T4E On Board Unit
(T4E OBU)

User Manual

Intended use

The Toll4Europe On Board Unit (T4E OBU) is intended to be used for electronic toll collection and other telematic services, and may only be used for this purpose, unless explicitly stated otherwise. Any other use is considered to be a prohibited misuse and would result in the denial of any claims.

Safety Instructions

General instructions:
Do not operate the OBU with pointed or sharp-edged objects. For cleaning use only, a damp cloth, no solvents or abrasive cleaners. Replace damaged power supply cables immediately to avoid any risk of short circuit or fire.

Usage in potential explosive atmosphere:
The usage of the EETS OBU in potential explosive atmosphere in general is not permitted.

Destruction caused by over-voltage:
The T4E OBU is designed for a voltage range of 8 V – 32 V DC and must therefore be used inside this voltage range. If your on-board network can generate higher voltages (e.g. jump-starting from an external power source or from additional stronger power generators in the vehicle), then you must disconnect the unit from the on-board network for the duration of the over-voltage.

Danger caused by (rechargeable) battery:
Protect the battery from mechanical strain (shock, drop, vibration) as well as from temperatures >+85 °C as this may create a potential Fire hazard! For further safety precautions and directives, please, follow the detailed user manual

Danger of explosion:
For ADR vehicles (European Agreement concerning the International Carriage of Dangerous Goods by Road) only a fixed installation is permitted. This must be performed by authorized staff. If you wish to install the device into an ADR vehicle contact your Customer Service.

Danger of obstructed line-of-sight:
Always mount the OBU in such a way that driver's field of vision is not impaired! If in doubt, please contact Customer Service.

Risk of accident:
Handling of the OBU while driving is not permitted! The navigation button is locked to prevent any operation during vehicle movement.

Environmental pollution:
Do not remove any batteries from the OBU. Return the OBU completely to your Service Partner. Contact your Customer Service to get further information.

For any support you need, please, note the telephone number of your Customer Service:

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1 Toll Charging in EETS Domains

Service Provider Toll4Europe GmbH (T4E) offers its EETS Service to users of toll liable vehicles in Europe. EETS stands for European Electronic Toll Service. The aim to facilitate driving through Europe by using only one device for toll collection. With Toll4Europe's EETS-enabled On Board Unit (T4E OBU) the use of toll roads through Europe is simplified for truck drivers, by offering a comprehensive toll collection and collective toll payment services from one provider.

EETS in general

Depending on the regulations of the different European toll domains, the T4E OBU can be used by heavy goods vehicles with a Gross Vehicle Weight (GVW) of more than 3.5 tons (i.e. in Belgium) or 7.5 tons (i.e. in Germany) for tolling on motorways, and/or a number of national and regional roads, and/or tunnels and bridges. The T4E OBU:

- is used for detecting the relevant toll per driven kilometers in a toll domain. A toll domain is either the entire toll network of a country or a certain part of the tolled road network within a country (roads, tunnels, bridges).
- may cover many toll domains throughout Europe and thus collects toll relevant information across borders.
- is installed in the vehicle to detect whether a toll road or a non-toll road is used,
- collects the information relevant for toll charging and transmits it to the data center where the data is processed for billing purposes.
- will be linked to a vehicle which can be subscribed for the EETS Service in one or several toll domains (e.g. Belgium, Germany, France, Spain, Austria etc.).

If a certain toll domain is not yet covered by the T4E EETS Service, the user may also operate additional national toll devices. However, if a user changes from the national tolling service provider(s) to the EETS Service, he must switch off the national OBU before using the EETS OBU for the selected toll domain.

EETS with Toll4Europe

The T4E OBU complies with the toll regulations of the national/regional authorities. Furthermore, a T4E OBU enables the user to cross borders without interruption as it is interoperable among different technologies used in various toll domains (GNSS and/or DSRC).

The Toll4Europe EETS Service can be booked for one or more countries (as a" toll service" for dedicated toll domains). The coverage of Toll4Europe's bookable toll services is continuously expanding. However, for each toll domain, only one device must be used to avoid the risk of over paying.

It is the obligation of the road user to check whether his truck is subject to tolling and which stipulations or exemptions apply to each toll domain. These regulations are determined in the national toll laws.

When registering for the T4E EETS Service, the user or transport company must select the desired toll services for the toll domains he intends to use. The registration is done beforehand via dedicated Toll4Europe Sales and Service Partners. The user or transport company must provide the relevant customer and vehicle data during registration. The Sales and Service Partner takes care of the registration and assigns a T4E OBU to each vehicle. As soon as all relevant data is transferred to the system, the T4E OBU can be personalized for individual use. The personalization process includes the update of the T4E OBU with the needed software, user and vehicle

parameters, and tariff data. The personalization of the T4E OBU is done via mobile network “over the air” when the T4E OBU is mounted in the vehicle, is connected to the power supply and the driver starts the engine.

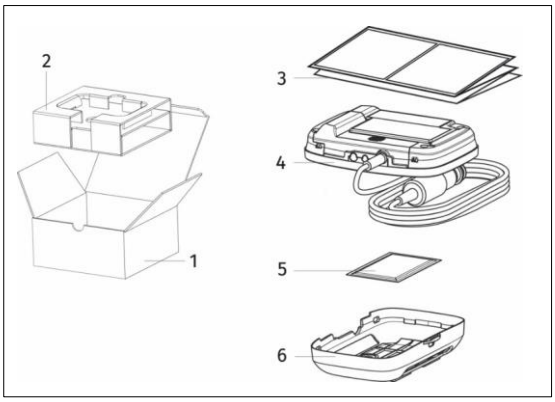
In some selected toll domains, the driver is obliged to check first (additional) selected changeable data to the T4E OBU itself (i.e. number of axles trailer, maximum permissible total weight) before driving on the toll domain’s road network.

In the following chapters the usage of the T4E OBU is described in detail. In addition, T4E provides a Quick Start Guides which describe the handling of the T4E OBU and how to enter toll domain specific input parameters at www.toll4europe.eu

2 T4E On Board Unit (T4E OBU)

2.1 Package content

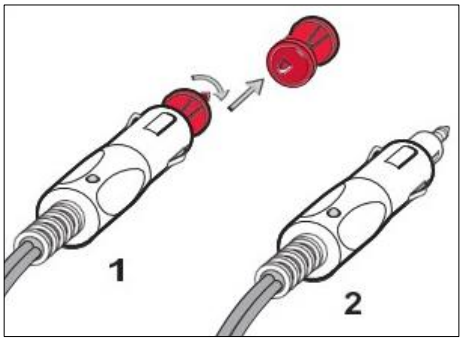
Unpack the T4E OBU. Please, check if the package content is complete and undamaged.



1 Box
2 Inlay
3 Quick Start Manual
4 OBU with power cable
5 Cleaning cloth
6 Holder with adhesive pads

Figure 1: Package content T4E OBU

The T4E OBU contains all batteries and the power cable is prepared for flexible installation. The adhesive pads are already fixed on the holder to mount the T4E OBU on the windshield.



The adapter is necessary to connect the OBU with the power connection depending of the socket in your vehicle.
Flexible power connection for:
1 DIN standard socket
2 Cigarette lighter socket

Figure 2: Adapter for flexible power connection

If you find something missing or damaged do not use the T4E OBU and contact your Customer Service immediately.

2.2 T4E OBU Design

Figure 3: T4E OBU design

2.3 Start Display

The T4E OBU is prepared for the prompt use. After connecting to the power, the T4E OBU boots immediately. The T4E OBU will be personalized with the vehicle data that was transmitted with the registration of the vehicle by your Service Partner. Also, the data for the selected EETS Service are stored and personalized on the T4E OBU.

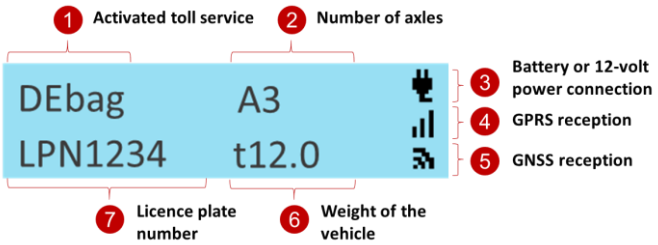


Figure 4: Start Display of the T4E OBU

The abbreviation for the activated EETS Service is shown if the service is available and correctly activated and if you are in or approaching the corresponding EETS domain.

Wherever the number of axles is displayed, it is calculated from the personalized (static) number of tractor unit (as stated by the Sales Partner in the registration) axles plus the actual trailer axles, set according to the current status by the driver on the OBU.

Note: The GPS reception is needed for the personalization. Please ensure a free view to the sky (GPS satellites). Detailed information about the installation of the T4E OBU is given in chapter 3 Install T4E OBU.
You can find additional information and hints about the display in chapter 6 Troubleshooting

2.4 Navigate in the Menu

After the T4E OBU has booted the start display is shown.
To show the stored information use the navigation button to select the menu items and to scroll in the menus.

Open the main menu:
Press the button longer than 2 seconds.

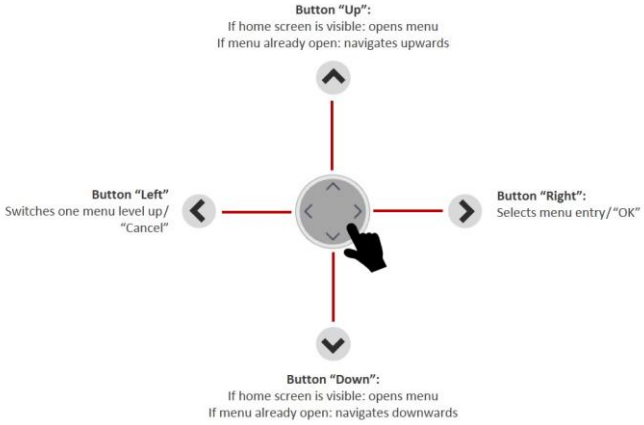


Figure 5: Menu navigation

2.5 Status Indicator and Signalization

The status indicator is the LED ring around the navigation button. Additionally, a buzzer signals the status of the T4E OBU acoustically. The status indicator supports the driver during driving and gives feedback to the driver about different interactions.

T4E OBU is not active.
The T4E OBU is switched off, or is in sleep mode, or in transport mode.

The T4E OBU is active and ready for operation.
You can drive. Please note the indicated information in the display.

The T4E OBU is activated but not ready for operation. Please check (via the menu in the OBU display) which toll services are activated. If the T4E OBU is not activated for the EETS Service, the Status Indicator is red.
In case of a technical defect a red status indicator and an error message appear. In this case, do not drive with the OBU and contact your Customer Service.
In every case the Status Indicator is flashing if it is Red.
You can find further information on checking the T4E OBU in chapter 6 Troubleshooting.

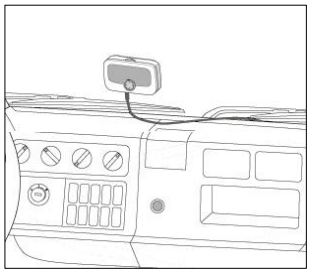
Buzzer - for acoustic signalization:

- signalization of performed actions or warning, e.g. no GPS reception
- feedback to user interactions, e.g. changes in the menu
- signalization of additional information during driving

3 Install T4E OBU

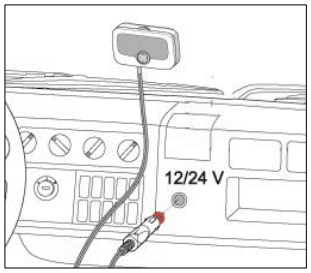
The T4E OBU is designed for a voltage range of 8 V – 32 V DC and must therefore be used inside this voltage range. If your on-board network can generate higher voltages (e.g. jump-starting from an external power source or from additional stronger power generators in the vehicle), then you must disconnect the T4E OBU from the on-board network for the duration of the over-voltage.

The T4E OBU can be installed in two versions:



Fix installation:
The T4E OBU is connected permanently to the vehicle electrical system.

Figure 6: Fix installation on the windshield



Flexible installation:
The T4E OBU is connected to the cigarette lighter socket.

Figure 7: Flexible installation on the windshield

The status of the power supply is visible on the display:

Power supply via connection to the vehicle electric system

Power supply via rechargeable battery. Please, consider the battery loading status during driving.

3.1 Positioning the T4E OBU on the windshield

Mount the T4E OBU always in such way that the driver's field of vision is not impaired!

Please, consider different windshield characteristics, e.g. metalized, unmetallized areas, depending on the mounted windshield in your vehicle. Check the windshield characteristic in the

documentation of your vehicle. A windshield coating can hinder the communication of the T4E OBU to the GPS and GPRS systems.

Position the T4E OBU on the inside of the windshield in the way that:

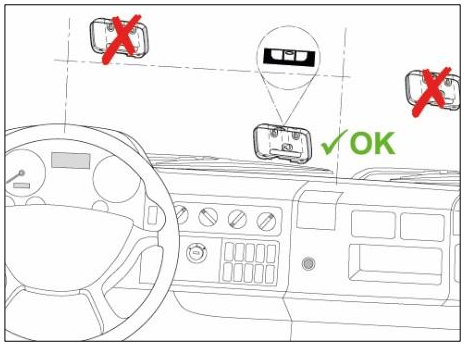
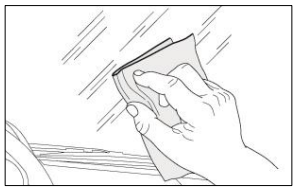


Figure 8: Right T4E OBU position on windshield

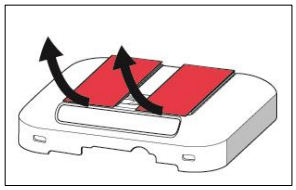
- the driver's field of vision is not impaired while driving,
- the chosen position must not be near moving parts e.g. air bag covers of the vehicle,
- the T4E OBU is visible from outside and is not hidden by other elements such as windshield wipers when switched off,
- the T4E OBU does not constrain the function of the defroster vents,
- in the case of metalized windscreen use non-metalized area,
- local laws and regulations as well as recommendations of the vehicle manufacturer are complied with.

3.2 Mount the T4E OBU on the windshield

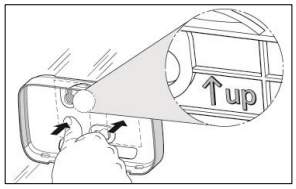
Attaching the adhesive pads to the windscreen must be done at temperatures above 20 °C. The glue of the adhesive pads reaches its final strength 72 h after application at temperatures of 20 °C or above. If applicable, bring the windscreen and the holder's adherend to appropriate temperatures.



Clean the selected location on the windshield carefully with cleaning cloth. Wait until the surface dried.



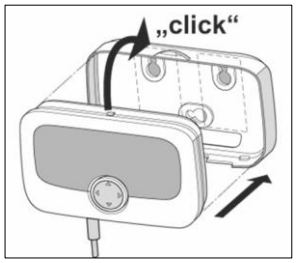
Remove the protection films from the adhesive pads.
Attach the holder at the chosen position with the adhesive pads.



Consider the sign ↑ up for the right direction of the holder.
Position the holder and press firmly at the areas of the adhesive pads.

Figure 9: Mount the holder on the windshield

3.3 Assemble the T4E OBU to the holder



Place the T4E OBU in front of the holder and click it into the holder.
Check the right position of the T4E OBU.
You cannot move the T4E OBU in the holder. Check this carefully.

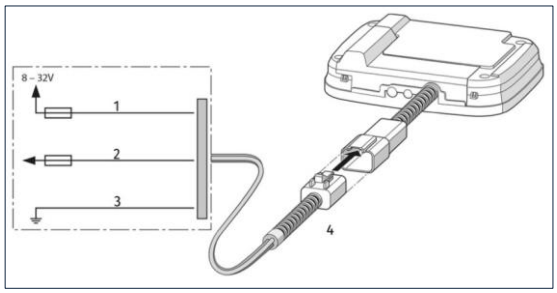
Figure 10: Assemble the T4E OBU to the holder

3.4 Fix installation

ADR

Installation in an ADR vehicle is permitted only for fixed installation and must be performed by authorized staff. If you wish to install the device into an ADR vehicle contact your Customer Service.

The fix installation of the T4E OBU must be relied to the provided circuit diagram. Use the respective fuses.



Vehicle electrical system:

1 Red: constant voltage (+)
2 Black: ignition
3 Brown: ground (-)
4 Permanent Power supply cable with intermediate connector

*Fuses (1 A, 2 A) not included

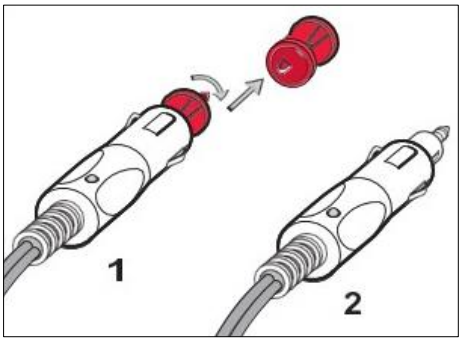
Figure 11: Circuit diagram for fix installation

For any further information needed, please, contact your Customer Service.

3.5 Flexible installation

Fix the power supply cable in such a way that it cannot become disconnected while driving the vehicle or otherwise negatively affects the vehicle operation.

Use the adapter to connect the T4E OBU with the power connection depending of the socket in your car.



Flexible power connection for
1 DIN standard socket
2 Cigarette lighter socket

Figure 12: Power connection for flexible installation

During driving the rechargeable battery will be recharged.
In battery mode (connection to the cigarette lighter disconnected) the T4E OBU will be supplied by the battery for 4 hours.

The battery charge will be shown in the display.

Please, consider the battery loading status during driving.

4 OBU Menu and Toll Domain Specifics

4.1 OBU Menu Structure

The figures in the menu chart below are only examples and could be different in your T4E OBU.

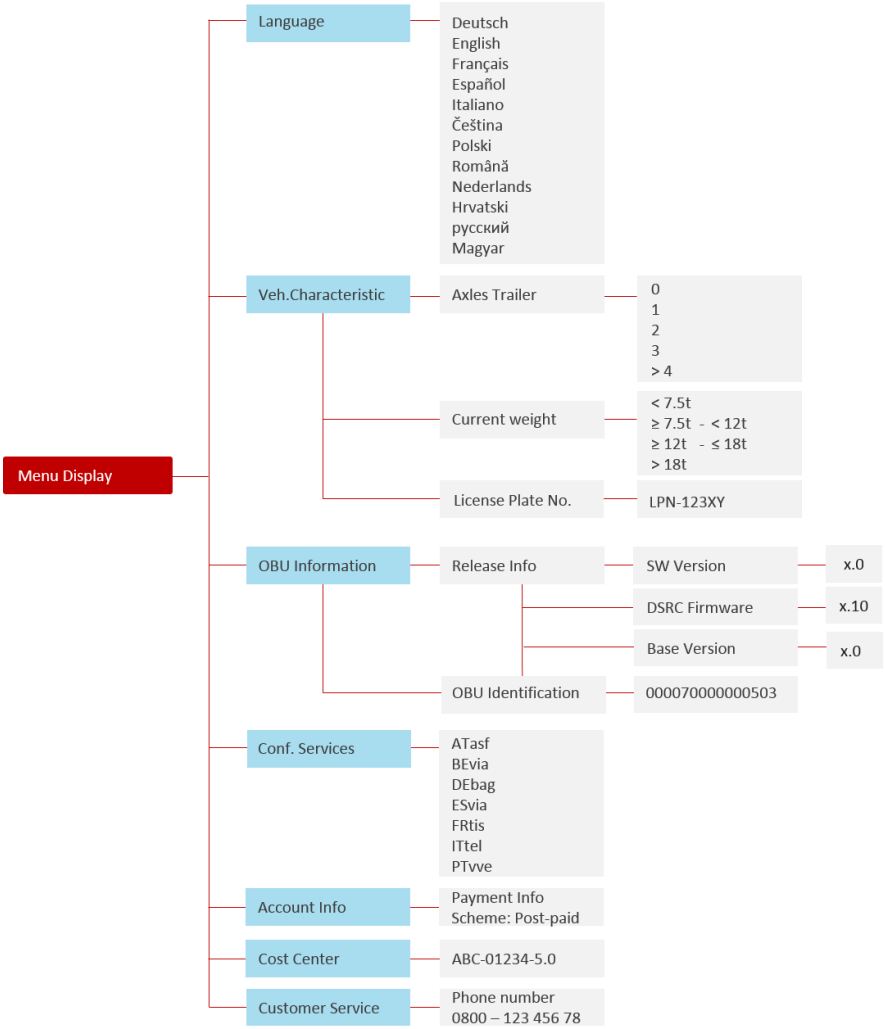


Figure 13: Overview menu structure

4.2 OBU Parameter Settings

The following examples show how the driver can browse through the OBU menu in order to find relevant information and how he can enter and update information.

Select language

- Main Menu
  - Language
  - Veh.Characteristic
  - OBU Information
  - Conf. Services
  - Cost Center
  - Customer Service
- Language
  - Deutsch
  - English
  - Français
  - Español
  - Italiano
  - Čeština
  - Polski
  - Română
  - Nederlands
  - Hrvatski
  - русский
  - Magyar
  - ok

Enter vehicle parameters

- VehCharacteristics
  - Axles Trailer
    - 0
    - 1
    - 2
    - 3
    - > 4
    - ok
  - Current weight
    - < 7,5t
    - ≥ 7,5t < 12t
    - ≥ 12t ≤ 18t
    - > 18t
    - ok

Show software versions

- OBU Information
  - Release Info
    - SW Version: x.0
    - DSRC Firmware: x.10
    - Base Version: x.0
  - OBU Identification: 000070000000503

Show activated toll services	Conf. Services > BEvia BEliT DEbag DEwaT ATasf ESvia FRtis PTvve
Show Account Info	Account Info > Payment Info Scheme: Post-paid
Enter cost center	Cost Center > ABC-01234-5.0 Please enter your cost center here. You can use the following characters: Characters A-Z, digits 0-9, special characters (-) minus, (,) comma, (.) dot, and spaces. You can choose the characters via the buttons up, down and right. Save your entry with a long pressure on the button right. If you have more than 17 characters you must scroll.
Show number of customer support service	Customer Service > Phone number 0800 – 123 456 78 Please note the telephone number of your Customer Service here: ..... [There is only a number displayed, if the Service Partner has one central customer service phone number. In case of various country-specific numbers, the Service Partner informs the client directly.]

For the use of the EETS service and the associated Toll4Europe On Board Unit (T4E OBU) in the toll domain dedicated vehicle paratmeters have to be transmitted. They serve as the basis for the calculation of the toll. These include for example license plate number, permissible total weight, emission class.

The customer registration for the EETS service is done by the Sales and Service Partner. The transmission of the necessary data to the T4E OBU takes place automatically during the personalization of the T4E OBU.

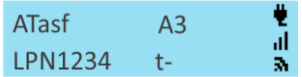
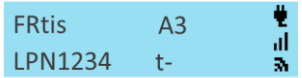
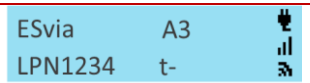
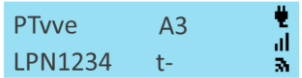
In some cases, domain specific OBU parameters have to be updated by the driver during his trip. These will be explained in the following chapters

4.3 Domain specific changeable OBU parameters (Overview)

Toll charger and toll domain specific requests lead to the need to enter and update certain data to the OBU and thus lead to differing OBU displays. Depending on special regulations of a toll domain, the number of axles and the permissible total weight must be entered seperately by the driver with regards to the current vehicle train. As part of the self-declaration obligation, the driver is responsible for the correctness of this information.

The following table shows which data and toll domains are concerned, and which OBU startup screens will appear depending on the chosen toll service:

Toll Service (domain)	**OBU start-up screen**	**Parameters to be updated** by the driver	**Explanation**
	DEbag A3 LPN1234 t12.0	**Number of trailer axles** ➢ Menu => vehicle characteristics => axles trailer **Current total permissible loading weight**: ➢ Menu => vehicle characteristics => current weight	**Axles**: the current, actual total number of axles for the vehicle combination (tractor unit + trailer) is displayed (here: "A3"), which may differ depending on the attached trailer and thereforethe trailer axles must be specified separately by the driver via the OBU. **Weight**: The new, actual total permissible loading weight must be updated, when attaching a trailer to the tractor unit. When selecting the weight range via the OBU menu, e. g. > 7.5t and <12t, always the lower value will be displayed on the OBU screen.
German Tunnels - Warnow crossing + Herren tunnel	DEwaT A- LPN1234 t-	–	No driver input necessary.
Belgium - BEvia	BEvia A- LPN1234 t11.8	–	No extra driver input necessary. For Belgium, the maximum permissible gross weight for the vehicle combination is already stored in the system during client registration and is automatically displayed on the OBU screen, e. g. 11.8t.
Belgian tunnel - Liefkenshoek	BEliT A- LPN1234 t-	–	For the Belgian Liefkenshoek tunnel no driver input necessary.

Toll Service (domain)	Start-up screen	Changeable Parameters – to be updated by the driver	Further explanation
Austria ATasf 		**Number of trailer axles** ➢ Menu => vehicle characteristics => axles trailer	OBU display shows the sum of tractor unit axles + trailer axles. **Number of trailer axles must** be updated if a trailer is attached to the tractor unit
France FRtis 		Number of trailer axles ➢ Menu => vehicle characteristics => axles trailer	Number of **trailer axles**: should be updated if a trailer is attached to the tractor unit. Input via OBU not obligatory but recommended. Number of axles is determined in parallel by the Toll Charger's roadside equipment.
Spain ESvia 		Number of trailer axles ➢ Menu => vehicle characteristics => axles trailer	Number of **trailer axles**: should be updated if a trailer is attached to the tractor unit. Input via OBU not obligatory but recommended. Number of axles is determined in parallel by the Toll Charger's roadside equipment.
Portugal PTvve 		Number of trailer axles ➢ Menu => vehicle characteristics => axles trailer	Number of **trailer axles**: should be updated if a trailer is attached to the tractor unit. Input via OBU not obligatory but recommended. Number of axles is determined in parallel by the Toll Charger's roadside equipment.

4.4 Domain specific Toll Lanes

General information

In the toll lane, the speed limits and the signage are to be considered. When the OBU is successfully detected, the traffic light turns green. The toll gate is opened and the OBU makes a sound if necessary. Please note that the driver should have (and in France must have) always an alternative means of payment with him (fuel card, credit card, or cash). The list of accepted payment methods can be found on the website of the respective toll operator.

In case of a fault:

- If necessary, pull a ticket at the entrance.
- At the exit: press the emergency button and follow the instructions of the toll staff.
- If the OBU is defective, please contact your Service Partner contact person.

The following signs are used in the toll domains to guide the driver to the right track.

France	Spain	Portugal	Italy	Belgium	Germany	Toll lanes - recommended driver behavior
						If you wish automatic toll collection via your OBU, please use lanes with these signs.
						If you wish to have automatic toll collection via your OBU and your vehicle is Category 4, please use lanes with these signs.
						If you want to drive faster through the gantry, please use lanes with the sign "Tempo 30". Pay attention to a minimum distance of 4 meters to the vehicle in front and only drive through at green light.
						If your OBU is defective and you have to pay the toll by cash or by card, please use the lanes with these signs.

4.5 Domain specifics Germany

INFORMATION ON THE EETS DOMAIN GERMANY-BAG

Specifications for the truck toll in the toll domain Germany-BAG (DEbag) and information about exemptions from the toll: www.bag.bund.de/DE/Navigation/Verkehrsaufgaben/Lkw-Maut/lkw-maut_node.html

D**omain specific changeable parameters**
For the toll domain Germany (DEbag) the driver must upddate the following parameters on the OBU according actual state:

- Number of trailer axles
- Weight (total permissible loading weight)

.
Axles: the current, actual total number of axles for the vehicle combination (tractor unit + trailer) is displayed (here: "A3"), which may differ depending on the attached trailer and thereforethe trailer axles must be specified separately by the driver via the OBU.

Weight: The new, actual total permissible loading weight must be updated, when attaching a trailer to the tractor unit.
When selecting the weight range via the OBU menu, e. g. > 7.5t and <12t, always the lower value will be displayed on the OBU screen.

4.6 Domain specifics Belgium

INFORMATION ON THE EETS DOMAIN BELGIUM-VIAPASS

Specifications for the truck toll in the toll domain Belgium-Viapass (BEvia) can be found under:
www.viapass.be/en/downloads/

Information about exemptions from the toll
Certain vehicles are exempted from the toll. The exemption must be requested from the relevant regional services. Please refer to:
www.viapass.be/en/downloads/exemptions-clarified/

Domain specific changeable parameters
For the toll domain Belgium (BEvia) the driver does not have to change any parameters on the OBU.

Note on classification for missing parameters
If the vehicle parameters "maximum permissible gross vehicle weight" and "Euro emission class" are not available for a vehicle or if they are not adequately documented, the vehicle is classified as follows:

- Vehicle weight as „gross vehicle weight over 32 t“
  and
- Vehicle category „other Euro emission class“.

Subsequent evidence, e. g. to the emission class of the vehicle, cannot be considered retroactively for already driven kilometers.

4.7 Domain specifics France

INFORMATION ON THE EETS DOMAIN FRANCE

Specifications for the truck toll in the toll domain France TIS PL „Télépéage Inter-Sociétés Poids Lourds“ (FRtis) can be found under: www.autoroutes.fr/index.htm?lang=en

Domain specific changeable parameters
For the toll domain France (FRtis) the driver should upddate the following parameters on the OBU according actual state:

- Trailer axles

Different types of toll lanes
Take the lane or, if there is none, take the lane when leaving or joining the motorway. If the lane has a height restriction bar, then the lane is exclusively for light vehicles with a height less than 2 metres (Category 1, light vehicle).
If the lane does not have a bar, it can be used by any vehicle. There are also some toll booths with “Tempo 30 lanes”, which allow a faster passage. This lane can be driven through at a speed of up to 30 km/h and the OBU will automatically be recognized when you drive up to the toll lane if the OBU is properly fitted in the vehicle.

Correct use of the toll lane
Drive at walking pace to ensure the OBU can be successfully recognized (it beeps). Keep a minimum distance of 4 metres from the vehicle ahead of you. Look for the green light, which signals a successful drive through. If the barrier is already open as you approach it, do not proceed until the green light shows. Look out for Motorway personnel who may have to cross the toll lane.

4.8 Domain specifics Austria

INFORMATION ON THE EETS DOMAIN AUSTRIA

Specifications for the truck toll in the toll domain Austria Asfinag (ATasf) can be found under:
www.asfinag.at/toll/go-box-for-hgv-and-bus/european-electronic-toll-service/

Domain specific changeable parameters
For the toll domain Austria (ATasf) the driver must upddate the following parameters on the OBU according actual state:

- Number of trailer axles

Vehicle declaration
In Austria the driver is obliged to carry a vehicle declaration similar to the following example and to show it in case of enforcement. He receives this declaration via his Service Partner.

Nur zur Verwendung im österreichischen Mautgebiet!
Use in the Austrian toll system only!

Vertragspartner / contract partner:
Service Partner XY
Street 1-123
D - 12345 City
Tel.: +49 (0) 30 1234567 - 0
E-Mail: kontakt@xxx.com
www.contractpartnerx.de

FAHRZEUGDEKLARATION
VEHICLE DECLARATION

Kundennummer / Customer Number	123456
Kfz - Kennzeichen / License Plate	LPN 123
Nationality / Nationality	RU
PAN	907043990000000123
OBU ID	940007000700001D73
Emissionsklasse / Euro Emission Class	4
Achsanzahl Zugfahrzeug / Number of Axles (Tractor)	2
Europ. Fahrzeugklasse / European Vehicle Class	4
Service Provider	Service Provider für den Mautbetreiber ASFINAG, Wien ist DKV Euroservice GmbH & Co. KG, Balcke-Dürr-Allee 3, D-40882 Ratingen

Nutzungshinweise

Bitte überprüfen Sie vor Fahrtantritt, ob die oben angeführte **Toll4Europe OBU** In dem oben angeführten Kfz ordnungsgemäß montiert wurde.
Die Fahrzeugdeklaration ist vom Fahrezuglenker während der Fahrt mitzuführen.

Durch jedwede Änderung der oben angeführten, registrierten Daten verliert diese Fahrzeugdeklaration ihre Gültigkeit.

Änderungen sind umgehend bekanntzugeben.

Auskunft zur Box erteilt ihr Vertragspartner.

Diese Fahrzeugdeklaration ist ausschließlich zur Verwendung mit dem österreichischen Mautsystem der ASFINAG vorgesehen.

OBU ID

Advise for usage

Before starting your trip, please check if the above mentioned **Toll4Europe OBU** has been mounted properly in the vehicle referred above.

The vehicle driver must carry the vehicle declaration on board during the trip.

With any change of the above data this vehicle declaration loses its validity. Any changes have to be reported immediately.

Information about your box will be delivered by your contract partner only.

This vehicle declaration shall only be used in the Austrian toll collection system of ASFINAG.

4.9 Domain specifics Spain and Portugal

INFORMATION ON THE EETS DOMAIN PORTUGAL AND SPAIN

Specifications for the truck toll in the toll domain Spain (ESvia) can be found under:
www.viat.es

Specifications for the truck toll in the toll domain Portugal (PTvve) can be found under:
www.viaverde.pt

Domain specific changeable parameters
For the toll domains Portugal (PTvve) and Spain (ESvia) the driver should upddate the following parameters on the OBU according actual state:

- Number of trailer axles

Z komentarzem [BH1]: Andrea: weieter Infos? URLS?

5 Driving with the T4E OBU

5.1 Start the T4E OBU

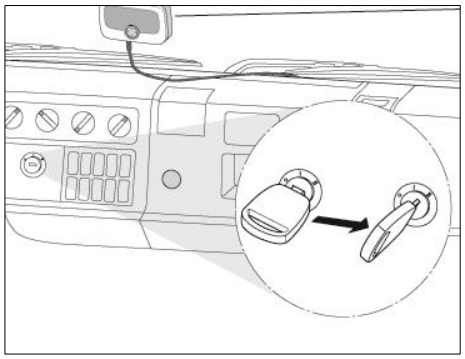


Figure 14: Start the T4E OBU

- Turn on the ignition of your vehicle. The T4E OBU starts to boot automatically.
- The boot information will be shown in the display. The status indicator shows the status of the T4E OBU.
- The initial configuration and activation of the T4E OBU is done automatically.
  The vehicle data for this T4E OBU is provided according to the registration data provided by your Service Partner .
- Please note, the T4E OBU indicates the corresponding EETS Service depending on your place of location.

```
Welcome...
      please wait.
```

```
Waiting for
personalization
```

```
Not ready
```

```
UNKNOWN    A-
ABCDEF12   t0.0
```

```
DEbag      A2
ABCDEF12   t12.0
```

The EETS Service is detected and the display shows the start screen with the corresponding EETS Service.

Before you start to drive:
Please, check the shown vehicle data: License plate number, number of axles.
Please, check the relevant settings for the corresponding EETS Service.
Change the settings if necessary, see chapter 4.3 Domain specific changeable OBU parameters:

- Number of axles
- Maximum train weight.

```
DEbag      A2
ABCDEF12   t12.0
```

The T4E OBU is ready for operation.
You can start driving.

In some cases, the EETS Service cannot be detected if the GPS reception is too low.

Not ready Searching for GPS

In this case, please, move the vehicle shortly to get a better GPS reception.

For any other information shown in the display, please, check chapter 6 Troubleshooting. If you would like to change some settings in the T4E OBU, e.g. the language, please, go to chapter 4.1 OBU Menu Structure.

Hint: If you stop driving for longer than 30 minutes the T4E OBU goes to sleep mode. It starts again automatically if the vehicle starts to move (see below).

5.2 T4E Operation modes

Standard mode:
The T4E OBU is in the standard mode during driving. All data is available and the T4E OBU is ready for operation. If the T4E OBU detects vehicle movement it is ready to measure the driven kilometers. The status is shown in the display and the driver will be informed about status changes and changes depending on the current location.

Sleep mode:
Flexible installation: If the T4E OBU detects no vehicle movements for 30 minutes it shut down to sleep mode. If the vehicle starts to move the T4E OBU will be in the standard mode after a few seconds.
Fix installation: The T4E OBU shut downs to sleep mode after the ignition is switched off for longer than 30 minutes. If the ignition is switched on the T4E OBU will be in the standard mode after a few seconds.

Power save mode:
Flexible installation: The T4E OBU switches to power save mode after the power cable is disconnected from the cigarette lighter. The display will be dimmed. The T4E OBU is still ready for operation. Please, consider the battery loading status during driving.
Fix installation: The T4E OBU switches to power save mode after the switching off the ignition. The display will be dimmed.

5.3 Driving with the T4E OBU

Depending on the vehicle's location, the T4E OBU indicates the relevant information during the trip. The corresponding registration for the EETS Service will be detected as well as the toll liable parameters valid for the concerned EETS domain.

OBU display information while driving in a booked EETS Service

	DEbag A2 ABCDEF12 t12.0	Start display. You can drive after you have checked or entered the relevant vehicle parameters.
	Tollfree DEbag	You are driving in an EETS domain with a valid and booked EETS Service. But you are not liable to pay toll, e. g. the maximum train weight is below the liable toll parameter for the corresponding EETS Service.
	New Toll Domain Toll Domain: BEvia	The T4E OBU indicates that you are going to drive into a new EETS domain. This information will be shown for 60 seconds and disappears afterwards. Hint: Please, check if any vehicle data changes on the T4E OBU are necessary for the new EETS domain. Afterwards you can continue your drive. The new EETS domain is shown in the display if you are driving inside the Belgian EETS domain (Viapass) area and the EETS service is active.
	BEvia A- ABCDEF12 t15.8	You are driving in the domain of the booked EETS Service where the vehicle parameter “number of axles” is not a liable toll parameter. You can continue your drive.
	ATasf A4 ABCDEF12 t12,0	The buzzer is ringing. In some toll domains a sound signal is requested by the national toll charger after passing an enforcement gantry and a transaction was performed. You can continue your drive.

During driving the T4E OBU shows information depending on the activated EETS service. Please check the conditions of the relevant EETS domain.

OBU display information while driving outside a booked EETS service

	Not available Use local toll provider	You are driving in a toll domain, for which the EETS service is not booked. The T4E OBU is not in service for this toll domain and does not perform any toll charging. Please, check if you are using another On Board Unit of another service provider for toll charging in this domain.

You can further information on warning messages or to solve some problems of the T4E OBU in chapter 6 Troubleshooting.

5.4 Examples for driving across different EETS domains

While travelling through Europe the T4E OBU indicates if an EETS Service is booked (for one or several toll domains) or is not booked (“no valid service”), and depending on the required input data, the T4E OBU checks the active vehicle parameters and the toll liability of the vehicle.

The number of axles and the maximum train weight must be declared by the driver depending on the vehicle train and the EETS domain.

In the following, two exemplary road trips through European toll domains will be shown. You can follow the changes during the trip on the T4E OBU display.

Example 1: EETS Services are booked for Belgium (Viapass) **and** for Germany (BAG).
Vehicle parameters are: gross value weight between 3.5 t and 7.5 t without trailer.
The vehicle is obliged to pay toll in Belgium.
The vehicle is not obliged to pay toll in Germany because the gross train weight is below 7.5 t.

Route	Information in the display	Explanation
Driving in Belgium	BEvia A- ABCDEF12 t6.9	The start display shows the active EETS Service and the related parameters.
Driving close to the German border in direction to Germany	New Toll Domain Toll Domain: DEbag	The buzzer is ringing. This information is shown for 60 seconds and can be confirmed by the driver. Until passing the border the previous screen will be shown.
Passing border and driving in Germany	Tollfree DEbag	After entering Germany, the EETS Service DEbag is activated. The vehicle is not obliged to pay toll. The gross train weight is below 7.5 t and therefore below the toll liable limit.

Example 2: EETS Services are booked for Belgium (Viapass) but **not** for Germany (BAG).
Vehicle parameters are: gross value weight between 3.5 t and 7.5 t without trailer.
The vehicle is obliged to pay toll in Belgium.
The EETS Service for Germany is not booked.

Route	Information in the display	Explanation
Driving in Belgium	BEvia A- ABCDEF12 t6.9	The start display shows the active EETS Service and the related parameters.
Driving close to the German border in direction to Germany	New Toll Domain Toll Domain: DEbag	The buzzer is ringing. This information is shown for 60 seconds and can be confirmed by the driver. Until passing the border the previous screen will be shown.

Passing border and driving in Germany		Not available. Use local toll provider	After entering Germany, the EETS Service DEbag is not available.

5.5 Change vehicle parameter on the T4E OBU

Depending on the EETS domain it is necessary to change some information stored in the T4E OBU. Especially the number of trailer axles is important as well as the weight of the tractor unit or the tractor and trailer combination. See also chapter 4.3 Domain specific changeable OBU parameters.

Hint: We recommend to change always the number of trailer axles on the T4E OBU immediately after you have linked the trailer to the truck.

6 Troubleshooting

Status indicator	Information in the display	Possible error	Troubleshooting
	Not ready	The T4E OBU is not completely personalized or has not all data available after an over-the-air-update.	Please, wait some minutes. The T4E OBU is running the self-check automatically and starts the boot routine again. If the OBU does not boot completely, please, contact your Customer Service.
	Not ready	The T4E OBU is not ready for toll charging.	Contact your Customer Service to get some information about alternative possibilities to continue your trip. You can use the national toll system as an alternative operation. Example for Germany: Book a ticket on a terminal of Toll Collect for your planned trip. Example for Belgium: Get a Satellic OBU at the Satellic vending machines (Satellomat). The information how to find the next Satellomat you may request from your Customer Service.
	Problem-ID 74 Contact customer ++ (Contact Customer Service)	The T4E OBU is locked because an error has occurred.	Please, if possible, note the problem-ID number and contact the Customer Service.
	Contact Customer Service	Your T4E OBU asks you to contact the service after your trip.	Please, contact your Customer Service immediately after your trip.
	Not ready Out of data storage	This message informs you that your T4E OBU has stored too much data and the memory capacity is reached. It happens very rarely. The T4E OBU transmits the data for contemporary storage to the back end.	Please, contact your Customer Service and return the T4E OBU.

	Not ready Searching for GPS…	Depending on your place of location the GPS reception could be poor, e.g. in a tunnel.	Please, continue your drive for some minutes, e.g. after leaving the tunnel the GPS reception will be available again. If not and you are on a highway or a toll road, leave it at the next possible exit. Contact your Customer Service.
	Not ready Release validity e++ (Release validity expired)	This could happen if you did not use the T4E OBU for a long time. This message informs you that the status of the T4E OBU release software is expired and must be updated.	Stop the vehicle. Normally T4E OBU will request an update of the release software continuously during booting. Wait for a short time. If you cannot wait no longer or if you have already waited for a long time, please, contact your Customer Service and follow the given instructions.
	Not available Use local toll provider	You are driving in the area of an EETS Service which is known by T4E. But the EETS Service is not activated on your T4E OBU.	Continue your trip. But check if you pay toll on a different way via another provider. Or contact your Customer Service to book the EETS Service for this area.
	Not available. Use local toll provider ABCDEF 12	You are driving in an unknown area without any EETS Services supported by the T4E OBU.	Continue your trip.
	Customer Service UNKNOWN	Your Service Partner did not provide a specific telephone number.	Please, find the telephone number of your Customer Service on the provided Service Partner web site. Please, note the telephone number of your Customer Service on page 2. Continue your trip.

Technical data

Operating temperature	- 40 °C to +85 °C (also ambient storage temperature)
Power supply	Operating power supply 8–32 V DC
Fuse (external)	1 A (in cigarette lighter cable connector) 2 A (before connecting to vehicle electrical system Term 15 and 30), not included
Buffer battery	Coin cell, nominal voltage = 3.0 V
Rechargeable battery	Li-Ion with a nominal voltage of 3.6 V, nominal capacity of 1600 mAh. Charging time: 4 h at 3.0 V to 4.05 V
Power consumption	Power mode “Standby”: 25 mW typ. Power mode “Running”: 450 mW typ.
Supported technologies	GNSS: GPS, GLONASS, Galileo 12 channel high sensitivity GPS receiver with internal antenna GSM: Quad-band GSM module with GPRS (multi-slot class 10) capability DSRC: DSRC interface is in accordance with CEN/TC 278
Dimensions	145 × 93 × 36 mm
Weight	400 g
Protection class	IP42 according to IEC 60529

Conformity declaration

CE 0408 — The T4E OBU is conform to European guideline 2014/53/EU (RED) and 2011/65/EU (RoHS).

E12 10R – 04 0012 — The OBU satisfies ECE Regulation No. 10.5 - Electromagnetic Compatibility.