## AdvLinuxTU User Manual

V3.0



**Enabling an Intelligent Planet** 

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## **1. About This Manual**

Thank you for choosing Advantech.

AdvLinuxTU v3.0 is based on Ubuntu Desktop 20.04.3, its kernel is 5.11.0.



# 2. AdvLinuxTU Overview

AdvLinuxTU is an embedded Linux system designed for Advantech embedded devices, and it is especially optimized for TPC/UNO/PPC series.

## 2.1. Hardware Support List

AdvLinuxTU can be installed on all Advantech devices theoretically.

### 2.2. Main Features

AdvLinuxTU has many important features coming for industrial customers. Here we list some of them and give a brief introduction. We will explain them in detail in later sections.

- Provide Embedded QT runtime environment The user can run embedded QT application.
- ➢ USB installation support

The user can burn the AdvLinuxTU ISO to a USB disk, and then the user can install AdvLinuxTU to Advantech device from the USB disk.

Hardware auto detection

When installing AdvLinuxTU, the installation will detect the hardware automatically and install all drivers it needs. Therefore, once the installation is completed, no more drivers will be needed unless the user adds some other devices such as Advantech data collecting card to the embedded device.

➢ OEM Installation

User can install OEM mode and ship to customers, they can create them language, keyboard and account of Ubuntu.

Online Installation and Update You can use apt-get command to install and update software, extending AdvLinuxTU functions.



## 2.3. AdvLinuxTU Screenshot





# **3. Installation Guide**

In this chapter, we will introduce the installation step by step.

## **3.1. System Requirements**

Recommended requirements: Storage size: 32 G or more Memory size: 2 G or more

## 3.2. Prepare for Installation

We suggest that the user makes a copy of data in storage medium in order to prevent data lost in case of improper operation during installation.

AdvLinuxTU supports installing from USB disk.

Prepare:

- ✓ Rufus (Rufus is open source and is 100% Free Software (GPL v3), You can download from https://rufus.ie/)
- ✓ USB Disk (storage size is more than 4G)
- ✓ AdvLinxTU ISO

### 3.3. Install from USB disk

We use Rufus tool to burn AdvLinuxTU ISO file to USB disk, Rufus is a utility that helps format and create bootable USB flash drives.

#### **System Requirements for Rufus:**

Windows 7 or later, 32 or 64 bit doesn't matter. Once downloaded, the application is ready to use.



🖋 Rufus 3.13.1730		-	· 🗌	$\times$
Drive Properties				
Device				
Advl inuxTu-V3.0.2 (F:) [16 GB]				~
Post selection				
Adv/ inuxTu-V3.0.2 ico	~	0	SELECT	
	-	٢	SELECT	
Persistent partition size		0 (No	nersistence)	
- Dartition ach anns	Taxa et avete	0 (110	persistence	
MRR	BIOS or LIE	m =1		~
	BIOS OF DEL			Ť
<ul> <li>Show advanced drive properties</li> </ul>				
Format Options ———				
Volume label				
AdvLinuxTu-V3.0.2				
File system	Cluster size			
FAT32 (Default)	8192 bytes	(Default	)	$\sim$
Show advanced format options				
Status				
READ	/			
ILAD I				
Ø û ≈ 🖩	START	-	CLOSE	
	L			
1 device found				

Picture 3-3-1 Select the AdvLinuxTU ISO File and start to burn

Burn the ISO as follows:

- a) Insert USB disk to windows PC
- b) Start Rufus tool
- c) Select AdvLinuxTU ISO
- d) Click START to start burn



## 3.4. Raid mode & Installation Steps

UNO-2483G, UNO-2484G, UNO-3283G, TPC-B500...etc support raid mode.

## 3.4.1. Setting RAID Mode

Enter the BIOS interface, set the hard disk mode to RAID mode.

### 3.4.2. Create RAID Volume

Enter "ctr + i" will show the RAID interface, choose "Create RAID Volume" and press enter.



Enter "Shift + y" to Create Raid Volume. At present, RAID1 is mainly supported. The specific steps are as follows



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Copyright (C) Intel Co	prporation. All rights reserved.
COPYRIGHT (C) Intel Co	TE VOLUME MENU ]
Nane: Vo	plume1
RAID Level: Rf	HD1(Mirror)
Disks: Se	plect Disks
Strip Size: N/	YA
Capacity: 59	D.6 GB
	YA
HARNING: ALL DATA ON	I SELECTED DISKS WILL BE LOST.
Are you sure you war	It to create this volume? (Y/N):
Press ENTER to c	create the specified volume.

Don't modify the defalt "Volume1", otherwise AdvlinuxTU will install failed. You can see Volume1 show up.

	Copyright (C	) Intel Corporat	ion. Al	l rights reserved.	
RAID	1. Create RAID <mark>2. Delete RAID</mark> 3. Reset Disks Volumes:	Volume Volume to Non-RAID DISK/VOLUME	4. 1 5. 1 6. 1 Informat	Recovery Volume Opti Acceleration Options Exit ION ]	ions s
ID	Nane	Level	Strip	Size Status	Bootable
0.	Volume1 _	RAID1(Mirror)	N/A	59.6GB Normal	fes
Phys ID 0 1	ical Devices: Device Model S SQF-S25M8-64G-S8 8 SQF-S25M8-64G-S8 8	Serial # 1761080803435873 1753120801514442		Size Type/Status 59.6GB Member Disk 59.6GB Member Disk	(Vol ID) (0) (0)
1	1		and the second		
	[↑↓]-Select	[ESC]-Exit		LENTERJ-Select Her	IU

Enter "Shift + y" to exit.



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	Copyrig	ht (C) Intel Corpora	ation. All rights reserved				
	1. Create 2. Delete 3. Reset	RAID Volune RAID Volune Disks to Non-RAID	4. Recovery Volume O 5. Acceleration Optio 6. Exit	pt ions ons			
RAID ID 0 Phys	Volumes: Name Volume1 ical	Level RAID1(Mirror) [ CONFI	Strip Size Status N/A 59.6GB Normal RM EXIT J	Bootable Yes			
0 1	SQF SQF	Are you sure you want to exit? (Y/N):					
	[↑↓]-Sele	ct LESC J-Ex	it [ENTER]-Select	Menu			



## **3.5. Boot Mode & Installation Steps**

AdvLinuxTU supports two boot modes: Legacy and UEFI (recommend).

## **3.5.1. Legacy Boot Mode Installation Steps**

## 3.5.1.1. BIOS Configuration

Step1: CSM configuration

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Advanced					
Compatibility Support Module	Compatibility Support Module Configuration				
CSM Support					
CSM16 Module Version	07.76				
GateA20 Active Option ROM Messages	[Upon Request] [Force BIOS]				
Boot option filter	[Legacy only]				
Option ROM execution					
Network Storage Video Other PCI devices	[Do not launch] [Legacy] [Legacy] [Legacy]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values			

Step2: USB configuration



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Havanceb		
USB Configuration		Enables Legacy USB support.
USB Module Version USB Devices: 1 Drive, 1 Keyboard, 1 Hub	10	AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
Legacy USB Support XHCI Hand-off EHCI Hand-off USB Mass Storage Driver Support	[Enab Led] [Enab Led] [Enab Led] [Enab Led]	
USB hardware delays and time-outs: USB transfer time-out Device reset time-out Device power-up delay	[20 sec] [20 sec] [Auto]	++: Select Screen fJ: Select Item Enter: Select +/-: Change Opt.
Mass Storage Devices: KingstonDataTraveler 3.0PMAP	[Auto]	F1: General Help F2: Previous Values F3: Optimized Defaults

#### Step3: Boot Option #1 selection

Aptio Setup Util Main Advanced Chipset Secu	ity – Copyright (C) 2020 America rity <mark>Boot </mark> Save & Exit	n Megatrends, Inc.
Boot Configuration Setup Prompt Timeout Bootup NumLock State	1 [0n]	Sets the system boot order
Quiet Boot	[Enabled]	
Boot Option Priorities Boot Option #1 Hard Drive BBS Priorities		
		++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit

### 3.5.1.2. Install Mode Selection

If you want to install for your end-user (OEM mode), select the first one (default).



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GNU GRUB version 2.04						
*Advantech Advantech Advantech	Install Install Install	Ubuntu Ubuntu Ubuntu	Desktop Desktop Desktop	[Advar (Full (Disk	ntech manufacturer] Configuration) Encryption)	
Use the ↑ and ↓ keys to select which entry is highlighted. Press enter to boot the selected OS, `e' to edit the commands before booting or `c' for a command-line.						

If you want to install for you (End-user mode), select the second one.



### **3.5.2. UEFI Boot Mode Installation Steps**

#### 3.5.2.1. BIOS Configuration

Step1: CSM configuration



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Aptio Setup Uti Advanced	lity – Copyright (C) 2020 Amer	rican Megatrends, Inc.
Compatibility Support Module	Determines OpROM execution	
CSM Support	[Enabled]	Network, Storage, or Video
CSM16 Module Version	07.76	
GateA20 Active Option ROM Messages	[Upon Request] [Force BIOS]	
Boot option filter	[UEFI only]	
Option ROM execution		
Network Storage Video Other PCI devices	[Do not launch] [UEFI] [UEFI]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit

### Step2: USB configuration

Aptio Setup Utility - Advanced	Copyright (C) 2020 A	merican Megatrends, Inc.
USB Configuration USB Module Version USB Devices:	10	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available
Legacy USB Support XHCI Hand-off EHCI Hand-off USB Mass Storage Driver Support	(Disabled) [Enabled] [Enabled] [Enabled]	only for Erl applications.
USB hardware delays and time-outs: USB transfer time-out Device reset time-out Device power-up delay Mass Storage Devices: KingstonDataTraveler 3.0PMAP	[20 sec] [20 sec] [Auto] [Auto]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults

Step3: Boot Option #1 selection



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Aptio Setup Main Advanced Chipset	Utility – Copyright (C) 2020 American Security <mark>Boot</mark> Save & Exit	Megatrends, Inc.
Boot Configuration Setup Prompt Timeout Bootup NumLock State	1 [0n]	Sets the system boot order
Quiet Boot	[Enabled]	
Boot Option Priorities Boot Option #1 Boot Option #2	(UEFI: KingstonDataT) [UEFI: Built-in EFI]	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values

#### 3.5.2.2. Install Mode Selection

If you want to install for your end-user (OEM mode), select the first one (default).



#### If you want to install for you (End-user mode), select the second one.



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			GNU GRI	JB ve	rsion	2.04	
Advantech *Advantech	Install Install	Ubuntu Ubuntu	Desktop Desktop	[Advar (Full	n <b>tech</b> Conf	manufacturer] iguration)	
Advantech	Install	Ubuntu	Desktop	(Disk	Encr	yption)	
U 41-	4 3			(	4 -		3
Use the Press e before	nter to booting	l keys 1 boot tl or `c'	to select he select for a co	t whic ted OS ommand	n ent: , `e' -line	ry is highlighte to edit the com	a. mands
	3						



#### 3.5.3.OS Installation

### 3.5.3.1. OEM mode

In OEM mode, the installation will start by itself and the screen will show the pictures in below.





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Click "Restart Now" in Installation Complete dialog.



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# **ADVANTECH**

Please remove the installation medium, then press ENTER:

After reboot, the device will initialize itself.



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After initialization, the device will login automatically (Login User: oem, Password: oem).





Now you can check anything in the state. Before shipping to end-user, you need click the icon in desktop.

Activitie	S		Nov 18: 09:19	
6				
Â.				
2		Authenticat Authentication is requir	cion Required ed to install your machine em	1
		Cancel	Authenticate	







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Activitie	5		Nov 18: 09:2	1	<u>#</u> ∰) () +
			Power Off		
		The system wi	ill power off automatical	ly in 50 seconds.	
		Cancel	Restart	Power Off	

If the device is UNO-420 or UNO-2271G, the default is console mode. Before shipping to end-user, you need input the command:

\$ sudo oem-config-prepare

\$ poweroff



After the steps, the device is shutdown. Now you can ship the device to end-user.



### 3.5.3.2. End-user mode

In End-user mode, you need choose settings in installation. Select installation language you want.

	Nov 22 03:03	A
	Install	8
Welcome		
English Español Esperanto Euskara Français Gaeilge Galego Hrvatski Íslenska Italiano Kurdî Latviski Lietuviškai Lietuviškai Magyar Nederlands No localization (UTF-8) Norsk bokmål	You may wish to read the <u>release notes</u> .	



#### Select current keyboard layout.

Finnish     English (US) - English (US, euro on 5)       French     English (US) - English (US) - English (US, intl., with dead keys)       Type here to test your keyboard     English (US) - English (US)	Finnish     English (US) - English (US, euro on 5)       French     English (US) - English (US) - English (US), intl., with dead keys)       Type here to test your keyboard     English (US) - English (US	Choose your keyboard layout: English (Australian) English (Cameroon) English (Chana) English (Nigeria) English (Nigeria) English (UK) English (UK) Esperanto Estonian Faroese Filipino	English (US) English (US) - Cherokee English (US) - English (Colemak) English (US) - English (Dvorak) English (US) - English (Dvorak, alt. intl.) English (US) - English (Dvorak, intl., with dead keys) English (US) - English (Dvorak, left-handed) English (US) - English (Dvorak, right-handed) English (US) - English (Macintosh) English (US) - English (Norman) English (US) - English (US, alt. intl.)
Type here to test your keyboard	Type here to test your keyboard Detect Keyboard Layout	Finnish French	English (US) - English (US, euro on 5) English (US) - English (US, intl., with dead keys)
	Detect Keyboard Layout	Type here to test your keyboard	

#### We recommend minimal installation, you can change it.

Nov 22 03:04		Å
Install		8
Updates and other software		
What apps would you like to install to start with?		
○ Normal installation		
Web browser, utilities, office software, games, and media players.		
O Minimal installation		
Web browser and basic utilities.		
Other options		
Download updates while installing Ubuntu		
This saves time after installation.		
Install third-party software for graphics and Wi-Fi hardware and additional	media formats	
This software is subject to license terms included with its documentation. Some is propriet	ary.	
	Ouit	Captions
	Quit DdCK	Continue



This is recommending for preset partitions, you can change it.

				No	v 22 03:05				
					Install				(
Installa	tion								
IIISLalla	LIOI	гуре							
sda1 (fat: 98.6 MB	32)	sda2 (ext4) 33.7 GB	<b>sda5 (e</b> 510.7 ME	xt4)					
Device	Туре	Mount poin	t Format?	Size	Used	System			
/dev/sda									
/dev/sda1 /dev/sda2	efi	,		98 MB	98 MB				
/dev/sda2 /dev/sda5	ext4	/ /var/log		510 MB	35 MB				
		, , , ,	_						
+ -	Chang	ge					New Partition T	able	Revert
Device for b	ootloa	ader installatio	on:						·
/dev/sda	ATA V	BOX HARDDIS	K (34.4 GB)						-
							Quit Back	In	stall Now
				•••	••	$\circ \circ$			

Reconfirm the settings of disk. You can click "Continue" to next step.

Install Something else stat (fat32) sda2 (ext4) sda2 (ext4) fyou continue, the changes listed below will be written to the disks. Otherwise, you will be able to mak WARNING: This will destroy all data on any partitions you have removed as well as on the partitions tha The partition tables of the following devices are changed:	xe further changes manually t are going to be formatted
Install Something else sda1 (fat32) sda2 (ext4) sda5 (ext4) Write the changes to disks?  f you continue, the changes listed below will be written to the disks. Otherwise, you will be able to mak WARNING: This will destroy all data on any partitions you have removed as well as on the partitions tha The partition tables of the following devices are changed:	× t are going to be formatted t are going to be formatted
Something else sda1 (fat32) sda2 (ext4) sda5 (ext4) Write the changes to disks? If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to mak WARNING: This will destroy all data on any partitions you have removed as well as on the partitions tha The partition tables of the following devices are changed:	e further changes manually t are going to be formatted
Some change cisc         sda1 (fat32)       sda2 (ext4)         Write the changes to disks?         If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to mak         WARNING: This will destroy all data on any partitions you have removed as well as on the partitions that         The partition tables of the following devices are changed:	t are going to be formatted
sda1 (fat32) sda2 (ext4) sda5 (ext4) Write the changes to disks? If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to mak WARNING: This will destroy all data on any partitions you have removed as well as on the partitions that The partition tables of the following devices are changed:	Refurther changes manually t are going to be formatted
Write the changes to disks? If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to mak WARNING: This will destroy all data on any partitions you have removed as well as on the partitions tha The partition tables of the following devices are changed:	ke further changes manually t are going to be formatted
If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to mai WARNING: This will destroy all data on any partitions you have removed as well as on the partitions tha The partition tables of the following devices are changed:	ke further changes manually t are going to be formatted
WARNING: This will destroy all data on any partitions you have removed as well as on the partitions tha The partition tables of the following devices are changed:	t are going to be formatted
The partition tables of the following devices are changed:	
SCSI1 (0,0,0) (sda)	
The following partitions are going to be formatted: partition #1 of SCSI1 (0,0,0) (sda) as partition #2 of SCSI1 (0,0,0) (sda) as ext4 partition #5 of SCSI1 (0,0,0) (sda) as ext4	
	Go Back Continue
Quit Back	Install Now



Choose your location.



Setting the device information and your account.

	Nov 22 11:08		<b>∴</b> •)
	Install		×
Who are you?			
Your name: Your computer's name: Pirk a username:	advantech advantech-UNO-2484G		
Choose a password:	Good password		
Confirm your password:	<ul> <li>Log in automatically</li> <li>Require my password to log in</li> <li>Use Active Directory</li> <li>You'll enter domain and other details in the next step.</li> </ul>		
		Back	Continue
	•••••		

After settings, the installation will start. It needs take some times.



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Click "Restart Now" in Installation Complete dialog.



Remove your USB disk from device, then press "ENTER".



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Please remove the installation medium, then press ENTER:

After reboot, the device will initialize itself.



After initialization, you can login it.



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#### 3.5.3.3. Shipping from OEM

If you are not install OS to the device, you can power on the device and setting the device you want.



Select vour Language.

System Configuration         System Configuration         Welcome       Bahasa Indonesia       Bosanski       Català         Ásturianu       Bahasa Indonesia       Bosanski       Català         Čeština       Cymraeg       Dansk       Deutsch         Eesti       English       Español       Esperanto         Euskara       Français       Gaeilge       Galego         Hrvatski       Íslenska       Italiano       Kurdî         Latviški       Lietuviškai       Magyar       Nederlands         No localization (UTF-8)       Norsk bokmål       Norsk nynorsk       Polski         Português       Português do Brasil       Română       Sámegillii         Shqip       Slovenčina       Slovenščina       Ślünski
System Configuration         Welcome       Bahasa Indonesia       Bosanski       Català         Čeština       Cymraeg       Dansk       Deutsch         Eesti       English       Español       Esperanto         Euskara       Français       Gaeilge       Galego         Hrvatski       Íslenska       Italiano       Kurdî         Latviski       Lietuviškai       Magyar       Nederlands         No localization (UTF-8)       Norsk bokmål       Norsk nynorsk       Polski         Português       Português do Brasil       Română       Sámegillii         Shqip       Slovenčina       Slovenščina       Ślúnski
System Configuration         Welcome       Bahasa Indonesia       Bosanski       Català         Ásturianu       Bahasa Indonesia       Bosanski       Català         Čeština       Cymraeg       Dansk       Deutsch         Eesti       English       Español       Esperanto         Euskara       Français       Gaeilge       Galego         Hrvatski       Íslenska       Italiano       Kurdi         Latviski       Lietuviškai       Magyar       Nederlands         No localization (UTF-8)       Norsk bokmål       Norsk nynorsk       Polski         Português       Português do Brasil       Română       Sámegillii         Shqip       Slovenčina       Slovenščina       Ślünski
System Configuration         Welcome       Bahasa Indonesia       Bosanski       Català         Ásturianu       Bahasa Indonesia       Bosanski       Català         Čeština       Cymraeg       Dansk       Deutsch         Eesti       English       Español       Esperanto         Euskara       Français       Gaeilge       Galego         Hrvatski       Íslenska       Italiano       Kurdī         Latviski       Lietuviškai       Magyar       Nederlands         No localization (UTF-8)       Norsk bokmāl       Norsk nynorsk       Polski         Português       Português do Brasil       Romānā       Sámegillii         Shqip       Slovenčina       Slovenščina       Ślúnski
Asturianu       Bahasa Indonesia       Bosanski       Català         Čeština       Cymraeg       Dansk       Deutsch         Eesti       English       Español       Esperanto         Euskara       Français       Gaeilge       Galego         Hrvatski       Íslenska       Italiano       Kurdî         Latviski       Lietuviškai       Magyar       Nederlands         No localization (UTF-8)       Norsk bokmål       Norsk nynorsk       Polski         Português       Português do Brasil       Română       Sámegillii         Shqip       Slovenčina       Slovenščina       Slúnski
AsturianuBahasa IndonesiaBosanskiCatalàČeštinaCymraegDanskDeutschEestiEnglishEspañolEsperantoEuskaraFrançaisGaeilgeGalegoHrvatskiÍslenskaItalianoKurdîLatviskiLietuviškaiMagyarNederlandsNo localization (UTF-8)Norsk bokmålNorsk nynorskPolskiPortuguêsPortuguês do BrasilRomânăSámegilliiShqipSlovenčinaSlovenščinaŚlünski
ČeštinaCymraegDanskDeutschEestiEnglishEspañolEsperantoEuskaraFrançaisGaeilgeGalegoHrvatskiÍslenskaItalianoKurdîLatviskiLietuviškaiMagyarNederlandsNo localization (UTF-8)Norsk bokmålNorsk nynorskPolskiPortuguêsPortuguês do BrasilRomânăSámegilliiShqipSlovenčinaSlovenščinaŚlúnski
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EuskaraFrançaisGaeilgeGalegoHrvatskiÍslenskaItalianoKurdîLatviskiLietuviškaiMagyarNederlandsNo localization (UTF-8)Norsk bokmålNorsk nynorskPolskiPortuguêsPortuguês do BrasilRomânăSámegilliiShqipSlovenčinaSlovenščinaŚlúnski
HrvatskiÍslenskaItalianoKurdîLatviskiLietuviškaiMagyarNederlandsNo localization (UTF-8)Norsk bokmålNorsk nynorskPolskiPortuguêsPortuguês do BrasilRomânăSámegilliiShqipSlovenčinaSlovenščinaŚlúnski
LatviskiLietuviškaiMagyarNederlandsNo localization (UTF-8)Norsk bokmålNorsk nynorskPolskiPortuguêsPortuguês do BrasilRomânăSámegilliiShqipSlovenčinaSlovenščinaŚlûnski
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Português     Português do Brasil     Română     Sámegillii       Shqip     Slovenčina     Slovenščina     Ślûnski         Continue
Shqip     Slovenčina     Slovenščina     Ślúnski       Continue
Continue
$\bullet \circ \circ \circ \circ$

Select current keyboard layout.

Keyboard layout:         English (Nigeria)         English (South Africa)         English (UK)         English (US)		System Configuration	
Choose your keyboard layout:         English (Nigeria)         English (South Africa)         English (UK)         English (US)         Esperanto         Estonian         Faroese         Eulisino         Eulisino         Type here to test your keyboard         Detect Keyboard Layout	Keyboard layout		
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Type here to test your keyboard Detect Keyboard Layout Back Continue	Faroese	English (US) - Eng	alish (Dvorak, right-handed)
Detect Keyboard Layout Back Continue	Type here to test your keyboard		
Back Continue	Deheet Kerk and Laurut		
Back Continue	Detect Reyboard Layout		
			Back
$\bullet \bullet \circ \circ \circ$		$\bullet \bullet \circ \circ \circ$	



Confirm your location.



Setting the device information and your account.

	Nov 18 09:27		. <b>.</b>
	System Configuration		
Who are you?			
Your name:	advantech	•	
Your computer's name:	advantech-UNO-238		
	The name it uses when it talks to other computers.		
Pick a username:	advantech		
Choose a password:	Good password		
Confirm your password:	••••••••••		
	O Log in automatically		
	Require my password to log in		
		Back Continue	



It will configure your settings

Nov 18 09:28	♣ ♦) Ü ▼
System Configuration	
Welcome to Ubuntu	
Fast and full of new features, the latest version of Ubuntu makes computing easier than ever. Here are just a few cool new things to look out for	
► Configuring keyboard Skip	

After configuration, you can login it.

+- 18 17:30	÷ - ∴ • ∪ -
advantech	
Not listed?	



#### 3.5.3.4. Change Boot Option #1

Enter Reboot and go into BIOS, You can see there are two UEFI Boot hard disk. Ubuntu (P0: KINGSTON SA400S37240G) and UEFI OS (P0: KINGSTON SA400S37240G).

You can choose both of them.

Main	Advanced Chipse	t Security <b>Boot</b> Save & Exit	Megatrends, Inc.
Boot Setup Bootu	Configuration Prompt Timeout p NumLock State	1 [On]	Sets the system boot order
Boot Boot Boot Boot Boot	Option Priorities Option #1 Option #2 Option #3 Option #4	[Enabled] [UEFI OS (PO: KINGST] Boot Option #1 UEFI: Built-in EFI Shell UEFI: KingstonDataTraveler 3.0PMAP, Part	ition 1
boot		ubuntu (PO: KINGSTON SA400S37240G) UEFI OS (PO: KINGSTON SA400S37240G) Disabled	Screen Item ect e Opt. F1: General Help



# 4. Advantech device driver

AdvLinuxTU supports Advantech products, and the related drivers, the related drivers will be installed in /usr/src/advantech and auto loaded during the booting process. Here are some examples or demos in /usr/src/advantech/\${driver name}/example/.

If you want use Advantech device driver, you need to check secure boot is disable in BIOS.



# **5. GPIO Sysfs Interface**

Some devices use GPIO Sysfs Interface to control GPIOs. You can get more detail from https://www.kernel.org/doc/Documentation/gpio/sysfs.txt. We list the mapping tables of devices as below.

For example, for GPIO0 of UNO-420. You can get the gpio pin direction: \$ cat /sys/class/gpio/gpio504/direction The output is "in" as DI or "out" as DO.

You can set the gpio pin direction: \$ echo in > /sys/class/gpio/gpio504/direction //set as DI \$ echo out > /sys/class/gpio/gpio504/direction //set as DO

You can get the status of gpio pin: \$ cat /sys/class/gpio/gpio504/value The output is "0" as low or "1" as high.

You can set the status of gpio pin when direction is DO \$ echo 0 > /sys/class/gpio/gpio504/value //set to low \$ echo 1 > /sys/class/gpio/gpio504/value //set to high

## 5.1.UNO-238

GPIO0	/sys/class/gpio/gpio192
GPIO1	/sys/class/gpio/gpio193
GPIO2	/sys/class/gpio/gpio194
GPIO3	/sys/class/gpio/gpio195
GPIO4	/sys/class/gpio/gpio196
GPIO5	/sys/class/gpio/gpio197
GPIO6	/sys/class/gpio/gpio198
GPIO7	/sys/class/gpio/gpio199



## 5.2. UNO-420

GPIO0	/sys/class/gpio/gpio504
GPIO1	/sys/class/gpio/gpio505
GPIO2	/sys/class/gpio/gpio506
GPIO3	/sys/class/gpio/gpio507
GPIO4	/sys/class/gpio/gpio508
GPIO5	/sys/class/gpio/gpio509
GPIO6	/sys/class/gpio/gpio510
GPIO7	/sys/class/gpio/gpio511

### 5.3. UNO-137

DIO	/sys/class/gpio/gpio451
DI1	/sys/class/gpio/gpio453
DI2	/sys/class/gpio/gpio454
DI3	/sys/class/gpio/gpio455
DI4	/sys/class/gpio/gpio456
DI5	/sys/class/gpio/gpio457
DI6	/sys/class/gpio/gpio458
DI7	/sys/class/gpio/gpio452
DO0	/sys/class/gpio/gpio459
DO1	/sys/class/gpio/gpio460
DO2	/sys/class/gpio/gpio461
DO3	/sys/class/gpio/gpio462
DO4	/sys/class/gpio/gpio463
DO5	/sys/class/gpio/gpio464
DO6	/sys/class/gpio/gpio465
DO7	/sys/class/gpio/gpio466



## 5.4. UNO-148

DIO	/sys/class/gpio/gpio424
DI1	/sys/class/gpio/gpio425
DI2	/sys/class/gpio/gpio426
DI3	/sys/class/gpio/gpio427
DI4	/sys/class/gpio/gpio428
DI5	/sys/class/gpio/gpio429
DI6	/sys/class/gpio/gpio430
DI7	/sys/class/gpio/gpio431
DO0	/sys/class/gpio/gpio314
DO1	/sys/class/gpio/gpio315
DO2	/sys/class/gpio/gpio325
DO3	/sys/class/gpio/gpio326
DO4	/sys/class/gpio/gpio327
DO5	/sys/class/gpio/gpio328
DO6	/sys/class/gpio/gpio329
DO7	/sys/class/gpio/gpio330

## 5.5. UNO-348

GPIO0	/sys/class/gpio/gpio40
GPIO1	/sys/class/gpio/gpio41
GPIO2	/sys/class/gpio/gpio42
GPIO3	/sys/class/gpio/gpio43
GPIO4	/sys/class/gpio/gpio44
GPIO5	/sys/class/gpio/gpio45
GPIO6	/sys/class/gpio/gpio46
GPIO7	/sys/class/gpio/gpio47
Programmable LED	/sys/class/gpio/gpio65



## 5.6. UNO-2484G V2

GPIO0	/sys/class/gpio/gpio40
GPIO1	/sys/class/gpio/gpio41
GPIO2	/sys/class/gpio/gpio42
GPIO3	/sys/class/gpio/gpio43
GPIO4	/sys/class/gpio/gpio44
GPIO5	/sys/class/gpio/gpio45
GPIO6	/sys/class/gpio/gpio46
GPIO7	/sys/class/gpio/gpio47



# 6. EAPI(Embedded API) Solution

AdvLinuxTU supports EAPI soulution. if you want to know the detail, please read *Embedded API (EAPI) Developer Guide V1.4*.



# 7. Introduction of service

## 7.1.SSH

The default SSH service is enable. You can check status in command:

#### \$ systemctl status sshd.service



If you want to enable/disable, you can try in commands:

\$ sudo systemctl enable sshd.service

\$ sudo systemctl disable sshd.service

The system will start/stop in next boot.



If service started, you can use ssh client (like putty) to connect the device.

🕵 PuTTY Configuration	? ×
Category:	
Session     Logging    Logging    Logging    Feminal    Keyboard    Bell    Features    Window    Appearance    Behaviour    Translation    Colours    Colours	Basic options for your PuTTY session         Specify the destination you want to connect to         Host Name (or IP address)       Port         172.16.12.88       22         Connection type:       Rogin • SSH · Segial         Load, save or delete a stored session       Serial         Load, save or delete a stored session       Saved Sessions         Default Settings       Load         2184G       Save         3384G       Save         BM6875       Delete         COM1       Vox-32         Close window on exit:       • Only on clean exit
About <u>H</u> elp	<u>O</u> pen <u>C</u> ancel

### 7.2. FTP

The default FTP service is disable. You can check status in command:

```
$ systemctl status vsftpd.service
```



If you want writable permission, we need to uncomment "write\_enable=YES" in /etc/vsftpd.conf

\$ sudo vi /etc/vsftpd.conf





If you want to enable/disable, you can try in commands:

\$ sudo systemctl enable vsftpd.service

\$ sudo systemctl disable vsftpd.service

The system will start/stop in next boot.

If service started, you can use ftp client (like FileZilla) to connect the device.

			×	
General Adv	anced Transfer Settings Chars	et		
Protocol:	FTP - File Transfer Protocol		$\sim$	
Host:	172.16.12.88	ſ	Port: 21	
Encryption:	Use explicit FTP over TLS if avail	able	~	
Logon Type:	Normal		~	
User:	advantech			
Password:	•••••			1
Background c	olor: None 🗸		< ~ ~	
	Connect	ОК	Cancel	
Z Test - advantech@172.16.12	8 - FileZilla ver Rockmarks Helo New version available!			
Host:         User           Status:         Logged in           Status:         Retrieving directory           Status:         Directory listing of ",	ame: Password: Port	Quickconnect		
Local site: E:\images\AdvLinux	\V3.0.2_Release\ lease lease lease		<ul> <li>✓</li> <li>Remote si</li> <li>□-?/</li> <li>□-?/</li></ul>	te: /home/advantech home advantech



## 7.3. Watchdog

The default Watchdog service is disable. You can check status in command:

\$ systemctl status watchdog.service

<pre>odemBduburtu:-@ systemcl status watchdog.service * watchdog.service - wstchdog.deend Loaded: loaded (/lb/systemd/aystem/watchdog.service; enabled; vendor preset: enabled) Active: active (running) since The 2021-12-02 06:17:17 UTC; lmin 21s ago Process: 1715 ExecStattPre=/bin/sh -c [ -z *@(watchdog_module)* ]    ( *@(watchdog_module)* = *none* ]    /sbin/modprobe &amp;vatchdog_module (code=exited, status=0/SUCCESS) Process: 1715 ExecStattPre=/bin/sh -c [ 2run_watchdog != 1 ]    exec /usr/sbin/watchdog &amp;vatchdog_options (code=exited, status=0/SUCCESS) Main FID: 1728 (watchdog) Tasks: 1 (lini: 44:0) Memory: 588.0% CGroup: /system.slice/watchdog.service </pre>	
<pre>* vatchdog.service - vatchdog deemon Loaded: loaded (lib/systemd/system/system/vatchdog.service; enabled; vendor preset: enabled) Active: active (running) since Thm 2021-12-02 06:17:17 UTC; lmin 21s ago Process: 1718 ExecStattPre/bin/sh - c [ - x *(lvatchdog module)" = "none" ]    /sbin/modprobe \$vatchdog_module (code=exited, status=0/SUCCESS) Process: 1728 ExecStattPre/bin/sh - c [ srun_watchdog != l ]    exec /usr/sbin/watchdog \$vatchdog_options (code=exited, status=0/SUCCESS) Main PID: 728 (watchdog) Tasks: l (limit: 413) Memory: 586.0K CGroup: /system.slice/watchdog.service L 128 /usr/sbin/watchdog L 20 60:17:17 ubuntu watchdog[1728]; interface: no interface to check Dec 02 60:17:17 ubuntu watchdog[1728]; interface: no interface to check Dec 02 60:17:17 ubuntu watchdog[1728]; or cepst binary files Dec 02 60:17:17 ubuntu watchdog[1728]; or cepst binary files Dec 02 60:17:17 ubuntu watchdog[1728]; or cepst binary files Dec 02 60:17:17 ubuntu watchdog[1728]; error retry time-out = 60 seconds Dec 02 60:17:17 ubuntu watchdog[1728]; vatchdog now set to 60 seconds Dec 02 60:17:17 ubuntu watchdog[1728]; vatchdog now set to 60 seconds Dec 02 60:17:17 ubuntu watchdog[1728]; vatchdog now set to 60 seconds Dec 02 60:17:17 ubuntu watchdog[1728]; vatchdog now set to 60 seconds Dec 02 60:17:17 ubuntu watchdog[1728]; vatchdog now set to 60 seconds</pre>	oemêubuntu:~\$ systemctl status watchdog.service
Loaded: loaded (/lb/systemd/ystrm/watchdog.service: enabled) Active: active (running) since The 2021-2-20 & 06:17:17 UCL running) since The 2021-2-20 & 07:17:17 UCL running since The 2021 & 07:17:17 UCL running since The 2021-2-20 & 07:17:17 UCL running since The 2021 & 07:17:17 UCL ru	• watchdog.service - watchdog daemon
Active: active (running) miner Thm 2021-2-02 06:17:17 UTC; lmin 21s ago Process: 1715 ExecStartre/bin/sh - C [ ~ 2*(uschdog module)" ]   [ * (*(uschdog module)" = "none" ]    /sbin/modprobe &vatchdog module (code=exited, status=0/SUCCESS) Process: 1725 ExecStartr/bin/sh - C [ & Drun_watchdog != 1 ]    exec /usr/sbin/watchdog &vatchdog_options (code=exited, status=0/SUCCESS) Main FDI: 728 (watchdog) Tasks: 1 (lmit: 418) Memory: 586.0K CGroup: /system slice/watchdog.service L=1728 /usr/shin/watchdog Dec 02 06:17:17 ubuntu watchdog[1728]: interface: no interface to check Dec 02 06:17:17 ubuntu watchdog[1728]: no repair binary files Dec 02 06:17:17 ubuntu watchdog[1728]: no repair binary files Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[none] to=root no_act=no forc=no Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[second] Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[second] Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[second] Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	Loaded: loaded (/lib/systemd/system/watchdog.service; enabled; vendor preset: enabled)
<pre>Process: 1719 ExecStartPrev/bin/sh -= { *@(watchdog module)* ]    (*@(watchdog module)* = *mone* ]    /sbin/modprobe &amp;watchdog module (code=exited, status=0/SUCCESS) Nain FID: 1728 (watchdog) Tasks: 1 (limit: 4180) Memory: 588.0% CGroup: /system.alice/watchdog.service</pre>	Active: active (running) since Thu 2021-12-02 06:17:17 UTC; 1min 21s ago
<pre>Process: 1735 ExecState+/bin/wh - c { \$run_watchdog != 1 }      exec /usr/sbin/watchdog \$watchdog_options (code=exited, status=0/SUCCESS) Main FDI: 728 (watchdog) Tasks: 1 (linit: 4418) Memory: 588.0% GGroup: /system.slice/watchdog.service L_128 /usr/sbin/watchdog Bec 03 66:17:17 ubuntu watchdog[1728]: interface: no interface to check Dec 03 66:17:17 ubuntu watchdog[1728]: no rest binary files Dec 03 66:17:17 ubuntu watchdog[1728]: no rest binary files Dec 03 66:17:17 ubuntu watchdog[1728]: no rest binary files Dec 03 66:17:17 ubuntu watchdog[1728]: no rest binary files Dec 03 66:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 03 66:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[none] to=root no_act=no Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[sone] Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[sone] to=root no_act=no Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[soned] Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[sone] to=root no_act=no Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[sone] to=root no_act=no Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog heartbeat=[sone] to=root no_act=no Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 Becconds Dec 03 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60</pre>	Process: 1719 ExecStartPre=/bin/sh -c [ -z "\$(watchdog module}" ]    [ "\$(watchdog module)" = "none" ]    /sbin/modprobe \$watchdog module (code=exited, status=0/SUCCESS)
<pre>Main FID: 1728 (watchdog) Tasks: 1 (limit: 418) Memory: 588.0% GGroup: /system.slice/watchdog.service L1728 /usr/sbin/watchdog.service L1728 /usr/sbin/watchdog.reg. Bec 02 06:17:17 ubuntu watchdog[1728]: temperature: no sensors to check Dec 02 06:17:17 ubuntu watchdog[1728]: no test binary files Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdo heartbeat=[none] to=root no_act=no Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: balle=formation force=no Dec 02 06:17:17 ubuntu watchdog[1728]: balle=formation force=n</pre>	Process: 1723 ExecStart=/bin/sh -c [ \$run watchdog != 1 ]    exec /usr/sbin/watchdog \$watchdog options (code=exited, status=0/SUCCESS)
Tasks: 1 (limit: 4418) Memory: 588.0% CGroup: /ayntem.slice/watchdog.service L/28 /usr/sbin/watchdog Dec 02 06:17:17 ubuntu watchdog[1728]: temperature: no sensors to check Dec 02 06:17:17 ubuntu watchdog[1728]: temperature: no sensors to check Dec 02 06:17:17 ubuntu watchdog[1728]: no test binary files Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	Main FID: 1728 (watchdog)
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CGroup: /system.slice/watchdog.service L728 /usr/sbin/watchdog Dec 02 06:17:17 ubuntu watchdog[1728]: instrface: no interface to check Dec 02 06:17:17 ubuntu watchdog[1728]: temperature: no sensors to check Dec 02 06:17:17 ubuntu watchdog[1728]: no test binary files Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	Memory: 588.0K
Li228 /usr/abin/watchdog Dec 02 06:17:17 ubuntu watchdog[1728]: interface: no interface to check Dec 02 06:17:17 ubuntu watchdog[1728]: temperature: no sensors to check Dec 02 06:17:17 ubuntu watchdog[1728]: no test binary files Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	CGroup: /system.slice/watchdog.service
Dec 02 06:17:17 ubuntu watchdog[1728]: interface: no interface to check Dec 02 06:17:17 ubuntu watchdog[1728]: temperature: no sensors to check Dec 02 06:17:17 ubuntu watchdog[1728]: no test binary files Dec 03 06:17:17 ubuntu watchdog[1728]: no repair binary files Dec 03 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 03 06:17:17 ubuntu watchdog[1728]: repair attempt = 1 Dec 03 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 03 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 03 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	1728 /usr/sbin/watchdog
Dec 02 66:17:17 ubuntu watchdog[1728]: interface: no interface to check Dec 02 66:17:17 ubuntu watchdog[1728]: temperature: no sensors to check Dec 02 66:17:17 ubuntu watchdog[1728]: no test binary files Dec 02 66:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 66:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 66:17:17 ubuntu watchdog[1728]: eliver/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds Dec 02 66:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	
Dec 02 06:17:17 ubuntu watchdog[1728]; temperature: no sensors to check Dec 02 06:17:17 ubuntu watchdog[1728]; no repair binary files Dec 02 06:17:17 ubuntu watchdog[1728]; no repair binary files Dec 02 06:17:17 ubuntu watchdog[1728]; error retry lme-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]; repair attempt = 1 Dec 02 06:17:17 ubuntu watchdog[1728]; alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]; watchdog now set to 60 seconds	Dec 02 06:17:17 ubuntu watchdog[1728]: interface: no interface to check
Dec 02 66:17:17 ubuntu watchdog[1728]; no test binary files Dec 02 66:17:17 ubuntu watchdog[1728]; ercor retry time-out = 60 seconds Dec 02 66:17:17 ubuntu watchdog[1728]; ercor retry time-out = 60 seconds Dec 02 66:17:17 ubuntu watchdog[1728]; elive-/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 66:17:17 ubuntu watchdog[1728]; watchdog now set to 60 seconds Dec 02 66:17:17 ubuntu watchdog[1728]; watchdog now set to 60 seconds	Dec 02 06:17:17 ubuntu watchdog[1728]: temperature: no sensors to check
Dec 02 06:17:17 ubuntu watchdog[1728]; no repair binary files Dec 02 06:17:17 ubuntu watchdog[1728]; ercor retry time-out = 60 seconds Dec 02 06:17:17 ubuntu watchdog[1728]; repair attempts = 1 Dec 02 06:17:17 ubuntu watchdog[1728]; alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]; watchdog now set to 60 seconds	Dec 02 06:17:17 ubuntu watchdog[1720]: no test binary files
Dec 02 60:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds Dec 02 60:17:17 ubuntu watchdog[1728]: repair attempt = 1 Dec 03 60:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 60:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	Dec 02 06:17:17 ubuntu watchdog[1728]: no repair binary files
Bec 02 06:17:17 ubuntu watchdog[1728]; repair attempts = 1 Dec 02 06:17:17 ubuntu watchdog[1728]; alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]; watchdog now set to 60 seconds	Dec 02 06:17:17 ubuntu watchdog[1728]: error retry time-out = 60 seconds
Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no_act=no force=no Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	Dec 02 06:17:17 ubuntu watchdog[1728]: repair attempts = 1
Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds	Dec 02 06:17:17 ubuntu watchdog[1728]: alive=/dev/watchdog heartbeat=[none] to=root no act=no force=no
	Dec 02 06:17:17 ubuntu watchdog[1728]: watchdog now set to 60 seconds
Dec 02 06:17:17 ubuntu watchdog[1728]: hardware watchdog identity: wdat wdt	Dec 02 06:17:17 ubuntu watchdog[1728]: hardware watchdog identity: wdat wdt
Dec 02 06:17:17 ubuntu systemd[1]: Started watchdog daemon.	Dec 02 06:17:17 ubuntu systemd[1]: Started watchdog daemon.

You can enable/disable it in command:

\$ sudo systemctl enable watchdog.service

\$ sudo systemctl disable watchdog.service

In "/etc/watchdog.conf", you can add "watchdog-timeout" for specific timeout and more detail from WebSite.

If you want to test if the hardware watchdog is working, you can try in command: (make sure that the status of watchdog service is disable)

\$ sudo watchdog -v -F

The system will reboot after kill watchdog (Ctrl+C).

Or make kernel crash in command: (make sure that the status of watchdog service is enable)

```
$ echo c | sudo tee /proc/sysrq-trigger
```

The command will make system hang and hardware watchdog will reboot system after it's timeout.

## 7.4. WISE-Agent

The Image is pre-installed WISE-Agent which is a service of Advantech to connect WISE-DeviceOn. The default WISE-Agent service is disable.

You can enable/disable it in command:

```
$ sudo systemctl enable saagent.service
```

```
$ sudo systemctl disable saagent.service
```



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You can get more detail from /usr/src/advantech/wise-agent/bin/Install manual and WebSite.

## 7.5. Firewall

The default Firewall of the image is active and only allow ssh. You can check status in command:

\$ sudo ufw status		
Status: active		
То	Action	From
22/tcp	ALLOW	Anywhere
22/tcp (v6)	ALLOW	Anywhere (v6)

You can enable or disable

\$ sudo ufw enableFirewall is active and enabled on system startup\$ sudo ufw disableFirewall stoped and disabled on system startup

You can add protocol or port connection to allow list

\$ sudo ufw allow ssh

or

\$ sudo ufw allow 22

you can delete protocol or port connection from allow list

\$ sudo ufw delete allow ssh

or

\$ sudo ufw delete allow 22



you can reset firewall

\$ sudo ufw reset

After reset, default is deny all connection when firewall enable. You can allow all connection

\$ sudo ufw default allow

You can deny all connection

\$ sudo ufw default deny



# 8. Full disk encryption

AdvLinuxTU supports enabling disk encryption during installation. Disk encryption protects the data on a block device by encrypting it. To access the device's decrypted contents, user need to provide a passphrase or key as authentication. AdvLinuxTU integrate the key with TPM, so you do not need to input the passphrase during running. The function of Disk encryption is like the bitlocker function of Windows Embedded.

## 8.1. Install

You need to choose [Advantech Install Ubuntu Desktop (Disk Encryption)] in grub menu.





You need to input a security key and remember it. The security key can unlock disk encryption when you boot device if you change device, update BIOS or clear TPM. We also create a random key in TPM to boot without any input.

Inst	tallation type	
	Disk encryption protects time the computer starts Any files outside of Ubun	your files in case you lose your computer. It requires you to enter a security key each : up. tu will not be encrypted.
	Choose a security key:	
	Confirm the security key:	
	Enable recovery key:	A recovery key is generated and will be temporarily saved on the live system. You can select an alternate location. Save this file and keep it in a safe place elsewhere before rebooting.
	Recovery key:	•
	Confirm recovery key:	
	Location:	/home/ubuntu/recovery.key
	Warning: If you lose this s safe place elsewhere.	ecurity key, all data will be lost. If you need to, write down your key and keep it in a
	For more security:	Overwrite empty disk space
		The installation may take much longer.
		Quit Back Install No

## 8.2. Change keys

You can change the security key after boot. [Show Applications  $\rightarrow$  Disks]

100000110110		is not supported		
Volumes		Format Partition		
		Edit Partition	Extended Partition Partition 3 33 GB	
Filesystem Fil	esystem	Edit Filesystem	Partition 5	
99 MB FAT 1.0	) GB Ext4	Change Passphrase	33 GB LUKS	* 🔒
* ►	*►	Resize	33 GB LVM2 PV	
	ä	Check Filesystem		
	¢r.	Repair Filesystem		
Siz	ze 33 GB	Edit March Oakiana		
Devic	e /dev/	Edit Mount Options		



You can change the TPM key for disk encryption.

#### \$ sudo atcc.fde -tpm-update

dvantec	h
	Disk encryption PASSPHRASE Please enter any exist passphrase?
	< OK > <cancel></cancel>

You need input the security key created in the image installation for create a new random key in TPM.

Upd	Disk late Success!	encryption	unlock fr	om TPM	
					1



# 9. Read-Only system setting

AdvLinuxTU supports read-only system setting and any changes will be lost after reboot. It has two modes for read-only system setting. User can choose read-only setting in all file system or root file system only.

## 9.1. Install

Read-only system setting is not install in default and you need to install if you want.

\$ sudo atcc.rofs -install

You can choose read-only in all file system or root file system only. You can read-write or do changes in non-root file system if you choose read-only in root file system only.

Advante	ch
	Advantech Read-Only system setting ReadOnly for all filesystem or only root filesystem? YES: all filesystem, NO: only root filesystem
	< Y as > < No >



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After install, the system will reboot and it boot in read-only system by default.





you can check setting status.

\$ atcc.rofs -show

advantech@advantech-device:~\$ atcc.rofs -show at-uwf: Installed Current: ReadOnly enable in root filesystem only

## 9.2. Changes for read-only setting

You want to do changes in read-only file system. you can reboot device and choose "Ubuntu" in GRUB menu.

GNU GRUB version 2.04
Ubuntu ReadOnly *Ubuntu Advanced options for Ubuntu
use the A and I know to poloot which ontout is bightighted
Use the   and ↓ keys to select which entry is highlighted. Press enter to boot the selected OS, `e' to edit the commands before booting or `c' for a command-line.

You must reboot and back into read-only system after changes be done.



## 9.3. Uninstall

You want to uninstall read-only system setting. you must reboot and choose "Ubuntu" in GRUB menu.

\$ sudo atcc.rofs -uninstall





After uninstall, the system will reboot.





# 10. Backup & Restore

AdvLinuxTU supports disk backup and restore. You can use USB disk to backup and use the USB disk to restore. The USB disk size should be the same or more then the disk size to make sure everything is ok.

AdvLinuxTu backup and restore process cannot support secure boot enable in BIOS.

## 10.1. Backup

You can use a USB disk to backup.

\$ sudo atcc.backup

Select HDD to backup

ldvantech	
Backup Disk	
Sta ATA WDC WDS500G2B0A	
<pre></pre>	



Select your backup USB disk.

Advantech	1.	
	Backup Disk	
	What is the USB Disk to save the backup image?	
	sdb USB FLASH DRIVE	
	< OK > <cancel></cancel>	

Make sure to delete files in USB disk.

Backup Disk	
ALL files in USB will be delete! Are you sure?	
< Y (85 > < No >	



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The system will reboot and run backup process after press [OK].

SYSTEM WILL REBOOT A	Backup Disk AFTER OK!	
	< 0 <mark>K</mark> >	

### 10.2. Restore

If AdvLinuxTu can boot into system, you can

\$ sudo atcc.restore

Select restore USB disk.

What is the USB Disk t	o restore from?	
sdh USB	FLASH DRIVE	•
< <mark>0</mark> K >	<cancel></cancel>	



Select HDD to restore.

What is the HDD	) you want to	restore?		_
50	a ATA	WDC WDS500G2I	BOA	
L				
	< <mark>o</mark> K >	<cancel></cancel>		-

Make sure to delete all files in HDD

Restore Disk All files in HDD will be delete! Are you sure?	Restore Disk All files in HDD will be delete! Are you sure?			
All files in HDD will be delete! Are you sure?	All files in HDD will be delete! Are you sure?	Rest	tore Disk	]
< Y 🔜 < No >	< Mas > < No >	All files in HDD will be	delete! Are you sure?	
< V 🗪 > < No >	< Y@S > < No >			
< V - > < No >	< Y * > < No >			
< Y - > < No >	< No >			
		< Y <mark>es</mark> >	< No >	



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The system will reboot and run restore process after press [OK].

SYSTEM WILL REBOOT	AFTER OK!	
	< 0 <mark>K &gt;</mark>	



If you cannot boot AdvLinuxTu, you can boot from the restore USB via BIOS to run restore process.

GNU GRUB version 2.04
luLinuxTu Restore
Use the ▲ and ▼ keys to select which entry is highlighted.