V3200 Series

11th Gen Intel® Core™ processor railway computers with power isolation, multiple expansion slots for wireless, 2 SSD slots

MIL3
Secure

Features and Benefits

- Intel® Celeron®/Intel® Core™ i3/i5/i7 embedded computer for in-vehicle applications

- Multiple interfaces: Up to 8 GbE, 2 serial, 2 USB, 2 DIs, 2 DOs, 1 mPCIe slot for wireless (Wi-Fi 5 or 4G), and 1 M.2 E key for wireless (Wi-Fi 6)

- Supports dual independent displays (VGA and HDMI with 4K resolution)

- Native TSN support (for models with i7-1185GRE processor)

- Onboard TPM module for enhanced cybersecurity

- Complies with all EN 50155 mandatory test items[1]

- EN 50121-4 compliant

- IEC 61373 certified for shock and vibration resistance

- Multiple OSes including Moxa Industrial Linux with 10-year long-term support

Certifications

EN 50121-4   C E   EN 50155   FC

Introduction

The V3200 Series embedded computers are built around an Intel® Core™ i7/i5/i3 or Intel® Celeron® high-performance processor and come with up to 64 GB RAM, one M.2 2280 M key slot, and two 2.5" SSD slots 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.
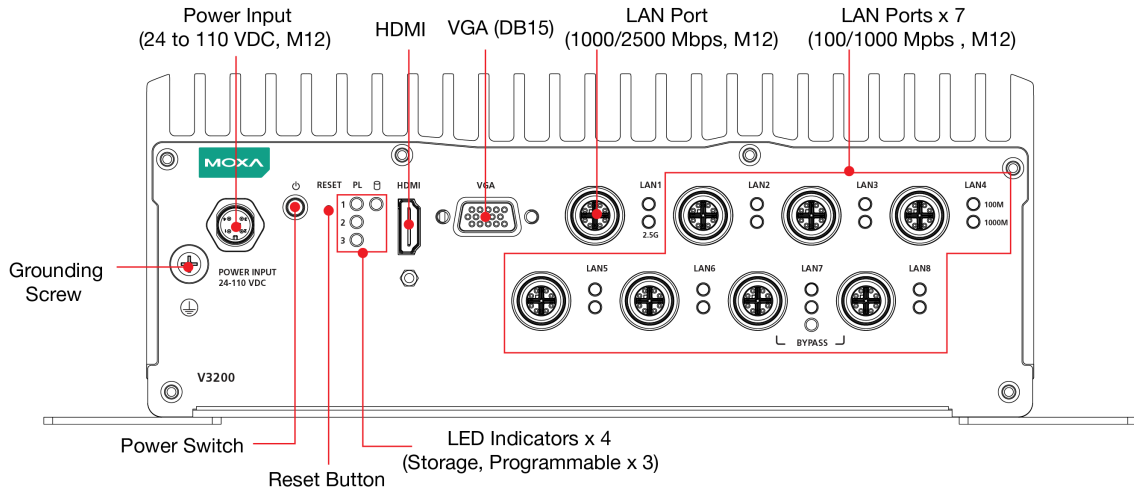
For connecting with onboard and wayside systems and devices, the V3200 computers are equipped with a rich set of interfaces including 4 Gigabit Ethernet ports (default; can go up to 8 ports) with one-pair LAN bypass function to ensure uninterrupted data transmission, 2 RS-232/422/485 serial ports, 2 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. The V3200 computers come with one LTE and 6 SIM-card slots to help establish redundant LTE/Wi-Fi connections and three programmable LEDs that enable monitoring of the runtime status of software.
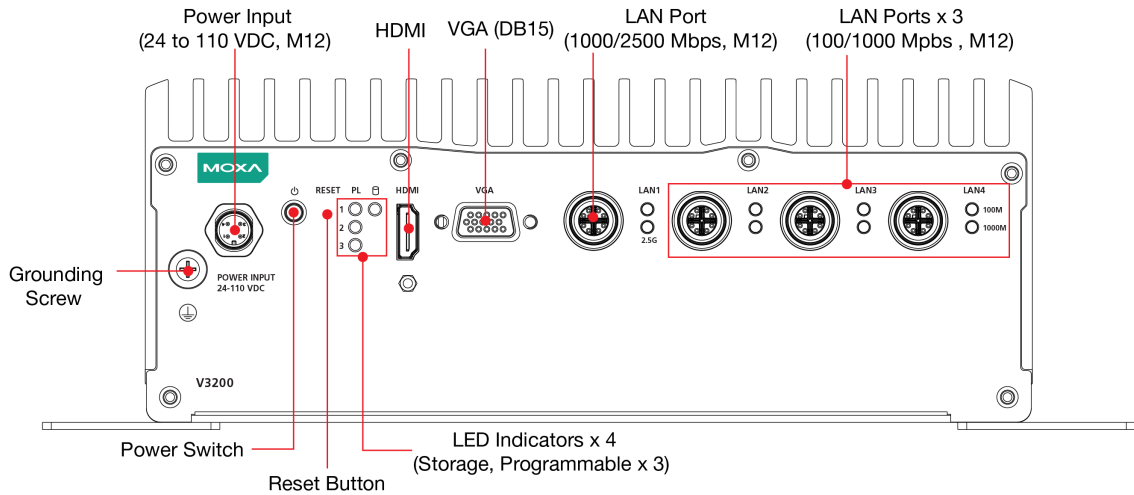
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1. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf
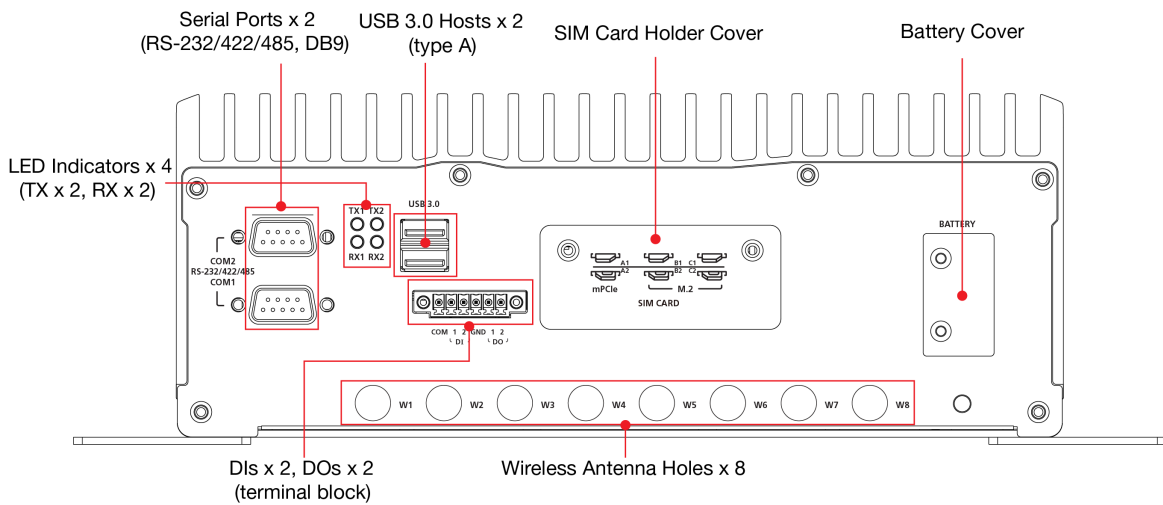
Appearance

Front View 8P Models

Power Input (24 to 110 VDC, M12)
HDMI
VGA (DB15)
LAN Port (1000/2500 Mbps, M12)
LAN Ports x 7 (100/1000 Mpbs , M12)
Grounding Screw
Power Switch
Reset Button
LED Indicators x 4 (Storage, Programmable x 3)

Front View 4P Models

Power Input (24 to 110 VDC, M12)
HDMI
VGA (DB15)
LAN Port (1000/2500 Mbps, M12)
LAN Ports x 3 (100/1000 Mpbs , M12)
Grounding Screw
Power Switch
Reset Button
LED Indicators x 4 (Storage, Programmable x 3)

Rear View

Serial Ports x 2 (RS-232/422/485, DB9)
USB 3.0 Hosts x 2 (type A)
SIM Card Holder Cover
Battery Cover
LED Indicators x 4 (TX x 2, RX x 2)
DIs x 2, DOs x 2 (terminal block)
Wireless Antenna Holes x 8

Specifications

Computer

CPU	V3210-TL1-4L-T/8L-T/4L-CT-T/8L-CT-T: Intel® Celeron® 6305E processor (2C/2T, 4M cache, 1.8 GHz) V3210-TL3-4L-T/8L-T/4L-CT-T/8L-CT-T: Intel® Core™ i3-1115G4E processor (2C/4T, 6M cache, 2.2 GHz) V3210-TL5-4L-T/8L-T/4L-CT-T/8L-CT-T: Intel® Core™ i5-1145G7E processor (4C/8T, 8M cache, 1.5 GHz) V3210-TL7-4L-T/8L-T/4L-CT-T/8L-CT-T: Intel® Core™ i7-1185G7E processor (4C/8T, 12M cache, 1.8 GHz) V3210-TL7-4L-TSN-CT-T/8L-TSN-CT-T: Intel® Core™ i7-1185GRE processor (4C/8T, 12M cache, 1.8 GHz)
System Memory Slot	SODIMM DDR4 slots x 2 (64 GB max)
System Memory Pre-installed	16 GB DDR4
Storage Slot	2.5-inch SSD slots x 2 M.2 M key 2280 slot x 1 (NVMe; 128 GB preinstalled)
Supported OS	Windows 10 IoT Enterprise LTSC 2021 LTSC 64-bit Moxa Industrial Linux 3 (Debian 11, kernel 5.10), 2031 EOL Linux drivers supported: Debian 12 Ubuntu 22.04 LTS (HWE)
Graphics Controller	Intel® Celeron®/Core™ i3 Models: Intel® UHD Graphics Intel® Core™ i5/i7 Models: Intel® Iris® Xe Graphics

Computer Interface

Ethernet Ports	Default: 4 ports (2.5 GbE x 1 and GbE x 3), can go up to 8 ports Auto-sensing 1000/2500 Mbps x 1 Auto-sensing 10/100/1000 Mbps x up to 7 LAN1: Intel® Ethernet Network Adapter I225 with Intel® AMT support
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)
Wi-Fi Antenna Connector	QMA x 8 (optional with accessory kit)
Expansion Slots	M.2 B key 3052/3050 slots x 2 M.2 E key slots x 1 (for Wi-Fi 6) mPCIe slots x 1 (for LTE with 2 Micro SIMs, Wi-Fi 5, or I/O expansion)
SIM Format	Micro
Number of SIMs	6
TPM	TPM v2.0

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

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)
User Programmable	3

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

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Power Parameters

Input Voltage	24 to 110 VDC
Power Connector	M12 A-coded male connector
Power Consumption	100 W (max.)

Physical Characteristics

Housing	Aluminum
IP Rating	IP30
Dimensions (without ears)	250 x 96.7 x 180 mm (9.84 x 3.80 x 7.09 in)
Weight	Product Only: 3.86 kg (8.51 lb) Product With Package: 5.10 kg (11.24 lb)
Installation	Wall mounting
Protection	PCB conformal coating Available on request

Environmental Limits

Operating Temperature	-40 to 70°C (-40 to 158°F)
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 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

Declaration

Green Product	RoHS, CRoHS, WEEE

MTBF

Time	4L Models: 382,624 hrs 8L Models: 305,836 hrs
Standards	Telcordia (Bellcore), GB

Warranty

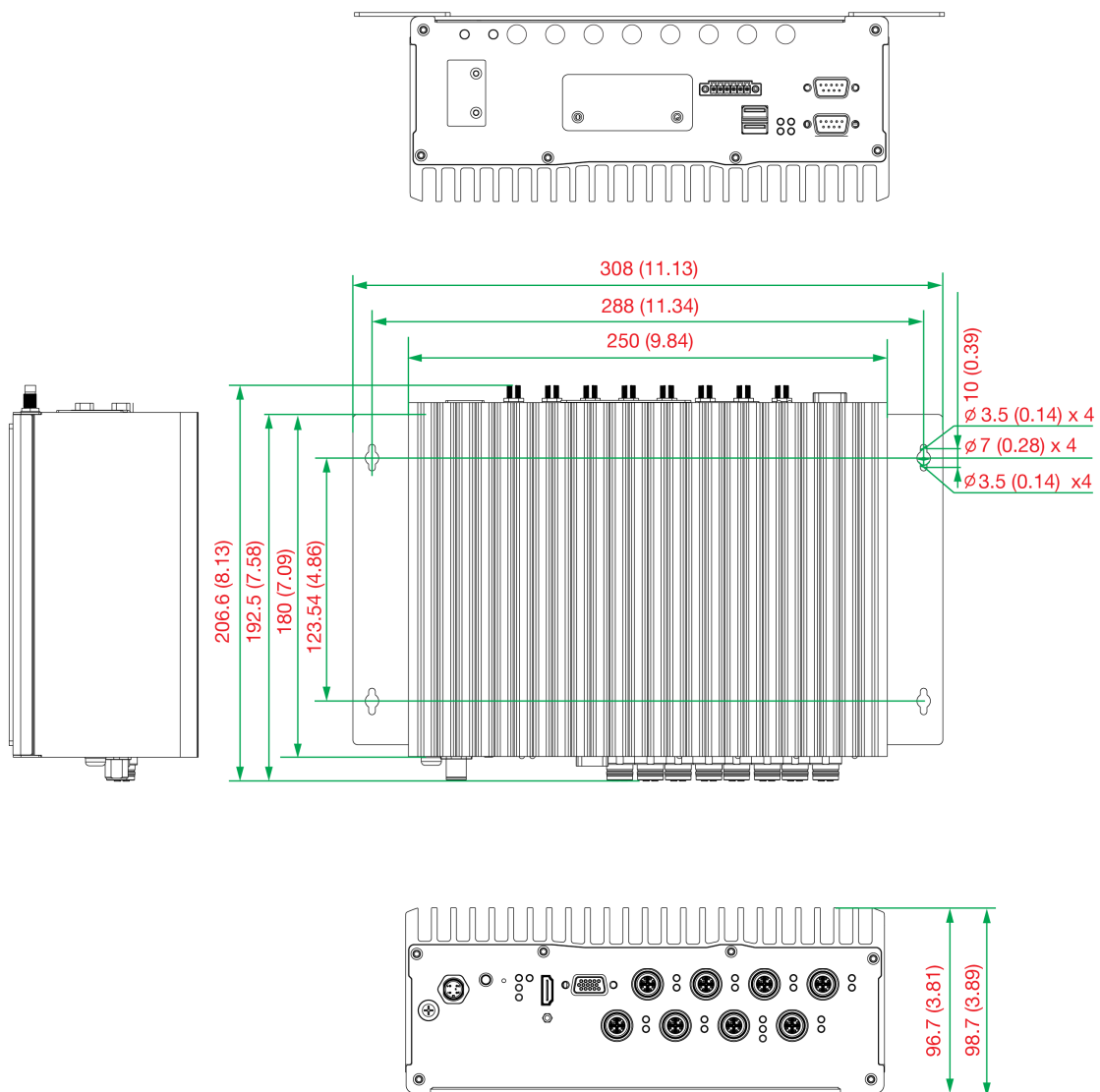|	
Warranty Period	3 years
Details	See www.moxa.com/warranty

Package Contents

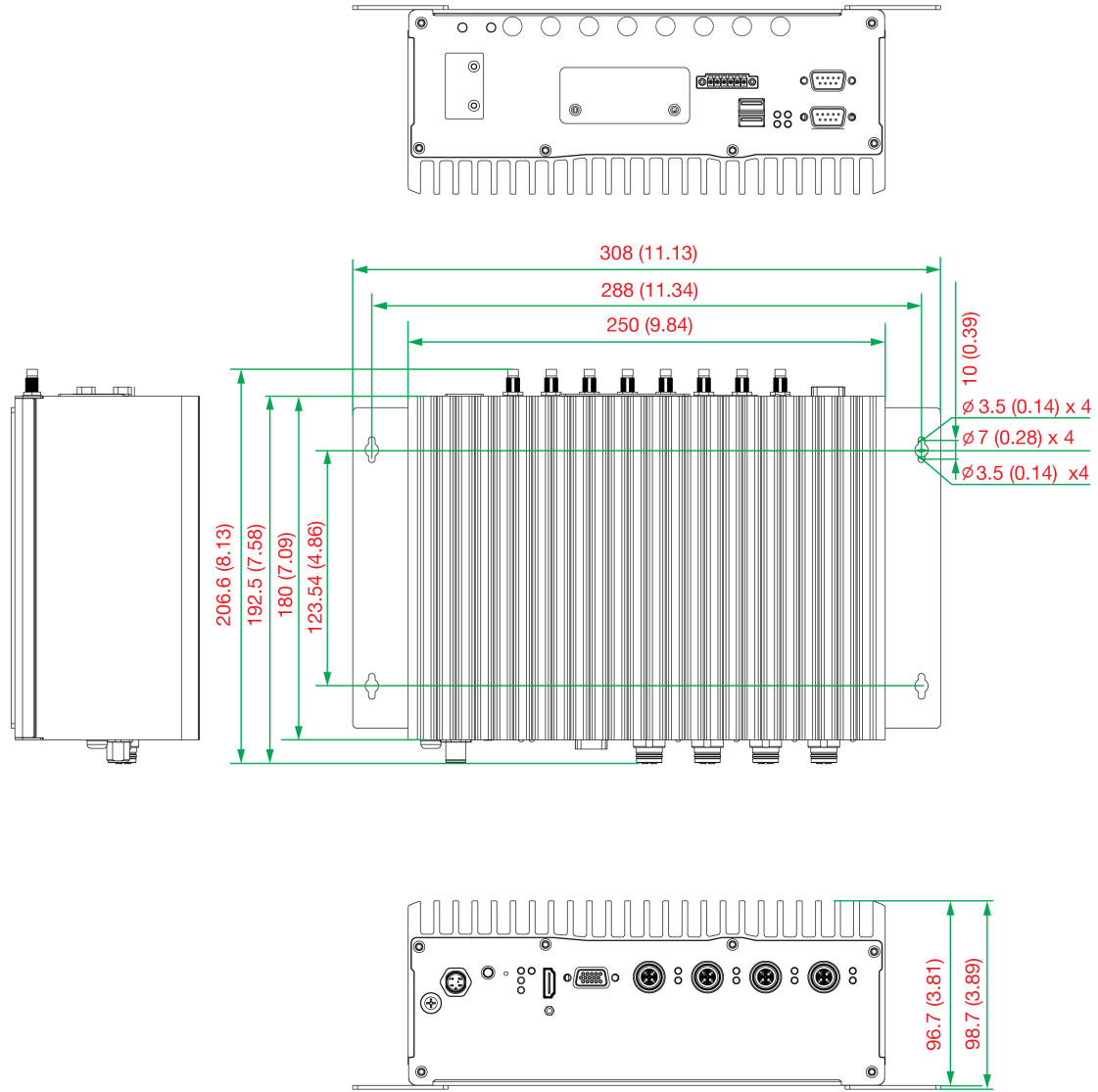|	
Device	1 x V3200 Series computer
Installation Kit	4 x SSD/HDD brackets 1 x wall-mounting kit
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

8P Models

Unit: mm (inch)

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4P Models

Unit: mm (inch)

Ordering Information

Model Name	CPU	Memory	OS Storage (M.2 M Key)	2.5" SSD Slots (2)	GbE Ports	TPM 2.0	Native TSN Enhancement	Power Input	Operating Temp.	Conformal Coating
V3210-TL1-4L-T	Celeron 6305E	16 GB	128 GB	Optional	4	✓	–	24-110 VDC	-40 to 70°C	–
V3210-TL3-4L-T	i3-1115G4E	16 GB	128 GB	Optional	4	✓	–	24-110 VDC	-40 to 70°C	–
V3210-TL3-4L-CT-T	i3-1115G4E	16 GB	128 GB	Optional	4	✓	–	24-110 VDC	-40 to 70°C	✓
V3210-TL7-4L-T	i7-1185G7E	16 GB	128 GB	Optional	4	✓	–	24-110 VDC	-40 to 70°C	–
V3210-TL1-8L-CT-T	Celeron 6305E	16 GB	128 GB	Optional	8	✓	–	24-110 VDC	-40 to 70°C	✓
V3210-TL5-8L-CT-T	i5-1145G7E	16 GB	128 GB	Optional	8	✓	–	24-110 VDC	-40 to 70°C	✓

Model Name	CPU	Memory	OS Storage (M.2 M Key)	2.5" SSD Slots (2)	GbE Ports	TPM 2.0	Native TSN Enhancement	Power Input	Operating Temp.	Conformal Coating
V3210-TL7-8L-CT-T	i7-1185G7E	16 GB	128 GB	Optional	8	✓	–	24-110 VDC	-40 to 70°C	✓
V3210-TL7-8L-TSN-CT-T	i7-1185GRE	16 GB	128 GB	Optional	8	✓	✓	24-110 VDC	-40 to 70°C	✓

Accessories (sold separately)

Wi-Fi Wireless Modules

V3200-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, 160 mm), 1 thermal pad
V3200-WLAN22-AX	Wi-Fi 6 (802.11ax) module, 2 coaxial cables (I-PEX 4 MHF male connector to QMA female connector, 160 mm), 1 thermal pad
V3200-LTECat4-GL	Telit LE910C4 LTE Cat. 4 mPCIe card, 3 coaxial cables (I-PEX MHF male connector to QMA female connector, 160 mm), 1 thermal pad

Cables

CBL-M12(FF5P)/OPEN-100 IP67	A-coded female M12-to-5-pin open wire cable, black, IP67-rated, 1 m