Model: HNA10_00

Installation Instructions for Telematics Control Unit

RAMSES

("**R**outer **A**nd **M**obile **SE**rvice**S**")

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1.0 INTRODUCTION

The Telematics Control Unit (TCU) described herein is a vehicle mounted Telematics control unit designed and manufactured by Continental for exlusive use by a premium automotive OEM. The product name has been designated by the customer as RAMSES (Router And Mobile SErviceS). The TCU contains an embedded LTE wireless communication module and interacts with remote call/data centers to provide valuable services to the vehicle customer.

1.1 PURPOSE AND SCOPE

This conditions document is to provide installation instruction to OEM to insure safe use of the device.

1.2 TCU FUNCTIONALITY

The RAMSES TCU provides LTE advanced connectivity to the vehicle and interfaces to the vehicle head unit as well as the Ethernet buss. The TCU is designed to

- intiate automatic emergency calls if an automatic emergency call trigger is received;
- allow initiation of a Manual Emergency Call by a car occupant;
- allow manual initiation of Roadside Assistance or Inforamtion Calls by a car occupant;
- establish Data Packet Connection with telematics service;
- establish Data Packet Connection to support the internet connection of Head Units equipped with WiFi (Head Unit is not Continental’s product).

2.0 ELECTRICAL HARDWARE DESCRIPTION

2.1 POWER & GROUNDING

The power supply subsystem for the Ramses TCU conditions unfiltered fused vehicle battery input and distributes the necesary regulated voltages required for each of the subsystems and circuits in the design.
Vehicle battery nominal is defined as:

Nominal 13.5V (The operating voltage range as UBmin=6V, UBmax=16V)

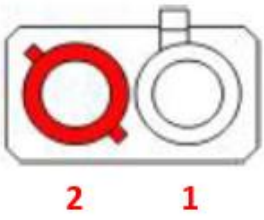
2.2 TCU INTERFACE TO EXTERNAL RF SIGNALS

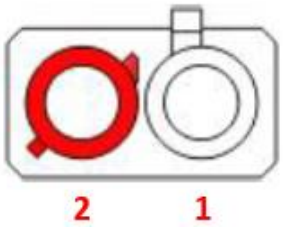
These connectors provide coaxial connection for RF signals for LTE and GPS connectivity to antennas. They are populated as needed for each variant technology.

Dual Fakra (Blue / Code C)	
1	GNSS IN
2	GNSS OUT

Dual Fakra (Beige / Code I)	
1	DRX0 / Backup
2	Primary TX/RX

Key:





2.3 AUDIO SUBSYSTEM

The Ramses TCU audio system will provides a hands-free user interface for emergency Telematics calling within a vehicular environment. The user interface is realized through the seamless connection between the Ramses TCU module and the vehicle.
At a glance Ramses audio system shall provide the following interfaces.

- Microphone front end input with switchable bias
- Amplified speaker driver via class D amplifier
- Speaker load diagnostics and protection via PA I2C
- Support for digital audio IO via HDBaseT
- Hands-free processing and prompt playback realized by the SOC

3.0 LABELING

TCU labeling comply with the regulatory homologation compliance mark(s) that are required by law in the country.

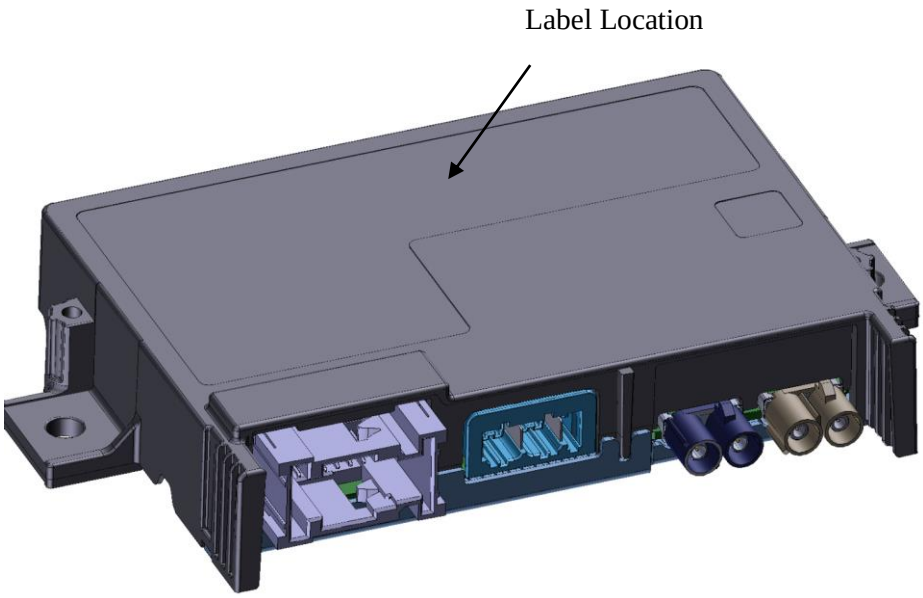


Fig.1. Label location on the device.

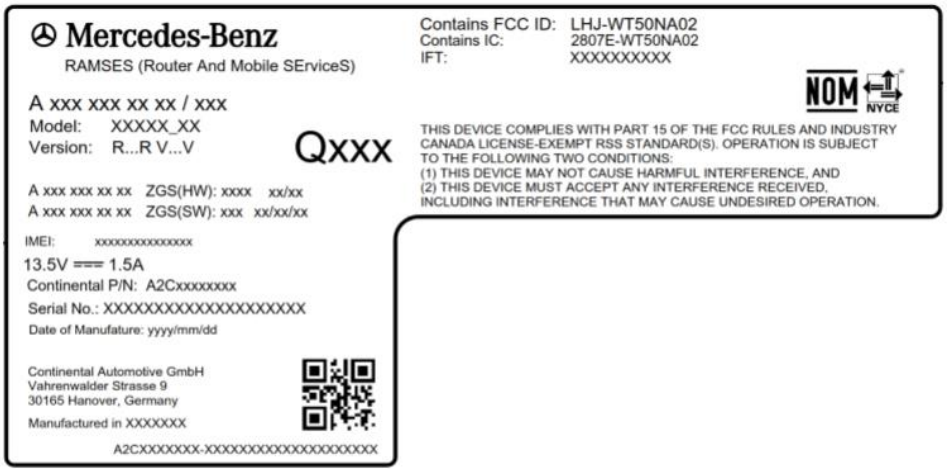


Fig. 2. Label for HNA10_00 variant.

4.0 VEHICLE INSTALLATION GUIDELINES

Normal operating conditions are between -40ºC to +80ºC.

The sheet metal cover is designed to be a heat sink. A gap between the heat sink and the mounting surface is recommended to facilitate heat transfer out of the module. Exceptions can be made if the module is mounted to a surface that can help facilitate heat transfer such as a large aluminum body panel.

WARNING: When the temperature of the device is above 70oC, the metal cover will be hot. DO NOT TOUCH.

The device does not have sealed connectors. It is designed to meet Class I water intrusion conditions (no drip test required), so it should not be placed in area that can get wet.

Continental recommends that the automotive OEM uses the mating harness supplier's recommendations for the keep out zone around the connectors to ensure proper mating of each connector.

Changes or modifications to this system by other than a facility authorized by Continental could void authorization to use this equipment.

5.0 REGULATORY COMPLIANCE NOTES

FCC:

This device complies with Part 15, Part 22(H), Part 24(E) and Part 27 of the FCC Rules. The device contains FCC ID LHJ-WT50NA02. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

INDUSTRY OF CANADA:

This device complies with Industry Canada's license-exempt RSSs. 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."
« Le présent appareil est conforme aux CNR d'Industrie 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, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le

brouillage est susceptible d'en compromettre le fonctionnement. »
This device contains a radio transmitter with IC ID 2807E-WT50NA02 has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.
« Cet appareil contient un émetteur radio avec IC ID 2807E-WT50NA02 a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.».

MEXICO:

La operación de este dispositivo está sujeta a las siguientes dos condiciones:
(1) Este equipo o dispositivo no deberá ocasionar interferencias perjudiciales.
(2) Este equipo o dispositivo debe aceptar cualquier interferencia recibida, incluidas aquellas que pudieran causar un funcionamiento no deseado.

6.0 EXTERNAL ANTENNA REQUIREMENTS FOR USE WITH HNA10_00 TCU

The HNA10_00 device is for use with external antennas ONLY.

This radio transmitter (FCC ID: LHJ-WT50NA02; IC: 2807E-WT50NA02) has been approved by FCC and Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.
« Le présent émetteur radio (ID: LHJ-WT50NA02; IC: 2807E-WT50NA02) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l’émetteur. »

7.0 INSTRUCTIONS TO OEMS

The OEM must inform the end-user (i.e. the owner / driver of the car with this device installed) that “The installation of HNA10_00 with its radio transmitters and antennas is in compliance with the U.S. and CANADA RF Exposure Regulations”. This text, or similar, must be included into the car manual.

Antenna Information:

Only the same or equivalent-type antennas as shown below have been evaluated and may be used with this module. Other un-equivalent-type antennas may require additional authorization for operation. The equivalent-type means the same antenna type that results in similar in-band and out-of-band radiation patterns.

For incorporation in Vehicle platform (the distance from the antenna to the user according to OEM installation requirements):

Brand	Model Name	Antenna Type	Connector
CONTINENTAL	USA A-MID	External roof mounted	Fakra

With antenna Gain as listed in the table below:

Band	Total System Gain Antenna Cell3 component, dBi
GSM-850	-1.0
GSM-1900	1.3
WCDMA II	1.3
WCDMA IV	0.6
WCDMA V	-1.0
LTE B2	1.3
LTE B4	0.6
LTE B5	-1.0
LTE B7	2.0
LTE B12	-0.1
LTE B13	0.2
LTE B 66	0.6

Antenna Placement:

This device is authorized for installation in qualified vehicles that can provide enough minimum separation distance. To ensure RF exposure compliance the antenna(s) used with this module must be installed in vehicles to provide a minimum separation distance, in all operating modes and orientations of the vehicles. The separation distance is measured from the antenna and the passengers in all directions for potential exposure conditions. This module must not be co-located with any other RF modules or transmitters. Additional SAR evaluation and FCC equipment approval would be required if other RF modules or transmitters are co-located with this module. The required minimum separation distance for the antenna placement is 1.2cm.