

# **RM300 SDK User Guide** **for Ubuntu x64**

**For RM300 4-Port Version**

2020/09/29---Ver. 1.0

## Revision History

| Revision | Pages | Description | By      | Date       |
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## Chapter 1 – Prepare Environment

- Host PC OS: Ubuntu 16.04 x64
- RM300 SDK:

[http://w3.tw.ute.com/pub/rd/RM300/SDK/rm300-sdk.ubuntu-x86\\_64.tar.gz](http://w3.tw.ute.com/pub/rd/RM300/SDK/rm300-sdk.ubuntu-x86_64.tar.gz)

### 1.1 Install Ubuntu

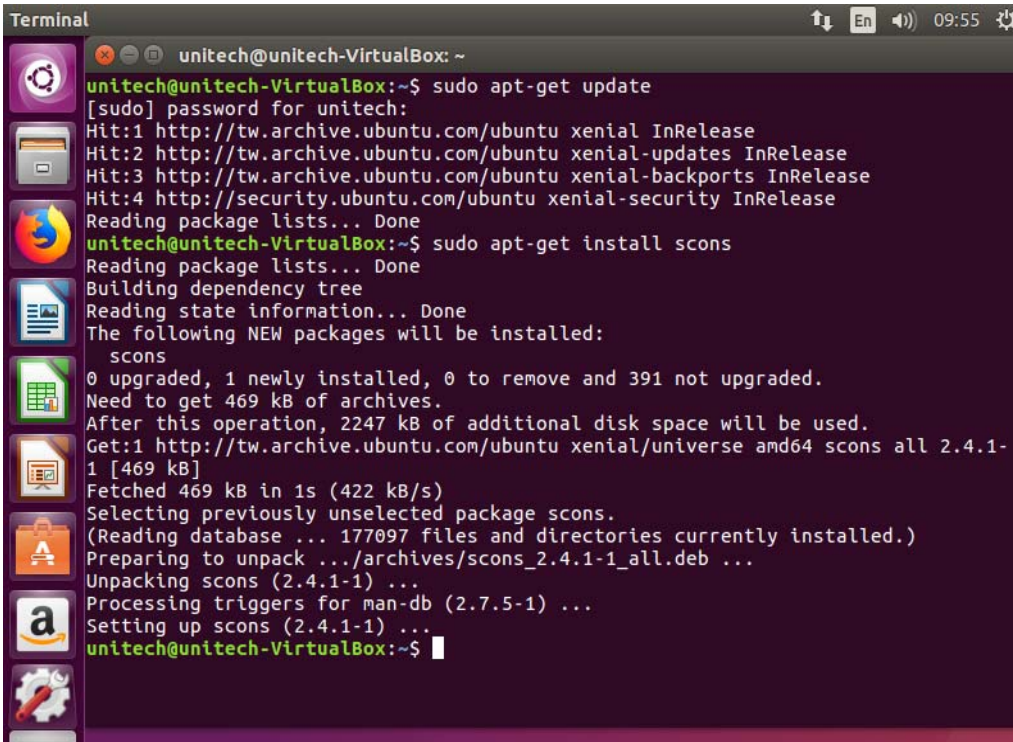
- Host PC OS: Ubuntu 16.04 x64

<https://releases.ubuntu.com/16.04/ubuntu-16.04.6-desktop-amd64.iso>

### 1.2 Install Tools

- Install essential packages

```
$ sudo apt-get update
$ sudo apt-get install scons
```

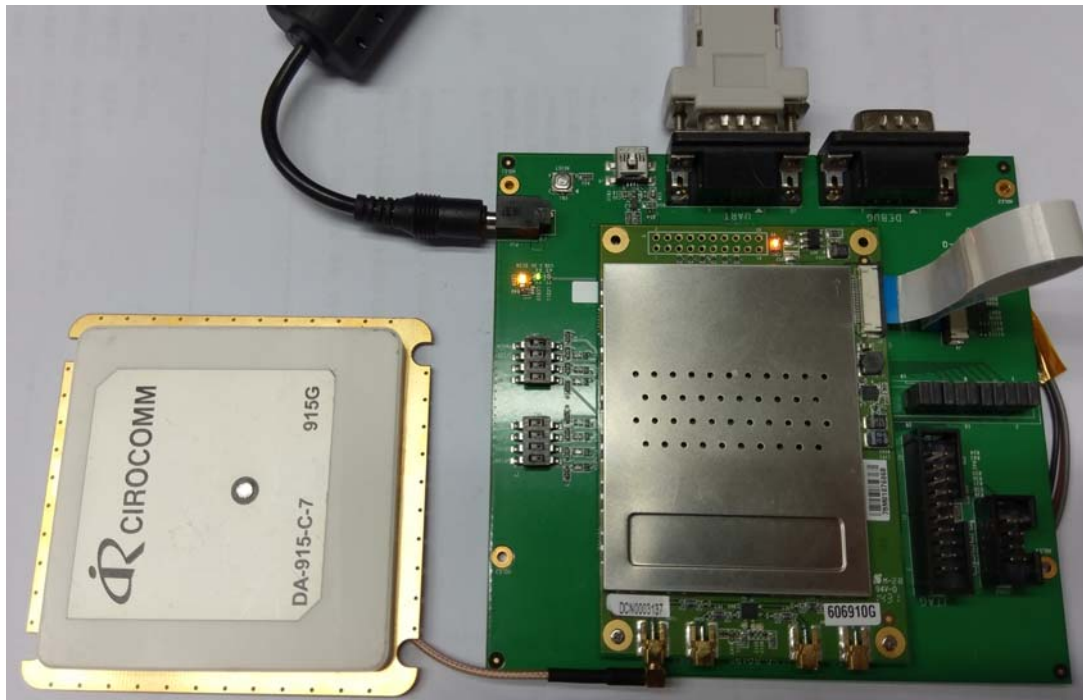


```
Terminal
unitech@unitech-VirtualBox: ~
unitech@unitech-VirtualBox:~$ sudo apt-get update
[sudo] password for unitech:
Hit:1 http://tw.archive.ubuntu.com/ubuntu xenial InRelease
Hit:2 http://tw.archive.ubuntu.com/ubuntu xenial-updates InRelease
Hit:3 http://tw.archive.ubuntu.com/ubuntu xenial-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu xenial-security InRelease
Reading package lists... Done
unitech@unitech-VirtualBox:~$ sudo apt-get install scons
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  scons
0 upgraded, 1 newly installed, 0 to remove and 391 not upgraded.
Need to get 469 kB of archives.
After this operation, 2247 kB of additional disk space will be used.
Get:1 http://tw.archive.ubuntu.com/ubuntu xenial/universe amd64 scons all 2.4.1-1 [469 kB]
Fetched 469 kB in 1s (422 kB/s)
Selecting previously unselected package scons.
(Reading database ... 177097 files and directories currently installed.)
Preparing to unpack .../archives/scons_2.4.1-1_all.deb ...
Unpacking scons (2.4.1-1) ...
Processing triggers for man-db (2.7.5-1) ...
Setting up scons (2.4.1-1) ...
unitech@unitech-VirtualBox:~$
```

## 1.3 Setup for RM300

---

- Connect PC UART to RM300 UART port

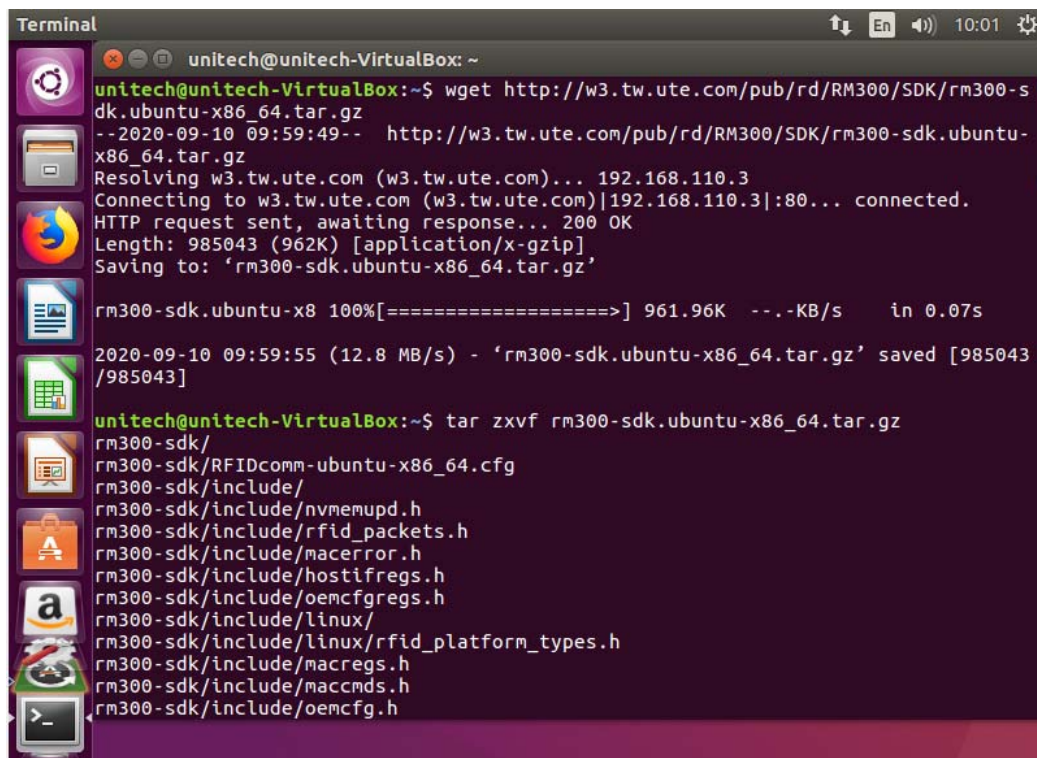


## Chapter 2 – Install / Setup SDK

### 2.1 Install SDK

- Download URL:  
[http://w3.tw.ute.com/pub/rd/RM300/SDK/rm300-sdk.ubuntu-x86\\_64.tar.gz](http://w3.tw.ute.com/pub/rd/RM300/SDK/rm300-sdk.ubuntu-x86_64.tar.gz)
- Install SDK (rm300-sdk)

```
$ wget  
http://w3.tw.ute.com/pub/rd/RM300/SDK/rm300-sdk.ubuntu-x86_64.tar.gz  
$ tar zxvf rm300-sdk.ubuntu-x86_64.tar.gz
```



```
Terminal
unitech@unitech-VirtualBox: ~
unitech@unitech-VirtualBox:~$ wget http://w3.tw.ute.com/pub/rd/RM300/SDK/rm300-s
dk.ubuntu-x86_64.tar.gz
--2020-09-10 09:59:49-- http://w3.tw.ute.com/pub/rd/RM300/SDK/rm300-sdk.ubuntu-
x86_64.tar.gz
Resolving w3.tw.ute.com (w3.tw.ute.com)... 192.168.110.3
Connecting to w3.tw.ute.com (w3.tw.ute.com)|192.168.110.3|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 985043 (962K) [application/x-gzip]
Saving to: 'rm300-sdk.ubuntu-x86_64.tar.gz'

rm300-sdk.ubuntu-x8 100%[=====] 961.96K --.-KB/s in 0.07s

2020-09-10 09:59:55 (12.8 MB/s) - 'rm300-sdk.ubuntu-x86_64.tar.gz' saved [985043
/985043]

unitech@unitech-VirtualBox:~$ tar zxvf rm300-sdk.ubuntu-x86_64.tar.gz
rm300-sdk/
rm300-sdk/RFIDcomm-ubuntu-x86_64.cfg
rm300-sdk/include/
rm300-sdk/include/nvmemupd.h
rm300-sdk/include/rfid_packets.h
rm300-sdk/include/macerror.h
rm300-sdk/include/hostifregs.h
rm300-sdk/include/oemcfgregs.h
rm300-sdk/include/linux/
rm300-sdk/include/linux/rfid_platform_types.h
rm300-sdk/include/macregs.h
rm300-sdk/include/maccmds.h
rm300-sdk/include/oemcfg.h
```

## 2.2 Using SDK

---

- Build/Compile

```
$ cd rm300-sdk  
$ scon
```

- Source

- Dir: *rm300-sdk*

- Hierarchy of **RM300-SDK**

- ◆ **SConstruct**: Makefile for sdk

- ◆ Includes files of sdk

- host/rfid\_library/samples/include/\*
- host/include/\*
- include/\*

- ◆ Libraries of sdk

- host/compat/linux/libcpl.so
- host/transport/library/linux/librfidtx.so
- host/rfid\_library/librfid.so

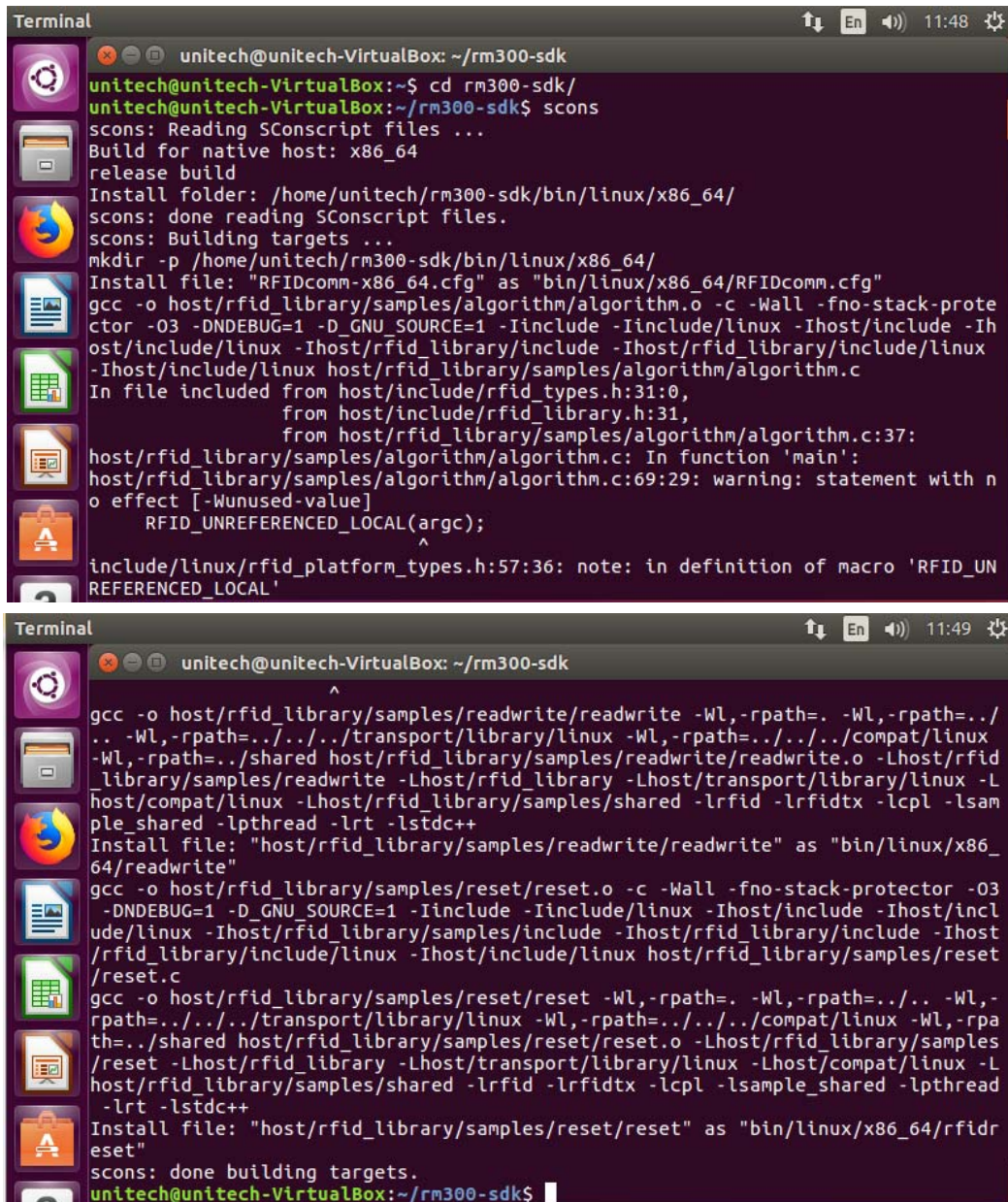
- ◆ Other samples

- host/rfid\_library/samples/\*

- ◆ **RFIDcomm-x86\_64.cfg**: UART port configfile (i.e. /dev/ttyUSB0)

- Output

- Dir: *rm300-sdk/bin/linux/x86\_64*



```

Terminal
unitech@unitech-VirtualBox: ~/rm300-sdk
unitech@unitech-VirtualBox:~$ cd rm300-sdk/
unitech@unitech-VirtualBox:~/rm300-sdk$ scons
scons: Reading SConscript files ...
Build for native host: x86_64
release build
Install folder: /home/unitech/rm300-sdk/bin/linux/x86_64/
scons: done reading SConscript files.
scons: Building targets ...
mkdir -p /home/unitech/rm300-sdk/bin/linux/x86_64/
Install file: "RFIDcomm-x86_64.cfg" as "bin/linux/x86_64/RFIDcomm.cfg"
gcc -o host/rfid_library/samples/algorithm/algorithm.o -c -Wall -fno-stack-protector -O3 -DNDEBUG=1 -D_GNU_SOURCE=1 -Iinclude -Iinclude/linux -Ihost/include -Ihost/include/linux -Ihost/rfid_library/include -Ihost/rfid_library/include/linux -Ihost/include/linux host/rfid_library/samples/algorithm/algorithm.c
In file included from host/include/rfid_types.h:31:0,
                 from host/include/rfid_library.h:31,
                 from host/rfid_library/samples/algorithm/algorithm.c:37:
host/rfid_library/samples/algorithm/algorithm.c: In function 'main':
host/rfid_library/samples/algorithm/algorithm.c:69:29: warning: statement with no effect [-Wunused-value]
    RFID_UNREFERENCED_LOCAL(argc);
                           ^
include/linux/rfid_platform_types.h:57:36: note: in definition of macro 'RFID_UNREFERENCED_LOCAL'

Terminal
unitech@unitech-VirtualBox: ~/rm300-sdk
gcc -o host/rfid_library/samples/readwrite/readwrite -Wl,-rpath=. -Wl,-rpath=../.. -Wl,-rpath=../transport/library/linux -Wl,-rpath=../compat/linux -Wl,-rpath=../shared host/rfid_library/samples/readwrite/readwrite.o -Lhost/rfid_library/samples/readwrite -Lhost/rfid_library -Lhost/transport/library/linux -Lhost/compat/linux -Lhost/rfid_library/samples/shared -lrfid -lrfidtx -lcpl -lsample_shared -lpthread -lrt -lstdc++
Install file: "host/rfid_library/samples/readwrite/readwrite" as "bin/linux/x86_64/readwrite"
gcc -o host/rfid_library/samples/reset/reset.o -c -Wall -fno-stack-protector -O3 -DNDEBUG=1 -D_GNU_SOURCE=1 -Iinclude -Iinclude/linux -Ihost/include -Ihost/include/linux -Ihost/rfid_library/samples/include -Ihost/rfid_library/include -Ihost/rfid_library/include/linux -Ihost/include/linux host/rfid_library/samples/reset/reset.c
gcc -o host/rfid_library/samples/reset/reset -Wl,-rpath=. -Wl,-rpath=../.. -Wl,-rpath=../transport/library/linux -Wl,-rpath=../compat/linux -Wl,-rpath=../shared host/rfid_library/samples/reset/reset.o -Lhost/rfid_library/samples/reset -Lhost/rfid_library -Lhost/transport/library/linux -Lhost/compat/linux -Lhost/rfid_library/samples/shared -lrfid -lrfidtx -lcpl -lsample_shared -lpthread -lrt -lstdc++
Install file: "host/rfid_library/samples/reset/reset" as "bin/linux/x86_64/rfidreset"
scons: done building targets.
unitech@unitech-VirtualBox:~/rm300-sdk$

```

**Fig. Build Application**

## Chapter 3 – Sample Application

### 3.1 Sample Application - Inventory

---

- Description: Inventory application using SDK.
- Source
  - Dir: **rm300-sdk/host/rfid\_library/samples**
  - Hierarchy of /host/rfid\_library/samples/inventory\_live :
    - **inventory\_live.c**: Main program code
    - **SConscript**: Makefile of inventory\_live using scon
- Output
  - Dir: **rm300-sdk/bin/linux/x86\_64**
  - Target App: **inventory\_live**

1. Build:

```
$ cd rm300-sdk  
$ scon
```

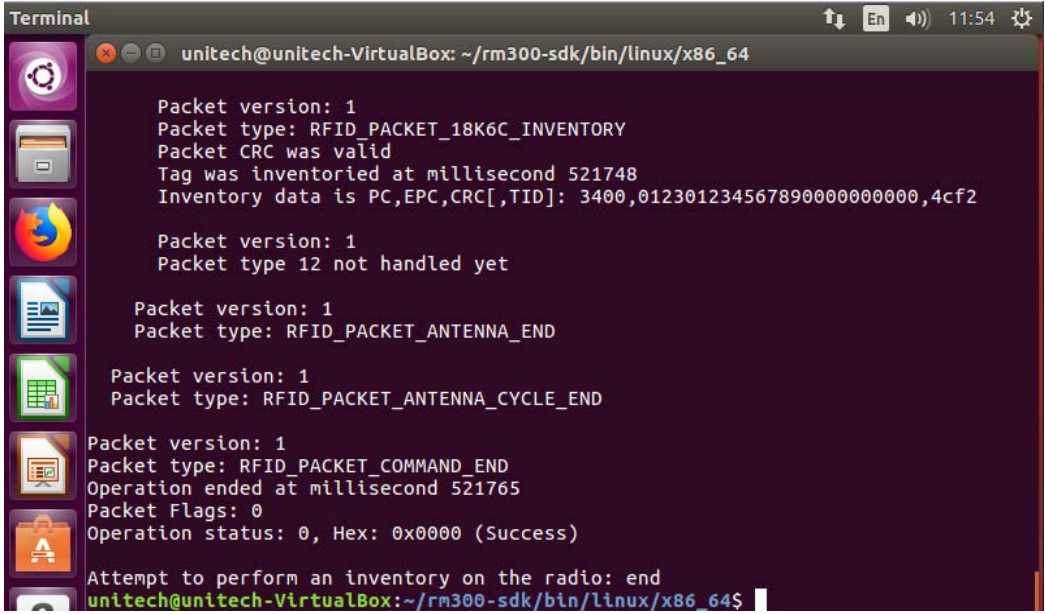
2. Run (UART port: /dev/ttyUSB0)

```
$ cd rm300-sdk/bin/linux/x86_64  
$ echo "port=/dev/ttyUSB0" > RFIDcomm.cfg  
$ sudo ./inventory_live
```

```
Terminal
unitech@unitech-VirtualBox: ~/rm300-sdk
unitech@unitech-VirtualBox:~$ cd rm300-sdk/
unitech@unitech-VirtualBox:~/rm300-sdk$ scons
scons: Reading SConscript files ...
Build for native host: x86_64
release build
Install folder: /home/unitech/rm300-sdk/bin/linux/x86_64/
scons: done reading SConscript files.
scons: Building targets ...
mkdir -p /home/unitech/rm300-sdk/bin/linux/x86_64/
Install file: "RFIDcomm-x86_64.cfg" as "bin/linux/x86_64/RFIDcomm.cfg"
gcc -o host/rfid_library/samples/algorithm/algorithm.o -c -Wall -fno-stack-protector -O3 -DNDEBUG=1 -D_GNU_SOURCE=1 -Iinclude -Iinclude/linux -Ihost/include -Ihost/include/linux -Ihost/rfid_library/include -Ihost/rfid_library/include/linux -Ihost/include/linux host/rfid_library/samples/algorithm/algorithm.c
In file included from host/include/rfid_types.h:31:0,
                 from host/include/rfid_library.h:31,
                 from host/rfid_library/samples/algorithm/algorithm.c:37:
host/rfid_library/samples/algorithm/algorithm.c: In function 'main':
host/rfid_library/samples/algorithm/algorithm.c:69:29: warning: statement with no effect [-Wunused-value]
```

**Fig. Build Application**

```
Terminal
unitech@unitech-VirtualBox: ~/rm300-sdk/bin/linux/x86_64
unitech@unitech-VirtualBox:~$ cd rm300-sdk/bin/linux/x86_64/
unitech@unitech-VirtualBox:~/rm300-sdk/bin/linux/x86_64$ echo "port=/dev/ttyUSB0" > RFIDcomm.cfg
unitech@unitech-VirtualBox:~/rm300-sdk/bin/linux/x86_64$ sudo ./inventory_live
RFID_RADIO_ENUM.length = 24
RFID_RADIO_ENUM.totalLength = 92
RFID_RADIO_ENUM.countRadios = 1
Radio 1:
  Structure length: 60
  Cookie: 0x00000000
  Driver Version:
    Major: 2
    Minor: 6
    Maintenance: 0
    Release: 240
  Unique ID Length: 18
  Unique ID: 496d7069 6e6a5365 7269616c 4e756d30 |ImpinjSerialNum0|
             3100                                |1|
  MAC Version:
    Major: 2
    Minor: 4
    Maintenance: 3
    Release: 44
Attempt to perform an inventory on the radio: begin
```



The image shows a terminal window titled "Terminal" with a dark background. The prompt is "unitech@unitech-VirtualBox: ~/rm300-sdk/bin/linux/x86\_64". The output consists of several lines of text, grouped into four sections separated by blank lines. Each section starts with "Packet version: 1". The first section shows a successful inventory operation with details like "Packet type: RFID\_PACKET\_18K6C\_INVENTORY", "Packet CRC was valid", and "Inventory data is PC,EPC,CRC[,TID]: 3400,012301234567890000000000,4cf2". The second section shows "Packet type 12 not handled yet". The third section shows "Packet type: RFID\_PACKET\_ANTENNA\_END" and "Packet type: RFID\_PACKET\_ANTENNA\_CYCLE\_END". The fourth section shows "Packet type: RFID\_PACKET\_COMMAND\_END", "Operation ended at millisecond 521765", "Packet Flags: 0", and "Operation status: 0, Hex: 0x0000 (Success)". The final line is "Attempt to perform an inventory on the radio: end" followed by the shell prompt "unitech@unitech-VirtualBox:~/rm300-sdk/bin/linux/x86\_64\$".

```
Terminal
unitech@unitech-VirtualBox: ~/rm300-sdk/bin/linux/x86_64

Packet version: 1
Packet type: RFID_PACKET_18K6C_INVENTORY
Packet CRC was valid
Tag was inventoried at millisecond 521748
Inventory data is PC,EPC,CRC[,TID]: 3400,012301234567890000000000,4cf2

Packet version: 1
Packet type 12 not handled yet

Packet version: 1
Packet type: RFID_PACKET_ANTENNA_END

Packet version: 1
Packet type: RFID_PACKET_ANTENNA_CYCLE_END

Packet version: 1
Packet type: RFID_PACKET_COMMAND_END
Operation ended at millisecond 521765
Packet Flags: 0
Operation status: 0, Hex: 0x0000 (Success)

Attempt to perform an inventory on the radio: end
unitech@unitech-VirtualBox:~/rm300-sdk/bin/linux/x86_64$
```

**Fig. Run Application**