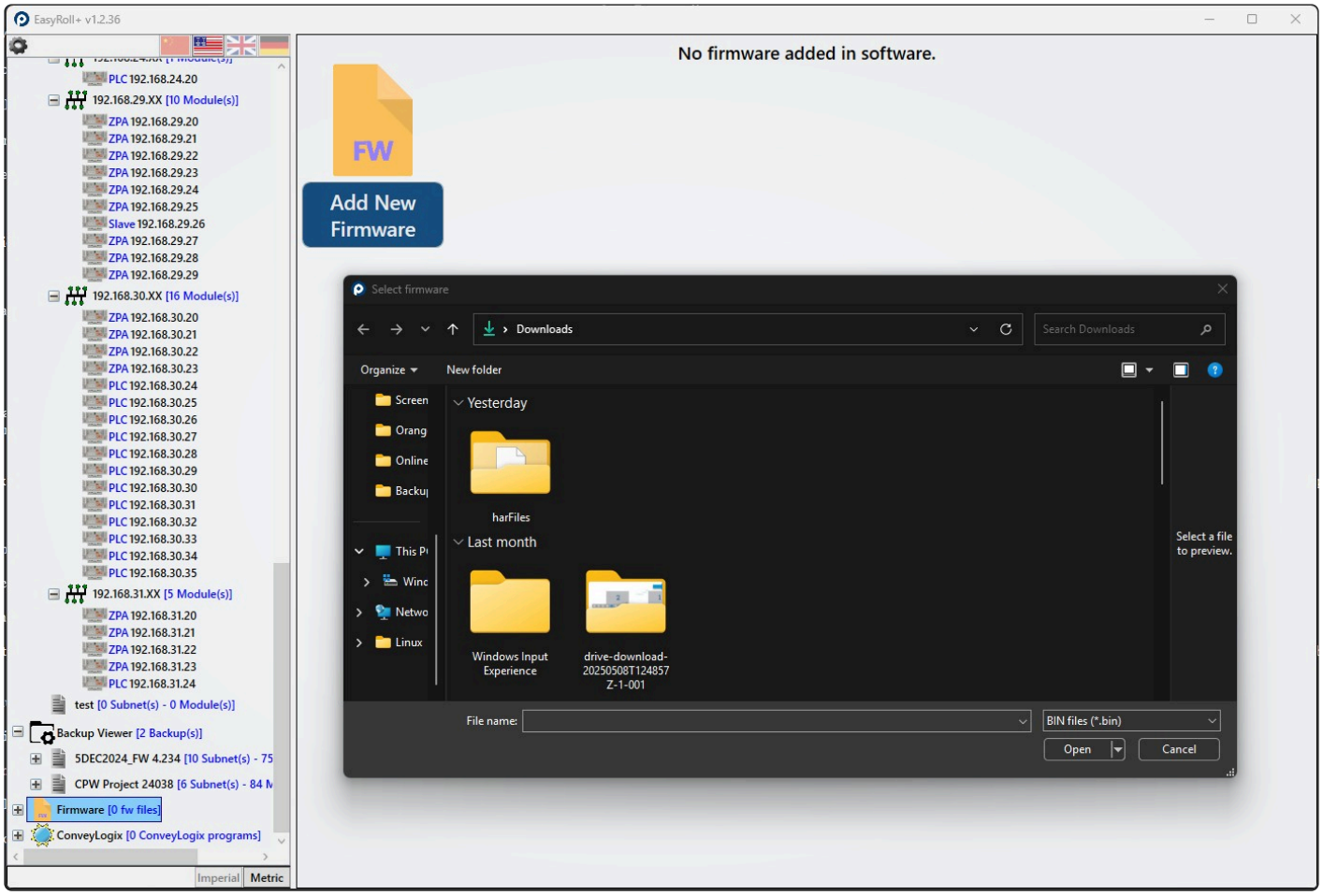
https://www.youtube.com/embed/zecZDisHjWo?rel=0



Item	Function	Description
1	Firmware	• *Click to open the Firmware screen* • *Tree expands to show all Firmware currently saved from your PC* • *Right clicking allows you to add firmware without navigating to the Add New Firmware button*
2	Add New Firmware	• *Opens dialog for you to select a new Firmware file to load from your PC* • *Firmware names are vital and should not be altered*

Add New Firmware

As shown below, selecting the “Add New Firmware” button will open the file viewer for your computer. Navigate to the firmware you’d like to add and select it.



This is what the firmware look like in the Firmware viewer. Note that the module type and version number are specified in the list.

ConveyLogix

ConveyLogix

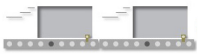
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

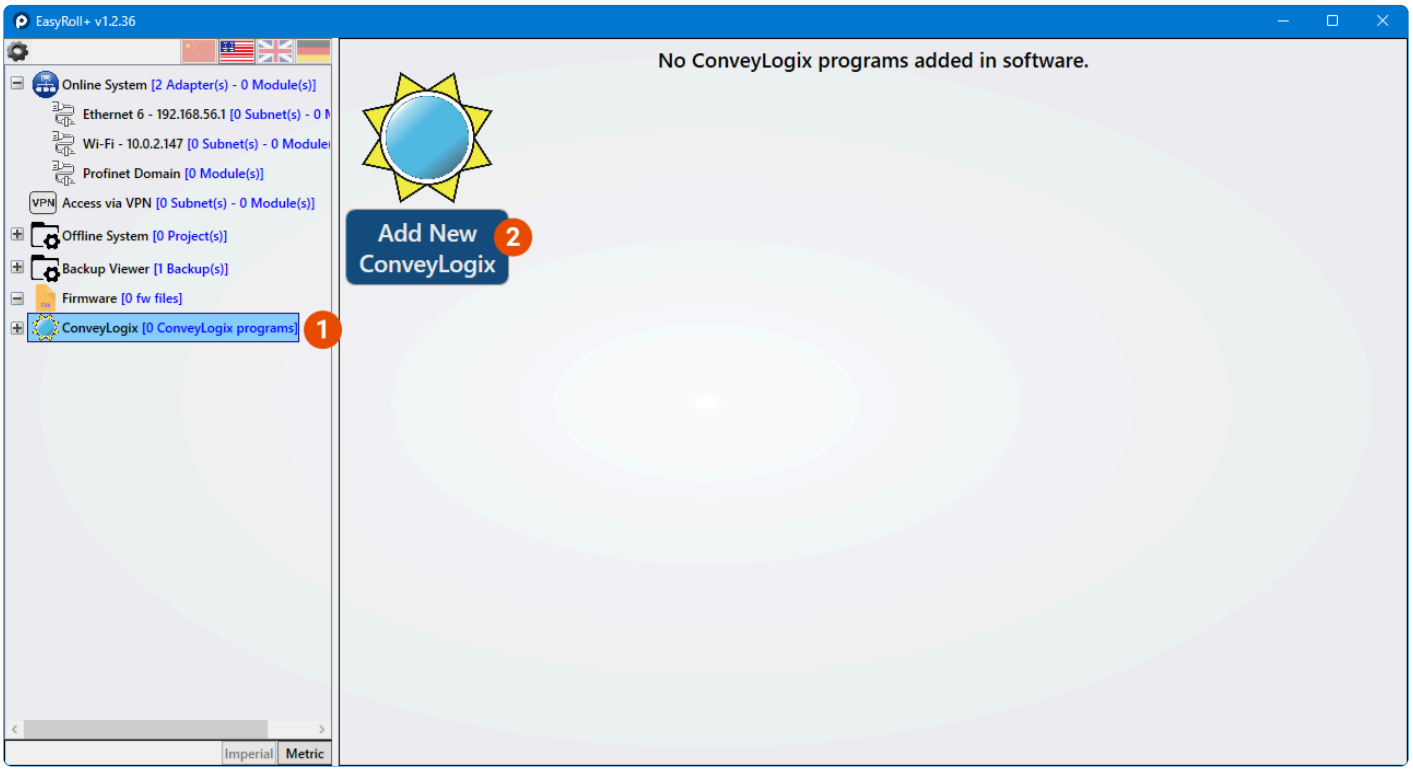
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The ***ConveyLogix*** screen displays all of the ConveyLogix programs that have previously been added, and allows you to add any additional ConveyLogix programs.

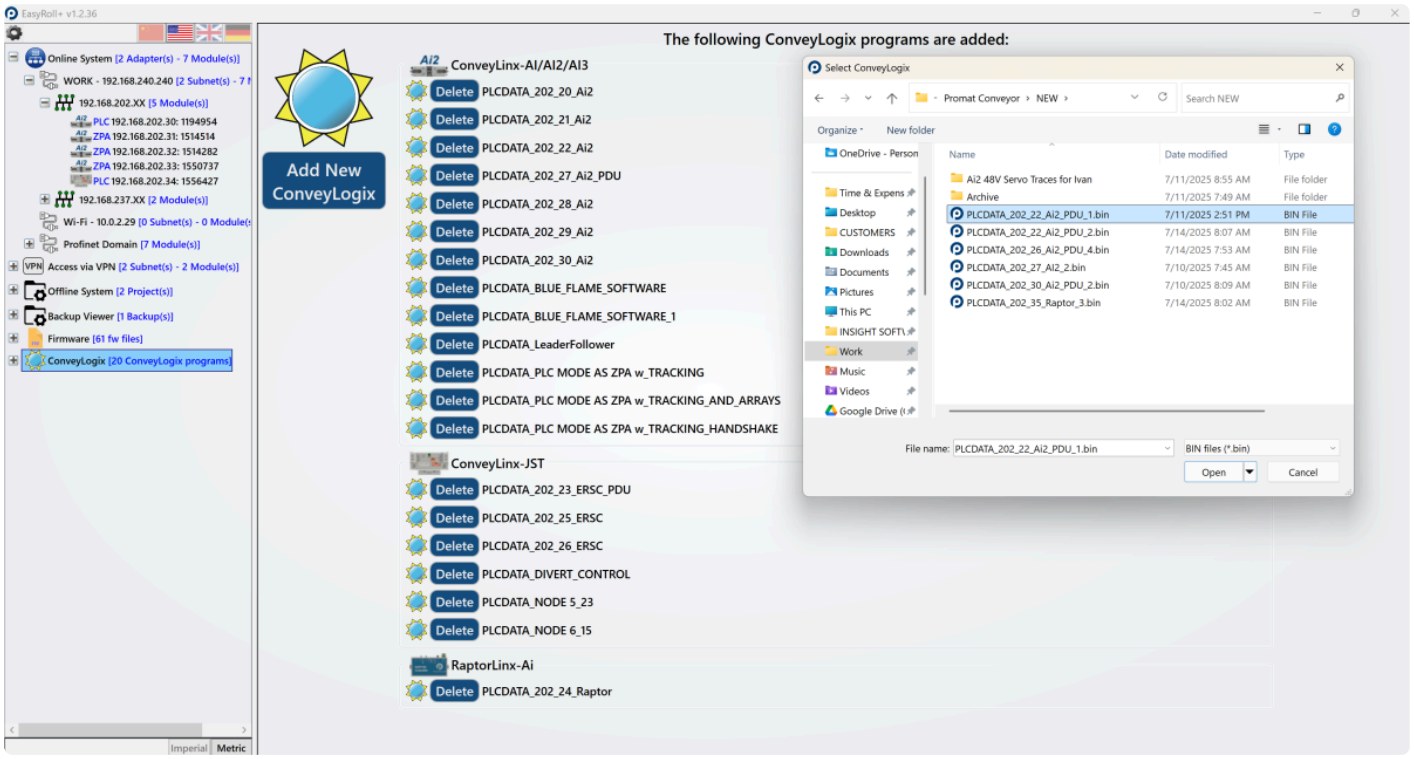


Item	Function	Description
1	ConveyLogix	• *Click to open the ConveyLogix screen* • *Tree expands to show all ConveyLogix programs currently saved from your PC*

		• *Right clicking allows you to add ConveyLogix programs without navigating to the Add New ConveyLogix button*
2	Add New ConveyLogix Button	• *Opens dialog for you to select a ConveyLogix program from your PC* • *Project names must be unique and should be meaningful*

Adding a new ConveyLogix Program to *EasyRoll+*

Files appear as .bin files, clicking the “Add New ConveyLogix” button opens the window to select the ConveyLogix Program. Once you select your file and click “Open”, the ConveyLogix program will be added to the appropriate place in the module-type sorted list.



Appendix

Appendix

This appendix contains information that further explains the concepts and functionality of various ConveyLinx networked controller features. These features are common across all of the products for which ***EasyRoll+*** is applicable:

Learn More:

Interlock Signal Definition

Appendix /

Interlock Signal Definition

The terms ***Interlock Input*** and ***Interlock Output*** are used generically in this documentation to represent a functional signal for **ConveyLinx modules**. The names and locations of the physical connection points depends on the specific module. The following chart defines these signals in relation to their specific **ConveyLinx module**:

Module	Interlock Input	Interlock Output
ConveyLinx-ERSC Family	Left/Right Control Port – Pin 4 Local Accumulate – Pin3	Control Port Output
ConveyLinx-Ai/Ai2/ Ai3 Family 24V & 48V	Left/Right Sensor Port Pin 2 Function selectable in ***EasyRoll+***	Left/Right Sensor Port Pin 2 Function selectable in ***EasyRoll+***
ConveyLinx-ECO	Left/Right Sensor Port AUX Function selectable in ***EasyRoll+***	N/A

Learn More about SE Breakout Module for ERSC Family controllers

Learn More about IOX-2 Interface Module for Ai Family controllers

Motor Rotation

Appendix /

Motor Rotation

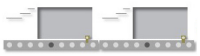
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The **ConveyLinx module** uses a ***Clock-Wise (CW)*** and ***Counter Clock-Wise (CCW)*** motor rotation definition. The reference for this distinction is based upon viewing the MDR from the cable exit end of the roller.

Motor Rotation Definition

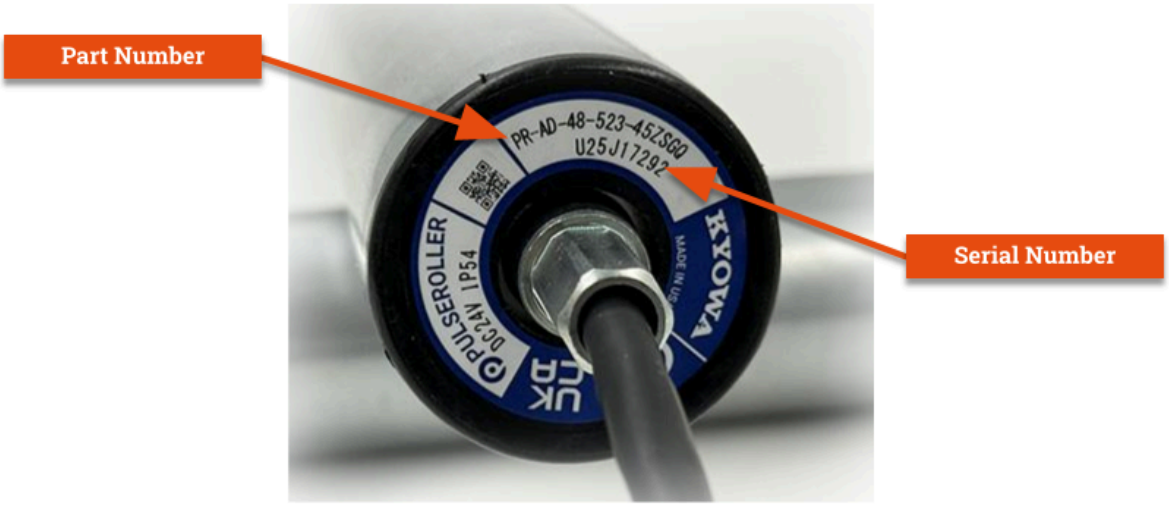
✻ ***Auto Configuration Procedure*** will automatically adjust the motor rotation direction based upon the flow established by the procedure as long as the cable end of the roller is on the same side of the conveyor as the **ConveyLinx module**. If the rotation direction is not correct after the ***Auto-Configuration Procedure***, you can change it in ***EasyRoll+***.

Motor Roller Part Number

Appendix /

Motor Roller Part Number

The motor roller's part number is located on the end cap label on the motor cable end of the roller tube. This label also displays the unit's serial number



✻ Depending on the part number, the ***serial number*** may also be required when contacting Pulseroller in order to understand all of the options and configuration for that specific roller

Get Part Number and Serial Number from Main screen tab Tool Tip

Jam Conditions

Appendix /

Jam Conditions

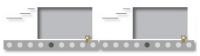
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



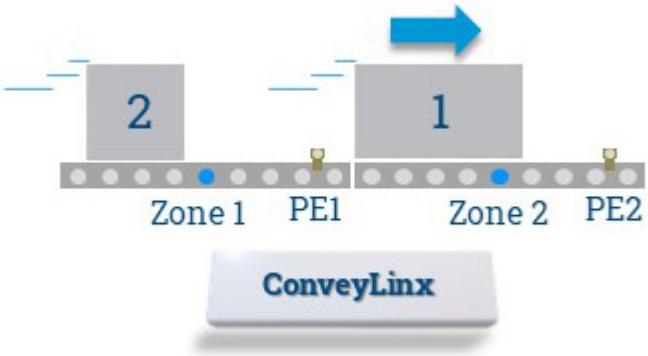
PLC I/O Mode ?

There are two (2) types of Jam conditions detected by the **ConveyLinx modules**: **Arrival Jam** and **Sensor Jam**

Arrival Jam

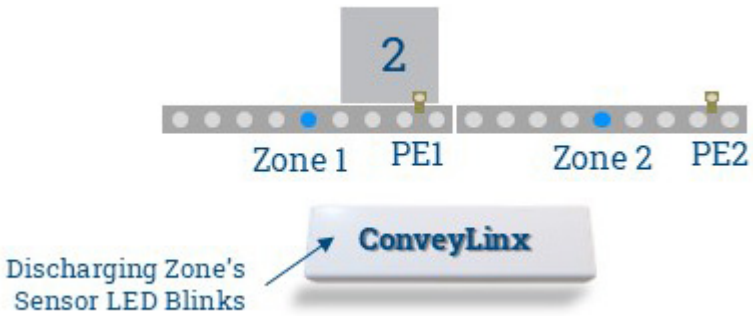
When a carton leaves an upstream zone and is conveyed to its next downstream zone, this upstream zone expects positive confirmation of carton arrival from the downstream zone. This communication occurs automatically along the ConveyLinx network. If a new carton arrives at this upstream zone while this upstream zone is waiting for a downstream arrival confirmation, the new carton will accumulate on this upstream zone. If the upstream zone does not receive this confirmation within the ***Jam Timer*** interval, the **ConveyLinx module** will produce an ***Arrival Jam*** fault. Once an ***Arrival Jam*** occurs, the **ConveyLinx module** will automatically hold any new carton at the upstream zone for a pre-determined ***Auto Clear Time*** Timer value and then resume normal ZPA function. By default, the ***Jam Timer*** and the ***Auto Clear Timer*** values are set to 5 seconds for each. This condition will be indicated on the corresponding Sensor LED on the module.

Carton 1 has left PE1 and is on its way to PE2 and because PE1 is clear, Carton 2 is entering Zone 1



Carton 1 disappears but the Zone 2 motor continues to run for the Jam Time period (5 sec. by default). During this time Carton 2 arrives at PE1 but Zone 1 stops because Jam Timer is still timing

When the Jam Timer expires, the Sensor LED blinks to indicate an Arrival Jam and keeps blinking for the Auto Clear Time (5 sec. by default). When Auto Clear Time expires, the Arrival Jam is reset and Carton 2 will release if Zone 2 is empty



[How to Disable Arrival Jam]

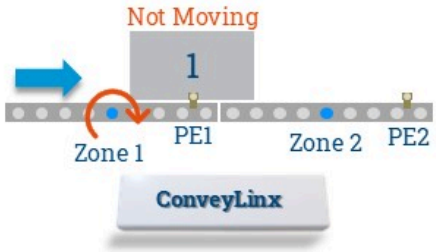
[How to change the Jam and Auto Clear Timers]

Sensor Jam

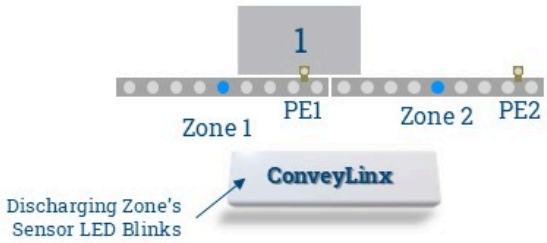
While a zone is releasing a carton; if this carton remains blocking the photo-sensor for

the Jam Timer period (default of 5 seconds), the **ConveyLinx module** will detect a Sensor Jam. This will be indicated on the corresponding Sensor LED on the module.

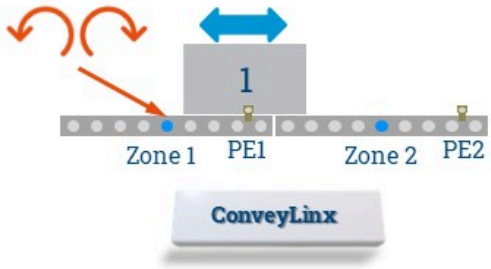
Carton 1 is leaving Zone 1 but has got stuck. Zone 1 and Zone 2 motors are running but PE1 is remaining blocked



When the Jam Timer has expired (5 sec. by default) Zone 1 and Zone 2 motors stop and Zone 1 Sensor LED flashes green/amber for the Auto Clear Time (5 sec. by default)



When the Auto Clear Timer has expired, Zone 1 will start performing the Sensor Jam Auto Clear procedure



Sensor Jam Auto Clear

Here is what happens when Sensor Jam Auto Clear procedure occurs

1. Run the zone motor in reverse until the sensor is clear or 1 second has elapsed, whichever happens first
2. Wait for the Auto Clear Timer to expire
3. Run the zone motor forward to attempt discharge to the downstream zone (Attempt #1 complete)
4. If sensor is still blocked after discharge attempt, the zone motor runs in reverse until the sensor is clear or 1 second has elapsed, whichever happens first

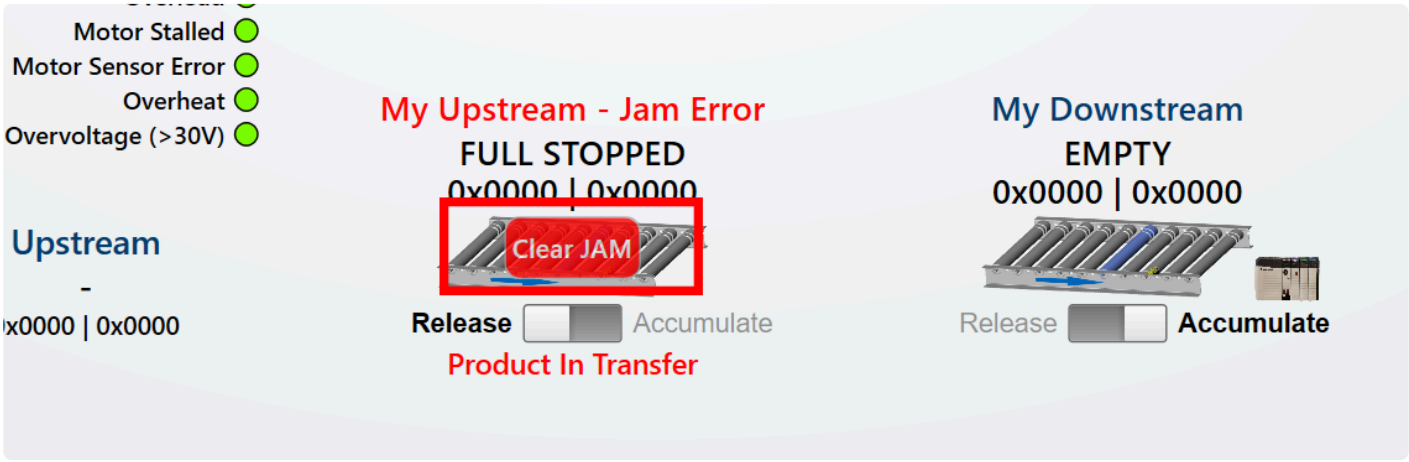
5. Wait for the Auto Clear Timer to expire
6. Run the zone motor forward to attempt discharge to the downstream zone (Attempt #2 complete)
7. If sensor is still blocked after discharge attempt, the zone motor runs in reverse until the sensor is clear or 1 second has elapsed, whichever happens first
8. Wait for the Auto Clear Timer to expire
9. Run the zone motor forward to attempt discharge to the downstream zone (Attempt #3 complete)
10. If sensor is still blocked after Attempt #3, the sensor must either be cleared manually to reset the Sensor Jam condition, the Clear Jam Button in ***EasyRoll+*** can be pressed, or a PLC can set the Clear Jam Bit. Please note that if any of the discharge to downstream attempts (steps 3, 6, or 9) are successful, the Sensor Jam condition is automatically reset.

✻ The 5 second Jam Timer and Auto Clear Timer values are default settings. How to change the Jam and Auto Clear Timers

✻ How to Disable Sensor Auto Clear Function

If Jam Does Not Clear

If item is still blocking the sensor after Sensor Jam Auto Clear procedure is complete you have to either physically clear the jam by removing the item or attempt another **Auto Clear procedure** by clicking the ***Clear JAM*** button on the Main Screen of the ZPA Module



Interlocks vs. Local Accumulation

Appendix /

Interlocks vs. Local Accumulation

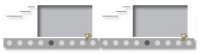
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

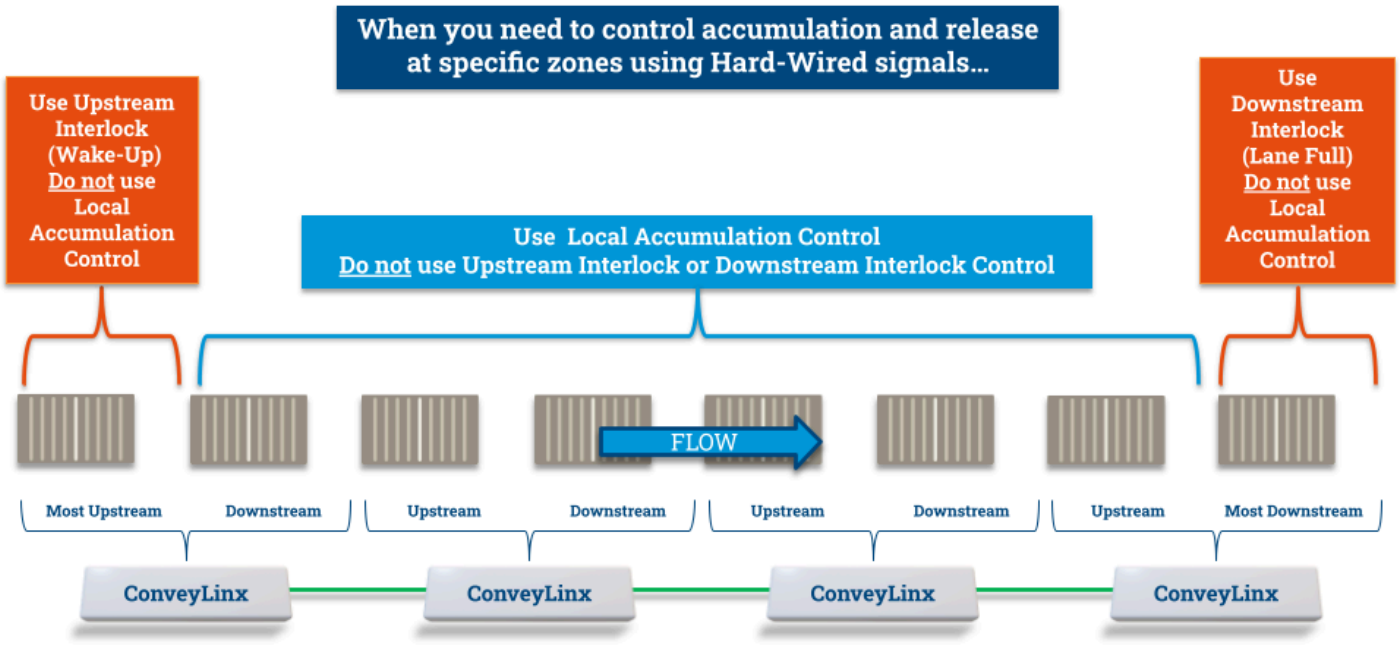


PLC I/O Mode ?

Only use the *Interlock Input* signal for the *Upstream Interlock* on the **most upstream zone** of a network. Do not use the ***Upstream Interlock*** function on any of the other zones whose **ConveyLinx module** has an **upstream connection** to another **ConveyLinx module**. You may get unexpected results because signal may or may not over-ride the status coming from upstream over the network.

Similarly, only use the ***Interlock Input*** signal for the *Downstream Interlock* on the **most downstream zone** of a network. Do not use the ***Downstream Interlock*** function on any of the other zones whose **ConveyLinx module** has a **downstream connection** to another **ConveyLinx module**. You may get unexpected results because signal may or may not over-ride the status coming from downstream over the network.

If you need to accumulate and release from a zone whose **ConveyLinx module** has upstream and/or downstream connection(s) to another **ConveyLinx module**, utilize the *Local Zone Accumulate* function.


When you need to control accumulation and release at specific zones using Hard-Wired signals...
Use Upstream Interlock (Wake-Up) Do not use Local Accumulation Control
Use Local Accumulation Control
Do not use Upstream Interlock or Downstream Interlock Control
Use Downstream Interlock (Lane Full) Do not use Local Accumulation Control
FLOW
Most Upstream
Downstream
Upstream
Downstream
Upstream
Downstream
Upstream
Most Downstream
ConveyLinx
ConveyLinx
ConveyLinx
ConveyLinx

Upstream Interlock

Appendix /

Upstream Interlock

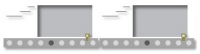
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

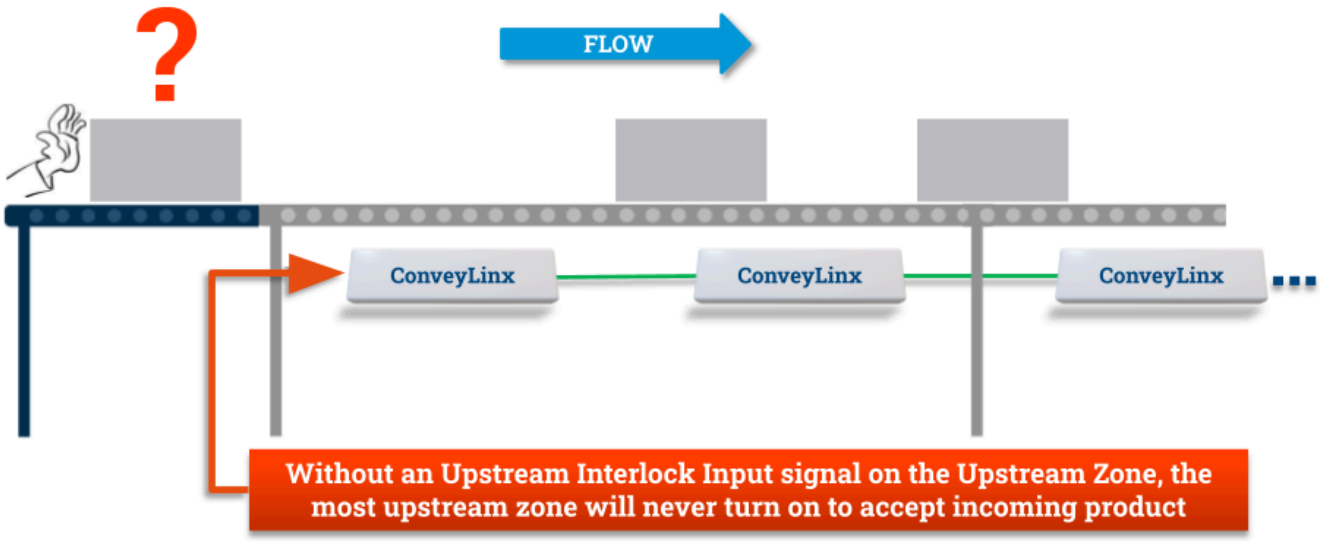
ConveyLinx-ECO ?

ZPA Mode ?



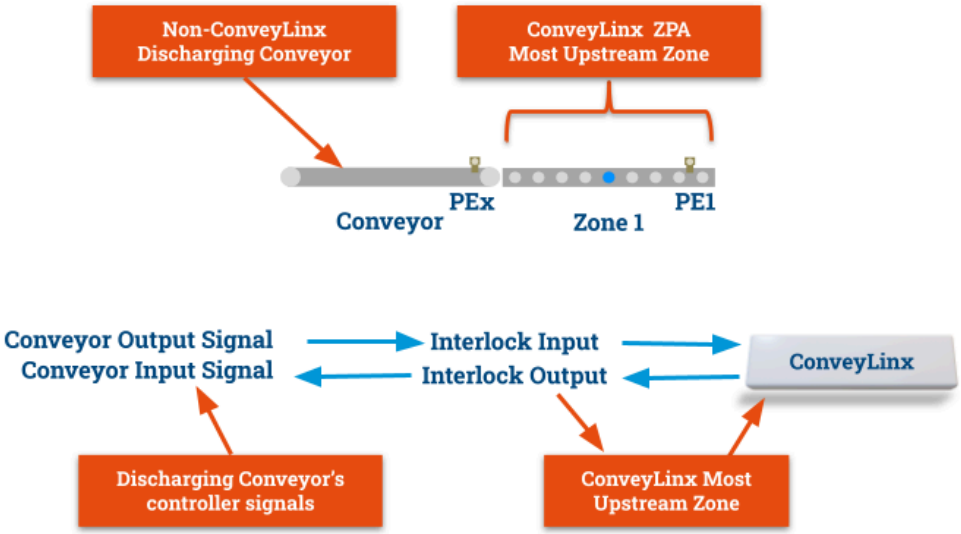
PLC I/O Mode ?

At a minimum, to interlock or “Wake Up” the most upstream ZPA zone, the upstream zone’s Input Interlock signal must be used. For a complete “Handshake” where the Non-ConveyLinx controlled feeding conveyor requires the block or clear status of the most upstream ZPA zone; both the ***Input Interlock*** and Output Interlock signals must be used.



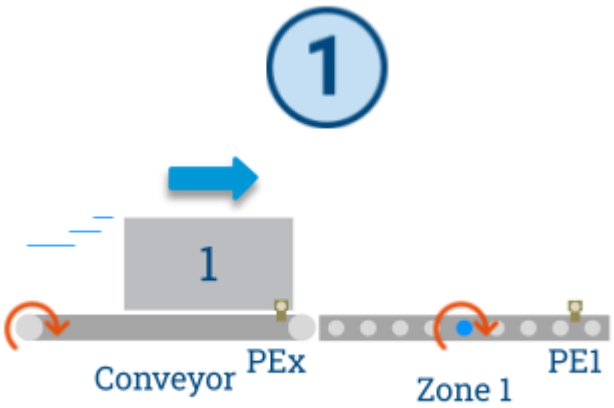
Upstream Interlock Definition

For powered and controlled (PLC or otherwise) non-ConveyLinx discharging conveyor, the following image depicts a typical interface and the signals required.

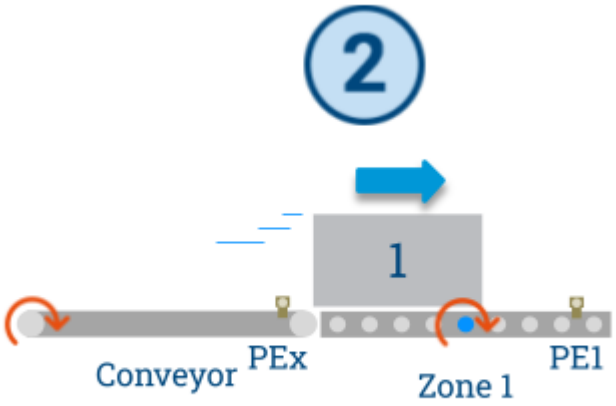


Singulated Transfer to Most Upstream ZPA Zone

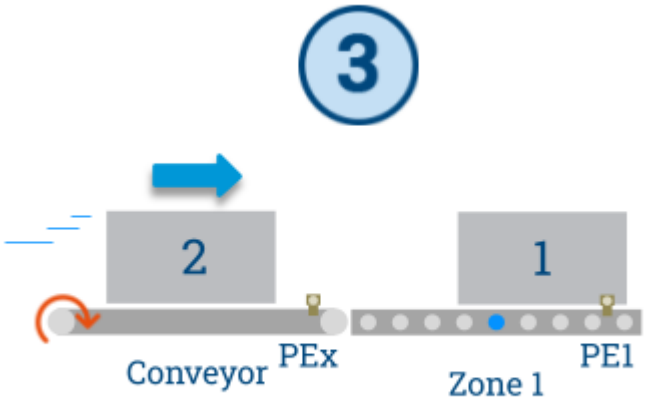
Because the ***Output Interlock*** is OFF indicating ***PE1*** is clear, when ***PEx*** is blocked, the Discharge Conveyor controller energizes its Conveyor Output Signal to energize the **ConveyLinx module *Interlock Input*** . This causes ***Zone 1's*** motor to run



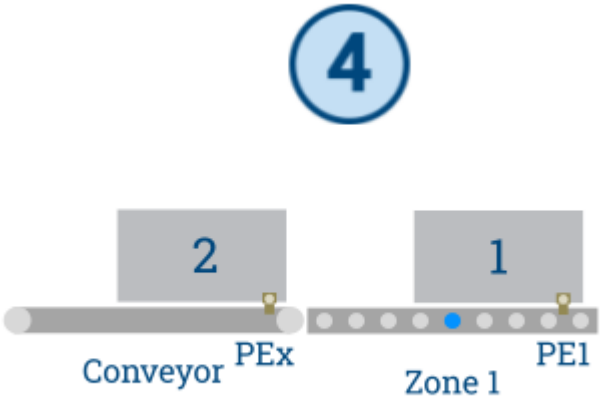
Zone 1's motor will continue to run as long as its ***Interlock Input*** is ON. The Discharge Conveyor can run or stop its motor as needed once its ***PEx*** is clear



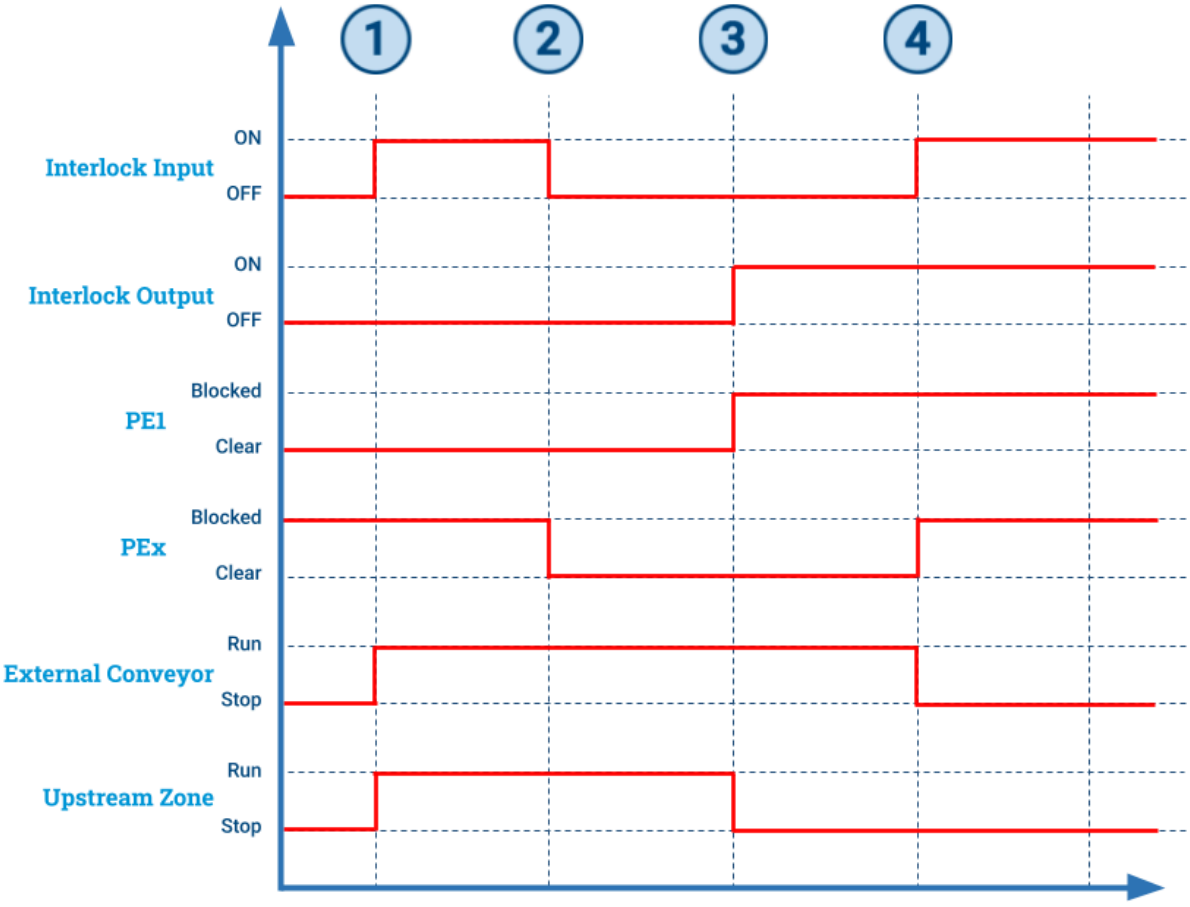
When ***PE1*** becomes blocked, the **ConveyLinx module** stops ***Zone 1's*** motor and energizes its ***Interlock Output*** which in turn energizes the Conveyor Input Signal indicating that ***PE1*** is blocked



As long as ***PE1*** is blocked; the **ConveyLinx module** will keep its ***Output Interlock*** energized to signal the Discharge Conveyor to stop its motor if and when ***PEx*** becomes blocked



Here is a timing diagram for the operation



! The most upstream zone's motor will continue to run as long as the *Interlock Input* signal is energized and its zone sensor remains unblocked. If the signal is removed, the zone will continue to run for Jam Timer setting (5 seconds by default) and then stop

Downstream Interlock

Appendix /

Downstream Interlock

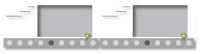
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

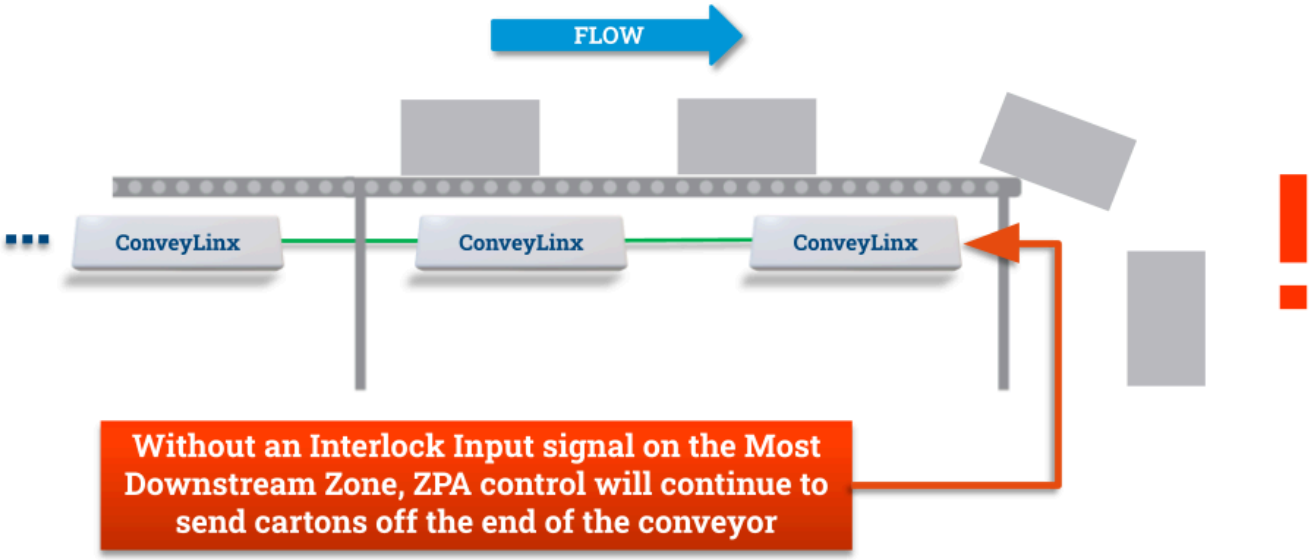
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

On a newly Auto-Configured linear conveyor without any intervention from external signals, if an item is on the conveyor, it will convey to the last downstream zone and try to continue on.



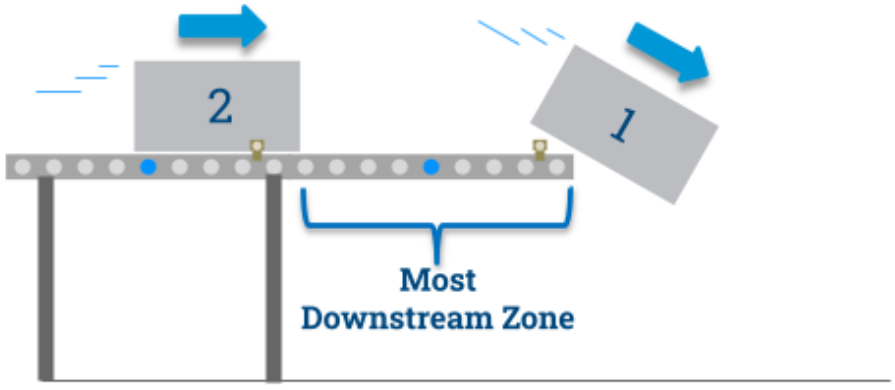
Whichever side (Left or Right) is on the *Downstream Side* of the **ConveyLinx module** will accept a signal on its *Interlock Input* . When a digital signal is applied to the ***Interlock Input***, the zone will still run its motor to accept an item but it will stop and accumulate when the item reaches its zone sensor. Additionally, the *Downstream Side* of the

ConveyLinx module can provide an ***Interlock Output*** that can be connected to the accepting conveyor or machine's controls to indicate that an item is accumulated at the discharge of the most downstream zone and ready to be conveyed. This combination of downstream ***Interlock Input*** and ***Interlock Output*** signals can provide a ***fully functional singulation handshake*** between most downstream **ConveyLinx module** and external conveyor/machine controls.

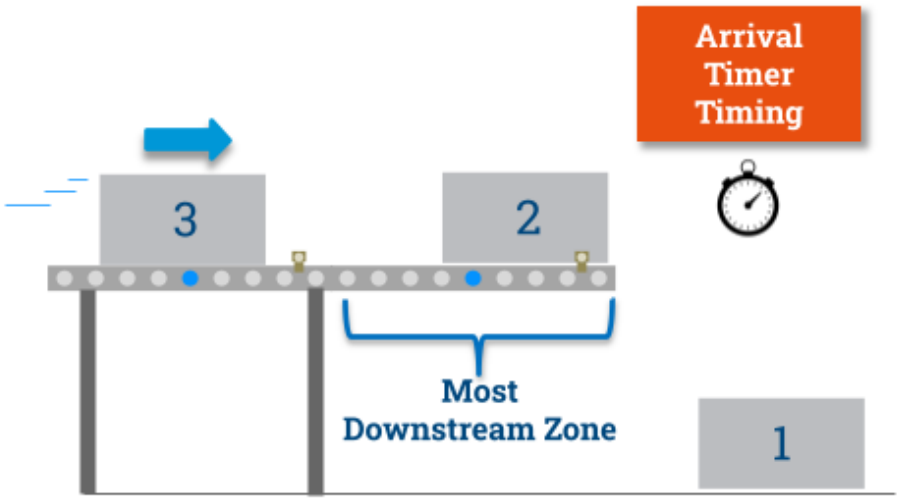
✻ Please note that the **ConveyLinx-ECO** module does not have the ability to produce an ***Interlock Output*** signal, thus a fully functional singluation handshake between the most downstream **ConveyLinx-ECO** module and external conveyor/machine controls is not possible without additional sensor(s) or signals connected to the external conveyor / machine controls.

Here is what happens when there is NO Downstream Interlock Input

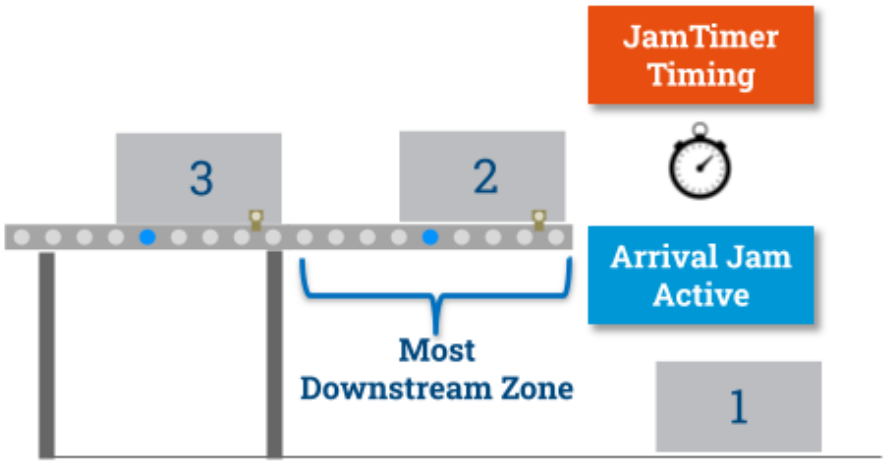
With no ***Interlock Input***, Carton 1 will convey off the end of the most downstream zone. When the downstream zone's sensor is clear, if Carton 2 was stopped in its zone, it will start to convey into the most downstream zone. When the most downstream zone's sensor becomes clear, the Arrival Timer begins timing



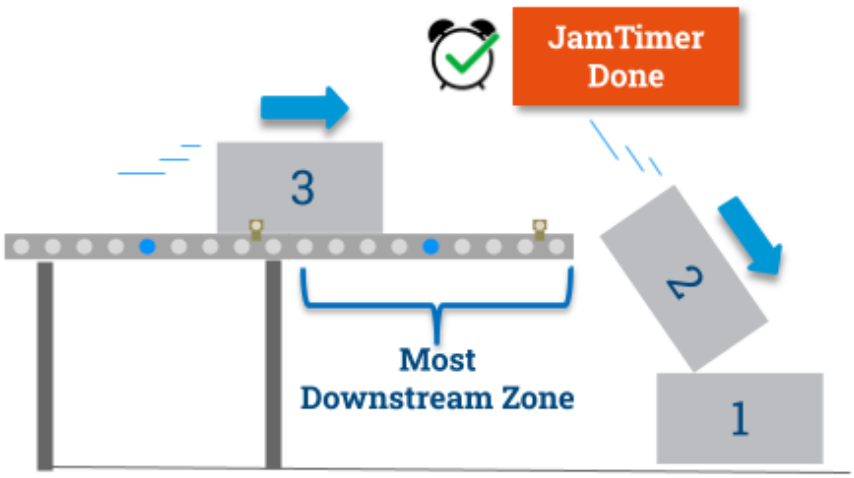
When Carton 2 arrives at the most downstream zone's sensor, it will stop if the Arrival Timer is still timing. Carton 3 will convey into the next downstream zone



When Arrival timer is done, the Arrival Jam timer begins timing. While the Arrival Jam Timer is timing, the most downstream zone will indicate there is an Arrival jam and indicate such with its appropriate LED blinking pattern. While the Arrival Jam is occurring, both Carton 2 and Carton 3 will remain stopped on their respective zone sensors



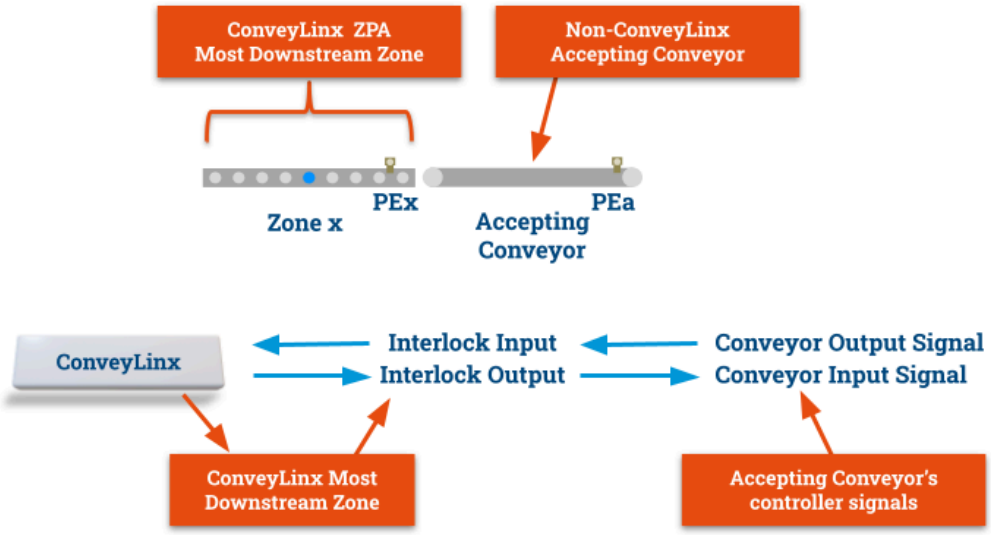
When the Arrival Jam Timer has expired, Carton 2 will convey off the end of the conveyor and when the most downstream sensor is clear, Carton 3 will convey into the most downstream zone and the cycle will repeat.



✻ As long as there is NO ***Interlock Input*** signal, cartons will continue to discharge at an interval equal to 2X the Jam Timer setting. If no timer settings have been modified from their default values; a carton will convey off the end of the conveyor every 10 seconds.

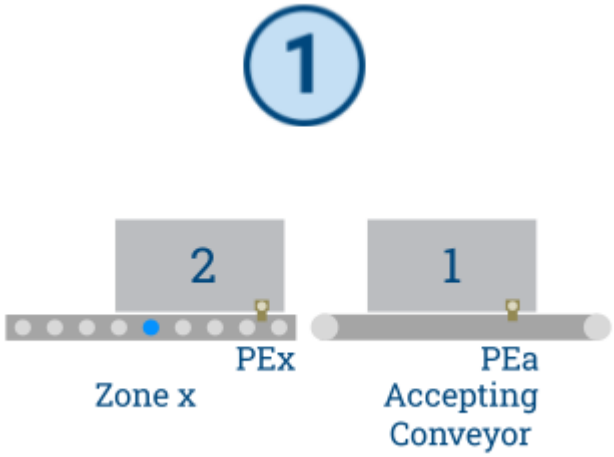
Downstream Interlock Definition

For powered and controlled (PLC or otherwise) non-ConveyLinx accepting conveyor, the following image depicts a typical interface and the signals required.

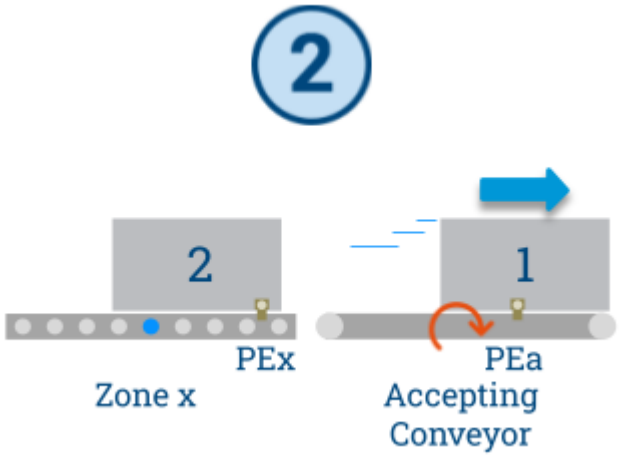


Singulated Transfer from Most Downstream ZPA Zone

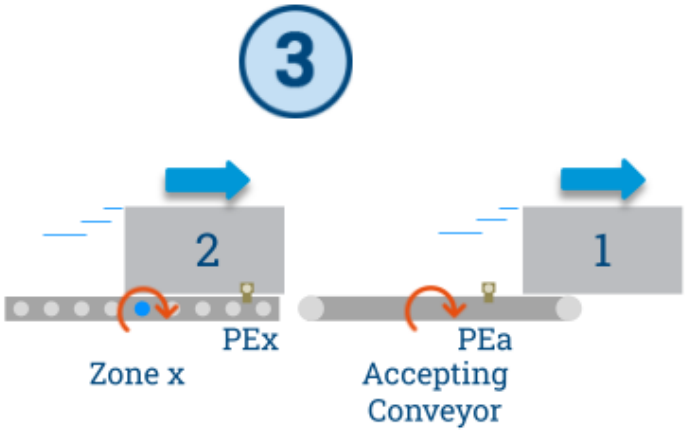
Because *Accepting Conveyor* controller has energized its output to the ConveyLinx module's ***Interlock Input***, this indicated to the *ConveyLinx ZPA* controls that ***PEa*** is blocked. When *ConveyLinx ZPA* controls conveys *Carton 2* to ***PEx***, *Zone x* will stop and accumulate *Carton 2*. Because ***PEx*** is blocked, *ConveyLinx ZPA* control also energizes its ***Interlock Output*** indicating to the *Accepting Conveyor* controller that *Carton 2* is ready to be discharged.



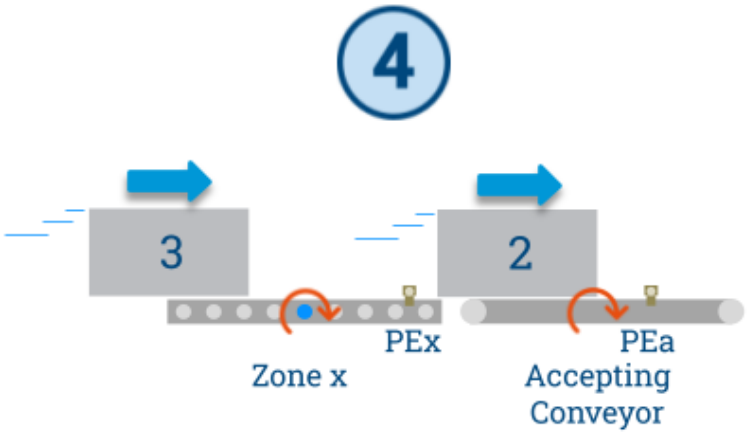
When the *Accepting Conveyor* controller determines by its own logic that *Carton 1* is ready to be conveyed, it energizes its motor to run. As long as ***PEa*** is blocked, the ***Interlock Input*** to *ConveyLinx ZPA* controls remains energized and the *Conveylinx ZPA* control keeps *Zone x* from running.



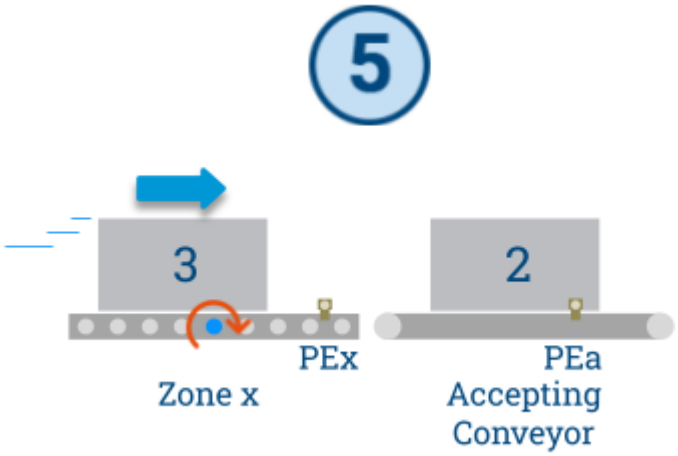
When ***PEa*** becomes clear, the *Accepting Conveyor* controller de-energizes the ***Interlock Input*** signaling to the *ConveyLinx ZPA* controls that it can release *Carton 2* from *Zone x* and run its motor. Note that as long as ***PEx*** is blocked, the ***Interlock Output*** remains energized



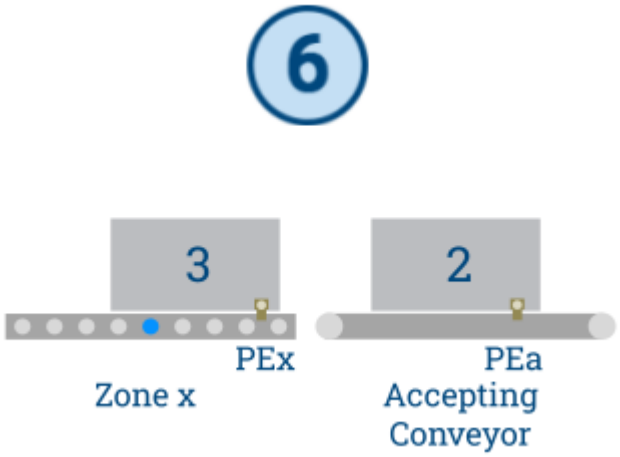
When *Carton 2* has cleared ***PEx*** , the *ConveyLinx ZPA* controls will singulate the waiting *Carton 3* into *Zone x* .



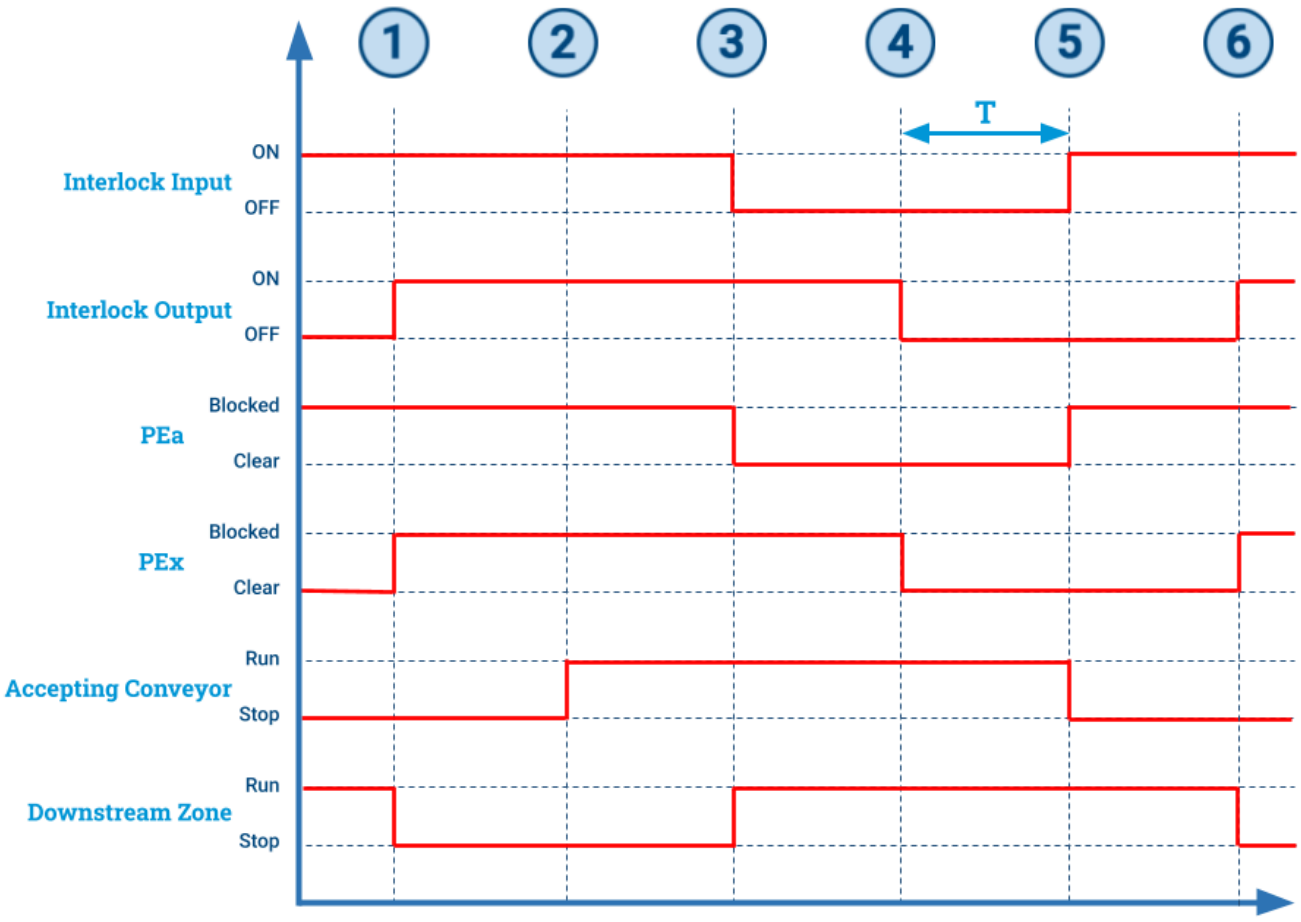
When *Carton 2* reaches ***PEa*** , the *Accepting Conveyor* controller will energize the ***Interlock Input*** indicating to the *ConveyLinx ZPA* controls to not allow any cartons to discharge from *Zone x* . If *Carton 3* is already in transit into *Zone x*, the *ConveyLinx ZPA* controls will stop *Zone x* when *Carton 3* arrives at ***PEx***



As long as the *Accepting Conveyor* controller continues to energize the ***Interlock Input*** , the *ConveyLinx ZPA* controls continue to hold *Carton 3* at ***PEx*** . The cycle can be repeated from Step 1.



Here is a timing diagram for the operation



✻ When the ***Interlock Input*** is used on the most Downstream Zone, the cycling off and on of this signal generates an "Arrival" in the **ConveyLinx module** logic and thus preventing an Arrival Jam. In the above timing chart **T MUST be LESS than the Arrival Jam Timer** setting to avoid triggering an Arrival Jam.

Local Zone Accumulate

Appendix /

Local Zone Accumulate

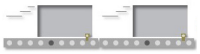
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

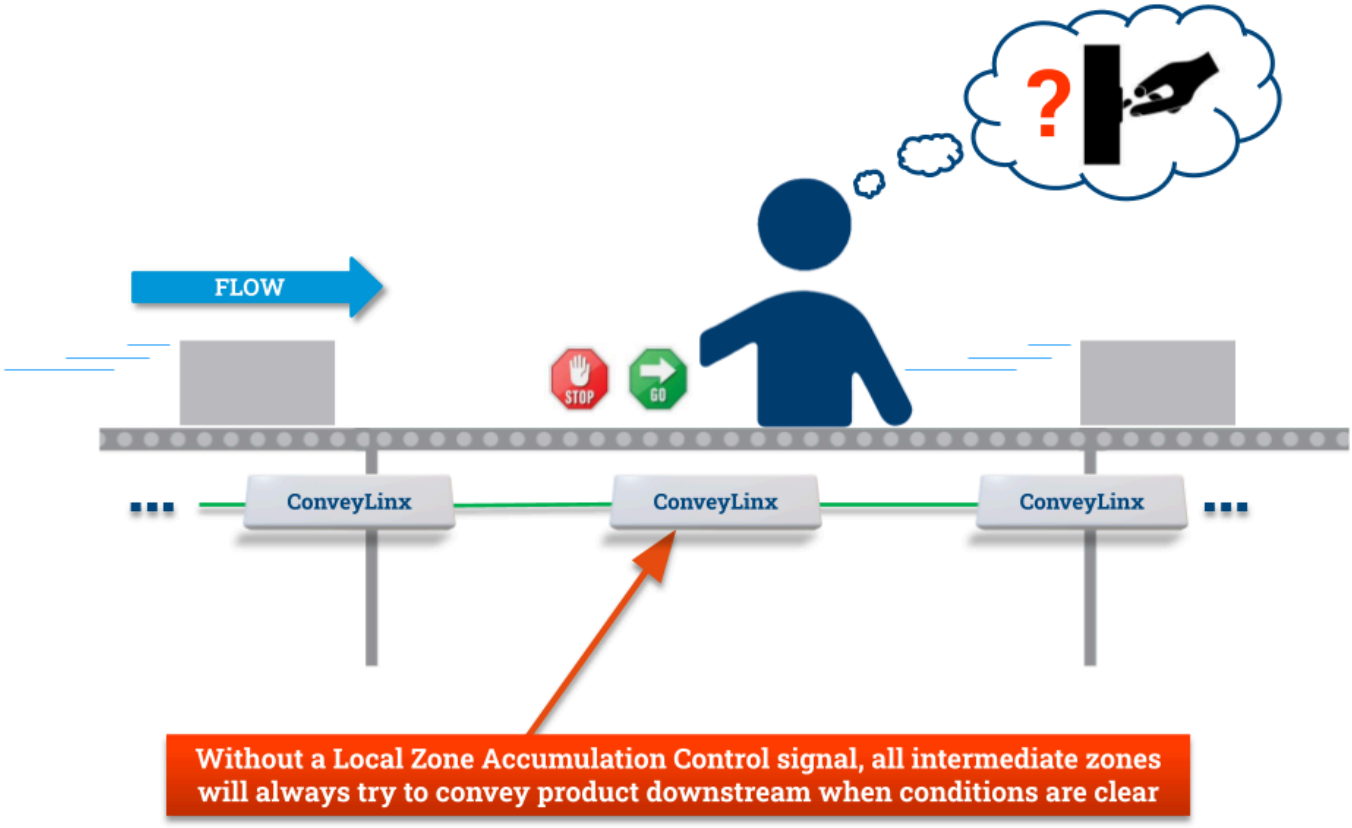
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

By default, and without intervention; all zones in between the most upstream and most downstream zones always try to convey items downstream if the next downstream zone is clear. To cause an intermediate zone to accumulate based upon a wired signal, you need to configure the *Interlock Input* as an ***Accumulate*** signal.



[Accumulate Control for ConveyLinx-ERSC Family]

[Accumulate Control for ConveyLinx-Ai2/Ai3 Family]

[Accumulate Control for ConveyLinx-ECO]

Lane Full Interface

Appendix /

Lane Full Interface

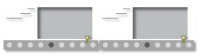
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



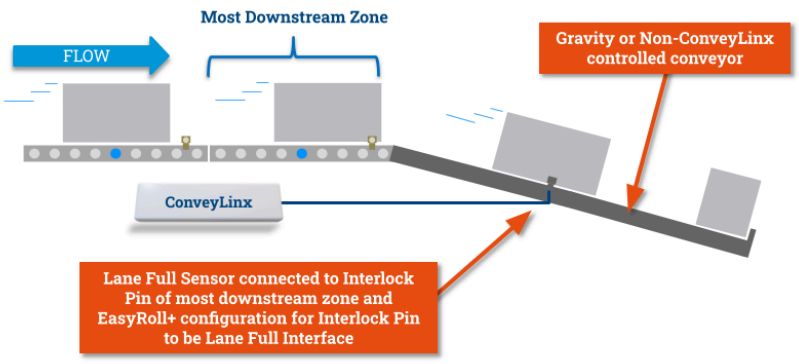
PLC I/O Mode ?

A special case for the most downstream zone's *Interlock Input* signal is referred to as ***Lane Full Interface***. This is used when you want to simply ***continually discharge*** items onto non-ConveyLinx controlled conveyor/machine and by-pass the normal ConveyLinx ZPA singulation release functionality.

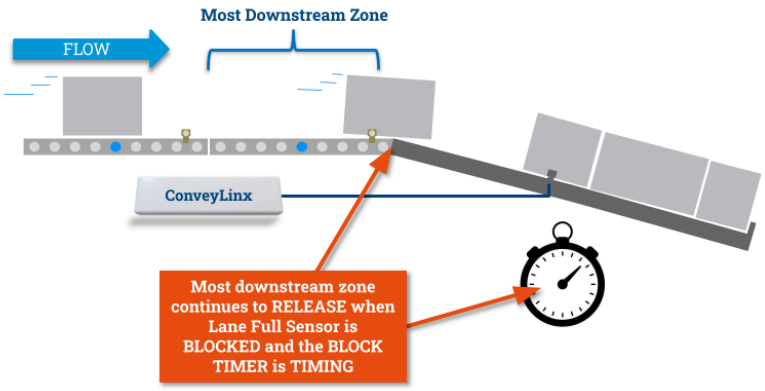
✻ Enabling the ***Lane Full Interface*** automatically Disables the Arrival Jam

✻ **Helpful Tip:** The ***Lane Full Interface*** works particularly well for *pitched gravity conveyor lanes* because ***EasyRoll+*** includes **block** and **clear** timer settings just like you would have to use in a PLC program for a connected sensor. This feature allows you to use a ***standard sensor*** instead of a special sensor with integrated timers.

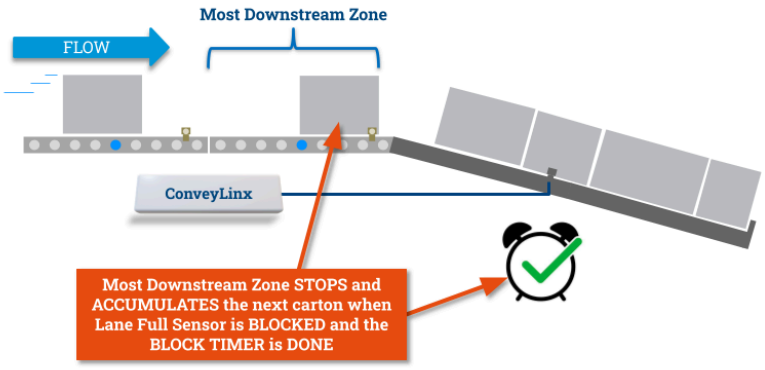
You set this up by connecting a sensor (or PLC output) to the **most downstream zone's** Interlock Input and then selecting **Lane Full Interface(DI)** for the corresponding ***Interlock Input*** in ***EasyRoll+***.



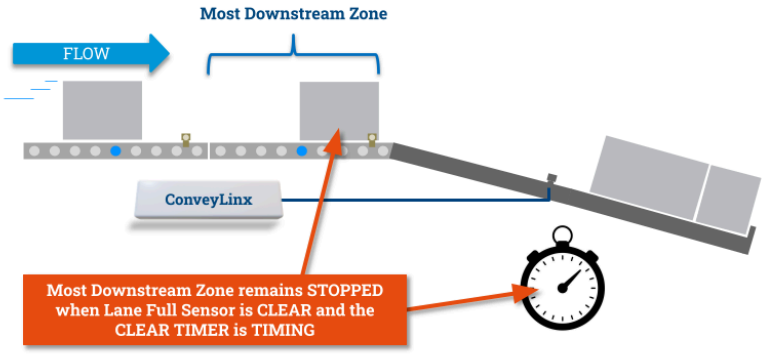
When the ***Interlock Input*** is energized, the **ConveyLinx module** module starts its **Block Timer**. During the period that the Interlock input is energized and the **Block Timer is timing**, items will **continue to discharge** from the most downstream zone



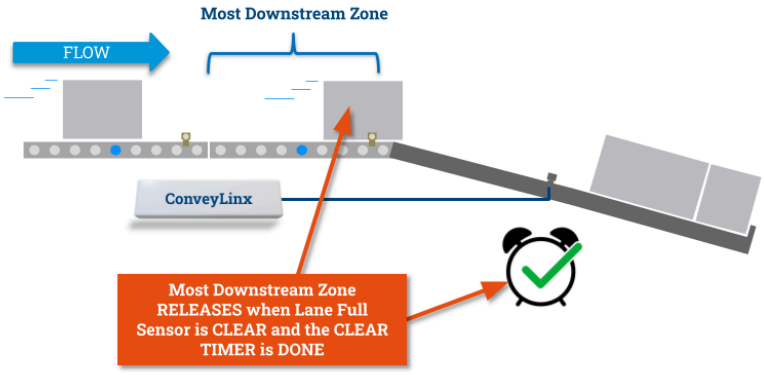
When the **Block Timer** expires, the most downstream zone will **stop releasing**.



When the ***Interlock Input*** is de-energized the **ConveyLinx module** module starts its **Clear Timer**. During this period when the ***Interlock Input*** is de-energized and the **Clear Timer is timing**, items will not release from the most downstream zone



When the **Clear Timer** expires, the most downstream will begin releasing items again



Continuous Discharge

Appendix

Continuous Discharge

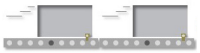
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

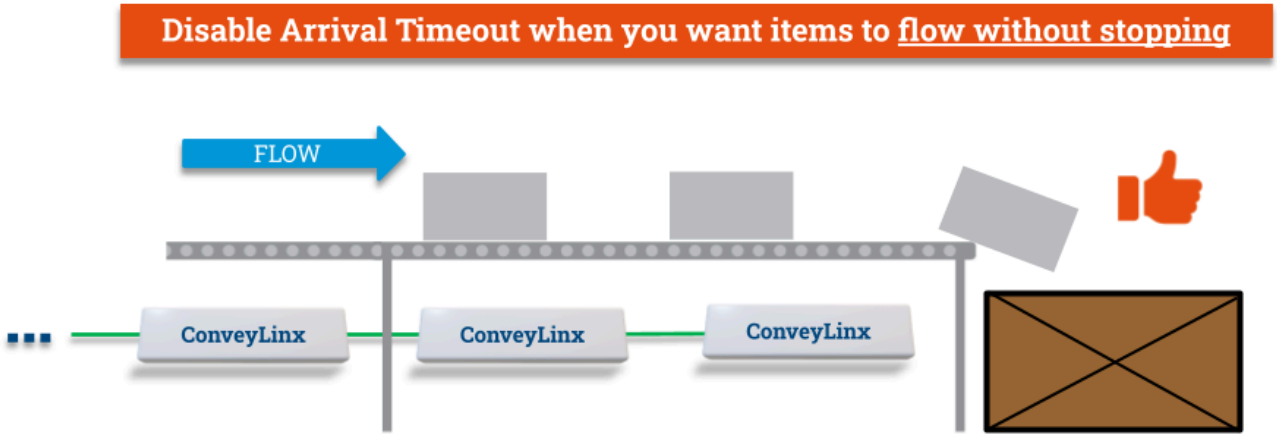
ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

If you require that the ***most downstream zone*** continuously discharges any item that arrives, then Disable Arrival Timeout and Disable Arrival Jam Reset Delay.



✻ This is not required if you are using a lane full sensor, or using a PLC to send an arrival confirmation.

Interlocks with Single Zone Module

Appendix /

Interlocks with Single Zone Module

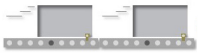
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

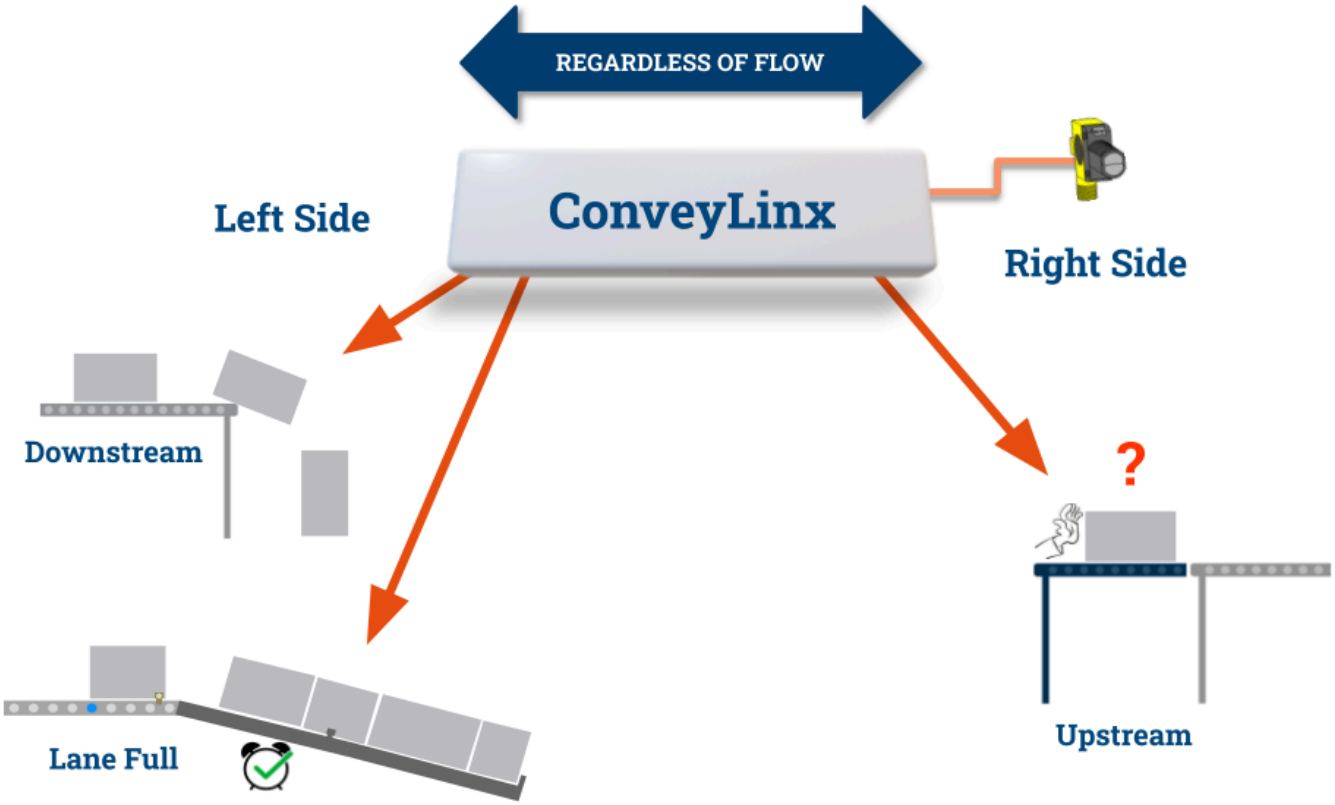
When you have a ***single zone ConveyLinx module*** (one sensor and one or two motors); whichever side of the **ConveyLinx module** (Left or Right) that **has** the ***Sensor*** attached will **always be the Upstream Zone** of the **ConveyLinx module** and that same side's ***Interlock Input*** and ***Interlock Output*** will provide the Upstream Interlock function.

Whichever side of the **ConveyLinx module** (Left or Right) that **does not** have the ***Sensor*** attached will **always be the Downstream Zone** of the **ConveyLinx module** and that same side's ***Interlock Input*** and ***Interlock Output*** will provide the Downstream Interlock function as well as the Lane Full Interface function.

Single Zone ConveyLinx module with Sensor on RIGHT Side

The ***Interlock Input*** and ***Interlock Output*** signals on the **RIGHT** side operate the ***Upstream Interlock*** Function *regardless of flow direction* because the Sensor is connected to the **RIGHT** side of the **ConveyLinx module**

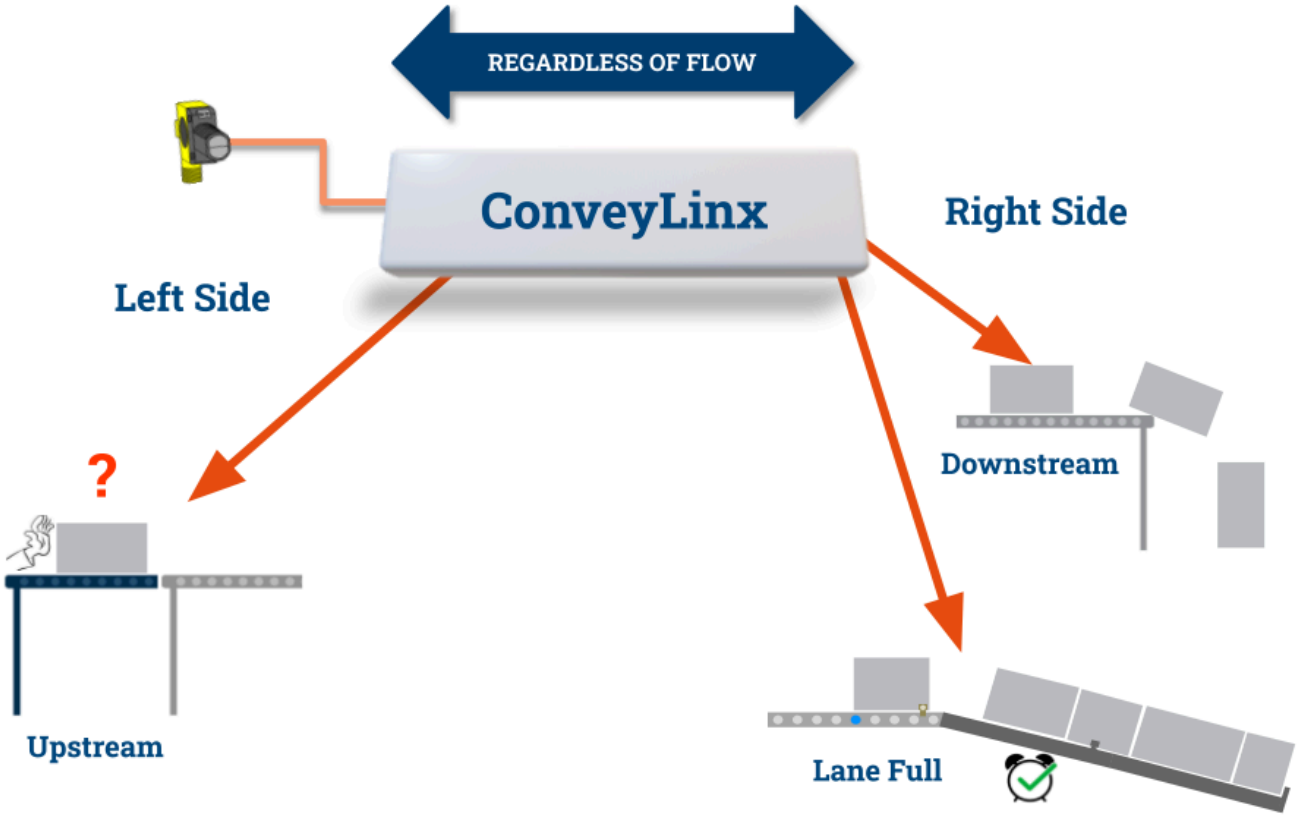
The ***Interlock Input*** and ***Interlock Output*** signals on the **LEFT** side of the **ConveyLinx module** operate the ***Downstream Interlock*** and/or ***Lane Full Interface*** functions *regardless of flow direction* because the **LEFT** side **does not** have a Sensor connected



Single Zone ConveyLinx module with Sensor on LEFT Side

The ***Interlock Input*** and ***Interlock Output*** signals on the **LEFT** side operate the ***Upstream Interlock*** Function *regardless of flow direction* because the Sensor is connected to the **LEFT** side of the **ConveyLinx module**

The ***Interlock Input*** and ***Interlock Output*** signals on the **RIGHT** side of the **ConveyLinx module** operate the ***Downstream Interlock*** and/or ***Lane Full Interface*** functions *regardless of flow direction* because the **RIGHT** side **does not** have a Sensor connected


REGARDLESS OF FLOW
ConveyLinx
Left Side
Right Side
?
Upstream
Downstream
Lane Full

Flex Zone

Appendix /

Flex Zone

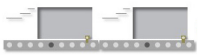
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

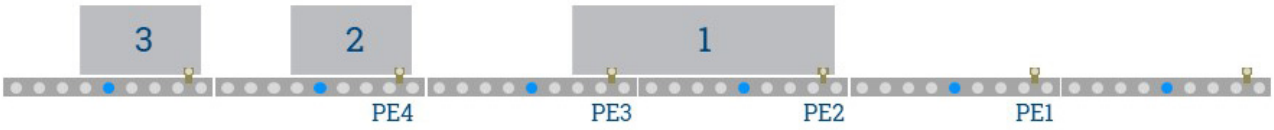


PLC I/O Mode ?

In ZPA mode, **ConveyLinx modules** will automatically detect that a given carton is longer than one zone length and automatically adjust accumulation control so that the longer carton occupies multiple logical zones and will keep the next upstream carton from conveying into the longer carton. The ConveyLinx-ERSC module supports 2 Zone lengths for the Flex Zone, the ConveyLinx-Ai supports multiple zones, in house we have tested up to 5 zones.

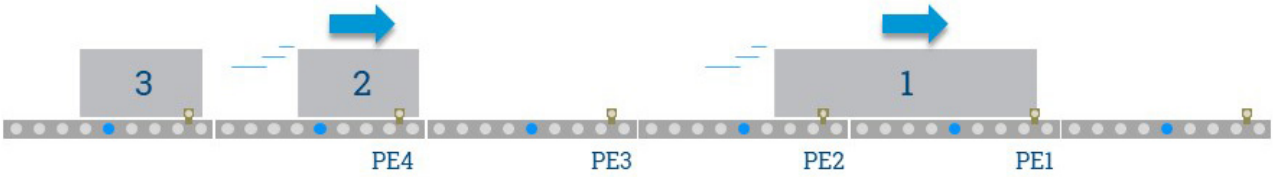
! Flex Zone mode only functions in singulation release mode

All 3 Cartons are accumulated and the Zone at PE3 has Flex Zone enabled



Carton 1 Releases – Even though PE3 is clear, because it has Flex Zone enabled, Carton 2 remains accumulated

When Carton 1's leading edge reaches PE1, Flex Zone is cleared from the Zone at PE3 and Carton 2 releases

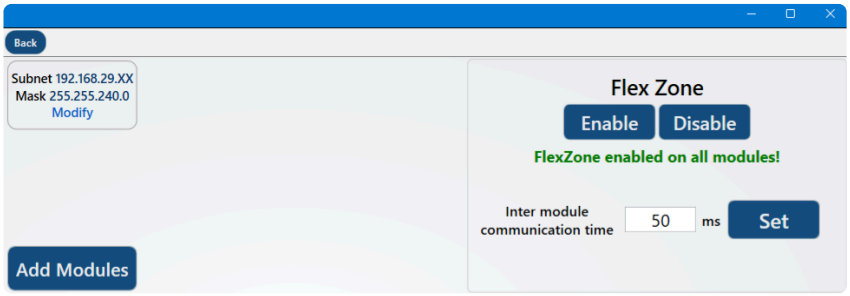


! Please note that Flex Zone mode operates for carton lengths up to 2 zone lengths only. Operating conveyor system with cartons whose lengths are in excess of 2 zone lengths may produce undesirable results such as excessive detected jam conditions and faults.

The ***Flex Zone*** feature is enabled by default when you perform the *Auto Configure Procedure*. There can be certain situations such as higher speed applications and/or applications where a large percentage of cartons are at a length very close to the zone length where a "false triggering" of a flex zone condition can occur. In these situations, when product needs to accumulate, you may see several zones unoccupied because of this false triggering. For these applications where accumulation density is paramount, you can disable *Flex Zone* to eliminate this false triggering situation.

! Please note that Flex Zone function has to be enabled or disabled for the entire subnet. It cannot be disabled or enabled on a per zone basis or for a group of zones within the same subnet.

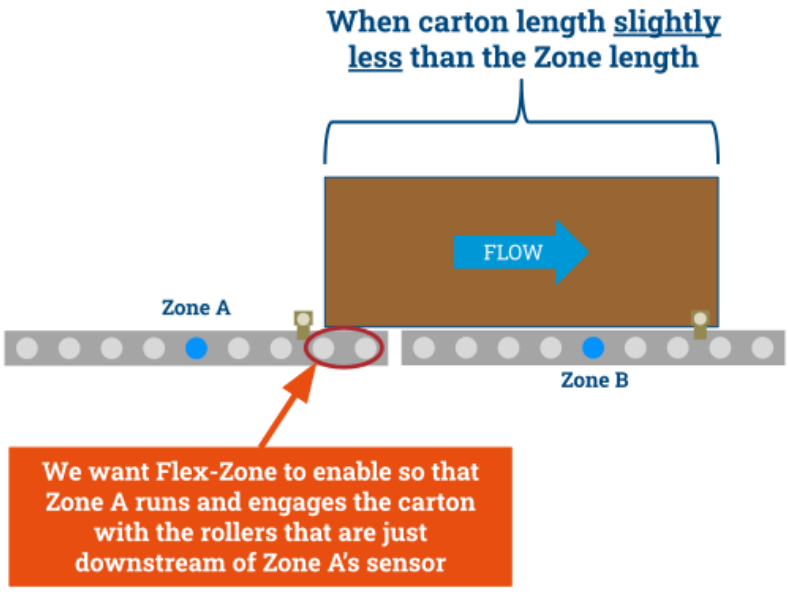
Click the appropriate button to either ***Disable*** or ***Enable*** Flex Zone based upon the ***Subnet's*** current status as indicated. Because this function applies to all modules in the ***Subnet***, it does not matter what module you were connected to in order to disable or enable ***Flex Zone***



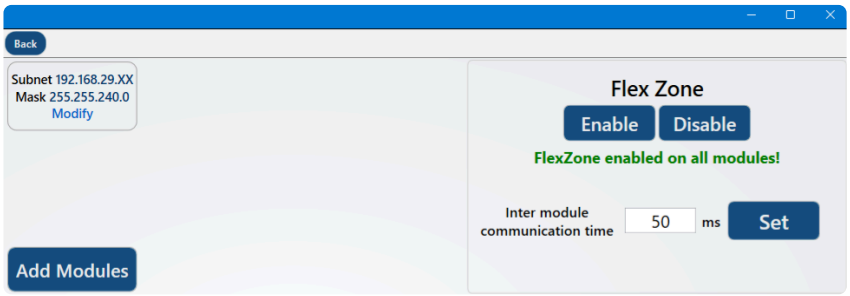
Inter Module Communication Time

The ***Inter Module Communication Time*** value is used to adjust the behavior of the Flex Zone operation. In situations where carton lengths can be close to the length of the zones (i.e. distance between photoeyes), you may want to adjust Flex Zone operation so that it either engages or not in these situations.

Typically there are one or two driven rollers past the sensor in a Zone. If you have cartons that encroach upon these rollers when accumulated in the downstream zone, you may want ***Flex Zone*** to engage so that the next upstream carton will not enter the zone (Zone A in the example), thus not running these rollers underneath the accumulated carton.



The value entered is in msec and it can be thought of as an amount of time added to the logic after the trailing edge of the sensor in order to simulate increasing the carton length. Please note that this value will be set the same for each module in the ***Subnet***.



> ✻ **Please note this value has nothing to do with speeding up or slowing down the actual speed of communications between modules**

Brake Method

Appendix /

Brake Method

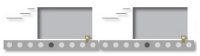
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

The available **Brake Method** selections vary depending upon the controller family you are using. Here are the selection descriptions based upon controller family:

ConveyLinx-Ai2 / Ai3 Both 24V and 48V

Method	Description
Normal	Once the controls have decelerated the rotor to a stop, the motor coil are internally connected. The permanent magnet forces in the rotor and the mechanical inertia of the gearbox holds the rotor in place. This is the MDR industry standard holding brake method and is often termed short circuit or shunt. ***Normal*** is the default factory setting for all module zones from the *Auto-Configuration Procedure*
Free	Once the controls have decelerated the rotor to a stop, the motor coils are internally disconnected and only the mechanical gearbox inertia holds the rotor in place
Servo Brake	When the controls have decelerated the rotor to a stop, the processor notes the *Hall Effect* sensor status. If the *Hall Effect* sensor status changes indicating a change in position of the rotor, the controls will inject current into the motor coils in the proper

	sequence to move the rotor back to its original stop position
Continuous Torque	When the controls have decelerated the rotor to a stop, the processor monitors the *Hall Effect* sensor status. If the *Hall Effect* sensor status changes indicating a change in position of the rotor, the controls will inject current into the motor coils to generate torque in order to try and stop the rotor. Unlike the *Servo Brake* function, the controls do not try and return the rotor to its original stop position

! Servo Brake function utilizes motor power and depending on the torque demanded by the motor to hold the load the potential for heat build-up exists

✻ ***Continuous Torque*** Brake method requires ***EasyRoll*** version 4.21 or later

---

ConveyLinx-ERSC

Method	Description
Normal	Once the controls have decelerated the rotor to a stop, the motor coil are internally connected. The permanent magnet forces in the rotor and the mechanical inertia of the gearbox holds the rotor in place. This is the MDR industry standard holding brake method and is often termed short circuit or shunt. ***Normal*** is the default factory setting for all module zones from the *Auto-Configuration Procedure*
Free	Once the controls have decelerated the rotor to a stop, the motor coils are internally disconnected and only the mechanical gearbox inertia holds the rotor in place
Servo Brake 1	When the controls have decelerated the rotor to a stop, the processor notes the *Hall Effect* sensor status. If the *Hall Effect* sensor status changes indicating a change in position of the rotor, the controls will inject current into 2 of the 3 motor coils in the proper sequence to move the rotor back to its original stop position

Servo Brake 2	When the controls have decelerated the rotor to a stop, the processor notes the *Hall Effect* sensor status. If the *Hall Effect* sensor status changes indicating a change in position of the rotor, the controls will inject current into all 3 of the motor coils in the proper sequence to move the rotor back to its original stop position

✻ Please note that if you change the ***Brake Method*** and this module goes through another ***Auto Configuration*** procedure, the ***Brake Method*** setting **will not** reset back to default. It will remain unchanged at the last selected setting.

! Servo Brake 1 and 2 are functionally equivalent. Servo Brake 2 utilizes more power and provides more holding torque. Consequently, because Servo 2 uses more current, the potential for heat build-up is present depending on your application. If Servo Brake 1 provides enough holding torque for the application, it is recommended using it in lieu of Servo Brake 2. Servo Brake 2 should only be used when Servo Brake 1 does not provide enough holding torque for the application

ConveyLinx-ECO

Method	Description
Normal	Once the controls have decelerated the rotor to a stop, the motor coil are internally connected. The permanent magnet forces in the rotor and the mechanical inertia of the gearbox holds the rotor in place. This is the MDR industry standard holding brake method and is often termed short circuit or shunt. ***Normal*** is the defauilt factory setting for all module zones from the *Auto-Configuration Procedure*.
Free	Once the controls have decelerating the rotor to a stop, the motor coils are internally disconnected and only the mechanical gearbox inertia holds the rotor in place.
Servo Brake	When the controls have decelerated the rotor to a stop, the processor notes the *Hall Effect* sensor status. If the *Hall Effect* sensor status changes indicating a change in position of the rotor,

	the controls will inject current into the motor coils in the proper sequence to move the rotor back to its original stop position.
Continuous Torque	When the controls have decelerated the rotor to a stop, the processor monitors the *Hall Effect* sensor status. If the *Hall Effect* sensor status changes indicating a change in position of the rotor, the controls will inject current into the motor coils to generate torque in order to try to stop the rotor. Unlike the *Servo Brake* function, the controls do not try to return the rotor to its original stop position.

Sensor Debounce

Appendix /

Sensor Debounce

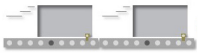
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

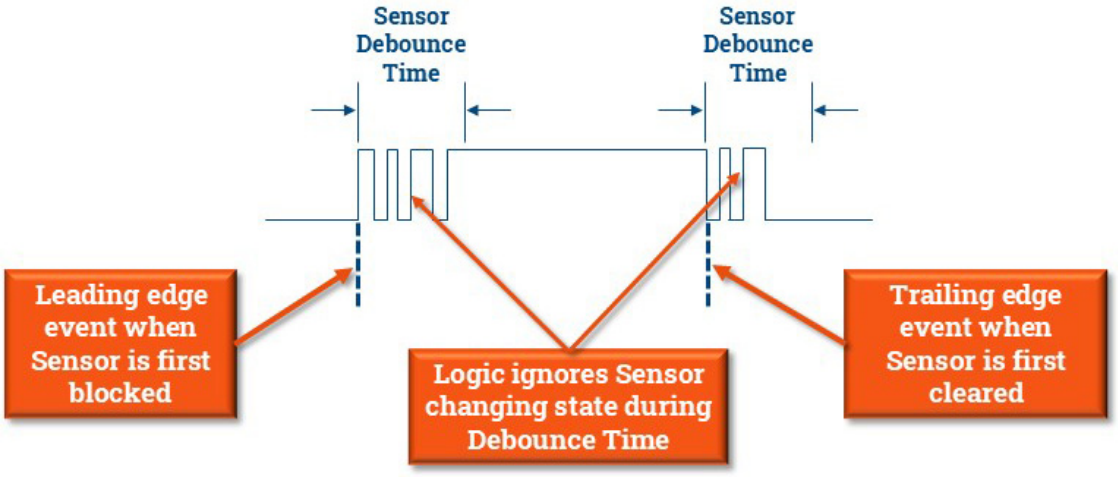
ConveyLinx-ECO ?

ZPA Mode ?



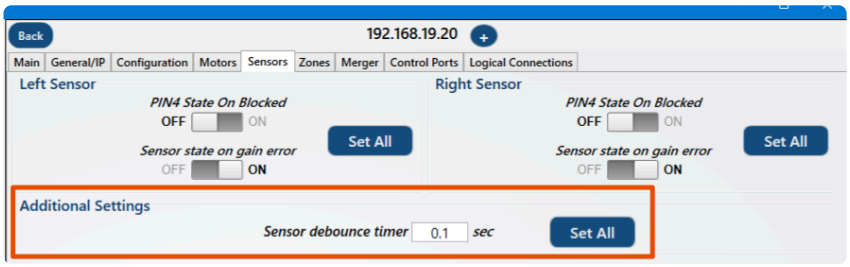
PLC I/O Mode ?

Sensor Debounce setting is the time the logic holds the state of its Sensor inputs after a change of state. Keep in mind this is not a delay prior to detecting a carton when it first blocks the sensor. The module will detect the leading edge of a carton and hold this state for the ***Sensor Debounce*** time period. Similarly, when the trailing edge of the carton clears the sensor, the logic holds this state for the ***Sensor Debounce*** time period.



The **ConveyLinx module** keeps a running count of the number of changes of state that have occurred during the ***Sensor Debounce Time*** window even though the logic is ignoring these state changes. This running value is called the ***Flicker Counter***

Enter the desired value in seconds and click the *Set* button. The default is 0.1 seconds and the valid range is 0 to 10 seconds. Please note this setting applies to **both** the **Left and Right Sensor** ports. The *Set All* button will apply these same settings for the range of modules indicated at the top of the dialog.



Look Ahead Slow Down

Appendix /

Look Ahead Slow Down

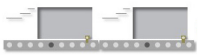
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

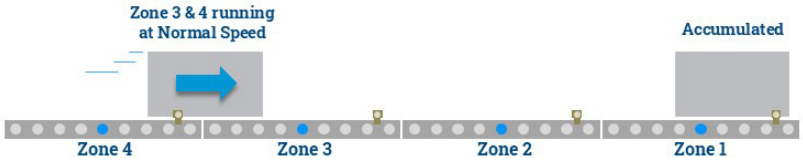
ZPA Mode ?



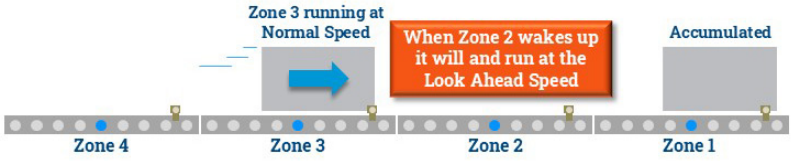
PLC I/O Mode ?

The ***Look Ahead*** feature configures the logic to "look ahead" to its next downstream zone and if it is occupied when a carton is entering its zone, the module will dynamically adjust the MDR to the selected speed. This feature in intended to be used in higher speed applications were increased stopping distance is required to keep cartons from over-travelling their stop positions. This function can be applied per zone or for multiple zones

A carton is accumulated and stopped at Zone 1 and another carton is conveying at normal set speed



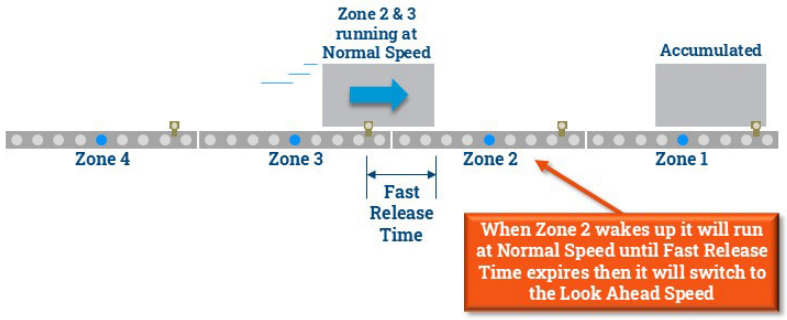
When carton reaches end of Zone 3, Zone 2 will wake up and run at the Look Ahead Speed



Fast Release Time

The ***Fast Release Time*** option allows you to set a delay before the ***Slow Down Speed*** is engaged for the slow-down zone

When Zone 2 wakes up it will run at normal set speed until the *Fast Release Time* has expired, then it will switch to run at the *Slow Down Speed*



Run After

Appendix /

Run After

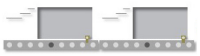
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

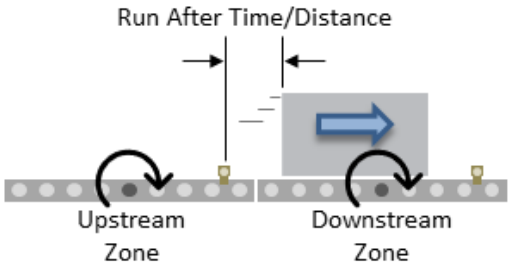
ZPA Mode ?



PLC I/O Mode ?

The ***Run After*** time value is used by the logic for normal zone discharge. This is the amount of time the zone's MDR will continue run after its photo-sensor has been clear when discharging to the next downstream zone.

This extra run time allows the zone to run so that the trailing edge of the carton can completely pass the photo-sensor and fully enter the next zone. This value is adjustable to compensate for special conditions where a zone photo-sensor is required to be placed farther upstream or downstream

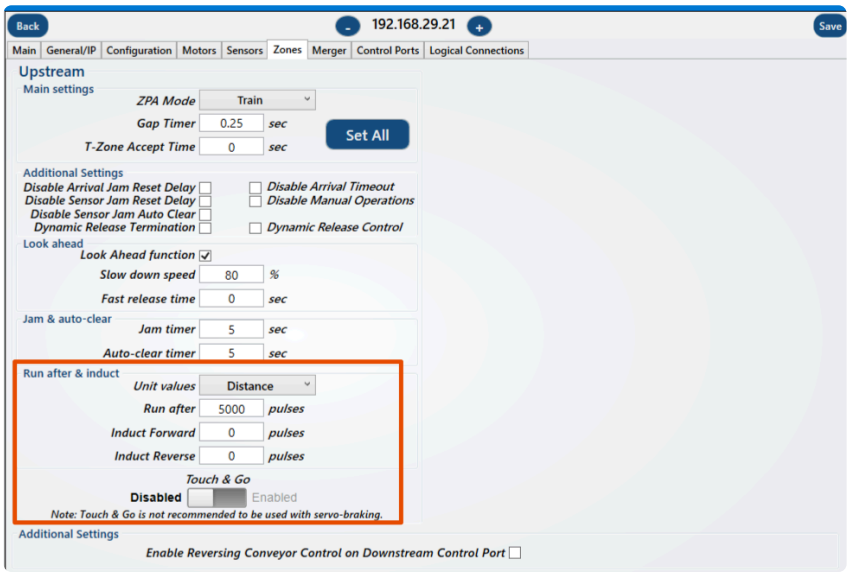


✻ Please note that ***Run After*** does not affect throughput rate. A longer ***Run After*** time will not prevent an upstream item from entering the ***Upstream Zone***.

Run After Distance

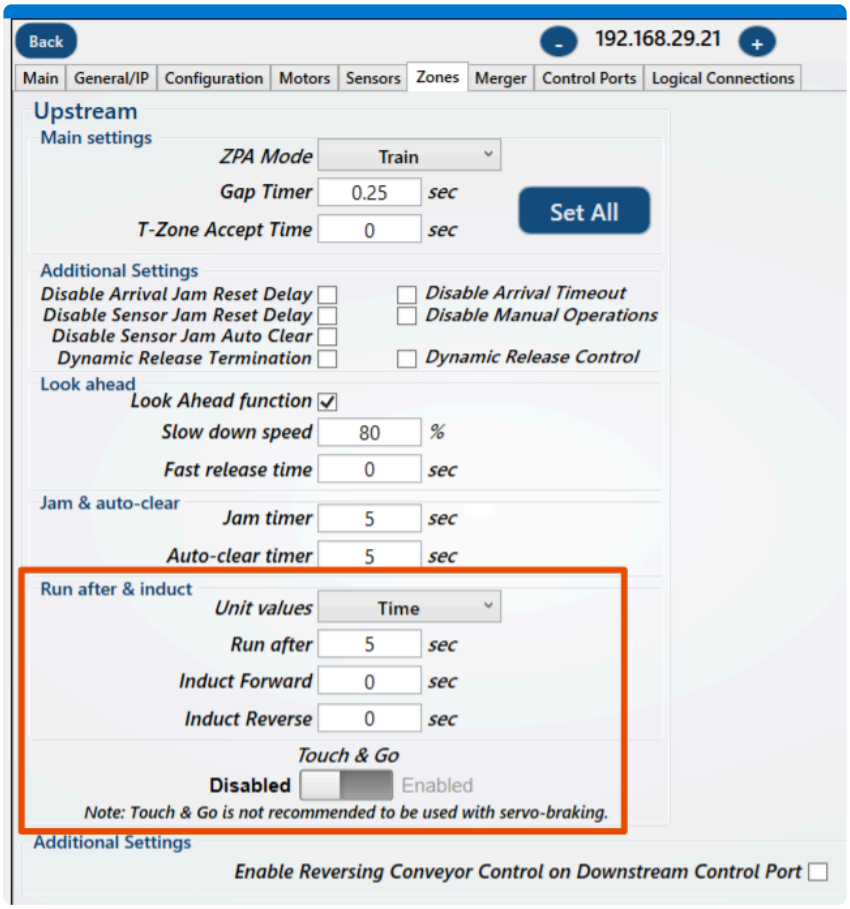
EasyRoll provides the option to change the ***Run After*** metric to be distance based instead of time based. When the metric is distance, the value entered is millimeters instead of seconds

Select ***Distance*** from the drop-down box and enter new values for upstream and/or downstream ***Run After*** distance and click the corresponding *Set* button. The default is 1000 mm and the valid range is 0 to 65,535. The *Set All* button will apply these same settings for any module(s) selected in the Set All Dialog box. In this example we changed the ***Run After*** distance to 100 mm and using the *Set All* button to update this setting in Nodes 3 thru 4.



Run After Time

Enter new values for upstream and/or downstream ***Run After*** time and click the corresponding *Set* button. The default is 5 seconds and the valid range is 0 to 65 seconds. The *Set All* button will apply these same settings for any module(s) selected in the Set All Dialog box, you can set the range of modules and which settings to configure.



Selecting modules from the *Set All* dialog box.

Induct Forward & Reverse

Appendix /

Induct Forward & Reverse

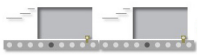
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

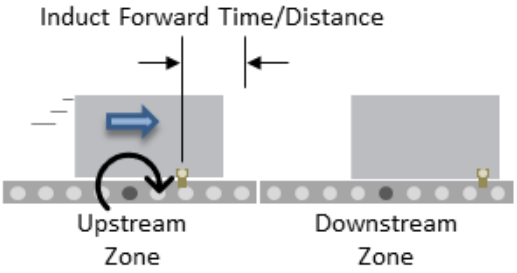
ZPA Mode ?



PLC I/O Mode ?

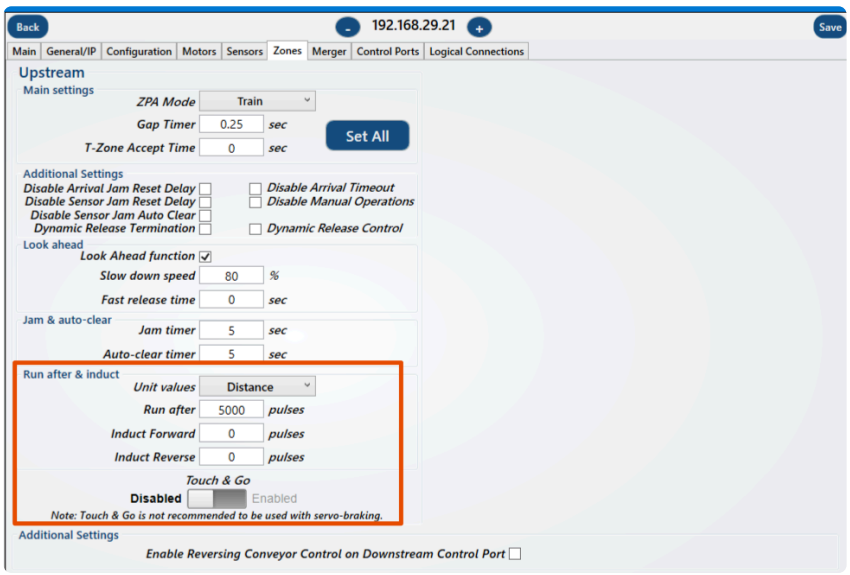
Induct Forward value is used to cause the MDR to continue to run after the zone's photo-sensor has been blocked when receiving a carton from upstream.

This value is adjustable per zone to compensate for special conditions when for example a zone's photo-sensor needs to be placed farther upstream from the discharge end of the zone



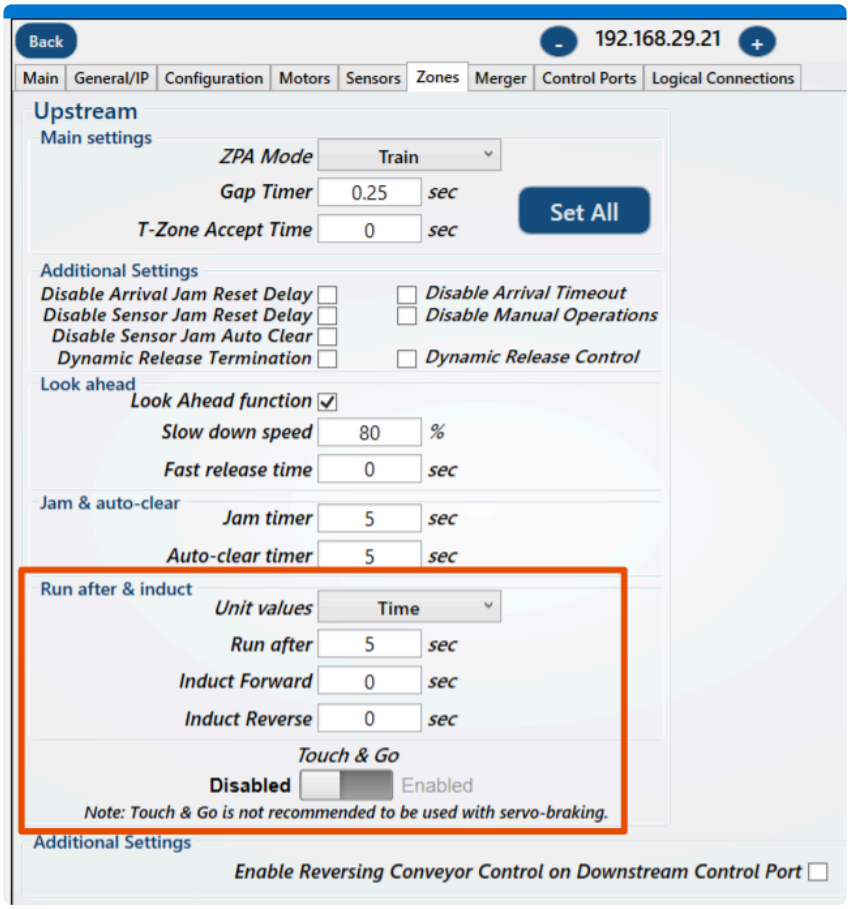
Induct Forward Distance

Select Distance from the drop down box and enter new values for upstream and/or downstream ***Induct Forward*** pulses and click the corresponding *Set* button. The default is 0 mm and the valid range is 0 to 65,535 mm. The *Set All* button will apply these same settings for any module(s) selected in the Set All Dialog box, you can set the range of modules and which settings to configure.



Induct Forward Time

Enter new values for upstream and/or downstream *Induct Forward* time and click the corresponding *Set* button. The default is 0 seconds and the valid range is 0 to 65 seconds. The *Set All* button will apply these same settings for any module(s) selected in the Set All Dialog box, you can set the range of modules and which settings to configure.



Selecting modules from the *Set All* dialog box.

Touch & Go

Appendix /

Touch & Go

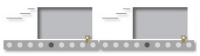
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

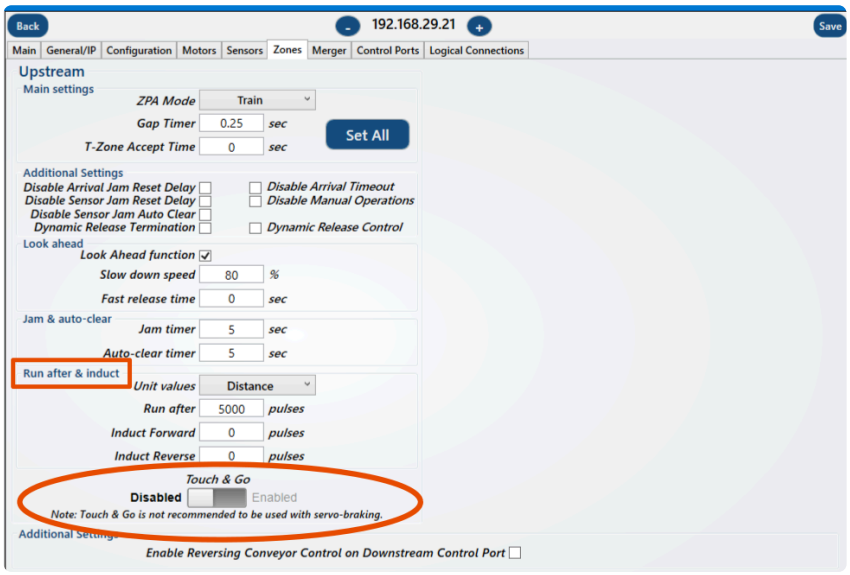
ZPA Mode ?



PLC I/O Mode ?

The *Touch & Go* function is available in ZPA mode and when activated causes the MDR in the activated zone to sense rotational movement of the MDR in its default direction. If this rotational movement (such as someone pushing a carton onto the zone) is of sufficient duration and speed; the zone will "wake up" as if its upstream interlock had been energized. You enable this function by checking the appropriate Upstream or Downstream checkbox in the *Touch & Go* area.

You can set this functionality for either or both the Upstream and Downstream Zones in the direction of flow. In this example we checked the Upstream zone



! Touch & Go is only applicable for ZPA mode. Do NOT use Touch & Go with Servo

Braking

! Touch & Go functionality is *NOT* a substitute for a wake up photo eye sensor

PGD Motor Pulse Distance Calculation

Appendix /

PGD Motor Pulse Distance Calculation

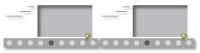
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

For the PGD motor there are 30 pulses per revolution of the motor shaft. The formula to calculate the linear distance the pulley would turn in one pulse is:

$$mm/pulse = (\pi \times Pulley\ Diameter) / (30 \times Gear\ Ratio)$$

✻ Gear Ratio values for specific speed codes are found in our Senergy MDR & Gear Drive Technical Guide

For example, we have a standard Senergy roller with a diameter of 48.6 mm (standard 1.9" tube) and our speed code is 60. From the chart on page 10 (2019 edition of the Catalog) indicates that the Gear ratio for a 60-speed code is 11. From this information we plug in the values into our formula:

$$(\pi \times 48.6) / (30 \times 11) = 0.463\ mm\ per\ pulse$$

For this 60-speed code Senergy roller, when you set the Deceleration in Closed Loop mode to 50 pulses; the roller will decelerate for a distance of:

$$0.463\ mm/pulse \times 50\ pulses \cong 23\ mm$$

ConveyLinx Ethernet Definition

Appendix /

ConveyLinx Ethernet Definition

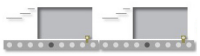
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



PLC I/O Mode ?

All **ConveyLinx Modules** communicate over Ethernet network and use TCP/IP based protocols for normal function. All TCP/IP protocols require that each device on a network have a unique I.P. address assigned to it in order to function properly.
An I.P. address is in the format of: **AAA.BBB.CCC.DDD** where **AAA**, **BBB**, **CCC**, and **DDD** are numerical values between 0 and 255.

> ✻ For the purposes of ConveyLinx; the **AAA.BBB.CCC** portion of the I.P. address taken together is defined as the **Subnet**.

For example; if a module has an I.P. address of “192.168.25.20” then its ***Subnet*** address is “192.168.25”

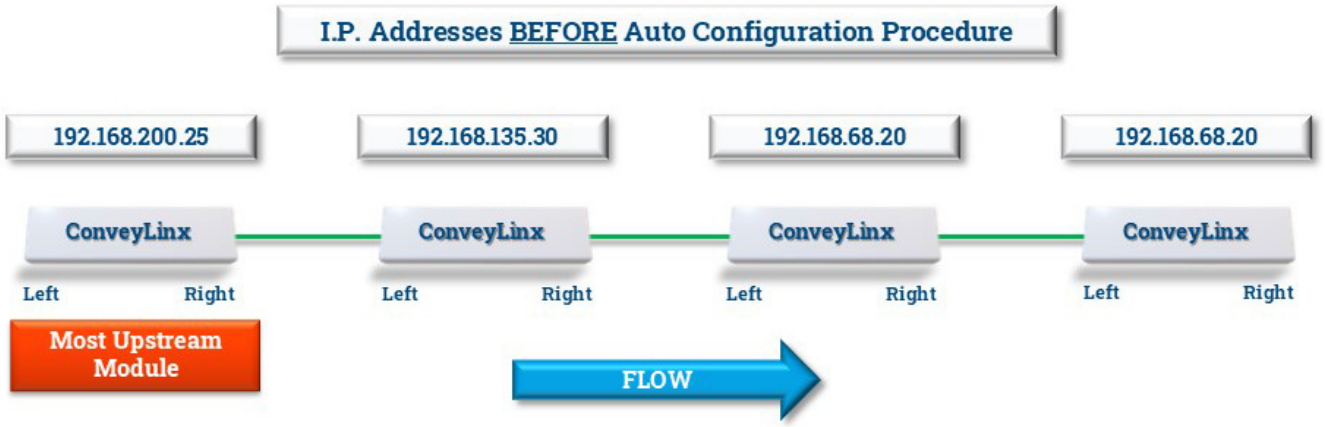
At the factory, each and every module is assigned an I.P. address that is used by automated testing equipment and fixtures so that every module is verified prior to shipment. When a module is taken “out of the box” it will still have this I.P. address stored in its memory.

When the ***Auto Configuration Procedure*** is initiated; one of the many things that occur is that each module is automatically assigned a new I.P. address. This I.P. address for all modules is determined by the ***Subnet*** of the I.P. address already stored inside the most upstream module. Even if all downstream modules from the most upstream have the same or different ***Subnet*** values; these downstream modules will have their ***Subnet***

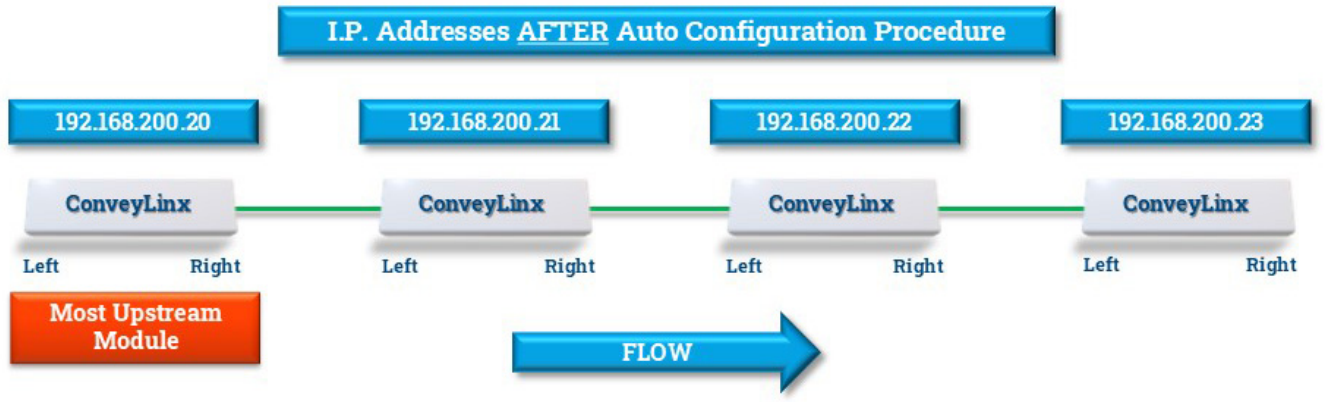
changed to the existing ***Subnet*** of the most upstream module. Furthermore, when the *Auto Configuration Procedure* occurs; the most upstream module will also have its ***DDD*** octet value changed to 20. All downstream Modules will then have their respective ***DDD*** values automatically set beginning with 21.

An Example

Here is a 4-module network with possible I.P. addresses that could have been on the module from the factory. Note that their ***Subnets*** could be different as well as there could be duplicate addresses.



Once the ***Most Upstream Module*** is identified as the ***Selected Auto-Configuration Module*** and when the ***Auto-Configuration Procedure*** is performed; all 4 modules will have their I.P. address configured as shown.



Each Subnet is limited to **221 Modules**

Connections for a Subnet

Appendix /

Connections for a Subnet

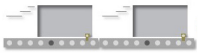
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?

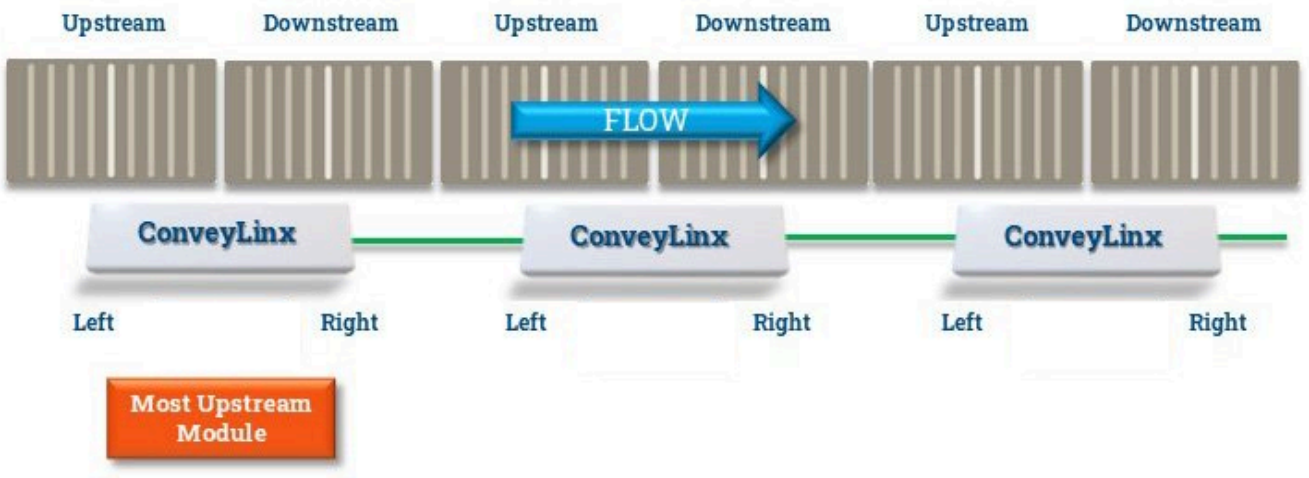


PLC I/O Mode ?

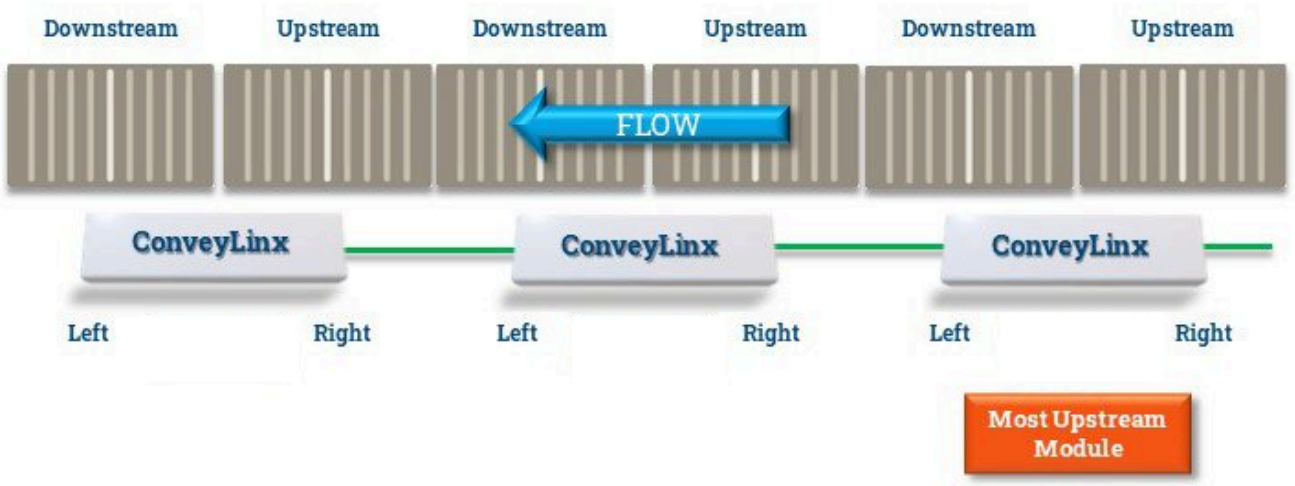
With your motors and sensor connected to your individual **ConveyLinx module**, you will need to connect the Ethernet network cabling from module to module in a daisy chain fashion.

> ✻ Please note that the ***Flow*** is based upon the Ethernet cable routing during the ***Auto-Configure Procedure***. The ***Flow*** direction cannot be changed or over-ridden. The only way to change the ***Flow*** direction is to perform another ***Auto-Configuration Procedure***

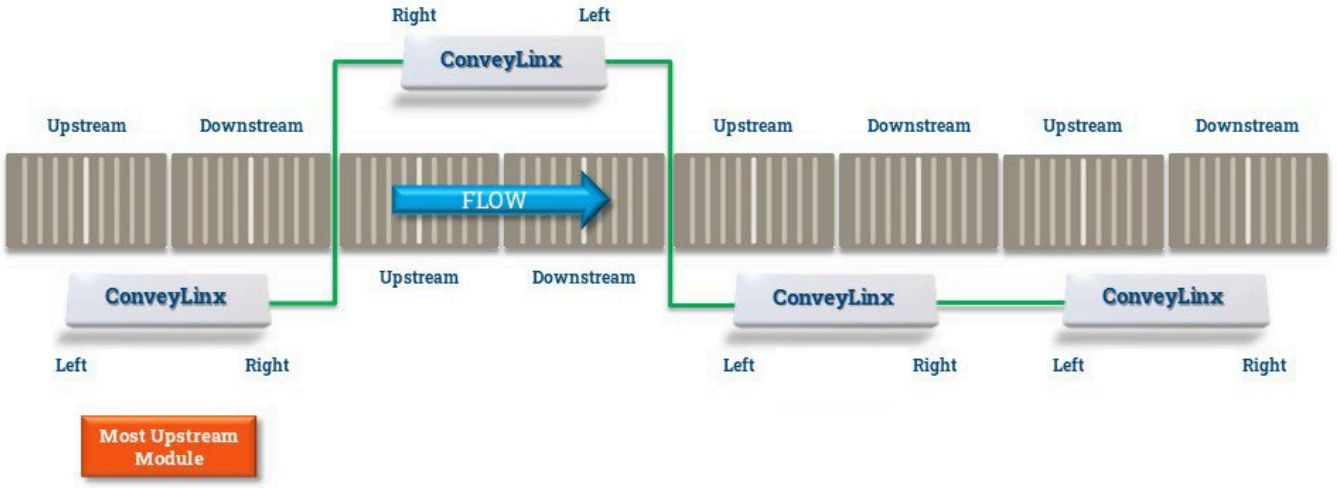
Subnet with Left to Right Flow:



Subnet with Right to Left Flow:



Subnet showing one module on the opposite side of conveyor:



Expected Results

Appendix /

Expected Results

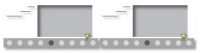
ConveyLinx ERSC ?

ConveyLinx-Ai 24V ?

ConveyLinx-Ai 48V ?

ConveyLinx-ECO ?

ZPA Mode ?



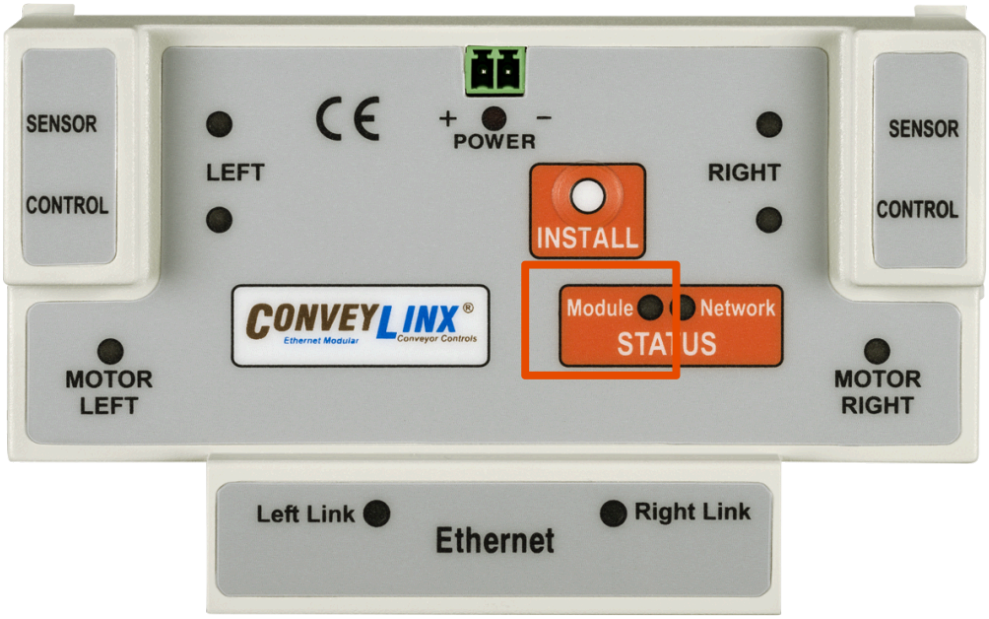
PLC I/O Mode ?

When the ***Auto-Configuration Procedure*** routine is complete, each **ConveyLinx module** will automatically reboot. When a **ConveyLinx module** has been successfully configured and rebooted, its ***Module Status*** LED will blink on and off green. **Please note that the location of the *Module Status* indicator is different on all module types**

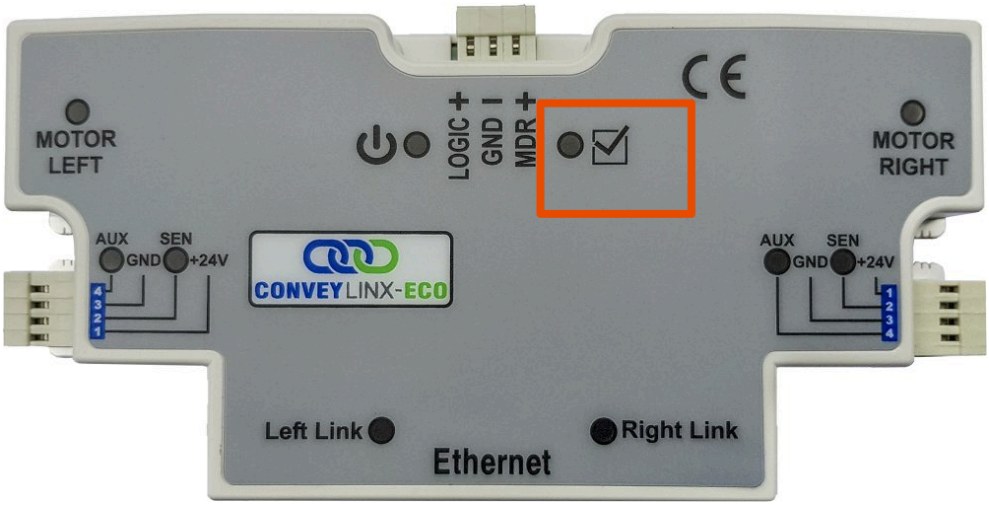
ConveyLinx-Ai2 ?

ConveyLinx-Ai3 ?

ConveyLinx-ERSC ?



ConveyLinx-ECO ?



Please note that the time to complete the ***Auto-Configuration Procedure*** is dependent on the number of **ConveyLinx Modules** being configured. Larger networks will take more time than smaller networks

How to verify success

Conveyor Operation

Place a carton on your empty conveyor so that it blocks the most upstream zone's sensor. It should convey all the way to the discharge end and the last most downstream zone should try to convey it off the end of its zone. If this does not happen, then at the point where the carton stops, check that module's motor connection is sound and that the zone's sensor is properly aligned. If the sensor was not properly plugged in and powered

when the ***Auto-Configuration Procedure*** was performed, you will have to perform the procedure again. If the sensor was powered but is misaligned when the ***Auto-Configuration Procedure*** was performed, you can either perform the procedure again or use the ***Sensor*** tab to change the logical polarity of that particular sensor.

Examine the Network

While the ***Auto-Configuration Procedure*** is in process, you should see all of your modules' LEDs flashing on and off red. If this is not the case, then check your Ethernet cables and connections and power connections.

To verify that all the modules you expected to be configured are in fact configured, with ***EasyRoll*** you can connect to your newly configured **ConveyLinx module** network and perform a ***Discover*** function. The ***Discover*** function will display all modules that it finds and from the list your most upstream **ConveyLinx module** should have the 4th octet of its IP Address as .20 and you should see each module you configured in the list.