MILBOX-AGX-SDI

USER MANUAL

UM-MBXAGXSDI-01
Revision 1.1
20/02/2025

NVIDIA Preferred Partner

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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 MILBOX-AGX-SDI. Therefore, this manual only represents the technical status of Forecr MILBOX-AGX-SDI 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 MILBOX-AGX-SDI, please reach out to the Forecr reseller from which you purchased the MILBOX-AGX-SDI.

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

Contact Information

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Limited Product Warranty

Forecr provides a 1-year Warranty for the MILBOX-AGX-SDI. This warranty period is valid from the original purchase date of the MILBOX-AGX-SDI. In order to maintain warranty, the MILBOX-AGX-SDI must not be altered or modified in any way. Changes or modifications to the MILBOX-AGX-SDI 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 MILBOX-AGX-SDI 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	01.10.2024	Preliminary Release
rev 1.1	20.02.2025	Form Factor / Dimensions in the Section 2.1 has been corrected. Section 6,7 and 8 have been added.

1. Introduction

Introducing our latest military grade ruggedized computer, powered by the cutting-edge AGX Orin SoM technology. This compact and powerful device is designed to withstand the toughest environments, making it the perfect solution for military, industrial, and other demanding applications.

With 4x Gigabit Ethernet ports, USB3.2, HDMI, 2x CAN, 4x RS- 232, 4x RS-422 and 4x SDI video input this ruggedized computer offers unparalleled connectivity options.

Our ruggedized computer is built to last, with a ruggedized chassis that can withstand extreme temperatures, shocks, and vibrations. You can rely on this device to operate reliably in the most challenging environments. Whether you're in the military, working in industrial settings, or need a reliable computing solution for outdoor applications, our ruggedized computer is the ideal choice. With its powerful performance, rugged design, and extensive connectivity options, this device is sure to exceed your expectations.

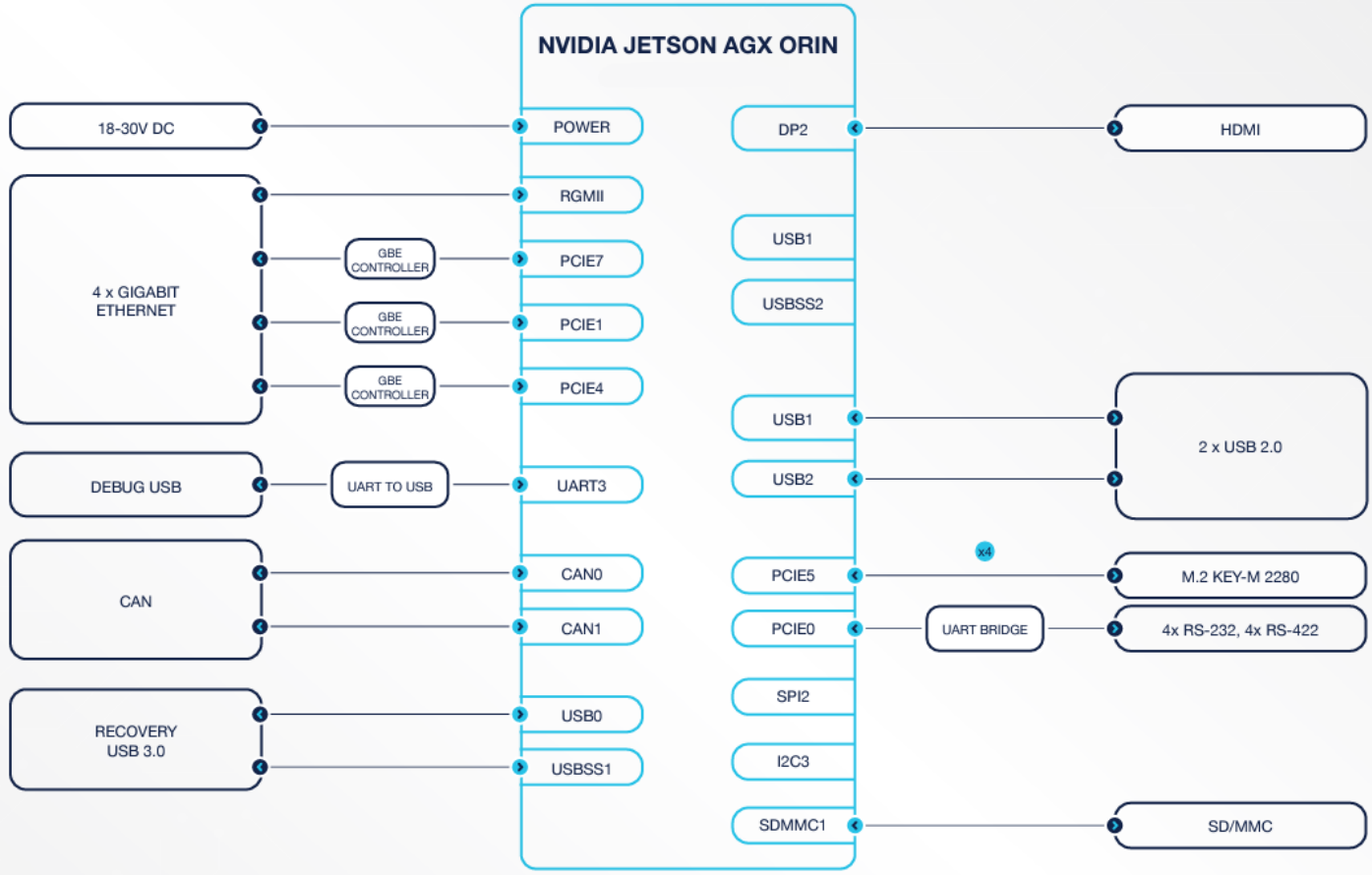
Latest revision of this user manual, datasheet, and 3D model can be downloaded from Forecr Web Page.

2. Product Specification

2.1 Technical Specification

Supported Modules	NVIDIA Jetson AGX Orin 32GB NVIDIA Jetson AGX Orin 64GB NVIDIA Jetson AGX Orin Industrial
Memory	32 GB 256-bit LPDDR5x 64 GB 256-bit LPDDR5x
Graphics Interfaces	1x HDMI 4x SDI Video Input
Interfaces	4x Gigabit Ethernet 1x USB 3.1 2x USB 2.0 1x USB 2.0 (Serial Console) 2x CAN Bus 4x RS232 4x RS422
Wireless Communication	None
Power Supply	12-36 VDC (28 VDC Nominal)
Extension Sockets	None
Mass Storage	64 GB eMMC 5.1 Flash 1x M.2 Key-M SSD Slot (occupied) SD Card
Ambient Conditions	-25°C ... +85°C (-40°C for Industrial Module)
Form Factor / Dimensions	30cm x 24cm x 10cm, 5292gr
Operating Systems	Ubuntu Linux 20.04 Ubuntu Linux 22.04
Standards	Designed to meet MIL-STD-1275/704, MIL-STD-810, MIL-STD-461, IP67
JetPack Support	JetPack 5.x JetPack 6.x

2.2 Block Diagram



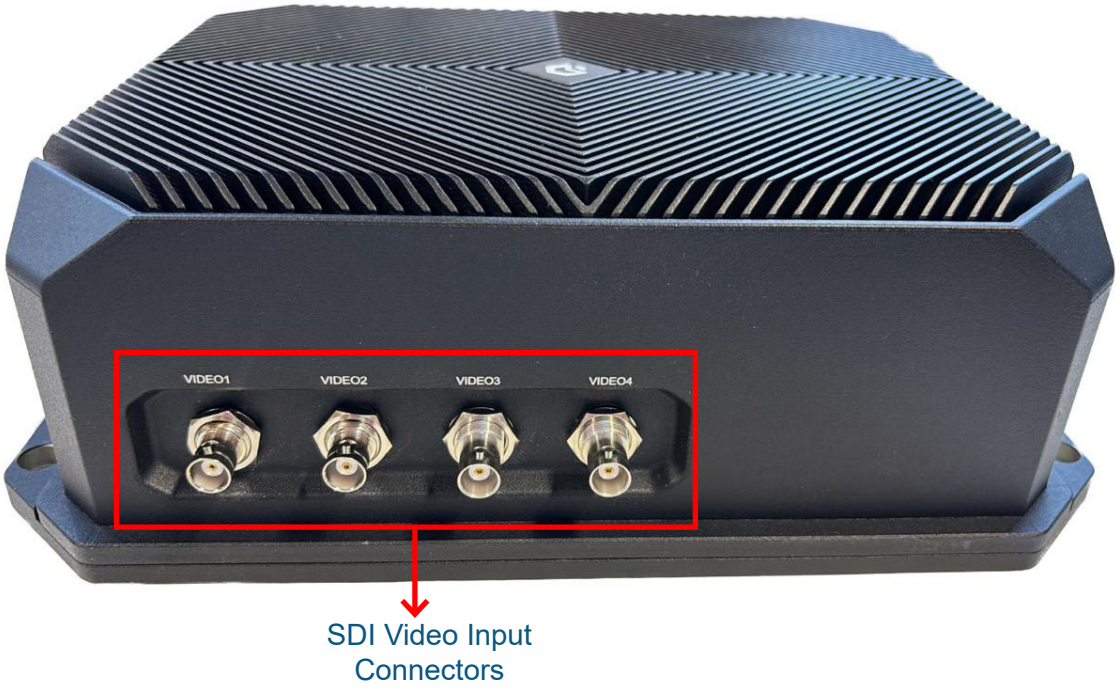
2.3 MILBOX-AGX-SDI Visuals

3.Hardware Information

3.1 Connector Location

3.1.1 Front Side

3.1.2 Rear Side



3.2 List of Connector

Connectors
MILBOX-AGX-SDI Power Connector
MILBOX-AGX-SDI HIGH-SPEED Connector
MILBOX-AGX-SDI USB 3.0 Connector
MILBOX-AGX-SDI Ethernet Connectors
MILBOX-AGX-SDI LOW-SPEED Connector
MILBOX-AGX-SDI SDI Video Input Connectors

3.3 The Definition of Each Connector

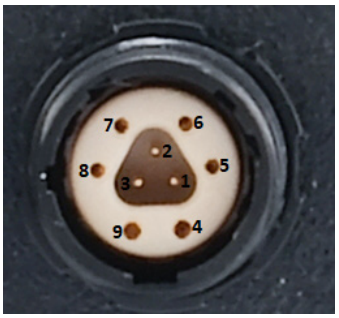
3.3.1 Power Connector (X1)

Function	Description	
Mating Connector	D38999/26WC4SN	
Voltage Range	12-36 VDC (28 VDC Nominal)	
X1-Pinout	**Pin**	**Description**
	A	VIN
	B	VIN
	C	GND
	D	GND

3.3.2 High-Speed Connector (X2)

Function	Description			
Mating Connector	UP01L18 M042C BK1 Z1ZB			
X2-Pinout	**Pin**	**Description**	**Pin**	**Description**
	1*	TMDS DATA 1+	22	GND (NO WIRE)
	2*	TMDS DATA 1-	23	GND (NO WIRE)
	3	TMDS DATA 1 SHIELD	24	GND (NO WIRE)
	4*	TMDS CLOCK+	25	GND (NO WIRE)
	5*	TMDS CLOCK-	26	GROUND
	6*	TMDS DATA 0+	27	RECOVERY
	7*	TMDS DATA 0-	28	RESET
	8	TMDS DATA 0 SHIELD	29	USB0 GROUND
	9	TMDS CLOCK SHIELD	30	USB0 +5V POWER
	10*	TMDS DATA 2+	31	ID
	11*	TMDS DATA 2-	32	USB2 +5V POWER
	12	HDMI +5V POWER	33	USB2 GROUND
	13	HDMI GROUND	34*	USB0 D+
	14	HOT PLUG DETECT	35*	USB0 D-
	15	DDC CLOCK	36	USB1 GROUND
	16	DDC DATA	37	USB1 +5V POWER
	17	CEC	38*	USB2 D-
	18	TMDS DATA 2 SHIELD	39*	USB2 D+
	19	GND (NO WIRE)	40	GND (NO WIRE)
	20	GND (NO WIRE)	41*	USB1 D+
	21	GND (NO WIRE)	42*	USB1 D-
	Note: Pins with * mark in Pin section are differential signals.			

3.3.3 USB 3.0 Connector (X3)



Function	Description	
Mating Connector	MP11ZS08 2007 BK1 Z1AS	
X3-Pinout	**Pin**	**Description**
	1*	USB 2.0 D-
	2	SS drain
	3*	USB 2.0 D+
	4	Vbus 5V
	5*	SS TX+
	6*	SS TX-
	7*	SS RX+
	8*	SS RX-
	9	Vbus GND
	Note: Pins with * mark in Pin section are differential signals.	

3.3.4 Ethernet Connector (X4,X5,X6,X7)

X4 and X5

X6 and X7

Function	Description	
Mating Connector	MP11ZS08 0008 BK1 Z1AS	
X4,X5,X6,X7-Pinout	**Pin**	**Description**
	1*	DATA A+
	2*	DATA A-
	3*	DATA B+
	4*	DATA B-
	5*	DATA C+
	6*	DATA C-
	7*	DATA D+
	8*	DATA D-
	Note: Pins with * mark in Pin section are differential signals.	

3.3.5 Low-Speed Connector (X8)

Function	Description			
Mating Connector	UP01L18 M042C BK2 Z1ZB			
X8-Pinout	**Pin**	**Description**	**Pin**	**Description**
	1*	RS422 CH1 A	22	RS232 CH4 GROUND
	2*	RS422 CH1 B	23	RS232 CH4 RX
	3	RS422 CH1 GROUND	24	RS232 CH4 TX
	4*	RS422 CH1 Z	25	RS232 CH3 GROUND
	5*	RS422 CH1 Y	26	RS232 CH3 TX
	6	RS422 CH2 GROUND	27	RS232 CH3 RX
	7*	RS422 CH2 A	28	GND (NO WIRE)
	8*	RS422 CH2 B	29	CAN CH1 GROUND
	9*	RS422 CH2 Z	30*	CAN CH1 LO
	10*	RS422 CH2 Y	31*	CAN CH1 HI
	11	GND (NO WIRE)	32	RS422 CH3 GROUND
	12	RS232 CH2 GROUND	33*	RS422 CH3 Y
	13	RS232 CH2 RX	34*	RS422 CH3 Z
	14	RS232 CH2 TX	35*	RS422 CH3 B
	15	GND (NO WIRE)	36*	RS422 CH3 A
	16	CAN CH2 GROUND	37	GND (NO WIRE)
	17*	CAN CH2 HI	38*	RS422 CH4 Y
	18*	CAN CH2 LO	39*	RS422 CH4 Z
	19	RS232 CH1 GROUND	40	RS422 CH4 GROUND
	20	RS232 CH1 RX	41*	RS422 CH4 B
	21	RS232 CH1 TX	42*	RS422 CH4 A
	Note: Pins with * mark in Pin section are differential signals.			

3.3.6 SDI Video Input Connectors

	Function	Description
	Connector Type	BNC type 3G-SDI video input connectors

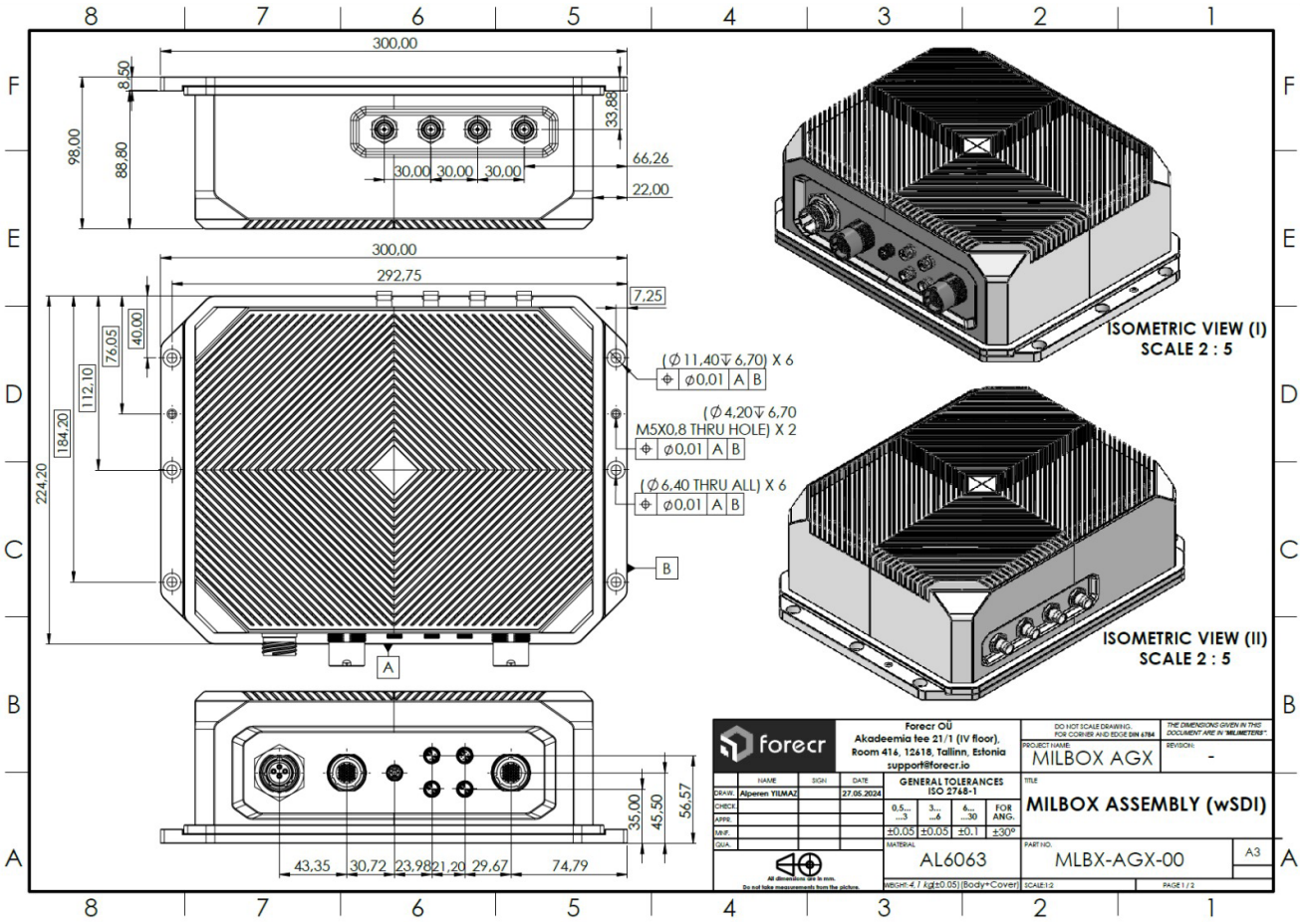
4. Software Information

4.1 Installation

JetPack-5.x Installation can be found here: https://www.forecr.io/blogs/installation/jetpack-5-x-installation-for-milboard-agx

JetPack-6.x Installation can be found here: https://www.forecr.io/blogs/installation/jetpack-6-x-installation-for-milboard-agx

5. Mechanical Drawing



6. Power Consumption

6.1 AGX Orin 32GB

Power Supply: 28V-4A

All CPU and GPU cores are %100 loaded.

	Power Up Sequence	Idle	Standby (Suspend mode)	15W (4 core)	30W (8 core)	40W (8 core)	MAXN (8 core)
Current (A)	1,11	0,5	0,22	0,83	1,08	1,72	2,17
Power (W)	31,08	14	6,16	23,24	30,24	48,16	60,76

6.2 AGX Orin 64GB

Power Supply: 28V-4A

All CPU and GPU cores are %100 loaded.

	Power Up Sequence	Idle	Standby (Suspend mode)	15W (4 core)	30W (8 core)	50W (12 core)	MAXN (12 core)
Current (A)	1,59	0,54	0,24	0,81	1,07	1,75	3,26
Power (W)	44,52	15,12	6,72	22,68	29,96	49	91,28

6.3 AGX Orin Industrial

Power Supply: 28V-4A

All CPU and GPU cores are %100 loaded.

	Power Up Sequence	Idle	Standby (Suspend mode)	15W (4 core)	35W (8 core)	60W (12 core)	MAXN (12 core)
Current (A)	1,53	0,6	0,24	0,87	1,15	1,94	3,24
Power (W)	42,84	16,8	6,72	24,36	32,2	54,32	90,72

7. Cables

Power Cable (for X1)	
End 1	D38999/26WC4SN
End 2	4x Open Wire (2 for positive, 2 for negative)
Cable Length	100cm

High-Speed Cable (for X2)	
End 1	UP01L18 M042C BK1 Z1ZB
End 2	1x HDMI Female, 3x USB-2.0 Type-A Female (1 for Debug, 2 for USB host), 4x Open Wire (GND (pin-26), Recovery (pin-27), Reset (pin-28), ID (pin-31, unused))
Cable Length	50cm

USB Cable (for X3)	
End 1	MP11ZS08 2007 AN1 Z1AS
End 2	USB-3.0 Type-A Female
Cable Length	50cm

Ethernet Cable (for X4, X5, X6, X7)	
End 1	MP11ZS08 0008 AN1 Z1AS
End 2	RJ-45 Ethernet Male
Cable Length	150cm

Low-Speed Cable (for X8)	
End 1	UP01L18 M042C BK2 Z1ZB
End 2	10x DB9 Female (4 for RS-232, 4 for RS-422, 2 for CAN Bus)
Cable Length	50cm

8. MTBF Prediction

Prediction method	Mil Hdbk 217F2, parts count
Environment	GF - Ground Fixed, T_A=40^{0}C, T_J=60^{0}C
Date	19-Feb-2024
Total Failure Rate	9.862036(FPMH)
MTBF	101399 (Hours) 11.58 (Years)