F-IPC110 Industrial Computer User Manual

the user manual is suitable fort and the following model:

Model	Product Type
F-IPC110	Industrial Computer

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Product appearance



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Chapter 1 Brief Introduction of Product

1.1 General

IPC (Industrial Personal Computer, IPC) is industrial control computer, a bus structure of the production process, electrical and mechanical equipment, process equipment tools collectively performed to detect and control. IPC has important attributes and characteristics of a computer, such as a computer having a CPU, hard drive, memory, peripherals and interfaces, and operating system, network and protocol control, computing power, user-friendly interface. Industrial products and technologies industry is very special, are intermediate products, to provide reliable, embedded, intelligent industrial computers for various other industries.

F-IPC110 ARM architecture processors combine Android operating system, and device manufacturers emphasize video image processing effects to bring new solutions. F-IPC110 integrates Freescale Cortex™-A9 i.MX6, support the Android operating system, device manufacturers rely on conventional X86 architecture computing platform, especially advertising media playback device manufacturers to bring lower power consumption less heat s solution.

F-IPC110 is a function of the transmission belt 3G/4G ARM IPC, support 3G / 4G dial-up Internet access, support for firewall, VPN, QOS, port mapping, DDNS, system log storage, remote device management and other functions, support for open secondary customer development, support BS media distribution system architecture graphics, 2D / 3D accelerator Open VG™1.1 for 2D; Open GLES2.0 for 3D video codecs: H.264 HP, MPEG4 ASP, MPEG2 MP image processing BMP, JPG, PNG, GIF, temperature sensor measuring industrial machine operating temperature to provide API, support for USB infrared touch screen, supports USB camera, USB mouse, keyboard encryption lamp, support HDMI, support for VGA, 1 Ethernet port, support for 3G / 4G networks, WIFI, 4 USB, 6 RS232, 2 RS485, solid state drives(SSD), SD external interface, supports OTG

interface.

F-IPC110 support DC 5-36V DC wide input voltage and wide temperature properties are industrial applications, offers a variety of API, easy to read hardware information equipment manufacturers to achieve more development.

1.2 Features and Benefits

Design for Industrial Application

- High-powered industrial cellular module
- Freescale Cortex™-A9 i.MX6 processor
- Professional power supply design, with undervoltage, overvoltage, overcurrent, reverse polarity, short circuit, surge protection function
- Power range: DC 5~36V
- Temperature（-35℃~75℃）
- Air power connector, tightening does not fall off
- Metal casing, heat resistance, impact resistance
- Machine fanless design
- TF, SIM card with anti-theft design
- Built-in Android, LINUX (optional) Operating System

Stability and Reliability

- Support hardware and software WDT
- Support auto recovery mechanism, including online detect, auto redial when offline to make Machine always online
- SSD storage (optional)，High-speed data read and write and to ensure security and stability
- Ethernet port: 1.5KV magnetic isolation
- RS232port: 15KV ESD protection
- SIM/UIM port: 15KV ESD protection
- Antenna port: lightning protection(optional)

Standard and Convenience

- Enter into work state automatically when powered
- Support 10/100/1000Mbps Ethernet
- Support for multiple standard USB2.0 interface
- Support for multiple interfaces RS232 DB9
- Support for audio input and output interfaces

High-performance

- Support 1080P video codecs and 3D acceleration
- Local storage support SSD (optional), TF card (optional)
- Open Android environment, self-development and installation of application
- Support HDMI, VGA, LVDS (optional) external display device such as a touch screen
- Support for 802.11 b / g / n WIFI network, and provide a variety of encryption
- Support rich external interfaces to meet customer application requirements
- Support 3G / 4G dial-up Internet access
- Support APN / VPDN dial private network
- Smart online support to maintain, and even dropped weight, abnormal recovery
- Optional dual-card backup, dual-mode dual-link backup
- Support for PPTP, L2TP, IPSEC, GRE, OPENVPN VPN capabilities
- Providing PWR, SYS, WIFI, ONLINE, use and maintenance easier
- Support NTP, RTC embedded.Schedule Reboot, Schedule Online and Offline, etc.
- Support equipment management platform for remote status monitoring, configuration, updates and other functions
- Support multiple LAN/ WAN access methods, including static IP, DHCP,3G/4G
- Support double link backup between 3G/4G and LAN/WAN (optional)

1.3 Product Specification

1.3.1Cellular Specification

Item	Content
Cellular Module	Industrial cellular module（Single module, dual module or no module）
Standard and Band	TDD-LTE/FDD-LTE/EVDO/WCDMA/TD-SCDMA/CDMA1X/GPRS/EDGE Optional single mode, multimode or full Netcom
Bandwidth	FDD LTE(Download speed:100Mbps，upload speed:50Mbps) EVDO Rev A ((Download speed:3.1Mbps，upload speed:1.8Mbps) WCDMA((Download speed:42Mbps，upload speed:5.76Mbps)
TX power	<24dBm
RX sensitivity	<-109dBm

WIFI Specification

Item	Content
Standard	IEEE802.11b/g/n，2.4G
Bandwidth	IEEE802.11b：11Mbps (max) IEEE802.11g：54Mbps (max) IEEE802.11n：150Mbps (max)
Security	WEP, WPA, WPA2, etc.
TX power	15dBm（max）
RX sensitivity	<-70dBm@54Mpbs

1.3.2 Hardware System

Item	Content	
CPU	CPU	Freescale i.MX6 Cortex-A9
	DRAM	On-board DDR3 2GB
	Flash	4 GB-32GB（Optiona）eMMC
	mSATA	128GB -2TB（Optiona）
Software Support	operating system	Android 4.4.2
	Application	Compatible Android system rich applications
		BS architecture supports media distribution system
Graphic processing	2D/3D accelerator	Open VG™1.1 for 2D; Open GLES2.0 for 3D
	Video Codec	H.264 HP, MPEG4 ASP, MPEG2 MP
	Image	BMP,JPG, PNG, GIF

	Processing	
	HDMI	1920x1080， 1366x768， 1280x720， 1024x768 etc.
	VGA	1920x1080， 1366x768， 1280x720， 1024x768 etc.
3G/4G network	support	LTE, FDD-LTE, WCDMA (HSPA+) etc.
Security function	support	VPN PPTP, IPSEC VPN
Wi-Fi	support	802.11b/g/n, Client/AP mode
Hardware monitor	WDT	support
Schedule Reboot	support	Schedule Reboot
USB devices	support	USB infrared touch screen USB camera USB mouse, etc.

1.3.3Hardware Specification

Item	Content	
Interfaces	Ethernet interface	1*10/100/1000Mbps ,LAN/WAN
	Serial	6 RS232 / 2 RS485, DB9 male
	USB Interface	4*USB2.0 Host & 1*OTG
	SIM card	1 SIM card slot
	Power Interface	DC-input, 5~36V DC，4-pin power connector for the aviation head interface
	Headphone jack	Binaural, 24bit, 108dB, THD+N>95dB, 192kHZ(max)
	MIC	1 MIC input interface
	Mricro SD	1 Mricro SD slot
	mSATA	1
	Antenna connector	3G/4G: 2*SMA & Wi-Fi: 1*RP-SMA
	Wi-Fi	802.11b/g/n
	HDMI	1920x1080, 1366x768, 1280x720, 1024x768
	VGA	1920x1080, 1366x768, 1280x720, 1024x768
Physical Characteristics	Dimensions （mm）	180x150x45
	Housing	Iron
	Protection class	IP40
	cooling method	Fanless cooling
	Weight	0.9kg
Power	Standard Power	DC 12V/1.5A
	Power range	DC 5~36V

Environmental Limits	Operating Temperature	-35~+75ºC（-31~+167℉）
	Storage Temperature	-40~+85ºC (-40~+185℉)
	Operating Humidity	95% (unfreezing)
Lights	PWR	Power Lights
	SYS	System Lights
	ONLINE	Module on-line indicator
	WIFI	WIFI working lights
EMC indicators	Static electricity	EN61000-4-2,level 3 (Contact 6 kv, 8 kv air discharge)

Chapter 2 Installation Introduction

2.1 Overview

F-IPC110 must be installed correctly before they achieve the design features, the device must be installed in a generally recognized by the Company under the guidance of a qualified engineer.

2.2 Encasement List

For safe transport, usually we need a reasonable package, when you are out of the box, please take good care of packing materials for use in future transport needs.It includes the following elements:

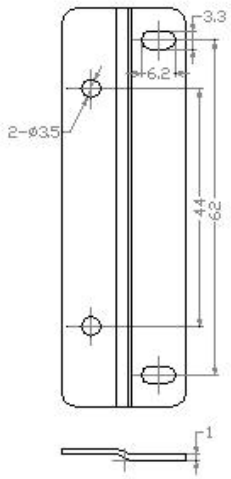
It includes the following elements:

- ✧ 1 User's guide CD
- ✧ 2 Wireless cellular antenna (SMA male head)
- ✧ 1 Power line
- ✧ Product certification
- ✧ Warranty Card

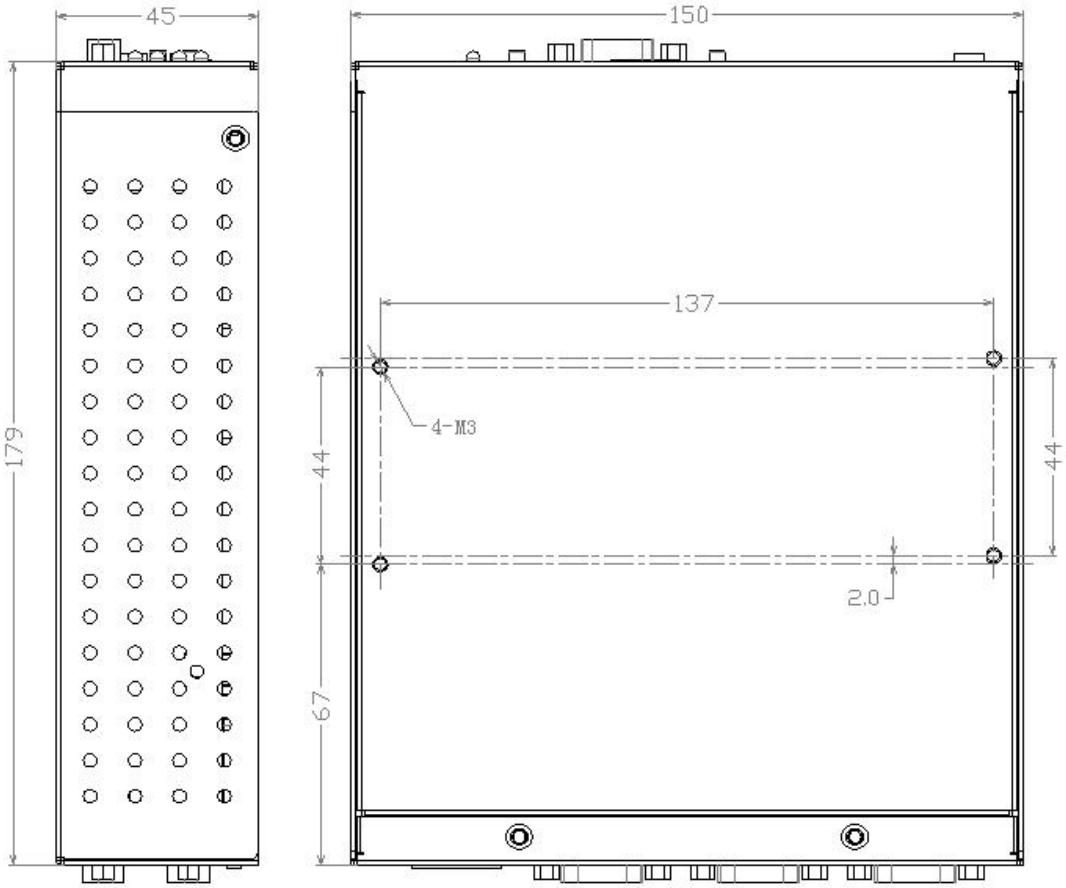
2.3 Installation and Cable Connection

Stator and IPC equipment of screw specification for: M3 * 5 mm countersunk head screws (black)

Dimension (unit: mm)



Fixed Size



IPC Size

Chapter 3 Hardware Functions

3.1 External Interface

3.1.1 Front view.



3.1.2 Back view



3.2 The front panel I/O connector

3.2.1 Audio Port(Speak-out, Mic-in)

MB-F-IPC110 uses SGTL5000XNAA3 audio controller chip. Green is the audio output interface (Speak-out), the pink microphone input interface (MIC-in).



3.2.2 LED Lights

From the bottom indicates: PWR system power indicator lights, SYS system running lights, the online module line indicator lights, WIFI working indicator light.



3.2.3 Serial（COM1-COM6）

Provide 6 DB9 serial ports



COM1-COM4 Pin definitions：

Pin	Signal Name	Signal Description
1	CD	Carrier Detect
2	TXD	Transfer data

3	RXD	Receive data
4	DTR	Data communication ready
5	GND	Ground
6	DSR	Communications equipment ready
7	RTS	Request to Send
8	CTS	Allowed to send
9	RI	Ring Indicator

COM5-COM6 Pin definitions：

Pin	Signal Name	Signal Description
1	NC	
2	TXD	transfer data
3	RXD	Receive data
4	NC	
5	GND	GND
6	RS485-A	RS485 data+
7	RTS	Request to Send
8	CTS	Allowed to send
9	RS485-B	RS485 data-

3.2.4 USB Interface

MB-F-IPC110 offers 4 standard USB2.0 interface, 1 OTG interface, support plug and play.



USB Pin definitions：

Pin	Signal Name
1.5	5V
2.6	D-
3.7	D+
4.8	GND

3.2.5 Ethernet Interface（LAN/WAN）

MB-F-IPC110 offers 1 * 10/100/1000Mbps Fast Ethernet ports, LAN or WAN, given below its pin definitions, LILED and ACTLED Ethernet interfaces on both sides of the green and yellow LED display them with the active LAN.



RJ45 LAN LED Status Description：

ACT LED (yellow) Status	**Function**	LED (green) Status	**Function**
Bright	Data transmission	Flash	Effective link
off	Data transfer is stopped	off	Invalid connection on or off

3.2.6 Display Interface(HDMI&VGA)

Provide 1 high-definition HDMI display interface,1 VGA interface, dual-channel LVDS interface.



3.2.7 Power Interface

DC-input, 5-36 VDC, power connector aviation head interface, the machine automatically when a call starts, you can set whether the power-on self start.



3.3 Internal interface specifications

Please carefully read when connecting external connector of the present manual, in order to avoid damage to the motherboard.

3.3.1 SSD Interface(mSATA&J23)

mSATA (mini PCI-e) interface.

m SATA interface definition：

Pin	Signal Name
4.9.15.18.21.26.34.35.37.40.43.50	GND
23	RX+
25	RX-
27.29	GND
31	TX-
33	TX+
2.24.39.41.52	VCC3V3
1.3.5.6.7.8.10.11.12.13.14.16.17. 19.20.28.30.32.36.38.42.45.46.47. 48.49.50.51	NC
44	LED

3.3.2 Display Interface (LVDS&CN3)

LCDS-socket interface pin definitions：

Signal Name	Pin	Pin	Signal Name
LVDS0_TX3_3P	1	2	VCC3V3/5V/12V
LVDS0_TX3_3M	3	4	VCC3V3/5V/12V
LVDS0_CLKP	5	6	VCC3V3/5V/12V
LVDS0_CLKN	7	8	VCC3V3/5V/12V
LVDS0_TX2_2P	9	10	VCC3V3/5V/12V
LVDS0_TX2_2M	11	12	3V3
LVDS0_TX1_1P	13	14	3V3
LVDS0_TX1_1M	15	16	3V3
LVDS0_TX0_0P	17	18	3V3
LVDS0_TX0_0M	19	20	GND
LVDS1_TX3_3P	21	22	GND
LVDS1_TX3_3M	23	24	GND
LVDS1_CLKP	25	26	GND
LVDS1_CLKN	27	28	GND
LVDS1_TX2_2P	29	30	GND
LVDS1_TX2_2M	31	32	CSO
LVDS1_TX1_1P	33	34	DISP_PWR_EN
LVDS1_TX1_1M	35	36	CONTRAST
LVDS1_TX0_0P	37	38	LR
LVDS1_TX0_0M	39	40	UD

3.3.4 Mricro SD cards lot

MB-F-IPC110 supports external expansion Microsd slot, maximum support 32G expansion.



3.3.5 SIM card slot

1 SIM card slot, support for 3G/4G.



Chapter 4 Software Functions

4.1 Android System

4.1.1Display Interface

Support VGA and HDMI display differnce

Support VGA and HDMI display same

LVDS Interface(optional)。

4.1.2 USB

4*USB interface, Support USB Disk, USB mouse/keyboard, USB camera, USB touch screen etc..

USB Disk mount on directory: “/mnt/media_rw/udisk/”, can read or write on PC by OTG cable.

4.1.3 COM

COM device node: ” /dev/ttymxc1” to “/dev/ttymxc6” for COM1 to COM6.

4.1.4 TF Card

TF Card mount on directory: “/mnt/media_rw/extsd/”, can read or write on PC by OTG cable。

4.1.5 Hard Disk

Hard Disk mount on directory: /mnt/media_rw/sata, can read/write on PC by OTG cable.

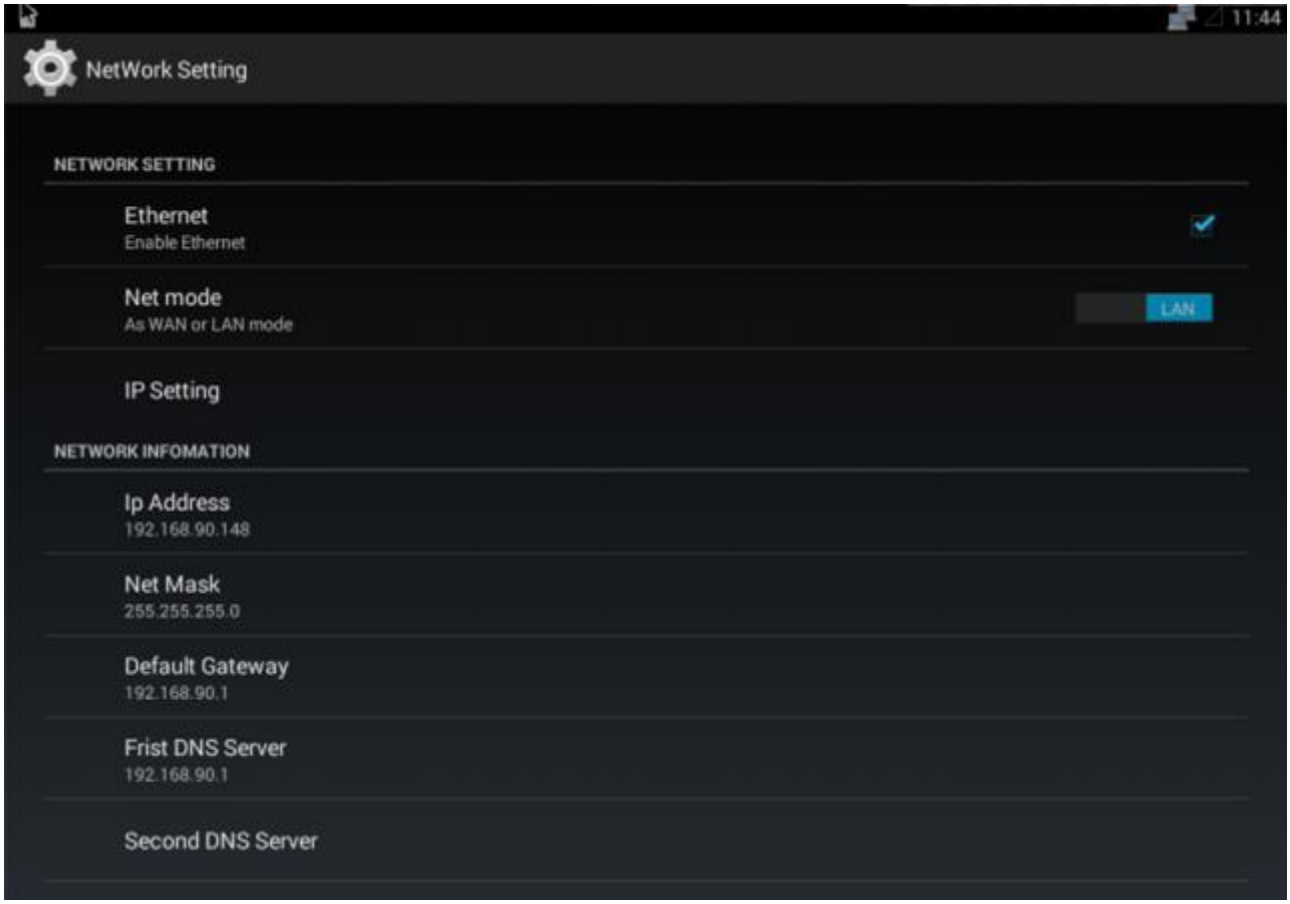
4.1.6 WIFI

Support SDIO interface module and usb interface module. Customer can select (used SDIO default).

4.1.7 Ethernet

10/100/1000Mbps Ethernet Mac. At android system“Setting”->”Ethernet”config.

The following figure provides the Ethernet config：



4.1.8 Network Auto Switch

Support Network auto switch.

Priority: Ethernet->WIFI->3G/4G

4.1.9 USB Camera

USB Camera support YUV, MJPG data format.

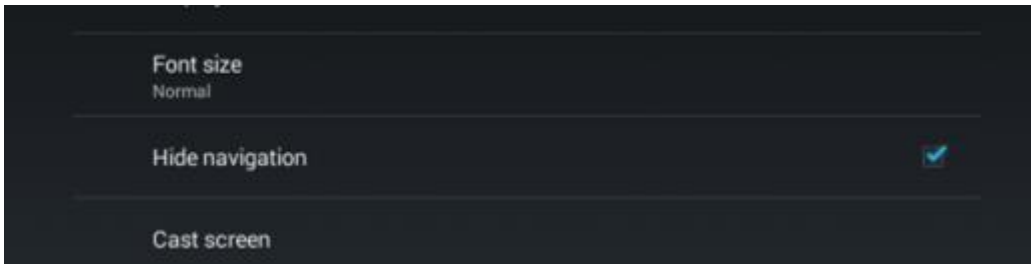
4.1.10 Voice

Double channel Local audio and HDMI audio out, one channel MIC input.

Local audio support power amplifier an head phone out switch.

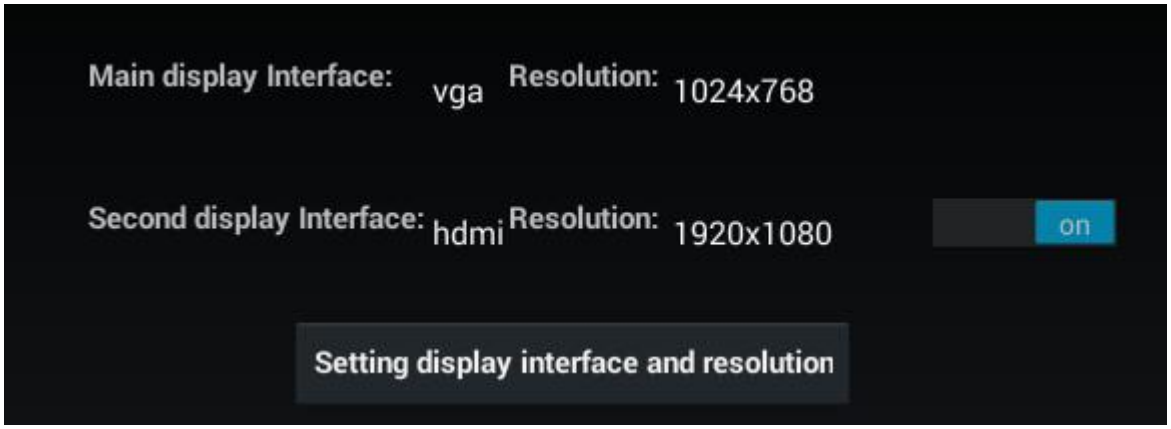
4.1.11 Hide navigation

At “setting”->”display” set Hide navigation or on. Like the following figure:



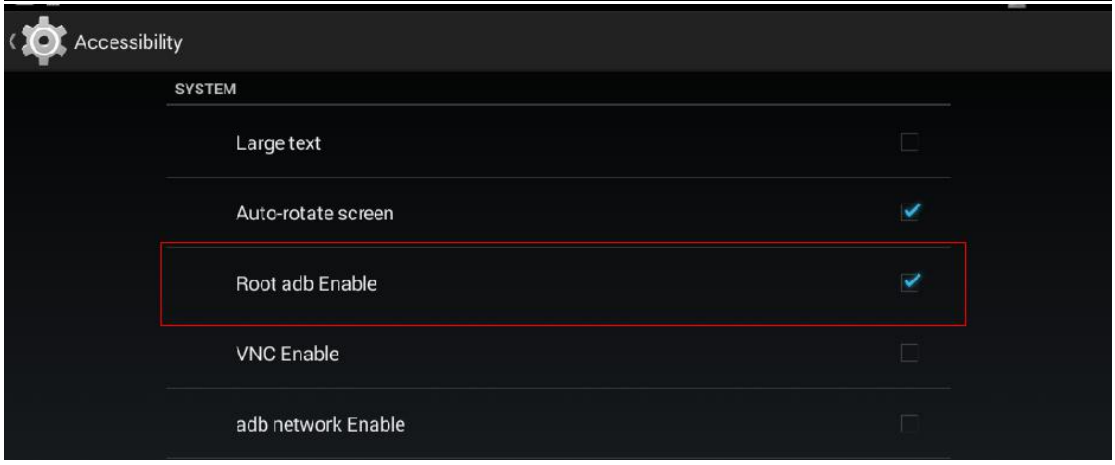
4.1.12 Display Interface Setting

At “setting”->”display” set Display Interface. Like the following figure:



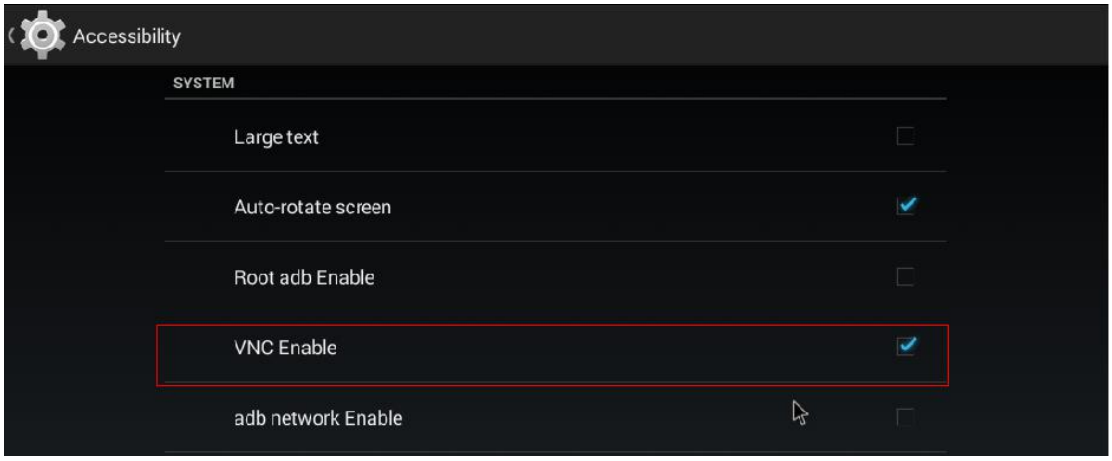
4.1.13 Accessibility

At “Setting” ->”Accessibility”->”Root adb Enable”.Like the following figure:

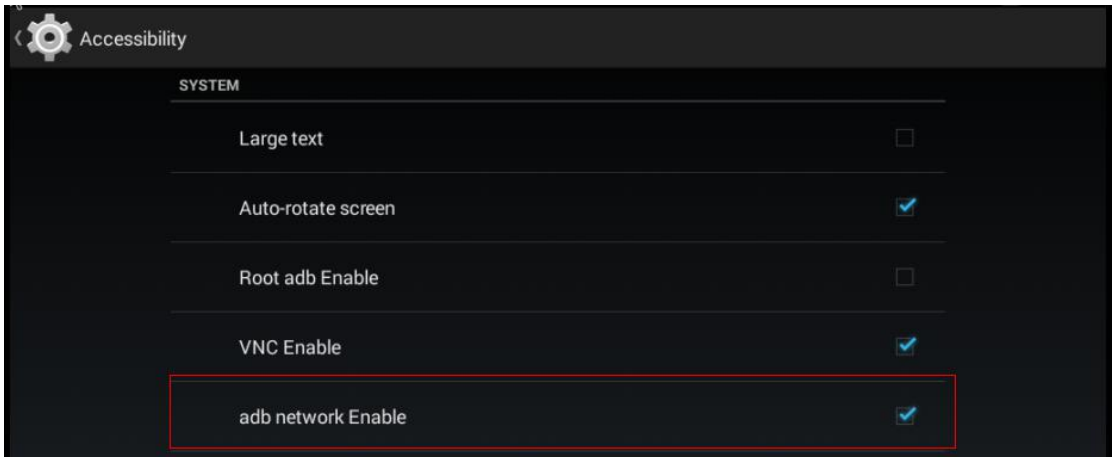


Cancel root adb enable take effective after reboot.

At “Setting” ->”Accessibility”->”VNC Enable”.Like the following figure:



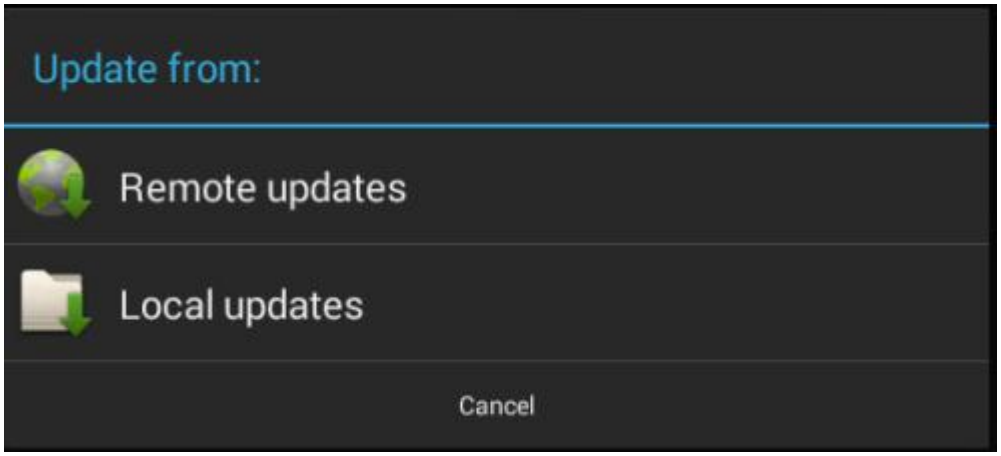
At “Setting” ->”Accessibility”->” adb network Enable”.Like the following figure:



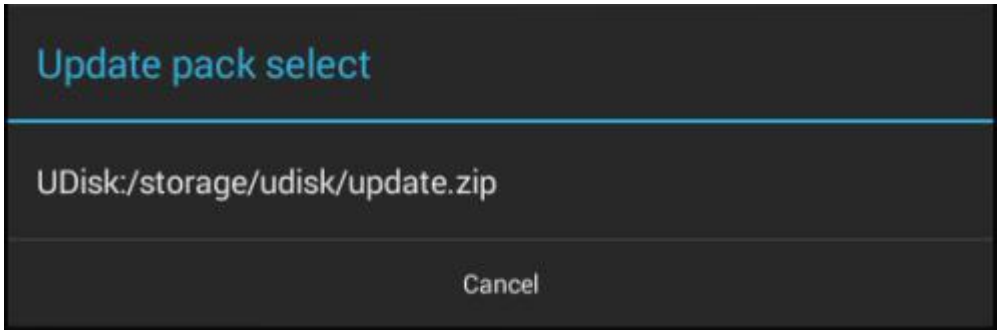
adb network enable need connect again if reboot.

4.1.14 System update

At “Setting”->”About tablet”->”System update”->Local updates. Like the following figure:



Click update.zip to finish system update.



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