

V3400 Series

Railway fanless x86 computers with 11th Gen Intel® Core™ processor, 5G and Wi-Fi 6 support, 2 hot-swappable HDD/SSD slots with lock, -40 to 70°C operating temperature (EN 50155 OT4)



Features and Benefits

- Intel® Core™ i3/i7 embedded computer for in-vehicle applications
- Multiple wireless connectivity options: Up to two 5G, one Wi-Fi 6, and one 4G or Wi-Fi 5
- Up to 8 Ethernet ports, suitable for onboard secure-gateway application
- Two hot-swappable HDD/SSD slots with locks for enhanced security
- Onboard TPM module for enhanced cybersecurity
- Low voltage monitoring support of RTC battery
- Isolated 24 to 110 VDC power input to meet versatile power requirements of rolling-stock applications
- Meets EN 50155 OT4 operating temperature (-40 to 70°C with cellular and Wi-Fi modules enabled)
- Complies with EN 50121-4
- Complies with IEC 61373 requirements for shock and vibration resistance
- Complies with all EN 50155 mandatory test items¹
- -40 to 70°C operating temperature with cellular and Wi-Fi modules enabled (EN 50155 OT4 range)

Certifications



EN 50121-4



EN 50155



Introduction

The V3400 Series embedded computers are built around an Intel® Core™ i7/i3 high-performance processor and come with up to 64 GB RAM, one M.2 2280 M key slot, and two hot-swappable HDD/SSD for storage expansion. The computers are compliant with EN 50155 and EN 50121-4 standards covering operating temperature, power input voltage, surge, ESD, and vibration, making them suitable for railway onboard and wayside applications. For enhanced security, the cover of the storage slots comes with a lock, allowing only authorized personnel with keys to access the storage drives.

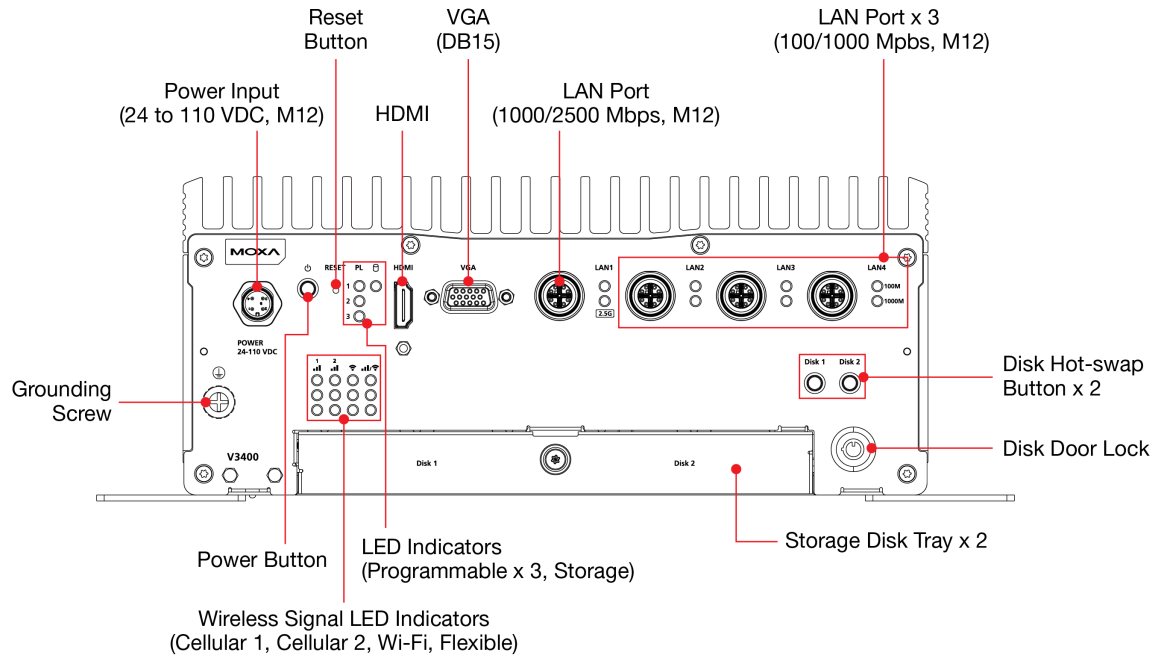
For connecting with onboard and wayside systems and devices, the V3400 computers are equipped with a rich set of interfaces including 4 to 8 Gigabit Ethernet ports with one-pair LAN bypass function (V3408 models only) to ensure uninterrupted data transmission, 2 RS-232/422/485 serial ports, 2 DIs, 2 DOs, and 2 USB 3.0 ports. The built-in TPM 2.0 module ensures platform integrity and provides hardware-based security as well as protection from tampering.

Vehicular applications require reliable connectivity. They also require clear indicators on the device that identify the status of the software. V3400 computers support multiple wireless configurations such as two 5G modules in M.2 slots, one LTE or Wi-Fi 5 in an mPCIe slot, and one Wi-Fi 6 in an M.2 slot. Six SIM-card slots help establish redundant 5G/LTE connections. An optimized mechanism and thermal design allow the V3400 to meet the EN 50155 OT4 (-40 to 70°C) requirement, even with two 5G modules and one Wi-Fi 6 module installed, making it well suited for practical applications in demanding onboard transportation environments.

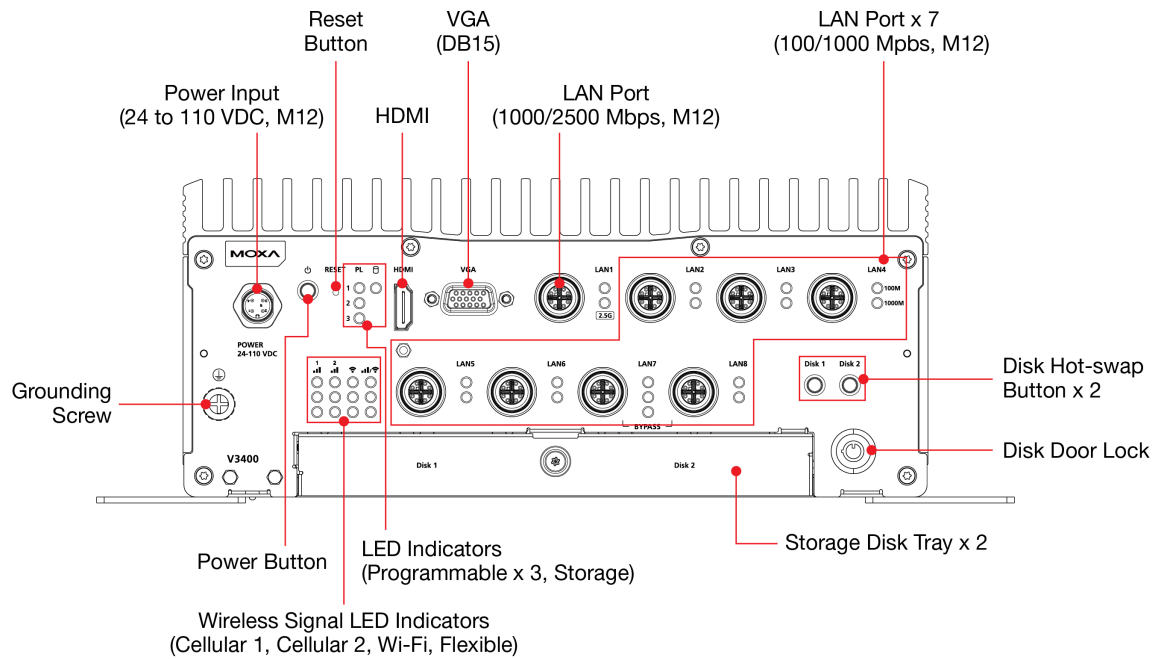
1. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf

Appearance

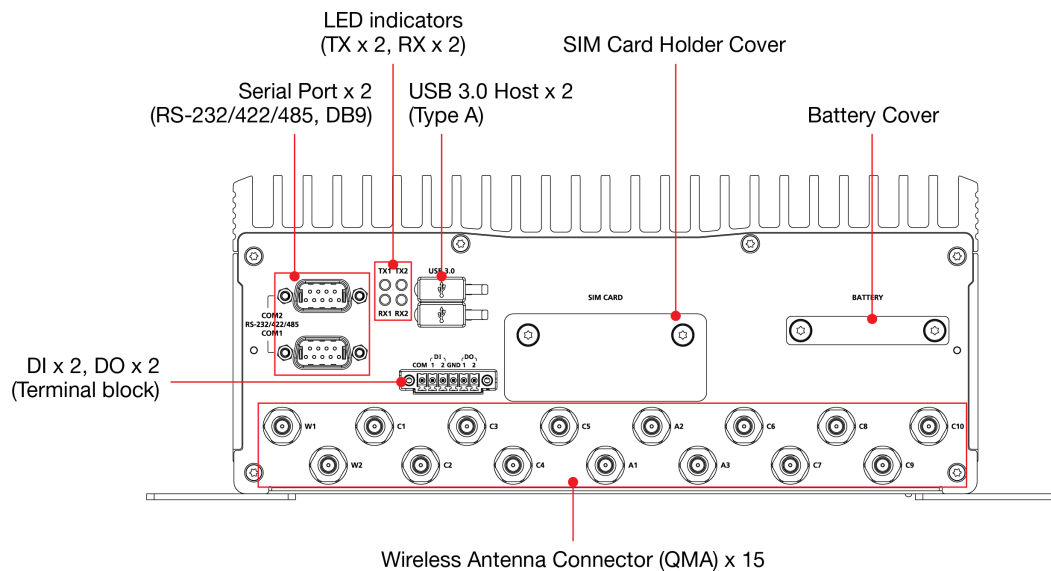
V3404-TL Models—Front View



V3408-TL Models—Front View



Rear View



Specifications

Computer

CPU	TL3 models: 11th gen Intel® Core™ i3-1115G4E (2C/4T, 6M, 2.2 GHz) TL7 models: 11th gen Intel® Core™ i7-1185G7E (4C/8T, 12M, 1.8 GHz)
System Memory Slot	SODIMM DDR4 slots x 2 (64 GB max, 16 GB preinstalled)
System Memory Pre-installed	16 GB DDR4
Storage Slot	2.5-inch SSD slots x 2 (hot swappable) M.2 M key 2280 slot x 1 (NVMe; 128 GB preinstalled)
Storage Pre-installed	M.2 M key 128 GB SSD
Supported OS	Windows 11 IoT Enterprise LTSC 2024 64-bit Windows 10 IoT Enterprise LTSC 2021 64-bit Moxa Industrial Linux 3 (Debian 11, kernel 5.10, EOL 2031) Linux drivers supported: Debian 12 Ubuntu 22.04 LTS (HWE)
Buttons	Disk hot-swap, Reset, Power

Computer Interface

Ethernet Ports	V3404 models: Auto-sensing 10/100/1000 Mbps x 3 Auto-sensing 1000/2500 Mbps x 1 V3408 models: Auto-sensing 10/100/1000 Mbps x 7 Auto-sensing 1000/2500 Mbps x 1
Serial Ports	RS-232/422/485 ports x 2 (software-selectable, DB9 male connector)
Digital Input	DIs x 2
Digital Output	DOs x 2
USB 3.0	USB 3.0 hosts x 2, type-A connectors
Video Output	VGA x 1, 15-pin D-sub connector (female) HDMI x 1, HDMI connector (type A)

Expansion Slots	M.2 B key 3052 slots x 2 (for 5G with 2 Nano SIMs, 1 5G module preinstalled) M.2 E key slots x 1 (for Wi-Fi 6, 1 Wi-Fi 6 module preinstalled) mPCIe slots x 1 (for 4G with 2 Nano SIMs, or Wi-Fi 5)
Wireless Modules (preinstalled)	5G x 1 (M.2 B key 3052 slot) Wi-Fi 6 x 1 (M.2 E key slot)
Wi-Fi Antenna Connector	QMA x 15 7 QMA connectors preinstalled with 5G and Wi-Fi 6 8 QMA connectors with cover to be used with optional wireless accessory packages
SIM Format	Nano
Number of SIMs	6
TPM	TPM v2.0

Ethernet Interface

Connector	M12 X-coded push-pull type (female)
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Serial Interface

Baudrate	50 bps to 115.2 kbps
Connector	DB9 male
ESD	Contact: 6 kV; Air: 8 kV (level 3)
Isolation	2 kV
Data Bits	5, 6, 7, 8
Stop Bits	1, 1.5, 2
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, XON/XOFF Automatic Data Direction Control (ADDC) for RS-485 RTS Toggle (RS-232 only)

Serial Signals

RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND

Digital Inputs

Connector	Screw-fastened Euroblock terminal
Isolation	3k VDC
Sensor Type	Dry contact Wet contact (NPN)
Dry Contact	Logic 0: Close to GND Logic 1: Open
Wet Contact (COM to DI)	Logic 0: 10 to 30 VDC Logic 1: 0 to 3 VDC

Digital Outputs

Connector	Screw-fastened Euroblock terminal
Current Rating	200 mA per channel
I/O Type	Sink
Voltage	0 to 30 VDC
Isolation	3k VDC

Cellular Interface

5G NR Bands (5G module)	NSA and SA bands: n1 (2100 MHz), n2 (1900 MHz), n3 (1800 MHz), n5 (850 MHz), n7 (2600 MHz), n8 (900 MHz), n12 (700 MHz), n13 (700 MHz), n14 (700 MHz), n18 (800 MHz), n20 (800 MHz), n25 (1900 MHz), n26 (850 MHz), n28 (700 MHz), n29 (700 MHz), n30 (2300 MHz), n38 (2600 MHz), n40 (2300 MHz), n41 (2500 MHz), n48 (3600 MHz), n66 (1700 MHz), n71 (600 MHz), n75 (1500 MHz), n77 (3700 MHz), n78 (3500 MHz), n79 (4500 MHz)
LTE Bands (5G module)	B1 (2100 MHz), B2 (1900 MHz), B3 (1800 MHz), B4 (1700 MHz), B5 (850 MHz), B7 (2600 MHz), B8 (900 MHz), B12 (700 MHz), B13 (700 MHz), B14 (700 MHz), B17 (700 MHz), B18 (800 MHz), B19 (800 MHz), B20 (800 MHz), B25 (1900 MHz), B26 (850 MHz), B28 (700 MHz), B29 (700 MHz), B30 (2300 MHz), B32 (1500 MHz), B34 (2000 MHz), B38 (2600 MHz), B39 (1900 MHz), B40 (2300 MHz), B41 (2500 MHz), B42 (3500 MHz), B43 (3600 MHz), B46 (5200 MHz), B48 (3600 MHz), B66 (1700 MHz), B71 (600 MHz)
LTE Bands (LTE module)	Band 1 (2100 MHz), Band 2 (1900 MHz), Band 3 (1800 MHz), Band 4 (1700 MHz), Band 5 (850 MHz), Band 7 (2600 MHz), Band 8 (900 MHz), Band 9 (1800 MHz), Band 12 (700 MHz), Band 13 (700 MHz), Band 14 (700 MHz), Band 18 (850 MHz), Band 19 (850 MHz), Band 20 (800 MHz), Band 25 (1900 MHz), Band 26 (850 MHz), Band 28 (700 MHz)
UMTS/HSPA Bands (5G module)	Band 1 (2100 MHz), Band 2 (1900 MHz), Band 4 (1700 MHz), Band 5 (850 MHz), Band 6 (850 MHz), Band 8 (900 MHz), Band 19 (850 MHz)
UMTS/HSPA Bands (LTE module)	Band 1 (2100 MHz), Band 2 (1900 MHz), Band 4 (1700 MHz), Band 5 (850 MHz), Band 6 (850 MHz), Band 8 (900 MHz), Band 19 (850 MHz)
2G Bands (LTE module)	Band 2 (PCS_1900), Band 3 (DCS_1800), Band 5 (GSM_850), Band 8 (EGSM_900)
Cables	5G module: IPEX MHF4 to QMA cables x 5 (4 for data transition, 1 for GNSS) LTE module: IPEX MHF to QMA cables x 3 (2 for data transition, 1 for GNSS)

GPS Interface

Frequency Range	5G module: Wide-band GNSS: 1559 to 1606 MHz (recommended) GPS: BW NB GPS 2.046 MHz (centered at 1575.42 MHz) GLONASS: BW 8.3 MHz approx. (1597.05 to 1606 MHz) BeiDou: 4.092 MHz BW (1559.05 to 1563.14 MHz) Galileo: 4.092 MHz BW (centered at 1575.42 MHz) LTE module: Wide-band GNSS: 1559 to 1606 MHz (recommended) State-of-the-art GNSS solution with GPS/GLONASS/BeiDou /Galileo/QZSS
Antenna Types Supported	5G module: Active antenna (default) 7.5 dB < Gain < 26 dB for nominal performance 1.5 dB < Gain < 7.5 dB for nominal performance Configured via AT command Passive antenna: 1.5 dBi < Gain < 3dBi LTE module: Typ. 14 dBi < Gain < 17 dBi (external active antenna with a GNSS pre-filter)
Time to First Fix (TTFF)	5G module: Hot start: 1 s Warm start: 27 s Cold start: 28 s

	Open Sky, mean TTFF LTE module: Hot start: 1.1s Warm start: 22.1s Cold start: 29.9s GPS + GLONASS simulator test
Sensitivity	5G module: Cold starts: -146 dBm Tracking: -161 dBm Acquisition: -148 dBm LTE module: Cold starts: -145 dBm Tracking: -160 dBm Acquisition: -147 dBm
Update Rate	1 Hz (min.)

WLAN Interface

WLAN Standards	Wi-Fi 6 module: 802.11a/b/g/n/ac/ax Wi-Fi 5 module: 802.11ac/a/b/g/n
Frequency Band	Wi-Fi 6 module: 2.4 GHz/5 GHz/6 GHz Wi-Fi 5 module: 2.4 GHz/5 GHz
Cables	Wi-Fi 6 module: IPEX MHF4 to QMA cables x 2 Wi-Fi 5 module: IPEX MHF to QMA cables x 2

LED Indicators

System	Power x 1 Storage x 1
LAN	2 per port (LAN1: 1000/2500 Mbps, LAN2 to LAN8: 100/1000 Mbps) 1 per LAN bypass pair (LAN7 - LAN8)
Serial	2 per port (Tx, Rx)
Wireless Signal Strength	3 per connection
User Programmable	3

Power Parameters

Input Voltage	24 to 110 VDC
Power Connector	M12 A-coded male connector
Power Consumption	V3404 models: 74.4 W (max.) V3408 models: 76.8 W (max.)

Physical Characteristics

Housing	Aluminum
IP Rating	IP30
Dimensions (without ears)	106 x 250 x 180 mm (4,20 x 9.84 x 7.09 in)
Weight	Product Only: 5.2 kg (11.461 lb) Product with wall-mounting kit: 5.5 kg (12.13 lb)
Installation	Wall mounting

Environmental Limits

Operating Temperature	-40 to 70°C (-40 to 158°F) (with two 5G and one Wi-Fi 6 module)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)

Standards and Certifications

EMC	EN 55032/35
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV, Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Safety	EN 62368-1 IEC 62368-1 UL 62368-1
Railway Fire Protection	EN 45545-2:2020
Railway	EN 50121-4 EN 50121-3-2 EN 50155:2017
Shock	IEC 60068-2-27, IEC 61373
Vibration	IEC 60068-2-64, IEC 61373
International Approval	CE UKCA FCC
Wireless	EN 301 489-1/-17/-19/-52 EN 62311 EN 300 328 (WLAN 2.4G) EN 301 893 (WLAN 5G) EN 303 687 (WLAN 6 GHz) EN 301 908-1 EN 303 413 EN 301 511 (only for models with LTE) FCC UKCA

Declaration

Green Product	RoHS, CRoHS, WEEE
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MTBF

Time	V3404 models: 764,543 hrs V3408 models: 654,694 hrs
Standards	Telcordia (Bellcore), GB, GC

Warranty

Warranty Period	3 years
Details	See www.moxa.com/warranty

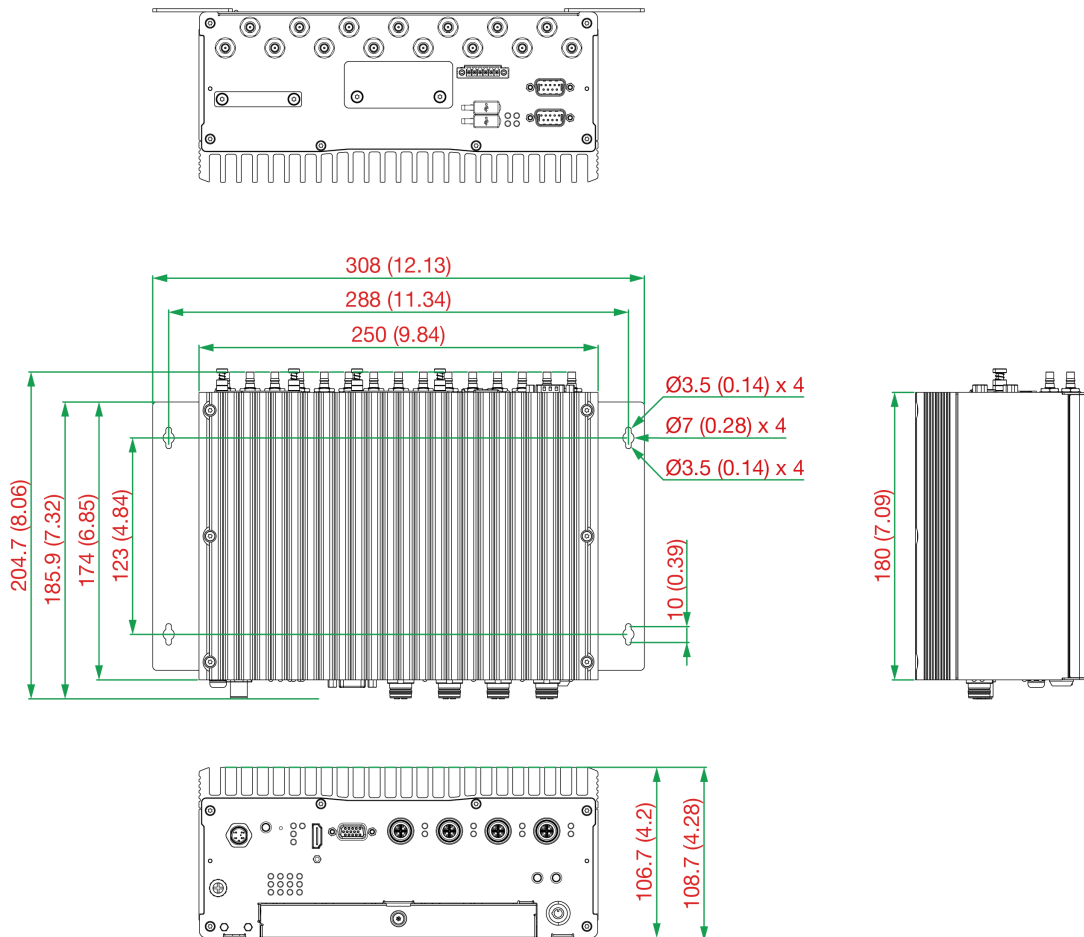
Package Contents

Device	1 x V3400 Series computer
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

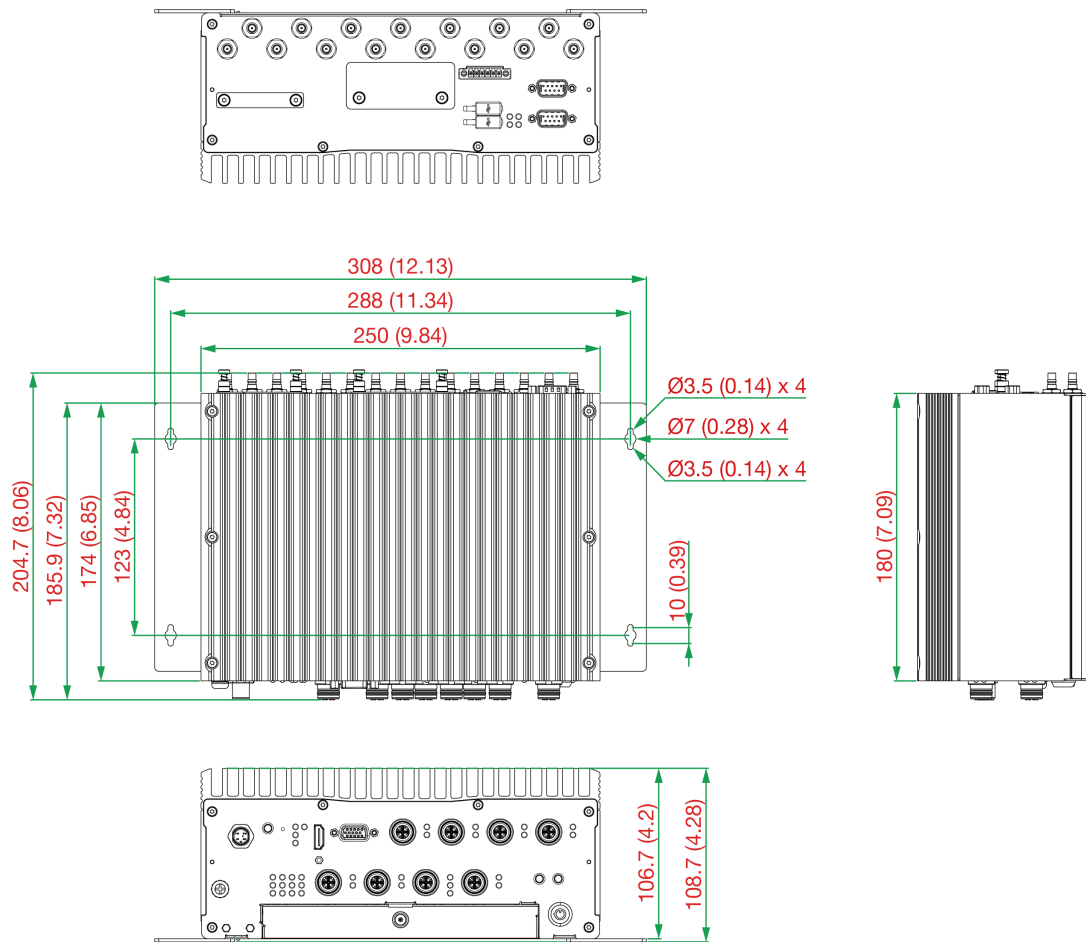
V3404-TL Models

Unit: mm (inch)



V3408-TL Models

Unit: mm (inch)



Ordering Information

Model Name	CPU	Memory	OS Storage (M.2 M Key)	2.5" SSD Slots (2)	GbE Ports	5G (up to 2)	LTE/ Wi-Fi 5	Wi-Fi 6	Operating Temp.
V3404-TL3-W-CT-T	Intel® Core™ i3-1115G4E	16 GB	128 GB	Optional	4	1 preinstalled, 1 optional	Optional	Preinstalled	-40 to 70°C
V3408-TL3-W-CT-T	Intel® Core™ i3-1115G4E	16 GB	128 GB	Optional	8	1 preinstalled, 1 optional	Optional	Preinstalled	-40 to 70°C
V3404-TL7-W-CT-T	Intel® Core™ i7-1185G7E	16 GB	128 GB	Optional	4	1 preinstalled, 1 optional	Optional	Preinstalled	-40 to 70°C
V3408-TL7-W-CT-T	Intel® Core™ i7-1185G7E	16 GB	128 GB	Optional	8	1 preinstalled, 1 optional	Optional	Preinstalled	-40 to 70°C

Accessories (sold separately)

Wi-Fi Wireless Modules

V3400-LTECat4-GL	Telit LE910C4 LTE Cat. 4 mPCIe card, 3 coaxial cables (I-PEX MHF male connector to QMA female connector), 2 thermal pads, 1 heat sink for the V3400 Series
V3400-5G-GL	Telit FN990A 5G module, 5 coaxial cables (I-PEX MHF male connector to QMA female connector), 2 thermal pads for the V3400 Series
V3400-WLAN22-AC	Wi-Fi 5 (802.11ac) module, 1 mPCIe adapter bracket with 4 screws, 2 coaxial cables (I-PEX MHF male connector to QMA female connector), 2 thermal pads for the V3400 Series
V3400-WLAN22-AX	Wi-Fi 6 (802.11ax) module, 2 coaxial cables (I-PEX 4 MHF male connector to QMA female connector), 2 thermal pads for the V3400 Series

Cables

CBL-M12(FF5P)/OPEN-100 IP67

A-coded female M12-to-5-pin open wire cable, black, IP67-rated, 1 m

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