

Telematic Control Unit

Technical Description and Installers Manual

Model: CTP3NA



This technical manual is intended for usage in the context of regulatory approvals (please ensure that the correct model-name reference is used).

It does not replace a vehicle- or region-specific OEM owners or user manual.

It is the OEMs responsibility to ensure that all mandatory information with regulatory relevance is made available to end-customers in the owners and user manuals.

| | |
|----------------------------------------------|-------------------------------------------------------------------------|
| Business name of device manufacturer: | Robert Bosch GmbH |
| Address: | Robert Bosch GmbH Robert-Bosch-Platz 1 70839 Gerlingen Germany |
| Brand: | BOSCH |

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DEVICE DESCRIPTION

Common Telematics Platform 3rd Generation (CTP3) is a telematic Unit to provide fleet management services & remote diagnostics, allows remote measurement and also serves as AP-Server for Internet via Wireless LAN.

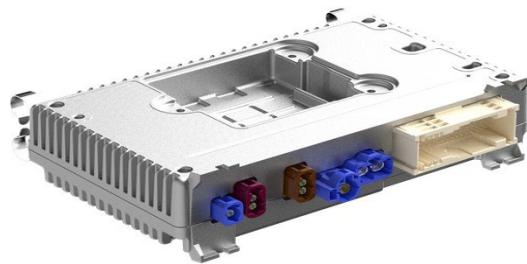
CTP3NA is intended to support the OEMs new E-Architecture in different countries. It is provided in Non-DIN Variant, with the optional delivery of a DIN-Interface, when necessary, to allow for driver identification via Smart Card.

The device is planned to be introduced in various trucks of the OEM.

There are "BASE" and "EXT" variants

For vehicles with the new architecture CTP3NA "EXT" is used. For vehicles with the legacy architecture, the CTP3NA "BASE" is used.

The only difference between EXT and BASE is, that "BASE" comes without the Ethernet ports and Ethernet connectors.



EXT



BASE

| | |
|-----------------------------------------------|-----------------------------------------------------------------------------------------|
| Model Names and their variants | CTP3NA <ul style="list-style-type: none"> • EXT • BASE 667 /500 |
|-----------------------------------------------|-----------------------------------------------------------------------------------------|

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Operational conditions of the device:

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|------------------------------|-----------------------------------------------------------------------|
| Nominal Supply voltage: | 12V - 24V DC |
| Extended voltage range: | 8V to 32V DC |
| Max. Current consumption: | 2A at 12V / 1A at 24V |
| Sleep current consumption: | <1mA |
| Operating Temperature Range: | -40°C - +60°C (full operation) +60°C - +85°C (feature degradation) |
| Storage Temperature: | -40°C - +85°C |
| IP protection class: | IP30 |
| ASIL level: | QM (no ASIL) |
| Device class: | Class B |
| Lowest internal frequency | 1Hz |
| Highest clock frequency | 5825 MHz |

Radio Transmitters and Receivers

| | |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bluetooth | Version 5.3 EDR, LE Power class 2 <4dBm |
| W-LAN 2.4GHz | 802.11b/g/n/a/ax... <20dBm |
| W-LAN 5.1GHz | 802.11b/g/n/a/ax... <16dBm |
| W-LAN 5.8GHz | 802.11b/g/n/a/ax... <14dBm |
| Access-point (AP) | Support 2x2 SU-MIMO (single user) No AP functionality for 5GHz DFS Channels. |
| Station (STA) | Support 2x2 SU-MIMO (single user) |
| Cellular network | 3GPP Release 10 |
| CTP3NA | GSM 850/1900MHz LTE category 6 Band 2 (1960 MHz) Band 4 (2135 MHz) Band 5 (850MHz) Band 7 (2650 MHz) Band 12 (738 MHz) Band 14 (763 MHz) Band 17 (740 MHz) Band 25 (1963MHz) Band 26 (877 MHz) Band 66 (2155 MHz) |
| GNSS | GPS Galileo GLONASS BeiDou BeiDou+SBAS QZSS |
| Geolocation capabilities | YES, over Cellular MCC code |

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External Antenna Information:

| Hirschmann Car Communications | | | | | | | |
|-------------------------------|-------------------------|------------------|-------------------------|------------------|------------------|--------------|-------------------------|
| Manufacturer | A 006 | A 006 | 66-08735- | A 006 | A 006 | PN: 960 | A 006 |
| Part number | 820 39 | 820 40 | 000 | 820 31 | 820 32 | 810 58 | 820 30 |
| | 75 | 75 | | 75 | 75 | 19 or 960 | 75 |
| | | | | | | 810 63 | |
| | | | | | | 19 | |
| Antenna Type | Sharkfin | Dashboard | Sharkfin | Dashboard | Dashboard | GNSS antenna | Combi antenna box |
| Antenna Frequency Ranges | GNSS, WLAN and Cellular | Bluetooth / WLAN | GNSS, WLAN and Cellular | Bluetooth / WLAN | Bluetooth / WLAN | GNSS | GNSS, WLAN and Cellular |

SAFETY AND WARNING NOTES

This paragraph contains important safety and warning notes for handling and operating the device in series applications.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to physical injury.



- The product will be provided and approved for a rated voltage of 12/24 volts. Short circuits must be securely prevented, even in the event of a fault. Creeping short-circuits lead to high arc energies that cannot be switched off by conventional melting fuses. If other rated voltages are present in the vehicle (e.g. 24/48 V for example in hybrid vehicles, or 400/800 V in electric vehicles) we recommend that safety precautions are taken in the vehicle itself (e.g. additional insulation of high voltage lines and the use of edge protectors when passing through sharp-edged areas, in order to prevent short circuits to inputs/outputs of our device, e. g. to loudspeaker lines).
- No moving pictures/movies/videos should be visible for the driver during driving. Visibility of the co-driver monitor/display must be disabled (e.g. by activating the switchable privacy technology when driving).
- The product emits invisible infrared radiation which might cause damage to the human eye and skin. Therefore, the customer shall perform a risk assessment according to target-market specific regulations and shall instruct its personnel accordingly. Furthermore, the customer shall inform and instruct the end-user (e.g. via entry in the manual) about the emitted radiation, the corresponding risks and counter-measures. Bosch will support on request.



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- The product is intended, and has been approved, for installation and operation in vehicles with a rated voltage of 12/24 volts. It may be necessary to adapt the product's factory-set state to suit the specific country.
- Only connecting cables and external devices that are appropriate for the device in question may be used (e.g.: proper current carrying capability, proper EMC shielding, flammability verified with appropriate certificates). Compliance with the applicable standards can no longer be guaranteed if the device – including the software – is modified without the agreement of Bosch.
- Bosch assumes no responsibility for damage as a result of incorrect indicators/displays. These may arise if the device has not been connected or has been incorrectly connected, or if the device receives false or erroneous signals from the system.

NOTICE

- Formation of condensation on the device must be avoided. In case of condensation formation, you must allow an acclimatization time of up to two hours to pass.
- Do not cover ventilation openings and heat sinks. Otherwise, a build-up of heat that could lead to malfunction may occur in the device.
- Do not insert foreign bodies into the insertion slots or openings of the device. Injury, or damage to the device, may occur otherwise.
- The device must not come into contact with hot or burning objects (e.g. cigarettes).
- To clean the device, never use hard or sharp objects that could damage the protective pane or housing. Do not use aggressive cleaning agents such as thinners, gasoline, abrasive cleaners, spray cleaners, acidic or alkaline solutions, or wax. Do not spray any liquids onto the device. To clean the housing and protective pane / display, moisten a soft cloth with tepid water and wipe off the dirt. Make sure that no liquid enters the inside of the display. Afterwards, wipe the cleaned surface with a clean, dry cloth.
- If the device is to be cleaned before installation in the vehicle, you must make sure the openings (in particular the connector contact points) are kept sealed so that no liquid can enter the device.
- Any media compatibility test (such as a single wetting with gasoline) that may be referred to in Chapter 4.5 (Chemical Characteristics) does not represent an extension to the permitted cleaning agents.
- Camera Window shall not be covered or obstructed. Do not position/keep any objects in front or near the camera window. Doing such will compromise the Driver Drowsiness and Attention Warning function. (This information is also relevant to the End User, we recommend respective note in the Vehicle User Manual)
- The customer must ensure that Bluetooth/WiFi functionality is always configured according to target market specific regulations, e.g. with regards to receiving frequency

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bands. The customer must ensure correct configuration of frequency bands in case of SW updates.

- The customer must ensure that GNSS functionalities are configured according to regulations of different target markets, e.g. US (e.g. GLONASS requires licensing), RUS (GLONASS), China (e.g. encryption of positioning information required).

OPERATING MODES AND WIRELESS CHARACTERISTICS

The device operates with three Antennas, whereas one is always cellular RX Diversity antenna

Bluetooth and Wireless LAN can work together.

Cellular has always a diversity RX antenna.

Wireless LAN works either MIMO or SISO

Bluetooth is always SISO

CTP3NA integrates a pre-certified Bluetooth and Wireless LAN combined module **LGIT ATC6NPL002C** as well as a pre-certified cellular radio module **WNC UMC-MT2731CBN**

Bluetooth

- Bluetooth operates in the 2.4 GHz band (2402 ~ 2480MHz)
- Bluetooth works in both the BDR and EDR
- Bluetooth operates in the Classic and Low Energy modes.
- Bluetooth Class 2, version 5.2
- Bluetooth max Output power : <4 dBm EIRP

Wireless LAN

W-LAN has the following operating Modes. The device can connect to the external Access points in Station mode. The device can also operate as an Access point.

Used WLAN Modes:

- Station Mode (STA)
 - Device does connect to external AP on DFS Channels
- Access Point Mode (AP)
 - DFS channels are not used

INSTALLATION

Assembly

The CTP devices are air cooled. The customer must ensure that a heat exchange with the environment is possible.

The operating mode “sleeping“ applies for either completely disconnected from power supply or for connected to power supply with only the co-processor running (main processor powered down).

The product's operating safety is only ensured if the permissible conditions are maintained.

Voltage supply and grounding: Make sure that the loudspeaker cables do not have any contact to ground (earth, negative terminal of the vehicle battery). Observe the correct sequence when connecting to /disconnecting from the vehicle's electrical system.

Do not knock the unit during installation. In particular, do not exert pressure on the screen area to push the unit into its final position. Instead press the four corners of the bezel and let the unit slide into the opening.

Permitted Use

The CTP3NA may only be used within the conditions (environment, application, installation, loads, see e.g. chapter 9) as described in this TCD and the agreed upon documents.

Only connecting cables and external devices that are appropriate for the device in question as regards safety, electromagnetic compatibility and grade of shielding may be used (see e.g. section “4.5 Aerials”).

Compliance with the applicable standards can no longer be guaranteed if the device is modified without the agreement of Bosch.

Improper Use

All use outside the permitted conditions of use constitutes improper use and is therefore not permissible. Bosch does not accept liability for damage caused by improper use.

The following examples of foreseeable misuse constitute improper use:

- The customer must not use the Digital I/Os and the RS-232 to control functions that are not consistent with the “QM” rating of the CTP3NA.
- The customer must take appropriate measures to ensure that the audio mute function does not suppress safety relevant messages.
- The customer must only use splitters for the GPS antenna that contain diodes to prevent that current flows from one device connected to the splitter into another device.
- Use in vehicles with 24V rated power without central load dump suppression.
- Use outside the approved operational characteristics stipulated in this document or the appendixes (with the exception of customer-specific approvals)

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- Modification of the factory settings by unauthorized persons
- Use of add-on components
- Use in watercraft, aircraft and spacecraft and in aggressive atmospheres

Bosch must be notified about all changes to the environment of the product that deviate from the TCD and the agreed documents. Such use or application of the product may only take place after approval has been provided by Bosch on the basis of the changed environment and the deviation from the TCD.

If the device is connected incorrectly, it may draw the full operating current even when switched off. In this case, without any further deactivation on the vehicle side, there is a risk of battery depletion. No liability is assumed for any damage occurring as a result of this.

CERTIFICATION NOTICES AND REGULATORY VERBIAGE

General Notices

The OEM shall include the following regulatory statements in his user guide/manual

Type Designation: Telematic Control Unit

Model Name: **CTP3NA EXT, CTP3NA Base,**

Certificate Holder: Robert Bosch GmbH

Address: Robert-Bosch-Platz 1
70839 Gerlingen
Germany

This equipment shall be installed and operated according to the above defined installation requirements including the minimum distance between the CTP3NA internal / external antenna and the nearest interior Class-A surface of >26 cm.

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CTP3NA EXT and CTP3NA Base

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.

To comply with FCC Exposure requirements the OEM is instructed by the Grantee to assure a minimum separation distance of 26 cm between the housing where the integrated antenna is located and any human body as documented in the filing.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canada

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.

RF Exposure Information:

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 32.1 cm between the radiator and your body for Wireless LAN and Bluetooth™ operations and 49.9 cm for cellular operations.

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.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 32.1 cm de distance entre la source de rayonnement et votre corps pour les opérations W-LAN et Bluetooth™ et de 49.9 cm pour les opérations cellulaires.