Briterencoder Absolute Rotary Encoder

SSI Interface Communication Protocol

1. Wiring Definition and connection

Red wire	Power Supply	DC 5V~24V
Black wire	0V (GND)	-
Green wire	CLOCK+	-
White wire	DATA+	-
Grey wire	DATA-	-
Yellow wire	Function line	1. It serves for encoder zero position setting. 2. During normal encoder operation, keep the yellow wire suspended and disconnected.
Orange wire	Function line	1. 1.It serves for encoder setting direction and midpoint. 2. During normal encoder operation, keep the yellow wire suspended and disconnected.

Three simple ways to set absolute encoder to zero position?

- ✧ Method 1. Connect yellow wire to ground (black wire) more than 100mS. After set zero, please separate the yellow and black wire.
- ✧ Method 2. After right connected the wires according to the wiring definition. send set zero position command according to the user manual.
- ✧ Method 3. Use the upper computer provided by our company (BriterEncoder).

How to set directions of encoder rotation?

- ✧ Step 1: After power off, connect the orange wire to the black wire.
- ✧ Step 2: Power on and hold for two minutes.
- ✧ Step 3: Power off, then separate the orange wire from the black wire. The rotary encoder has now switched direction.

How to set midpoint of encoder?

Setting the absolute encoder to the midpoint position. Connect the orange wire to ground (black wire) for more than 100 milliseconds. After setting, please separate the orange and black wires.

2. SSI communication protocol

SSI communication protocol, abbreviated as Synchronous Serial Interface, uses RS422 as the physical interface and is divided into two parts: clock pulse and data. The receiving device sends a series of clock pulses to the encoder, and the encoder outputs encoder values bit by bit based on the number of clock pulse bits, including angle position, calibration signal, or encoder working status, upon receiving synchronization of the clock pulses. SSI is a widely used position sensor.

The SSI interface encoder only requires two signals: clock and data, which are independent of the encoder's accuracy. The data reading speed of the encoder depends on the clock frequency given by the host, and the encoder emits real-time data based on the clock pulses given by the host. In order to enhance anti-interference ability and long-distance transmission, the SSI interface adopts RS422 level, a pair of differential clock signals, and a pair of differential data signals.

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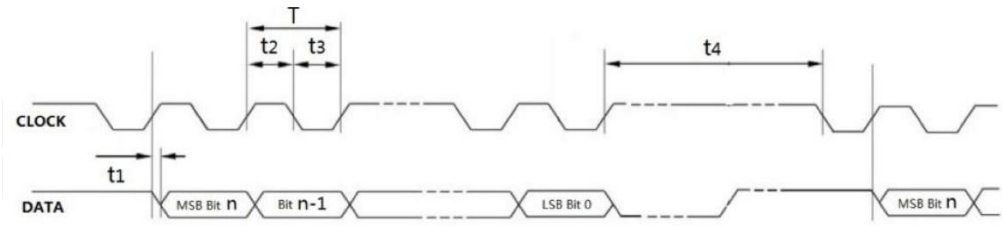
Suitable for motion controllers, PLCs with SSI interfaces, or for simulating SSI host acquisition through a microcontroller.



As shown in the above figure, the absolute position value of the encoder is emitted by the host's clock signal, starting from the binary high bit (MSB) and outputting a serial signal synchronized with the clock signal. The clock is emitted from the host device and outputs N pulses in the total number of bits of the encoder. When the signal is not transmitted, both the clock and data bits are high. At the first falling edge of the clock signal, the current value begins to be stored. From the rising edge of the clock signal, the data signal begins to be transmitted, and one clock pulse synchronizes one bit of data.

T=500ns ~ 10us;

t2=t3=1/2T;

t1 < 1us;

t4 > 20us。

3. Precautions and warranty

● Encoders belong to precision instruments. Please handle them with care and use them with care, especially do not knock, hit, or forcefully pull the encoder shaft.
● The encoder and mechanical connection should use flexible connectors or elastic brackets to avoid hard damage caused by non concentric rigid connections.
● Although the encoder itself does not lose the number of turns in interference environments, it can cause interference to the data during transmission. Therefore, when there is a motor or strong electromagnetic interference environment in the system, an isolated power supply should be used to power the encoder. And when there's external extended communication lines, it is best to use double shielded cables.
● The encoder casing and shielding wire should be well grounded to prevent damage to the encoder circuit caused by lightning strikes or high-voltage static electricity
● 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).

4. 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.**