

Briterencoder Absolute Rotary Encoder

BISS 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	<ol style="list-style-type: none"> 1. It serves for encoder zero position setting. 2. During normal encoder operation, keep the yellow wire suspended and disconnected.
Orange wire	Function line	<ol style="list-style-type: none"> 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?

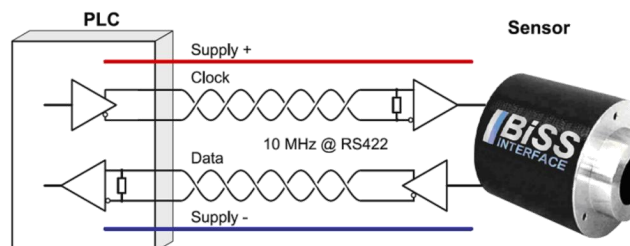
- ✦ Step 1: After power off, connect the orange wire to the black wire.
- ✦ Step 2: Power on and hold for two minutes.
- ✦ Step 3: Power off, then separate the orange wire from the black wire. The rotary encoder has now switched direction.

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.

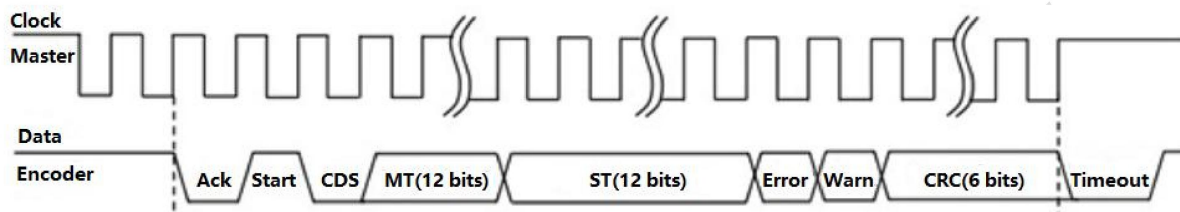
2. BISS-C communication protocol

BISS communication protocol is a full duplex synchronous serial bus communication protocol designed specifically to meet real-time, bidirectional, and high-speed sensor communication, and is compatible with industry standard SSI bus protocol in hardware. Its typical application is to achieve communication between servo drivers and encoders in the field of motion control. The current version of the BISS communication protocol is BISS-C. The BISS protocol can generally be decoded through hardware or software. Hardware decoding requires the main station to have a decoding chip of the BISS protocol, and software decoding can read data through the processor IO port to simulate the clock (providing stm32 reading routines).



BISS Networking diagram

The BISS communication frame is as follows: the controller sends out a drive signal, the encoder sends out a data signal, and completing one BISS communication frame indicates that the controller has received one frame of data.



Timing Description

Byte	Identification name	Description	Default value	Data length
N+10	Ack	Encoder preparation data	0	1bit
N+9	Start	Ready to start sending data	1	1bit
N+8	CDS	1 bit low level after Start	0	1bit
N+7	AP	Data, high bit before low bit after	/	M+N bit
7	Error	error	1	1bit
6	Warn	warning	1	1bit
0~5	CRC	CRC verification data	/	6bit
	Timeout	Data remains at a low level and ends this communication after being pulled up	/	20us

On the first rising edge of the Clock, the encoder is in a latched state, and on the second rising edge, the encoder pulls the Data down to respond to the Master's communication (Ack). Subsequently, the Data is pulled up, indicating that the encoder data is ready (Start). After Start, the encoder will send a 1-bit CDS signal ('0'). The subsequent number of turns and single turn values are sequentially issued (with the high bit in front), and the encoder data is followed by 1 bit error bit, 1 bit warning bit, and 6 bits check bit. After the data transmission is completed, the data remains at a low level of less than 10us, which is called a timeout period. This signal is maintained until the Data is pulled up, indicating that the current frame communication has ended and the next frame communication can begin.

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.