Geotab® GO9 RUGGED™ — Ruggedized Telematics Device

For the most up-to-date version of this document, visit: https://gtb.page.link/GR9S

GO9 RUGGED device

Geotab's GO9 RUGGED telematics device is the most powerful yet. The GO9 RUGGED offers a 32-bit processor, 4x more memory and 5x more RAM than the GO8 RUGGED®. Similar to the GO8 RUGGED, the GO9 RUGGED offers state-of-the-art GPS technology, G-force monitoring, GEOTAB IOX® expandability, engine and battery health assessments, and communication on the LTE network*.

Vehicle tracking

Using Geotab's patented tracking algorithm, the GO9 RUGGED accurately recreates vehicle trips and analyzes incidents. The GO9 RUGGED also offers in-vehicle alerts to instantly notify drivers of infractions and — with hardware Add-Ons — provides live coaching for driver's on-road performance. The GO9 RUGGED does not require a dash-mounted antenna or any wire splicing.

Security

Geotab platform security is designed for end-to-end protection of your data.

Key implementations include:

- GO™ device and network interfaces use authentication, encryption, and message integrity verification.
- GO devices are individualized. Each device uses a unique ID and non-static security key, making it difficult to fake a device's identity.
- Over-the-air updates use digitally-signed firmware to verify that updates come from a trusted source.
- Geotab uses independent third-party experts to validate the platform from end-to-end.
- FIPS 140-2 validated firmware module used for performing cryptography (certificate #3371).

  ✱ **NOTE:** FIPS 140-3 Inside (Certificate #4875), deploying soon.

Top features

- IP68 & IP69K rated for water, dust ingress and pressure spray protection
- Built-in auto-calibrating accelerometer and gyrometer
- Near-real-time vehicle data

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- LTE connectivity
- Simple device design for covert installations
- Intelligent in-vehicle driver coaching
- Breakthrough collision detection and notification
- External device expandability via IOX Technology
- Fast GPS acquisition time using Almanac OTA support
- Support for GPS+GLONASS connectivity
- Additional native support for more vehicle protocols
- End-to-end cybersecurity

Technical specifications and features

Interfaces	Engine Management • Legacy OBD (SAE J1850 PWM/VPW, ISO 9141-2, and ISO 14230 (KWP2000)) • ISO 15765 CAN (including WWH-OBD, GMLAN, VW TP2.0) @ 125/250/500 kbps • J1708/1587, J1939 500/250 kps • 2- or 3-wire installation support (for older vehicles/asset tracking) • Modbus and secondary CAN Input/Output • LEDs — Ignition, GPS, Cellular • IOX (more details below) • Internal GPS/Cellular antennas
Cellular	Availability varying on certification — full list of supported countries here. (GR9-LTE) GO9 RUGGED LTE ATT/TELUS/ROGERS • LTE (CAT-1): Bands 2/4/5/12 • 3G: Bands 2/5 (GR9-LTE) GO9 RUGGED LTE Verizon • Single mode LTE (CAT-1): Bands 4/13 (GR9-LTE) GO9 RUGGED LTE CATM1 Oceania • LTE (CAT-M1): Bands 3, 28 (GR9-LTE) GO9 RUGGED LTE CATM1 EMEA • LTE (CAT-M1): Bands 1, 3, 5, 8, 20, 28 • 2G: 850/900/1800/1900 MHz (GR9-3G) GO9 RUGGED 3G/2G Global • 3G: 800/850/900/1900/2100 MHz • 2G: 850/900/1800/1900 MHz 3GPP Compliant
GPS Receiver	72-channel engine (GPS/GLONASS) Under 2 second Time-To-First Fix for hot and aided starts Cold start: 26s E1 and Above Models: Cold Start under 24s. Below E1: Cold start : under 26 s E1 and Above Models: Concurrent GPS, GLONASS, Galileo and BeiDou plus SBAS and QZSS. Below E1: Concurrent GPS and

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	GLONASS plus SBAS and QZSS. A-GNSS Accuracy: ~2.0 m CEP OTA FW updates supported
Environmental	Operating Temperature: −40 to +85 °C **SAE J1455** Temperature • Thermal Shock • Temperature Cycle Humidity • Salt Spray Atmosphere Salt Spray (Fog) Mechanical Vibration • Swept Sine Vibration • Random Vibration Mechanical Shock • Operational Shock General Heavy-Duty Truck Electrical Environment • Steady State Electrical Characteristics **IEC 60529** IP6X IPX8 IPX9K
Accelerometer & Gyroscope	3D accelerometer and 3D gyroscope. Full-scale acceleration range of ±8g and an angular rate range of ±250 dps.
Mechanical	Weight: 396 g (0.87 lbs) Casing Dimensions: 159 mm L × 122 mm W × 31 mm H Cable Length: 1000 mm Housing: Polycarbonate (PC) thermoplastic two-piece housing (Flammability rating: UL 94 V-0)
Electrical	Voltage: 12 V and 24 V systems supported **! IMPORTANT**: Maximum battery voltage that can be supplied to the GO9 RUGGED device is 36V. Current • 120 mA at 12 V Operating mode (typical/nominal current draw) • 250 mA at 12 V Operating mode (max. current draw) • 4.5 mA at 12 V Sleep mode (min. current draw) • 3.0 mA at 24 V Sleep mode (min. current draw)

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	✱ **NOTE**: Maximum current draw values are reached during transmission in regions with fair to excellent cellular coverage. Maximum current draw at 24 V will be less than at 12 V. GO9 devices can pass through a maximum total current of 2750 mA @ 12 V/24 V to IOX hardware in a daisy chain via resettable overcurrent protection. ✱ **NOTE**: For each IOX in the daisy chain, add their max current draw, and do not exceed the max total IOX current draw.
Compliance	FCC, ISED, PTCRB, NOM, CE, E-Mark, REACH, RoHS, WEEE, RCM, UKCA, RAMATEL, ANATEL, SUBTEL, CRC, Indotel, ARCOTEL, SDPPI, SIRIM, ANRT, TRA, MTC, IMDA, NBTC Carriers: AT&T, TELUS, Verizon, Telenor, Telefonica, Vodafone, Rogers, Bell, Telstra
Over-the-Air (OTA) Support	Firmware Updates: For maintenance, new features, and custom applications Parameters: For turning additional features on/off Almanac/Ephemeris Data: For quicker GPS latch
Voltage Recording	Curve-based voltage logging to detect weak batteries, failing alternators, and failing starters.
64-Mb Non-volatile Flash Memory	Main Data Memory: Up to 80,000 logs in offline mode (out of coverage) Collision Data Memory: Buffer records over 100 minutes of second-by-second data (6,000 logs). Last 72 records (1.2 minutes) are sent instantly on accelerometer-triggered collision-level events.
Recording Parameters	Patented curve-based GPS/voltage/accelerometer/engine data logging algorithm for fewer, more accurate data points.
Intelligent Ignition	Non-engine-based ignition detection voltage and movement, allowing for 3-wire installation. Ideal for older vehicles with no engine information and covert installation for asset recovery.

Differences between GO9 and GO9 RUGGED

Engine communication

The GO9 RUGGED **does not** support the following engine protocols and corresponding engine information:

- Single wire CAN bus: Seat belt and odometer data on some GM, Fiat, and Dodge vehicles.
- Medium speed CAN bus: Ford transit and Mazda seat belt.

Buzzer and other IOX Add-Ons

The GO9 RUGGED is made for external environments and can be installed outside of a vehicle. The IOX-BUZZ (external buzzer) or IOX-GOTALK can be installed if driver feedback is required. The HRN-RX06S4 is required to install any IOX on the GO9 RUGGED.

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Harness options

The GO9 RUGGED requires the following harnesses for successful vehicle and/or IOX installation. Please refer to the Harness Identification and Application document for more information on the best harness for your application. All harnesses in the table below are IP68 rated up to the boundary, as shown in Figure 1.

Harness Name	Description	Application Type
HRN-RS12S2	12-way Amphenol weather-resistant rugged harness for GO RUGGED — PWR, GND, IGN.	16-pin ALDL Connector
HRN-GR09K1	Universal rugged heavy-duty T-harness kit	9-pin Deutsch Connector
HRN-RMRCA1	CAT specific adapter for the GO RUGGED device (requires HRN-GR09K1)	
HRN-RW03K4	3-wire harness kit for GO RUGGED. This kit contains the harness and a fuse kit.	No diagnostic connector available
HRN-RX06S4	6-way IOX harness for GO RUGGED to provide IOX add-on support. The gray connector is weather resistant.	IOX connection point for GO RUGGED
HRN-DC14S2	14-pin harness for CAT vehicles 2016+.	14-pin Deutsch Connector
HRN-RW08K1	8-wire harness kit for GO RUGGED. This kit contains the harness and a fuse kit.	Customer OEM Diagnostic Connector
HRN-RW04K4	Differential harness used for negative battery disconnect, oil pressure switch, and/or negative output ignition for the GO RUGGED device. This is required for ground service equipment. The kit contains the harness and a fuse kit. Includes HRN-RW04S4.	Ground Service Equipment (GSE)
HRN-RZ04T4	Kubota gas engine interface harness for the GO RUGGED device. This is required for ground service equipment.	
HRN-RZ04S4	Ford EDI TUG engine interface harness for the GO RUGGED device. This is required for ground service equipment.	
HRN-RW03S5	Pulse harness for engines not reporting ignition/RPM for the GO RUGGED device. This is required for ground service equipment.	
HRN-RC12T2	12-pin Komatsu harness.	Construction, mining, forestry, and industrial equipment
HRN-RW07T1	3-pin Deutsch harness with J1939 HI, J1939 LO, and signal ground in the connector, with power and chassis ground as separate wires. This harness allows connection to the equipment's CAN bus without using the diagnostic connector, but still capturing the same engine data.	No harness matching the diagnostic connector available, or limited space
HRN-RS12K1	Battery disconnect bypass harness.	Any vehicle with a positive battery terminal disconnect kill switch

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Harness pin diagram and description for ALDL and IOX

For professional installation where specific cable routing is required, the terminals on the weather-resistant connectors can be de-pinned on both the GO9 RUGGED and the corresponding HRN-RS12S2 and HRN-RX06S4 harnesses. This allows the installer to route the wires through a smaller opening. The wires can then be re-pinned into the connectors as described in the tables below. In this manner, the GO9 RUGGED can be installed in restricted spaces while maintaining its IP68 rating.

The GO9 RUGGED and its connectors are IP68-rated. The HRN-RX06S4 and HRN-RS12S2 are only IP67-rated in part, and the gray connectors are the only weatherproof elements. Removal of the gray connectors on either the GO9 RUGGED or its harnesses will reduce the overall weatherproofing of the system. Figure 1 illustrates the scope of the weatherproofing for the GO9 RUGGED and its harnesses:

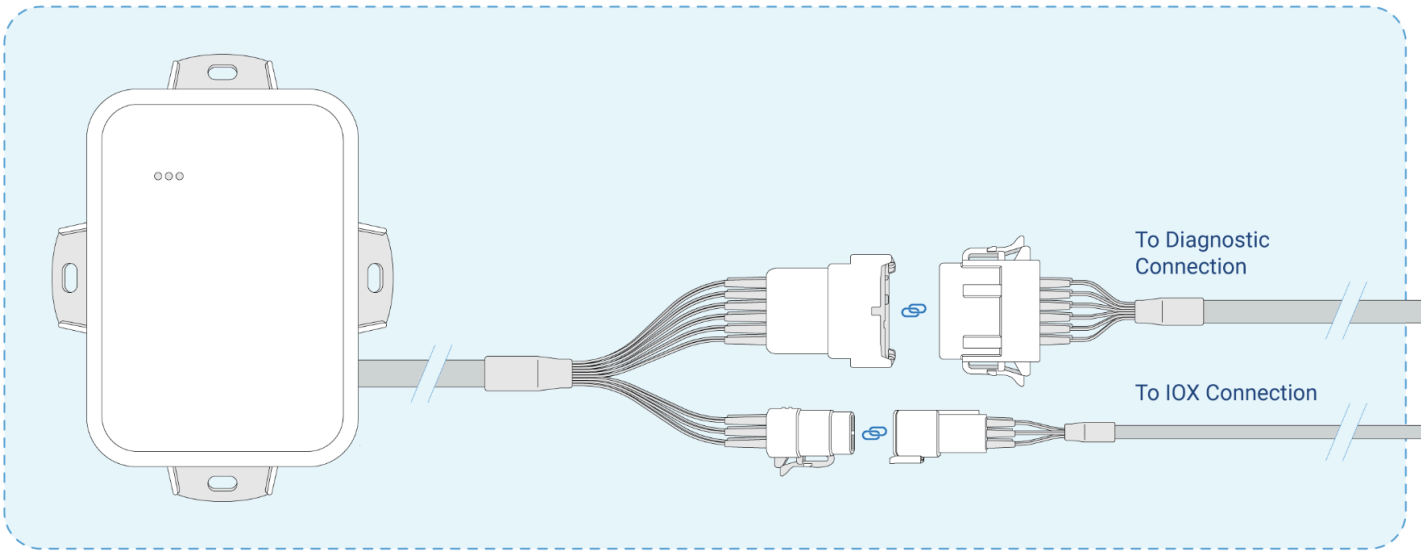

Figure 1: The blue region highlights the scope of the IP68 rating.

HRN-RS12S2/GO9 RUGGED — ALDL Diagnostic Port Connector

✱ **NOTE**: Not all pins are populated on all vehicles.

Pin	Wire Color	Description for ALDL Port	Pin	Wire Color	Description for ALDL Port
1	Orange	Ground (Signal Shield)	7	Brown	Make/Model Specific
2	Green/White	CAN Low / TTL CAN Low	8	Pink	Make/Model Specific
3	Blue/White	L Line	9	Black	J1850 (+) / MODBUS
4	Brown/White	J1850 (-) / MODBUS	10	Green	K Line
5	Purple/White	Make/Model Specific	11	Yellow	CAN Line / TTL CAN High
6	Gray	Make/Model Specific	12	Orange/White	Power (12 V/24 V)

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HRN-RX06S4 — IOX Port Connector

Pin	Wire Color	Description for ALDL Port	Pin	Wire Color	Description for ALDL Port
1	Red	Power	4	Black	Ground
2	White	CAN Low	5	Green	CAN High
3	Yellow	Wake-Up	6	—	—

GO9 RUGGED — IOX Port Connector

Pin	Wire Color	Description for ALDL Port	Pin	Wire Color	Description for ALDL Port
3	Black/White	Power	4	White	Ground
2	Blue	CAN Low	5	Purple	CAN High

Preparing for installation

Before installing the GO device, please record the device serial number. The serial number is used to verify the communication status of the GO device.

Carefully read the device release notes (goo.gl/fZURff) or the vehicle-specific installation notes (goo.gl/MCIXt0) to verify that we support your vehicle. If you have any questions or concerns, please contact your Reseller.

Ensure no dash warning lights are on in the vehicle while it is running, and that all other functions, such as headlamps, turn signals, etc… are working prior to installing the device. Before the installation, add the device to your MyGeotab™ database using the device serial number. This ensures that all data logged by the device is sent to your database.

✱ **NOTE**: You must select the correct Geotab hardware suitable for your specific installation environment and vehicle use. For installations where exposure to the elements (e.g., liquids, dust, or interior wet cleaning/powerwash) is anticipated, select the GO RUGGED device (GR8 rated IP67 and GR9 rated IP68 and IP69K). For additional information regarding environmental contaminants, see the applicable installation instructions in the Important Safety Information & Limitations of Use document.

Installation instructions

Professional Installation Required — Installation of the GO9 RUGGED requires that the installer have sufficient technical knowledge and expertise for mobile device installation and integration into modern vehicles, i.e. Certified Geotab Installer certification or equivalent.

⚠ Read important related safety information and limitations of use following these installation instructions. Read and follow all instructions and warnings to prevent serious injury and/or vehicle damage.

WARNING! Prior to GO installation, read and follow important safety information including limitations of use located following these installation instructions. Always read and follow all safety information to prevent loss of vehicle control and serious injury.

WARNING! Some installations are not straightforward and must be completed by an Authorized Geotab Installer to ensure a secure installation. An unsecure device installation can cause poor electric and/or data connection that can lead to

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short circuits and fires or cause malfunctions of vehicle controls that can result in serious personal injury or significant damage to your vehicle. Some examples requiring professional installation from an Authorized Geotab Installer are:

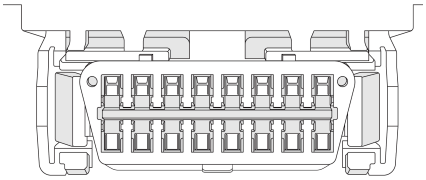
- The OBD port location is such that the device protrudes and interferes with entering or exiting the vehicle, or located where it could be inadvertently kicked or bumped during vehicle operation
- The device isn't fully secured and so may come loose with vibrations or accidental contact
- An electrical harness or additional wiring is required
- Vehicle mounting modifications are required to secure the device, i.e. removing of panels; deformed/damaged OBD connector; or physical damage to the electrical wiring
- The device does not beep six times and power on when first installed
- The installer questions their ability to complete a secure installation according to these instructions.

WARNING! Do not attempt to install, reconfigure, or remove any product from a vehicle while the vehicle is in motion or otherwise in operation. All installation, configuration, or removal must be done only in stationary vehicles which are securely parked. Attempting to service devices while the vehicle is in motion could result in malfunctions or collisions, leading to death or serious personal injury.

Please refer to the GO9 and GR9 Installation FAQ if you have any questions during the installation process.

Installing the GO9 RUGGED device

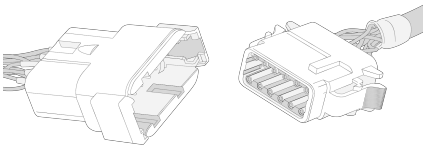
1 Locate the vehicle's engine diagnostic port, typically found in the driver's area at or below knee level (the connector inside the vehicle may differ from the image shown).



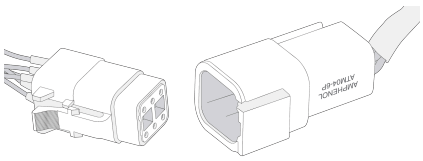
Align the OBD connector on the chosen harness (sold separately - based on vehicle/application) with the vehicle diagnostic port and push in place.

✱ **NOTE**: For heavy-duty trucks, always use a vehicle-specific harness when offered by Geotab or the vehicle manufacturer (see Harness Identification and Application and Harness Assessment Cheat Sheet GUIDE V2.0). Where a heavy-duty truck-specific harness is not offered by Geotab or the vehicle manufacturer, use the adapter harness (HRN-CG13S1) for any 16-pin (OBDII) installation method to avoid possible GO device damage.

2 Connect the 12-pin male connector on the GO9 RUGGED device to the 12-pin female connector on the corresponding harness as shown, and click into place. Ensure that all connections are secure. All three lights on the device will flash briefly and it will emit 6 quick beeps.



3 If you are also installing an IOX, connect the 6-pin female connector on the device to the 6-pin male connector on the HRN-RX06S4 and click into place.



Connect the female mini-USB connector on the other side of the HRN-RX06S4 to the male mini-USB connector on your IOX. Ensure that the two USB connectors are secured with a zip tie.

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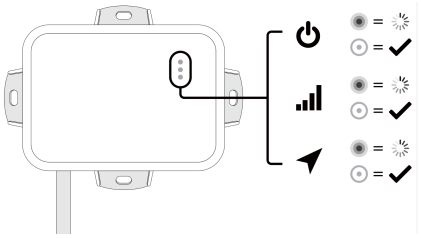
4 Once the device is connected and receives power, the LEDs on the front of the device start blinking then turn solid once completing the actions below.



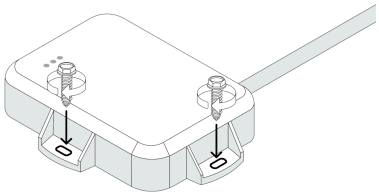
Red LED — Device configuration

Green LED — Cellular network connectivity

Blue LED — GPS network connectivity

The device emits two quick beeps every 60 seconds during set-up. Initial startup may take several minutes to complete.

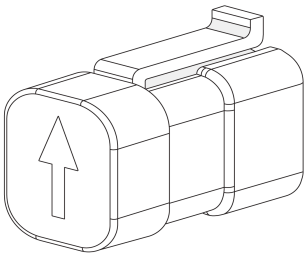
5 Once all three LEDs have lit up, select a location to attach your device. Drill 5/32 inch pilot holes first then secure the device into place using the supplied Hex Washer head screws. Ensure that you install your device in a location where the wires will not interfere with the safe operation of the vehicle.



✱ **NOTE:** Mounting position has influence on the degree of ingress protection. Ensure the GR9 is installed against a flat surface, with the LEDs facing toward the installer. Failing to install enclosure as per intended use degrades GR9 from its IP69K rating to IP68.

6 The GPS antenna in a GO9 RUGGED is located on the same face as the LED lights on the top of the casing. Make sure that the antenna is always pointing upwards towards the sky for faster GPS latch times.

7 The 6-pin weatherproof female connector of the telematics device comes covered with a sealing cap for waterproofing and dustproofing. Remove the cap only if you plan on using an IOX (requires HRN-RX06S4 adapter cable). Otherwise, keep the cap in place with the arrow facing towards the lock clip located at the top of the 6-pin female connector as shown. Attaching the sealing cap in any other orientation will not guarantee a waterproof and dustproof seal.



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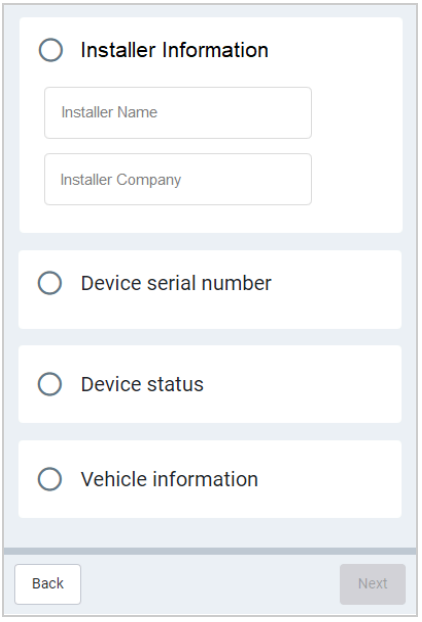
8 Navigate to installmygps.com and open MyInstall (public) to verify that the device is communicating. Under the **Installer Information**, enter your name and your company name, and then press **Next**. Under **Device serial number**, enter your GO Device serial number, found at the bottom of the device, and then press **Validate**.

9 The Device Status displays a **PASS** or **FAIL** label to inform you of the status of the device. The **PASS** status indicates that the device has successfully communicated with the network in the last 24 hours. The **FAIL** status indicates that the device has not communicated with the network in the last 24 hours.

*** NOTE:** If the device is not communicating, please ensure the GO Device is installed correctly and try again.



10 Press **Next** to go to the **Vehicle information** section. Enter vehicle related information: vehicle name, license plate, VIN, make, model, year, odometer, engine hours, work order reference, and installation comments. You can manually enter the **Make**, **Model**, and **Year** fields or tap the search icon beside **VIN** to auto-populate them. If you enter the **Odometer** value, you must select a unit of measurement (km or miles). You can use the **Work order reference** field to enter the work order number. You can enter **Installation comments** if desired. Tap **Finish installation** to complete the installation.

✱ **NOTE**: For some vehicle makes and models, the auto-populate option might not be possible.

Please refer to the MyInstall User Guide for more information.

WARNING! All in-vehicle devices and related cabling must be securely fastened and kept clear of all vehicle controls, including gas, brake and clutch pedals. This requires the use of a cable tie when securing the device or any extension harness to the OBD connector, securing both sides of the harness. If you do not use a cable tie, vibration in the vehicle can lead to a loose connection which could indirectly cause the vehicle's engine computer to fail, loss of vehicle control and cause serious injury. Inspect devices and cabling regularly to ensure all devices and cables remain securely attached.

WARNING! If at any point after an in-vehicle device is installed a warning lights up on the vehicle dash or the vehicle stalls or has a marked drop in performance, shut off the engine, remove the device, and contact your reseller. Continuing to operate a vehicle with these symptoms can cause loss of vehicle control, and serious injury.

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Important safety information and limitations of use

For the latest version of the Limitations of Use, please visit: goo.gl/k6Fp0w.

WARNING! Do not attempt to remove the devices from the vehicle in which they are originally installed for installation in another vehicle. Not all vehicles share compatibility, and doing so may result in unexpected interactions with your vehicle, including sudden loss of power or shutdown of the vehicle's engine while in operation or cause your vehicle to operate poorly or erratically and cause serious injury and/or vehicle damage.

NOTICE: This product does not contain any user-serviceable parts. Configuration, servicing, and repairs must only be made by an authorized reseller or installer. Unauthorized servicing of these products will void your product warranty.

NOTICE: The EU Declaration of Conformity is available at https://gtb.page.link/tf7m (3G) and https://gtb.page.link/EHcq (LTM).

Regulatory statements

Warning: RF exposure compliance

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instruction and transmitter operating conditions for satisfying RF exposure compliance.

L'antenne ou les antennes utilisées pour cet émetteur doivent être installées pour fournir une distance de séparation d'au moins 20 cm de toutes les personnes et ne doivent pas être co-localisées ou fonctionner en conjonction avec une autre antenne ou émetteur. Les utilisateurs et les installateurs doivent recevoir des instructions d'installation de l'antenne et les conditions de fonctionnement de l'émetteur pour satisfaire la conformité à l'exposition aux RF.

CANADA

CAN ICES-003(B) / NMB-003(B)

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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USA

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by Geotab could void the user's authority to operate the equipment.

Mexico

La operación de este equipo está sujeta a las siguientes dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada

EU

Product Wireless Information
703-748 MHz: Max 27.2 dBm EIRP
830-845 MHz: Max 25 dBm EIRP
832-862 MHz: Max 27.35 dBm EIRP
880-915 MHz: Max 31.17 dBm EIRP
1710-1785 MHz: Max 30.49 dBm EIRP
1920-1980 MHz: Max 27.3 dBm EIRP

SCIP Number(s)
d954540e-557f-4deb-886c-ae1b69cb8db9

Germany

Wir besitzen keine Versand- und Lagerfläche in Deutschland und sind nicht von der Rücknahmepflicht nach § 17 ElektroG betroffen.

Japan

本装置には、電波法に基づく技術基準適合証明を受けた特定無線設備が含まれています。認証番号と上段の表記はあくまでも推奨です。

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R 003-180062

Malaysia

MCMC
CIDF 21 00 2655

Thailand

เครื่องโทรคมนาคมและอุปกรณ์นี้ มีความสอดคล้องตามมาตรฐานหรือข้อก าหนดทางเทคนิคของ กสทช.

เครื่องวิทยุคมนาคมนี้มีระดับการแผ่คลื่นแม่เหล็กไฟฟ้าสอดคล้องตามมาตรฐาน

ความปลอดภัยต่อสุขภาพของมนุษย์จากการใช้เครื่องวิทยุคมนาคมที่คณะกรรมการกิจการโทรคมนาคมแห่งชาติประกาศก าหนด

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