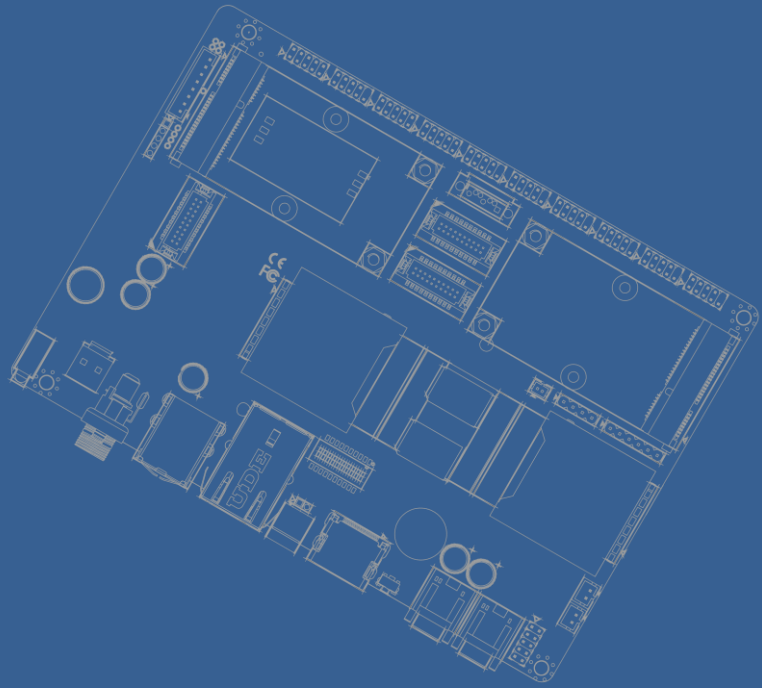


User Manual
Ver. 2nd



NexCore Q116

3.5" SBC with Rockchip RK3399 Processor
ARM ® Cortex A72+A53 Architecture

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Declaration of Conformity

FCC Class A

Note: this device has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of following measures:

- ◆ Reorient or relocate the receiving antenna
- ◆ Increase the separation between the device and receiver
- ◆ Connect the device into an outlet on a circuit different from that to which receiver is connected
- ◆ Consult the dealer or an experienced radio/TV technician for help

CE Marking

This device has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables.

This device has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

Document Amendment History

Revision	Date	Remark
1 st	May 2020	Initial released
2 nd	June 2020	Added chapter 2 and 3

Table of Contents

1.	Product Overview	9
1.1.	Introduction	9
1.2.	Specification	9
1.3.	Block Diagram	12
2.	Hardware User Guide.....	14
2.	14
2.1.	DIP Switch Setting and Connector Locations	14
2.2.	Connector	15
2.2.1.	Connector List.....	15
2.2.2.	Connector Setting	16
2.2.2.1.1.	AUDIO1	16
2.2.2.1.2.	JBKL1.....	16
2.2.2.1.3.	COM1.....	16
2.2.2.1.4.	COM2.....	17
2.2.2.1.5.	COM3.....	17
2.2.2.1.6.	COM4.....	17
2.2.2.1.7.	COM5 (DB9).....	18
2.2.2.1.8.	EDP.....	19
2.2.2.1.9.	VDD1 (EDP panel power selects)	19
2.2.2.1.10.	VDD2 (EDP panel power selects)	19
2.2.2.1.11.	CSI	20
2.2.2.1.12.	BAT	20
2.2.2.1.13.	USB2.....	20
2.2.2.1.14.	W_USB	21
2.2.2.1.15.	JLVDS1	21
2.2.2.1.16.	JLVDS2 (LVDS panel power selects)	22
2.2.2.1.17.	I2C1.....	22
2.2.2.1.18.	SD1.....	22
2.2.2.1.19.	DCIN1	22
2.2.2.1.20.	DCIN2	22
2.2.2.1.21.	PWR_ON1	22
2.2.2.1.22.	RESET1.....	23
2.2.2.1.23.	CN1.....	23
2.2.2.1.24.	HDMI2.....	23
2.2.2.1.25.	LAN12	24
2.2.2.1.26.	MINIPCIE	24

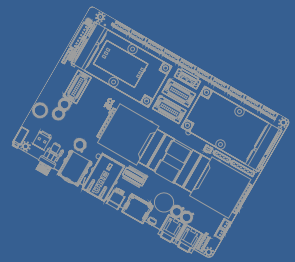
2.2.2.1.27.	SIM	25
2.2.2.1.28.	USB1	25
2.2.2.1.29.	OTG	26
2.2.2.1.30.	SW2	26
2.2.2.1.31.	M2	26
2.3.	Mechanical Drawing	28
3.	Software User Guide.....	30
3.	30
3.1.	Introduction	30
3.2.	Development Environment	30
3.2.1.	How to Install Toolchain	30
3.2.2.	RS232 Debug Console.....	32
3.2.2.1.1.	Debug Console Information	32
3.2.2.1.2.	Debug Console Device Node.....	32
3.2.2.1.3.	Boot Message.....	32
3.2.3.	Networking Settings	33
3.2.4.	Firmware Version	33
3.2.4.1.1.	Android Version	33
3.2.5.	eMMC Default Partitions	35
3.3.	Interface Introduce	36
3.3.1.	RS232	36
3.3.1.1.1.	RS232 Interface	36
3.3.1.1.2.	RS232 Specification	36
3.3.1.1.3.	RS232 Device Node.....	36
3.3.1.1.4.	RS232 Sample Code.....	36
3.3.2.	RS422/485.....	37
3.3.2.1.1.	RS422/485 Information	37
3.3.2.1.2.	RS422/485 Specification.....	37
3.3.2.1.3.	RS422/485 Device Node	37
3.3.2.1.4.	RS422/485 Sample Code	37
3.3.3.	RTC & Watchdog (Not Ready).....	38
3.3.3.1.1.	RTC & Watchdog Information.....	38
3.3.3.1.2.	RTC & Watchdog Specification	38
3.3.3.1.3.	RTC & Watchdog Device Node.....	38
3.3.3.1.4.	RTC & Watchdog Example	38
3.3.4.	I2C bus (Inter-Integrated Circuit).....	39
3.3.4.1.1.	I2C bus Information	39
3.3.4.1.2.	I2C bus Specification.....	39

3.3.4.1.3.	I2C bus Device Node	39
3.3.4.1.4.	I2C bus Example	40
3.3.5.	Audio.....	41
3.3.5.1.1.	Audio Information.....	41
3.3.6.	Display	41
3.3.6.1.1.	Display Information.....	41

Chapter 1

Product Overview

This chapter provides background information of NEXCORE Q116.



1. Product Overview

1.1. Introduction

NexCore Q116 is a 3.5" SBC (Single Board Computer) with ARM Cortex-A73+A53 NXP Rockchip RK3399 processor. NexCore Q116 has outstanding crash free protection on both hardware reliability and software stability. With the special features, NexCore Q116 is a perfect device to meet customers' versatile needs.

The NexCore Q116 focuses on industrial application and it provides high performance and low power consumption from its ARM ® Cortex A72 + A53 architecture which is ready-to-run, compact, and easy-to-expand. With flexible I/O interfaces and complete hardware and software solutions, NexCore Q116 is a fast time-to-market platform for customers to develop their applications and products easily.

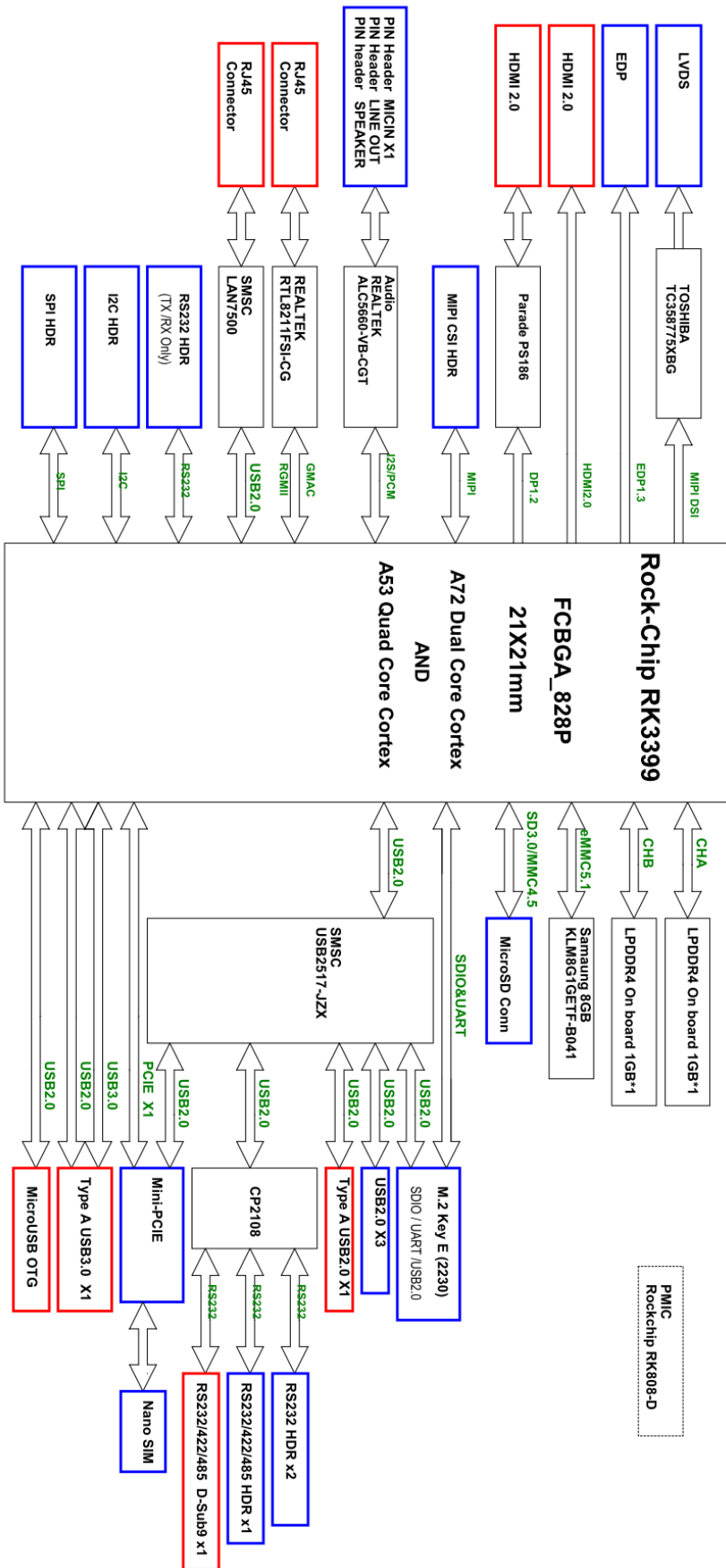
1.2. Specification

Feature	Items	Description
■ Processor	CPU	RK3399 Dual-core Cortex-A72 up to 1.8GHz / Quad-core Cortex-A53 up to 1.4GHz
■ GPU	Main Chips	Mali-T864 GPU
■ Memory	Type	LPDDR4 2GB Onboard
■ Storage	eMMC	8GB eMMC flash Onboard
	Card reader	SD card
■ Display	HDMI	2 x 4K 60fps · Single display: each port supports 4K 60fps · Simultaneous dual display: 1 x 4K 60fps, 1 x 1080p
	LVDS	1 x (18/24-bit LVDS with 1920x1080 for dual channels at 60Hz)
	eDP	1
■ Audio		1 x pin header support Mic in / line out / speaker out
■ Video in	MIPI CSI	1
■ Network	Ethernet	2 x LAN 10/100/1000 Mbps
	Wi-Fi	1 x M.2 E key, support optional Wi-Fi modules 1 x mini-PCIe (USB2.0, PCIe), support optional Wi-Fi and LTE modules

■ I/O	Serial Ports	2 x RS232/422/485 (switched by GPIO/SW) 2 x RS232 (TX/RX/CTS/RTS/DSR/DTR/DCD) 1 x RS232 (TX/RX)
	USB 2.0	2 x USB2.0 1 x USB 2.0 for touch 1 x Micro USB2.0 OTG
	USB 3.0	1 x USB3.0
	Others	1 x I2C/SPI 1 x Inverter 1 x reset button header 1 x power button header 1 x 12V DC header
■ Power Supply	DC	12V DC-in
■ External I/O	Front I/O	1 x HDD LED 1 x Power button
	Rear I/O	1 x Micro USB2.0 OTG 1 x USB2.0 1 x USB3.0 2 x LAN 2 x HDMI 1 x COM 1 x DC in
	Left I/O	1 x nano SIM slot 1 x SD card holder
■ System Physical Characteristic	Dimensions	Board Size: 3.5" ; System: TBD after ID confirmed
	Color	Black
	Cooling	Fanless design
	Material	Metal
■ Watchdog		Watchdog
■ OS Support		Android 7.1
■ Environment		Operating Temperatures: @100% CPU loading and component thermal profile: -20-65°C Storage Temperature: -20°C ~85°C Relative humidity (Non-condensing): 95%

<p>■ Vibration</p>		<p><u>Operation (X-Y-Z): Sine vibration</u> Sine wave vibration test : Acceleration: 2g rms</p> <ul style="list-style-type: none"> ✓ Frequency: 5 – 500 Hz ✓ Test Axis: X,Y,Z axis ✓ Test Time: 1 Hour per axis ✓ Total Test Time: 3 Hour <p><u>Operation (X-Y-Z): Random vibration</u> Random vibration test(Operating) : Accelerate: 2g rms</p> <ul style="list-style-type: none"> ✓ Frequency: 5 – 500 Hz ✓ Test Axis: X,Y,Z axis ✓ Test Time: 1 Hour (Each axis). ✓ Total Test Time: 3 Hours
<p>■ Shock</p>		<p>50g peak acceleration (11 msec. duration)</p>
<p>■ Certificate</p>		<p>CE / FCC class B / LVD</p>
<p>■ Environmental</p>		<ul style="list-style-type: none"> ✓ Compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2015/863/EU ✓ RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBBs) < 0.1% or 1,000ppm, Polybrominated diphenyl Ethers (PBDEs) < 0.1% or 1,000ppm, Bis (2-ethylhexyl) phthalate (DEHP)<0.1% or 1,000ppm , Butyl benzyl phthalate (BBP)<0.1% or 1,000ppm , Dibutyl phthalate (DBP)<0.1% or 1,000ppm , and Diisobutyl phthalate (DIBP)<0.1% or 1,000ppm

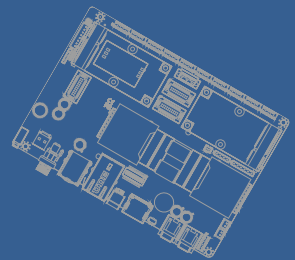
1.3. Block Diagram



Chapter 2

Hardware User Guide

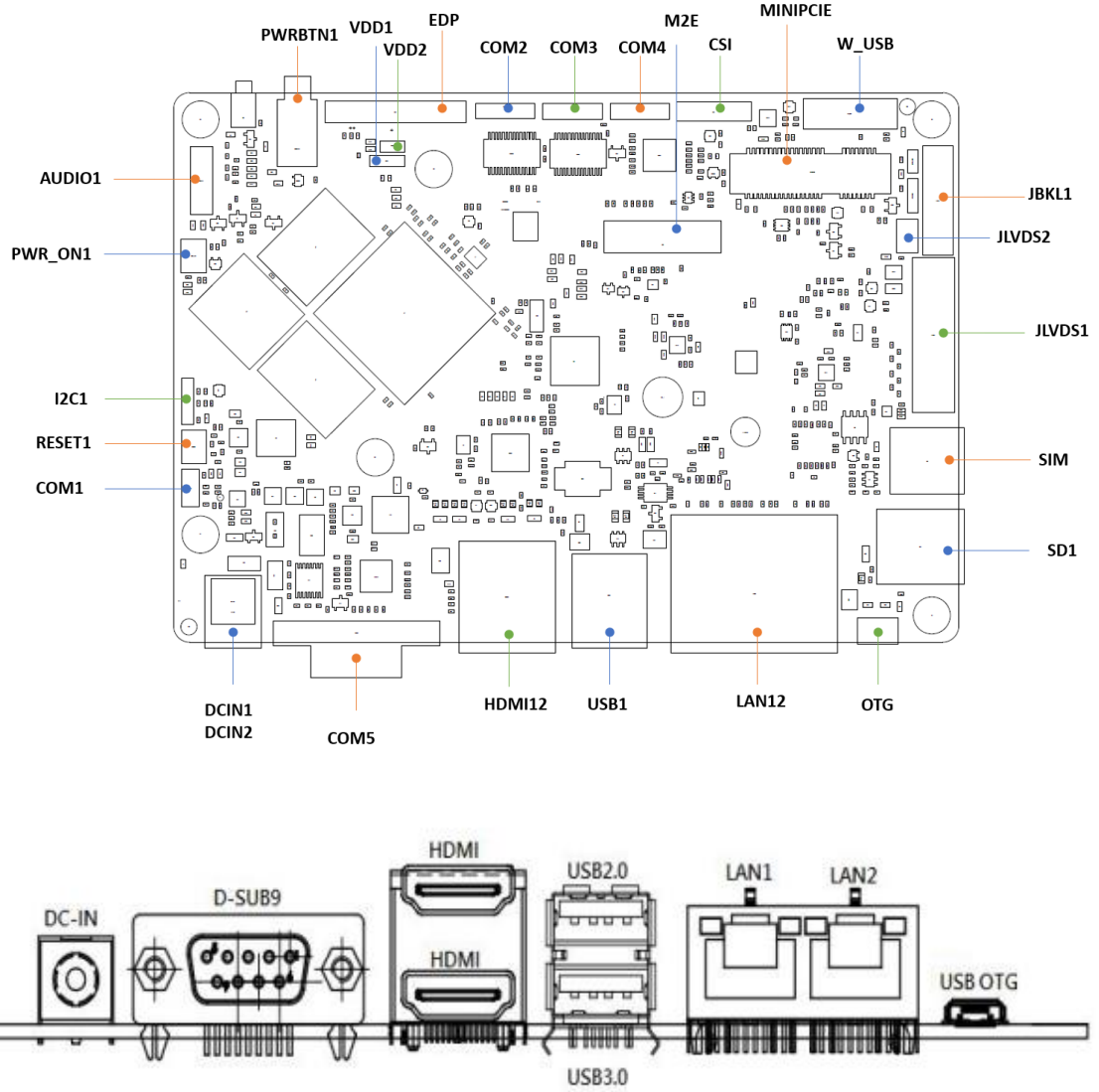
This chapter introduces the startup procedures of NexCore Q116, device integration. It also introduces the setting of switches, indicators and shows the mechanical drawings. Be sure to read all safety precautions before you begin installation procedure.



2. Hardware User Guide

2.1. DIP Switch Setting and Connector Locations

Top side:



2.2. Connector

2.2.1. Connector List

DC-IN	DC power input connector	DC power(+12V) input connector
AUDIO1	Line out/Line in/Mic in/Speaker out	Pin header 2.0mm,2x6.
JLVDS1	LVDS	WTOB CON 40P 0.5MM, R/A.
JBKL1	LVDS back light	WTOB CON 7P, 2.5mm
JLVDS2	LVDS panel power select	Pin header 2.0mm, 2x3
EDP	EDP	WTOB CON 40P 0.5MM, R/A
VDD1	EDP panel power select	Pin header 2.0mm, 2x3
VDD2	EDP panel power select	Pin header 2.0mm, 1x2
CSI	MIPI CSI connector	FPC 39p
BAT	Battery connector	JST 1.25mm, 1x2
USB2	internal USB 2.0 connector	Header 2.0mm, 2x5
W_USB	internal USB 2.0 connector	JST 2.5mm, 1x6
COM1	COM1 connector	D-SUB connector
COM2	COM2 connector	WTOB 1.0mm, 1x9
COM3	COM3 connector	WTOB 1.0mm, 1x9
COM4	COM4 connector	WTOB 1.0mm, 1x9
COM5	COM5 connector	D-SUB connector
I2C1	I2C connector	Pin header 2.0mm, 1x4
SD1	micro SD connector	micro SD connector
DCIN1	DC power(+12V) input connector	
DCIN2	DC power(+12V) input connector	3.96mm, 1x2
PWR_ON1	Power button connector	Pin header 2.0mm, 1x2
RESET1	RESET button connector	Pin header 2.0mm, 1x2
CN1	SPI ROM program connector	WTOB 1.25mm, 1x6
HDMI2	HDMI connector	Dual layer HDMI connector
LAN12	LAN connector	Dual layer LAN RJ45 connector
MINIPCIE	mini PCIE socket	
SIM	SIM card socket	
USB1	USB2.0+USB3.1 SD connector	USB2.0+USB3.1 dual layer connector
OTG	USB2.0 connector (for OTG)	micro USB connector
SW2	ATX/AT mode select	
M2	M.2 E key 2242 connector	

2.2.2. Connector Setting

2.2.2.1.1. AUDIO1

Description	Pin	Pin	Description
Line Out_R	1	2	LINE Out_L
NA	3	4	NA
GND	5	6	GND
Mic In_P	7	8	Mic In_N
Line In_R	9	10	Line In_L
Speaker Out_P	11	12	Speaker Out_N

2.2.2.1.2. JBKL1

Description	Pin
5V	1
12V	2
12V	3
Back light Control	4
GND	5
GND	6
Back light Enable	7

2.2.2.1.3. COM1

Description	Pin
NC	1
TXD	2
RXD	3
GND	4

2.2.2.1.4. COM2

Description	Pin	Pin	Description
DCD#	1	2	RXD
TXD	3	4	DTR#
GND	5	6	DSR#
RTS	7	8	CTS
RI#	9		

2.2.2.1.5. COM3

Description	Pin	Pin	Description
DCD#	1	2	RXD
TXD	3	4	DTR#
GND	5	6	DSR#
RTS	7	8	CTS
RI#	9		

2.2.2.1.6. COM4

RS232 Mode

Description	Pin	Pin	Description
DCD#	1	2	RXD
TXD	3	4	DTR#
GND	5	6	DSR#
RTS	7	8	CTS
RI#	9		

RS422 Mode

Description	Pin	Pin	Description
Tx-	1	2	TX+
RX+	3	4	RX-
GND	5	6	
	7	8	
	9		

RS485 Mode

Description	Pin	Pin	Description
DATA-	1	2	DATA+
	3	4	
GND	5	6	
	7	8	
	9		

2.2.2.1.7. COM5 (DB9)

Description	Pin	Pin	Description
DCD#	1	2	RXD
TXD	3	4	DTR#
GND	5	6	DSR#
RTS	7	8	CTS
RI#	9		

RS422 Mode

Description	Pin	Pin	Description
Tx-	1	2	TX+
RX+	3	4	RX-
GND	5	6	
	7	8	
	9		

RS485 Mode

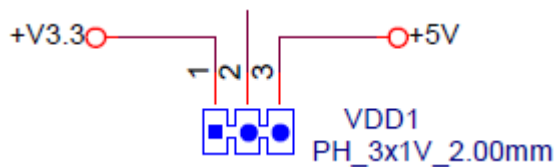
Description	Pin	Pin	Description
DATA-	1	2	DATA+
	3	4	
GND	5	6	
	7	8	
	9		

2.2.2.1.8. EDP

Description	Pin	Pin	Description
NC	1	2	GND
EDP_TX3N	3	4	EDP_TX3P
GND	5	6	EDP_TX2N
EDP_TX2P	7	8	GND
EDP_TX1N	9	10	EDP_TX1P
GND	11	12	EDP_TX0N
EDP_TX0P	13	14	GND
EDP_AUX+	15	16	EDP_AUX-
GND	17	18	+VDD_EDP(3V/5V/12V)
+VDD_EDP(3V/5V/12V)	19	20	+VDD_EDP(3V/5V/12V)
+VDD_EDP(3V/5V/12V)	21	22	NC
GND	23	24	GND
GND	25	26	GND
EDP_PHD	27	28	GND
GND	29	30	GND
GND	31	32	Back Light Enable
Back Light Control	33	34	NC
NC	35	36	+12V
+12V	37	38	+12V
+12V	39	40	NC

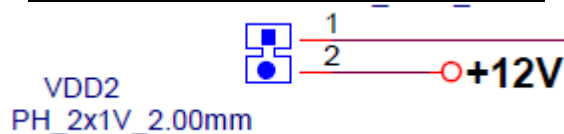
2.2.2.1.9. VDD1 (EDP panel power selects)

Description	Pin
+3.3V	1-2
+5V	2-3



2.2.2.1.10. VDD2 (EDP panel power selects)

Description	Pin
+12V	1-2



2.2.2.1.11. CSI

Description	Pin	Pin	Description
+3.3V	1	2	
MIPI_D0P	3	4	MIPI_D0N
GND	5	6	MIPI_D1P
MIPI_D1N	7	8	GND
MIPI_D2P	9	10	MIPI_D2N
CAM_RST#	11	12	MIPI_D3P
MIPI_D3N	13	14	GND
MIPI_CKLP	15	16	MIPI_CLKN
GND	17	18	I2C_CLK
I2C_DAT	19	20	CAM_PWR#
CAM_MCK	21	22	NC
NC	23	24	NC
GND	25	26	NC
NC	27	28	GND
NC	29	30	NC
NC	31	32	NC
NC	33	34	GND
NC	35	36	NC
NC	37	38	NC
NC	39		

2.2.2.1.12. BAT

Description	Pin
BAT	1
GND	2

2.2.2.1.13. USB2

Description	Pin	Pin	Description
+5V_USB	1	2	GND
USB_P1M	3	4	GND
USB_P1P	5	6	USB_P2P
GND	7	8	USB_P2M
GND	9	10	+5V_USB

2.2.2.1.14. **W_USB**

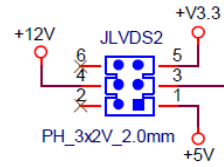
Description	Pin
+5V_USB	1
USB_P6M	2
USB_P6P	3
NC	4
NC	5
GND	6

2.2.2.1.15. **JLVDS1**

Description	Pin	Pin	Description
LVDS0_D3+	1	2	LVDS0_D3-
LVDS0_D2+	3	4	LVDS0_D2-
LVDS0_D1+	5	6	LVDS0_D1-
LVDS0_D0+	7	8	LVDS0_D0-
LVDS1_D3+	9	10	LVDS1_D3-
LVDS1_D2+	11	12	LVDS1_D2-
LVDS1_D1+	13	14	LVDS1_D1-
LVDS1_D0+	15	16	LVDS1_D0-
GND	17	18	+VDD_LVDS(3V/5V/12V)
+VDD_LVDS(3V/5V/12V)	19	20	+VDD_LVDS(3V/5V/12V)
GND	21	22	3.3V
GND	23	24	GND
GND	25	26	LVDS0_CLK+
LVDS0_CLK-	27	28	GND
GND	29	30	GND
I2C_CLK	31	32	Back Light Enable
Back Light Control	33	34	LVDS1_CLK+
LVDS1_CLK-	35	36	+12V
+12V	37	38	+12V
NC	39	40	I2C_DAT

2.2.2.1.16. JLVD52 (LVDS panel power selects)

Description	Pin
+3.3V	5-3
+5V	1-3
+12V	4-3



2.2.2.1.17. I2C1

Description	Pin
+3.3V	1
I2C4_SCL	2
I2C4_SDA	3
GND	4

2.2.2.1.18. SD1

Description	Pin	Pin	Description
DATA2	1	2	DATA3
CMD	3	4	+3.3V
CLK	5	6	GND
DATA0	7	8	DATA1
Card Detect	SWA	SWB	GND

2.2.2.1.19. DCIN1

Description	Pin
+12V input	1
GND	2

2.2.2.1.20. DCIN2

Description	Pin
GND	1
+12V	2

2.2.2.1.21. PWR_ON1

Description	Pin
PWR_ON1	1
GND	2

2.2.2.1.22. RESET1

Description	Pin
RESET button	1
GND	2

2.2.2.1.23. CN1

Description	Pin
+3.3V	1
CS	2
CLK	3
TX	4
RX	5
GND	6

2.2.2.1.24. HDMI2

Description	Pin	Pin	Description
HDMI1_DATA2+	PA1	PA2	GND
HDMI1_DATA2-	PA3	PA4	HDMI1_DATA1+
GND	PA5	PA6	HDMI1_DATA1-
HDMI1_DATA0+	PA7	PA8	GND
HDMI1_DATA0-	PA9	PA10	HDMI1_CLK+
GND	PA11	PA12	HDMI1_CLK-
HDMI1_CEC	PA13	PA14	NC
HDMI1_DDC_CLK	PA15	PA16	HDMI1_DDC_DAT
GND	PA17	PA18	+5V_HDMI
HDMI1_HPD	PA19		
HDMI2_DATA2+	PB1	PB2	GND
HDMI2_DATA2-	PB3	PB4	HDMI2_DATA1+
GND	PB5	PB6	HDMI2_DATA1-
HDMI2_DATA0+	PB7	PB8	GND
HDMI2_DATA0-	PB9	PB10	HDMI2_CLK+
GND	PB11	PB12	HDMI2_CLK-
HDMI2_CEC	PB13	PB14	NC
HDMI2_DDC_CLK	PB15	PB16	HDMI2_DDC_DAT
GND	PB17	PB18	+5V_HDMI
HDMI2_HPD	PB19		

2.2.2.1.25. LAN12

Description	Pin	Pin	Description
LAN1_LED1	AL1	AL2	LAN1_LED2
LAN1_MDI0+	AR1	AR2	LAN1_MDI0-
LAN1_MDI1+	AR3	AR4	LAN1_MDI1-
CAP	AR5	AR6	GND
LAN1_MDI2+	AR7	AR8	LAN1_MDI2-
LAN1_MDI3+	AR9	AR10	LAN1_MDI3-
LAN1_ACT-	AL3	AL4	LAN1_ACT+
LAN2_LED1	BL1	BL2	LAN2_LED2
LAN2_MDI0+	BR1	BR2	LAN2_MDI0-
LAN2_MDI1+	BR3	BR4	LAN2_MDI1-
CAP	BR5	BR6	GND
LAN2_MDI2+	BR7	BR8	LAN2_MDI2-
LAN2_MDI3+	BR9	BR10	LAN2_MDI3-
LAN2_ACT-	BL3	BL4	LAN2_ACT+

2.2.2.1.26. MINIPCIE

Description	Pin	Pin	Description
NA	1	2	+3.3V
NA	3	4	GND
NA	5	6	+1.5V
CLK_REQ#	7	8	UIM_PWR
GND	9	10	UIM_DATA
CLK-	11	12	UIM_CLK
CLK+	13	14	UIM_RST
GND	15	16	UIM_VPP
NA	17	18	GND
NA	19	20	WIFI_DISABLE#
GND	21	22	PERST#
PCIE_RX-	23	24	+3.3V
PCIE_RX+	25	26	GND
GND	27	28	+1.5V
GND	29	30	MINIPCIE_SCL
PCIE_TX-	31	32	MINIPCIE_SDA
PCIE_TX+	33	34	GND
GND	35	36	USB_DM
GND	37	38	USB_DP

+3.3V	39	40	GND
+3.3V	41	42	NA
GND	43	44	NA
NA	45	46	NA
NA	47	48	+1.5V
NA	49	50	GND
NA	51	52	+3.3V

2.2.2.1.27. SIM

Description	Pin
GND	CD
SIM_VCC	C1
SIM_VPP	C2
SIM_DATA	C3
GND	C5
SIM_RST	C6
SIM_CLK	C7

2.2.2.1.28. USB1

Description	Pin
+5V_USB	1
USB_D1-	2
USB_D1+	3
GND	4
USB3_RX-	5
USB3_RX+	6
GND	7
USB3_TX-	8
USB3_TX+	9
+5V_USB	10
USB_D2-	11
USB_D2+	12
GND	13

2.2.2.1.29. OTG

Description	Pin
+5V_USB	1
USB-	2
USB+	3
GND	4
GND	5

2.2.2.1.30. SW2

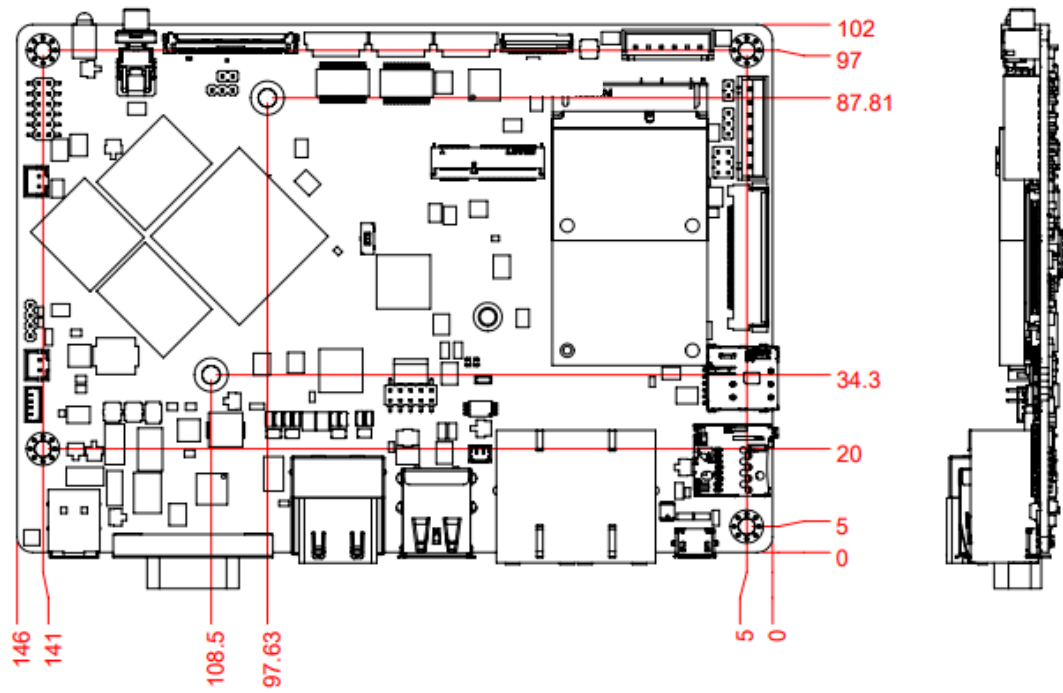
Description	Pin
ATX	1-2
AT	2-3

2.2.2.1.31. M2

Description	Pin	Pin	Description
GND	1	2	+3.3V
USB_DP	3	4	+3.3V
USB_DN	5	6	WLAN_LED#
GND	7	8	NA
SDIO_CLK	9	10	NA
SDIO_CMD	11	12	NA
SDIO_D0	13	14	NA
SDIO_D1	15	16	NA
SDIO_D2	17	18	GND
SDIO_D3	19	20	BT_WAKE#
WIFI_WAKE#	21	22	UART_RX
WIFI_REG_ON	23		Key
Key		32	
GND	33	34	UART_CTS#
NA	35	36	UART_RTS#
NA	37	38	NA
GND	39	40	NA
NA	41	42	NA
NA	43	44	NA
GND	45	46	NA
NA	47	48	NA
NA	49	50	RTC_CLK

GND	51	52	NA
NA	53	54	BT_DISABLE#
NA	55	56	WIFI_DISABLE#
GND	57	58	NA
NA	59	60	NA
NA	61	62	NA
GND	63	64	NA
NA	65	66	NA
NA	67	68	NA
GND	69	70	NA
NA	71	72	+3.3V
NA	73	74	+3.3V
GND	75		

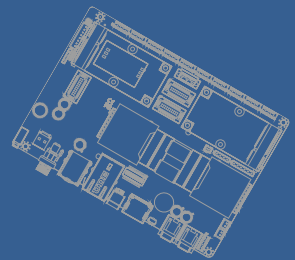
2.3. Mechanical Drawing



Chapter 3

Software User Guide

This chapter details the operation system on NEXCORE Q116.



3. Software User Guide

3.1. Introduction

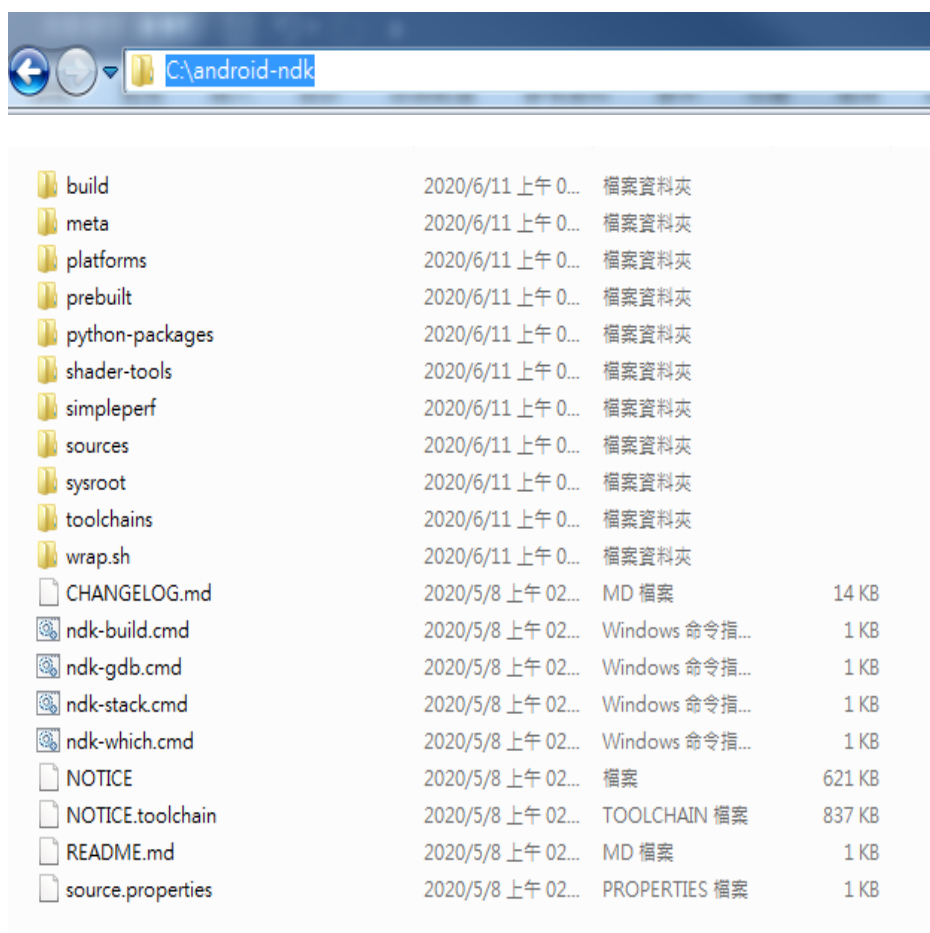
This chapter details the NexCore Q116 platform. The platform is an embedded system with Linux kernel 4.4. It contains all system-required shell commands and drivers ready. User can develop under Linux environment. Such as Ubuntu, Debian, Fedora...etc.

The purpose of this chapter is to introduce software development of NEXCORE Q116 and improve software development time and efficiency.

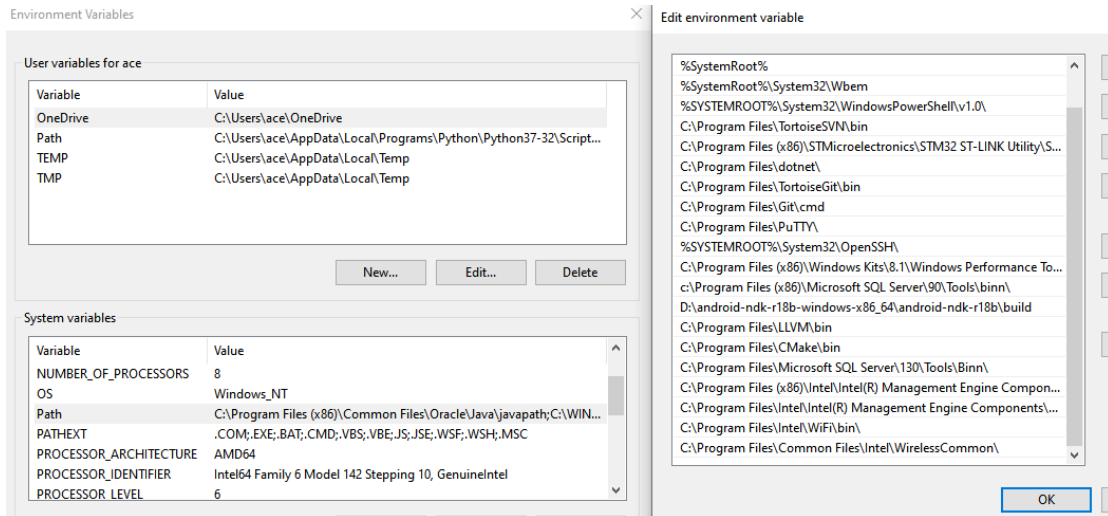
3.2. Development Environment

3.2.1. How to Install Toolchain

1. Please Download the NDK for Windows OS from [Link](#).
2. Extract zip file to target folder. (For example: C:\android-ndk\)



3. Add toolchain path in your \$PATH environment variable.



4. Download Example from github. (TBD)

5. Run ndk-build.

```
D:\NEXCOM\BEC-3399\Example\hello>ndk-build
Android NDK: APP_PLATFORM not set. Defaulting to minimum supported version android-16.
Android NDK: WARNING: APP_PLATFORM android-16 is higher than android:minSdkVersion 1 in ./AndroidManifest.xml. NDK binaries will *not* be compatible with devices older than android-16. See https://android.googlesource.com/platform/ndk/+master/docs/user/common_problems.md for more information.
[arm64-v8a] Compile      : hello <= hello.c
[arm64-v8a] Executable   : hello
[arm64-v8a] Install     : hello => libs/arm64-v8a/hello
[x86_64] Compile        : hello <= hello.c
[x86_64] Executable     : hello
[x86_64] Install       : hello => libs/x86_64/hello
[armeabi-v7a] Compile thumb : hello <= hello.c
[armeabi-v7a] Executable   : hello
[armeabi-v7a] Install     : hello => libs/armeabi-v7a/hello
[x86] Compile           : hello <= hello.c
[x86] Executable        : hello
[x86] Install           : hello => libs/x86/hello
```

3.2.2. RS232 Debug Console

3.2.2.1.1. Debug Console Information

The serial communication parameters are **115200, N81, VT100**. Use your preferred serial terminal tools to access the RS232 debug console.

RS232 Utility recommend:

- ➔ On Windows system, use **putty** or **teraterm**.
- ➔ On Linux/OSX system, use **minicom** utility.

3.2.2.1.2. Debug Console Device Node

RS232 Port	Device node	Pinout Define Section
COM1	/dev/ttyFIQ0	2.3.2.1.3

3.2.2.1.3. Boot Message

```
[ 13.910631] type=1400 audit(13.903:26): avc: denied { open } for pid=332 comm="B
nder:332_1" path="/proc/584/cmdline" dev="proc" ino=18140 scontext=u:r:mediaserver:s
0 tcontext=u:r:system_server:s0 tclass=file permissive=1
[ 13.960794] sdcardfs version 2.0
[ 13.960898] sdcardfs: dev_name -> /data/media
[ 13.961098] sdcardfs: options -> fsuid=1023, fsgid=1023, multiuser, mask=6, userid=0,
gid=1015
[ 13.961300] sdcardfs: mnt -> ffffffff058632fe0
[ 13.961359] sdcardfs: mounted on top of /data/media type ext4
[ 13.962876] sdcardfs version 2.0
[ 13.962985] sdcardfs: dev_name -> /data/media
[ 13.962990] sdcardfs: options -> fsuid=1023, fsgid=1023, multiuser, mask=23, userid=0,
, gid=9997
[ 13.962996] sdcardfs: mnt -> ffffffff0586ea720
[ 13.963026] sdcardfs: mounted on top of /data/media type ext4
[ 13.965683] sdcardfs version 2.0
[ 13.965721] sdcardfs: dev_name -> /data/media
[ 13.965730] sdcardfs: options -> fsuid=1023, fsgid=1023, multiuser, mask=7, userid=0,
gid=9997
[ 13.965741] sdcardfs: mnt -> ffffffff0584dce20
[ 13.965849] sdcardfs: mounted on top of /data/media type ext4
[ 15.224783] dwhdmi-rockchip ff940000.hdmi: Rate 0 missing; compute N dynamically
[ 15.394214] init: cannot find '/system/bin/glgps' (No such file or directory), di
sabling 'gpsd'
[ 15.395088] init: Starting service 'exec 6 (/system/bin/bootstat)'...
[ 15.406226] init: Service 'exec 6 (/system/bin/bootstat)' (pid 1045) exited with
status 0
[ 15.406519] init: Starting service 'exec 7 (/system/bin/bootstat)'...
[ 15.418089] init: Service 'exec 7 (/system/bin/bootstat)' (pid 1046) exited with
status 0
[ 15.418343] init: Starting service 'exec 8 (/system/bin/bootstat)'...
[ 15.432134] init: Service 'exec 8 (/system/bin/bootstat)' (pid 1047) exited with
status 0
[ 15.432393] init: Starting service 'exec 9 (/system/bin/bootstat)'...
[ 15.446789] init: Service 'exec 9 (/system/bin/bootstat)' (pid 1048) exited with
status 0
[ 18.315379] init: Service 'bootanim' is being killed...
[ 18.346317] init: Service 'bootanim' (pid 273) killed by signal 9
```


3.2.3. Networking Settings

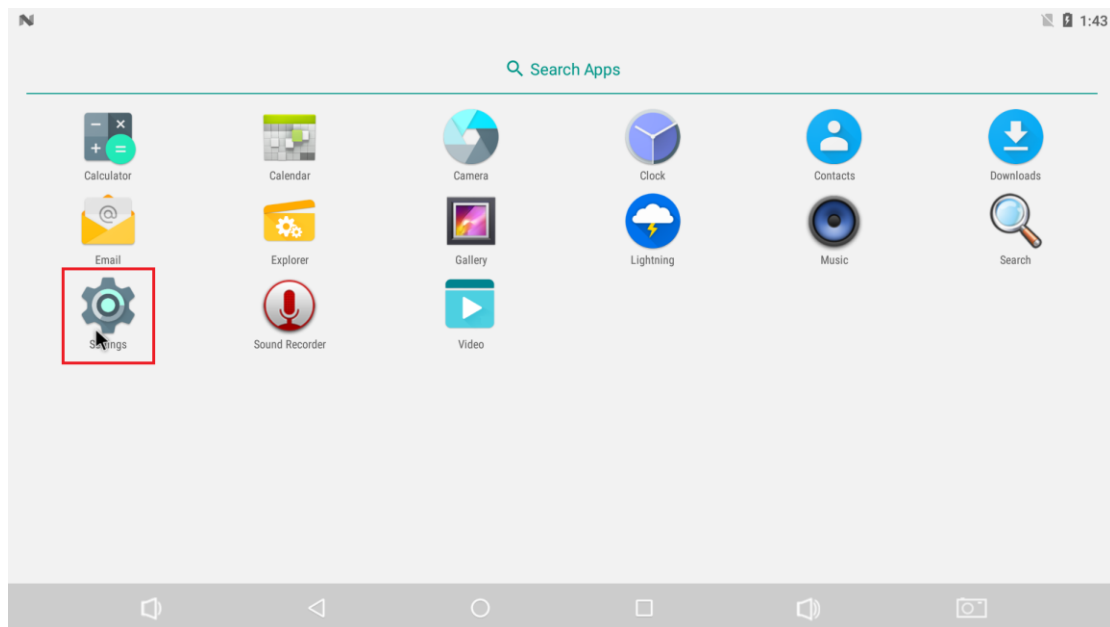
The NEXCORE Q116 has one Ethernet port, the default network setting is following:

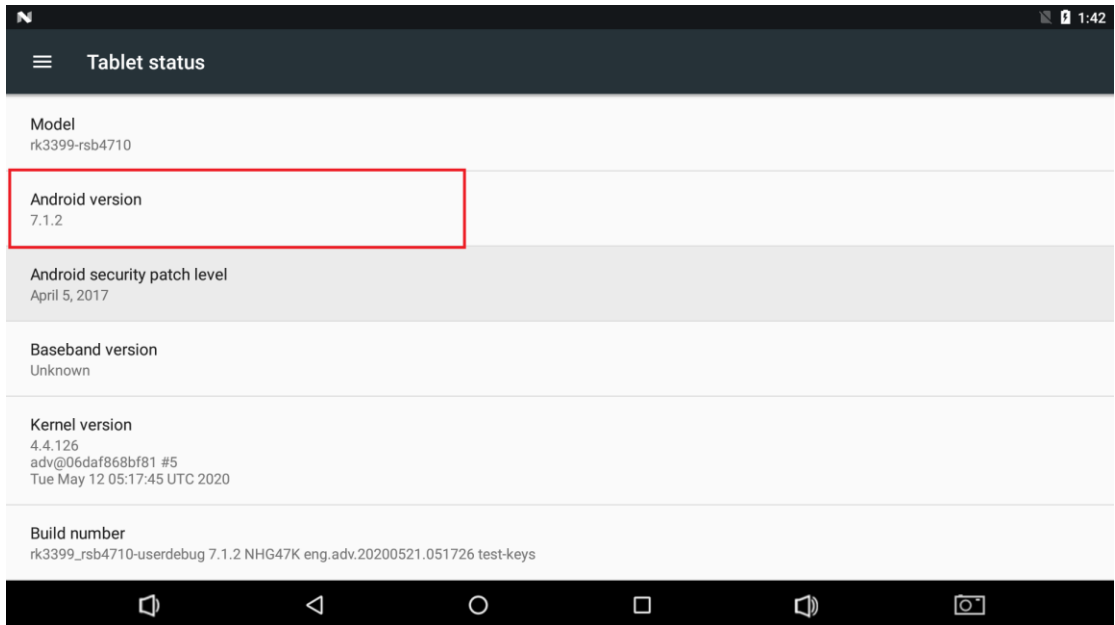
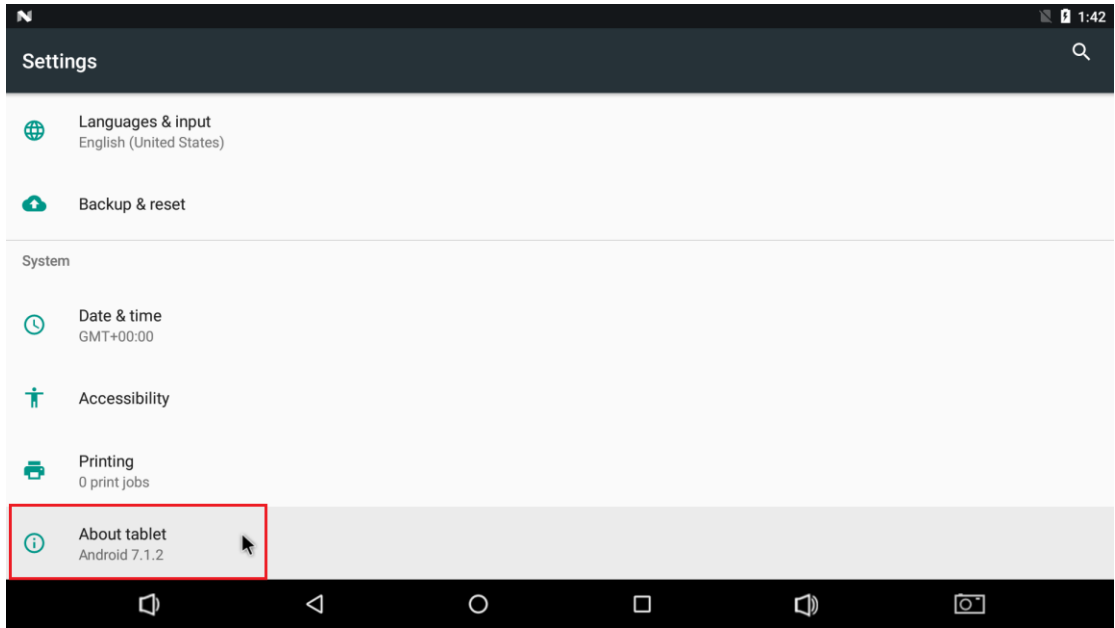
Device Node	IP mode
Eth0	DHCP
Eth1	DHCP

3.2.4. Firmware Version

3.2.4.1.1. Android Version

Android Version can be found under **Settings -> About Tablet -> Android version**





3.2.5. eMMC Default Partitions

Device Node	Size	Format	Discuses
mmcblk0p1	3GB	Ext4	Main system. (Sync all data and metadata every 5 seconds) PATH: /
mmcblk0p2	32MB	Ext4	User Space. PATH: /media/mmcblk0p2
mmcblk0p3	1 byte		N/A
mmcblk0p5	1KB		N/A
mmcblk0p6	1KB		N/A
mmcblk0p7	1KB		N/A
mmcblk0p8	1KB		N/A
mmcblk0p9	512MB	VFAT	User Space. PATH: /media/mmcblk0p9
mmcblk0p10	90MB	VFAT	Boot Images: Kernel, DTB, Boot-Env PATH: /boot or /media/mmcblk0p10

3.3. Interface Introduce

3.3.1. RS232

3.3.1.1.1. RS232 Interface

2 RS232 serial ports for user interface control, and all RS232 ports are DTE mode.

The pinout direction please refer below table:

Name	Abbreviation	Direction
Transmitted Data	TXD	Output
Received Data	RXD	Input
Clear to Send	CTS	Input
Request to Send	RTS	Output
Data Set Ready	DSR	Input
Data Terminal Ready	DTR	Output
Data Carrier Detect	DCD	Input
Ring Indicator	RI	Input
Common Ground	GND	Common

3.3.1.1.2. RS232 Specification

Name	Value
Baud Rate	Up to 250Kbps
Data Bits	5, 6, 7, 8 bits
Parity	None, Even, Odd, Mark, Space
Stop Bits	1, 1.5, 2 bits

3.3.1.1.3. RS232 Device Node

Connector	Device node	Pinout Define Section
COM2	/dev/ttyUSB0	2.3.2.1.4
COM3	/dev/ttyUSB1	2.3.2.1.5

3.3.1.1.4. RS232 Sample Code

http://github.com/embux/Example/tree/master/serial_test(TBD)

3.3.2. RS422/485

3.3.2.1.1. RS422/485 Information

2 x RS422/485 serial ports for user interface control.

3.3.2.1.2. RS422/485 Specification

Name	Value
Baud Rate	Up to 250Kbps
Data Bits	5, 6, 7, 8 bits
Parity	None, Even, Odd, Mark, Space
Stop Bits	1, 1.5, 2 bits

3.3.2.1.3. RS422/485 Device Node

Connector	Device node	Pinout Define Section
COM4	/dev/ttyUSB2	2.3.2.1.6
COM5	/dev/ttyUSB3	2.3.2.1.7

3.3.2.1.4. RS422/485 Sample Code

http://github.com/embux/Example/tree/master/J485_test (TBD)

3.3.3. RTC & Watchdog (Not Ready)

3.3.3.1.1. RTC & Watchdog Information

A real-time clock (RTC) keeps track of the current time, and NexCore Q116 will synchronize hardware clock to system clock when boot.

Watchdog timer, during normal operation, the computer regularly resets the watchdog timer to prevent it from elapsing, or "timing out". If, due to a hardware fault or program error, the computer fails to reset the watchdog, the timer will elapse and generate a timeout signal.

3.3.3.1.2. RTC & Watchdog Specification

Name	Value
RTC Frequency Tolerance	5 ± 23 ppm
Watchdog	0.5 ~ 128 seconds (unit: 0.5s)

* Equivalent to 1 minute of monthly deviation.

3.3.3.1.3. RTC & Watchdog Device Node

Device	Device node
RTC	/dev/rtc0
Watchdog	/dev/watchdog

3.3.3.1.4. RTC & Watchdog Example

Example Code:

<https://github.com/embux/Example/tree/master/watchdog> (TBD)

Example Commands:

#1: show RTC time.

```
root@rk3399:~# hwclock
Tue Aug 7 03:47:34 2018 0.000000 seconds
```

#2: Set the System Time from the Hardware Clock.

```
root@rk3399:~# hwclock -s
```

#3: Set the Hardware Clock to the current System Time.

```
root@rk3399:~# hwclock -w
```

3.3.4. I2C bus (Inter-Integrated Circuit)

3.3.4.1.1. I2C bus Information

The bus is intended for communication between different ICs. It consists of two lines: a bidirectional data signal (SDA) and a clock signal (SCL).

3.3.4.1.2. I2C bus Specification

Name	Value
I2C Clock Speed	100 ~ 400 kHz
I2C pull up resistor	4.7k

3.3.4.1.3. I2C bus Device Node

Connector	Device node	Pinout Define Section
J12C (I2C2)	/dev/i2c-1	2.2.2.1.17

3.3.4.1.4. I2C bus Example

Example Code:

https://github.com/embux/Example/tree/master/i2c_example (TBD)

Example Commands:

#1: Detect I2C1 ID:

```
root@ICM-3011:~# i2cdetect 0
WARNING! This program can confuse your I2C bus, cause data loss and worse!
I will probe file /dev/i2c-0.
I will probe address range 0x03-0x77.
Continue? [Y/n] y
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
10:  --  --  --  --  --  --  --  --  --  --  --  --  UU  --  --  --
20:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
30:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
40:  UU  UU  --  --  --  --  --  --  --  --  --  --  --  --  --  --
50:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
60:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
70:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
```

#2: Detect I2C2 ID:

```
root@ICM-3011:~# i2cdetect 1
WARNING! This program can confuse your I2C bus, cause data loss and worse!
I will probe file /dev/i2c-1.
I will probe address range 0x03-0x77.
Continue? [Y/n] Y
   0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
10:  UU  --  --  --  --  --  --  --  --  --  --  --  UU  --  --  --
20:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
30:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
40:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
50:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
60:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
70:  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --  --
```


3.3.5. Audio

3.3.5.1.1. Audio Information

NexCore Q116 supports full Advanced Linux Sound Architecture (ALSA), that is a software framework and part of the Linux kernel that provides an application programming interface (API) for sound card device drivers.

3.3.6. Display

3.3.6.1.1. Display Information

NexCore Q116 provides 2 x HDMI, 1 x eDP and 1 x LVDS interface.