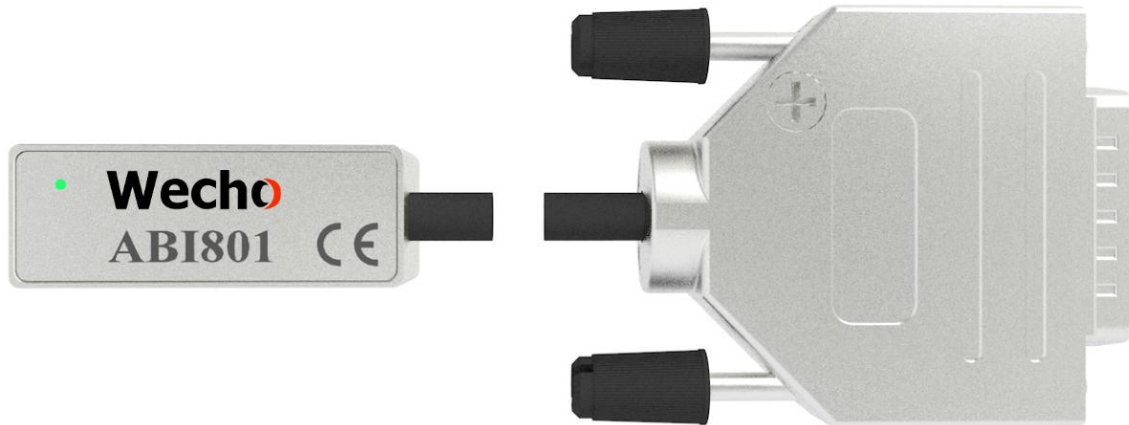


Datasheet

ABI801 Series Optical Encoder System

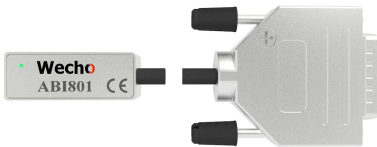


Highlights

Optical Readhead

- Non-contact optical incremental encoders
- Industry-standard TTL signals (**Up to 0.2 μ m resolution**)
- Integrated Automatic Gain Control ensures optimal signal strength
- Ideal for high-precision applications
- Compact design optimized for integration into space-constrained systems
- Simple installation with the diagnostic LED

1. Specifications

Optical Readhead		
Image		
Series		ABI801
Description		Recommended for long-stroke linear motion, equipped with a Hall sensor for multiple indexing selection
Scanning Principle		Optical (Reflective)
Scanning Type		Incremental
Signal Period		80 μm
Output Signal		TTL
Resolution	TTL	1.0 μm (80X angle steps per period) 0.5 μm (160X angle steps per period) 0.2 μm (400X angle steps per period)
Power Supply (Without Load)	5 V $\pm 10\%$	<70 mA (Typical)
Temperature	Storage	-20 °C to +70 °C @ RH < 80% (Non-condensing)
	Operating	0 °C to +70 °C @ RH < 80% (Non-condensing)
Acceleration	Operating	500 m/s ² , 3 Axes
Shock	Non-Operating	<1000 m/s ² , 6 ms, ½ Sine, 3 Axes
Vibration	Operating	<100 m/s ² Max @ 55 to 2000 Hz, 3 Axes
Mass	Readhead	9.5 g
	Cable	35 g/m
Cable Design		10 Cores, Single Shielded
Cable Diameter		4.5 \pm 0.2 mm
Cable Bend Radius	Static	30 mm
	Dynamic	70 mm
Cable Termination		DSUB 15 Male
Readhead Dimension	Length	36.0 mm
	Width	13.5 mm
	Height	14.8 mm
IP Rating		IP40

2. Speed Performance

2.1 TTL Output Signal

2.1.1 Linear Motion


2.1.1.1 Minimum Edge Separation: 50 ns

Interpolator Factor	Angle Steps per Period	Resolution (μm)	Max Speed (m/s)
20X	80X	1.0	8
40X	160X	0.5	8
100X	400X	0.2	3

2.1.1.2 Minimum Edge Separation: 200 ns

Interpolator Factor	Angle Steps per Period	Resolution (μm)	Max Speed (m/s)
20X	80X	1.0	4
40X	160X	0.5	1.8
100X	400X	0.2	0.7

3. LED Definition

Model		ABI801
LED Location		<p>On readhead body</p> <p>LED</p> 
LED Colour	Green	Optimal signal quality
	Green (Blinking)	Passing through the selected index mark
	Amber	Warning
	Red	Error

LED

13.5

18.0

Optical Centerline

7.5

5.5

6.8

36.0

5.0 min

4.0

26.0

14.8

3.0

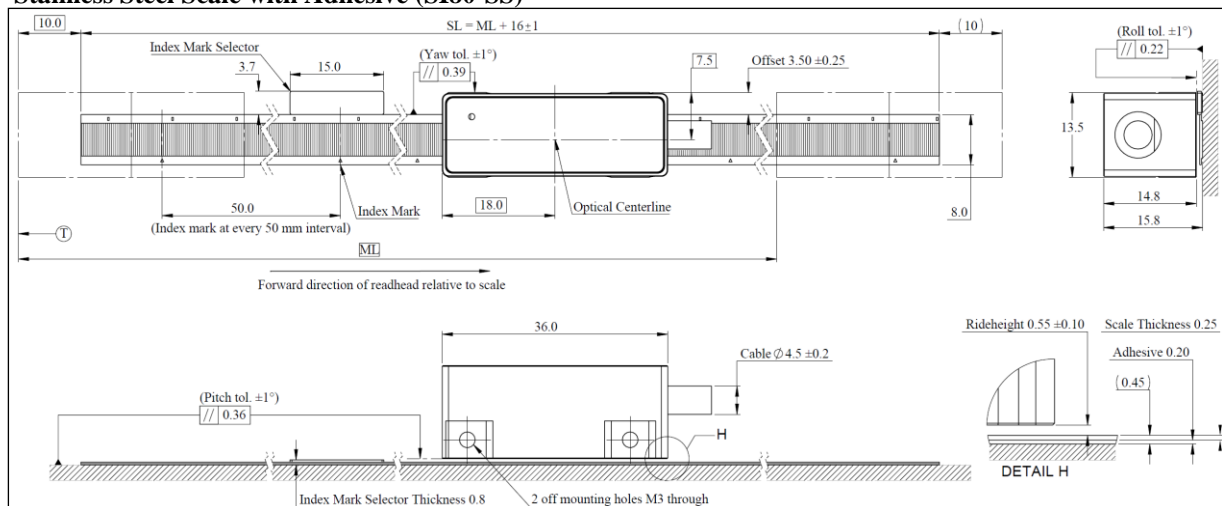
$R > 70$ Dynamic bend radius
 $R > 30$ Static bend radius

Cable $\varnothing 4.5 \pm 0.2$

2 off mounting holes M3 through

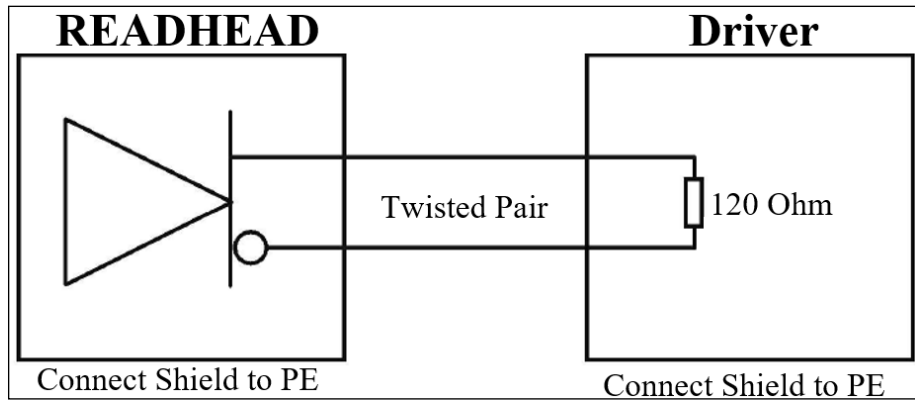
1. All dimensions are in mm.

5.1 Stainless Steel Scale with Adhesive (SI80-SS)



1. All dimensions are in mm.
2. SL = Scale length
3. ML = Measuring length
4. **T** = Beginning of the measuring length
5. **Λ** = Index mark

6. Electrical Connection

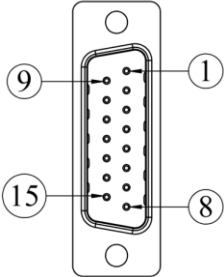


IMPORTANT: Readhead shield must be connected to the driver earth (Field ground).

Maximum readhead cable length: 3 m

7. Pinout

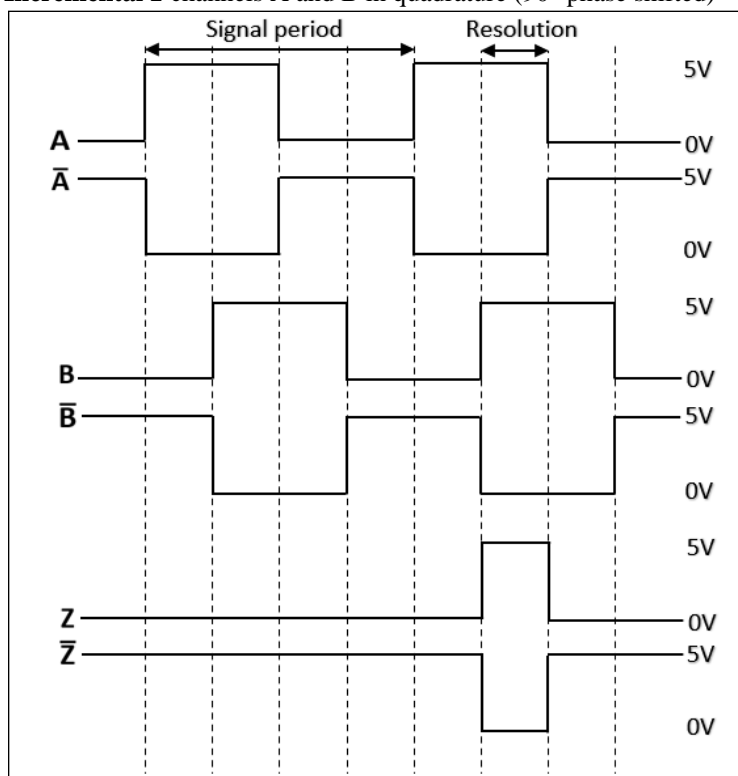
7.1 TTL Output Signal

Connector	Pinout	Signal	Function	Colour
 <p>Type: DSUB 15 Male Jack Screws: UNC 4-40</p> <p>Mating Recommendation Type: DSUB 15 Female Hex Extender: UNC 4-40, 6 mm</p>	Pin 1	A+	TTL A+ signal	Blue
	Pin 2	0 V	Encoder supply (0 V)	Black
	Pin 3	B+	TTL B+ signal	Grey
	Pin 4	VCC	Encoder supply (5 V)	Red
	Pin 5	Modbus A	Modbus A	Amber
	Pin 6	NC	Not connected	-
	Pin 7	I-	Index- signal	Green
	Pin 8	NC	Not connected	-
	Pin 9	A-	TTL A- signal	Violet
	Pin 10	0 V Sensor	Encoder supply (0 V) Shorted with Pin 2	Black
	Pin 11	B-	TTL B- signal	White
	Pin 12	VCC Sensor	Encoder supply (5 V) Shorted with Pin 4	Red
	Pin 13	Modbus B	Modbus B	Brown
	Pin 14	I+	Index+ signal	Yellow
	Pin 15	NC	Not connected	-
	Case	Outer Shield	Outer Shield	-

8. Output Specifications

8.1 TTL Output Signal

Incremental 2 channels A and B in quadrature (90° phase shifted)



9. Model Name

ABI801-400X-05C1

Cable Termination:
C1: DSUB 15 Male

Cable Length:
05: 0.5 m
10: 1.0 m
30: 3.0 m

Output Signal:
80X: TTL output signal, resolution 1.0 μm (80X angle steps per period)
160X: TTL output signal, resolution 0.5 μm (160X angle steps per period)
400X: TTL output signal, resolution 0.2 μm (400X angle steps per period)

Series:
ABI801: Recommended for long-stroke linear motion for 80 μm signal period

Note:

- For customization, please contact our sales team for more information.


10. Compatible Scale/Disc

Type	Model	Description
Scale	SI80-SS	Linear incremental 80 μm grating period, stainless steel with adhesive
Disc	Not recommended	If needed, please contact our sales team

11. Accessories List

Part Number	Image	Description
N/A		0.55 mm Shim Kit is used during readhead assembly to precisely adjust the rideheight between the readhead and the scale, ensuring optimal signal quality. By using the appropriate shims, the required rideheight can be accurately achieved, preventing signal degradation and enhancing the overall performance of the readhead. <i>* Included in every readhead</i>

12. Introduction to Similar Products

Model	Image	Description
ABI80		Miniature readhead, supports short-stroke linear and rotary motion, suitable for compact systems