AVerMedia's AI Box PC D135

Applies to NVIDIA® Jetson Orin NX 16GB

(Preliminary)

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Preface

Disclaimer

The information contained in this user manual, including but not limited to any product specification is subject to change without notice. AVerMedia assumes no liability for any damages incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and the user manual.

Technical Support

If you experience any difficulty after reading this manual and/or using the product, please contact the reseller from which you purchased the product. In most cases, the reseller can help you with the product installation and the difficulty you encountered.

In case the reseller is not able to resolve your problem, our highly capable global technical support team can certainly assist you. Our technical support section is available 24 hours a day and 7 days a week through our website For more contact information, you may find it in the section of AVerMedia Global Offices.

Contact Enquiry

For more information of our products, pricing, and order placement, please fill in our inquiry form here, we will contact you within 24 hours.

Download User Manual

Please click the link here to download the file of this user manual from AVerMedia website.

Revision History

Revision	Date	Updates
V0.1	Sep, 7, 2024	1st Released.
V0.2	Oct 14, 2024	Minor document updates.
V0.3	Dec 04, 2024	Added on “How To Open The Rear Panel” in P.39
V0.4	Dec 05, 2024	Removed Dual Fan SKU.
V0.5	Feb 3, 2025	Added on notes in P.10 & P.14 of warmup and power on. Added on package in P.11
V0.6	Feb 26, 2025	Updated 2x Micro SIM card support function in P.10.
V0.7	Sep. 12, 2025	Modify Product Warranty

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Product Warranty

Please refer to Support | Warranty And Rma Services | AVerMedia

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ESD Warning

Electronic components and circuits are sensitive to Electrostatic Discharge (ESD). When handling any circuit board assemblies including AVerMedia products, it is highly recommended that ESD safety precautions can be observed. ESD safe best practices can include, but are not limited to, the following:

1. Leave the circuit board in the antistatic package until it is ready to be installed.
2. Use a grounded wrist strap when handling the circuit board. At a minimum, you need to touch a grounded metal object to dissipate any static charge, which may be present on you.
3. Avoid handling the circuit board in carpeted areas.
4. Handle the board by the edges and avoid the contact with the components.
5. Only handle the circuit boards in ESD safe areas, which may include ESD floor and/or table mats, wrist strap stations, and ESD safe lab coats.

Safety Precaution:

1. All cautions and warnings on the device should be noted.
2. For safety consideration, do NOT open the device if not a qualified service staff.
3. Place the device on a solid surface during installation to prevent falls.
4. Keep the device away from humidity.
5. Do NOT leave this device in an un-controlled environment with temperatures beyond the device's permitted storage temperature to avoid damage.
6. All adaptors and cables supplied by AVerMedia are verified. Do NOT use any others not supplied by AVerMedia to avoid any malfunction or fires.
7. Make sure the power source matches the power rating of the device.
8. Place the power cord where people cannot step on it. Do not put anything on the power cord.
9. Always completely disconnect the power while the device is not in use or idle for a long time.
10. Disconnect the device from any AC supply before cleaning. While cleaning, use a damp cloth instead of liquid or spray detergents.

11. Make sure the device is installed near a power outlet and easily accessible.
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Pay attention to the heatsink or heat spreader of the device when the system is running.
14. Never pour any liquid into the openings. This could cause fire or electric shock.
15. Static electricity should be noted while installing any internal components. Consider using a grounding wrist strap and put all electronic parts in static-shielded containers.

If the following situations occur, please contact our service personnel:

(1) The device is dropped or damaged
(2) Damaged power cord or plug
(3) Exposure to excessive moisture
(4) Liquid intrusion into the device
(5) Any obvious signs of damage displayed on the device
(6) Device is not working as expected or in a manner as described in this manual

1.0 Introduction

AVerMedia's AI Box PC D135 equips powerful NVIDIA® Jetson Orin NX 16GB module. This efficient system-on-module (SoM) opens new worlds of embedded IoT applications with full analytic capabilities.

D135 BOX PC is designed for the IP65 (IP67 by request) and features a rich assortment of waterproof I/O ports for rapid AI-based solution development and seamless deployment as required by demanding applications.

AVerMedia supports businesses of all sizes and offers customizable BSP services, flexible MoQ, in addition to NVIDIA's JetPackTM SDK.

Stay Ahead with AVerCooler – Achieving 5°C Lower Operation under Others' Regular Workload for Enhanced NVIDIA Jetson Efficiency, Extended Lifespan, and Superior Performance.

1.1 Product Specifications

Model	D135OXB
Type	IP65 Box PC (IP67 by request)
NVIDIA GPU SoC Module Compatibility	NVIDIA® Jetson Orin NX 16GB module
Networking	2x GbE with PoE 802.3af (2x M12 X-Code)
Wireless	1x Wi-Fi Module (M.2 E key 2230) (optional) 1x LTE/5G module (M.2 B key 3042/3052) (optional) 1x GNSS or RTK GNSS module(mPCIe) (optional)
USB	2x USB 3.2 Gen1 (2x M20 Type A)
Camera Inputs	Either 8x GMSL2 Camera (8x Fakra Z-code) or 4x GbE with PoE 802.3af IP Camera (4x M12 X-Code)
Storage	1x NVMe (M.2. key M 2280, 256G SSD pre-installed) (*The SSD capacity for the 6x POE SKU is limited to a maximum of 2TB)
CAN Bus	2x Isolated CAN 2.0 FD Ports (M12A-Code 8 pin, Engineering Port)
Misc.	4x Isolated GPI & 2x Isolated GPO & 1x RS485 (M12A-Code 12 pin, Engineering Port) 2x Antenna for Wi-Fi (2x Fakra Connector I-code) (optional) 2x Antenna for LTE/5G (2x Fakra Connector D-code) (optional) 2x Antenna for RTK GNSS (2x Fakra Connector C-code) (optional)
Repair Area with an Access Panel with O ring for waterproof	1x USB 3.2 Gen1 (Type A) 1x GbE RJ45 1x HDMI output Type A (4Kp60 for Orin NX) 1x USB 2.0 type C for recovery 1x USB 2.0 type C for debug UART 1x Power push button 1x Recovery mode push button 1x DIP switch for power mode & UART path selection 2x Micro SIM card slot for LTE/5G module, Only support in Dual SIM Single Standby (DSSS) mode, the limitation is from EM05(4G)
OOB	Allxon OOB supported (optional)
Super Capacitor	Super Capacitor (250W/sec, TBC)
Temperature	Operating temperature: -40°C~70°C (8x GMSL + 2x POE, TBC) Operating temperature: -40°C~50°C (6x POE, TBC) Storage temperature: -40°C ~ 85°C Relative humidity: 40 °C @ 95%, Non-Condensing The system requires approximately at least 10 minutes of warmup time when operating at an ambient temperature of -40°C before it can be powered on.

Power requirement	Voltage	DC Input Range 9-36V DC input with Power Ignition Controller (M12 B-Code 5 pin)
	Current	Max 15A (TBC)
Buttons	Power and Reset with RGB indicator	
RTC Battery	Support RTC battery and Battery Life Monitoring by MCU	
Verification	MIL-STD-810H for shock & vibration (TBC)	
Dimensions	300mm x 153mm x 103mm(11.81” x 6.02” x 4.06”) with mounting hole Weight : 4.9kg (BOX PC)	
Certifications	CE, FCC, VCCI, KC (TBC)	
Package	1x D135OXB (256G SSD pre-installed)	
Adaptor/Power Cord	N/A	

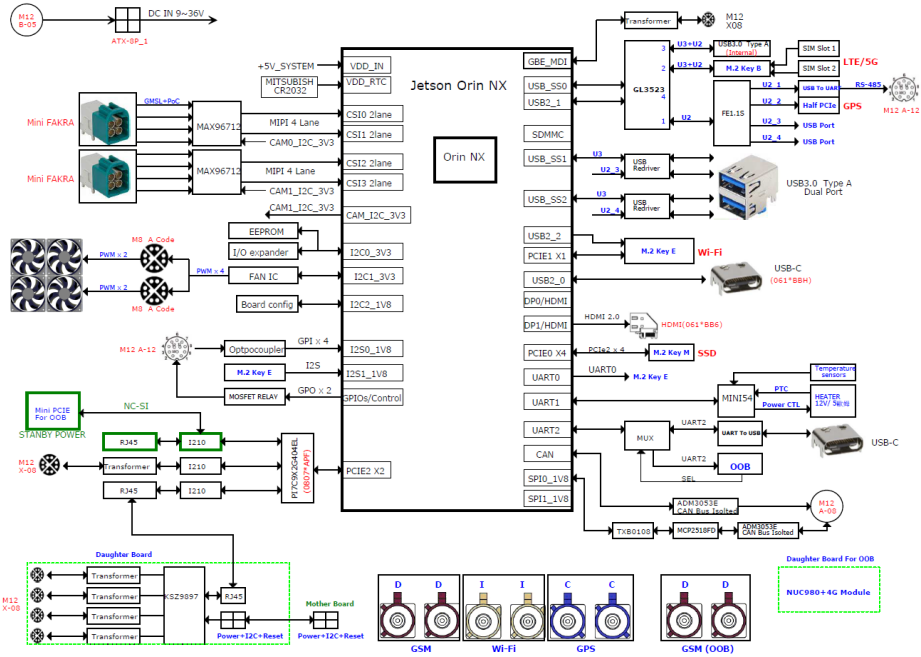
1.2 OPTIONAL ACCESSORY

Item	D135OXB
IP67/69K GMSL2 Camera	oToBrite: oToCAM222-H61M 、 oToCAM222-C120M 、 oToCAM222-S195M 、 oToCAM223-H61M 、oToCAM223-C120M 、oToCAM223-S195M
Wi-Fi Module M.2 E key 2230	Intel® Wi-Fi 6E AX210 (-40°C ~ 85°C)
LTE Cat 4 M.2 B key 3042	Quectel EM05-G (-40°C ~ 85°C)
5G M.2 B key 3042	Quectel RM520N-GL (-40°C ~ 85°C)
RTK GPS module mPCIE / USB wafer	ublox F9P (-40°C ~ 85°C)
RTK GPS module mPCIE / USB wafer	ublox F9P+F9H (-40°C ~ 85°C)
RTK GPS module mPCIE / USB wafer	ublox NEO-M8N-0-12 (-40°C ~ 85°C)
5 in 1 Combo External Antenna FAKRA	IP67 Supports Cellular + Wi-Fi + Single GNSS (-40°C ~ 85°C)
GNSS External Antenna, FAKRA	IP67 Single GNSS Antenna with magnet (C-Code) (-40°C ~ 85°C)
OOB module (NCSI) wafer	OOB BOARD Module+Cable (-40°C ~ 85°C, TBD)

Adapter + Power Cord DC JACK	FSP 12V/5A for 8xGMSL + 2x POE (For POC only)
Adapter + Power Cord DC JACK	FSP 12V/12.5A for 6x POE (For POC only)
M12 Power Cable	M12 5pin to DC JACK B-Code male (POWER), 1m(100cm)
M12 POE to RJ45 Cable	M12 8 pin X-Code POE to RJ45 Cable, 1m(100cm)
M12 CAN BUS Cable	M12 8 pin to 6 pin A-Code CAN BUS Cable, 1m(100cm)
M12 GPIO+RS232 Cable	M12 12 pin to 12 pin A-Code GPIO+RS232 Cable, 1m(100cm)

2.0 Product Overview

2.1 Block Diagram for Orin NX



2.2 Front View and Three-Quarter View of BoxPC (GMSL SKU, Fanless)

Front view

Top view

Rear view

Back view

2.3 Connector Summary

External Connector Summary (8x GMSL + 2x POE)

Location	Connector	Description
Front	DC IN	9V to 36V Power input - M12 B-Code 5 pin
Front	USB3.0-1 USB3.0-2	USB 3.2 Gen1 - M20 Type A connectors
Front	POE 1 POE 2	GbE with PoE 802.3af - M12 X-Code connectors
Front	CAN BUS	CAN 2.0 - M12A-Code 8 pin connector (Engineering Port)
Front	GPIO/RS485	GPIO & RS485 - M12A-Code 12 pin connector (Engineering Port)
Front	GMSL 1 GMSL 2 GMSL 3 GMSL 4 GMSL 5 GMSL 6 GMSL 7 GMSL 8	GMSL FAKRA SMB plug Z-code connectors
Front	ANT 1 ANT 2 ANT 3 ANT 4 ANT 5 ANT 6	Wi-Fi, LTE/5G, and RTK GNSS antenna connectors.
Back	Power Button Reset Button	Power and Reset buttons with RGB indicator NOTE: If the power adapter is disconnected during operation, when reconnecting the power adapter, you should press the Power Button to power on the device.

Repair Area with an Access Panel with O ring for waterproof

Connector	Description
JETPACK INSTALLING	USB 2.0 type C connector for JetPack installing
Power Recovery	Power and Forced-Recovery mode push button
DEBUG UART	USB 2.0 type C connector for debug UART
DIP SWITCH	DIP SWITCH for power mode & UART path selection
RJ45	GbE RJ45 Connector
HDMI	HDMI Type A Connector
USB3.2	USB 3.2 Gen1 Type A connector
MICRO SIM 1 MICRO SIM 2	Micro SIM card slot for LTE/5G module

3.0 Feature Description

3.1 Jetson module Connector

Function	NVIDIA® Jetson Orin NX
Location	Internal J1
Type Description	SOM
Pinout	Please refer to NVIDIA Jetson System-on-Module datasheet for pinout details.
Remarks	https://developer.nvidia.com/ embedded/downloads

3.2 DC IN Connector

Function	DC power input
Location	Front
Type Description	M12 B-Code 5 pin
Manufacturer and Part Number	PRODACONN 12B05-S09F-LS0-F0
Mating Connector	Any Standard M12 B-Code 5-pin plug.
Pinout	

Pin Number	Description
1	DC IN
2	DC IN
3	GND
4	GND
5	ACC

Remarks	NA

USB 3.0 Connector #1 , #2

Function	USB 3.2 Gen 1 Type-A connector #1 #2	
Location	Front	
Type Description	USB 3.2 Gen 1 M20 Type-A	
Manufacturer and Part Number	PRODACONN U3M09-C20F-SLD-00	
Mating Connector	Any USB 3.2 standard Type-A interface cable or device.	
Pinout	Please refer to USB connectors standard.	
Remarks	5V only, Max 5 Gbps speed Re-Driver included	

3.3 POE Connector #1 , #2

Function	GbE with PoE 802.3af #1 , #2	
Location	Front	
Type Description	M12 X-Code 8-pin	
Manufacturer and Part Number	PRODACONN 12X08-00SX-RDS-00	
Mating Connector	Any Standard M12 X-Code 8-pin plug	

<table>
<tr><td>Pinout</td><td><table>
<tr><th>Pin Number</th><th>Description</th></tr>
<tr><td>1</td><td>ETH_A+</td></tr>
<tr><td>2</td><td>ETH_A-</td></tr>
<tr><td>3</td><td>ETH_B+</td></tr>
<tr><td>4</td><td>ETH_B-</td></tr>
<tr><td>5</td><td>ETH_C+</td></tr>
<tr><td>6</td><td>ETH_C-</td></tr>
<tr><td>7</td><td>ETH_D+</td></tr>
<tr><td>8</td><td>ETH_D-</td></tr>
</table></td><td> 
</td></tr>
<tr><td>Remarks</td><td colspan="2">POE Connector #1 can support OOB(I210-NCSI) with Allxon OOB</td></tr>
</table>

3.4 GPIO/RS485 Connector

Function	4x Isolated GPI & 2x Isolated GPO & 1x RS485	
Location	Front	
Type Description	M12A-Code 12 pin	
Manufacturer and Part Number	PRODACONN 12A12-00SX-RDS-01	
Mating Connector	Any Standard M12 A-Code 12-pin plug	

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<tr><th>Pin Number</th><th>Description</th></tr>
<tr><td>1</td><td>GPI0</td></tr>
<tr><td>2</td><td>GPI1</td></tr>
<tr><td>3</td><td>GPI2</td></tr>
<tr><td>4</td><td>GPI3</td></tr>
<tr><td>5</td><td>GPO_A1</td></tr>
<tr><td>6</td><td>GPO_A2</td></tr>
<tr><td>7</td><td>GPO_B1</td></tr>
<tr><td>8</td><td>GPO_B2</td></tr>
<tr><td>9</td><td>RS485_A</td></tr>
<tr><td>10</td><td>RS485_B</td></tr>
<tr><td>11</td><td>GND</td></tr>
<tr><td>12</td><td>ISO_GND</td></tr>
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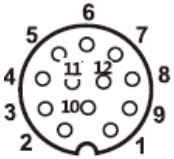
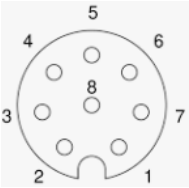
<td> 
</td>
</tr>
<tr>
<td>Remarks</td>
<td colspan="2">GPI0~3 is recommended under 12V
GPO_A & GPO_B : max. 60V & 1.4A</td>
</tr>
</table>

3.5 CAN BUS Connector

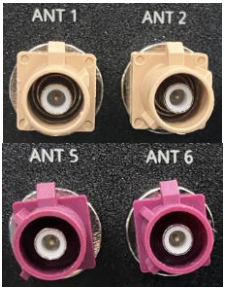
Function	Isolated CAN 2.0 FD
Location	Front
Type Description	M12A-Code 8 pin
Manufacturer and Part Number	PRODACONN 12A08-00SX-RDS-00
Mating Connector	Any Standard M12 A-Code 8-pin plug

Pinout	<table><tr><th>Pin Number</th><th>Description</th></tr><tr><td>1</td><td>NC</td></tr><tr><td>2</td><td>NC</td></tr><tr><td>3</td><td>CAN1_H</td></tr><tr><td>4</td><td>CAN1_L</td></tr><tr><td>5</td><td>ISO_GND</td></tr><tr><td>6</td><td>CAN2_H</td></tr><tr><td>7</td><td>CAN2_L</td></tr><tr><td>8</td><td>ISO_GND</td></tr></table>	
Remarks	None	

3.6 GMSL Connector#1-8

Function	GMSL2 Camera	
Location	Front	
Type Description	GMSL FAKRA SMB plug Z-code (water blue)	
Manufacturer and Part Number	Amphenol RF FK1321ZW-036-NT5GP-050	
Mating Connector	Any Standard FAKRA Jack Z-code (water blue)	
Pinout	Refer to standard FAKRA SMB plug	
Remark		

3.7 ANT Connector #1-6

Function	Wi-Fi, LTE/5G, and RTK GNSS antenna connectors	
Location	Front	
Type Description	Wi-Fi : FAKRA SMB Plug I-code (Beige) LTE/5G : FAKRA SMB Plug D-Code(violet) RTK GNSS :	

	FAKRA SMB Plug C-code (Blue)	
Manufacturer and Part Number	COXOC 1413102005I 1413102005D 1413101004C	
Pinout	Refer to standard FAKRA SMB plug	
Remark	ANT #1-6 could be changed to C/D/I-code by customer optional request for wifi/LTE/5G/RTK GNSS	

3.8 Power Button

Function	Power button	
Location	Back	
Type Description	buttons with RGB LED	
Manufacturer and Part Number	Champway MP16-CARP-P-JR-0V	
Pinout	N/A	
Remark	• When Box PC is in "Button Power Mode," pressing the button will initiate the boot-up sequence. • When Box PC is ON, pressing the button will display the Power Off GUI. If no operation is performed, the system will automatically power off in 60 seconds. • LED indicator – check system status	

Color	Description
Solid Blue	ACC normal (10sec)
Flashing Blue	heater active
Flashing Green(quickly)	booting (waiting ACC)
Flashing Green(slowly)	System abnormal
Solid Green	System normal (system ready)
Flashing Red	Fan module PWM health issue
Solid Red	Fan module issue

3.9 Reset Button

Function	Reset button	
Location	Back	
Type Description	buttons with RGB LED	
Manufacturer and Part Number	Champway MP16-CARP-P-JR-0V	
Pinout	N/A	
Remark	• When Box PC is ON, holding the button for more than 5 seconds will force a full system reset. • LED indicator – check accessory status OOB/GPS & IMU/ WIFI/SSD/4G & 5G included	

Color	Description
Solid White	Accessory is normal
Flashing Orange	OOB link abnormal
Flashing Green	GPS & IMU abnormal
Flashing Yellow	WIFI abnormal
Flashing Blue	SSD abnormal (SMART for health)
Flashing Red	4G/5G abnormal

3.10 USB 2.0 type C Connector

Function	USB 2.0 type C connector for JetPack installing	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	JACK_USB_C TYPE(F)_90°_PIP-L1.45 ㎜	
Manufacturer and Part Number	ACES, 57988-0240D-001	
Mating Connector	Any USB type C standard interface cable or device.	
Pinout	Please refer to USB type C standard.	

Remark	USB2.0 Only (Device Mode)

3.11 Internal Power Button

Function	Power button	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	TACT SWITCH w/o LED, Right Angle	
Manufacturer and Part Number	DIPTRONICS DTSA-62N-V	
Pinout	N/A	
Remarks	• When Box PC is in "Button Power Mode," pressing the button will initiate the boot-up sequence. • When Box PC is ON, pressing the button will display the Power Off GUI. If no operation is performed, the system will automatically power off in 60 seconds. • When Box PC is ON, holding the button for more than 5 seconds will force a full system power down.	

3.12 Recovery Button

Function	Force Recovery Mode button	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	TACT SWITCH w/o LED, Right Angle	
Manufacturer and Part Number	DIPTRONICS DTSA-62N-V	
Pinout	N/A	
Remarks	• No function during normal operation. • The SOM will enter recovery mode when held down during power ON	

3.13 DEBUG UART Connector

Function	USB 2.0 type C connector for debug UART	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	JACK_USB_C TYPE(F)_90°_PIP-L1.45 ㎜	
Manufacturer and Part Number	ACES, 57988-0240D-001	
Mating Connector	Any USB type C standard interface cable or device.	
Pinout	Please refer to USB type C standard.	
Remarks	USB2.0 Only	

3.14 DIP SWITCH Connector

Function	Power mode & UART path selection	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	DIP SWITCH, Right Angle	
Manufacturer and Part Number	Champway DAAH-04RR-T	
Pinout	N/A	

No..	Description	SW ON	SW OFF
1	Power ON mode	Always Power ON	Auto Power ON
2	Power-Up / Start-up Control	"ATX Mode" Power Button Press Required	"AT Mode" Automatic Start-up Enabled
3	UART select #1	OOB Auto link	Internal M.2 Key-E UART
4	UART select #2	OOB Debug	USB-C Debug

Remarks	• Blue font is default setting • OOB UART is selected when Allxon OOB installed

3.15 GbE RJ45 Connector

Function	Single port GbE RJ45 Connector	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	GbE RJ45 with integrated magnetics	
Manufacturer and Part Number	CONTACT TECHNOLOGY MJ45-111QC4A-GY-S307	
Mating Connector	Any standard GbE mating connector can be applicable	
Pinout	Comply with Ethernet standards	
Remarks	For optional PSE daughter board Replace GMSLx8 to 4x GbE with PoE 802.3af IP Camera (4x M12 X-Code)	

3.16 HDMI OUTPUT Connector

Function	HDMI output connector	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	HDMI Type-A female connector	
Manufacturer and Part Number	Compupack, ACNHM220028-001	
Mating Connector	Any HDMI standard Type-A interface cable or device.	
Pinout	Please refer to HDMI standard.	
Remarks	None	

3.17 USB 3.2 Type-A Connector

Function	USB 3.2 Type-A connector	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	USB 3.2 Type-A female connector	
Manufacturer and Part Number	Foxconn UEA1112C-4HK1-4H	
Mating Connector	Any USB 3.2 standard Type-A interface cable or device.	
Pinout	Please refer to USB 3.2 standard.	
Remarks	Max 5 Gbps speed	

3.18 MICRO SIM card slot #1, #2

Function	micro sim card slot for LTE/5G module	
Location	Repair Area with an Access Panel with O ring for waterproof	
Type Description	Micro Sim Push Push Type	
Manufacturer and Part Number	Fullglory FG-0271AAAG06A	
Pinout	Refer to Micro SIM card standard	
Remarks	Push Push type MICRO SIM card slot #2 is for main sim card MICRO SIM card slot #1 is for dual sim function	

Other Switches and Jumpers

Other switches and jumpers listed on the board but not mentioned in this manual are reserved

for the internal use by AVerMedia. They are not open to the client application.

4.0 Installation

1. Check and ensure all the external system power supplies are turned off.
2. Plug in the USB type-C cable to Jetson platform connector.
3. Press and hold on the Recovery button.
4. Connect the power cord to the box PC.
5. Turn on the power supply.

4.1 BSP Setup Instructions

BSP (Board Support Package) file: D135_ORIN-R*.*.*.$.$.$.tar.gz for D135
($.$.$: JetPack Version ; *.*.*: AVerMedia Version)

If you want to get the BSP download link, please contact AVerMedia's Support Team.

Default login username/password of the BSP is nvidia/nvidia

If you have difficulties to access the BSP download link, please visit AVerMedia's website at https://www.avermedia.com/professional/support/download-and-faq, or contact technical support at
https://www.avermedia.com/professional/support/technical or e-mail us at support3@avermedia.com for further assistance.

BSP Installation steps for NVIDIA Jetson board: (Important Note: Please backup your personal files before re-flashing BSP)
After you download the BSP file onto a x86 Linux PC, please refer to the steps below to re-flash BSP.

1. Place the JETSON Orin NX initiate recovery mode.

You have to hold the "Recovery" button and then power on the NVIDIA Jetson board to initiate recovery mode.
When connecting a NVIDIA Jetson board to a Linux PC via a USB type-C to USB cable, you can check command "lsusb"
Once you see the device status, this means that the NVIDIA Jetson board is in recovery mode.
Bus 001 Device 090: ID 0955:7323 NVIDIA Corp. APX

Bus 001 Device 093: ID 0955:7323 NVIDIA Corp.

2. Use the commands below in the Linux PC to start re-flashing BSP.

$ sudo tar zxvf <BSP_tarball_filename>.tar.gz

where <BSP_tarball_filename> is the BSP tarball file name for your target device.

$ cd JetPack_xxx/Linux_for_Tegra

$ sudo ./install.sh

Note: sudo is required to extract the BSP.

3. More information on how to Flash BSP for Orin NX, please refer to following link.

https://www.avermedia.com/professional/support/faq/how-to-flash-bsp-for-orin-nano-nx

4.2 Software

This section describes BSP features for D135

1. Support optional M.2 WI-FI/Bluetooth modules (Intel® Wireless-AX210), the manager UI of AX210 Wi-Fi/Bluetooth is located on the upper-right corner of Ubuntu desktop.

2. Power Mode
   Power mode can be modified by the UI on the upper-right corner of Ubuntu or the following commands.

```
# get current power mode
$ sudo nvpmodel -q
# setup power mode
$ sudo nvpmodel -m <x>

Where <x> is the power mode ID (for example, 0, 1, 2 or 3)

https://docs.nvidia.com/jetson/archives/r36.3/DeveloperGuide/SD/PlatformPowerAndPerforma
power-and-performance
```

3. RTC Battery
   The following command can get RTC battery voltage.

```
$ sudo avt_tool -a | grep -oP "AIN5.*\[\K[^\]]*"
```

4. GMSL Camera
   There are 8 GMSL ports and support oTo Sony ISX021.

```
Please switch to max power in D135 system.
```

Start Streaming command
gst-launch-1.0 -v v4l2src device="/dev/video<***X***>" ! videorate ! video/x-raw,framerate=30/1 ! videoconvert ! fpsdisplaysink video-sink=xvimagesink sync=false
<*X*>: means the camera device
Ex: /dev/video0
$ gst-launch-1.0 -v v4l2src device="/dev/video0" ! videorate ! video/x-raw,framerate=30/1 ! videoconvert ! fpsdisplaysink video-sink=xvimagesink sync=false

**For stability purpose, you can set ISP and VI clock to maximum and locking it.
change to root and run following command :
MAX_VI_RATE=$(cat /sys/kernel/debug/bpmp/debug/clk/vi/max_rate)
MAX_ISP_RATE=$(cat /sys/kernel/debug/bpmp/debug/clk/isp/max_rate)
MAX_NVCSI_RATE=$(cat /sys/kernel/debug/bpmp/debug/clk/nvcsi/max_rate)
MAX_VIC_RATE=$(cat /sys/kernel/debug/bpmp/debug/clk/vic/max_rate)
MAX_EMC_RATE=$(cat /sys/kernel/debug/bpmp/debug/clk/emc/max_rate)

echo $MAX_VI_RATE > /sys/kernel/debug/bpmp/debug/clk/vi/rate
echo $MAX_ISP_RATE > /sys/kernel/debug/bpmp/debug/clk/isp/rate
echo $MAX_NVCSI_RATE > /sys/kernel/debug/bpmp/debug/clk/nvcsi/rate
echo $MAX_VIC_RATE > /sys/kernel/debug/bpmp/debug/clk/vic/rate
echo $MAX_EMC_RATE > /sys/kernel/debug/bpmp/debug/clk/emc/rate

echo 1 > /sys/kernel/debug/bpmp/debug/clk/vi/mrq_rate_locked
echo 1 > /sys/kernel/debug/bpmp/debug/clk/isp/mrq_rate_locked
echo 1 > /sys/kernel/debug/bpmp/debug/clk/nvcsi/mrq_rate_locked
echo 1 > /sys/kernel/debug/bpmp/debug/clk/vic/mrq_rate_locked
echo 1 > /sys/kernel/debug/bpmp/debug/clk/emc/mrq_rate_locked

5. CAN BUS

There are 2 CAN BUS for D135, see the following command for usage.

```
# CAN0 setup
sudo modprobe can; sleep 0.5; sudo modprobe can_raw; sleep 0.5; sudo modprobe mttcan

# check CAN0 status
ip -details link show can0

sudo ip link set can0 type can bitrate 500000 dbitrate 2000000 berr-reporting on fd on restart-ms 100; sleep 0.5; sudo ip link set up can0

# check CAN0 status
```

```
ip -details link show can0

  # CAN1 setup
sudo ip link set can1 type can bitrate 500000 restart-ms 100; sleep 0.5; sudo ip link set
up can1
# check CAN1 status
ip -details link show can1

# Test 1:
# ========================================
Send: MCP2515 (interface: CAN1)
Receive: MTTCAN (interface: CAN0)

candump can0 &
cangen -v can1
# Test 2:
# ========================================
Send: MTTCAN (interface: CAN0)
Receive: MCP2515 (interface: CAN1)

candump can1 &
cangen -v can0
```

6. GPIO usage

Please refer to **libgpiod** for GPIO usage.

https://github.com/brgl/libgpiod

There are 2 Output, 4 Input as below:

GPO:

GPIO	Chip index	line
PN.01	0	85
PQ.06	0	106

GPI

GPIO	Chip index	line

PH.07	0	50
PI.00	0	51
PI.01	0	52
PI.02	0	53

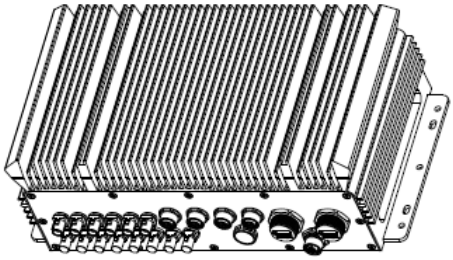
For L4T (Linux for Tegra) BSP support and the other software support associated with NVIDIA® Jetson Orin NX, please visit AVerMedia's website to contact our technical support function. (https://www.avermedia.com/professional/support/technical)

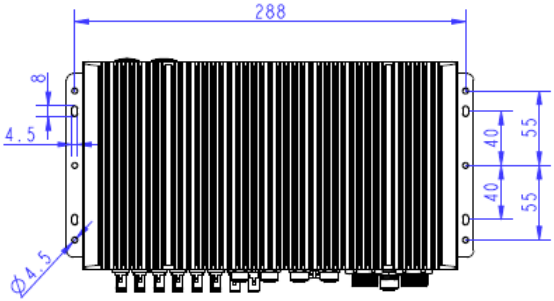
5.0 Power Consumption (T.B.D)

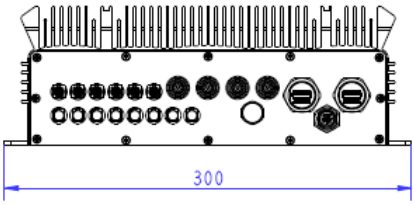
Item Description	Power Consumption
Theoretical Maximum System Power Consumption	T.B.D
Typical System Power Consumption	The power consumption under the normal operating mode is depending on the application software running with NVIDIA® Jetson Orin NX

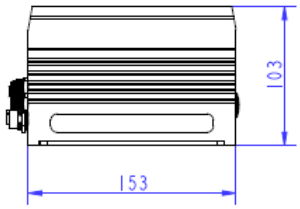
6.0 Dimension Drawing of Box PC

Fanless with 8xGMSL+2xPOE (Front View)

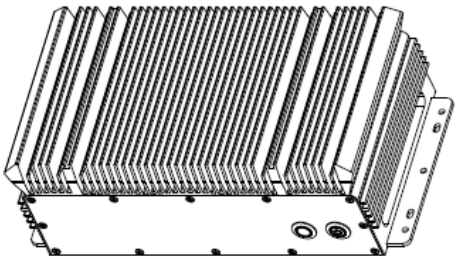


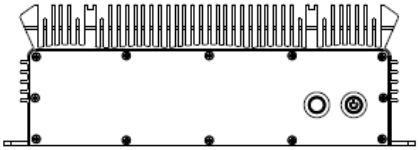


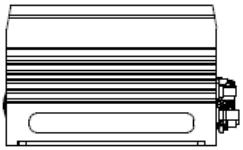


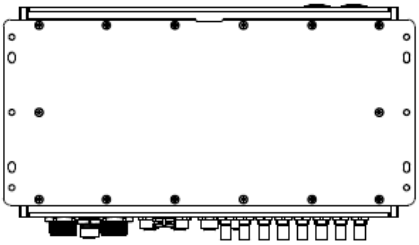


Fanless with 8xGMSL+2xPOE (Back View)

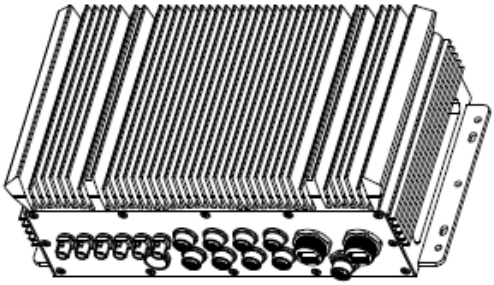


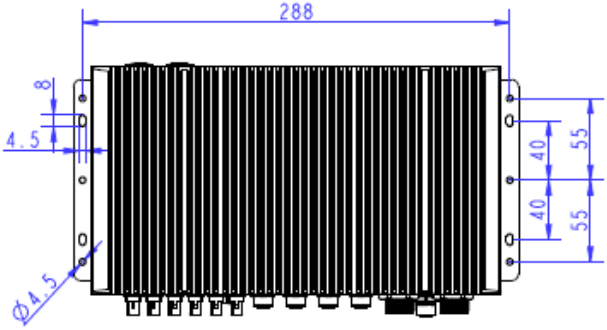


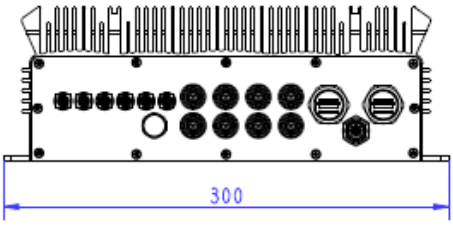


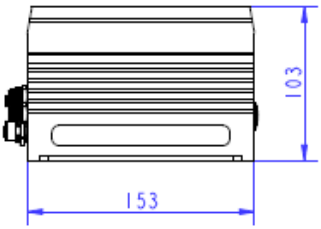


Fanless with 6xPOE (Front View)

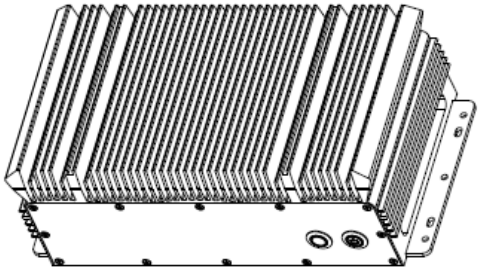


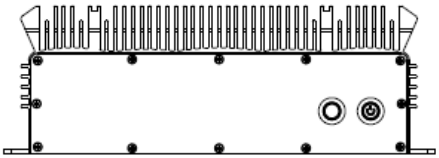


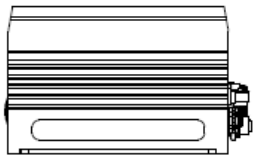


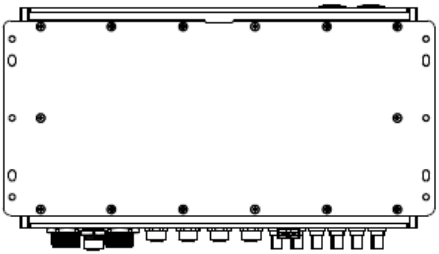


Fanless with 6xPOE (Back View)



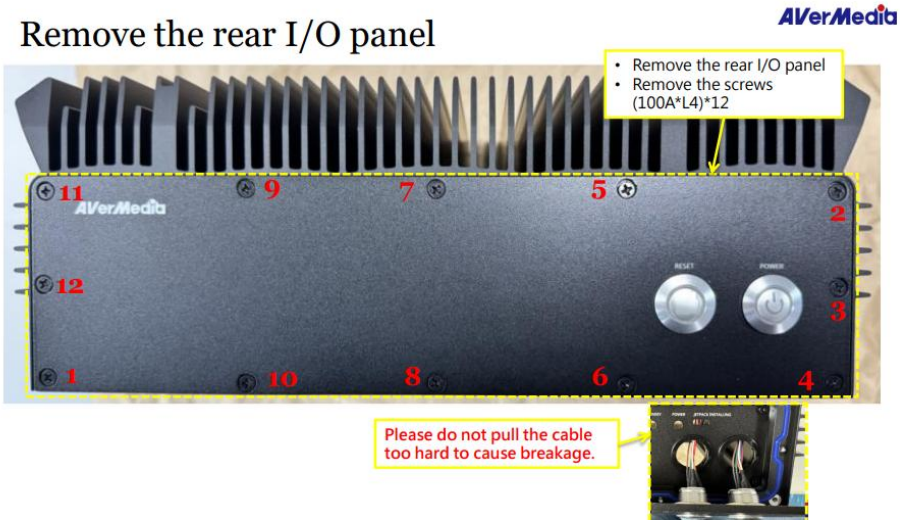




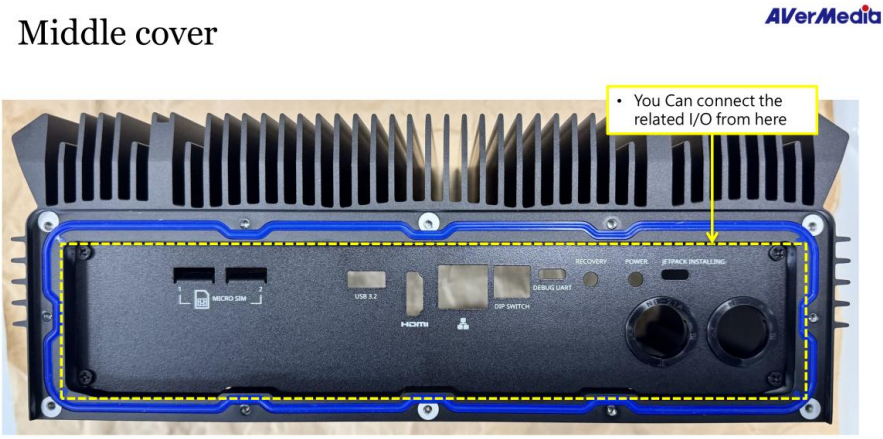


7.0 How To Open The Rear Panel

Step 1. Unscrew the rear panel to access maintenance IO ports.



Step 2. User can connect the related I/O from here. (EX: HDMI, USB3.2, Debug UART…etc)



Step 3. Assembled rear I/O panel and attach the screws in sequence (100A*L4)*12 pcs (Torque 6~7 kgf-cm)