YDLIDAR SDK

V1.4.6

Generated by Doxygen 1.8.11

Contents

Chapter 1

CYdLidar(YDLIDAR SDK API)

Library	CYdLidar
File	CYdLidar.h
Author	Tony [code at ydlidar com]
Source	https://github.com/ydlidar/YDLidar-SDK
Version	1.0.0
Sample	ydlidar test[G1 G2 G4 G6 S2 X2 X4)

This API calls Two LiDAR interface classes in the following sections:

- YDlidarDriver

Jump to the ::CYdLidar interface documentation.

Chapter 2

YDlidarDriver

YDlidarDriver API

Library	YDlidarDriver
File	ydlidar_driver.h
Author	Tony [code at ydlidar com]
Source	https://github.com/ydlidar/YDLidar-SDK
Version	1.0.0

This YDlidarDriver support TYPE_TRIANGLE and TYPE_TOF LiDAR

Copyright

Chapter 3

README

YDLIDAR SDK

1 Introduction

YDLIDAR(https://www.ydlidar.com/) series is a set of high-performance and low-cost LIDAR sensors, which is the perfect sensor of 2D SLAM, 3D reconstruction, multi-touch, and safety applications.

If you are using ROS (Robot Operating System), please use our open-source ROS Driver .

1.1 Prerequisites

- Linux
- Windows 7/10, Visual Studio 2015/2017
- C++11 compiler

1.2 Release Notes

Title	Version	Data
SDK	1.4.6	2020-02-15

- [feat] the output points are fixed, when FixedResolution is set to true.

2 YDLidar SDK Communication Protocol

YDLidar SDK communication protocol opens to all users. It is the communication protocol between user programs and YDLIDAR products. The protocol consists of control commands and data format. Please refer to the YDLidar SDK Communication Protocol for detailed information.

3 YDLidar SDK

YDLidar SDK provides the implementation of control commands and Laser scan data transmission, as well as the C/C++ API. The basic structure of YDLidar SDK is shown as below:

Serial or network is used for communication between YDLidar SDK and LiDAR sensors. Please refer to the YDLidar SDK Communication Protocol for further information. LaserScan supports Laser Scan Data transmission, while Command handler receives and sends control commands. And the C++ API is based on Command and LaserScan Hander.

The YDLidar LiDAR sensors can be connected to host directly by serial or through the YDLidar Adapter board. YDLidar SDK supports both connection methods. When LiDAR units are connected to host directly by Serial, the host will establish communication with each LiDAR unit individually. And if the LiDAR units connect to host through Adapter board, then the host only communicates with the YDLidar Adapter board while the Adapter Board communicates with each LiDAR unit.

4 YDLidar SDK API

YDLidar SDK API provides a set of C++ style functions which can be conveniently integrated in C/C++ programs. Please refer to the `YDLidar SDK API Reference` for further information.

4.1 Installation

The installation procedures in Ubuntu 18.04/16.04/14.04 LTS and Windows 7/10 are shown here as examples. For Ubuntu 18.04/16.04/14.04 32-bit LTS and Mac, you can get it in `YDLidar-SDK wiki`.

4.1.1 Ubuntu 18.04/16.04/14.04 LTS

Dependencies

YDLidar SDK requires `CMake 2.8.2+` as dependencies. You can install these packages using apt:

```
1 sudo apt install cmake pkg-config
```

Compile YDLidar SDK

In the YDLidar SDK directory, run the following commands to compile the project:

```
1 git clone https://github.com/YDLIDAR/YDLidar-SDK.git
2 cd YDLidar-SDK/build
3 cmake ..
4 make
5 sudo make install
```

4.1.2 Windows 7/10

Dependencies

YDLidar SDK supports Visual Studio 2015/2017 and requires `CMake 2.8.2+` as dependencies. `vcpkg` is recommended for building the dependency libraries as follows: For the 32-bit project:

```
1 .\vcpkg install cmake
2 .\vcpkg integrate install
```

For the 64-bit project:

```
1 .\vcpkg install cmake:x64-windows
2 .\vcpkg integrate install
```

Then, in the YDLidar SDK directory, run the following commands to create the Visual Studio solution file. Please replace [vcpkgroot] with your vcpkg installation path. Generate the 32-bit project:

```
1 cd build && \
2 cmake .. "-DCMAKE_TOOLCHAIN_FILE=[vcpkgroot]\scripts\buildsystems\vcpkg.cmake"
```

Generate the 64-bit project:

```
1 cd build && \
2 cmake .. -G "Visual Studio 15 2017 Win64"
       "-DCMAKE_TOOLCHAIN_FILE=[vcpkgroot]\scripts\buildsystems\vcpkg.cmake"
```

Compile YDLidar SDK

You can now compile the YDLidar SDK in Visual Studio.

4.2 Run YDLidar SDK Sample

Three samples are provided in samples, which demonstrate how to configure YDLidar LiDAR units and receive the laser scan data when directly connecting YDLidar SDK to LiDAR units or by using a YDLidar Adapter board, respectively. The sequence diagram is shown as below:

4.2.1 Ubuntu 18.04/16.04 /14.04 LTS

For Ubuntun 18.04/16.04/14.04 LTS, run the *ydlidar_test* if connect with the Triangle LiDAR unit(s) or TOF LiDAR unit(s):

```
1 ./ydlidar_test
```

4.2.2 Windows 7/10

After compiling the YDLidar SDK as shown in section 4.1.2, you can find `ydlidar_test.exe` in the {sdk} or {sdk} folder, respectively, which can be run directly.

Then you can see SDK initializing the information as below:

Then you can see SDK Scanning the information as below:

4.3 Connect to the specific LiDAR units

Samples we provided will connect all the LiDAR device in you USB in default.There are two ways to connect the specific units:

- run sample with input options in serial port.
- run sample with input options in network.

4.3.1 Program Options

We provide the following program options for connecting the specific units :

```
1 [Please select the lidar baudrate:]: input LiDAR BaudRate.
2 [Whether the Lidar is one-way communication[yes/no]:]: Whether The Current LiDAR is single-channel.
3 [Whether the Lidar is a TOF Lidar [yes/no]:]: Whether The Current LiDAR is TOF Type LiDAR.
4 [Please enter the lidar scan frequency[5-12]:]:input LiDAR Scan Frequency.
```

Note: Specific LiDAR Input Options, refer to DataSet

Here is the example:

```
1 __   ______  _     ___ ____     _    ____
2 \ \ / /  _ \| |   |_ _|  _ \   / \  |  _ \
3  \ V /| | | | |    | || | | |/ _ \ | |_) |
4   | | | |_| | |___ | || |_| / ___ \|  _ <
5   |_| |____/|_____|___|____/_/   \_\_| \_\
6
7 Baudrate:
8 0. 115200
9 1. 128000
10 2. 153600
11 3. 230400
12 4. 512000
13 Please select the lidar baudrate:4
14 Whether the Lidar is one-way communication[yes/no]:no
15 Whether the Lidar is a TOF Lidar [yes/no]:yes
16 Please enter the lidar scan frequency[5-12]:10
```

5 SDK Flow Chart

6 TOF LiDAR

7 Dataset

LIDAR	Model	Baudrate	Sample↩ Rate(K)	Range(m)	Frequency(HZ)	Intenstiy(b	Single↩ Channel	voltage(↩ V)
F4	1	115200	4	0.12∼12	5∼12	false	false	4.8∼5.2
S4	4	115200	4	0.10∼8.0	5∼12 (PWM)	false	false	4.8∼5.2
S4B	4/11	153600	4	0.10∼8.0	5∼12(P↩ WM)	true(8)	false	4.8∼5.2
S2	4/12	115200	3	0.10∼8.0	4∼8(P↩ WM)	false	true	4.8∼5.2

LIDAR	Model	Baudrate	Sample↩ Rate(K)	Range(m)	Frequency(HZ)	Intenstiy(b	Single↩ Channel	voltage(↩ V)
G4	5	230400	9/8/4	0.↩ 28/0.26/0.↩ 1∼16	5∼12	false	false	4.8∼5.2
X4	6	128000	5	0.12∼10	5∼12(P↩ WM)	false	false	4.8∼5.2
X2/X2L	6	115200	3	0.10∼8.0	4∼8(P↩ WM)	false	true	4.8∼5.2
G4PRO	7	230400	9/8/4	0.↩ 28/0.26/0.↩ 1∼16	5∼12	false	false	4.8∼5.2
F4PRO	8	230400	4/6	0.12∼12	5∼12	false	false	4.8∼5.2
R2	9	230400	5	0.12∼16	5∼12	false	false	4.8∼5.2
G6	13	512000	18/16/8	0.↩ 28/0.26/0.↩ 1∼25	5∼12	false	false	4.8∼5.2
G2A	14	230400	5	0.12∼12	5∼12	false	false	4.8∼5.2
G2	15	230400	5	0.28∼16	5∼12	true(8)	false	4.8∼5.2
G2C	16	115200	4	0.1∼12	5∼12	false	false	4.8∼5.2
G4B	17	512000	10	0.12∼16	5∼12	true(10)	false	4.8∼5.2
G4C	18	115200	4	0.1∼12	5∼12	false	false	4.8∼5.2
G1	19	230400	9	0.28∼16	5∼12	false	false	4.8∼5.2
TX8	100	115200	4	0.1∼8	4∼8(P↩ WM)	false	true	4.8∼5.2
TX20	100	115200	4	0.1∼20	4∼8(P↩ WM)	false	true	4.8∼5.2
TG15	100	512000	20/18/10	0.05∼15	3∼16	false	false	4.8∼5.2
TG30	101	512000	20/18/10	0.05∼30	3∼16	false	false	4.8∼5.2
TG50	102	512000	20/18/10	0.05∼50	3∼16	false	false	4.8∼5.2

Note: PWM option speed control requires external PWM wave.

8 Licence

The SDK itself is licensed under BSD license

9 Support

You can get support from YDLidar with the following methods:

- Send email to `support@ydlidar.com` with a clear description of your problem and your setup
- Github Issues

10 Contact EAI

If you have any extra questions, please feel free to `contact us`

Chapter 4

Namespace Index

4.1 Namespace List

Here is a list of all namespaces with brief descriptions:

Chapter 5

Class Index

5.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 6

File Index

6.1 File List

Here is a list of all files with brief descriptions:

Chapter 7

Namespace Documentation

7.1 angles Namespace Reference

Functions

- static double from_degrees (double degrees)

  Convert degrees to radians.
- static double to_degrees (double radians)

  Convert radians to degrees.
- static double normalize_angle_positive (double angle)

  normalize_angle_positive
- static double normalize_angle (double angle)

  normalize
- static double shortest_angular_distance (double from, double to)

  shortest_angular_distance
- static double two_pi_complement (double angle)

  returns the angle in [-2∗M_PI, 2∗M_PI] going the other way along the unit circle.
- static bool find_min_max_delta (double from, double left_limit, double right_limit, double &result_min_delta, double &result_max_delta)

  This function is only intended for internal use and not intended for external use. If you do use it, read the documentation very carefully. Returns the min and max amount (in radians) that can be moved from "from" angle to "left_limit" and "right_limit".
- static bool shortest_angular_distance_with_limits (double from, double to, double left_limit, double right_limit, double &shortest_angle)

  Returns the delta from "from_angle" to "to_angle" making sure it does not violate limits specified by left_limit and right_limit. The valid interval of angular positions is [left_limit,right_limit]. E.g., [-0.25,0.25] is a 0.5 radians wide interval that contains 0. But [0.25,-0.25] is a 2∗M_PI-0.5 wide interval that contains M_PI (but not 0). The value of shortest_angle is the angular difference between "from" and "to" that lies within the defined valid interval. E.g. shortest_angular_distance_with_limits(-0.5,0.5,0.25,-0.25,ss) evaluates ss to 2∗M_PI-1.0 and returns true while shortest_angular_distance_with_limits(-0.5,0.5,-0.25,0.25,ss) returns false since -0.5 and 0.5 do not lie in the interval [-0.25,0.25].

7.1.1 Function Documentation

7.1.1.1 static bool angles::find_min_max_delta (double *from,* double *left_limit,* double *right_limit,* double & *result_min_delta,* double & *result_max_delta*) [static]

This function is only intended for internal use and not intended for external use. If you do use it, read the documentation very carefully. Returns the min and max amount (in radians) that can be moved from "from" angle to "left_limit" and "right_limit".

Returns

returns false if "from" angle does not lie in the interval [left_limit,right_limit]

Parameters

from	- "from" angle - must lie in [-M_PI, M_PI)
left_limit	- left limit of valid interval for angular position - must lie in [-M_PI, M_PI], left and right limits are specified on the unit circle w.r.t to a reference pointing inwards
right_limit	- right limit of valid interval for angular position - must lie in [-M_PI, M_PI], left and right limits are specified on the unit circle w.r.t to a reference pointing inwards
result_min_delta	- minimum (delta) angle (in radians) that can be moved from "from" position before hitting the joint stop
result_max_delta	- maximum (delta) angle (in radians) that can be movedd from "from" position before hitting the joint stop

7.1.1.2 static double angles::from_degrees (double *degrees*) [inline], [static]

Convert degrees to radians.

7.1.1.3 static double angles::normalize_angle (double *angle*) [inline], [static]

normalize

Normalizes the angle to be -M_PI circle to +M_PI circle It takes and returns radians.

7.1.1.4 static double angles::normalize_angle_positive (double *angle*) [inline], [static]

normalize_angle_positive

Normalizes the angle to be 0 to 2∗M_PI It takes and returns radians.

7.1.1.5 static double angles::shortest_angular_distance (double *from,* double *to*) [inline], [static]

shortest_angular_distance

Given 2 angles, this returns the shortest angular difference. The inputs and ouputs are of course radians.

The result would always be -pi <= result <= pi. Adding the result to "from" will always get you an equivelent angle to "to".

7.1.1.6 static bool angles::shortest_angular_distance_with_limits (double *from,* double *to,* double *left_limit,* double *right_limit,* double & *shortest_angle*) [inline], [static]

Returns the delta from "from_angle" to "to_angle" making sure it does not violate limits specified by left_limit and right_limit. The valid interval of angular positions is [left_limit,right_limit]. E.g., [-0.25,0.25] is a 0.5 radians wide interval that contains 0. But [0.25,-0.25] is a 2∗M_PI-0.5 wide interval that contains M_PI (but not 0). The value of shortest_angle is the angular difference between "from" and "to" that lies within the defined valid interval. E.↩ g. shortest_angular_distance_with_limits(-0.5,0.5,0.25,-0.25,ss) evaluates ss to 2∗M_PI-1.0 and returns true while shortest_angular_distance_with_limits(-0.5,0.5,-0.25,0.25,ss) returns false since -0.5 and 0.5 do not lie in the interval [-0.25,0.25].

Returns

true if "from" and "to" positions are within the limit interval, false otherwise

Parameters

from	- "from" angle
to	- "to" angle
left_limit	- left limit of valid interval for angular position, left and right limits are specified on the unit circle w.r.t to a reference pointing inwards
right_limit	- right limit of valid interval for angular position, left and right limits are specified on the unit circle w.r.t to a reference pointing inwards
shortest_angle	- result of the shortest angle calculation

7.1.1.7 static double angles::to_degrees (double *radians*) [inline], [static]

Convert radians to degrees.

7.1.1.8 static double angles::two_pi_complement (double *angle*) [inline], [static]

returns the angle in [-2∗M_PI, 2∗M_PI] going the other way along the unit circle.

Parameters

angle	The angle to which you want to turn in the range [-2∗M_PI, 2∗M_PI] E.g. two_pi_complement(-M_PI/4) returns 7_M_PI/4 two_pi_complement(M_PI/4) returns -7∗M_PI/4

7.2 impl Namespace Reference

Functions

- uint32_t getHDTimer ()
- uint64_t getCurrentTime ()

7.2.1 Function Documentation

7.2.1.1 uint64_t impl::getCurrentTime ( )

7.2.1.2 uint32_t impl::getHDTimer ( )

7.3 serial Namespace Reference

Classes

- class MillisecondTimer
- struct PortInfo
- class Serial
- struct termios2
- struct Timeout

Enumerations

- enum bytesize_t { fivebits = 5, sixbits = 6, sevenbits = 7, eightbits = 8 }
- enum parity_t {
  parity_none = 0, parity_odd = 1, parity_even = 2, parity_mark = 3,
  parity_space = 4 }
- enum stopbits_t { stopbits_one = 1, stopbits_two = 2, stopbits_one_point_five }
- enum flowcontrol_t { flowcontrol_none = 0, flowcontrol_software, flowcontrol_hardware }

Functions

- std::vector< PortInfo > list_ports ()
- timespec timespec_from_ms (const uint32_t millis)
- static void set_common_props (termios *tio)
- static void set_databits (termios *tio, serial::bytesize_t databits)
- static void set_parity (termios *tio, serial::parity_t parity)
- static void set_stopbits (termios *tio, serial::stopbits_t stopbits)
- static void set_flowcontrol (termios *tio, serial::flowcontrol_t flowcontrol)
- static bool is_standardbaudrate (unsigned long baudrate, speed_t &baud)

7.3.1 Detailed Description

setup_port - Configure the port, eg. baud rate, data bits,etc.

Parameters

fd	: The serial port
speed	: The baud rate
data_bits	: The data bits
parity	: The parity bits
stop_bits	: The stop bits

Returns

Return 0 if everything is OK, otherwise -1 with some error msg.

Note

Here are termios structure members:

```
Member      Description
c_cflag     Control options
c_lflag     Line options
c_iflag     Input options
c_oflag     Output options
c_cc        Control characters
c_ispeed    Input baud (new interface)
c_ospeed    Output baud (new interface)
```

The c_cflag member controls the baud rate, number of data bits, parity, stop bits, and hardware flow control. There are constants for all of the supported configurations. Constant Description

```
CBAUD   Bit mask for baud rate
B0  0 baud (drop DTR)
B50 50 baud
B75 75 baud
B110    110 baud
B134    134.5 baud
B150    150 baud
B200    200 baud
B300    300 baud
B600    600 baud
B1200   1200 baud
B1800   1800 baud
B2400   2400 baud
B4800   4800 baud
B9600   9600 baud
B19200  19200 baud
B38400  38400 baud
B57600  57,600 baud
B76800  76,800 baud
B115200 115,200 baud
EXTA    External rate clock
EXTB    External rate clock
CSIZE   Bit mask for data bits
CS5 5   data bits
CS6 6   data bits
CS7 7   data bits
CS8 8   data bits
CSTOPB  2 stop bits (1 otherwise)
CREAD   Enable receiver
PARENB  Enable parity bit
PARODD  Use odd parity instead of even
HUPCL   Hangup (drop DTR) on last close
CLOCAL  Local line - do not change "owner" of port
LOBLK   Block job control output
CNEW_RTSCTS CRTSCTS Enable hardware flow control (not supported on all
platforms)
```

The input modes member c_iflag controls any input processing that is done to characters received on the port. Like the c_cflag field, the final value stored in c_iflag is the bitwise OR of the desired options.

```
Constant    Description
INPCK   Enable parity check
IGNPAR  Ignore parity errors
PARMRK  Mark parity errors
ISTRIP  Strip parity bits
IXON    Enable software flow control (outgoing)
IXOFF   Enable software flow control (incoming)
IXANY   Allow any character to start flow again
IGNBRK  Ignore break condition
BRKINT  Send a SIGINT when a break condition is detected
INLCR   Map NL to CR
IGNCR   Ignore CR
ICRNL   Map CR to NL
IUCLC   Map uppercase to lowercase
IMAXBEL Echo BEL on input line too long
```

Here are some examples of setting parity checking:
No parity (8N1):

```
options.c_cflag &= ~PARENB
options.c_cflag &= ~CSTOPB
options.c_cflag &= ~CSIZE;
options.c_cflag |= CS8;
```

Even parity (7E1):

```
options.c_cflag |= PARENB
options.c_cflag &= ~PARODD
options.c_cflag &= ~CSTOPB
options.c_cflag &= ~CSIZE;
options.c_cflag |= CS7;
```

Odd parity (7O1):

```
options.c_cflag |= PARENB
options.c_cflag |= PARODD
options.c_cflag &= ~CSTOPB
options.c_cflag &= ~CSIZE;
options.c_cflag |= CS7;
```

7.3.2 Enumeration Type Documentation

7.3.2.1 enum serial::bytesize_t

Enumeration defines the possible bytesizes for the serial port.

Enumerator

fivebits

sixbits

sevenbits

eightbits

7.3.2.2 enum serial::flowcontrol_t

Enumeration defines the possible flowcontrol types for the serial port.

Enumerator

flowcontrol_none

flowcontrol_software

flowcontrol_hardware

7.3.2.3 enum serial::parity_t

Enumeration defines the possible parity types for the serial port.

Enumerator

parity_none

parity_odd

parity_even

parity_mark

parity_space

7.3.2.4 enum serial::stopbits_t

Enumeration defines the possible stopbit types for the serial port.

Enumerator

stopbits_one

stopbits_two

stopbits_one_point_five

7.3.3 Function Documentation

7.3.3.1 static bool serial::is_standardbaudrate (unsigned long *baudrate,* speed_t & *baud*) [inline], [static]

7.3.3.2 std::vector<PortInfo> serial::list_ports ( )

7.3.3.3 static void serial::set_common_props (termios * *tio*) [inline], [static]

7.3.3.4 static void serial::set_databits (termios * *tio,* serial::bytesize_t *databits*) [inline], [static]

7.3.3.5 static void serial::set_flowcontrol (termios * *tio,* serial::flowcontrol_t *flowcontrol*) [inline], [static]

7.3.3.6 static void serial::set_parity (termios * *tio,* serial::parity_t *parity*) [inline], [static]

7.3.3.7 static void serial::set_stopbits (termios * *tio,* serial::stopbits_t *stopbits*) [inline], [static]

7.3.3.8 timespec serial::timespec_from_ms (const uint32_t *millis*)

7.4 ydlidar Namespace Reference

Classes

- class YDlidarDriver

Enumerations

- enum YDLIDAR_MODLES {
  YDLIDAR_F4 = 1, YDLIDAR_T1 = 2, YDLIDAR_F2 = 3, YDLIDAR_S4 = 4,
  YDLIDAR_G4 = 5, YDLIDAR_X4 = 6, YDLIDAR_G4PRO = 7, YDLIDAR_F4PRO = 8,
  YDLIDAR_R2 = 9, YDLIDAR_G10 = 10, YDLIDAR_S4B = 11, YDLIDAR_S2 = 12,
  YDLIDAR_G6 = 13, YDLIDAR_G2A = 14, YDLIDAR_G2B = 15, YDLIDAR_G2C = 16,
  YDLIDAR_G4B = 17, YDLIDAR_G4C = 18, YDLIDAR_G1 = 19, YDLIDAR_TG15 = 100,
  YDLIDAR_TG30 = 101, YDLIDAR_TG50 = 102, YDLIDAR_Tail }
- enum YDLIDAR_RATE { YDLIDAR_RATE_4K = 0, YDLIDAR_RATE_8K = 1, YDLIDAR_RATE_9K = 2, YDLIDAR_RATE_10K = 3 }

Functions

- std::string lidarModelToString (int model)

  lidarModelToString
- int lidarModelDefaultSampleRate (int model)

  lidarModelDefaultSampleRate
- bool isOctaveLidar (int model)

  isOctaveLidar
- bool hasSampleRate (int model)

  hasSampleRate
- bool hasZeroAngle (int model)

  hasZeroAngle
- bool hasScanFrequencyCtrl (int model)

  hasScanFrequencyCtrl
- bool isSupportLidar (int model)

  isSupportLidar
- bool hasIntensity (int model)

  hasIntensity
- bool isSupportMotorCtrl (int model)

  isSupportMotorCtrl
- bool isSupportScanFrequency (int model, double frequency)

  isSupportScanFrequency
- bool isTOFLidar (int type)
- bool isOldVersionTOFLidar (int model, int Major, int Minor)
- bool isValidSampleRate (std::map< int, int > smap)
- int ConvertUserToLidarSmaple (int model, int m_SampleRate, int defaultRate)
- int ConvertLidarToUserSmaple (int model, int rate)
- bool isValidValue (uint8_t value)
- bool isVersionValid (const LaserDebug &info)
- bool isSerialNumbValid (const LaserDebug &info)
- bool ParseLaserDebugInfo (const LaserDebug &info, device_info &value)
- void init (int argc, char *argv[])
- bool ok ()
- void shutdownNow ()
- bool fileExists (const std::string filename)

7.4.1 Enumeration Type Documentation

7.4.1.1 enum ydlidar::YDLIDAR_MODLES

Enumerator

YDLIDAR_F4 F4雷达型号代号.

YDLIDAR_T1 T1雷达型号代号.

YDLIDAR_F2 F2雷达型号代号.

YDLIDAR_S4 S4雷达型号代号.

YDLIDAR_G4 G4雷达型号代号.

YDLIDAR_X4 X4雷达型号代号.

YDLIDAR_G4PRO G4PRO雷达型号代号.

YDLIDAR_F4PRO F4PRO雷达型号代号.

YDLIDAR_R2 R2雷达型号代号.
YDLIDAR_G10 G10雷达型号代号.
YDLIDAR_S4B S4B雷达型号代号.
YDLIDAR_S2 S2雷达型号代号.
YDLIDAR_G6 G6雷达型号代号.
YDLIDAR_G2A G2A雷达型号代号.
YDLIDAR_G2B G2雷达型号代号.
YDLIDAR_G2C G2C雷达型号代号.
YDLIDAR_G4B G4B雷达型号代号.
YDLIDAR_G4C G4C雷达型号代号.
YDLIDAR_G1 G1雷达型号代号.
YDLIDAR_TG15 TG15雷达型号代号.
YDLIDAR_TG30 T30雷达型号代号.
YDLIDAR_TG50 TG50雷达型号代号.
YDLIDAR_Tail

7.4.1.2 enum ydlidar::YDLIDAR_RATE

Enumerator

YDLIDAR_RATE_4K
YDLIDAR_RATE_8K
YDLIDAR_RATE_9K
YDLIDAR_RATE_10K

7.4.2 Function Documentation

7.4.2.1 int ydlidar::ConvertLidarToUserSmaple (int *model,* int *rate*) [inline]

7.4.2.2 int ydlidar::ConvertUserToLidarSmaple (int *model,* int *m_SampleRate,* int *defaultRate*) [inline]

7.4.2.3 bool ydlidar::fileExists (const std::string *filename*) [inline]

7.4.2.4 bool ydlidar::hasIntensity (int *model*) [inline]

hasIntensity

Parameters

model	

Returns

7.4.2.5 bool ydlidar::hasSampleRate (int *model*) [inline]

hasSampleRate

Parameters

model	

Returns

7.4.2.6 bool ydlidar::hasScanFrequencyCtrl (int *model*) [inline]

hasScanFrequencyCtrl

Parameters

model	

Returns

7.4.2.7 bool ydlidar::hasZeroAngle (int *model*) [inline]

hasZeroAngle

Parameters

model	

Returns

7.4.2.8 void ydlidar::init (int *argc*, char * *argv[]*) [inline]

7.4.2.9 bool ydlidar::isOctaveLidar (int *model*) [inline]

isOctaveLidar

Parameters

model	

Returns

7.4.2.10 bool ydlidar::isOldVersionTOFLidar (int *model,* int *Major,* int *Minor*) [inline]

7.4.2.11 bool ydlidar::isSerialNumbValid (const LaserDebug & *info*) [inline]

7.4.2.12 bool ydlidar::isSupportLidar (int *model*) [inline]

isSupportLidar

Parameters

model	

Returns

7.4.2.13 bool ydlidar::isSupportMotorCtrl (int *model*) [inline]

isSupportMotorCtrl

Parameters

model	

Returns

7.4.2.14 bool ydlidar::isSupportScanFrequency (int *model,* double *frequency*) [inline]

isSupportScanFrequency

Parameters

model	
frequency	

Returns

7.4.2.15 bool ydlidar::isTOFLidar (int *type*) [inline]

7.4.2.16 bool ydlidar::isValidSampleRate (std::map< int, int > *smap*) [inline]

7.4.2.17 bool ydlidar::isValidValue (uint8_t *value*) [inline]

7.4.2.18 bool ydlidar::isVersionValid (const LaserDebug & *info*) [inline]

7.4.2.19 int ydlidar::lidarModelDefaultSampleRate (int *model*) [inline]

lidarModelDefaultSampleRate

Parameters

model	

Returns

7.4.2.20 std::string ydlidar::lidarModelToString (int *model*) [inline]

lidarModelToString

Parameters

model	

Returns

7.4.2.21 bool ydlidar::ok ( ) [inline]

7.4.2.22 bool ydlidar::ParseLaserDebugInfo (const LaserDebug & *info,* device_info & *value*) [inline]

7.4.2.23 void ydlidar::shutdownNow ( ) [inline]

Chapter 8

Class Documentation

8.1 cmd_packet Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t syncByte
- uint8_t cmd_flag
- uint8_t size
- uint8_t data

8.1.1 Member Data Documentation

8.1.1.1 uint8_t cmd_packet::cmd_flag

8.1.1.2 uint8_t cmd_packet::data

8.1.1.3 uint8_t cmd_packet::size

8.1.1.4 uint8_t cmd_packet::syncByte

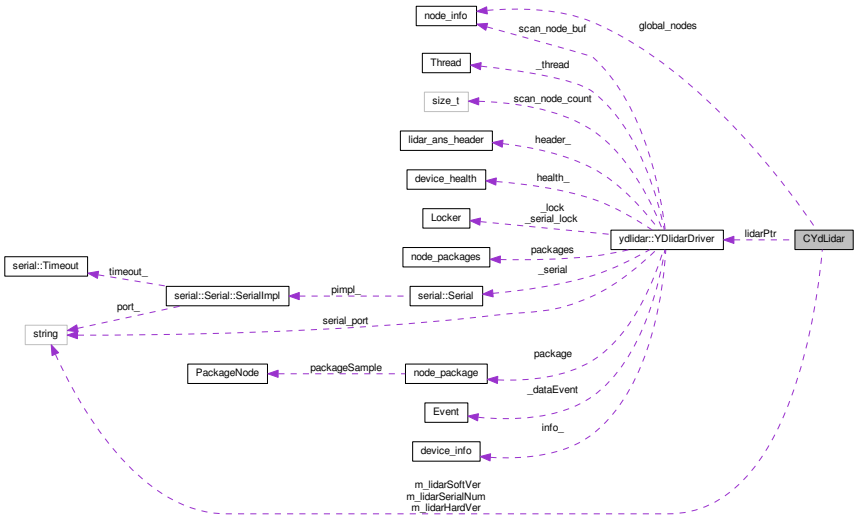
The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.2 CYdLidar Class Reference

`#include <CYdLidar.h>`

Collaboration diagram for CYdLidar:



Public Member Functions

- CYdLidar ()

  Constructor.
- virtual ~CYdLidar ()

  Destructor: turns the laser off.
- bool initialize ()

  initialize
- bool doProcessSimple (LaserScan &outscan, bool &hardwareError)
- bool turnOn ()

  See base class docs.
- bool turnOff ()

  See base class docs.
- void disconnecting ()

  Closes the comms with the laser. Shouldn't have to be directly needed by the user.
- float getAngleOffset () const
- bool isAngleOffetCorrected () const
- std::string getSoftVersion () const

  get lidar software version
- std::string getHardwareVersion () const

  get lidar hardware version
- std::string getSerialNumber () const

  get lidar serial number

Protected Member Functions

- bool checkCOMMs ()
- bool checkStatus ()
- bool checkHardware ()
- bool getDeviceHealth ()
- bool getDeviceInfo ()
- void checkSampleRate ()

  checkSampleRate
- bool CalculateSampleRate (int count, double scan_time)

  CalculateSampleRate.
- bool checkScanFrequency ()
- bool checkLidarAbnormal ()
- void checkCalibrationAngle (const std::string &serialNumber)

  checkCalibrationAngle
- bool isRangeValid (double reading) const

  isRangeValid
- bool isRangeIgnore (double angle) const

  isRangeIgnore
- void handleSingleChannelDevice ()

  handleSingleChannelDevice
- void parsePackageNode (const node_info &node, LaserDebug &info)

  parsePackageNode
- void handleDeviceInfoPackage (int count)

  handleDeviceInfoPackage
- void printfVersionInfo (const device_info &info)

  printfVersionInfo

Private Member Functions

- PropertyBuilderByName (float, MaxRange, private) ; PropertyBuilderByName(float

  Set and Get LiDAR Maximum effective range.
- PropertyBuilderByName (float, MaxAngle, private)

  Set and Get LiDAR Maximum effective angle.
- PropertyBuilderByName (float, MinAngle, private)

  Set and Get LiDAR Minimum effective angle.
- PropertyBuilderByName (int, SampleRate, private)

  Set and Get LiDAR Sampling rate.
- PropertyBuilderByName (float, ScanFrequency, private)

  Set and Get LiDAR Scan frequency.
- PropertyBuilderByName (bool, FixedResolution, private)

  Set and Get LiDAR Fixed angluar resolution.
  .
- PropertyBuilderByName (bool, Reversion, private)

  Set and Get LiDAR Reversion.
  true: LiDAR data rotated 180 degrees.
  false: Keep raw Data.
  default: false
  .
- PropertyBuilderByName (bool, Inverted, private)

Set and Get LiDAR inverted.
true: Data is counterclockwise
false: Data is clockwise
Default: clockwise.

- PropertyBuilderByName (bool, AutoReconnect, private)

  Set and Get LiDAR Automatically reconnect flag.
  Whether to support hot plug.
- PropertyBuilderByName (int, SerialBaudrate, private)

  Set and Get LiDAR baudrate or network port.
- PropertyBuilderByName (int, AbnormalCheckCount, private)

  Set and Get LiDAR Maximum number of abnormal checks.
- PropertyBuilderByName (std::string, SerialPort, private)

  Set and Get LiDAR Serial port or network IP address.
- PropertyBuilderByName (std::vector< float >, IgnoreArray, private)

  Set and Get LiDAR filtering angle area.
- PropertyBuilderByName (float, OffsetTime, private)
- PropertyBuilderByName (bool, SingleChannel, private)

  Set and Get LiDAR single channel. Whether LiDAR communication channel is a single-channel.
- PropertyBuilderByName (int, LidarType, private)

  Set and Get LiDAR Type.

Private Attributes

- MinRange
- private
- bool isScanning
- int m_FixedSize
- float m_AngleOffset
- bool m_isAngleOffsetCorrected
- float frequencyOffset
- int lidar_model
- uint8_t Major
- uint8_t Minjor
- YDlidarDriver * lidarPtr
- uint64_t m_PointTime
- uint64_t last_node_time
- node_info * global_nodes
- std::map< int, int > SampleRateMap
- bool m_ParseSuccess
- std::string m_lidarSoftVer
- std::string m_lidarHardVer
- std::string m_lidarSerialNum
- int defalutSampleRate
- int m_UserSampleRate

8.2.1 Detailed Description

"Dataset"

LIDAR	Model	Baudrate	Sample↩ Rate(K)	Range(m)	Frequency HZ)	Intenstiy(I	Single↩ Channel	voltage(↩ V)
F4	1	115200	4	0.12∼12	5∼12	false	false	4.8∼5.2
S4	4	115200	4	0.↩ 10∼8.0	5∼12 (PWM)	false	false	4.8∼5.2
S4B	4/11	153600	4	0.↩ 10∼8.0	5∼12(P↩ WM)	true(8)	false	4.8∼5.2
S2	4/12	115200	3	0.↩ 10∼8.0	4∼8(P↩ WM)	false	true	4.8∼5.2
G4	5	230400	9/8/4	0.↩ 28/0.26/0.↩ 1∼16	5∼12	false	false	4.8∼5.2
X4	6	128000	5	0.12∼10	5∼12(P↩ WM)	false	false	4.8∼5.2
X2/X2L	6	115200	3	0.↩ 10∼8.0	4∼8(P↩ WM)	false	true	4.8∼5.2
G4PRO	7	230400	9/8/4	0.↩ 28/0.26/0.↩ 1∼16	5∼12	false	false	4.8∼5.2
F4PRO	8	230400	4/6	0.12∼12	5∼12	false	false	4.8∼5.2
R2	9	230400	5	0.12∼16	5∼12	false	false	4.8∼5.2
G6	13	512000	18/16/8	0.↩ 28/0.26/0.↩ 1∼25	5∼12	false	false	4.8∼5.2
G2A	14	230400	5	0.12∼12	5∼12	false	false	4.8∼5.2
G2	15	230400	5	0.28∼16	5∼12	true(8)	false	4.8∼5.2
G2C	16	115200	4	0.1∼12	5∼12	false	false	4.8∼5.2
G4B	17	512000	10	0.12∼16	5∼12	true(10)	false	4.8∼5.2
G4C	18	115200	4	0.1∼12	5∼12	false	false	4.8∼5.2
G1	19	230400	9	0.28∼16	5∼12	false	false	4.8∼5.2
TX8	100	115200	4	0.01∼8	4∼8(P↩ WM)	false	true	4.8∼5.2
TX20	100	115200	4	0.01∼8	4∼8(P↩ WM)	false	true	4.8∼5.2
TG15	100	512000	20/18/10	0.01∼30	3∼16	false	false	4.8∼5.2
TG30	101	512000	20/18/10	0.01∼30	3∼16	false	false	4.8∼5.2
TG50	102	512000	20/18/10	0.01∼50	3∼16	false	false	4.8∼5.2

Dataset:

example: G4 LiDAR

```
CYdLidar laser;
laser.setMaxAngle(180);
laser.setMinAngle(-180);
laser.setMinRange(0.1);
laser.setMaxRange(16.0);
laser.setSerialPort("/dev/ydlidar");
laser.setSerialBaudrate(230400);
laser.setFixedResolution(false);
laser.setReversion(true);
laser.setInverted(true);
laser.setScanFrequency(10.0);
laser.setSampleRate(9);
laser.setAutoReconnect(true);
std::vector<float> ignore_array;
laser.setIgnoreArray(ignore_array);
laser.setSingleChannel(false);
laser.setLidarType(TYPE_TRIANGLE);
laser.setDeviceType(YDLIDAR_TYPE_SERIAL);
```

```
laser.setIntensity(false);
laser.setAbnormalCheckCount(4);
laser.setSupportMotorDtrCtrl(false);
```

example: S2 LiDAR

```
CYdLidar laser;
laser.setMaxAngle(180);
laser.setMinAngle(-180);
laser.setMinRange(0.1);
laser.setMaxRange(8.0);
laser.setSerialPort("/dev/ydlidar");
laser.setSerialBaudrate(115200);
laser.setFixedResolution(false);
laser.setReversion(false);
laser.setInverted(true);
laser.setScanFrequency(6.0);
laser.setSampleRate(3);
laser.setAutoReconnect(true);
std::vector<float> ignore_array;
laser.setIgnoreArray(ignore_array);
laser.setSingleChannel(true);
laser.setLidarType(TYPE_TRIANGLE);
laser.setDeviceType(YDLIDAR_TYPE_SERIAL);
laser.setIntensity(false);
laser.setAbnormalCheckCount(4);
laser.setSupportMotorDtrCtrl(true);
```

example: TG30 LiDAR

```
CYdLidar laser;
laser.setMaxAngle(180);
laser.setMinAngle(-180);
laser.setMinRange(0.01);
laser.setMaxRange(32.0);
laser.setSerialPort("/dev/ydlidar");
laser.setSerialBaudrate(512000);
laser.setFixedResolution(false);
laser.setReversion(true);
laser.setInverted(true);
laser.setScanFrequency(10.0);
laser.setSampleRate(20);
laser.setAutoReconnect(true);
std::vector<float> ignore_array;
laser.setIgnoreArray(ignore_array);
laser.setSingleChannel(false);
laser.setLidarType(TYPE_TOF);
laser.setDeviceType(YDLIDAR_TYPE_SERIAL);
laser.setIntensity(false);
laser.setAbnormalCheckCount(4);
laser.setSupportMotorDtrCtrl(false);
```

example: TX8 LiDAR

```
CYdLidar laser;
laser.setMaxAngle(180);
laser.setMinAngle(-180);
laser.setMinRange(0.1);
laser.setMaxRange(8.0);
laser.setSerialPort("/dev/ydlidar");
laser.setSerialBaudrate(115200);
laser.setFixedResolution(false);
laser.setReversion(false);
laser.setInverted(true);
laser.setScanFrequency(6.0);
laser.setSampleRate(4);
laser.setAutoReconnect(true);
std::vector<float> ignore_array;
laser.setIgnoreArray(ignore_array);
laser.setSingleChannel(true);
laser.setLidarType(TYPE_TOF);
laser.setDeviceType(YDLIDAR_TYPE_SERIAL);
laser.setIntensity(false);
laser.setAbnormalCheckCount(4);
laser.setSupportMotorDtrCtrl(true);
```

example: T15 LiDAR

```
CYdLidar laser;
```

```
laser.setMaxAngle(180);
laser.setMinAngle(-180);
laser.setMinRange(0.01);
laser.setMaxRange(64.0);
laser.setSerialPort("192.168.1.11");
laser.setSerialBaudrate(8000);
laser.setFixedResolution(false);
laser.setReversion(true);
laser.setInverted(true);
laser.setScanFrequency(20.0);
laser.setSampleRate(20);
laser.setAutoReconnect(true);
std::vector<float> ignore_array;
laser.setIgnoreArray(ignore_array);
laser.setSingleChannel(false);
laser.setLidarType(TYPE_TOF_NET);
laser.setDeviceType(YDLIDAR_TYPE_TCP);
laser.setIntensity(true);
laser.setAbnormalCheckCount(4);
laser.setSupportMotorDtrCtrl(false);
```

Provides a platform independent class to for LiDAR development. This class is designed to serial or socket communication development in a platform independent manner.

- LiDAR types
  1. ydlidar::YDlidarDriver Class
  2. ydlidar::ETLidarDriver Class

8.2.2 Constructor & Destructor Documentation

8.2.2.1 CYdLidar::CYdLidar ( )

Constructor.

8.2.2.2 CYdLidar::~CYdLidar ( ) [virtual]

Destructor: turns the laser off.

8.2.3 Member Function Documentation

8.2.3.1 bool CYdLidar::CalculateSampleRate (int *count*, double *scan_time*) [protected]

CalculateSampleRate.

Parameters

count	

Returns

8.2.3.2 void CYdLidar::checkCalibrationAngle (const std::string & *serialNumber*) [protected]

checkCalibrationAngle

Parameters

serialNumber	

8.2.3.3 bool CYdLidar::checkCOMMs ( ) [protected]

Returns true if communication has been established with the device. If it's not, try to create a comms channel.

Returns

false on error.

8.2.3.4 bool CYdLidar::checkHardware ( ) [protected]

Returns true if the normal scan runs with the device. If it's not,

Returns

false on error.

8.2.3.5 bool CYdLidar::checkLidarAbnormal ( ) [protected]

returns true if the lidar data is normal, If it's not

8.2.3.6 void CYdLidar::checkSampleRate ( ) [protected]

checkSampleRate

8.2.3.7 bool CYdLidar::checkScanFrequency ( ) [protected]

Retruns true if the scan frequency is set to user's frequency is successful, If it's not

8.2.3.8 bool CYdLidar::checkStatus ( ) [protected]

Returns true if health status and device information has been obtained with the device. If it's not,

Returns

false on error.

8.2.3.9 void CYdLidar::disconnecting ( )

Closes the comms with the laser. Shouldn't have to be directly needed by the user.

8.2.3.10 bool CYdLidar::doProcessSimple (LaserScan & *outscan,* bool & *hardwareError*)

8.2.3.11 float CYdLidar::getAngleOffset ( ) const

8.2.3.12 bool CYdLidar::getDeviceHealth ( ) [protected]

Returns true if the device is in good health, If it's not

Returns true if the device is connected & operative

8.2.3.13 bool CYdLidar::getDeviceInfo ( ) [protected]

Returns true if the device information is correct, If it's not

8.2.3.14 std::string CYdLidar::getHardwareVersion ( ) const

get lidar hardware version

8.2.3.15 std::string CYdLidar::getSerialNumber ( ) const

get lidar serial number

8.2.3.16 std::string CYdLidar::getSoftVersion ( ) const

get lidar software version

8.2.3.17 void CYdLidar::handleDeviceInfoPackage (int *count*) [protected]

handleDeviceInfoPackage

Parameters

count	

8.2.3.18 void CYdLidar::handleSingleChannelDevice ( ) [protected]

handleSingleChannelDevice

8.2.3.19 bool CYdLidar::initialize ( )

initialize

to connect and turns the laser on. Raises an exception on error.

8.2.3.20 bool CYdLidar::isAngleOffetCorrected ( ) const

8.2.3.21 bool CYdLidar::isRangeIgnore (double *angle*) const [protected]

isRangeIgnore

Parameters

angle	

Returns

8.2.3.22 bool CYdLidar::isRangeValid (double *reading*) const [protected]

isRangeValid

Parameters

reading	

Returns

8.2.3.23 void CYdLidar::parsePackageNode (const node_info & *node,* LaserDebug & *info*) [protected]

parsePackageNode

Parameters

node	
info	

8.2.3.24 void CYdLidar::printfVersionInfo (const device_info & *info*) [protected]

printfVersionInfo

Parameters

info	

8.2.3.25 CYdLidar::PropertyBuilderByName (float , MaxRange , private) [private]

Set and Get LiDAR Maximum effective range.

Note

The effective range beyond the maxmum is set to zero.
the MaxRange should be greater than the MinRange.

Remarks

unit: m

See also

PropertyBuilderByName and DataSet
CYdLidar::setMaxRange and CYdLidar::getMaxRange Set and Get LiDAR Minimum effective range.

Note

The effective range less than the minmum is set to zero.
the MinRange should be less than the MaxRange.

Remarks

unit: m

See also

PropertyBuilderByName and Dataset
CYdLidar::setMinRange and CYdLidar::getMinRange

8.2.3.26 CYdLidar::PropertyBuilderByName (float , MaxAngle , private) [private]

Set and Get LiDAR Maximum effective angle.

Note

The effective angle beyond the maxmum will be ignored.
the MaxAngle should be greater than the MinAngle

Remarks

unit: degree, Range:-180∼180

See also

PropertyBuilderByName and Dataset
CYdLidar::setMaxAngle and CYdLidar::getMaxAngle

8.2.3.27 CYdLidar::PropertyBuilderByName (float , MinAngle , private) [private]

Set and Get LiDAR Minimum effective angle.

Note

The effective angle less than the minmum will be ignored.
the MinAngle should be less than the MaxAngle

Remarks

unit: degree, Range:-180∼180

See also

PropertyBuilderByName and Dataset
CYdLidar::setMinAngle and CYdLidar::getMinAngle

8.2.3.28 CYdLidar::PropertyBuilderByName (int , SampleRate , private) [private]

Set and Get LiDAR Sampling rate.

Note

If the set sampling rate does no exist. the actual sampling rate is the LiDAR's default sampling rate.
Set the sampling rate to match the LiDAR.

Remarks

unit: kHz/s, Ranges: 2,3,4,5,6,8,9,10,16,18,20

G4/F4	4,8,9
F4PRO	4,6
G6	8,16,18
G4B	10
G1	9
G2A/G2/R2/X4	5
S4/S4B/G4C/TX8/TX20	4
G2C	4
S2	3
TG15/TG30/TG50	10,18,20
T5/T15	20

See also

CYdLidar::setSampleRate and CYdLidar::getSampleRate

8.2.3.29 CYdLidar::PropertyBuilderByName (float , ScanFrequency , private) [private]

Set and Get LiDAR Scan frequency.

Note

If the LiDAR is a single channel, the scanning frequency nneds to be adjusted by external PWM.
Set the scan frequency to match the LiDAR.

Remarks

unit: Hz

S2/X2/X2L/TX8/TX20	4∼8(PWM)
F4/F4PRO/G4/G4PRO/R2	5∼12
G6/G2A/G2/G2C/G4B/G4C/G1	5∼12
S4/S4B/X4	5∼12(PWM)
TG15/TG30/TG50	3∼16
T5/T15	5∼40

See also

CYdLidar::setScanFrequency and CYdLidar::getScanFrequency

8.2.3.30 CYdLidar::PropertyBuilderByName (bool , FixedResolution , private) [private]

Set and Get LiDAR Fixed angluar resolution.
.

Note

The Lidar scanning frequency will change slightly due to various reasons. so the number of points per circle will also change slightly.
if a fixed angluar resolution is required. a fixed number of points is required.

If set to true, the angle_increment of the fixed angle resolution in LaserConfig will be a fixed value.

See also

CYdLidar::setFixedResolution and CYdLidar::getFixedResolution

8.2.3.31 CYdLidar::PropertyBuilderByName (bool , Reversion , private) [private]

Set and Get LiDAR Reversion.
true: LiDAR data rotated 180 degrees.
false: Keep raw Data.
default: false
.

Note

Refer to the table below for the LiDAR Reversion.
This is currently related to your coordinate system and install direction. Whether to reverse it depends on your actual scene.

LiDAR	reversion
G1/G2/G2A/G2C/F4/F4PRO/R2	true
G4/G4PRO/G4B/G4C/G6	true
TG15/TG30/TG50	true
T5/T15	true
S2/X2/X2L/X4/S4/S4B	false
TX8/TX20	false

Reversion Table

See also

CYdLidar::setReversion and CYdLidar::getReversion

8.2.3.32 CYdLidar::PropertyBuilderByName (bool , Inverted , private) [private]

Set and Get LiDAR inverted.
true: Data is counterclockwise
false: Data is clockwise
Default: clockwise.

Note

If set to true, LiDAR data direction is positive counterclockwise. otherwise it is positive clockwise.

See also

CYdLidar::setInverted and CYdLidar::getInverted

8.2.3.33 CYdLidar::PropertyBuilderByName (bool , AutoReconnect , private) [private]

Set and Get LiDAR Automatically reconnect flag.
Whether to support hot plug.

See also

CYdLidar::setAutoReconnect and CYdLidar::getAutoReconnect

8.2.3.34 CYdLidar::PropertyBuilderByName (int , SerialBaudrate , private) [private]

Set and Get LiDAR baudrate or network port.

Note

Refer to the table below for the LiDAR Baud Rate.
Set the baudrate or network port to match the LiDAR.

F4/S2/X2/X2L/S4/TX8/TX20/G4C	115200
X4	128000
S4B	153600
G1/G2/R2/G4/G4PRO/F4PRO	230400
G2A/G2C	230400
G6/G4B/TG15/TG30/TG50	512000
T5/T15(network)	8000

Remarks

See also

CYdLidar::setSerialBaudrate and CYdLidar::getSerialBaudrate

8.2.3.35 CYdLidar::PropertyBuilderByName (int , AbnormalCheckCount , private) [private]

Set and Get LiDAR Maximum number of abnormal checks.

Note

When the LiDAR Turn On, if the number of times of abnormal data acquisition is greater than the current AbnormalCheckCount, the LiDAR Fails to Turn On.

The Minimum abnormal value is Two, if it is less than the Minimum Value, it will be set to the Mimimum Value.

See also

CYdLidar::setAbnormalCheckCount and CYdLidar::getAbnormalCheckCount

8.2.3.36 CYdLidar::PropertyBuilderByName (std::string , SerialPort , private) [private]

Set and Get LiDAR Serial port or network IP address.

Note

If it is serial port, your need to ensure that the serial port had read and write permissions.
If it is a network, make sure the network can ping.

See also

CYdLidar::setSerialPort and CYdLidar::getSerialPort

8.2.3.37 CYdLidar::PropertyBuilderByName (std::vector< float >, IgnoreArray, private) [private]

Set and Get LiDAR filtering angle area.

Note

If the LiDAR angle is in the IgnoreArray, the current range will be set to zero.
Filtering angles need to appear in pairs.

The purpose of the current paramter is to filter out the angular area set by user

example: Filters 10 degrees to 30 degrees and 80 degrees to 90 degrees.

```
CYdLidar laser;//Defining an CYdLidar instance.
std::vector<float> ignore_array;
ignore_array.push_back(10.0);
ignore_array.push_back(30.0);
ignore_array.push_back(80.0);
ignore_array.push_back(90.0);
laser.setIgnoreArray(ignore_array);
```

See also

CYdLidar::setIgnoreArray and CYdLidar::getIgnoreArray

8.2.3.38 CYdLidar::PropertyBuilderByName (float, OffsetTime, private) [private]

8.2.3.39 CYdLidar::PropertyBuilderByName (bool, SingleChannel, private) [private]

Set and Get LiDAR single channel. Whether LiDAR communication channel is a single-channel.

Note

For a single-channel LiDAR, if the settings are reversed.
an error will occur in obtaining device information and the LiDAR will Faied to Start.
For dual-channel LiDAR, if th setttings are reversed.
the device information cannot be obtained.
Set the single channel to match the LiDAR.

G1/G2/G2A/G2C	false
G4/G4B/G4PRO/G6/F4/F4PRO	false
S4/S4B/X4/R2/G4C	false
S2/X2/X2L	true
TG15/TG30/TG50	false
TX8/TX20	true
T5/T15	false
	true

Remarks

See also

CYdLidar::setSingleChannel and CYdLidar::getSingleChannel

8.2.3.40 CYdLidar::PropertyBuilderByName (int , LidarType , private) [private]

Set and Get LiDAR Type.

Note

Refer to the table below for the LiDAR Type.
Set the LiDAR Type to match the LiDAR.

G1/G2A/G2/G2C	TYPE_TRIANGLE
G4/G4B/G4C/G4PRO	TYPE_TRIANGLE
G6/F4/F4PRO	TYPE_TRIANGLE
S4/S4B/X4/R2/S2/X2/X2L	TYPE_TRIANGLE
TG15/TG30/TG50/TX8/TX20	TYPE_TOF
T5/T15	TYPE_TOF_NET

Remarks

See also

LidarTypeID
CYdLidar::setLidarType and CYdLidar::getLidarType

8.2.3.41 bool CYdLidar::turnOff ( )

See base class docs.

8.2.3.42 bool CYdLidar::turnOn ( )

See base class docs.

8.2.4 Member Data Documentation

8.2.4.1 int CYdLidar::defalutSampleRate [private]

8.2.4.2 float CYdLidar::frequencyOffset [private]

8.2.4.3 node_info* CYdLidar::global_nodes [private]

8.2.4.4 bool CYdLidar::isScanning [private]

8.2.4.5 uint64_t CYdLidar::last_node_time [private]

8.2.4.6 int CYdLidar::lidar_model [private]

8.2.4.7 YDlidarDriver* CYdLidar::lidarPtr [private]

8.2.4.8 float CYdLidar::m_AngleOffset [private]

8.2.4.9 int CYdLidar::m_FixedSize [private]

8.2.4.10 bool CYdLidar::m_isAngleOffsetCorrected [private]

8.2.4.11 std::string CYdLidar::m_lidarHardVer [private]

8.2.4.12 std::string CYdLidar::m_lidarSerialNum [private]

8.2.4.13 std::string CYdLidar::m_lidarSoftVer [private]

8.2.4.14 bool CYdLidar::m_ParseSuccess [private]

8.2.4.15 uint64_t CYdLidar::m_PointTime [private]

8.2.4.16 int CYdLidar::m_UserSampleRate [private]

8.2.4.17 uint8_t CYdLidar::Major [private]

8.2.4.18 uint8_t CYdLidar::Minjor [private]

8.2.4.19 CYdLidar::MinRange [private]

8.2.4.20 CYdLidar::private [private]

8.2.4.21 std::map<int, int> CYdLidar::SampleRateMap [private]

The documentation for this class was generated from the following files:

- include/CYdLidar.h
- src/CYdLidar.cpp

8.3 device_health Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t status
  健康状体
- uint16_t error_code
  错误代码

8.3.1 Member Data Documentation

8.3.1.1 uint16_t device_health::error_code

错误代码

8.3.1.2 uint8_t device_health::status

健康状体

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.4 device_info Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t model
  雷达型号
- uint16_t firmware_version
  固件版本号
- uint8_t hardware_version
  硬件版本号
- uint8_t serialnum [16]
  系列号

8.4.1 Member Data Documentation

8.4.1.1 uint16_t device_info::firmware_version

固件版本号

8.4.1.2 uint8_t device_info::hardware_version

硬件版本号

8.4.1.3 uint8_t device_info::model

雷达型号

8.4.1.4 uint8_t device_info::serialnum[16]

系列号

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.5 Event Class Reference

`#include <locker.h>`

Public Types

- enum { EVENT_OK = 1, EVENT_TIMEOUT = 2, EVENT_FAILED = 0 }

Public Member Functions

- Event (bool isAutoReset=true, bool isSignal=false)
- ~Event ()
- void set (bool isSignal=true)
- unsigned long wait (unsigned long timeout=0xFFFFFFFF)

Protected Member Functions

- void release ()

Protected Attributes

- pthread_condattr_t _cond_cattr
- pthread_cond_t _cond_var
- pthread_mutex_t _cond_locker
- bool _is_signalled
- bool _isAutoReset

8.5.1 Member Enumeration Documentation

8.5.1.1 anonymous enum

Enumerator

EVENT_OK

EVENT_TIMEOUT

EVENT_FAILED

8.5.2 Constructor & Destructor Documentation

8.5.2.1 Event::Event (bool *isAutoReset* = `true`, bool *isSignal* = `false`) [inline],[explicit]

8.5.2.2 Event::~Event ( ) [inline]

8.5.3 Member Function Documentation

8.5.3.1 void Event::release ( ) [inline],[protected]

8.5.3.2 void Event::set (bool *isSignal* = `true`) [inline]

8.5.3.3 unsigned long Event::wait (unsigned long *timeout* = `0xFFFFFFFF`) [inline]

8.5.4 Member Data Documentation

8.5.4.1 pthread_condattr_t Event::_cond_cattr [protected]

8.5.4.2 pthread_mutex_t Event::_cond_locker [protected]

8.5.4.3 pthread_cond_t Event::_cond_var [protected]

8.5.4.4 bool Event::_is_signalled [protected]

8.5.4.5 bool Event::_isAutoReset [protected]

The documentation for this class was generated from the following file:

- include/locker.h

8.6 function_state Struct Reference

```
#include <ydlidar_protocol.h>
```

Public Attributes

- uint8_t state

8.6.1 Member Data Documentation

8.6.1.1 uint8_t function_state::state

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.7 LaserConfig Struct Reference

A struct for returning configuration from the YDLIDAR.

`#include <ydlidar_protocol.h>`

Public Member Functions

- LaserConfig & operator= (const LaserConfig &data)

Public Attributes

- float min_angle

  Start angle for the laser scan [rad]. 0 is forward and angles are measured clockwise when viewing YDLIDAR from the top.
- float max_angle

  Stop angle for the laser scan [rad]. 0 is forward and angles are measured clockwise when viewing YDLIDAR from the top.
- float angle_increment

  angle resoltuion [rad]
- float time_increment

  Scan resoltuion [s].
- float scan_time

  Time between scans.
- float min_range

  Minimum range [m].
- float max_range

  Maximum range [m].

8.7.1 Detailed Description

A struct for returning configuration from the YDLIDAR.

8.7.2 Member Function Documentation

8.7.2.1 LaserConfig& LaserConfig::operator= (const LaserConfig & *data*) [inline]

8.7.3 Member Data Documentation

8.7.3.1 float LaserConfig::angle_increment

angle resoltuion [rad]

8.7.3.2 float LaserConfig::max_angle

Stop angle for the laser scan [rad]. 0 is forward and angles are measured clockwise when viewing YDLIDAR from the top.

8.7.3.3 float LaserConfig::max_range

Maximum range [m].

8.7.3.4 float LaserConfig::min_angle

Start angle for the laser scan [rad]. 0 is forward and angles are measured clockwise when viewing YDLIDAR from the top.

8.7.3.5 float LaserConfig::min_range

Minimum range [m].

8.7.3.6 float LaserConfig::scan_time

Time between scans.

8.7.3.7 float LaserConfig::time_increment

Scan resoltuion [s].

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.8 LaserDebug Struct Reference

```
#include <ydlidar_protocol.h>
```

Public Attributes

- uint8_t W3F4CusMajor_W4F0CusMinor
- uint8_t W4F3Model_W3F0DebugInfTranVer
- uint8_t W3F4HardwareVer_W4F0FirewareMajor
- uint8_t W3F4BoradHardVer_W4F0Moth
- uint8_t W2F5Output2K4K5K_W5F0Date
- uint8_t W1F6GNoise_W1F5SNoise_W1F4MotorCtl_W4F0SnYear
- uint8_t W7F0SnNumH
- uint8_t W7F0SnNumL
- uint8_t MaxDebugIndex

8.8.1 Member Data Documentation

8.8.1.1 uint8_t LaserDebug::MaxDebugIndex

8.8.1.2 uint8_t LaserDebug::W1F6GNoise_W1F5SNoise_W1F4MotorCtl_W4F0SnYear

8.8.1.3 uint8_t LaserDebug::W2F5Output2K4K5K_W5F0Date

8.8.1.4 uint8_t LaserDebug::W3F4BoradHardVer_W4F0Moth

8.8.1.5 uint8_t LaserDebug::W3F4CusMajor_W4F0CusMinor

8.8.1.6 uint8_t LaserDebug::W3F4HardwareVer_W4F0FirewareMajor

8.8.1.7 uint8_t LaserDebug::W4F3Model_W3F0DebugInfTranVer

8.8.1.8 uint8_t LaserDebug::W7F0SnNumH

8.8.1.9 uint8_t LaserDebug::W7F0SnNumL

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.9 LaserPoint Struct Reference

```
#include <ydlidar_protocol.h>
```

Public Member Functions

- LaserPoint & operator= (const LaserPoint &data)

Public Attributes

- float angle
  lidar angle [rad]
- float range
  lidar range [m]
- float intensity
  lidar intensity

8.9.1 Member Function Documentation

8.9.1.1 LaserPoint& LaserPoint::operator= (const LaserPoint & *data*) [inline]

8.9.2 Member Data Documentation

8.9.2.1 float LaserPoint::angle

lidar angle [rad]

8.9.2.2 float LaserPoint::intensity

lidar intensity

8.9.2.3 float LaserPoint::range

lidar range [m]

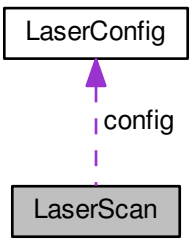
The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.10 LaserScan Struct Reference

`#include <ydlidar_protocol.h>`

Collaboration diagram for LaserScan:



Public Member Functions

- LaserScan & operator= (const LaserScan &data)

Public Attributes

- uint64_t stamp

  System time when first range was measured in nanoseconds.
- std::vector< LaserPoint > points

  Array of lidar points.
- LaserConfig config

  Configuration of scan.

8.10.1 Member Function Documentation

8.10.1.1 LaserScan& LaserScan::operator= (const LaserScan & *data*) [inline]

8.10.2 Member Data Documentation

8.10.2.1 LaserConfig LaserScan::config

Configuration of scan.

8.10.2.2 std::vector<LaserPoint> LaserScan::points

Array of lidar points.

8.10.2.3 uint64_t LaserScan::stamp

System time when first range was measured in nanoseconds.

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.11 lidar_ans_header Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t syncByte1
- uint8_t syncByte2
- uint32_t size: 30
- uint32_t subType: 2
- uint8_t type

8.11.1 Member Data Documentation

8.11.1.1 uint32_t lidar_ans_header::size

8.11.1.2 uint32_t lidar_ans_header::subType

8.11.1.3 uint8_t lidar_ans_header::syncByte1

8.11.1.4 uint8_t lidar_ans_header::syncByte2

8.11.1.5 uint8_t lidar_ans_header::type

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.12 Locker Class Reference

`#include <locker.h>`

Public Types

- enum LOCK_STATUS { LOCK_OK = 0, LOCK_TIMEOUT = -1, LOCK_FAILED = -2 }

Public Member Functions

- Locker ()
- ~Locker ()
- Locker::LOCK_STATUS lock (unsigned long timeout=0xFFFFFFFF)
- void unlock ()
- pthread_mutex_t * getLockHandle ()

Protected Member Functions

- void init ()
- void release ()

Protected Attributes

- pthread_mutex_t _lock

8.12.1 Member Enumeration Documentation

8.12.1.1 enum Locker::LOCK_STATUS

Enumerator

LOCK_OK

LOCK_TIMEOUT

LOCK_FAILED

8.12.2 Constructor & Destructor Documentation

8.12.2.1 Locker::Locker ( ) [inline]

8.12.2.2 Locker::~Locker ( ) [inline]

8.12.3 Member Function Documentation

8.12.3.1 pthread_mutex_t* Locker::getLockHandle ( ) [inline]

8.12.3.2 void Locker::init ( ) [inline], [protected]

8.12.3.3 Locker::LOCK_STATUS Locker::lock (unsigned long *timeout* = 0xFFFFFFFF) [inline]

8.12.3.4 void Locker::release ( ) [inline], [protected]

8.12.3.5 void Locker::unlock ( ) [inline]

8.12.4 Member Data Documentation

8.12.4.1 pthread_mutex_t Locker::_lock [protected]

The documentation for this class was generated from the following file:

- include/locker.h

8.13 serial::MillisecondTimer Class Reference

```
#include <unix_serial.h>
```

Public Member Functions

- MillisecondTimer (const uint32_t millis)
- int64_t remaining ()

Static Private Member Functions

- static timespec timespec_now ()

Private Attributes

- timespec expiry

8.13.1 Constructor & Destructor Documentation

8.13.1.1 serial::MillisecondTimer::MillisecondTimer (const uint32_t *millis*) [explicit]

8.13.2 Member Function Documentation

8.13.2.1 int64_t serial::MillisecondTimer::remaining ( )

8.13.2.2 timespec serial::MillisecondTimer::timespec_now ( ) [static], [private]

8.13.3 Member Data Documentation

8.13.3.1 timespec serial::MillisecondTimer::expiry [private]

The documentation for this class was generated from the following files:

- src/impl/unix/unix_serial.h
- src/impl/unix/unix_serial.cpp

8.14 node_info Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t sync_flag
- uint16_t sync_quality
- uint16_t angle_q6_checkbit
  信号质量
- uint16_t distance_q2
  测距点角度
- uint64_t stamp
  当前测距点距离
- uint8_t scan_frequence
  时间戳
- uint8_t debug_info [12]
  特定版本此值才有效,无效值是*0*
- uint8_t index

8.14.1 Member Data Documentation

8.14.1.1 uint16_t node_info::angle_q6_checkbit

信号质量

8.14.1.2 uint8_t node_info::debug_info[12]

特定版本此值才有效,无效值是0

8.14.1.3 uint16_t node_info::distance_q2

测距点角度

8.14.1.4 uint8_t node_info::index

8.14.1.5 uint8_t node_info::scan_frequence

时间戳

8.14.1.6 uint64_t node_info::stamp

当前测距点距离

8.14.1.7 uint8_t node_info::sync_flag

8.14.1.8 uint16_t node_info::sync_quality

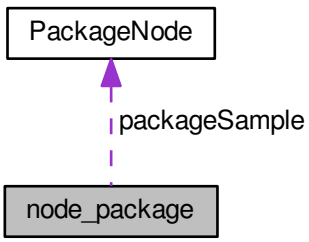
The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.15 node_package Struct Reference

`#include <ydlidar_protocol.h>`

Collaboration diagram for node_package:



Public Attributes

- uint16_t package_Head
- uint8_t package_CT
- uint8_t nowPackageNum
- uint16_t packageFirstSampleAngle
- uint16_t packageLastSampleAngle
- uint16_t checkSum
- PackageNode packageSample [PackageSampleMaxLngth]

8.15.1 Member Data Documentation

8.15.1.1 uint16_t node_package::checkSum

8.15.1.2 uint8_t node_package::nowPackageNum

8.15.1.3 uint8_t node_package::package_CT

8.15.1.4 uint16_t node_package::package_Head

8.15.1.5 uint16_t node_package::packageFirstSampleAngle

8.15.1.6 uint16_t node_package::packageLastSampleAngle

8.15.1.7 PackageNode node_package::packageSample[PackageSampleMaxLngth]

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.16 node_packages Struct Reference

```
#include <ydlidar_protocol.h>
```

Public Attributes

- uint16_t package_Head
- uint8_t package_CT
- uint8_t nowPackageNum
- uint16_t packageFirstSampleAngle
- uint16_t packageLastSampleAngle
- uint16_t checkSum
- uint16_t packageSampleDistance [PackageSampleMaxLngth]

8.16.1 Member Data Documentation

8.16.1.1 uint16_t node_packages::checkSum

8.16.1.2 uint8_t node_packages::nowPackageNum

8.16.1.3 uint8_t node_packages::package_CT

8.16.1.4 uint16_t node_packages::package_Head

8.16.1.5 uint16_t node_packages::packageFirstSampleAngle

8.16.1.6 uint16_t node_packages::packageLastSampleAngle

8.16.1.7 uint16_t node_packages::packageSampleDistance[PackageSampleMaxLngth]

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.17 offset_angle Struct Reference

```
#include <ydlidar_protocol.h>
```

Public Attributes

- int32_t angle

8.17.1 Member Data Documentation

8.17.1.1 int32_t offset_angle::angle

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.18 PackageNode Struct Reference

```
#include <ydlidar_protocol.h>
```

Public Attributes

- uint8_t PakageSampleQuality
- uint16_t PakageSampleDistance

8.18.1 Member Data Documentation

8.18.1.1 uint16_t PackageNode::PakageSampleDistance

8.18.1.2 uint8_t PackageNode::PakageSampleQuality

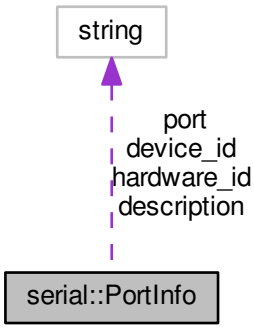
The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.19 serial::PortInfo Struct Reference

```
#include <serial.h>
```

Collaboration diagram for serial::PortInfo:



Public Attributes

- std::string port
- std::string description
- std::string hardware_id
- std::string device_id

8.19.1 Detailed Description

Structure that describes a serial device.

8.19.2 Member Data Documentation

8.19.2.1 std::string serial::PortInfo::description

Human readable description of serial device if available.

8.19.2.2 std::string serial::PortInfo::device_id

Hardware Device ID or "" if not available.

8.19.2.3 std::string serial::PortInfo::hardware_id

Hardware ID (e.g. VID:PID of USB serial devices) or "n/a" if not available.

8.19.2.4 std::string serial::PortInfo::port

Address of the serial port (this can be passed to the constructor of Serial).

The documentation for this struct was generated from the following file:

- include/serial.h

8.20 sampling_rate Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t rate
  采样频率

8.20.1 Member Data Documentation

8.20.1.1 uint8_t sampling_rate::rate

采样频率

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.21 scan_exposure Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t exposure
  低光功率模式

8.21.1 Member Data Documentation

8.21.1.1 uint8_t scan_exposure::exposure

低光功率模式

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.22 scan_frequency Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint32_t frequency
  扫描频率

8.22.1 Member Data Documentation

8.22.1.1 uint32_t scan_frequency::frequency

扫描频率

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.23 scan_heart_beat Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t enable
  掉电保护状态

8.23.1 Member Data Documentation

8.23.1.1 uint8_t scan_heart_beat::enable

掉电保护状态

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.24 scan_points Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t flag

8.24.1 Member Data Documentation

8.24.1.1 uint8_t scan_points::flag

The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.25 scan_rotation Struct Reference

`#include <ydlidar_protocol.h>`

Public Attributes

- uint8_t rotation

8.25.1 Member Data Documentation

8.25.1.1 uint8_t scan_rotation::rotation

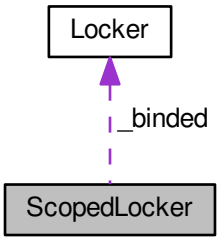
The documentation for this struct was generated from the following file:

- include/ydlidar_protocol.h

8.26 ScopedLocker Class Reference

`#include <locker.h>`

Collaboration diagram for ScopedLocker:



Public Member Functions

- ScopedLocker (Locker &l)
- void forceUnlock ()
- ~ScopedLocker ()

Public Attributes

- Locker & _binded

8.26.1 Constructor & Destructor Documentation

8.26.1.1 ScopedLocker::ScopedLocker (Locker & l) [inline], [explicit]

8.26.1.2 ScopedLocker::~ScopedLocker ( ) [inline]

8.26.2 Member Function Documentation

8.26.2.1 void ScopedLocker::forceUnlock ( ) [inline]

8.26.3 Member Data Documentation

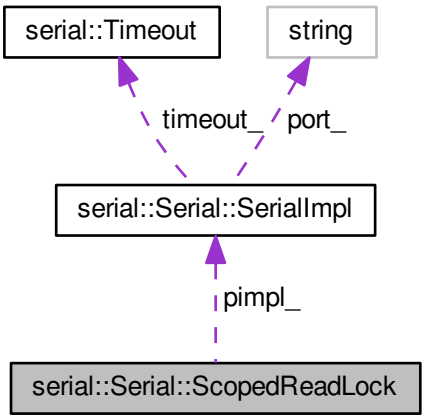
8.26.3.1 Locker& ScopedLocker::_binded

The documentation for this class was generated from the following file:

- include/locker.h

8.27 serial::Serial::ScopedReadLock Class Reference

Collaboration diagram for serial::Serial::ScopedReadLock:



Public Member Functions

- ScopedReadLock (Serial::SerialImpl *pimpl)
- ~ScopedReadLock ()

Private Member Functions

- ScopedReadLock (const ScopedReadLock &)
- const ScopedReadLock & operator= (ScopedReadLock)

Private Attributes

- Serial::SerialImpl * pimpl_

8.27.1 Constructor & Destructor Documentation

8.27.1.1 serial::Serial::ScopedReadLock::ScopedReadLock (Serial::SerialImpl * *pimpl*) [inline], [explicit]

8.27.1.2 serial::Serial::ScopedReadLock::~ScopedReadLock ( ) [inline]

8.27.1.3 serial::Serial::ScopedReadLock::ScopedReadLock (const ScopedReadLock &) [private]

8.27.2 Member Function Documentation

8.27.2.1 const ScopedReadLock& serial::Serial::ScopedReadLock::operator= (ScopedReadLock) [private]

8.27.3 Member Data Documentation

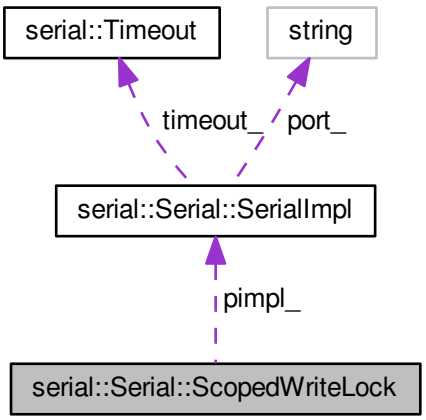
8.27.3.1 Serial::SerialImpl* serial::Serial::ScopedReadLock::pimpl_ [private]

The documentation for this class was generated from the following file:

- src/serial.cpp

8.28 serial::Serial::ScopedWriteLock Class Reference

Collaboration diagram for serial::Serial::ScopedWriteLock:



Public Member Functions

- ScopedWriteLock (Serial::SerialImpl *pimpl)
- ~ScopedWriteLock ()

Private Member Functions

- ScopedWriteLock (const ScopedWriteLock &)
- const ScopedWriteLock & operator= (ScopedWriteLock)

Private Attributes

- Serial::SerialImpl * pimpl_

8.28.1 Constructor & Destructor Documentation

8.28.1.1 serial::Serial::ScopedWriteLock::ScopedWriteLock (Serial::SerialImpl * *pimpl*) [inline], [explicit]

8.28.1.2 serial::Serial::ScopedWriteLock::~ScopedWriteLock ( ) [inline]

8.28.1.3 serial::Serial::ScopedWriteLock::ScopedWriteLock (const ScopedWriteLock &) [private]

8.28.2 Member Function Documentation

8.28.2.1 const ScopedWriteLock& serial::Serial::ScopedWriteLock::operator= (ScopedWriteLock) [private]

8.28.3 Member Data Documentation

8.28.3.1 Serial::SerialImpl* serial::Serial::ScopedWriteLock::pimpl_ [private]

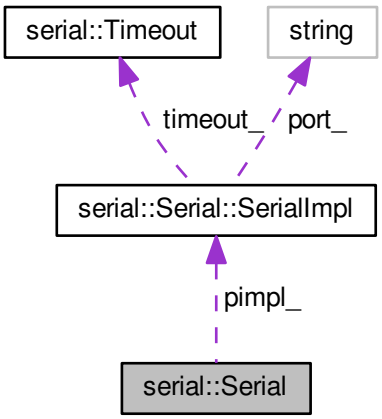
The documentation for this class was generated from the following file:

- src/serial.cpp

8.29 serial::Serial Class Reference

`#include <serial.h>`

Collaboration diagram for serial::Serial:



Classes

- class ScopedReadLock
- class ScopedWriteLock
- class SerialImpl

Public Member Functions

- Serial (const std::string &port="", uint32_t baudrate=9600, Timeout timeout=Timeout(), bytesize_t bytesize=eightbits, parity_t parity=parity_none, stopbits_t stopbits=stopbits_one, flowcontrol_t flowcontrol=flowcontrol_none)
- virtual ~Serial ()
- bool open ()
- bool isOpen ()
- void closePort ()
- size_t available ()
- bool waitReadable ()
- void waitByteTimes (size_t count)
- int waitfordata (size_t data_count, uint32_t timeout, size_t *returned_size)

  waitfordata
- virtual size_t writeData (const uint8_t *data, size_t size)

  writeData
- virtual size_t readData (uint8_t *data, size_t size)

  readData
- size_t read (uint8_t *buffer, size_t size)
- size_t read (std::vector< uint8_t > &buffer, size_t size=1)
- size_t read (std::string &buffer, size_t size=1)
- std::string read (size_t size=1)
- size_t readline (std::string &buffer, size_t size=65536, std::string eol="\n")
- std::string readline (size_t size=65536, std::string eol="\n")
- std::vector< std::string > readlines (size_t size=65536, std::string eol="\n")
- size_t write (const uint8_t *data, size_t size)
- size_t write (const std::vector< uint8_t > &data)
- size_t write (const std::string &data)
- void setPort (const std::string &port)
- std::string getPort () const
- void setTimeout (Timeout &timeout)
- void setTimeout (uint32_t inter_byte_timeout, uint32_t read_timeout_constant, uint32_t read_timeout_multiplier, uint32_t write_timeout_constant, uint32_t write_timeout_multiplier)
- Timeout getTimeout () const
- bool setBaudrate (uint32_t baudrate)
- uint32_t getBaudrate () const
- bool setBytesize (bytesize_t bytesize)
- bytesize_t getBytesize () const
- bool setParity (parity_t parity)
- parity_t getParity () const
- bool setStopbits (stopbits_t stopbits)
- stopbits_t getStopbits () const
- bool setFlowcontrol (flowcontrol_t flowcontrol)
- flowcontrol_t getFlowcontrol () const
- void flush ()
- void flushInput ()
- void flushOutput ()

- void sendBreak (int duration)
- bool setBreak (bool level=true)
- bool setRTS (bool level=true)
- bool setDTR (bool level=true)
- bool waitForChange ()
- bool getCTS ()
- bool getDSR ()
- bool getRI ()
- bool getCD ()
- int getByteTime ()

Private Member Functions

- Serial (const Serial &)
- Serial & operator= (const Serial &)
- size_t read_ (uint8_t *buffer, size_t size)
- size_t write_ (const uint8_t *data, size_t length)

Private Attributes

- SerialImpl * pimpl_

8.29.1 Detailed Description

Class that provides a portable serial port interface.

8.29.2 Constructor & Destructor Documentation

8.29.2.1 serial::Serial::Serial (const std::string & *port* = " ", uint32_t *baudrate* = 9600, Timeout *timeout* = Timeout (), bytesize_t *bytesize* = eightbits, parity_t *parity* = parity_none, stopbits_t *stopbits* = stopbits_one, flowcontrol_t *flowcontrol* = flowcontrol_none) [explicit]

Creates a Serial object and opens the port if a port is specified, otherwise it remains closed until serial::Serial::open is called.

Parameters

port	A std::string containing the address of the serial port, which would be something like 'COM1' on Windows and '/dev/ttyS0' on Linux.
baudrate	An unsigned 32-bit integer that represents the baudrate
timeout	A serial::Timeout struct that defines the timeout conditions for the serial port.

See also

serial::Timeout

Parameters

bytesize	Size of each byte in the serial transmission of data, default is eightbits, possible values are: fivebits, sixbits, sevenbits, eightbits
parity	Method of parity, default is parity_none, possible values are: parity_none, parity_odd, parity_even
stopbits	Number of stop bits used, default is stopbits_one, possible values are: stopbits_one, stopbits_one_point_five, stopbits_two
flowcontrol	Type of flowcontrol used, default is flowcontrol_none, possible values are: flowcontrol_none, flowcontrol_software, flowcontrol_hardware

Exceptions

serial::PortNotOpenedException	
serial::IOException	
std::invalid_argument	

8.29.2.2 serial::Serial::~Serial ( ) [virtual]

Destructor

8.29.2.3 serial::Serial::Serial (const Serial &) [private]

8.29.3 Member Function Documentation

8.29.3.1 size_t serial::Serial::available ( )

Return the number of characters in the buffer.

8.29.3.2 void serial::Serial::closePort ( )

Closes the serial port.

8.29.3.3 void serial::Serial::flush ( )

Flush the input and output buffers

8.29.3.4 void serial::Serial::flushInput ( )

Flush only the input buffer

8.29.3.5 void serial::Serial::flushOutput ( )

Flush only the output buffer

8.29.3.6 uint32_t serial::Serial::getBaudrate ( ) const

Gets the baudrate for the serial port.

Returns

An integer that sets the baud rate for the serial port.

See also

Serial::setBaudrate

\

8.29.3.7 bytesize_t serial::Serial::getBytesize ( ) const

Gets the bytesize for the serial port.

See also

Serial::setBytesize

\

8.29.3.8 int serial::Serial::getByteTime ( )

Returns the singal byte time.

8.29.3.9 bool serial::Serial::getCD ( )

Returns the current status of the CD line.

8.29.3.10 bool serial::Serial::getCTS ( )

Returns the current status of the CTS line.

8.29.3.11 bool serial::Serial::getDSR ( )

Returns the current status of the DSR line.

8.29.3.12 flowcontrol_t serial::Serial::getFlowcontrol ( ) const

Gets the flow control for the serial port.

See also

Serial::setFlowcontrol

\

8.29.3.13 parity_t serial::Serial::getParity ( ) const

Gets the parity for the serial port.

See also

Serial::setParity

\

8.29.3.14 string serial::Serial::getPort ( ) const

Gets the serial port identifier.

See also

Serial::setPort

Exceptions

std::invalid_argument	

8.29.3.15 bool serial::Serial::getRI ( )

Returns the current status of the RI line.

8.29.3.16 stopbits_t serial::Serial::getStopbits ( ) const

Gets the stopbits for the serial port.

See also

Serial::setStopbits

\

8.29.3.17 serial::Timeout serial::Serial::getTimeout ( ) const

Gets the timeout for reads in seconds.

Returns

A Timeout struct containing the inter_byte_timeout, and read and write timeout constants and multipliers.

See also

Serial::setTimeout

8.29.3.18 bool serial::Serial::isOpen ( )

Gets the open status of the serial port.

Returns

Returns true if the port is open, false otherwise.

8.29.3.19 bool serial::Serial::open ( )

Opens the serial port as long as the port is set and the port isn't already open.

If the port is provided to the constructor then an explicit call to open is not needed.

See also

Serial::Serial

Returns

Returns true if the port is open, false otherwise.

8.29.3.20 Serial& serial::Serial::operator= (const Serial &) [private]

8.29.3.21 size_t serial::Serial::read (uint8_t * *buffer*, size_t *size*)

Read a given amount of bytes from the serial port into a given buffer.

The read function will return in one of three cases:

- The number of requested bytes was read.
  - In this case the number of bytes requested will match the size_t returned by read.
- A timeout occurred, in this case the number of bytes read will not match the amount requested, but no exception will be thrown. One of two possible timeouts occurred:
  - The inter byte timeout expired, this means that number of milliseconds elapsed between receiving bytes from the serial port exceeded the inter byte timeout.
  - The total timeout expired, which is calculated by multiplying the read timeout multiplier by the number of requested bytes and then added to the read timeout constant. If that total number of milliseconds elapses after the initial call to read a timeout will occur.
- An exception occurred, in this case an actual exception will be thrown.

Parameters

buffer	An uint8_t array of at least the requested size.
size	A size_t defining how many bytes to be read.

Returns

A size_t representing the number of bytes read as a result of the call to read.

8.29.3.22 size_t serial::Serial::read (std::vector< uint8_t > & *buffer*, size_t *size* = 1)

Read a given amount of bytes from the serial port into a give buffer.

Parameters

buffer	A reference to a std::vector of uint8_t.
size	A size_t defining how many bytes to be read.

Returns

A size_t representing the number of bytes read as a result of the call to read.

8.29.3.23 size_t serial::Serial::read (std::string & *buffer*, size_t *size* = 1)

Read a given amount of bytes from the serial port into a give buffer.

Parameters

buffer	A reference to a std::string.
size	A size_t defining how many bytes to be read.

Returns

A size_t representing the number of bytes read as a result of the call to read.

8.29.3.24 string serial::Serial::read (size_t *size* = 1)

Read a given amount of bytes from the serial port and return a string containing the data.

Parameters

size	A size_t defining how many bytes to be read.

Returns

A std::string containing the data read from the port.

8.29.3.25 size_t serial::Serial::read_ (uint8_t * *buffer*, size_t *size*) [private]

8.29.3.26 size_t serial::Serial::readData (uint8_t * *data*, size_t *size*) [virtual]

readData

Parameters

data	
size	

Returns

8.29.3.27 size_t serial::Serial::readline (std::string & *buffer*, size_t *size* = 65536, std::string *eol* = "\n")

Reads in a line or until a given delimiter has been processed.

Reads from the serial port until a single line has been read.

Parameters

buffer	A std::string reference used to store the data.
size	A maximum length of a line, defaults to 65536 (2^16)
eol	A string to match against for the EOL.

Returns

A size_t representing the number of bytes read.

8.29.3.28 std::string serial::Serial::readline (size_t *size* = 65536, std::string *eol* = "\n")

Reads in a line or until a given delimiter has been processed.

Reads from the serial port until a single line has been read.

Parameters

size	A maximum length of a line, defaults to 65536 (2^16)
eol	A string to match against for the EOL.

Returns

A std::string containing the line.

8.29.3.29 vector< string > serial::Serial::readlines (size_t *size* = 65536, std::string *eol* = "\n")

Reads in multiple lines until the serial port times out.

This requires a timeout > 0 before it can be run. It will read until a timeout occurs and return a list of strings.

Parameters

size	A maximum length of combined lines, defaults to 65536 (2^16)
eol	A string to match against for the EOL.

Returns

A vector<string> containing the lines.

8.29.3.30 void serial::Serial::sendBreak (int *duration*)

Sends the RS-232 break signal. See tcsendbreak(3).

8.29.3.31 bool serial::Serial::setBaudrate (uint32_t *baudrate*)

Sets the baudrate for the serial port.

Possible baudrates depends on the system but some safe baudrates include: 110, 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 56000, 57600, 115200 Some other baudrates that are supported by some comports: 128000, 153600, 230400, 256000, 460800, 921600

Parameters

baudrate	An integer that sets the baud rate for the serial port.

8.29.3.32 bool serial::Serial::setBreak (bool *level* = true)

Set the break condition to a given level. Defaults to true.

8.29.3.33 bool serial::Serial::setBytesize (bytesize_t *bytesize*)

Sets the bytesize for the serial port.

Parameters

bytesize	Size of each byte in the serial transmission of data, default is eightbits, possible values are: fivebits, sixbits, sevenbits, eightbits

\

8.29.3.34 bool serial::Serial::setDTR (bool *level* = `true`)

Set the DTR handshaking line to the given level. Defaults to true.

8.29.3.35 bool serial::Serial::setFlowcontrol (flowcontrol_t *flowcontrol*)

Sets the flow control for the serial port.

Parameters

flowcontrol	Type of flowcontrol used, default is flowcontrol_none, possible values are: flowcontrol_none, flowcontrol_software, flowcontrol_hardware

\

8.29.3.36 bool serial::Serial::setParity (parity_t *parity*)

Sets the parity for the serial port.

Parameters

parity	Method of parity, default is parity_none, possible values are: parity_none, parity_odd, parity_even

\

8.29.3.37 void serial::Serial::setPort (const std::string & *port*)

Sets the serial port identifier.

Parameters

port	A const std::string reference containing the address of the serial port, which would be something like 'COM1' on Windows and '/dev/ttyS0' on Linux.

Exceptions

std::invalid_argument	

8.29.3.38 bool serial::Serial::setRTS (bool *level* = `true`)

Set the RTS handshaking line to the given level. Defaults to true.

8.29.3.39 bool serial::Serial::setStopbits (stopbits_t *stopbits*)

Sets the stopbits for the serial port.

Parameters

stopbits	Number of stop bits used, default is stopbits_one, possible values are: stopbits_one, stopbits_one_point_five, stopbits_two

\

8.29.3.40 void serial::Serial::setTimeout (serial::Timeout & *timeout*)

Sets the timeout for reads and writes using the Timeout struct.

There are two timeout conditions described here:

- The inter byte timeout:
  - The inter_byte_timeout component of serial::Timeout defines the maximum amount of time, in milliseconds, between receiving bytes on the serial port that can pass before a timeout occurs. Setting this to zero will prevent inter byte timeouts from occurring.
- Total time timeout:
  - The constant and multiplier component of this timeout condition, for both read and write, are defined in serial::Timeout. This timeout occurs if the total time since the read or write call was made exceeds the specified time in milliseconds.
  - The limit is defined by multiplying the multiplier component by the number of requested bytes and adding that product to the constant component. In this way if you want a read call, for example, to timeout after exactly one second regardless of the number of bytes you asked for then set the read_timeout_constant component of serial::Timeout to 1000 and the read_timeout_multiplier to zero. This timeout condition can be used in conjunction with the inter byte timeout condition with out any problems, timeout will simply occur when one of the two timeout conditions is met. This allows users to have maximum control over the trade-off between responsiveness and efficiency.

Read and write functions will return in one of three cases. When the reading or writing is complete, when a timeout occurs, or when an exception occurs.

A timeout of 0 enables non-blocking mode.

Parameters

timeout	A serial::Timeout struct containing the inter byte timeout, and the read and write timeout constants and multipliers.

See also

serial::Timeout

8.29.3.41 void serial::Serial::setTimeout (uint32_t *inter_byte_timeout,* uint32_t *read_timeout_constant,* uint32_t *read_timeout_multiplier,* uint32_t *write_timeout_constant,* uint32_t *write_timeout_multiplier*) [inline]

Sets the timeout for reads and writes.

8.29.3.42 void serial::Serial::waitByteTimes (size_t *count*)

Block for a period of time corresponding to the transmission time of count characters at present serial settings. This may be used in con- junction with waitReadable to read larger blocks of data from the port.

8.29.3.43 bool serial::Serial::waitForChange ( )

Blocks until CTS, DSR, RI, CD changes or something interrupts it.

Can throw an exception if an error occurs while waiting. You can check the status of CTS, DSR, RI, and CD once this returns. Uses TIOCMIWAIT via ioctl if available (mostly only on Linux) with a resolution of less than +-1ms and as good as +-0.2ms. Otherwise a polling method is used which can give +-2ms.

Returns

Returns true if one of the lines changed, false if something else occurred.

8.29.3.44 int serial::Serial::waitfordata (size_t *data_count,* uint32_t *timeout,* size_t * *returned_size*)

waitfordata

Parameters

data_count	
timeout	
returned_size	

Returns

8.29.3.45 bool serial::Serial::waitReadable ( )

Block until there is serial data to read or read_timeout_constant number of milliseconds have elapsed. The return value is true when the function exits with the port in a readable state, false otherwise (due to timeout or select interruption).

8.29.3.46 size_t serial::Serial::write (const uint8_t * *data*, size_t *size*)

Write a string to the serial port.

Parameters

data	A const reference containing the data to be written to the serial port.
size	A size_t that indicates how many bytes should be written from the given data buffer.

Returns

A size_t representing the number of bytes actually written to the serial port.

Exceptions

serial::PortNotOpenedException	
serial::SerialException	
serial::IOException	

8.29.3.47 size_t serial::Serial::write (const std::vector< uint8_t > & *data*)

Write a string to the serial port.

Parameters

data	A const reference containing the data to be written to the serial port.

Returns

A size_t representing the number of bytes actually written to the serial port.

8.29.3.48 size_t serial::Serial::write (const std::string & *data*)

Write a string to the serial port.

Parameters

data	A const reference containing the data to be written to the serial port.

Returns

A size_t representing the number of bytes actually written to the serial port.

8.29.3.49 size_t serial::Serial::write_ (const uint8_t * *data*, size_t *length*) [private]

8.29.3.50 size_t serial::Serial::writeData (const uint8_t * *data*, size_t *size*) [virtual]

writeData

Parameters

data	
size	

Returns

8.29.4 Member Data Documentation

8.29.4.1 SerialImpl* serial::Serial::pimpl_ [private]

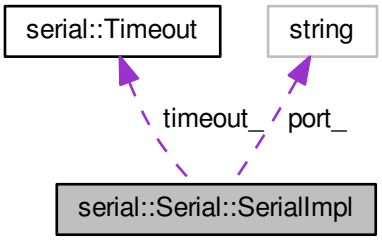
The documentation for this class was generated from the following files:

- include/serial.h
- src/serial.cpp

8.30 serial::Serial::SerialImpl Class Reference

```
#include <unix_serial.h>
```

Collaboration diagram for serial::Serial::SerialImpl:



Public Member Functions

- SerialImpl (const string &port, unsigned long baudrate, bytesize_t bytesize, parity_t parity, stopbits_t stopbits, flowcontrol_t flowcontrol)
- virtual ~SerialImpl ()
- bool open ()
- void close ()
- bool isOpen () const
- size_t available ()
- bool waitReadable (uint32_t timeout)
- void waitByteTimes (size_t count)
- int waitfordata (size_t data_count, uint32_t timeout, size_t *returned_size)
- size_t read (uint8_t *buf, size_t size=1)
- size_t write (const uint8_t *data, size_t length)
- void flush ()
- void flushInput ()
- void flushOutput ()
- void sendBreak (int duration)
- bool setBreak (bool level)
- bool setRTS (bool level)
- bool setDTR (bool level)
- bool waitForChange ()
- bool getCTS ()
- bool getDSR ()
- bool getRI ()
- bool getCD ()
- uint32_t getByteTime ()
- void setPort (const string &port)
- string getPort () const
- void setTimeout (Timeout &timeout)
- Timeout getTimeout () const
- bool setBaudrate (unsigned long baudrate)
- bool setStandardBaudRate (speed_t baudrate)
- bool setCustomBaudRate (unsigned long baudrate)
- unsigned long getBaudrate () const
- bool setBytesize (bytesize_t bytesize)
- bytesize_t getBytesize () const
- bool setParity (parity_t parity)
- parity_t getParity () const
- bool setStopbits (stopbits_t stopbits)
- stopbits_t getStopbits () const
- bool setFlowcontrol (flowcontrol_t flowcontrol)
- flowcontrol_t getFlowcontrol () const
- bool setTermios (const termios *tio)
- bool getTermios (termios *tio)
- int readLock ()
- int readUnlock ()
- int writeLock ()
- int writeUnlock ()

Private Attributes

- string port_
- int fd_
- pid_t pid
- bool is_open_
- bool xonxoff_
- bool rtscts_
- Timeout timeout_
- unsigned long baudrate_
- uint32_t byte_time_ns_
- parity_t parity_
- bytesize_t bytesize_
- stopbits_t stopbits_
- flowcontrol_t flowcontrol_
- pthread_mutex_t read_mutex
- pthread_mutex_t write_mutex

8.30.1 Constructor & Destructor Documentation

8.30.1.1 serial::Serial::SerialImpl::SerialImpl (const string & *port*, unsigned long *baudrate*, bytesize_t *bytesize*, parity_t *parity*, stopbits_t *stopbits*, flowcontrol_t *flowcontrol*) [explicit]

8.30.1.2 serial::Serial::SerialImpl::~SerialImpl ( ) [virtual]

8.30.2 Member Function Documentation

8.30.2.1 size_t serial::Serial::SerialImpl::available ( )

8.30.2.2 void serial::Serial::SerialImpl::close ( )

8.30.2.3 void serial::Serial::SerialImpl::flush ( )

8.30.2.4 void serial::Serial::SerialImpl::flushInput ( )

8.30.2.5 void serial::Serial::SerialImpl::flushOutput ( )

8.30.2.6 unsigned long serial::Serial::SerialImpl::getBaudrate ( ) const

8.30.2.7 serial::bytesize_t serial::Serial::SerialImpl::getBytesize ( ) const

8.30.2.8 uint32_t serial::Serial::SerialImpl::getByteTime ( )

8.30.2.9 bool serial::Serial::SerialImpl::getCD ( )

8.30.2.10 bool serial::Serial::SerialImpl::getCTS ( )

8.30.2.11 bool serial::Serial::SerialImpl::getDSR ( )

8.30.2.12 serial::flowcontrol_t serial::Serial::SerialImpl::getFlowcontrol ( ) const

8.30.2.13 serial::parity_t serial::Serial::SerialImpl::getParity ( ) const

8.30.2.14 string serial::Serial::SerialImpl::getPort ( ) const

8.30.2.15 bool serial::Serial::SerialImpl::getRI ( )

8.30.2.16 serial::stopbits_t serial::Serial::SerialImpl::getStopbits ( ) const

8.30.2.17 bool serial::Serial::SerialImpl::getTermios (termios * *tio*)

8.30.2.18 serial::Timeout serial::Serial::SerialImpl::getTimeout ( ) const

8.30.2.19 bool serial::Serial::SerialImpl::isOpen ( ) const

8.30.2.20 bool serial::Serial::SerialImpl::open ( )

8.30.2.21 size_t serial::Serial::SerialImpl::read (uint8_t * *buf,* size_t *size* = `1`)

8.30.2.22 int serial::Serial::SerialImpl::readLock ( )

8.30.2.23 int serial::Serial::SerialImpl::readUnlock ( )

8.30.2.24 void serial::Serial::SerialImpl::sendBreak (int *duration*)

8.30.2.25 bool serial::Serial::SerialImpl::setBaudrate (unsigned long *baudrate*)

8.30.2.26 bool serial::Serial::SerialImpl::setBreak (bool *level*)

8.30.2.27 bool serial::Serial::SerialImpl::setBytesize (serial::bytesize_t *bytesize*)

8.30.2.28 bool serial::Serial::SerialImpl::setCustomBaudRate (unsigned long *baudrate*)

8.30.2.29 bool serial::Serial::SerialImpl::setDTR (bool *level*)

8.30.2.30 bool serial::Serial::SerialImpl::setFlowcontrol (serial::flowcontrol_t *flowcontrol*)

8.30.2.31 bool serial::Serial::SerialImpl::setParity (serial::parity_t *parity*)

8.30.2.32 void serial::Serial::SerialImpl::setPort (const string & *port*)

8.30.2.33 bool serial::Serial::SerialImpl::setRTS (bool *level*)

8.30.2.34 bool serial::Serial::SerialImpl::setStandardBaudRate (speed_t *baudrate*)

8.30.2.35 bool serial::Serial::SerialImpl::setStopbits (serial::stopbits_t *stopbits*)

8.30.2.36 bool serial::Serial::SerialImpl::setTermios (const termios * *tio*)

8.30.2.37 void serial::Serial::SerialImpl::setTimeout (serial::Timeout & *timeout*)

8.30.2.38 void serial::Serial::SerialImpl::waitByteTimes (size_t *count*)

8.30.2.39 bool serial::Serial::SerialImpl::waitForChange ( )

8.30.2.40 int serial::Serial::SerialImpl::waitfordata (size_t *data_count*, uint32_t *timeout*, size_t * *returned_size*)

8.30.2.41 bool serial::Serial::SerialImpl::waitReadable (uint32_t *timeout*)

8.30.2.42 size_t serial::Serial::SerialImpl::write (const uint8_t * *data*, size_t *length*)

Error

Timeout

Port ready to write

8.30.2.43 int serial::Serial::SerialImpl::writeLock ( )

8.30.2.44 int serial::Serial::SerialImpl::writeUnlock ( )

8.30.3 Member Data Documentation

8.30.3.1 unsigned long serial::Serial::SerialImpl::baudrate_ [private]

8.30.3.2 uint32_t serial::Serial::SerialImpl::byte_time_ns_ [private]

8.30.3.3 bytesize_t serial::Serial::SerialImpl::bytesize_ [private]

8.30.3.4 int serial::Serial::SerialImpl::fd_ [private]

8.30.3.5 flowcontrol_t serial::Serial::SerialImpl::flowcontrol_ [private]

8.30.3.6 bool serial::Serial::SerialImpl::is_open_ [private]

8.30.3.7 parity_t serial::Serial::SerialImpl::parity_ [private]

8.30.3.8 pid_t serial::Serial::SerialImpl::pid [private]

8.30.3.9 string serial::Serial::SerialImpl::port_ [private]

8.30.3.10 pthread_mutex_t serial::Serial::SerialImpl::read_mutex [private]

8.30.3.11 bool serial::Serial::SerialImpl::rtscts_ [private]

8.30.3.12 stopbits_t serial::Serial::SerialImpl::stopbits_ [private]

8.30.3.13 Timeout serial::Serial::SerialImpl::timeout_ [private]

8.30.3.14 pthread_mutex_t serial::Serial::SerialImpl::write_mutex [private]

8.30.3.15 bool serial::Serial::SerialImpl::xonxoff_ [private]

The documentation for this class was generated from the following files:

- src/impl/unix/unix_serial.h
- src/impl/unix/unix_serial.cpp

8.31 serial::termios2 Struct Reference

Public Attributes

- tcflag_t c_iflag
- tcflag_t c_oflag
- tcflag_t c_cflag
- tcflag_t c_lflag
- cc_t c_line
- cc_t c_cc [SNCCS]
- speed_t c_ispeed
- speed_t c_ospeed

8.31.1 Member Data Documentation

8.31.1.1 cc_t serial::termios2::c_cc[SNCCS]

8.31.1.2 tcflag_t serial::termios2::c_cflag

8.31.1.3 tcflag_t serial::termios2::c_iflag

8.31.1.4 speed_t serial::termios2::c_ispeed

8.31.1.5 tcflag_t serial::termios2::c_lflag

8.31.1.6 cc_t serial::termios2::c_line

8.31.1.7 tcflag_t serial::termios2::c_oflag

8.31.1.8 speed_t serial::termios2::c_ospeed

The documentation for this struct was generated from the following file:

- src/impl/unix/unix_serial.cpp

8.32 Thread Class Reference

`#include <thread.h>`

Public Member Functions

- Thread ()
- virtual ~Thread ()
- _size_t getHandle ()
- int terminate ()
- void * getParam ()
- int join (unsigned long timeout=-1)
- bool operator== (const Thread &right)

Static Public Member Functions

- template<class CLASS , int(CLASS::*)(void) PROC>
  static Thread ThreadCreateObjectFunctor (CLASS *pthis)
- template<class CLASS , int(CLASS::*)(void) PROC>
  static _size_t THREAD_PROC createThreadAux (void *param)
- static Thread createThread (thread_proc_t proc, void *param=NULL)

Protected Member Functions

- Thread (thread_proc_t proc, void *param)

Protected Attributes

- void * _param
- thread_proc_t _func
- _size_t _handle

8.32.1 Constructor & Destructor Documentation

8.32.1.1 Thread::Thread ( ) [inline], [explicit]

8.32.1.2 virtual Thread::~Thread ( ) [inline], [virtual]

8.32.1.3 Thread::Thread (thread_proc_t *proc*, void * *param*) [inline], [explicit], [protected]

8.32.2 Member Function Documentation

8.32.2.1 static Thread Thread::createThread (thread_proc_t *proc*, void * *param* = NULL) [inline], [static]

8.32.2.2 template<class CLASS , int(CLASS::*)(void) PROC> static _size_t THREAD_PROC Thread::createThreadAux (void * *param*) [inline], [static]

8.32.2.3 _size_t Thread::getHandle ( ) [inline]

8.32.2.4 void* Thread::getParam ( ) [inline]

8.32.2.5 int Thread::join (unsigned long *timeout* = -1) [inline]

8.32.2.6 bool Thread::operator== (const Thread & *right*) [inline]

8.32.2.7 int Thread::terminate ( ) [inline]

8.32.2.8 template<class CLASS , int(CLASS::*)(void) PROC> static Thread Thread::ThreadCreateObjectFunctor (CLASS * *pthis*) [inline], [static]

8.32.3 Member Data Documentation

8.32.3.1 thread_proc_t Thread::_func [protected]

8.32.3.2 _size_t Thread::_handle [protected]

8.32.3.3 void* Thread::_param [protected]

The documentation for this class was generated from the following file:

- include/thread.h

8.33 serial::Timeout Struct Reference

`#include <serial.h>`

Public Member Functions

- Timeout (uint32_t inter_byte_timeout_=0, uint32_t read_timeout_constant_=0, uint32_t read_timeout_multiplier_=0, uint32_t write_timeout_constant_=0, uint32_t write_timeout_multiplier_=0)

Static Public Member Functions

- static uint32_t max ()
- static Timeout simpleTimeout (uint32_t timeout)

Public Attributes

- uint32_t inter_byte_timeout
- uint32_t read_timeout_constant
- uint32_t read_timeout_multiplier
- uint32_t write_timeout_constant
- uint32_t write_timeout_multiplier

8.33.1 Detailed Description

Structure for setting the timeout of the serial port, times are in milliseconds.

In order to disable the interbyte timeout, set it to Timeout::max().

8.33.2 Constructor & Destructor Documentation

8.33.2.1 serial::Timeout::Timeout (uint32_t *inter_byte_timeout_* = 0, uint32_t *read_timeout_constant_* = 0, uint32_t *read_timeout_multiplier_* = 0, uint32_t *write_timeout_constant_* = 0, uint32_t *write_timeout_multiplier_* = 0) [inline], [explicit]

8.33.3 Member Function Documentation

8.33.3.1 static uint32_t serial::Timeout::max ( ) [inline], [static]

8.33.3.2 static Timeout serial::Timeout::simpleTimeout (uint32_t *timeout*) [inline], [static]

Convenience function to generate Timeout structs using a single absolute timeout.

Parameters

timeout	A long that defines the time in milliseconds until a timeout occurs after a call to read or write is made.

Returns

Timeout struct that represents this simple timeout provided.

8.33.4 Member Data Documentation

8.33.4.1 uint32_t serial::Timeout::inter_byte_timeout

Number of milliseconds between bytes received to timeout on.

8.33.4.2 uint32_t serial::Timeout::read_timeout_constant

A constant number of milliseconds to wait after calling read.

8.33.4.3 uint32_t serial::Timeout::read_timeout_multiplier

A multiplier against the number of requested bytes to wait after calling read.

8.33.4.4 uint32_t serial::Timeout::write_timeout_constant

A constant number of milliseconds to wait after calling write.

8.33.4.5 uint32_t serial::Timeout::write_timeout_multiplier

A multiplier against the number of requested bytes to wait after calling write.

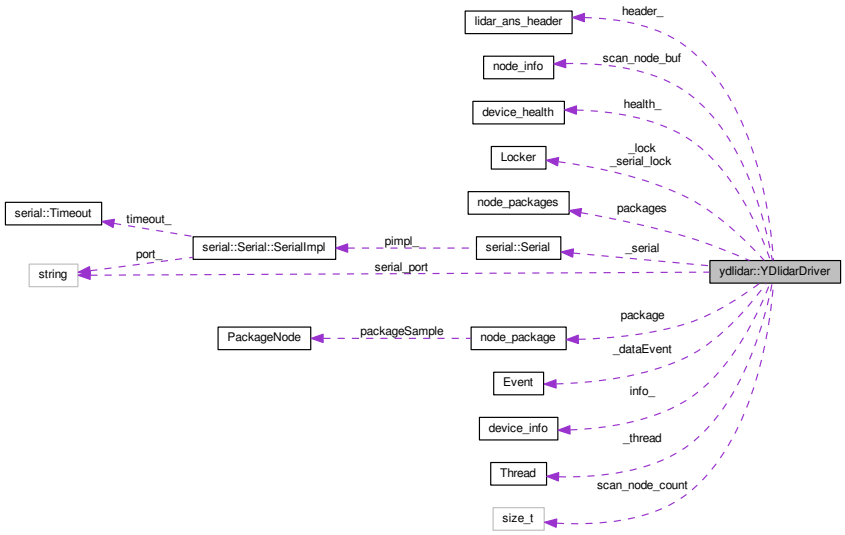
The documentation for this struct was generated from the following file:

- include/serial.h

8.34 ydlidar::YDlidarDriver Class Reference

`#include <ydlidar_driver.h>`

Collaboration diagram for ydlidar::YDlidarDriver:



Public Types

- enum { DEFAULT_TIMEOUT = 2000, DEFAULT_HEART_BEAT = 1000, MAX_SCAN_NODES = 3600, D↩ EFAULT_TIMEOUT_COUNT = 1 }

Public Member Functions

- PropertyBuilderByName (bool, SingleChannel, private)

  Set and Get LiDAR single channel. Whether LiDAR communication channel is a single-channel.
- PropertyBuilderByName (int, LidarType, private)

  Set and Get LiDAR Type.
- PropertyBuilderByName (uint32_t, PointTime, private)

  Set and Get Sampling interval.
- YDlidarDriver ()
- virtual ~YDlidarDriver ()

- result_t connect (const char *port_path, uint32_t baudrate)
  连接雷达
  连接成功后，必须使用*::disconnect*函数关闭
- void disconnect ()
  断开雷达连接
- bool isscanning () const
  扫图状态
- bool isconnected () const
  连接雷达状态
- void setIntensities (const bool &isintensities)
  设置雷达是否带信号质量
  连接成功后，必须使用*::disconnect*函数关闭
- void setAutoReconnect (const bool &enable)
  设置雷达异常自动重新连接
- result_t getHealth (device_health &health, uint32_t timeout=DEFAULT_TIMEOUT)
  获取雷达设备健康状态
- result_t getDeviceInfo (device_info &info, uint32_t timeout=DEFAULT_TIMEOUT)
  获取雷达设备信息
- result_t startScan (bool force=false, uint32_t timeout=DEFAULT_TIMEOUT)
  开启扫描
- result_t stop ()
  关闭扫描
- result_t grabScanData (node_info *nodebuffer, size_t &count, uint32_t timeout=DEFAULT_TIMEOUT)
  获取激光数据
- result_t ascendScanData (node_info *nodebuffer, size_t count)
  补偿激光角度
  把角度限制在*0*到*360*度之间
- result_t reset (uint32_t timeout=DEFAULT_TIMEOUT)
  重置激光雷达
- result_t startMotor ()
  打开电机
- result_t stopMotor ()
  关闭电机
- result_t getScanFrequency (scan_frequency &frequency, uint32_t timeout=DEFAULT_TIMEOUT)
  获取激光雷达当前扫描频率
- result_t setScanFrequencyAdd (scan_frequency &frequency, uint32_t timeout=DEFAULT_TIMEOUT)
  设置增加扫描频率*1HZ*
- result_t setScanFrequencyDis (scan_frequency &frequency, uint32_t timeout=DEFAULT_TIMEOUT)
  设置减小扫描频率*1HZ*
- result_t setScanFrequencyAddMic (scan_frequency &frequency, uint32_t timeout=DEFAULT_TIMEOUT)

设置增加扫描频率*0.1HZ*

- result_t setScanFrequencyDisMic (scan_frequency &frequency, uint32_t timeout=DEFAULT_TIMEOUT)

  设置减小扫描频率*0.1HZ*

- result_t getSamplingRate (sampling_rate &rate, uint32_t timeout=DEFAULT_TIMEOUT)

  获取激光雷达当前采样频率

- result_t setSamplingRate (sampling_rate &rate, uint32_t timeout=DEFAULT_TIMEOUT)

  设置激光雷达当前采样频率

- result_t getZeroOffsetAngle (offset_angle &angle, uint32_t timeout=DEFAULT_TIMEOUT)

  获取激光雷达当前零位角

Static Public Member Functions

- static std::string getSDKVersion ()

  获取当前*SDK*版本号
  静态函数
- static std::map< std::string, std::string > lidarPortList ()

  lidarPortList 获取雷达端口

Public Attributes

- std::atomic< bool > isConnected

  串口连接状体
- std::atomic< bool > isScanning

  扫图状态
- std::atomic< bool > isAutoReconnect

  异常自动从新连接
- std::atomic< bool > isAutoconnting

  是否正在自动连接中
- node_info * scan_node_buf

  激光点信息
- size_t scan_node_count

  激光点数
- Event _dataEvent

  数据同步事件
- Locker _lock

  线程锁
- Locker _serial_lock

  串口锁
- Thread _thread

  线程*id*

Protected Member Functions

- result_t createThread ()
  创建解析雷达数据线程
- result_t startAutoScan (bool force=false, uint32_t timeout=DEFAULT_TIMEOUT)
  重新连接开启扫描
- result_t stopScan (uint32_t timeout=DEFAULT_TIMEOUT)
  stopScan
- result_t checkDeviceInfo (uint8_t *recvBuffer, uint8_t byte, int recvPos, int recvSize, int pos)
  checkDeviceStatus
- result_t waitDevicePackage (uint32_t timeout=DEFAULT_TIMEOUT)
  waitDevicePackage
- result_t waitPackage (node_info *node, uint32_t timeout=DEFAULT_TIMEOUT)
  解包激光数据
- result_t waitScanData (node_info *nodebuffer, size_t &count, uint32_t timeout=DEFAULT_TIMEOUT)
  发送数据到雷达
- int cacheScanData ()
  激光数据解析线程
- result_t sendCommand (uint8_t cmd, const void *payload=NULL, size_t payloadsize=0)
  发送数据到雷达
- result_t waitResponseHeader (lidar_ans_header *header, uint32_t timeout=DEFAULT_TIMEOUT)
  等待激光数据包头
- result_t waitForData (size_t data_count, uint32_t timeout=DEFAULT_TIMEOUT, size_t *returned_size=NULL)
  等待固定数量串口数据
- result_t getData (uint8_t *data, size_t size)
  获取串口数据
- result_t sendData (const uint8_t *data, size_t size)
  串口发送数据
- void checkTransDelay ()
  checkTransDelay
- void disableDataGrabbing ()
  关闭数据获取通道
- void setDTR ()
  设置串口*DTR*
- void clearDTR ()
  清除串口*DTR*
- void flushSerial ()
  flushSerial
- result_t checkAutoConnecting ()
  checkAutoConnecting

Private Attributes

- int PackageSampleBytes
  一个包包含的激光点数
- serial::Serial * _serial
  串口
- bool m_intensities
  信号质量状体
- uint32_t m_baudrate
  波特率
- bool isSupportMotorDtrCtrl
  是否支持电机控制
- uint32_t trans_delay
  串口传输一个*byte*时间
- int m_sampling_rate
  采样频率
- int model
  雷达型号
- int sample_rate
- node_package package
  带信号质量协议包
- node_packages packages
  不带信好质量协议包
- uint16_t package_Sample_Index
  包采样点索引
- float IntervalSampleAngle
- float IntervalSampleAngle_LastPackage
- uint16_t FirstSampleAngle
  起始采样角
- uint16_t LastSampleAngle
  结束采样角
- uint16_t CheckSum
  校验和
- uint8_t scan_frequence
  协议中雷达转速
- uint16_t CheckSumCal
- uint16_t SampleNumlAndCTCal
- uint16_t LastSampleAngleCal
- bool CheckSumResult
- uint16_t Valu8Tou16
- std::string serial_port
  雷达端口
- uint8_t * globalRecvBuffer
- int retryCount
- bool has_device_header
- uint8_t last_device_byte
- int asyncRecvPos
- uint16_t async_size
- device_info info_
- device_health health_
- lidar_ans_header header_
- uint8_t * headerBuffer

- uint8_t * infoBuffer
- uint8_t * healthBuffer
- bool get_device_info_success
- bool get_device_health_success
- int package_index
- bool has_package_error

8.34.1 Detailed Description

Class that provides a lidar interface.

8.34.2 Member Enumeration Documentation

8.34.2.1 anonymous enum

Enumerator

DEFAULT_TIMEOUT 默认超时时间.

DEFAULT_HEART_BEAT 默认检测掉电功能时间.

MAX_SCAN_NODES 最大扫描点数.

DEFAULT_TIMEOUT_COUNT

8.34.3 Constructor & Destructor Documentation

8.34.3.1 ydlidar::YDlidarDriver::YDlidarDriver ( )

A constructor. A more elaborate description of the constructor.

8.34.3.2 ydlidar::YDlidarDriver::~YDlidarDriver ( ) [virtual]

A destructor. A more elaborate description of the destructor.

8.34.4 Member Function Documentation

8.34.4.1 result_t ydlidar::YDlidarDriver::ascendScanData (node_info * *nodebuffer*, size_t *count*)

补偿激光角度
把角度限制在0到360度之间

Parameters

in	*nodebuffer*	激光点信息
in	*count*	一圈激光点数

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

补偿之前，必须使用::grabScanData函数获取激光数据成功

8.34.4.2 int ydlidar::YDlidarDriver::cacheScanData ( ) [protected]

激光数据解析线程

8.34.4.3 result_t ydlidar::YDlidarDriver::checkAutoConnecting ( ) [protected]

checkAutoConnecting

8.34.4.4 result_t ydlidar::YDlidarDriver::checkDeviceInfo (uint8_t * *recvBuffer,* uint8_t *byte,* int *recvPos,* int *recvSize,* int *pos*) [protected]

checkDeviceStatus

Parameters

byte	

Returns

8.34.4.5 void ydlidar::YDlidarDriver::checkTransDelay ( ) [protected]

checkTransDelay

8.34.4.6 void ydlidar::YDlidarDriver::clearDTR ( ) [protected]

清除串口DTR

8.34.4.7 result_t ydlidar::YDlidarDriver::connect (const char * *port_path*, uint32_t *baudrate*)

连接雷达
连接成功后，必须使用::disconnect函数关闭

Parameters

in	*port_path*	串口号
in	*baudrate*	波特率，YDLIDAR-SS雷达波特率： 230400 G2-SS-1

Returns

返回连接状态

Return values

0	成功
<	0 失败

Note

连接成功后，必须使用::disconnect函数关闭

See also

函数::YDlidarDriver::disconnect (“::”是指定有连接功能,可以看文档里的disconnect变成绿,点击它可以跳转到disconnect.)

8.34.4.8 result_t ydlidar::YDlidarDriver::createThread ( ) [protected]

创建解析雷达数据线程

Note

创建解析雷达数据线程之前，必须使用::startScan函数开启扫图成功

8.34.4.9 void ydlidar::YDlidarDriver::disableDataGrabbing ( ) [protected]

关闭数据获取通道

8.34.4.10 void ydlidar::YDlidarDriver::disconnect ( )

断开雷达连接

8.34.4.11 void ydlidar::YDlidarDriver::flushSerial ( ) [protected]

flushSerial

8.34.4.12 result_t ydlidar::YDlidarDriver::getData (uint8_t * *data*, size_t *size*) [protected]

获取串口数据

Parameters

in	*data*	数据指针
in	*size*	数据大小

Returns

返回执行结果

Return values

RESULT_OK	获取成功
RESULT_FAILE	获取失败

8.34.4.13 result_t ydlidar::YDlidarDriver::getDeviceInfo (device_info & *info*, uint32_t *timeout* = DEFAULT_TIMEOUT)

获取雷达设备信息

Parameters

in	*info*	设备信息
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	获取成功
RESULT_FAILE	or RESULT_TIMEOUT 获取失败

8.34.4.14 result_t ydlidar::YDlidarDriver::getHealth (device_health & *health*, uint32_t *timeout* = DEFAULT_TIMEOUT)

获取雷达设备健康状态

Returns

返回执行结果

Return values

RESULT_OK	获取成功
RESULT_FAILE	or RESULT_TIMEOUT 获取失败

8.34.4.15 result_t ydlidar::YDlidarDriver::getSamplingRate (sampling_rate & *rate*, uint32_t *timeout* = DEFAULT_TIMEOUT)

获取激光雷达当前采样频率

Parameters

in	*frequency*	采样频率
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作

8.34.4.16 result_t ydlidar::YDlidarDriver::getScanFrequency (scan_frequency & *frequency*, uint32_t *timeout* = DEFAULT_TIMEOUT)

获取激光雷达当前扫描频率

Parameters

in	*frequency*	扫描频率
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作

8.34.4.17 std::string ydlidar::YDlidarDriver::getSDKVersion ( ) [static]

获取当前SDK版本号
静态函数

Returns

返回当前SKD 版本号

8.34.4.18 result_t ydlidar::YDlidarDriver::getZeroOffsetAngle (offset_angle & *angle,* uint32_t *timeout =* DEFAULT_TIMEOUT)

获取激光雷达当前零位角

Parameters

in	*angle*	零位偏移角
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作

8.34.4.19 result_t ydlidar::YDlidarDriver::grabScanData (node_info * *nodebuffer,* size_t & *count,* uint32_t *timeout =* DEFAULT_TIMEOUT)

获取激光数据

Parameters

in	*nodebuffer*	激光点信息
in	*count*	一圈激光点数
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	获取成功
RESULT_FAILE	获取失败

Note

获取之前，必须使用::startScan函数开启扫描

8.34.4.20 bool ydlidar::YDlidarDriver::isconnected ( ) const

连接雷达状态

Returns

返回连接状态

Return values

true	成功
false	失败

8.34.4.21 bool ydlidar::YDlidarDriver::isscanning ( ) const

扫图状态

Returns

返回当前雷达扫图状态

Return values

true	正在扫图
false	扫图关闭

8.34.4.22 std::map< std::string, std::string > ydlidar::YDlidarDriver::lidarPortList ( ) [static]

lidarPortList 获取雷达端口

Returns

在线雷达列表

8.34.4.23 ydlidar::YDlidarDriver::PropertyBuilderByName (bool , SingleChannel , private)

Set and Get LiDAR single channel. Whether LiDAR communication channel is a single-channel.

Note

For a single-channel LiDAR, if the settings are reversed.
an error will occur in obtaining device information and the LiDAR will Faied to Start.
For dual-channel LiDAR, if th setttings are reversed.
the device information cannot be obtained.
Set the single channel to match the LiDAR.

G1/G2/G2A/G2C	false
G4/G4B/G4PRO/G6/F4/F4PRO	false
S4/S4B/X4/R2/G4C	false
S2/X2/X2L	true
TG15/TG30/TG50	false
TX8/TX20	true
T5/T15	false
	true

Remarks

See also

DriverInterface::setSingleChannel and DriverInterface::getSingleChannel

8.34.4.24 ydlidar::YDlidarDriver::PropertyBuilderByName (int , LidarType , private)

Set and Get LiDAR Type.

Note

Refer to the table below for the LiDAR Type.
Set the LiDAR Type to match the LiDAR.

G1/G2A/G2/G2C	TYPE_TRIANGLE
G4/G4B/G4C/G4PRO	TYPE_TRIANGLE
G6/F4/F4PRO	TYPE_TRIANGLE
S4/S4B/X4/R2/S2/X2/X2L	TYPE_TRIANGLE
TG15/TG30/TG50/TX8/TX20	TYPE_TOF
T5/T15	TYPE_TOF_NET

Remarks

See also

LidarTypeID
DriverInterface::setLidarType and DriverInterface::getLidarType

8.34.4.25 ydlidar::YDlidarDriver::PropertyBuilderByName (uint32_t , PointTime , private)

Set and Get Sampling interval.

Note

Negative correlation between sampling interval and lidar sampling rate.
sampling interval = 1e9 / sampling rate(/s)
Set the LiDAR sampling interval to match the LiDAR.

See also

DriverInterface::setPointTime and DriverInterface::getPointTime

8.34.4.26 result_t ydlidar::YDlidarDriver::reset (uint32_t *timeout* = DEFAULT_TIMEOUT)

重置激光雷达

Parameters

in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作, 如果在扫描中调用::stop函数停止扫描

8.34.4.27 result_t ydlidar::YDlidarDriver::sendCommand (uint8_t *cmd*, const void * *payload* = NULL, size_t *payloadsize* = 0) [protected]

发送数据到雷达

Parameters

in	*cmd*	命名码
in	*payload*	payload
in	*payloadsize*	payloadsize

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

8.34.4.28 result_t ydlidar::YDlidarDriver::sendData (const uint8_t * *data*, size_t *size*) [protected]

串口发送数据

Parameters

in	*data*	发送数据指针
in	*size*	数据大小

Returns

返回执行结果

Return values

RESULT_OK	发送成功
RESULT_FAILE	发送失败

8.34.4.29 void ydlidar::YDlidarDriver::setAutoReconnect (const bool & *enable*)

设置雷达异常自动重新连接

Parameters

in	*enable*	是否开启自动重连: true 开启 false 关闭

8.34.4.30 void ydlidar::YDlidarDriver::setDTR ( ) [protected]

设置串口DTR

8.34.4.31 void ydlidar::YDlidarDriver::setIntensities (const bool & *isintensities*)

设置雷达是否带信号质量
连接成功后，必须使用::disconnect函数关闭

Parameters

in	*isintensities*	是否带信号质量: true 带信号质量 false 无信号质量

Note

只有S4B(波特率是153600)雷达支持带信号质量, 别的型号雷达暂不支持

8.34.4.32 result_t ydlidar::YDlidarDriver::setSamplingRate (sampling_rate & *rate,* uint32_t *timeout* = DEFAULT_TIMEOUT)

设置激光雷达当前采样频率

Parameters

in	*rate*	采样频率
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作

8.34.4.33 result_t ydlidar::YDlidarDriver::setScanFrequencyAdd (scan_frequency & *frequency,* uint32_t *timeout* = DEFAULT_TIMEOUT)

设置增加扫描频率1HZ

Parameters

in	*frequency*	扫描频率
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作

8.34.4.34 result_t ydlidar::YDlidarDriver::setScanFrequencyAddMic (scan_frequency & *frequency,* uint32_t *timeout* = DEFAULT_TIMEOUT)

设置增加扫描频率0.1HZ

Parameters

in	*frequency*	扫描频率
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作

8.34.4.35 result_t ydlidar::YDlidarDriver::setScanFrequencyDis (scan_frequency & *frequency,* uint32_t *timeout* = DEFAULT_TIMEOUT)

设置减小扫描频率1HZ

Parameters

in	*frequency*	扫描频率
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作

8.34.4.36 result_t ydlidar::YDlidarDriver::setScanFrequencyDisMic (scan_frequency & *frequency,* uint32_t *timeout* = DEFAULT_TIMEOUT)

设置减小扫描频率0.1HZ

Parameters

in	*frequency*	扫描频率
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

Note

停止扫描后再执行当前操作

8.34.4.37 result_t ydlidar::YDlidarDriver::startAutoScan (bool *force* = false, uint32_t *timeout* = DEFAULT_TIMEOUT) [protected]

重新连接开启扫描

Parameters

in	*force*	扫描模式
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	开启成功
RESULT_FAILE	开启失败

Note

sdk 自动重新连接调用

8.34.4.38 result_t ydlidar::YDlidarDriver::startMotor ( )

打开电机

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

8.34.4.39 result_t ydlidar::YDlidarDriver::startScan (bool *force* = false, uint32_t *timeout* = DEFAULT_TIMEOUT)

开启扫描

Parameters

in	*force*	扫描模式
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	开启成功
RESULT_FAILE	开启失败

Note

只用开启一次成功即可

8.34.4.40 result_t ydlidar::YDlidarDriver::stop ( )

关闭扫描

Returns

返回执行结果

Return values

RESULT_OK	关闭成功
RESULT_FAILE	关闭失败

8.34.4.41 result_t ydlidar::YDlidarDriver::stopMotor ( )

关闭电机

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_FAILE	失败

8.34.4.42 result_t ydlidar::YDlidarDriver::stopScan (uint32_t *timeout* = DEFAULT_TIMEOUT) [protected]

stopScan

Parameters

timeout	

Returns

8.34.4.43 result_t ydlidar::YDlidarDriver::waitDevicePackage (uint32_t *timeout* = DEFAULT_TIMEOUT) [protected]

waitDevicePackage

Parameters

timeout	

Returns

8.34.4.44 result_t ydlidar::YDlidarDriver::waitForData (size_t *data_count*, uint32_t *timeout* = DEFAULT_TIMEOUT, size_t * *returned_size* = NULL) [protected]

等待固定数量串口数据

Parameters

in	*data_count*	等待数据大小
in	*timeout*	等待时间
in	*returned_size*	实际数据大小

Returns

返回执行结果

Return values

RESULT_OK	获取成功
RESULT_TIMEOUT	等待超时
RESULT_FAILE	获取失败

Note

当timeout = -1 时, 将一直等待

8.34.4.45 result_t ydlidar::YDlidarDriver::waitPackage (node_info * node, uint32_t timeout = DEFAULT_TIMEOUT) [protected]

解包激光数据

Parameters

in	*node*	解包后激光点信息
in	*timeout*	超时时间

8.34.4.46 result_t ydlidar::YDlidarDriver::waitResponseHeader (lidar_ans_header * header, uint32_t timeout = DEFAULT_TIMEOUT) [protected]

等待激光数据包头

Parameters

in	*header*	包头
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	获取成功
RESULT_TIMEOUT	等待超时
RESULT_FAILE	获取失败

Note

当timeout = -1 时, 将一直等待

8.34.4.47 result_t ydlidar::YDlidarDriver::waitScanData (node_info * nodebuffer, size_t & count, uint32_t timeout = DEFAULT_TIMEOUT) [protected]

发送数据到雷达

Parameters

in	*nodebuffer*	激光信息指针
in	*count*	激光点数大小
in	*timeout*	超时时间

Returns

返回执行结果

Return values

RESULT_OK	成功
RESULT_TIMEOUT	等待超时
RESULT_FAILE	失败

8.34.5 Member Data Documentation

8.34.5.1 Event ydlidar::YDlidarDriver::_dataEvent

数据同步事件

8.34.5.2 Locker ydlidar::YDlidarDriver::_lock

线程锁

8.34.5.3 serial::Serial* ydlidar::YDlidarDriver::_serial [private]

串口

8.34.5.4 Locker ydlidar::YDlidarDriver::_serial_lock

串口锁

8.34.5.5 Thread ydlidar::YDlidarDriver::_thread

线程id

8.34.5.6 uint16_t ydlidar::YDlidarDriver::async_size [private]

8.34.5.7 int ydlidar::YDlidarDriver::asyncRecvPos [private]

8.34.5.8 uint16_t ydlidar::YDlidarDriver::CheckSum [private]

校验和

8.34.5.9 uint16_t ydlidar::YDlidarDriver::CheckSumCal [private]

8.34.5.10 bool ydlidar::YDlidarDriver::CheckSumResult [private]

8.34.5.11 uint16_t ydlidar::YDlidarDriver::FirstSampleAngle [private]

起始采样角

8.34.5.12 bool ydlidar::YDlidarDriver::get_device_health_success [private]

8.34.5.13 bool ydlidar::YDlidarDriver::get_device_info_success [private]

8.34.5.14 uint8_t* ydlidar::YDlidarDriver::globalRecvBuffer [private]

8.34.5.15 bool ydlidar::YDlidarDriver::has_device_header [private]

8.34.5.16 bool ydlidar::YDlidarDriver::has_package_error [private]

8.34.5.17 lidar_ans_header ydlidar::YDlidarDriver::header_ [private]

8.34.5.18 uint8_t* ydlidar::YDlidarDriver::headerBuffer [private]

8.34.5.19 device_health ydlidar::YDlidarDriver::health_ [private]

8.34.5.20 uint8_t* ydlidar::YDlidarDriver::healthBuffer [private]

8.34.5.21 device_info ydlidar::YDlidarDriver::info_ [private]

8.34.5.22 uint8_t* ydlidar::YDlidarDriver::infoBuffer [private]

8.34.5.23 float ydlidar::YDlidarDriver::IntervalSampleAngle [private]

8.34.5.24 float ydlidar::YDlidarDriver::IntervalSampleAngle_LastPackage [private]

8.34.5.25 std::atomic<bool> ydlidar::YDlidarDriver::isAutoconnting

是否正在自动连接中

8.34.5.26 std::atomic<bool> ydlidar::YDlidarDriver::isAutoReconnect

异常自动从新连接

8.34.5.27 std::atomic<bool> ydlidar::YDlidarDriver::isConnected

串口连接状体

8.34.5.28 std::atomic<bool> ydlidar::YDlidarDriver::isScanning

扫图状态

8.34.5.29 bool ydlidar::YDlidarDriver::isSupportMotorDtrCtrl [private]

是否支持电机控制

8.34.5.30 uint8_t ydlidar::YDlidarDriver::last_device_byte [private]

8.34.5.31 uint16_t ydlidar::YDlidarDriver::LastSampleAngle [private]

结束采样角

8.34.5.32 uint16_t ydlidar::YDlidarDriver::LastSampleAngleCal [private]

8.34.5.33 uint32_t ydlidar::YDlidarDriver::m_baudrate [private]

波特率

8.34.5.34 bool ydlidar::YDlidarDriver::m_intensities [private]

信号质量状体

8.34.5.35 int ydlidar::YDlidarDriver::m_sampling_rate [private]

采样频率

8.34.5.36 int ydlidar::YDlidarDriver::model [private]

雷达型号

8.34.5.37 node_package ydlidar::YDlidarDriver::package [private]

带信号质量协议包

8.34.5.38 int ydlidar::YDlidarDriver::package_index [private]

8.34.5.39 uint16_t ydlidar::YDlidarDriver::package_Sample_Index [private]

包采样点索引

8.34.5.40 node_packages ydlidar::YDlidarDriver::packages [private]

不带信好质量协议包

8.34.5.41 int ydlidar::YDlidarDriver::PackageSampleBytes [private]

一个包包含的激光点数

8.34.5.42 int ydlidar::YDlidarDriver::retryCount [private]

8.34.5.43 int ydlidar::YDlidarDriver::sample_rate [private]

8.34.5.44 uint16_t ydlidar::YDlidarDriver::SampleNumlAndCTCal [private]

8.34.5.45 uint8_t ydlidar::YDlidarDriver::scan_frequence [private]

协议中雷达转速

8.34.5.46 node_info* ydlidar::YDlidarDriver::scan_node_buf

激光点信息

8.34.5.47 size_t ydlidar::YDlidarDriver::scan_node_count

激光点数

8.34.5.48 std::string ydlidar::YDlidarDriver::serial_port [private]

雷达端口

8.34.5.49 uint32_t ydlidar::YDlidarDriver::trans_delay [private]

串口传输一个byte时间

8.34.5.50 uint16_t ydlidar::YDlidarDriver::Valu8Tou16 [private]

The documentation for this class was generated from the following files:

- include/ydlidar_driver.h
- src/ydlidar_driver.cpp

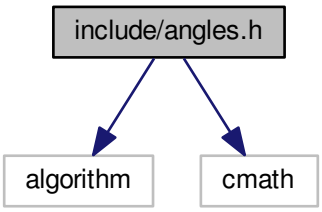
Chapter 9

File Documentation

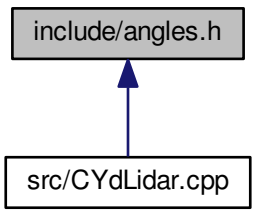
9.1 include/angles.h File Reference

```
#include <algorithm>
#include <cmath>
```

Include dependency graph for angles.h:



This graph shows which files directly or indirectly include this file:



Namespaces

- angles

Macros

- #define M_PI 3.1415926

Functions

- static double angles::from_degrees (double degrees)

  Convert degrees to radians.
- static double angles::to_degrees (double radians)

  Convert radians to degrees.
- static double angles::normalize_angle_positive (double angle)

  normalize_angle_positive
- static double angles::normalize_angle (double angle)

  normalize
- static double angles::shortest_angular_distance (double from, double to)

  shortest_angular_distance
- static double angles::two_pi_complement (double angle)

  returns the angle in [-2∗M_PI, 2∗M_PI] going the other way along the unit circle.
- static bool angles::find_min_max_delta (double from, double left_limit, double right_limit, double &result_↩ min_delta, double &result_max_delta)

  This function is only intended for internal use and not intended for external use. If you do use it, read the documentation very carefully. Returns the min and max amount (in radians) that can be moved from "from" angle to "left_limit" and "right_limit".
- static bool angles::shortest_angular_distance_with_limits (double from, double to, double left_limit, double right_limit, double &shortest_angle)

  Returns the delta from "from_angle" to "to_angle" making sure it does not violate limits specified by left_limit and right_limit. The valid interval of angular positions is [left_limit,right_limit]. E.g., [-0.25,0.25] is a 0.5 radians wide interval that contains 0. But [0.25,-0.25] is a 2∗M_PI-0.5 wide interval that contains M_PI (but not 0). The value of shortest_angle is the angular difference between "from" and "to" that lies within the defined valid interval. E.↩ g. shortest_angular_distance_with_limits(-0.5,0.5,0.25,-0.25,ss) evaluates ss to 2∗M_PI-1.0 and returns true while shortest_angular_distance_with_limits(-0.5,0.5,-0.25,0.25,ss) returns false since -0.5 and 0.5 do not lie in the interval [-0.25,0.25].

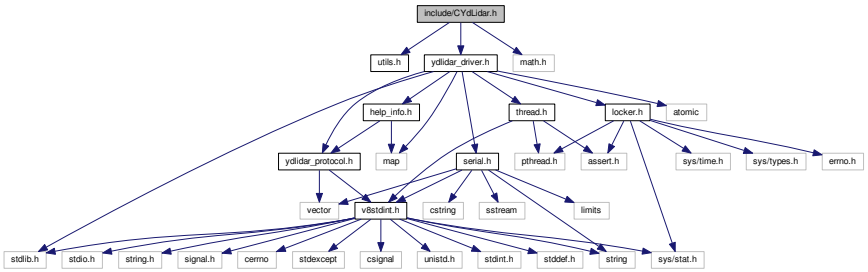
9.1.1 Macro Definition Documentation

9.1.1.1 #define M_PI 3.1415926

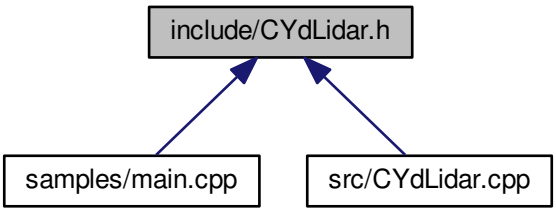
9.2 include/CYdLidar.h File Reference

```
#include "utils.h"
#include "ydlidar_driver.h"
#include <math.h>
```

Include dependency graph for CYdLidar.h:



This graph shows which files directly or indirectly include this file:



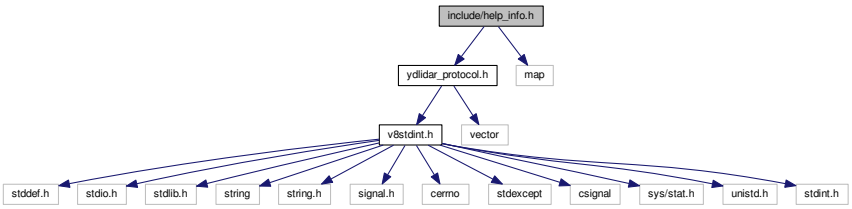
Classes

- class CYdLidar

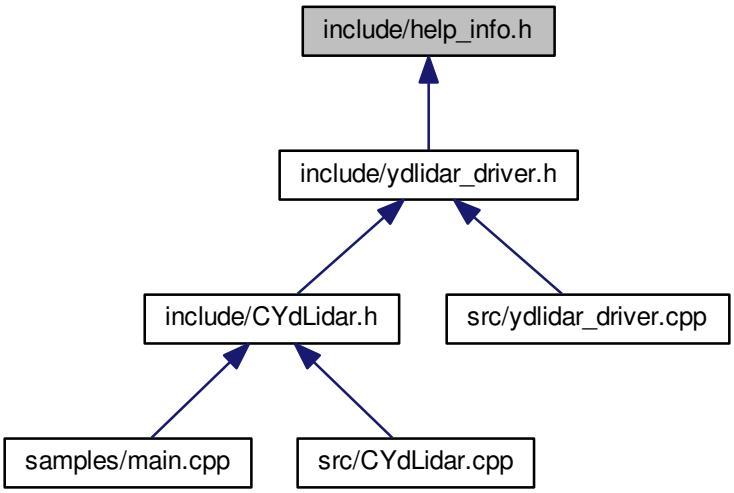
9.3 include/help_info.h File Reference

```
#include <ydlidar_protocol.h>
#include <map>
```

Include dependency graph for help_info.h:



This graph shows which files directly or indirectly include this file:



Namespaces

- ydlidar

Enumerations

- enum ydlidar::YDLIDAR_MODLES {
  ydlidar::YDLIDAR_F4 = 1, ydlidar::YDLIDAR_T1 = 2, ydlidar::YDLIDAR_F2 = 3, ydlidar::YDLIDAR_S4 = 4,
  ydlidar::YDLIDAR_G4 = 5, ydlidar::YDLIDAR_X4 = 6, ydlidar::YDLIDAR_G4PRO = 7, ydlidar::YDLIDAR_↩
  F4PRO = 8,
  ydlidar::YDLIDAR_R2 = 9, ydlidar::YDLIDAR_G10 = 10, ydlidar::YDLIDAR_S4B = 11, ydlidar::YDLIDAR_S2
  = 12,
  ydlidar::YDLIDAR_G6 = 13, ydlidar::YDLIDAR_G2A = 14, ydlidar::YDLIDAR_G2B = 15, ydlidar::YDLIDAR↩
  _G2C = 16,
  ydlidar::YDLIDAR_G4B = 17, ydlidar::YDLIDAR_G4C = 18, ydlidar::YDLIDAR_G1 = 19, ydlidar::YDLIDAR↩
  _TG15 = 100,
  ydlidar::YDLIDAR_TG30 = 101, ydlidar::YDLIDAR_TG50 = 102, ydlidar::YDLIDAR_Tail }
- enum ydlidar::YDLIDAR_RATE { ydlidar::YDLIDAR_RATE_4K = 0, ydlidar::YDLIDAR_RATE_8K = 1,
  ydlidar::YDLIDAR_RATE_9K = 2, ydlidar::YDLIDAR_RATE_10K = 3 }

Functions

- std::string ydlidar::lidarModelToString (int model)

  lidarModelToString
- int ydlidar::lidarModelDefaultSampleRate (int model)

  lidarModelDefaultSampleRate
- bool ydlidar::isOctaveLidar (int model)

  isOctaveLidar

- bool ydlidar::hasSampleRate (int model)

  hasSampleRate
- bool ydlidar::hasZeroAngle (int model)

  hasZeroAngle
- bool ydlidar::hasScanFrequencyCtrl (int model)

  hasScanFrequencyCtrl
- bool ydlidar::isSupportLidar (int model)

  isSupportLidar
- bool ydlidar::hasIntensity (int model)

  hasIntensity
- bool ydlidar::isSupportMotorCtrl (int model)

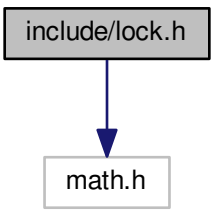
  isSupportMotorCtrl
- bool ydlidar::isSupportScanFrequency (int model, double frequency)

  isSupportScanFrequency
- bool ydlidar::isTOFLidar (int type)
- bool ydlidar::isOldVersionTOFLidar (int model, int Major, int Minor)
- bool ydlidar::isValidSampleRate (std::map< int, int > smap)
- int ydlidar::ConvertUserToLidarSmaple (int model, int m_SampleRate, int defaultRate)
- int ydlidar::ConvertLidarToUserSmaple (int model, int rate)
- bool ydlidar::isValidValue (uint8_t value)
- bool ydlidar::isVersionValid (const LaserDebug &info)
- bool ydlidar::isSerialNumbValid (const LaserDebug &info)
- bool ydlidar::ParseLaserDebugInfo (const LaserDebug &info, device_info &value)

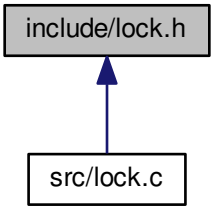
9.4 include/lock.h File Reference

```
#include <math.h>
```

Include dependency graph for lock.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define LOCK system_does_not_lock
- #define UNLOCK system_does_not_unlock

Functions

- int check_group_uucp ()
- int check_lock_pid (const char *file, int openpid)
- int lock_device (const char *)
- void unlock_device (const char *)
- int is_device_locked (const char *)
- int check_lock_status (const char *)
- int lfs_unlock (const char *, int)
- int lfs_lock (const char *, int)
- int lib_lock_dev_unlock (const char *, int)
- int lib_lock_dev_lock (const char *, int)
- void fhs_unlock (const char *, int)
- int fhs_lock (const char *, int)
- void uucp_unlock (const char *, int)
- int uucp_lock (const char *, int)

9.4.1 Macro Definition Documentation

9.4.1.1 #define LOCK system_does_not_lock

9.4.1.2 #define UNLOCK system_does_not_unlock

9.4.2 Function Documentation

9.4.2.1 int check_group_uucp ( )

9.4.2.2 int check_lock_pid (const char * *file*, int *openpid*)

9.4.2.3 int check_lock_status (const char *)

9.4.2.4 int fhs_lock (const char *, int)

9.4.2.5 void fhs_unlock (const char *, int)

9.4.2.6 int is_device_locked (const char *)

9.4.2.7 int lfs_lock (const char *, int)

9.4.2.8 int lfs_unlock (const char *, int)

9.4.2.9 int lib_lock_dev_lock (const char *, int)

9.4.2.10 int lib_lock_dev_unlock (const char *, int)

9.4.2.11 int lock_device (const char *)

9.4.2.12 void unlock_device (const char *)

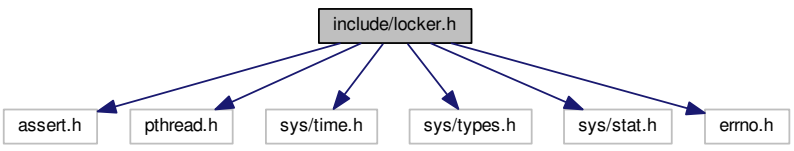
9.4.2.13 int uucp_lock (const char *, int)

9.4.2.14 void uucp_unlock (const char *, int)

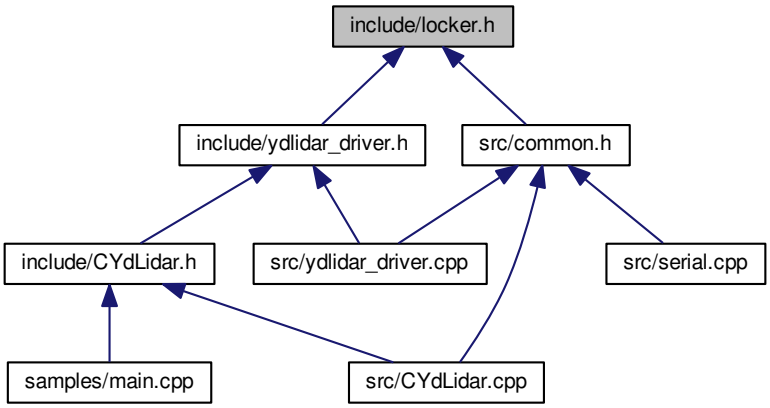
9.5 include/locker.h File Reference

```
#include <assert.h>
#include <pthread.h>
#include <sys/time.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <errno.h>
```

Include dependency graph for locker.h:



This graph shows which files directly or indirectly include this file:



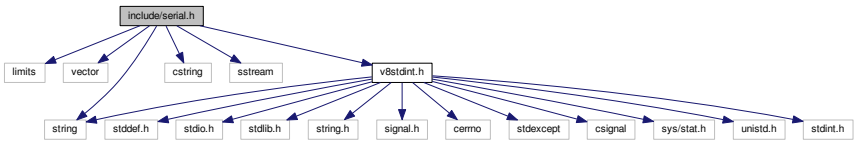
Classes

- class Locker
- class Event
- class ScopedLocker

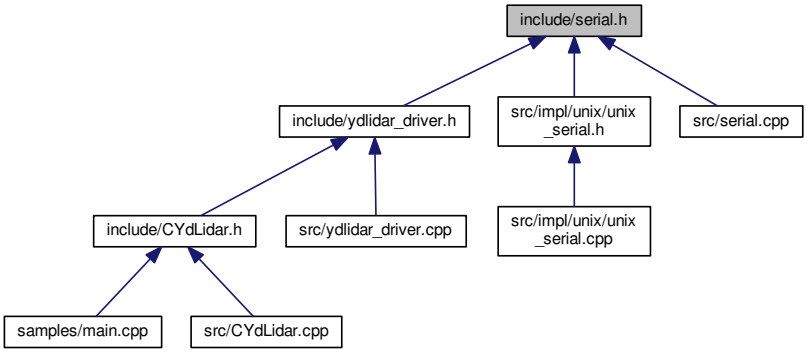
9.6 include/serial.h File Reference

```
#include <limits>
#include <vector>
#include <string>
#include <cstring>
#include <sstream>
#include "v8stdint.h"
```

Include dependency graph for serial.h:



This graph shows which files directly or indirectly include this file:



Classes

- struct serial::Timeout
- class serial::Serial
- struct serial::PortInfo

Namespaces

- serial

Enumerations

- enum serial::bytesize_t { serial::fivebits = 5, serial::sixbits = 6, serial::sevenbits = 7, serial::eightbits = 8 }
- enum serial::parity_t {
  serial::parity_none = 0, serial::parity_odd = 1, serial::parity_even = 2, serial::parity_mark = 3,
  serial::parity_space = 4 }
- enum serial::stopbits_t { serial::stopbits_one = 1, serial::stopbits_two = 2, serial::stopbits_one_point_five }
- enum serial::flowcontrol_t { serial::flowcontrol_none = 0, serial::flowcontrol_software, serial::flowcontrol_↩
  hardware }

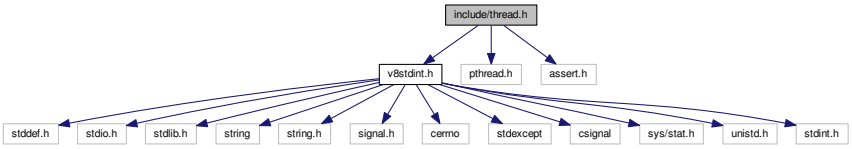
Functions

- std::vector< PortInfo > serial::list_ports ()

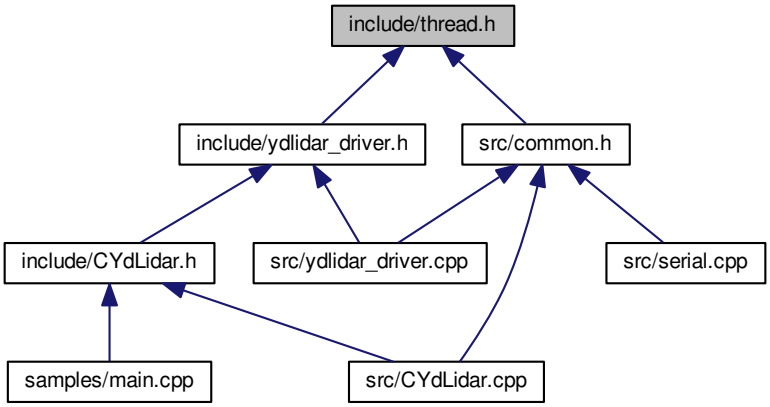
9.7 include/thread.h File Reference

```
#include "v8stdint.h"
#include <pthread.h>
#include <assert.h>
```

Include dependency graph for thread.h:



This graph shows which files directly or indirectly include this file:



Classes

- class Thread

Macros

- #define UNUSED(x) (void)x
- #define CLASS_THREAD(c, x) Thread::ThreadCreateObjectFunctor<c, &c::x>(this)

9.7.1 Macro Definition Documentation

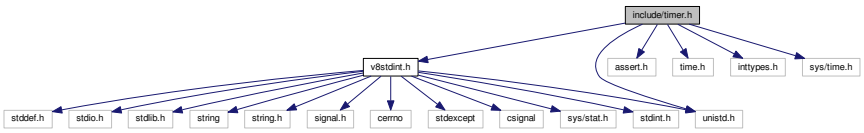
9.7.1.1 #define CLASS_THREAD(c, x) Thread::ThreadCreateObjectFunctor<c, &c::x>(this)

9.7.1.2 #define UNUSED(x) (void)x

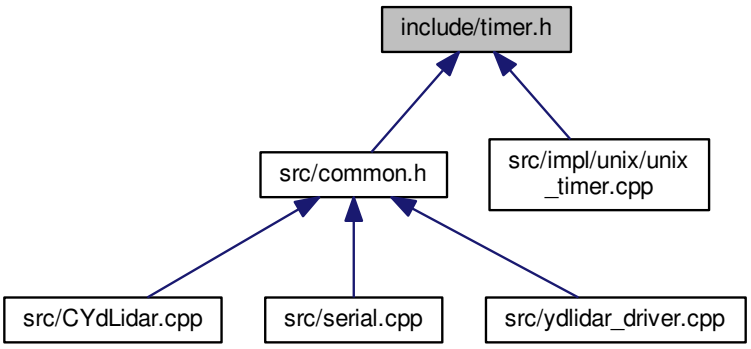
9.8 include/timer.h File Reference

```
#include "v8stdint.h"
#include <assert.h>
#include <time.h>
#include <inttypes.h>
#include <sys/time.h>
#include <unistd.h>
```

Include dependency graph for timer.h:



This graph shows which files directly or indirectly include this file:



Namespaces

- impl

Macros

- #define BEGIN_STATIC_CODE(_blockname_)
- #define END_STATIC_CODE(_blockname_) } _instance_##_blockname_;
- #define getms() impl::getHDTimer()
- #define getTime() impl::getCurrentTime()

Functions

- static void delay (uint32_t ms)
- uint32_t impl::getHDTimer ()
- uint64_t impl::getCurrentTime ()

9.8.1 Macro Definition Documentation

9.8.1.1 #define BEGIN_STATIC_CODE(_blockname_)

Value:

```
static class _static_code_##_blockname_ {    \
    public:     \
    _static_code_##_blockname_ ()
```

9.8.1.2 #define END_STATIC_CODE(_blockname_) } _instance_##_blockname_;

9.8.1.3 #define getms( ) impl::getHDTimer()

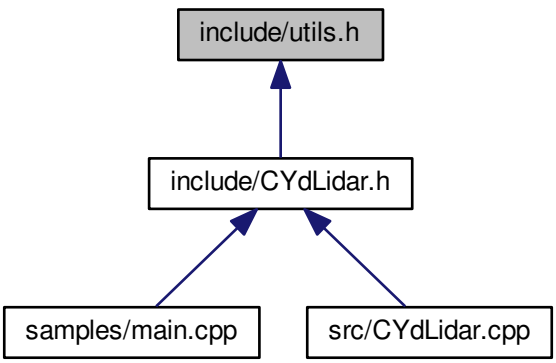
9.8.1.4 #define getTime( ) impl::getCurrentTime()

9.8.2 Function Documentation

9.8.2.1 static void delay (uint32_t *ms*) [inline], [static]

9.9 include/utils.h File Reference

This graph shows which files directly or indirectly include this file:



Macros

- #define YDLIDAR_API

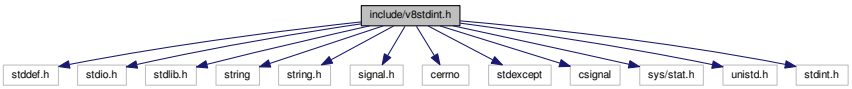
9.9.1 Macro Definition Documentation

9.9.1.1 #define YDLIDAR_API

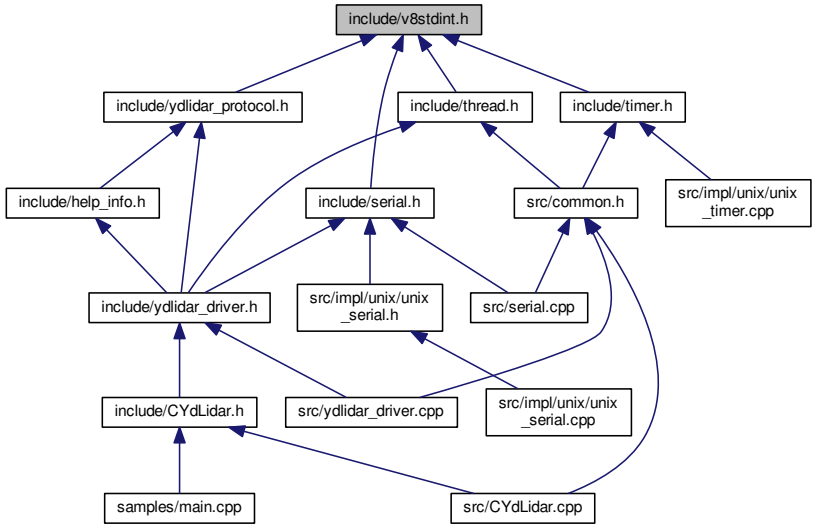
9.10 include/v8stdint.h File Reference

```
#include <stddef.h>
#include <stdio.h>
#include <stdlib.h>
#include <string>
#include <string.h>
#include <signal.h>
#include <cerrno>
#include <stdexcept>
#include <csignal>
#include <sys/stat.h>
#include <unistd.h>
#include <stdint.h>
```

Include dependency graph for v8stdint.h:



This graph shows which files directly or indirectly include this file:



Namespaces

- ydlidar

Macros

- #define UNUSED(x) (void)x
- #define _access access
- #define __small_endian
- #define __attribute__(x)
- #define RESULT_OK 0
- #define RESULT_TIMEOUT -1
- #define RESULT_FAIL -2
- #define INVALID_TIMESTAMP (0)
- #define IS_OK(x) ((x) == RESULT_OK)
- #define IS_TIMEOUT(x) ((x) == RESULT_TIMEOUT)
- #define IS_FAIL(x) ((x) == RESULT_FAIL)

Typedefs

- typedef _size_t(THREAD_PROC * thread_proc_t) (void *)
- typedef int32_t result_t
- typedef void(* signal_handler_t) (int)

Enumerations

- enum { DEVICE_DRIVER_TYPE_SERIALPORT = 0x0, DEVICE_DRIVER_TYPE_TCP = 0x1 }

Functions

- signal_handler_t set_signal_handler (int signal_value, signal_handler_t signal_handler)
- void trigger_interrupt_guard_condition (int signal_value)
- void signal_handler (int signal_value)
- void ydlidar::init (int argc, char *argv[])
- bool ydlidar::ok ()
- void ydlidar::shutdownNow ()
- bool ydlidar::fileExists (const std::string filename)

Variables

- static volatile sig_atomic_t g_signal_status = 0
- static signal_handler_t old_signal_handler = 0

9.10.1 Macro Definition Documentation

9.10.1.1 #define __attribute__(x)

9.10.1.2 #define __small_endian

9.10.1.3 #define _access access

9.10.1.4 #define INVALID_TIMESTAMP (0)

9.10.1.5 #define IS_FAIL(x) ((x) == RESULT_FAIL)

9.10.1.6 #define IS_OK(x) ((x) == RESULT_OK)

9.10.1.7 #define IS_TIMEOUT(x) ((x) == RESULT_TIMEOUT)

9.10.1.8 #define RESULT_FAIL -2

9.10.1.9 #define RESULT_OK 0

9.10.1.10 #define RESULT_TIMEOUT -1

9.10.1.11 #define UNUSED(x) (void)x

9.10.2 Typedef Documentation

9.10.2.1 typedef int32_t result_t

9.10.2.2 typedef void(∗ signal_handler_t) (int)

9.10.2.3 typedef _size_t(THREAD_PROC ∗ thread_proc_t) (void ∗)

9.10.3 Enumeration Type Documentation

9.10.3.1 anonymous enum

Enumerator

DEVICE_DRIVER_TYPE_SERIALPORT

DEVICE_DRIVER_TYPE_TCP

9.10.4 Function Documentation

9.10.4.1 signal_handler_t set_signal_handler (int *signal_value,* signal_handler_t *signal_handler*) [inline]

9.10.4.2 void signal_handler (int *signal_value*) [inline]

9.10.4.3 void trigger_interrupt_guard_condition (int *signal_value*) [inline]

9.10.5 Variable Documentation

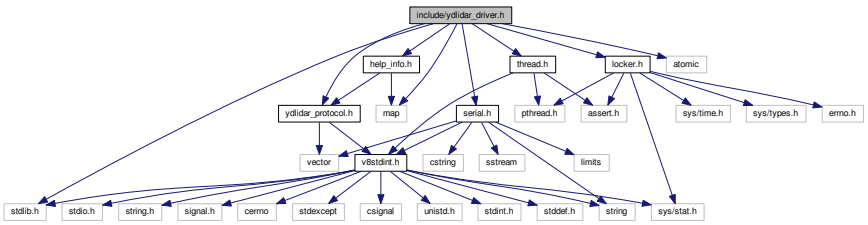
9.10.5.1 volatile sig_atomic_t g_signal_status = 0 [static]

9.10.5.2 signal_handler_t old_signal_handler = 0 [static]

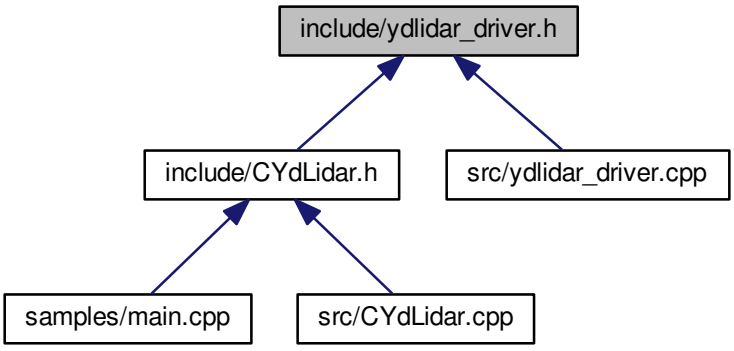
9.11 include/ydlidar_driver.h File Reference

```
#include <stdlib.h>
#include <atomic>
#include <map>
#include "serial.h"
#include "locker.h"
#include "thread.h"
#include "ydlidar_protocol.h"
#include "help_info.h"
```

Include dependency graph for ydlidar_driver.h:



This graph shows which files directly or indirectly include this file:



Classes

- class ydlidar::YDlidarDriver

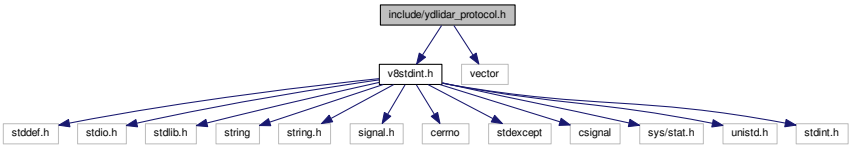
Namespaces

- ydlidar

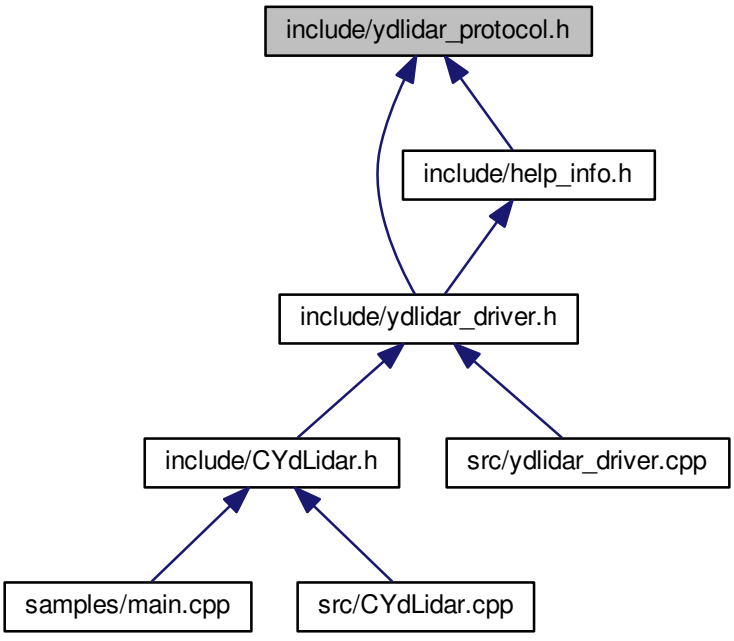
9.12 include/ydlidar_protocol.h File Reference

```
#include "v8stdint.h"
#include <vector>
```

Include dependency graph for ydlidar_protocol.h:



This graph shows which files directly or indirectly include this file:



Classes

- struct node_info
- struct PackageNode
- struct node_package
- struct node_packages
- struct device_info
- struct device_health
- struct sampling_rate
- struct scan_frequency
- struct scan_rotation
- struct scan_exposure
- struct scan_heart_beat
- struct scan_points
- struct function_state
- struct offset_angle
- struct cmd_packet
- struct lidar_ans_header
- struct LaserPoint
- struct LaserDebug
- struct LaserConfig

  A struct for returning configuration from the YDLIDAR.
- struct LaserScan

Macros

- #define PropertyBuilderByName(type, name, access_permission)
- #define _countof(_Array) (int)(sizeof(_Array) / sizeof(_Array[0]))
- #define M_PI 3.1415926
- #define SUNNOISEINTENSITY 0xff
- #define GLASSNOISEINTENSITY 0xfe
- #define LIDAR_CMD_STOP 0x65
- #define LIDAR_CMD_SCAN 0x60
- #define LIDAR_CMD_FORCE_SCAN 0x61
- #define LIDAR_CMD_RESET 0x80
- #define LIDAR_CMD_FORCE_STOP 0x00
- #define LIDAR_CMD_GET_EAI 0x55
- #define LIDAR_CMD_GET_DEVICE_INFO 0x90
- #define LIDAR_CMD_GET_DEVICE_HEALTH 0x92
- #define LIDAR_ANS_TYPE_DEVINFO 0x4
- #define LIDAR_ANS_TYPE_DEVHEALTH 0x6
- #define LIDAR_CMD_SYNC_BYTE 0xA5
- #define LIDAR_CMDFLAG_HAS_PAYLOAD 0x80
- #define LIDAR_ANS_SYNC_BYTE1 0xA5
- #define LIDAR_ANS_SYNC_BYTE2 0x5A
- #define LIDAR_ANS_TYPE_MEASUREMENT 0x81
- #define LIDAR_RESP_MEASUREMENT_SYNCBIT (0x1<<0)
- #define LIDAR_RESP_MEASUREMENT_QUALITY_SHIFT 2
- #define LIDAR_RESP_MEASUREMENT_CHECKBIT (0x1<<0)
- #define LIDAR_RESP_MEASUREMENT_ANGLE_SHIFT 1
- #define LIDAR_RESP_MEASUREMENT_DISTANCE_SHIFT 2
- #define LIDAR_RESP_MEASUREMENT_ANGLE_SAMPLE_SHIFT 8
- #define LIDAR_CMD_RUN_POSITIVE 0x06
- #define LIDAR_CMD_RUN_INVERSION 0x07

- #define LIDAR_CMD_SET_AIMSPEED_ADDMIC 0x09
- #define LIDAR_CMD_SET_AIMSPEED_DISMIC 0x0A
- #define LIDAR_CMD_SET_AIMSPEED_ADD 0x0B
- #define LIDAR_CMD_SET_AIMSPEED_DIS 0x0C
- #define LIDAR_CMD_GET_AIMSPEED 0x0D
- #define LIDAR_CMD_SET_SAMPLING_RATE 0xD0
- #define LIDAR_CMD_GET_SAMPLING_RATE 0xD1
- #define LIDAR_STATUS_OK 0x0
- #define LIDAR_STATUS_WARNING 0x1
- #define LIDAR_STATUS_ERROR 0x2
- #define LIDAR_CMD_ENABLE_LOW_POWER 0x01
- #define LIDAR_CMD_DISABLE_LOW_POWER 0x02
- #define LIDAR_CMD_STATE_MODEL_MOTOR 0x05
- #define LIDAR_CMD_ENABLE_CONST_FREQ 0x0E
- #define LIDAR_CMD_DISABLE_CONST_FREQ 0x0F
- #define LIDAR_CMD_GET_OFFSET_ANGLE 0x93
- #define LIDAR_CMD_SAVE_SET_EXPOSURE 0x94
- #define LIDAR_CMD_SET_LOW_EXPOSURE 0x95
- #define LIDAR_CMD_ADD_EXPOSURE 0x96
- #define LIDAR_CMD_DIS_EXPOSURE 0x97
- #define PackageSampleMaxLngth 0x100
- #define Node_Default_Quality (10)
- #define Node_Sync 1
- #define Node_NotSync 2
- #define PackagePaidBytes 10
- #define PH 0x55AA
- #define NORMAL_PACKAGE_SIZE 90
- #define INTENSITY_NORMAL_PACKAGE_SIZE 130

Enumerations

- enum CT { CT_Normal = 0, CT_RingStart = 1, CT_Tail }
- enum LidarTypeID { TYPE_TOF = 0, TYPE_TRIANGLE = 1, TYPE_Tail }

Functions

- struct node_info __attribute__ ((packed))

Variables

- uint8_t sync_flag
- uint16_t sync_quality
- uint16_t angle_q6_checkbit
  信号质量
- uint16_t distance_q2
  测距点角度
- uint64_t stamp
  当前测距点距离
- uint8_t scan_frequence
  时间戳
- uint8_t debug_info [12]

特定版本此值才有效,无效值是*0*

- uint8_t index
- uint8_t PakageSampleQuality
- uint16_t PakageSampleDistance
- uint16_t package_Head
- uint8_t package_CT
- uint8_t nowPackageNum
- uint16_t packageFirstSampleAngle
- uint16_t packageLastSampleAngle
- uint16_t checkSum
- PackageNode packageSample [PackageSampleMaxLngth]
- uint16_t packageSampleDistance [PackageSampleMaxLngth]
- uint8_t model

  雷达型号
- uint16_t firmware_version

  固件版本号
- uint8_t hardware_version

  硬件版本号
- uint8_t serialnum [16]

  系列号
- uint8_t status

  健康状体
- uint16_t error_code

  错误代码
- uint8_t rate

  采样频率
- uint32_t frequency

  扫描频率
- uint8_t rotation
- uint8_t exposure

  低光功率模式
- uint8_t enable

  掉电保护状态
- uint8_t flag
- uint8_t state
- int32_t angle
- uint8_t syncByte
- uint8_t cmd_flag
- uint8_t size
- uint8_t data
- uint8_t syncByte1
- uint8_t syncByte2
- uint32_t subType
- uint8_t type
- struct LaserPoint __attribute__

9.12.1 Macro Definition Documentation

9.12.1.1 #define _countof(_Array) (int)(sizeof(_Array) / sizeof(_Array[0]))

9.12.1.2 #define GLASSNOISEINTENSITY 0xfe

9.12.1.3 #define INTENSITY_NORMAL_PACKAGE_SIZE 130

9.12.1.4 #define LIDAR_ANS_SYNC_BYTE1 0xA5

9.12.1.5 #define LIDAR_ANS_SYNC_BYTE2 0x5A

9.12.1.6 #define LIDAR_ANS_TYPE_DEVHEALTH 0x6

9.12.1.7 #define LIDAR_ANS_TYPE_DEVINFO 0x4

9.12.1.8 #define LIDAR_ANS_TYPE_MEASUREMENT 0x81

9.12.1.9 #define LIDAR_CMD_ADD_EXPOSURE 0x96

9.12.1.10 #define LIDAR_CMD_DIS_EXPOSURE 0x97

9.12.1.11 #define LIDAR_CMD_DISABLE_CONST_FREQ 0x0F

9.12.1.12 #define LIDAR_CMD_DISABLE_LOW_POWER 0x02

9.12.1.13 #define LIDAR_CMD_ENABLE_CONST_FREQ 0x0E

9.12.1.14 #define LIDAR_CMD_ENABLE_LOW_POWER 0x01

9.12.1.15 #define LIDAR_CMD_FORCE_SCAN 0x61

9.12.1.16 #define LIDAR_CMD_FORCE_STOP 0x00

9.12.1.17 #define LIDAR_CMD_GET_AIMSPEED 0x0D

9.12.1.18 #define LIDAR_CMD_GET_DEVICE_HEALTH 0x92

9.12.1.19 #define LIDAR_CMD_GET_DEVICE_INFO 0x90

9.12.1.20 #define LIDAR_CMD_GET_EAI 0x55

9.12.1.21 #define LIDAR_CMD_GET_OFFSET_ANGLE 0x93

9.12.1.22 #define LIDAR_CMD_GET_SAMPLING_RATE 0xD1

9.12.1.23 #define LIDAR_CMD_RESET 0x80

9.12.1.24 #define LIDAR_CMD_RUN_INVERSION 0x07

9.12.1.25 #define LIDAR_CMD_RUN_POSITIVE 0x06

9.12.1.26 #define LIDAR_CMD_SAVE_SET_EXPOSURE 0x94

9.12.1.27 #define LIDAR_CMD_SCAN 0x60

9.12.1.28 #define LIDAR_CMD_SET_AIMSPEED_ADD 0x0B

9.12.1.29 #define LIDAR_CMD_SET_AIMSPEED_ADDMIC 0x09

9.12.1.30 #define LIDAR_CMD_SET_AIMSPEED_DIS 0x0C

9.12.1.31 #define LIDAR_CMD_SET_AIMSPEED_DISMIC 0x0A

9.12.1.32 #define LIDAR_CMD_SET_LOW_EXPOSURE 0x95

9.12.1.33 #define LIDAR_CMD_SET_SAMPLING_RATE 0xD0

9.12.1.34 #define LIDAR_CMD_STATE_MODEL_MOTOR 0x05

9.12.1.35 #define LIDAR_CMD_STOP 0x65

9.12.1.36 #define LIDAR_CMD_SYNC_BYTE 0xA5

9.12.1.37 #define LIDAR_CMDFLAG_HAS_PAYLOAD 0x80

9.12.1.38 #define LIDAR_RESP_MEASUREMENT_ANGLE_SAMPLE_SHIFT 8

9.12.1.39 #define LIDAR_RESP_MEASUREMENT_ANGLE_SHIFT 1

9.12.1.40 #define LIDAR_RESP_MEASUREMENT_CHECKBIT (0x1<<0)

9.12.1.41 #define LIDAR_RESP_MEASUREMENT_DISTANCE_SHIFT 2

9.12.1.42 #define LIDAR_RESP_MEASUREMENT_QUALITY_SHIFT 2

9.12.1.43 #define LIDAR_RESP_MEASUREMENT_SYNCBIT (0x1<<0)

9.12.1.44 #define LIDAR_STATUS_ERROR 0x2

9.12.1.45 #define LIDAR_STATUS_OK 0x0

9.12.1.46 #define LIDAR_STATUS_WARNING 0x1

9.12.1.47 #define M_PI 3.1415926

9.12.1.48 #define Node_Default_Quality (10)

9.12.1.49 #define Node_NotSync 2

9.12.1.50 #define Node_Sync 1

9.12.1.51 #define NORMAL_PACKAGE_SIZE 90

9.12.1.52 #define PackagePaidBytes 10

9.12.1.53 #define PackageSampleMaxLngth 0x100

9.12.1.54 #define PH 0x55AA

9.12.1.55 #define PropertyBuilderByName(type, *name*, *access_permission*)

Value:

```
access_permission:\
        type m_##name;\
    public:\
    inline void set##name(type v) {\
        m_##name = v;\
    }\
    inline type get##name() {\
        return m_##name;\
}\
```

9.12.1.56 #define SUNNOISEINTENSITY 0xff

9.12.2 Enumeration Type Documentation

9.12.2.1 enum CT

Enumerator

CT_Normal

CT_RingStart

CT_Tail

9.12.2.2 enum LidarTypeID

Enumerator

TYPE_TOF

TYPE_TRIANGLE

TYPE_Tail

9.12.3 Function Documentation

9.12.3.1 struct node_info __attribute__ ((packed))

9.12.4 Variable Documentation

9.12.4.1 struct lidar_ans_header __attribute__

9.12.4.2 int32_t angle

9.12.4.3 uint16_t angle_q6_checkbit

信号质量

9.12.4.4 uint16_t checkSum

9.12.4.5 uint8_t cmd_flag

9.12.4.6 uint8_t data

9.12.4.7 uint8_t debug_info[12]

特定版本此值才有效,无效值是0

9.12.4.8 uint16_t distance_q2

测距点角度

9.12.4.9 uint8_t enable

掉电保护状态

9.12.4.10 uint16_t error_code

错误代码

9.12.4.11 uint8_t exposure

低光功率模式

9.12.4.12 uint16_t firmware_version

固件版本号

9.12.4.13 uint8_t flag

9.12.4.14 uint32_t frequency

扫描频率

9.12.4.15 uint8_t hardware_version

硬件版本号

9.12.4.16 uint8_t index

9.12.4.17 uint8_t model

雷达型号

9.12.4.18 uint8_t nowPackageNum

9.12.4.19 uint8_t package_CT

9.12.4.20 uint16_t package_Head

9.12.4.21 uint16_t packageFirstSampleAngle

9.12.4.22 uint16_t packageLastSampleAngle

9.12.4.23 PackageNode packageSample[PackageSampleMaxLngth]

9.12.4.24 uint16_t packageSampleDistance[PackageSampleMaxLngth]

9.12.4.25 uint16_t PakageSampleDistance

9.12.4.26 uint8_t PakageSampleQuality

9.12.4.27 uint8_t rate

采样频率

9.12.4.28 uint8_t rotation

9.12.4.29 uint8_t scan_frequence

时间戳

9.12.4.30 uint8_t serialnum[16]

系列号

9.12.4.31 uint32_t size

9.12.4.32 uint64_t stamp

当前测距点距离

9.12.4.33 uint8_t state

9.12.4.34 uint8_t status

健康状体

9.12.4.35 uint32_t subType

9.12.4.36 uint8_t sync_flag

9.12.4.37 uint16_t sync_quality

9.12.4.38 uint8_t syncByte

9.12.4.39 uint8_t syncByte1

9.12.4.40 uint8_t syncByte2

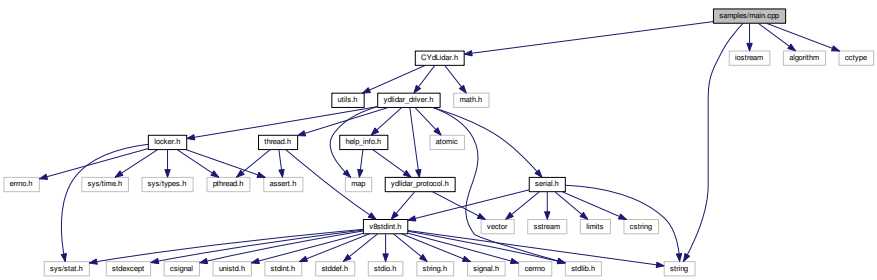
9.12.4.41 uint8_t type

9.13 README.md File Reference

9.14 samples/main.cpp File Reference

```
#include "CYdLidar.h"
#include <iostream>
#include <string>
#include <algorithm>
#include <cctype>
```

Include dependency graph for main.cpp:



Functions

- int main (int argc, char ∗argv[ ])

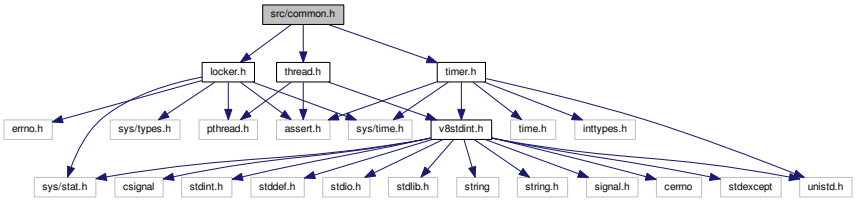
9.14.1 Function Documentation

9.14.1.1 int main (int *argc,* char ∗ *argv[ ]*)

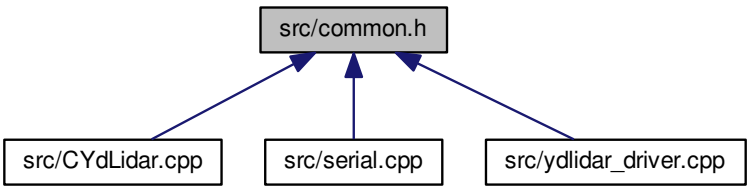
9.15 src/common.h File Reference

```
#include "locker.h"
#include "thread.h"
#include "timer.h"
```

Include dependency graph for common.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define SDKVerision "1.4.6"

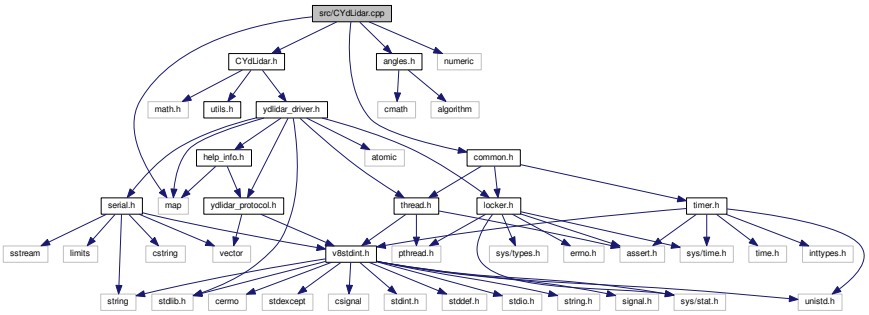
9.15.1 Macro Definition Documentation

9.15.1.1 #define SDKVerision "1.4.6"

9.16 src/CYdLidar.cpp File Reference

```
#include "CYdLidar.h"
#include "common.h"
#include <map>
#include <angles.h>
#include <numeric>
```

Include dependency graph for CYdLidar.cpp:



9.17 src/impl/list_ports/list_ports_linux.cpp File Reference

9.18 src/impl/unix/list_ports_linux.cpp File Reference

9.19 src/impl/list_ports/list_ports_osx.cpp File Reference

9.20 src/impl/list_ports/list_ports_win.cpp File Reference

9.21 src/impl/windows/list_ports_win.cpp File Reference

9.22 src/impl/unix/unix.h File Reference

```
#include <stdio.h>
```

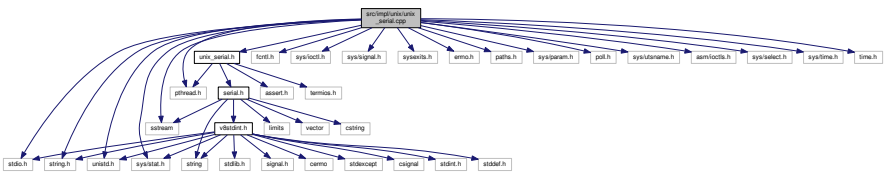
```
#include <stdint.h>
#include <string.h>
#include <stdlib.h>
#include <assert.h>
#include <math.h>
#include <time.h>
#include <stdarg.h>
#include <iostream>
#include <string>
#include <unistd.h>
#include <errno.h>
#include <pthread.h>
#include <sys/time.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <sys/ioctl.h>
#include <sys/select.h>
```

Include dependency graph for unix.h:

9.23 src/impl/unix/unix_serial.cpp File Reference

```
#include <stdio.h>
#include <string.h>
#include <sstream>
#include <unistd.h>
#include <fcntl.h>
#include <sys/ioctl.h>
#include <sys/signal.h>
#include <sysexits.h>
#include <errno.h>
#include <paths.h>
#include <sys/param.h>
#include <pthread.h>
#include <poll.h>
#include <sys/utsname.h>
#include <asm/ioctls.h>
#include <sys/select.h>
#include <sys/time.h>
#include <sys/stat.h>
#include <time.h>
#include "unix_serial.h"
```

Include dependency graph for unix_serial.cpp:



Classes

- struct serial::termios2

Namespaces

- serial

Macros

- #define TIOCINQ 0x541B
- #define SNCCS 19
- #define TCGETS2 _IOR('T', 0x2A, struct termios2)
- #define TCSETS2 _IOW('T', 0x2B, struct termios2)
- #define BOTHER 0010000

Functions

- timespec serial::timespec_from_ms (const uint32_t millis)
- static void serial::set_common_props (termios *tio)
- static void serial::set_databits (termios *tio, serial::bytesize_t databits)
- static void serial::set_parity (termios *tio, serial::parity_t parity)
- static void serial::set_stopbits (termios *tio, serial::stopbits_t stopbits)
- static void serial::set_flowcontrol (termios *tio, serial::flowcontrol_t flowcontrol)
- static bool serial::is_standardbaudrate (unsigned long baudrate, speed_t &baud)

9.23.1 Macro Definition Documentation

9.23.1.1 #define BOTHER 0010000

9.23.1.2 #define SNCCS 19

9.23.1.3 #define TCGETS2 _IOR('T', 0x2A, struct termios2)

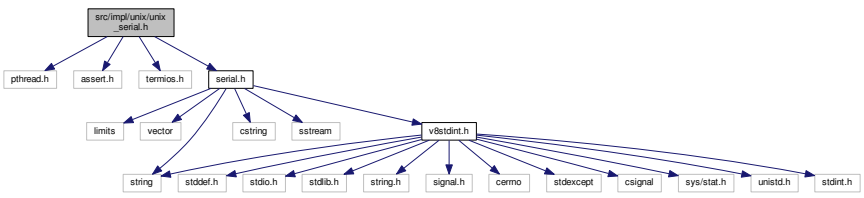
9.23.1.4 #define TCSETS2 _IOW('T', 0x2B, struct termios2)

9.23.1.5 #define TIOCINQ 0x541B

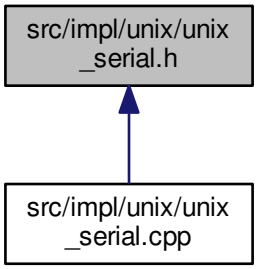
9.24 src/impl/unix/unix_serial.h File Reference

```
#include <pthread.h>
#include <assert.h>
#include <termios.h>
#include "serial.h"
```

Include dependency graph for unix_serial.h:



This graph shows which files directly or indirectly include this file:



Classes

- class serial::MillisecondTimer
- class serial::Serial::SerialImpl

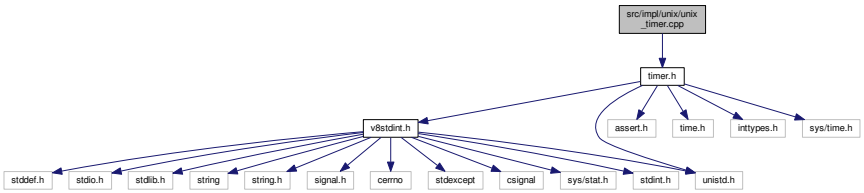
Namespaces

- serial

9.25 src/impl/unix/unix_timer.cpp File Reference

```
#include "timer.h"
```

Include dependency graph for unix_timer.cpp:



Namespaces

- impl

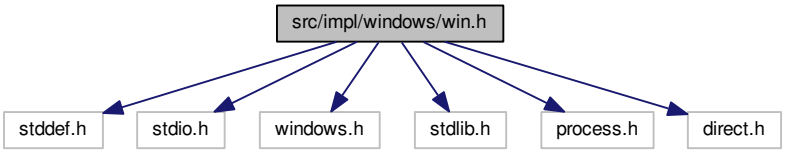
Functions

- uint32_t impl::getHDTimer ()
- uint64_t impl::getCurrentTime ()

9.26 src/impl/windows/win.h File Reference

```
#include <stddef.h>
#include <stdio.h>
#include <windows.h>
#include <stdlib.h>
#include <process.h>
#include <direct.h>
```

Include dependency graph for win.h:



9.27 src/impl/windows/win_serial.cpp File Reference

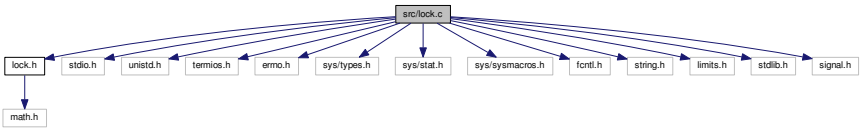
9.28 src/impl/windows/win_serial.h File Reference

9.29 src/impl/windows/win_timer.cpp File Reference

9.30 src/lock.c File Reference

```
#include "lock.h"
#include <stdio.h>
#include <unistd.h>
#include <termios.h>
#include <errno.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <sys/sysmacros.h>
#include <fcntl.h>
#include <string.h>
#include <limits.h>
#include <stdlib.h>
#include <signal.h>
```

Include dependency graph for lock.c:



Functions

- int fhs_lock (const char *filename, int pid)
- int uucp_lock (const char *filename, int pid)
- int check_lock_status (const char *filename)
- void fhs_unlock (const char *filename, int openpid)
- void uucp_unlock (const char *filename, int openpid)
- int check_lock_pid (const char *file, int openpid)
- int check_group_uucp ()
- int is_device_locked (const char *port_filename)

9.30.1 Function Documentation

9.30.1.1 int check_group_uucp ( )

9.30.1.2 int check_lock_pid (const char * *file*, int *openpid*)

9.30.1.3 int check_lock_status (const char * *filename*)

9.30.1.4 int fhs_lock (const char * *filename*, int *pid*)

9.30.1.5 void fhs_unlock (const char * *filename*, int *openpid*)

9.30.1.6 int is_device_locked (const char * *port_filename*)

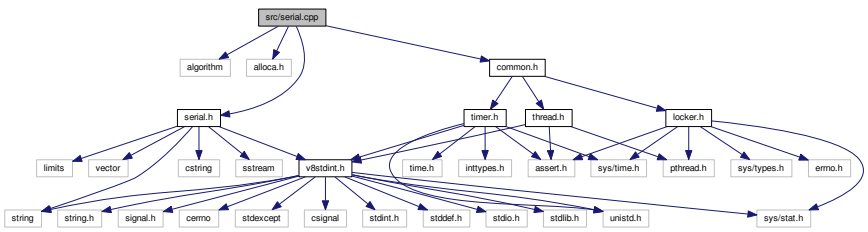
9.30.1.7 int uucp_lock (const char * *filename*, int *pid*)

9.30.1.8 void uucp_unlock (const char * *filename*, int *openpid*)

9.31 src/serial.cpp File Reference

```
#include <algorithm>
#include <alloca.h>
#include "serial.h"
#include "common.h"
```

Include dependency graph for serial.cpp:



Classes

- class serial::Serial::ScopedReadLock
- class serial::Serial::ScopedWriteLock

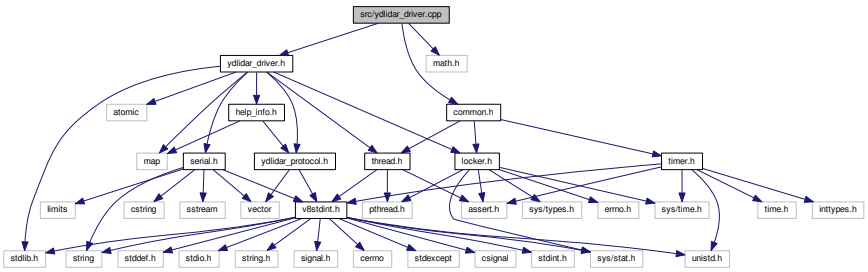
Namespaces

- serial

9.32 src/ydlidar_driver.cpp File Reference

```
#include "ydlidar_driver.h"
#include "common.h"
#include <math.h>
```

Include dependency graph for ydlidar_driver.cpp:



Namespaces

- ydlidar

Index