

TeliCamSDK for Linux

Getting Started Guide

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Information contained in this document is subject to change without prior notice.

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1. Introduction

This document is a getting started guide for TeliCamSDK for Linux which is a software development kit used to control Toshiba Teli USB3 and GigE Vision I/F Digital Camera series.

This document describes the various settings required to use cameras.

Refer to “TeliCamAPI for Linux Library Manual Eng.pdf” for specifications of individual functions necessary for programming to use cameras.

The current version of sdk supports only USB3 Vision camera.

2. System requirements

TeliCamSDK for Linux supports under the following operating systems:

Ubuntu 14.04 LTS amd64 ※1, ※2	For 64-bit Intel/AMD (x86_64)
Debian 8.1.0 amd64 (with the GNOME desktop)	For 64-bit Intel/AMD (x86_64)

※1 Ubuntu 14.04 has a problem regarding XHCI driver :

If stream start / stop are invoked repeatedly, the stream interface can stop.

To avoid this problem, the handling of Strm_Stop function in TeliCamSDK for Linux is different from that of the SDK for Windows.

(It invokes AcquisitionAbort command instead of AcquisitionStop command.)

We recommend that you use Ubuntu 14.04.1 or later, or update the kernel version.

※2 Ubuntu 14.04 has a problem regarding suspension and hibernation :

USB ports do not work after suspensions and hibernations.

We recommend that you do not use the suspension and hibernation functions.

To use TeliCamSDK, you need to use specific hardware shown in the table below.

Notice that, we do not guarantee that the SDK works in every PC environment.

USB3.0 adapter (recommended)	Adapters with a USB3.0 host controller manufactured by Renesas Electronics
Camera	USB3 Vision Cameras manufactured by Toshiba Teli

To install or compile sample applications, your computer must have the following software installed:

sudo	A program that allows users to run programs with the superuser privilege
GNU make	An automation tool for compiling and building applications
GNU gcc/g++	C/C++ compiler
Qt	A cross-platform application framework (Used by GUI applications)

3. Installation

TeliCamSDK installation package is provided as a archive file.

In order to install TeliCamSDK, you must have sudo installed in your system.

Follow the instructions below to install TeliCamSDK :

1. Open a terminal window (gnome-terminal).
2. Change the current directory where the installation package is stored.
3. Uncompress the installation package.

tar xvfz TeliCamSDK_Linux_v*.tar.gz

4. Run the installation script.

sh setup_TeliCamSDK.sh

Superuser privilege is required to install. If a message asking the superuser privilege is displayed, enter superuser password.

After installation, files are deployed in the following directories.

```
/opt/
├── TeliCamSDK
│   ├── bin                ... binaries (viewer application)
│   ├── lib                ... library files
│   ├── include            ... header files
│   ├── documents          ... document files
│   │   └── licenses       ... license files
│   └── genicam            ... GenICam related files
/home/ 'username' /TeliCamSDK/
├── samples                ... samples using TeliCamAPI
└── genicam                ... GenICam cache files
/etc/udev/rules.d/         ... udev rule file
/etc/ld.so.conf.d/         ... configuration file (telicamsdk_x*.conf)
/etc/profile.d/            ... configuration file (telicamsdk.sh)
/usr/share/applications/    ... desktop entry file
```

4. Performance tuning

TeliCamSDK raises the priority of the packet reception threads to minimize the variation of image grab time required.

However, non- superuser on Linux cannot raise the priority of a thread.

If you want to run applications that require high performance, do one of the following methods to raise the priority of a thread:

- Run applications as the superuser.
- Modify the system configuration to allow users to change the priority of real-time processes :
You can do this using the pam_limits module of the Pluggable Authentication Modules (PAM).
By default values are specified in /etc/security/limits.conf.
For example, the following line allows all users to change the priority of real-time processes.

```
* - rtprio 99
```

You must restart the system after modifying the configuration file.

5. Viewer

You can use the Viewer to connect to a camera, and you can display stream images from the camera. The Viewer application are located in the following directory.

/opt/TeliCamSDK/bin/

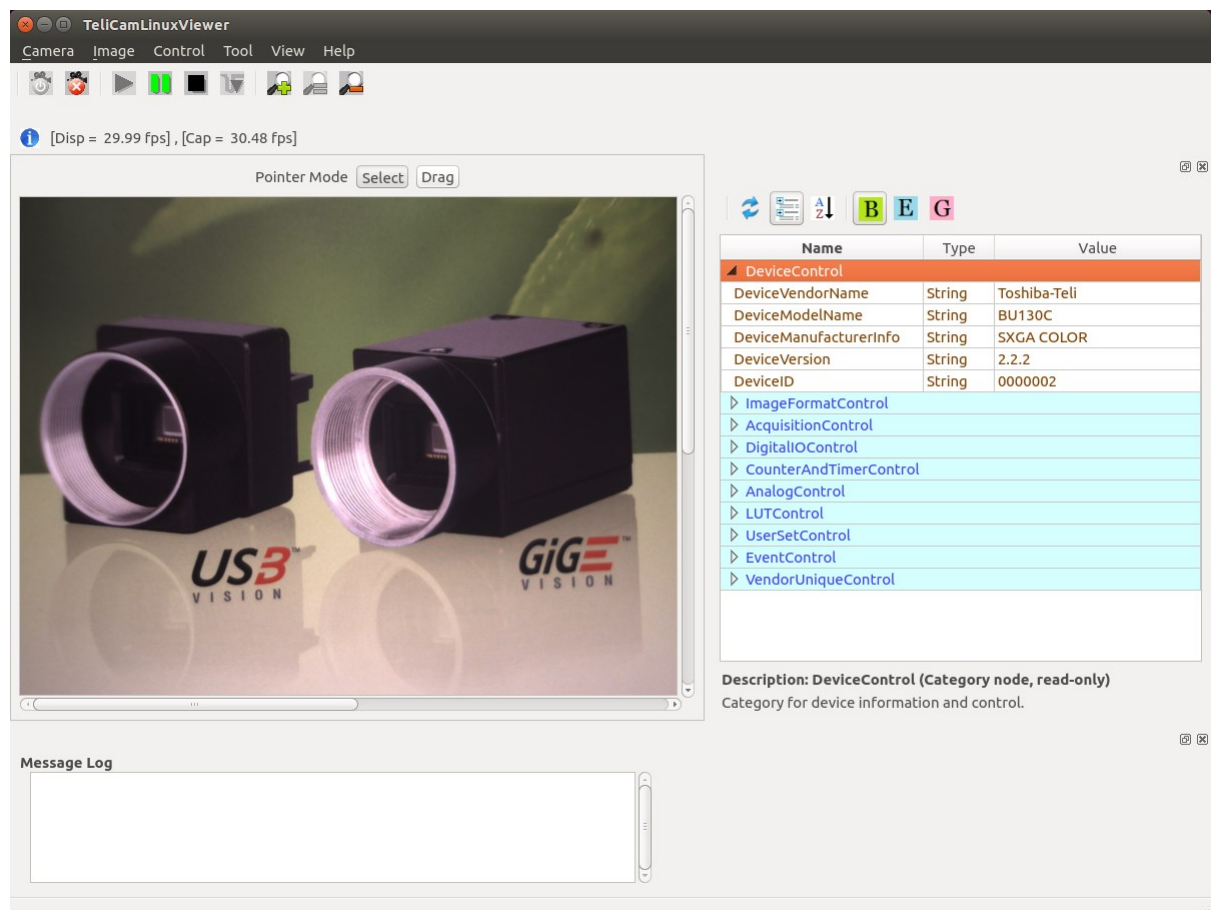
Follow the instructions below to execute the viewer application :

1. Open a terminal window (gnome-terminal).
2. Move the directory placed the viewer application.

cd /opt/TeliCamSDK/bin/

3. Run the viewer application by the shell script.

sh execute_TeliCamLinuxViewer.sh



6. Sample source codes

TeliCamSDK provides sample applications in the following table for user's reference.

Sample name	UI	Function
GrabStream_FreerunUsingCallback	CUI	Display of the image pixel values.
GrabStream_FreerunUsingSignal	CUI	
GrabStream_SWTrigUsingSignal	CUI	
GrabStream_ViaNode	CUI	
GrabStream_RegBU	CUI	
GrabStream_FreerunUsingCallback	CUI	Display of the image pixel values. (Grab images by free-run mode using callback.)
GrabStream_FreerunUsingSignal	CUI	Display of the image pixel values. (Grab images by free-run mode using signal.)
GrabStream_SWTrigUsingSignal	CUI	Display of the image pixel values. (Grab images by software-trigger mode using signal.)
GrabStream_ViaNode	CUI	Display of the image pixel values. (Grab images by the GenICam nodes.)
GrabStream_RegBU	CUI	Display of the image pixel values. (Grab images by the register access of the BU cameras.)
GrabEvent	CUI	Get "FrameTrigger" event.
MultiCamera	GUI	Draw images of up to 4 cameras.

Sample applications are located in the following directory.

`$HOME/TeliCamSDK/samples`

To compile and run applications using TeliCamSDK, you must set the environment variables.

```
TELICAMSDK=/opt/TeliCamSDK
```

```
export TELICAMSDK
```

```
export
```

```
LD_LIBRARY_PATH=$TELICAMSDK/lib:$TELICAMSDK/genicam/bin/Linux64_x64:$LD_LIBRARY_PATH
```

This can be set by the shell script.

```
source /opt/TeliCamSDK/set_env.sh
```

6.1. Console sample

Follow the instructions below to compile console samples :

1. Open a terminal window.
2. Move the sample directory.

```
cd $HOME/TeliCamSDK/samples/CPP/ConsoleSamples
```

3. Compile console projects.

```
make
```

If successful, a binary file will be generated in each project directory.

When you run the script in each project directory, you can run the application.

For example:

```
cd ./GrabStream_FreerunUsingCallback
```

```
sh ./execute_GrabStream_FreerunUsingCallback.sh
```

6.2. Qt sample

To compile, you need to install Qt.

Follow the instructions below to compile Qt samples :

1. Open a terminal window.
2. Move the sample directory.

For example:

```
cd $HOME/TeliCamSDK/samples/CPP/QtSamples/Qt5/MultiCamera
```

3. Set environments, and run Qt Creator.

```
sh ./set_qt_env.sh
```

7. Un installation

Follow the instructions below to uninstall TeliCamSDK :

1. Open a terminal window (gnome-terminal).
2. Change the current directory where the uninstallation file is stored.

cd /opt/TeliCamSDK

3. Run the uninstallation script.

sh remove_TeliCamSDK.sh

Superuser privilege is required to install. If a message asking the superuser privilege is displayed, enter superuser password.

8. Others

8.1. Disclaimer

The disclaimer of this Software is described in another “License Agreement TeliCamSDK for Linux Eng.txt”.

Make sure to read this Agreement carefully before using it.

Refer to the TeliCamSDK installation directory. (/opt/TeliCamSDK/documents/licenses)

8.2. License Information

TeliCamSDK consists of multiple, independent software components. Each software component is copyrighted by a third party. TeliCamSDK uses software components that are distributed as freeware under a third-party end-user license agreement or copyright notice (hereinafter referred to as a “EULA”).

Some EULAs require that the source code of the applicable component be disclosed as the condition for distributing the software component in executable format. You can check the software components subject to such EULA requirements. For more information, please contact our sales representative.

Toshiba Teli provides a warranty for TeliCamSDK under conditions set forth by Toshiba Teli. (See “License Agreement TeliCamSDK for Linux Eng.txt” and “License Agreement TeliCamSDK for Linux Sample Eng.txt”) However, some of the software components distributed under an EULA are made available for use by the user on the assumption that they are not copyrighted or warranted by a third party. These software components are licensed to the user free of charge and therefore not covered by any warranty within the scope of the applicable laws. These software components are not subject to any copyrights or other third-party rights and are provided in “as is” condition without any warranty, whether express or implied. “Warranty” here includes, but not limited to, an implied warranty for marketability

or fitness for specific uses. All risks associated with the quality or performance of these software components are assumed by the user.

EULAs are included in the installation directory: /opt/TeliCamSDK/documents/licenses .

Toshiba Teli shall not be liable whatsoever for any cost of repair or correction or other incidental expense incurred in connection with a defect found in any of these software components. Unless specified under the applicable laws or in a written agreement, a party who changes or redistributes the software with consent from the copyright holders or based on the aforementioned licenses shall not be held liable whatsoever for any loss arising from the use of or inability to use such software components. The same applies even when the copyright holders or relevant third parties have been informed of the possibility of such loss. “Loss” here includes normal, special, incidental and indirect loss (including, but not limited to, the loss of data or its accuracy; loss incurred by the user or any

third party; and interface incompatibility with other software). Please read each EULA for details on the use conditions and items that must be observed regarding these software components.

The table below lists the software components using in TeliCamSDK, which are subject to EULAs. The user should read the applicable EULAs carefully before using these software components.

Project name	Project license
gcc libgcc	GPLv3.txt and gcc-exception.txt (GPLv3 with GCC Runtime Library Exception)
gcc libstdc++	GPLv3.txt and gcc-exception.txt (GPLv3 with GCC Runtime Library Exception)
glibc	LGPLv2.1
libteliusb (libusb)	LGPLv2.1
GenICam	GenICam license
Qt	LGPLv2.1 and Digia Qt LGPL Exception version 1.1

The Trade name used in this document is the trademark or the registered trademark of each company.

8.3. Inquiry

Please make inquiries using the help request form if you have questions about TeliCamSDK.

<http://www.toshiba-teli.co.jp/en/support/contact/industrial.htm>

Or, please contact the receptionist below.

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