

Oplayer3399 OPS Player



User Manual

Version: 1.2

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Revision History:

No.	Version	Description	Date
1	V1.0	First release	Oct. 23, 2022
2	V1.1	Supplemented the pinout description of the JAE connector	Jul. 14, 2023
3	V1.2	Added the use of the serial port	Nov. 14, 2023

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Foreword

Thank you for purchasing Oplayer3399 OPS Player (“the Device” or “the Product”). This manual intends to provide guidance and assistance necessary on setting up, operating or maintaining the Product. Please read this manual and make sure you understand the structure and functionality of the Product before putting it into use.

Intended Users

This manual is intended for:

- Operator of the Product
- Technical support engineers
- Other users

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It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without notice.

Technical Support and Assistance

Should you have any question about the Product that is not covered in this manual, contact your sales representative for solution. Please contain the following information in your question:

- Product name and PO number;
- Complete description of the problem;
- Error message you received, if any.

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Regulatory Information

The Product is designed to comply with:

- CE
- FCC
- CCC

Please refer to the Appendix for Regulatory Compliance Statement.

Symbology

This manual uses the following signs to prompt users to pay special attention to relevant information.

	Caution for latent damage to system or harm to personnel
	Attention to important information or regulations

General Safety Instructions

The Product is supposed be installed by knowledgeable, skilled persons familiar with local and/or international electrical codes and regulations. For your safety and prevention of damage to the Product and other equipment connected to it, please read and observe carefully the following safety instructions prior to installation and operation. Keep this manual well for future reference.

- Do not disassemble or otherwise modify the Product. Such action may cause heat generation, ignition, electronic shock, or other damages including human injury, and may void your warranty.
- Keep the Product away from heat source, such as heater, heat dissipater, or engine casing.
- Do not insert foreign materials into any opening of the Product as it may cause the Product to malfunction or burn out.
- To ensure proper functioning and prevent overheating of the Product, do not cover or block the ventilation holes of the Product.
- Follow the installation instructions with the installation tools provided or recommended.
- The use or placement of the operation tools shall comply with the code of practice of such tools to avoid short circuit of the Product.
- Cut off the power before inspection of the Product to avoid human injury or product damage.

Precautions for Power Cables and Accessories

-  Use proper power source only. Make sure the supply voltage falls within the specified range. The Product is designed to use 12V~24V DC. Always check whether the Product is DC powered before applying power.
-  Place the cables properly at places without extrusion hazards.
-  Use only approved antenna(s). Non-approved antenna(s) may produce spurious or excessive RF transmitting power which may violate FCC limits.
-  Cleaning instructions:
 - Power off before cleaning the Product
 - Do not use spray detergent
 - Clean with a damp cloth
 - Do not try to clean exposed electronic components unless with a dust collector
-  Power off and contact Vantron technical support engineer in case of the following faults:
 - The Product is damaged
 - The temperature is excessively high
 - Fault is still not solved after troubleshooting according to this manual
-  Do not use in combustible and explosive environment:
 - Keep away from combustible and explosive environment
 - Keep away from all energized circuits
 - Unauthorized removal of the enclosure from the device is not allowed
 - Do not replace components unless the power cable is unplugged
 - In some cases, the device may still have residual voltage even if the power cable is unplugged. Therefore, it is a must to remove and fully discharge the device before replacement of the components.

CHAPTER 1 INTRODUCTION

1.1 Product Overview

Conforming to Intel Open Pluggable Specification (OPS), Vantron Oplayer3399 OPS Player is powered by Rockchip RK3399 hex-core high-performance processor. Vantron Oplayer3399 offers a choice between 2GB memory and 4GB memory. Despite its energy efficiency, Oplayer3399 boasts rich interfaces, including HDMI with 4K UHD output, 3.5mm line out jack, USB 2.0 & 3.0 ports, RS232 and Ethernet jack, allowing for flexible connectivity with different peripherals.

Oplayer3399 can be easily connected to an OPS compliant display via the JAE TX24/25 plug connector which offers DisplayPort, HDMI, USB 2.0, USB 3.0, audio (Line-out), power input and UART signals. Such design greatly reduces space requirements and lowers deployment and maintenance costs.

Oplayer3399 is designed to be seamlessly installed on Vantron TMC series large-screen touch monitors to offer an overall digital signage solution, significantly saving customers' efforts and expenditures.

1.2 Product Feature

Oplayer3399

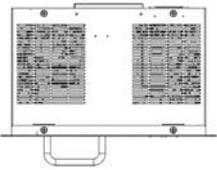
-  Rockchip RK3399 hex-core processor
-  Intel OPS compliant for flexible installation
-  Space saving
-  4K UHD output
-  Rich interfaces for expansion
-  Wi-Fi/BT/4G/ETH for communication
-  Android 10 system, Linux available
-  Micro USB, USB 2.0, USB 3.0

1.3 Terminology

Terminology	Description
NC	No connection
VCC	Voltage common collector
OC	Open collector
GND	Ground
/	Active low signal
+	Positive of difference signal
-	Negative of difference signal
I	Input
O	Output
I/O	Input/output
P	Power or ground
A	Analog
OC	Open collector output
CMOS	3.3 V CMOS
LVC MOS	Low Voltage CMOS
LVTTL	Low Voltage TTL
3.3V	3.3V signal level
5V	5V signal level
USB	Universal Serial Bus
CK/CLK	Clock (line)

1.4 Unpacking

The Product has been carefully packed with special attention to quality. However, should you find any component damaged or missing, please contact your sales representative in due time.

Standard accessories		Optional accessories	
	1 x Oplayer3399		1 x 12V DC Power adapter & power cord
	1 x Wi-Fi antenna		2 x 4G LTE antenna
	1 x Qualified certificate	/	/

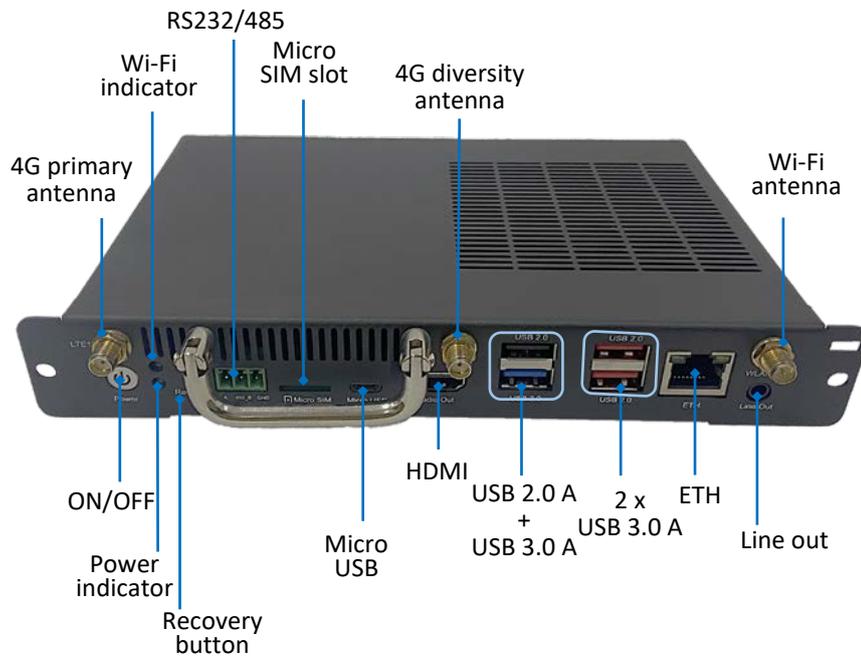
 *Actual accessories might vary slightly from the list above as the customer order might be different from the standard configuration options.*

1.5 Specifications

Oplayer3399		
System	CPU	Rockchip RK3399, dual-core ARM Cortex-A72 and quad-core ARM Cortex-A53 processor, 1.8GHz (Max.)
	GPU	Mali-G52
	Memory	2GB LPDDR4 (Optional: 4GB)
	Storage	16GB eMMC (Optional: 64GB)
Communication	Ethernet	1 x RJ45, 100/1000Mbps
	Cellular	4G LTE (Optional)
	Wi-Fi & BT	Wi-Fi 802.11 a/b/g/n/ac + BT 5.0
I/Os	Media	1 x HDMI 2.0 (4K @60Hz supported)
		1 x 3.5mm Line out jack
	USB	1 x USB 3.0 Type-A 3 x USB 2.0 Type-A
		1 x Micro USB 2.0 (USB 2.0 OTG supported)
	Serial port	1 x RS232/RS485
	SIM slot	1 x Micro SIM slot
	Antenna	2 x 4G LTE SMA connector 1 x Wi-Fi & BT SMA connector
	RTC	Supported
Watchdog timer	Supported	
JAE TX25	Display	1 x DP 1.2 (4K @60Hz supported)
		1 x HDMI 2.0 (4K @60Hz supported)
	USB	1 x USB 3.0 2 x USB 2.0
	Audio	1 x Line out
	UART	1 x 3.3V UART
Power	12V ~ 19V power input	
System Control	Button	1 x ON/OFF button 1 x Recovery button
	LED indicator	1 x Power indicator 1 x Wi-Fi indicator
Software	OS	Android 10 (Optional: Linux)
Power	Input	Power via the DC jack (12V ~ 24V 3A)
		Power via the OPS monitor (12V ~ 19V 3A)
Mechanical	Dimensions	200mm x 120mm x 30mm
	Heat dissipation	Heat sink
Environment Condition	Temperature	Operating: -10°C ~ +60°C Storage: -20°C ~ +70°C
	Humidity	Operating: 10%~85% RH (non-condensing)
		Storage: 5%~95% RH (non-condensing)
	Certification	CE, FCC, CCC

1.6 Product Layout

1.6.1 Front view



1.6.2 Back view

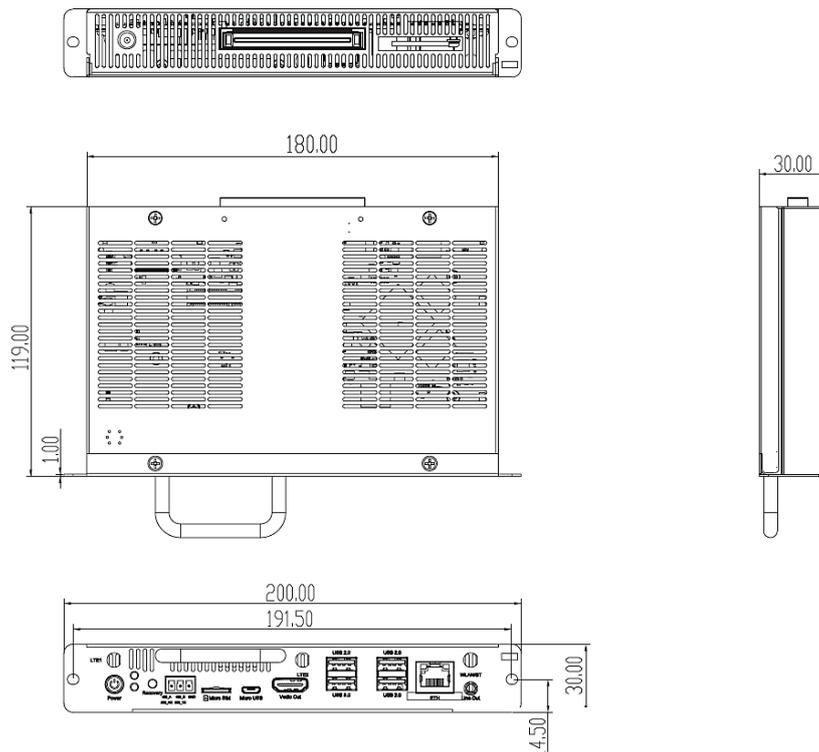


1.7 Operating System

Oplayer3399 runs Android 10 operating system and users also have the option for Linux distributions.

1.8 Mechanical Dimensions

- 200mm x 120mm x 30mm (With mounting frame)



1.9 Power Supply

Oplayer3399 is designed to work with 12V ~ 24V DC power input via the power jack on the back of the device or powered by 12V ~ 19V DC from the docking display via the pluggable connector.

CHAPTER 2 GETTING STARTED

2.1 Device Installation

Typically, Oplayer3399 is used with an OPS compliant display to offer a digital signage solution for users with 4K UHD output. The following steps use Vantron TMC550 55-inch touchscreen monitor to illustrate how to install Oplayer3399 to an OPS compliant display.

1. Carefully place Oplayer3399 into the opening of the TMC550 touchscreen monitor and make sure the JAE plug connector of Oplayer3399 is accurately aligned with the receptacle connector in the opening;



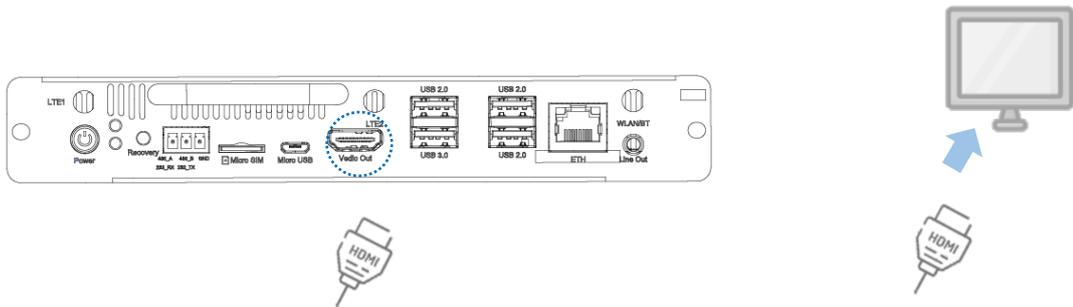
2. Plug the Oplayer3399 OPS player into the monitor;
3. Fix the player with two M4 screws.



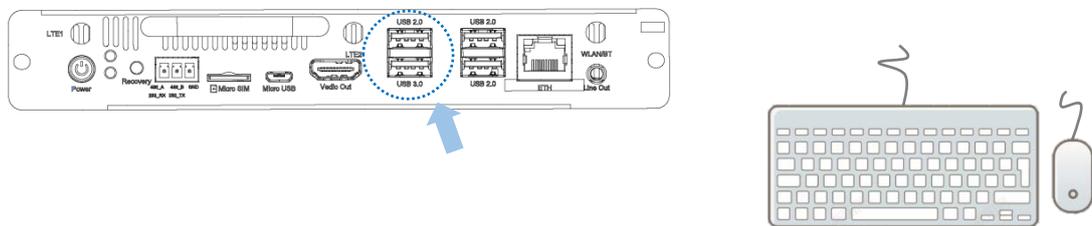
2.2 Using the Device

Oplayer3399 is also intended for independent use as a common industrial computer. To access the GUI of the device, follow the steps below to connect it to a mouse, keyboard and monitor.

1. Insert one end of an HDMI cable to the corresponsive interface of the device and the other end to a monitor;



2. Connect the mouse and keyboard to the USB ports on the device;



3. Power on the device using a 12V~24V DC power adapter;
4. The LED indicator of the ON/OFF button will turn solid red after power on, indicating it is in the sleep mode. A short press of the button will change the indicator to blue and wake up/boot the device to the operating system.

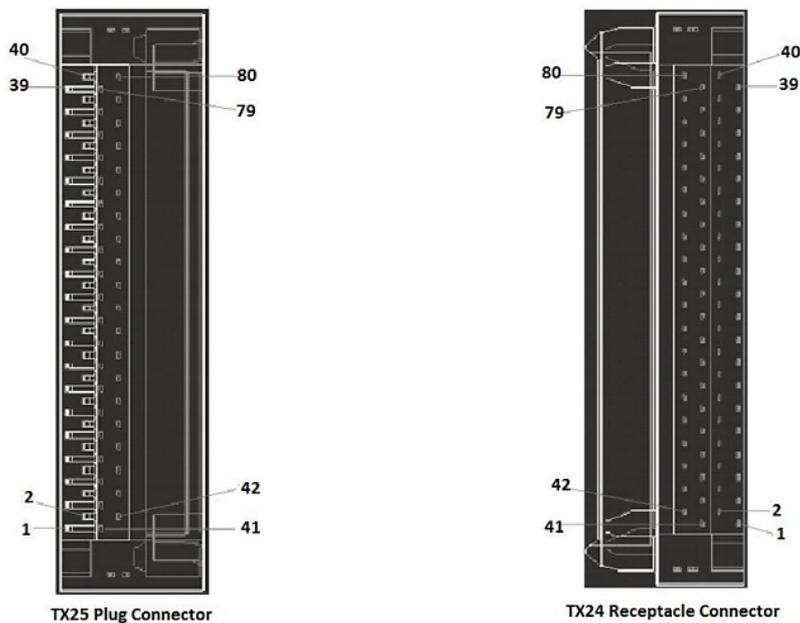
CHAPTER 3 HARWARE DESCRIPTION

This section briefs on the hardware definition and connector/jumper pinout.

3.1 JAE TX25 connector

The Open pluggable specification is based on the 80-pin board-to-board JAE TX25 plug connector and JAE TX24 receptacle connector which offer a diverse range of I/O signals that users can utilize for expansion purposes. The maximum current allowed on the pins is 1A.

Specification: 2 x 40, 1.27mm, 1A, Male, 9mm H, Right Angle, WDT, THR, RoHS



Pinout description:

Pin	Signal	Description	I/O Type
1	DDP_3N	DisplayPort	O
2	DDP_3P	DisplayPort	O
3	GND	Ground	-
4	DDP_2N	DisplayPort	O
5	DDP_2P	DisplayPort	O
6	GND	Ground	-
7	DDP_1N	DisplayPort	O
8	DDP_1P	DisplayPort	O
9	GND	Ground	-
10	DDP_0N	DisplayPort	O
11	DDP_0P	DisplayPort	O
12	GND	Ground	-

13	DDP_AUXN	DisplayPort	I/O
14	DDP_AUXP	DisplayPort	I/O
15	DDP_HPD	DisplayPort	I
16	GND	Ground	-
17	TMDS_CLK-	DVI-D	O
18	TMDS_CLK+	DVI-D	O
19	GND	Ground	-
20	TMDS0-	DVI-D	O
21	TMDS0+	DVI-D	O
22	GND	Ground	-
23	TMDS1-	DVI-D	O
24	TMDS1+	DVI-D	O
25	GND	Ground	-
26	TMDS2-	DVI-D	O
27	TMDS2+	DVI-D	O
28	GND	Ground	-
29	DVI_DDC_DATA	DVI-D	I/O
30	DVI_DDC_CLK	DVI-D	I/O
31	DVI_HPD	DVI-D	I
32	GND	Ground	-
33	+12V~+19V	Power	-
34	+12V~+19V	Power	-
35	+12V~+19V	Power	-
36	+12V~+19V	Power	-
37	+12V~+19V	Power	-
38	+12V~+19V	Power	-
39	+12V~+19V	Power	-
40	+12V~+19V	Power	-
41	RSVD	Reserved	NC
42	RSVD	Reserved	NC
43	RSVD	Reserved	NC
44	RSVD	Reserved	NC
45	RSVD	Reserved	NC
46	RSVD	Reserved	NC
47	RSVD	Reserved	NC
48	RSVD	Reserved	NC
49	RSVD	Reserved	NC

50	SYS_FAN	System Fan Control	O
51	UART_RXD	UART 3.3V	I
52	UART_TXD	UART 3.3V	O
53	GND	Ground	-
54	StdA_SSRX-	USB 3.0	I
55	StdA_SSRX+	USB 3.0	I
56	GND	Ground	-
57	StdA_SSTX-	USB 3.0	O
58	StdA_SSTX+	USB 3.0	O
59	GND	Ground	-
60	USB_PN2	USB	I/O
61	USB_PP2	USB	I/O
62	GND	Ground	-
63	USB_PN1	USB	I/O
64	USB_PP1	USB	I/O
65	GND	Ground	-
66	USB_PN0	USB	I/O
67	USB_PP0	USB	I/O
68	GND	Ground	-
69	AZ_LINEOUT_L	Audio-Lch	O
70	AZ_LINEOUT_R	Audio-Rch	O
71	CEC	Consumer Electronics Control	I/O
72	PB_DET	Pluggable Board Detect	O
73	PS_ON#	Pluggable Signal ON	I
74	PWR_STATUS	Power Good	OUT (OC)
75	GND	Ground	-
76	GND	Ground	-
77	GND	Ground	-
78	GND	Ground	-
79	GND	Ground	-
80	GND	Ground	-

3.2 Power jack

Oplayer3399 is designed to work with 12V ~ 24V DC power input via the power jack on the back of the device or powered by 12V~19V DC from the docking display via the pluggable connector.

Specification of the power jack: 2.0mm D, 6.5mm D, 5A, Male, RA, WDT, THR, RoHS



Pinout description:

Pin	Signal	Type	Description
1	+VDC	P	DC-IN POWER +
2	GND	P	Ground

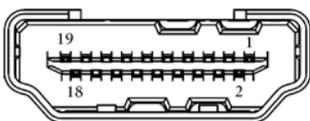
3.3 Ethernet jack

Oplayer3399 implements an RJ45 Ethernet jack, supporting 10M/100M/1000Mbps data rate. The Ethernet jack has two LED indicators to indicate the link/activity status of the network.

To connect the device to the Internet, connect one end of an Ethernet cable to the ethernet jack of the device and the other end to a 100-Base-T hub or 1000-Base-T hub.

3.4 HDMI (Video)

Oplayer3399 offers an HDMI 2.0 port (Type-A) with resolution up to 4096 x 2160 @60Hz for delivering high-definition video and high-resolution audio.



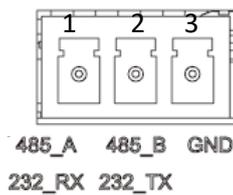
Pinout description:

Pin	Signal	Type	Description
1	HDMI_TXD2P_R	O	HDMI DATA
2	GND	P	Ground
3	HDMI_TXD2N_R	O	HDMI DATA

4	HDMI_TXD1P_R	O	HDMI DATA
5	GND	P	Ground
6	HDMI_TXD1N_R	O	HDMI DATA
7	HDMI_TXD0P_R	O	HDMI DATA
8	GND	P	Ground
9	HDMI_TXD0N_R	O	HDMI DATA
10	HDMI_TXCOP_R	O	HDMI CLK
11	GND	P	Ground
12	HDMI_TXCON_R	O	HDMI CLK
13	NC		NC
14	NC		NC
15	HDMI_DDC_SCL	I/O	HDMI DDC I2C CLK
16	HDMI_DDC_SDA	I/O	HDMI DDC I2C DATA
17	GND	P	Ground
18	VCC_HDMI	P	HDMI POWER +5V
19	HDMI_HPD	I	HDMI HOT PLUG DETECTION

3.5 Serial port

Oplayer3399 offers a serial port that operates in RS232 mode by default and can be easily switched to RS485 mode with a baud rate of 9600. Please refer to 4.5 for the commands to switch the serial modes.



Pinout description:

Pin	Signal	Type	Description
1	RS485_A/RS232_RX	I	RS485_A/RS232 receive data
2	RS485_B/RS232_TX	O	RS485_B/RS232 transmit data
3	GND	P	Ground

3.6 USB ports

Oplayer3399 implements three USB 2.0 Type-A ports and a USB 3.0 Type-A port ideally for connecting USB peripherals such as a keyboard, mouse, scanner, etc.

There is also a Micro USB port for connecting compact and mobile devices. It also supports USB 2.0 OTG for debugging the device.

3.7 Antenna connectors

There are three SMA antenna connectors on the enclosure. LTE1 and LTE2 are intended for connecting primary LTE antenna and diversity LTE antenna, respectively. The WLAN/BT connector is for connecting a Wi-Fi & Bluetooth antenna.

3.8 Recovery button

Oplayer3399 provides a recovery button for factory rest the device upon a short press of the button for about 3 seconds.

Specification: 7.3mm, 6.25mm H, WDT, SMT, RoHS

3.9 ON/OFF button

The ON/OFF button is designed to turn on/off the device when the device has power.

There is an LED indicator on the button to indicate the device status. The LED indicator will turn solid red after powering on, indicating it is in the sleep mode. A short press of the button will change the indicator to blue and boot/wake up the device to the operating system.

Indicator color	Description
Red	Sleep mode
Blue	Normal operation

3.10 Line out

Oplayer3399 provides a line out jack on the front panel for connecting an earphone or amplifier.

3.11 LED indicators

There are two LED indicators on the front panel with functions separately described as follows.

Indicator name	Location	Description
Wi-Fi indicator	Upper indicator	Turns solid green when there is wireless connection.
Power indicator	Lower indicator	Turns solid green when the device is running.

CHAPTER 4 SOFTWARE SETUP

4.1 Enable Developer Options

To enable Developer options of Oplayer3399, follow the steps below:

1. Connect the device to a mouse, a keyboard, and a monitor for easier operations;
2. After the system has booted, swipe up to access the application drawer;
3. Click **Settings > About <device>** in sequence;
4. Scroll down to **Build number**, and click it consecutively for at least 7 times to enable **Developer options**;
5. Go back to **Settings > System > Advanced > Developer options** and toggle on **USB debugging**, then you can customize the device settings.

 Depending on the Android version, the entry might vary slightly.

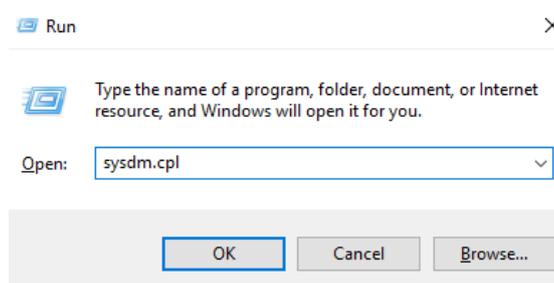
4.2 ADB Setup on the Windows Host

Android Debug Bridge (ADB) is a tool that is designed to connect your development workstation directly to your Android device for debugging, device upgrading, app installation, etc.

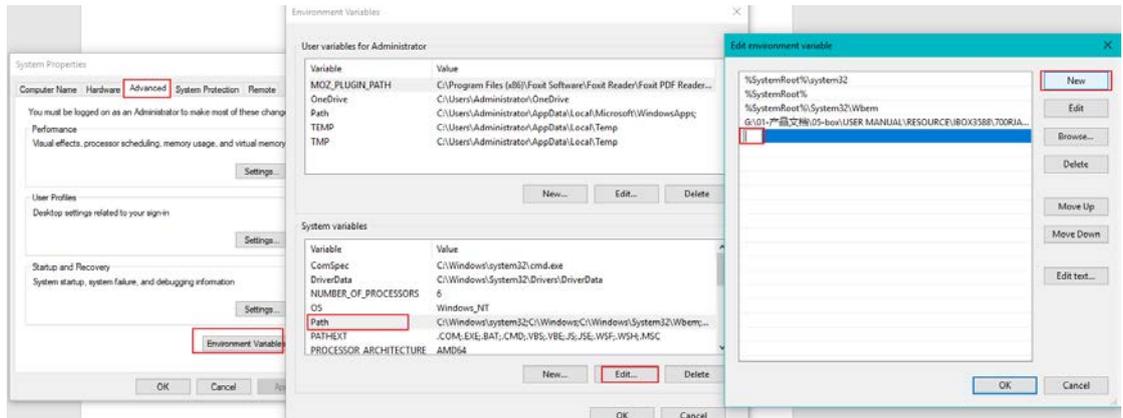
Adding the ADB executable file to the system's environment variable allows you to run the ADB tool regardless of your current working directory.

Follow the steps below to set up the ADB on the Windows host computer.

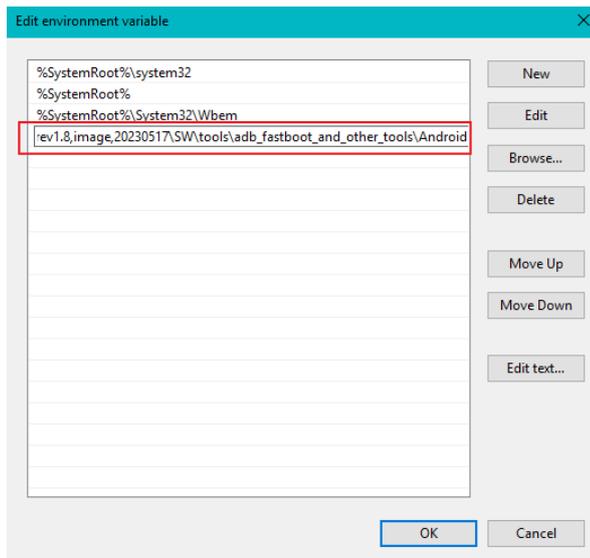
1. Unzip the software release package and navigate to the following directory: \SW;
2. Extract the **adb_fastboot** zip file that contains the adb tool and copy the folder path;
3. Press "Win + R" and input `sysdm.cpl` in the dialogue box to open the settings interface;



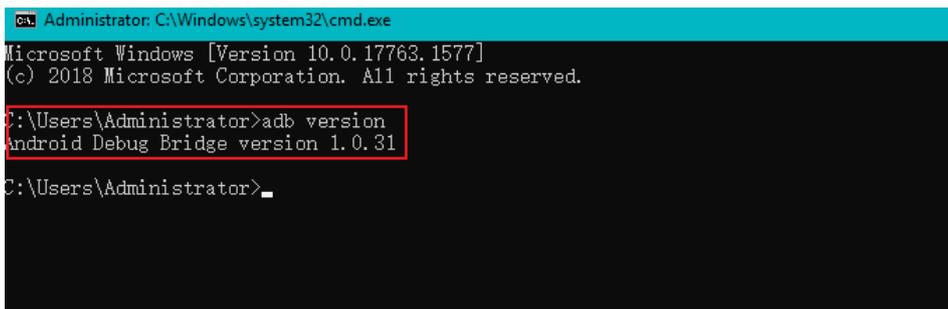
- Click in sequence **Advanced > Environment Variables > System Variables > Path > Edit**, and click **New** in the pop-up;



- Paste the folder path of the adb tool, and click **OK** one by one to confirm and exit the dialog;



- Press "Win + R" and input `cmd` in the dialogue box;
- Input `adb version` in the command prompt to check if the ADB tool is installed.



4.3 App Installation via ADB Commands

In addition to the standard pre-installed Android applications, users can install their own applications on the device provided that it runs Android system and the ADB tool kit is installed and accessible on the Windows host computer.

1. Follow the steps in 4.2 to finish ADB setup on the host computer;
2. Turn on Oplayer3399 and make sure the LED indicator on the ON/OFF button is blue;
3. Connect Oplayer3399 and the host computer via a Micro USB cable;
4. Press “Win + R” and input `cmd` in the dialogue box;
5. Input `adb devices -l` in the command prompt to check if the device is connected to the host computer;

```
C:\Users\Administrator>adb devices -l
List of devices attached
674cc0aaede7d049          device product:occam model:Nexus_4 device:mako transport_id:1
```

6. When the device information is displayed under the command, you can copy the serial number (squared as shown above) for the next-step use;
7. Input the following command line to install the app;

```
adb -s <serial number> install <APP path>
```

8. The installation will be executed after the command line is input and the result of installation will be displayed below;

```
C:\Users\Administrator>adb -s 674cc0aaede7d049 install "C:\Users\Administrator\Desktop\Libraries for developers_v3.83_apkpure.com.apk"
Performing Streamed Install
Success
```

9. The newly installed app will be displayed on the App drawer in the Alphabetic order.

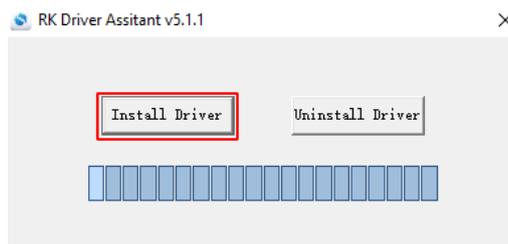
 *The screenshots are for illustration only and are not intended to represent the actual device number and other information of the device currently in your possession.*

 *In step 7 shown above, you can drag the .apk file from the local directory to the command line to replace the <App path> you typed in manually.*

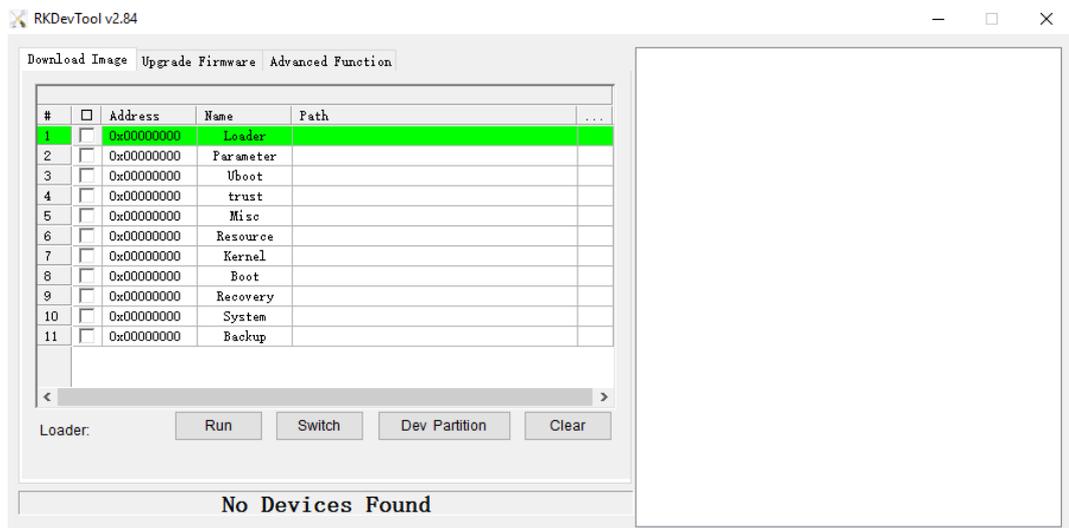
 *Make sure there is no special character in the app path. If you failed to install the apk, try using the absolute path of the .apk file enclosed in double quotation marks.*

4.4 Firmware Upgrade in Windows Environment

1. Follow the steps in 4.2 to finish ADB setup on the host computer;
2. Unzip the release package and open the directory of the upgrade driver (\SW\DriverAssitant_vxxx.zip);
3. Extract the upgrade driver;
4. Right click the mouse and run the driver **DriverInstall.exe** as administrator;
5. Click **Install Driver** and wait for the installation to complete;

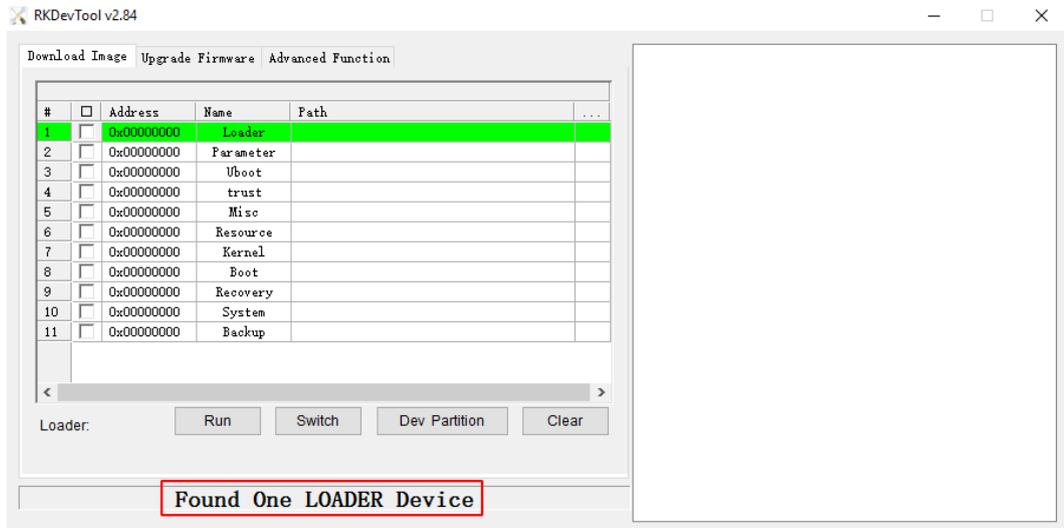


6. Open the directory of the upgrade tool (\SW\RKDevTool_Release_vxxx);
7. Unzip the folder and double click the driver for the upgrade tool **RKDevTool.exe** to open the upgrade window;

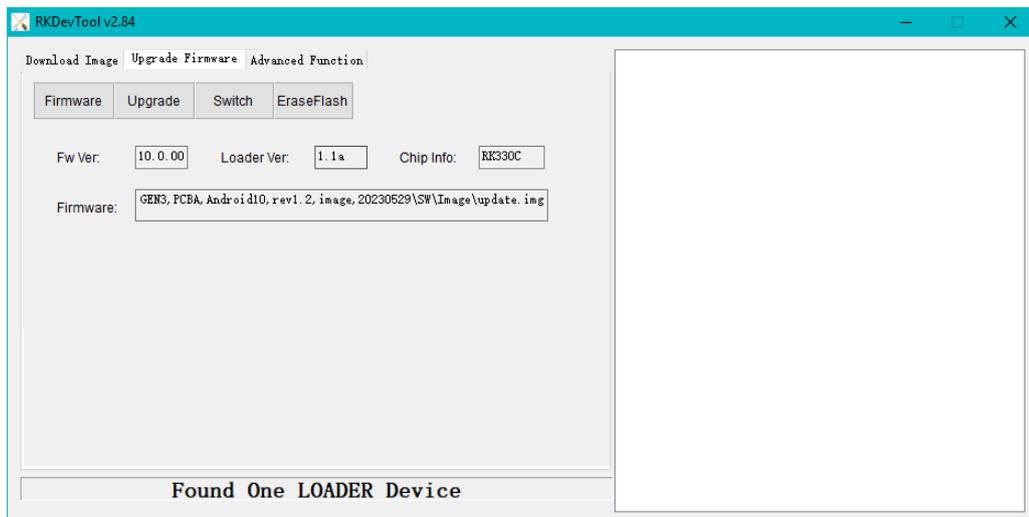


8. Connect Oplayer3399 to the Windows host computer using a Micro USB cable;
9. Press “Win + R” and input `cmd` in the dialog box to open the command prompt;
10. Input `adb devices` in the command prompt to check if the device is connected to the Windows host computer;
11. Once the device is identified by the Windows host computer, input `adb reboot loader` to reboot the device into the bootloader mode;

- Then the upgrade window will prompt for the existence of a Loader device, indicating that the upgrade process is ready;



- Click **Upgrade Firmware > Firmware** in the upgrade window;
- Select the upgrade file (**update.img**) from the directory (\SW\Image) and click **Open**, and the firmware details will be automatically populated in the boxes;



- Click the **Upgrade** button and the device will start to download the image and upgrade the firmware automatically;
- When the upgrade finishes, the device will reboot automatically.

4.5 Serial Port

Oplayer3399 offers a serial port that operates in RS232 mode by default and can be easily switched to RS485 mode with a baud rate of 9600.

Please confirm if a 4G module is installed on the device before using the serial port. For Oplayer3399 with a 4G module, the serial port is mapped as ttyUSB4 in the system. Otherwise, the serial port is mapped as ttyUSB0 in the system.

Check the GPIO nodes of the serial port:

```
# cat /d/gpio
```

```
vt_ops3399:/ # cat d/gpio
gpiochip0: GPIOs 0-31, parent: platform/ff720000.gpio0, gpio0:
gpio-4  (          |bt_default_wake_host) in  lo
gpio-5  (          |GPIO Key Power      ) in  lo
gpio-9  (          |bt_default_reset   ) out  hi
gpio-10 (          |reset              ) out  hi
gpio-11 (          |spk-con            ) out  lo

gpiochip1: GPIOs 32-63, parent: platform/ff730000.gpio1, gpio1:
gpio-33 (          |dp-det             ) in  lo
gpio-35 (          |jae_fan_en         ) out  hi
gpio-36 (          |otg_vbus_en        ) out  hi
gpio-41 (          |rs485_en           ) out  hi
gpio-42 (          |rs232_en           ) out  lo
gpio-46 (          |vsel               ) out  lo
gpio-49 (          |vsel               ) out  lo
gpio-50 (          |pcie-pwren         ) out  hi
gpio-56 (          |edp_en             ) out  hi
```

The following commands assume that the device **DOES NOT** have a 4G module.

- RS232 mode (enabled by default)

```
$ adb root          //restart the adb with root permission
$ adb shell         // open a remote shell on the Oplayer3399
# cd dev/           // change the current directory to dev/
# echo "vantron" > ttyUSB0 // write the string "vantron" to the serial port
# cat ttyUSB0       // read the data sent to the serial port
```

- RS485 mode

To disable RS232 and switch to RS485:

```
$ adb root
$ adb shell
# cd /sys/class/gpio/gpio41
# echo 0 > value
# cd
# cd /sys/class/gpio/gpio42
# echo 1 > value
```

To transmit and receive data in RS485 mode:

```
# cd
# cd dev/
# echo "vantron" > ttyUSB0
# cat ttyUSB0
```

You can restart the device or execute the following commands to switch the serial mode back to RS232.

```
$ adb root
$ adb shell
# cd /sys/class/gpio/gpio42
# echo 0 > value
# cd
# cd /sys/class/gpio/gpio41
# echo 1 > value
```

4.6 Watchdog Timer

1. Enable the watchdog;

```
# echo A > /dev/watchdog
```

2. Disable the watchdog;

```
# echo V > /dev/watchdog
```

CHAPTER 5 DISPOSAL AND WARRANTY

5.1 Disposal

When the device comes to end of life, you are suggested to properly dispose of the device for the sake of the environment and safety.

Before you dispose of the device, please back up your data and erase it from the device.

It is recommended that the device is disassembled prior to disposal in conformity with local regulations. Please ensure that the abandoned batteries are disposed of according to local regulations on waste disposal. Do not throw batteries into fire or put in common waste canister as they are explosive. Products or product packages labeled with the sign of “explosive” should not be disposed of like household waste but delivered to specialized electrical & electronic waste recycling/disposal center.

Proper disposal of this sort of waste helps avoid harm and adverse effect upon surroundings and people’s health. Please contact local organizations or recycling/disposal center for more recycling/disposal methods of related products.

5.2 Warranty

Product warranty

VANTRON warrants to its CUSTOMER that the Product manufactured by VANTRON, or its subcontractors will conform strictly to the mutually agreed specifications and be free from defects in workmanship and materials (except that which is furnished by the CUSTOMER) upon shipment from VANTRON. VANTRON's obligation under this warranty is limited to replacing or repairing at its option of the Product which shall, within **24 months** after shipment, effective from invoice date, be returned to VANTRON's factory with transportation fee paid by the CUSTOMER and which shall, after examination, be disclosed to VANTRON's reasonable satisfaction to be thus defective. VANTRON shall bear the transportation fee for the shipment of the Product to the CUSTOMER.

Out-of-Warranty Repair

VANTRON will furnish the repair services for the Product which are out-of-warranty at VANTRON's then-prevailing rates for such services. At customer's request, VANTRON will provide components to the CUSTOMER for non-warranty repair. VANTRON will provide this service as long as the components are available in the market; and the CUSTOMER is requested to place a purchase order up front. Parts repaired will have an extended warranty of 3 months.

Returned Products

Any Product found to be defective and covered under warranty pursuant to Clause above, shall be returned to VANTRON only upon the CUSTOMER's receipt of and with reference to a VANTRON supplied Returned Materials Authorization (RMA) number. VANTRON shall supply an RMA, when required within three (3) working days of request by the CUSTOMER. VANTRON shall submit a new invoice to the CUSTOMER upon shipping of the returned products to the CUSTOMER. Prior to the return of any products by the CUSTOMER due to rejection or warranty defect, the CUSTOMER shall afford VANTRON the opportunity to inspect such products at the CUSTOMER's location and no Product so inspected shall be returned to VANTRON unless the cause for the rejection or defect is determined to be the responsibility of VANTRON. VANTRON shall in turn provide the CUSTOMER turnaround shipment on defective Product within **fourteen (14) working days** upon its receipt at VANTRON. If such turnaround cannot be provided by VANTRON due to causes beyond the control of VANTRON, VANTRON shall document such instances and notify the CUSTOMER immediately.

Appendix Regulatory Compliance Statement

This product has been determined to be compliant with the applicable standards, regulations, and directives for the countries where the product is marketed.

FCC Statement

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

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

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate this equipment.