NEWALL

Newall Measurement Systems

SHG-AG and SHG-AB

(Spherosyn Absolute)

Linear Encoder

SSI Protocol

SHG-AG and SHG-AB SERIES (SPHEROSYN ABSOLUTE) LINEAR ENCODER WITH SSI INTERFACE

(Revision 11.01.04)

Power Requirements	5Vdc +-5% < 350mA
Shock (11ms)	100g / 980m/s-2 (IEC 69-2-6)
Vibration (55-2000Hz)	30G / 294m/s-2 (IEC 68-2-27)
Ingress Protection Level	IP67
Operating Temperature Range	0 to 55 deg. C (32 to 131 deg. F)
Storage Temperature Range	-20 to 70 deg. C (-4 to 158 deg. F)
Scale Material	316 Grade Stainless Steel
Scale (Tube) OD	15.25mm (0.601")
Moving Force	20N
Standard Cable	15-core Cable with PUR
Max Cable Length	20m (65ft)
Cable Bend Radius (PUR)	Static: 12.7mm (0.5") Active: 50.8mm (2")
Cable Bend Radius with Armor	50.8mm (2")

SSI SIGNAL DESCRIPTIONS

The SSI interface uses two differential signals CLK+, CLK- (Clock), and DATA+, DATA- (Data). The encoder position is read by sending a pulse train to the Clock input. At the first low to high transition the Most Significant Data Bit is output to the Data lines. At each subsequent low to high transition of the Clock, the next highest bit is transmitted.

SSI OUTPUT FORMAT

SERIAL DATA OUTPUT (D23 to D0)

D23	D22	D21	D20	D19	D18	D17	D16	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
MSB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	LSB

NOTE:

- The encoder position data is transmitted in Gray Code (SHG-AG) or Binary (SHG-AB) format.
- D23 is transmitted first. This is the most significant bit of the position data.
- D0 is the least significant bit.

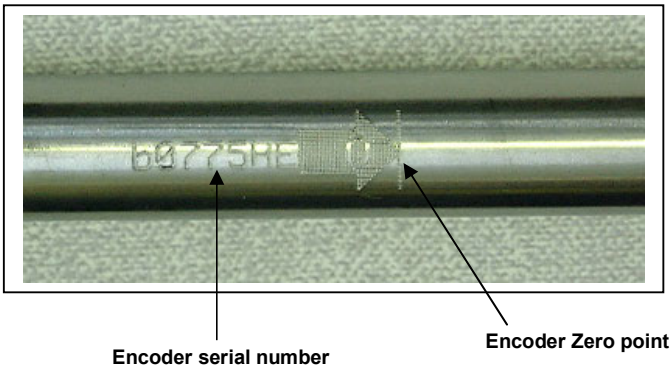
CONNECTIONS

FUNCTION	15 WAY D-TYPE PIN	FLYING LEAD
SSI CLK+	1	Light Green
Reserved	2	Orange
Reserved	3	Pink & White
Reserved	4	Grey
Reserved	5	Red
Reserved	6	Yellow
Reserved	7	Pink
+5 VDC	8	Black
SSI CLK-	9	Light Green & White
SSI Data+	10	Brown
SSI Data-	11	Brown & White
Reserved	12	Violet
Reserved	13	Blue
Reserved	14	Dark Green
0V	15	White

* These connections are not implemented and are to be left unconnected.

ZERO POINT MARKER

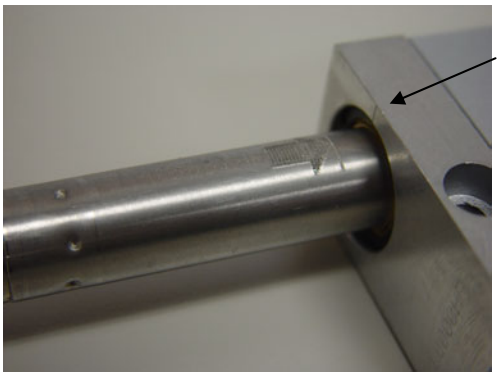
The scale is marked with an arrow and a line at the position where the position data is zero. This point is 55mm in from the end of the scale.



INSTALLATION

Install the scale and reader head hardware as described in the Spherosyn Absolute, Distance Coded, and Digital SP Encoder Hardware Installation Manual (Code LEHM – v1).

It is important to ensure that the scale and reader head are rotationally aligned before operation. There is an arrow etched into the tube that needs to be aligned with the notch in the reader head. Once aligned the scale brackets are tightened as detailed in the installation manual.



Apply power to the reader-head. The Signal LED on the front of the reader-head will go RED and then GREEN as it establishes position and performs its self-diagnostics.

Move the reader-head along the full length of travel from the scale (taking care not enter the unusable sections at either end of the scale). Cycle power periodically as you traverse the reader head along the scale. The reader-head LED should go RED then GREEN each time the power is turned on. If the LED stays RED then there is misalignment between the reader head and scale. If this occurs loosen the scale brackets and rotate the scale approximately 2-3 degrees. Tighten the scale brackets as described in the installation manual and repeat the process until the signal LED remains GREEN for the full period of travel. Once the LED has turned RED, the only way to get the GREEN LED is to cycle power while the encoder is properly aligned.

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