

# ***Rockchip***

## ***ROS Instruction***

**Version:** 1.01

**Date:** 2019.12

## Warranty Disclaimer

This document is provided by "status" and Fuzhou Rockchip Electronics Co., Ltd ("our company ", the same below) does not provide any express or implied statement or warranty of any accuracy, reliability, integrity, merchantability, specific purpose and non-infringement of any statement, information and content of this document. This document is intended as a guide only for use.

Due to product version upgrades or other reasons, this document may be updated or modified from time to time without notice.

## Trademarks

Rockchip and “瑞芯微”、“瑞芯” are trademarks of Fuzhou Rockchip Electronics Co., Ltd. and are exclusively owned by Fuzhou Rockchip Electronics Co., Ltd.

References to other companies and their products use trademarks owned by the respective companies and are for reference purpose only.

## Copyright © 2018 Fuzhou Rockchip Electronics Co., Ltd.

Exceeding the scope of reasonable use, No part of this publication may be copied or reproduced without the written permission of our company, and may not be transmitted in any form.

Fuzhou Rockchip Electronics Co., Ltd

Address: No.18 Building, A District, No.89 Software Boulevard, FuZhou, FuJian, PRC

Website: [www.rock-chips.com](http://www.rock-chips.com)

Tel: +86-591-83991906

Fax: +86-591-83951833

Mail: [service@rock-chips.com](mailto:service@rock-chips.com)

# Preface

## Overview

This document mainly introduces how to use ROS of Rockchip Linux SDK.

## Chipset model

Chip Name	Kernel Version
RK3XXX	4.40

## Applicable object

This document is mainly suitable for the following engineers:

- Field application engineers
- Software development engineers

## Revision history

Revision Date	Version No.	Author	Revision Description
2018-12	V1.00	Zain Wang	Ros has been porting into buildroot, removing the original compilation method and switching to new method.
2019-12	V1.01	Zain Wang	Fix beginner_tutorials compilation issue

## Chapter 1. Overview

Rockchip Linux SDK integrates with ROS which provides a range of libraries and tools to help software developers create robotic applications.

ROS version which Rockchip integrated are Indigo and kinetic

## Chapter 2. Compile

There are two default configurations of `ros_indigo.config` and `ros_kinetic.config` under `buildroot/configs/rockchip` directory. Before compiling rootfs, add `ros_XXX.config` to the config corresponding to rootfs.

Take RK3308 Linux SDK as an example. Other methods are similar, modify `buildroot/configs/rockchip_rk3308_release_defconfig`

```
diff --git a/configs/rockchip_rk3308_release_defconfig b/configs/rockchip_rk3308_release_defconfig
index f905f16..a2afac1 100644
--- a/configs/rockchip_rk3308_release_defconfig
+++ b/configs/rockchip_rk3308_release_defconfig
@@ -135,3 +135,4 @@ BR2_TARGET_ROOTFS_SQUASHFS=y
# BR2_TARGET_ROOTFS_TAR is not set
BR2_PACKAGE_HOST_MKE2IMG=y
BR2_PACKAGE_HOST_VBOOT_UTILS=y
+#include "ros_indigo.config"
```

Then run `./build.sh`,

Or first select the `rockchip_rk3308_release` corresponding to `source envsetup.sh`, then run `make`

The compilation for the first time will take a few hours. After the compilation is complete, `buildroot/output/rockchip_rk3308_release/images/rootfs.squashfs` which is the rootfs firmware will be generated.

## Chapter 3. Add the new ros code

Provide the `ros_sample`: [https://github.com/DZain/ROS\\_Sample.git](https://github.com/DZain/ROS_Sample.git)

Synchronize the project to external, and rename it to `beginner_tutorials`.

Then add the following files and modifications in `buildroot`

1) `vi buildroot/package/rockchip/ros/beginner_tutorials/Config.in`

Add the following items:

```
1 config BR2_PACKAGE_BEGINNER_TUTORIALS
2     bool "beginner tutorials"
3     select BR2_PACKAGE_ROSCPP
4     select BR2_PACKAGE_ROSPY
5     select BR2_PACKAGE_STD_MSGS
6     select BR2_PACKAGE_GENMSG
7     help
8     beginner tutorials
```

The select option in the Config depends on the dependencies in the project

```
2) vi buildroot/package/rockchip/ros/beginner_tutorials/beginner_tutorials.mk
1 BEGINNER_TUTORIALS_VERSION = 1.0.0
2 BEGINNER_TUTORIALS_SITE_METHOD = local
3 BEGINNER_TUTORIALS_SITE = $(TOPDIR)/../external/beginner_tutorials
4
5 BEGINNER_TUTORIALS_DEPENDENCIES = roscpp rospy std-msgs genmsg
6
7 ${eval ${catkin-package}}
```

3) Add beginner\_tutorials to buildroot

```
@@ -46,6 +46,7 @@ source "package/rockchip/ros/cmake_modules/Config.in"
source "package/rockchip/ros/rospack/Config.in"
source "package/rockchip/ros/orocos_kinematics_dynamics/Config.in"
source "package/rockchip/ros/image-common/Config.in"
+source "package/rockchip/ros/beginner_tutorials/Config.in"
```

4) Compile

The source envsetup.sh in the SDK root directory, select rockchip\_rk3308\_release (If you have already ran, don't have to run again).

Configure make menuconfig, use or enter search, search BEGINNER\_TUTORIALS (step 1, defined in Config.in), and select.

Save the configuration.

Compile with make.

(Or use make beginner\_tutorials directly. Recompile using make beginner\_tutorials-dirclean && make beginner\_tutorials)

## Chapter 4. Flashing

Please refer to the release documentations of Rockchip Linux SDK for instructions on how to flash firmware. It won't go into details here. Just compile ROS generated Rootfs.img download to the corresponding rootfs partition.

## Chapter 5. Run

The steps to run ROS are as follows:

1, Configure environment variables

```
source /opt/ros/indigo/setup.sh
```

2, Run roscore

```
roscore &
```

3, Run the code

Take the above beginner\_tutorials as an example:

```
roslaunch beginner_tutorials talker
```

Running result:

```
[ INFO] [1501923947.458788791]: hello world 0
```

```
[ INFO] [1501923947.558904332]: hello world 1
```

## **Rockchip Developer Guide**

---

```
[ INFO] [1501923947.658774958]: hello world 2  
[ INFO] [1501923947.758644458]: hello world 3  
[ INFO] [1501923947.858779666]: hello world 4  
[ INFO] [1501923947.958779291]: hello world 5
```

(The beginner\_tutorials code is a pair of programs, the talker is sending and the listener is listener, open talker alone, calculation will always accumulate. There is no phenomenon when opening listener alone, but when talker is opened at the same time, the two programs calculate and simultaneously print)