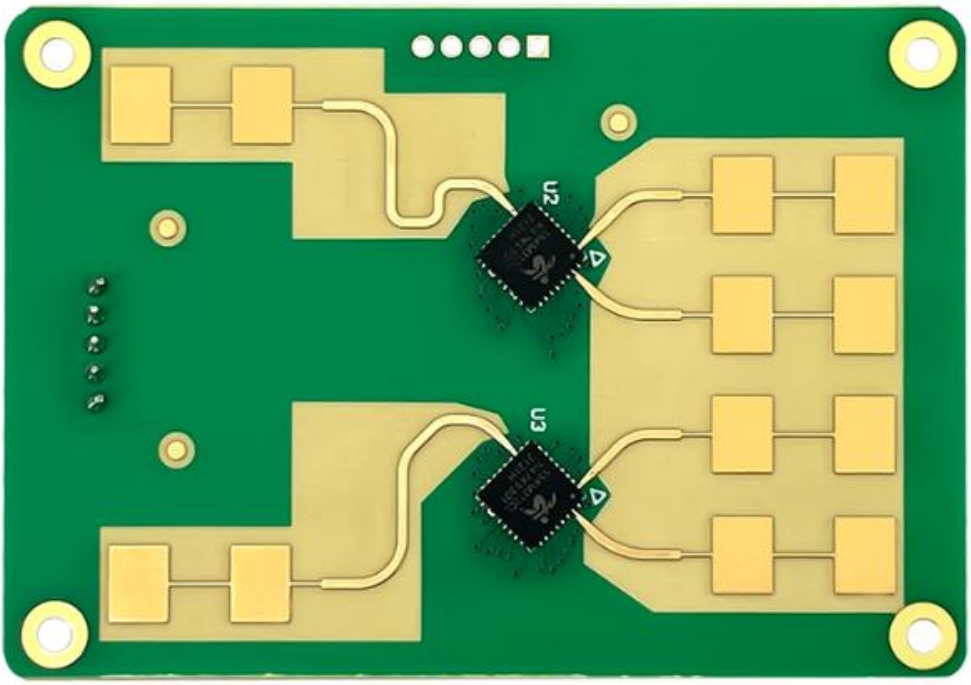
Shenzhen Hi-Link Electronic Co., Ltd

HLK-LD2461

Motion target detection and tracking module

serial communication protocol



1. Protocol format

1.1. Protocol data format

Serial port data communication of LD2461 uses the big-endian format.

All data in the following table is hexadecimal

1.2. Send command frame format

frame header	data length	command word	command value	checksum	frame end
FF EE DD	2 bytes	1 byte	N byte	1 byte	DD EE FF

Returns the command protocol frame format

frame header	data length	command word	command value	checksum	frame end
FF EE DD	2 bytes	1 byte	N byte	1 byte	DD EE FF

Data length: 2 bytes, command word length + command value length

Checksum: 1 byte, command word + command value, take the lowest 8 bits of the sum. Column: Suppose command word + command value =0x3068 then the checksum will be 68

Command value: N bytes. The number of bytes used by the command value varies with the command value

2. Baud rate modification

After this command is sent, it takes effect immediately, and the baud rate of the serial port changes to the modified value. The default value is 256000

Command word: 0x01

Command value: 3 bytes baud rate of the serial port

Return value: 1 byte (0 failed, 1 succeeded)

Send data (Change the baud rate of the serial port to 115200)

FF EE DD	00 04	01	01 C2 00	C4	DD EE FF

Return data (success)

FF EE DD	00 02	01	01	02	DD EE FF

Example for mapping the serial port baud rate (serial port baud rate ranges from 9600 to 256000)

command value	baud rate
0x002580	9600（default）
0x004B00	19200
0x009600	38400
0x00E100	57600
0x01C200	115200
0x03E800	256000

3. Version number and unique ID

Query only and return the current version number and unique ID of the module after sending
Command word: 0x09
Command value: 0x01
Return value: 4 bytes version number +4 bytes ID number
Version number 4 bytes, the first byte (month), the second byte (day), the third byte (major version), and the fourth byte (minor version). The column is 15 20 00 01, and the version number is version 0.1 on May 20, 2021

Send data (query the current module version number and ID)

FF EE DD	00 02	09	01	0A	DD EE FF

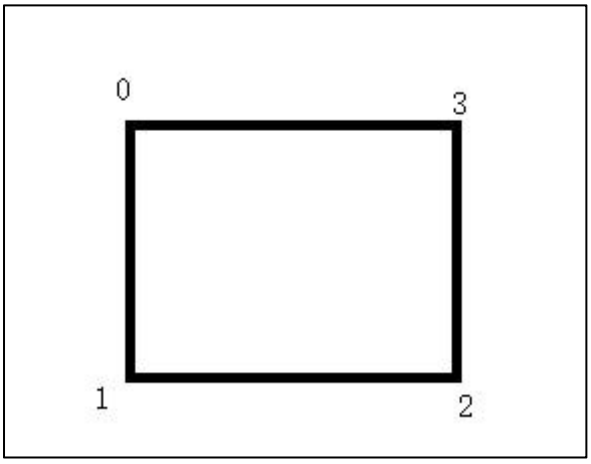
Return data (Version number is version 0.1 as of November 1, 2023)

FF EE DD	00 09	09	3B 01 00 01 5C 5A D5 56	27	DD EE FF

4. Zone filtering

Set the specified area to detect only or not detect the target. A maximum of three areas can be set
Command word: 0x04
Command value: NTH block area +x0 y0 x1 y1 x2 y2 x3 y3 + Area type int8 Type x and y multiplied by 10 respectively (see the following table for composition)
Returned value: 3 bytes,1 byte area number +1 byte area type +1 byte result (0 failed,1 succeeded)

Area number	Regional coordinate	Area type
1 byte 1 Area 1 2 Area 2 3 Area 3	8 bytes A total of 4 vertices, each vertex coordinate occupies 2 bytes, the coordinate vertices are set in the order of 0,1,2,3 in the figure below. The format of coordinate value is int8 type x and y multiplied by 10 respectively.	1 byte 0x00 Detect only targets in the area 0x01 Target in area not detected



Send data (set up the 1st area with the coordinates of each vertex as (-0.5,2), (-0.5,1), (0.5,1), (0.5,2) to detect only the targets in that area)

FF EE DD	00 0B	04	01 FB 14 FB 0A 05 0A 05 14 00	41	DD EE FF

Return data

FF EE DD	00 04	04	01 00 01	06	DD EE FF

5. Withdrawn areas

Select to cancel area filtering for a setting

Command word: 0x05

Command value：1 byte area number

Return value: 1 byte area number + 1 byte setting result (0 failure, 1 success)

Send data (cancellation of filter setting for area 1)

FF EE DD	00 02	05	01	06	DD EE FF

Return data

FF EE DD	00 03	05	01 01	07	DD EE FF

6. Reading areas

Command word：0x06

Command value：0x01

Return value：No.1 area（1 byte）+area type（1 byte）+area coordinate（8 byte）+No.2 area（1 byte）+area type（1 byte）+area coordinate（8 byte）+No.3 area（1 byte）+area type（1 byte）+area coordinate（8 byte)

Send data:

FF EE DD	00 02	06	01	07	DD EE FF

Return data (radar areas 1 and 3 are each 1 m long and wide, with coordinates (-2,2), (-2,1), (-1,1), (-1,2) and (1,2), (1,1), (2,1), (2,2), area 1 is the area for detecting moving targets, and area 3 is the area for shielding moving targets)

3byte tip	2byte data length	1byte command word	1byte Area 1	1byte Type of area No. 1	8byte Coordinates of area 1
FF EE DD	00 1F	06	01	00	EC 14 EC 0A F6 0A F6 14
1byte Area 2	1byte Type of area No. 2	8byte Coordinates of area 2	1byte Area 3	1byte Type of area No. 3	8byte Coordinates of area 3
02	00	00 00 00 00 00 00 00 00	03	01	0A 14 0A 0A 14 0A 14 14
1byte checksum	3byte bun the end				
85	DD EE FF				

7. Setting up the radar reporting format

Modify the format of the radar reporting data, the default is to show only whether there is a target in the area or not

Command word: 0x02

Command value: 1 byte

Return value: 1 byte (0 failure, 1 success)

Command word	Define
0x01	Represents that only the trace coordinate values are displayed
0x02	Represents the presence or absence of targets in the display area only
0x03	Represents the value of the trace coordinates and the presence or absence of targets in the area.

Sending data (Setting the value of the displayed trace coordinates)

FF EE DD	00 02	02	01	03	DD EE FF

Receive data

FF EE DD	00 02	02	01	03	DD EE FF

8. Read radar reporting format

Read the format of current radar reported data

Command word: 0x03

Command value: 0x01

Return value: 1 byte radar reporting format (see command value definition in "7. Setting Radar Reporting Format" for status details)

Send data

FF EE DD	00 02	03	01	04	DD EE FF

Return data

FF EE DD	00 02	03	01	04	DD EE FF

9. Restore factory settings

Restore to default unpartitioned mode (does not reset serial port baud rate)

Command word: 0x0A

Command value: 0x01

Return value: 1 byte (0 failure, 1 success)

Send data

FF EE DD	00 02	0A	01	0B	DD EE FF

Receive data

FF EE DD	00 02	0A	01	0B	DD EE FF

10. Radar reporting

The module takes the initiative to report the data, and the format of the reported content is affected by the parameter "7.Report radar data format".

Command word: 0x07&0x08

Command value: see the following table

Return value: XX

Radar reporting format	corresponding command word	command value
0x01	0x07	x and y coordinates of different areas
0x02	0x08	1 occupied, 0 unoccupied

Receiving data (radar reporting format is "0x02" target in area 1, no target in area 2, target in area 3)

header	data length	command word	Availability of targets in region 1	Availability of targets in region 2	Availability of targets in region 3
FF EE DD	00 04	08	01	00	01
checksum	end				
0A	DD EE FF				

Receiving data (radar reporting format is "0x01" X coordinate value of target 1 + Y coordinate value of target 1 + X coordinate value of target 2 + Y coordinate value of target 2 (the method of calculating coordinate values is the same as the method of calculating coordinates in "4. Area Filtering")).

header	data length	command word	Availability of targets in region 1	Availability of targets in region 2	checksum
FF EE DD	00 05	07	F1 0F	0F 0F	25
end					
DD EE FF					

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