Geotab® GO9™ RUGGED — Ruggedised telematics device

For the most up-to-date version, please visit: 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, four times more memory and five times 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 analyses 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 on-road performance. The GO9 RUGGED does not require a dash-mounted aerial or any wire splicing.

Security

Geotab platform security is designed for the 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 individualised. 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 by NIST (certificate no. 3371).

Top features

- IP68 & IP69K-rated for water, dust ingress and pressure spray protection
- LTE connectivity
- Simple device design for covert installations
- Intelligent in-vehicle driver coaching
- Breakthrough collision detection and notification
- External device expandability via IOX Technology
- Built-in auto-calibrating accelerometer and gyroscope
- Near-real-time vehicle data
- Fast GPS acquisition time using Almanac OTA support
- Support for GPS and 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) at 125/250/500 kbps

J1708/1587, J1939 500/250 kps

Two- or three-wire installation support (for older vehicles/asset tracking)

Modbus and secondary CAN

Input/output

LEDs — Ignition, GPS, mobile network

IOX (more details below)

Internal GPS/mobile network aerial

Mobile network

Availability varies on certification — full list of supported countries here.

GO9 RUGGED LTE ATT/TELUS/ROGERS

LTE (CAT-1): Bands 2/4/5/12

3G: Bands 2/5

GO9 RUGGED LTE Verizon

Single mode LTE (CAT-1): Bands 4/13

GO9 RUGGED LTE CATM1 Oceania

LTE (CAT-M1): Bands 3, 28

GO9 RUGGED LTE CATM1 EMEA

LTE (CAT-M1): Bands 1, 3, 5, 8, 20, 28

2G: 850/900/1800/1900 MHz

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 one second Time-To-First Fix for hot and aided starts

Cold start: 26 s

Concurrent GPS and GLONASS system

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 lorry electrical environment • Conducted transients (inductive switching, burst transients, starter motor engagement) • Coupled transients • Electrostatic Discharge (ESD) handling, operational and non-operational • Electromagnetic Compatibility (EMC) • Electromagnetic Interference (EMI) **IEC 60529** IP6X IPX8 IPX9K
Accelerometer and gyroscope	3D accelerometer and 3D gyroscope. Full-scale acceleration range of ±8 g and an angular rate range of ±250 dps. Acceleration and angular rate output data rate of 1.66 kHz.
Mechanical	**Weight**: 396 g (0.87 lbs) **Casing dimensions**: L 159 mm × W 122 mm × H 31 mm **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 **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) ✱ **NOTE:** Maximum current draw values are reached during transmission in regions with fair to excellent mobile network coverage. Maximum current draw at 24 V will be less than at 12 V. GO9 devices can pass through a maximum total current of 2500 mA at 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

	Mobile network operators: 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 connection
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 (6000 logs). The 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 three-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 on the 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 connect any IOX to the GO9 RUGGED device.

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.	Nine-pin Deutsch connector
HRN-RMRCA1	CAT-specific adapter for the GO RUGGED device (requires HRN-GR09K1).	
HRN-RW03K4	Three-wire harness kit for GO RUGGED. This kit contains the harness and a fuse kit.	No diagnostic connector available
HRN-RX06S4	Six-way IOX harness for GO RUGGED to provide IOX add-on support. The grey 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	Eight-wire harness kit for GO RUGGED. This kit contains the harness and a fuse kit.	Customer OEM diagnostic connector
HRN-RW04S4	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.	Ground Service Equipment (GSE)
HRN-RZ04T4	Kubota petrol 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	Three-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

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 way, the GO9 RUGGED can be installed in restricted spaces whilst 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 grey connectors are the only weatherproof elements. Removal of the grey 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:

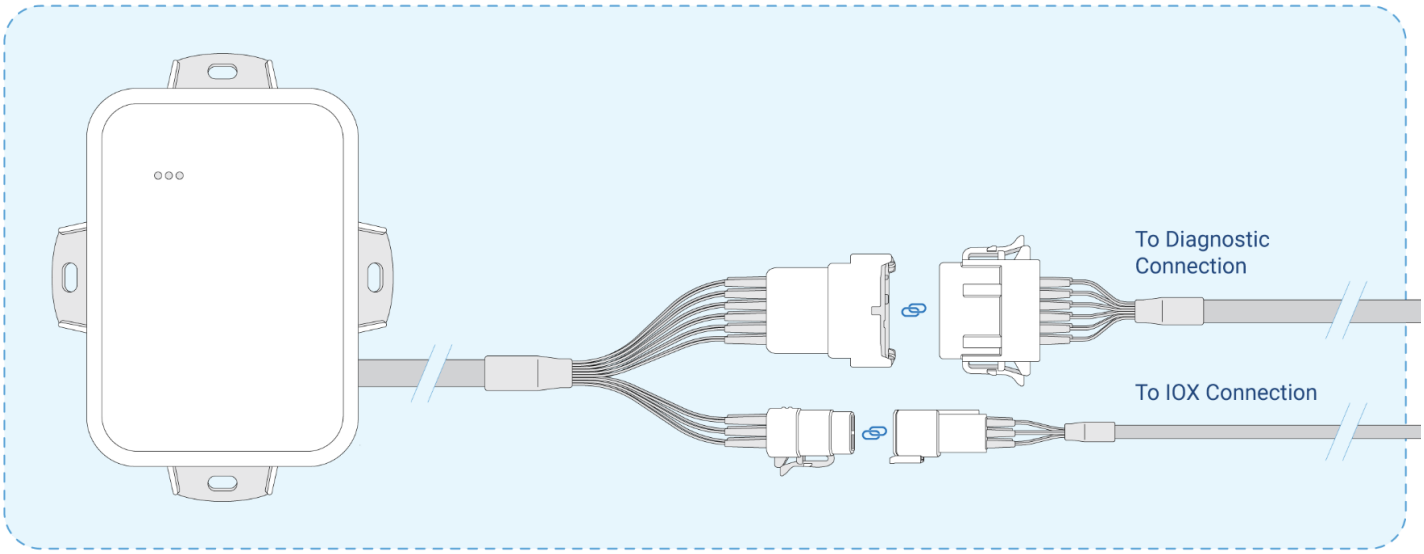


Figure 1: The blue region highlights the scope of the IP68 rating.

HRN-RS12S2/GO9 RUGGED — ALDL diagnostic port connector

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

Pin	Wire colour	Description for ALDL port	Pin	Wire colour	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	Grey	Make/model-specific	12	Orange/white	Power (12 V/24 V)

HRN-RX06S4 — IOX port connector

Pin	Wire colour	Description for ALDL port	Pin	Wire colour	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 colour	Description for ALDL port	Pin	Wire colour	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 that no dashboard warning lights are on in the vehicle whilst it is running and that all other functions, such as headlights, indicators etc. are working prior to installing the device. Before 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/power washing) 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 and limitations of use document.

Installation instructions

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

Read the 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 the important safety information including the limitations of use found after 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 authorised Geotab Installer to ensure a secure installation. An unsecured device installation can cause poor electric and/or data connections that can lead to short circuits and fires or cause the malfunction of vehicle controls that can result in serious personal injury or significant damage to your vehicle. Some examples that require professional installation by an authorised Geotab Installer include:

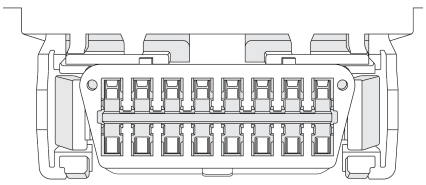
- The OBD port location is such that the device protrudes and interferes with entering or exiting the vehicle or is located where it could be inadvertently kicked or bumped during vehicle operation
- The device isn't fully secured and so may come loose from vibrations or accidental contact
- An electrical harness or additional wiring is required
- Vehicle mounting modifications are required to secure the device, i.e. removal 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 doubts 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 whilst the vehicle is in motion or otherwise in operation. All installation, configuration or removal must be only carried out on stationary vehicles that are securely parked. Attempting to service devices whilst the vehicle is in motion could result in malfunction or collisions, leading to death or serious personal injury.

Please refer to the GO and GR installation FAQs if you have any questions during the installation process.

How to install 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).

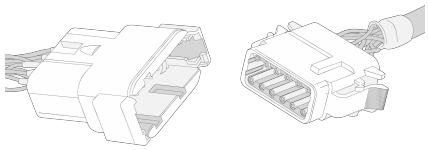


Align the OBD connector on the chosen harness (sold separately based on vehicle/application) with the vehicle diagnostic port and push into place.

✱**NOTE**: For heavy-duty lorries, 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). When a

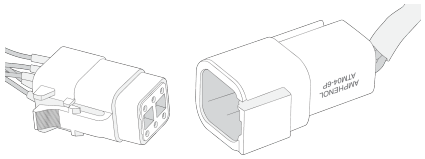
heavy-duty lorry-specific harness is not offered by Geotab or the vehicle manufacturer, use the adapter harness (HRN-CG13S1) for any 16-pin (OBDII) installation methods to avoid possible GO device damage.

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 six quick beeps.



3 If you are also installing an IOX, connect the six-pin female connector on the device to the six-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 cable tie.



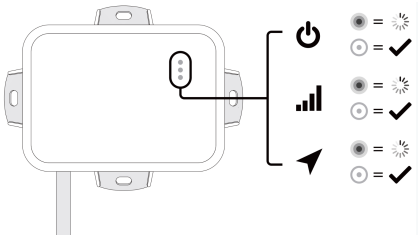
4 Once the device has been connected and is receiving power, the LEDs on the front of the device will start blinking then turn solid once the actions below have been completed.

Red LED — Device configuration

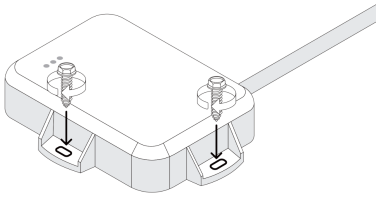
Green LED — Mobile network connectivity

Blue LED — GPS network connectivity

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

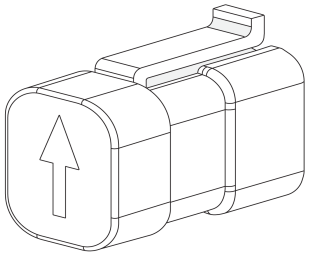


5 Once all three LEDs have lit up, select a location to attach your device to. Drill 5/32 inch pilot holes first, then secure the device into place using the supplied hex washer head screws. Ensure that you install your device in a location where the wires will not interfere with the safe operation of the vehicle.
✱ **NOTE:** The mounting position influences the degree of ingress protection. Ensure that the GR9 is installed against a flat surface, with the LEDs facing towards the installer. Failure to install the enclosure as per the intended use downgrades GR9 from its IP69K rating to IP68.

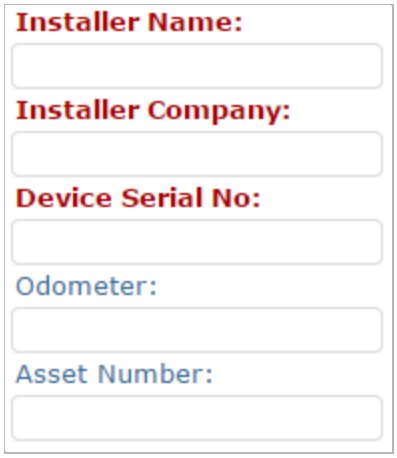


6 The GPS aerial in a GO9 RUGGED is located on the same face as the LED lights on the top of the casing. Make sure that the aerial is always pointing upwards, towards the sky, for faster GPS connection times.

7 The six-pin weatherproof female connector of the telematics device comes covered by a sealing cap for waterproofing and dust-proofing. Only remove the cap 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 six-pin female connector as shown. Attaching the sealing cap in any other position will not guarantee a waterproof and dust-proof seal.



8 Navigate to installmygps.com to verify that the device is communicating. In the space provided, enter your name, the company name and the GO device serial number found at the bottom of the device. Click **Log install**.



9 After you click **Log install**, the web page displays the current communication status of the device in **GREEN** or **RED** text. If the device is communicating, the status is displayed in **GREEN** text. If the device is not communicating, the status is displayed in **RED** text.

✱ **NOTE**: If the device is not communicating, please ensure that the GO device has been installed correctly and try again.

WARNING! All in-vehicle devices and related cabling must be securely fastened and kept clear of all vehicle controls, including the accelerator, 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 that could indirectly cause the vehicle's engine computer to fail, a loss of vehicle control and cause serious injury. Inspect devices and cabling regularly to ensure that all devices and cables remain securely attached.

WARNING! If, at any point after an in-vehicle device is installed, a warning light appears on the vehicle dashboard or the vehicle stalls or has a marked drop in performance, turn 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.

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 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 a sudden loss of power or the shut down of the vehicle's engine whilst in operation. It may also 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 authorised reseller or installer. Unauthorised servicing of these products will void your product warranty.

REGULATORY STATEMENTS

Warning: RF exposure compliance

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

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.

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

Germany

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