Absolute Encoder CAX60---R4B User Manual

- A "magnetic detection mode", with excellent impact and vibration resistance.
- Programmable, intelligent absolute encoder; professional setting software, convenient for user operation.
- Wide operating voltage, low current consumption.
- Clamping flange, servo flange or blind hollow shaft, the international standard structure.
- External resetting line to reset the default location, easy installation, no need to find ZERO.

★Please totally read the following instruction first for proper use of encoder.

Parameter

Operating Voltage	10-30Vdc or 5V optional, polarity protection
Current Consumption	< 110mA (24V power supply) no load
Output Signal	RS485, you can set the length, angle, speed application output
Output load capacity	≤ 400 ohms, the standard 200-250 Ohm work
Resolution	1-4096
Resolution	4096（Clock-type gear structure）64，256turns optional
Operating Temperature	-40—80℃ Programming temperature range：0℃～＋70℃
Storage Temperature	-40—80℃
Protection class	IP67 for housing IP65 for shaft
Vibration & shock	20g，10～2000Hz；100g，6ms
Permissible Rotation Rate	2400rpm
Output refresh cycle	<1.4ms
Connection Cable	1m 8-core shielded cable.
Overall Feature	Clamping flange or synchronous flange, metal enclosure, sealed dual-bearing structure (see attached drawing of overall dimension)
Shaft	Clamping flange , stainless steel, synchro flange, blind hollow shaft etc.
Signal Conditioning	direction can be set; preset position, external set, such as external zero

Connection

signal	Vcc	GND	RS485 A	RS485 B	Reset	Permit
Color	Brown	white	Green	Yellow	Gray	Blue

Note: 1. How to use Programming-permit-line (Blue)

When setting the mode: the blue wire of the encoder and the brown wire are connected to the positive power+ together. At this time, the communication rate of the encoder is fixed at 19200bps.

Non-setting mode: In normal operation, it is recommended to connect the blue wire and the white wire together to the power ground.

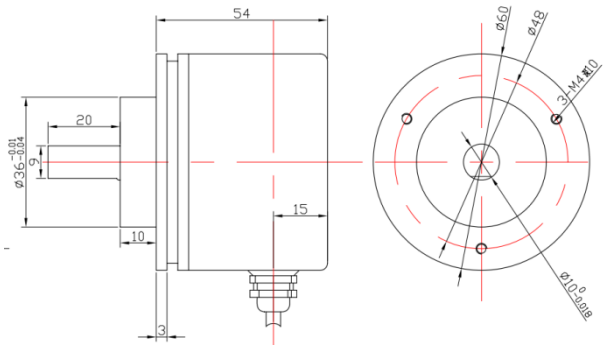
2. How to use reset line (gray)

When the reset line (gray) connected to power+ for more than 1 second, the current data of the encoder becomes the reset value (the reset value of the encoder can be set arbitrarily)

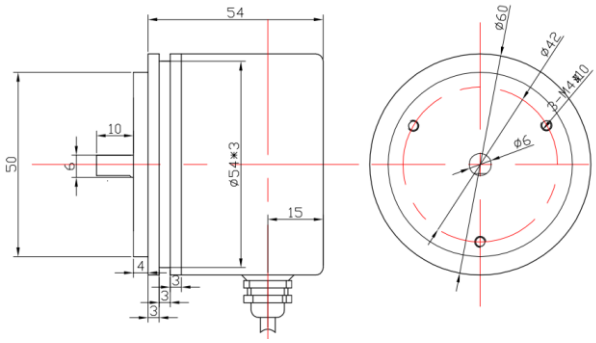
The encoder can also be reset by using the instruction (for specific instructions, refer instance 2)

Installation dimensions (Unit: mm)

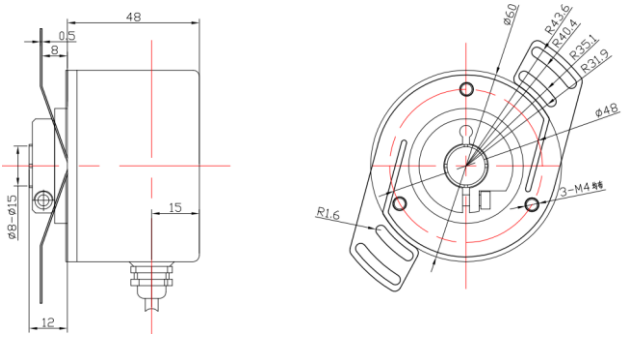
a. Clamping & synchro flange(default)



b. Synchro flange



C. Blind hollow shaft



Custom RS485 communication protocol description:

Baud Rate: 4800bps 9600bps 19200bps 38400bps 115200bps.

Frame format: 8 data bits, 1 stop bit, no parity, no flow control.

The parameter of encoders is set by software instruction.

When the encoder is in active mode, that is the encoder automatically sends data to the host. Data length is 16 hexadecimal ASCII code format is: XAB> ± DATA ↙, as follow:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
X	address		>	±	DATA										↙

Wherein, "X" is the leading letters,">" is delimiters, "±" is the sign bit; "DATA" is the data, ASCII format, 10, from 0 to 9 constitute the range of -9,999,999,999 ~ +9,999,999,999. "↙" is carriage return (0D).

When the encoder is in passive mode, it is the question and answer mode. The host computer sends an inquiry command to the encoder. The command is a 4-digit hexadecimal ASCII code in the format: D + AB ↙.

AB is the encoder address, the range is 0 to 99

Instance:

1: Read data:

Host send: D + address + 0D

Encoder reply: X + address +> + match bit + data bit + 0D

Example:

Host send: 44 30 31 0D (when the encoder address is 01)

Encoder back: 58 30 31 3E 2B 30 30 30 30 30 30 30 31 32 33 0D

2: Encoder reset command:

Host send: D + address + L + M + sum check + 0D

Encoder reply: X + address + l + m + sum check + 0D

Example:

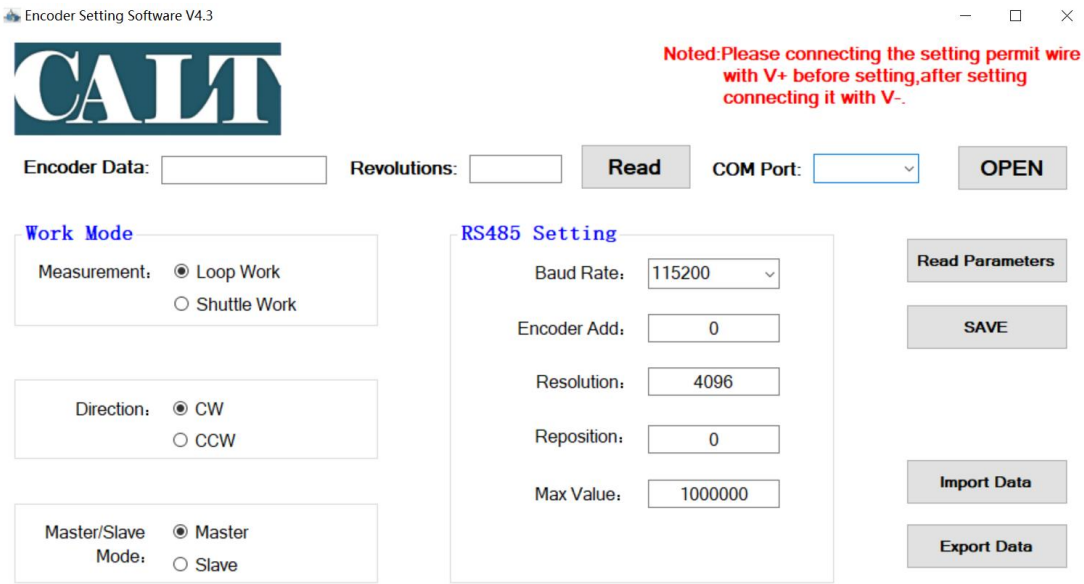
Host send: 44 30 31 4C 4D sum check 0D (when the encoder address is 01)

Encoder reply: 58 30 31 6C 4D sum check 0D (reset current position)

Note:

Sum check: The sum of all the previous data, take the lower two digits as the check value

For encoder parameter setting, please use our company's special CALT software.



Operate instructions:

1. Work mode

Loop work: After the data exceeds the maximum measurement value, the data returns to 0. Conversely, it is the same if it exceeds 0.

Shuttle work: That is, the data remains unchanged after the data exceeds the maximum measured

value. Conversely, it is the same if it exceeds 0.

2. Data direction

Clockwise: Encoder data increases when the encoder rotates clockwise facing the encoder shaft.

Counterclockwise: Encoder data increases when the encoder rotates counterclockwise facing the encoder shaft.

3. Master/slave mode:

Master mode is broadcast

Slave mode is question and answer mode

4. Baud rate:

Setting range: 4800 ---- 115200

5. Resolution: The data output by the encoder in one revolution

1--4096 can be set

6. Encoder address:

Setting range: 0--99

7. Reset value:

a. When the reset line (gray) connected to power+ for more than 1 second, the current value of the encoder becomes the reset value.

b. When sending a reset command to the encoder, the current value of the encoder becomes the reset value. (Instance 2)

8. Max. Value:

The maximum measured value range is resolution * number of turns (the specific value depends on the actual situation)

Read parameters: That is to read the original parameters of the encoder

Save: Write the currently modified parameters to the encoder.

Export parameters: Store the parameter that has just been set to the place specified by the computer. In order to import the storage parameters directly in the future.

Import parameters: Import the previously exported parameters into the software and use them.

RS485 communication considerations:

1. Communication speed and transmission distance is a contradiction. The higher the rate, the transmission distance is shorter, but more stable, and vice versa.

2. External reset line (gray wire) used to reset the encoder current position to presetting value. When using, the gray wire should connected to high level (24V). But after the completion of the operation, It's better to connect gray wire to power ground to avoid interference.

3. In the strong external electromagnetic interference, RS485 connection is best to use double-shielded cable.

4. When multiple encoders connect host, because of the encoder have no parity, it is suggested that when the PC programming in time to distinguish between the various encoder data returned.

5. When the system has a motor, encoder power supply should be isolated from other.

Since RS485 circuit is a differential form, A, B are two signal lines with voltage, often times connect to ground or high level, RS485 circuit will cause damage

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