Connect Tech Inc.

Embedded Computing Experts

USERS GUIDE

Sentry-X

CTIM-00053(0.01) 2021-07-26

NVIDIA ELITE PARTNER

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PREFACE

Disclaimer

The information contained within this user's guide, including but not limited to any product specification, is subject to change without notice.

Connect Tech 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's guide.

Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Connect Tech reseller from which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

In the event that the reseller is unable to resolve your problem, our highly qualified support staff can assist you. Our support section is available 24 hours a day, 7 days a week on our website at: https://connecttech.com/support/resource-center/. See the contact information section below for more information on how to contact us directly. Our technical support is always free.

Contact Information

Contact Information	
Mail/Courier	Connect Tech Inc. Technical Support 489 Clair Rd. W. Guelph, Ontario Canada N1L 0H7
Contact Information	sales@connecttech.com support@connecttech.com www.connecttech.com Toll Free: 800-426-8979 (North America only) Telephone: +1-519-836-1291 Facsimile: 519-836-4878 (on-line 24 hours)
Support	Please go to the Connect Tech Resource Center for product manuals, installation guides, device drivers, BSPs and technical tips. Submit your technical support questions to our support engineers. Technical Support representatives are available Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time.

Limited Product Warranty

Connect Tech Inc. provides a one-year Warranty for the Sentry-X. Should this product, in Connect Tech Inc.'s opinion, fail to be in good working order during the warranty period, Connect Tech Inc. will, at its option, repair or replace this product at no charge, provided that the product has not been subjected to abuse, misuse, accident, disaster or non-Connect Tech Inc. authorized modification or repair.

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

The Connect Tech Inc. Limited 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, Connect Tech Inc. reserves the right to substitute an equivalent product if available or to retract the Warranty if no replacement is available.

The above warranty is the only warranty authorized by Connect Tech Inc. Under no circumstances will Connect Tech Inc. 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.

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ESD Warning

Electronic components and circuits are sensitive to ElectroStatic Discharge (ESD). When handling any circuit board assemblies including Connect Tech COM Express carrier assemblies, it is recommended that ESD safety precautions be observed. ESD safe best practices include, but are not limited to:

- Leaving circuit boards in their antistatic packaging until they are ready to be installed.
- Using a grounded wrist strap when handling circuit boards, at a minimum you should touch a grounded metal object to dissipate any static charge that may be present on you.
- Only handling circuit boards in ESD safe areas, which may include ESD floor and table mats, wrist strap stations and ESD safe lab coats.
- Avoiding handling circuit boards in carpeted areas.
- Try to handle the board by the edges, avoiding contact with components.

REVISION HISTORY

Revision	Date	Changes
0.00	2020-09-02	Initial Release
0.01	2021-07-26	Corrected power pinout and updated address

INTRODUCTION

Connect Tech's Sentry-X Rugged Embedded System is built for the NVIDIA® Jetson AGX Xavier™, bringing out a wide assortment of I/O. Features included in this embedded system include 2x GbE, 3x USB 3.1, 2x HDMI, 2x CAN 2.0b, 2x RS-232/422/485, 1x UART 3.3V TTL, with 4x GPI and 4x GPO.

Sentry-X is designed to meet MIL-STD-810G as well as DO-160G for shock and vibration along with ingress protection of IP67.

The embedded system is ideal for aerospace and defense applications, or for any market that can benefit from the Jetson AGX Xavier's incredible performance in a rugged enclosure.

Product Features and Specifications

Specifications	
System Overview	1x Compute Module 1x Rear I/O Dock
Module Compatibility	NVIDIA® Jetson AGX Xavier™ - GPU: 512-Core Volta GPU with Tensor Cores - CPU: 8-Core ARM v8.2 64-Bit CPU, 8MB L2 + 4MB L3 - DL Accelerator: (2x) NVDLA Engines - Vision Accelerator: 7-Way VLIW Vision Processor - Encoder/Decoder: (2x) 4Kp60 | HEVC/(2x) 4Kp60
USB	Front I/O - 1x USB 3.1 Gen 2 Type C (1x OTG Capable) Rear I/O - 2x USB 3.0
Ethernet	Rear I/O - 2x GBE (1000BASE-T)
Video Output	Rear I/O - 2x Display (HDMI)
Serial/UART	Rear I/O - 2x RS-232/422/485 - 1x UART 3.3V TTL (Debug UART)
CAN Bus	Rear I/O - 2x CAN 2.0b
GPIO	Rear I/O - 4x Discrete Input +5V TTL - 4x Discrete Outputs +5V TTL
Storage	NVIDIA® Jetson AGX Xavier™ - 1x 32 GB eMMC

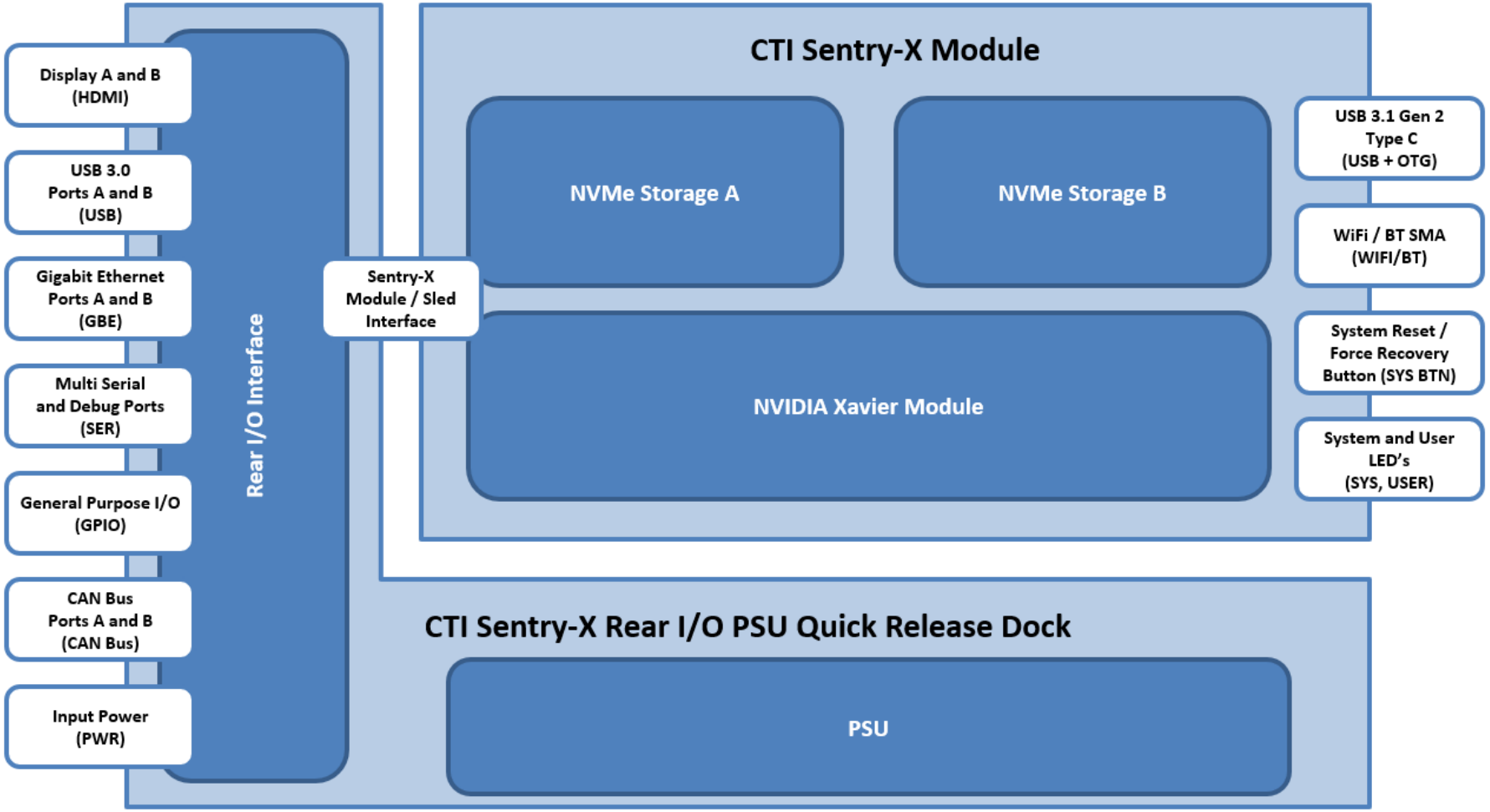
	System Expansion - 2x M.2 M-Key NVMe Modules
Connectivity	1x Dual-Band 802.11ac Wi-Fi + Bluetooth v5.1
System Control	Front I/O - 1x Reset/Force Recovery Button - 1x Tri-Colour System State LED (Operating/Reset/Force Recovery) - 1x Tri-Colour System User LED (User Controllable)
Flexible Rear I/O Interface	Fischer MiniMax Series Circular Connectors Sealed PC Style Connectors Meritec Hercules Rugged Circular MIL-DTL-38999L Series III Shell Connectors M12 Shell Connectors
Flexible Input Power	Standard Unit Operation - +11V to +65V DC Input MIL Spec PSU Option - MIL-STD-461F - MIL-STD-704 - MIL-STD-1275
Ingress Protection Rating	IP67
Compliance / Certifications (Pending)	MIL-STD-810G (Thermal, Shock, Vibration, Altitude, Humidity) MIL-STD-461F (EMI/EMC) DO-160G (Thermal, Shock, Vibration, Altitude, Humidity, EMI/EMC)
Mechanical (Outer Dimensions)	Sentry-X Compute Module (Standalone) - 199.7 x 180 x 57 mm Sentry-X Module with Dock (Integrated) - 199.7 x 180 x 79 mm
Weight	6.05 lbs (Includes Compute Module and Dock with no MIL PSU) 6.80 lbs (Includes Compute Module and Dock with MIL PSU)
Operating Temperature	-25°C to +70°C
Warranty and Support	1 Year Warranty and Free Technical Support

Part Numbers / Ordering Information

Part Numbers	
SGX001	Sentry-X Module (NVIDIA Jetson AGX Xavier, 0x NVMe)
SGX002	Sentry-X Module (NVIDIA Jetson AGX Xavier, 1x NVMe)
SGX003	Sentry-X Module (NVIDIA Jetson AGX Xavier, 2x NVMe)
SGX007	Sentry-X Module (NVIDIA Jetson AGX Xavier, 0x NVMe, No WiFi/BT)
SGX008	Sentry-X Module (NVIDIA Jetson AGX Xavier, 1x NVMe, No WiFi/BT)
SGX009	Sentry-X Module (NVIDIA Jetson AGX Xavier, 2x NVMe, No WiFi/BT)
SGX00X-01	Sentry-X Module with Fischer MiniMax Series Connectors Rear I/O Dock
SGX00X-02	Sentry-X Module with Fischer MiniMax Series Connectors and MIL-STD-PSU Rear I/O Dock
SGX00X-03	Sentry-X Module with Sealed PC Style Connectors Rear I/O Dock
SGX00X-04	Sentry-X Module with Sealed PC Style Connectors and MIL-STD-PSU Rear I/O Dock
SGX00X-05	Sentry-X Module with Meritec Hercules Rugged Circular MIL-DTL-38999L Series III Shell Connectors Rear I/O Dock
SGX00X-06	Sentry-X Module with Meritec Hercules Rugged Circular MIL-DTL-38999L Series III Shell Connectors and MIL-STD-PSU Rear I/O Dock
SGX00X-07	Sentry-X Module with M12 Shell Connectors Rear I/O Dock
SGX00X-08	Sentry-X Module with M12 Shell Connectors and MIL-STD-PSU Rear I/O Dock
RIO001-01	Fischer MiniMax Series Connectors Rear I/O Dock
RIO001-02	Fischer MiniMax Series Connectors and MIL-STD-PSU Rear I/O Dock
RIO001-03	Sealed PC Style Connectors Rear I/O Dock
RIO001-04	Sealed PC Style Connectors and MIL-STD-PSU Rear I/O Dock
RIO001-05	Meritec Hercules Rugged Circular MIL-DTL-38999L Series III Shell Connectors Rear I/O Dock
RIO001-06	Meritec Hercules Rugged Circular MIL-DTL-38999L Series III Shell Connectors and MIL-STD-PSU Rear I/O Dock
RIO001-07	M12 Shell Connectors Rear I/O Dock
RIO001-08	M12 Shell Connectors and MIL-STD-PSU Rear I/O Dock

PRODUCT OVERVIEW

Block Diagram



Front I/O Connector Summary & Locations

Designator	Description
P1	USB Type C Connector for USB 3.1 Gen 2 and OTG Connection to Sentry-X NVIDIA Jetson AGX Xavier Module
P2	SMA Antenna Connector for Dual-Band 802.11ac Wi-Fi + Bluetooth v5.1

Front I/O Button Summary & Locations

Designator	Description
BTN	System Reset and Force Recovery Button

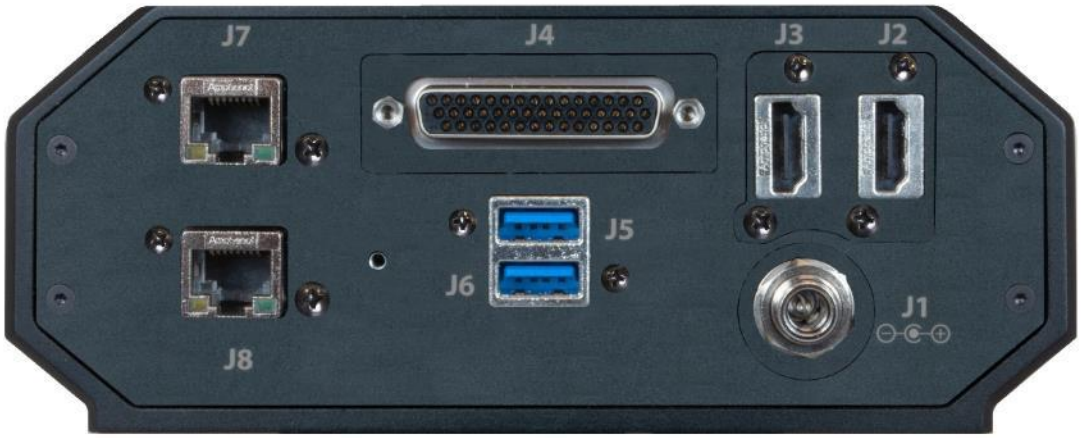
Front I/O LED Summary & Locations

Designator	Description
SYS	System Status LED (Operational/Reset/Force Recovery Mode)
USER	User Configurable LED

Fischer MiniMax Series Rear I/O Dock Connector Summary & Locations

Designator	Description
J6	Display Connector A (HDMI)
J9	Display Connector B (HDMI)
J7	USB 3.0 Connector A
J8	USB 3.0 Connector B
J2	Gigabit Ethernet Connector A
J3	Gigabit Ethernet Connector B
J5	Dual Multi-Serial, Debug UART, GPIO, and Zeroize Connector
J4	Dual CAN Bus Connector
J1	Sentry-X Power Input Connector

Sealed PC Style Rear I/O Dock Connector Summary & Locations



Designator	Description
J2	HDMI Display Connector A
J3	HDMI Display Connector B
J5	USB 3.0 Connector A
J6	USB 3.0 Connector B
J7	Gigabit Ethernet Connector A
J8	Gigabit Ethernet Connector B
J4	Dual CAN Bus, Dual Multi-Serial, Debug UART, GPIO, and Zeroize Connector
J1	Sentry-X Power Input Connector

Meritec Hercules Rugged Circular MIL-DTL-38999L Series III Rear I/O Dock Shell Connector Summary & Locations

Designator	Description
TBD	TBD

M12 Shell Rear I/O Dock Shell Connector Summary & Locations

Designator	Description
TBD	TBD

DETAILED FEATURE DESCRIPTION

Sentry-X Front I/O

Enabling ease of access to the Sentry-X, the Front I/O allows for Control without needing to remove the Compute Module from the Rear I/O Dock.

USB + OTG

Function	USB + OTG		
Location	Front I/O Panel – P1		
Type	USB Type C Connector		
Cable	Any USB Type C Cable		
Pinout	**Pin**	**Description**	
	A1	GND	
	A2	SS_TX1+	
	A3	SS_TX1-	
	A4	VBUS	
	A5	CC1	
	A6	DATA1+	
	A7	DATA1-	
	A8	SBU1	
	A9	VBUS	
	A10	SS_RX1-	
	A11	SS_RX1+	
	A12	GND	
	B1	GND	
	B2	SS_TX2+	
	B3	SS_TX2-	
	B4	VBUS	
	B5	CC2	
	B6	DATA2+	
	B7	DATA2-	
	B8	SBU2	
	B9	VBUS	
	B10	SS_RX2-	
	B11	SS_RX2+	
	B12	GND	

WIFI/BT

Function	WIFI/BT		
Location	Front I/O Panel – P2		
Type	50 Ohm SMA Jack		
Pinout	**Pin**	**Description**	
	1	5GHz/2.4GHz Antenna	
	Shell	GND	

SYS BTN

Function	SYS BTN		
Location	Front I/O Panel		
Type	Reset/Force Recovery Push Button		
Button Settings	**Position**	**Description**	
	N/A	Standard Operating Position	
	Push and Hold 0.5s+	Reset System	
	Push and Hold 6s+	Force Recover System	

System Button Operation

The Sentry-X System Button (SYS BTN) is designed for harsh shock and vibration environmental use. As such its operation differs from what one would expect from a standard use case.

To RESET the system, the System Button needs to be depressed for 0.5 seconds to 5.75 seconds. This is ensure that during operation, unintention button presses that will occur from shock and vibration, will not trigger a Reset on the Reset Line to the NVIDIA Jetson AGX Xavier Module. While in the RESET State, the SYS LED will change to be GREEN in Colour.

To FORCE RECOVER the system, the System Button needs to be depressed for 5.75 seconds or longer. This will toggle the Force Recovery Mode on the NVIDIA Jetson AGX Xavier Module. As there is an additional delay on the Reset Line, the system will then boot back up in Force Recovery Mode. While in a FORCE RECOVER State, the SYS LED will change to be RED in Colour.

SYS LED

Function	SYS LED		
Location	Front I/O Panel		
Type	Sentry-X System Status LED		
Button Settings	**LED Colour**	**Description**	
	BLUE	Standard Operating State	
	GREEN	Reset State	
	RED	Force Recover State	

System LED State

The Sentry-X System LED (SYS LED) is intended to be a quick reference LED for system operators to understand the state of the Sentry-X. The System LED should never be a combination of the tri-colour LED. This allows for only three operational LED states.

BLUE means that the System is Powered and/or Operating.
GREEN means that the System is about to Reset.
RED means that the System is about to enter Force Recovery.

USER LED

Function	USER LED		
Location	Front I/O Panel		
Type	Sentry-X User Controlled LED		
Button Settings	**LED Colour**	**Description**	
	BLUE	NVIDIA Jetson AGX Xavier GPIO07	
	GREEN	NVIDIA Jetson AGX Xavier GPIO08	
	RED	NVIDIA Jetson AGX Xavier GPIO09	

User LED State

The User LED (SYS LED) on Sentry-X is intended for custom operator use to show custom user operation states. Unlike the System LED, the User LED allows for both single and combination use of the tri-colour LED. This allow for nine operational LED states.

BLUE LED is contolled by the NVIDIA Jetson AGX Xavier GPIO07 Pin (sysfs = 254).
GREEN LED is contolled by the NVIDIA Jetson AGX Xavier GPIO08 Pin (sysfs = 256).
RED LED is contolled by the NVIDIA Jetson AGX Xavier GPIO09 Pin (sysfs = 257).

More information on these GPIOs can be found within Connect Tech Xavier GPIO KDB Article.

Fischer MiniMax Series Rear I/O Dock

Suited for applications where SWaP (Space, Weight and Power) is critical, Fischer MiniMax connectors offer a unique ruggedized, watertight interface for the Sentry-X.

HDMI

Function	HDMI DISPLAY	
Location	Rear I/O Panel – J6/J9	
Type	Fischer MiniMax Series 08 Shell 24 Pin 01 Key Connector	
Cable	CBG337	
Pinout	**Pin**	**Description (DP / HDMI)**
	1	GND
	2	GND
	3	GND
	4	GND
	5	ML_LANE0+ / TMDS2+
	6	CONFIG1 / RSVD
	7	CONFIG2 / CEC
	8	ML_LANE2- / TMDS0-
	9	ML_LANE2+ / TMDS0+
	10	HPD
	11	CABLE_DET
	12	ML_LANE0- / TMDS2-
	13	ML_LANE1+ / TMDS1+
	14	GND
	15	AUX_CH+ / HDMI_SCL
	16	AUX_CH- / HDMI_SDA
	17	GND
	18	ML_LANE3- / TMDS_CLK-
	19	ML_LANE3+ / TMDS_CLK+
	20	DP_PWR (+3.3V) / RSVD
	21	GND
	22	GND
	23	RSVD / HDMI_PWR (+5V)
	24	ML_LANE1- / TMDS1-
	Shell	Shell

USB

Function	USB 3.0		
Location	Rear I/O Panel – J7/J8		
Type	Fischer MiniMax Series 08 Shell 09 Pin 01 Key Connector		
Cable	CBG334		
Pinout	**Pin**	**Description**	
	1	DATA-	
	2	GND	
	3	DATA+	
	4	VBUS	
	5	SS_TX+	
	6	SS_TX-	
	7	SS_RX+	
	8	SS_RX-	
	9	GND	
	Shell	Shell	

GBE

Function	GIGABIT ETHERNET		
Location	Rear I/O Panel – J2/J3		
Type	Fischer MiniMax Series 08 Shell 08 Pin 01 Key Connector		
Cable	CBG333		
Pinout	**Pin**	**Description**	
	1	MDI0+	
	2	MDI0-	
	3	MDI1+	
	4	MDI1-	
	5	MDI2+	
	6	MDI2-	
	7	MDI3+	
	8	MDI3-	
	Shell	Shell	

SER/GPIO

Function	SERIAL / DEBUG / GPIO / ZEROIZE		
Location	Rear I/O Panel – J5		
Type	Fischer MiniMax Series 08 Shell 24 Pin 02 Key Connector		
Cable	CBG336		
Pinout	**Pin**	**Description**	
	1	Zeroize (sysfs 253)	
	2	Debug_TX	
	3	GND	
	4	Debug_RX	
	5	Multi_Serial_Z1	
	6	Multi_Serial_B1	
	7	GPI1 (sysfs 446)	
	8	GPI2 (sysfs 417)	
	9	Multi_Serial_Z2	
	10	Multi_Serial_B2	
	11	GPO1 (sysfs 440)	
	12	GPO2 (sysfs 443)	
	13	Multi_Serial_Y1	
	14	GND	
	15	Multi_Serial_A1	
	16	GPI0 (sysfs 445)	
	17	GND	
	18	GPI3 (sysfs 420)	
	19	Multi_Serial_Y2	
	20	GND	
	21	Multi_Serial_A2	
	22	GPO0 (sysfs 437)	
	23	GND	
	24	GPO3 (sysfs444)	
	Shell	Shell	

CAN BUS

Function	CAN BUS		
Location	Rear I/O Panel – J4		
Type	Fischer MiniMax Series 08 Shell 08 Pin 02 Key Connector		
Cable	CBG339		
Pinout	**Pin**	**Description**	
	1	CAN_A_DATA+	
	2	CAN_A_DATA-	
	3	CAN_A_PWR	
	4	CAN_A_GND	
	5	CAN_B_DATA+	
	6	CAN_B_DATA-	
	7	CAN_B_PWR	
	8	CAN_B_GND	
	Shell	Shell	

POWER

Function	INPUT POWER		
Location	Rear I/O Panel – J1		
Type	Fischer MiniMax Series 06 Shell 04 Pin 01 Key Connector		
Cable	CBG335		
Pinout	**Pin**	**Description**	
	1	VIN+	
	2	VIN+	
	3	VIN-	
	4	VIN-	
	Shell	Shell	

Sealed PC Style Rear I/O Dock

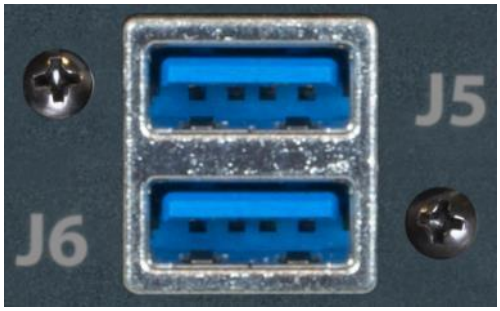
Designed for Harsh Environments where Shock and Vibration are less of a concern, the Sealed PC Style connectors allow for standard PC Cabling.

HDMI

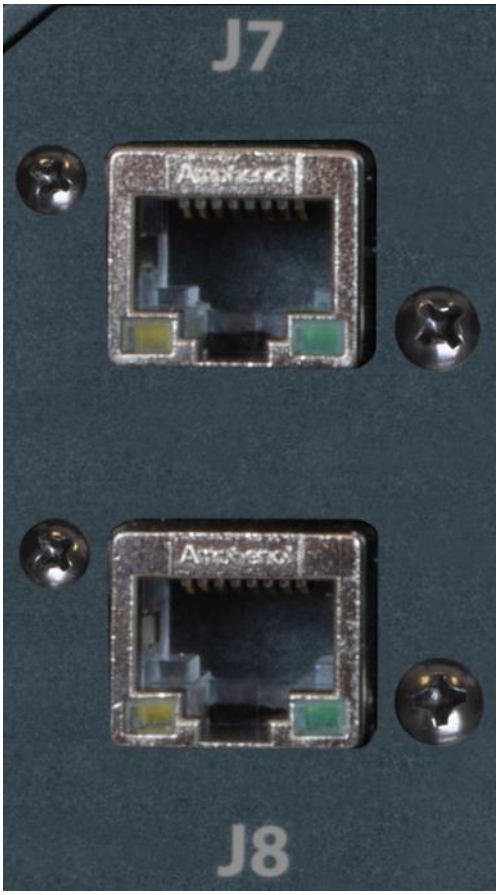
Function	HDMI		
Location	Rear I/O Panel		
Type	Amphenol ICC Harsh Environment MHDRA51130 Connector		
Cable	Any HDMI Type A Cable		
Pinout	**Pin**	**Description**	
	1	TMDS2+	
	2	GND	
	3	TMDS2-	
	4	TMDS1+	
	5	GND	
	6	TMDS1-	
	7	TMDS0+	
	8	GND	
	9	TMDS0-	
	10	TMDS_CLK+	
	11	GND	
	12	TMDS_CLK-	
	13	CEC	
	14	RSVD	
	15	HDMI_SDA	
	16	HDMI_SCL	
	17	GND	
	18	HDMI_PWR (+5V)	
	19	HPD	
	Shell	Shell	

USB 3.0

Function	USB 3.0		
Location	Rear I/O Panel		
Type	Amphenol ICC Harsh Environment MUSBR-4593-M0 Connector		
Cable	Any USB Type A Cable		
Pinout	**Pin**	**Description**	
	1	VBUS_A	
	2	DATA_A-	
	3	DATA_A+	
	4	GND	
	5	SSRX_A-	
	6	SSRX_A+	
	7	GND	
	8	SSTX_A-	
	9	SSTX_A+	
	10	Shell	
	11	VBUS_B	
	12	DATA_B-	
	13	DATA_B+	
	14	GND	
	15	SSRX_B-	
	16	SSRX_B+	
	17	GND	
	18	SSTX_B-	
	19	SSTX_B+	
	20	Shell	



GBE

Function	GBE		
Location	Rear I/O Panel		
Type	Amphenol ICC Harsh Environment MRF51840F Connector		
Cable	Any Cat5 or Cat6 RJ45 Ethernet Cable		
Pinout	**Pin**	**Description**	
	1	MDI0+	
	2	MDI0-	
	3	MDI1+	
	4	MDI2+	
	5	MDI2-	
	6	MDI1-	
	7	MDI3+	
	8	MDI3-	
	Shell	Shell	

POWER

Function	POWER		
Location	Rear I/O Panel		
Type	Switchcraft Power Jack 2.5mm x 5.5mm PCL712AS		
Cable	CBG344		
Pinout	**Pin**	**Description**	
	Center Pin	+VIN	
	Sleeve	-VIN	
	Shell	Shell	

SERIAL/GPIO

Function	SERIAL / DEBUG / GPIO / ZEROIZE				
Location	Rear I/O Panel				
Type	Conec D-SUB 44 Pin Female				
Cable	Any D-SUB 44 Pin Male				
Pinout	**Pin**	**Description**	**Pin**	**Description**	
	1	GPI3 (sysfs 420)	23	GND	
	2	GPI2 (sysfs 417)	24	Multi_Serial_A1	
	3	GPI1 (sysfs 446)	25	Multi_Serial_B1	
	4	GPI0 (sysfs 445)	26	Debug_TX	
	5	GND	27	Debug_RX	
	6	Multi_Serial_Y2	28	GND	
	7	Multi_Serial_Z2	29	Zeroize (sysfs 253)	
	8	GND	30	GND	
	9	Multi_Serial_Y1	31	GPO3 (sysfs 444)	
	10	Multi_Serial_Z1	32	GPO2 (sysfs 443)	
	11	GND	33	GPO1 (sysfs 440)	
	12	CAN_A_PWR	34	GPO0 (sysfs 437)	
	13	CAN_A_GND	35	GND	
	14	CAN_A_DATA+	36	GND	
	15	CAN_A_DATA-	37	GND	
	16	GND	38	GND	
	17	GND	39	GND	
	18	GND	40	GND	
	19	GND	41	CAN_B_PWR	
	20	GND	42	CAN_B_GND	
	21	Multi_Serial_A2	43	CAN_B_DATA+	
	22	Multi_Serial_B2	44	CAN_B_DATA-	

Meritec Hercules Rugged Circular MIL-DTL-38999L Series III Rear I/O Dock

TBD

M12 Shell Rear I/O Dock

TBD

User Configurable IO

Zeroize

Zeroisation is the practice of erasing sensitive parameters (Electronically Stored Data, Cryptographic Keys, and/or Critical Security Parameters) from a cryptographic module to prevent disclosure.

Sentry-X has been designed with this Security Feature in mind. A single Zerioze line is present for enabling this erasing function. This connects to GPIO06 (sysfs 253) on the Xavier module, and software must be developed to act accordingly when this signal is triggered.

Debug Serial

The NVIDIA Jetson AGX Xavier Debug Serial Port is accessible on Sentry-X. Located at the Rear I/O, this enables access to the Modules boot loader as well as the operating system, once loaded. It uses 3.3V TTL logic levels.

Multi-Serial

There are two Multi-Serial interfaces available on the Sentry-X. These can be configured into either RS-232 or RS-485, in Full or Half Duplex Mode, and with or out without 120 Ohm Termination (For RS-485 Only).

These configurations options are contolled by GPIO from the NVIDIA Jetson AGX Xavier Module. More information on these GPIOs can be found within Connect Tech Xavier GPIO KDB Article.

GPIO	Serial Port	Function
019 (sysfs 423)	1	Serial Mode Select: 0 = RS-232 (default), 1= RS-485
020 (sysfs 291)	1	RS-485 Duplex Mode Select: 0 =Full (default), 1= Half
021 (sysfs 288)	1	RS-485 Termination Select: 0 = None (default), 1 = 120ohm
023 (sysfs 490)	2	Serial Mode Select: 0 = RS-232 (default), 1= RS-485
024 (sysfs 387)	2	RS-485 Duplex Mode Select: 0 =Full (default), 1= Half
025 (sysfs 389)	2	RS-485 Termination Select: 0 = None (default), 1 = 120ohm

Once configured, the Serial Ports are available at the SER/GPIO Connector on Pin Names Y, Z, A, and B. The table below shows the operating mode of each of these pins depending upon the configuration mode.

Pin	RS-232	RS-485 FULL DUPLEX	RS-485 HALF DUPLEX
Y	TX	TX+	DATA+
Z	RTS#	TX-	DATA-
A	RX	RX+	-
B	CTS#	RX-	-

GPI/GPO

Eight GPIOs from the Xavier module can be utilized for external system use, operating at +5V TTL. Four are configured for General Purpose Inputs only, while the other four are configured for General Purpose Outputs only.

Module GPIO	Sentry-X GPIO	Function
011 (sysfs 437)	GPO0	General Purpose Output 0
012 (sysfs 440)	GPO1	General Purpose Output 1
013 (sysfs 443)	GPO2	General Purpose Output 2
014 (sysfs 444)	GPO3	General Purpose Output 3
015 (sysfs 445)	GPI0	General Purpose Input 0
016 (sysfs 446)	GPI1	General Purpose Input 1
017 (sysfs 417)	GPI2	General Purpose Input 2
018 (sysfs 420)	GPI3	General Purpose Input 3

More information on these GPIOs can be found within Connect Tech Xavier GPIO KDB Article.

TYPICAL INSTALLATION/REMOVAL

The Sentry-X is not a monolithic system. It consists of a Compute Module and Dock. Please follow the instructions below for installation and removal of the Compute Module from the Dock.

Compute Module and Dock

1. Ensure the Compute Module handle is in the up position.

2. Slide the Compute Module into place on the Dock using the guide feet and connector alignment as shown below. Push the Compute Module firmly into the Dock to ensure the connector is fully seated and the IP rated gasket has sealed the connector opening.

3. Once the Compute Module is fully seated onto the Dock, place the handle into the down position. This will allow the guide pins to help secure the Compute Module in place. This is a suitable fastening procedure for non-vibrating up-right installations in controlled environments.

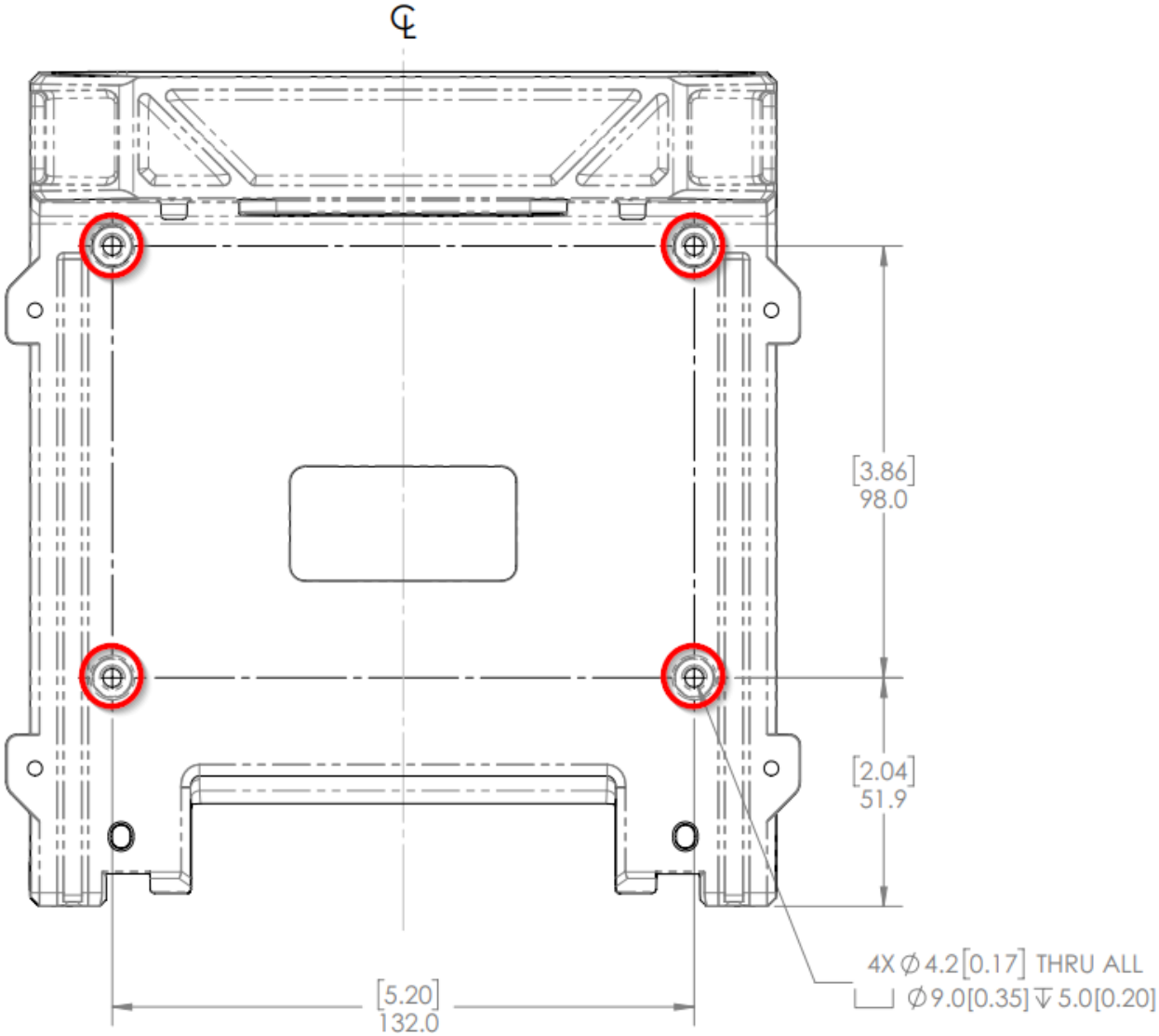
4. For deployments in the field, or in vibrating environments, use the four M4 mounting locations shown below to fasten the Compute Module to the Dock. This is required for most field deployments, non-up-right orientations, or when the system will experience shock and/or vibration. The M4 screws and lock washers are included with the units.

5. To remove the Compute Module from the Dock, ensure the four mounting locations described above are not fastened. One confirmed, lift the handle to the up position and pull the Compute Module from the Dock.

Field Installation

1. Remove the Compute Module from the Dock, as explained in the previous section.

2. On the Dock, there are four mounting locations used when mounting the system in the field. Please see the mounting locations marked by red circles in the image below. Use these four M4 sized mounting holes to fasten and secure the dock to the chassis/vehicle/final deployment.



3. Once the Dock is fastened in place, you can now install the Compute Module onto the Dock as explained in the previous section.

POWER CONSUMPTION & THERMALS

Below is the maximum rating of the Sentry-X. Ratings are specified below with a +24V input voltage to the system.

Sentry-X Configuration	Power
Absolute Theoretical Maximum Draw of All Functional Sentry-X Systems	125W

Below are measurements taken with the Sentry-X running in various configurations. Some values will change depending on what operation or software is installed. All measurements were taken in a lab environment with an ambient temperature of 25 degrees Celsius.

Sentry-X Configuration	Power
System Powered, NVIDIA Xavier Module Off, Single HDMI, USB Keyboard/Mouse, Dual NVMes	8.5W
System Idle, NVIDIA Xavier Module (MODE_30W_ALL), Single HDMI, USB Keyboard/Mouse, Single GBE, Dual NVMes, Displaying Ubuntu Desktop	12.25W
Single HDMI, NVIDIA Xavier Module (MODE_30W_ALL), USB Keyboard/Mouse, Single GBE, Dual NVMes, Running GPU Burn, Running CPU Stress	30W
Single HDMI, NVIDIA Xavier Module (MAXN), USB Keyboard/Mouse, Single GBE, Dual NVMes, Running GPU Burn, Running CPU Stress	65W

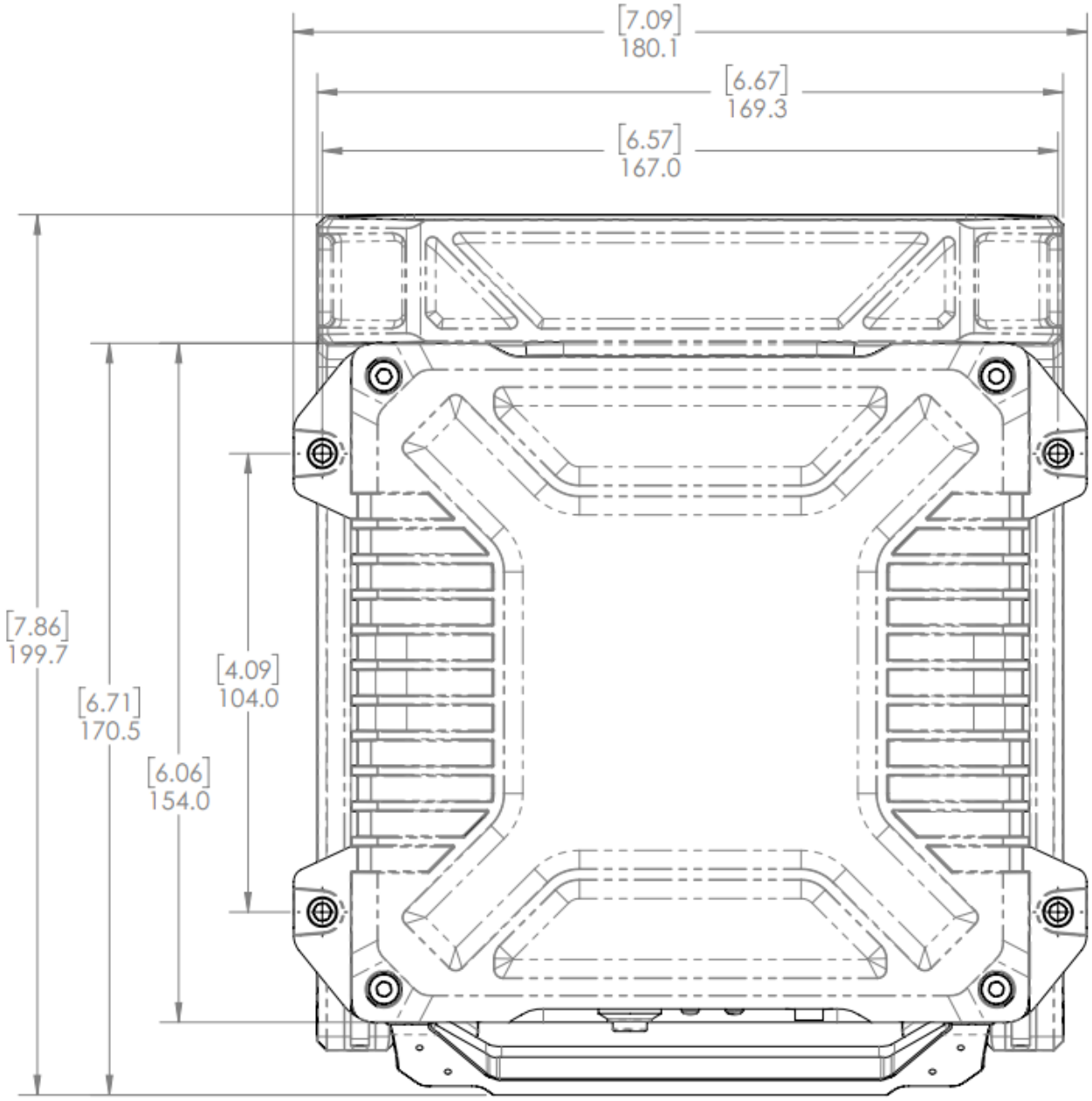
MECHANICAL DRAWINGS & MODELS

3D Model

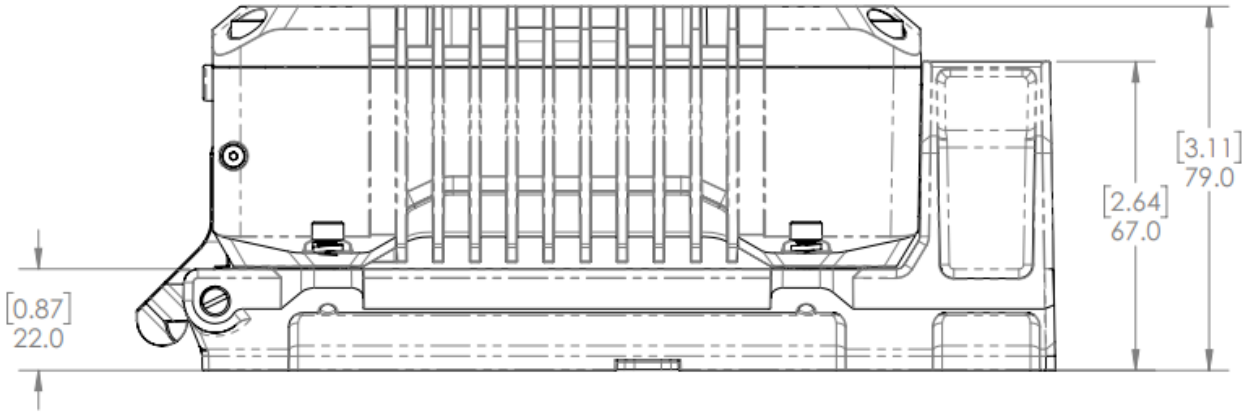
Contact sales@connecttech.com to get access to the 3D model.

2D Mechanical Dimensioned Drawing

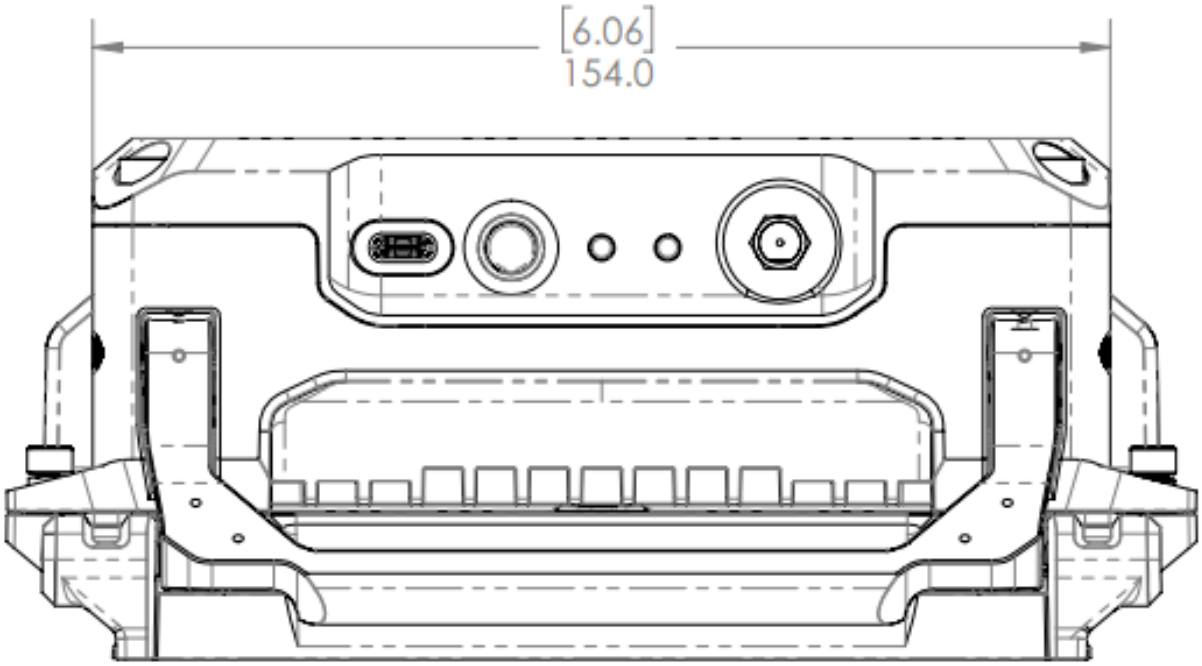
Top View



Side View



Front View



POWER SUPPLIES

The following table summarizes the Sentry-X Power Supplies available. This includes an off-the-shelf power supply with a Connect Tech Inc. supplied cable adapter.

Part Number	Description
MSG088	Sentry-X Fischer Style +24V 90W Power Supply
MSG089	Sentry-X Sealed PC Style +24V 90W Power Supply

Note: 1 power supply is included with each SGX00#-0# system when shipped.

CABLES

The following tables summarize the Sentry-X cables available.

Fischer MiniMax Series Cables

Part Number	Description
CBG335	Fischer MiniMax Series 06 Shell 04 Pin 01 Key Power Cable (2.5mm barrel socket)
CBG333	Fischer MiniMax Series 08 Shell 08 Pin 01 Key GBE Cable (RJ45 Socket)
CBG339	Fischer MiniMax Series 08 Shell 08 Pin 02 Key CAN Bus Cable (flying leads)
CBG334	Fischer MiniMax Series 08 Shell 09 Pin 01 Key USB 3.0 Cable (USB 3.0 Type A socket)
CBG337	Fischer MiniMax Series 08 Shell 24 Pin 01 Key HDMI Cable (HDMI Type A plug)
CBG336	Fischer MiniMax Series 08 Shell 24 Pin 02 Key Serial/GPIO Cable (flying leads)