ADL-AI2500

USER MANUAL

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Terminology & Acronyms

The following terms and acronyms are used throughout this manual and are provided here for clarity.

Term	Definition	Term	Definition
ADLES	ADL Embedded Solutions Inc.	**MAXN**	Maximum-performance NVIDIA power mode.
ADL-AI2500	Rugged embedded AI system based on NVIDIA Jetson Orin NX.	**NX**	NVIDIA Jetson Orin NX module family designation.
GMSL	Gigabit Multimedia Serial Link camera/video interface.	**SOM**	System on Module.
I/O	Input/Output signals or interfaces.	**SSD**	Solid-State Drive storage device.
JetPack	NVIDIA software stack for Jetson platforms.	**TOPS**	Tera Operations Per Second; AI compute performance metric.
M.2	Compact internal expansion connector/form factor for SSDs and wireless modules.	**1GbE**	One Gigabit Ethernet.

Preface

Disclaimer

ADLES emphasizes that the information contained in this user manual is continuously updated in line with the technical modifications and enhancements made by ADLES to its ADL-AI2500. Therefore, this manual only represents the technical status of ADL-AI2500 at the time of publishing.

ADLES shall not be held responsible for any damages that may occur directly or indirectly as a result of any technical or typographical errors or omissions found in this document or for any discrepancies between the product and the user's manual.

Customer Support

In case you encounter any challenges after reading the user manual and/or using the ADL-AI2500, please reach out to ADLES. See the contact information section below for more information on how to contact us directly.

Contact Information

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Limited Product Warranty

ADLES provides a 1-year Warranty for the ADL-AI2500. This warranty period is valid from the original purchase date of the ADL-AI2500. In order to maintain warranty, the ADL-AI2500 must not be altered or modified in any way. Changes or modifications to the ADL-AI2500, that are not explicitly approved by ADLES and described in this user manual or received from ADLES Support as a special handling instruction, will void your warranty.
To receive warranty service, the ADL-AI2500 must be delivered to ADLES within the warranty period together with the original invoice or proof of purchase.

Revision History

Revision No	Revision Date	Revision Description
rev 1.0	03/01/2026	Preliminary Release

1. Introduction

ADL-AI2500 is a high-performance industrial fan-less Embedded System that delivers exceptional computing power for demanding industrial applications. Built with the latest NVIDIA Jetson Orin NX System on Module (SOM), it offers advanced AI and machine learning capabilities with 100 TOPS (and up to 157 TOPS in Super Mode) of computing performance.

With a range of connectivity options and advanced thermal management, the ADL-AI2500 is designed to operate reliably in a range of harsh industrial environments. Its rugged and durable construction ensures long-lasting performance, while its compact design allows for easy integration into existing industrial systems.

Whether you need a powerful computing solution for advanced robotics, automation, or other industrial applications, the ADL-AI2500 is the ideal choice. Upgrade your industrial computing power with the ADL-AI2500 today.

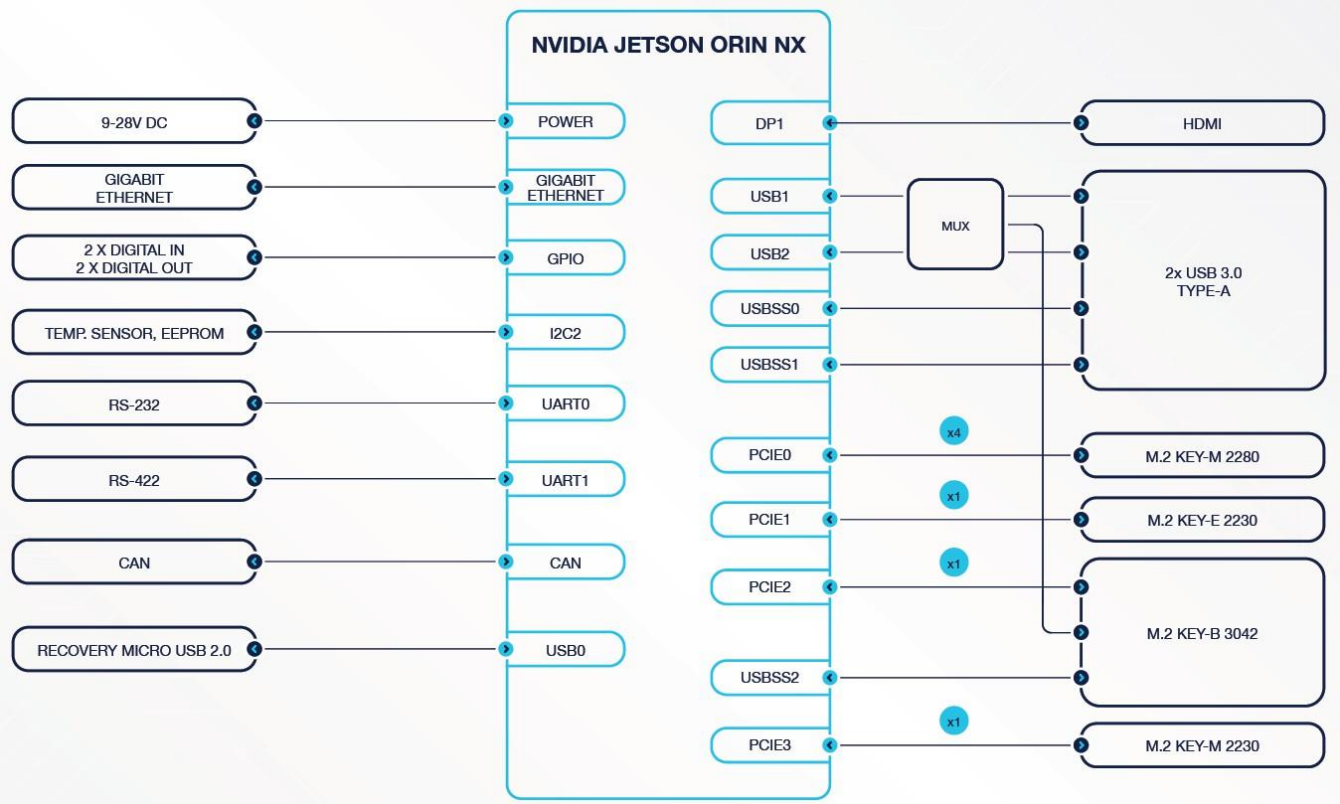
Latest revision of this user manual, datasheet, and other information can be found at ADL-AI2500 Web Page.

2. Product Specification

2.1 Technical Specification

Supported Modules	NVIDIA Jetson Orin NX 8GB / 16GB
Memory	8 GB 256-bit LPDDR5 / 16 GB 128 bit LPDDR5
Graphics Interfaces	1x HDMI 2.0(max resolution 3840x2160)
Interfaces	1x Gigabit Ethernet 2x USB 3.1 Type-A 1x CAN Bus 1x RS232 & 1x RS422 1x microUSB 2.0 (Recovery) 2x Digital Input 2x Digital Output
Wireless Communication	WIFI/LTE/5G/Bluetooth Connectivity by extension sockets
Power Supply	9-28 VDC
Extension Sockets	1x M.2 Key-E, 1x M.2 Key-B, 1x SIM
Mass Storage	2x M.2 Key-M SSD Slot
Ambient Conditions	-25°C ... +60°C Standard Temp. -25°C ... +70°C with conduction cooling
Form Factor / Dimensions	5.11”x 4.36” x 2.92” (130mm x 110.7mm x 74.2mm) ~2lb
Operating Systems	Ubuntu Linux 20.04 Ubuntu Linux 22.04
JetPack Support	JetPack 5.x JetPack 6.x

2.2 Block Diagram

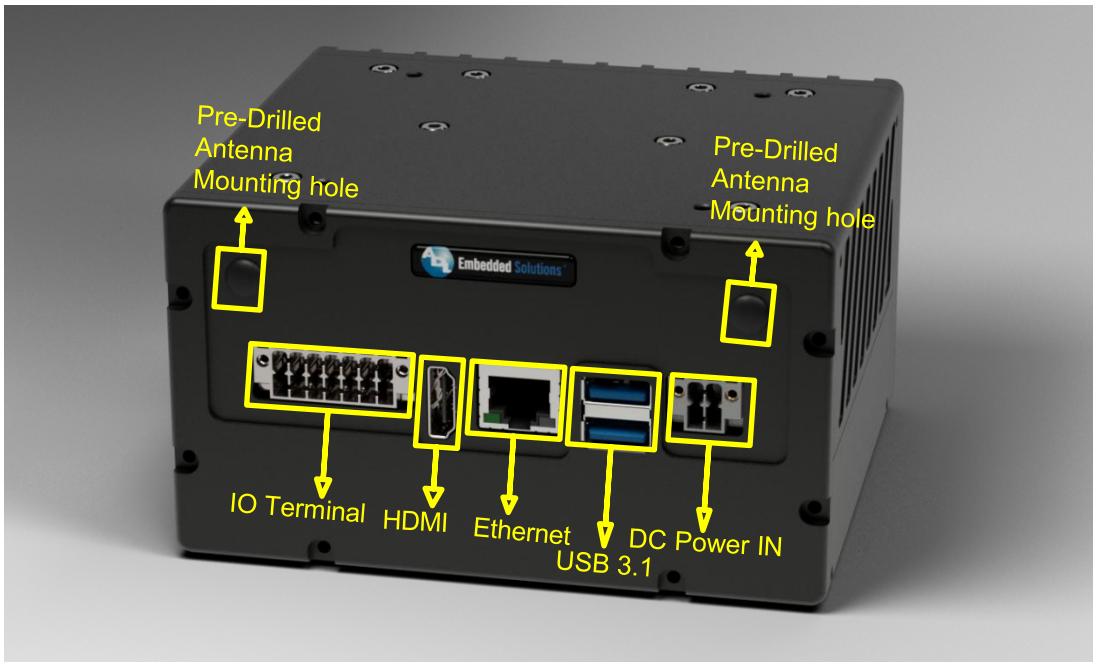


2.3 ADL-AI2500 Visuals

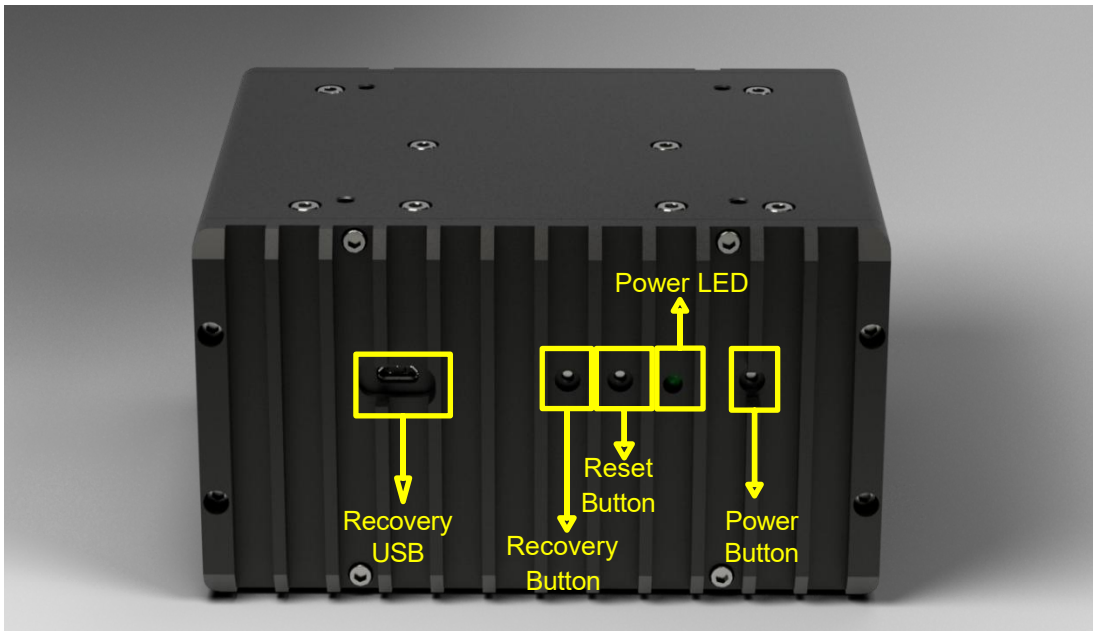
3. Hardware Information

3.1 Connector Location

3.1.1 Front Connectors Layout



3.1.2 Rear Connectors Layout



3.2 List of Connectors and Buttons

Connectors
I/O Terminal Connector
HDMI Conector
Gigabit Ethernet Connector
USB 3.1 Type-A Connector
Power Connector
Recovery mode USB 3.1 Type C Connector
Recovery Button
Reset Button
Power Button

3.3 The Definition of Each Connector

3.3.1 I/O Terminal Connector

Function	Description		
Mating connector	1790344 (DFMC 1,5/ 7-STF-3,5) from Phoenix Contact.		
Pinout	**Pin**	**Description**	**I/O Type**
	1	RS232 TX	I/O
	2	RS232 RX	I/O
	3	RS422 A	I/O
	4	RS422 Z	I/O
	5	RS422 B	I/O
	6	RS422 Y	I/O
	7	CAN_H	I/O
	8	CAN_L	I/O
	9	GROUND	Power
	10	GROUND	Power
	11	DIGITAL_OUT1 Note: Up to 24V, low-side switch	Output
	12	DIGITAL_IN1	Input
	13	DIGITAL_OUT0 Note: Up to 24V, low-side switch	Output
	14	DIGITAL_IN0	Input

3.3.2 HDMI Connector

	Description
	The NVIDIA® Jetson Orin NX module will output video via the vertical HDMI connector that is HDMI 2.0 capable.

3.3.3 Gigabit Ethernet Connector

	Description
	It is a RJ-45 ethernet connector for internet communication.

3.3.4 USB 3.1 Type-A Connector

	Description
	There are 2 USB 3.1 Type-A connectors with a 1.5A current limit per connector.

3.3.5 Power Connector

Function	Description	
Mating Connector	1708595	
Minimum Input Voltage	+9V	
Maximum Input Voltage	+28V	
Pinout	**Pin**	**Description**
	1	Positive
	2	Negative
	3	Positive
	4	Negative

3.3.6 Recovery Mode USB 3.1 Type-C Connector

	Description
	It is used to allow to install or upgrade the operating system.

3.3.7 Recovery Button

	Description
	Recovery button should be pressed with reset button at the same time. After released reset button, recovery button should be pressed a little bit more (min. 250 ms).

3.3.8 Reset Button

	Description
	Reset button is used to reset the Jetson SOM.

3.3.9 Power Button

	Description
	Power button is used to energize the platform.

4. Software Information

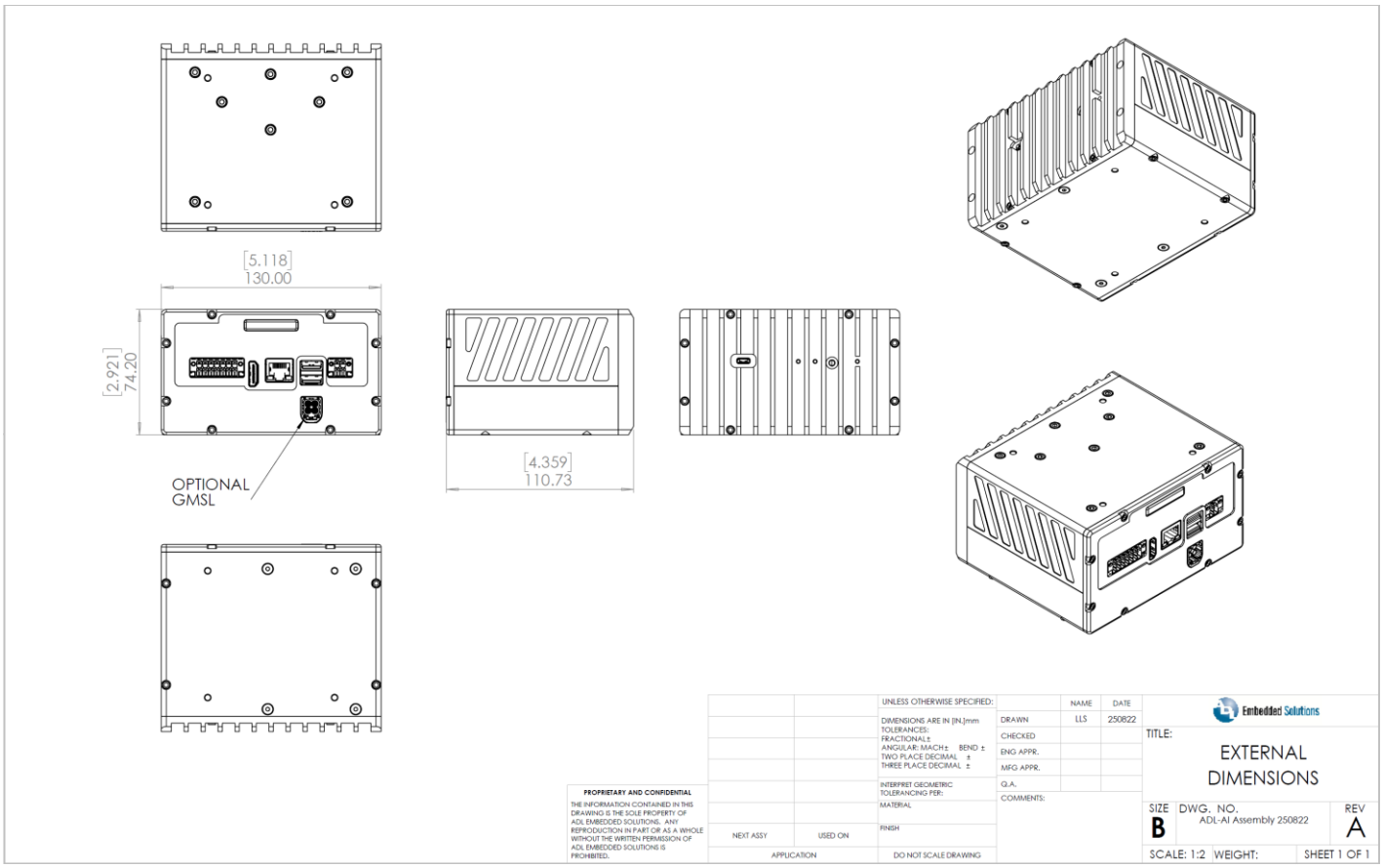
4.1 Installation

JetPack-6.x Installation can be found here: https://www.adl-usa.com/Jet6TBD

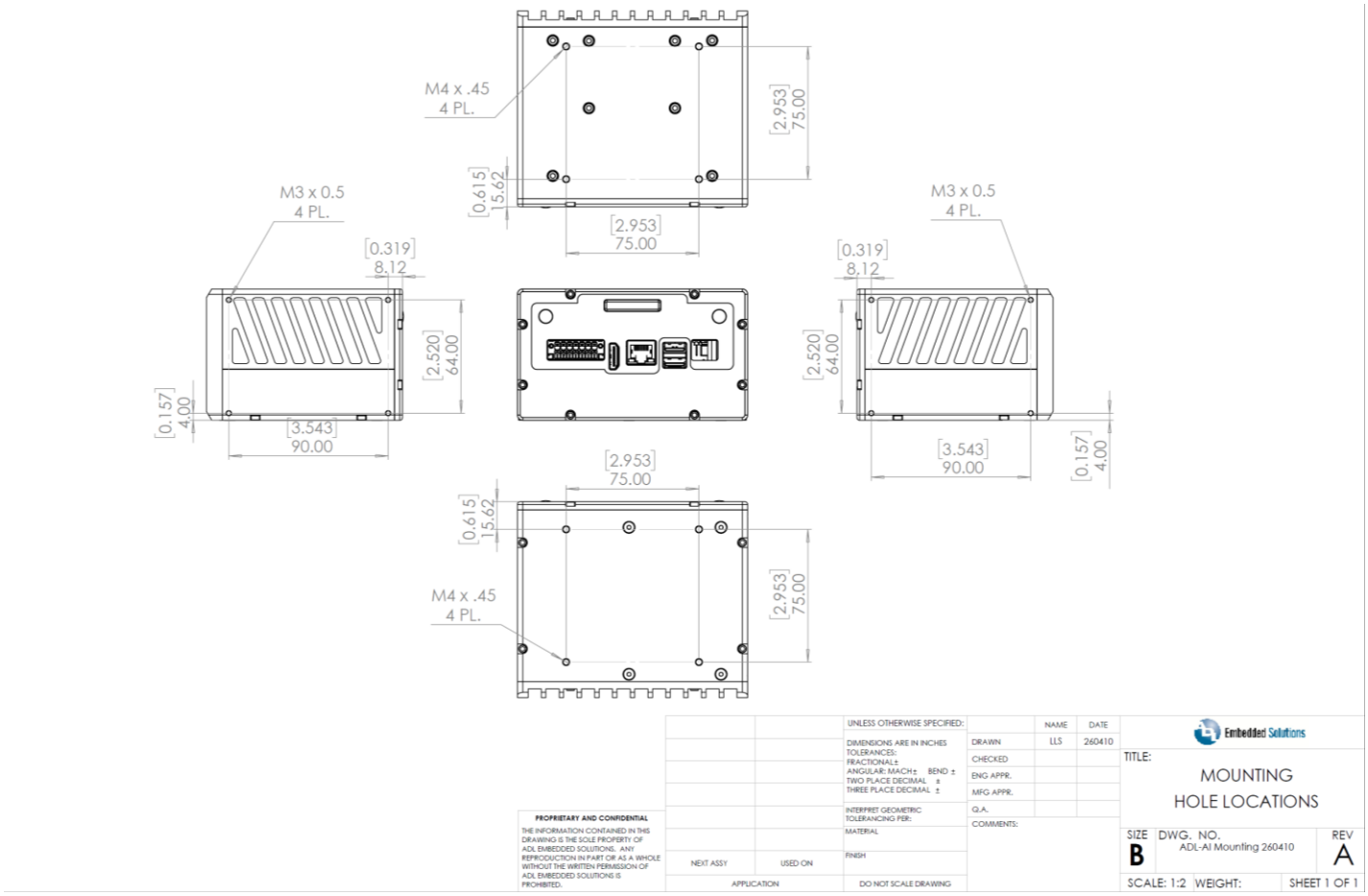
5. Mechanical Information

5.1 2D Mechanical Drawing

External Dimensions



Mounting Hole Locations



6. Power Consumption

6.1 Orin NX 16GB

Power Supply: 12V-5A

All CPU and GPU cores are %100 loaded.

	Power Up Sequence	Idle	Standby (Suspend mode)	10W (4 core)	15W (4 core)	25W (8 core)	MAXN (8 core)
Current (A)	1,34	0,55	0,07	1,23	1,51	1,8	2,5
Power (W)	16,08	6,6	0,84	14,76	18,12	21,6	30

6.2 Orin NX 8GB

Power Supply: 12V-5A

All CPU and GPU cores are %100 loaded.

	Power Up Sequence	Idle	Standby (Suspend mode)	10W (4 core)	15W (4 core)	20W (6 core)	MAXN (6 core)
Current (A)	1,44	0,6	0,08	1,3	1,56	1,64	2,04
Power (W)	17,28	7,2	0,96	15,6	18,72	19,68	24,48

7. Configurations/Options

Please check our https://www.adl-usa.com/systems/adl-ai2500/ for more information about the available ADL-AI2500 options and various configurations, which include:

- ADL-AI2500-LAN – which comes configured with an additional 1x 1Gb Ethernet (2x 1GbE total)
- ADL-AI2500-USB - which comes configured with additional 4x USB 3.0
- ADL-AI2500-GMSL4 - which comes configured with an additional 1x Quad Mini Fakra GMSL (w/ 4x camera inputs)
- ADL-AI2500-GMSL - which comes configured with additional 4x Fakra Plugs GMSL Camera Inputs

8. Ordering Information