

# Length-angle sensors

## LWG720



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### User manuals

Versions: Av2

Document No.0000288201

# User Manual

## Length angle sensors

### Catalog

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## **Release**

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# Signature (system test experiment)/date

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# Signature (Project Manager)/ Date

### Historical Records

| Version | Date       | Release | Author | Changes                                  |
|---------|------------|---------|--------|------------------------------------------|
| Av1     | 2022/10/16 | N       | ChenMo | First Edition                            |
| Av2     | 2022/10/17 | N       | ChenMo | Adding product dimensional drawings      |
| Av3     | 2022/10/26 | Y       | ChenMo | Revision of product dimensional drawings |
| Bv1     | 2022/12/9  | N       | ChenMo | Revise                                   |
| Bv2     | 2022/12/9  | Y       | ChenMo | Add product installation instructions    |
| Cv1     | 2023/5/17  | N       | ChenMo | Revise                                   |
| Cv2     | 2023/5/17  | Y       | ChenMo | Modify object dictionary protocol        |

# 1. Security instructions

## 1.1. Copyright

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## 1.2. Preface

This manual has been verified and reviewed for accuracy. The instructions and descriptions contained in this manual are accurate for the LWG720 Series Length Angle Sensor at the time of publication. However, future issues of the LWG720 Series Length Angle Sensor and its manuals are subject to change without notice. Xuzhou Mook Electro-Hydraulic Co., Ltd. assumes no responsibility for damages arising directly or indirectly from errors, omissions or discrepancies between the product and the manual.

## 1.3. Marking of notices

| Icon                                                                                | Meaning     | Detailed instructions                                                             |
|-------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------|
|  | DANGEROUS   | It can be predicted to cause unavoidable serious injury, death or property damage |
|  | WARNING     | May result in unavoidable serious injury, death or property damage                |
|  | NOTE        | This may result in minor injuries and losses                                      |
|  | INSTRUCTION | Non-safety-related usage guidance and information                                 |
|  | ANNOTATION  | Additional instructions or usage recommendations                                  |

# 2. Products

## 2.1. Product Description

LWG720 series length angle sensor consists of length detection unit and angle detection unit, which can realize length and angle measurement, while the length angle sensor has built-in multiplex slip ring for signal transmission through high strength length measurement cable.

The length angle sensor is suitable for length measurement of telescopic mechanism and angle measurement of luffing mechanism, such as telescopic boom crane, telescopic truck-mounted crane, telescopic aerial work truck, aerial fire truck and other construction machinery with telescopic luffing mechanism.

## 2.2. Technical parameters

| Technical parameters                |                                                                                                                                                                                                                                                                      |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating temperature               | -40°C~+85°C                                                                                                                                                                                                                                                          |
| Storage temperature                 | -40°C~+85°C                                                                                                                                                                                                                                                          |
| Protection grade                    | IP66                                                                                                                                                                                                                                                                 |
| Working voltage                     | 9~36V DC                                                                                                                                                                                                                                                             |
| Effective measuring length range    | 0~15m                                                                                                                                                                                                                                                                |
| Length measurement accuracy         | 0.5%FS                                                                                                                                                                                                                                                               |
| Effective angle measuring range     | CAN type: 0°~360°<br>Current type: -22.5°~112.5°                                                                                                                                                                                                                     |
| Angle measuring accuracy            | ±0.3°                                                                                                                                                                                                                                                                |
| Output signal                       | 4~20mA/CANopen                                                                                                                                                                                                                                                       |
| Maximum stretching speed            | 1m/s                                                                                                                                                                                                                                                                 |
| Testing Standards                   |                                                                                                                                                                                                                                                                      |
| Low temperature test                | <b>Execution standard: GB/T2423.01/IEC60068-2-1</b><br>-40°C low temperature start test, 10 times, start normal<br>-40°C low temperature working test 16h<br>-40°C Low temperature storage test 72h                                                                  |
| High temperature test               | <b>Execution standard: GB/T2423.02/IEC60068-2-2</b><br>+85°C high temperature full load working test 16h<br>+85°C high temperature storage test 72h                                                                                                                  |
| Temperature shock test              | <b>Execution standard: GB/T2423.22/IEC60068-2-14</b><br>Low temperature -40°C, high temperature 85°C, high and low temperature conversion time 3min, cycle times 10 times                                                                                            |
| Temperature and humidity cycle test | <b>Execution standard: GB/T2423.34/IEC60068-2-38</b><br>High temperature 65±2°C, 93±3%; room temperature 25±2°C, 93±3%; low temperature -10°C, 24h for one cycle, carry out ten cycles                                                                               |
| Vibration Test                      | <b>Execution standard: GB/T2423.10/IEC60068-2-6 Sine vibration</b><br>Vibration (sine) 30Hz, 4g, vertical 4h, horizontal direction left and right, front and rear 2h, total 8h                                                                                       |
| Shock Test                          | <b>Execution standard: GB/T2423.5/IEC60068-2-27</b><br>10g/6ms, half sine wave, three axial 100 times each axial                                                                                                                                                     |
| Drop Test                           | <b>Execution standard: GB/T2423.8/IEC60068-2-32</b><br>Transportation status with packaging, drop height 1000mm, 2 times                                                                                                                                             |
| Salt spray resistance test          | <b>Execution standard: GB/T2423.17/IEC60068-2-11</b><br>Under 35°C, 5% sodium chloride salt spray environment, 120h test without electricity, no corrosion of shell, connector and other parts after the test, and normal operation after accessing the test voltage |
| EMC                                 | <b>EN 61000-6-2:2005; EN 61000-6-4: 2011;</b><br>ISO7637 immunity; ISO11452 immunity; ISO16750 immunity                                                                                                                                                              |

### 2.3. Order Number

| No. | Material Description                      | Material No. |
|-----|-------------------------------------------|--------------|
| 1   | Length angle sensor, LWG720-015135-113-Na | 228957       |
| 2   | Length angle sensor, LWG720-015360-133-Na | 228979       |
| 3   | Length angle sensor, LWG720-015360-130-Na | 228981       |

## 2.4. Product Code Description

LWG 720 - 015 360 - 1 3 3 - Na

**Product Code**

**LWG: Length angle sensor**

**Series Code**

**720: 720 series**

## Measuring length range

**015: 0~15m**

## Measuring angle range

**135:  $-22.5^\circ \sim 112.5^\circ$**

**360:  $-0^\circ \sim 360^\circ$**

## Redundant Codes

### 1: Non-redundant

### Signal Type

1: 4~20mA

### 3: CANopen

### Length measuring line code

0: Wire rope

### 3: 3-core cable

### Other codes

**Na: No other flags**

## 3. Port Description

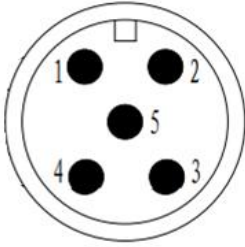
### 3.1. Electrical Interface

| No. | Connectors               | Function                                        |
|-----|--------------------------|-------------------------------------------------|
| 1   | M12 five-pole pin socket | Transmission of angle signals/CAN communication |
| 2   | Three prong plug, type A | Arm head signal transmission                    |

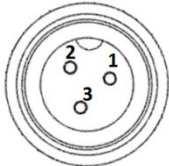
### 3.2. Pin Definition

#### 3.2.1. CAN type cable length measurement line sensor

➤ M12 five-pole pin socket:

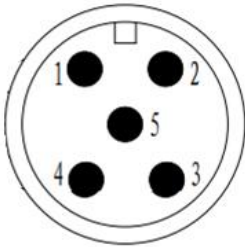
|  | Pin | Pin Definition |
|------------------------------------------------------------------------------------|-----|----------------|
|                                                                                    | 1   | Shield         |
|                                                                                    | 2   | Power          |
|                                                                                    | 3   | Ground         |
|                                                                                    | 4   | CAN_H          |
|                                                                                    | 5   | CAN_L          |

➤ Three-prong plug, type A:

|  | Pin | Pin Definition |
|-------------------------------------------------------------------------------------|-----|----------------|
|                                                                                     | 1   | A2B            |
|                                                                                     | 2   | Ground         |
|                                                                                     | 3   | -              |

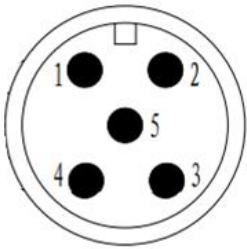
#### 3.2.2. CAN type wire rope length measuring line sensor

➤ M12 five-pole pin socket:

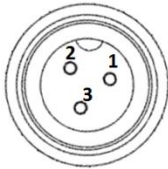
|  | Pin | Pin Definition |
|-------------------------------------------------------------------------------------|-----|----------------|
|                                                                                     | 1   | Shield         |
|                                                                                     | 2   | Power          |
|                                                                                     | 3   | Ground         |
|                                                                                     | 4   | CAN_H          |
|                                                                                     | 5   | CAN_L          |

### 3.2.3. Current type cable length measurement line sensor

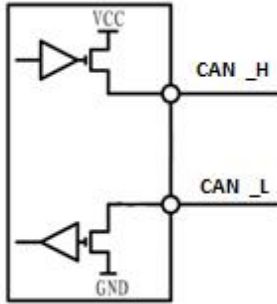
- M12 five-pole pin socket:

|  | Pin | Pin Definition |
|-----------------------------------------------------------------------------------|-----|----------------|
|                                                                                   | 1   | Power          |
|                                                                                   | 2   | Ground         |
|                                                                                   | 3   | Length         |
|                                                                                   | 4   | Angle          |
|                                                                                   | 5   | A2B            |

- Three-prong plug, type A:

|  | Pin | Pin Definition |
|-----------------------------------------------------------------------------------|-----|----------------|
|                                                                                   | 1   | A2B            |
|                                                                                   | 2   | Ground         |
|                                                                                   | 3   | -              |

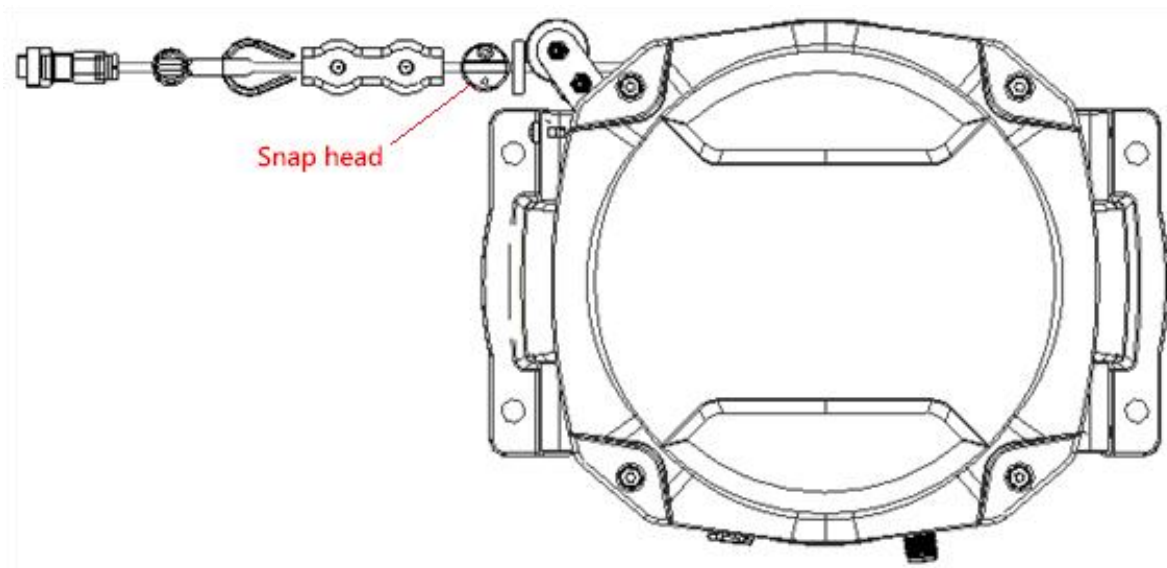
## 3.3. Communication Port

|                        |                                                                                      |
|------------------------|--------------------------------------------------------------------------------------|
| Schematic              |  |
| Baud Rate Range        | 10K bit/s ~ 1M bit/s                                                                 |
| Default Baud Rate      | 125K bit/s                                                                           |
| Communication Protocol | CAN2.0B                                                                              |
| Port Protection        | CAN_H and CAN_L have short-circuit protection for UB and GND respectively            |
| Termination resistance | Built-in 120Ω termination resistor                                                   |

## 4. Installation Instructions

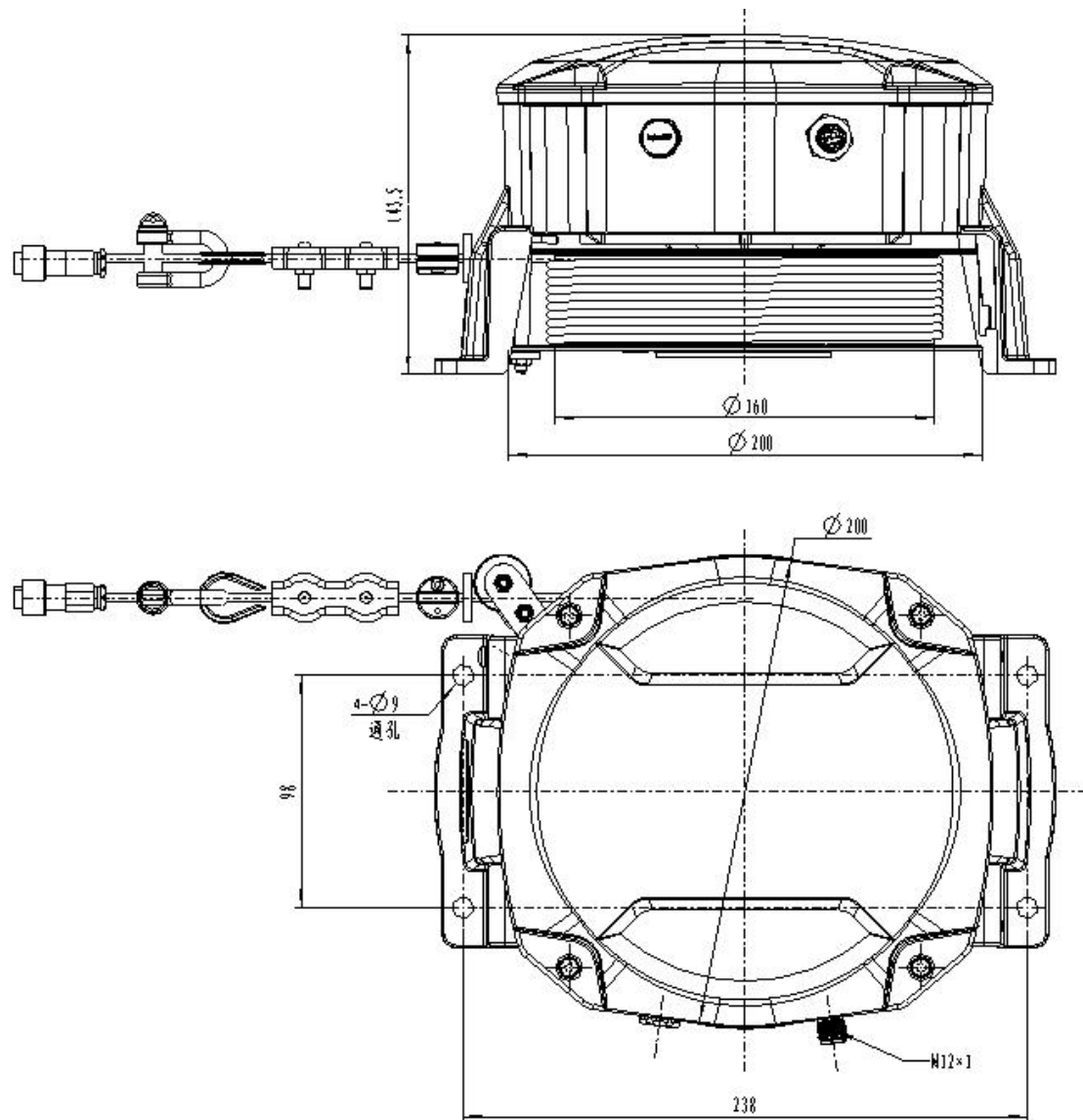
### 4.1. Pre-installation inspection

|  | Tips                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | LWG720 series length angle sensor is pre-tightened at the factory, and has been reserved for the installation of the length of the measurement line length, please check the power supply, wiring is complete correspondence, the product condition is intact, no bump before installation. As shown in the figure below: |



|  | Note                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     | <p>(1) If you find that the long-angle sensor comes with a loose wire wheel at the chuck before installation, please do not carry out installation operations, please contact our service personnel to solve;</p> <p>(2) Before installing the long-angle sensor, the crane telescopic boom (or other telescopic equipment) where the long-angle sensor needs to be installed should be in a fully retracted state.</p> |

## 4.2. Outline and installation dimensions drawing



## 4.3. Installation method

### 4.3.1. Sensor Installation

(1) Longhorn sensor mounting surface should be installed parallel to the vertical plane, and the vertical plane angle  $\alpha$  should meet  $-1^\circ \leq \alpha \leq +1^\circ$ , as shown in Figure 4.3-1.

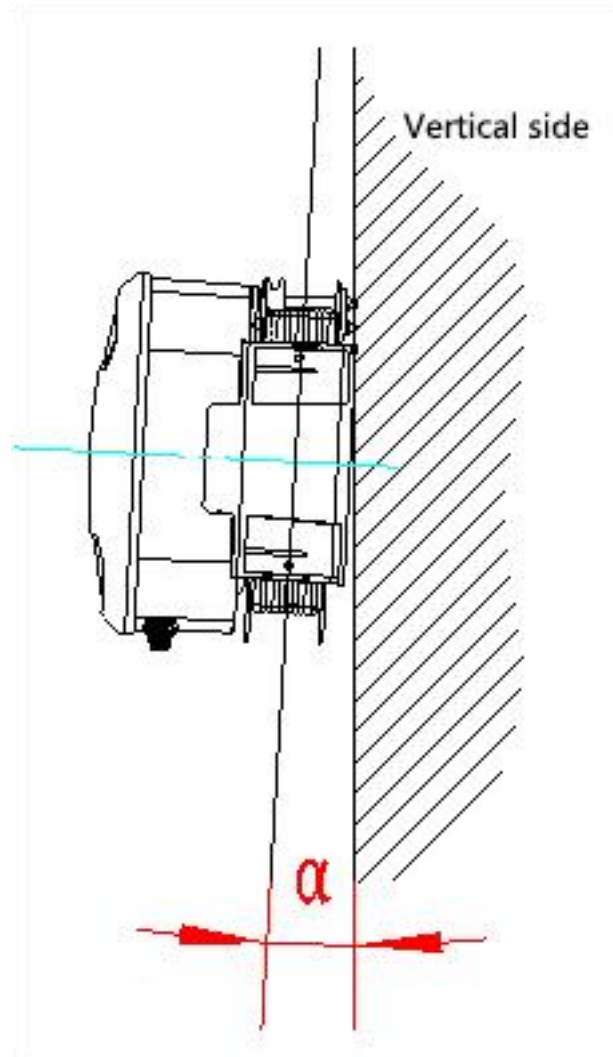


Figure 4.3-1

(2) When the centerline of the long angle sensor is placed parallel to the horizontal plane as shown in Figure 4.3-2, the angle output value of the long angle sensor is  $0^\circ$ . If the long-angle sensor is left-set type, the angle value increases when the long-angle sensor is rotated clockwise, and decreases when the long-angle sensor is rotated counterclockwise. If the long-angle sensor is right-set type, the angle value increases by rotating the long-angle sensor counterclockwise, and decreases by rotating the long-angle sensor clockwise. Customers should determine the initial position of the long angle sensor according to their own applications.

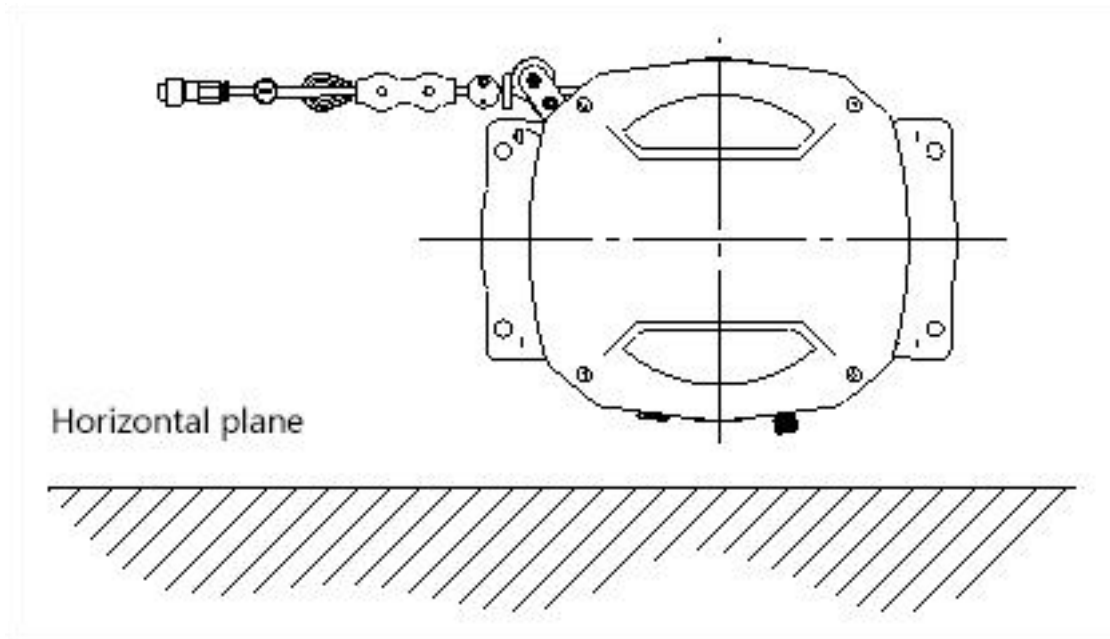


Figure 4.3-2

(3) The front end of the length sensor measuring line has been provided for fixing the measuring line front end fixing assembly, which consists of three parts: unloading buckle, chicken heart ring, and double-row chuck, as shown in Figure 4.3-3. The dimensions of the shackle used are shown in Figure 4.3-4.

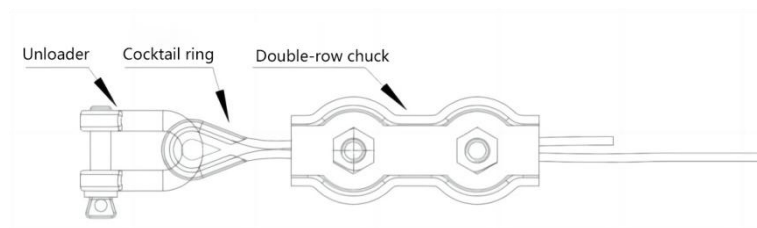


Figure 4.3-3

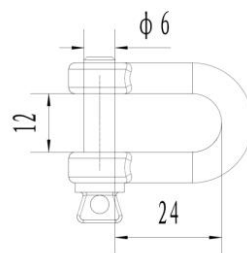


Figure 4.3-4

If it is necessary to reserve a mounting hole in the front position of the fixed measuring length line for the installation of the unloader, the distance between the mounting hole and the center of the arm, S, should be equal to the distance between the center of the reel of the long-angle sensor and the center of the big arm, M. If the above distance cannot be guaranteed to be equal due to the process and other reasons, several adjustment holes can be made in the mounting bracket to facilitate the assembly personnel to make

adjustments during the assembly process. As shown in Figure 4.3-5.

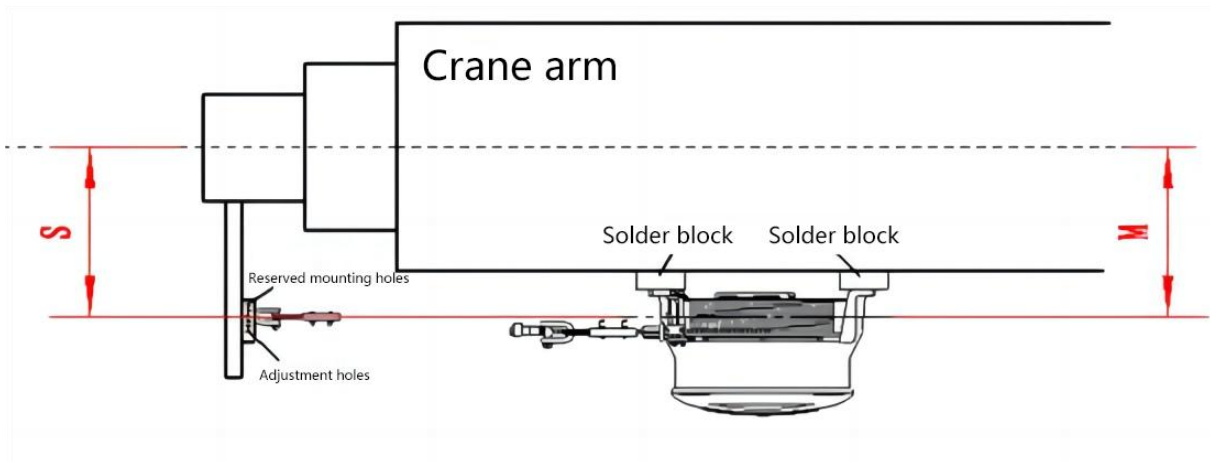


Figure 4.3-5

### Guide wheel installation

In order to ensure the normal operation of the long-angle sensor, a certain number of guide wheels need to be installed in the direction of measuring the length, the installation of the long-angle sensor and guide wheels should meet the following conditions:

In the basic arm along the long angle sensor measuring length direction should be installed a guide wheel, the guide wheel is called a guide wheel, the rest of the guide wheel at all levels in accordance with the long angle sensor distance from near to far called the second guide wheel, the third guide wheel ..... In the vertical direction and the center of the long angle sensor, the front fixed point of the measuring length line in the same line. As shown in Figure 4.3-6.

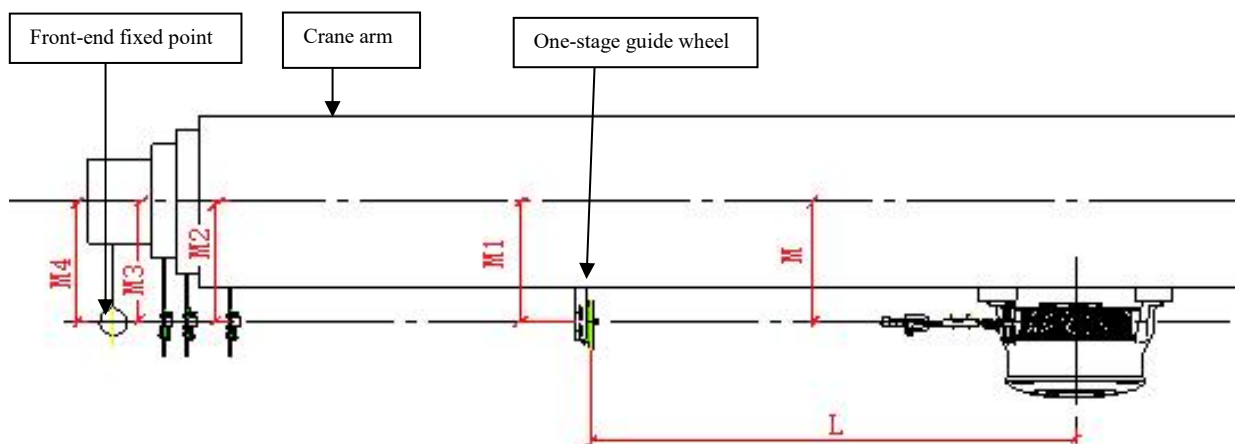


Figure 4.3-6

- The distance L between the center position of the primary guide wheel mounting hole in the horizontal direction and the center of the long angle sensor should meet the following table:

| One-stage Crimping Wheel | L allowable range                      | L recommended value |
|--------------------------|----------------------------------------|---------------------|
| Fixed type               | $1.1\text{m} \leq L \leq 1.50\text{m}$ | 1.3m                |

- Usually a guide wheel is installed on each section of the boom. The distance M between the center of the long angle sensor reel and the center line of the boom and the distance M1, M2, M3 and M4 between the center of the guide wheel and the center line of the boom at each level should be equal. As shown in Figure 4.3-11,  $M=M1=M2=M3=M4$ .
- The first-stage guide wheel is recommended to use the type of guide wheel shown in Figure 4.3-7.

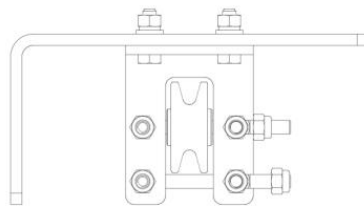


Figure 4.3-7

(2) A guide wheel plays the role of compressing the measuring length line, should make the center of the first level guide wheel is located above the center line of the sensor, that is, the first level guide wheel vertical size L2 should meet the following figure. Figure 4.3-8 is applicable to the upper line and Figure 4.3-9 is applicable to the lower line.

| One-stage guide wheel | Preferred range of L2   |
|-----------------------|-------------------------|
| Fixed type            | $L2 \geq 100\text{ mm}$ |

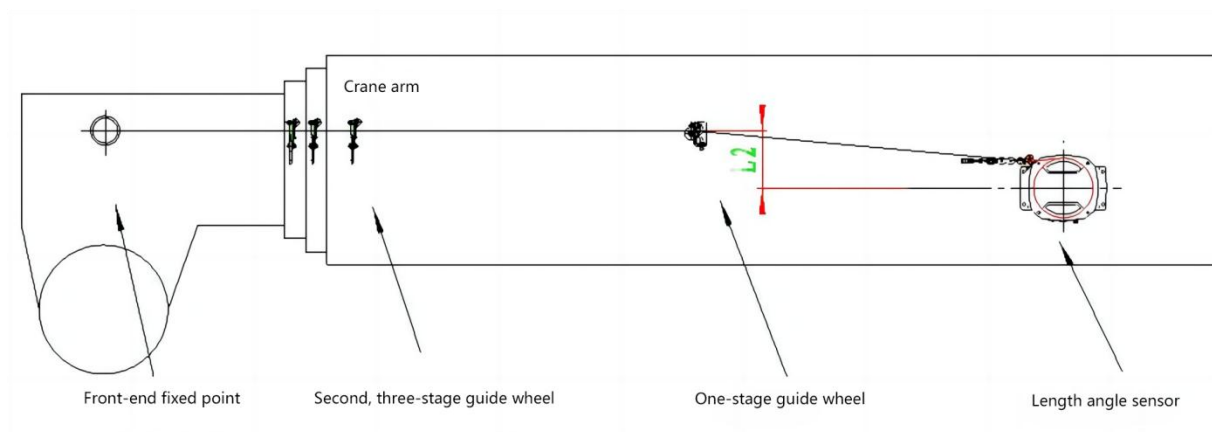


Figure 4.3-8

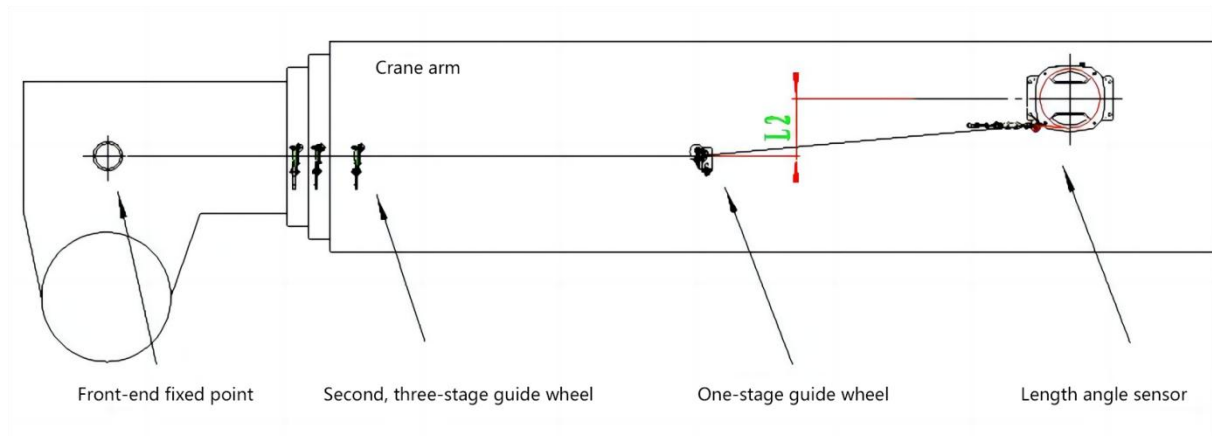


Figure 4.3-9

- After installation, the length measurement line should be tightened against the lower edge of the roller. The larger the L2 size, the better the tensioning effect, as shown in Figure 4.3-10:

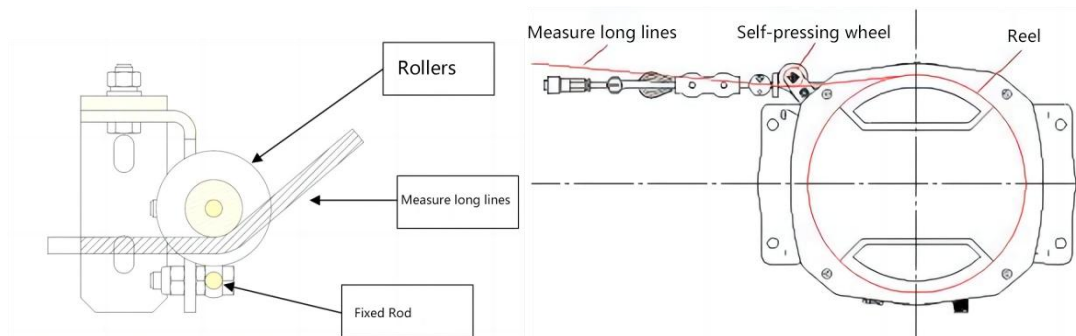


Figure 4.3-10

- In addition to the first level guide wheel, the other levels of guide wheel is recommended to use the frame type pressure wheel shown in Figure 4.3-11. In order to prevent the roller from pinching the line, the pressure wheel without chamfer on the roller should be used, and the big wheel is located above.

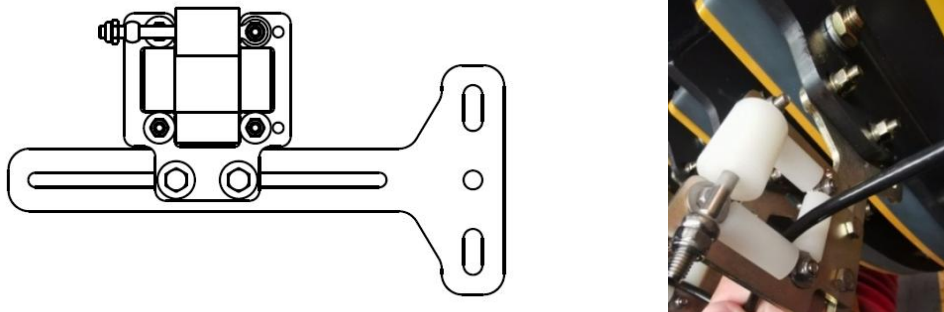


Figure 4.3-11

- (3) The mounting surface of each level guide wheel should be installed parallel to the vertical surface, and the angle  $\beta$  with the vertical surface should meet  $-1^\circ \leq \beta \leq +1^\circ$ , as shown in Figure 4.3-12.

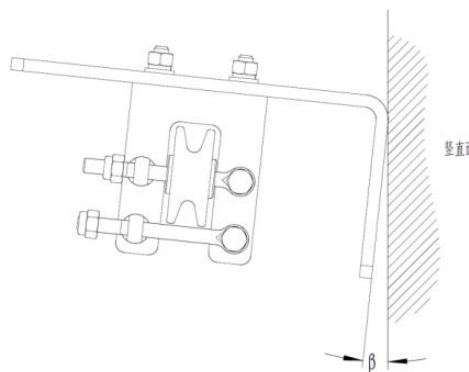


Figure 4.3-12

|                                                                                     | Note                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Here it should be noted that the long angle sensor and the guide wheel are usually fixed on the boom by means of bolted welding blocks, and the height difference of the welding blocks selected for the long angle sensor and the guide wheel should be considered in the above distance calculation. The recommended thickness of the welding block for the long-angle sensor is 30mm, and the recommended thickness of the welding block for the guide wheel at all levels is 15mm.</p> |

## 4.4. Cautions

- (1) It is strictly forbidden to remove the chuck until the long-angle sensor has been stably mounted in a fixed position, and if there is no interference with the chuck during the telescopic travel of the long-angle sensor, there is no need to remove the chuck;
- (2) The mounting surface of the guide wheel must be flat and must not be tilted;

(3) The end of the length measurement line and the fixed point should be fixed firmly, there should be no loose slippage phenomenon;

(4) The long-angle sensor and the guide wheel are forbidden to be painted and oiled, otherwise it will affect the normal work of the guide wheel and lead to the product not being used normally;

(5) Each guide wheel is aligned with the center of the reel.

## 5. Parameter configuration description

### 5.1. Configuration Method

The CAN device is configured on site through the CAN device. One end of the CAN device is connected to the M12 five-pin socket on the product through the CAN cable, and one end is connected to the configuration computer through USB, and the parameters are configured through the CAN device software on the computer.

### 5.2. Default Configuration

|                            |            |
|----------------------------|------------|
| Default Node Number        | 0x0F       |
| Default Baud Rate          | 125K bit/s |
| Default heartbeat period   | 600ms      |
| Default cyclic send period | 50ms       |

### 5.3. PDO message

#### 5.3.1. Heartbeat message

➤ The heartbeat message is sent periodically after the initialization is completed.

| COB-ID        | BYTE0     |
|---------------|-----------|
| 0x700+node_id | Heartbeat |

| Note                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Node states defined:<br/> 0: start-up;<br/> 5: normal mode;<br/> 7F: pre-run mode;<br/> After CAN initialization is completed, Node states = 5, and it automatically enters normal mode and starts sending PDO data.</p> |

#### 5.3.2. PDO1

| COB-ID        | BYTE0            | BYTE1             | BYTE2             | BYTE3              | BYTE4             | BYTE5 | BYTE6 | BYTE7 |
|---------------|------------------|-------------------|-------------------|--------------------|-------------------|-------|-------|-------|
| 0x180+node_id | Angle low 8 bits | Angle high 8 bits | Length low 8 bits | Length high 8 bits | Analog High Limit | 0x00  | 0x00  | 0x00  |

|                                                                                   | Note                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Resistance type A2B is highly limited state:<br/>           0x01 indicates a short circuit (resistance value less than 2K<math>\Omega</math>);<br/>           0x04 indicates a broken circuit (resistance value greater than 12K<math>\Omega</math>);<br/>           0xF2 indicates normal (resistance value greater than 2.5K<math>\Omega</math>, less than 11.5K<math>\Omega</math>);<br/>           Angular data range: 0~7200 (0°~360°);<br/>           Length data range: 1250~3800 (15m).</p> |

## 5.4. SDO Message

### 5.4.1. Object Dictionary

| Address Index | Sub-index | Command Description                           | Corresponding values                                                                                                                                               | Read or write  |
|---------------|-----------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1800          | 02        | TxPDO1 transmit mode                          | 0xFE-loop, 0xFD-request, 0xFF-loop+change, default is 0xFF, effective immediately                                                                                  | Read and write |
|               | 05        | TxPDO1 transmit cycle                         | 10~3000ms, default is 50ms, effective in time                                                                                                                      | Read and write |
| 1801          | 02        | TxPDO2 transmit mode                          | 0xFE-loop, 0xFD-request, 0xFF-loop+change, default is 0xFE, effective immediately                                                                                  | Read and write |
|               | 05        | TxPDO2 transmit cycle                         | 10~3000ms, default is 50ms, effective immediately                                                                                                                  | Read and write |
| 1017          | 00        | Heartbeat Cycle                               | 10~3000ms, default is 600ms, effective immediately                                                                                                                 | Read and write |
| 100C          | 00        | Heartbeat mode                                | 0-cycle, 1-request, default is 0                                                                                                                                   | Read and write |
| 1018          | 0A        | Angle left to right                           | Default is left, 0 - left, 1 - right When the message is 0xAA 0x55, the series sensor angle is right; other data, the sensor is left                               | Read and write |
|               | 0C        | Power-on self-start setting                   | Default is no self-start, 0 - no self-start, 1 - self-start Set to self-start when the message is 0xAA 0x55; other data will cancel self-start                     | Read and write |
| 2008          | 0B        | Angle filtering points                        | Angle filter parameter, is the new value of the proportion, the smaller, the deeper the filter                                                                     | Read and write |
|               | 0C        | Real-time angle filtering points              | Real-time effective, not saved, the default 10, angle filtering parameters, is the new value of the proportion, the smaller, indicating that the deeper the filter | Read and write |
| 2013          | 01        | Length left to right mark (active shaft/reel) | 0-counterclockwise (default), 1-clockwise (for the main axis, the magnet rotates in the opposite direction to the main axis)                                       | Read and write |
|               | 06        | Biss interface use                            | 0-Biss is not available, 1-Biss is available                                                                                                                       | Read and write |
| 200B          | 00        | Angle offset clear                            | Clear the angle output to 0                                                                                                                                        | Read and write |
| 2320          | 00        | Node number                                   | 1~7F, default is 0x0F                                                                                                                                              | Read and write |

|      |    |                      |                                                                                      |                |
|------|----|----------------------|--------------------------------------------------------------------------------------|----------------|
| 2321 | 00 | Baud rate            | 1-10<br>2-20<br>3-50<br>4-100<br>5-125(default)<br>6-250<br>7-500<br>8-800<br>9-1000 | Read and write |
| 2014 | 00 | Command Write Enable | All chip control commands, need to send command enable first                         | Write only     |
|      | 01 | MHM chip status      |                                                                                      | Read Only      |
|      | 02 | PVL chip status      | 00 address low byte, 02 address high byte                                            | Read Only      |
|      | 03 | MHM RESET            | Writing must be enabled before use                                                   | Write Only     |
|      | 04 | PVL RESET            | Enable write before use                                                              | Write only     |
|      | 05 | PVL REBOOT           | Enable write before use                                                              | Write only     |
|      | 06 | PVL SCLR             | Enable write before use                                                              | Write only     |
|      | 07 | MHM PRESET           | Enable write before use                                                              | Write only     |

(Continued from previous page)

| Address Index | Sub-index | Command Description                    | Corresponding values                                                                                  | Read or write  |
|---------------|-----------|----------------------------------------|-------------------------------------------------------------------------------------------------------|----------------|
| 2015          | 00        | Start the calibration process          | 01 - start calibration, 00 - no calibration                                                           | Write only     |
|               | 01        | Calibrate the specified length         | Calibration to specified length, can be calibrated directly to 0m (MHM PRESET is called in this case) | Write Only     |
| 2018          | 00        | Number of product information elements | The default value is 8                                                                                | Read Only      |
|               | 01        | Model number                           | Default value is 0                                                                                    | Read Only      |
|               | 02        | Serial number write enable             |                                                                                                       | Write only     |
|               | 03        | Software version                       |                                                                                                       | Read Only      |
|               | 04        | Hardware version                       |                                                                                                       | Read Only      |
|               | 05        | Manufacturer                           |                                                                                                       | Read Only      |
|               | 06        | Serial number 1 (1-4)                  |                                                                                                       | Read and Write |
|               | 07        | Serial number 2 (5-8)                  |                                                                                                       | Read-Write     |
|               | 08        | Serial number 3 (9-10)                 |                                                                                                       | Read-write     |

#### 5.4.2. Usage of Object Dictionary

(1) Modify the command:

| COB-ID        | BYTE 0 | BYTE1                          | BYTE2                         | BYTE3     | BYTE4                         | BYTE5 | BYTE6 | BYTE7 |
|---------------|--------|--------------------------------|-------------------------------|-----------|-------------------------------|-------|-------|-------|
| 0x600+node_id | 0x22   | Index address lower two digits | Index address high two digits | Sub-index | Enter the corresponding value |       |       |       |

A successful modification is indicated when the following command is received:

| COB-ID        | BYTE0 | BYTE1                                                   | BYTE2                                                  | BYTE3                  | BYTE4 | BYTE5 | BYTE6 | BYTE7 |
|---------------|-------|---------------------------------------------------------|--------------------------------------------------------|------------------------|-------|-------|-------|-------|
| 0x580+node_id | 0x60  | The same index address as above in the lower two digits | The same index address as above with two higher digits | Same subindex as above | 0x00  | 0x00  | 0x00  | 0x00  |

**Example: Node number modified to 0x18**

Send modification command:

| COB-ID        | BYTE0 | BYTE1 | BYTE2 | BYTE3 | BYTE4 | BYTE5 | BYTE6 | BYTE7 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0x600+node_id | 0x22  | 0x00  | 0x20  | 0x00  | 0x18  | 0x00  | 0x00  | 0x00  |

Node number 0x18 is successfully modified when the following command is received:

| COB-ID        | BYTE0 | BYTE1 | BYTE2 | BYTE3 | BYTE4 | BYTE5 | BYTE6 | BYTE7 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0x580+node_id | 0x60  | 0x00  | 0x20  | 0x00  | 0x00  | 0x00  | 0x00  | 0x00  |

Send the save command to save the modified node number to:

| COB-ID        | BYTE0 | BYTE1 | BYTE2 | BYTE3 | BYTE4 | BYTE5 | BYTE6 | BYTE7 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0x600+node_id | 0x22  | 0x10  | 0x10  | 0x01  | 0x73  | 0x61  | 0x76  | 0x65  |

(2) Read command:

| COB-ID        | BYTE0 | BYTE1                          | BYTE2                         | BYTE3     | BYTE4 | BYTE5 | BYTE6 | BYTE7 |
|---------------|-------|--------------------------------|-------------------------------|-----------|-------|-------|-------|-------|
| 0x600+node_id | 0x40  | Index address lower two digits | Index address high two digits | Sub-index | 0x00  | 0x00  | 0x00  | 0x00  |

Indicates a read result when the following command is received:

| COB-ID        | BYTE0 | BYTE1                                                   | BYTE2                                                  | BYTE3                  | BYTE4                                                                      | BYTE5 | BYTE6 | BYTE7 |
|---------------|-------|---------------------------------------------------------|--------------------------------------------------------|------------------------|----------------------------------------------------------------------------|-------|-------|-------|
| 0x580+node_id | 0x43  | The same index address as above in the lower two digits | The same index address as above with two higher digits | Same subindex as above | Corresponding value (look up the specific result in the object dictionary) |       |       |       |

|  | Note                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | <p>According to the data of BYTE0, the number of BYTE occupied by the corresponding value can be read. For example, when the data of BYTE0 is 0x43, the corresponding value occupies 4 BYTES (BYTE4, BYTE5, BYTE6, BYTE7). Their correspondence is as follows:</p> <p>4F: 1 个 BYTE (BYTE4)</p> <p>4B: 2 个 BYTE (BYTE4、BYTE5)</p> <p>47: 3 个 BYTE (BYTE4、BYTE5、BYTE6)</p> <p>43: 4 个 BYTE (BYTE4、BYTE5、BYTE6、BYTE7)</p> |

#### Example: Read node number

Send read command:

| COB-ID        | BYTE0 | BYTE1 | BYTE2 | BYTE3 | BYTE4 | BYTE5 | BYTE6 | BYTE7 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0x600+node_id | 0x40  | 0x00  | 0x20  | 0x00  | 0x00  | 0x00  | 0x00  | 0x00  |

The device node number is 0x18 and occupies a BYTE when the following command is received:

| COB-ID        | BYTE0 | BYTE1 | BYTE2 | BYTE3 | BYTE4 | BYTE5 | BYTE6 | BYTE7 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0x580+node_id | 0x4F  | 0x00  | 0x20  | 0x00  | 0x18  | 0x00  | 0x00  | 0x00  |

## 6. Common Troubleshooting

|  | Attention                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     | <p>Alteration or repair of the LWG720 series length angle sensor is not permitted and may result in dangerous failures. repair of the LWG720 series length angle sensor should only be performed by Xuzhou Weika or an authorized partner.</p> |

| No. | FAQ                                                              | Solutions                                                                                                                                        |
|-----|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Cable slack                                                      | Reel preload is not enough, you can preload the reel 1-2 turns again.                                                                            |
| 2   | No tension in the cable at all                                   | Broken coil spring, replace LWG720 series sensor.                                                                                                |
| 3   | Reel jammed                                                      | Broken coil spring, replace LWG720 series sensor.                                                                                                |
| 4   | Large swing when the reel is rotating, swing amount > 3mm        | Replace the LWG720 series sensor.                                                                                                                |
| 5   | No output from the port after power on                           | Check if the supply voltage is normal.                                                                                                           |
| 6   | No A2B or anemometer signal collected at the port after power on | Check if the signal voltage is normal and check if the software port configuration is correct.                                                   |
| 7   | Length angle signal lost                                         | Check whether the reel mechanism action is normal, power on and observe the data, not normal then contact the manufacturer for maintenance.      |
| 8   | CAN communication failure after power on                         | Check if the baud rate is correct, check if the external CAN line sequence is connected correctly, and check if the termination resistors match. |