

DWIN Linux Screen Development Guide (40 Series & 40ZOS-1 Series)



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1 Product Introduction

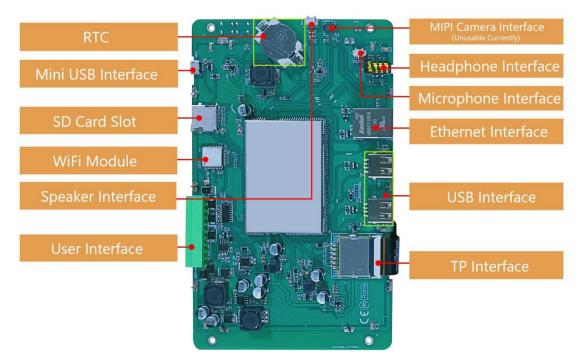
1.1 Product Feature

DWIN Linux screen 40 series: CPU: RK3566, Quad-core ARM Cortex-A55, 1.8GHz RAM: 2GB LPDDR4 Flash: 8GB EMMC5.0 Linux Version: Linux 4.19

Debian version (module suffix is ZOS-1)



(DMG12800T070_40WTC front)



(DMG12800T070_40WTC back)

1.1.1 Development Method

QT and LVGL options.

1.1.2 Documentation

Documents: https://www.dwin-global.com/development-guide/

Tool: https://www.dwin-global.com/tool-page/

Tutorial on YouTube:

https://youtube.com/playlist?list=PLKfWyFPPaoDr3Vq98orVxJqKA5MDaliN&si=BVVDmdfCopcH--nK

1.1.3 Shipping List (for reference)

- screen ×1 piece
- antenna × 1 piece

1.1.4 Optional Accessories

• Speaker

DWIN material code B01851, cable length 180 mm, with socket 2PIN_1.25, 88 ± 3 dB, 8Ω , 0.8W

- SD card
- 4G module

China and India: LUAT Air780EI Europe: QUECTEL EC200A-EU Australia: QUECTEL EC200A-AU

• Camera

Support camera with USB interface

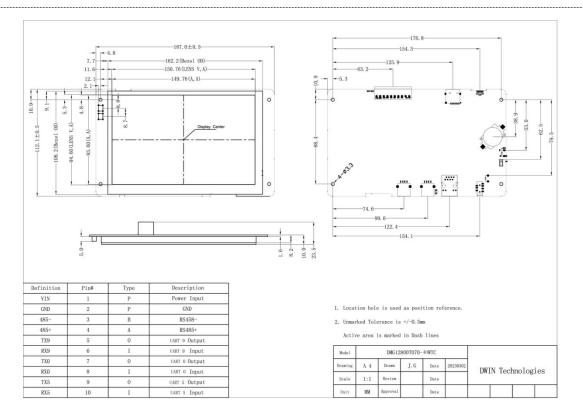
1.2 Wiring

Regarding the definition of serial please refer to the related datasheet as below,

Peripherals and Interfaces

Properties	Parameters	Description
	2-way RS232	UART5 & UART9
СОМ	1-way RS485	UART8
	1-way TTL/COMS	UART0



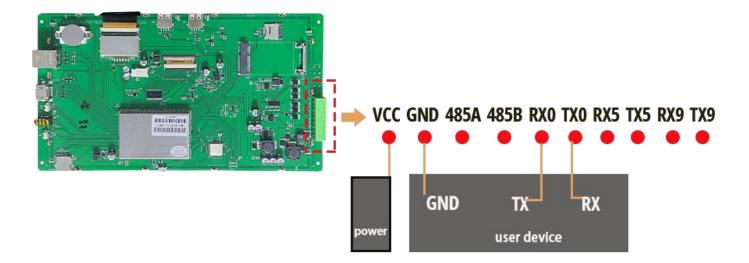


1.2.1 Hardware Connection

GND, Ground, connect to GND pin of the user device.

TXD, Transmit, connect to RX pin of the user device.

RXD, Receive, connect to TX pin of the user device.



1.2.2 Serial Parameter Setting

Regarding baud rate, UART 2 is 1500000, else are 115200.

For programming purposes, serial ports are identified by names that follow the pattern ttyS, such as ttyS0 or ttyS1.



1.2.3 Other Tools

DC regulated 12V power supply is recommended for testing, using SD card with 1~16 GB memory for project downloading.

2 Environment Setup

2.1 Ubuntu16.04 Configuration

2.1.1 Introduction

This chapter will introduce the installation of a virtual machine and the configuration of Ubuntu16.04. If you have already installed Ubuntu16.04, you can <u>click here</u>.

2.1.2 Environment Requirements

CPU: no specific requirement Memory: generally over 2G.

Host machine OS: Windows XP, Windows 7 and above.

Software version: you can choose VMware workstation 10 and above for Windows according to your needs, it is not recommended to use previous versions.

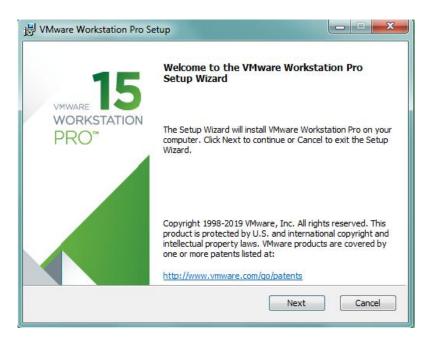
Note:

This example will use VMware Workstation 15 Pro for installation demonstration.

2.1.3 VMware Workstation Installation

(1) Download VMware Workstation pro installation package on the official website below.

https://www.vmware.com/products/workstation-pro.html



- (2) Double clicks on downloaded exe file to start the installation and click "Next".
- (3) Select "I accept the terms in the License Agreement" and click "Next".



VMware Workstation Pro S	Setup		X
End-User License Agree Please read the following liv	e ment cense agreement carefully.		ø
VMWARE END U	SER LICENSE AGREE	MENT	6
LICENSE AGREE OF THE SOFTWA	HAT THE TERMS OF T MENT SHALL GOVER RE, REGARDLESS OF AR DURING THE INST	N YOUR USE ANY TERMS	2
			÷

(4) Select the installation destination. Click "**Change**" if you want to install on another destination. Select "**Enhanced Keyboard**..." and then click "**Next**".

랑 VMware Workstation Pro Setup	
Custom Setup	
Select the installation destination and any additional features.	
Install to: C:\Program Files (x86)\VMware\VMware Workstation\	Change
	\sim
Enhanced Keyboard Driver (a reboot will be required to use this This feature requires 10MB on your host drive.	feature)



(5) Select "Check for product updates on startup" and "Join the VMware Customer Experience Improvement Program" based on what you need. Then click "Next".

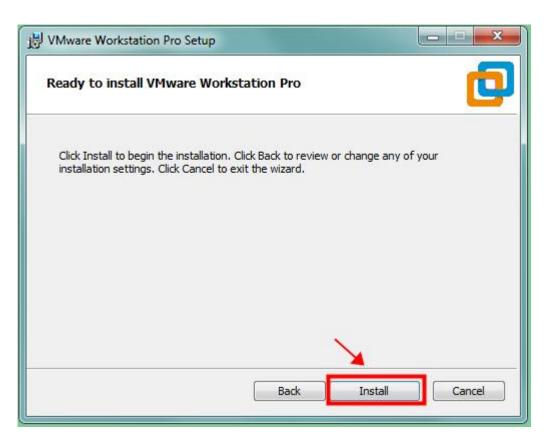


User Experience Settings Edit default settings that can improve your user experience.	Ċ
 Check for product updates on startup When VMware Workstation Pro starts, check for new versions of the application and installed software components. Qoin the VMware Customer Experience Improvement Program 	n
VMware's Customer Experience Improvement Program ("CEIP") provides VMware with information that enables VMware to improve its products and services, to fix problems, and to advise you on how best to deploy and use our products. As part of the CEIP, VMware collects technical	*
Learn More	

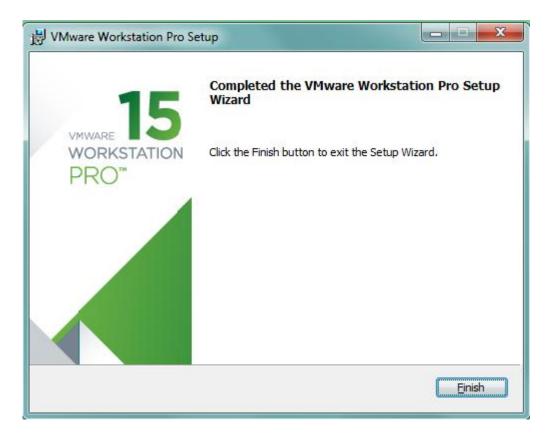
(6) Select the shortcuts you wish to place on your system. It's recommended to select both. Click "Next".

岁 VMware Workstation Pro Setup	
Shortcuts Select the shortcuts you wish to place on your system.	٥
Create shortcuts for VMware Workstation Pro in the following places:	
Back Next	Cancel

(7) Click "Install" to start the installation.



(8) The installation is completed. Click "Finish" to exit the Setup Wizard.



2.1.4 Download Ubuntu



- (1) Download Ubuntu 16.04 from the official website below. https://releases.ubuntu.com/16.04/
- (2) Select "64-bit PC(AMD64) desktop image" to download "ubuntu-16.04.7-desktop-amd64.iso".

Select an image

Ubuntu is distributed on two types of images described below.

Desktop image	 64-bit PC (AMD64) desktop image Choose this if you have a computer based on the AMD64 or
The desktop image allows you to try Ubuntu without changing	EM64T architecture (e.g., Athlon64, Opteron, EM64T Xeon, Core 2). If you have a non-64-bit processor made by AMD, or if you
your computer at all, and at your option to install it	need full support for 32-bit code, use the i386 images instead. Choose this if you are at all unsure. 32-bit PC (i386) desktop image For almost all PCs. This includes most machines with
permanently later. This type of image is what most people will	Intel/AMD/etc type processors and almost all computers that run
want to use. You will need at least 384MiB of RAM to install	Microsoft Windows, as well as newer Apple Macintosh systems
from this image.	based on Intel processors.
Server install image	64-bit PC (AMD64) server install image Choose this if you have a computer based on the AMD64 or EM64T architecture (a.g., Abblan64, Optaron, EM64T Yeon, Core

2.1.5 Install Ubuntu

(1) Open VMware Workstation Pro.



(2) Click "Create a new virtual machine".

VMware Workstation		
File Edit View VM Tabs	Help ▶ ▼ 母 ₽ ♀ ♀ 🔲 🗆 🛱 🕅 🛛 🖂	
Library ×	G Home ×	
 ✓ Type here to search ✓ My Computer 		
Shared VMs	WORKSTATION 15.5 PRO*	
	WORKSTATION 13.5 THE	
	\bigcirc \square \rightarrow	
	\Rightarrow $\overrightarrow{\Delta}$ \neq	
	Create a New Open a Virtual Connect to a Virtual Machine Machine Remote Server	
	vmware	



(3) Select "Custom (advanced)" and click "Next".

New Virtual Machine Wizard	X
10	Welcome to the New Virtual Machine Wizard
	What type of configuration do you want?
WORKSTATION	Typical (recommended)
PRO™	Create a Workstation 15.x virtual machine in a few easy steps.
	Oustom (advanced)
	Create a virtual machine with advanced options, such as a SCSI controller type, virtual disk type and compatibility with older VMware products.
Help	< Back Next > Cancel

irtual machine hardware o	compatibility		
<u>H</u> ardware compatibility:	Workstation	n 15.x	7
Compatible with:	[√] E <u>S</u> X Serv	er	
Compatible products:		Limitations:	
Fusion 11.x Workstation 15.x	*	64 GB memory 16 processors 10 network adapters 8 TB disk size 3 GB shared graphics memory	*
	-		Ŧ

(5) Click "Next"



(6) Select "Installer disc image file (iso)", next click "Browse...", and select the downloaded Ubuntu

***.iso file. This installer will automatically recognize and read file. Click "Next".

	System Installation he is like a physical compute ill you install the guest ope		1
install from:			
🔿 Installer <u>d</u> isc:			
No drives ava	ailable	*	
 Installer disc imag ⇒ Select the installer 	e file (iso): staller disc image to continu		wse
	erating system later.		
O I will install the op			
	ne will be created with a bl	ank hard disk.	

(7) Enter the custom name and password. The password is the Ubuntu login password and sudo privilege password. Click "Next".

ersonalize Linu Full name:	Ubuntu 16.04-40
User name:	dwin
Password:	•••••
Confirm:	•••••

(8) Set the Ubuntu name and location, and click "Next".

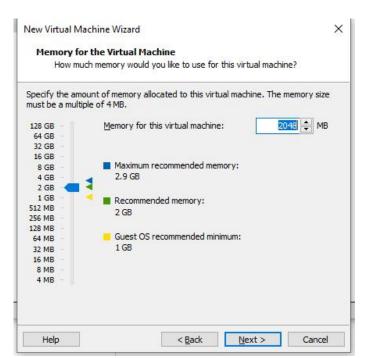
Name the Virtual Machine What name would you like to use for this virtual machine?	
Virtual machine name:	AS 1
Location:	
D:\VMware\Ubuntu 16.04-40	Browse
< Back Next >	Cancel

(8) According to needs and the computer configuration, allocate processors and cores (here the total number of processor cores is set to 2). Then click "Next".

Processor Configuration		
Specify the number of proc	essors for this virtual machine.	
Processors	44 114	
Number of processors:	2 ~	
Number of <u>c</u> ores per processor:	1 ~	
Total processor cores:	2	

(9) The default operating memory is 2G (enough and changeable), click "Next".

DW



(10) Keep default configuration (or choose bridge network for tftp transfer). Click "Next".

Network Type		
What type of network do	o you want to add?	
Network connection		
OUse bridged networking		
	stem direct access to an exter ave its own IP address on the o	
	ation (NAT) stem access to the host comp connection using the host's IP	
OUse host-only networking		
Connect the guest operating computer.	g system to a private virtual n	etwork on the host
O Do not use a network conne	ction	

(11) Keep default and click "Next".

.....

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	Controller Types CSI controller type would you like to use?	
I/O controller ty	/pes	
SCSI Controller:	r	
🔿 B <u>u</u> sLogic	(Not available for 64-bit guests)	
Isi Logic	(Recommended)	
C LSI Logic	SAS	

Select a	Iachine Wizard Disk Type kind of disk do you want to create?
Virtual disk	type
© <u>I</u> DE	
SCSI	(Recommended)
SATA	
© N <u>V</u> Me	
Help	<u>Kack</u>

(12) Keep default and click "Next".



(13) Select "Create a new virtual disk" and click "Next".

Disk	
Create a r	new <u>v</u> irtual disk
will appea	lisk is composed of one or more files on the host file system, which r as a single hard disk to the guest operating system. Virtual disks be copied or moved on the same host or between hosts.
O Use an <u>e</u> x	isting virtual disk
Choose t	is option to reuse a previously configured disk.
OUse a phy	sical disk (for advanced users)
	iis option to give the virtual machine direct access to a local hard uires administrator privileges.

(14) Specify the disk capacity. If there is enough computer memory, it is recommended to set 30G or more because small memory may not be able to meet the subsequent demand. Select "**Split virtual disk into multiple files**". Click "**Next**". If the disk capacity is small, you can expand it (see subsequent sections).

Maximum disk	<u>s</u> ize (GB):	20.0		
Recommended	d size for obuntu: zo	GB		
Allocate all	disk space now.			
	the full capacity can			
now, the	isk space to be availa virtual disk starts sma ial disk as a single file	all and grows as y		
Now, the v	virtual disk starts sma	all and grows as y		
Store virtu Split virtua Splitting th	virtual disk starts sma nal disk as a single file	all and grows as y e es er to move the vir	ou add data to it	•

(15) The disk will be named automatically. Keep the default and click "Next".



Specify Disk File Where would you like to store the disk f	île?
Disk file	
A 40 GB virtual disk be created using multiple automatically named based on this file name.	
Ubuntu 16.04-40.vmdk	Browse
Help < Back	Next > Cancel

(16) Click "Finish" and the virtual machine will be opened and installed.

and then VMwa	reate the virtual machine and start installing Ubuntu 64-bit are Tools.
he virtual machine w	vill be created with the following settings:
Name:	Ubuntu 16.04-40
Location:	D:\VMware\Ubuntu 16.04-40
Version:	Workstation 15.x
Operating System:	Ubuntu 64-bit
Hard Disk:	40 GB, Split
Memory:	2048 MB
Network Adapter:	NAT
Other Devices:	2 CPU cores, CD/DVD, USB Controller, Printer, Sound
Customize Hardwa	are
Power on this virt	ual machine after creation

(17) Wait for a while.





(18) When this page appears, the installation of Ubuntu is complete (Note: The login interface has two user login entries. The red box is user-defined, and the green box is the system default).

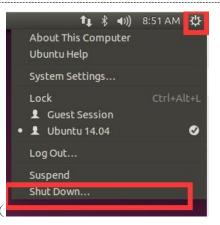
untu					<i>c</i> , <i>c</i>	110	une	510		<i>501</i>	15 0	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	6 tı	En	⊲)))	9:26 AM	4 45
		Ubun	tu16.	.04-40	D												
		Pass	word														
	F	Guesi							4								
	L	Guesi	. sess	sion					_								
ut	рцг	ntu®	16.0	04 LI	rs _.												

(19) Next, we'll start configuring some of the required settings for Ubuntu.

2.1.6 Shared Folder Setting

(1) Shut down Ubuntu.





(2) After shutdown, click "Edit Virtual Machine Settings" -> "Options" -> "Shared Folder" -> "Always Enable" -> "Add", to add a folder as a medium for file transfer between the host and the virtual machine. click "Next" and follow the Add Shared Folder Wizard. Finally click "OK".

Library	× 🕼 Home 🛛 🗋 Ubuntu 1	16.04-40 ×	Virtual Machine Setting	gs		2
	-		Hardware Options			
🗉 🖵 My Computer	l Ubuntu 16.04	4-40		×	Folder sharing	
Ubuntu 16.04-40	Power on this virtual m	achine	Settings	Sumpary Ubuntu 10-0440	A Shared folders expose y	our files to programs in the
	Edit virtual machine set	ttings	Power	~3	your data at risk. Only e	y put your computer and enable shared folders if you
	= Dovisor		Shared Folders	Enabled	trust the virtual machine	e with your data.
	 Devices Memory 	2 GB	(1) AutoProtect	Disabled	Always enabled	
	Processors	2	Guest Isolation	Not encrypted	 Enabled until next po 	wer off or suspend
	Hard Disk (SCSI)		Add Shared Folder Wi			
	 CD/DVD 2 (SATA) CD/DVD (SATA) 	Auto det Auto det			HostPath	
	Network Adapter	NAT		Welcome to the	e Add Shared	V
	🚭 USB Controller	Present				
	⊲₀ Sound Card	Auto det	^{PRO[®]} 15.	5		
	Printer Display	Present Auto det	13.	This wizard will guide you adding a new shared folde	through the steps of	<u>/</u>
	()	Hato acc		machine.	Add.	Remove Properties
	 Description 					
	Type here to enter a descri machine.	ption of this vi				
				<u> </u>	K	
				< Back Nex	t > Cancel	
			TT			
						OK Cancel Help
						OK Cancel Help
				<u>.</u>		OK Cancel Help
				Add Shared Folder W	Protect	
red Folder Wizard					lizard	Uisabled
			8	Specify Shared I	^r izard Folder Attributes	Disabled
red Folder Wizard	this shared folder?		8	Specify Shared I	lizard	Disabled
red Folder Wizard	this shared folder?			Specify Shared I	^r izard Folder Attributes	Disabled
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red Folder Wizard Ie the Shared Folder What would you like to cal ath	this shared folder?	Br		Specify Shared I Specify the so Additional attributes	^r izard Folder Attributes	Disabled

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(3) Click "**Power on this virtual machine**" to start the virtual machine. Click "**VM**" -> "**Install VMware Tools**" (Note: The 'Install VMware Tools' is only selectable after powering on. In the example, VMware Tools have already been installed, so it shows 'Reinstall VMware Tools').

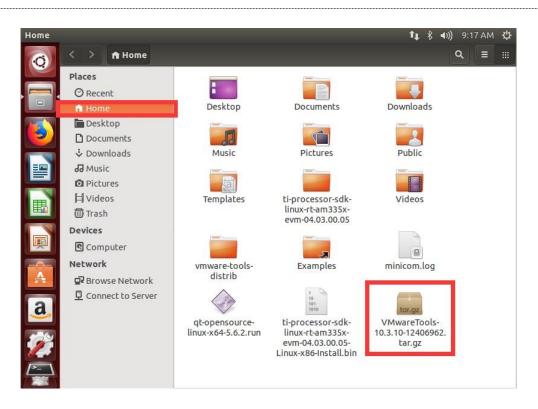
📴 Ubuntu 16.04-35	- VMware Workstation	
File Edit View	VM Tabs Help 📗	- 母 ŷ 🏔 🎐 🔲 🗆 🏹 🏹
Library	Power Armovable Devices	
🕞 🖵 My Comput		Ctrl+Shift+P
Ubuntu 1 D Shared VMs	Grap input	Ctrl+G
	Capture Screen	Ctrl+Alt+PrtScn
	Manage Reinstall VMware Tool	÷ 5
	C Settings	Ctrl+D

(4) Click the "DVD" icon and open it to see a tar file "VMwareTools-10.3.10-12406962.tar.gz".

Image: Second state File Edit View Go Bookn Image: Second state					
Places © Recent A Home Documents Documen	manifest.txt	run_upgrader.sh	VMwareTools- 10.3.10-12406962. tar.gz	vmware-tools- upgrader-32	vmware-tools- upgrader-64

(5) Right click the tar file and click "copy to" a path with permission, e.g., to "Home".

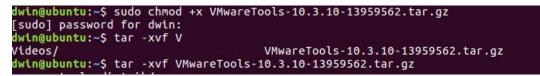




(6) At this point, we need to open the terminal as shown. Click the upper left icon and enter "**Terminal**" and click the "**Terminal**" icon (the terminal can be locked in the taskbar by right-clicking the icon and select "**Lock to Launcher**"). You can also press [Ctrl]+[Alt]+[T] under the root directory to open the terminal.



(7) Enter the command to enable the operable privilege: **sudo chmod +x VM** (to display the full name by **Tab** key) (**enter**). (Note: for the first time to use the administrator sudo privilege, younced to enter the password, i.e., the login password, which is not visible when entering.)





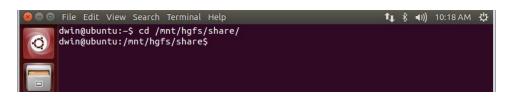
(8) Enter the decompression command: **tar -xvf VM (Tab key) (Enter)**, then it will automatically extract the tar file to the current directory. You can see the decompressed file named "vmware-tools- distrib" in the current directory. Enter the command: **cd vm (Tab key)** (The rest part is omitted).



(9) Enter the operation command: **sudo**./**vm** (**Tab**), and then the installation will start. When [yes] or [no] appears, just type **yes** and enter for all the following options until the installation is complete as shown.



(10) At this time, we can enter the command: **cd /mn** (Tab all the way to the shared folder you set), the path is /mnt/hfgs/***, and the shared folder is set up here.



2.2 Install RK3566 Toolchain

(1)Use the shared folder or SFTP to move the RK3566 tar file to Ubuntu.

View Tools	Help			
 Include i 	in library 🔹 Share with 👻 New folder			
tes	Name	Date modified	Туре	Size
Downloads	buildroot-RK3566-Qt5.12.2-20221213.tar	15/03/2023 3:12 p	WinRAR 压缩文件	411,665 KB

(2) Move the tar file to the root directory (/home/dwin) by shared folder. Enter the command: **sudo mv buil** (**Tab**)~. Wait a while and it will be moved to the root directory.

(3) Enter the command tar -xvf bu(TAB)(enter) to extract the tar file.

(4) Enter the following command in substance:

2.2.1.1 cd bui(TAB)(enter)

2.2.1.2 source env-setup(enter)

Enter the command **qmake -v** to check the version of qmake and see if the environment is successfully built.

iwin@ubuntu:~/buildroot-RK3566-Qt5.12.2-20221213\$ source env-setup.sh
dwin@ubuntu:~/buildroot-RK3566-Qt5.12.2-20221213\$ qmake -v
QMake version 3.1
Jsing Qt version 5.12.2 in /home/dwin/buildroot-RK3566-Qt5.12.2-20221213/usr/loc
al/Qt-5.12.2/lib

2.3 Screen Configuration for QT Development

2.3.1 Hardware Introduction

Please refer to the relevant model specification for specific details.

2.3.2 Terminal Software

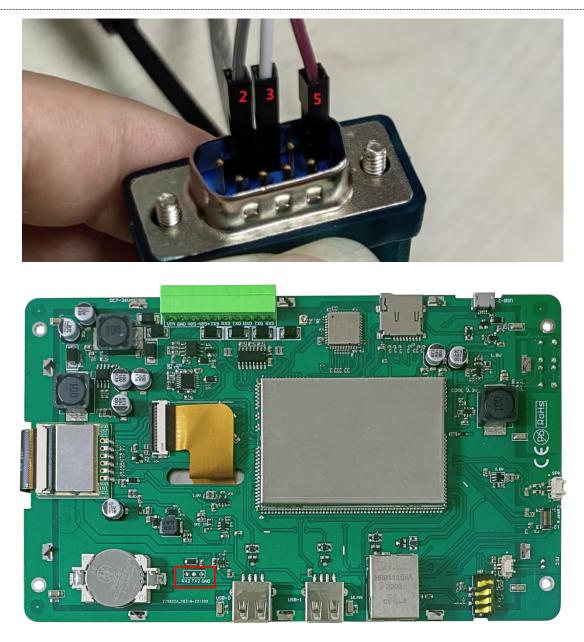
(1) You can download and use either SecureCRT or MobaXterm, and this section will introduce the use of MobaXterm.

(2) There are two connection options: Serial connection and Telnet connection by a network cable.

2.3.3 Serial Connection

(1) Serial connection. As illustrated in the following pictures(RS232 as an example here.)





 $2(RX) \Leftrightarrow TX, 3(TX) \Leftrightarrow RX, 5(GND) \Leftrightarrow GND.$ (Please prepare RS232 or TTL interface before connection. For the specific type of the debugging serial port, please refer to the datasheet of the corresponding model. At present, the debugging serial port of this series is RX2 and TX2.)



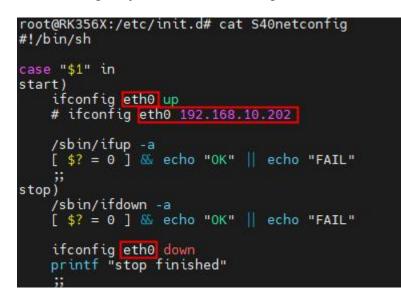
(2) Select [Sessions]-> [New Session]. First, select "Serial". Next, select serial port and select

speed. Last, check the information and click "OK" to finish.

(3) Power up the development board, and enter "root" to start. (Note: If you operate after a while after powering up, there may be no text on the displayed interface, and only a black screen with no boot information. In this case, you only need to enter "root").

2.3.4 Static IP

Modify the file /etc/init.d/S40netconfig. Adjust the static IP as required and remove the comment symbol #.



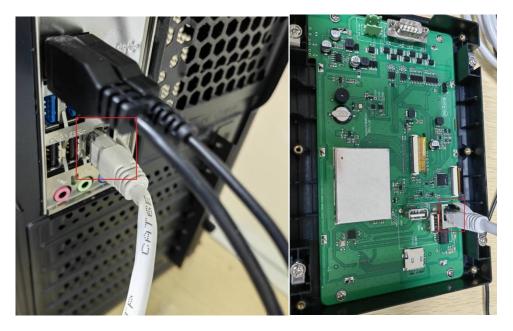
Comment out two lines in the /etc/init.d/S41dhcpcd file, as shown in the figure below:



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2.3.5 Ethernet SSH Connection

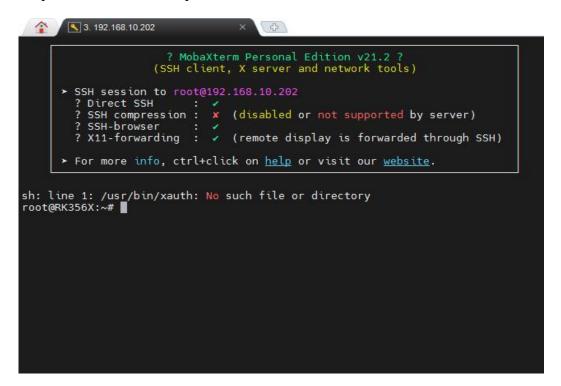
(1) Plug the network cable into the development board network port, an refer the specific notes on the Internet.



(2) First, click "Sessions" and select "New sessions" then select "SSH". Next, enter the IP of the development board and click "OK" (Note: For 40 series devices, the IP is automatically assigned via DHCP. There is no default IP. You need to refer to the previous step. After connecting to the device via the serial port, check the current IP value of the device. The IP here is 192.168.10.202.)

Session settings							
SSH I I I I I I I I I I I I I I I I I I							
Basic SSH settings 2 Remote host * 192.168.10.202 Specify username Port 22							
Advanced SSH settings Terminal settings 🔅 Network settings 🔶 Bookmark settings							
Secure Shell (SSH) session							
3							

(3) Power on the development board and the following interface is displayed. Enter "root" for the username and "rockchip" for the password to start the operation.

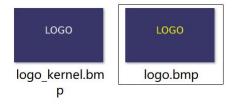


2.3.6 Modify the startup logo

Create a new folder named "update" on the USB drive. Then, create a sub-folder named "DWIN_V1-0-0". Inside the "DWIN_V1-0-0" sub - folder, create a folder named "logo" and a file named "emcversion".

各 称 ^ ^ ^	修改日期	类型			大小	
logo	2024/8/23 11:36	文件:	夹			
emcversion	2024/8/23 13:27	文件			1 k	(B
install	2024/8/23 11:42	SH 1	東文件		1 K	¢Β
/// emcversion - 记事	本	~		×	1	
文件(F) 编辑(E) 格式	t(O) 查看(V) 帮助(H)					
DWIN V1-0-0				1	× .	

Prepare two BMP-format pictures and name them "logo" and "logo_kernel" respectively. Then put them into the "logo" folder.



Put the install script file into the DWIN V1-0-0 folder, and add the following code to the install script file:

```
#!/bin/sh
copy_dir()
 if [ -d $1 ]; then
     for libfile in $1/*; do
         if [ -f $libfile ]; then
            cp $libfile $2/
            chmod $3 $2/${libfile##*/}
           #echo $2/${libfile##*/}
         fi
      done
 fi
instdir=$(cd `dirname $0`; pwd)
#cp $instdir/emcversion /etc/
#cp -f $instdir/lib/libglinuxfb.so /usr/local/Qt 5.12.5/plugins/platforms/
#chmod 755 /usr/local/Qt 5.12.5/plugins/platforms/libglinuxfb.so
#cp -f $instdir/etc/runqt /etc/
#chmod 777 /etc/runqt
mkdir -p /userdata/custom_logo
cp -r $instdir/logo/* /userdata/custom_logo
sync
#$instdir/serio app
```

Compress the DWIN_V1-0-0 folder into a tar-format file. Then put it into the update folder on the USB drive. The upgrade package is ready.

Insert the USB flash drive into the Linux screen and power it on again. Wait for the progress bar during the upgrade process. If a green progress bar appears, it means the logo replacement is successful. After the replacement is successful, the device will automatically shut down. Then remove the USB drive and power it on again.

2.3.7 Wi-Fi Connection

In the update folder within the "Modify LOGO" section, there is a code file named wpa_supplicant.conf. The code is shown in the figure below. The content marked by the red frame is the Wi-Fi name, and the content marked by the blue frame is the Wi-Fi password. Users can modify the content within the double quotes according to the actual situation.



ap_	rl_interface=/var/run/wpa_supplicant _scan=1
	date_config=1
l	twork={ ssid="SSID"
	psk="PASSWORD"
}	key_mgmt=WPA-PSK

After the modification, place the code file wpa_supplicant.conf in the same directory as install.sh.

O → update → DWIN_V1-0-0 →			~	Q
5称	修改日期	类型	大小	
logo	2024/8/28 17:49	文件夹		
emcversion	2024/8/23 21:27	文件	1 KB	
install	2024/8/23 19:42	SH 源文件	1 KB	
wpa_supplicant.conf	2024/8/28 17:29	CONF 文件	1 KB	

Add the code within the following green box to the install.sh folder.

<pre>mkdir -p /userdata/custom_logo cp -r \$instdir/logo/* /userdata/c</pre>	ustom_logo	
<pre>cp \$instdir/wpa_supplicant.conf</pre>	/etc	
sync		

Insert the USB flash drive into the Linux screen and power it on again.

2.3.8 Time Zone Replacement

As mentioned in the previous section, add the following code to the install.sh file.

```
ln -sf /usr/share/zoneinfo/Asia/Shanghai /etc/localtime
```

Note: Please change the specific time zone according to your needs. /Asia/Shanghai

2.3.9 System Time Settings

date: View the system time.

date-s: Set the system time.

hwclock: View the hardware clock.

hwclock-w: Write the system time to the hardware clock.

root@RK356X:/etc/network# date	
Fri Sep 27 07:25:10 UTC 2024	
root@RK356X:/etc/network# date -s "2023-10-10	9 10:10:10"
Tue Oct 10 10:10:10 UTC 2023	
root@RK356X:/etc/network# hwclock	
Fri Sep 27 07:25:47 2024 0.000000 seconds	
root@RK356X:/etc/network# hwclock -w	
root@RK356X:/etc/network# hwclock	
Tue Oct 10 10:10:35 2023 0.000000 seconds	
root@RK356X:/etc/network#	

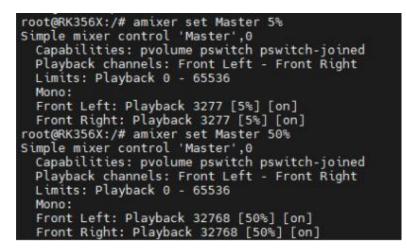
2.3.10 Screen Volume and Brightness

2.3.10.1 Volume

Command: amixer set Master 5% (Range: 0%~100%)

Pressing the numbers from 1 to 9 sets the volume to 10, 20, 30...

Press Shift +"+" or"-" to increase or decrease the volume by single-digit percentages.



2.3.10.2 Brightness

Modify the value in the file /sys/class/backlight/backlight/brightness.

Range: 0~255.

```
root@RK356X:/# cat /sys/class/backlight/backlight/brightness
200
root@RK356X:/# echo 100 > /sys/class/backlight/backlight/brightness
root@RK356X:/# echo 5 > /sys/class/backlight/backlight/brightness
```

2.3.11 ADB

Open the serial communication tool \rightarrow Shell \rightarrow Windows PowerShell(Select the directory where the adb_fastboot folder is located as the startup director) \rightarrow OK \rightarrow Enter .\adb.exe shell.

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会话设置															×
		<i>8</i>	X	in the second se	V C	(0	ø	(10)		۲	8	1 00		
SSH	Telnet	Rsh	Xdmcp	RDP	VNC	FTP	SFTP	Serial	File	Shell	Browser	Mosh	Aws S3	WSL	
P Ba	sic Shell s 终端		Windows	PowerSh	ell	V		启动目录	C:\Use	rs\Admin	istrator\De:	skt(🚬			
P Ad	/anced Sh	ell settin	gs 💽	终端设置	昱 🕺	书签设置	昱								

2-0.05	TS-KA. (479)	天主	N.J.
adb_fastboot	2024/11/5 17:19	文件夹	
MobaXterm_Portable_v23.0_cn	2024/11/5 17:18	文件夹	
RK3566_Linux_40系列_帮助文档	2024/11/5 17:23	DOC 文档	183 KB

	× 🗖	桌面		
	>	adb_fastboot MobaXterm 串口诵信丁具		
C:\Users\Admir	nistrator\D	esktop\adb_fastboot		
新建			确定	取消

PS C:\Users\Administrator\Desktop\adb_fastboot> .\adb.exe shell root@RK356X:/# root@RK356X:/#



2.4 Screen Confguration for Debian Development

2.4.1 Wi-Fi

Locate Wi-Fi

ımcli dev wifi	list							
	inaro-alip:/# nmcli		I become i	121121012				
IN-USE	BSSID	SSID	MODE		RATE	SIGNAL	BARS	SECURITY
	88:25:93:5D:7E:4A	DWIN-813	Infra		405 Mbit/s	57		WPA1 WPA2
	D0:76:E7:12:13:B0	TP-LINK 13B0	Infra		405 Mbit/s	47	100	
	4C:10:D5:3B:A2:88	2.4G-AP	Infra		405 Mbit/s	39		WPA1 WPA2
	0A:71:90:37:CE:22	DIRECT-OAKWIOKmsPK	Infra		130 Mbit/s	34		WPA2
	32:24:49:07:D9:FA	DIRECT-fa-HP 8133	Infra		65 Mbit/s	32		WPA2

Show Wi-Fi connection

nmcli connection show			
root@linaro-alip:/#	nmcli connection show		
NAME	UUID	TYPE	DEVICE
DWIN-813	395e7634-bfbc-4753-8b25-728ed626b979	wifi	p2p0
4G-UFI-6C37	d46bd0d3-4edb-403b-9473-e36f7cd089be	wifi	
ASCC	eb4046a1-850f-483e-abe0-ec8633c2b37b	wifi	1944-19
DIRECT-fa-HP 8133	8bf27efd-170d-41f4-a442-1414f94937ee	wifi	2 2
Wired connection 1	861bbc46-b69b-3fb9-a164-62e11d3f07fa	ethernet	2

Remove the Wi-Fi connection

nmcli con delete id "DWIN-813"

root@linaro-alip:/#	nmeli con show	2	20
NAME	UUID	TYPE	DEVICE
Wired connection 1	861bbc46-b69b-3fb9-a164-62e11d3f07fa	ethernet	

Add a new Wi-Fi connection

```
nmcli dev wifi connect "DWIN-813" password "123456"
              root@linaro-alip:/# nmcli con show
              NAME
                                          UUID
                                                                                                TYPE
                                                                                                              DEVICE
              DWIN-813
              Wired connection 1 861bbc46-b69b-3fb9-a164-62e11d3f07fa
                                                                                                ethernet
           root@linaro-alip:/# nmcli dev wifi connect "Redmi K50 Ultra" password "unopsice of
Device 'p2p0' successfully activated with '7f8d8286-c80c-418e-9713-2182f94ba6d8'.
root@linaro-alip:/# nmcli con show
           NAME
                                    UUID
                                                                                     TYPE
                                                                                                 DEVICE
                  K50 Ultra
                                     7f8d8286-c80c-418e-9713-2182f94ba6d8
                                                                                     wifi
                                                                                    wifi
                                     5a5575b3-b114-4d02-ba83-44700aa4286e
           DWIN-813
           Wired connection
                                    861bbc46-b69b-3fb9-a164-62e11d3f07fa
                                                                                    ethernet
```

It is necessary to remove other invalid connections before creating a new Wi-Fi connection.



2.4.2 4G Network

```
nmcli con add type gsm ifname "xxx" con-name "xxx"
```

lsusb: Check if the 4G module is successfully loaded

root	t@li	naro-al	ip:/#	lsı	usb	
Bus	006	Device	001:	ID	1d6b:0003	Linux Foundation 3.0 root hub
Bus	005	Device	001:	ID	1d6b:0002	Linux Foundation 2.0 root hub
Bus	004	Device	001:	ID	1d6b:0001	Linux Foundation 1.1 root hub
Bus	002	Device	006:	ID	2c7c:6005	Quectel Wireless Solutions Co., Ltd. Android
Bus	002	Device	001:	ID	1d6b:0002	Linux Foundation 2.0 root hub
Bus	003	Device	001:	ID	1d6b:0001	Linux Foundation 1.1 root hub
Bus	001	Device	001:	ID	1d6b:0002	Linux Foundation 2.0 root hub

```
ifname "": nmcli d
```

DEVICE	TYPE	STATE	CONNECTION
ttyUSB2	gsm	disconnected	
риро 🖌 🦰 💳	wifi	disconnected	
wlan0	wifi	disconnected	100 million
p2p-dev-p2p0	wifi-p2p	disconnected	
p2p-dev-wlan0	wifi-p2p	disconnected	
eth0	ethernet	unavailable	
lo	loopback	unmanaged	

con-name"": Customize the connection name for quick reference in subsequent operations.

root@linaro-alip:/# nmcli connection show	fully added.	
NAME UUID TYPE 4g a84b4365-bc93-4995-937a-76459346f4fe gsm Wired connection 1 1613a081-861c-3fc0-8c51-9a49a8f9b1a1 ether	ttyUSB2	

Priority: Wired connection > wifi > 4g

root@linaro-alip:/#	nmcli connection show		
NAME	UUID	TYPE	DEVICE
Wired connection 1	1613a081-861c-3fc0-8c51-9a49a8f9b1a1	ethernet	eth0
DWIN-813	546801f5-c6b0-4732-b7d7-e8a8fcd8bb14	wifi	p2p0
4g	a84b4365-bc93-4995-937a-76459346f4fe	gsm	ttyUSB2

2.4.3 Bluetooth

Run the "bluetoothctl" command to enter the bluetooth settings interface.

scan on

	h]# scan on
Discovery	
[mCHGm]	Controller F0:A8:82:32:02:11 Discovering: yes
[mNEW m]	Device 41:AB:9A:FE:A7:B6 41-AB-9A-FE-A7-B6
[mNEW m]	Device 6C:A5:9D:3B:67:EA 6C-A5-9D-3B-67-EA
[mNEW m]	Device 5C:F1:A1:4D:2E:68 5C-F1-A1-4D-2E-68
	Device 5C:60:BA:FC:9F:87 5C-60-BA-FC-9F-87
	Device 4A:51:B0:04:54:D3 4A-51-B0-04-54-D3
[mNEW m]	Device 6D:02:91:26:E0:CA 6D-02-91-26-E0-CA
[mNEW m]	Device 7E:65:4D:A7:45:17 7E-65-4D-A7-45-17
[mNEWm]	Device 53:41:48:A4:AD:50 53-41-48-A4-AD-50
[mNEWm]	Device 65:15:7F:50:CC:63 65-15-7F-50-CC-63
[mNEWm]	Device A4:C1:38:BD:1A:69 LYWSD03MMC
	Device 48:02:86:8E:2C:7F 真我GT Neo2
	Device 52:B0:54:7E:9F:5D 52-B0-54-7E-9F-5D
NEW [m]	Device EC:30:B3:40:0D:E2 1502026941的Redmi K50 Ultra
	Device 48:02:86:8E:2C:7F LegacyPairing: yes
[mNEW m]	Device 7E:4A:C4:4B:41:6C 7E-4A-C4-4B-41-6C



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scan off

pair [dev]

[bluetooth]# pair EC:30:B3:40:0D:E2
Attempting to pair with EC:30:B3:40:0D:E2
[mDELm] Device 41:AB:9A:FE:A7:B6 41-AB-9A-FE-A7-B6
[mDELm] Device 5C:F1:A1:4D:2E:68 5C-F1-A1-4D-2E-68
[mDELm] Device 5C:60:BA:FC:9F:87 5C-60-BA-FC-9F-87
[mDELm] Device 6C:A5:9D:3B:67:EA 6C-A5-9D-3B-67-EA
[mDELm] Device 4A:51:B0:04:54:D3 4A-51-B0-04-54-D3
[CHG] Device EC:30:B3:40:0D:E2 Connected: yes
Request confirmation
[agent] Confirm passkey 074696 (yes/no): [mDELm] Device 7E:65:4D:A7:45:17 7E-65-4D-A7-45-17
[agent] Confirm passkey 074696 (yes/no): [mDELm] Device 53:41:48:A4:AD:50 53-41-48-A4-AD-50
[agent] Confirm passkey 074696 (yes/no): [mDELm] Device 65:15:7F:50:CC:63 65-15-7F-50-CC-63
[agent] Confirm passkey 074696 (yes/no): [mDELm] Device 6D:02:91:26:E0:CA 6D-02-91-26-E0-CA
[agent] Confirm passkey 074696 (yes/no): [mDELm] Device A4:C1:38:BD:1A:69 LYWSD03MMC
[agent] Confirm passkey 074696 (yes/no): [mDELm] Device 52:B0:54:7E:9F:5D 52-B0-54-7E-9F-5D
[agent] Confirm passkey 074696 (yes/no): [mDELm] Device 7E:4A:C4:4B:41:6C 7E-4A-C4-4B-41-6C
[agent] Confirm passkey 074696 (yes/no): [DEL] Device 48:02:86:8E:2C:7F 真我GT Neo2
[agent] Confirm passkey 074696 (yes/no): yes
[CHG] Device EC:30:B3:40:0D:E2 ServicesResolved: yes
[CHG] Device EC:30:B3:40:0D:E2 Paired: yes
Pairing successful
[mCHGm] Device EC:30:B3:40:0D:E2 ServicesResolved: no
[CHG] Device EC:30:B3:40:0D:E2 Connected: no
[[[choh]] bevice tersonario objez connected, no
connect [dev]
This starth 1# segment TO: 20, D2, 40, 0D, T2
[bluetooth]# connect EC:30:B3:40:0D:E2
Attempting to connect to EC:30:B3:40:0D:E2
[CHG] Device EC:30:B3:40:0D:E2 Connected: yes
Connection successful
[mCHGm] Device EC:30:B3:40:0D:E2 ServicesResolved: yes
[1502026941A9Redmi K50 Ultra]#
trust [dev]
[1502026941的Redmi K50 Ultra]# trust EC:30:B3:40:0D:E2
[CHG] Device EC:30:B3:40:0D:E2 Trusted: yes
Changing EC:30:B3:40:0D:E2 trust succeeded

Use the "Help" option in the menu to get a list of available commands.

3 QT Project Cross-compilation

3.1 Install Qt Creator

3.1.1 System Requirements

This document is based on Ubuntu 14.04 system for verification. Other versions of Ubuntu systems should work but are not verified.

3.1.2 Download Qt Creator

The version of Qt Creator used in this document is 2.7.2. Please download the version that matches the operating system.

	source/	02-Jul-2013 19:43	-	
Ľ	qt-creator-windows-opensource-2.7.2.exe	02-Jul-2013 19:43	53M	Details
Ľ	qt-creator-mac-opensource-2.7.2.dmg	02-Jul-2013 19:43	<mark>53M</mark>	Details
ľ	<u>qt-creator-linux-x86_64-opensource-2.7.2.bin</u>	02-Jul-2013 19:43	62M	Details
ľ	qt-creator-linux-x86-opensource-2.7.2.bin	02-Jul-2013 19:43	<mark>63M</mark>	Details
•	qt-creator-2.7.2-src.zip	02-Jul-2013 19:43	27M	Details
ľ	qt-creator-2.7.2-src.tar.gz	02-Jul-2013 19:43	22M	Details

3.1.3 Install Qt Creator

Copy the installer to your Ubuntu system and add execute permissions to the file:

```
# chmod +x qt-creator-linux-x86_64-opensource-2.7.2.bin
```

dwin@ubuntu:~\$ cd /home/dwin dwin@ubuntu:~\$ chmod +x qt-creator-linux-x86_64-opensource-2.7.2.bin

Run the installer

sudo ./qt-creator-linux-x86_64-opensource-2.7.2.bi

Click the "Next":





Qt Creator 2.7.2 S	etup
nstallation Folder	
lease specify the folder whe	re Qt Creator will be installed.
/opt/qtcreator-2.7.2	B <u>r</u> owse
	< Back Next > Cancel





	1112111.				
80	Qt Creator	2.7.2 Setu	р		
Rea	dy to Ins	tall			
Setup	is now ready t	to <mark>begin insta</mark>	lling Qt Creat	or on your com	puter.
Show	v Details				
	20				
			< <u>B</u> ac	k Install	Cancel

10.3.21-14772444.

(1.1.1.1.1.1.1.1	4411		50%
nstalling component Qt	Creator Applic	ation	
Show Details			



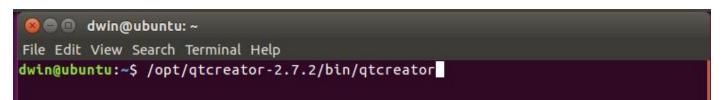


3.2 Set up the cross-compilation environment

3.2.1 Run the Qt Creator

The Qt Creator executable file is in the bin directory of the installation directory.

#/opt/qtcreator-2.7.2/bin/qtcreator





The interface of software is as below.

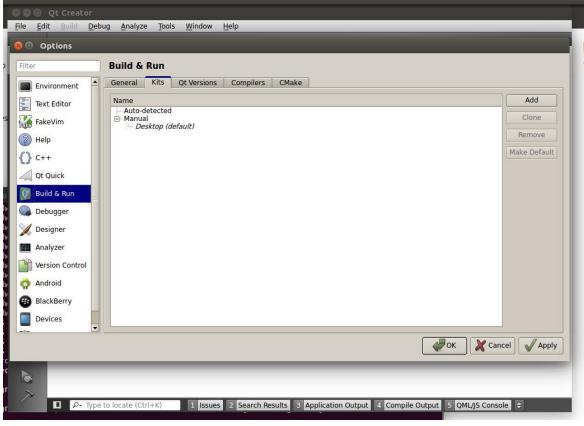
Soc Q		indow <u>H</u> elp		
Welcome Edit	Ot Creator Getting Started		Getting Started	Develop Examples Tutorials
Debug Projects	COREATE COL FILO FILO	E thereads is the second secon	READV?	Tutoriats
Help	IDE Overview To find out what kind of integrated environment (IDE) Qt Creator is.	User Interface To become familiar with the parts of the Qt Creator user interface and to learn how to use them.	Building and Running an Example Application To check that the Qt SDK installation was successful, open an example application and run it.	Start Developing To select a tutorial and learn how to develop applications.
Analyze © Help	User Guide TT Online C	ommunity 🛓 Blogs		
<i>≫</i>	■ P+ Type to locate (Ctrl+K)	I Issues 2 Search Results 3	Application Output 4 Compile Outpu	it 5 QML/JS Console 🗢



3.2.2 Set up the cross-compilation environment

Choose [tool] – [options] as below.





Set qmake: choose [Build & Run] – [Qt Version] – [Add],

"qmake" is in the 'local/Qt-5.12.2/bin/' directory of buildroot-RK3566-Qt5.12.2-20221213.tar.gz

Pekt Editori FakeVim Help C++ Qt Quick Qt Quick Debugger Debugger Version Control Mainzer Version Control Mainzer File name: qmake Files of type: qmake (qmake-qt4* qmake4* qmake-qt5* qmake5* qmake*) \$ Cancel	dd move
 Text Editor FakeVim Help C++ Qt Quick Build & Run Debugger Designer Analyzer Version Control Android BlackBerry Devices Text Editor Computer Image: Image: Imag	move
FakeVim Help C++ Qt Quick Boild & Run Designer Analyzer Version Control Android BlackBerry BlackBerry Devices	
 Help C++ Qt Quick Build & Run Debugger Designer Analyzer Version Control Android BlackBerry BlackBerry Devices ✓ 	an up
C++ Q Q Quick Build & Run Debugger Designer Analyzer Version Control Android BlackBerry BlackBerry Devices ↓	ean up
Qt Quick Build & Run Debugger Designer Analyzer Version Control Android BlackBerry BlackBerry Devices	
Build & Run Debugger Designer Analyzer Version Control Android BlackBerry BlackBerry Devices File name: qmake @ Devices	
Debugger Designer Analyzer Version Control Android BlackBerry BlackBerry Devices	
 ✓ Designer Analyzer ✓ Version Control ✓ Android BlackBerry Devices ✓ 	
Analyzer Version Control Android BlackBerry Devices	
Version Control Android BlackBerry Devices Version Control File <u>n</u> ame: <u>qmake</u> <u>qmake</u> <u><u>open</u> Files of type: <u>qmake(qmake-qt4* qmake4* qmake-qt5* qmake5* qmake*)</u> Version Control File <u>n</u>ame: <u>qmake</u></u>	
Android BlackBerry Devices ▼	
BlackBerry Devices V	
Devices	
Apply 🔀 Cancel	
	<u>о</u> к
le Edit Build Debug Analyze Tools Window Help	
Options	
Filter Build & Run	
Environment 🔺 General Kits Qt Versions Compilers CMake	
Text Editor Name qmake Location Ac	Add
EakeVim Auto-detected Ren	emove
Help	
Clea	ean up
2 Ot Ouick	
Qt Quick OK Build & Run	
0 Build & Run	
Build & Run Debugger Version name: DMTX_40WTX_0t 5.12.2	
W: Build & Run Image: Constraint of the second	
Image: Second	
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Image: Second	
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Set compilation toolchain: choose [Build & Run] – [Compilers] – [Add] – [GCC]:

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The compiler is located in the 'bin' directory of the 'buildroot-RK3566-Qt5.12.2-20221213.tar.gz' package.

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BlackBerry	ABI: unknown-lini 🗘 unknown 🗘 - linux 🗘 - generic 💠 - elf 🗘 - 32bit 🗘	
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	Apply Zancel	

Set up the build kit: choose [Build & Run] – [Kits]:

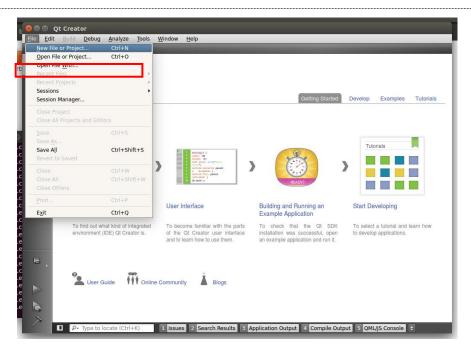
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🔀 Designer	Device:		Manage
Analyzer	Sysroot:	/home/dwin/buildroot-RK3566-Qt5.12.2-20221213/aarch64-buildroot-linux-gnu/sysroot	Browse
	Compiler:	DMTX-40WTX-G++	Manage
Version Contro			
対 Android	Debugger:	GDB Engine using "/usr/bin/gdb" Auto-detect	Edit
BlackBerry	Qt version:	DMTX_40WTX_Qt 5.12.2 \$	Manage
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•		Apply	el 🖉 Ok

3.3 Compile Qt project

3.3.1 Open the project

[File] – [open file or project]:





Choose the Qt project:

		Look in:	/home/dwin	÷ 🔾 🔾 🤞 🖽 [
	Getting Star	Computer	buildroot-RK3566-Qt5.12.2-20221213	DWIN QT DEMO.pro
5	5	dwin	Desktop	examples.desktop
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Configure the project:



B 🛛 🕞 🖉	T_DEMO - Qt Creator		
File Edit Build DWIN QT	Debug Analyze Tools Window Help	_	_
- / /	re Project Editor Code Style Dependencies	_	_
elcome	Configure Project		
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%	The project DWIN_QT_DEMO is not yet configured. Qt Creator uses the kit DMTX-40WTX to parse the project.		
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Debug	Debug /home/build-DWIN_QT_DEMO-DMTX_40WTX-Debug		Browse
rojects	Release /home/build-DWIN_QT_DEMO-DMTX_40WTX-Release		Browse
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VIEMO			
Ξ.,			
config ured			
D 2-	Type to locate (Ctrl+K) 1 Issues 2 Search Results 3 Application Output 4 Compile Output	5 QML/	S Console

3.3.2 Add environment variables

Go to [Projects] – [Build & Run[- [Build Environment], and add a variable:

Variable Name 1: RK3566_SDK_PATH

Value 1: Root directory of the 'buildroot-RK3566-Qt5.12.2-20221213.tar.gz' package

Variable Name 2: RK3566_SYSROOT

Value 2: 'sysroot' directory in the 'aarch64-buildroot-linux-gnu' directory of the 'buildroot-RK3566-Qt5.12.2-20221213.tar.gz' package.

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Help	Make: make in /home/dwin/DWIN_QT_DEMO	Details 🔻
	Add Build Step •	
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Release	Add Clean Step +	
\triangleright	Build Environment	
× 10	Use System Environment and Set RK3566 SDK PATH to /home/dwin/buildroot-RK3566-Qt5.12.2-20221213 Set RK3566 SYSROOT to /home/dwin/buildroot-RK3566-Qt5.12.2-20221213/aarch64-buildroot-linux-gnu/	Details 🛨
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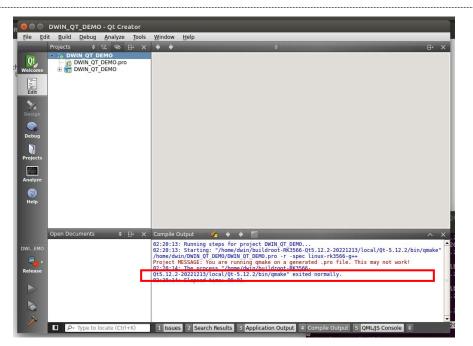
3.3.3 Run qmake

Choose project, 'right key' - run qmake

	O - Qt Creator	Musia Disturse	Dublis Transi
	<u>Analyze Tools Window H</u> elp		
	∇. Ə. B+ X ♦ ♦ DEMO	•	B+ ×
Open Documents DWIEMO Release		Results 3 Application Output 4 Compile Output	5 QML/JS Console 👻

When qmake is successful, it looks like the image below (the red part is the printout of DWIN_QT_DEMO.pri, which does not affect).

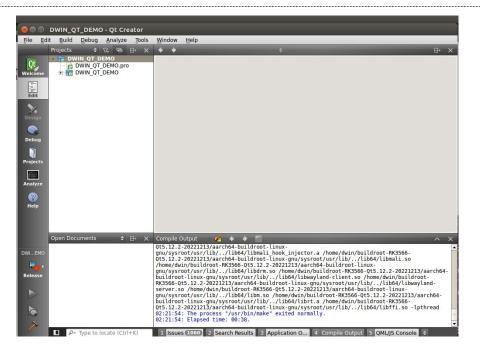




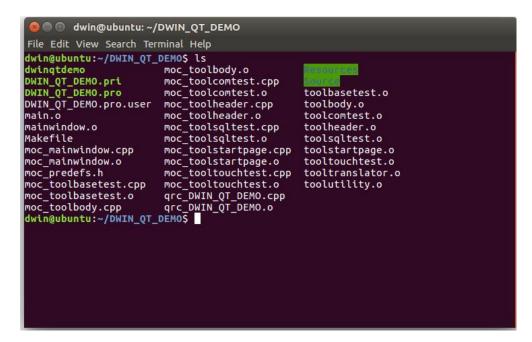
3.3.4 Build

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File Edit Build Debug Projects \$	7. @ B+ X + 	\$	B+ ×
Qt Welcome	Set "DWIN_QT_DEMO" as Active Project		
Edit	Run gmake Deploy Run		
Design	Rebuild Clean		
Debug Projects	Add New Add Existing Files New Subproject Add Library Find in this directory Close Project *DWIN_QT_DEMO*		
Analyze	Collapse Ali		
Open Documents	¢ B+ ×		
P+ Type to	locate (Ctrl+K) 1 Issues 2 Search R	esults 3 Application Output 4 Compile Out	put 5 QML/JS Console 🗘





At this point, the target files have been generated in the project directory and can be copied to thescreen for execution.



3.4 qmake

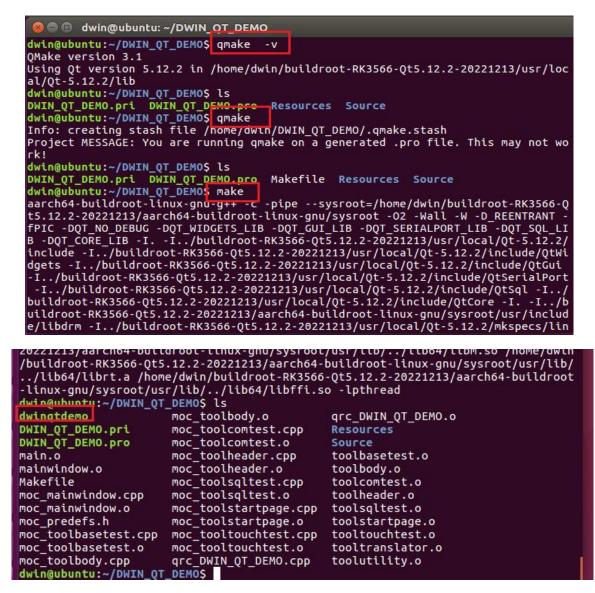
(1) After enter the environment (running the "source env-setup.sh" command), enter the command

"**qmake-v**" to check if the environment is correct. Open the project folder you need to cross-compile (here using the provided folder named "DWIN_QT_DEMO" and adding it to "Ubuntu /home/dwin"). Enter the command: **qmake** (if the .pro file hasn't been generated, enter "**qmake -project**".) to generate the Makefile.





(2) Enter the command: **make**, and then a binary file named after the project will be generated. But the file cannot be run in Ubuntu, so you need to download it to the development board. You can refer to 2.2.



3.5 USB Download

(1) Put the cross-compiled files in the shared folder, you can copy the files using the command: cp (file name)

(the path of shared folder), i.e., cp dwinqtdemo /mnt/hgfs/share/

(2) Move the target file in the shared folder from the computer to the USB/SD card.

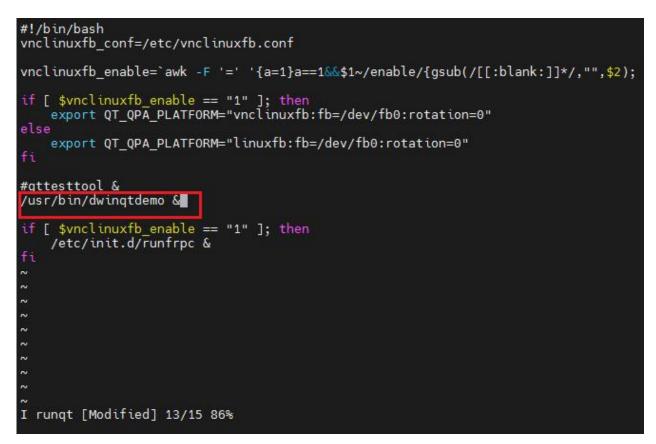
(3) Insert the USB into the development board.

(4) Open MobaXterm and connect. Enter the command: **cd /mnt/usb** to open the "usb" folder and select "sdax" folder. Copy or move the target file to the target directory (you can customize the folder to avoid clutter) using the command: **cp (target file)(folder)**, i.e. **cp dwinqtdemo /usr/bin**/.

3.6 Run the Dwinqtdemo Program

Configuration file /etc/init.d/S99qtlinuxfb should be modified to run the demo.

Enter the command: **vi/etc/init.d/S99qtlinuxfb** and move the cursor to the beginning of the "qttesttool" line. Press **i** to enter insert mode. Input "#" to comment out this line. Move the cursor to the end of this line and press enter. Input the absolute path of dwinqtdemo+ a blank space +&. Then press Esc to exit insert mode. Enter ": wq" to save the modification.



You can run the demo using the command "./runqt".



DWIN Technology Co., Ltd.

	# cd /etc, # ./run runhmi # ./rungt	/init.d/ runqt	runupdate	
- • • • -				-
「カリア」 首页	基本测试 串口测试	试 数据库		
当前版本: VI.1 公司官阿: http	Build 2022-08-10 ://www.dwin.com.cn			
		GUSII DWI	N Technologies	

3.7 Network Connection

Brightness adjustment, buzzer, and system time setting for the 40 series are Linux universal interfaces.

To check the current brightness:

cat /sys/class/backlight/backlight/brightness

Config the backlight to 0 (display off):

echo 0 > /sys/class/backlight/backlight/brightness

Config the backlight to 200:

echo 200 > /sys/class/backlight/backlight/brightness

3.8 System time setting

date -s "2023-03-01 11:07:09"

hwclock -w



4 Set up the build environment

4.1 The build environment of Linux SDK

Note:

(1) It is recommended to develop in the Ubuntu 18.04 system environment. If other system versions are

used, the build environment may need to be adjusted accordingly.

(2) Compile with normal user, do not compile with root user authority.



4.1.1 Directory

├── app	
├── buildroot	<pre># Buildroot root filesystem build directory</pre>
<pre>build.sh -> device/rockchip/common/build.sh</pre>	<pre># compile script</pre>
├── debian	# Debian root filesystem compilation directory
├── device	<pre># Compile related configuration files</pre>
- docs	# Documentation
<pre>envsetup.sh -> buildroot/build/envsetup.sh</pre>	
- external	
- kernel	# Kernel
<pre>Makefile -> buildroot/build/Makefile</pre>	
├── mkfirmware.sh -> device/rockchip/common/mkfirmwa	re.sh # Link script
├── prebuilts	# Cross compilation toolchain
├── rkbin	
<pre>here -> device/rockchip/common/rkflash.sh</pre>	# Flash script
├── tools	# Tools directory
└── u-boot #U-Boot	

4.1.2 Install Dependencies

Install directly on PC:

```
sudo apt-get install repo git ssh make gcc libssl-dev liblz4-tool \
expect g++ patchelf chrpath gawk texinfo chrpath diffstat binfmt-support \
qemu-user-static live-build bison flex fakeroot cmake \
unzip device-tree-compiler python-pip ncurses-dev python-pyelftools
```



4.2 Compile Debian Firmware

This chapter introduces the compilation process of Debian firmware. It is recommended to develop under Ubuntu 18.04 system environment. If you use other system versions, you may need to adjust the compilation environment accordingly.

4.2.1 Compile SDK

4.2.1.1 Configuration before compilation

In the device/rockchip/rk356x/ directory, there are configuration files of different board types.

Return to SDK root directory and execute build.sh to select the configuration file:

./build.sh BoardConfig-rk3566-dwin.mk

The configuration file will be linked to **device/rockchip/.BoardConfig.mk**, check the file to verify whether the configuration is successful.

4.2.1.2 Debian root filesystem

Change to the root filesystem directory:

cd debian ./build.sh

Create a link and link the filesystem to linaro-rootfs.img:

```
cd ..
ln -rsf debian/linaro-rootfs.img rockdev/rootfs.img
```

4.2.1.3 Automatic compilation

Fully automatic compilation will perform all compilation and packaging operations to generate complete RK firmware.

./build.sh

4.2.1.4 Partial compilation

• Compile u-boot

./build.sh uboot

• Compile kernel

./build.sh kernel

Compile recovery

./build.sh recovery

4.2.1.5 Update link

Update each part of the mirror link to rockdev/ directory:

```
./build.sh firmware
```

4.2.1.6 Package the firmware

Pack the firmware, the generated complete firmware will be saved to the rockdev/pack/ directory.

RK firmware is the firmware packaged in Rockchip's proprietary format, and can be flashed to eMMC or SD card with the tools provided by Rockchip.

./build.sh updateimg

4.3 Compile Buildroot firmware

This chapter introduces the compilation process of Buildroot firmware. It is recommended to develop in the Ubuntu 18.04 system environment. If you use other system versions, you may need to adjust the compilation environment accordingly.

4.3.1 Compile SDK

In the device/rockchip/rk356x/ directory, there are configuration files of different board types.

Return to SDK root directory to select the configuration file:

./build.sh BoardConfig-rk3566-dwin.mk

The configuration file will be linked to **device/rockchip/.BoardConfig.mk**, check the file to verify whether the configuration is successful.

4.3.1.1 Partial compilation

• Compile u-boot

./build.sh uboot

• Compile Kernel

./build.sh kernel

• Compile recovery

./build.sh recovery

• Compile Buildroot root filesystem

for you DWIN Technology Co., Ltd.

Compiling the Buildroot root filesystem will generate a compilation output directory in **buildroot/output** :

./build.sh rootfs
Note: Make sure to compile the Buildroot root filesystem as a normal user to avoid unnecessary errors.

4.3.1.2 Package the firmware

Update each part of the mirror link to the **rockdev**/ diectory:

./build.sh firmware

Pack the firmware, the generated complete firmware will be saved to the rockdev/pack/ directory.

./build.sh updateimg

4.4 Upgrade the firmware(40 series & 40ZOS-1 series)

4.4.1 Upgrade the firmware via SD card

To upgrade the firmware using an SD card, you need to use a tool on a computer to write the unified firmware onto the SD card. Currently, this operation is only supported on the Windows operating system.

Operation steps:

Run SDDiskTool_v1.69, check the "Upgrade Firmware" box and select the correct removable disk device.

Insert SD card into USB card reader and then into USB port of host computer.

Click button "Create" to make it and wait until it is finished.

Remove the SD card, insert it into the SD card slot of the motherboard, power on the board, it will start upgrading automatically.

After the upgrade, remove the SD card and restart the motherboard automatically to complete the whole process of firmware update.

First	Choose removable disk	SDBoot:2.1
	SDHC Card 14.4G	~
Seco	ond:Choose function mode	
	🗹 Upgrade Firmware 🛛 PCBATest	SD Boot
Thire	d:Choose firmware	Restore
	D:\01_工作\01_文件资料\01-01安卓\00_常规资料\	32 Firmware
Four	th:Choose demo(Option)	
		Demo
		Create

4.4.2 Upgrade the firmware via Micro USB

If the computer is being used for the first time to perform the burn-in process, you need to install the driver.

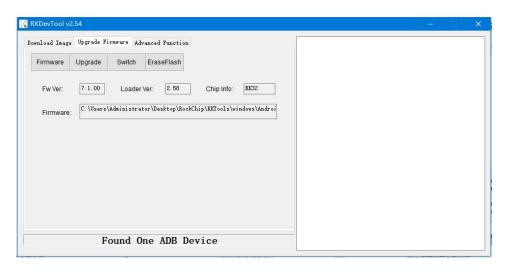


Please refer to the "USB Driver Installation Instructions" in the USB driver directory.

Operation steps:

Download the firmware you need to upgrade to the screen.

Open RKDevTool, select "Upgrade Firmware," and click on "Firmware" to choose the .img file to be burned.



While the device is powered off, press and hold the Recover button on the Android screen. First, connect the PC using a USB cable, and then connect the power supply (DC-12V). The following interface will appear. Click "Upgrade" to start the burn-in process. Once the burn-in is complete, the device will automatically restart.

wnload Image	Upgrade Fi	rnware Ad	vanced Function					
Firmware	Upgrade	Switch	EraseFlash					
Fw Ver:	7.1.00	Loader	Ver: 2.58	Chip Info:	RK32			
Firmware:	C:\Users\	Administra	tor\Desktop\RockC	hip\RKTools\w	indows\Androi			

5 Revision Records

Rev	Revise Date	Content	Editor
00	2023-2-20	First Edition	Yu Yihe
01	2023-3-17	English version	Chen Lvzhi
02	2024-3-20	Added examples about brightness adjustment and system time settings	Chen Yan
03	2024-7-25	Add QT creator compile configurate, compile Linux 4.19 firmware, and chapter 1.	Chen Yan
04	2024-11-07	Add chapter 4.4 (40 series & 40ZOS-1 series)	Chen Xian
05	2025-02-08	Add Boot logo update method and other QT screen configuration options. Add examples of Debian screen configuration.	Chen Xian
06	2025-02-13	Update the location of "Run dwinqtdemo"	Chen Xian
07	2025-02-17	Delete the part of "obtaining the SDK by downloading via repo" , Sync code and Download SDK	Chen Xian
08	2025-03-10	Update "Modify the Startup LOGO"	Chen Xian

Disclaimer: The product design is subject to alternation and improvement without prior notice.

Please contact us if you have any questions about the use of this document or our products, or if you would like to know the latest information about our products:

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Thank you all for continuous support of DWIN, and your approval is the driving force of our progress!