



## 2D LiDAR Sensor Communication Data Protocol v2.1



Please read this manual before using the product for the best product performance.  
Be sure to keep this manual for future reference.

CPEN-1F/1BS-202202

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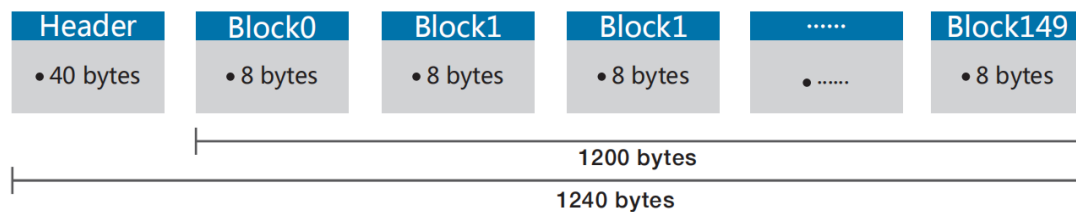
## 1. Type of Connector

1.1 Connector: RJ-45 standard internet connector

1.2 Basic protocol: UDP/IP standard internet protocol. Data are in little-endian format, lower byte first

## 2. Data Packet Format

### 2.1. General



The total length of a data frame is 1240 bytes, including:

- Frame header: 40 bytes
- Data block:  $150 \times 8 = 1,200$  bytes

### 2.2. Header

Definition of Frame Header

Offset	Length	Description
0	4	ID, it is always 0xFE0010F
4	2	Protocol version code, the current code is 0x0200
6	1	Distance scale, distance = readout data x distance scale
7	3	Brand name code, use capital letters and digits. Using "\0" for missing code
10	12	Commercial type code: ended with "\0"
22	2	Internal type code
24	2	Hardware version
26	2	Software version
28	4	Time stamp When NTP is OFF:Unit ms.represents the number of milliseconds after power-on When NTP is ON:Represents the fractional part of a timestamp in NTP64 format.
32	2	Bit[14:0]: Rotation rate Bit15:Rotation direction(0: clockwise, 1: counter clockwise)
34	1	Safe zone status,same as the hardware INPUT/OUTPUT BIT[3:0]:Same as OUTPUT[3:0], BIT[7:4]:Same as INPUT[3:0]

Offset	Length	Description
35	1	Error status. A corresponding bit of “1” indicates an error BIT0:Motor fault,BIT1:Abnormal voltage,BIT2:Temperature fault
36	4	When NTP is OFF:Reserved When NTP is ON:Represents the integer part of a timestamp in NTP64 format.

### 2.3. Data block definition

Offset	Length	Description
0	2	Angle, unsigned integer. Range: 0~35999 Unit:0.01 °/LSB, range 0 ~ 359.99 ° <b>Note: Data block is invalid if this value is greater or equal than 0xFF00</b>
2	2	Distance readout data,unsigned integer, indicating that the distance is determined by “readout data x distance scale”
4	2	Signal strength, indicates the strength of the received signal, range 0~65535
6	2	Reserved (TBD)



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