# Briterencoder Linear Wire Displacement Sensor

## BRT38X Series Analog 4~20mA Output User Manual V202507

### 1. Product Model Description

**Communication Protocal:**

R0M=RS485 (Modbus RTU)
R2M=RS232(Modbus RTU)
R4M=RS422(Modbus RTU)
T0M=TTL(Modbus RTU)
C0M=CANbus
C2M=CANopen

S1M=SSI
S2M=BISS-C
A0M=4~20mA
V5M=0~5V
V10M=0~10V
K5M=0~5K

K10M=0~10K
R0&A0M=RS485&4~20mA
R0&V5M=RS485&0~5V
R0&V10M=RS485&0~10V

Resolution:
1024、4096

RT1=Side Outlet
AT1=Tail Outlet
(Default Cable Length 1~1.2M)

| BRT38X | 1M | R0M | 1024 | RT1 | IP68 |
|---|---|---|---|---|---|

BRT=BriterEncoder
BRT38= OD.39mm
BRT50= OD50mm
BRT27=27*27mm
BRT38X=X series

Measuring range:0.3M、0.5M、1M、2M、3M、4M、5M、6M、7M、8M、9M、10M、11M、12M、13M、14M、15M、(Customizable)

IP54:Normal
IP68:Waterproof
(Usable 1m underwater)
EX:Explosion-proof

**Model description:**

1.Structural form of the encoder: e.g., BRT38 indicates an outer diameter of 38mm.
2.Measuring range: e.g., 1M indicates a measuring stroke range of 0 - 1000mm.
3.Communication interface: e.g., R0M indicates an electrical interface of RS485 and the communication protocol is Modbus RTU.
4.Resolution: e.g., 1024 means that the internal encoder and the winding wheel feed back 1024 data when rotating one circle. For a 1 - meter stroke, referring to the corresponding table parameters, if the diameter of the internal winding wheel is 100mm, it means that the encoder feeds back 1024 data when moving 100mm. The minimum displacement resolution: 100mm / 1024 = 0.098mm. That is, the displacement resolution of 1024 is 0.098mm.
5.Inventory: Some randomly combined models may be out of stock. Please consult in advance to ensure that the selected model is available.

## 2.Wiring Definition and connection

| | | |
|---|---|---|
| Grey wire | 4-20mA positive | - |
| Brown wire (optional) | 4-20mA negative. | 1. In three-wire configuration, this line remains unconnected as the signal negative and power negative are directly connected.<br>2.In four-wire configuration, this line needs to be connected to the negative of the 4-20mA current loop (i.e., the signal negative). |
| Black wire | 0V (GND) | - |
| Red wire | Power Supply | DC 12-24V |
| Orange wire | Function line | SETH/ Direction |
| Yellow wire | Function line | SETL/ Reset |

## 2. Product Parameters

| Measuring Range | Interface | Linear accuracy | Resolution 1024PPR | Resolution 4096PPR | Winding wheel diameter(mm) |
|---|---|---|---|---|---|
| 500mm | 4~20mA | ±0.1% | 0.126mm | 0.031mm | 130 |
| 1000mm | | ±0.1% | 0.126mm | 0.031mm | 130 |
| 2000mm | | ±0.1% | 0.175mm | 0.043mm. | 180 |
| 3000mm | | ±0.1% | 0.224mm | 0.056mm | 230 |
| 4000mm | | ±0.1% | 0.292mm | 0.073mm | 300 |
| 5000mm | | ±0.1% | 0.375mm | 0.093mm | 385 |
| Service times | >5million times | | Working temp. | -40~+85°C | |
| Pull Tension | 2~3N | | Body material | Aluminum alloy (anti-static), stainless steel head | |
| Max. Working Speed | 1m/s | | Pull rope material | Stranded steel wire | |
| Protection Grade | IP54, IP68 Waterproof, Explosion proof | | Service Life | 5million times | |
| Cable Length | 1-1.2meters(Customizable) | | Drawstring Diameter | 0.6mm | |

## Function Line Setting Method

### Set the minimum value:

When power on, use the yellow wire to touch the black wire (0V) for a short time (more than100ms) to set the current position to the minimum analog value;

### Set the maximum value:

When power on, use the orange wire to touch the black wire (0V) for a short time (more than100ms) to set the current position to the maximum analog value;

### Set the midpoint value:

When power on, use the yellow wire and the orange wire for to touch the black wire (0V) a short time (more than100ms) to set the current position to the midpoint analog value;

### Restore the encoder to factory settings:

When the encoder is in power-off state, connect the yellow wire to the black wire (0V). Then power on and keep it on for 2 minutes (110~130 seconds) to reset the encoder.



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### Set the encoder's value direction

When the encoder is in a powered-off state, the orange wire contacts the black wire (0V). Then power on and keep it on for 2 minutes (110~130 seconds), the encoder can switch its direction of value.

## 4.How to calculate the displacement length

The displacement length=measuring range * (current -4)/16 (unit: mm)
E. g. If a single turn 4-20mA sensor with the measuring range of 500mm is used and the current is 12mA, then the displacement length=500* (12-4)/16=250mm

## 5.Precautions and warranty

● The displacement sensor of the pull rope is installed in a fixed position, and when the pull head is pulled out, it is strictly prohibited to let go and allow the pull rope to retract instantly.
● Movement needs to be kept unobstructed, and the cable should be pulled out vertically during installation.
● Non technical personnel are strictly prohibited from disassembling. If necessary, please disassemble and reassemble under the guidance of technical personnel;
● When installing the stainless steel ropes, attention should be paid to angle control. If necessary, pulleys can be added appropriately to change direction to ensure measurement accuracy and the service life of the steel rope, and to avoid friction between the wire and the outlet.
● Please confirm the power is turned off when wiring, and be aware that incorrect wiring may cause the encoder main board to burn out.
● The product is guaranteed for one year free of charge when used correctly.
● When exceed the warranty period, or the product is damaged due to improper use, the product can be sent back to the original factory for repair (only raw material cost is required when repair).

## 6.Encoder Indicator Lights Description

1. The status light displays are as follows:
1) Default indication status: "Blue -> Blue -> Blue -> Cyan -> Blue" 1s slow flash, indicating normal power supply to the encoder;

2) Other work status indications:
a. Setting minimum value status: Orange light flashes quickly at 0.5s intervals;
b. Setting maximum value status: Purple light flashes quickly at 0.5s intervals;
c. Setting midpoint value status: Orange light flashes quickly at 0.5s intervals;
d. Power-on reset status: Orange light flashes quickly at 0.5s intervals;
e. Setting direction status: Purple light flashes quickly at 0.5s intervals;

## 7.Contact us and technology support

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### Technical documentation

Detailed version of the instruction manual;
PC software;
2D drawings and 3D model files;
Additional Video Tutorials;

For more details, please visit our website:
**www.briterencoder.com.**

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