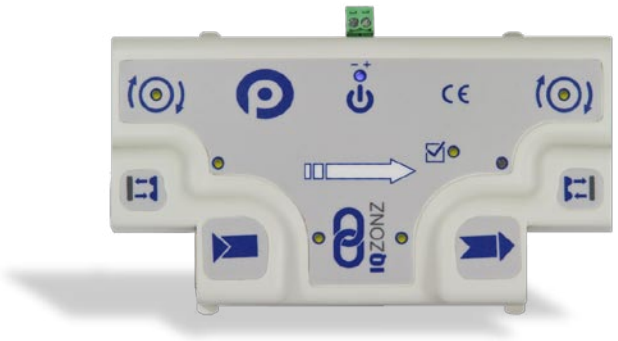
PULSEROLLER

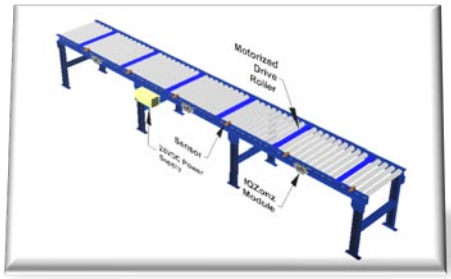
IQZONZ

Quick Start Guide

Version 1.1

January 2016





Publication IQ-1000

Module firmware and functionality is protected by U.S. and international patents. For complete patent information visit www.pulseroller.com/patents

IMPORTANT USER INFORMATION

IQZonz and *IQMap* 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, Insight Automation Inc. does not assume responsibility or liability (to include intellectual property liability) for actual use based on the examples shown in this publication

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SUMMARY OF CHANGES

The following table summarizes the changes and updates made to this document since the last revision

Revision	Date	Change / Update
1.0	April 2014	Initial Release
1.1	January 2016	Added patent information

GLOBAL CONTACT INFORMATION

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INTRODUCTION TO IQZONZ

IQZonz provides simple Zero Pressure Accumulation (ZPA) conveyor control for conveyors utilizing Pulse brand Senergy model Motorized Drive Rollers (MDRs). *IQZonz* modules require no manual set up or configuration by either on-board switches or dials nor are any configuration required by connecting a PC based software package and downloading.

IQZonz modules interconnected via standard shielded Ethernet cabling to form an integrated solution for MDR (Motorized Drive Roller) conveyor functionality. Each *IQZonz* module can accommodate up to 2 MDR's and 2 photo-sensors to provide control for up to 2 conveyor zones.

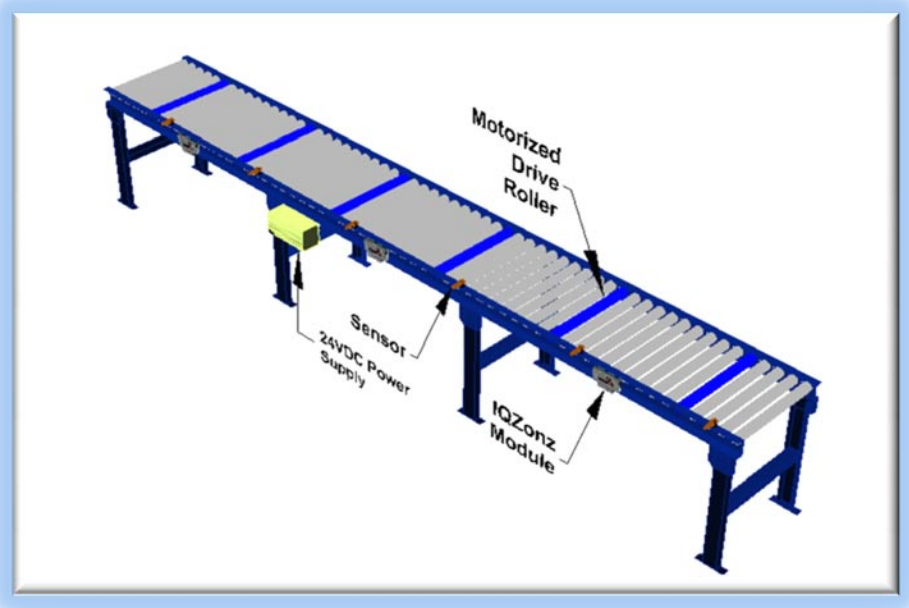
A companion module to *IQZonz* is the *IQMap* module that allows you to add functionality to the basic ZPA operation of your conveyor.

For a complete description of IQZonz and IQMap module functionality and specifications, please refer to the IQZonz Reference Manual (Insight Automation publication IQ-1000).

TYPICAL IQZONZ CONVEYOR COMPONENTS

These are the typical components for a simple linear ZPA conveyor:

- ✓ *IQZonz* modules
- ✓ MDRs – one or two per *IQZonz*
- ✓ Photo-sensors – one or two per *IQZonz*
- ✓ 24VDC Power Supplies
- ✓ Communication Cables



GETTING STARTED

This guide will show you how to get up and running with *IQZonz* module and as well as how to add an *IQMap* module to change conveyor speed and to provide Wake Up and Lane Full Interface functions as the infeed and discharge ends of you conveyor. First let's get familiar with the *IQZonz* module. Figure 1 shows the module and its connection points along with some default settings.

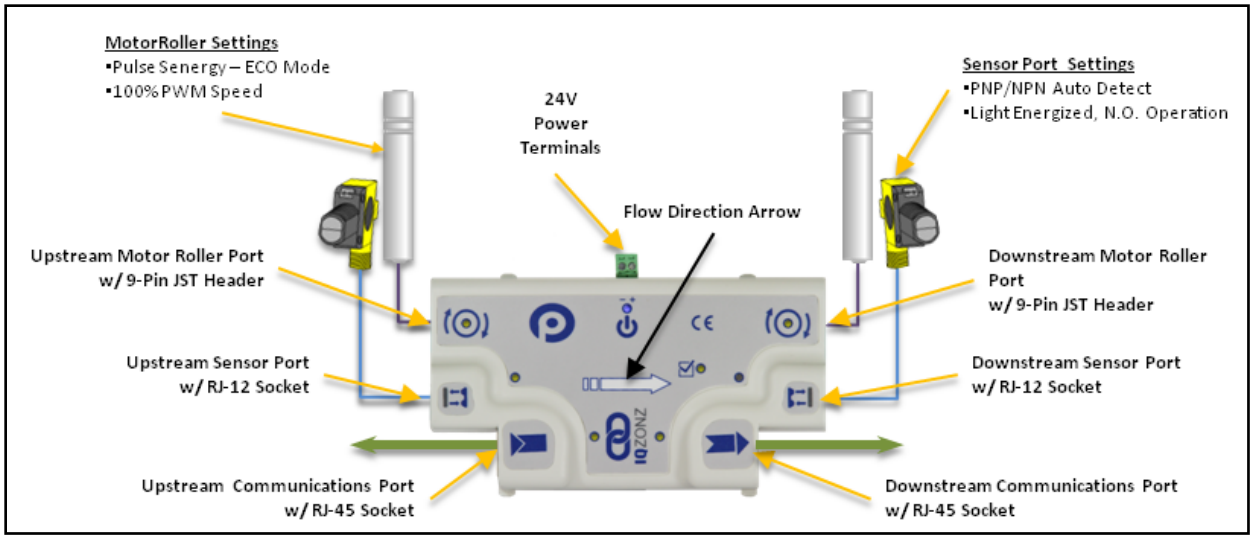


FIGURE 1 - IQZONZ MODULE DETAIL

IQZONZ CONTROL DEFAULTS

IQZonz operates ZPA conveyor in standard singulation mode which means an upstream zone will not discharge to its downstream zone unless and until the downstream zone is clear. The following chart lists the default settings and device connection requirements.

MDR SETTINGS

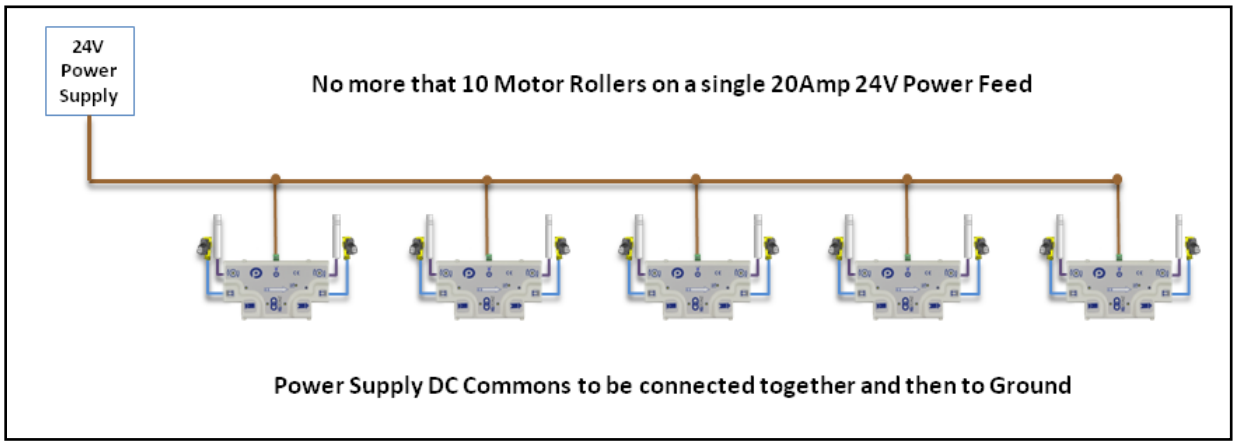
- Pulse Senergy Eco Mode
- 100% PWM Speed

SENSOR PORT

- RJ-12 Connection
- PNP or NPN – Port auto detects electrical polarity
- Sensor Output on Pin 4
- With or without Health signal on Pin 3
- Light Energized, Normally Open output signal such that output energized means zone is clear

Power Supply Requirements

Power requirements can vary depending upon the application. For typical carton handling applications, 8 to 10 motor rollers per 20A circuit is sufficient.



It is ultimately up to the integrator to verify power supply requirements. Insufficient power supply sizing can result in unexpected performance.

SETTING UP YOUR CONVEYOR

Senergy motor cables should be exiting the roller tube on the same side of the conveyor as you mount your *IQZonz* modules. The direction of flow is indicated by the arrow on the *IQZonz* module. To change the direction, simply rotate the module 180 deg so the arrow points the other way as shown in Figure 2 .

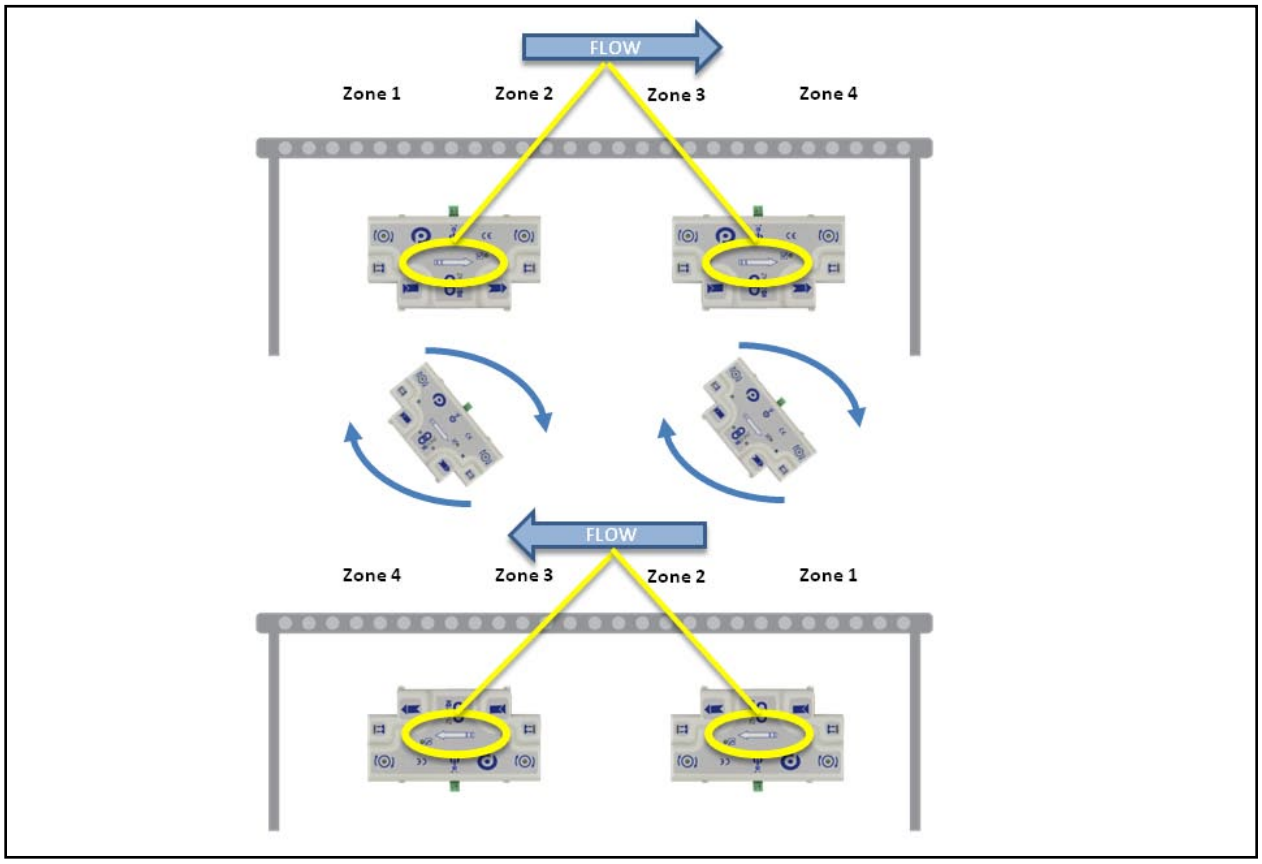


FIGURE 2 - HOW TO CHANGE DIRECTION OF FLOW

4 EASY STEPS

1. Plug sensors into sensor ports
2. MDRs into the MDR ports
3. Plug in standard RJ-45 Ethernet Communication Cables between each *IQZonz* module
4. Supply 24V to the power terminals for each *IQZonz* module

Upon power up and module initialization, *IQZonz* modules immediately begin ZPA operation without any further adjustment or configuration.

HOW TO WAKE UP MOST UPSTREAM ZONE

To wake up the most upstream zone with a sensor; simply connect an *IQMap* upstream to you most upstream *IQZonz* module and plug a sensor into the *IQMap*'s Sensor port. When this sensor is blocked, the most upstream zone of the most upstream *IQZonz* module will run in order to accept the item. As shown in Figure 3, when the *Wake-up Sensor* is blocked; *Zone 1* will run to accept the item.

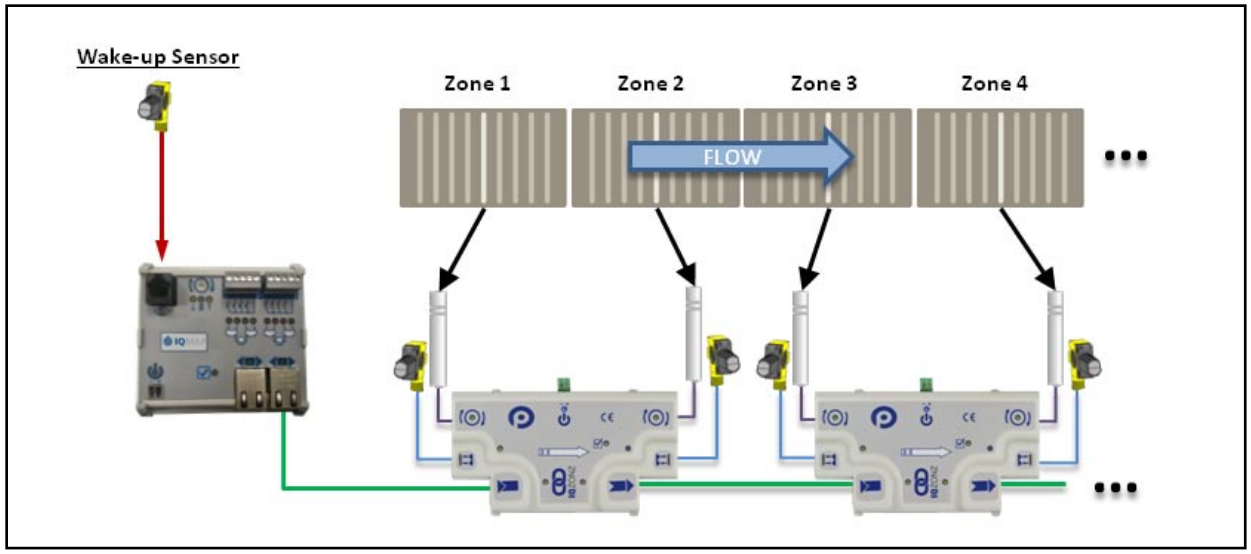


FIGURE 3 - WAKE UP MOST UPSTREAM ZONE WIH IQMAP AND SENSOR

HOW TO STOP THE MOST DOWNSTREAM ZONE (LANE FULL INTERFACE)

Similarly to the Wake up function; to stop the most downstream zone from releasing an item simply connect an *IQMap* module downstream of the most downstream *IQZonz* module. Then plug a sensor into the *IQMap*'s sensor port. When this sensor is blocked, the most downstream zone on the most downstream *IQZonz* module will not allow any item to release past its zone sensor. As shown in Figure 4, when *Lane Full Sensor* is blocked; *Zone n* will stop when the next item reaches its zone sensor. When the *Lane Full Sensor* is clear, *Zone n* will run to discharge any item that was previously stopped on its zone sensor.

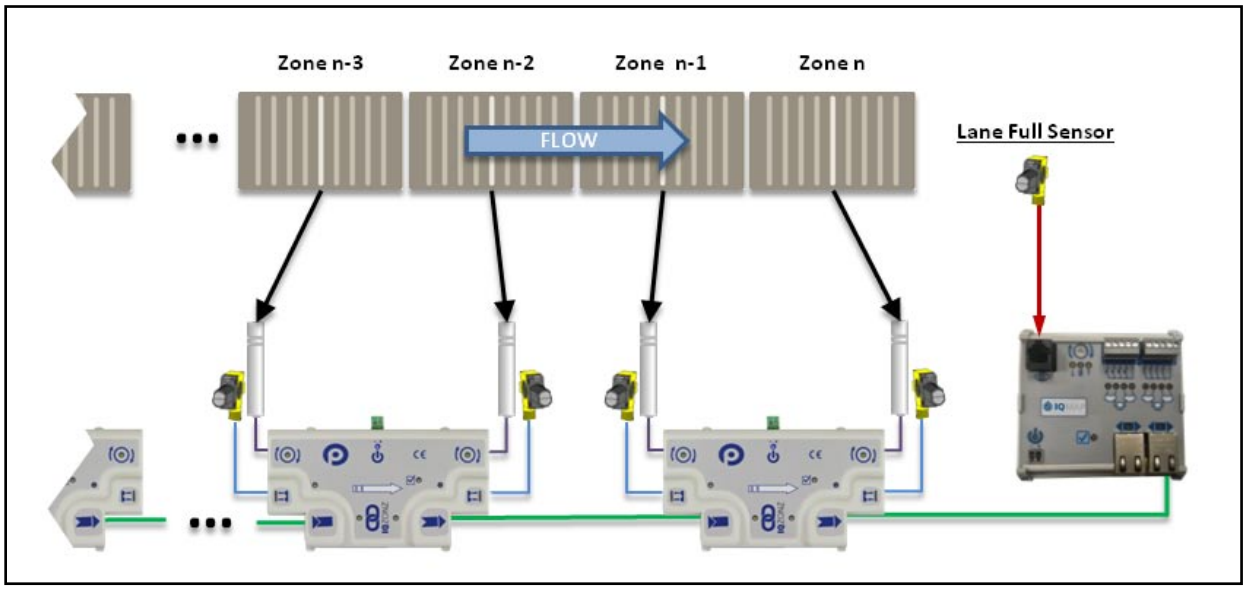
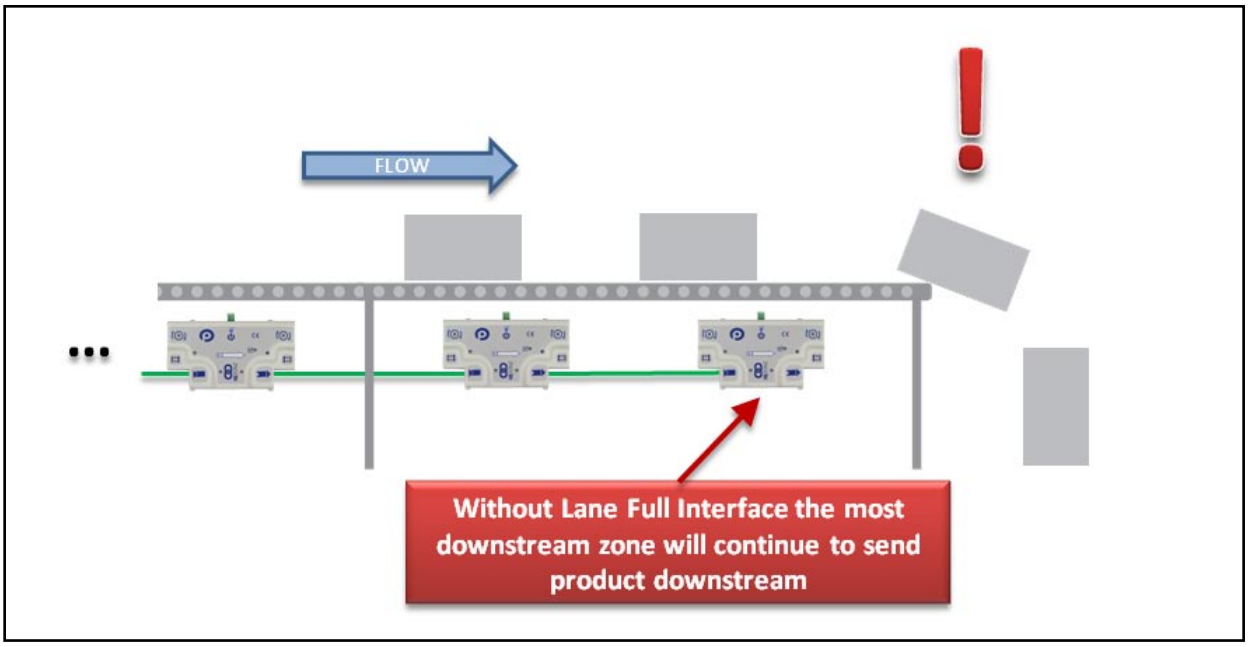


FIGURE 4 - ACCUMULATE THE MOST DOWNSTREAM WITH IQMAP AND SENSOR

Please note that by default with no IQMap and Lane Full Sensor connected; the most downstream zone of the most downstream IQZonz controlled conveyor will attempt to continue to convey any item that arrives at its sensor.



For a complete description of how to affect the accumulation of zones other than than the most upstreamor most downstream zones, please refer to the IQZonz Reference Manual (Insight Automation publication IQ-1000).

CHANGING SPEEDS

The *IQMap* module contains a rotary dial for speed control. Depending upon where in the network the *IQMap* is inserted and the setting of this dial; you can achieve flexible speed control results. The speed control dial has 3 functions depending upon its rotary position:

- Turned all the way to 0 – use default speed setting in *IQZonz* module
- Turned all the way to max – use speed reference from next upstream *IQMap*
- In between 0 and max – use speed setting (10% to 97%) from insertion point on downstream

Figure 5 shows a close-up of the *IQMap* speed control adjustment and LED indicators and their respective meanings.

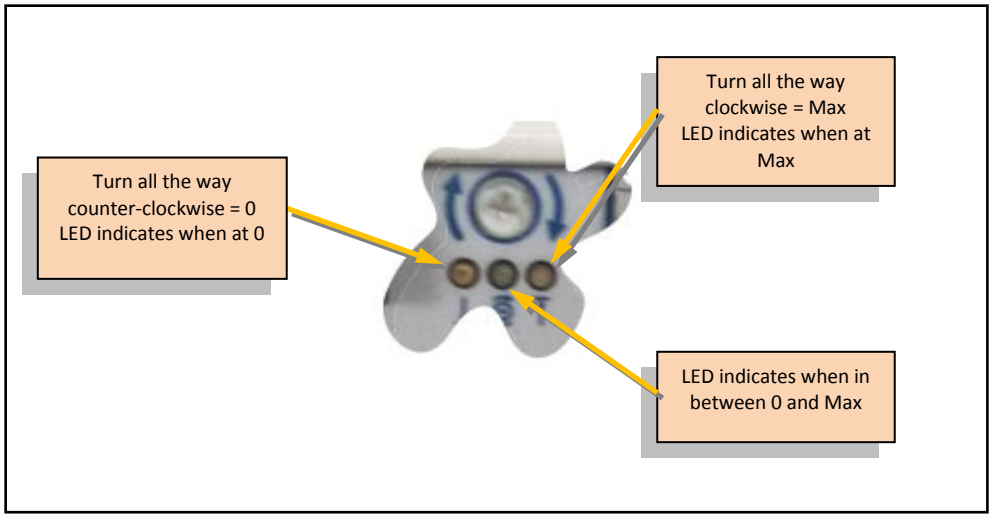


FIGURE 5 - IQMAP SPEED ADJUSTMENT AND LED INDICATORS

In its simplest usage, *IQMap* speed control for an entire line is accomplished by attaching the *IQMap* module to the network ahead of the most upstream module. In this configuration, the position of the rotary dial between 0 and max will provide speed setting of between 10% and 97% PWM for all *IQZonz* modules. Figure 6 shows how to connect an *IQMap* module to perform speed control.

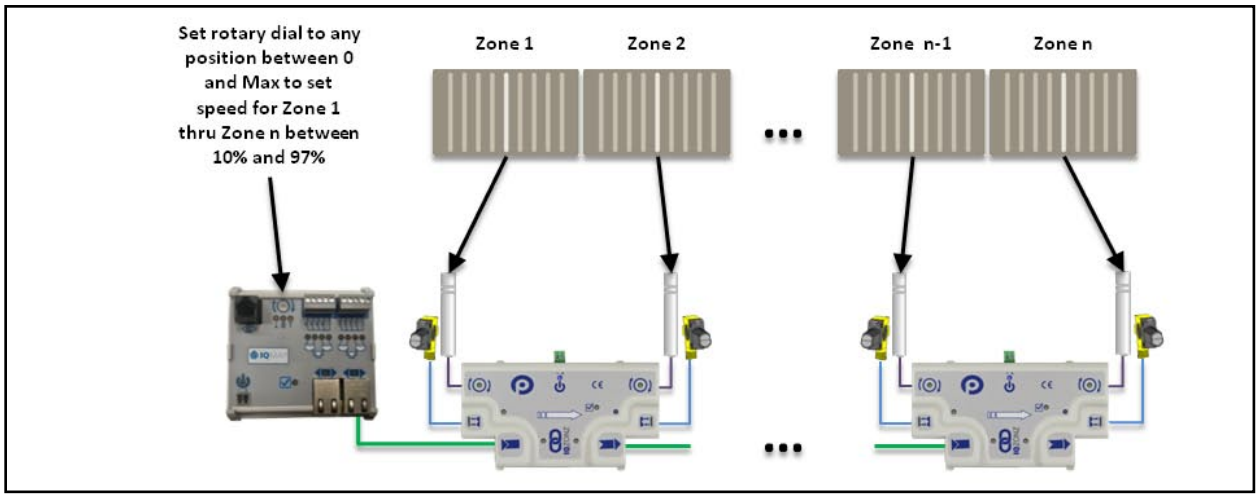


FIGURE 6 - SPEED CONTROL FOR ALL MODULES

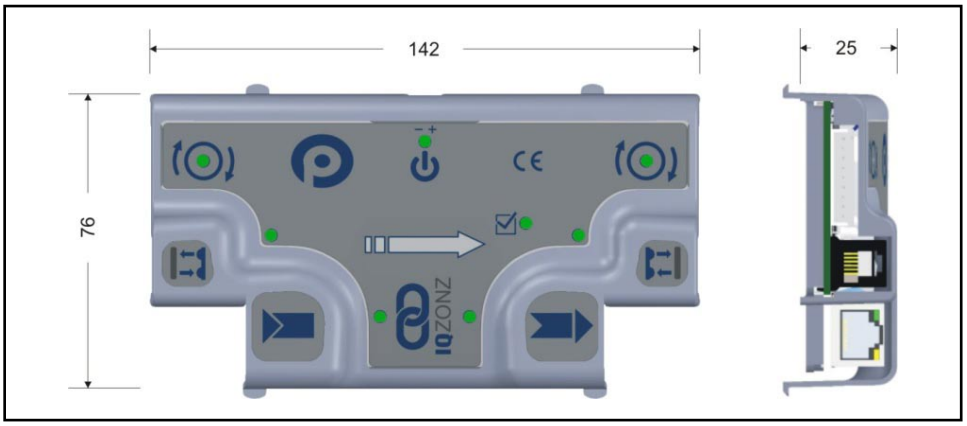
Please note that in the configuration shown in Figure 6, setting the rotary dial to the "0" position will cause all *IQZonz* to use their default or memory stored speed setting.

For a complete description of all the speed control options available with IQZonz and IQMap modules, please refer to the IQZonz Reference Manual (Insight Automation publication IQ-1000).

APPENDIX A – DIMENSIONS AND MOUNTING

IQZONZ MODULE

The *IQZonz* module is intended to be mounted either directly into the conveyor side frame or separate mounting bracket. For either case, the hole pattern and size of holes are shown below in Figure 7. Please note that the mounting for *IQZonz* modules is symmetrical such that the module attaches identically regardless of the direction of flow for the control. All dimensions in mm



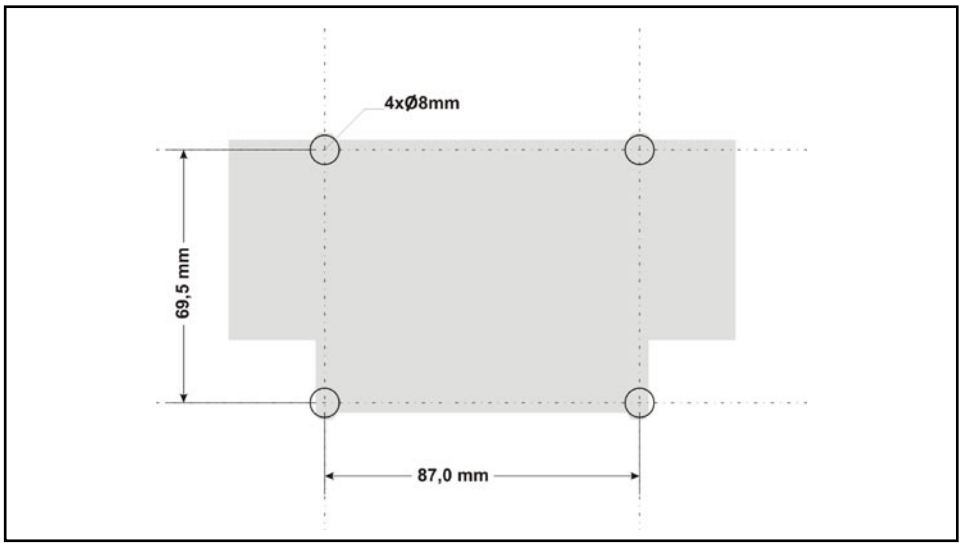


FIGURE 7 - IQZONZ MOUNTING HOLE DIMENSIONS

IQMAP MODULE

The *IQMap* module is available with 2 mounting options. One is for flat mount and the other is for DIN Rail mount.

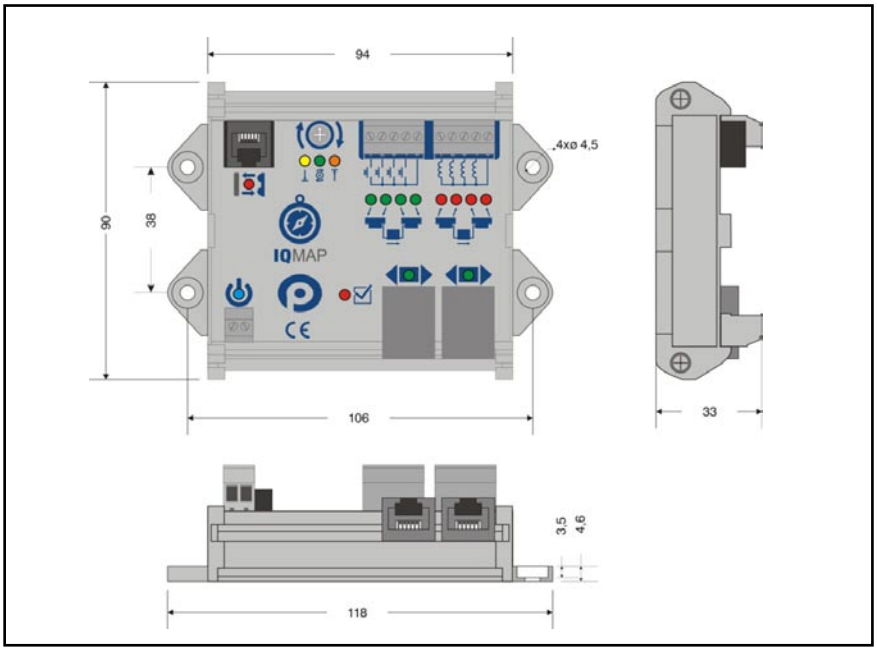


FIGURE 8 - IQMAP FLAT MOUNT OPTION

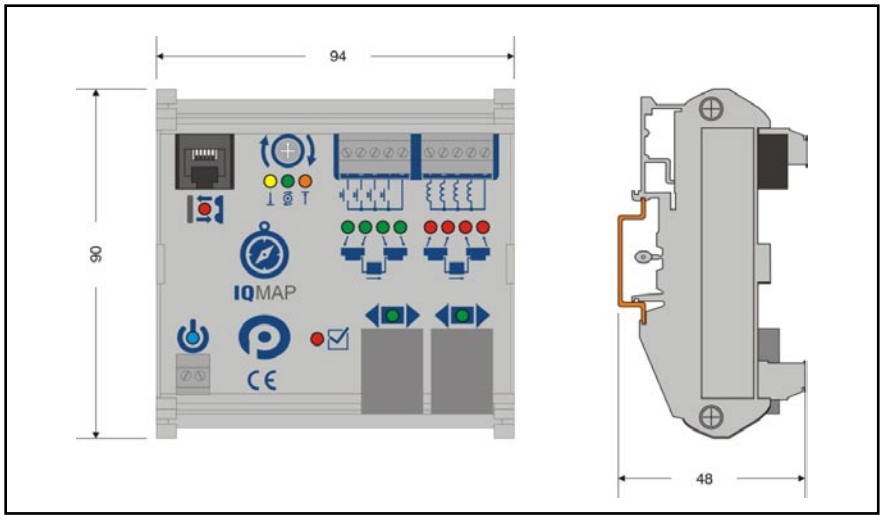


FIGURE 9 - IQMAP WITH DIN RAIL OPTION

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