

Industrial module communication protocol V2.0.7

The communication of the laser rangefinder is transmitted by data packets, and the specific format is as follows:

1. Data packet format: (8 data bits, 1 stop bit, no parity, default rate 9600)

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7						BC	BE

(The contents of bytes are all expressed in hexadecimal, the same below)

Beginning of packet 1: fixed as AE

Beginning of packet 2: fixed as A7

Data length: the length from data length to checksum (including checksum)

Address code: the address of the acquisition module, it is 00 when leaving the factory

Data field: According to the different content and length of the command word, it changes accordingly.

Checksum: the sum of data length, address code, command word and data field (carry is not considered).

Note: When the command word or data field changes, the calibration sum will change. When you change the data field, please change the checksum accordingly.

End of packet 1: fixed as BC

End of packet 2: fixed as BE

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2. Command format

2.1 Ranging control

2.1.1 Single ranging control

Send command: **AE A7 04 00 05 09 BC BE**

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (0byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	04	00	05		09	BC	BE

Reply to command on success:

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (19byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	17	00	85	MMSG*		BC	BE

* MMSG is the returned result after measurement, defined as follows:

Elevation (2byte)	Straight line distance (2byte)	Sine height (2byte)	Horizontal distance (2byte)	Two points high (2byte)	Azimuth (2byte)	Horizontal angle (2byte)	Span (2byte)	Speed (2byte)	Distance unit (1byte)	Elevation (2byte)
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The value of the measurement item occupies two bytes, and is transmitted in a signed short type with the high 8 bits in the front and the low 8 bits in the back.

Angle unit: 0.1 degree; Speed unit: 0.1KM/H;

Note: Industrial module equipment only supports four measurement items: elevation angle, straight line distance, sine height, and horizontal distance. The result of other items is 0 during normal measurement.

Response command when it fails: **AE A7 04 00 05 09 BC BE**

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2.1.2 Continuous ranging control

Send command: **AE A7 04 00 0E 12 BC BE**

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (0byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	04	00	0E		12	BC	BE

Respond after receiving the command: **AE A7 04 00 8E 92 BC BE**

Start continuous measurement and respond to the command when the measurement is successful:

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (19byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	17	00	85	MMSG*		BC	BE

* MMSG is the returned result after measurement, defined as follows:

Elevation (2byte)	Straight line distance (2byte)	Sine height (2byte)	Horizontal distance (2byte)	Two points high (2byte)	Azimuth (2byte)	Horizontal angle (2byte)	Span (2byte)	Speed (2byte)	Distance unit (1byte)	Elevation (2byte)
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The value of the measurement item occupies two bytes and is transmitted in a signed short type with the high 8 bits in the front and the low 8 bits in the back.

Angle unit: 0.1 degree; Speed unit: 0.1KM/H; Distance unit: When the distance unit byte is 01, it means 0.1M (meter), 02 means 0.1Y (yard), and 03 means 0.1F (feet).

Note: Industrial module equipment only supports four measurement items: elevation angle, straight line distance, sine height, and horizontal distance.

The results of other items are 0 when they are measured normally.

Response command when measurement fails: **AE A7 04 00 0E 12 BC BE**

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2.1.3 Stop continuous ranging control command: **AE A7 04 00 0F 13 BC BE**

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (0byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	04	00	0F		13	BC	BE

Respond after receiving the command: **AE A7 04 00 8F 93 BC BE**

2.2 Baud rate setting

Send command

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (1byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7		00	0A	BAUD*		BC	BE

* BAUD is the baud rate of the device: 00 means 2400, 01 means 4800, 02 means 9600 (default), 03 means 19200, 04 means 38400, 05 means 57600, 06 means 115200

Note: After the change, the baud rate of the module will not be changed immediately, and it will become effective after power-on again.

Reply command

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (0byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	04	00	8A		8E	BC	BE

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2.3 Device address code setting

Send command

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (1byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	05	00	0B	ADDR*		BC	BE

Reply command

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (0byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	04	ADDR*	8B			BC	BE

*ADDR is the address code to be set, the setting range is 01~EF.

Note: This product has a unified address: 00.

If you forget the address you set during the operation, you can use the 00 address to operate the product, and it can still respond normally.

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2.4 Red dot laser instruction command

Send command

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (1byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	05	00	40	MSG		BC	BE

Reply command

Beginning of packet 1 (1byte)	Beginning of packet 2 (1byte)	Data length (1byte)	Address code (1byte)	Command word (1byte)	Data field (0byte)	Checksum (1byte)	End of packet 1 (1byte)	End of packet 2 (1byte)
AE	A7	04	00	C0		C4	BC	BE

MSG contains 1 byte: Byte0: 0x01 turn on the red dot laser indicator; 0x00 turn off the red dot laser indicator

After the host successfully receives the response command, it means that the ranging module has successfully executed the red dot command.