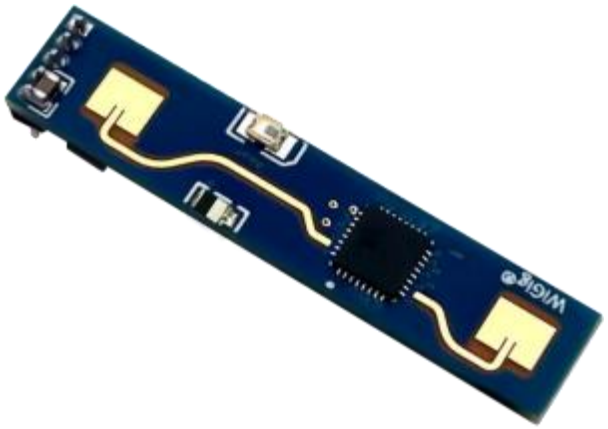
Shenzhen Hailingke Electronics Co., Ltd

HLK-LD2410B

Human presence sensing module

Serial communication protocol



Version:V1.06 modification date:February 21, 2023

catalogue

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1 Introduction to Communication Interface

1.1 Pin Definition

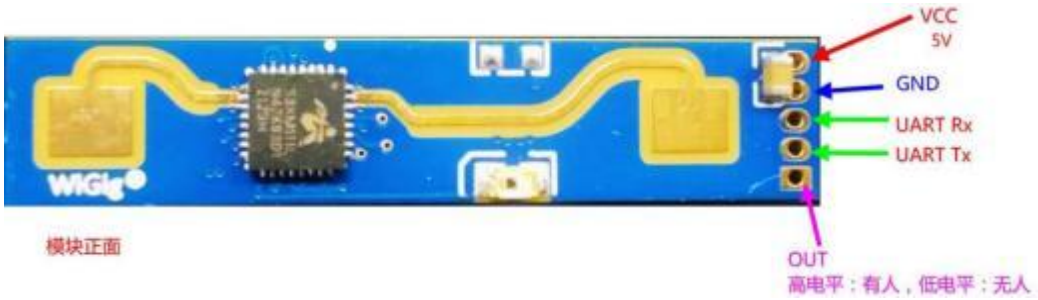


Figure 1 Module Pin Definition Diagram

Pin	symbol	name	function
1	OUT	Target state output	Detected presence of human body: output high level No human presence: output low level
2	UART_Tx	Serial port Tx	Serial Tx pin
3	UART_Rx	Serial port Rx	Serial port Rx pin
4	GND	Power supply ground	Power supply ground
5	VCC	power input	Power supply input 5V

Table 1 Pin Definition Table

1.2 Usage and Configuration

1.2.1 Typical application circuit

The LD2410B module directly outputs the detected target state (manned high level, unmanned low level) through an IO pin, and can also output the detection result data according to the specified protocol through the serial port. The serial port output data includes target state and distance assistance information, etc. Users can flexibly use it according to specific application scenarios.

The module power supply voltage is 5V, and the power supply capacity of the input power supply is required to be greater than 200mA.

The IO output level of the module is 3.3V. The default baud rate for the serial port is 256000, with 1 stop bit and no parity bit.

1.2.2 The role of configuration parameters

Users can modify the configuration parameters of the module through the LD2410B serial port to adapt to different application requirements.

The configurable radar detection parameters include the following:

Longest detection distance

Set the farthest detectable distance, and only human targets that appear within this farthest distance will be detected and output results.

Set in units of distance gates, with a maximum of 8 distance gates and configurable distance resolution (0.2m or 0.75m per distance gate).

This includes the farthest gate for motion detection and the farthest gate for static detection, which can be set to a range of 1-8. For example, if the farthest gate is set to 2 and the distance resolution is 0.75m, only if there is a human body within 1.5m can the result be effectively detected and output.

Sensitivity

When the detected target energy value (ranging from 0 to 100) is greater than the sensitivity value, it will be determined as the presence of the target, otherwise it will be ignored.

The sensitivity value can be set within the range of 0-100. Each distance gate can independently set sensitivity, allowing for precise adjustment of detection within different distance ranges, local precise detection, or filtering of interference sources in specific areas.

In addition, if the sensitivity of a certain distance gate is set to 100, the effect of not recognizing the target below this distance gate can be achieved. For example, if the sensitivity of distance gates 3 and 4 is set to 20, and the sensitivity of other distance gates is set to 100, and the distance resolution is 0.75m, it can only detect human bodies within the range of 2.25-3.75m from the distance module.

Unmanned duration

During the output of the radar from manned to unmanned, it will continue to report manned for a period of time. If unmanned continues within the radar testing range during this period, the radar will report unmanned; If the radar detects someone during this time period, it will refresh this time in seconds. It is equivalent to the unmanned delay time. After the person leaves, the output status will be unmanned only after the duration of keeping unmanned has exceeded.

1.2.3 Visual Configuration Tool Description

In order to facilitate users to quickly and efficiently test and configure the module, a PC based upper computer configuration tool is provided. Users can use this tool software to connect the serial port of the module, read and configure the parameters of the module, receive the detection result data reported by the module, and perform real-time visualization display, greatly facilitating users' use.

Usage of upper computer tools:

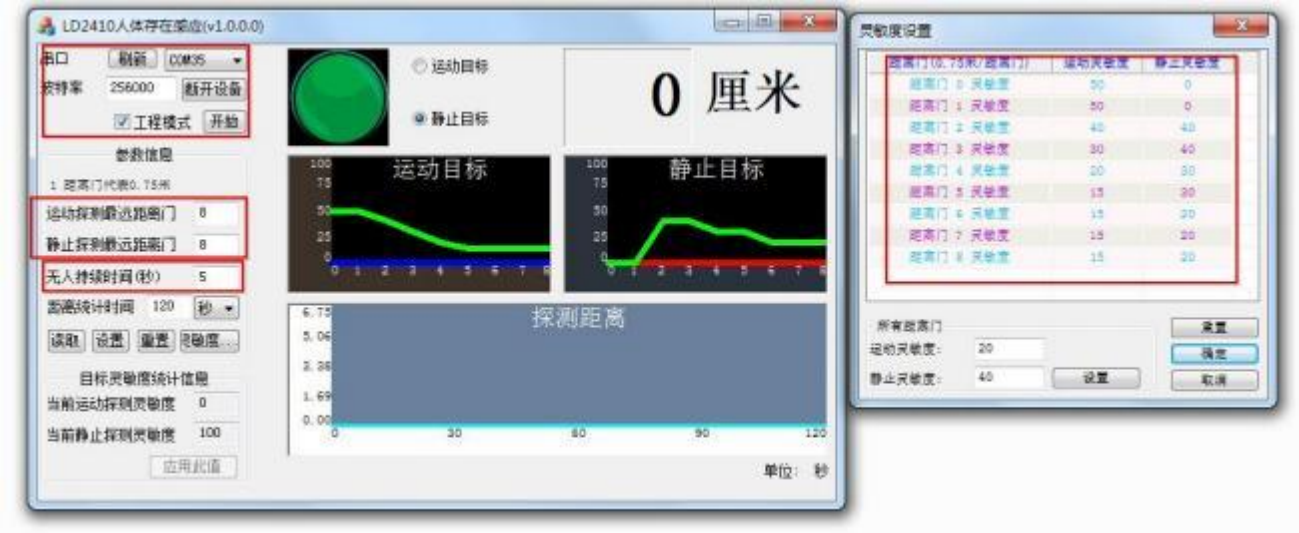
1. Connect the module serial port correctly using the USB to serial port tool;

2. Select the corresponding serial port number in the upper computer tool, set the baud rate of 256000, select the engineering mode, and click to connect the device; 3. After successful connection, click the start button, and the graphical interface on the right will display the detection results and data;

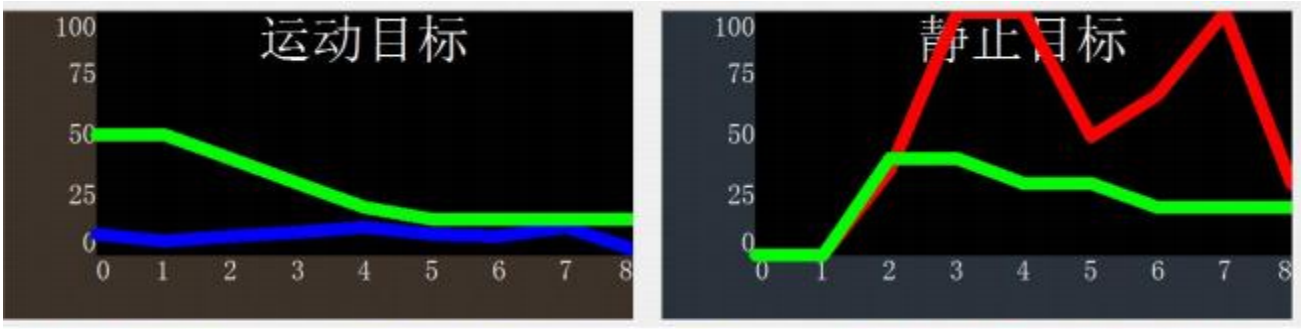
4. After connecting, if the start button is not clicked, or if the stop button is clicked after starting, the mode parameter information can be read or set;

Note: After clicking 'Start', parameters cannot be read and configured. Configuration can only be performed after stopping.

The interface and common functions of the upper computer tools are shown in the following figure:



The ball represents the target state output indicator: red represents an artificial moving target, and purple represents an artificial stationary target; Green represents no one



绿色线：设置的灵敏度　　蓝色线：每个距离门上的运动目标能量值　　红色线：每个距离门上的静止目标能量值

2 communication protocol

This communication protocol is mainly used by users who are separated from visualization tools for secondary development. LD2410B communicates with the outside world through a serial port (TTL level). The data output and parameter configuration commands of the radar are carried out under this protocol. The default baud rate for the radar serial port is 256000, with 1 stop bit and no parity bit.

2.1 protocol format

2.1.1 Protocol Data Format

The serial data communication of LD2410B uses small end format, and all data in the following table is in hexadecimal.

2.1.2 Command Protocol Frame Format

The radar configuration commands and ACK command formats defined by the protocol are shown in Tables 2 to 5.

Table 2 Send Command Protocol Frame Format

Header	Intraframe data length	Intra frame data	End of Frame
FD FC FB FA	2 bytes	See Table 3	04 03 02 01

Table 3 Format of sending intra frame data

Command word (2 bytes)	Command value (N bytes)

Table 4 ACK Command Protocol Frame Format

Header	Intraframe data length	Intra frame data	End of Frame
FD FC FB FA	2 bytes	See Table 5	04 03 02 01

Table 5 ACK intra frame data format

Send Command Word | 0x0100 (2 bytes)	Return value (N bytes)

2.2 Sending commands and ACKs

2.2.1 Enable configuration commands

Any other command issued to the radar must be issued before it can be executed, otherwise it will be invalid.

Command word: 0x00FF

Command value: 0x0001

Return value: 2-byte ACK status (0 successful, 1 failed)+2-byte protocol version (0x0001)+2-byte buffer size (0x0040)

Sending data:

FD FC FB FA	04 00	FF 00	01 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	08 00	FF 01	00 00	01 00	40 00	04 03 02 01

2.2.2 End Configuration Command

End the configuration command and execute it to restore the radar to working mode. If you need to issue another command, you need to send the enable configuration command first.

Command word: 0x00FE

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)

Sending data:

FD FC FB FA	02 00	FE 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	FE 01	00 00	04 03 02 01

2.2.3 Maximum distance gate and unmanned duration parameter configuration command

This command sets the maximum detection range gate of the radar (motion&rest) (configuration range 2-8), as well as the unmanned duration parameter (configuration range 0-65535 seconds). Please refer to the table below for specific parameter numbers. This configuration value does not lose power when powered down.

Command word: 0x0060

Command value: 2-byte maximum motion distance gate word+4-byte maximum motion distance gate parameter+2-byte maximum rest distance gate word+4-byte maximum rest distance gate parameter+2-byte unmanned duration word+4-byte unmanned duration parameter.

Return value: 2-byte ACK status (0 successful, 1 failed)

0x0060 protocol parameter word

Parameter	Parameter number
Maximum movement distance gate	0x0000
Maximum stationary distance gate	0x0001
Unmanned duration	0x0002

Sending data: Maximum distance gate 8 (motion&rest), unmanned duration 5 seconds

FD FC FB FA	14 00	60 00	00 00	08 00 00 00	01 00	08 00 00 00	02 00	05 00 00 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	60 01	00 00	04 03 02 01

2.2.4 Read Parameter Command

This command can read the current configuration parameters of the radar.

Command word: 0x0061

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)+header (0xAA)+maximum distance gate N (0x08)+configured maximum motion distance gate+configured maximum rest distance gate+distance gate 0 motion sensitivity (1 byte)++ Distance gate N motion sensitivity (1 byte)+Distance gate 0 rest sensitivity (1 byte)++ Distance gate N static sensitivity (1 byte)+unmanned duration (2 bytes)

Sending data:

FD FC FB FA	02 00	61 00	04 03 02 01

Radar ACK: (Success, maximum distance gate 8, configured motion distance gate 8, stationary distance gate 8, 0-8 motion sensitivity 20, 0-8 static sensitivity 25, unmanned duration 5 seconds)

Byte 1~4		Byte 5, 6	Byte 7, 8	Byte 9, 10	Byte 11	Byte 12	Byte 13	Byte 14	Byte 15	Byte 16	Byte 17	Byte 18
FD FC FB FA		1C 00	61 01	00 00	AA	08	08	08	14	14	14	14
Byte 19	Byte 20	Byte 21	Byte 22	Byte 23	Byte 24	Byte 25	Byte 26	Byte 27	Byte 28	Byte 29	Byte 30	
14	14	14	14	14	19	19	19	19	19	19	19	
Byte 31	Byte 32	Byte 33, 34	Byte 35~38									
19	19	05 00	04 03 02 01									

2.2.5 Enable Engineering Mode Command

This command opens radar engineering mode. After opening the engineering mode, the energy values of each range gate will be added to the radar report data. Please refer to 2.3.2 Target Data Composition for detailed format. After the module is powered on, the engineering mode is turned off by default, and this configuration value is lost upon power failure.

Command word: 0x0062

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)

Sending data:

FD FC FB FA	02 00	62 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	62 01	00 00	04 03 02 01

2.2.6 Close Engineering Mode Command

This command turns off radar engineering mode. After shutdown, please refer to 2.3.2 Target Data Composition for the format of radar report data.

Command word: 0x0063

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)

Sending data:

FD FC FB FA	02 00	63 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	63 01	00 00	04 03 02 01

2.2.7 Distance Gate Sensitivity Configuration Command

This command configures the sensitivity of the distance gate, and the configured value is not lost when powered off. It supports both individual configuration of each distance gate and simultaneous configuration of all distance gates into a unified value. If the sensitivity of all distance gates is set to the same value at the same time, the distance gate value needs to be set to 0xFFFF.

Command word: 0x0064

Command value: 2-byte distance gate word+4-byte distance gate value+2-byte motion sensitivity word+4-byte motion sensitivity value+2-byte rest sensitivity word+4-byte rest sensitivity value

Return value: 2-byte ACK status (0 successful, 1 failed)

0x0064 protocol parameter word

Parameter	Parameter number
Distance gate	0x0000
Motion sensitivity word	0x0001
Static sensitivity word	0x0002

Sending data: Configure motion sensitivity of 40 and static sensitivity of 40 for distance gate 3

FD FC FB FA	14 00	64 00	00 00	03 00 00 00	01 00	28 00 00 00	02 00	28 00 00 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	64 01	00 00	04 03 02 01

Sending data: Configure the motion sensitivity of all distance gates to 40, and the static sensitivity to 40

FD FC FB FA	14 00	64 00	00 00	FF FF 00 00	01 00	28 00 00 00	02 00	28 00 00 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	64 01	00 00	04 03 02 01

2.2.8 Read Firmware Version Command

This command reads the radar firmware version information.

Command word: 0x00A0

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)+2-byte firmware type (0x0001)+2-byte major version number+4-byte count Version number

Sending data:

FD FC FB FA	02 00	A0 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	0C 00	A0 01	00 00	00 01	02 01	16 24 06 22	04 03 02 01

The corresponding version number is V1.02.22062416

2.2.9 Set Serial Port Baud Rate

This command is used to set the baud rate of the module serial port. The configuration value is not lost when power is lost, and takes effect after restarting the module.

Command word: 0x00A1

Command value: 2-byte baud rate selection index

Return value: 2-byte ACK status (0 successful, 1 failed)

Table 6 Serial Port Baud Rate Selection

Baud rate selection index value	BAUD
0x0001	9600
0x0002	19200
0x0003	38400
0x0004	57600
0x0005	115200
0x0006	230400
0x0007	256000
0x0008	460800

The factory default value is 0x0007, which is 256000

Sending data:

FD FC FB FA	04 00	A1 00	07 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	A1 01	00 00	04 03 02 01

2.2.10Restore factory settings

This command is used to restore all configuration values to their original factory values, which take effect after restarting the module.

Command word: 0x00A2

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)

Sending data:

FD FC FB FA	02 00	A2 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	A2 01	00 00	04 03 02 01

The factory default configuration values are as follows:

Table 7 Factory Default Configuration Values

configuration item	Default value
Maximum movement distance gate	8
Maximum stationary distance gate	8
Unmanned duration	5
Serial Port Baud Rate	256000
range resolution	0.75m

configuration item	Default value	configuration item	Default value
Motion sensitivity of distance gate 0	50	Static sensitivity of distance gate 0	-(Not settable)
Motion sensitivity of distance gate 1	50	Static sensitivity of distance gate 1	-(Not settable)
Motion sensitivity of distance gate 2	40	Static sensitivity of distance gate 2	40
Motion sensitivity of distance gate 3	30	Static sensitivity of distance gate 3	40
Motion sensitivity of distance gate 4	20	Static sensitivity of distance gate 4	30
Motion sensitivity of distance gate 5	15	Static sensitivity of distance gate 5	30
Motion sensitivity of distance gate 6	15	Static sensitivity of distance gate 6	20
Motion sensitivity of distance gate 7	15	Static sensitivity of distance gate 7	20
Motion sensitivity of distance gate 8	15	Static sensitivity of distance gate 8	20

2.2.11Restart module

The module receives this command and will automatically restart after the response is sent.

Command word: 0x00A3

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)

Sending data:

FD FC FB FA	**02 00**	**A3 00**	**04 03 02 01**

Radar ACK (successful):

FD FC FB FA	**04 00**	**A3 01**	**00 00**	**04 03 02 01**

2.2.12Bluetooth Settings

This command is used to control whether Bluetooth is turned on or off, and the Bluetooth function of the module is turned on by default. The configuration value is not lost after power failure, and takes effect after restarting the module.

Command word: 0x00A4

Command value: 0x0100 Turn on Bluetooth 0x0000 Turn off Bluetooth

Return value: 2-byte ACK status (0 successful, 1 failed)

Sending data:

FD FC FB FA	04 00	A4 00	01 00	04 03 02 01

Indicates Bluetooth is turned on

Radar ACK (successful):

FD FC FB FA	04 00	A4 01	00 00	04 03 02 01

2.2.13Obtain MAC address

This command is used to query MAC addresses

Command word: 0x00A5

Command value: 0x0001

Return value: 2-byte ACK status (0 successful, 1 failed)+1-byte fixed type (0x00)+3-byte MAC address (large end sequence)

Sending data:

FD FC FB FA	04 00	A5 00	01 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	0A 00	A5 01	00 00	8F 27	2E B8	0F 65	04 03 02 01

The MAC address found is: 8F 27 2E B8 0F 65

2.2.14Obtain Bluetooth permissions

This command is used to obtain Bluetooth permissions. After successful acquisition, you can use the APP to obtain device information and debugging parameters through Bluetooth

Command word: 0x00A8

Command value: 6-byte password value (small end order every 2 bytes)

Return value: 2-byte ACK status (0 successful, 1 failed)

The default password is "HiLink", and the corresponding value is 0x4869 (Hi) 0x4c69 (Li) 0x6e6b (nk)

Sending data:

FD FC FB FA	08 00	A8 00	48 69	4c 69	6e 6b	48 69	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	A8 01	00 00	04 03 02 01

Note: This response only responds to Bluetooth and not to the serial port

2.2.15Set Bluetooth password

This command is used to set the password for Bluetooth control. The configuration value is not lost after power failure, and takes effect after restarting the module.

Command word: 0x00A9

Command value: 6-byte password value (each byte is in small endian order)

Return value: 2-byte ACK status (0 successful, 1 failed)

Sending data:

FD FC FB FA	08 00	A9 00	48 69	4c 69	6e 6b	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	A9 01	00 00	04 03 02 01

2.2.16Distance resolution setting

Set the distance resolution of the module, that is, how far each distance gate represents. The configuration value will not be lost after power failure, and will take effect after restarting the module.

It can be configured to be 0.75m or 0.2m away from each door, and the maximum supported number of distance doors is 8.

Command word: 0x00AA

Command value: 2-byte distance resolution selection index

Return value: 2-byte ACK status (0 successful, 1 failed)

Table 8 Distance Resolution Selection

Distance resolution selection index value	Distance resolution (distance represented by each distance gate)
0x0000	0.75m
0x0001	0.2m

The factory default value is 0x0001, which is 0.75m

Sending data:

FD FC FB FA	04 00	AA 00	01 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	04 00	AA 01	00 00	04 03 02 01

2.2.17Query distance resolution settings

The current distance resolution setting of the query module, that is, how far each distance gate represents.

Command word: 0x00AB

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)+2-byte distance resolution selection index

The definition of the return value is the same as the distance resolution selection in Table 8

Sending data:

FD FC FB FA	02 00	AB 00	04 03 02 01

Radar ACK (successful):

FD FC FB FA	06 00	AB 01	00 00	01 00	04 03 02 01

The distance resolution currently set is 0.2m

2.2.18Auxiliary control function settings

This module comes with a photosensitive diode, which can be used to detect the output photosensitive value (please refer to Table 15 for the composition of engineering mode target data). Users can also configure to enable the photosensitive auxiliary control function;

Turn on the light sensing auxiliary control function, and the output of the OUT pin is influenced by both the radar detection results and the light sensing control logic:

The output of the OUT pin changes from unmanned to manned, and it needs to meet the following requirements: the radar detects someone and the logic conditions for light assisted control are met; The OUT pin output changes from manned to unmanned, which needs to meet the following requirements: radar detects unmanned;

The light sensing control logic can choose to detect that the light sensing value is less than the set light sensing threshold, or detect that the light sensing value is greater than the set light sensing threshold; The default output level of the OUT pin can also be configured;

Command word: 0x00AD

Command value: 4-byte configuration value

Return value: 2-byte ACK status (0 successful, 1 failed)

Table 9 Command Values for Auxiliary Control Function Settings

First Byte	illustrate

0x00	Turn off the light sensing auxiliary control function, and the OUT pin output is not affected by light sensing
0x01	Enable the light sensing auxiliary control function. When the detection light sensing value is less than the set threshold, the auxiliary control condition meets the second byte as the light sensing threshold to be set (range 0x00~0xFF)
0x02	Turn on the light sensing auxiliary control function, and when the light sensing detection value is greater than the set threshold, the auxiliary control conditions are met; The second byte is the light sensitivity threshold to be set (range 0x00~0xFF)

The factory default value is 0x00, which

Second Byte	illustrate
0x00 ~ 0xFF	The light sensitivity threshold to be set (range 0 to 255), defaults to 0x80

OUT pin default level configuration

Third Byte Configuration Value	illustrate
0x00	The OUT pin defaults to low level, outputs low level when there is no target trigger, and outputs high level when there is a target trigger
0x01	The OUT pin defaults to high level, outputs high level when there is no target trigger, and outputs low level when there is a target trigger

The default value is 0x00, which means that the OUT pin defaults to low level

Sending data:

FD FC FB FA	**06 00**	**AD 00**	**01 60 00 00**	**04 03 02 01**

Indicates that the auxiliary control condition is met when the detection light sensitivity value is less than the set threshold; Set the light sensitivity threshold to 0x060; OUT defaults to low level

Radar ACK (successful):

FD FC FB FA	**04 00**	**AD 01**	**00 00**	**04 03 02 01**

2.2.19Query auxiliary control function configuration

Query the current auxiliary control configuration values of the module

Command word: 0x00AE

Command value: None

Return value: 2-byte ACK status (0 successful, 1 failed)+4-byte configuration value

The configuration value definition is the same as the command values for auxiliary control function settings in Table 9

Sending data:

FD FC FB FA	**02 00**	**AE 00**	**04 03 02 01**

Radar ACK (successful):

FD FC FB FA	**08 00**	**AE 01**	**00 00**	**01 60 01 00**	**04 03 02 01**

Indicates that the current setting is to meet the auxiliary control conditions when the detection light sensitivity value is less than the set threshold; Set the light sensitivity threshold to 0x060; OUT defaults to high level

2.3 Radar Data Output Protocol

LD2410B outputs radar detection results through a serial port, with default output of basic target information, including target status, motion energy value, stationary energy value, motion distance, stationary distance, and other information. If the radar is configured in engineering mode, it will output additional energy values for each range gate (motion&rest). Radar data is output in the specified frame format.

2.3.1 Report data frame format

The format of radar reporting message frames defined by the protocol is shown in Tables 10 and 11. The definition of reported data type values in normal working mode and engineering mode is shown in Table 12.

Table 10 Report Data Frame Format

Frame header	Intraframe data length	Intra frame data	Frame tail
F4 F3 F2 F1	2 bytes	See Table 11	F8 F7 F6 F5

Table 11 Format of intra frame data frames

data type	head	target data	tail	check
1 byte (see Table 12)	0xAA	See Tables 13 and 15	0x55	0x00

Table 12 Data Type Description

Data type value	illustrate
0x01	Engineering mode data
0x02	Target basic information data

2.3.2 Target data composition

The target data content reported by the radar will change according to the working mode of the radar. Under normal working mode, the radar defaults to outputting basic information data of the target; After being configured in engineering mode, the radar will add energy value information of each range gate after the basic information data of the target. Therefore, the basic information of the target is always output in the radar reported data, while the range gate energy value information needs to be enabled by commands before it can be output.

Under normal working mode, the composition of target data reported by the radar is shown in Table 13, and the definition of target status values is shown in Table 14. The composition of the target data frame in engineering mode is shown in Table 15, and some data has been added to the data reported in normal working mode.

Table 13 Composition of Target Basic Information Data

target state	Target state motion target distance(cm)	Moving target energy value	Distance from stationary target (cm)	Energy value of stationary target	Detection distance (cm)
1 byte (see Table 14)	2 bytes	1 byte	2 bytes	1 byte	2 bytes

Table 14 Description of Target State Values

Target State Value	illustrate
0x00	No target
0x01	Moving Target
0x02	stationary target
0x03	Moving&stationary targets

Table 15 Composition of Engineering Mode Target Data

Add the following data after the target basic information data in Table 13

...	Maximum movement distance gate N	Maximum stationary distance gate N	Motion distance gate 0 energy value	...	Motion distance gate N energy value	Stationary distance gate 0 energy value	...	Energy value of stationary distance gate N	Photosensitive detection value	OUT pin output status
...	1 byte	1 byte	1 byte	...	1 byte	1 byte	...	1 byte	1 byte	1 byte

Photosensitive detection value range: 0-255, OUT pin output status: 0 unmanned, 1 manned

Reported data instance:

Reporting data in normal working mode:

Frame header	Intraframe data length	Intra frame data	Frame tail
F4 F3 F2 F1	0D 00	02 AA 02 51 00 00 00 00 3B 00 00 55 00	F8 F7 F6 F5

Report data in engineering mode:

Frame header	Intraframe data length	Intra frame data	Frame tail
F4 F3 F2 F1	23 00	01 AA 03 1E 00 3C 00 00 39 00 00 08 08 3C 22 05 03 03 04 03 06 05 00 00 39 10 13 06 06 08 04 60 01 55 00	F8 F7 F6 F5

2.4 Radar command configuration method

2.4.1 Radar Command Configuration Steps

The process of executing a configuration command for LD2410B radar includes two steps: the upper computer "sends the command" and the radar "replies to the command ACK".If the radar has no ACK response or fails to respond to ACK, it indicates that the radar has failed to execute the configuration command.

As mentioned earlier, before sending any other commands to the radar, the developer needs to first send the "enable configuration" command, and then send the configuration command within the specified time. After the command configuration is completed, send the "End Configuration" command to inform the radar that the configuration has ended.

For example, to read radar configuration parameters, the upper computer first sends the "enable configuration" command; After receiving a successful radar ACK, send the "Read Parameters" command again; After receiving a successful radar ACK, finally send the "End Configuration" command; After the radar ACK is successful, it indicates that the complete parameter reading operation is completed.

The radar command configuration process is shown in the following figure.

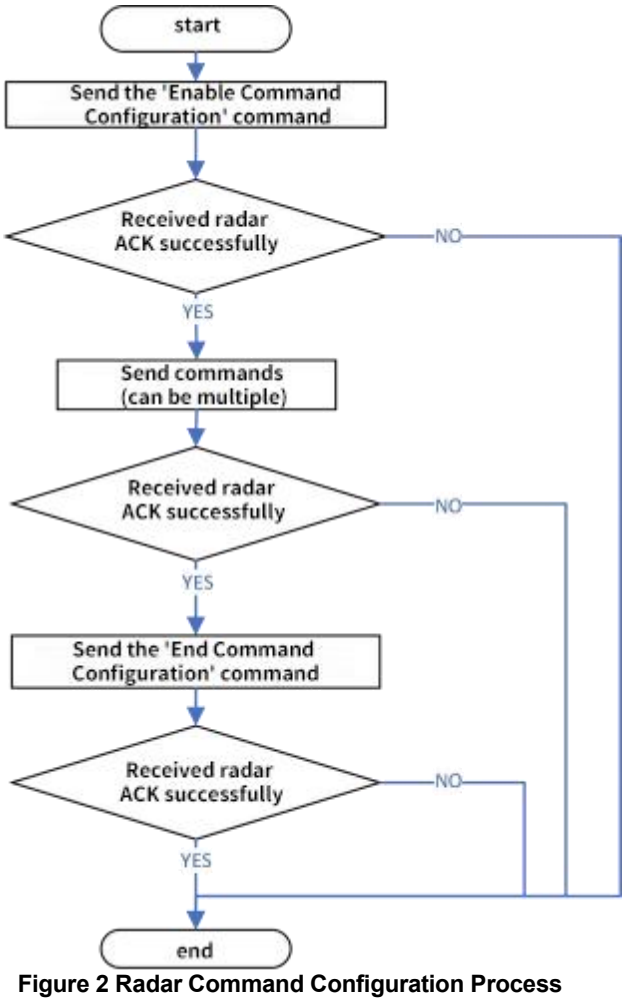


Figure 2 Radar Command Configuration Process

3 Revision record

date	version	revision
June 24, 2022	1.01	Initial version
July 1st, 2022	1.02	Corrected some error descriptions and added restart and factory restore commands
July 19, 2022	1.03	Fix the length value of some command instances
August 26, 2022	1.04	Command Description for Adding Distance Resolution Configuration
September 20th, 2022	1.05	Add protocol for Bluetooth part
February 21, 2023	1.06	Add instructions for light sensitivity output and add commands for setting auxiliary control functions

4 Technical support and contact information

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