

TREK SDK Linux Installation Guide

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1 Introduction

The TREK Linux SDK (Software Development Kit) is a software library that can be used to support for building the user application.

It contains many topics such as Controller Area Network (CAN), J1939, and VPM etc.

The SDK is available as a plain 'C-style SO' and can be easily accessed from any programming language (including C/C++, Java, etc). This document will provide SDK installation guide and using guide.

1.1 Hardware support

- TREK520
- TREK674
- TREK572
- TREK570

2 Revision History

2.1 2.0

- **2014/9/24**
 - Add EEPROM description

2.2 1.1

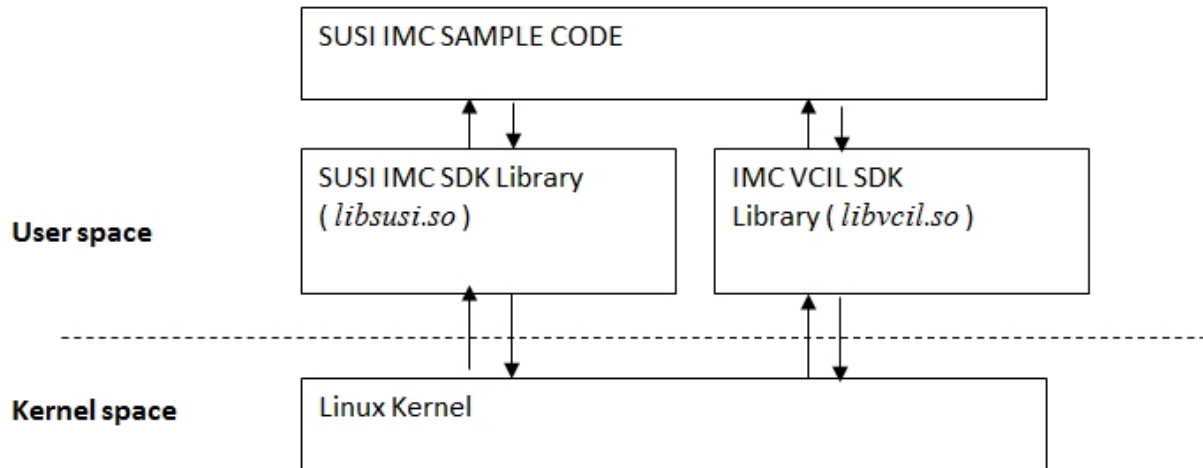
- **2014/7/7**
 - Add TREK-674,TREK-570,TREK-572

2.3 1.0

- **2014/4/1**
 - Document created

3 TREK IMC SDK Architecture on Linux

This system architecture follows Linux standards. The functions of TREK SDK are separated into C/C++ library. The system block diagram is as following.



To implement the system, Advantech provides one kinds of file, *libsusi.so* and *libvcil.so* file. The *libsusi.so* and *libvcil.so* is the Shared-Object file for software application to access the functions. This library included the CAN driver and J1939, VPM driver, watch dog driver etc.

SDK had to provide the sample code with all APIs. Sample codes just demo the APIs usage.

4 How to create the build environment for Linux on PC?

If user wants to build the sample code, user can follow this step to build the compiler environment.

1. Install ia32-libs via apt-get on ubuntu.

```
# sudo apt-get install ia32-libs
```

Note: [Step 2] optional, only use to x86 machine version for demo VPM, VCIL

2. Install gtk-2.0 via apt-get on ubuntu.

```
# sudo apt-get install libgtk2.0-0 libgtk2.0-dev
```

Note: [Step 3-5] optional, only use to ARM machine version for demo VPM, VCIL

3. Install xapt via apt-get on Ubuntu

```
# sudo apt-get install xapt
```

4. Install gtk-2.0 for arm via apt-get on ubuntu

```
#xapt -m -a armel -M http://ports.ubuntu.com -S precise libgtk2.0-0
```

```
#xapt -m -a armel -M http://ports.ubuntu.com -S precise libgtk2.0-dev
```

5. Load the configuration to environment parameter.

```
# export PKG_CONFIG_PATH=/usr/arm-linux-gnueabi/lib/pkgconfig/
```

Note: If you want to default load this setting, you can write this setting to “/etc/environment”.

5 How to create the build environment for Linux on TREK platform?

You also can create the build environment on TREK platform.

1. You must connect to internet on TREK platform.
2. Modify “/etc/apt/sources.list”.
Replace the content ...
`deb http://ports.ubuntu.com/ubuntu-ports/ natty main universe multiverse`
`deb-src http://ports.ubuntu.com/ubuntu-ports/ natty main universe multiverse`
To
`#deb http://ports.ubuntu.com/ubuntu-ports/ natty main universe multiverse`
`#deb-src http://ports.ubuntu.com/ubuntu-ports/ natty main universe multiverse`
`deb http://old-releases.ubuntu.com/ubuntu/ natty main universe multiverse`
3. Upgrade the apt-get
`#apt-get update`
`#apt-get upgrade`
4. Install g++ via apt-get.
`#apt-get install g++`
5. Install gtk+-2.0 via apt-get.
`# apt-get install libgtk2.0-0 libgtk2.0-dev`

6 How to build the TREK IMC SDK sample code on PC?

After chapter 3, you can make the sample code on PC. Please copy the file of SDK to PC. SDK had included the Sample code of Linux. User just follow this step, they can easy build the sample code and test it.

1. Copy the SDK file into PC.
2. Unzip SDK file into your workspace.
`# unzip IMC_SDK_<version number>.zip`
3. Change folder to sample code.
`# cd IMC_SDK_V3\sample\Linux-<Architecture>\<platform>_Linux\IMC_SUSI_CORE_SAMPLE_CODE`
4. Build the sample code
`# make`

Note: After this step, user can find this binary file on same folder. User can copy this file to device and execute this binary file.

Make sure the binary file with execute permissions at following command

```
#chmod +x <binary file>
```

7 TREK IMC SDK

User application can control I/O devices (CPU status, GPIO, Watchdog ...) easily through TREK IMC API (Application Programming Interface).

7.1 IMC SDK package summary

Before starting the process, please get all of the files from Advantech. After user get this SDK file, please unzip and copy the files into PC. The SDK included list are shown below,

- **/doc** : SDK documents folder, it included installation guide and SDK API Reference guide.
- **/headers** : Header file of SDK APIs folder, it include the all header file of IMC library.
- **/libs** : Library files folder, it include IMC java package and IMC library files. This folder also had install.sh, user can execute this script to install IMC Demo app into device.
- **/sample** : This folder include all sample code about IMC Demo app.

7.2 Install IMC SDK Demo AP into device

Please follow this setup process to install IMC SDK into device.

1. Copy IMC SDK into your device and unzip it.

```
# cd /<IMC SDK file path>
# unzip IMC_SDK_V3<IMC SDK version>.zip
# cd / IMC_SDK_V3<IMC SDK version>/ libs/<platform name>_LINUX/
```
2. Run the script to install the IMC SDK Demo AP

```
# ./install.sh
```

This script will install “susi_config” and “libsusi.so” and “vcil_config” and “libvcil.so” into device.
3. Modify the folder of permission.

```
#chmod -R a+x IMC_SDK_V3
```

8 How to execute the sample code on TREK ?

This SDK package included the all sample code for TREK Linux version. When you follow Step 6 to build the sample code, you will get binary file. You can copy this binary to TREK and execute it. But SDK have already to build the all sample code and put to same folder. You can execute the default sample code binary file on TREK.

8.1 Sample code mapping table

Below table as APIs mapping table, you can follow this table to find the sample code.

API name	Path of folder
SUSI_IMC_CORE_FUNCTION_*	IMC_SDK_V3/sample/Linux-<Architecture>/<platform name>_Linux/ IMC_SUSI_CORE_SAMPLE_CODE
SUSI_IMC_DIO_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/ IMC_SUSI_DIO_SAMPLE_CODE
SUSI_IMC_DISPLAY_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/ IMC_SUSI_DISPLAY_SAMPLE_CODE
SUSI_IMC_GSENSOR_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/IMC_SUSI_GSENSOR_SAMPLE_CODE
SUSI_IMC_IIC_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/IMC_SUSI_IIC_SAMPLE_CODE

SUSI_IMC_EEPROM_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/IMC_SUSI_EEPROM_SAMPLE_CODE
SUSI_IMC_LIGHTSENSOR_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/ IMC_SUSI_LIGHTSENSOR_SAMPLE_CODE
SUSI_IMC_PERIPHERALCTRL_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/IMC_SUSI_PERIPHEALCTRL_SAMPLE_CODE
SUSI_IMC_VCIL_* SUSI_IMC_CAN_* SUSI_IMC_J1939_* SUSI_IMC_OBD2_* SUSI_IMC_J1708_* SUSI_IMC_J1587_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/IMC_SUSI_VCIL_SAMPLE_CODE
SUSI_IMC_VPM_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/ IMC_SUSI_VPM_SAMPLE_CODE
SUSI_IMC_WATCH_DOG_*	IMC_SDK_V3/sample/ Linux-<Architecture>/<platform name>_Linux/ IMC_SUSI_WATCHDOG_SAMPLE_CODE

Example:

```
#cd IMC_SDK_V3/sample/Linux-x86/TREK520_Linux/IMC_SUSI_CORE_SAMPLE_CODE
```

```
#./imc_susi_core_demo
```

8.2 EEPROM Application Note

Since the linux is not load i2c-dev driver on system startup . Please following below in order to execute EEPROM sample code:

1. Load i2c driver
modprobe i2c-dev