SOPHGO SE5 16-EA4-11 Micro Server User Guide

Contents

SOPHGO SE5 16-EA4-11 Micro Server

Product Information

- **Product Name:** Micro Server
- **Product Model:** SE5 16-EA4-11
- **File Version:** V1.0
- **Release Date:** 2023-3-7

Product Usage Instructions

Safety

General Safety
When operating and installing the equipment, please pay attention to the equipment identifications and safety precautions described in the manual.
The Danger, Warning, and Precautions mentioned in the manual are only supplements to safety matters and do not represent all possible situations.

Installation Requirements

Please ensure that you meet the following installation requirements:

- Read and understand the safety precautions in the manual.
- Verify that the equipment identifications match the product model SE5 16-EA4-11.
- Follow the installation configuration instructions provided in the manual.

Operation and Installation

Panel Description
The panel description provides information about the different components on the mainframe front panel of the Micro Server. Refer to page 26 of the manual for detailed descriptions.

Equipment Operation
To power off the Micro Server, follow these steps:

1. Refer to page 26 of the manual for the location of the power button on the mainframe front panel.
2. Press and hold the power button for a few seconds until the server powers off.

Ethernet SSH
Refer to page 10 of the manual for instructions on using Ethernet SSH.

Remote Desktop X11VNC
Refer to page 11 of the manual for instructions on using Remote Desktop X11VNC.

Device ID
Refer to page 13 of the manual for information on the Device ID feature.
Please consult the complete user guide for comprehensive information on product features, specifications, system architecture, application scenarios, and more.

Preface

Summary
This file is about the product features, specifications, system architecture, application scenarios, installation configuration, etc. of the Micro Server.

Target Readers
This document is mainly targeted to the following personnel:

- Enterprise administrators and users;
- Enterprise developers and pre-sales personnel

Signs
The meanings of these signs are as follows:

Name	Description
Danger	Indicates a highly dangerous situation that, if not avoided, may result in death or serious inj ury.
Warning	Indicates a potentially dangerous situation that, if not avoided, may result in death or seriou s injury.
Precaution	Indicates a potentially hazardous situation that, if not avoided, may lead to equipment dam age, data loss, performance degradation or unpredictable results.
Description	For important or key information. Not safety warnings.

Revisions

File Version	Release Date	Description
V1.0	2023-3-6	First official release.

Safety

Instruction

- When operating and installing the equipment, please pay attention to the equipment identifications and safety precautions described in the manual.
- The “Danger”, “Warning” and “Precautions” mentioned in the manual are only supplements to safety matters and do not represent all possible situations

Installation requirements

The personnel who operate, install and maintain the equipment must understand all safety precautions and master correct operations. The installation requirements are as follows:

- Equipment operation, installation and maintenance must be done by trained personnel.
- Equipment maintenance must be done by authorized personnel of our company.
- Equipment components replacement must be done by authorized personnel of our company.
- The operator shall contact our company in time in case of equipment failure and abnormality when installing.

Grounding Requirements

- The grounding operation shall be completed before equipment installation. The ground wire shall be removed after the removal of the equipment.
- It is forbidden to carry out any operation on the equipment when it is not grounded or poorly grounded.
- Please check the grounding before operating the equipment to ensure it is well grounded.

Personal Safety

- Please wear anti-static clothes, gloves and wristbands for equipment installation and operation. Please remove conductive ornaments to avoid short circuit and electric shock damage.
- It is strictly prohibited to operate and install equipment in dangerous environment, such as thunderstorm weather, flammable environment, etc.

Equipment Safety

- Ensure that the equipment is firm and reliable under any installation mode, such as installation on table, wall or

bracket.

- Ensure that the equipment is well grounded before startup. Remove the ground wire after shutdown of Micro server.
- Anti-static gloves are required for maintenance window operation. Please use a screwdriver to remove or install the maintenance window cover.
- It is strictly prohibited to cover or block the ventilation panel of the equipment.
- It is strictly prohibited to remove the sealant plug, such as the antenna rubber plug.
- The equipment needs to be grounded with a three-core power cord

Electrical Safety

Harsh Environment

- It is strictly prohibited to operate the equipment with AC in thunderstorm weather for fear of fatal danger.
- It is strictly prohibited to carry out outdoor equipment operations in thunderstorm weather for fear of fatal danger.
- It is strictly prohibited to operate nonstandard under high-voltage power supply for fear of fatal danger.

Equipment Power Supply

- It is strictly prohibited to remove the power cord when the equipment is powered on for fear of physical injury caused by electric sparks.
- Turn off the power switch before removing the power cord.
- Before connecting the power cord to the equipment, make sure the positive and negative electrodes are placed correctly.
- Ensure that the connection is firm after the equipment power cord is connected to the equipment.

Static Electricity

- Electrostatic discharge shall be carried out before equipment operation so as to prevent static electricity generated by human friction and movement.
- Wear an anti-static wristband and ground its terminal before touching and holding the device.

Equipment Sign

Equipment safety signs are as follows:

Name	Description
High Temperature	This sign indicates that the surface temperature is high. Do not directly touch the equipment shell without wearing protecting gloves.
Static Electricity	This sign indicates that this area is an electrostatic sensitive area. Do not touch the equipment directly. Please wear anti- static gloves or wristbands when operating in this area.
Grounding	This sign indicates that the equipment needs external grounding. Connect the equipment with the grounding point of the cabinet or workbench through the protective ground wire to ensure its normal operation.

Introduction

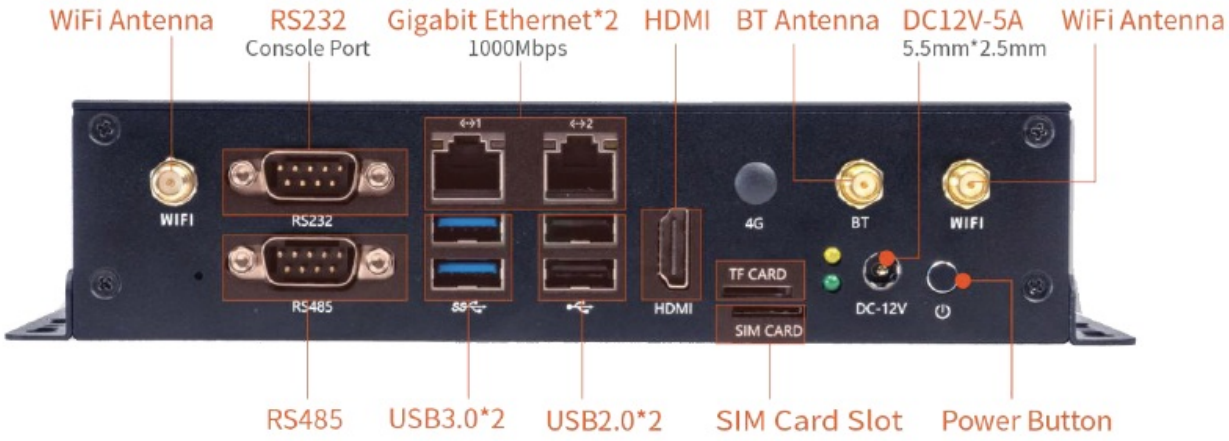
Powered by SOPHON AI processor BM1684, SE5 16-EA4-11 can be configured with 16GB RAM. With up to 17.6TOPS of INT8 computing power, it provides mainstream programming frameworks, and a complete, easy-to-use tool chain, featuring low cost of algorithm migration. SE5 16-EA4-11 can be applied to visual computing, edge computing, general computing services, smart transportation, unmanned supermarkets, drones and other AI computing scenarios

SDK Development Guide
SE5 16-EA4-11 supports the deep learning framework developed by SOPHON's AI chip. For this development, Sophon SDK is required, which covers model optimization and efficient runtime support capabilities required for the neural network inference stage, providing an easy-to-use and efficient full-stack solution for deep learning application development and deployment. For the SDK development guide, users can refer to
SOPHON SophonSDK3 development guide

Interface Introduction

SE5 16-EA4-11 provides abundant interfaces, including:

- DC-12V
- POWER button
- RS232
- RS485
- Gigabit Ethernet x 2
- USB 3.0 x 2
- USB 2.0 x 2
- HDMI
- TF card slot
- SIM card
- BT antenna
- WIFI antenna x 2
- 4G antenna



Login
There are two login methods for SE5 16-EA4-11: RS232 and network SSH. The username and password are both linaro

RS232

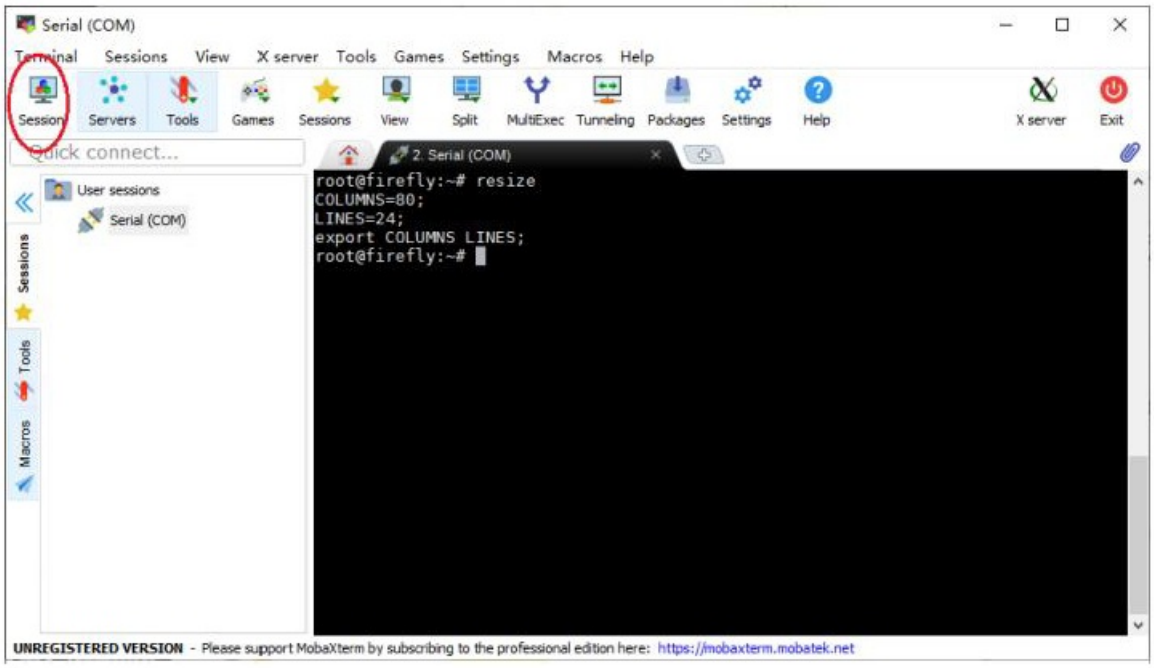
Serial Port Parameter Configuration
SE5 16-EA4-11 uses the following serial port parameters:

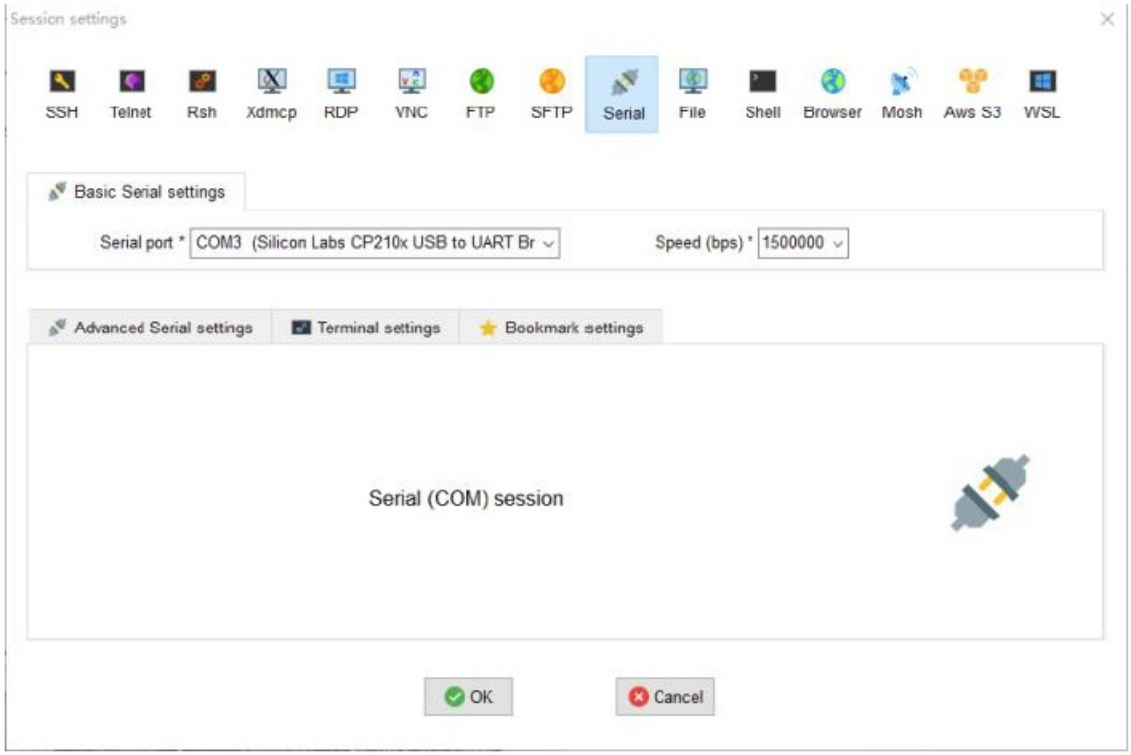
- Baud rate: 115200
- Data bit: 8
- Stop bit: 1
- Parity bit: No
- Flow control: No

Using Serial Port Debugging on Windows
Putty or SecureCRT software is usually used on Windows. We recommend the free version of MobaXterm. This is a powerful terminal software. We will introduce how to use this software and the way you use it is also available for other software.

Download MobaXterm:

1. Select session as Serial.
2. Change Serial port to the COM port found in Device Manager.
3. Set Speed (bps) to 115200.
4. Click OK





Serial Port Debugging on Linux
There are several options on Linux

- minicom
- picocom
- kermit

Take minicom for example:
Install minicom sudo apt-get install minicom
See what the serial device file is after connecting the serial cable. The following example is /dev/ttyUSB0: $ ls /dev/ttyUSB* /dev/ttyUSB0

Run:

$ sudo minicom -b 115200 -D /dev/ttyUSB0 Welcome to minicom 2.7 OPTIONS: I18n
Compiled on Jan 1 2014, 17:13:19. Port /dev/ttyUSB0, 15:57:00

Ethernet SSH

- SE5 16-EA4-11 has two Ethernet ports. By default, Ethernet port 0 (near the serial port) is configured with dynamic IP, while Ethernet port 1 (near the HDMI port) is configured with static
- IP 192.168.150.1, subnet mask 255.255.255.0, you can set the PC to 192.168.150.2/24 for initial login.
- Ethernet port 0 is typically assigned an IP address by the router, and the IP address information may not be known in advance. Therefore, it is recommended for users to use Ethernet port 1 for the initial login.
- After the Ethernet port LED blinks normally, open a terminal and use ssh to log in. The port number is 22, and the username and password are both linaro ssh linaro@192.168.150.1
- If the login fails, you can try whether ping the IP address of SE5 16-EA4-11's Ethernet port 1 by using PC.
- **Note**: the PC needs to add the same network segment IP, because the IP address of the PC may not be in the same one.
- The following is how to add the same network segment IP on PC (using administrator mode):
- windows 10
- netsh int ipv4 add address "Ethernet" 192.168.150.101 255.255.255.0
- "Ethernet" refers to the network port, 192.168.150.101 is the IP address, and 255.255.255.0 is the subnet mask.
- linux
- ifconfig enp4s0:1 192.168.100.89
- enp4s0 is the name of the network card driver of the PC, and you need to use ifconfig command to check the detail

Remote Desktop X11VNC

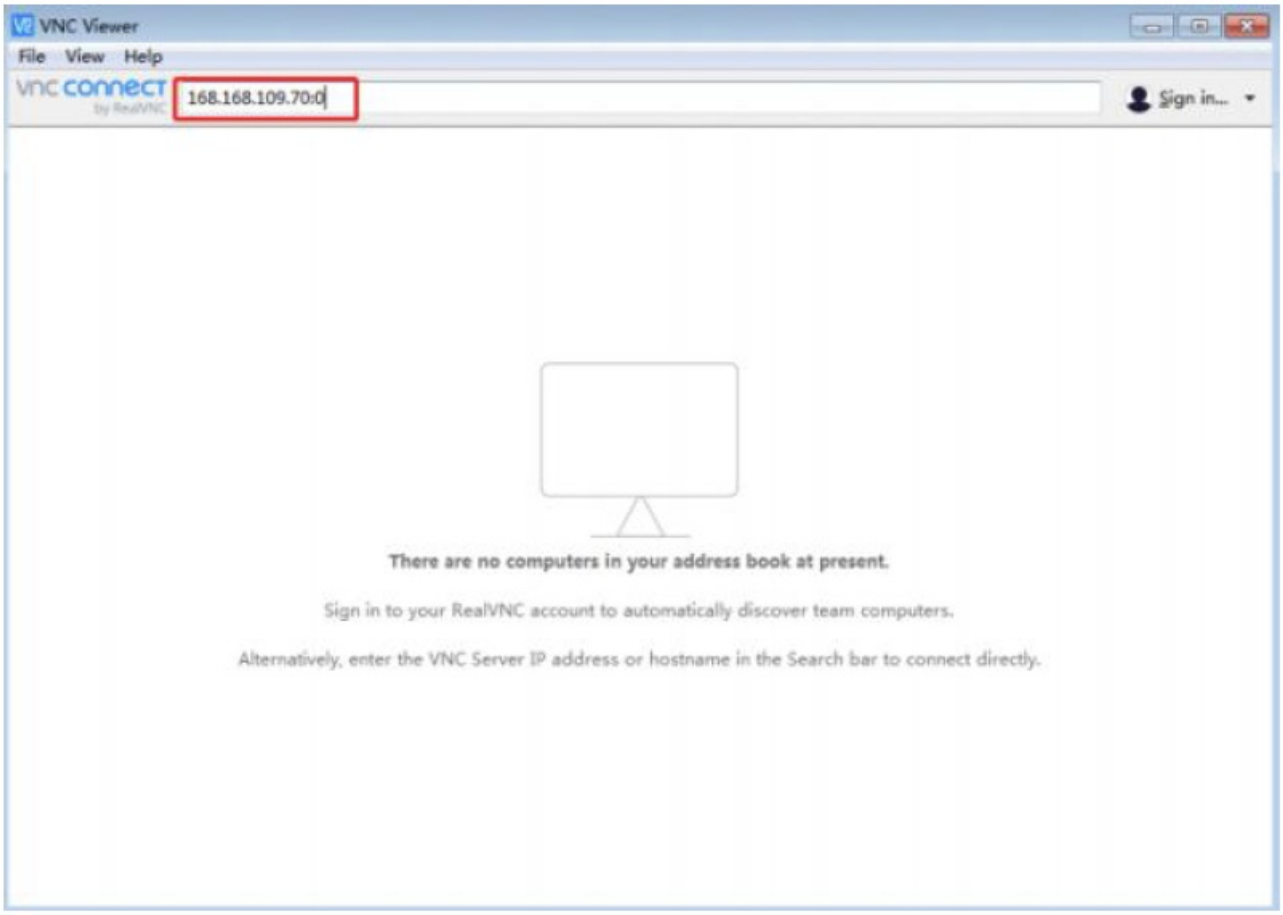
x11vnc is a tool that allows administrators to directly connect to the server's real X desktop via the VNC Viewer. First, it is necessary to install the X desktop environment on SE5 16-EA4-11 During installation, select Display Manager to lightdm:

```
sudo apt update
sudo apt install -y xserver-xorg-video-dummy x11vnc xfce4
sudo vim /etc/X11/xorg.conf
sudo reboot

Content in /etc/X11/xorg.conf as:

Section "Device"
   Identifier  "Configured Video Device"
   Driver      "dummy"
   VideoRam 256000
EndSection

Section "Monitor"
   Identifier  "Configured Monitor"
   HorizSync 5.0 - 1000.0
   VertRefresh 5.0 - 200.0
   ModeLine "1920x1080" 148.50 1920 2448 2492 2640 1080 1084 1089 1125
+Hsync +Vsync
#   Modeline "1280x800" 24.15 1280 1312 1400 1432 800 819 822 841
EndSection

Section "Screen"
   Identifier  "Default Screen"
   Monitor     "Configured Monitor"
   Device      "Configured Video Device"
   DefaultDepth 24
   SubSection "Display"
   Depth 24
   Modes "1920x1080"
#   Modes "1280x800"
   EndSubSection
EndSection
```

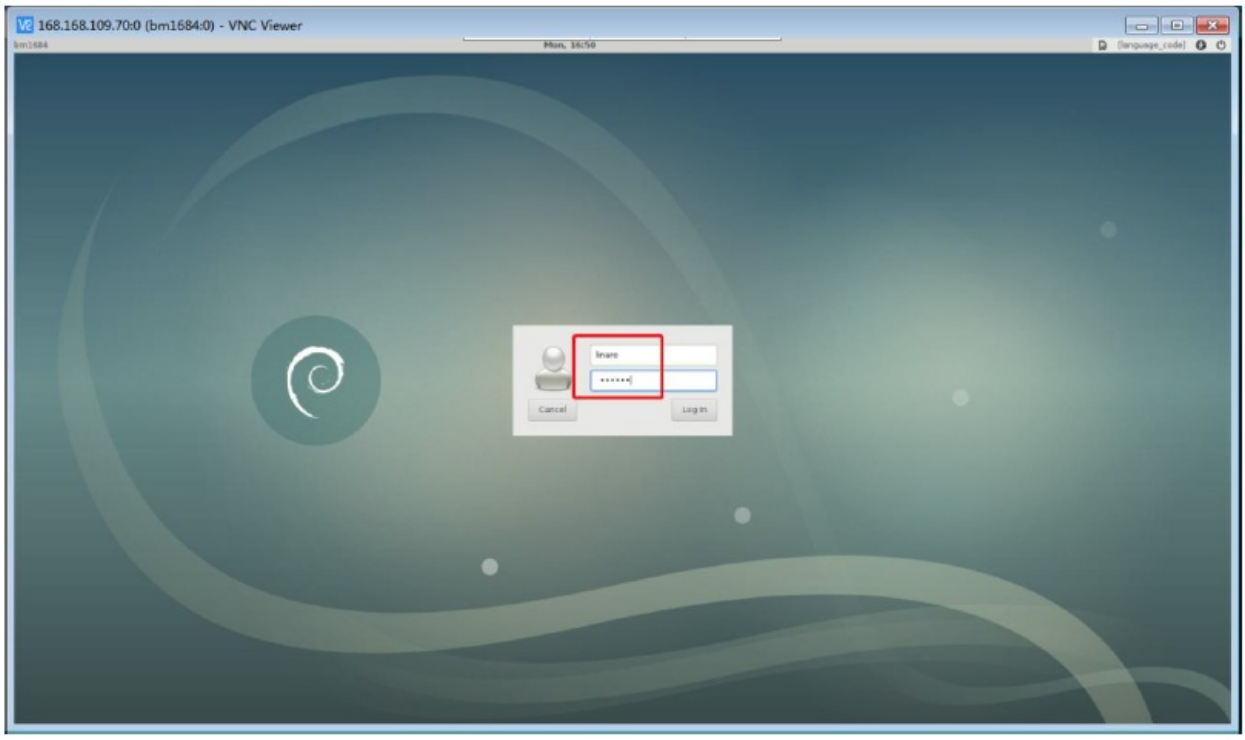
After the installation, start the x11vnc service.

After that, users can use $bm1684_ip:0 address on the PC to remotely connect via VNC. Here are the specific steps to use VNC Viewer:

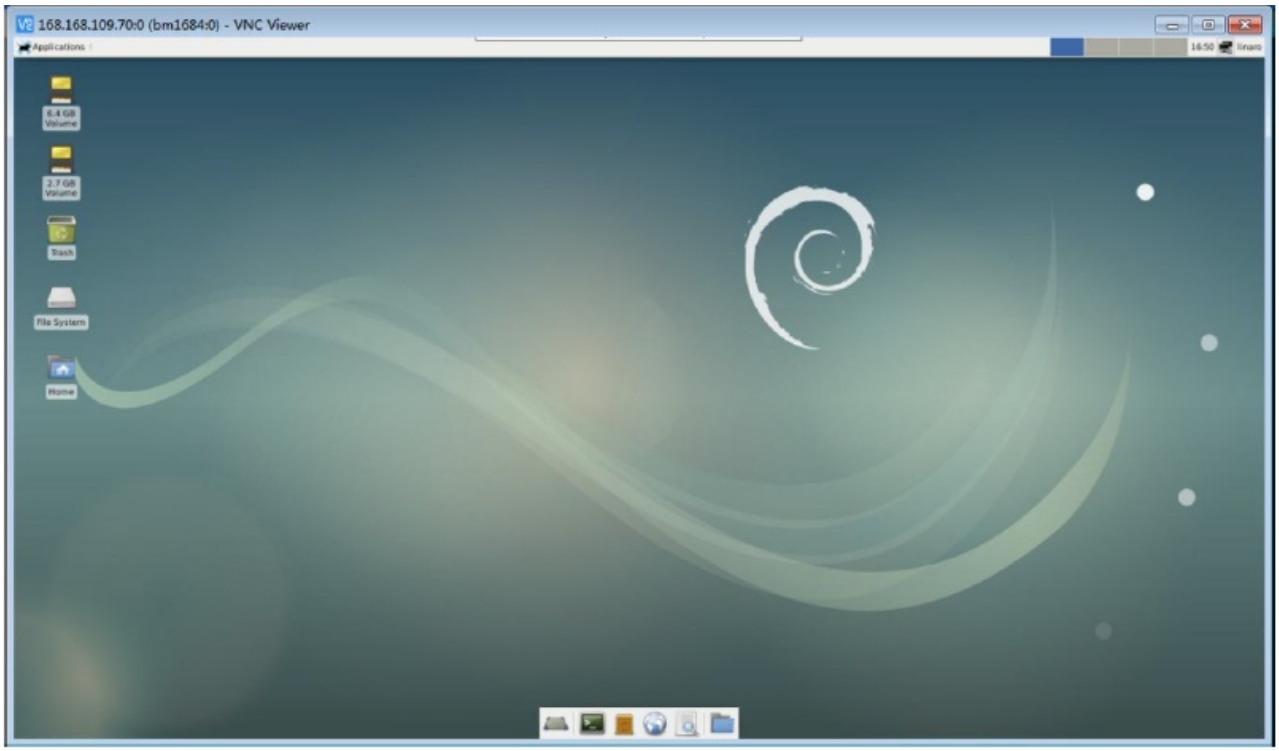
1. First, download VNC Viewer from the official website and select an appropriate one based on your PC system.
2. After installation, open VNC Viewer and skip the login:



3. Enter SE5 16-EA4-11: $bm1684_ip:0 address



4. Enter the user and password linaro
5. Enter the xfce4 desktop successfully:



Device ID

Check device ID
To check the device ID, you can read the serial number of the core board. After reading successfully, a string in json format will be returned

Fan Operation
SE5 16-EA4-11 fan operates at 4 different levels

Processor current temperature	Fan operating level
≥ 53℃	1
≥ 65℃	2
≥ 75℃	3
≥ 80℃	4

The higher the fan operating level, the faster the speed. If the current temperature of the processor is below 53℃, the fan is turned off by default. Users can check the current operating temperature of the processor by executing the following command:
cat /sys/class/thermal/thermal_zone1/temp
Additionally, users can manually turn on the fan (write 0-4. 0 is off and 4 is the maximum level.)
sudo -i echo 4 > /sys/class/thermal/cooling_device0/cur_state

HDMI Display Test

- SE5 16-EA4-11 does not come with a Graphics card chip and the processor HDMI output does not use a standard framebuffer driver. As a result, there is no display when the HDMI is connected by default.

If you want to test the HDMI display, you can connect it to the HDMI port and then execute the test-hdmi script.

- linaro@linaro:~$ sudo -i
- root@bm1684:~# test-hdmi
- found (1024, 768) @ 60 fps
- entry [0] = (1024, 768) added
- found (1024, 768) @ 60 fps
- found (1024, 768) @ 60 fps
- found (1024, 768) @ 60 fps
- found (1024, 768) @ 60 fps
- found (1024, 768) @ 60 fps
- found (1024, 768) @ 60 fps
- found (1024, 768) @ 60 fps
- found (1920, 1080) detailed timing desc
- entry [1] = (1920, 1080) added
- found (1920, 1080) detailed timing desc
- found (1920, 1080) detailed timing desc
- found (1920, 1080) detailed timing desc

Network IP Configuration

- The SE5 16-EA4-11 comes with Debian 9 as the default operating system. By default, eth0 in the dual Ethernet port configuration obtains IP dynamically (that is, DHCP). eth1 is 192.168.150.1
- Configure eth1 via /etc/network/interfaces.d/eth1 file. This file serves as the only modification to Debian's original network configuration.

linaro@linaro:~$ cat /etc/network/interfaces.d/eth1 auto eth1
iface eth1 inet static
address 192.168.150.1
netmask 255.255.255.0
dns-nameservers 192.168.150.1

If users delete this file, eth1 will obtain IP dynamically (DHCP), like eth0 . If you wants to set a static IP address for eth0 as well, you can create an eth0 file under the /etc/network/interafces.d folder, which will take effect after restarting.
It is important to note that it is advisable to avoid configuring both network interface cards as the same network segment. Otherwise this could cause issues.

WIFI

SE5 16-EA4-11 supports WIFI, and the network card name in the system is wlan0 by default

WIFI Cconnection

1. Enable WIFI:
   nmcli radio wifi on
2. Check if WIFI is enabled successfully:
   # Print enabled to indicate success
   nmcli radio wifi

3. Check WIFI access points:
   nmcli dev wifi list
4. Connect to a WIFI access point:
   sudo nmcli device wifi connect zouxftest1 password 12345678 name test zouxftest1 is the name of the WIFI access point and 12345678 is the password.

The connection log is as follows:

- Device ‘wlan0’ successfully activated with ‘fd6c634b-f517-4ae9-a8e9- 292a9c19d25c’.
  Please note that if you want to disable WIFI connection.
- nmcli radio wifi off

WIFI Hotspot
You can create a wireless AP hotspot by using the nmcli command: sudo nmcli device wifi hotspot ifname wlan0 con-name my-hostapt ssid zouxftest7 band bg password 12345678 channel 5

Instructions are as follow:

- con-name : the connection name, my-hostapt
- ssid : the AP hotspot name, zouxftest7
- band : WIFI protocol standard, bg
- password : AP hotspot’s password, 12345678
- channel : AP hotspot’s channel , 5

After the wireless AP hotspot is created, you can turn on/off the WIFI hotspot by using the following command: sudo nmcli connection up[down] my-hostapt

Bluetooth

SE5 16-EA4-11 supports wireless Bluetooth and its Bluetooth device information can be displayed by using hciconfig -a command.

- linaro@linaro:~$ hciconfig -a
- hci0: Type: Primary Bus: USB
- BD Address: 20:57:9E:BA:7C:EC ACL MTU: 1021:8 SCO MTU:
- 255:16
- UP RUNNING
- RX bytes:650 acl:0 sco:0 events:41 errors:0
- TX bytes:2170 acl:0 sco:0 commands:41 errors:0
- Features: 0xff 0xff 0xff 0xfa 0xdb 0xbd 0x7b 0x87
- Packet type: DM1 DM3 DM5 DH1 DH3 DH5 HV1 HV2 HV3
- Link policy: RSWITCH HOLD SNIFF PARK
- Link mode: SLAVE ACCEPT
- Name: ‘bm1684’
- Class: 0x000000

- Service Classes: Unspecified
- Device Class: Miscellaneous,
- HCI Version: 4.2 (0x8) Revision: 0xaba8
- LMP Version: 4.2 (0x8) Subversion: 0xa0cd
- Manufacturer: Realtek Semiconductor Corporation (93)

If you encounter the following error message:
Can’t open HCI socket.: Address family not supported by protocol
It may indicate an issue with the dependencies of the load module. In such cases, reloading the dependencies and performing a soft reboot will resolve the issue

- sudo -i
- depmod -a
- reboot

To check whether the current device is the master or slave device:

- linaro@linaro:~$ hciconfig hci0 lm
- hci0: Type: Primary Bus: USB
- BD Address: 20:57:9E:BA:7C:EC ACL MTU: 1021:8 SCO MTU: 255:16
- Link mode: SLAVE ACCEPT # slave devices

To start the PulseAudio service for the media device:

linaro@linaro:~$ pulseaudio –start –log-target=syslog

The steps to connect a Bluetooth device are as follows:

- Start the Bluetooth management tool:
- linaro@linaro:~$ bluetoothctl
- [NEW] Controller 20:57:9E:BA:7C:EC bm1684 [default]

Power on the Bluetooth controller:

- [bluetooth]# power on
- Changing power on succeeded

Set the Bluetooth agent as default value:

- [bluetooth]# agent on
- Agent registered
- [bluetooth]# default-agent
- Default agent request successful

Make the device discoverable by other Bluetooth devices:

- [bluetooth]# discoverable on
- Changing discoverable on succeeded
- [CHG] Controller 20:57:9E:BA:7C:EC Discoverable: yes

At this time, the SE5 16-EA4-11 Bluetooth device can be found on the smartphone. Click on the smartphone and pair

- [NEW] Device A4:90:CE:DF:64:4F iQOO Neo6 SE
- [CHG] Device A4:90:CE:DF:64:4F Modalias: bluetooth:v001Dp1200d1436
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 00001105-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 0000110a-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 0000110c-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 0000110e-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 00001112-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 00001115-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 00001116-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 0000111f-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 0000112d-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 0000112f-0000-1000-8000-00805f9b34fb
- [CHG] Device A4:90:CE:DF:64:4F UUIDs: 00001132-0000-1000-8000-00805f9b34fb

Connect the mobile phone:

- [bluetooth]# connect A4:90:CE:DF:64:4F
- Attempting to connect to A4:90:CE:DF:64:4F
- [CHG] Device A4:90:CE:DF:64:4F Connected: yes
- Connection successful
- [CHG] Device A4:90:CE:DF:64:4F ServicesResolved: yes
- [iQOO Neo6 SE]#

Setting up the mobile phone as a trusted device:

- [iQOO Neo6 SE]# trust A4:90:CE:DF:64:4F
- [CHG] Device A4:90:CE:DF:64:4F Trusted: yes
- Changing A4:90:CE:DF:64:4F trust succeeded

Bluetooth Audio
bluez-alsa is available, a Bluetooth audio ALSA backend application.

Install bluez-alsa
SE5 16-EA4-11 does not come with the bluez-alsa tool pre-installed. Users need to compile and install it . Here are the steps for version 1.3.0:

1. Download: **https://github.com/Arkq/bluez-alsa/releases/tag/v1.3.0**
2. Install dependencies

sudo apt install -y libasound2-dev libbluetooth-dev libglib2.0-dev libsbcdev
libfdk-aac-dev pkgconf

Unzip:

tar xzvf bluez-alsa-1.3.0.tar.gz
cd bluez-alsa-1.3.0

Compile and install:

autoreconf –install
mkdir build && cd build
../configure –enable-aac –enable-debug
make &&
make install

Audio Test
After installation, you can connect Bluetooth headphones or speakers for music playback. First, configure Bluetooth as the master device mode

- sudo hciconfig hci0 lm master
- # Remove PulseAudio process killall pulseaudio
- # Start the bluez-alsa service for connecting to bluetooth headphones or speakers
- bluealsa -p a2dp-source -p hsp-ag &Start the bluez-alsa service. Note that the PulseAudio service and bluez-alsa are mutually exclusive.

Connect Bluetooth headphone:

- [bluetooth]# connect 0C:AE:BD:9B:BB:5C
- Attempting to connect to 0C:AE:BD:9B:BB:5C
- [CHG] Device 0C:AE:BD:9B:BB:5C Connected: yes
- Connection successful
- [CHG] Device 0C:AE:BD:9B:BB:5C ServicesResolved: yes
- [EDIFIER LolliPods 2022 version]#

File Transfer
Bluetooth file transfer can be done by using the OBEX protocol, which encapsulates information data with an object model and transmits application with a communication protocol. On Linux, the Obex service is needed. First, SE5 16-EA4-11 connect the Bluetooth device according to the previous steps on; start the Obex daemon, and the receiving directory is set as/home/linaro/:/usr/lib/bluetooth/obexd -r /home/linaro -a -d &

Use obex push

- First, configure the Bluetooth as the master device mode. sudo hciconfig hci0 lm master
- Search for Phone Obex Push service channel:
    - linaro@bm1684:~$ sdptool search –bdaddr A4:90:CE:DF:64:4F OPUSH
    - Searching for OPUSH on A4:90:CE:DF:64:4F …
    - Service Name: OBEX Object Push
    - Service RecHandle: 0x1000d
    - Service Class ID List:
    - “OBEX Object Push” (0x1105)
    - Protocol Descriptor List:
    - “L2CAP” (0x0100)
    - “RFCOMM” (0x0003)
    - Channel: 12
    - “OBEX” (0x0008)
    - Profile Descriptor List:
    - “OBEX Object Push” (0x1105)
    - Version: 0x0102
    - Searching for OPUSH on A4:90:CE:DF:64:4F …
    - Service Search failed: Invalid argument
- You can see the channel is 12, and you can then push the file to the phone.
    - linaro@linaro:~$ obexftp –nopath –noconn –uuid none –bluetooth
    - A4:90:CE:DF:64:4F –channel 12 –put sn.txt
    - Suppressing FBS.
    - Connecting..\done
    - Sending “sn.txt”…/done
    - Disconnecting..-done

On the phone, a pop-up window showing whether to receive the file or not will appear.

Received successfully:

Use obexctl interactive command line
The following demonstrates the steps for SE5 16-EA4-11 to receive files:

1. Enable obex service on the device (the slave device): root@linaro:~# systemctl –user start obex
2. Enter the interactive command line: root@linaro:~# obexctl
   [NEW] Client /org/bluez/obex
3. Connect SE5 16-EA4-11 (the master device):
    1. [obex]# connect 20:57:9E:BA:7C:EC

2. Attempting to connect to 20:57:9E:BA:7C:EC …
3. [NEW] Session /org/bluez/obex/client/session2 [default]
4. [NEW] ObjectPush /org/bluez/obex/client/session2

4. Send the file:
    1. [20:57:9E:BA:7C:EC]# send /root/test.txt
    2. Attempting to send /root/test.txt to /org/bluez/obex/client/session1
    3. [NEW] Transfer /org/bluez/obex/client/session1/transfer1
    4. Transfer /org/bluez/obex/client/session1/transfer1
    5. Status: queued
    6. Name: test.txt
    7. Size: 0
    8. Filename: /root/test.txt
    9. Session: /org/bluez/obex/client/session1
    10. [CHG] Transfer /org/bluez/obex/client/session1/transfer1 Status: complete
5. Check the /home/linaro/ directory for the test.txt file on SE5 16-EA4-11:
    1. linaro@linaro:~$ ls -l test.txt
    2. -rw——- 1 linaro linaro 0 Nov 25 15:49 test.txt

USB Flash Drive and TF Card Mounting

When a U flash drive or TF card is inserted, the storage device will be recognized as /dev/sdb1 or /dev/mmcblkp1, like desktop PC Linux environment.
The file system supports FAT, FAT32, EXT2/3/4, NTFS. SE5 16-EA4-11 does not support automatic mounting, so you need to mount by yourself. After completing data writing, please use sync or umount operation in time. When shutting down, please use the sudo poweroff command to avoid data loss

USB Flash Drive Mounting
Insert the USB flash drive and use dmesg to find out the corresponding sd device: [15460.953423] [5] sdb: sdb1

- Mount USB Flash Drive:
    - # create mounting directory
    - mkdir disk
    - # mount
    - sudo mount /dev/sdb1 disk
    - # Check the files in the U disk

TF card Mounting
TF card mounting is similar to USB flash drive. Use dmesg to find out the corresponding mmcblk device: [16220.776440] [4] mmcblk1: p1

Mount the TF disk:

- # create mounting directory mkdir media
- # mount
- sudo mount /dev/mmcblk1p1 media
- # Check the files in the TF Card ls media

Use RS485/RS232

RS485

- $ sudo kermit
- C-Kermit> set line /dev/ttyUSB0
- C-Kermit> set speed 9600
- C-Kermit> set flow-control none
- C-Kermit> connect

/dev/ttyUSB0 is the device file of the USB-to-serial adapter, which may vary depending on the actual recognition of the PC.

Send data
The device file for RS232 is /dev/ttyS1. Run the following command on the device:

- sudo -s
- stty -F /dev/ttyS2 9600 -echo
- echo linaroRS485 test… > /dev/ttyS2

The PC's serial terminal will then receive the string "linaro RS485 test…".

Receive data

- First, run the following command on the device:
- sudo -s
- cat /dev/ttyS2

Then, enter the string "linaro RS485 test…" in the PC's serial terminal, and the device will receive the same string.

RS232

- In addition to RS485, SE5 16-EA4-11 also has an RS232 interface with device name /dev/ttyS1 , supporting full-duplex communication with a default baud rate of 115200.
  Note that RS232 is used for login by default, so users should enter the following command to restore it to normal communication serial port functionality: sudo systemctl disable –now serial-getty@ttyS1.service
- The testing steps are similar to RS485. You just need to pay attention to the device name and baudV rate.

Firmware Upgrade

SE5 16-EA4-11 uses a TF card to upgrade firmware. Users must strictly follow the following steps.

Preparation

- SE5 16-EA4-11
- PC

- USB card reader
- TF card (Class10 or higher is recommended, and choose an 8/16/32 GB capacity according to the firmware)
- Firmware to be upgraded

Upgrade Steps

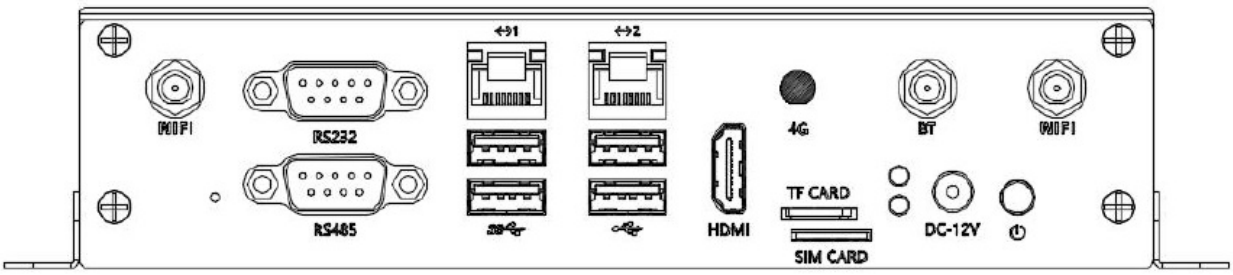
1. The TF card needs to use MBR partition and to be formatted in FAT32 format;
2. Unzip all files from the firmware (in zip compressed format) onto the TF card;
3. Insert the TF card into the TF card slot of SE5 16-EA4-11 and power on;
4. During the upgrade process, the LED light will flash briefly, indicating that the upgrade is in progress;
5. If the upgrade is successful, the green LED light will flash continuously;
6. If the upgrade fails, all LED lights will turn off.

Note:

- If the TF card exceeds 32GB, it may be unable to format it in FAT32 due to limitations of the Windows system, so it would be better to choose a TF card with a size of 32GB or less.
- The upgrade process may take about six minutes. Please be patient.

Operation and Installation

Panel Description
Mainframe Front Panel
Micro server Mainframe front panel is described as follow



Equipment Operation

Power Off
Micro server supports the following two ways of powering off.

1. **Press the power switch button**
    1. Step 1 Press the power switch on the front panel for 3 seconds.
    2. Step 2 Observe the power indicator (green). If it is off, Micro server is powered off successfully.
    3. The End
2. **Cut the power cable**
    1. Step 1 Unplug the power cable to power off Micro server.
    2. Step 2 Observe the power indicator (green). If it is off, Micro server is powered off successfully.
    3. The End

Power On
Micro server supports the following two ways of powering on.

1. Press the power switch button
    1. Step 1 Press the power switch on the front panel for 2 seconds to power on.
2. Step 2 Observe the power indicator. If it turns green, Micro server is powered on successfully.
3. The End

Connect the power cable

- Step 1 Connect the power cable to power on Micro server.
- Step 2 Observe the power indicator. If it turns green, Micro server is powered on successfully.
- The End

Equipment Installation
Desk Installation Precaution

- Ensure that the equipment is well grounded.
- Ensure that the desk is stable and the ventilation and heat dissipation environment is good.
- It is forbidden to cover the air outlet or shell surface of Micro server panel.

Steps

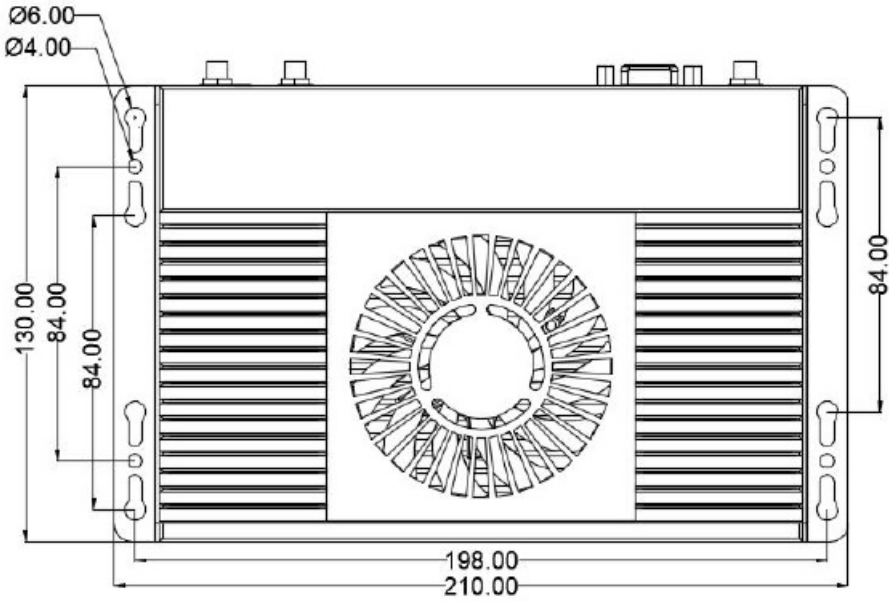
- Step 1 Place Micro server on the desk.
- Step 2 Connect external cables,
- Step 3 Power on Micro server, see in 4.2.2 Power On
- The End

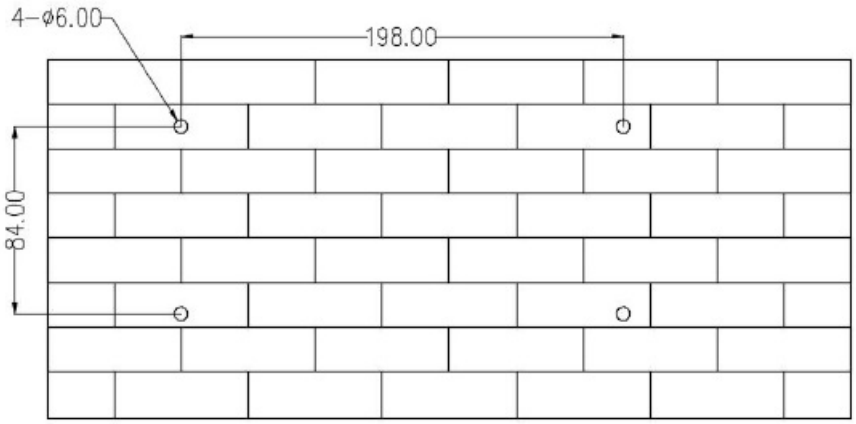
Wall Installation

- Ensure that the selected perforated wall has a thickness of more than 50cm and a bearing capacity of more than 10kg.
- Ensure that the installed bracket is parallel to the ground without skewing.

Steps

- Step 1 Prepare an electric drill, and drill holes in the wall according to the distance shown in the figure.





- Step 2 Prepare a hammer and M4*25 self-tapping screws. Hammer 4 plastic expansion anchors into the holes.
- Step 3 Fix the device to the wall with 4 self-tapping screws
- Step 5 Connect the external cable.
- Step 6 Power on Micro server, see in 4.2.2 Power On.
- The End

FCC Regulatory Compliance

This equipment has been tested and found to comply with the limits for a Class B 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 equipment 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 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 the 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.
Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF Exposure Compliance
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The equipment should be installed with at least distance 20 cm between the radiator and your body. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

Documents / Resources

 Micro Server User Guide	SOPHGO SE5 16-EA4-11 Micro Server [pdf] User Guide SE5-EA400, 2A98G-SE5-EA400, 2A98GSE5EA400, SE5 16-EA4-11, SE5 16-EA4-11 Micro Server, Micro Server, Server

References

- Release v1.3.0 · arkq/bluez-alsa · GitHub
- GitHub - arkq/bluez-alsa at v1.3.0