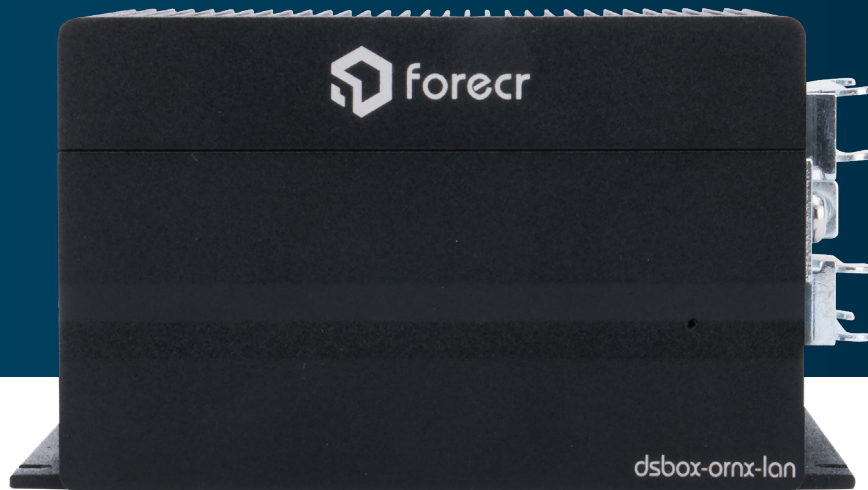




DSBOX ORNX-LAN

USER MANUAL

UM-DSBXORNX-LAN-01

Revision 1.12

04/10/2024

Table of Contents

Preface	4
Disclaimer	4
Customer Support	4
Contact Information	4
Copyright Notice	4
Trademark Acknowledgment	4
Limited Product Warranty	5
Revision History	5
1. Introduction	6
2. Product Specification	6
2.1 Technical Specification	6
2.2 Block Diagram	7
2.3 DSBOX ORNX-LAN Visuals	7
3. Hardware Information	8
3.1 Connector Location	8
3.1.1 Front Connectors Layout	8
3.1.2 Rear Connectors Layout	8
3.2 List of Connectors and Buttons	9
3.3 The Definition of Each Connector	9
3.3.1 I/O Terminal Connector	9
3.3.2 HDMI Connector	10
3.3.3 Gigabit Ethernet Connector	10
3.3.4 Power Connector	10
3.3.5 USB 3.1 Type-C Connectors	10
3.3.6 Recovery Mode USB 3.1 Type-C Connector	10
3.3.7 Reset Pushbutton	11
3.3.8 Recovery Pushbutton	11
4. Software Information	11
4.1 Installation	11
5. Mechanical Models & Drawings	12
5.1 3D Model	12
5.2 2D Mechanical Drawing	12
6. Power Consumption	13
6.1 Orin NX 16GB	13
6.2 Orin NX 8GB	13
6.3 Orin Nano 8GB	13

6.4 Orin Nano 4GB.....	13
7. Cables	14
8. MTBF Prediction	14
9. Ordering Information	14

Preface

Disclaimer

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

Forecr 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 DSBOX-ORNXLAN, please reach out to the Forecr reseller from which you purchased the DSBOX-ORNXLAN.

See the contact information section below for more information on how to contact us directly.

Contact Information

E-mail Address	For information requests: info@forecr.io For support requests: support@forecr.io For wholesale inquiries: sales@forecr.io
Address	Forecr OÜ Akadeemia tee 21/1 (II floor), Room 219, 12618, Tallinn, Estonia
Telephone Number	Estonia +372 5332 2632
Website	https://www.forecr.io

Copyright Notice

The information provided in this manual is subject to change without notice. Forecr shall not be held responsible for any errors contained herein or for any incidental or consequential damages that may arise from the provision, implementation, or utilization of this material. This manual is protected by copyright. All rights are reserved by Forecr. No part of this manual may be reproduced, copied, translated or transmitted in any form without the prior written consent of Forecr.

Copyright © 2023 - Forecr.io

Trademark Acknowledgment

Forecr recognizes and acknowledges that all trademarks, registered trademarks, and/or copyrights mentioned in this user manual belong to their respective owners. All possible trademarks or copyright acknowledgments that are not listed herein do not mean a lack of acknowledgment to the rightful owners of mentioned trademarks and copyrights. Forecr acknowledge the rights of the trademark owners and respect their intellectual property.

Limited Product Warranty

Forecr provides a 1-year Warranty for the DSBOX-ORNXLAN. This warranty period is valid from the original purchase date of the DSBOX-ORNXLAN. In order to maintain warranty, the DSBOX-ORNXLAN must not be altered or modified in any way. Changes or modifications to the DSBOX-ORNXLAN, that are not explicitly approved by Forecr and described in this user manual or received from Forecr Support as a special handling instruction, will void your warranty.

To receive warranty service, the DSBOX-ORNXLAN must be delivered to Forecr within the warranty period together with the original invoice or proof of purchase.

Revision History

Revision No	Revision Date	Revision Description
rev 1.0	18.03.2024	Preliminary Release
rev 1.1	17.07.2024	JetPack 6.x has been added to the 2.1 Technical Specification Section and the 4.1 Installation Section.
rev 1.11	01.10.2024	Section 9 - Ordering Information has been edited.
rev 1.12	04.10.2024	Ubuntu Linux 22.04 has been added to the 2.1 Technical Specification Section. Section 6 - Power Consumption has been edited.

1. Introduction

DSBOX-ORNX-LAN is a powerful and reliable industrial computing device with dual LAN connectivity, suitable for industrial applications that require high processing power and ruggedness, such as autonomous driving, robotics, and intelligent video analytics. It is based on the NVIDIA DRIVE AGX Orin system-on-a-chip, featuring multiple NVIDIA Ampere GPU cores and Arm64 CPU cores, providing the processing power required for complex industrial applications such as autonomous driving, robotics, and intelligent video analytics.

DSBOX-ORNX-LAN has a rugged and compact design optimized for industrial environments. It is built with an aluminum chassis that provides excellent heat dissipation and protection against dust, shock, and vibration. The device features a wide operating temperature range and a wide input voltage range to ensure reliable operation in harsh industrial environments.

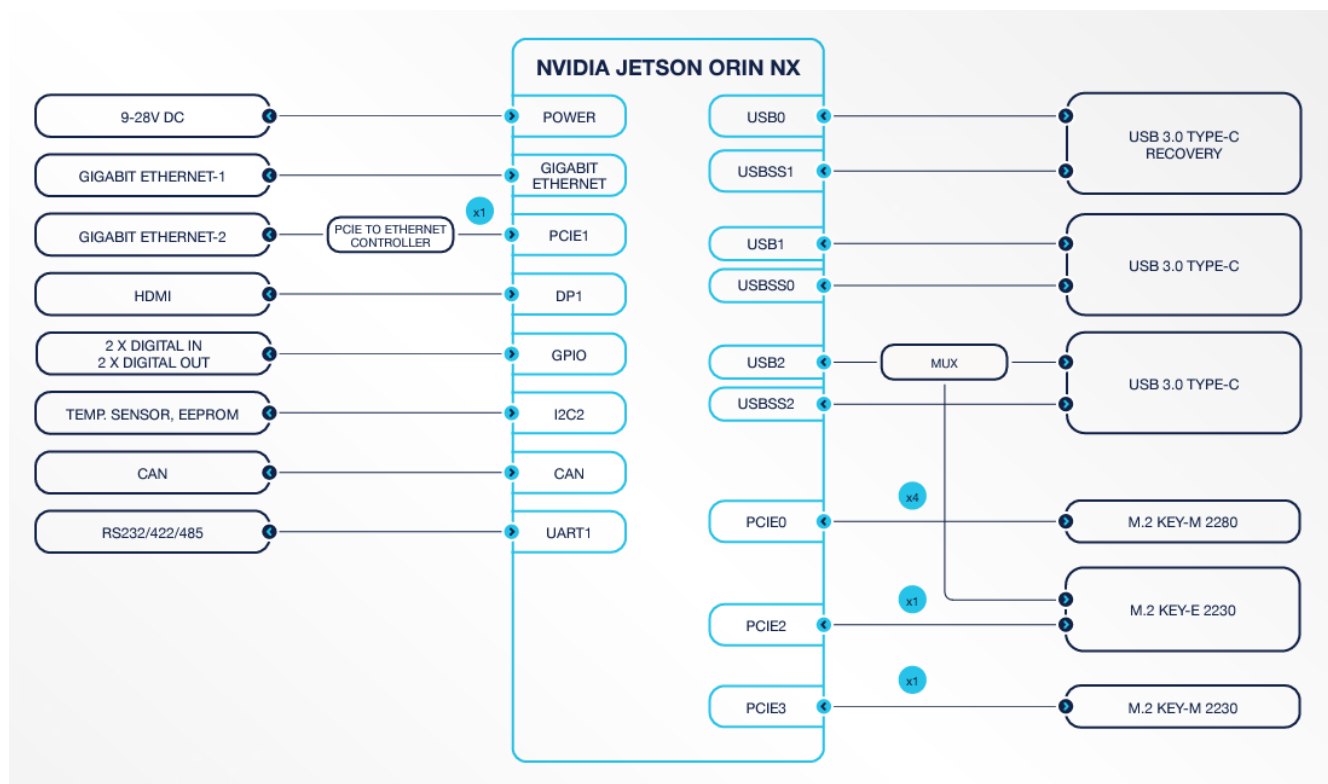
Latest revision of this user manual, datasheet, and 3D model can be downloaded from [Forecr](#) Web Page.

2. Product Specification

2.1 Technical Specification

Supported Modules	NVIDIA Jetson Orin Nano 4GB / 8GB NVIDIA Jetson Orin NX 8GB / 16GB
Memory	4 GB 64-bit LPDDR5 / 8 GB 128 bit LPDDR5 8 GB 256-bit LPDDR5 / 16 GB 128 bit LPDDR5
Graphics Interfaces	1x HDMI 2.0(max resolution 3840x2160)
Interfaces	2x Gigabit Ethernet 3x USB 3.1 Type-C 1x CAN Bus 1x RS232 & 1x RS422 2x Digital Input, 2x Digital Output
Wireless Communication	WiFi/Bluetooth Connectivity by extension sockets
Power Supply	9-28 VDC
Extension Sockets	1x M.2 Key-E
Mass Storage	2x M.2 Key-M SSD Slot
Ambient Conditions	-25°C ... +85°C
Form Factor / Dimensions	110 mm x 130 mm x 60 mm 765gr
Operating Systems	Ubuntu Linux 20.04 Ubuntu Linux 22.04
JetPack Support	JetPack 5.x JetPack 6.x

2.2 Block Diagram



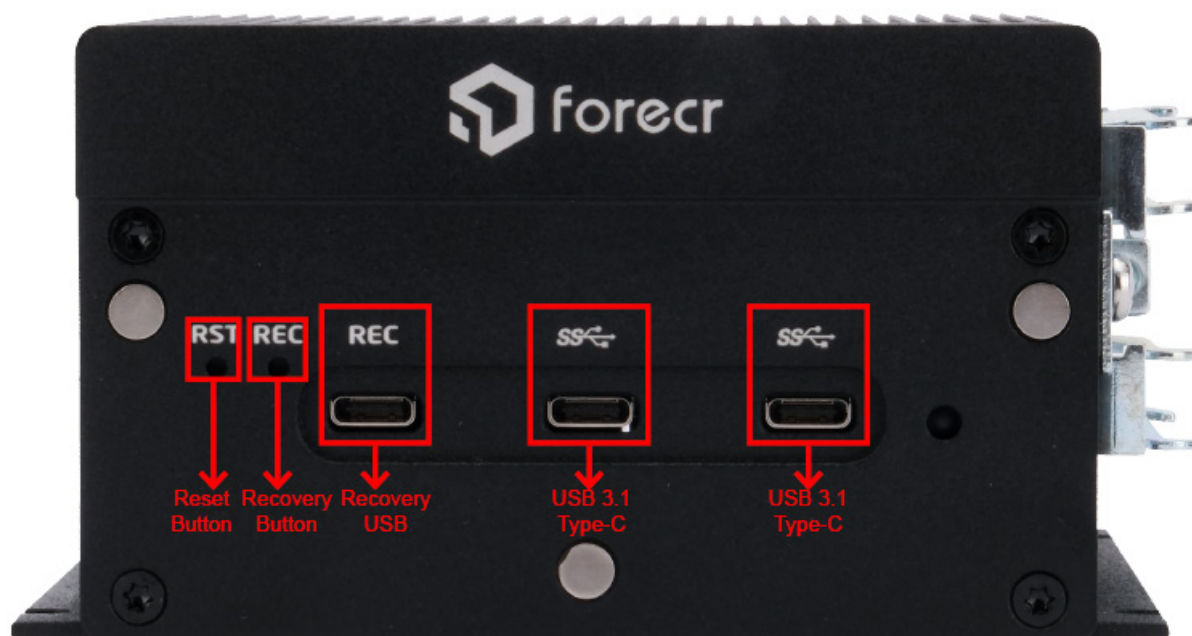
2.3 DSBOX ORNX-LAN Visuals



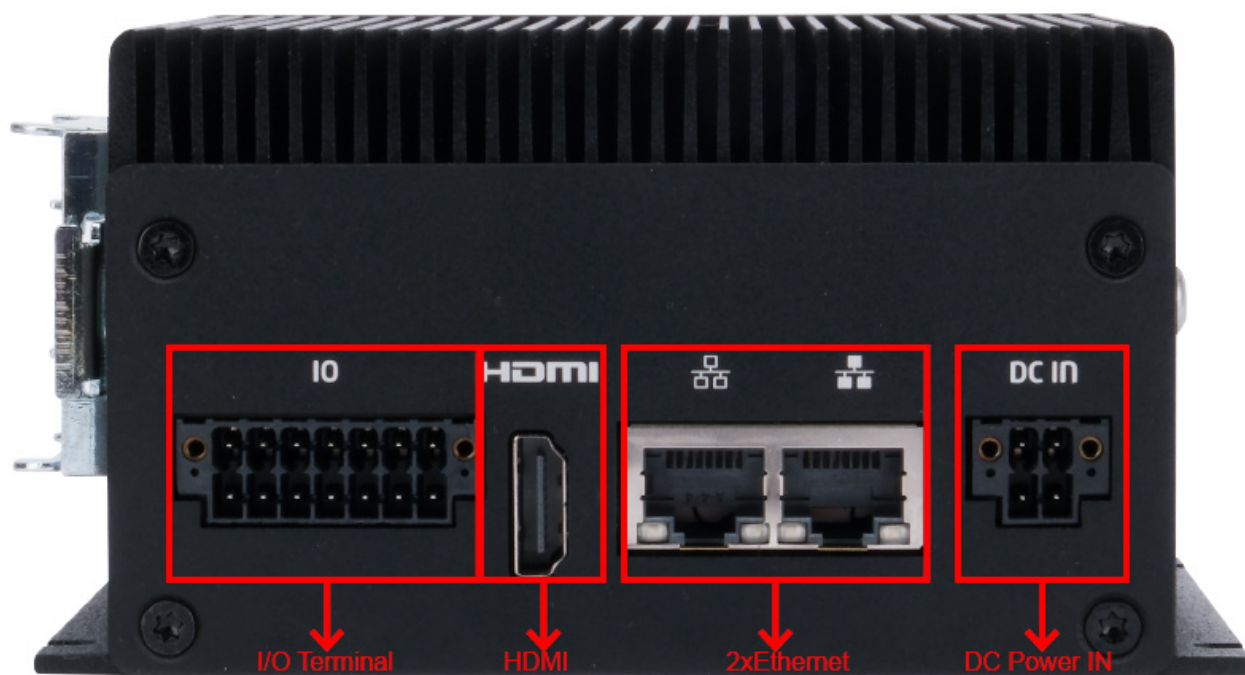
3. Hardware Information

3.1 Connector Location

3.1.1 Front Connectors Layout



3.1.2 Rear Connectors Layout

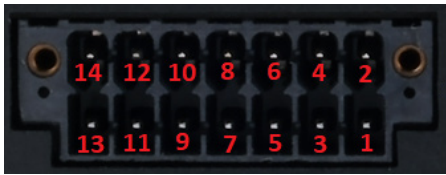


3.2 List of Connectors and Buttons

Connectors
DSBOX-ORNX-LAN I/O Terminal Connector
DSBOX-ORNX-LAN HDMI Connector
DSBOX-ORNX-LAN Gigabit Ethernet Connector
DSBOX-ORNX-LAN Power Connector
DSBOX-ORNX-LAN USB 3.1 Type-C Connectors
DSBOX-ORNX-LAN Recovery Mode USB 3.1 Type-C Connector
DSBOX-ORNX-LAN Reset Pushbutton
DSBOX-ORNX-LAN Recovery Pushbutton

3.3 The Definition of Each Connector

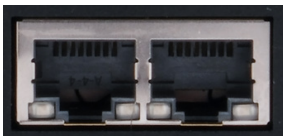
3.3.1 I/O Terminal Connector

	Function	Description		
	Mating connector	1790344 (DFMC 1,5/ 7-STF-3,5) from Phoenix Contact.		
	Pinout	Pin	Description	I/O Type
		1	RS422 B	I/O
		2	RS422 Y / RS485 A	I/O
		3	RS232 RX / RS422 A	I/O
		4	RS232 TX / RS422 Z / RS485 B	I/O
		5	CAN_H	I/O
		6	GROUND	Power
		7	CAN_L	I/O
		8	GROUND	Power
		9	GROUND	Power
		10	GROUND	Power
		11	DIGITAL_OUT1 <i>Note:</i> Up to 24V, low-side switch mechanism	Output
		12	DIGITAL_IN1 <i>Note:</i> High at 11-24V	Input
		13	DIGITAL_OUT0 <i>Note:</i> Up to 24V, low-side switch mechanism	Output
		14	DIGITAL_IN0 <i>Note:</i> High at 11-24V	Input

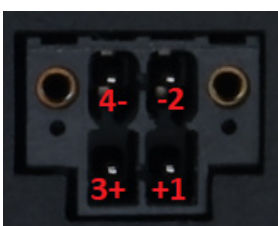
3.3.2 HDMI Connector

	<table><tr><th data-bbox="536 255 1326 468">Description</th></tr><tr><td data-bbox="536 255 1326 468">The NVIDIA® Jetson Orin modules will output video via vertical HDMI connector that is HDMI 2.0 capable.</td></tr></table>	Description	The NVIDIA® Jetson Orin modules will output video via vertical HDMI connector that is HDMI 2.0 capable.
Description			
The NVIDIA® Jetson Orin modules will output video via vertical HDMI connector that is HDMI 2.0 capable.			

3.3.3 Gigabit Ethernet Connector

	<table><thead><tr><th>Description</th></tr></thead><tbody><tr><td>There are 2 port RJ-45 ethernet connector for network communication.</td></tr></tbody></table>	Description	There are 2 port RJ-45 ethernet connector for network communication.
Description			
There are 2 port RJ-45 ethernet connector for network communication.			

3.3.4 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

3.3.5 USB 3.1 Type-C Connectors

	<table><tr><th>Description</th></tr><tr><td>There are 3 USB 3.1 Type-C connectors with a 1.5A current limit per connector.</td></tr></table>	Description	There are 3 USB 3.1 Type-C connectors with a 1.5A current limit per connector.
Description			
There are 3 USB 3.1 Type-C connectors with a 1.5A current limit per connector.			

3.3.6 Recovery Mode USB 3.1 Type-C Connector

	<table><tr><th>Description</th></tr><tr><td>It is used to allow to install or upgrade the operating system.</td></tr></table>	Description	It is used to allow to install or upgrade the operating system.
Description			
It is used to allow to install or upgrade the operating system.			

3.3.7 Reset Pushbutton

	Description
	Reset button is used to reset the Jetson SoM.

3.3.8 Recovery Pushbutton

	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).

4. Software Information

4.1 Installation

JetPack-5.x Installation can be found here: <https://www.forecr.io/blogs/installation/jetpack-5-x-installation-for-dsboard-orxn-lan>

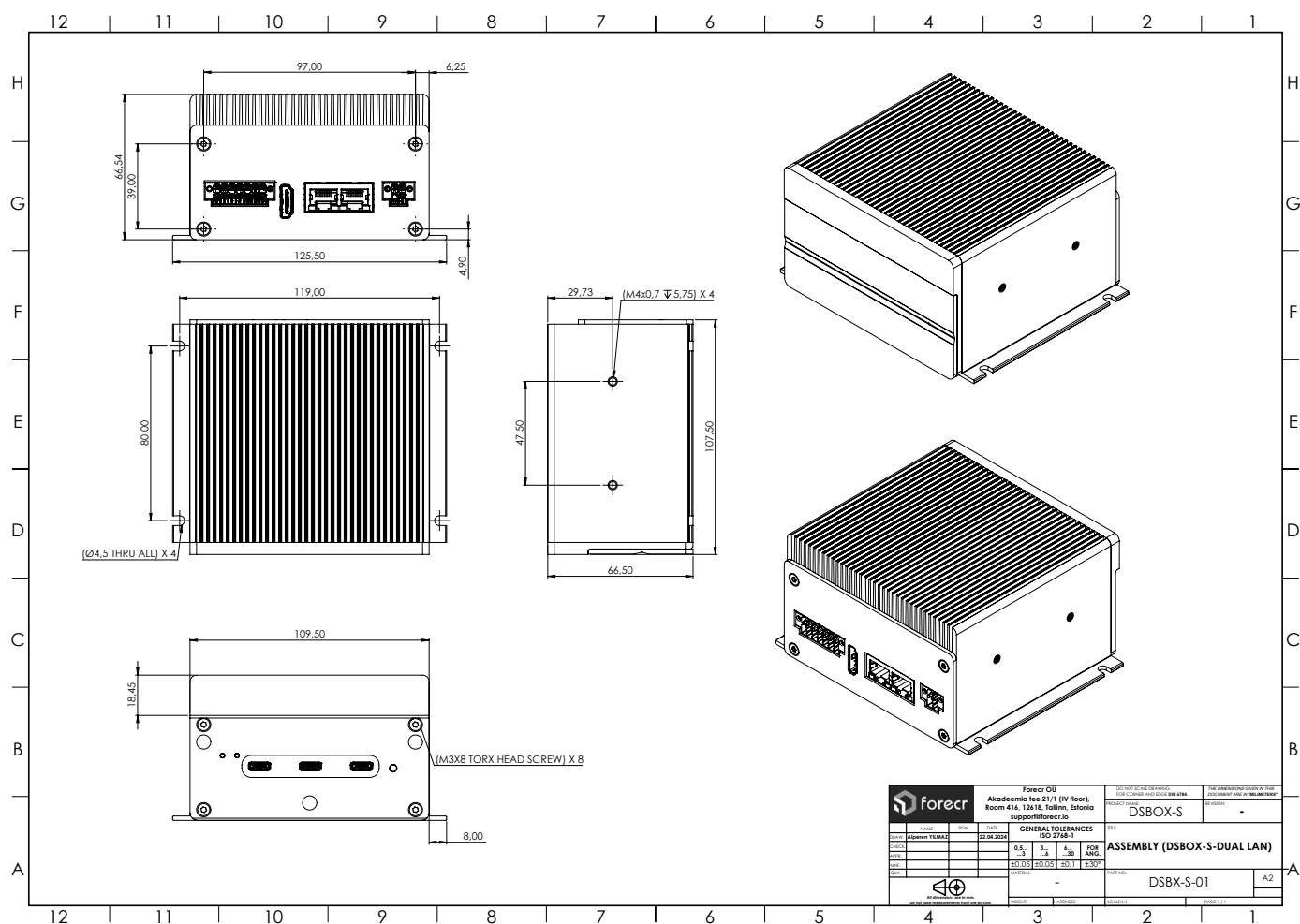
JetPack-6.x Installation can be found here: <https://www.forecr.io/blogs/installation/jetpack-6-x-installation-for-dsboard-orxn-lan>

5. Mechanical Models & Drawings

5.1 3D Model

Full 3D models of all DSBOX-ORNX-LAN can be found here: https://github.com/forecr/forecr_3d_models/tree/master/DSBOX-ORNX-LAN

5.2 2D Mechanical Drawing



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)	1,5	0,62	0,07	1,35	1,61	1,86	2,54
Power (W)	18	7,44	0,84	16,2	19,32	22,32	30,48

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)	1,3	0,6	0,07	1,34	1,54	1,66	2,1
Power (W)	15,6	7,2	0,84	16,08	18,48	19,92	25,2

6.3 Orin Nano 8GB

Power Supply: 12V-5A

All CPU and GPU cores are %100 loaded.

	Power Up Sequence	Idle	Standby (Suspend mode)	7W (4 core)	15W (6 core)
Current (A)	1,2	0,7	0,09	1,21	1,7
Power (W)	14,4	8,4	1,08	14,52	20,4

6.4 Orin Nano 4GB

Power Supply: 12V-5A

All CPU and GPU cores are %100 loaded.

	Power Up Sequence	Idle	Standby (Suspend mode)	7W_CPU (4 core)	7W_AI (4 core)	10W (6 core)
Current (A)	1,1	0,58	0,11	1,03	1,1	1,19
Power (W)	13,2	6,96	1,32	12,36	13,2	14,28

7. Cables

This section will be completed soon. It will be published on our website once completed. Please check our [Forecr](#) Web Page regularly.

8. MTBF Prediction

This section will be completed soon. It will be published on our website once completed. Please check our [Forecr](#) Web Page regularly.

9. Ordering Information

