WARNING: To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes. ***Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.***

If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call Technical Support at 770-844-4200.

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Connector Specifications

Connector Type	IDC style header with latch, Omron XG4A-4034
Number of Pins	40 point
Pitch	0.1 in (2.54 mm)

Document Name	Edition/Revision	Date
P2-HSO-DS	3rd Ed.	11/9/2021

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P2-HSO High-Speed Isolated Sinking/Sourcing Output

The P2-HSO High-Speed Output Module provides up to 1MHz of pulse/direction, up/down, and quadrature pulse output on each of two independent channels. Additionally, six 5-24 VDC general purpose inputs and four 5-24 VDC general purpose outputs are included for use with the Productivity2000 System.

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Warranty: Thirty-day money-back guarantee. Two-year limited replacement. (See www.productivity2000.com for details).

General Specifications

Module Type	Intelligent
Modules per Base	15 maximum*
I/O Points Used	None, mapped directly to tags in CPU
Operating Temperature	0º to 60ºC (32º to 140ºF)
Storage Temperature	-20º to 70ºC (-4º to 158ºF)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters max
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC 60068-2-6 (Test Fc)
Shock	IEC 60068-2-27 (Test Ea)
Overvoltage Category	II
Field to Logic Side Isolation	1800VAC applied for 1 second
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	6.26 W
Enclosure Type	Open Equipment
Emissions	EN61000-6-4 (Conducted and Radiated RF Emissions)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada & USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity2000 System
Field Wiring	Use ZIPLink Wiring System. See "Wiring Options" on page 4.
EU Directive	See the "EU Directive" topic in the Productivity2000 Help File. Information can also be obtained at: www.productivity2000.com
Weight	90g (3.2 oz)

*Meets EMC and Safety requirements. See the D.O.C. for details.

Pulse Output Specifications

Pulse Outputs	2 Channels	
Output Pulse Type, per Channel Select	Selectable for pulse & direction, up/down or quadrature	
Output Signal Type, per Channel Select	RS-422 Line Driver Current Sinking and Sourcing	Open Drain FET Outputs Current Sinking
Output Volts	RS-422 levels	24VDC
Output Volts Maximum	5VDC	36VDC
Protection for Overcurrent and Short Circuit to Power	Current limit and thermal shutdown[2]	Current limit and thermal shutdown[1]
Protection Short to Ground	Yes	Yes
Overcurrent Trip Level	Output current limit ±200mA max[2]	100mA minimum
Maximum Continuous Output Current	±60mA	40mA
Maximum Switching Frequency, 1m cable*	1MHz	500kHz
Maximum Switching Frequency, 10m cable*	1MHz	200kHz

NOTES:

1. Any fault shuts off the output. Fault is indicated and output is kept off until a new move start is received.
2. RS-422 thermal faults auto reset after device cool down.

* Outputs are not limited to these speeds but single ended signals produced by the FETs are not usually reliable above these speeds due to cabling capacitance.

Power Specifications

External Power	24VDC -15% / +10%, Class 2
Maximum Voltage	26.4 VDC
Minimum Voltage	20.4 VDC
Current Consumption Excluding Outputs	130mA
Maximum Current Consumption Total of the 4 Status Outputs	2A

Status Input Specifications

Status Input	6 sink/source
Isolation	Each status input is individually isolated from all other circuits
Input Volts Range	5–24 VDC
Input Volts Maximum	34VDC, limited by protection
Input Impedance	1kΩ minimum, 5kΩ maximum
Inputs Rated Current	5–24 VDC, 16mA 5.2 mA typical @ 5VDC 22mA maximum @ 34VDC
Input Minimum ON Voltage	4.5 VDC
Input Maximum OFF Voltage	2.0 VDC
Input Minimum ON Current	5.0 mA
Input Maximum OFF Current	1.4 mA
OFF to ON Response Time	4µs
ON to OFF Response Time	4µs

NOTES:
1. Mechanical contacts are not recommended to be used as counter or encoder inputs as they may cause unreliable readings. The bounce of mechanical contacts can cause the input to see more edges than intended.

Status LEDs

Fault LEDs	(F) 1, 2, 3, 4, 5, 6 (one per pulse output and one per status output)
Input LEDs	(IN) 1, 2, 3, 4, 5, 6 (one per status input)
Output Status LEDs	(O) OUT 1A & 1B, OUT 2A & 2B, OUT 3, 4, 5, 6

NOTES: All front panel fault LED's blinking indicates loss of external power.

Status Output Specifications

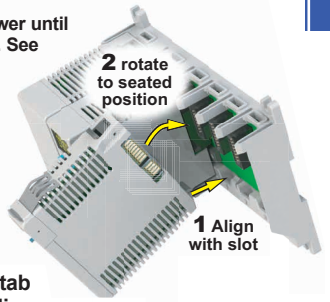
Status Outputs	4 sink/source	
Output Signal Type, per Channel Select	Current Sinking	Current Sourcing
Operating Voltage[2]	5–24 VDC	5–24 VDC[2]
Output Volts Maximum[2]	36VDC	26.4 VDC[2]
Output Current Maximum	500mA	
Overcurrent Protection	Short circuit detect, overcurrent shutdown[1]	
Output Self Limiting Current	1.2 to 2.4 A	
Max Inrush Current	Self limited	
Output Voltage Drop	0.7 VDC @ 0.5 A	
Thermal Protection	Independent over temperature protection each output	
Output Voltage Clamp During Inductive Switching	+45VDC	-20VDC
Maximum OFF to ON Response	25µs[3]	
Maximum ON to OFF Response	25µs[3]	

NOTES:
1. Any fault shuts off the output. Fault is indicated and output is kept off until a new move start is received.
2. Operating voltage for current sourcing outputs must be less or equal to the external power.
3. Measured at 5VDC operating voltage, 0.5 A load.

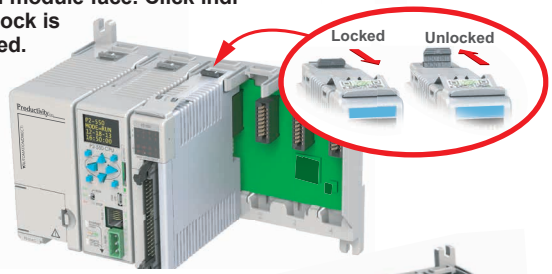
Module Installation

WARNING: Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

Step One: Align module catch with base slot and rotate module into connector.



Step Two: Pull top locking tab toward module face. Click indicates lock is engaged.



Step Three: Attach field wiring using the ZIPLink wiring system.

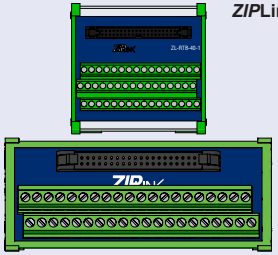
Wiring Options

***ZIP*Link Connection System**
Cable + *ZIP*Link Module = Complete System

***ZIP*Link pre-wired cables**

0.5 m (1.6 ft) cable — ZL-CBL40-S
1.0 m (3.3 ft) cable — ZL-CBL40-1S
2.0 m (6.6 ft) cable — ZL-CBL40-2S

***ZIP*Link Modules**



Feed through — ZL-RTB40

Note: P2-HSI is UL/CUL listed when used with ZL-RTB40. — ZL-RTB40-1

QR Code

Use any QR Code reader application to display the module's product insert.

Frequency Measurements

Inaccuracy of Output Frequency Due to Time Base Errors

25 MHz Crystal for Time Base	
Inaccuracy at 25°C, Maximum	±30 PPM
Inaccuracy 0-60°C, Referenced to 25°C	±30 PPM
Inaccuracy Due to Aging, Maximum	±5 PPM/Year
Max. Time Base Inaccuracy 0-60°C and 10 Years Operation	0.01%

Resolution of Frequency Output Measurements

Output Frequency	Resolution
1kHz	0.01 Hz
10kHz	0.67 Hz
100kHz	67Hz
1MHz	6622Hz

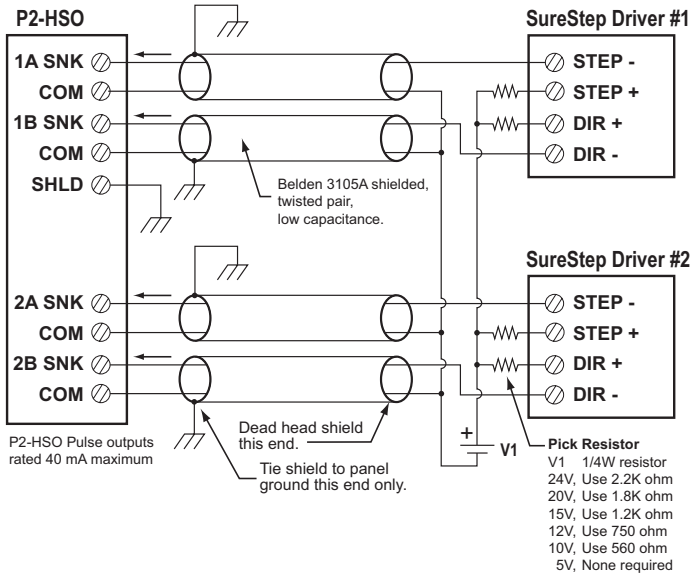
Module Range:	**Target position range ± 2.147 billion (32-bit signed integer)**

Caution: *If possible, remove field power prior to proceeding. If not, then* ***EXTREME*** *care* ***MUST*** *be taken to prevent damage to the module, or even personal injury due to a short circuit from the live terminal block.*

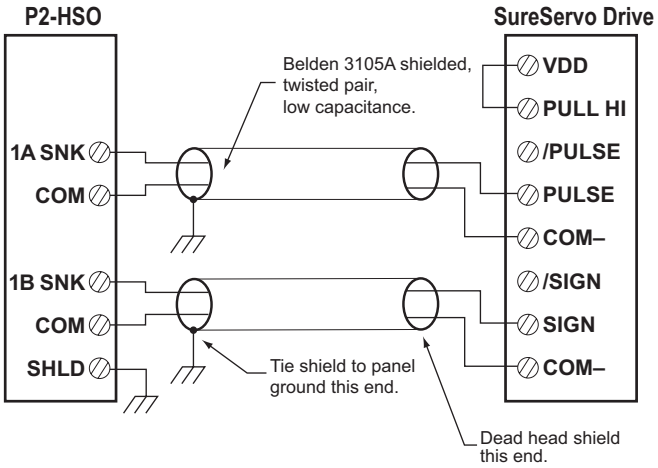
Important Hot-Swap Information

The Productivity2000 System supports hot-swap! Individual modules can be taken offline, removed, and replaced while the rest of the system continues controlling your process. Before attempting to use the hot-swap feature, be sure to read the hot-swap topic in the programming software's help file or our online documentation at AutomationDirect.com for details on how to plan your installation for use of this powerful feature.

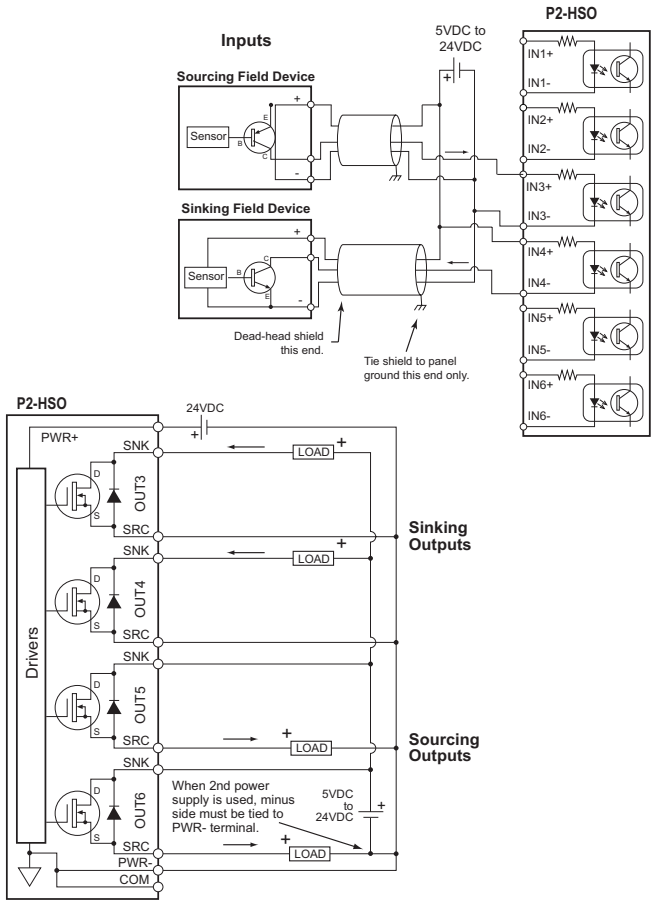
SureStep Wiring Diagram



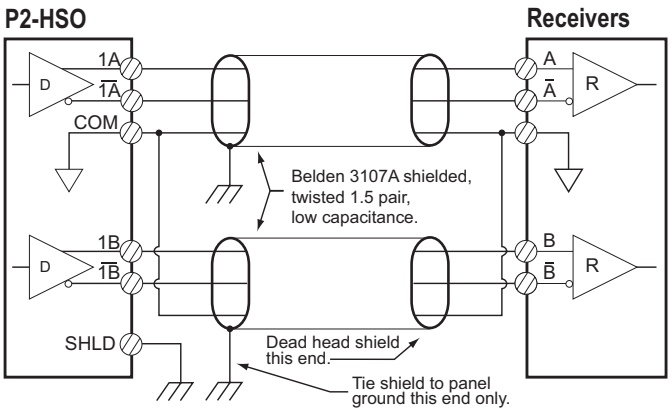
SureServo Wiring Diagram



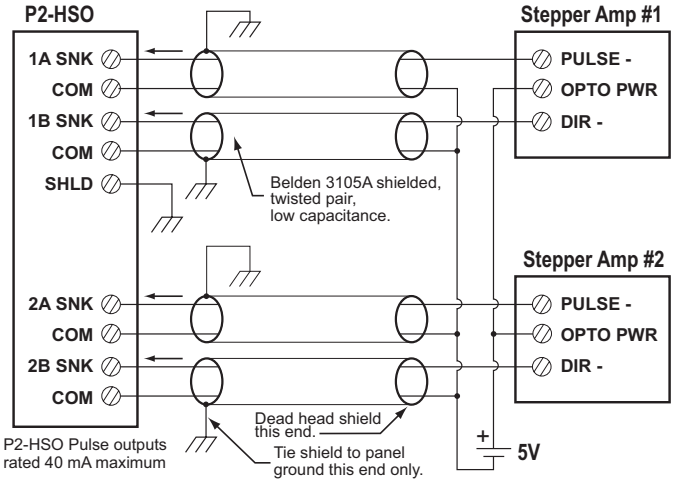
Status Inputs and Outputs



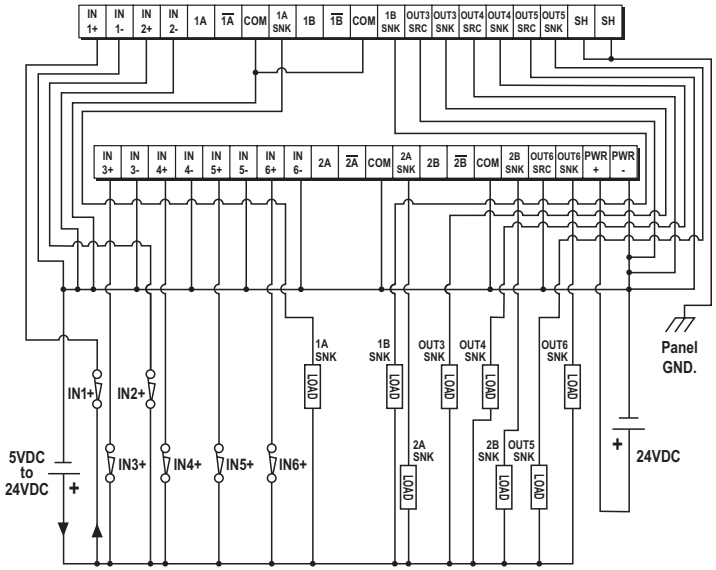
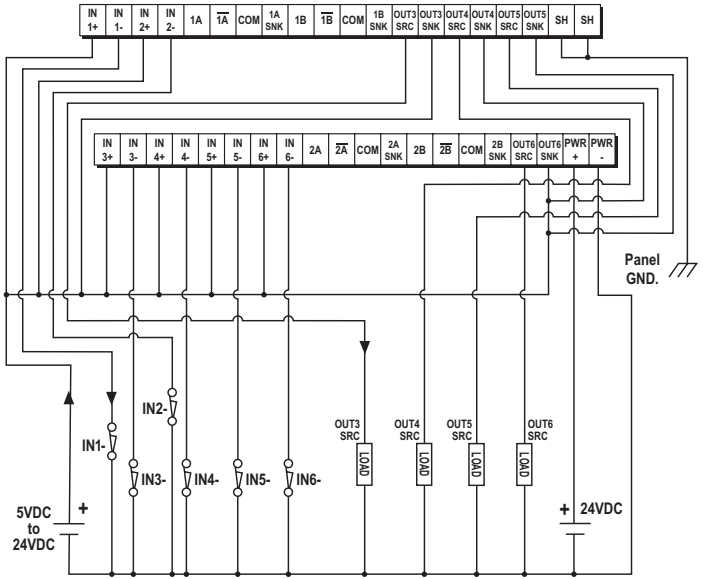
Line Driver Pulse Output Wiring Diagram



Sinking Pulse Output Wiring Diagram



Sinking I/O Wiring Diagram



Sourcing I/O Wiring Diagram