

TI_ADC124S101_ADC_User_Guide

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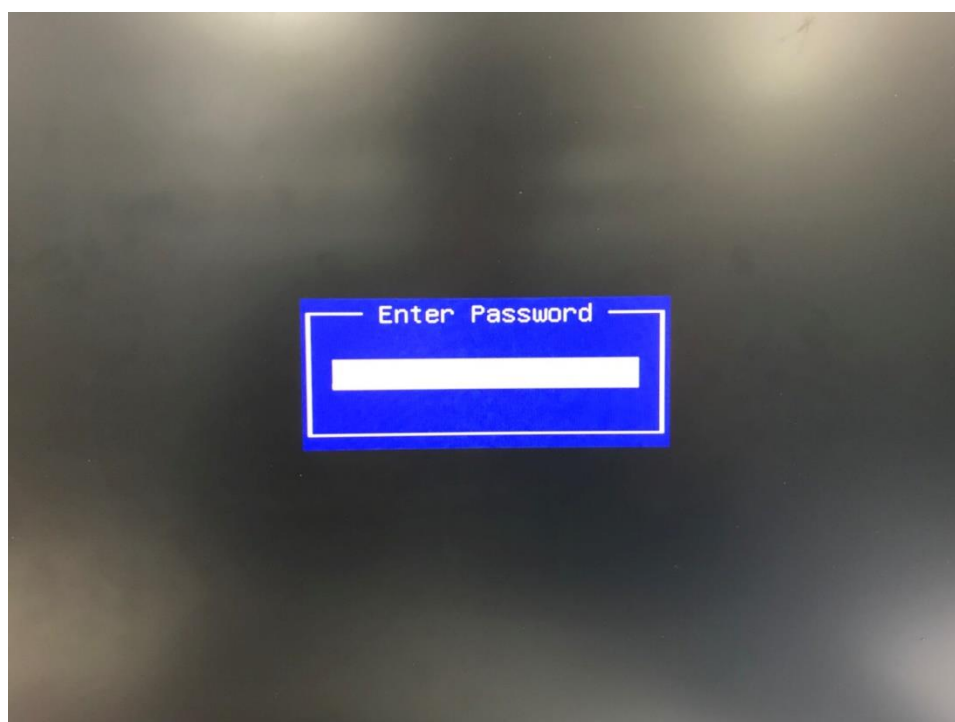
1. BIOS Configuration

Step 1.

Press the “Delete” key to enter BIOS menu in boot stage.

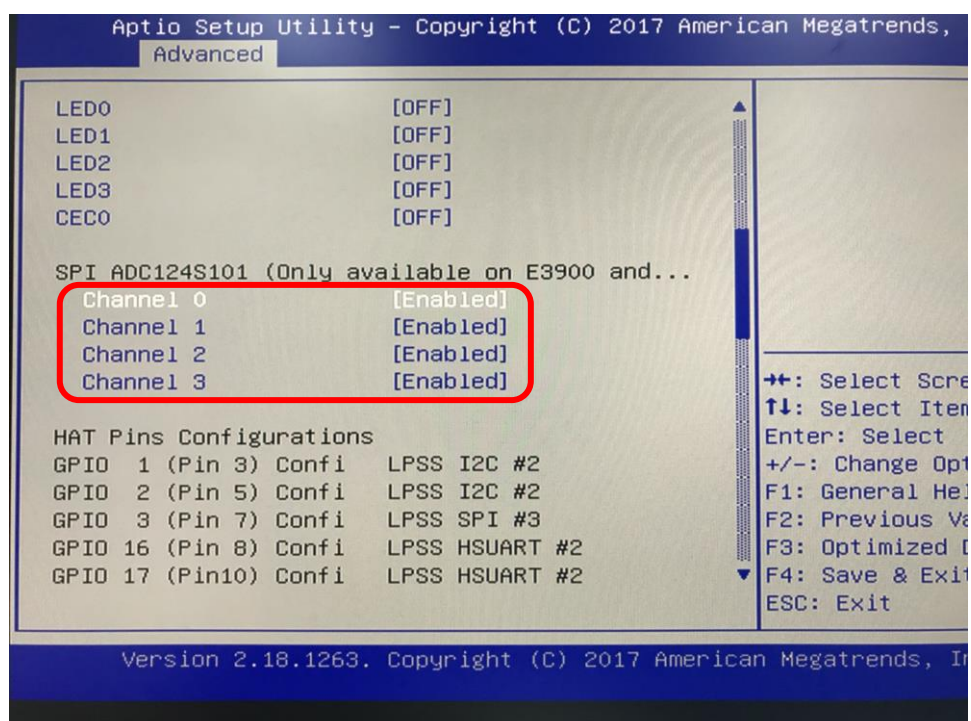
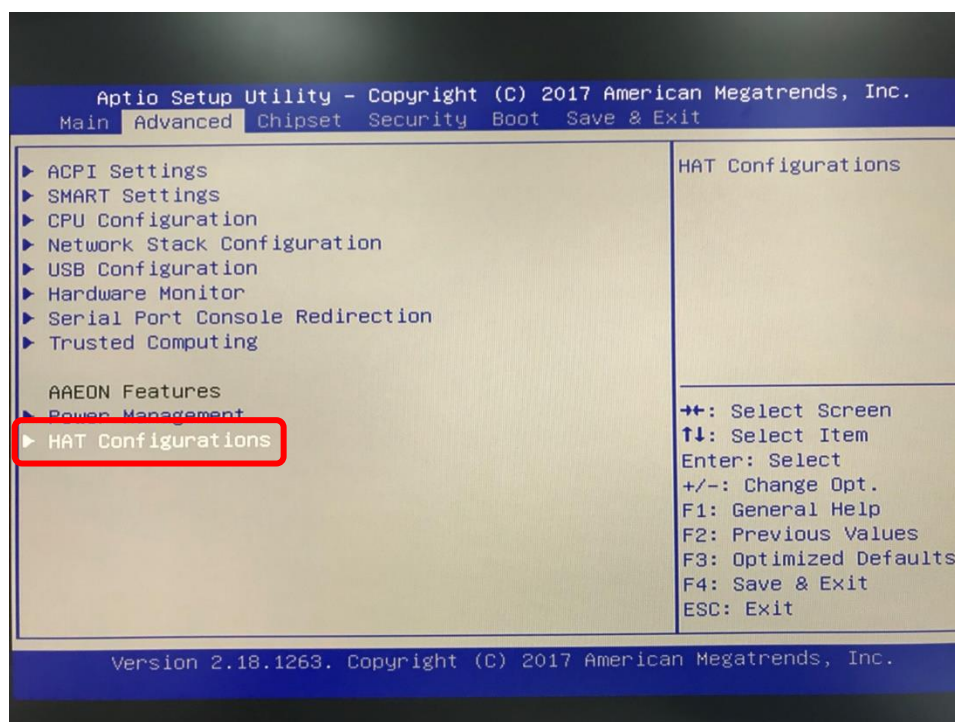
Step 2.

Press the “Enter” key to skip the “Enter Password” stage.



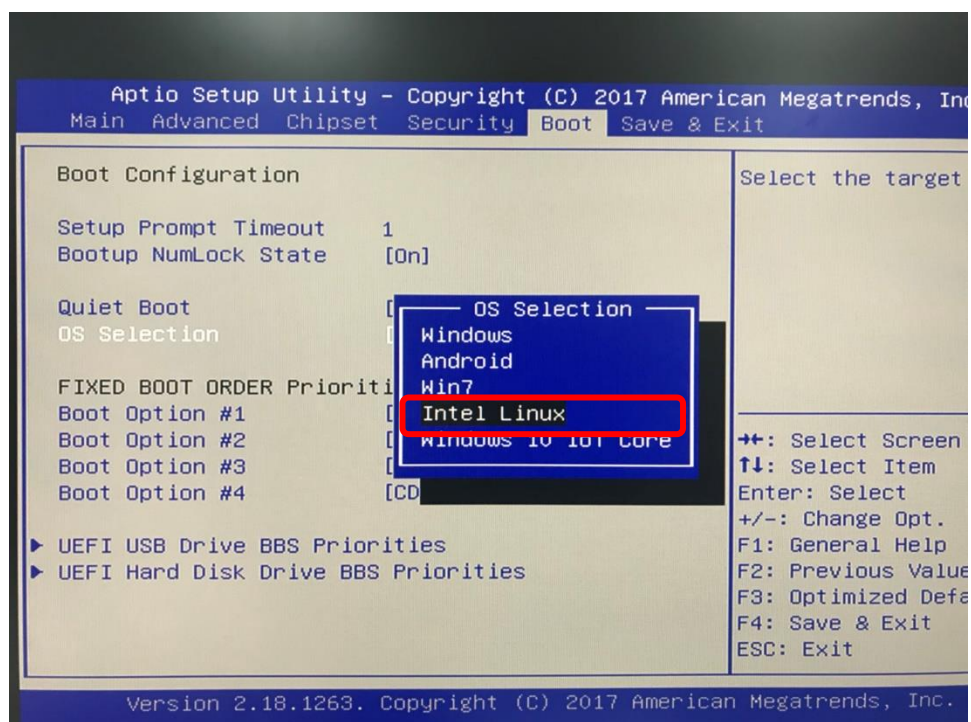
Step 3.

Enable the "Advanced -> HAT Configurations -> SPI ADC124S101 **Channel** item.



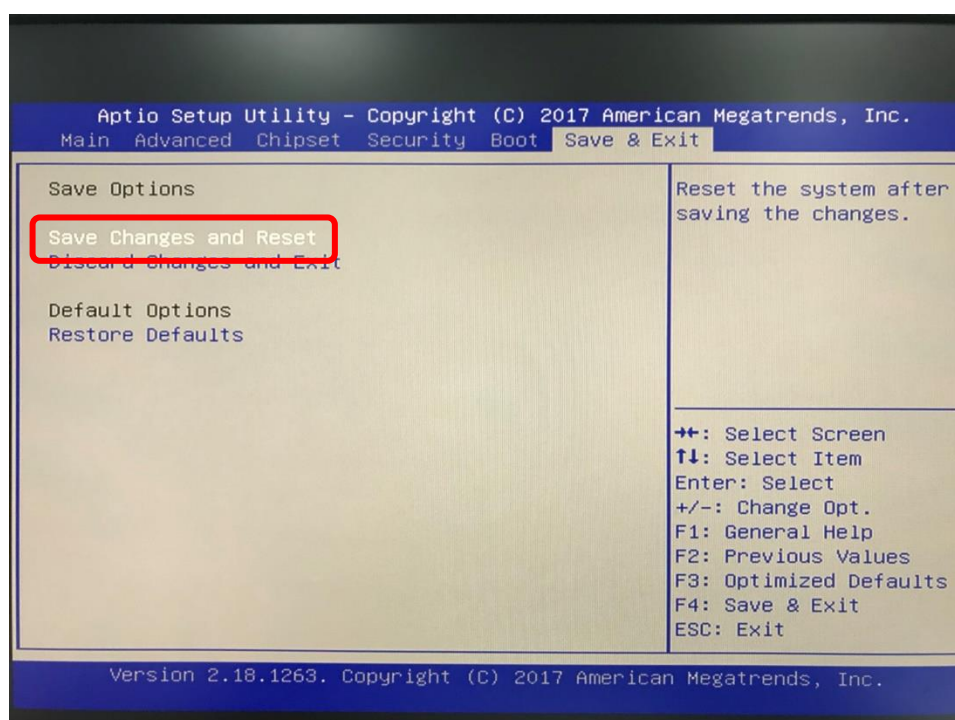
Step 4.

Change the “OS Selection” item to “Intel Linux”.



Step 5.

Save changes and reset.



2. Install Ubuntu 16.04.2

Step 1.

Install Ubuntu 16.04.2 (64-bit).

Step 2.

Check the version.

```
$ lsb_release -a
```

```
aaeon@aaeon-UP-APL01:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 16.04.2 LTS
Release:        16.04
Codename:       xenial
```

Step 3.

Check the Ubuntu kernel version.

```
$ uname -mrs
```

```
aaeon@aaeon-UP-APL01:~$ uname -mrs
Linux 4.8.0-36-generic x86_64
```

3. Update Ubuntu Kernel

Step 1.

Update kernel to AAEON kernel for UP2.

```
$ cp up2_ti_adc124s101_adc.zip ~/
$ unzip ~/up2_ti_adc124s101_adc.zip
$ cd ~/up2_ti_adc124s101_adc
$ sudo apt-get install -y dpkg
$ sudo dpkg -i linux-*.deb
```

```
aaeon@aaeon-UP-APL01:~$ unzip up2_ti_adc124s101_adc.zip
Archive: up2_ti_adc124s101_adc.zip
  creating: up2_ti_adc124s101_adc/
  extracting: up2_ti_adc124s101_adc/linux-headers-4.9.45-aaeon-gd287010-dirty_amd64.deb
  extracting: up2_ti_adc124s101_adc/linux-image-4.9.45-aaeon-gd287010-dirty_amd64.deb
aaeon@aaeon-UP-APL01:~$ cd ~/up2_ti_adc124s101_adc/
aaeon@aaeon-UP-APL01:~/up2_ti_adc124s101_adc$ sudo apt-get install -y dpkg
[sudo] password for aaeon:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be upgraded:
  dpkg
1 upgraded, 0 newly installed, 0 to remove and 271 not upgraded.
Need to get 2084 kB of archives.
After this operation, 0 B of additional disk space will be used.
Get:1 http://tw.archive.ubuntu.com/ubuntu xenial-updates/main amd64 dpkg amd64 1.18.4ubuntu1.3 [2084 kB]
Fetched 2084 kB in 0s (17.6 MB/s)
(Reading database ... 211982 files and directories currently installed.)
Preparing to unpack .../dpkg_1.18.4ubuntu1.3_amd64.deb ...
Unpacking dpkg (1.18.4ubuntu1.3) over (1.18.4ubuntu1.1) ...
Setting up dpkg (1.18.4ubuntu1.3) ...
Processing triggers for man-db (2.7.5-1) ...
aaeon@aaeon-UP-APL01:~/up2_ti_adc124s101_adc$ sudo dpkg -i linux-*.deb
(Reading database ... 211982 files and directories currently installed.)
Preparing to unpack linux-headers-4.9.45-aaeon-gd287010-dirty_amd64.deb ...
Unpacking linux-headers-4.9.45-aaeon-gd287010-dirty (4.9.45-aaeon-gd287010-dirty) over (4.9.45-aaeon-gd287010-dirty) ...
Preparing to unpack linux-image-4.9.45-aaeon-gd287010-dirty_amd64.deb ...
Examining /etc/kernel/header_postinst.d/
Done.
Unpacking linux-image-4.9.45-aaeon-gd287010-dirty (4.9.45-aaeon-gd287010-dirty) over (4.9.45-aaeon-gd287010-dirty) ...
Examining /etc/kernel/postrm.d .
run-parts: executing /etc/kernel/postrm.d/initramfs-tools 4.9.45-aaeon-gd287010-dirty /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
run-parts: executing /etc/kernel/postrm.d/zz-update-grub 4.9.45-aaeon-gd287010-dirty /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
Setting up linux-headers-4.9.45-aaeon-gd287010-dirty (4.9.45-aaeon-gd287010-dirty) ...
Examining /etc/kernel/header_postinst.d.
Setting up linux-image-4.9.45-aaeon-gd287010-dirty (4.9.45-aaeon-gd287010-dirty) ...

Hmm. There is a symbolic link /lib/modules/4.9.45-aaeon-gd287010-dirty/build
However, I can not read it: No such file or directory
Therefore, I am deleting /lib/modules/4.9.45-aaeon-gd287010-dirty/build

Hmm. The package shipped with a symbolic link /lib/modules/4.9.45-aaeon-gd287010-dirty/source
However, I can not read the target: No such file or directory
Therefore, I am deleting /lib/modules/4.9.45-aaeon-gd287010-dirty/source

Running depmod.
Examining /etc/kernel/postinst.d.
run-parts: executing /etc/kernel/postinst.d/apt-auto-removal 4.9.45-aaeon-gd287010-dirty /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
run-parts: executing /etc/kernel/postinst.d/initramfs-tools 4.9.45-aaeon-gd287010-dirty /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
update-initramfs: Generating /boot/initrd.img-4.9.45-aaeon-gd287010-dirty
W: Possible missing firmware /lib/firmware/i915/kbl_guc_ver9_14.bin for module i915
W: Possible missing firmware /lib/firmware/i915/bxt_guc_ver8_7.bin for module i915
run-parts: executing /etc/kernel/postinst.d/pm-utils 4.9.45-aaeon-gd287010-dirty /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
run-parts: executing /etc/kernel/postinst.d/unattended-upgrades 4.9.45-aaeon-gd287010-dirty /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
run-parts: executing /etc/kernel/postinst.d/update-notifier 4.9.45-aaeon-gd287010-dirty /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
run-parts: executing /etc/kernel/postinst.d/zz-update-grub 4.9.45-aaeon-gd287010-dirty /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
Generating grub configuration file ...
Warning: Setting GRUB_TIMEOUT to a non-zero value when GRUB_HIDDEN_TIMEOUT is set is no longer supported.
Found linux image: /boot/vmlinuz-4.10.0-42-generic
Found initrd image: /boot/initrd.img-4.10.0-42-generic
Found linux image: /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
Found initrd image: /boot/initrd.img-4.9.45-aaeon-gd287010-dirty
Adding boot menu entry for EFI firmware configuration
done
```

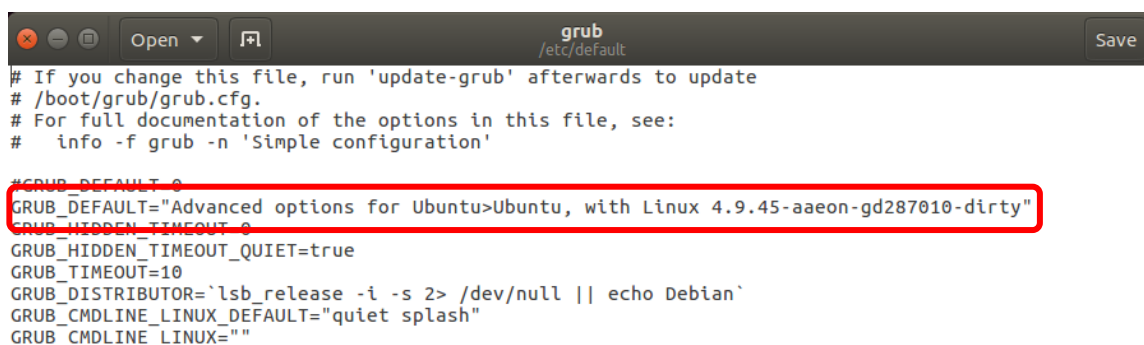

Step 2.

Change default grub boot option.

- a. Edit /etc/default/grub

```
$ sudo gedit /etc/default/grub
```

- b. For example, the Linux kernel is "4.9.45-aaeon-gd287010-dirty". Replace GRUB_DEFAULT value from 0 to **"Advanced options for Ubuntu>Ubuntu, with Linux 4.9.45-aaeon-gd287010-dirty"**.



```
grub
/etc/default

# 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_DEFAULT='Advanced options for Ubuntu>Ubuntu, with Linux 4.9.45-aaeon-gd287010-dirty'
GRUB_HIDDEN_TIMEOUT=0
GRUB_HIDDEN_TIMEOUT_QUIET=true
GRUB_TIMEOUT=10
GRUB_DISTRIBUTOR=`lsb_release -i -s 2> /dev/null || echo Debian`
GRUB_CMDLINE_LINUX_DEFAULT="quiet splash"
GRUB_CMDLINE_LINUX=""
```

- c. Save /etc/default/grub

- d. Update grub.

```
$ sudo update-grub
```

```
aaeon@aaeon-UP-APL01:~$ sudo update-grub
Generating grub configuration file ...
Warning: Setting GRUB_TIMEOUT to a non-zero value when GRUB_HIDDEN_TIMEOUT is set is no longer supported.
Found linux image: /boot/vmlinuz-4.10.0-42-generic
Found initrd image: /boot/initrd.img-4.10.0-42-generic
Found linux image: /boot/vmlinuz-4.9.45-aaeon-gd287010-dirty
Found initrd image: /boot/initrd.img-4.9.45-aaeon-gd287010-dirty
Adding boot menu entry for EFI firmware configuration
done
```

- e. Reboot system.

```
$ sudo reboot
```


Step 3.

Verify the kernel version.

```
$ uname -mrs
```

```
aaeon@aaeon-UP-APL01:~$ uname -mrs  
Linux 4.9.45-aaeon-gd287010-dirty x86_64
```

Step 4.

Verify the ADC.

```
$ ll /sys/bus/iio/devices/iio\:device0/
```

The output should look like:

```
aaeon@aaeon-UP-APL01:~$ ll /sys/bus/iio/devices/iio\:device0/  
total 0  
drwxr-xr-x 3 root root 0 — 15 11:52 ./  
drwxr-xr-x 5 root root 0 — 15 11:50 ../  
-r--r--r-- 1 root root 4096 — 15 11:51 dev  
-rw-r--r-- 1 root root 4096 — 15 11:51 in_voltage0_raw  
-rw-r--r-- 1 root root 4096 — 15 11:51 in_voltage1_raw  
-rw-r--r-- 1 root root 4096 — 15 11:51 in_voltage2_raw  
-rw-r--r-- 1 root root 4096 — 15 11:51 in_voltage3_raw  
-rw-r--r-- 1 root root 4096 — 15 11:51 in_voltage_scale  
-r--r--r-- 1 root root 4096 — 15 11:51 name  
drwxr-xr-x 2 root root 0 — 15 11:51 power/  
lrwxrwxrwx 1 root root 0 — 15 11:50 subsystem -> ../../../../../../bus/iio/  
-rw-r--r-- 1 root root 4096 — 15 11:50 uevent
```