

VEGA

MODEL 2803512



SSI TO QUADRATURE CONVERTER WITH SELECTABLE RESOLUTION AND SAMPLING FREQUENCY. RUNOUT FEATURE FOR ABSOLUTE POSITION ON STARTUP AND SIMULATED HALL SENSORS FOR COMMUTATION

APPLICATIONS

- PLC Positioning Control
- Interface to any device that outputs SSI
- Compatible with Transducers and Absolute Encoders
- Ideal for Closed Loop Positioning Systems

SSI TO QUADRATURE INTERFACE

- Supports Up To 29 Bit SSI Interface
- Supports Long SSI Cable Lengths by Adjusting SSI Clock Frequency
- Sampling Frequency 20/10/5/2.5 KHz
- Removable Screw Terminals

Field Programmable Gate Array allows for parameter customization at the factory. Resolution, Sampling Frequency and SSI CLK Frequency can all be customized at the time of order.

2803512 SPECIFICATIONS

Max Sample Freq: 20 KHz
Max SSI Clk Freq: 1 MHz
Power Requirements: 5 VDC @250 mA
24 VDC @125 mA
Drive Capacity: 200 mA Peak

CONVERTER TRACKING RATE

The tracking rate is a function of the sampling frequency and delays in the measuring device. The higher the sampling rate the more closely the quadrature reflects the actual position. 20 KHz sampling rates have been proven.

ADVANCED FEATURES

- Easy to Use and Setup
- Single 5VDC and 24VDC Supply Options
- Initiate Runout Signal to Receive Absolute Position on Startup
- Simulated Hall Effect Sensors for Motor Commutation
- Status LED's for Power, Quadrature, Halls
- Not Sensitive to Controller Reset
- Differential TTL/Line Driver Outputs

SSI (Synchronous Serial Interface)

The 2803512 SSI to Digital Converter has a differential SSI interface to applications requiring serial communication. This interface can be expanded up to 29 bits of resolution with sampling frequencies up to 20 KHz. The ability to send quadrature at power up to reflect the absolute position of the measuring device is configurable.

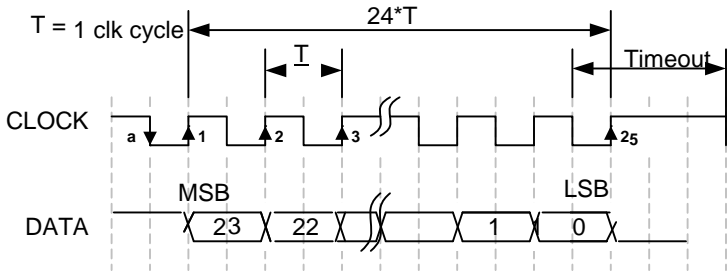
MODEL NUMBERS

<u>Model</u>	<u>Description</u>
2803512.05	5 VDC Input Voltage
2803512.24	24 VDC Input Voltage
Mating Connectors Included	

SSI (Synchronous Serial Input)

The 2803512 board's SSI interface receives serial transmission of absolute position data in binary from the sensor based on a timed clock pulse train from the converter. The SSI differential interface provides a high degree of noise immunity. For each sequential clock pulse from the converter, the host device transmits one data bit.

SSI TIMING - 24 BIT EXAMPLE

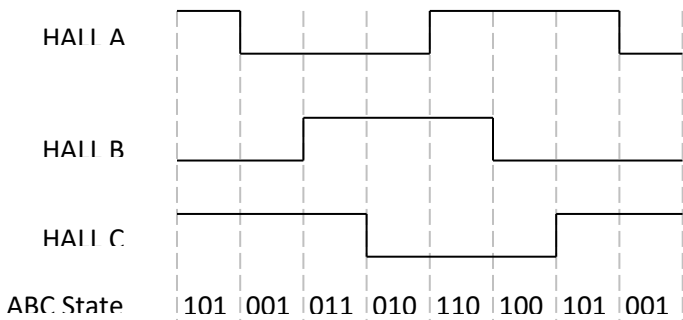


Resolution should be specified at time of order.

Hall Effect Outputs

The 2803512 Converter uses the position feedback to produce three Hall type signals at TTL levels to duplicate the signals required by drives using Hall effect sensors to determine the shaft position for commutation purposes. This makes the Converter IDEAL for retrofitting Drives for AC Servomotors requiring indicators of motor shaft position in order to properly commutate the winding power.

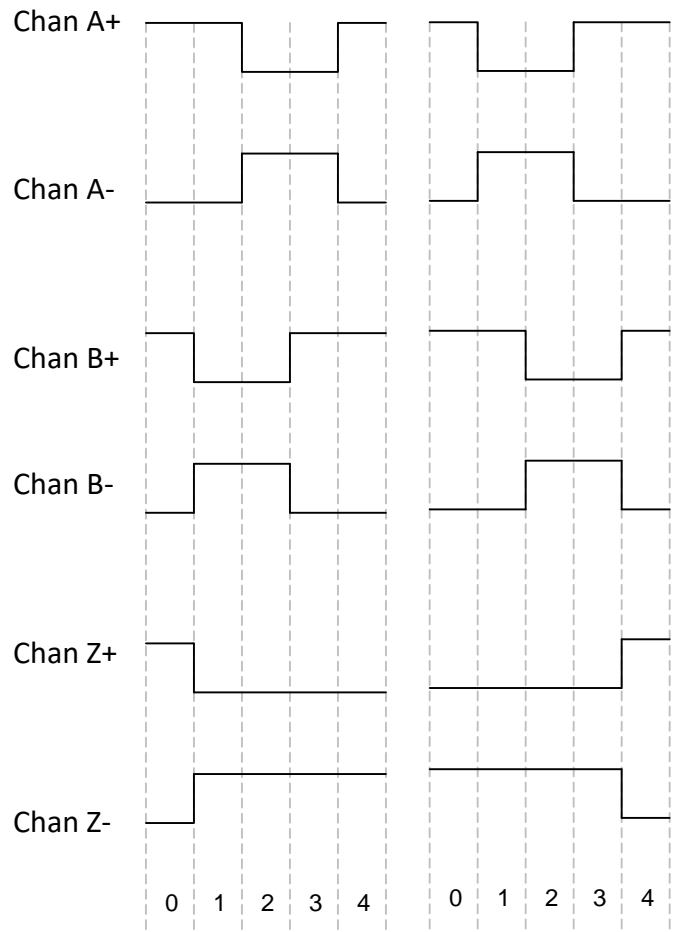
Hall Effect Output Format



QUADRATURE OUTPUT

The VEGA 2803 series of converter boards use RS-422-A differential drivers to provide 40 mA into a 100 ohm differential load. These outputs are also TTL compatible. The output latency is dependent on the sampling frequency. At 20 KHz the response will be 50 uSec. Quadrature is provided via Channels A+, A-, B+ and B-. A count is considered to occur whenever there is a transition in either the Channel A or B output signals. The Channel Z (Index) occurs once per roll over cycle and is not used with linear devices. The phase relationship of the two signals indicates the direction of the motion.

QUADRATURE OUTPUT FORMAT COUNTING UP COUNTING DOWN



P1 POWER CONNECTOR

<u>PIN#</u>	<u>FUNCTION</u>	<u>COLOR</u>
1	5 VDC IN (5V version only)	Red
2	DC Ground	Blk
3	Shield In	SHLD
4	No Connection	N/A
5	Initiate Runout (IRO) input	Blu/Red
6	No Connection	N/A
7	Runout Complete (RO) out	Blu/Blk
8	!Fault	Org
9	I/O VDC IN	Blu/Wht
10	24 VDC IN (24V version)	Blu

P3 SSI CONNECTOR

<u>PIN#</u>	<u>FUNCTION</u>	<u>COLOR</u>
1	No Connection	N/A
2	No Connection	N/A
3	Shield	SHLD
4	DC Ground Out	N/A
5	SSI Data-	Red/Wht
6	SSI Data+	Red
7	SSI Clock-	Blue/Wht
8	SSI Clock+	Blue
9	No Connection	N/A

P2 ENCODER CONNECTOR

<u>PIN#</u>	<u>FUNCTION</u>	<u>COLOR</u>
1	Channel A+	Grey
2	Channel A-	Violet
3	Channel B+	Yellow
4	Channel B-	Orange
5	Channel Z+	Blue
6	Channel Z-	Green
7	Shield Out	SHLD
8	Hall A+ (S1)	
9	Hall A-	
10	Hall B+ (S2)	
11	Hall B-	
12	Hall C+ (S3)	
13	Hall C-	


P4 RESOLVER CONNECTOR

<u>PIN#</u>	<u>FUNCTION</u>	<u>COLOR</u>
1-11	No Connection	N/A

Note: Hall A-, Hall B- and Hall C- are used as differential outputs. If the input device does not support differential outputs then only use Hall A+, Hall B+ and Hall C+ and the negative outputs are unused.

FUNCTION	QUADRATURE COUNTS											
	1	2	3	4	5	6	7	8	9	0	1	2
2.5 kHz Sampling	0	0										
5.0 kHz Sampling	1	0										
10 kHz Sampling	0	1										
20 kHz Sampling	1	1										
Initiate Runout			0									
Message Length				1	0	1	0	0				
Direction = CW								0				
Direction = CCW								1				
Reserved									0			
Reserved									1			
Reserved										1	1	
Reserved										1	0	
Reserved										0	0	
Reserved										0	1	

Figure 1.0

 Indicates Default

JUMPER SETTINGS

FREQUENCY SELECTION JB1-1, JB1-2

JB1-1, JB1-2 select excitation frequencies from 20 to 2.5 kHz.

INITIATE RUNOUT JB1-3

JB1-3 enables handshaking signal that provide absolute position at startup.

SSI MESSAGE LENGTH JB1-4 to JB1-8

JB1-4 to JB1-8 defines the length of the SSI message in binary. JB1-8 is the LSB. Selecting a value > 29 is unsupported and will trigger the fault light. A length must be selected.

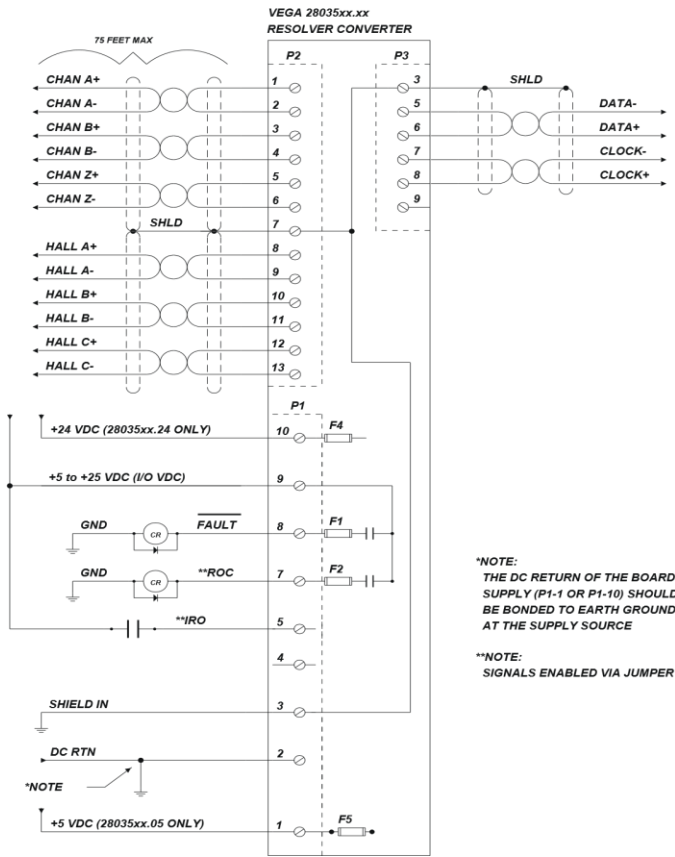
COUNTING DIRECTION (JB1-9)

Jumper JB1-9 controls the direction of the counting for the quadrature output. Install a jumper on JB1-9 to reverse the direction of the quadrature counting.

RESERVED JB1-10 to JB1-12

JB1-10 to JB1-12 are unused and should be removed

APPLICATION INTERFACE



DISASSEMBLY

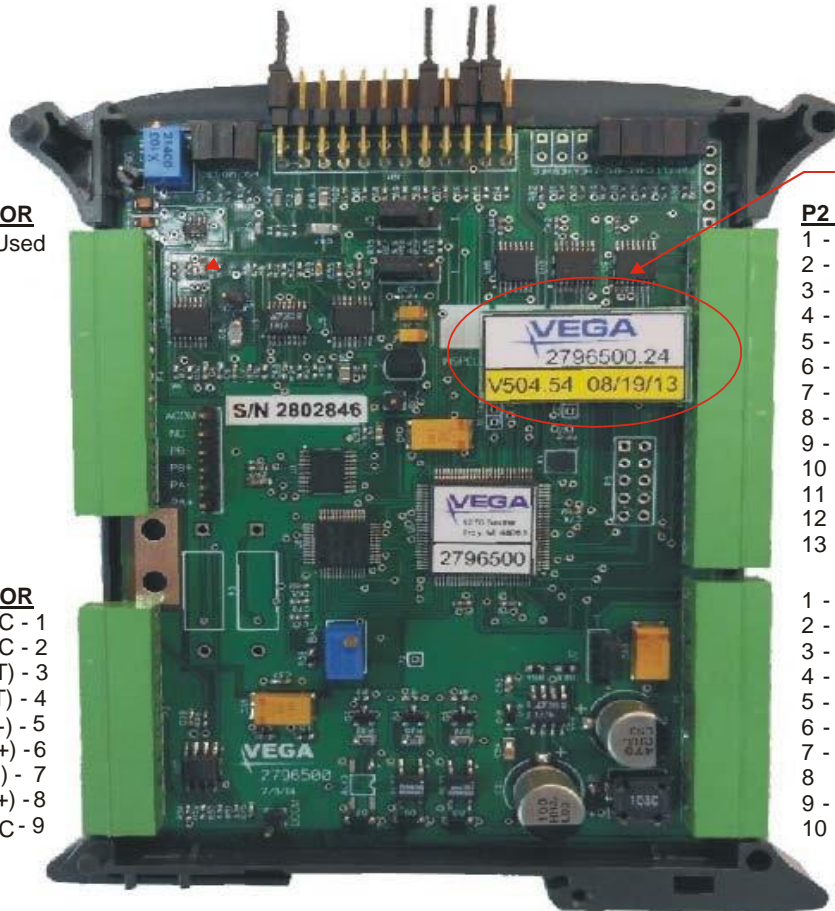


Firmly press the center of the latch hook down and slide towards the center of the enclosure
NOTE: Use caution not to drop the spring under the latch hook.



Using a small flat head screwdriver release all four of the enclosure cover hooks.
NOTE: Use caution to avoid breaking the cover hooks.

MECHANICAL



P4 CONNECTOR
 Not Used

P3 CONNECTOR
 NC - 1
 NC - 2
 SHIELD (OUT) - 3
 DC RETURN (OUT) - 4
 SSI DATA (-) - 5
 SSI DATA (+) - 6
 SSI CLOCK (-) - 7
 SSI CLOCK (+) - 8
 NC - 9

PERSONALITY MODULE

P2 CONNECTOR
 1 - CHANNEL A +
 2 - CHANNEL A -
 3 - CHANNEL B +
 4 - CHANNEL B -
 5 - CHANNEL Z +
 6 - CHANNEL Z -
 7 - SHIELD (OUT)
 8 - HALL A+ (S1)
 9 - HALL A-
 10 - HALL B+ (S2)
 11 - HALL B-
 12 - HALL C+ (S3)
 13 - HALL C-

1 - (+) 5 VDC (.05 Version Only)
 2 - DC RETURN (IN)
 3 - SHIELD (IN)
 4 - NC
 5 - INITIATE RUNOUT (IN)
 6 - NC
 7 - RUNOUT COMPLETE (OUT)
 8 - !FAULT (OUT) LOW ACTIVE
 9 - I/O VDC (IN)
 10 - (+) 24 VDC (.24 Version Only)

TROUBLE SHOOTING

SYMPTOM	CHECKS	SOLUTION
No Power LED	Check 5 VDC or 24 VDC	If VDC present then check F4 and F5 fuse
Commanded and Actual Distance Different	Measurement of distance	Verify resolution bits are the same on both devices.
Feedback Polarity is Reversed. Move backwards	None	Installing a jumper on JB1-9 will reverse the feedback polarity
Fault Light Flashing	Jumpers at JB1-4 to JB1-8 are set	Set SSI message length. JB1-8 LSB

SETUP PROCEDURE

- 1 With the power turned off install the 2803512 board as described in the application drawing and complete the following steps.
- 2 Review and set the desired jumpers in JB1.
- 3 Do not adjust any potentiometers on the board.
- 4 Complete the wiring of the 5 or 24 VDC power, SSI interface (Clock +/-, Data +/-, Shield) and Quadrature (A+/-, B+/-, Z optional, Shields) interface, HALL Sensors and Absolute Positioning Handshaking. No connections required on P4.
- 5 There is a short delay on power up to give the measuring device time to initialize and prepare to accept data requests.

LED STATUS INDICATORS

CHA = Channel A State Indicator
CHB = Channel B State Indicator
CHZ = Channel Z State Indicator
PWR = Power Status Indicator
HEA = Hall A (S1) State Indicator
HEB = Hall B (S2) State Indicator
HEC = Hall C (S3) State Indicator
LO = Unused
MID = Unused
HSG = Unused

ELECTRICAL

POWER REQUIREMENTS

The 5 VDC board requires ~250 mAmps for operation.
The 24VDC board requires ~125 mAmps for operation.
The supplied power should have less than 50 mVolts of noise and drift.

POWER SUPPLIES

TDK DSP30-5 (5VDC @3Amps)
TDK DSP60-24 (24VDC @2.5Amps)

CABLE RECOMMENDATIONS

Proper routing and shielding techniques should be observed. Shielded twisted pair cables should be used for all interface signals. Recommended cable: Shielded (3) twisted pair with drain wire. Belden #8103 or equivalent.

REPAIR AND TECHNICAL SUPPORT

Monday-Friday 8:00AM to 6:00PM Central. Call (248) 585-3600.