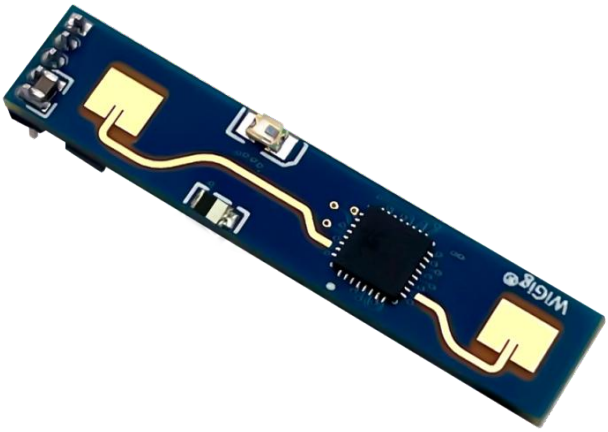
Shenzhen Hailinke Electronics Co.

HLK-LD2410B Human presence sensing module

Serial communication protocol



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1.1 Pin Definition

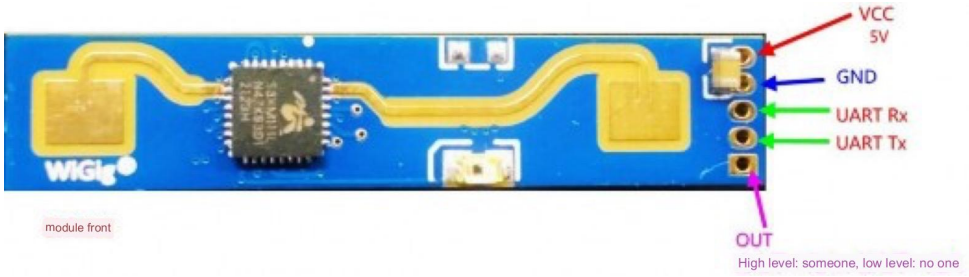


Figure 1 Module pin definition diagram

Pins	Symbols	Name	Function
1	OUT	Target state output	Human presence detected: output high level No human presence: output low level
2	UART_Tx	Serial Tx	Serial port Tx pins
3	UART_Rx	Serial Rx	Serial port Rx pins
4	GND	Power Ground	Power Ground
5	VCC	Power input	Power supply input 5V

Table 1 Pin Definition Table

1.2 Use and Configuration

1.2.1 Typical Application Circuits

LD2410B module directly through an IO pin output the detected target state (someone high, no one low), but also through the serial port in accordance with the prescribed protocol for the output of the detection results data, the serial output data contains the target state and distance auxiliary information, etc., the user can be used flexibly according to the specific application scenarios.

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

The module IO output level is 3.3 V. The default baud rate of 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 to the module through the serial port of LD2410B to adapt to different application requirements. The configurable radar detection parameters include the following:

Maximum detection distance

Set the farthest detectable distance, only human targets that appear within this farthest distance will be detected and output the result. Set up in distance gates, maximum 8 distance gates, configurable distance resolution (0.2m or 0.75m per distance gate).

Including motion detection of the farthest distance gate and stationary detection of the farthest distance gate, can be set in the range of 1 to 8, for example, set the farthest distance gate for 2, the distance resolution of 0.75m, then only in 1.5m the presence of the human body will be effectively detected and output the results.

Sensitivity

The presence of a target is determined when the detected target energy value (range 0 to 100) is greater than the sensitivity value, otherwise it is ignored.

Sensitivity value can be set in the range of 0 to 100. Each distance gate can be set independently of the sensitivity, that is, the detection of different distance range for accurate adjustment, localized and accurate detection or filtering of specific areas of interference sources.

In addition if the sensitivity of a certain distance gate is set to 100, the effect of not identifying the target under this distance gate can be achieved. For example, the sensitivity of the distance gate 3 and distance gate 4 is set to 20, the sensitivity of all other distance gates is set to 100, and the distance resolution is 0.75m, then it can achieve only the detection of the human body in the range of 2.25 to 3.75m from the distance module.

No one duration

Radar in the output from occupied to unoccupied results, will continue to report a period of time on the occupied, if the radar test range in this time period continued unoccupied, the radar reported unoccupied; if the radar detects someone in this time period, then refreshed this time, unit seconds. Equivalent to no one delay time, after the person left, keep no one more than this duration before the output status for no one.

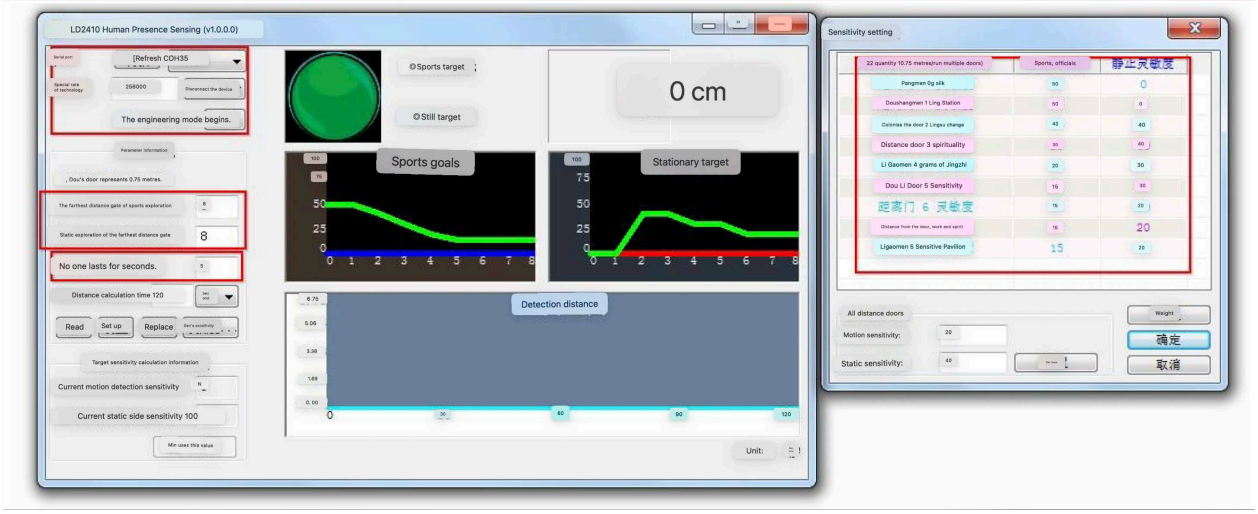
1.2.3 Visual configuration tool description

In order to facilitate users to quickly and efficiently test and configure the module, the PC terminal configuration tool is provided. Users can use this tool software to connect to the serial port of the module, read and configure the parameters of the module, and also receive the detection results data reported by the module, and make real-time visual display, which is greatly convenient for users.

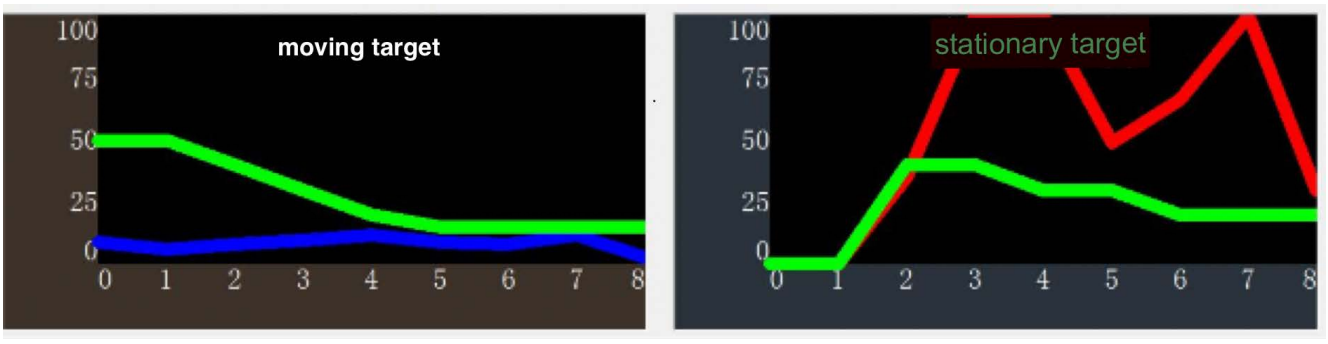
Usage of the Uplink tool:

1. Proper connection of the module serial port using the USB to serial tool;
2. (a) Select the corresponding serial port number in the upper computer tool, set the baud rate 256000, select the project mode and click Connect Device;
3. (a) After successful connection, click on the Start button and the test results and data will be displayed on the right graphical interface;
4. After connected, when the start button is not clicked, or click stop after starting, the mode parameter information can be read or set; Note: Parameters cannot be read and configured after clicking start, and can only be configured after stopping.

The interface and common functions of the OP tool are shown below:



(a) The round ball is an indication of the target status output: red means someone is a moving target, purple means someone is a stationary target; Green means no one



Green line: set sensitivity

Blue line: moving target energy value on each range gate

Red line: Stationary target energy value on each range gate

2 Communication protocols

This communication protocol is mainly for the users who need to do secondary development without visualization tools.

Boundary communication. The data output and parameter configuration commands of the radar are carried out under this protocol. The default baud rate of the radar serial port is 256000, 1 stop bit, no parity bit.

2.1 Protocol Format

2.1.1 Protocol Data Format

The LD2410B uses small-end format for serial data communication, and all data in the following tables are in hexadecimal.

2.1.2 Command protocol frame format

The protocol-defined radar configuration commands and ACK command formats are shown in Table 1 through Table 4.

Table 2 Send command protocol frame format

Frame header	Length of data in the frame	Intra-frame data	End of frame
FD FC FB FA	2 bytes	See Table 3	04 03 02 01

Table 3 Data format in the sent frame

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

Table 4 ACK command protocol frame format

Frame header	Length of data in the frame	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 Send command with ACK

2.2.1 Enabling configuration commands

Any other command issued to Radar must be executed after this command is issued, otherwise it is invalid. Command word: 0x00FF

Command value: 0x0001

Return value: 2 bytes ACK status (0 success, 1 failure) + 2 bytes protocol version (0x0001) + 2 bytes buffer size (0x0040) Send data:

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

Radar ACK (success):

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 the radar resumes working mode after execution. If you need to issue other commands again, you need to send the enable configuration command first.

Command word：0x00FE

Command value: None

Return value: 2-byte ACK status (0 success, 1 failure) Send data:

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

Radar ACK (success):

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

2.2.3 Maximum distance gate and unoccupied duration parameters configuration command

This command sets the maximum radar detection distance gate (motion & stationary) (configuration range 2~8), and the unmanned duration parameter (configuration range 0~65535 seconds). Please refer to the following table for specific parameter words. This configuration value is not lost when power is dropped.

Command word：0x0060

Command value: 2-byte maximum motion distance gate word + 4-byte maximum motion distance gate parameter + 2-byte maximum standstill distance gate word + 4-byte maximum standstill distance gate parameter + 2-byte unoccupied duration word + 4-byte unoccupied duration parameter

Return value: 2-byte ACK status (0 success, 1 failure)

0x0060 Protocol parameter word

Parameter Name	Parameter word
Maximum movement distance door	0x0000
Maximum resting distance door	0x0001
No one duration	0x0002

Send data: maximum distance door 8 (motion & stationary), no one 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 (success):

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 bytes ACK status (0 success, 1 failure) + header (0xAA) + max distance gate N (0x08) + config max motion distance gate + config max rest distance gate + distance gate 0 motion sensitivity (1 byte) + ... + distance gate N
Motion sensitivity (1 byte) + Distance gate 0 Stationary sensitivity 1 byte) + ... + distance gate Nstationary sensitivity (1 byte)
+ unoccupied duration

(2 bytes) Send 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 stationary sensitivity 25, unoccupied 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 Enabling Engineering Mode Command

This command opens the radar engineering mode. When the engineering mode is turned on, each distance gate energy value will be added to the radar report data, please refer to 2.3.2 Target Data Composition for detailed format. Engineering mode is off by default after the module is powered on, this configuration value is lost when power is lost.

Command word：

0x0062

Command

value：none

Return value: 2-byte ACK status (0

success, 1 failure) Send data:

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

Radar ACK (success):

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

2.2.6 Close project mode command

This command turns off the radar engineering mode. After turning off, 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

success, 1 failure) Send data:

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

Radar ACK (success):

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 power is lost. It supports to configure each distance gate individually or to configure all distance gates to a uniform value at the same time. If all distance gates are set to the same value at the same time, the distance gate value should 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 standstill sensitivity word + 4-byte standstill sensitivity value

Return value: 2-byte ACK status (0 success, 1 failure)

0x0064 Protocol parameter word

Parameter Name	Parameter word
Distance from the door	0x0000
Movement sensitivity word	0x0001
Static Sensitivity Word	0x0002

Sending data: configured distance from the door 3 motion sensitivity 40, stationary sensitivity 40

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 (success):

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

Sending data: configured motion sensitivity 40 for all distance doors, stationary sensitivity 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 (success):

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 bytes ACK status (0 success, 1 failure) + 2 bytes firmware type (0x0001) + 2 bytes major version number + 4 bytes minor version number

Sending data:

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

Radar ACK (success):

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 serial port of the module. The configured value will not be lost when power is lost, and the configured value will take effect after restarting the module. Command word：0x00A1

Command value: 2-byte baud rate selection index

Return value: 2-byte ACK status (0 success, 1 failure)

Table 6 Serial port baud rate selection

Baud rate selection index value	Baud rate
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 (success):

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

2.2.10 Restore factory settings

This command is used to restore all the configuration values to the non-factory values, and the configuration values take effect after rebooting the module. Command word：0x00A2

Command value: None

Return value: 2-byte ACK status (0

success, 1 failure) Send data:

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

Radar ACK (success):

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 items	Default Value	Configuration items	Default Value	Configuration items	Default Value
Maximum movement distance door	8	Motion sensitivity at distance gate 0	50	Stationary sensitivity at a distance of 0 from the door	-(not settable)
Maximum resting	8	Motion sensitivity of distance gate 1	50	Stationary sensitivity at distance from door 1	-(not settable)
		Motion sensitivity of distance gate 2	40	Stationary sensitivity at distance from gate	40

2.2.11 Reboot module

The module receives this command and will restart automatically after the answer is sent. Command word：0x00A3

Command value: None

Return value: 2-byte ACK status (0 success, 1 failure) Send data:

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

Radar ACK (success):

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

2.2.12 Bluetooth Settings

This command is used to control the Bluetooth on or off, the Bluetooth function of the module is on by default. The configuration value is not lost when power is lost, and the configuration value 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 success, 1 failure)

Sending data:

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

Turn on Bluetooth)

Radar ACK (success):

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

2.2.13 Get mac address

This command is used to

query the MAC address

command word: 0x00A5

Command value：0x0001

Return value: 2 bytes ACK status (0 success, 1 failure) + 1 byte fixed type (0x00) + 3 bytes MAC address (address is in big terminal order)

Sending data:

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

Radar ACK (success):

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

The mac address queried is: 8F 27 2E B8 0F 65

2.2.14 Obtaining Bluetooth Permissions

This command is used to get the Bluetooth permission, after getting successfully, you can use APP to get the device information and debug parameters through Bluetooth

Command word: 0x00A8

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

Return value: 2-byte ACK status (0 success, 1 failure)

The default password is "HiLink", which corresponds to the value 0x4869 (Hi)

0x4c69 (Li) 0x6e6b (nk) Send data:

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

Radar ACK (success):

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

Note: This response only answers to Bluetooth, not to the serial port

2.2.15 Set Bluetooth password

This command is used to set the password for Bluetooth control. The configuration value is not lost when power is lost, and the configuration value takes effect after restarting the module. Command word：0x00A9

Command value: 6 bytes of password value (each byte is in small end order)

Return value: 2-byte ACK status (0 success, 1 failure) Send data:

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

Radar ACK (success):

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

2.2.16 Distance resolution setting

Set the distance resolution of the module, i.e. how far away each distance gate represents, the configuration value is not lost when power is lost, and the configuration value takes effect after restarting the module. Can be configured to 0.75m or 0.2m per distance gate, the maximum number of distance gates supported are 8.

Command word：0x00AA

Command value: 2 bytes of distance resolution selection index

Return value: 2-byte ACK status (0 success, 1 failure)

Table 8 Distance resolution selection

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

Factory default value is 0x0001, i.e. 0.75m

Sending data:

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

Radar ACK (success):

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

2.2.17 Query distance resolution setting

Queries the current distance resolution setting of the module, i.e.

how far away each distance gate represents. Command word：

0x00AB

Command value: None

Return value: 2 bytes ACK status (0 success, 1 failure) + 2 bytes distance resolution selection index

Return value definition is the same as <Table 8 Distance Resolution Selection>.

Sending data:

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

Radar ACK (success):

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

Represents the currently set distance resolution of 0.2m

2.2.18 Auxiliary control function setting

This module comes with a photodiode, which can be used to detect the output light-sense value (please refer to), and the user can also configure to turn on the light-sense auxiliary control function; when the light-sense auxiliary control function is turned on, the output of OUT pin is affected by both the radar detection result and the light-sense control logic:

the output of the OUT pin changes from unoccupied to occupied, which requires that: the radar detects occupied and the light-sensing auxiliary control logic condition is met; the output of the OUT pin changes from occupied to unoccupied, which requires that: the radar detects unoccupied;

The light-sensing control logic can select whether the detected light-sensing value is less than the set light-sensing threshold or the detected 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 success, 1 failure)

Table 9 Command values for auxiliary control function settings

First byte	Description
0x00	Turn off the light sense auxiliary control function, OUT pin output is not affected by light sense
0x01	Open the light-sensing auxiliary control function, when the detection of light-sensing value is less than the set threshold value auxiliary control conditions to meet The second byte is the light-sensing threshold to be set (range 0x00 to 0xFF)
0x02	Enable the light-sensing auxiliary control function, when the light-sensing detection value is greater than the set threshold value auxiliary control conditions are met; The second byte is the light-sensing threshold to be set (range 0x00 to 0xFF)

The factory default value is 0x00, which means that the light-sensing assist control function is turned off

Second byte	Description
0x00 ~ 0xFF	The light sensitivity threshold to be set (range 0 to 255), default is 0x80

OUT pin default level configuration

Third byte configuration value	Description
0x00	OUT pin is low by default, output low when there is no target trigger, output high when there is a target trigger
0x01	OUT pin is high by default, output high when there is no target trigger, output low when there is a target trigger

The default value is 0x00, i.e. the OUT pin is low by default

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 satisfied when the detected light-sense value is less than the set threshold; the light-sense threshold is set to 0x060; the default level of OUT is low

Radar ACK (success):

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

2.2.19 Query auxiliary control function configuration

Query the current auxiliary

control configuration value of

the module Command word:

0x00AE

Command value: None

Return value: 2 bytes ACK status (0 success, 1 failure) + 4 bytes configuration value

The configuration values are defined as <Table 9 Command Values for Auxiliary Control Function Settings>.

Sending data:

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

Radar ACK (success):

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

Indicates that the current setting is that the auxiliary control condition is met when the detected light-sense value is less than the set threshold; the light-sense threshold is set to 0x060; the default level of OUT is high

2.3 Radar Data Output Protocol

LD2410B outputs radar detection results through the serial port, and outputs basic target information by default, including target status, motion energy value, static Information such as stop energy value, movement distance, and standstill distance. If the radar is configured for engineering mode, the radar will additionally output the energy value for each distance gate (motion & stationary). Radar data is output in the specified frame format.

2.3.1 Reported data frame format

The format of the radar uplink message frames defined by the protocol is shown in Tables 10 and 11. The definition of the value of the upload data type in normal operation mode and engineering mode is shown in Table 12.

Table 10 Format of reported data frames

Frame header	Length of data in the frame	Intra-frame data	End of frame
F4 F3 F2 F1	2 bytes	See Table 9	F8 F7 F6 F5

Table 11 Intra-frame data frame format

Data Type	Head	Target Data	Tail	Calibration
1 byte (see Table 10)	0xAA	See Table 11, Table 13	0x55	0x00

Table 12 Description of data types

Data type value	Description
0x01	Engineering Model Data
0x02	Target basic information data

2.3.2 Target data composition

The content of the target data reported by the radar will change depending on the operating mode of the radar. In normal operation mode, the radar outputs the basic information data of the target by default; when configured to engineering mode, the radar adds each distance gate energy value information after the basic information data of the target. Therefore, the basic information of the target will always be output in the radar reporting data, while the distance gate energy value information needs to be enabled by command before it will be output.

The composition of the target data reported by the radar in the normal operation mode is shown in Table 13, and the definition of the target state values is shown in Table 14. The composition of the target data frames in engineering mode is shown in Table 15, with additional data added to the data reported in normal operation mode.

Table 13 Composition of basic target information data

Target Status	Movement target distance (cm)	Exercise target energy value	Distance to stationary target (cm)	Stationary target energy value	Detection distance (cm)
1 byte (see Table 12)	2 bytes	1 byte	2 bytes	1 byte	2 bytes

Table 14 Description of target state values

Target state value	Description
0x00	No target
0x01	Campaign Objectives
0x02	Stationary Target
0x03	Motion & stationary targets

Table 15 Composition of engineering model target data

Add the following data after the target basic information data in Table 11

...	Maximum movement distance door N	Maximum resting distance door N	Movement distance gate 0 energy value	...	Movement distance gate N energy value	Stationary distance gate 0 energy value	...	Stationary distance gate N energy value	Photosensitive detection value	OUT pin output status
...	1 byte	1 byte	1 byte	...	1 byte	1 byte	...	1 byte	1 byte	1 byte

Photodetection value range: 0 to 255, OUT pin output state: 0 no one, 1 someone

Example of reported data:

Data reported in normal operating mode:

Frame header	Length of data in the frame	Intra-frame data	End of frame
F4 F3 F2 F1	0D 00	02 aa 02 51 00 00 00 00 3b 00 00 55 00	F8 F7 F6 F5

Data reported in engineering mode:

Frame header	Length of data in the frame	Intra-frame data	End of frame
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

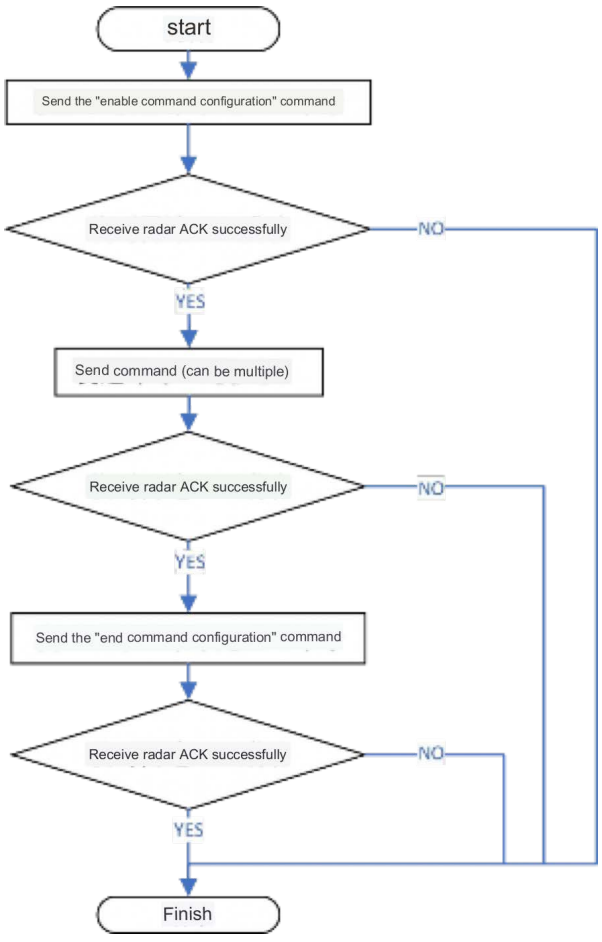
The process of executing a configuration command by LD2410B radar consists of two parts: the upper computer "sends the command" and the radar "replies to the command ACK". If the radar does not reply with ACK or fails to reply with ACK, it means the radar fails to execute the configuration command.

As mentioned earlier, before sending any other commands to the radar, the developer needs to send the "enable configuration" command and then send the configuration command within the specified time. After the commands are configured, send the "end configuration" command to inform the radar that the configuration is finished.

For example, if you want to read the radar configuration parameters, firstly, the upper computer sends the "enable configuration" command; after receiving a successful radar ACK, then sends the "read parameters" command; after receiving a successful radar ACK, finally sends the When the radar ACK is successful, then send the "end configuration" command; when the radar ACK is successful, it indicates that the complete action of reading parameters is finished.

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

Figure 2 Radar command configuration flow



3 Revision Record

Date	Versions	Modified content
2022-6-24	1.01	Initial Version
2022-7-1	1.02	Fix some error descriptions, add reboot and restore factory commands
2022-7-19	1.03	Fix the length value of some command instances
2022-8-26	1.04	Add distance resolution configuration command description
2022-9-20	1.05	Add Bluetooth part of the protocol
2023-2-20	1.06	Add light sensor value output description, add auxiliary control function setting command

4 Technical support and contact information

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