

Absolute Encoder CAX60---RMB User Manual

- ✧ Internal absolute code disk. Digital valued. Signal is resistant from temperature and mechanical movement. No zero drift.
- ✧ Modbus RTU output.
- ✧ Each lap 12 high resolution encoder, 4096 times in a row, working range.
- ✧ Direction setting External setting line can preset the position. Convenient installation and no need positioning.
- ✧ Wide working voltage ,low power consumption.
- ✧ Clamping flange or synchronous flange.

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

Parameter

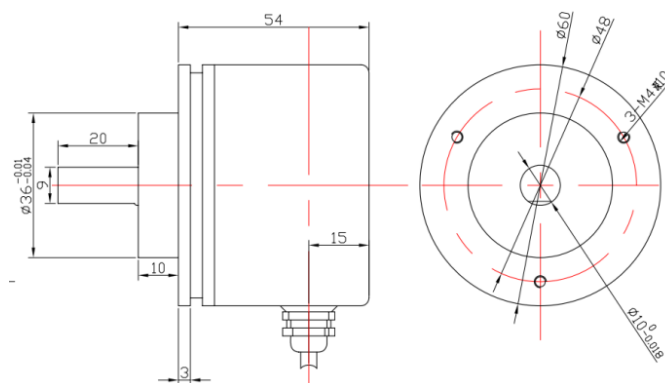
Operating Voltage	10-30Vdc or 5V polarity protection
Current Consumption	< 40mA (24V power supply) no load
Output Signal	Modbus RTU output Conform to the standard of GB/Z19582 Settable for length/ angle /velocity measurement
Linearity Resolution	1/4096
Laps	1~4096 laps
Repeatability Precision	Repeatability $\pm 2\text{BIT}$ (Actual precision related with installation and shaft concentricity.)
Signal adjustment	Resolution or direction settable, external setting line preset functiion.
Operating Temperature	-25—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
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)

Connection

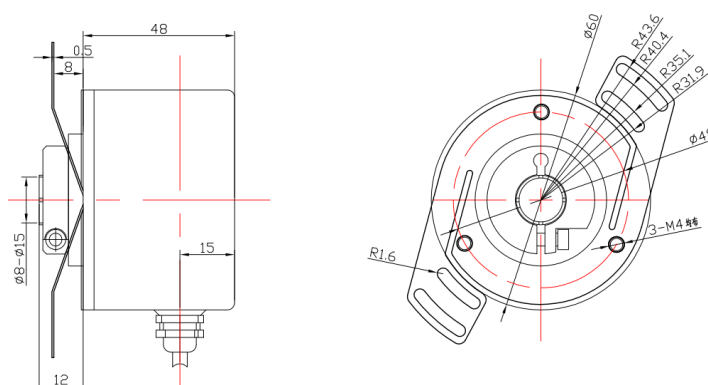
Cable Output	
Cable Color	Signal Output
Brown	10—30Vdc Operating Voltage
White	0V GND
Green	RS485 Output A
Yellow	RS485 Output B
Blue	Programming permitted line

Installation dimensions (Unit: mm)

a. Clamping & sychro



C. Blind hollow shaft



The Modbus communication protocol description:

Modbus protocol is based on the hardware interface RS485 communication protocol, it can realize networked control point to multipoint. The specific content of the agreement may refer to GB/Z 19582, protocol is divided into RTU and ASCII protocol. The company provided the product is follow the RTU based on Modbus protocol, allows the datas to exchange between the slaves and a master. Communication methods using questions and answers type (that is, the master command, at the request of the analysis is in accordance with the communication agreement, after receiving the slave, if it do reply).

Baud rate: 4800bps 9600bps (default) 19200bps 38400bps 115200bps....

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

i. The communication agreement between master-slave machine:

The master send each frame of data should contain the following information (hexadecimal)

The address of the slave / Command word/ Information words/Check code

Slave address (1 byte) :the Slave's number of equipment. From the address of the slave, the master identify communication equipment. That set by the user address, slave will receive information sent by the master. In a Modbus network ,each of the slave must have a unique address code, and can only respond to meet address code from the slave.

Command word (1 byte) : The master sends the function of code,than it inform the slave of the tasks.

Information word (N bytes) : Including different addresses of the data, the length of the data ,and the data's information between the communications of the machines.

Check code (2 bytes) :Because used to detect data communication is error, using cyclic redundancy CRC16 check.

ii . Communication parameter setting:

Communication Address: In a communications network ,the address of the slave, can be set to 1 ~ 247. (the default value is 1)

Communications speed: In a communications network ,the network communication speed can be choosed communication baud rate to 9600, 19200, 38400, 19200, 38400. (default is 19200)

Data format: Set data format in a communications network: a start bit, 8 data bits, 1 stop bit, a parity bit.

Communication protocol: The ModBus RTU communication protocol.

iii. Message format

Command word 03H: reads the parameter value

The requests of the master: address/ command word/ the address of the parameter/ the length of the data/ check code

The responses of the slave: address/ command word/the length of the byte /the parameter value/ check code

Command word 04H: read the measured values

The requests of the master: address/ command word/ the address of the data/ the length of the data/ check code

The responses of the slave: address/ command word/the length of the byte /the data information/ check code

Command word 08H: diagnosis

The requests of the master: address/ command word/ subfunction/ the data information / check code

The responses of the slave: address/ command word/ subfunction /the data information/ check code

Command word 10H: modify the parameter values

The requests of the master: address/ command word/the address of the paramete / the length of the data/ the length of the byte/ the parameter value / check code

The responses of the slave: address/ command word/ the address of the paramete / the length of the data / check code

Instance

Read the measurement data commands :

Host sends 01 04 00 01 00 02 20 0B

Note: 01 is encoder address , 04H is command word , 00H 01H is the data address , 00H 02H is data length , 20H 0BH is check code.

Slave back : 01H 04H 04H 00H 00H 01H 00H FAH 14H

Note: 01 is encoder address , 04H is the command word , 04H is the data length , 00H 00H 01H 00H is the data , FAH 14H is check code.

Read parameter command: Programming permitted line connected with Power+

Host sends 01 03 00 44 00 02 84 1E

Note: 01 is encoder address , 03H is command word , 00H 44H is the data address , 00H 02H of is data length , 84H 1EH is check code.

Slave back : 01H 03H 04H 00H 00H 00H 00H FBH 84H

Note: 01 is encoder address , 03H is the command word , 04H is the data length , 00H 00H 00H 00H is

the data , FBH 84H is check code.

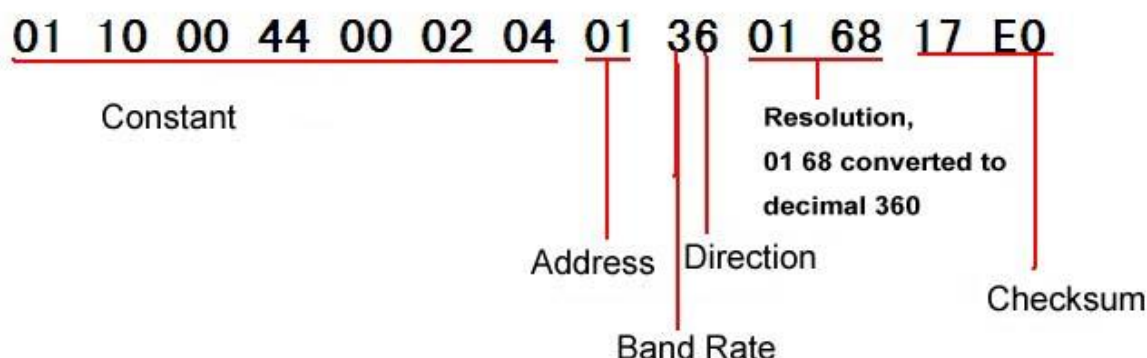
Modify parameters command: Programming permitted line connected to Power+

Host sends 01 10 00 44 00 02 04 00 00 00 00 F6 6C

Note: 01 is an encoder address, 10H is the command word, 00H 44H is the data address, 00H 02H is the data length, 04H is the byte length, 00H 00H 00H 00H parameter value (the first 00H is address bit, the high bit of the second 00H is baud rate, low is the direction, and the third and fourth 00H 00H is the resolution), F6H 6CH is check code.

Slave back : 01H 10H 00H 04H 00H 02H 01H DDH

Note: 01 is an encoder address , 10H is the command word , 00H 04H is the data address , 00H 02H is the data length , 01H DDH is check code.



Parameter table

Hex code	parameter	Hex code	parameter
01	4800bps baud rate	05	115200bps baud rate
02	9600bps baud rate	06	Clockwise data increase
03	19200bps baud rate	07	Counterclockwise data increase
04	38400bps baud rate		

Precaution:

- Encoder belongs to precision device, do not pound or knock the encoder, Light handling, using carefully.
- Ensure the power supply of encoder operate in the rated scope. Insulation must be ensured to avoid the impact to encoder due to the large electric activation in electric network. ;
- With the strong electromagnetic interference, extended signal line should be special line recommended, such as shielded twisted pair cables.
- Ensure good grounding of encoder signal line. When close distance within 2m, grounding for the two ends of shield net inside the cable; while lone distance, grounding for the metal housing of encoder. Encoder built-in shielded cable network suspends, single grounding for extended signal shielded cable network at the receiver termination of signal. If the signal cable is too long or being used outdoors, the iron pipe should be covered on the signal cable, and the two ends of metal pipe should grounding.
- Protection class of encoder is IP65, with water-proof. But do not souse the shaft of encoder.;
- Special flexible coupling should be selected for connection between encoder and machinery, and F6022 is recommended.