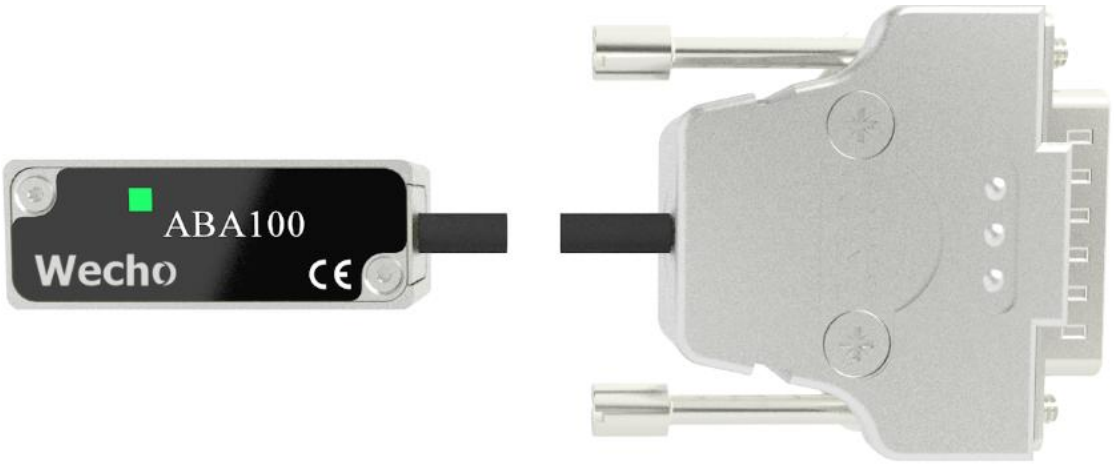
Datasheet

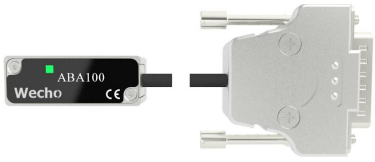
ABA100 Series Optical Encoder System



Highlights

Optical Readhead	• Non-contact optical absolute encoder • Industry-standard EnDat 2.2 (Bidirectional) & Mitsubishi (Mit03-2) communication protocol (**Up to 50 nm 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

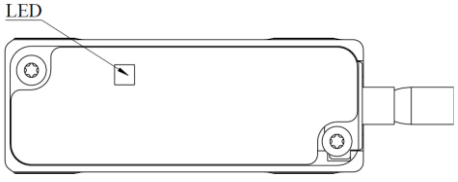
Optical Readhead		
Image		
Series		**ABA100**
Description		Recommended for long-stroke linear motion, suitable for high-precision applications
Scanning Principle		Optical (Reflective)
Scanning Type		Absolute
Signal Period		100 µm
Output Signal		EnDat 2.2 (Bidirectional)
		Mitsubishi (Mit03-2)
Resolution		50 nm (32-bit)
Power Supply (Without Load)	**3.6 VDC to 14 VDC**	100 mA at 5 VDC
Temperature	**Storage**	-20 °C to +70 °C @ RH < 80% (Non-condensing)
	Operating	-10 °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**	<500 m/s^2 Max @ 55 to 2000 Hz, 3 Axes
Mass	**Readhead**	12 g
	Cable	22 g/m
Cable Design		8 Cores, Single Shielded
Cable Diameter		3.7±0.2 mm
Cable Bend Radius	**Static**	8 mm
	Dynamic	40 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

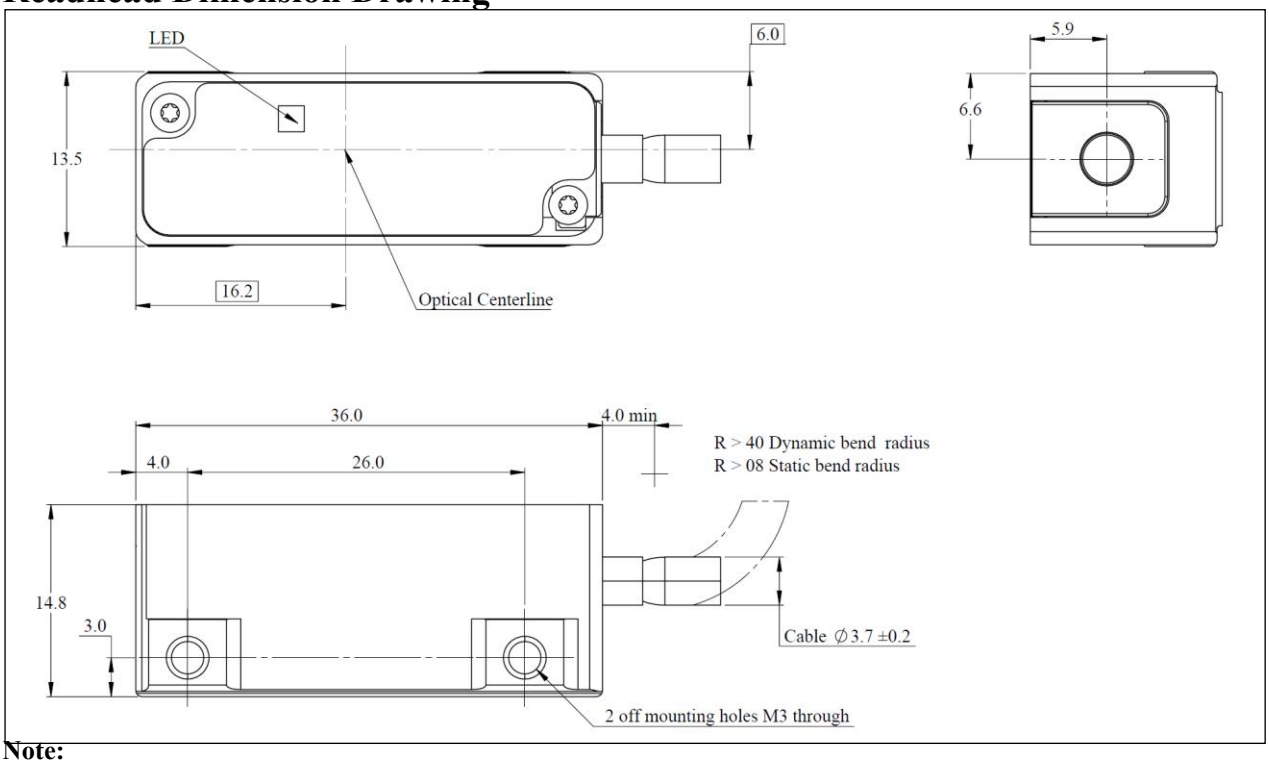
2.1 Linear Motion

Max Speed (m/s)
10

3. LED Definition

Model		ABA100
LED Location		On readhead body 
LED Colour	**Green**	Optimal signal quality
	Yellow	Warning
	Red	Error

4. Readhead Dimension Drawing

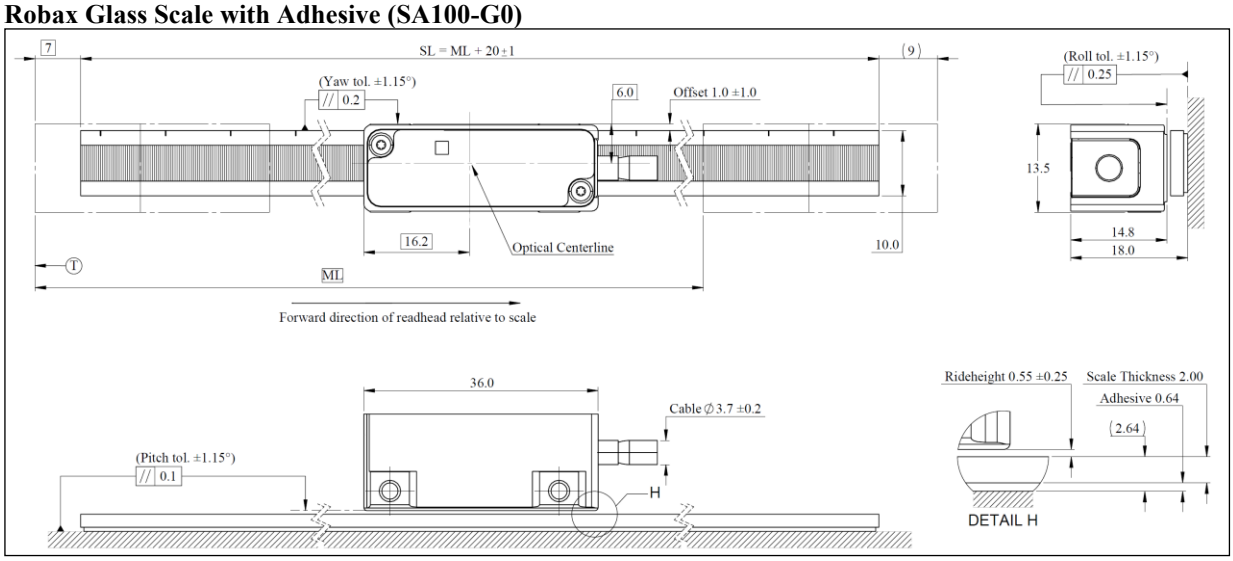


Note:

1. All dimensions are in mm.

5. Readhead Installation Guide

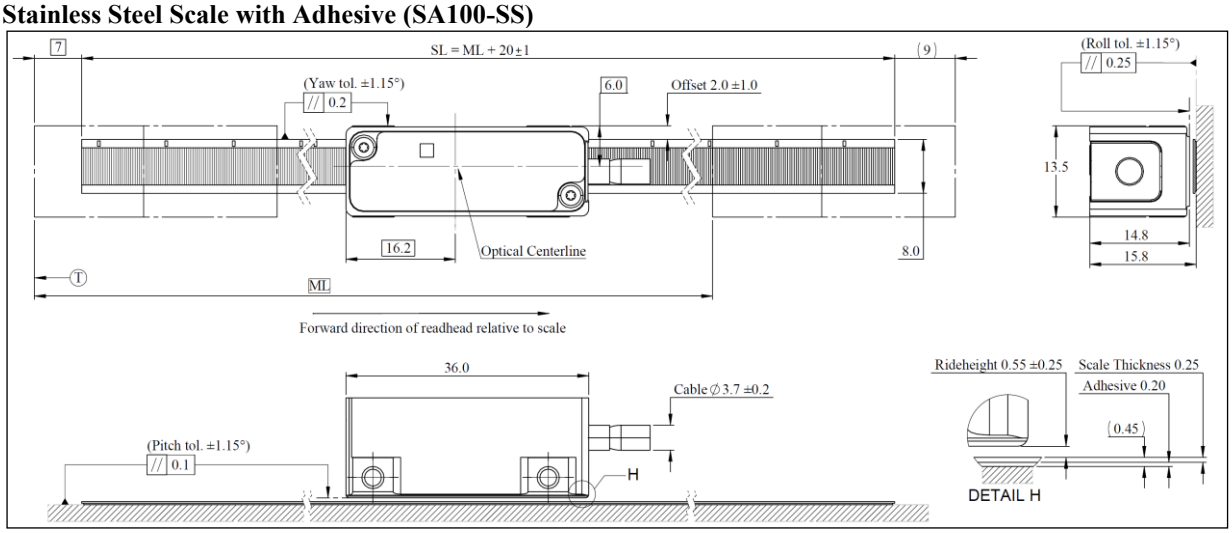
5.1 Robax Glass Scale with Adhesive (SA100-G0)



Note:

1. All dimensions are in mm.
2. SL = Scale length
3. ML = Measuring length
4. (T) = Beginning of the measuring length

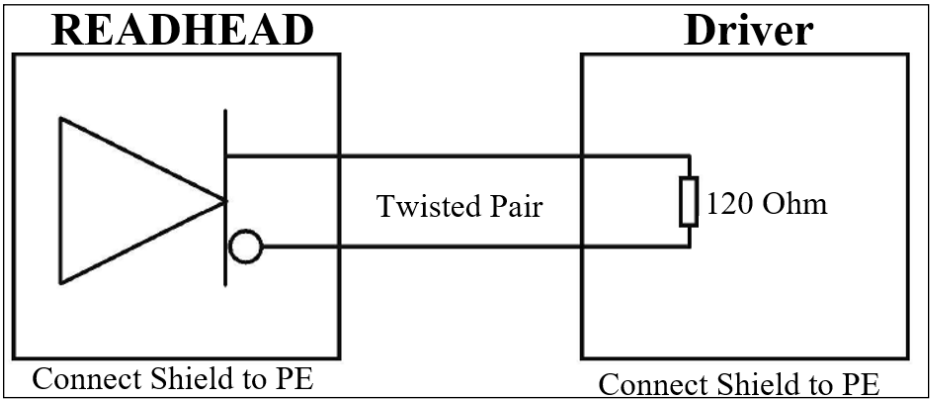
5.2 Stainless Steel Scale with Adhesive (SA100-SS)



Note:

1. All dimensions are in mm.
2. SL = Scale length
3. ML = Measuring length
4. (T) = Beginning of the measuring length

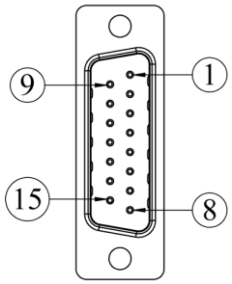
6. Electrical Connection



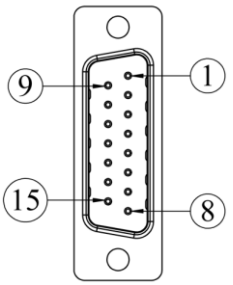
IMPORTANT: Readhead shield must be connected to the driver earth (Field ground).
Maximum readhead cable length: 3 m

7. Pinout

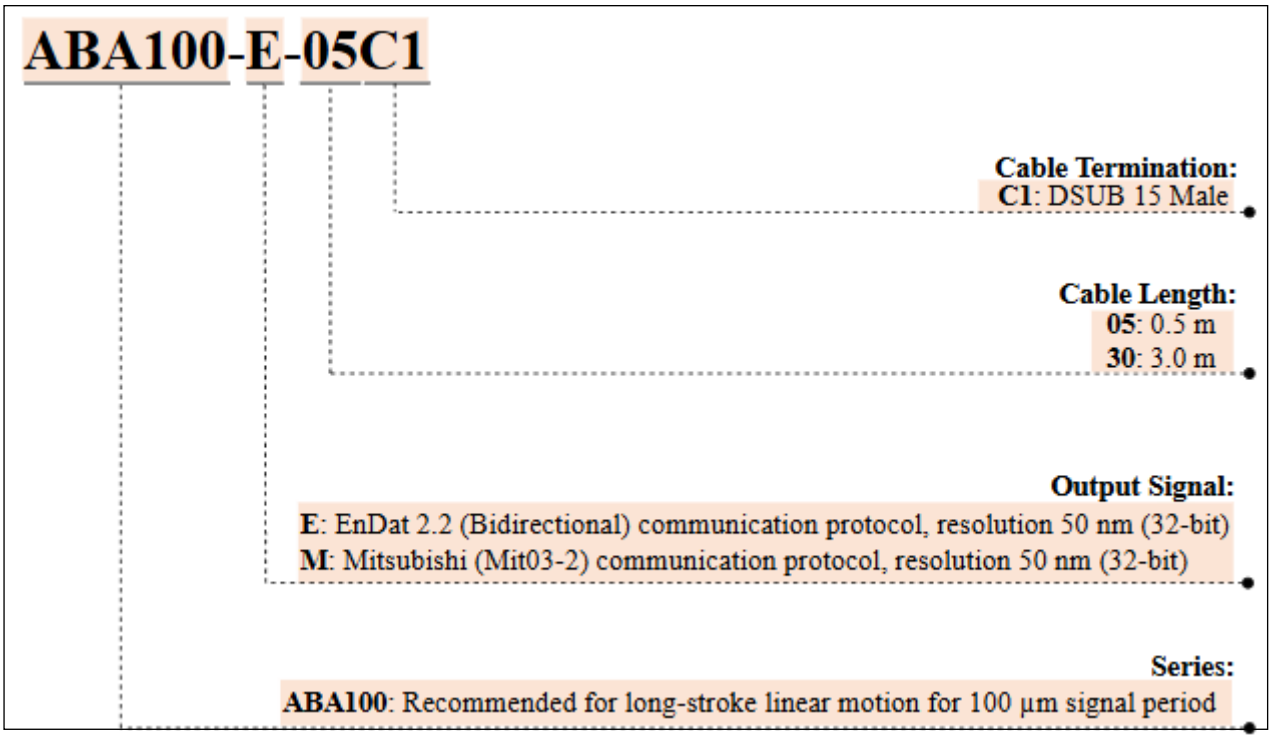
7.1 EnDat 2.2 (Bidirectional) Output Signal

Connector	Pinout	Signal	Function	Colour
 **Type:** DSUB 15 Male **Jack Screws:** UNC 4-40 **Mating Recommendation** **Type:** DSUB 15 Female **Hex Extender:** UNC 4-40, 6 mm	**Pin 1**	NC	Not connected	-
	Pin 2	0 V	Encoder supply (0 V)	White / Green
	Pin 3	NC	Not connected	-
	Pin 4	VCC	Encoder supply (5 V)	Brown / Green
	Pin 5	Data+	Data+	Grey
	Pin 6	NC	Not connected	-
	Pin 7	NC	Not connected	-
	Pin 8	Clock+	Clock+	Violet
	Pin 9	NC	Not connected	-
	Pin 10	0 V Sensor	Encoder supply (0 V) Shorted with Pin 2	White
	Pin 11	NC	Not connected	-
	Pin 12	VCC Sensor	Encoder supply (5 V) Shorted with Pin 4	Blue
	Pin 13	Data-	Data-	Pink
	Pin 14	NC	Not connected	-
	Pin 15	Clock-	Clock-	Yellow
	Case	Outer Shield	Outer Shield	-

7.2 Mitsubishi (Mit03-2) Output Signal

Connector	Pinout	Signal	Function	Colour
 **Type:** DSUB 15 Male **Jack Screws:** UNC 4-40 **Mating Recommendation** **Type:** DSUB 15 Female **Hex Extender:** UNC 4-40, 6 mm	**Pin 1**	NC	Not connected	-
	Pin 2	0 V	Encoder supply (0 V)	White / Green
	Pin 3	NC	Not connected	-
	Pin 4	VCC	Encoder supply (5 V)	Brown / Green
	Pin 5	Reserved	Do not connect	Grey
	Pin 6	NC	Not connected	-
	Pin 7	NC	Not connected	-
	Pin 8	Request/Data+	Request/Data+	Violet
	Pin 9	NC	Not connected	-
	Pin 10	0 V Sensor	Encoder supply (0 V) Shorted with Pin 2	White
	Pin 11	NC	Not connected	-
	Pin 12	VCC Sensor	Encoder supply (5 V) Shorted with Pin 4	Blue
	Pin 13	Reserved	Do not connect	Pink
	Pin 14	NC	Not connected	-
	Pin 15	Request/Data+	Request/Data+	Yellow
	Case	Outer Shield	Outer Shield	-

8. Model Name



Note:

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

9. Compatible Scale/Disc

Type	Model	Description
Scale	SA100-G0	Linear absolute 100 µm grating period, robax glass with adhesive
	SA100-SS	Linear absolute 100 µm grating period, stainless steel with adhesive
Disc	Not recommended	If needed, please contact our sales team

10. 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. ***Included in every readhead***