CINDUEL
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CDHX-R140 V1.0.1 Embedded Development Board

Hardware manual

Version number: V1.1

October 2022

Statement

Before using the product, please read the manual in detail, and then the operation of the motherboard, for any improper installation, the use of direct, indirect, intentional or unintentional serious damage and hidden problems are not responsible.

No free warranty for products that are one of the following:

● Exceeding the warranty service period;

● No valid purchase documents;

● Into the liquid, moisture or mold;

● Failure and damage caused by non-product quality reasons such as dropping, strong vibration or unauthorized alteration or misuse after purchase;

●Damage caused by force majeure.

Before ordering the product, please ask the dealer to understand in detail whether the product performance meets your needs to avoid unnecessary trouble for both sides.

The Company reserves the right to amend the manual without notice.

Product usage recommendations

- Before using the product, be sure to read the product manual carefully.

- The products that are not used are kept in anti-static protective bags as much as possible.

- Before taking the product from the bag, you should place your hand on a grounded metal object for a while to release the static electricity from your body and hands.

- When holding a product and should get into the habit of only touching its edge part.

- When the product is connected to the power supply, please confirm the power supply voltage.

- To avoid electric shock to human body or damage to the product, turn off the AC power or disconnect the AC power cord from the power outlet each time the product is unplugged or reconfigured.

- Please disconnect the power before moving the product.

- Disconnect the power before connecting or disconnecting any equipment.

- To avoid unnecessary damage to the product caused by frequent switching on and off, you should wait at least a few moments before turning on the product after turning it off.

- If there is any abnormality during the use of the equipment, please find professional staff to deal with it.

- The product may cause radio interference. It may be necessary for the user to take practical measures against its interference.

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Document Modification History

Model:	CDHX-R140		PCBA No	CDHX-RB30	
Preparation:			**Audit**	**Electronic**	
				Software	
Version change log					
Versions	**Date**	**Page**	**Note**		**Audit**
V1.0	2022-10-10		Update the labeling chart and silkscreen		

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Catalog

1、 **Product Overview**

Processor	ARM® hexa-core 64-bit processor with up to 1.8GHz Based on big.LITTLE large and small core architecture, dual-core Cortex-A72 (large core) + quad-core Cortex-A53 (small core)
Graphics Processor	ARM® Mali-T860 MP4 Quad-Core GPU Support OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11 AFBC (frame buffer compression) support
Video Processor	Supports 4K VP9 and 4K 10bits H265/H264 video decoding at up to 60fps Support 1080p@180fps H.264 decoding Support 1080p@90fps H.264 decoding 1080P multi-format video decoding (WMV, MPEG-1/2/4, VP8) 1080P video encoding, support H.264, VP8 format Video post-processor: anti-interlacing, noise removal, edge/detail/color optimization
NPU	Up to 9TOPs for INT8/300 GOPs for INT16/100GFLOPs for FP16 Support IN8/INT16/FP16 Support for TensorFlow, Caffe, ONNX and Darknet models
Memory	4GB Dual Channel 64Bit DDR
Memory	32GB high-speed eMMC 5.1
Application Scenarios	AI edge computing scenarios

2、 **Product hardware features**

Product Hardware Features	
Display Interface	**Video output interface:** **- 1 x HDMI 2.0 , support 4K@60fps output, support HDCP 1.4/2.2** **- 1 x HDMI-IN, supports 1080p@60fps input (optional)**
Audio	**1 x HDMI audio output** **1 x MIC audio input** **1 x headphone jack for audio output**
Network	**2 x RJ45 Dual Gigabit Ethernet ports** **-WiFi 2.4GHz/5GHz dual-band (supports 802.11a/b/g/n/ac protocol, 2x2 MIMO technology)** **- Bluetooth 4.1 (BLE support)** **On-board 3G/4G LTE (Mini-PCIe interface) module (optional):** **- Support WCDMA, EVDO, 4G full network access**
USB	**1 x USB3.0** **4 x USB2.0**
Serial port	**1 x RS485** **4 x RS232 (optional 4 TTL levels)** **1 x RS232 (debug serial port)**
System Watchdog	**Software Watchdog**
Other interfaces	**8 x GPIO**
RTC	**Built-in RTC real-time clock (supports timed on/off)**
System	**Android 7.1/Linxu file system (Kirin, Gaze, UBUNTU, Debian)**
Power supply	**Input voltage 12V, wide voltage design, support 9-24V**
Size	**180x140x52 (mm)**

3、 **Product size drawing**

4、 **Product physical picture**

5、 Product Interface Definition

1、GPIO:(24PIN Felix terminal), unmarked pins are empty

gpio output operation command (GPIO receive and output voltage is 3.3V, cannot be used above this voltage):

echo 135 > /sys/class/gpio/export

echo out > /sys/class/gpio/gpio135/direction Configure as output state

echo 1 > /sys/class/gpio/gpio135/value Control 3PIN seat output high (3.3V)

echo 0 > /sys/class/gpio/gpio2/value Control 3rd PIN holder output low (3.3V)

gpio output operation command (GPIO receive and output voltage is 3.3V, cannot be used above this voltage):

echo 135 > /sys/class/gpio/export

echo in > /sys/class/gpio/gpio135/direction Configure as output state

cat /sys/class/gpio/gpio135/value Read the 3rd PIN seat input high (3.3V) and read the result as 1, input low (0V) and read the result as 0

GPIO system number	Pin		GPIO system number
GND	1	2	VCC_3V
135	3	4	131
125	5	6	132
126	7	8	133
55	9	10	134
ACD_IN2	11	12	ACD_IN2
RST (reset function)	13	14	Recovery (system upgrade function)
GND	15	16	GND
TX3 (/dev/ttyVIZ2)	17	18	TX4 (/dev/ttyVIZ3)
RX3 (/dev/ttyVIZ2)	19	20	RX4 (/dev/ttyVIZ3)

2, COMDB debug serial port use method, first use the USB to 232 female debug serial port connection cable.

Open the serial port debugging tool, find the correct serial port number and set the parameters as follows:
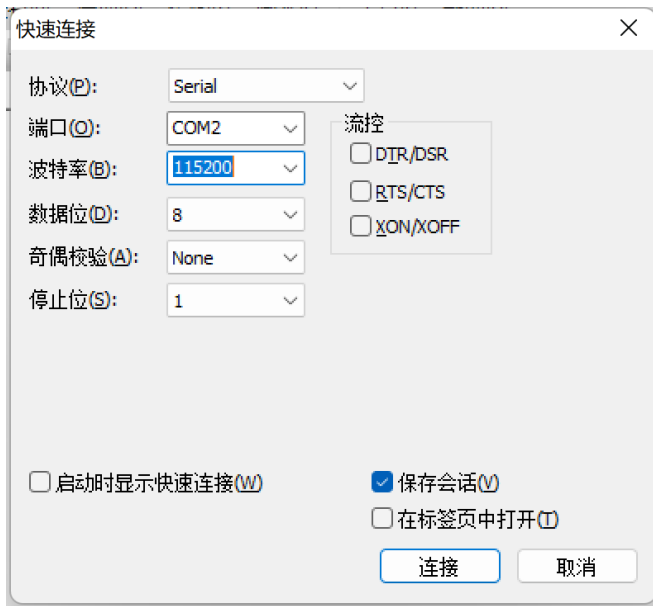
The corresponding serial port nodes are as follows:

Serial port silkscreen number	System Node Number
COM1	/dev/ttyVIZ0
COM2	/dev/ttyVIZ1
RS485	/dev/ttyS4
TX3, RX3	/dev/ttyVIZ2
TX4, RX4	/dev/ttyVIZ3

6、 **Transportation, storage, use conditions**

1. Storage environment: anti-static, moisture-proof, anti-accumulation

2. Input voltage: DC 12V

3. RTC coin cell: 3.0V (lithium)

4. Working ambient temperature: 0 ~ 60℃

5. Relative humidity: 20% ~ 70%

6. Storage environment temperature: -20~ 60℃

This SPEC may not fully reflect all the latest changes to the product, the actual product shall prevail