ZoneLink3.S® 4 Zone Controllers
For Integral MAC Valve Manifolds and Generic Outputs

TECHNICAL DATA SHEET

Description

The ZoneLink[3] 4 Zone Controller product line expands the popular Holjeron ZoneLink family into non-Microroller® applications. Conventional conveyor types such as Belt-Driven Live Roller (BDLR), Lineshaft, VFD-driven and most AC Motor Pneumatic conveyors can now be controlled with the same ZPA logic and control as Holjeron's Microroller controls. Key features include:

- Integrated MAC BV10 Series 4 valve manifold – AM422
- Built-in selectable PWM operation for valve outputs
- Reversing Direction of Flow selector
- RJ-11 quick connect Autosensing NPN/PNP inputs
- Generic model controls remote valves, VFD, or AC motors – AG422
- Auxiliary Inputs and Outputs included
- Snap-in mounting plate for easy installation
- Fully compatible with all ZoneLink Microroller® systems

Additional Models in the ZoneLink[3] family of 4 Zone controllers include Merge, Divert, Transfer (MDT) modules and DeviceNet™ modules with integral serial ports.

AVAILABLE EXCLUSIVELY THROUGH...

The MAC Distributor Network
www.mdnworldwide.com

ZL3.S-AM422 (Integral MAC Manifold) above, and ZL3.S-AG422 Generic Outputs

Specifications

Part Numbers	ZL3.S-AM422	4 Zone ZPA controller with Integral MAC BV10 4 valve manifold
	ZL3.S-AG422	4 Zone ZPA controller for generic I/O
Electrical Power	Termination	Plug-In Spring Clamp Terminal
	Number	2 -2 pin (pass-through 10 Amps Max)
	Voltage Range	24 VDC (+/- 10%)
	Current Consumption	120mA plus Outputs and Sensors
Integral Valve Output Connection	Model AM422	Integrated
	Number	Four (4)
	Termination	2-pin connector internal
	Voltage Range	24 VDC
	Max Current Continuous	500mA – See Note 1 below
Generic I/O Connection	Model AG422	NPN – See ""Output Polarity" Page 3
	Number	4 Pairs
	Termination	On the 6-pin Molex Connector
	Maximum Current 'RUN'	500mA – See Note 1 below
	Maximum Current 'DIR'	25mA – See Note 2 below
ZoneLink Ports	Type	ZoneLink3.S
	Number	Two (2)
	Termination	RJ-45
	Voltage Range	24 VDC onboard
Sensor Inputs	Type	NPN/PNP Autosensing
	Number	Four (4)
	Termination	RJ-11
	Voltage Range	10-30VDC
	Maximum Sensor Current	50mA
	Sourcing Sensor Current	11 mA Max (Input pulled to 24V)
	Sinking Sensor Current	4.3 mA Max (Input pulled to 0V)
Auxiliary Inputs	Type	NPN
	Number	3
	Termination	Plug-in Terminal
	Voltage Range	10 to 28 VDC
	Maximum Current	5 mA
Auxiliary Outputs	Type	NPN
	Number	2
	Termination	Plug-in Terminal
	Voltage Range	10-28 VDC
	Maximum Current	250 mA
Environmental	Temperature Storage	-30° to 70° C (-22° to 158° F)
	Operating	0° to 60° C (32° to 140° F)
	Humidity	5-95% RH, non-condensing
	Vibration	2G at 10 to 500 Hz
	Shock	10G
Physical	Dimensions	8.2" W x 2.5" H x 1.4" D approx.
	Weight	8 oz. (without manifold)
	Indication Power LEDs	Green, arrow indicates Direction of Flow
	Output LEDs	4 Green
	Sensor LEDs	4 Amber

Note 1: The Generic Output "RUN" and the Internal Valve Output "ON" are the same. Connect only 1 per zone
Note 2: The combined current on the Generic Outputs between 24 VDC and Common may not exceed 1 Amp.

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Dimensions and Layout

Generic version shown.   MAC BV10 Manifold extends approx. 1.25" above the top edge of the module shown. Consult your local MAC Distributor for detailed dimensions or drawings of the MAC manifold.

Typical Installation

Main Air Supply

RJ-45 ZPA Cable

Valve Air to Puck
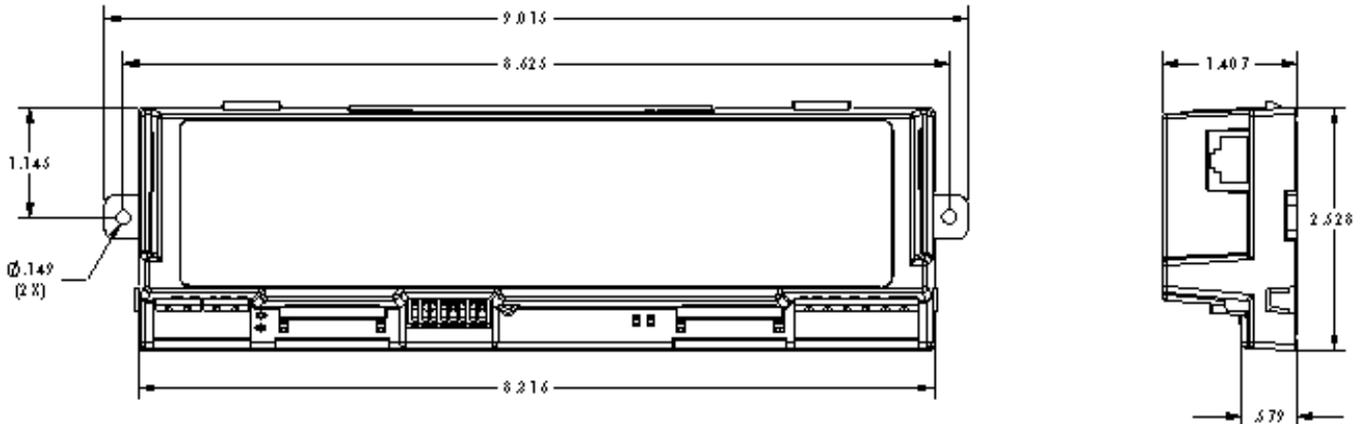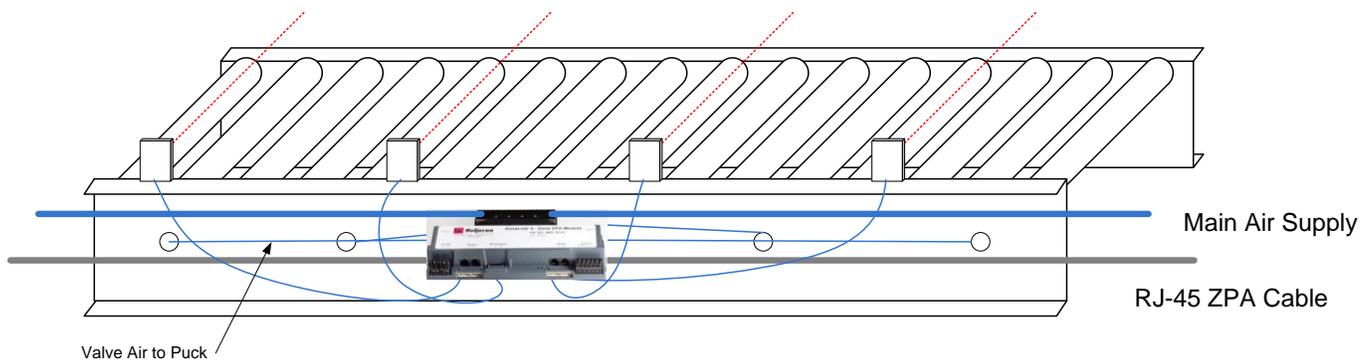
Configuration

DIP Switch Settings

Switch	Function	OFF (Default)	ON
1	Material Flow Direction	Left to Right	Right to Left
2	PWM Valve Control	OFF	ON
3	Sensor Type (Generic I/O)	Normally Open	Normally Closed
4	Output Polarity	Low (0VDC)	High (24VDC)
5	Accumulation Mode	Off to Accumulate	On to Accumulate
6	Active Zone Selection	See Zone Table	
7			
8	Sensor Type (RJ-11)	Normally Open	Normally Closed

Release Mode Default is ZPA, to change to Train or Slave use .S software.

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Zone Table

Zones are numbered 1-4 from the LEFT

Active Zone Selection	SW 6	SW 7
4	OFF	OFF
3	ON	OFF
2	OFF	ON
1	ON	ON

DIP Switch Settings

Material Flow Direction
The default Material Flow Direction is from Left to Right. Changing the DIP Switch reverses the Direction and allows the ZoneLink Ports to be connected without wiring around the module. Zone numbers and Port numbers do not change, but the ZPA logic runs in the reverse direction. Direction of Material Flow is indicated by the Power LED arrows.

PWM Valve Control
PWM Valve Control should be set to ON for Integral and remote MAC Valves. This setting extends valve life and reduces heat and energy consumption. The switch should be set to OFF for all other output applications.

Sensor Type (Generic I/O Connector)
This switch allows for choosing between normally open and normally closed sensor settings on the generic I/O connector. The controller is looking for an ON signal when a load is present blocking the sensor. When a load is present the sensor LED should be ON. If it is not, try changing the DIP switch. This setting applies to all 4 Zones.

Output Polarity
The outputs on the generic I/O connector are NPN with a 5.5K pull-up resistor and can be configured to invert logic, which is compatible with some PNP inputs. This switch allows for choosing between active high (24VDC), or active low (0VDC) for the output.

Accumulation Mode
This DIP Switch selects the Accumulation Mode between Motor Driven Roller/Variable Frequency AC Drive/Pneumatic Clutch systems where the accumulation output signal is OFF and Pneumatically controlled AC Motor systems where the accumulation output signal is ON. In the case of Output OFF to Accumulate (DIP switch OFF), there is a 'sleep' timer to let product run through the zone and then, if there is no other load, to turn off until there is one. In Output ON to Accumulate (DIP Switch ON), there is no 'sleep' timer, so the accumulation output stays OFF after release until there is product to accumulate.

Active Zone Selection
DIP Switches 6 and 7 determine the number of Zones that are active in the module (see Zone Table chart above). The default is 4 active zones. When set to 3 zones, Zone 4 is deleted, when set to 2 zones, Zones 3 and 4 are deleted, and when set to 1 zone, Zones 2, 3 and 4 are deleted. The order does not change based on Direction of Material Flow.

Sensor Type (RJ-11)
This switch allows for choosing between normally open and normally closed sensor settings on the RJ-11 Sensor jacks. The controller is looking for an ON signal when a load is present blocking the sensor. When a load is present the sensor LED should be ON. If it is not, try changing the DIP switch. This setting applies to all 4 Zones.

Auxiliary I/O Assignments

Table 1: AUX I/O Terminal Pin Assignments

Pin	I/O	Function when ON
6	Output 2	Downstream – RTS (Ready to Send)
5	Output 1	Upstream - Zone Clear – CTS (Clear To Send)
4	Input 3	Unassigned
3	Input 2	Downstream – Zone Clear – CTS (Clear To Send)
2	Input 1	Upstream – RTS (Ready To Send)
1		Common

Zone Configuration (Workstation Hold and Aux Sensor settings)
The zone configuration is only configurable through .S software. There are 3 settings that can be configured for EACH zone of the 4 Zone controller:

'Workstation Hold' is meant to hold a load in the zone until released downstream. Once the hold is released any up-stream loads will transition forward in standard ZPA mode, i.e., as soon as the zone sensor is clear the upstream load will start. Connect a sensor or switch to the Generic I/O connector sensor input (24VDC +/- is available there as well for sensor power). Then set the .S Property to enable Workstation Hold. This is not intended for use as a 'unload' zone. For 'unload' zones or 'forklift interface' see below for 'Unload Interlock.'

'Unload Interlock' is used where a load needs to be completely removed from the zone, typically from the side of the conveyor or vertically, before any upstream load is allowed to enter. This prevents any collisions that might occur after the zone sensor clears but before the load is completely removed. Connect a sensor or switch to the Generic I/O connector sensor input (24VDC +/- is available there as well for sensor power). Then set the .S Property to enable Work Station Hold AND Aux Sensor, on each zone you want to use.

'Aux Sensor NO/NC' is used to set the sensor input state (on the Generic I/O connector to NO (Normally Open) or NC (Normally Closed).

Note: Regardless of the zone setting, if there is no sensor connected to the generic input, the zone will function in standard ZPA Mode.

⚠️ GENERIC OUTPUTS USED WITH VARIABLE FREQUENCY DRIVES (VFD).

The Holjeron 4 Zone Controllers use current sinking (NPN) outputs on the Generic I/O connector. On loss of 24VDC power to the 4 Zone Controller, some VFDs may interpret the signal from the Generic I/O as a 'RUN' command. Unexpected operation may result. Care should be taken to insure that system power and control wiring protects against any unintended or unexpected operation.

⚠️ EMERGENCY STOPS AND SAFETY RELAYS

It is generally considered good safety practice to have E-stop and/or safety relays/controllers installed in any conveyor system, especially one with multiple control system voltages. Many state and local regulations/codes require them. Please consult qualified personnel who plan and design safety equipment for machines and systems and are familiar with the regulations governing safety in the workplace and accident prevention.

ZoneLink3.S®

The ZoneLink3.S® connections are RJ-45 jacks with pin assignments as defined in the diagram below. ZoneLink3.S® is designed to use standard Ethernet patch cables (Category 5, 5e or 6).

All ZoneLink3.S ports are bidirectional to support Direction of Material Flow selection and upstream (merge) and downstream (divert) applications.

The default configuration is ZoneLink Port 1, on the left side of the module is Upstream and ZoneLink Port 2 is Downstream on the right side. Changing the Direction of Material Flow reverses the configuration, making Port 1 Downstream and Port 2 Upstream.

The default sensor and output connections are numbered 1 through 4 starting at the left side of the module.

ZoneLink3.S® Block Diagram
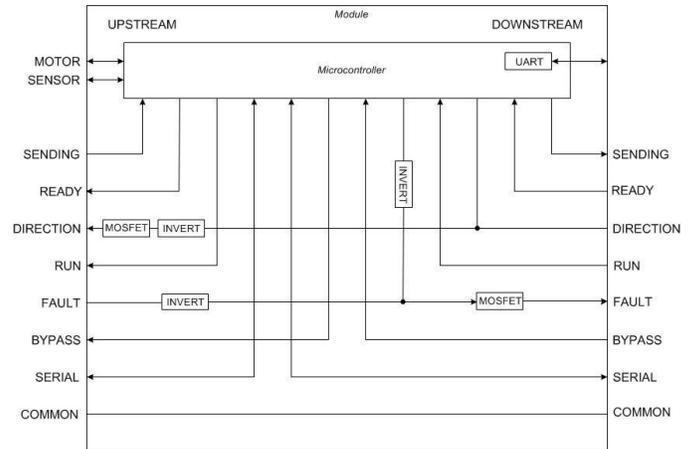
The default direction of flow (Left to right)

RJ-45 ZoneLink3.S® Port Connector

8 7 6 5 4 3 2 1
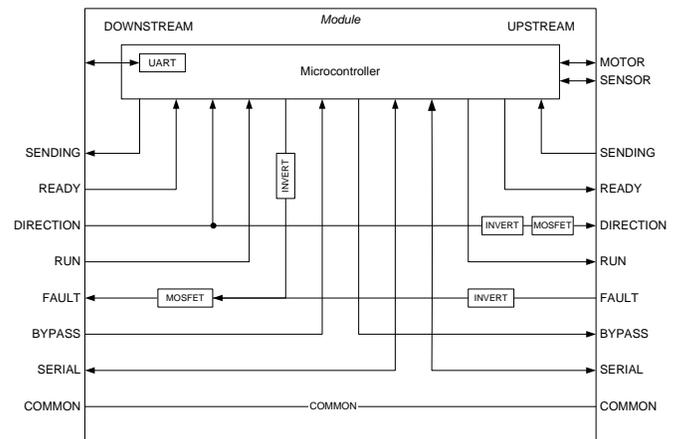
The reverse default direction of flow (Right to left)

ZoneLink3.S® Pin Assignments

Pin	Function	Upstream	Downstream
1	SENDING	Input	Output
2	READY	Output	Input
3	DIRECTION	Input	Output
4	RUN	Input	Output
5	FAULT	Output	Input
6	BYPASS	Input	Output
7	.S	Bi-directional	
8	COMMON	Pass-Through	

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Connector Wiring Diagrams

RJ-11 Sensor Jack Connectors - 4 each

123456
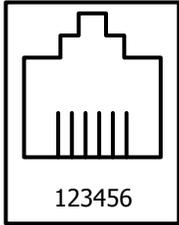
Pin	Signal
1	N/C
2	Ground
3	N/C
4	Sensor Input
5	24 VDC
6	N/C

Power Connectors (Pass Through) – 2 each

1 2   1 2

Pin	Signal
1	24 VDC
2	Common

2 – 2 position 5.08mm Pluggable Terminal Block

Auxiliary I/O Connector

6 5 4 3 2 1

Pin	Signal
6	Output 2
5	Output 1
4	Input 3
3	Input 2
2	Input 1
1	Common

6 position 5.08mm Pluggable Terminal Block

Lever Actuated Terminal Block – 2-pin Power and 6-pin Auxiliary I/O 5.08mm Pluggable Terminal Blocks

Operating the lever-actuated terminal blocks is very easy. Simply insert up to 14 gauge wire and lower the lever until it snaps. To release the wire, raise the lever.
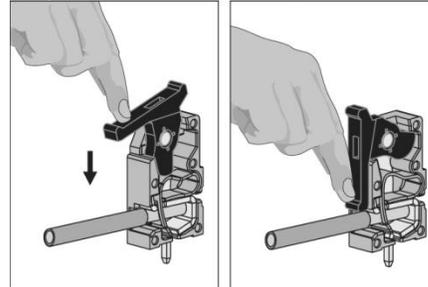
Generic I/O Connector
6-pin Molex

6 5 4 3 2 1
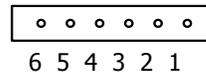
Pin	Signal	ZL3 Cable Wire Color
6	Common	Blue
5	Sensor	Black
4	Fault Input	White
3	Direction	Green
2	Run (On)	Red
1	24 VDC+	Brown

Note: For remote valves, a 2-pin Molex connector will plug into the pins 1 and 2 of the 6-pin connector for 24VDC and ON signal. 6-pin cables are available in 1, 3, 5 and 7 meter lengths.
6 position plug-in connector is Molex Part #51004-0600
2 position plug-in connector is Molex Part #51004-0200

Generic I/O Cable Part Numbers
ZL3-CBL001 – I meter
ZL3-CBL003 – 3 meter
ZL3-CBL005 – 5 meter
ZL3-CBL007 – 7 meter

Module Feature Locations

Model ZL3.S-AM422 Shown

Valve Air Ports 1 & 2

Valve Air Ports 3 & 4

Supply Air (pass through)

Supply Air (pass through)

ZoneLink Port 1

ZoneLink Port 2

Sensors

DIP Switch

Sensors

24 VDC

1   2
Generic I/O

3   4
Generic I/O

AUX

Power/ Direction LEDs-green (Left at edge)

LEDs (4 pairs) Sensor-yellow Output- green (at edge)
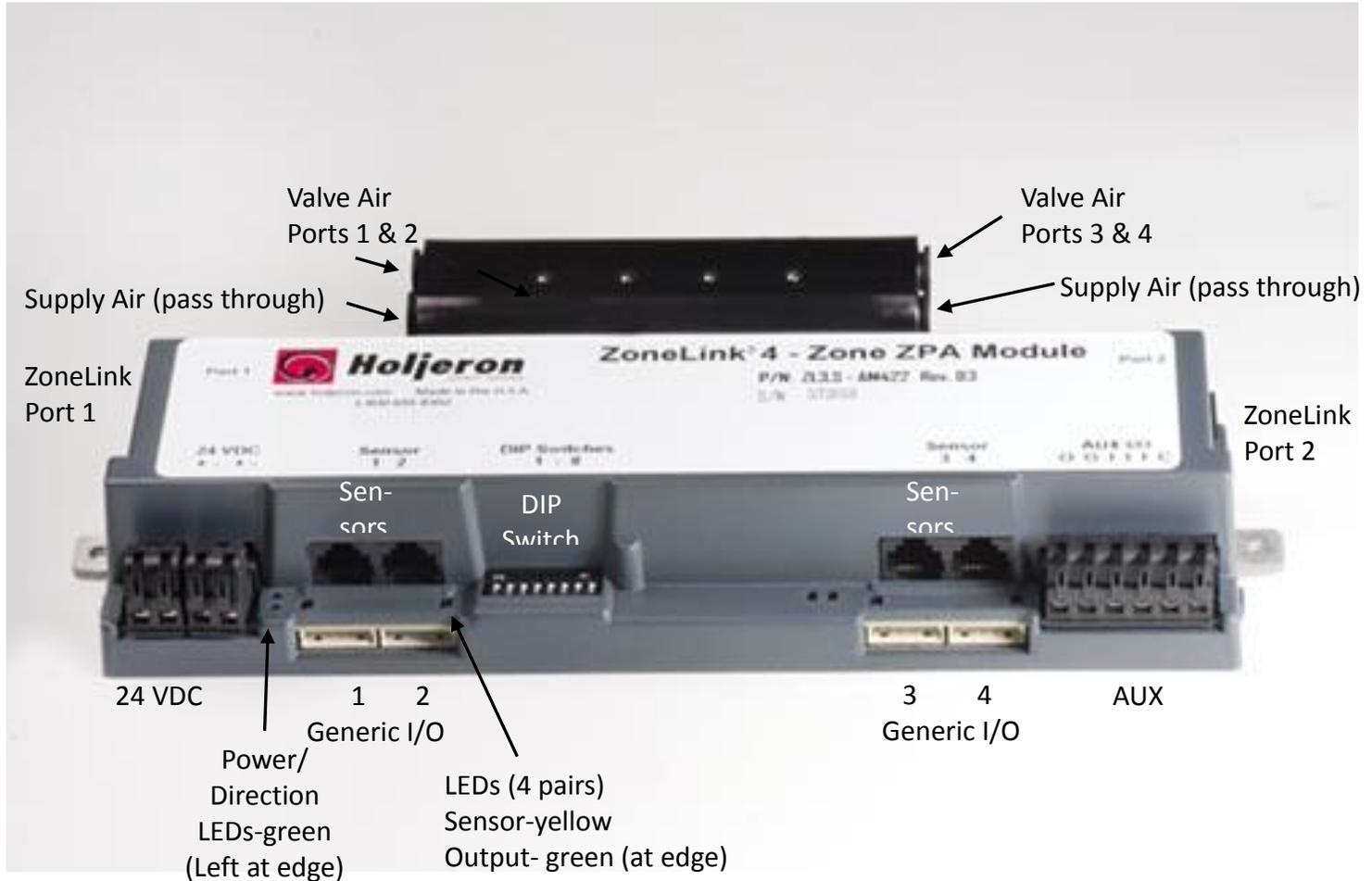
Timers

ZoneLink® ZPA modules are equipped with a set of timers that can be used to tailor functionality in certain applications. Listed below are the timers functional descriptions, default values, ranges, and .S attribute numbers:

Timer	Description	Timer Default	Timer Range	.S Attribute#
Release Delay Timer	When a product is accumulated, the release timer delays how long a product is held before it is released downstream. This is used to ensure gaps in the product.	25	0-255	36
Gap Timer	When running, attempts to maintain a gap between units.	3	1-255	34
Transfer Timer	Once a product is released and cleared the upstream sensor, the transfer timer is used to ensure a product reaches the downstream sensor. If the Transfer Timer expires, the accumulation logic is reset.	40	1-255	33
Sleep Timer	Once a product clears the downstream sensor, and there are no other packages being released into the zone, the zone will run for the length of the sleep timer before turning off.	20	0-255	35
Jam Timer	If a zone is running to transfer product, and the downstream sensor remains blocked for the length of the Jam Timer, then the module will stop the zone and indicate a fault. The zone can not run again until the sensor that is jammed has been cleared.	80	1-255	32

Serial Configuration

Serial configuration of a ZoneLink® ZPA Module requires connection to a ZoneLink®.S Controller capable of configuring ZoneLink®.S products, or using one of the ZoneLink®.S configuration tools available from Holjeron. Consult the documentation for the specific tool being used.

Product Information (Required in all products)

ID	Description	R/W	Default/Notes
0	Product ID	R	82=Zx3.S-AG422
			83=Zx3.S-AM422
1	Input variable	R	
2	Output variable	W	
3-9	Reserved		
10	Product Code	R	Zx3.S-Ax422
11	Software Version	R	Zx3.S-AG422= "210.4.K0012" (Rev.07)

Control Properties

ID	Description	R/W	Default/Notes
30	Direction of Flow	R	Left to Right − Status of DIP Switch 1
31	Operating Mode	R	Accumulation
32-43	Reserved		
44	PWM Mode	R	Off − Status of DIP Switch 2
45	Release Mode	W	Accumulation=0, Train=1, Slave=2
46-53	Reserved		
54	Zone Configuration	R	See Zone Configuration Table

Timers

ID	Description	R/W	Default/Notes
32	Jam Timer	W	80/.1sec units
33	Transfer Timer	W	40/.1sec units
34	Gap Timer	W	3/10ms units
35	Sleep Timer	W	20/.1sec units
36	Release Timer	W	25/10ms units

Zone Configuration Table

Bit	Description	Settings
1	Aux Sensor NO/NC	0=NO, 1 =NC
4	Hold Enable	0=Disable, 1=Enable
5	Aux Sensor	0=Disable, 1=Enable

Zone Configuration Settings

Dec	Settings
0	Aux Sensor NO, Hold Disabled, Aux Sensor Disabled (Default Setting)
2	Aux Sensor NC, Hold Disabled, Aux Sensor Disabled
16	Aux Sensor NO, Hold Enabled, Aux Sensor Disabled
18	Aux Sensor NC, Hold Enabled, Aux Sensor Disabled
32	Aux Sensor NO, Hold Disabled, Aux Sensor Enabled
34	Aux Sensor NC, Hold Disabled, Aux Sensor Enabled
48	Aux Sensor NO, Hold Enabled, Aux Sensor Enabled
50	Aux Sensor NC, Hold Enabled, Aux Sensor Enabled

⚠ EMERGENCY STOPS AND SAFETY RELAYS

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Warranty/Remedy

Seller warrants its products to be free from defects in design, material and workmanship under normal use and service. Seller will repair or replace without charge any such products it finds to be so defective on its return to Seller within 18 months after date of shipment by Seller. **The foregoing is in lieu of all other expressed or implied warranties (except title), including those of merchantability and fitness for a particular purpose.** The foregoing is also purchaser's sole remedy and is in lieu of all other guarantees, obligations, or liabilities or any consequences incidental, or punitive damages attributable to negligence or strict liability, all by way of example.

While Holjeron provides application assistance, personally and through our literature, it is up to the customer to determine the suitability of the product in the application.

All information contained herein, including illustrations, specifications and dimensions, is believed to be reliable as of the date of publication, but is subject to change without notice.

Complementary Products

Holjeron manufactures a complete line of smart conveyor control equipment. To complete your system, have you considered:

Stack Light Controllers for DeviceNet

Light Stacks for DeviceNet

Operator Panels for DeviceNet, Multiple function

Push Button Controllers for DeviceNet, Multiple I/O

Low Profile I/O for DeviceNet, Multiple I/O

Motor Starter Controllers for DeviceNet

ZoneLink.S® ZPA Module for 22W and 35W Microrollers® w/

ZoneLink.S® Driver Module for 22W and 35W Microrollers

ZoneLink3.S™ 4 Zone ZPA Controllers

About Holjeron

Our products are all designed and produced by us

If you need this modified or that to be changed, it can be done. We give you the technology that best suits your needs. We understand Common Industrial Protocols (CIP) such as DeviceNet and Ethernet/IP, as well as CANOpen and Smart Distributed System (SDS.) Our engineers can supply the distributed I/O solutions that meet your specific needs.

We push intelligence to the process

Holjeron's smart quick-connect products can reduce wiring and give you diagnostics designed for your material handling system.
Our products are designed with you system in mind. Using industry standards, we explore new ways to make things work in industrial automation. We apply the requisite technology to deliver the solution your system needs.

Want to kick around options?

Call us. Where else are you going to find people who love talking about this stuff? And who know enough to be helpful? The number to connect you to someone who understands your business – **800.691.8302**

Memberships

www.odva.org
ODVA is an international association comprised of members from the world's leading automation companies. Collectively, ODVA and its members support network technologies based on the Common Industrial Protocol (CIP™).

www.mhia.org
Member companies are given a greater voice in shaping the destiny of the industry both nationally and internationally. MHIA sponsors trade events, to both showcase the products and services of its member companies and to provide material handling educational opportunities.

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