YDLIDAR SDK build unknown build passing codebeat C

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 .

Release Notes

Title	Version	Data
SDK	1.3.7	2018-10-26

- [new feature] add G2-SS-1 Model.
- [new feature] support ini file calibration zero angle.

Dataset

Support LIDAR Model(Only S4Pro and S4B support intensity)

Model	Baudrate	Sampling Frequency	Range(m)	Scanning Frequency(HZ)	Working temperature(°C)	Laser power max(mW)	voltage(V)	Current(mA)
G2-SS-1	230400	5000	0.1-16	5-12	0-50	~5	4.8-5.2	400-480
G4	230400	9000	0.26-16	5-12	0-50	~5	4.8-5.2	400-480
X4	128000	5000	0.12-10	5-12	0-40	~5	4.8-5.2	330-380
F4	115200	4000	0.1-12	5-12	0-40	~5	4.8-5.2	400-480
S4	115200	4000	0.1-8	6-12	0-40	~5	4.8-5.2	330-380
S4Pro	153600	4000	0.1-8	6-12	0-40	~5	4.8-5.2	330-380

How to build YDLIDAR SDK samples

```
$ git clone https://github.com/yangfuyuan/sdk
$ cd sdk
$ git checkout samsung
$ cd ..
$ mkdir build
$ cd build
$ cmake ../sdk
$ make          ###linux
$ vs open Project.sln   ###windows
```

How to run YDLIDAR SDK samples

```
$ cd samples
```

linux:

```
$ ./ydlidar_test LidarAngleCalibration.ini
$Please enter the lidar serial port:/dev/ttyUSB0
$Please enter the lidar serial baud rate:230400
&Please enter the lidar intensity:0
```

windows:

```
$ ydlidar_test.exe LidarAngleCalibration.ini
$Please enter the lidar serial port:/dev/ttyUSB0
$Please enter the lidar serial baud rate:230400
&Please enter the lidar intensity:0
```

You should see YDLIDAR’s scan result in the console:

```
[YDLIDAR]:SDK Version: 1.3.7
[YDLIDAR]:Lidar running correctly ! The health status: good
[YDLIDAR] Connection established in [/dev/ttyUSB0][230400]:
Firmware version: 1.1
Hardware version: 3
Model: G2-SS-1
Serial: 2018101800011111
[YDLIDAR INFO] Current Sampling Rate : 5K
[YDLIDAR INFO] Successfully obtained the calibration value[0.000000] from the calibration file[LidarAngleCalibration.ini]
[YDLIDAR INFO] Current AngleOffset : 0.000000°
[YDLIDAR INFO] Current Scan Frequency : 8.000000Hz
[YDLIDAR INFO] Now YDLIDAR is scanning ......
Scan received: 625 ranges
Scan received: 626 ranges
```

code:

```
    void ParseScan(node_info* data, const size_t& size) {

        double current_frequence, current_distance, current_angle, current_intensity;

        uint64_t current_time_stamp;

        for (size_t i = 0; i < size; i++ ) {

            if( data[i].scan_frequence != 0) {

                current_frequence =  data[i].scan_frequence;//or current_frequence = data[0].scan_frequence

            }

            current_time_stamp = data[i].stamp;

            current_angle = ((data[i].angle_q6_checkbit>>LIDAR_RESP_MEASUREMENT_ANGLE_SHIFT)/64.0f);//LIDAR_RESP_MEASUREMENT_ANGLE_SHIFT equals 8

            current_distance =  data[i].distance_q/4.f;

            current_intensity = (float)(data[i].sync_quality);

        }

        if (current_frequence != 0 ) {

            printf("current lidar scan frequency: %f\n", current_frequence);

        } else {

            printf("Current lidar does not support return scan frequency\n");

        }
    }
```

Data structure

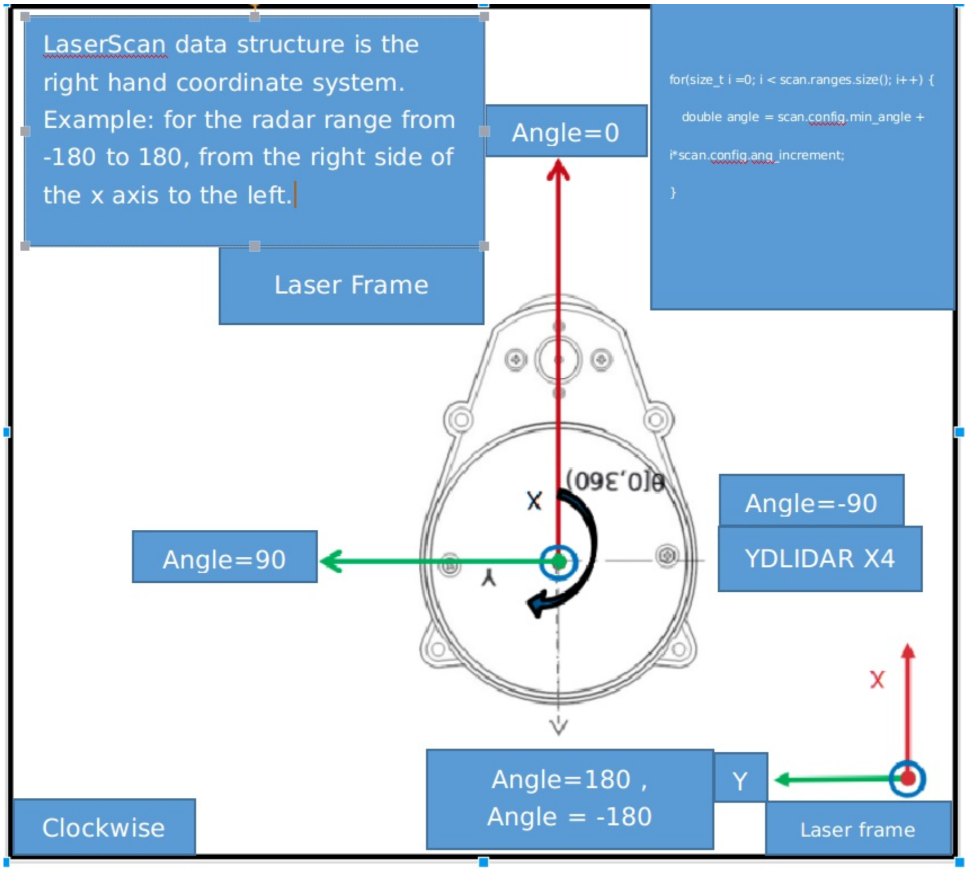
data structure:

```
//! A struct for returning configuration from the YDLIDAR
struct LaserConfig {

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

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

    //! Scan resolution [rad].
    float ang_increment;

    //! Scan resoltuion [ns]
    float time_increment;

    //! Time between scans
    float scan_time;

    //! Minimum range [m]
    float min_range;

    //! Maximum range [m]
    float max_range;

    //! Range Resolution [m]
    float range_res;

  };


  struct LaserScan {

    //! Array of ranges
    std::vector<float> ranges;

    //! Array of intensities
    std::vector<float> intensities;

    //! Self reported time stamp in nanoseconds
    uint64_t self_time_stamp;

    //! System time when first range was measured in nanoseconds
    uint64_t system_time_stamp;

    //! Configuration of scan
    LaserConfig config;

  };
```

example angle parsing:

```
LaserScan scan;

for(size_t i =0; i < scan.ranges.size(); i++) {

  // current angle
  double angle = scan.config.min_angle + i*scan.config.ang_increment;// radian format

  //current distance
  double distance = scan.ranges[i];//meters

  //current intensity
  int intensity = scan.intensities[i];

}
```

Coordinate System



LaserScan data structure is the right hand coordinate system. Example: for the radar range from -180 to 180, from the right side of the x axis to the left.

```
for(size_t i =0; i < scan.ranges.size(); i++) {
   double angle = scan.config.min_angle +
i*scan.config.ang_increment;
}
```

LaserScan data structure radar coordinate system

The relationship between the angle value and the data structure in the above figure:

```
double current_angle =  scan.config.min_angle + index*scan.config.ang_increment;// radian format
doube Angle = current_angle*180/M_PI;//Angle fomat
```

Upgrade Log

2018-10-26 version:1.3.7

1.add input angle calibration file.

2.remove network.

2018-10-15 version:1.3.6

1.add network support.

2018-05-23 version:1.3.4

1.add automatic reconnection if there is an exception

2.add serial file lock.

2018-05-14 version:1.3.3

1.add the heart function constraint.

2.add packet type with scan frequency support.

2018-04-16 version:1.3.2

1.add multithreading support.

2018-04-16 version:1.3.1

1.Compensate for each laser point timestamp.

Contact EAI

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