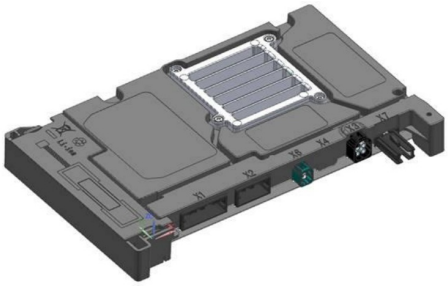

Continental G12R400G1 Telematics Connectivity Platform Module TCP User Manual

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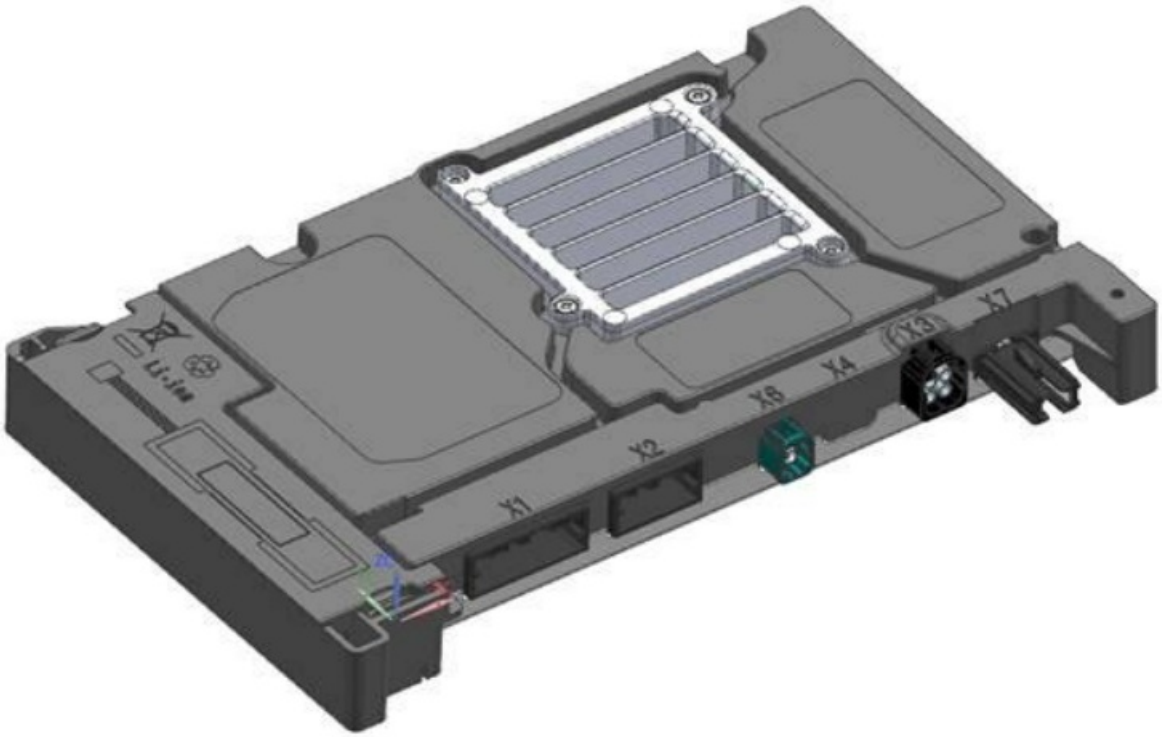


Contents

Scope of Document

The aim of this document is to provide a short overview on the Telematics Connectivity Platform Module (TCP) of model G12R400G1 and to describe the TCP.

General Product Information

Product type:

Telematics Connectivity Platform Module (TCP)

Manufacturer, Applicant:

Continental Automotive Technologies GmbH Siemens Strasse 12 93055 Regensburg Germany

Design location:

Continental Automotive Systems, Inc.
21440 West Lake Cook Road Deer Park, IL 60010 United States of America

Brand/Trademark:

Continental

Factory/Manufacturing Location:

Continental Automotive Maquila Mexico, S. de R.L. de C.V.
Carretera Panamericana Sur No, Ext. 114+354 No. Int. 9
Colonia: Parque Industrial Finsa Aguascalientes C.P. 20393

Country of origin:

Mexico

SYSTEM OVERVIEW

Short Description of the TCP

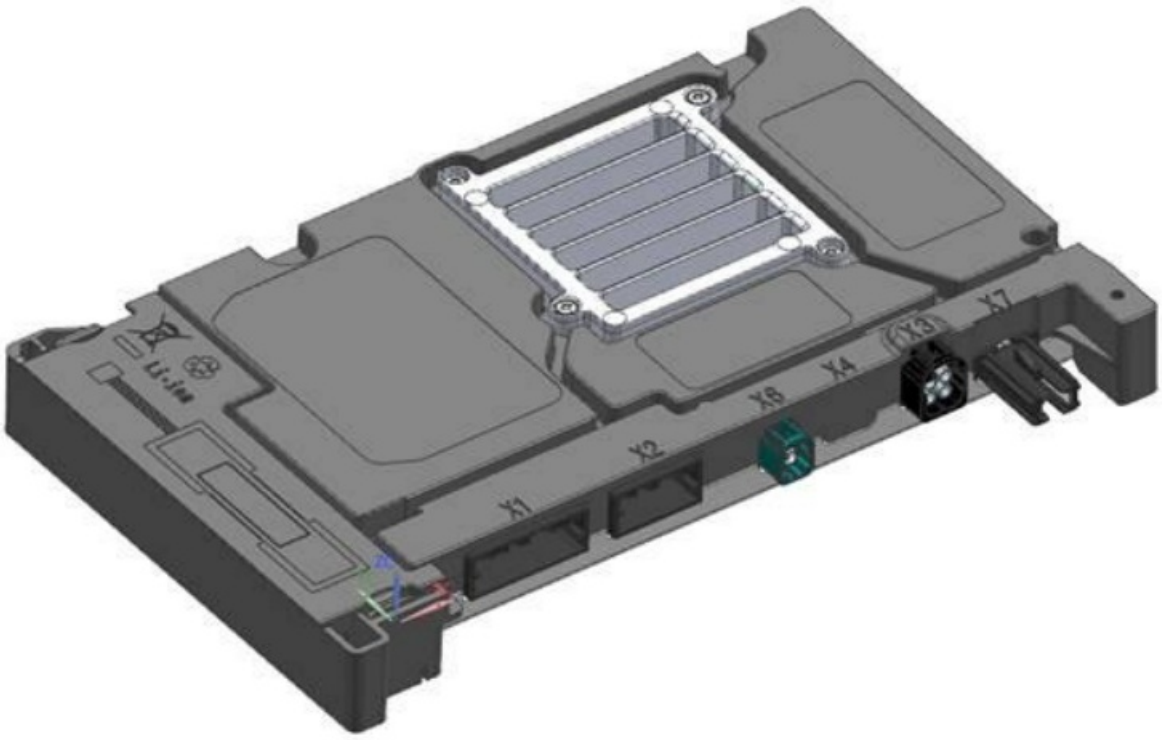
The product described herein is a Telematics Connectivity Platform Module (TCP) for the GM's GEN12 ONSTAR (Telematics and Connectivity Platform) program. It consists of integrated telematics transceivers for different wireless services, as well as several interfaces to the vehicle. The TCP is providing various connectivity services.

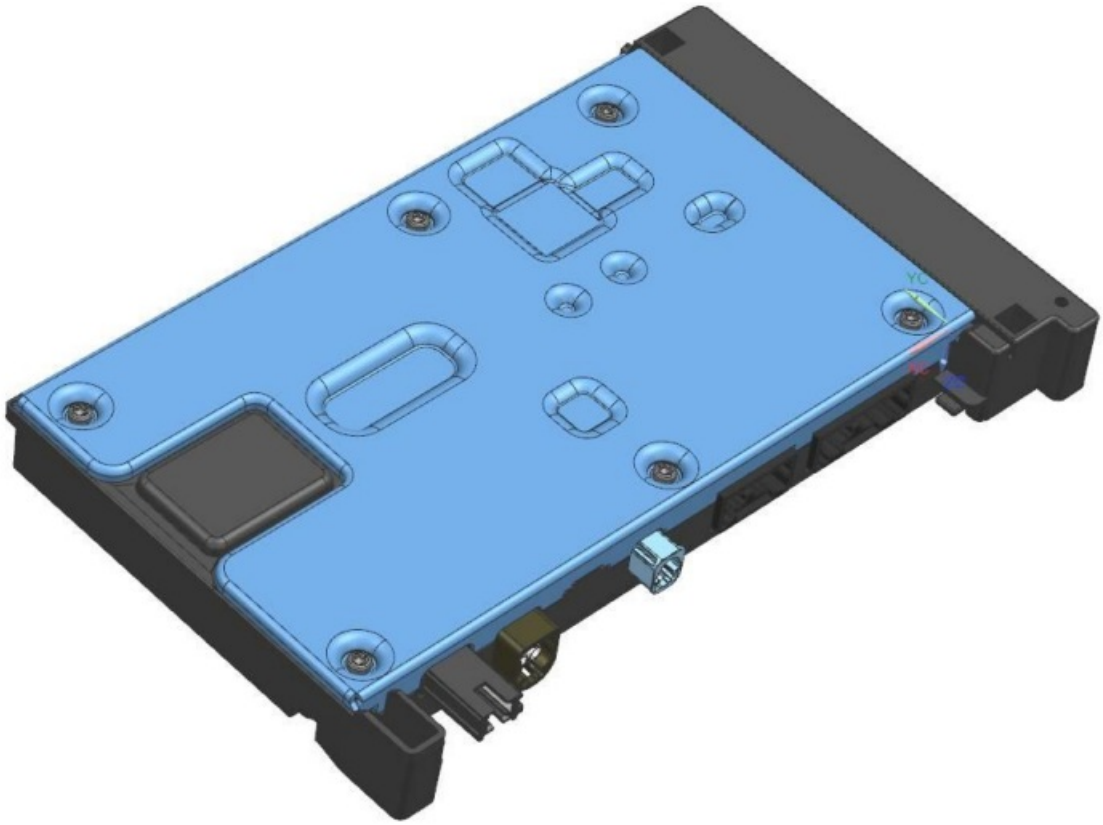
Rest of World (ROW) variants

TCP Variant	Model number	NAD Model Number
TCP ROW	G12R400G1	FE4RW0110

TCP Mechanical design

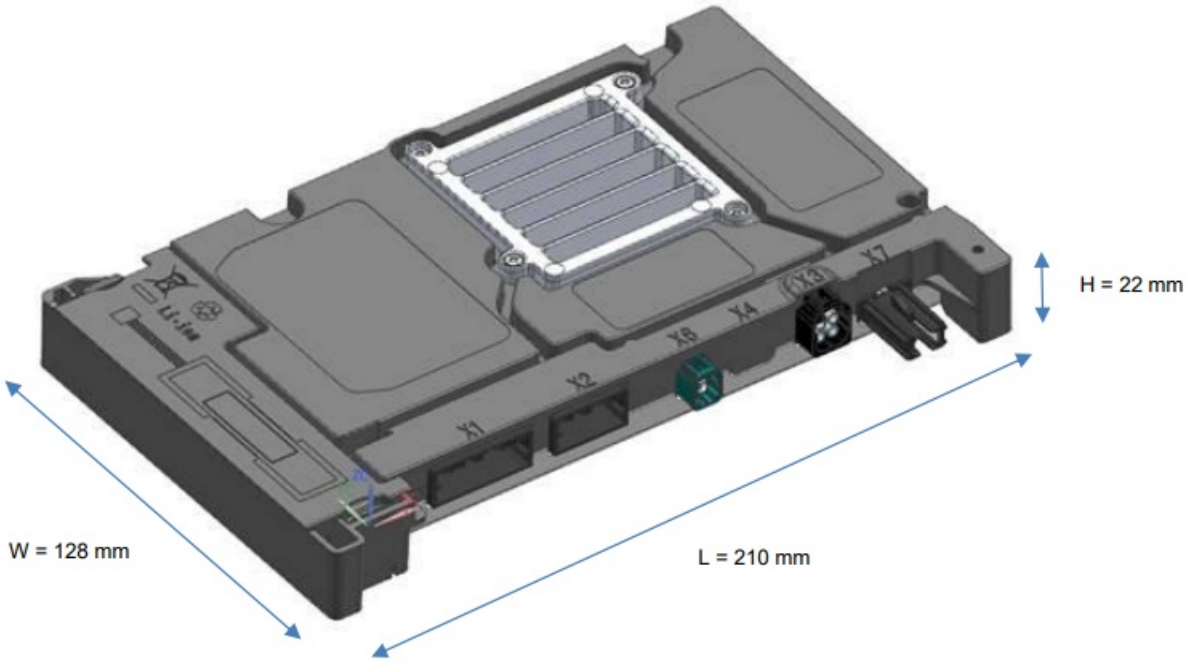
Pictures of the housing





Dimensions

Length: 210 mm
Width: 128 mm
Height: 22 mm



Weight

Weight: 0.47 kg

Description of the TCP module

Product features

The model main parts are:

- NAD with 2G/3G/4G/LTE and GNSS
- External and internal antennas
- Voice and Data
- 2×2 DL-MIMO for 4G
- Internal embedded Sim-IC
- Audio subsystem includes analog microphone input and speaker output
- Digital audio interfaces including CODEC and audio PA (Power Amplifier)
- Service calls
- Emergency Calls
- Internal Backup Battery (BUB)
- GNSS L1
- Glonass, Beidou, Galileo, GPS

External interfaces:

- Main power supply
- Primary LTE antennas
- GPS Input
- Three buttons keypad
- LED control
- External microphone (MIC+/-) input/output
- External backup speaker (SPK+/-) output
- CAN
- Ethernet 1000BaseT1
- Debug interfaces (USB, UART)

Ethernet:

Model number	**Speed**
G12R400G1	1 Gbit/s

Wireless services:

- 2G
- 3G/WCDMA
- 4G/LTE
- VoLTE
- Voice/Assistance Calls

    - Emergency Calls
    - Assistance Calls
    - Calls are only possible to some fixed phone numbers
- Global Positioning and Navigation: GPS, GNSS, Beidou, Glonass, AGNSS not supported
- Data Services

TCP external Antennas:

- Cell ANT1: 3G/LTE1 (outside vehicle), primary external
- Cell ANT2: LTE2 (Rx LTE only, outside vehicle), secondary external
- GNSS patch (outside vehicle)

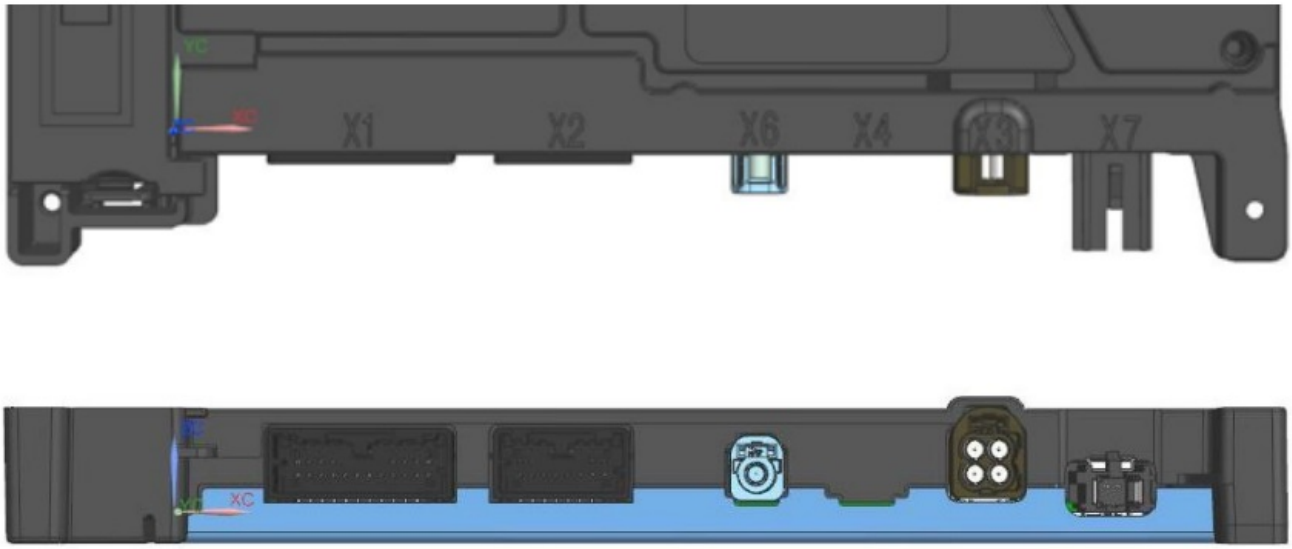
TCP internal Antennas:

- Cell/Backup ANT3, internal ANT1: 3G/4G/LTE1 (inside vehicle), primary internal
- Cell/Backup ANT4, internal ANT2: 4G/LTE2 (Rx LTE only, inside vehicle), secondary internal

Connectors:

The TCP has 6 types (fully featured variants) of connectors (from left to right):

- **X1:** 20-Pin Main Signal Connector
- **X2:** 12-Pin Audio
- **X6:** Single RF: C-V2X-2
- **X3:** Quad RF (Cellular PRIMARY, DRX0/GNSS, C-V2X-1)
- **X7:** 1000BASET1



This variant does not support V2X. Therefore, it does not have the X6 connector or CV2X-1 signal populated.

X1 20-Pin Main Connector Pin Out

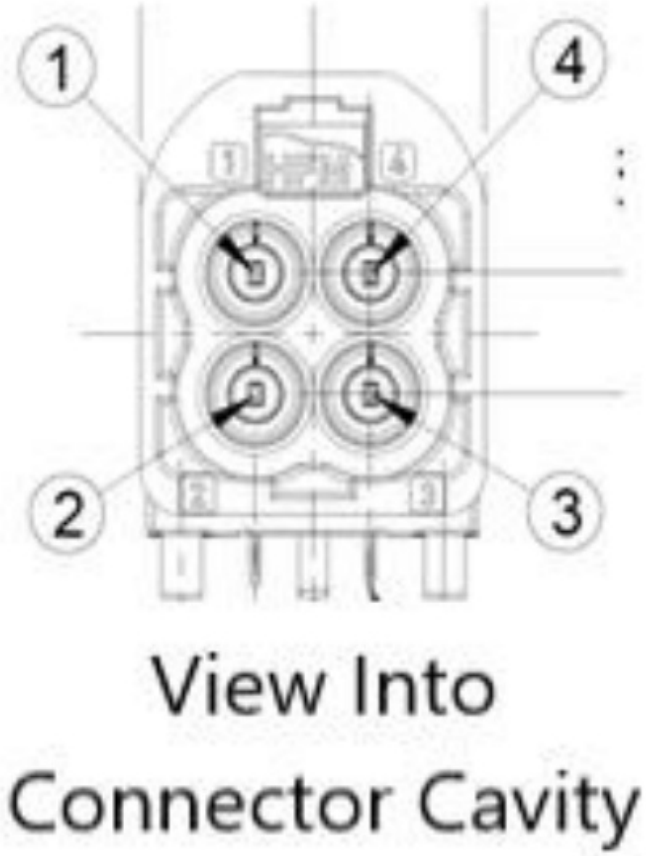
Pin	Signal	Pin	Signal	Pin	Signal
1	VBATT	8	CAN_L (IN)	15	
2	VBATT	9	GND	16	
3	10V_REF	10	GND	17	
4	Keypad_IN	11		18	GND
5	Green_LED	12		19	CAN_H (OUT)
6	Red_LED	13		20	CAN_L (OUT)
7	CAN_H (IN)	14		*Continental Debug Signals	

X2 12-Pin Audio Connector Pin Out

Pin	Signal		Pin	Signal
1	SPKR_P		7	MIC_OUT_N
2	SPKR_N		8	MIC_IN_P
3	Not Connected		9	MIC_IN_N
4	Not Connected		10	MIC Shield
5	GND		11	GND
6	MIC_OUT_P		12	GND

X3 Quad RF Connector

Pin	**Signal**
1	GNSS/DRX0
2	V2X_1
3	No Connect
4	Primary LTE



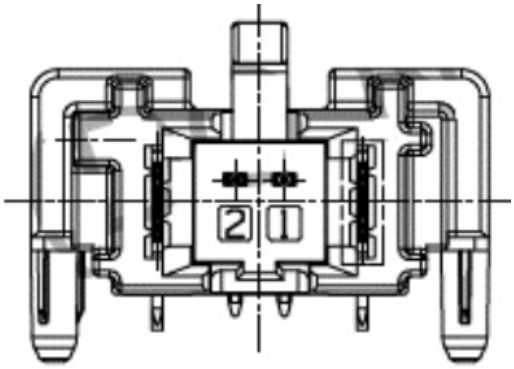
X6 Single RF Connector r (Present only when V2X is supported)

Not assembled:

Pin	Signal
1	V2X_2

X7 1000BASET1 Connector

Pin	Signal
1	1000BASET1+
2	1000BASET1-



Audio Subsystem
The TCP audio system will provide a hands-free user interface for emergency calls and call center concierge/personal calling within the vehicular environment.
The audio system provides the following.

- Microphone front end input
- Amplifier speaker driver (class D amplifier)

Keypad Subsystem

The keypad subsystem will provide an interface between the user and the TCP for emergency calls and call center concierge/personal calling within the vehicular environment.

The keypad includes the following interfaces:

- Three button interfaces
  - Phone Button
- Accept an incoming phone call
- End a phone call
- Initiate OnStar Screen on the infotainment unit
  - OnStar Button
- Initiate an OnStar phone call to the Backoffice
  - Emergency Button
- Initiate an Emergency phone call to the Backoffice
- Two color indicator LED’s
  - Green
  - Red

Technical data

Operating temperature Range

-40°C to 90°C

Supply Voltage

Nominal.: 12 V dc
Supply Voltage Range: 6 V to 18 V dc

Supply current consumption
Typical standby current: 250mA (at 12 V) Typical active current consumption: 350mA (at 12 V) Maximum active current consumption: 600mA dc (at 12 V)
Power Consumption
Typical power consumption: 5.5W (Cellular, GNSS active)

Wireless services supported

2G/GSM:

Wireless service:	**2G/GSM**
Frequency bands / range:	Band 2 (GSM1900): 1850-1910 / 1930-1990 MHz, Band 5 (GSM850): 824-849 / 869-894 MHz

Electrical output power (conducted into 5 0 Ohm)	**GSM:** At room Temperature: Low Band (850): + 32.0 dBm (+/- 1.0 dB), High Band (1900): + 28.5 dBm (+/- 1.0 dB), At extreme temperatures: Low Band (850): + 32.0 dBm (+ 1.0/-3.0 dB), High Band (1900): + 28.5 dBm (+1.0/-3.0 dB), The following Maximum Output Power Reduction will be taken d uring Multiplot GPRS operation: • 0 dB back -off for 1TX slot • 1.5 dB back-off for 2TX slots • 3.5 dB back-off for 3TX slots • 4.5 dB back-off for 4TX slots **EDGE:** At room Temperature: Low Band (850): + 26.0 dBm (+/- 1.0 dB), High Band (1900): + 24.5 dBm (+/- 1.0 dB), At extreme temperatures: Low Band (850): + 26.0 dBm (+1.0/-3.0 dB), High Band (1900): + 24.5 dBm (+1.0/-3.0 dB), The following Maximum Output Power Reduction will be taken d uring Multiplot EDGE operation: • 0 dB back -off for 1TX slot • 2.0 dB back-off for 2TX slots • 3.0 dB back-off for 3TX slots • 4.0 dB back-off for 4TX slots

3G/UMTS:

Wireless service:	3G/WCDMA
Frequency bands / range:	Band 2 (1900 UMTS): 1850-1910 / 1930-1990 MHz, Band 4 (1700 UMTS): 1710-1755 / 2110-2155 MHz, Band 5 (850 UMTS): 824-849 / 869-894 MHz
Electrical output power (conducted into 50 Ohm):	+22.5 dBm +/-1.0 dB

4G/LTE:

Wireless service:	4G/LTE
Frequency bands / range:	FDD Band 2 (1900 LTE): 1850-1910 / 1930-1990 MHz, FDD Band 4 (1700 LTE): 1710-1755 / 2110-2155 MHz, FDD Band 5 (850 LTE): 824-849 / 869-894 MHz, FDD Band 7 (2600 LTE): 2500-2570 / 2620-2690 MHz TDD Band 38 (2600 LTE): 2570-2620 MHz, TDD Band 41 (2500 LTE): 2496-2690 MHz
Electrical output power (conducted into 50 Ohm):	+21.5 dBm +/-1.0 dB

GNSS receiver:

Model number	GNSS
G12R400G1	L1

Wireless service:	GNSS Receiver
Frequency bands / range:	L1: GNSS L1 Frequency Band: Beidou-B1I, GalileoE1, GLONASS-G1, GPS-L1 and SBAS-L1 SBAS supported: EGNOS/MSAS/QZSS/WAAS/GAGAN AGNSS not supported.

Owner Manual statements

Owner manual USA

Continental
Model: G12R400G1
Contains FCC ID: LHJ-FE4RW0110 This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
This device complies with FCC/ISED radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines.
Please keep 20 cm separation distance between external antenna and human body.
Please keep 2.5 cm separation distance between internal antenna and human body.

FCC Class B digital device notice

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.

  Continental Automotive Systems, Inc. has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

END OF DOCUMENT

Documents / Resources

	Continental G12R400G1 Telematics Connectivity Platform Module TCP [pdf] User Manual G12R400G1 Telematics Connectivity Platform Module TCP, G12R400G1, Telematics Connectivity Platform Module TCP, Connectivity Platform Module TCP, Platform Module TCP, Module TCP

References

- User Manual