




Edge Gateway 3001 Specifications

Notes, cautions, and warnings

-  **NOTE:** A NOTE indicates important information that helps you make better use of your product.
-  **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.
-  **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Dimensions and weight

Product

Table 1. Product

Height	125 mm (4.92 in)
Width	125 mm (4.92 in)
Depth	51 mm (2 in)
Weight	1 kg (2.20 lb)
Volume	0.80 L

Packaging

 **NOTE:** The packaging weight includes the total weight of the Edge Gateway and four antennas. Antennas are available in the accessory box shipped with the Edge Gateway.

Table 2. Packaging

Height	262 mm (10.32 in)
Width	139 mm (5.47 in)
Depth	241 mm (9.49 in)
Shipping weight (includes packaging materials)	1.71 kg (3.77 lb)

Mounting dimensions

 **NOTE:** Mounting dimensions includes the dimensions of the Edge Gateway and various mounting options.

 **NOTE:** Each mounting option is sold separately.

Table 3. Mounting dimensions

	Standard mount	Quick mount	Quick mount and cable control bars	DIN mount	Perpendicular mount	Standard mount and cable control bars
Weight	1.23 kg (2.71 lb)	1.26 kg (2.78 lb)	1.55 kg (3.42 lb)	1.02 kg (2.25 lb)	1.10 kg (2.42 lb)	1.53 kg (3.37 lb)
Height	169.20 mm (6.66 in)	169.20 mm (6.66 in)	222.30 mm (8.75 in)	125 mm (4.92 in)	125 mm (4.92 in)	222.30 mm (8.75 in)
Width	167.20 mm (6.58 in)	167.20 mm (6.58 in)	273.30 mm (10.76 in)	125 mm (4.92 in)	143.50 mm (5.65 in)	273.30 mm (10.76 in)
Depth	61.90 mm (2.44 in)	64.60 mm (2.54 in)	64.60 mm (2.54 in)	59.20 mm (2.33 in)	55.50 mm (2.18 in)	61.90 mm (2.44 in)

VESA mounting dimensions

The Edge Gateway can be mounted on a standard VESA mount.

Table 4. VESA mounting dimensions

Height	75 mm (2.95 in)
Width	75 mm (2.95 in)

Environmental and operating conditions

Environmental conditions

Table 5. Environmental conditions

Ingress protection rating	IP50
Water and dust ingress	IEC 60529

 **CAUTION:** Install the Edge Gateway in an area that is not exposed to direct sunlight.





 **NOTE:** The Edge Gateway underwent and complies with salt fog testing conducted according to Mil-Std-810G Method 509.5, Procedure 1.

 **NOTE:** For outdoors and rugged environments, install the Edge Gateway in an external enclosure (sold separately).

Operating conditions

Table 6. Operating conditions

Maximum vibration

Operational	<ul style="list-style-type: none"> • 5 Hz with 0.0002 G²/Hz • 350 Hz with 0.0002 G²/Hz <p> NOTE: Operational values are based on the 0.26 Grms profile. These values are tested for all operational orientations and are retrieved from two minutes per test orientation with IO meter.</p> <p> NOTE: All screws on the Edge Gateway are embedded with a Nylock seal to resist vibration and loosening.</p>
Non-operational	<ul style="list-style-type: none"> • 10 Hz with 0.003 G²/Hz • 20 Hz with 0.01 G²/Hz • 250 Hz with 0.01 G²/Hz <p> NOTE: Non-operational values are based on the 1.54 Grms profile. These values are tested for all non-operational orientations and are retrieved every sixty minutes per test orientation with IO meter.</p>
Long Life Vibration	<p>0.79 Grms</p> <p> NOTE: The values are tested for all operational orientations and are retrieved every five hours per test orientation with IO meter.</p>

Maximum shock

Operational	<p>Half sine shock</p> <p>All operational orientations; 40 G ± 5% with pulse duration of 2 msec ± 10% (equivalent to 20 in/sec [51 cm/sec])</p>
Non-operational	<p>Half sine shock</p>

Tested on all six sides; 160 G ± 5% with pulse duration of 2 msec ± 10% (equivalent to 50 in/sec [127 cm/sec])

Maximum altitude

Operational (maximum, unpressurized) -15.20 m to 5,000 m (-50 ft to 16,404 ft)


 **NOTE: The maximum temperature is derated 1°C/305 m (1000 ft) above sea level altitude.**

Non-operational (maximum, unpressurized) -15.20 m to 10,668 m (-50 ft to 35,000 ft)

Operating environment

Temperature range (system)

- Operating:
 - With 0.7 m/s airflow: -30°C to 75°C (-22°F to 167°F)
 - Without airflow: -30°C to 70°C (-22°F to 158°F)
- Non-operating—With a maximum temperature gradation of 15°C (59°F) per hour:
 - With 0.7 m/s airflow: -40°C to 85°C (-40°F to 185°F)
 - Without airflow: -40°C to 85°C (-40°F to 185°F)

 **WARNING: The maximum operating temperature of the Edge Gateway is 70°C (158°F). Do not exceed this maximum temperature while operating the Edge Gateway inside an enclosure. Internal heating of the Edge Gateway electronics, other electronics, and the lack of ventilation inside an enclosure can cause the operating temperature of the Edge Gateway to be greater than the outside ambient temperature. Continuous operation of the Edge Gateway at temperatures greater than 70°C (158°F) may result in an increased failure rate and a reduction of the product life. Ensure that the maximum operating temperature of the Edge Gateway when placed inside an enclosure is 70°C (158°F) or less.**

Temperature range (with components)

- Operating (SD card): -40°C to 85°C (-40°F to 185°F)
- Operating (eMMC): -40°C to 85°C (-40°F to 185°F)

Maximum relative humidity (non-condensing)


- Operating: 10% to 90%—With a maximum temperature gradation of 15°C (59°F) per hour
- Non-operating: 5% to 95%—With a maximum temperature gradation of 20°C (68°F) per hour

Pollution degree


2

 **NOTE: The ambient temperature is based on the free-air environment, system mounting, and certain workload assumptions.**

 **NOTE: An open space of 63.50 mm (2.50 in) is recommended around the Edge Gateway for optimal air circulation.**

 **NOTE: The maximum operating temperature may vary, depending on factors such as air flow, system mounting, software applications, and so on.**

 **NOTE: The temperature at the center of the exposed base surface must not exceed 82°C (179.6°F).**

 **NOTE: For optimal thermal distribution when mounted, ensure that Edge Gateway is installed as instructed in the supplied documentation.**

Power

Power source

The Edge Gateway supports the following power sources, which are isolated to 2.5 KV:

- DC
- Power over Ethernet (PoE)

 **CAUTION: Power off the Edge Gateway before you change the power source.**

 **NOTE: For marine applications, limit input voltage to 12-48 VDC. The cable length for rail applications must not exceed 30 meters.**

 **NOTE: You can connect either DC-IN or PoE.**

 **NOTE: USB power is limited to 0.6 A/3 W for USB 3.0 port and 0.4 A/2 W for USB 2.0 port.**

Table 7. Power consumption





Power consumption (applicable to power source from DC or PoE)	
Maximum power consumption	12.9 W
System idle	4.2 W  NOTE: Operating system is active but no applications are running.
Processor full load	8.1 W  NOTE: Operating system active with 100% processor utilization and 2D/3D load.
System full load	12.9 W  NOTE: Operating system active with 100% processor utilization and simultaneous access to I/O devices.

Table 8. DC parameters

DC parameters	
Supported input voltage	12/24 V vehicle power system (12 V ~ 57 V wide DC input, ISO 7637-2 & SAE J1113 compliant).  NOTE: Supports vehicle cold-crank down to 6 V.
Rated DC input for marine environments	12–48 VDC
Maximum input current	1.08 A at 12 V/0.23 A at 57 V
Minimum DC supply power requirement	13 W
Power management	System power on, standby, and hibernate management through optional ignition input.
Supported wake up events	<ul style="list-style-type: none"> • Alarm (real-time clock)

DC parameters





	<ul style="list-style-type: none">• WLAN and LAN (Windows OS only)• USB• Ignition and Direct Ignition (DI)
Power protection	System power protection. For example, vehicle battery protection through optional ignition input.  NOTE: Ignition input provides an option to turn off the device or put it into a low-power mode (depending on the OS), whenever the vehicle ignition is turned off to protect from vehicle battery draining.
Recommended power supply	17 W (20% derating)  NOTE: With consideration of voltage derating under high environmental temperature.

Table 9. PoE parameters

PoE parameters

Compatibility	IEEE 802.3, IEEE 802.3u, IEEE802.3ab, IEEE802.3x, IEEE 802.3af  NOTE: Compliance with Alternative A of IEEE 802.3af standard for maximum 15.4 W, with power up to 48 V over existing Ethernet infrastructure. No modifications are required.  NOTE: Standard IEEE 802.3 Ethernet interface provided for 100BASE-TX and 10BASE-T applications (802.3, 802.3u, 802.3ab, and 802.3x) 9014-bytes jumbo frame support.
Number of ports	One Fast Ethernet Media Access Control (MAC) port and one physical layer (PHY) port
Speed	10/100 Mbps (supports Wake on LAN and WLAN)
Connector	8-pin RJ45
Protection	Built-in 2.25 KV isolation protection on LAN ports and ESD IEC61000-4-2 ±30 KV
Power input	12.95 W minimum according to Alternative A of IEEE 802.3af-2003 (standard)
Supported input voltage	48 V DC
Supported input current	0.27 A

Ignition

Table 10. Ignition parameters

Parameter	Minimum voltage	Maximum voltage	Default
High-level input voltage (V_{IH})	9 V	32 V	12 V
Low-level input voltage (V_{IL})	0 V	1.2 V	0 V

3 V CMOS coin-cell battery

Table 11. Coin-cell battery

RTC coin-cell battery (lithium-ion)	
Type	BR-2032
Manufacturer	Panasonic Corporation
Nominal voltage	3 V
Nominal capacity	200 mAh



NOTE: It is recommended to check or replace the coin-cell battery before operation. Also, check or replace the coin-cell battery if the system has been disconnected from a power source for more than two years.

Operating systems

The Edge Gateway supports the following operating systems:

- Windows 10 IoT Enterprise LTSC 2016
- Ubuntu Core 16



NOTE: Windows 10 IoT Enterprise LTSC 2016 is supported only on Edge Gateway models with 32 GB eMMC.

Processor

Table 12. Processor

Configuration	Processor	Cache	Number of Cores
Edge Gateway 3001	Intel Atom Processor E3805	1 MB L2 cache	2

Memory

Table 13. Memory type

Type	DDR3L
Memory channel	Single
Minimum memory	2 GB
Maximum system memory	2 GB

Storage

Table 14. Storage specifications

Storage type	Capacity supported
micro-SD	<ul style="list-style-type: none">• 8 GB• 32 GB• 64 GB• 128 GB
eMMC	<ul style="list-style-type: none">• 8 GB• 32 GB



NOTE: Windows 10 IoT Enterprise LTSB 2016 is supported only on Edge Gateway models with 32 GB eMMC.

External ports and connectors

 **NOTE:** For more information about ports and connectors location, see the *Edge Gateway Installation and Operation Manual*.

Table 15. Ports and connectors on Edge Gateway

Ports	Edge Gateway 3001
RS-232/RS-485/RS-422 ports	2
Audio line-out	0
Audio line-in	0
Ethernet port one (with PoE)	1
Ethernet port two (without PoE)	0
WLAN or Bluetooth antenna connector	1
GPS antenna connector	1
Mobile broadband antenna connector (3G)	1
Mobile broadband antenna connector (4G LTE)	1
ZigBee antenna connector	0
Connector for external enclosure chassis intrusion switch (optional)	1
DisplayPort	0
GPIO	1
USB 3.0	1
USB 2.0	1
CANbus	0

 **NOTE:** The connector for wireless antenna () and GPS antenna () is the same.

Communications

Wireless LAN

Table 16. Wireless LAN specifications

WLAN standards supported	802.11b, 802.11g or 802.11n
802.11b data rates supported	54, 48, 36, 24, 18, 12, 9, and 6 Mbps
802.11g data rates supported	54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, and 1 Mbps
802.11n data rates supported	MCS0 to MCS7 with and without Short GI.
Encryption	WEP 64-bit and 128-bit, TKIP, AES-CCMP 128-bit

Wireless WAN

Table 17. Wireless WAN specifications

Card	Region
DW5515—3G	Mexico and rest of the world
DW5815—4G LTE	AT&T (US and Canada) and Verizon (US)
DW5818—LTE, HSPA+	EMEA
DW5819—LTE, HSPA+	Asia Pacific

DW5515 specifications

Table 18. DW5515 card specifications

Network	HSPA+/WCMDA
Frequency bands	<ul style="list-style-type: none"> HSPA+/WCMDA band: 1, 2, 5, 6, 8, 19 EDGE/GPRS frequency: 850, 900, 1800, 1900 MHz
Speed—Downlink	< 21 Mbps
Speed—Uplink	< 5.76 Mbps
Fallback network	EDGE/GPRS
Fallback speed	<ul style="list-style-type: none"> Downlink: < 236.8 Kbps Uplink: < 118.4 Kbps
SIM	All

DW5815 specifications

Table 19. DW5815 card specifications

Network	LTE/HSPA+
Frequency bands	<ul style="list-style-type: none">• LTE band: 2, 4, 5, 13, 17• HSPA+/WCDMA band: 2, 5
Speed—Downlink	< 150 Mbps
Speed—Uplink	< 50 Mbps
Fallback network	HSPA+/WCDMA
Fallback speed	<ul style="list-style-type: none">• Downlink: < 42 Mbps• Uplink: < 5.76 Mbps
SIM	AT&T and Verizon

DW5818 specifications

Table 20. DW5818 card specifications

Network	LTE/HSPA+
Frequency bands	<ul style="list-style-type: none">• LTE FDD Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 20, 25, 26, 29, 30• LTE TDD Band 41• HSPA+/WCDMA Band 1, 2, 3, 4, 5, 8
Speed (Downlink)	<ul style="list-style-type: none">• LTE FDD < 300 Mbps (Cat 6)• LTE TDD < 222 Mbps
Speed (Uplink)	<ul style="list-style-type: none">• LTE FDD < 50 Mbps• LTE TDD < 26 Mbps
Fallback network	HSPA+/WCDMA
Fallback speed	<ul style="list-style-type: none">• Downlink: < 42 Mbps• Uplink: < 5.76 Mbps
SIM	All

DW5819 specifications

Table 21. DW5819 card specifications

Network	LTE/HSPA+
Frequency bands	<ul style="list-style-type: none">• LTE FDD Band 1, 3, 5, 7, 8, 18, 19, 21, 28• LTE TDD Band 38, 39, 40, 41• HSPA+/WCDMA Band 1, 5, 6, 8, 9, 19
Speed—Downlink	<ul style="list-style-type: none">• LTE FDD < 300 Mbps (Cat 6)

Speed—Uplink	<ul style="list-style-type: none"> • LTE TDD < 222 Mbps • LTE FDD < 50 Mbps • LTE TDD < 26 Mbps
Fallback network	HSPA+/WCDMA
Fallback speed	<ul style="list-style-type: none"> • Downlink: < 42 Mbps • Uplink: < 5.76 Mbps
SIM	All

WWAN providers and options

 **NOTE:** Depending on the network coverage available, the Edge Gateway selects the most optimal configuration and automatically switches between LTE and 3G networks. Measurements from network-signaling messages between the Edge Gateway and the WWAN provider determine the switch-over process.

Table 22. WWAN providers and options for Edge Gateway 3000 series

WWAN card	Provider	2G bands	3G bands	LTE bands
DW5515 Sierra Wireless AirPrime HL8548	HSPA+	EDGE/GPRS frequency: 850, 900, 1800, 1900 Mhz	HSPA B1, B2, B5, B6, B8, B19	Not supported
DW5815 Sierra Wireless AirPrime HL7588	AT&T (US) and Verizon (US)	Not applicable	B5 (850), B2 (1900)	B17 (700), B13 (700), B5 (850), B4 (1700), B2 (1900)
DW5818 Sierra Wireless AirPrime MC7455	LTE/HSPA+/WCDMA networks	Not applicable	HSPA+/WCDMA Band 1, 2, 3, 4, 5, 8	LTE FDD Band 1, 2, 3, 4, 5, 7, 8, 12, 13, 20, 25, 26, 29, 30 LTE TDD Band 41
DW5819 Sierra Wireless AirPrime MC7430	LTE/HSPA+/WCDMA networks	Not applicable	HSPA+/WCDMA Band 1, 5, 6, 8, 9, 19	LTE FDD Band 1, 3, 5, 7, 8, 18, 19, 21, 28 LTE TDD Band 38, 39, 40, 41

Global Navigation Satellite System (GNSS)

Table 23. GNSS specifications

GNSS chip in Edge Gateway	Supported GNSS systems
u-blox UBX-M8030	Concurrent reception of up to three GNSS systems: GPS (Global Positioning System)/Galileo with Beidou or GLONASS.

Table 24. Supported GNSS constellations

GNSS constellation	Details
GPS	Receives and tracks GPS L1 C/A signals at 1575.42 MHz.
GLONASS	Receives and tracks GLONASS L1 signals at 1602 MHz + $k^*562.5$ kHz, where k is the satellite's frequency channel number ($k = -7, \dots, 5, 6$). The GLONASS satellite system is an alternative to GPS.

GNSS constellation	Details
BeiDou	Receives and tracks BeiDou B1I signals at 1561.098 MHz. The ability to receive and track BeiDou signals with another constellation, results in higher coverage, improved reliability and better accuracy. BeiDou coverage is only available in China, with global coverage scheduled for 2020.
Galileo	Receives and tracks Galileo E1-B/C signals centered on the GPS L1 frequency band. GPS and Galileo signals can be processed with either BeiDou or GLONASS signals, enhancing coverage, reliability and accuracy.

Bluetooth

Table 25. Bluetooth specifications

Bluetooth standard supported	Dual-mode Bluetooth 4.0 BLE
Bluetooth Classic	Version 2.1+EDR
Bluetooth data rates supported	Up to 3 Mbps
Bluetooth Low Energy	Yes
Encryption	128-bit

COM ports

Table 26. COM ports specifications

Connector type	2x5 terminal block
Data rate	<ul style="list-style-type: none"> Up to 1 Mbps in RS-232 12 Mbps in RS-422/RS-485

RS-232/RS-422/RS-485

Table 27. RS-232/RS-422/RS-485 specifications

General

Bus type	USB 2.0
Connectors	2 x 2x5 terminal blocks (JVE/23N6963-10D00B-15G-2.9)
Power consumption	20 mA at +3.3 V

Communications

Communication controller	XR21V1412 (controller), SP339E (transceiver)
Data bits	7, 8, 9
Data signals	<ul style="list-style-type: none"> RS-232: DCD, RXD TXD, DTR, GND, DSR, RTS, CTS, RI RS-422: TXD+, TXD-, RXD+, RXD-, GND RS-485: Data+, Data-, GND
FIFO	<ul style="list-style-type: none"> 128 bytes (TX) 384 bytes (RX)

Flow control	Hardware (RTS/CTS or DTR/DSR), Software (Xon/Xoff)
Parity	None, Odd, Even, Mark, and Space
Speed/Baudrate	<ul style="list-style-type: none"> Up to 1 Mbps in RS-232 12 Mbps in RS-422/RS-485
Stop bits	1, 2

Protection

Isolation protection	Not applicable
ESD protection	Transceiver 6100-4-2 ± 15 KV (Air), ±8 KV (Contact)
EFT protection	Not applicable
Surge protection	Not applicable

GPIO

Table 28. General information

Connector part number	Anytek KE161351A010G http://www.anytek.com.tw
Temperature range	-40°C to 115°C (-40°F to 239°F)



NOTE: This part number is for reference only and is subjected to change.

Table 29. GPI configuration

GPI configuration	
Logic high	3.5 V to 5 V
Logic low	0 V to 1.5 V
Input resistance	1 k between connector and controller
Interrupt source	Not applicable
Isolation voltage	1 KV DC, controller to rest of system

Table 30. GPO configuration

GPO configuration	
Output	Open-drain or push-pull 1.6 mA per channel
Supply voltage	5 VDC
Isolation voltage	1 KV DC, controller to rest of system No Vdd pin on connector

Table 31. GPIO specifications

Name	Default setting	Default internal Pull-up and Pull-down
GPIO~7	85 K pull-down	Not applicable
GPO0~7	85 K pull-down	Not applicable

Name	Default setting	Default internal Pull-up and Pull-down
		Open-drain or push-pull output pin

Table 32. GPIO electrical specifications

Voltage/Current	Minimum	Maximum
Input low voltage (V_{il})		1.5 V
Input high voltage (V_{ih})	3.5 V	
Output low voltage (V_{ol})		0.4 V
Output high voltage (V_{oh})	4.8 V	
Output sink/source current		1.6 mA

 **CAUTION:** This port is ESD-sensitive. An insulated GPIO connector that prevents direct ESD exposure to the I/O pins is recommended.

Security

Table 33. Security specifications

Version	2.0 only
Manufacturer part number	Nuvoton NPCT654JBAYX
External enclosure chassis intrusion switch	When the chassis is opened, the external enclosure chassis intrusion switch raises an intruder electrical signal to the gateway, triggering an external enclosure chassis intrusion event.

 **NOTE: Depending on your country's regulations, TPM system boards may not be available.**

Environmental compliance

Table 34. Environmental compliance

BFR/PVC-free

No

Sensors

Pressure sensor

Table 35. Pressure sensor specifications

Controller	ST Micro LPS22HB
Temperature range	-40°C to 85°C (-40°F to 185°F)

Relative humidity and temperature sensor

Table 36. Relative humidity and temperature sensor specifications

Controller	ST Micro HTS221
Temperature range	-40°C to 120°C (-40°F to 248°F)
Humidity accuracy	± 3.5% rH, 20 to 80% rH
Temperature accuracy	± 0.5°C, 15 to 40°C

Accelerometer

Table 37. Accelerometer specifications

Controller	ST Micro LNG2DMTR
Type	Three-axis "femto" accelerometer

Software

The following software is supported in the Edge Gateway 3000 Series:

- Dell Command | Configure (DCC)
- Dell Command | Monitor (DCM)
- Dell Command | Powershell (DCPP)—For Windows only
- Edge Device Management (EDM)