OmniWise
www.omniwise.ai

Pulsar
Active AI Box

User Manuel

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Content

Preface Disclaimer

The information contained in this user manual, including but not limited to any product specification is subject to change without notice. OmniWise 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 the 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.

Limited Product Warranty

OmniWise provides two-year product warranty. Should this product, in OmniWise's opinion, fail to be in the good working order during the warranty period, OmniWise will, at its option, repair or replace it at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster, or non-OmniWise authorized modification or repair.

You may obtain the warranty service by delivering this product to an authorized OmniWise business partner or to OmniWise along with the proof of purchase. Product returned to OmniWise must be pre-authorized by OmniWise with an RMA (Return Material Authorization) number marked on the outside of the package and sent prepaid, insured, and packaged for the safe shipment. OmniWise will return the product by prepaid shipment service.

The limited product warranty is only valid over the serviceable life of the product. This is defined as the period during which all components are available. Should the product prove to be irreparable, OmniWise reserves the right to substitute an equivalent product if available or to retract the product warranty if no replacement is available.

The above product warranty is the only warranty authorized by OmniWise. Under no circumstances will OmniWise be liable in any way for any damages, including any lost profits, lost savings, or other incidental or consequential damages arising out of the use of, or inability
to use, such product.

Copyright Notice

ESD Warning

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

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 the carpeted areas.

4. Handle the board by the edges and avoid the contact with the components.

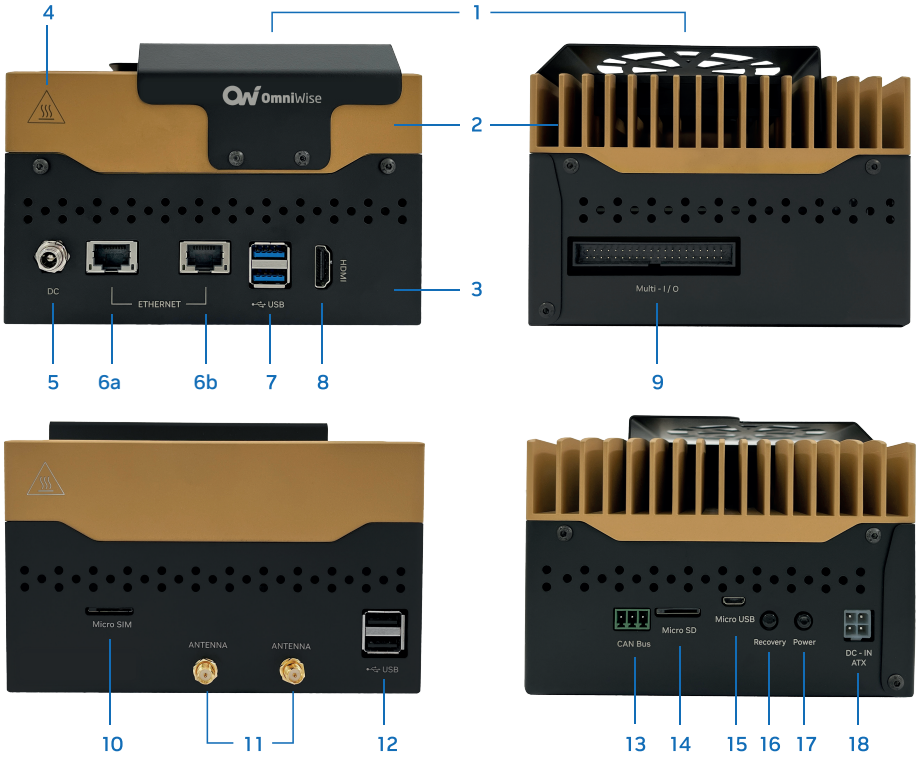
5. Only handle the circuit boards in ESD safe areas, which may include ESD floor and/or table mats, wrist strap stations, and ESD safe lab coats.

Revision	***Date***	***Updates***
Version 1.0	July, 02, 2025	1st Released

TECHNICAL SPECIFICATIONS

Module Support	NVIDIA Jetson AGX Orin, NVIDIA Jetson AGX Orin Industrial
Module Compatibility	NVIDIA Jetson AGX Orin 64GB, NVIDIA Jetson AGX Orin 32GB, NVIDIA Jetson AGX Orin Industrial
USB	1x USB 2.0 Micro-B for recovery - 2x USB 2.0 Type-A 2x USB 3.2 Type-A
Storage	1x micro-SD card slot, 1x M.2 M Key SSD
Ethernet	1x 1 GbE RJ-45, 1 1x 10 GbE RJ-45
Wifi & Bluetooth	1x M.2 E-Key – 2230 1x M.2B key (for 4G LTE module or 5G module)
GPIO	1x Micro SIM socket - 1x CAN bus 40-pin (1x UART, 1x SPI, 1x CAN, 2x I2C, 1x I2S, 5x GPIOs)
Display Output	1x HDMI Type A
RTC Battery Connector	3-Pin RTC Battery Connector
Fan Connector	4-Pin Fan Connector
Power Configuration	1x 12 - 54V DC Jack Input Power 1x 9 - 54V DC 4-Pin ATX Input Power
Dimensions	150mm(L) x 137.5mm(W) x 102.5mm(H)
Operating Temperature	-25°C ...+85°C
Warranty and Support	2 Year Warranty and Free Support
Weight	2080g (Including Antenna)
Certificate	CE

PULSAR ACTIVE AI BOX



Number	Name	Description
1	Fan	Active Cooling Airflow
2	Heatsink	Active Heatsink
3	Case	150mm(L) x 137,5mm(W) x 102,5mm(H) - 2080 g (Including Antenna)
4	Operating Temperature	-25°C to +85°C
5	DC Port	Voltage Range 12V - 54V
6ab	ETHERNET Port	1x 1 GbE RJ-45 ,1x 10 GbE RJ-45
7	USB Port	2x USB 3.0 Ports (Type-A)
8	HDMI Port	HDMI 2.0 (3840 x 2160 at 60Hz)
9	Multi - I / O Connector	40-pin (1x UART, 1x SPI, 1x CAN, 2x I2C, 1x I2S, 5x GPIOs)
10	Micro SIM	Micro SIM
11	Antenna Port	Antenna Port
12	USB Port	2x USB 2.0 Ports (Type-A)
13	CAN Bus	1x CAN Bus with Transceiver
14	Micro SD	Micro SD
15	Micro USB Port	USB 2.0 Micro-B
16	Recovery Button	Button for Recovery Mode
17	Power Button	Button for Power
18	DC - IN ATX	4-Pin 9V - 54V

HDMI OUTPUT

Function	HDMI output connector	
Location	8	
Type Description	HDMI Type -A female connector	
Manufacturer and Part Number	EDL TECHNOLOGY CO HM -FVD480B	
Mating Connector	Any HDMI standard Type -A interface cable or device.	
Pinout	Please refer to HDMI standard.	
Remarks	None	

USB 3.2 Gen 2 Type-A Connector #1 , #2

Function	USB 3 .2 Gen 2 Type-A connector #1 #2	
Location	7	
Type Description	Dual-port USB 3. 2 Gen 2 Type-A female connector	
Manufacturer and Part Number	Champway CU3B -AFR15U -096H	
Mating Connector	Any USB 3. 2 Gen 2 standard TypeA interface cable or device.	
Pinout	Please refer to USB 3. 2 Gen 2 standard.	

Remarks	None

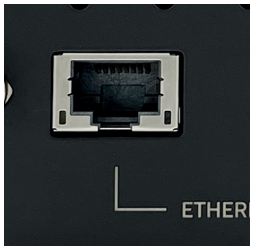
USB 2.0 Micro B Connector

Function	BSP Installation as recovery mode	
Location	15	
Type Description	USB micro-type B female connector	
Manufacturer and Part Number	Fullglory FG-MCB -111440	
Mating Connector	Any USB standard Micro-type interface cable or device.	
Pinout	Please refer to USB Micro-type standard.	
Remarks	None	

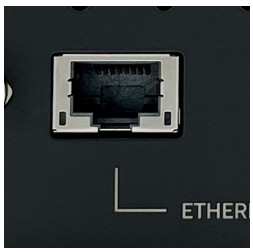
Micro SD Card Slot

Function	Micro SD Card	
Location	14	
Type Description	SOCKET_MICRO SD CARD_9PIN_90°_SMD	
Manufacturer and Part Number	Fullglory FG-0011BAAS09A	
Pinout	Refer to MicroSD card standard	
Remark	Push-Push	

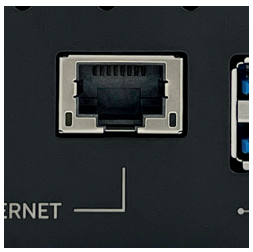
10 Gigabit Ethernet Connector(Original)

Function	10 Gb single-port Ethernet connector, used to connect to the host system.	
Location	6a	
Type Description	RJ45 with integrated magnetics	
Manufacturer and Part Number	Compupack(CPC) ACNRJJA0001-006 10G-LEFT(G/Y)+RIGHT(Y)-UP	
Mating Connector	Any standard 10Gb Ethernet mating connector can be applicable.	
Pinout	Comply with Ethernet standards.	
Remarks	None	

10 Gigabit Ethernet Connector(PCN20240528-1)

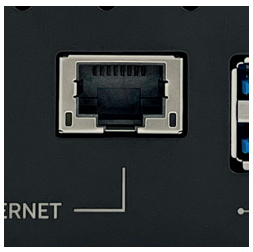
Function	10 Gb single-port Ethernet connector, used to connect to the host system.	
Location	6a	
Type Description	RJ45 with integrated magnetics	

Gigabit Ethernet Connector(Original)

Function	1Gb single-port Ethernet connector, used to connect to the host system.	
Location	6b	
Type Description	RJ45 with integrated magnetics	
Manufacturer and Part Number	Compupack(CPC) ACNRJGA0029 -006 1G-LEFT(G/Y)+RIGHT(Y) -UP	
Mating Connector	Any standard 1Gb Ethernet mating connector can be applicable.	
Pinout	Comply with Ethernetstandards.	

Remarks	None

Gigabit Ethernet Connector(PCN20240528-1)

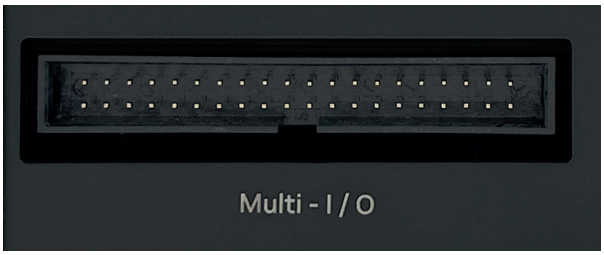
Function	1Gb single-port Ethernet connector, used to connect to the host system.	
Location	6b	
Type Description	RJ45 with integrated magnetics	
Manufacturer and Part Number	UDE S26-ZZ-0084 1G-LEFT(G/Y)+RIGHT(Y)-UP	
Mating Connector	Any standard 1Gb Ethernet mating connector can be applicable.	
Pinout	Comply with Ethernet standards.	

40-Pin expansion header

Function	General-purpose input/output	
Location	9	
Type Description	HEADER_BOX_2*20PIN_2.54 mm _90°_SMD	
Manufacturer and Part Number	Compupack(CPC) ACNBH420029 -040	
Mating Connector	Any 2.54mm pitch standard interface female	

Pinout

[PCB Ver.C]



Sysfs GPIO	Connector Label	Pin	Pin	Connector Label	Sysfs GPIO
	3.3 VDC	1	2	5.0 VDC	
/dev/i2c-7	I2C_GP8_DAT	3	4	5.0 VDC	
/dev/i2c-7	I2C_GP8_CLK	5	6	GND	
gpio454	MCLK05	7	8	UART1_TX	/dev/ttyTHS0
	GND	9	10	UART1_RX	
SFIO (gpio460)	UART1_RTS	11	12	I2S2_CLK	gpio398
SFIO (gpio456)	PWM01	13	14	GND	
gpio433	GPIO27_PWM2	15	16	GPIO8_AO_DMIC_IN_DAT	gpio325
	3.3 VDC	17	18	GPIO35_PWM3	gpio391
gpio483	SPI1_MOSI	19	20	GND	
gpio482	SPI1_MISO	21	22	GPIO17_40HEADER	gpio444
gpio481	SPI1_SCK	23	24	SPI1_CS0	gpio484
	GND	25	26	SPI1_CS1	gpio485
/dev/i2c-1	I2C_GP2_DAT	27	28	I2C_GP2_CLK	/dev/i2c-1
CAN0	CAN0_RX	29	30	GND	
CAN0	CAN0_TX	31	32	GPIO9_CAN1_GPIO0	gpio324
gpio318	CAN1_DOUT	33	34	GND	
gpio401	I2S2_FS	35	36	UART1_CTS	SFIO (gpio461)
gpio319	CAN1_DIN	37	38	I2S2_SDIN	gpio400
	GND	39	40	I2S2_SDOUT	gpio399

Remarks	None

Micro SIM Card Socket

Function	Micro SIM Card	
Location	10	
Type Description	SOCKET_MICRO SIM_8PIN_90°_SMD	
Manufacturer and Part Number	Fullglory FG-0271AAAG06A PUSH PUSH 1.42H	
Pinout	Refer to Micro SIM card standard	
Remark	*Push Push type *Inserting directing as below	

DC POWER JACK

Function	DC Power input with lock	
Location	5	
Type Description	JACK_DC POWER_D2.5 ㎜_90°_DIP include nut and washer	
Manufacturer and Part Number	JKCR DCD-020-105B	
Mating Connector	SMCTS OD 5.5*2.5 mm DC 10mm (655-236)	
Pinout	Pin Number / Description Center / Power Outer ring / GND	
Remarks	NA	

ATX 4P

Function	ATX 4P
Location	18
Type Description	WAFER_2*2PIN_4.2 ㎜_90°_DIP
Manufacturer and Part Number	Fullglory FPWD-42R2-04NAT
Mating Connector	Follow ATX 4pin power standard
Pinout	Pin Number / Description 1 / GND 2 / GND 3 / 12-54V Power 4 / 12-54V Power
Remarks	None

USB 2.0 Gen 1 Type-A Connector #1 , #2

Function	USB 2.0 Gen 1 Type-A connector #1 #2
Location	12
Type Description	Dual-port USB 2.0 Gen 1 Type-A female connector
Manufacturer and Part Number	EDL UAF208D010B
Mating Connector	Any USB 2.0 standard TypeA interface cable or device.
Pinout	Please refer to USB 2.0 Gen 1 standard.
Remarks	None

CAN Bus 3-pin terminal block with transceiver

Function	CAN Bus 3 -pin terminal blockwith transceiver	
Location	13	
Type Description	TERMINAL BLOCK_1*3PIN	
Manufacturer and Part Number	DECA, ME030-38103T, GREEN -P3.81 □	
Mating Connector	DECA, MC420-38103Z	
Pinout	Pin # / Description 1 / CANH 2 / GND 3 / CANL	
Remarks	None	

Power &Recovery Button

Function	Power & Recovery control button	
Location	16 Recovery - 17 Power	
Type Description	Button	
Manufacturer and Part Number	Champway LS67AK-NBR-A-R2KA9 RGB-CAP(BLACK)	
Pinout	N/A	
Remark	None	

Installation

1. Ensure all external system power supplies are off and disconnected.

2. Install the necessary cables for your application. At a minimum these would include:
    a. Power cable to the input power connector
    b. HDMI video display cable
    c. Keyboard and Mouse via USB

3.Connect the Power Cable of the 12 - 54V DC Jack Input Power into the (5) connector.

Recovery Mode

MicroUSB Jetson platform port of Pulsar Active AI Box can be used to re-program NVIDIA® Jetson AGX Orin & AGX Orin Industrial by using the other host system running NVIDIA Jetpack, as the procedure described below.

1. Before you start
    - Please make sure to use a Linux host PC with Ubuntu 18.04, 20.04, 22.04 operating system.
    - Please use a native setup (no virtual machine) installation file in the following steps.
    - You will also need a high-quality standard USB. Type A to micro-USB cable

2. Connect carrier board to host PC

3.Connect the system to the Linux host PC. Please use a USB cable (micro-USB on the carrier board).

4.After connecting to the host PC powering up the system. The system will detect the host PC and automatically enter the flashing state (also called force recovery mode).

5.Check that the connection is established with the lsusb command. You should find one entry with Nvidia Corp.

For BSP installation please follow the instructions in the link provided below

Flashing the Pulsar with D315 5G Carrier Board: A Comprehensive Guide

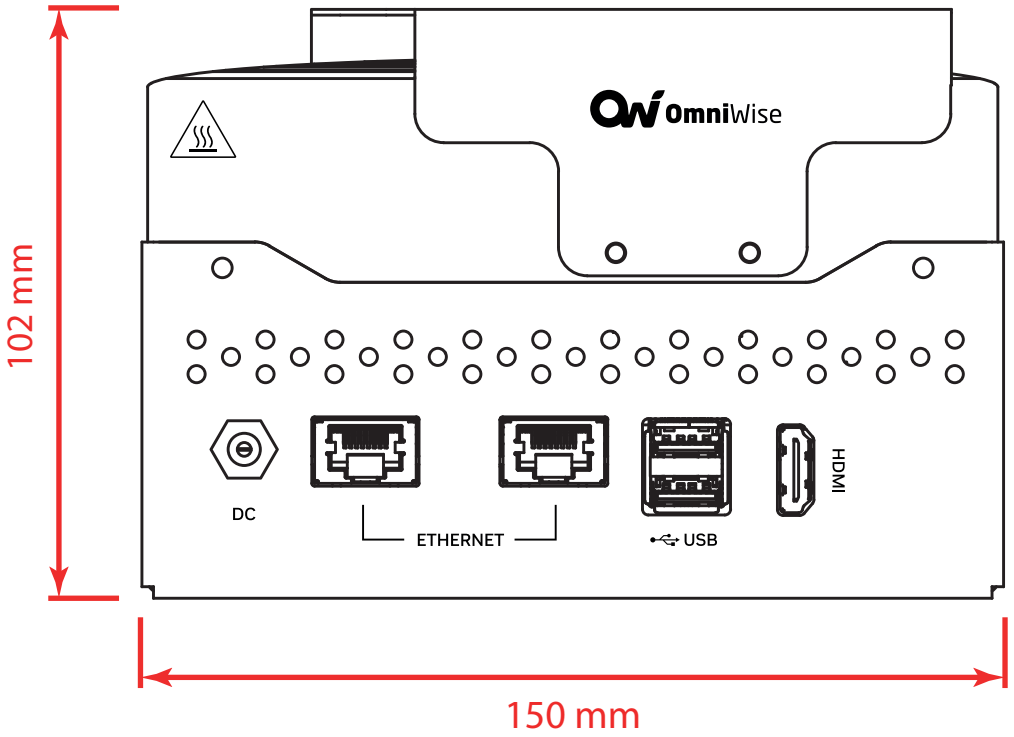
Thermal Details

Pulsar Active AI Box has an operating Temperature Range of -40 °C to +85°C. The NVIDIA® AGX Orin Module works with different temperature ranges which is shown in the table below.

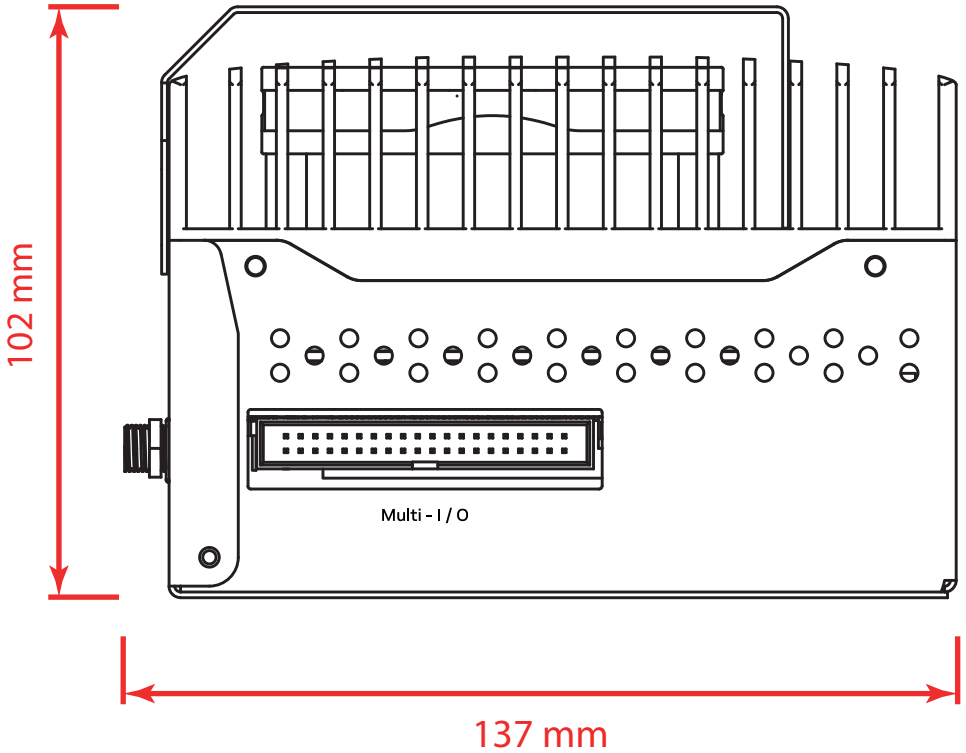
Power Consumption

Item Description	Power Consumption
Theoretical Maximum System Power Consumption	Power Consumption of PULSAR - 32G: 15W(*1) to 56W (*2) Power Consumption of PULSAR - 64G: 15W(*1) to 66W (*2) Power Consumption of PULSAR - Industrial: 17W(*1) to 76W (*2) *1: The condition is Normal Mode and connected to USB3*2/ USB2*2/ Ethernet*1(10G)/ Micro SD Card*1 *2: The condition is Full Loading Mode and connected USB3*2/ USB2*2)/ Ethernet*1(10G)/ Micro SD Card*1/ SSD(256G)*1/ WIFI (Intel AC9260)*1/ PCIe to SSD Adapter(500G)*1/ 4G(EM05G)*1
Typical System Power Consumption	The power consumption under the normal operating mode is depending on the application software running with NVIDIA® Jetson AGX Orin and AGX Orin Industrial.

MECHANICAL DETAILS



Front View Dimensions



Side View Dimensions