

TeliCamSDK for Linux

Getting Started Guide

Version 2.0.3 (2020/01/06)

Toshiba Teli Corporation

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

Contents

1. Introduction	2
2. System requirements	3
3. Installation.....	5
4. Performance tuning	6
5. Firewall	10
6. GigE Vision Digital Camera Guide	11
5.1. Camera IP setting	11
5.1.2 Communication between different networks	15
7. Viewer	18
8. Sample source codes	19
8.1. Console sample	20
8.2. Qt sample	20
9. Un installation.....	21
10. Others.....	22
10.1. Disclaimer	22
10.2. License Information	22
10.3. Inquiry	24

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.

2. System requirements

TeliCamSDK TeliCamApi for Linux runs on Intel / AMD x86 and ARM architecture.

Operation confirmed OS is as follows.

• Intel/AMD

Ubuntu 14.04 LTS amd64 ※1, ※2	For 64-bit Intel/AMD (x86_64)
Ubuntu 16.04 LTS amd64	For 64-bit Intel/AMD (x86_64)
Ubuntu 18.04 LTS amd64	For 64-bit Intel/AMD (x86_64)
Debian 8.1.0 amd64 (with the GNOME desktop environment)	For 64-bit Intel/AMD (x86_64)
CentOS 7.3 amd64	For 64-bit Intel/AMD (x86_64)
Fedora 27 amd64	For 64-bit Intel/AMD (x86_64)

• ARM

Jetson TK1 (Jetpack 3.0 ubuntu14.04)	For 32-bit ARM (armv7l)
Jetson TX2 (Jetpack 3.2 ubuntu16.04)	For 64-bit ARM (aarch64)
Jetson nano (Jetpack 4.2.1 ubuntu 18.04)	For 64-bit ARM (aarch64)
Odroid XU4 ※5 (Ubuntu mate 16.04)	For 32-bit ARM (armv7l)
Raspberry pi 3 ※5, ※6 Raspbian GNU/Linux 9 (stretch)	For 32-bit ARM (armv7l)

※1 Ubuntu 14.04 has a problem regarding XHCI driver :

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

If the stream interface stops, change the Strm_Stop function to the Strm_Abort function.

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.

※3 Supported Ubuntu from 16.04 to 16.04.5.

※4 Supported Ubuntu from 18.04 to 18.04.1.

※5 GigE Vision digital camera may not be able to acquire images at maximum frame rate.

※6 USB3 Vision digital camera can not be used.

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
Network adapter (recommended)	Gigabit Ethernet adapter supporting jumbo frames(over 9014 bytes).
Camera	USB3 Vision Camera manufactured by Toshiba Teli GigE Vision Camera 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
```

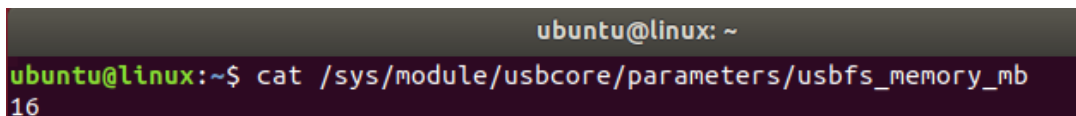
You must restart the system after modifying the configuration file.

•If you are using many USB3 Vision cameras or if CAM_API_STS_IO_DEVICE_ERROR occurs, change usbfs memory limit.

The setting method is as follows.

1. Open a terminal window (gnome-terminal).
2. Confirm the current value.

```
cat /sys/module/usbcore/parameters/usbfs_memory_mb
```

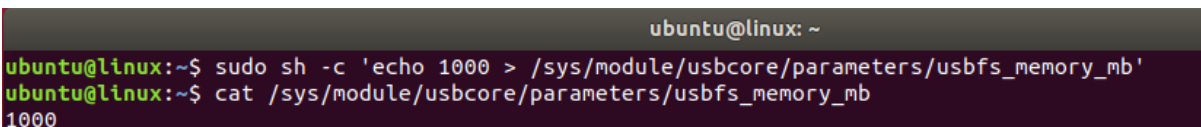


```
ubuntu@linux: ~  
ubuntu@linux:~$ cat /sys/module/usbcore/parameters/usbfs_memory_mb  
16
```

3. Change the memory limit.

For example: To change the memory limit to 1000 [MB]

```
sudo sh -c 'echo 1000 > /sys/module/usbcore/parameters/usbfs_memory_mb'
```



```
ubuntu@linux: ~  
ubuntu@linux:~$ sudo sh -c 'echo 1000 > /sys/module/usbcore/parameters/usbfs_memory_mb'  
ubuntu@linux:~$ cat /sys/module/usbcore/parameters/usbfs_memory_mb  
1000
```

or

Please edit “/sys/module/usbcore/parameters/usbfs_memory_mb” in the editor.

*After rebooting, the set value is 16 [MB]. Please set again.

*If the CAM_API_STS_TOO_MANY_PACKET_MISSING error (error code: 0x100C) occurs while using the GigE Vision camera, make the following settings.

- Jumbo frame setting value
- Receive buffer size
- Packet setting of network interface card (NIC)
- HUB (QoS setting)

Please try the following method.

- Jumbo frame

For ifconfig command:

1. Open a terminal window (gnome-terminal).
2. Confirm the current value.

`ifconfig [interface] | grep MTU`

```
ubuntu@linux: ~  
ubuntu@linux:~$ ifconfig enp0s31f6 | grep mtu  
enp0s31f6: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
```

3. Change jumbo frame setting.

For example:

`sudo ifconfig [interface] mtu 9000`

```
ubuntu@linux: ~  
ubuntu@linux:~$ sudo ifconfig enp0s31f6 mtu 9000  
ubuntu@linux:~$ ifconfig enp0s31f6 | grep mtu  
enp0s31f6: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 9000
```

For ip command:

1. Open a terminal window (gnome-terminal).
2. Confirm the current value.

`ip address | grep mtu`

```
ubuntu@linux: ~  
ubuntu@linux:~$ ip address | grep mtu  
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000  
2: enp0s31f6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
```

3. Change jumbo frame setting.

For example:

`sudo ip link set [interface] mtu 9000`

```
ubuntu@linux: ~  
ubuntu@linux:~$ sudo ip link set enp0s31f6 mtu 9000  
ubuntu@linux:~$ ip address | grep mtu  
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000  
2: enp0s31f6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 9000 qdisc fq_codel state UP group default qlen 1000
```


-
- Receiving buffer size

1. Open a terminal window (gnome-terminal).
2. Confirm the current value.

`sysctl net.core.rmem_max net.core.wmem_max net.core.rmem_default net.core.wmem_default`

```
ubuntu@linux: ~  
ubuntu@linux:~$ sysctl net.core.rmem_max net.core.wmem_max net.core.rmem_default net.core.wmem_default  
net.core.rmem_max = 212992  
net.core.wmem_max = 212992  
net.core.rmem_default = 212992  
net.core.wmem_default = 212992
```

3. Change Receiving buffer size setting.

For example:

`sysctl -w net.core.rmem_max=33554432 net.core.wmem_max=33554432`
`net.core.rmem_default=33554432 net.core.wmem_default=33554432`

```
ubuntu@linux: ~  
ubuntu@linux:~$ sudo sysctl -w net.core.rmem_max=33554432 net.core.wmem_max=33554432 net.core.rmem_default=3355  
4432 net.core.wmem_default=33554432  
net.core.rmem_max = 33554432  
net.core.wmem_max = 33554432  
net.core.rmem_default = 33554432  
net.core.wmem_default = 33554432
```

-
- Packet setting of network interface card (NIC)

(Jetson can not set packets.)

1. Open a terminal window (gnome-terminal).

2. Confirm the current value.

`ethtool -g [interface]`

```
ubuntu@linux: ~  
ubuntu@linux:~$ ethtool -g enp0s31f6  
Ring parameters for enp0s31f6:  
Pre-set maximums:  
RX:                4096  
RX Mini:           0  
RX Jumbo:          0  
TX:                4096  
Current hardware settings:  
RX:                256  
RX Mini:           0  
RX Jumbo:          0  
TX:                256
```

3. Change Network Interface Cards (NICs) packet setting.

For example:

`ethtool -G [interface] rx 4096 tx 4096`

```
ubuntu@linux: ~  
ubuntu@linux:~$ sudo ethtool -G enp0s31f6 rx 4096 tx 4096  
ubuntu@linux:~$ ethtool -g enp0s31f6  
Ring parameters for enp0s31f6:  
Pre-set maximums:  
RX:                4096  
RX Mini:           0  
RX Jumbo:          0  
TX:                4096  
Current hardware settings:  
RX:                4096  
RX Mini:           0  
RX Jumbo:          0  
TX:                4096
```

- HUB(QoS setting)

Please set the priority of your HUB port to the highest priority.

(For the setting method, please refer to the manual of the HUB you are using.

QoS settings may not be available in the HUB you are using.)

5. Firewall

To ensure communication with a camera using an IP address configuration tool, viewer or user application, we recommend that you should disable Firewall.

*If the firewall does not exist, no work is required.

1. Open a terminal window (gnome-terminal).
2. Confirm current setting.

firewall-cmd --state

A terminal window titled 'centos_7_3@localhost:~' showing the command 'firewall-cmd --state' being executed. The output is 'running'.

```
centos_7_3@localhost:~  
[centos_7_3@localhost ~]$ firewall-cmd --state  
running
```

3. Stop the firewall.

systemctl stop firewalld.service

A terminal window titled 'centos_7_3@localhost:~' showing two commands: 'systemctl stop firewalld.service' and 'firewall-cmd --state'. The output of the second command is 'not running' in red text.

```
centos_7_3@localhost:~  
[centos_7_3@localhost ~]$ systemctl stop firewalld.service  
[centos_7_3@localhost ~]$ firewall-cmd --state  
not running
```

6. GigE Vision Digital Camera Guide

GigE Vision digital camera requires network adapter and camera IP setting.

5.1. Camera IP setting

To perform communication with a PC, IP address is also required for the camera.

Run “IpConfigurationToolLinux” in the TeliCamSDK installation folder. “IpConfigurationToolLinux” will start. (/opt/TeliCamSDK/bin/)

The screenshot shows the 'IpConfigurationToolLinux' application window. At the top, there is a 'Refresh' button and a list of network interfaces: 'lo' and 'eth1'. The 'eth1' interface is selected, and its details are shown below: 'Toshiba Teli - BG505LMG - 0000001'. The window is divided into two main sections: 'Adapter's Information' and 'Device's Information'. The 'Adapter's Information' section includes fields for Name (eth1), IP Address (169.254.7.10), and Subnet Mask (255.255.255.0). The 'Device's Information' section includes fields for Name (BG505LMG), IP Address (169.254.7.145), Subnet Mask (255.255.255.0), Firmware Ver. (3.3.8), and User Defined (Module-01). There is a 'Set Force IP' button under the 'Force IP Setting' section. The 'IP Configuration & Persistent IP Setting' section has two columns: 'IP Configuration' and 'Persistent IP'. The 'IP Configuration' column has checkboxes for 'Persistent IP' (checked), 'DHCP' (unchecked), and 'LLA' (checked). The 'Persistent IP' column has fields for IP Address (192.168.0.9), Subnet Mask (255.255.0.0), and Default Gateway (0.0.0.0). A 'Save' button is located at the bottom of the 'IP Configuration' column.

Adapter's Information		Device's Information	
Name	eth1	Name	BG505LMG
IP Address	169.254.7.10	IP Address	169.254.7.145
Subnet Mask	255.255.255.0	Subnet Mask	255.255.255.0
Force IP Setting		Firmware Ver.	3.3.8
<input type="button" value="Set Force IP"/>		User Defined	Module-01 <input type="button" value="Set"/>
IP Configuration & Persistent IP Setting			
IP Configuration		Persistent IP	
<input checked="" type="checkbox"/> Persistent IP		IP Address	192.168.0.9
<input type="checkbox"/> DHCP		Subnet Mask	255.255.0.0
<input checked="" type="checkbox"/> LLA		Default Gateway	0.0.0.0
<input type="button" value="Save"/>			

5.1.1 Persistent IP Setting

Press [Refresh]: Adapter and camera information are displayed.

If you select an item in the list, information is displayed.

* The device may not be recognized immediately after turning on the camera. Please wait a little while and then press the "Refresh" button again.

* If the IpCnfgToolLnx does not recognize the camera, the network of the adapter and the camera may be different. Please refer to [5.1.2 Communication between different networks](#).

To perform communication with a PC, IP address is also required for the camera.

[Use DHCP] is selected by default in IP configuration of the camera. In this case, IP address is assigned to the camera by the DHCP server on the network.

IP address in a range from 169.254.0.1 to 169.254.255.254 and the subnet mask 255.255.0.0 are automatically assigned by automatic private IP address configuration when DHCP server is not available. In this case, it will take a little time before IP address of camera is determined.

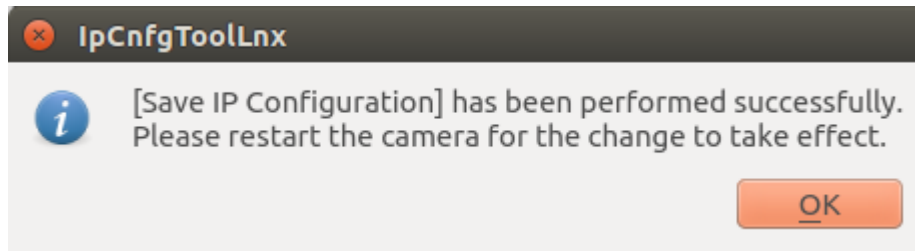
To shorten the time, we recommend that the user fixes IP address. Also, IP address configuration is required to use network different from a default one. The configuration procedure is as follows:

Confirm the contents of [IP Configuration & Persistent IP Setting]

1. Check [Persistent IP] inside [IP Configuration].
2. Enter [IP address] and [Subnet Mask].
3. Click [Save].

The screenshot shows the 'IpConfigurationToolLinux' window. At the top, there's a 'Refresh' button and a list of network interfaces: 'lo' and 'eth1'. The 'eth1' interface is selected, showing its MAC address 'Toshiba Teli - BG505LMG - 0000001'. Below this, there are two sections: 'Adapter's Information' and 'Device's Information'. 'Adapter's Information' includes fields for Name (eth1), IP Address (169.254.7.10), and Subnet Mask (255.255.255.0). 'Device's Information' includes fields for Name (BG505LMG), IP Address (169.254.7.145), Subnet Mask (255.255.255.0), Firmware Ver. (3.3.8), and User Defined (Module-01). A 'Set Force IP' button is located below the adapter information. At the bottom, there is a section titled 'IP Configuration & Persistent IP Setting' which is highlighted with a red box. This section is divided into 'IP Configuration' and 'Persistent IP'. Under 'IP Configuration', there are three checkboxes: 'Persistent IP' (checked), 'DHCP' (unchecked), and 'LLA' (checked). A 'Save' button is located below these checkboxes. Under 'Persistent IP', there are three input fields: 'IP Address' (192.168.0.9), 'Subnet Mask' (255.255.0.0), and 'Default Gateway' (0.0.0.0).

4. The following dialog will appear when IP address to the camera is successfully written.
5. Camera restart is required so that the new IP address of camera can take effect.



6. Force IP address is displayed in [Device's Information] after camera restarted.

A screenshot of the "IpConfigurationToolLinux" application window. The window has a title bar with standard Linux window controls. Inside, there's a "Refresh" button and a list of network interfaces: "lo" and "eth1". The "eth1" interface is selected, showing its MAC address "Toshiba Teli - BG505LMG - 0000001". Below this, there are two main sections: "Adapter's Information" and "Device's Information".
Adapter's Information:
Name: eth1
IP Address: 169.254.7.10
Subnet Mask: 255.255.255.0
Device's Information:
Name: BG505LMG
IP Address: 169.254.7.145 (highlighted with a red box)
Subnet Mask: 255.255.255.0 (highlighted with a red box)
Below these are "Force IP Setting" (with a "Set Force IP" button) and "User Defined" (with "Firmware Ver." 3.3.8 and "User Defined" Module-01, plus a "Set" button).
At the bottom is the "IP Configuration & Persistent IP Setting" section. It has two columns: "IP Configuration" and "Persistent IP".
IP Configuration:
- Persistent IP: ☒
- DHCP: ☐
- LLA: ☒
A "Save" button is at the bottom of this column.
Persistent IP:
IP Address: 192.168.0.9
Subnet Mask: 255.255.0.0
Default Gateway: 0.0.0.0

5.1.2 Communication between different networks

When starting a camera, the application cannot communicate with the camera if the network is different from that of network adapter. It is recommended to disable `rp_filter` setting.

1. Confirm the current setting of `rp_filter` with the following command.

```
sysctl -a 2>/dev/null | grep '\.rp_filter'
```

```
ubuntu@linux: ~  
ubuntu@linux:~$ sysctl -a 2>/dev/null | grep '\.rp_filter'  
net.ipv4.conf.all.rp_filter = 1  
net.ipv4.conf.default.rp_filter = 1  
net.ipv4.conf.enp0s31f6.rp_filter = 2  
net.ipv4.conf.enp4s0.rp_filter = 1  
net.ipv4.conf.lo.rp_filter = 0
```

2. Set "0" to "all" and "adapter connected camera" setting value.

```
sudo sysctl net.ipv4.conf.all.rp_filter=0
```

(The above is the command for "all".

For each adapter, please replace "all" command with the value of each adapter (eg eth1).)

```
ubuntu@linux: ~  
ubuntu@linux:~$ sudo sysctl net.ipv4.conf.all.rp_filter=0  
net.ipv4.conf.all.rp_filter = 0
```


The application can recognize cameras on different networks.

The screenshot shows the 'IpConfigurationToolLinux' application window. At the top, there is a 'Refresh' button and a list of network interfaces: 'lo' and 'eth1'. The 'eth1' interface is selected, and its details are shown below. The details are organized into several sections: 'Adapter's Information', 'Device's Information', 'Force IP Setting', and 'IP Configuration & Persistent IP Setting'. The 'Device's Information' section is highlighted with a red box, showing the IP Address as '192.168.0.9', Subnet Mask as '255.255.0.0', and Firmware Ver. as 'Different Network'. The 'Force IP Setting' section has a 'Set Force IP' button. The 'IP Configuration & Persistent IP Setting' section has checkboxes for 'Persistent IP', 'DHCP', and 'LLA', and a 'Save' button. The 'Persistent IP' section also has input fields for 'IP Address', 'Subnet Mask', and 'Default Gateway'.

Adapter's Information		Device's Information	
Name	eth1	Name	BG505LMG
IP Address	169.254.7.10	IP Address	192.168.0.9
Subnet Mask	255.255.255.0	Subnet Mask	255.255.0.0
		Firmware Ver.	Different Network

Force IP Setting

IP Configuration & Persistent IP Setting

IP Configuration	Persistent IP
<input checked="" type="checkbox"/> Persistent IP	IP Address <input type="text"/>
<input type="checkbox"/> DHCP	Subnet Mask <input type="text"/>
<input checked="" type="checkbox"/> LLA	Default Gateway <input type="text"/>
<input type="button" value="Save"/>	

3. Click [Set Force IP]. A random value is set to the IP of the camera from inside the adapter's network.

The screenshot shows the 'IpConfigurationToolLinux' window. At the top, there's a 'Refresh' button and a list of network interfaces: 'lo' and 'eth1'. The 'eth1' interface is selected, showing its MAC address 'Toshiba Teli - BG505LMG - 0000001'. Below this, there are two main sections: 'Adapter's Information' and 'Device's Information'. The 'Adapter's Information' section shows 'Name: eth1', 'IP Address: 169.254.7.10', and 'Subnet Mask: 255.255.255.0'. The 'Device's Information' section shows 'Name: BG505LMG', 'IP Address: 169.254.7.145', 'Subnet Mask: 255.255.255.0', 'Firmware Ver.: 3.3.8', and 'User Defined: Module-01'. A red box highlights the 'Force IP Setting' section, which contains a 'Set Force IP' button. Below this is the 'IP Configuration & Persistent IP Setting' section. It has two sub-sections: 'IP Configuration' with checkboxes for 'Persistent IP' (checked), 'DHCP' (unchecked), and 'LLA' (checked), and a 'Save' button; and 'Persistent IP' with fields for 'IP Address: 192.168.0.9', 'Subnet Mask: 255.255.0.0', and 'Default Gateway: 0.0.0.0'.

This setting value is a temporary one, and it will disappear as soon as the power of camera is turned off.

Perform the procedure in "[5.1.1 Persistent IP Setting](#)" to fix IP address of camera.

7. 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/`

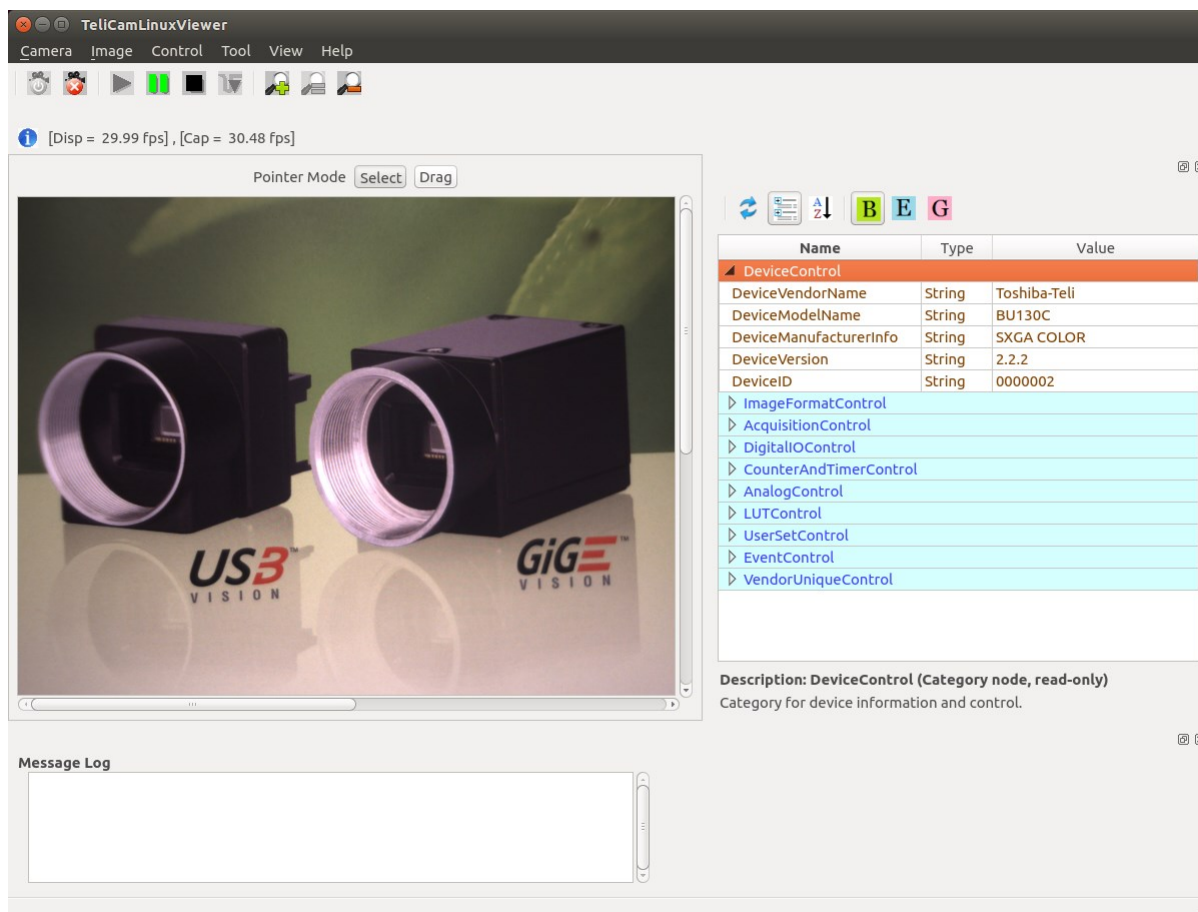
Follow the instructions below to execute the viewer application :

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`



8. Sample source codes

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

Sample name	UI	Function
Camera_Information	CUI	Display of camera information.
Camera_ControllingFunction	CUI	Acquisition and setting of parameters.
Stream_FreerunCallback	CUI	Continuous capture of images using the Callback function.
Stream_FreerunLockBuffer	CUI	Continuous capture of images using the LockBuffer function.
Stream_SWTrgReadCurrentImage	CUI	Image capture of software trigger using ReadCurrentImage function.
Stream_LowLevel	CUI	Continuous capture of images using the low level stream function.
CameraEvent	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
```

8.1. 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
```

8.2. 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
```

9. 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.

10. Others

10.1. 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/licenses)

10.2. 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 inquiries described in section 9.4.

Toshiba Teli corporation provides a warranty for TeliCamSDK under conditions set forth by Toshiba Teli corporation. (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/licenses .

Toshiba Teli corporation 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

GenICam GenApi uses the following third party software.

Project name	Project license
MathParser	LGPLv2.1
Log4Cpp	LGPLv2.1
CppUnit	LGPLv2.1
CLSerAll	NI license
xs3p	DSTC license
xxhash	xxhash license
XSLTProc	MIT license
XSDe	Proprietary

TeliCamSDK redistributes the binaries of LGPL-applied software, and for these source code only, you have the right to obtain, modify and redistribute it in accordance with the LGPL provisions.

To the customer who wants the source code, we write to the media (CD - ROM etc.) and send it by post.

Customers must pay for actual expenses such as shipping fee. If you want, please contact our inquiries described in section 9.4. We distribute source code only for open source software that you have right to obtain. (Source code of TeliCamSDK is not included.) Please understand beforehand that we can not answer questions about the content of the source code etc.

GigE Vision™ and USB3 Vision™ are camera interface standard defined by AIA (Automated Imaging Association).

GenICam™ is the trademark or the registered trademark of EMVA (European Machine Vision association).

Furthermore, the trade name used in this document is the trademark or the registered trademark of each company.

10.3. Inquiry

If you need help with TeliCamSDK, GigE Vision camera, USB3 Vision camera, please visit the following website :

<https://secure.toshiba-teli.co.jp/ttfa/web/faq/top.html>

If you still can not solve the problem, please contact “inquiries” on the following web site :

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