MILBOX-XV

USER MANUAL

UM-MBXXV-01
Revision 1.01
01/10/2024

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

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

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Limited Product Warranty

Forecr provides a 1-year Warranty for the MILBOX-XV. This warranty period is valid from the original purchase date of the MILBOX-XV. In order to maintain warranty, the MILBOX-XV must not be altered or modified in any way. Changes or modifications to the MILBOX-XV 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-XV 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	11.03.2024	Preliminary Release

1. Introduction

MILBOX-XV is the perfect computing platform for businesses that need high-performance and reliability in challenging environments. The NVIDIA Jetson AGX Xavier system-on-module, featuring an eight- core ARM CPU, 32 GB of RAM, and an NVIDIA Volta GPU, ensures top-notch processor performance. Its fanless design guarantees reliable operation in dusty or dirty environments, and it can handle extreme temperatures, shock, and vibration.

With its multiple I/O ports, including 4x Gigabit Ethernet, USB 3.0, HDMI, 4x RS-232, and 4x RS-422, the MILBOX-XV is an ideal solution for businesses that need to connect to various devices and sensors. MILBOX-XV's rugged design makes it suitable for military, industrial, and outdoor applications, and its processor performance ensures that your business can handle even the most demanding tasks.

Upgrade your business with the MILBOX-XV, a powerful computing platform that guarantees reliability and top-notch performance even in the toughest 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 AGX Xavier 32GB NVIDIA Jetson AGX Xavier 64GB NVIDIA Jetson AGX Xavier Industrial 32GB
Memory	32 GB 256-bit LPDDR4x 64 GB 256-bit LPDDR4x
Graphics Interfaces	1x HDMI
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	18-32 VDC (28 VDC Nominal)
Extension Sockets	None
Mass Storage	32 / 64 GB eMMC 5.1 Flash 1x M.2 Key-M SSD Slot
Ambient Conditions	-25°C ... +70°C (-40°C for Industrial Module)
Form Factor / Dimensions	210 mm x 296 mm x 92 mm 4750 grams
Operating Systems	Ubuntu Linux 18.04 / 20.04
Standards	Designed to meet MIL-STD-1275/704, MIL-STD-810, MIL-STD-461, IP67
JetPack Support	JetPack 4.x JetPack 5.x

2.2 Block Diagram
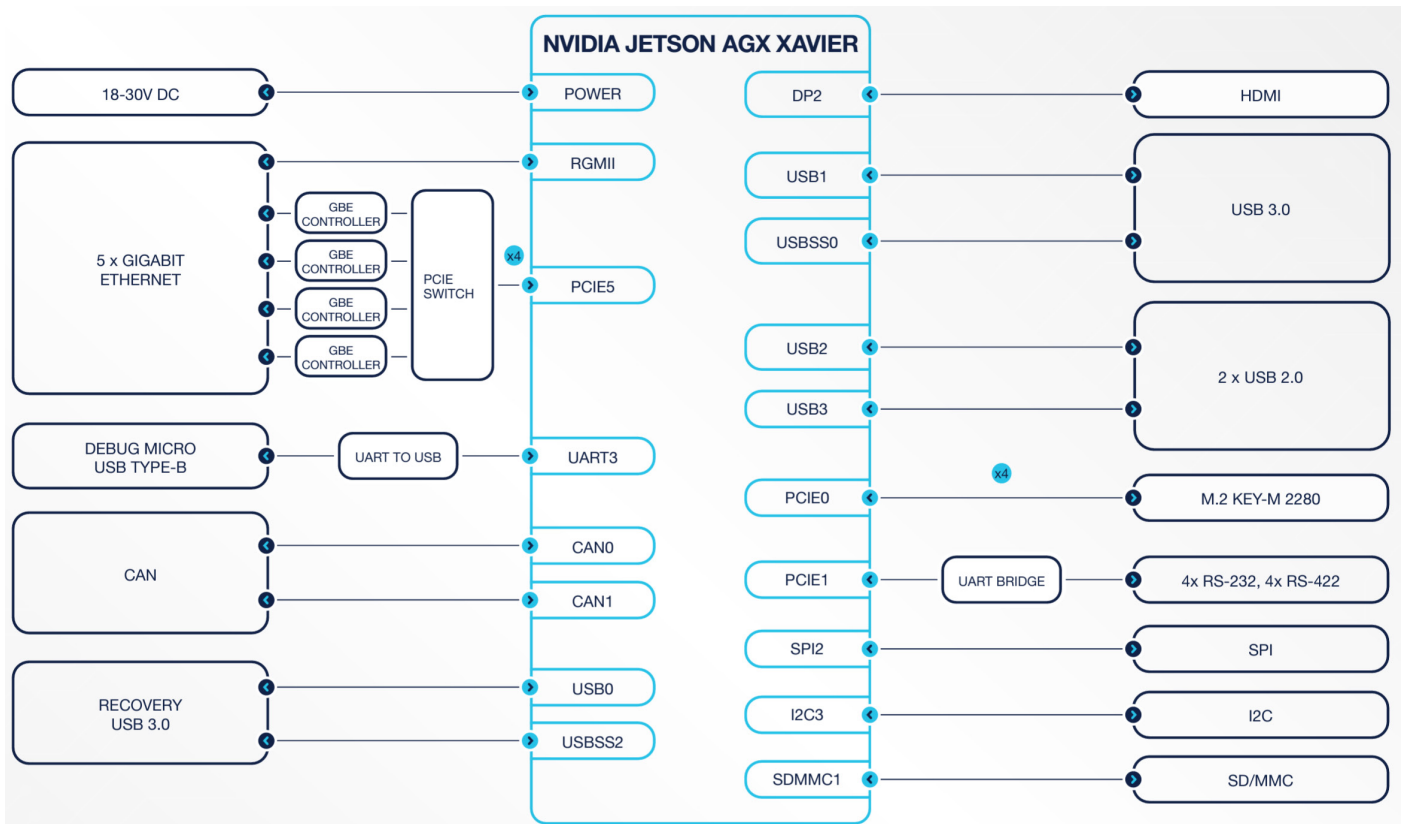
3.Hardware Information

3.1 Connector Location

Power Connector · High Speed Connector · USB 3.0 Connector · Ethernet Connectors · Low Speed Connector
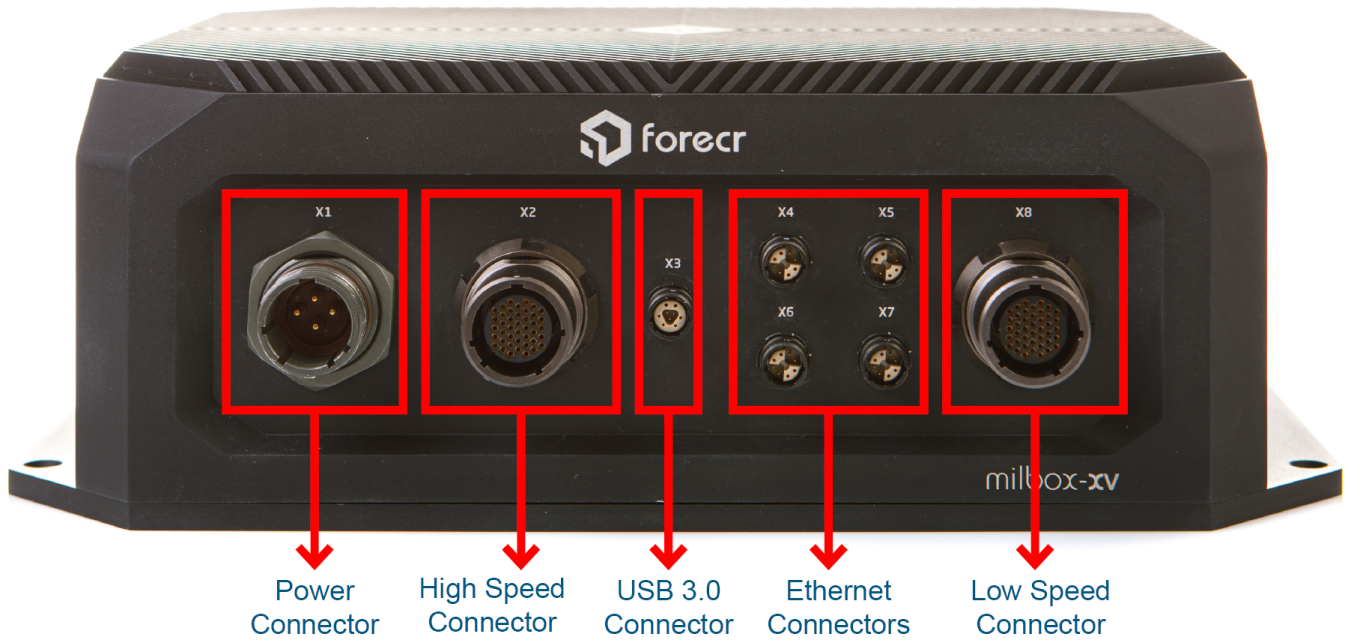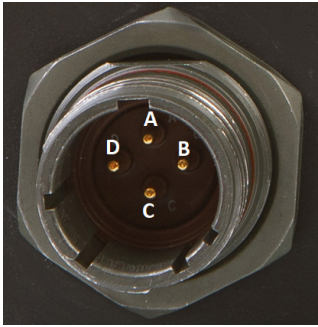
3.2 List of Connector

Connectors
MILBOX-XV Power Connector
MILBOX-XV HIGH-SPEED Connector
MILBOX-XV USB 3.0 Connector
MILBOX-XV Ethernet Connectors
MILBOX-XV LOW-SPEED Connector

3.3 The Definition of Each Connector
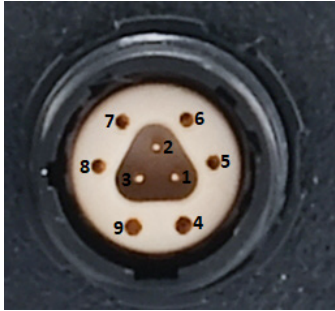
3.3.1 Power Connector (X1)

Function	Description	
Mating Connector	D38999/26WC4SN	
End Connector Type	Open Wire	
Cable Length	100 cm	
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			
End Connector Type	HDMI Female / USB Type-A Female /Open Wire			
Cable Length	50cm			
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		
End Connector Type	USB 3.0 Type-A Female		
Cable Length	50cm		
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	
	End Connector Type	RJ-45 Ethernet Male	
	Cable Length	50cm	
	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			
End Connector Type	DB9 Female			
Cable Length	50cm			
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.			

4. Software Information

4.1 Installation

JetPack-4.x Installation can be found here: https://www.forecr.io/blogs/installation/jetpack-4-x-installation-for-milboard-xv
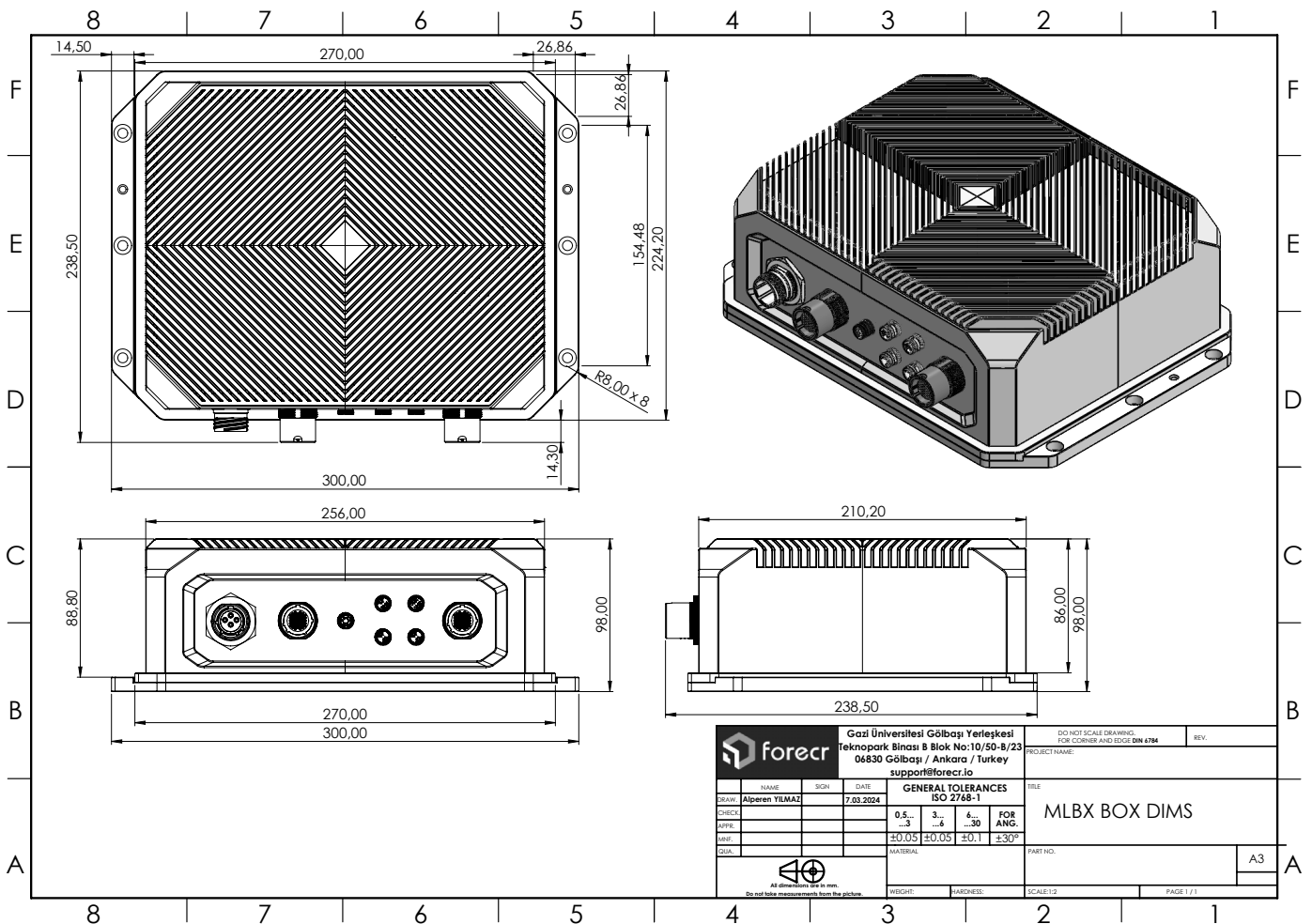
JetPack-5.x Installation can be found here: https://www.forecr.io/blogs/installation/jetpack-5-x-installation-for-milboard-xv

5. Mechanical Models & Drawings

5.1 3D Model

Full 3D models of all MILBOX-XV can be found here: https://github.com/forecr/forecr_3d_models/tree/master/MIL-BOX-XV

5.2 2D Mechanical Drawing

6. Power Consumption

This section will be completed soon. It will be published on our website once completed. Please check our Forecr Web Page regularly.

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