

KBSW190620

, publishDepthCamFrame

-
- core
- cube
-
-
-
- 1Intel Realsense D435i Windows SDK
- 2Intel Realsense D435i Linux SDK

SDKpublishDepthCamFrameSlamware Coreslamware Cube

core

RoboStudioSlamwareMCUMakehex



m
m

[KBSW180147](#)

[KBSW180158 Breakout kit](#)



2.6.7

cube

```
slamware_core_platform.h x
rpos::robot_platforms::SlamwareCorePlatform publishDepthCamFrame(int sensorId, const r
void publishDepthCamFrame(int sensorId, const rpos::message::depth_camera::DepthCameraFrame& frame);
```

sensorId:SlamwareId.

DepthCameraFrame:DepthCameraFrame

DepthCameraFrame

```
struct DepthCameraFrame
{
    float minValidDistance;    //@brief Min distance of the sensor (in meters)

    float maxValidDistance;    //@brief Max distance of the sensor (in meters)

    float minFovPitch;         //@brief The pitch of the first line of the frame (in rad)

    float maxFovPitch;         //@brief The pitch of the last line of the frame (in rad)

    float minFovYaw;           //@brief The yaw of the last column of the frame (in rad)

    float maxFovYaw;           //@brief The yaw of the first column of the frame (in rad)

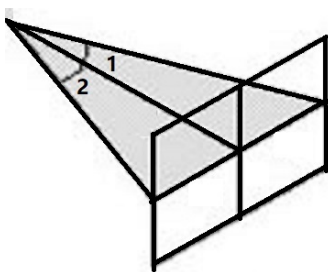
    int cols;                  //@brief how many columns in this frame

    int rows;                  //@brief how many rows in this frame

    // TODO:
    // We now use std::vector to store data, which will make *copying* frames very expensive
    // we should use a data structure support CoW (copy on write) or just use shared pointer to store the internal data
    /**
     * @brief The data (order: row by row, cell by cell in each row)
     */
    std::vector<float> data;
};
```

(FOV)DepthCameraFrame

- 1.
2. maxValidDistance2
3. colsrows320x240,
4. minFovPitchmaxFovPitchVFOV()VFOV=a(rad),minFovPitch=-a/2maxFovPitch=a/2
5. minFovYawmaxFovYawHFOV()HFOV=b(rad),minFovPitch=-b/2maxFovPitch=b/2
6. data



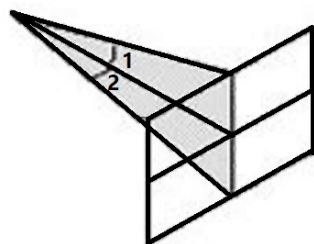
HFOV(水平视角)

1为maxFovYaw,

$\text{maxFovYaw} = \text{HFOV}/2(\text{rad})$;

2为minFovYaw,

$\text{minFovYaw} = -\text{HFOV}/2(\text{rad})$



VFOV(垂直视角)

1为minFovPitch,

$\text{minFovPitch} = -\text{VFOV}/2(\text{rad})$;

2为maxFovPitch,

$\text{maxFovPitch} = \text{VFOV}/2(\text{rad})$

publishDepthCamFrame

```
#include <rpos/robot_platforms/slamware_core_platform.h>

struct CamAttr
{
    float minValidDistance;
    float maxValidDistance;
    float minFovPitch;
    float maxFovPitch;
    float minFovYaw;
    float maxFovYaw;
    int cols;
    int rows;
};

int main(int argc, char* argv[])
{
    try
    {
        rpos::robot_platforms::SlamwareCorePlatform platform = rpos::robot_platforms::SlamwareCorePlatform::
connect("192.168.11.1", 1445);

        CamAttr camera_attr;
        getAttrFromDevice(camera_attr);          // TODO: Get attr from device doc maybe

        rpos::message::depth_camera::DepthCameraFrame frame;
        frame.minValidDistance = camera_attr.minValidDistance;
        frame.maxValidDistance = camera_attr.maxValidDistance;
        frame.minFovPitch = camera_attr.minFovPitch;
        frame.maxFovPitch = camera_attr.maxFovPitch;
        frame.minFovYaw = camera_attr.minFovYaw;
        frame.maxFovYaw = camera_attr.maxFovYaw;
        frame.cols = camera_attr.cols;
        frame.rows = camera_attr.rows;

        std::vector<float> frame_buffer;
        getFrameFromDepthCam(frame_buffer);      // TODO: Get Frame buffer from DepthCam Device

        int sensorId = 1; //TODO: Config your own SensorId
        platform.publishDepthCamFrame(sensorId, frame);
    }
    catch(const std::exception& ex)
    {
        std::string ex_str(ex.what());
    }
    return 0;
}
```

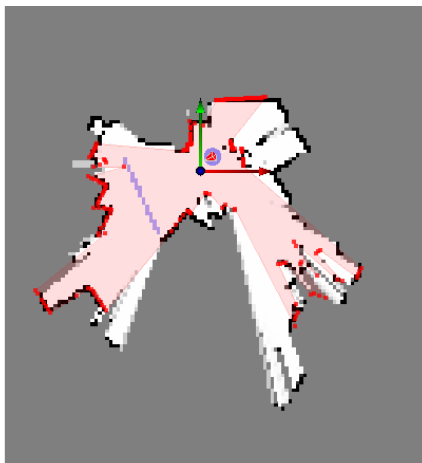
- 1.publishDepthCamFrame10
- 2.publishDepthCamFrame100ms
- 3.
- 4.SDK

1. RoboStudio

Slamware Sensor Map[RoboStudio](#)



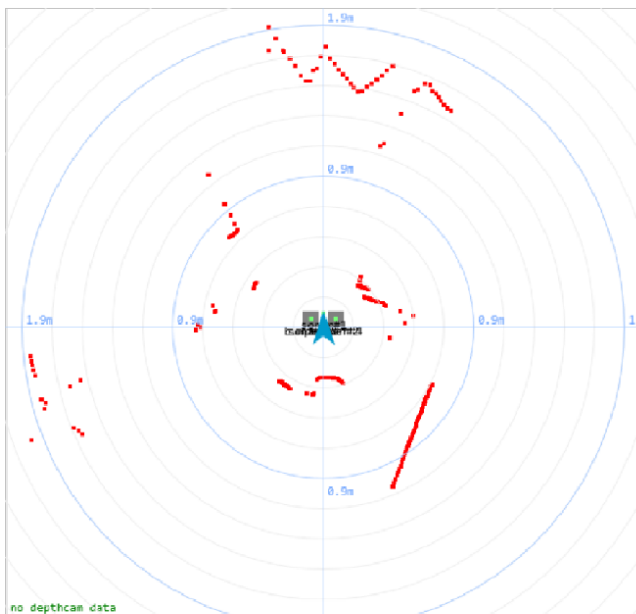
无深度信息



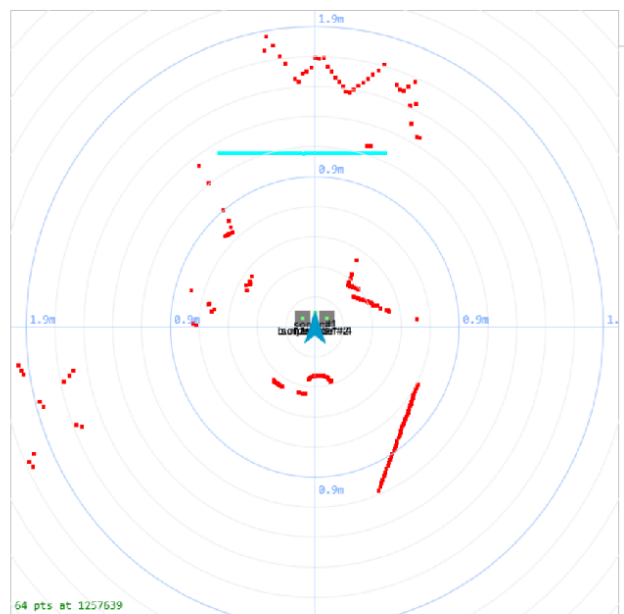
有深度信息

2. Web Portal

Web portalSlamware CoreKBSW180153 SLAMWARE Web Portal Function Overview



无深度信息



有深度信息

1Intel Realsense D435i Windows SDK

1. librealsense2

IntelD435i[librealsense2](#)

2. slamware sdk

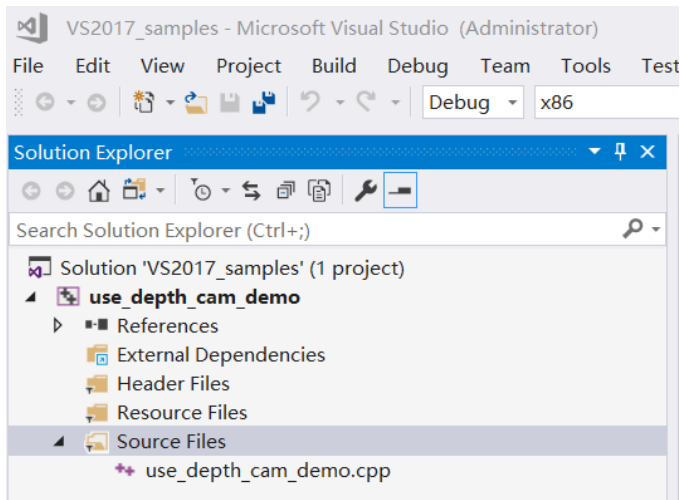
slamtecvs2017[sdk](#)

3. VS2017

librealsense2sdkVS2015slamwarewindows sdkVS2010VS2017VS2017

VS2017file new project Visual C++ Empty project

Source Files add new item Visual C++ C++ files(.cpp)cpp

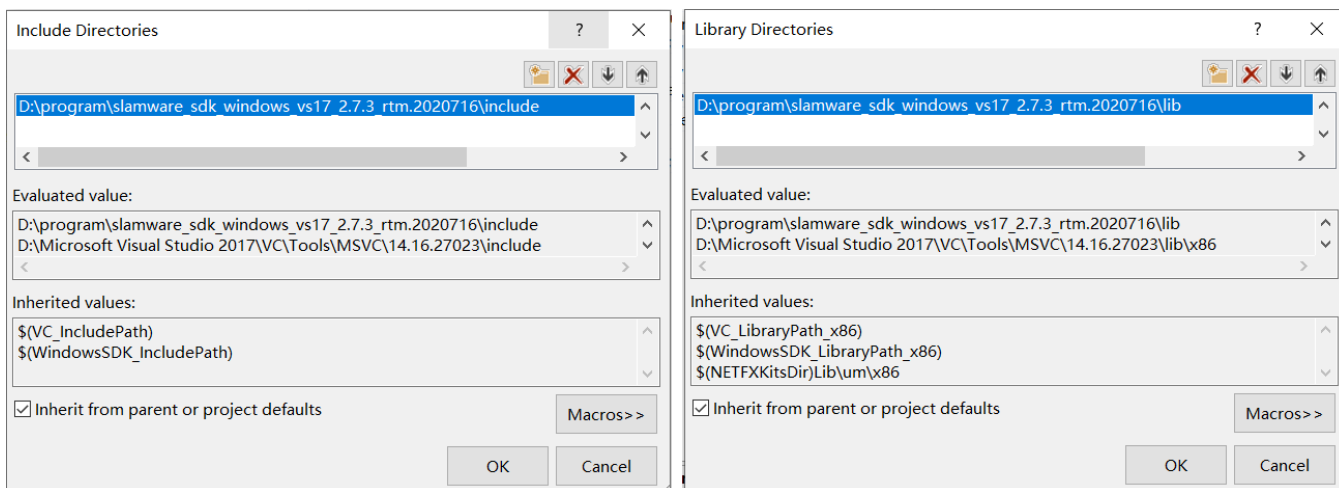


4.

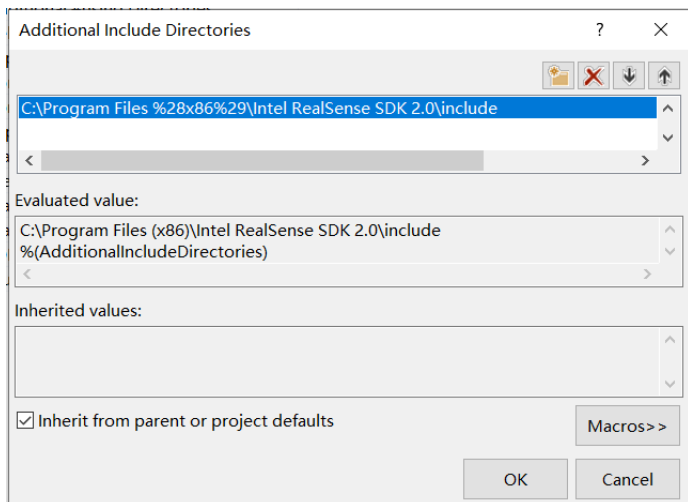
realsense SDKslamware SDK

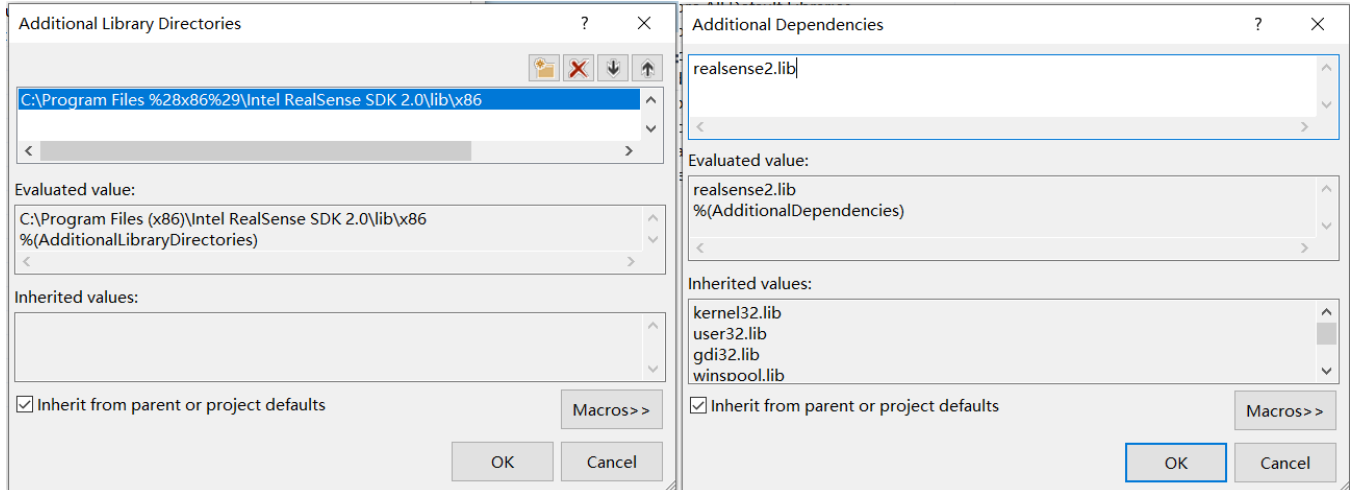
PropertiesWin32

VC++DirectoriesInclude DirectoriesLibrary DirectoriesInclude Directoriesslamware SDKIncludeLibrary Directoriesslamware SDKlib



PropertiesC/C++GeneralAdditional Include Directoriesrealsense SDKInclude





5.

use_depth_cam_demo.cpp

```
#include <regex>
#include <iostream>
#include <boost/thread/thread.hpp>

#include <rpos/robot_platforms/slamware_core_platform.h> //Include slamware API
#include <librealsense2/rs.hpp> //Include RealSense Cross Platform API

std::string ip_address = "";
const char *ip_regex = "\\d{1,3}\\.\\d{1,3}\\.\\d{1,3}\\.\\d{1,3}";
rpos::robot_platforms::SlamwareCorePlatform sdp;

void ShowHelp(std::string app_name) {
    std::cout << "SLAMWARE console demo." << std::endl <<
        "Usage: " << app_name << " <slamware_address>" << std::endl;
}

bool ParseCommandLine(int argc, const char *argv[]) {
    bool opt_show_help = false;
    for (int pos = 1; pos < argc; ++pos) {
        const char *current = argv[pos];
        if (strcmp(current, "-h") == 0)
            opt_show_help = true;
        else
            ip_address = current;
    }
    std::regex reg(ip_regex);
    if (!opt_show_help && !std::regex_match(ip_address, reg))
        opt_show_help = true;
    if (opt_show_help) {
        ShowHelp("use_depth_camera_demo");
        return false;
    }
    return true;
}

int main(int argc, const char *argv[]) {
    if (!ParseCommandLine(argc, argv)) return 1;
    std::cout << "Connecting SDP @ " << ip_address << "..." << std::endl;
    try {
        //connect device
        sdp = rpos::robot_platforms::SlamwareCorePlatform::connect(ip_address, 1445);
    }
```

```

std::cout << "SDK Version: " << sdp.getSDKVersion() << std::endl;
std::cout << "SDP Version: " << sdp.getSDPVersion() << std::endl;

//this id should be same as you set the cam info via RS config tool
int depthCamSensorId = 5;
//create a depth msg frame
rpos::message::depth_camera::DepthCameraFrame _frame;
_frame.minValidDistance = 0.2f;
_frame.maxValidDistance = 3.0f;
_frame.minFovPitch = -30 * 3.14 / 180;
_frame.maxFovPitch = 30 * 3.14 / 180;
_frame.minFovYaw = -45 * 3.14 / 180;
_frame.maxFovYaw = 45 * 3.14 / 180;
_frame.cols = 320;
_frame.rows = 240;
//init data vector
_frame.data.resize(_frame.cols * _frame.rows, 0.0f);

// Create a Pipeline - this serves as a top-level API for streaming and processing frames
rs2::pipeline p;
// Configure and start the pipeline
p.start();

//process data
while (true) {
    // Block program until frames arrive
    rs2::frameset rs_frames = p.wait_for_frames();
    // Try to get a frame of a depth image
    rs2::depth_frame _depth_frame = rs_frames.get_depth_frame();
    // Get the depth frame's dimensions
    int width = _depth_frame.get_width();
    int height = _depth_frame.get_height();
    std::cout << "x: " << width << " y: " << height << std::endl;
    auto it = _frame.data.begin();
    for (int i = (height - _frame.rows) / 2; i < height - (height - _frame.rows) / 2;
i++) {
        for (int j = (width - _frame.cols) / 2; j < width - (width - _frame.cols) /
2; j++) {
            *it = _depth_frame.get_distance(j, i);
            it++;
        }
    }
    sdp.publishDepthCamFrame(depthCamSensorId, _frame);
    std::cout << "publish a depth frame..." << std::endl;

    //control the publish rate less than 10HZ
    boost::this_thread::sleep_for(boost::chrono::milliseconds(100));
}
return EXIT_SUCCESS;
}
catch (const rpos::system::detail::ExceptionBase& e) {
    std::cout << e.what() << std::endl;
    return EXIT_FAILURE;
}
catch (const rs2::error & e)
{
    std::cerr << "RealSense error calling " << e.get_failed_function() << "(" << e.
get_failed_args() << "):\n    " << e.what() << std::endl;
    return EXIT_FAILURE;
}
catch (const std::exception& e)
{
    std::cerr << e.what() << std::endl;
    return EXIT_FAILURE;
}
}
}

```

realsenseUSB3.0

PropertiesDebuggingCommand ArgumentsIP192.168.11.1

realsense2.dllrealsense SDKbin/x86realsense2.dll

2Intel Realsense D435i Linux SDK

1. librealsense2

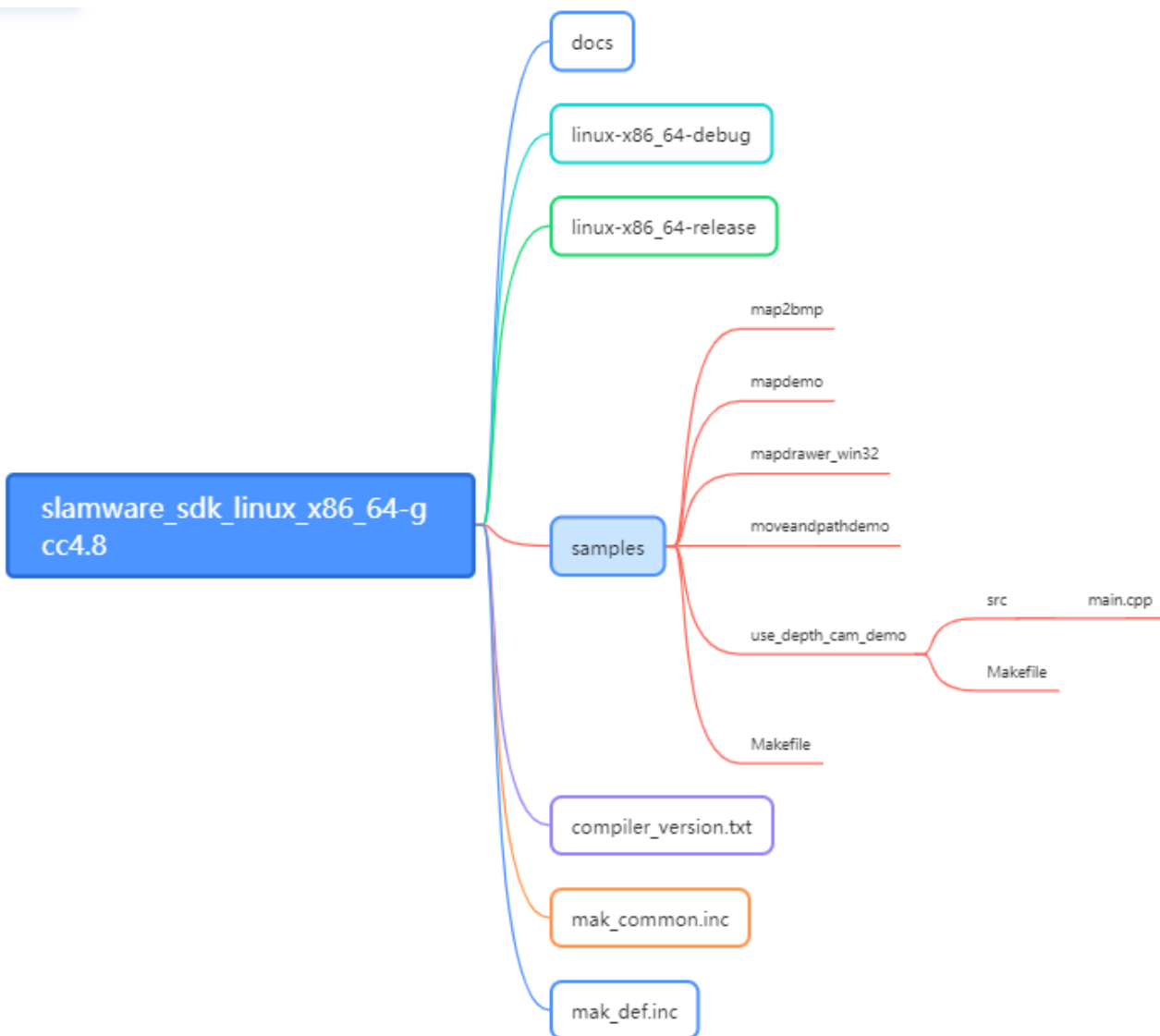
IntelD435ilibrealsense2

2. slamware sdk

slamtecLinux[sdk](#)

3.

slamware SDKSDKsamplesuse_depth_cam_demoMakefilesrcsrcmain.cpp



4.

main.cppwindow

5.

use_depth_cam_demo/Makefileslamware SDKlibrealsense2

Makefile

```
HOME_TREE := ../../

MODULE_NAME := $(notdir $(CURDIR))

CXXSRC      := src/main.cpp
CXXFLAGS    := -std=c++0x
LD_FLAGS    := -Wl,-Bdynamic -lrealsense2

LD_LIBS     = -Xlinker "-(" \
              -lstdc++ -ldl -lrt -lm -lpthread \
              -l$(RPOS_SLAMWARE_NAME) -l$(RPOS_CORE_NAME) \
              -lboost_atomic \
              -lboost_chrono \
              -lboost_date_time \
              -lboost_regex \
              -lboost_system \
              -lboost_thread \
              -lboost_filesystem \
              -lboost_random \
              -lbase64 \
              -ljsoncpp \
              -lrllelib \
              -lcrypto \
              -lcurl \
              -lssl \
              -Xlinker "-)" \

all: build_app

clean: clean_app

#includes the common definitions...
#do not remove them unless you know what you are doing
include $(HOME_TREE)/mak_def.inc
include $(HOME_TREE)/mak_common.inc
```

use_depth_cam_demomakegccg++4.9

linux-x86_64-release/output

```
$ ./use_depth_cam_demo 192.168.11.1
```