NEWALL

Newall Measurement Systems

SHG-A4 Series

(Spherosyn Absolute)

Linear Encoder

RS485 Protocol

SHG-A4 Series (SPHEROSYN ABSOLUTE) LINEAR ENCODER WITH RS485 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”)

RS485 INTERFACE

Baud Rate	= 115200
Data Bits	= 8
Parity	= NONE
Stop Bits	= 1
Address (ID)	= See encoder (e.g. 55Hex)
Minimum Delay Between Bytes	= 1ms
Minimum Delay Between Requests	= 25ms

REQUEST TO ENCODER

ID	Command	Carriage Return
1 byte	X Bytes depending on command	0D(hex)

RECEIVE FROM ENCODER

ID	Data	Checksum
1 byte	8 bytes	1 byte

ADDRESS (ID)

The encoder only responds to commands if the ID byte responds to the programmed encoder ID.

COMMANDS:

Command	Function	Data Returned
RT	Request Encoder type	01 (00=RS232 : 01=RS485)
RP	Request position	8 bytes position

NOTE:

- Position values are returned in resolution units.
- Position data is in ASCII decimal format.
- Encoder Address (ID) and carriage return values provided are in Hexadecimal.
- The checksum is calculated by summing the values in the data string AND address ID, and is the remainder after dividing by 256. The checksum value will be a hexadecimal number between 0 and 255.
- RS422 incremental position signals are active and can be used in conjunction with the RS485 output. See pinout below.

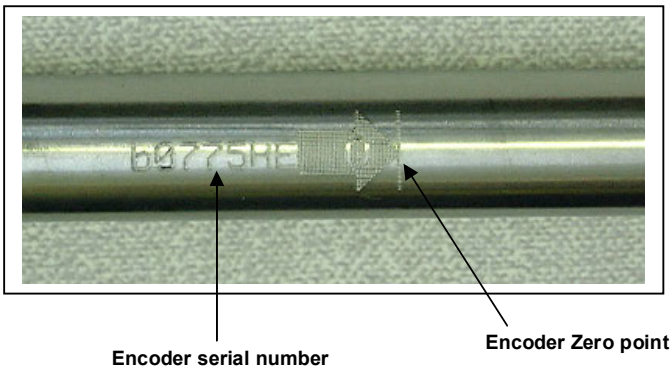
CONNECTIONS

FUNCTION	15 WAY D-TYPE PIN	FLYING LEAD
*Reserved	1	Light Green
*Reserved	2	Orange
*Reserved	3	Pink & White
*Reserved	4	Grey
B-	5	Red
A-	6	Yellow
*Reserved	7	Pink
+5 VDC	8	Black
*Reserved	9	Light Green & White
RS485+	10	Brown
RS485-	11	Brown & White
*Reserved	12	Violet
B+	13	Blue
A+	14	Dark Green
0V	15	White

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

ZERO POINT MARKER

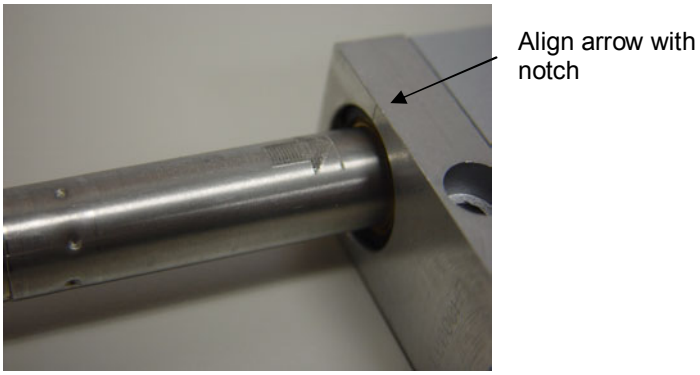
The scale is marked with an arrow and a line at the position where the position data is zero. This point is 55mm in from the end of the scale.



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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