

DGVOX

Synway CTI Driver Installation Guide

For Internal Use by IT Support Teams

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Introduction

This document serves as a comprehensive installation and configuration guide for the **Synway CTILinux Driver (version 5.4.42 and above)**, designed for deployment on systems running **Debian 12 (Bookworm)**. It is intended for IT administrators, system integrators, and technical support personnel responsible for installing and maintaining **DGVOX**, a Synway-based voice processing solution.

The guide outlines all necessary prerequisites, including kernel version requirements, driver package details, step-by-step installation instructions, and troubleshooting procedures. Special emphasis is placed on ensuring kernel compatibility, proper driver setup, and resolving common errors during deployment.

Important: Before beginning the driver installation, ensure that your system is running Debian 12 with **Linux kernel version 6.1.0-34**. For OS installation procedures, refer to the separate document titled "*Debian 12 Installation Guide*."

Following this guide will help ensure a smooth and successful setup of the Synway driver environment, minimizing downtime and configuration errors.

Kernel Version Requirement for Debian 12 (Bookworm)

To ensure compatibility with the SHCTI driver, your system must be running **Linux kernel version 6.1.0-34**. Follow the steps below to verify and install the required kernel version:

Start by logging in with root privileges by typing ‘**su**’ (in lowercase) at the command prompt and entering the password. *Note: Using capital letters like ‘SU’ will not work.*

Check the Current Kernel Version

Run the following command in the terminal:

```
uname -r
```

```
root@DGVox:~# uname -r
6.1.0-37-amd64
root@DGVox:~# |
```

If the output does **not** match 6.1.0-34, proceed with the installation steps below.

Search for Available Kernel Images

Use the following command to search for available kernel packages:

```
apt search linux-image
```

```
root@DGVox:~# uname -r
6.1.0-37-amd64
root@DGVox:~# apt search linux-image
Sorting... Done
Full Text Search... Done
linux-headers-6.1.0-32-amd64/stable 6.1.129-1 amd64
  Header files for Linux 6.1.0-32-amd64

linux-headers-6.1.0-32-cloud-amd64/stable 6.1.129-1 amd64
  Header files for Linux 6.1.0-32-cloud-amd64

linux-image-6.1.0-34-amd64/stable-security 6.1.135-1 amd64
  Linux 6.1 for 64-bit PCs (signed)

linux-image-6.1.0-34-cloud-amd64/stable-security 6.1.135-1 amd64
  Linux 6.1 for x86-64 cloud (signed)

linux-image-6.1.0-34-rt-amd64/stable-security 6.1.135-1 amd64
  Linux 6.1 for 64-bit PCs, PREEMPT_RT (signed)

linux-image-6.1.0-35-amd64/stable,now 6.1.137-1 amd64 [installed,automatic]
  Linux 6.1 for 64-bit PCs (signed)

linux-image-6.1.0-35-amd64-dbg/stable 6.1.137-1 amd64
  Debug symbols for linux-image-6.1.0-35-amd64

linux-image-6.1.0-35-amd64-unsigned/stable 6.1.137-1 amd64
  Linux 6.1 for 64-bit PCs

linux-image-6.1.0-35-cloud-amd64/stable 6.1.137-1 amd64
  Linux 6.1 for x86-64 cloud (signed)

linux-image-6.1.0-35-cloud-amd64-dbg/stable 6.1.137-1 amd64
  Debug symbols for linux-image-6.1.0-35-cloud-amd64

linux-image-6.1.0-35-cloud-amd64-unsigned/stable 6.1.137-1 amd64
  Linux 6.1 for x86-64 cloud

linux-image-6.1.0-35-rt-amd64/stable 6.1.137-1 amd64
  Linux 6.1 for 64-bit PCs, PREEMPT_RT (signed)

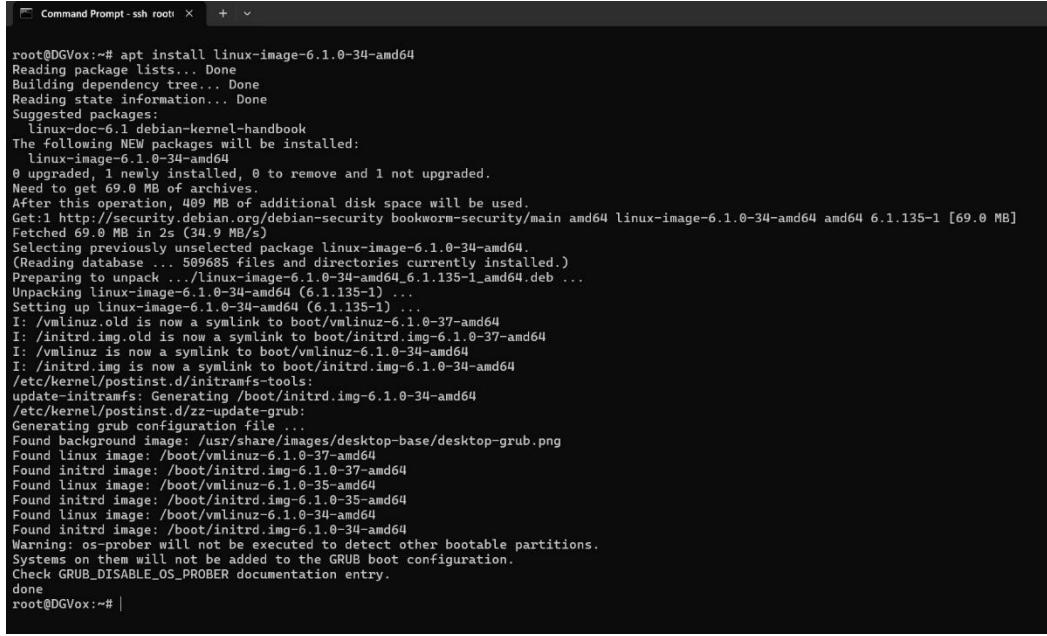
linux-image-6.1.0-35-rt-amd64-dbg/stable 6.1.137-1 amd64
  Debug symbols for linux-image-6.1.0-35-rt-amd64

linux-image-6.1.0-35-rt-amd64-unsigned/stable 6.1.137-1 amd64
  Linux 6.1 for 64-bit PCs, PREEMPT_RT
```

Install the Required Kernel Version

Install kernel version 6.1.0-34 using:

```
apt install linux-image-6.1.0-34-amd64
```



The screenshot shows a terminal window titled "Command Prompt - ssh root" with the following text output:

```
root@DGBox:~# apt install linux-image-6.1.0-34-amd64
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  linux-doc-6.1 debian-kernel-handbook
The following NEW packages will be installed:
  linux-image-6.1.0-34-amd64
0 upgraded, 1 newly installed, 0 to remove and 1 not upgraded.
Need to get 69.0 MB of additional disk space will be used.
Get:1 http://security.debian.org/debian-security bookworm-security/main amd64 linux-image-6.1.0-34-amd64 amd64 6.1.135-1 [69.0 MB]
Fetched 69.0 MB in 2s (34.9 MB/s)
Selecting previously unselected package linux-image-6.1.0-34-amd64.
(Reading database ... 509688 files and directories currently installed.)
Preparing to unpack .../linux-image-6.1.0-34-amd64_6.1.135-1_amd64.deb ...
Unpacking linux-image-6.1.0-34-amd64 (6.1.135-1) ...
Setting up linux-image-6.1.0-34-amd64 (6.1.135-1) ...
I: /vmlinuz.old is now a symlink to /boot/vmlinuz-6.1.0-37-amd64
I: /initrd.img.old is now a symlink to /boot/initrd.img-6.1.0-37-amd64
I: /vmlinuz is now a symlink to /boot/vmlinuz-6.1.0-34-amd64
I: /initrd.img is now a symlink to /boot/initrd.img-6.1.0-34-amd64
/etc/kernel/postinst.d/initramfs-tools:
update-initramfs: Generating /boot/initrd.img-6.1.0-34-amd64
/etc/kernel/postinst.d/zz-update-grub:
Generating grub configuration file ...
Found background image: /usr/share/images/desktop-base/desktop-grub.png
Found linux image: /boot/vmlinuz-6.1.0-37-amd64
Found initrd image: /boot/initrd.img-6.1.0-37-amd64
Found linux image: /boot/vmlinuz-6.1.0-35-amd64
Found initrd image: /boot/initrd.img-6.1.0-35-amd64
Found linux image: /boot/vmlinuz-6.1.0-34-amd64
Found initrd image: /boot/initrd.img-6.1.0-34-amd64
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
done
root@DGBox:~# |
```

Set the Installed Kernel as Default in GRUB

To ensure the system boots with the correct kernel:

Open the GRUB configuration file:

```
nano /etc/default/grub
```

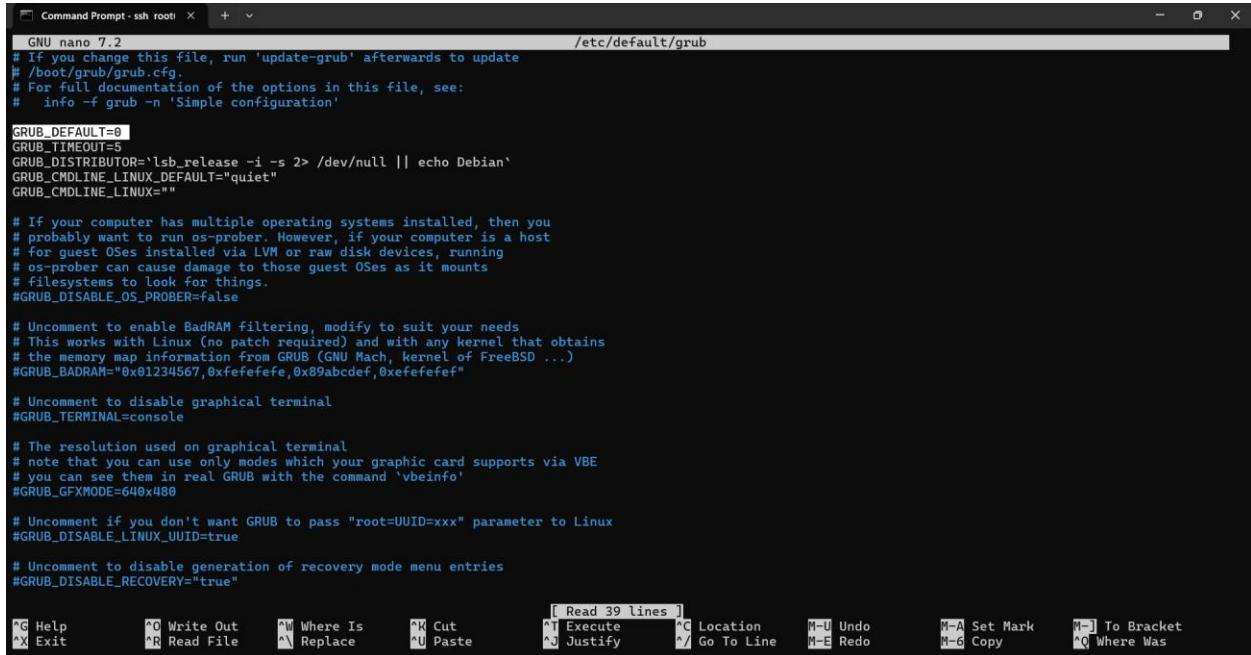
Locate the line:

```
GRUB_DEFAULT=
```

And update it to:

```
GRUB_DEFAULT='1>2'
```

Save the file by pressing CTRL+O and then CTRL+X to exit.



```
GNU nano 7.2                               /etc/default/grub
# If you change this file, run 'update-grub' afterwards to update
# /boot/grub/grub.cfg
# For full documentation of the options in this file, see:
#   info -f grub -n 'Simple configuration'

GRUB_DEFAULT=0
GRUB_TIMEOUT=5
GRUB_DISTRIBUTOR='lsb_release -i -s > /dev/null || echo Debian'
GRUB_CMDLINE_LINUX_DEFAULT="quiet"
GRUB_CMDLINE_LINUX=""

# If your computer has multiple operating systems installed, then you
# probably want to run os-prober. However, if your computer is a host
# for guest OSes installed via LVM or raw disk devices, running
# os-prober can cause damage to those guest OSes as it mounts
# filesystems to look for things.
#GRUB_DISABLE_OS_PROBER=false

# Uncomment to enable BadRAM filtering, modify to suit your needs
# This works with Linux (no patch required) and with any kernel that obtains
# the memory map information from GRUB (GNU Mach, kernel of FreeBSD ...)
#GRUB_BADRAM="0x01234567,0xffffefef,0x89abcdef,0xefefefef"

# Uncomment to disable graphical terminal
#GRUB_TERMINAL=console

# The resolution used on graphical terminal
# note that you can use only modes which your graphic card supports via VBE
# you can see them in real GRUB with the command 'vbeinfo'
#GRUB_GFXMODE=640x480

# Uncomment if you don't want GRUB to pass "root=UUID=xxx" parameter to Linux
#GRUB_DISABLE_LINUX_UUID=true

# Uncomment to disable generation of recovery mode menu entries
#GRUB_DISABLE_RECOVERY="true"

[[ Read 39 lines ]]
^C Help          ^O Write Out      ^W Where Is      ^X Cut           ^T Execute      ^C Location      M-U Undo       M-A Set Mark    M-] To Bracket
^X Exit         ^R Read File      ^R Replace      ^U Paste        ^J Justify      ^G Go To Line    M-E Redo       M-6 Copy        ^Q Where Was
```

Update GRUB Configuration

Apply the changes by updating GRUB:

```
update-grub
```

Reboot the System

Restart your machine:

```
reboot
```

```
Preparing to unpack .../linux-image-6.1.0-34-amd64_6.1.135-1_amd64.deb ...
Unpacking linux-image-6.1.0-34-amd64 (6.1.135-1) ...
Setting up linux-image-6.1.0-34-amd64 (6.1.135-1) ...
I: /vmlinuz.old is now a symlink to boot/vmlinuz-6.1.0-37-amd64
I: /initrd.img.old is now a symlink to boot/initrd.img-6.1.0-37-amd64
I: /vmlinuz is now a symlink to boot/vmlinuz-6.1.0-34-amd64
I: /initrd.img is now a symlink to boot/initrd.img-6.1.0-34-amd64
/etc/kernel/postinst.d/lintrams-tools:
update-initramfs: Generating /boot/initrd.img-6.1.0-34-amd64
/etc/kernel/postinst.d/zz-update-grub:
Generating grub configuration file ...
Found background image: /usr/share/images/desktop-base/desktop-grub.png
Found linux image: /boot/vmlinuz-6.1.0-37-amd64
Found initrd image: /boot/initrd.img-6.1.0-37-amd64
Found linux image: /boot/vmlinuz-6.1.0-35-amd64
Found initrd image: /boot/initrd.img-6.1.0-35-amd64
Found linux image: /boot/vmlinuz-6.1.0-34-amd64
Found initrd image: /boot/initrd.img-6.1.0-34-amd64
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
done
root@DGVox:~# nano /etc/default/grub
root@DGVox:~# update-grub
Generating grub configuration file ...
Found background image: /usr/share/images/desktop-base/desktop-grub.png
Found linux image: /boot/vmlinuz-6.1.0-37-amd64
Found initrd image: /boot/initrd.img-6.1.0-37-amd64
Found linux image: /boot/vmlinuz-6.1.0-35-amd64
Found initrd image: /boot/initrd.img-6.1.0-35-amd64
Found linux image: /boot/vmlinuz-6.1.0-34-amd64
Found initrd image: /boot/initrd.img-6.1.0-34-amd64
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
done
root@DGVox:~# reboot
root@DGVox:~# Connection to 192.168.2.220 closed by remote host.
Connection to 192.168.2.220 closed.

C:\Users\shism|
```

Confirm the Kernel Version After Reboot

Once the system has restarted, verify that the correct kernel is in use:

```
uname -r
```

The output should confirm:

6.1.0-34-amd64

This ensures your system is ready for SHCTI driver installation.

About the Driver Package

The **CtILinux driver installation package** follows a structured naming convention designed to help users easily identify important details about the driver version, target kernel, system architecture, and build date.

The package file is named:

CtILinux5.4.42-6.1.0-34-amd64-SMP-x86_64_20250624.tar.bz2

Each component of the filename conveys specific information:

- **CtILinux5.4.42** – Indicates the driver name and its version (v5.4.42)
- **6.1.0-34** – Denotes the compatible Linux kernel version
- **amd64 / x86_64** – Specifies support for 64-bit systems based on AMD64 architecture
- **SMP** – Confirms support for Symmetric Multiprocessing (multi-core CPU environments)
- **20250624** – Represents the package build date (June 24, 2025)
- **.tar.bz2** – File extension indicating a tarball archive compressed using the bzip2 algorithm

This format ensures clarity and consistency, making it easier to verify compatibility before installation. The archive contains all necessary files required for installing the SHCTI driver on supported Linux environments.

Driver Installation Steps

Step 1: Login as Root

Log in to the system with root privileges.

Step 2: Copy the Driver Package

Copy the driver installation package from the CD to the current working directory:

CtILinux5.4.42-6.1.0-34-amd64-SMP-x86_64_20250624.tar.bz2

Step 3: Extract the Package

Run the following command to extract the compressed driver package:

```
tar -xvf CtILinux5.4.42-6.1.0-34-amd64-SMP-x86_64_20250624.tar.bz2
```

This will create a directory named CtILinux5.4.42-6.1.0-34-amd64-SMP-x86_64.

Step 4: Navigate to the Installation Directory

Open this directory using the following command:

```
cd CtiLinux5.4.42-6.1.0-34-amd64-SMP-x86_64
```

Step 5: Auto Installation

Note: If a driver of the same version is already installed, back up the configuration file **ShConfig.ini** from /usr/local/lib/shcti/ver5.4.42/tools.

Run the following command under the newly created directory to start the auto installation process.

```
root@DGVox:~/CtiLinux5.4.42-6.1.0-34-amd64-SMP-x86_64# ./install.linux
```

```
root@DGVox:~/CtiLinux5.4.42-6.1.0-34-amd64-SMP-x86_64# ./install.linux
The version is stable version ver5.4.42!
The version is fixing version ver5.4.42!
Drivers ShCti ver5.4.42 installing...
```

During the execution of the installation script, you will be prompted to confirm several actions. When prompted, respond as follows:

```
This script will install IPR or HMP driver,you sure install it[yes/no]: no
This script will run record_slaver and HMPCodec,you sure run it[yes/no]: no
This script will Default ShConfig.ini,you sure default it[yes/no]: yes
```

After confirming the default configuration, the script completes the setup and displays a success message indicating that ShConfig.ini has been configured and the **ShCti driver version 5.4.42** has been successfully installed at the path: /usr/local/lib/shcti/ver5.4.42/

```
ShConfig.ini has been configured
Drivers ShCti ver5.4.42 install success at path /usr/local/lib/shcti/ver5.4.42/ !
root@DGVox:~/CtiLinux5.4.42-6.1.0-34-amd64-SMP-x86_64# |
```

This confirms that the configuration and driver installation were completed successfully.

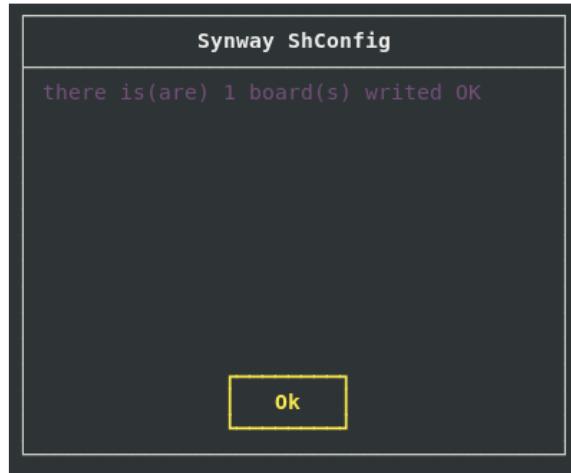
Step 6: Configure the ShCti Driver

Now, to configure the installed ShCti driver, navigate to the tools directory and run the configuration script using the following commands:

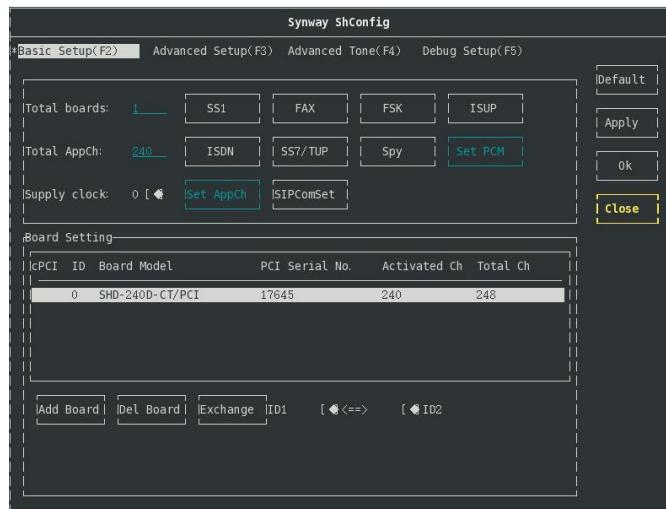
```
cd /usr/local/lib/shcti/ver5.4.42/tools
./ShCtiConfig
```

```
root@DGVox:~/CtiLinux5.4.42-6.1.0-34-amd64-SMP-x86_64# cd /usr/local/lib/shcti/ver5.4.42/tools
root@DGVox:/usr/local/lib/shcti/ver5.4.42/tools# ./ShCtiConfig
```

Note: If the following error occurs in the terminal: **Error opening terminal: xterm-256color**. Go to [Issue 2](#) and execute the same step. Once completed, the screen will appear as shown below.



To apply the default settings, click the "Default" button, then click "Apply" to save the changes.



Step 8: Uninstalling the Driver

To remove the installed ShCti driver from your system, follow the steps below:

 Navigate to the driver installation directory:

```
cd /usr/local/lib/shcti/ver5.4.42
```

 Run the uninstall script:

```
./uninstall.linux
```

Conclusion

After completing the steps in this section, your system should be running Linux kernel version 6.1.0-34, ensuring full compatibility with the SHCTI driver. This setup forms the foundation for a stable and successful installation of the CTILinux driver package. You may now proceed with the driver installation steps as outlined in the next section of this guide.

Frequently Asked Questions (FAQ)

Troubleshooting Common Issues with **ShCtiConfig** and **Driver Installation**.

Issue 1: Error while loading shared libraries (libKYLib.so not found)

Error Message:

./ShCtiConfig: error while loading shared libraries: libKYLib.so: cannot open shared object file:
No such file or directory

Solution:

Run the following command to set the library path:

```
export LD_LIBRARY_PATH=/usr/lib64
```

Issue 2: Error opening terminal: xterm-256color

Error Message:

Error opening terminal: xterm-256color.

Solution:

Execute the following commands one by one:

```
sudo mkdir -p /usr/share/terminfo/x  
cd /usr/share/terminfo/x  
sudo ln -s /lib/terminfo/x/xterm xterm  
export TERM=xterm or export TERM=xterm-16color
```

Issue 3: IPR already loaded error

Error Message:

IPR already loaded.

Solution:

1. Check if the driver is already loaded.
2. Run the command:

```
ipcs -m
```
3. If the bytes column value is 4, it is related to the driver.
4. Identify the corresponding shmid and remove it using:

```
ipcrm -m <shmid>
```

Example:

```
ipcrm -m 59
```

Issue 4: Segmentation Fault when running ShCtiConfig**Solution:**

1. Apply the testckm.rar patch.
2. If the segmentation fault persists, apply the patch files under the directory:
/usr/local/lib/shcti/ver5.4.42/out
3. Run ShCtiConfig again.

Issue 5: Error - libSDL2.0 not found (for SynIPR dongle & cloud licenses)**Solution:**

Install libSDL using:

```
apt-get install libsdl-ttf2.0-0
```

Issue 6: Error when running test.exe (LOADLIBRARY libpt_linux_x86_64_r.so.1.5.2 not found)**Error Message:**

LOADLIBRARY libpt_linux_x86_64_r.so.1.5.2: cannot open shared object file: No such file or directory

Solution:

Run the following command to set the library path:

```
export LD_LIBRARY_PATH=/usr/lib64
```

Issue 7: Auto Installation Failure – Driver Not Loaded**Problem:**

The automatic installation process fails, and the driver is not loaded properly.

Possible Causes:

- The required telephony board is not installed or not detected by the system.
- The kernel module was not correctly loaded.

Solution:

1. Verify Board Detection

Run the following command to check if the board is detected:

```
lspci
```

You should see an entry similar to:

04:00.0 Computer telephony device: PLX Technology, Inc. Device 0068 (rev 0b)

2. Manually Load the Driver Module

Navigate to the directory corresponding to your Linux kernel version:

CtiLinux5.4.42-6.1.0-34-amd64-SMP-x86_64/Linux/lkm/kx.x.x

(Replace kx.x.x with your actual kernel version)

Run the following commands based on the board type:

For PCI bus boards:

```
rmmod shdpci.ko
insmod shdpci.ko
```

For USB bus boards:

```
rmmod shdusb.ko
insmod shdusb.ko
```

Important: Disconnect the USB device before removing the USB module. Reconnect it after reinstalling the module.

3. Verify Driver Installation. Run the following command:

```
lsmod
```

You should see output like:

Module	Size	Used by
shdpci	613911	0

4. Test the Installation

To run the CUI test program, navigate to:

```
cd /usr/local/lib/shcti/ver5.4.42/tools/
./test
```

To run the GTK GUI test program, run:

```
./Test_gtk
```

5. Running Custom Applications

Ensure that your application correctly loads the configuration files:

- ShConfig.ini
- ShIndex.ini

6. Persistent Driver Loading at Boot

Always load the appropriate kernel module before launching the application. You can do this by:

```
insmod /usr/local/lib/shcti/ver5.4.42/lkm/kx.x.x/shdpci.ko
```

(Modify the path based on your kernel version and board type.)

To enable automatic loading at startup, add the above `insmod` command to `/etc/rc.local`.

If the kernel module files are already present and unchanged, they will automatically load during system startup.

Issue 8: Removing Older Linux Kernels Without Affecting the Running Kernel

To safely remove unused kernel versions and free up space, follow these steps:

1. Check installed kernels:

```
dpkg --list | grep linux-image
```

This will list all installed kernel versions.

2. Identify the kernel you are currently using:

```
uname -r
```

3. Remove all other kernel versions except the one you are currently running (e.g., 6.1.0-34-amd64):

```
apt remove linux-image-<version>
```

For example, to remove an older version:

```
apt remove linux-image-6.1.0-37-amd64
```

```
Linux DGUox 6.1.0-37-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.1.140-1 <2025-05-22>
x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Jul 22 11:29:49 2025 from 192.168.2.172
root@DGUox:~# uname -r
6.1.0-37-amd64
root@DGUox:~# dpkg --list | grep linux-image
ii  linux-image-6.1.0-34-amd64          6.1.135-1
ii  linux-image-6.1.0-35-amd64          6.1.137-1
ii  linux-image-6.1.0-37-amd64          6.1.140-1
ii  linux-image-amd64                 6.1.140-1
ii  linux-image-amd64                 6.1.140-1
                                         Linux for 64-bit PCs <meta-package>
root@DGUox:~# apt remove linux-image-amd64
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  linux-image-amd64
0 upgraded, 0 newly installed, 1 to remove and 1 not upgraded.
After this operation, 13.3 kB disk space will be freed.
Do you want to continue? [y/n] y
(Reading database ... 514617 files and directories currently installed.)
Removing linux-image-amd64 <6.1.140-1>...
root@DGUox:~# apt remove linux-image-6.1.0-35-amd64
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  linux-image-6.1.0-35-amd64
0 upgraded, 0 newly installed, 1 to remove and 1 not upgraded.
After this operation, 409 MB disk space will be freed.
Do you want to continue? [y/n] y
(Reading database ... 514614 files and directories currently installed.)
Removing linux-image-6.1.0-35-amd64 <6.1.137-1> ...
/etc/kernel/postinst.d/initramfs-tools:
update-initramfs: Deleting /boot/initrd.img-6.1.0-35-amd64
/etc/kernel/postinst.d/grub:
Generating grub configuration file...
Found background image: /usr/share/images/desktop-base/desktop-grub.png
Found linux image: /boot/vmlinuz-6.1.0-37-amd64
Found initrd image: /boot/initrd.img-6.1.0-37-amd64
Found linux image: /boot/vmlinuz-6.1.0-34-amd64
Found initrd image: /boot/initrd.img-6.1.0-34-amd64
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
done.
root@DGUox:~# apt remove linux-image-6.1.0-37-amd64
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  linux-image-6.1.0-37-amd64
0 upgraded, 0 newly installed, 1 to remove and 1 not upgraded.
After this operation, 409 MB disk space will be freed.
Do you want to continue? [y/n] y
(Reading database ... 509683 files and directories currently installed.)
Removing linux-image-6.1.0-37-amd64 <6.1.140-1> ...
```

Abort Kernel Removal Prompt: When attempting to remove a kernel, a warning prompt appears if the selected version is currently in use.

At this prompt, **select <No>** so the current version loads after the system reboots.

