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Sub-appendix 13

Submitted by the European Commission

This document, submitted by the European Commission, contains amendment proposals (identified in track changes) which aim at modifying Sub-appendix 13 as presented in Informal document No.1 (October 2019).

| Sub-appendix 13 - ITS Interface

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1. Introduction

This [Sub-appendix](#) specifies the design and the procedures to follow in order to implement the interface with Intelligent Transport Systems (ITS).

The tachographs of vehicles may be equipped with standardised interfaces allowing the data recorded or produced by tachograph to be used in operational mode, by an external device, provided that the following conditions are met:

- (a) the interface does not affect the authenticity and the integrity of the data of the tachograph;
- (b) the interface complies with the detailed provisions of [this Sub-appendix](#);
- (c) the external device connected to the interface has access to personal data, including geopositioning data, only after the verifiable consent of the driver to whom the data relates.

2. Scope

The scope of this [Sub-appendix](#) is to specify how applications hosted on external devices can via a Bluetooth® connection obtain data (*the Data*) from a tachograph.

The Data available via this interface is described in the Annex 1 of the present document. This interface does not prohibit the implementation of other interfaces (e.g. via the CAN bus) to transmit the data of the VU to other vehicle processing units.

This [Sub-appendix](#) specifies:

- *The Data* available through the ITS interface
- The Bluetooth® profile that is used to transfer the data
- The enquiry and download procedures and sequence of operations
- The pairing mechanism between the tachograph and the external device
- The consent mechanism available to the driver

For clarification, this [Sub-appendix](#) does not specify:

- The collection of *the Data* operation and management within the VU (which shall be specified elsewhere within [this Agreement](#) or otherwise shall be a function of product design).
- The form of presentation of collected data to application hosted on the external device.
- Data security provisions above what provides Bluetooth® (such as encryption) concerning the content of *the Data* (which shall be specified elsewhere within [this Agreement](#) [[Sub-appendix](#) 11 Common Security Mechanisms]).
- The Bluetooth® protocols used by the ITS interface

2.1. Acronyms, definitions and notations

The following acronyms and definitions specific to this [Sub-appendix](#) are used in this [Sub-appendix](#):

<i>the Communication</i>	exchange of information/data between a master unit (i.e. the tachographs) and an external unit through the ITS interface over Bluetooth®.
<i>the Data</i>	Data sets as specified in Annex 1.

BR	Basic Rate
EDR	Enhanced Data Rate
GNSS	Global Navigation Satellite System
IRK	Identity Resolution Key
ITS	Intelligent Transport System
LE	Low Energy
PIN	Personal Identification Number

PUC	Personal Unblocking Code
SID	Service Identifier
SPP	Serial Port Profile
SSP	Secure Simple Pairing
TRTP	Transfer Request Parameter
TREP	Transfer Response Parameter
VU	Vehicle Unit

3. Referenced Standards

The specification defined in this [Sub-appendix](#) refers to and depends upon all or parts of the following standards. Within the clauses of this [Sub-appendix](#) the relevant standards, or relevant clauses of standards, are specified. In the event of any contradiction the clauses of this [Sub-appendix](#) shall take precedence.

Standards referenced in this [Sub-appendix](#) are:

- ISO 16844 – 4 : Road vehicles – Tachograph systems – Part 4: Can interface
- ISO 16844 – 7 : Road vehicles – Tachograph systems – Part 7: Parameters
- Bluetooth® – Serial Port Profile – V1.2
- Bluetooth® – Core Version 4.2
- NMEA 0183 V4.1 protocol

4. Interface working principles

4.1. Preconditions to data transfer via the ITS interface

The VU shall be responsible to keep updated and maintain the data to be stored in the VU, without any involvement of the ITS interface. The means by which this is achieved is internal to the VU, specified elsewhere in [this Agreement](#), and is not specified in this [Sub-appendix](#).

4.1.1 Data provided through the ITS interface

The VU shall be responsible to update the data that will be available through the ITS interface at a frequency determined within VU procedures, without any involvement of ITS interface. The VU data shall be used as a basis to populate and update *the Data*, the means by which this is achieved is specified elsewhere in *the Regulation* or if there is no such specification is a function of product design and is not specified in this [Sub-appendix](#).

4.1.2 Content of the Data

The content of *the Data* shall be as specified in Annex 1 of this [Sub-appendix](#).

4.1.3 ITS Applications

ITS applications will be using the data made available through the ITS interface for instance to optimize driver activities management while respecting the [provisions of this Agreement \[23rd session: EU will check whether it should be "Appendix"\]](#), to detect possible faults of the tachograph or to use the GNSS data. The specification of the applications is not within the scope of this [Sub-appendix](#).

[Contracting Parties may set up restrictions to the transmission of data by ITS applications; those restrictions shall not affect the data provided through the ITS interface in accordance with point 4.1.1. Contracting Parties shall abide by the legislation on data protection in force in their respective territories, in what respects to collection, storage, processing and use of personal data obtained using ITS.](#)

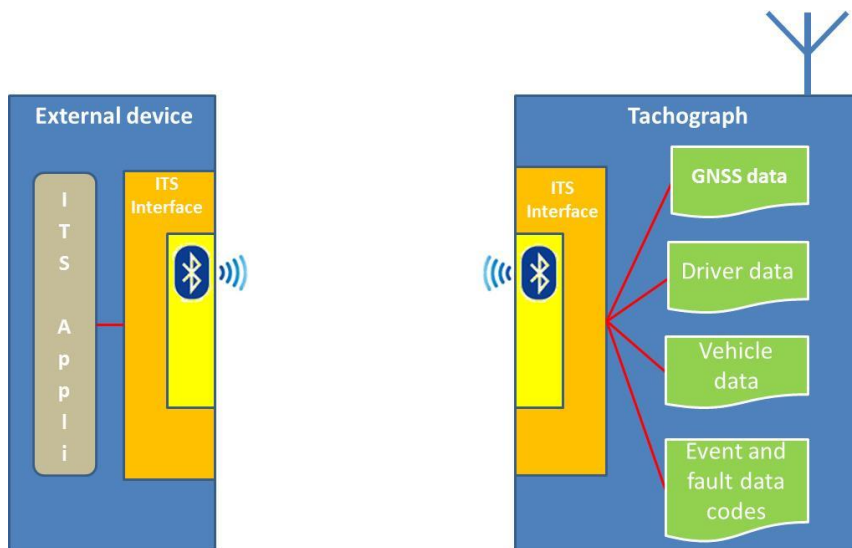
4.2. Communication technology

The Data exchange using the ITS interface shall be performed via a Bluetooth® interface compatible via version 4.2 or later. Bluetooth® operates in the unlicensed industrial, scientific and medical (ISM) band at 2.4 to 2.485 GHz. Bluetooth® 4.2 offers enhanced privacy and security mechanisms and increases speed and reliability of data transfers. For the purpose of this specification is Bluetooth® class 2 radio used with a range up to 10 meters. More information on Bluetooth® 4.2 is available on [www.bluetooth.com](https://www.bluetooth.com/specification/adopted-specifications?_ga=1.215147412.2083380574.1435305676) (https://www.bluetooth.org/en-us/specification/adopted-specifications?_ga=1.215147412.2083380574.1435305676).

The Communication shall be established with the communications equipment after a pairing process has been completed by an authorized device. As Bluetooth® is using a master/slave model to control when and where devices can send data, the tachograph will play the role of master while the external device will be the slave.

When an external device comes within range of the VU for the first time, the Bluetooth® pairing process can be initiated (see also annex 2). The devices share their addresses, names, and profiles and common secret key, which allows them to bond whenever they are together in the future. Once this step is completed, the external device is trusted and is in state to initiate requests to download data from the tachograph. It is not foreseen to add encryption mechanisms beyond what Bluetooth® provides. However, if additional security mechanisms are needed, this will be done in accordance with [Sub-appendix 11 Common Security Mechanisms](#).

The overall communication principle is described in the following figure.



The SPP (Serial Port Profile) profile of Bluetooth® shall be used to transfer data from the VU to the external device.

4.3. PIN authorization

For security reasons, the VU will require a PIN code authorization system separated from the Bluetooth pairing. Each VU shall be able to generate PIN codes for authentication purposes composed of at least 4 digits. Every time an external device pairs with the VU, it must provide the correct PIN code before receiving any data.

Succeeding entering the PIN shall result in putting the device on the whitelist. The whitelist shall store at least 64 devices paired with the particular VU.

Failing to provide the correct PIN code three times in a row shall result in putting temporarily the device on the blacklist. While blacklisted, every new attempt from the device shall be rejected. Further failure to provide the

correct PIN code three times in a row shall result in increasingly longer ban duration (See table 1). Providing the correct PIN code shall reset the ban duration and the number of attempt. Figure 1 in Annex 2 represents the sequence diagram of a PIN validation attempt.

Number of consecutive failure	Ban duration
3	30 seconds
6	5 minutes
9	1 hour
12	24 hours
15	Permanent

Table 1: Ban duration depending on the number of consecutive failure to provide the correct PIN code

Failing to provide the correct PIN code fifteen times (5x3) in a row shall result in a permanent blacklisting of the ITS Unit. Only providing the correct PUC code shall overturn this permanent ban.

The PUC code shall be composed of 8 digits and provided by the manufacturer with the VU. Failing to provide the correct PUC code ten times in a row will irrevocably blacklist the ITS Unit.

While the manufacturer may offer an option to change the PIN code directly through the VU, the PUC code shall not be alterable. Modifying the PIN code, if possible, shall require to enter the current PIN code directly in the VU.

Furthermore any devices stored in the whitelist shall be kept until manual removal of by the user (e.g. via the man-machine-interface of the VU or other means). By doing so lost or stolen ITS-units may be removed from the whitelist. Also, any ITS Unit leaving the Bluetooth connection range for more than 24 hours shall be automatically removed from the VU whitelist and must provide the correct PIN code again when the connection is established again.

The format of the messages between the VU interface and the VU are not provided but left to the discretion of the manufacturer. Said manufacturer shall however ensure the message format between the ITS Unit and the VU interface is respected (see ASN.1 specifications).

Any data request shall thus be met with the proper verification of the sender’s credential before any form of treatment. Figure 2 of Annex 2 represents the sequence diagram for this procedure. Any blacklisted device shall receive an automatic rejection, any non-blacklisted non-whitelisted device shall receive a PIN request it needs to fulfill before resending its data request.

4.4. Message Format

All messages exchanged between the ITS Unit and the VU interface shall be formatted with a structure consisting of three parts: A header composed by a target byte (TGT), a source byte (SRC) and a length byte (LEN).

The data field composed by a service identifier byte (SID) and a variable amount of data bytes (maximum 255).

The checksum byte is the 1 byte sum series modulo 256 of all the bytes of the message excluding the CS itself.

The message shall be Big Endian.

Header			Data Field					Checksum
TGT	SRC	LEN	SID	TRTP	CC	CM	DATA	CS
3 bytes			Max. 255 bytes					1 byte

Table 2: General message format.

Header

TGT and SRC : the ID of the Target (TGT) and Source (SRC) devices of the message. The VU Interface shall have the default ID “EE”. This ID cannot be changed. The ITS Unit shall use the default ID “A0” for its first message of

the communication session. The VU Interface shall then assign an unique ID to the ITS Unit and informs it of this ID for future messages during the session.

The LEN byte shall only take into account the "DATA" part of the Data Field (see Table 2), the 4 first bytes are implicit.

The VU Interface shall confirm the authenticity of the message's sender by cross-checking its own IDList with the Bluetooth data by checking the ITS Unit listed at the provided ID is currently in the range of the Bluetooth connection.

Data Field

Besides the SID, the Data Field shall also contain other parameters : a transfer request parameter (TRTP) and Counter bytes.

If the data to be handled is larger than the available space in one message, it will be split in several submessages. Each submessage shall have the same Header and SID, but will contain a 2-bytes counter, Counter Current (CC) and Counter Max (CM), to indicate the submessage number. To enable error checking and abort the receiving device acknowledges every submessage. The receiving device can accept the submessage, ask for it to be re-transmitted, request the sending device to start again or abort the transmission.

If not used, CC and CM shall be given the value 0xFF.

For instance, the following message

HEADER	SID	TRTP	CC	CM	DATA	CS
3 bytes	Longer than 255 bytes					1 byte

Shall be transmitted as such:

HEADER	SID	TRTP	01	n	DATA	CS
3 bytes	255 bytes					1 byte

HEADER	SID	TRTP	02	n	DATA	CS
3 bytes	255 bytes					1 byte

...

HEADER	SID	TRTP	N	N	DATA	CS
3 bytes	Max. 255 bytes					1 byte

Table 3 contains the messages the VU and the ITS Unit shall be able to exchange. The content of each parameter is given in hexadecimal. Aren't represented in the table CC and CM for clarity, see above for complete format.

Message	Header			DATA			Checksum
	TGT	SRC	LEN	SID	TRTP	DATA	
<i>RequestPIN</i>	<i>ITSID</i>	EE	00	01	FF		
<i>SendITSID</i>	<i>ITSID</i>	EE	01	02	FF	<i>ITSID</i>	
<i>SendPIN</i>	EE	<i>ITSID</i>	04	03	FF	4*INTEGER (0..9)	
<i>PairingResult</i>	<i>ITSID</i>	EE	01	04	FF	BOOLEAN (T/F)	
<i>SendPUC</i>	EE	<i>ITSID</i>	08	05	FF	8*INTEGER (0..9)	

<i>BanLiftingResult</i>	<i>ITSID</i>	EE	01	06	FF	BOOLEAN (T/F)	
<i>RequestRejected</i>	<i>ITSID</i>	EE	08	07	FF	Time	
<i>RequestData</i>							
standardTachData	EE	<i>ITSID</i>	01	08	01		
personalTachData	EE	<i>ITSID</i>	01	08	02		
gnssData	EE	<i>ITSID</i>	01	08	03		
standardEventData	EE	<i>ITSID</i>	01	08	04		
personalEventData	EE	<i>ITSID</i>	01	08	05		
standardFaultData	EE	<i>ITSID</i>	01	08	06		
manufacturerData	EE	<i>ITSID</i>	01	08	07		
<i>ResquestAccepted</i>	<i>ITSID</i>	EE	Len	09	TREP		Data
<i>DataUnavailable</i>							
No data available	<i>ITSID</i>	EE	02	0A	TREP	10	
Personal data not shared	<i>ITSID</i>	EE	02	0A	TREP	11	
<i>NegativeAnswer</i>							
General reject	<i>ITSID</i>	EE	02	0B	SID Req	10	
Service not supported	<i>ITSID</i>	EE	02	0B	SID Req	11	
Sub function not supported	<i>ITSID</i>	EE	02	0B	SID Req	12	
Incorrect message length	<i>ITSID</i>	EE	02	0B	SID Req	13	
Conditions not correct or request sequence error	<i>ITSID</i>	EE	02	0B	SID Req	22	
Request out of range	<i>ITSID</i>	EE	02	0B	SID Req	31	

Response pending	ITSID	EE	02	0B	SID Req	78	
ITSID Mismatch	ITSID	EE	02	0B	SID Req	FC	
ITSID Not Found	ITSID	EE	02	0B	SID Req	FB	

Table 3: Detailed message content.

RequestPIN (SID 01)

This message is issued by the VU Interface if a non-blacklisted but non-whitelisted ITS unit is sending any data request.

SendITSID (SID 02)

This message is issued by the VU Interface whenever a new device is sending a request. This device shall use the default ID "A0" before getting assigned an unique ID for the communication session.

SendPIN (SID 03)

This message is issued by the ITS Unit to be whitelisted from the VU interface. The content of this message is a 4 INTEGER between 0 and 9 code.

PairingResult (SID 04)

This message is issued by the VU Interface to inform the ITS Unit if the PIN code it sent was correct. The content of this message shall be a BOOLEAN with the value "True" if the PIN code was correct and "False" otherwise.

SendPUC (SID 05)

This message is issued by the ITS Unit to lift a blacklist sanction from the VU interface. The content of this message is a 8 INTEGER between 0 and 9 code.

BanLiftingResult (SID 06)

This message is issued by the VU Interface to inform the ITS Unit if the PUC code it sent was correct. The content of this message shall be a BOOLEAN with the value "True" if the PUC code was correct and "False" otherwise.

RequestRejected (SID 07)

This message is issued by the VU Interface as a reply to any message from a blacklisted ITS Unit except "SendPUC". The message shall contain the remaining time the ITS Unit is blacklisted, following the "Time" sequence format as defined in Annex 3.

RequestData (SID 08)

This message for data accessing is issued by the ITS Unit. A one byte transfer request parameter (TRTP) indicates the type of data required. There are several types of data:

- standardTachData (TRTP 01): Data available from the tachograph classified as non-personal.
- personalTachData (TRTP 02): Data available from the tachograph classified as personal.
- gnssData (TRTP 03): GNSS data, always personal.
- standardEventData (TRTP 04): Recorded event data classified as non-personal.
- personalEventData (TRTP 05): Recorded event data classified as personal.
- standardFaultData (TRTP 06): Recorded faults classified as non-personal.
- manufacturerData (TRTP 07): data made available by the manufacturer.

See Annex 3 of this [Sub-appendix](#) for more information about the content of each data type.

See [Sub-appendix 12](#) for more information about the format and content of GNSS data.

See [Appendix IB](#) and [IC](#) for more information about event data code and faults.

ResquestAccepted (SID 09)

This message is issued by the VU Interface if a ITS Unit “RequestData” message has been accepted. This message contains a 1-byte TREP, which is the TRTP byte of the associated RequestData message, and all the data of the requested type.

DataUnavailable (SID 0A)

This message is issued by the VU Interface if, for a certain reason, the requested data aren't available to be sent to a whitelisted ITS Unit. The message contains a 1byte TREP which is the TRTP of the required data and a 1 byte error code specified in the table 3. The Following codes are available:

- No data available (10) : The VU interface can't access the VU data for unspecified reasons.
- Personal data not shared (11) : The ITS Unit tries to retrieve personal data when they are not shared.

NegativeAnswer (SID 0B)

These messages are issued by the VU Interface if a request cannot be completed for any other reason than the unavailability of the data. These messages are typically the result of a bad request format (Length, SID, ITSID...) but aren't limited to that. The TRTP in the Data Field contains the SID of the request. The Data Field contains a code identifying the reason of the negative answer. The following codes are available:

- General Reject (code : 10)
The action can't be performed for a reason which isn't cited below nor in section (Enter *DataUnavailable* section number).
- Service not supported (code : 11)
The request's SID isn't understood.
- Sub function not supported (code : 12)
The request's TRTP isn't understood. It can be for instance missing or out of accepted values.
- Incorrect message length (code : 13)
The length of the received message is wrong (mismatch between the LEN byte and the actual message length).
- Conditions not correct or request sequence error (code : 22)
The required service is not active or the sequence of request messages is not correct
- Request out of range (code : 33)
The request parameter record (data field) is not valid
- Response pending (code : 78)
The action requested cannot be completed in time and the VU is not ready to accept another request.
- *ITSID* Mismatch (code : FB)
The SRC *ITSID* doesn't match the associated device after comparison with the Bluetooth information.
- *ITSID* Not Found (code : FC)
The SRC *ITSID* isn't associated with any device.

Lines 1 through 72 (**FormatMessageModule**) of the ASN.1 code in Annex 3 specify the messages format as described in table 3. More details about the messages content is given below.

4.5. Driver consent

All the data available are classified as either standard or personal. Personal data shall only be accessible if the driver gave his/her consent, accepting his/her tachograph personal data can leave the vehicle network for third party applications.

Driver consent is given when, at first insertion of a given driver card or workshop card currently unknown to the vehicle unit, the cardholder is invited to express his consent for tachograph related personal data output through the optional ITS interface. (see also [Appendix I C](#) paragraph 3.6.2).

The consent status (enabled/disabled) is recorded in the memory of the tachograph.

In case of multiple drivers, only the personal data about the drivers who gave their consent shall be shared with the ITS interface. For instance, if there's two drivers in the vehicle, and only the first driver accepted to share his personal data, the ones concerning the second driver shall not be shared.

4.6. Standard data retrieval

Figure 3 of Annex 2 represents the sequence diagrams of a valid request sent by the ITS Unit to access standard data. The ITS Unit is properly whitelisted and isn't requesting personal data, no further verification is required. The diagrams consider the proper procedure illustrated in Figure 2 of Annex 2 has already been followed. They can be equated to the *REQUEST TREATMENT* gray box of Figure 2.

Amongst available data, shall be considered standard:

- standardTachData (TRTP 01)
- StandardEventData (TRTP 04)
- standardFaultData (TRTP 06)

4.7. Personal data retrieval

Figure 4 of Annex 2 represents the sequence diagram for personal data request processing. As previously stated, the VU interface shall only send personal data if the driver has given his explicit consent (see also 4.5). Otherwise, the request must be automatically rejected.

Amongst available data, shall be considered personal:

- personalTachData (TRTP 02)
- gnssData (TRTP 03)
- personalEventData (TRTP 05)
- manufacturerData (TRTP 07)

4.8. Event and fault data retrieval

ITS units shall be able to request events data containing the list of all the unexpected events. These data are considered standard or personal, see Annex 3. The content of each event is in accordance with the documentation provided in Annex 1 of this [Sub-appendix](#).

ANNEX 1

1°) LIST OF AVAILABLE DATA THROUGH THE ITS INTERFACE

Data	Source	Data classification (personal/not personal)
VehicleIdentificationNumber	Vehicle Unit	not personal
CalibrationDate	Vehicle Unit	not personal
TachographVehicleSpeed speed instant t	Vehicle Unit	personal
Driver1WorkingState Selector driver	Vehicle Unit	personal
Driver2WorkingState	Vehicle Unit	personal
DriveRecognize Speed Threshold detected	Vehicle Unit	not personal
Driver1TimeRelatedStates Weekly day time	Driver Card	personal
Driver2TimeRelatedStates	Driver Card	personal
DriverCardDriver1	Vehicle Unit	not personal
DriverCardDriver2	Vehicle unit	not personal
OverSpeed	Vehicle Unit	personal
TimeDate	Vehicle Unit	not personal
HighResolutionTotalVehicleDistance	Vehicle Unit	not personal
ServiceComponentIdentification	Vehicle Unit	not personal
ServiceDelayCalendarTimeBased	Vehicle Unit	not personal
Driver1Identification	Driver Card	personal
Driver2Identification	Driver Card	personal
NextCalibrationDate	Vehicle Unit	not personal
Driver1ContinuousDrivingTime	Driver Card	personal
Driver2ContinuousDrivingTime	Driver Card	personal
Driver1CumulativeBreakTime	Driver Card	personal
Driver2CumulativeBreakTime	Driver Card	personal
Driver1CurrentDurationOfSelectedActivity	Driver Card	personal
Driver2CurrentDurationOfSelectedActivity	Driver Card	personal
SpeedAuthorised	Vehicle Unit	not personal
TachographCardSlot1	Driver Card	not personal
TachographCardSlot2	Driver Card	not personal
Driver1Name	Driver Card	personal
Driver2Name	Driver Card	personal
OutOfScopeCondition	Vehicle Unit	not personal
ModeOfOperation	Vehicle Unit	not personal
Driver1CumulatedDrivingTimePreviousAndCurrentWeek	Driver Card	personal
Driver2CumulatedDrivingTimePreviousAndCurrentWeek	Driver Card	personal
EngineSpeed	Vehicle Unit	personal
RegisteringMemberState	Vehicle Unit	not personal
VehicleRegistrationNumber	Vehicle Unit	not personal
Driver1EndOfLastDailyRestPeriod	Driver Card	personal
Driver2EndOfLastDailyRestPeriod	Driver Card	personal
Driver1EndOfLastWeeklyRestPeriod	Driver Card	personal
Driver2EndOfLastWeeklyRestPeriod	Driver Card	personal
Driver1EndOfSecondLastWeeklyRestPeriod	Driver Card	personal
Driver2EndOfSecondLastWeeklyRestPeriod	Driver Card	personal
Driver1CurrentDailyDrivingTime	Driver Card	personal
Driver2CurrentDailyDrivingTime	Driver Card	personal
Driver1CurrentWeeklyDrivingTime	Driver Card	personal
Driver2CurrentWeeklyDrivingTime	Driver Card	personal
Driver1TimeLeftUntilNewDailyRestPeriod	Driver Card	personal
Driver2TimeLeftUntilNewDailyRestPeriod	Driver Card	personal
Driver1CardExpiryDate	Driver Card	personal
Driver2CardExpiryDate	Driver Card	personal
Driver1CardNextMandatoryDownloadDate	Driver Card	personal
Driver2CardNextMandatoryDownloadDate	Driver Card	personal
TachographNextMandatoryDownloadDate	Vehicle Unit	not personal
Driver1TimeLeftUntilNewWeeklyRestPeriod	Driver Card	personal
Driver2TimeLeftUntilNewWeeklyRestPeriod	Driver Card	personal
Driver1NumberOfTimes9hDailyDrivingTimesExceeded	Driver Card	personal
Driver2NumberOfTimes9hDailyDrivingTimesExceeded	Driver Card	personal
Driver1CumulativeUninterruptedRestTime	Driver Card	personal
Driver2CumulativeUninterruptedRestTime	Driver Card	personal
Driver1MinimumDailyRest	Driver Card	personal
Driver2MinimumDailyRest	Driver Card	personal
Driver1MinimumWeeklyRest	Driver Card	personal
Driver2MinimumWeeklyRest	Driver Card	personal
Driver1MaximumDailyPeriod	Driver Card	personal
Driver2MaximumDailyPeriod	Driver Card	personal
Driver1MaximumDailyDrivingTime	Driver Card	personal
Driver2MaximumDailyDrivingTime	Driver Card	personal
Driver1NumberOfUsedReducedDailyRestPeriods	Driver Card	personal
Driver2NumberOfUsedReducedDailyRestPeriods	Driver Card	personal
Driver1RemainingCurrentDrivingTime	Driver Card	personal
Driver2RemainingCurrentDrivingTime	Driver Card	personal
GnssPosition	Vehicle Unit	personal

2°) CONTINUOUS GNSS DATA AVAILABLE AFTER DRIVER CONSENT

See [Sub-appendix 12](#) – GNSS.

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3°) EVENT CODES AVAILABLE WITHOUT DRIVER CONSENT

Event	Storage rules	Data to be recorded per event
Insertion of a non-valid card	- the 10 most recent events.	- date and time of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of the card creating the event. - number of similar events that day
Card conflict	- the 10 most recent events.	- date and time of beginning of event, - date and time of end of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of the two cards creating the conflict.
Last card session not correctly closed	- the 10 most recent events.	- date and time of card insertion, - card(s) type, number, issuing <u>Contracting Party</u> and generation, - last session data as read from the card: - date and time of card insertion, - VRN, <u>Contracting Party</u> of registration and VU generation.
Power supply interruption (2)	- the longest event for each of the 10 last days of occurrence, - the 5 longest events over the last 365 days.	- date and time of beginning of event, - date and time of end of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - number of similar events that day.
Communication error with the remote communication facility	- the longest event for each of the 10 last days of occurrence, - the 5 longest events over the last 365 days.	- date and time of beginning of event, - date and time of end of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - number of similar events that day.
Absence of position information from GNSS receiver	- the longest event for each of the 10 last days of occurrence, - the 5 longest events over the last 365 days.	- date and time of beginning of event, - date and time of end of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - number of similar events that day.
Communication error with the external GNSS facility	- the longest event for each of the 10 last days of occurrence, - the 5 longest events over the last 365 days.	- date and time of beginning of event, - date and time of end of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - number of similar events that day.
Motion data error	- the longest event for each of the 10 last days of occurrence, - the 5 longest events over the last 365 days.	- date and time of beginning of event, - date and time of end of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - number of similar events that day.

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Vehicle motion conflict	<ul style="list-style-type: none"> - the longest event for each of the 10 last days of occurrence, - the 5 longest events over the last 365 days. 	<ul style="list-style-type: none"> - date and time of beginning of event, - date and time of end of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - number of similar events that day.
Security breach attempt	<ul style="list-style-type: none"> - the 10 most recent events per type of event. 	<ul style="list-style-type: none"> - date and time of beginning of event, - date and time of end of event (if relevant), - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - type of event.
Time conflict	<ul style="list-style-type: none"> - the longest event for each of the 10 last days of occurrence, - the 5 longest events over the last 365 days. 	<ul style="list-style-type: none"> - control device date and time - GNSS date and time, - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - number of similar events that day.

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4°) EVENT CODES AVAILABLE WITH DRIVER CONSENT

Event	Storage rules	Data to be recorded per event
Driving without an appropriate card	<ul style="list-style-type: none"> - the longest event for each of the 10 last days of occurrence, - the 5 longest events over the last 365 days. 	<ul style="list-style-type: none"> - date and time of beginning of event, - date and time of end of event, - card(s) type, number, issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the event, - number of similar events that day.
Card insertion while driving	<ul style="list-style-type: none"> - the last event for each of the 10 last days of occurrence, 	<ul style="list-style-type: none"> - date and time of the event, - card(s) type, number, issuing <u>Contracting Party</u> and generation, - number of similar events that day
Over speeding (1)	<ul style="list-style-type: none"> - the most serious event for each of the 10 last days of occurrence (i.e. the one with the highest average speed), - the 5 most serious events over the last 365 days. - the first event having occurred after the last calibration 	<ul style="list-style-type: none"> - date and time of beginning of event, - date and time of end of event, - maximum speed measured during the event, - arithmetic average speed measured during the event, - card type, number, issuing <u>Contracting Party</u> and generation of the driver card (if applicable), - number of similar events that day.

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5°) FAULT DATA CODES AVAILABLE WITHOUT DRIVER CONSENT

Fault	Storage rules	Data to be recorded per fault
Card fault	<ul style="list-style-type: none"> - the 10 most recent driver card faults. 	<ul style="list-style-type: none"> - date and time of beginning of fault, - date and time of end of fault, - card(s) type, number, issuing <u>Contracting Party</u> and generation.

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<u>Control device</u> faults	- the 10 most recent faults for each type of fault, - the first fault after the last calibration.	- date and time of beginning of fault, - date and time of end of fault, - type of fault, - card(s) type, number and issuing <u>Contracting Party</u> and generation of any card inserted at beginning and/or end of the fault.
------------------------------	--	---

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This fault shall be triggered for any of these failures, while not in calibration mode:

- VU internal fault
- Printer fault
- Display fault
- Downloading fault
- Sensor fault
- GNSS receiver or external GNSS facility fault
- Remote Communication facility fault
- ITS interface fault (if applicable)

6°) MANUFACTURER SPECIFIC EVENTS AND FAULTS WITHOUT DRIVER CONSENT

Event or Fault	Storage rules	Data to be recorded per event
To be defined by Manufacturer	To be defined by Manufacturer	To be defined by Manufacturer

ANNEX 2

SEQUENCE DIAGRAMS OF MESSAGES EXCHANGES WITH THE ITS UNIT.

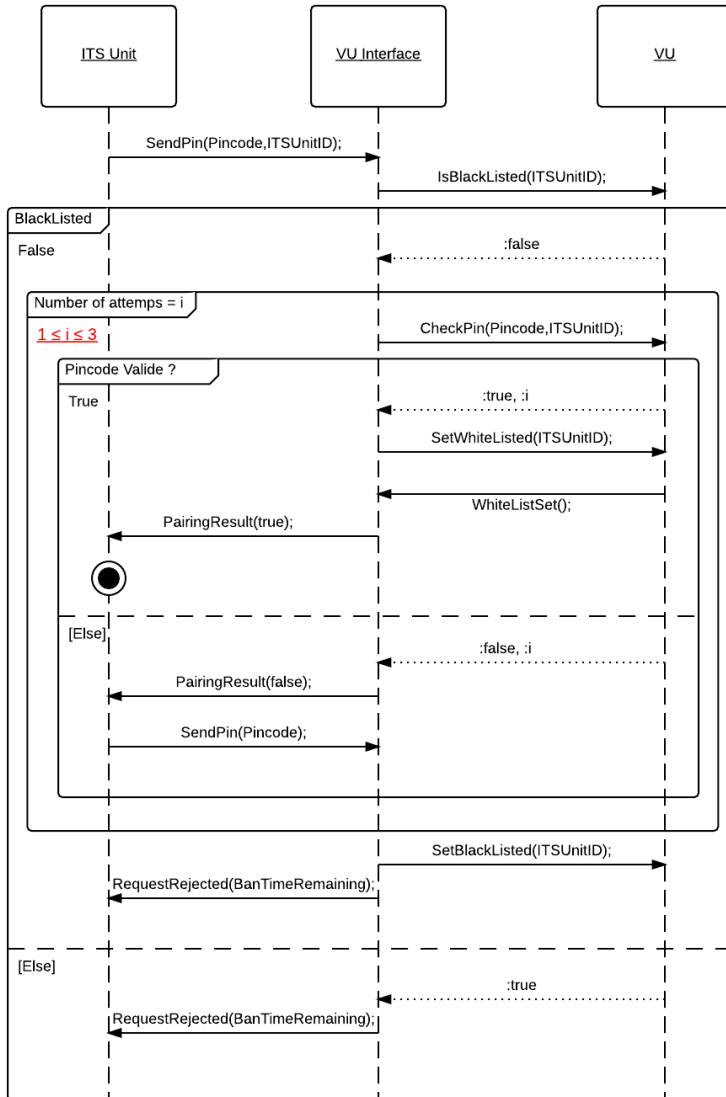


Figure 1. Sequence Diagram for PIN validation attempt

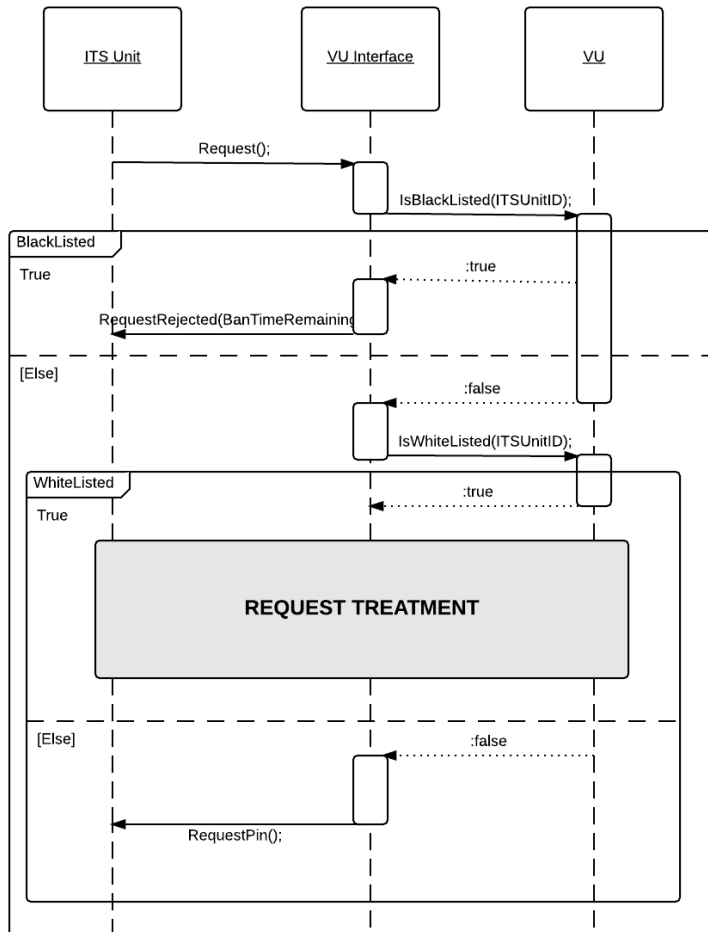


Figure 2. Sequence Diagram for ITS Unit's authorization verification

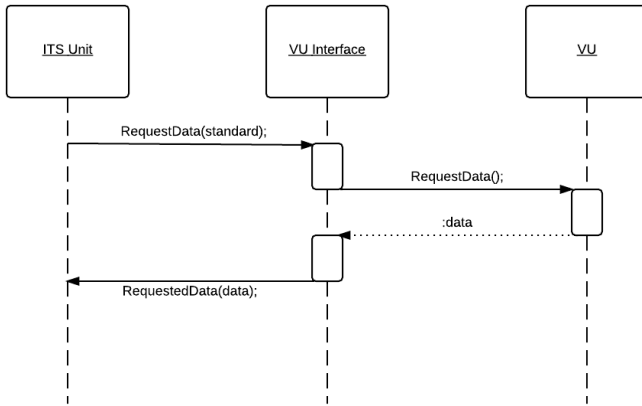


Figure 3. Sequence Diagram to process a request for data classified as non-personal (after correct PIN access)

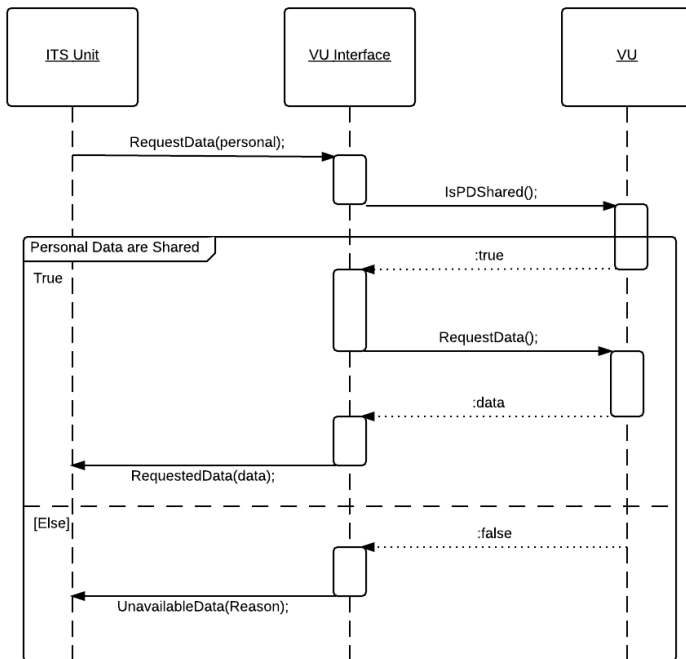


Figure 4. Sequence Diagram to process a request for data classified as personal (after correct PIN access)

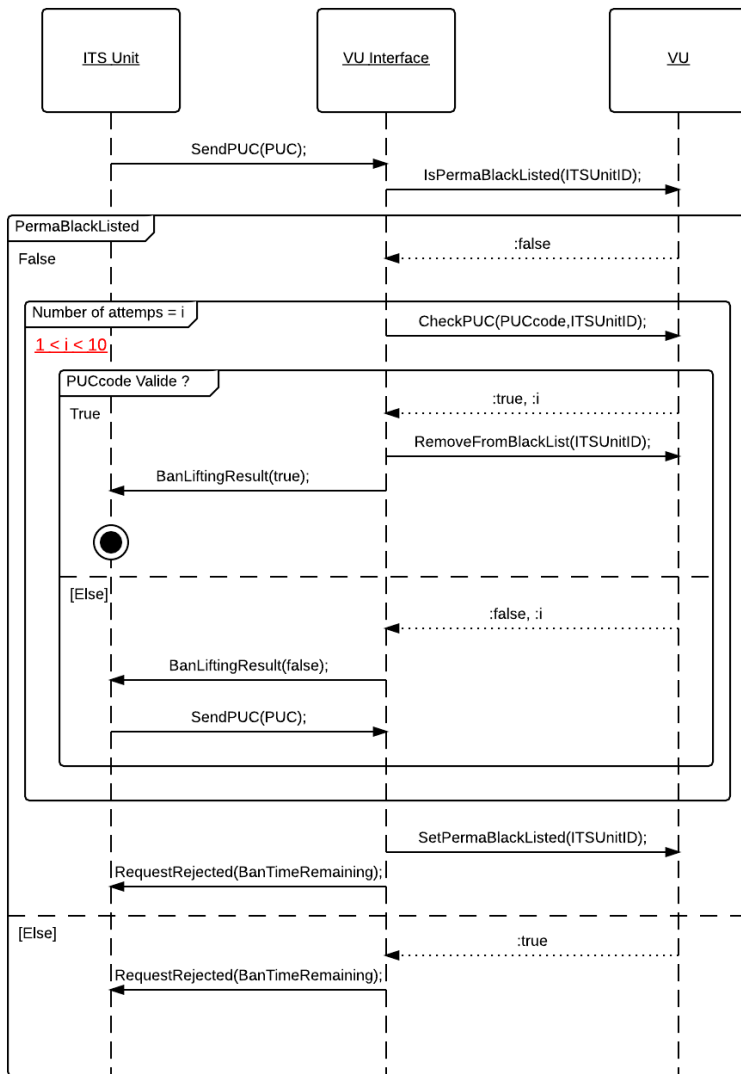


Figure 5. Sequence Diagram for PUC validation attempt

ANNEX 3

ASN.1 SPECIFICATIONS

```
1 FormatMessageModule DEFINITIONS AUTOMATIC TAGS ::= BEGIN
2 EXPORTS ;
3 IMPORTS SendPIN, SendPUC, PairingResult, RequestPIN, RequestRejected,
4     BanLiftingResult FROM PINPUCDataFieldsModule
5     RequestAccepted, RequestData, DataUnavailable FROM
6     RequestDataFieldsModule
7     SendITSID, NegativeAnswer FROM OtherDataFieldsModule;
8
9 CompleteMessage ::=SEQUENCE{
10     header Header,
11     data DataField,
12     checksum Checksum
13 }
14
15 -----
16 --HEADER TYPES--
17 -----
18
19 Header ::=SEQUENCE{
20     tgt IDList,
21     src IDList,
22     len BIT STRING (1..255)
23 }
24
25 vuID BIT STRING ::= 'EE'H
26 IDList ::=CHOICE{
27     vu BIT STRING (vuID),
28     itsUnits SEQUENCE OF BIT STRING,
29     --Default hex Value:A0, redefined after first message exchange--
30     --Each ID will be linked to the Bluetooth ID of the device--
31     ...
32 }
33
34 -----
35 --DATAFIELDS TYPES--
36 -----
37
38 DataField ::=SEQUENCE{
39     sid BIT STRING,
40     trtp BIT STRING,
41     subMBytes SubMessageBytes,
42     dataField Content,
43     ...
44 }
45
46 SubMessageBytes ::= SEQUENCE{
47     currentSubM BIT STRING,
48     totalSubM BIT STRING
49 }
50
51 Content ::= CHOICE{
52     requestPIN RequestPIN,
53     sendITSID SendITSID,
```

```
54     sendPin SendPIN,
55     pairRslt PairingResult,
56     sendPUC SendPUC,
57     banlift BanLiftingResult,
58     requestRejected RequestRejected,
59     requestData RequestData,
60     requestOK RequestAccepted,
61     dataUnavailable DataUnavailable,
62     negAns NegativeAnswer
63 }
64
65 -----
66 --CHECKSUM TYPES--
67 -----
68
69 Checksum ::= SEQUENCE{
70     --SHA2 checksum
71 }
72 END
73
```

```

74 PINPUCDataFieldsModule DEFINITIONS AUTOMATIC TAGS ::= BEGIN
75 EXPORTS SendPIN, SendPUC, PairingResult, RequestPIN, RequestRejected,
76 BanLiftingResult;
77 IMPORTS ;
78
79 -----
80 ---Utils--
81 -----
82
83 PUC ::= SEQUENCE (SIZE(8)) OF
84 INTEGER (SIZE(0..9))
85
86 PIN ::= SEQUENCE (SIZE(4)) OF
87 INTEGER (SIZE(0..9))
88
89 -----
90 --Messages From ITS Unit--
91 -----
92
93 SendPIN {PIN:pin} ::= SEQUENCE {
94     sid BIT STRING ('03'H),
95     pin PIN (pin)
96 }
97
98 SendPUC {PUC:puc} ::= SEQUENCE {
99     sid BIT STRING ('05'H),
100     puc PUC (puc)
101 }
102 -----
103 --Messages From VU--
104 -----
105
106 PairingResult ::= SEQUENCE{
107     sid BIT STRING ('04'H),
108     result BOOLEAN
109 }
110
111 RequestPIN {MType:receivedRequest} ::= SEQUENCE{
112     sid BIT STRING ('01'H)
113 }
114
115 RequestRejected ::= SEQUENCE{
116     sid BIT STRING ('07'H),
117     banTimeRemaining GeneralizedTime, --PermaBan == 1k years--}
118
119 BanLiftingResult ::= SEQUENCE{
120     sid BIT STRING ('06'H),
121     result BOOLEAN
122 }
123 END
124

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```

125 RequestDataFields DEFINITIONS AUTOMATIC TAGS ::= BEGIN
126     EXPORTS RequestAccepted,RequestData, DataUnavailable ;
127     IMPORTS StandardEvent, PersonalEvent, StandardFault FROM EventsModule;
128
129     -----
130     --From ITS Unit--
131     -----
132     RequestData ::= SEQUENCE{
133         sid BIT STRING ('08'H),
134         requestedData DataTypeCode,
135         ...
136     }
137
138     -----
139     --From VU--
140     -----
141     RequestAccepted ::=SEQUENCE{
142         sid BIT STRING ('09'H),
143         trtp DataTypeCode,
144         dataSheet CHOICE{
145             standardData StandardTachDataContent,
146             personalData PersonalTachDataContent,
147             gnss GNSSDataContent,
148             standardEvent StandardEventContent,
149             personalEvent PersonalEventContent,
150             standardFault StandardFaultContent,
151             manufacturerdata ManufacturerDataContent,
152             ...
153         }
154     }
155
156     DataTypeCode ::=CHOICE{
157         standardTachData BIT STRING ('01'H),
158         personalTachData BIT STRING ('02'H),
159         gnssData BIT STRING ('03'H),
160         standardEventData BIT STRING ('04'H),
161         personalEventData BIT STRING ('05'H),
162         standardFaultData BIT STRING ('06'H),
163         manufacturerData BIT STRING ('07'H),
164         ...
165     }
166
167     DataUnavailable ::=SEQUENCE{
168         sid BIT STRING ('0A'H),
169         trtp DataTypeCode,
170         reason UnavailableDataCodes
171     }
172
173     UnavailableDataCodes ::= CHOICE{
174         noDataAvailable BIT STRING ('10'H),
175         personalDataNotShared BIT STRING ('11'H),
176         ...
177     }
178     -----
179     --Complete Tachograph Data--
180     -----
181     --The format of the data was taken from the ISO16844-7 norm, more information
182     available in this ISO document--
183

```

```

184 Time ::= SEQUENCE{
185     seconds INTEGER (0..59.75), --increment: 0.25s--
186     minutes INTEGER (0..59), --increment: 1min--
187     hours INTEGER (0..23), --increment: 1h--
188     day INTEGER (0.25.. 31.75), --increment: 0.25d--
189     month INTEGER (1..12), --increment: 1month--
190     year INTEGER (1985..2235), --increment: 1year--
191     locMinOffset INTEGER (-59..59), --increment: 1min--
192     locHouroffset INTEGER (-23..23)--increment: 1h--
193 }
194
195 Date ::= SEQUENCE{
196     month INTEGER (1..12), --increment: 1month--
197     day INTEGER (0.25.. 31.75), --increment: 0.25d--
198     year INTEGER (1985..2235) --increment: 1year--
199 }
200
201 DriverName ::=SEQUENCE{
202     codePageSurname UTF8String, --See ISO/IEC 8859--
203     surname UTF8String,
204     codePageFirstname UTF8String, --See ISO/IEC 8859--
205     firstname UTF8String,
206 }
207
208 DriverID ::= SEQUENCE{
209     issuingMemberState OCTET STRING (SIZE(3)),
210     cardNumber OCTET STRING (SIZE(16))
211 }
212
213 -----
214 --Message Content--
215 -----
216
217 StandardTachDataContent ::= SEQUENCE{
218     trtp DataTypeCode (DataTypeCode.&standardTachData),
219     personal BOOLEAN (FALSE),
220     data StandardTachyDataSheet,
221 }
222
223 PersonalTachDataContent ::= SEQUENCE{
224     trtp DataTypeCode (DataTypeCode.&personalTachData),
225     personal BOOLEAN (TRUE),
226     data PersonalTachyDataSheet
227 }
228
229 GNSSDataContent ::= SEQUENCE{
230     trtp DataTypeCode (DataTypeCode.&gnssData),
231     personal BOOLEAN (TRUE),
232     data GNSSDataSheet
233 }
234
235 StandardEventContent ::= SEQUENCE{
236     trtp DataTypeCode (DataTypeCode.&standardEventData),
237     personal BOOLEAN (FALSE),
238     data StandardEventDataSheet
239 }
240
241 PersonalEventContent ::= SEQUENCE{
242     trtp DataTypeCode (DataTypeCode.&personalEventData),

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238         personal BOOLEAN (TRUE),
239         data PersonalEventDataSheet
240     }
241
242     StandardFaultContent ::= SEQUENCE{
243         trtp DataTypeCode (DataTypeCode.&standardFaultData),
244         personal BOOLEAN (FALSE),
245         data StandardFault
246     }
247
248     ManufacturerDataContent ::= SEQUENCE{
249         trtp DataTypeCode (DataTypeCode.&manufacturerData),
250         personal BOOLEAN (TRUE),
251         ...
252     }
253
254     -----
255     --DATA SHEETS--
256     -----
257
258     --Data sheet format follows ISO 16844-7.--
259     StandardTachyDataSheet ::= SEQUENCE{
260         vin UTF8String (SIZE(17)),
261         calibrationDate Date,
262         driveRecognize BIT STRING ('00'B UNION '01'B),
263         driverCardDriver1 BIT STRING ('00'B UNION '01'B),
264         driverCardDriver2 BIT STRING ('00'B UNION '01'B),
265         timeDate Time,
266         highResolutionTotalVehicleDistance INTEGER (0..21055406), --increment:
267 5m--
268         serviceComponentIdentification INTEGER (0..255),
269         serviceDelayCalendarTimeBased INTEGER (-125..125), --increment: 1week-
270 -
271         nextCalibrationDate Date,
272         speedAuthorised INTEGER (0..250.996), --increment 1/256km/h--
273         tachographCardSlot1 INTEGER (0..4...), --Maximum 250--
274         tachographCardSlot2 INTEGER (0..4...), --Maximum 250--
275         outOfScopeCondition BIT STRING ('00'B UNION '01'B),
276         modeOfOperation INTEGER (0..4...), --Maximum 250--
277         registeringMemberState UTF8String,         vehicleRegistrationNumber
278 SEQUENCE {
279         codePageVRN INTEGER (0..255),
280         vrn OCTET STRING (SIZE(13)),
281     },
282         tachographNextMandatoryDownloadDate Date,
283         ...
284     }
285
286     PersonalTachyDataSheet ::= SEQUENCE{
287         tachographVehicleSpeed INTEGER (0..250.996), --increment 1/256km/h--
288         driver1WorkingState BIT STRING ('000'B UNION '001'B UNION '010'B UNION
289 '011'B UNION '100'B UNION '101'B ...),
290         driver2WorkingState BIT STRING ('000'B UNION '001'B UNION '010'B UNION
291 '001'B UNION '100'B UNION '101'B ...),
292
293         driver1TimeRelatedStates BIT STRING ('0000'B UNION '0001'B UNION
294 '0010'B UNION '0011'B UNION '0100'B UNION '0101'B UNION
295 '0110'B UNION '0111'B UNION '1000'B UNION '1001'B UNION '1010'B
296 UNION '1011'B UNION '1100'B UNION '1101'B ...),

```

```

297
298
299     driver2TimeRelatedStates BIT STRING ('0000'B UNION '0001'B UNION
300     '0010'B UNION '0011'B UNION '0100'B UNION '0101'B UNION
301     '0110'B UNION '0111'B UNION '1000'B UNION '1001'B UNION '1010'B
302     UNION '1011'B UNION '1100'B UNION '1101'B ...),
303
304
305
306     overSpeed BIT STRING ('00'B UNION '01'B),
307     driver1Identification DriverID
308     driver2Identification DriverID
309
310
311     driver1ContinuousDrivingTime INTEGER (0.. 64255), --increment: 1min--
312     driver2ContinuousDrivingTime INTEGER (0.. 64255), --increment: 1min--
313     driver1CurrentDurationOfSelectedActivity INTEGER (0.. 64255), --
314 increment: 1min--
315     driver2CurrentDurationOfSelectedActivity INTEGER (0.. 64255), --
316 increment: 1min--
317     driver1Name DriverName,
318     driver2Name DriverName,
319     driver1CumulatedDrivingTimePreviousAndCurrentWeek INTEGER (0.. 64255),
320 --increment: 1min--
321     driver2CumulatedDrivingTimePreviousAndCurrentWeek INTEGER (0.. 64255),
322 --increment: 1min--
323     engineSpeed INTEGER(0..8031.875), --increment: 0,125r/min--
324     driver1EndOfLastDailyRestPeriod Time,
325     driver2EndOfLastDailyRestPeriod Time,
326     driver1EndOfLastWeeklyRestPeriod Time,
327     driver2EndOfLastWeeklyRestPeriod Time,
328     driver1EndOfSecondLastWeeklyRestPeriod Time,
329     driver2EndOfSecondLastWeeklyRestPeriod Time,
330     driver1CurrentDailyDrivingTime INTEGER (0.. 64255), --increment: 1min-
331 -
332     driver2CurrentDailyDrivingTime INTEGER (0.. 64255), --increment: 1min-
333 -
334     driver1CurrentWeeklyDrivingTime INTEGER (0.. 64255), --increment:
335 1min--
336     driver2CurrentWeeklyDrivingTime INTEGER (0.. 64255), --increment:
337 1min--
338     driver1TimeLeftUntilNewDailyRestPeriod INTEGER (0.. 64255), --
339 increment: 1min--
340     driver2TimeLeftUntilNewDailyRestPeriod INTEGER (0.. 64255), --
341 increment: 1min--
342     driver1CardExpiryDate Date,
343     driver2CardExpiryDate Date,
344     driver1CardNextMandatoryDownloadDate Date,
345     driver2CardNextMandatoryDownloadDate Date,
346     driver1TimeLeftUntilNewWeeklyRestPeriod INTEGER (0.. 64255), --
347 increment: 1min--
348     driver2TimeLeftUntilNewWeeklyRestPeriod INTEGER (0.. 64255), --
349 increment: 1min--
350     driver1NumberOfTimes9hDailyDrivingTimesExceeded INTEGER (0..13),
351     driver2NumberOfTimes9hDailyDrivingTimesExceeded INTEGER (0..13),
352     driver1CumulativeUninterruptedRestTime INTEGER (0.. 64255), --
353 increment: 1min--
354     driver2CumulativeUninterruptedRestTime INTEGER (0.. 64255), --
355 increment: 1min--

```

```

356     driver1MinimumDailyRest INTEGER (0.. 64255), --increment: 1min--
357     driver2MinimumDailyRest INTEGER (0.. 64255), --increment: 1min--
358     driver1MinimumWeeklyRest INTEGER (0.. 64255), --increment: 1min--
359     driver2MinimumWeeklyRest INTEGER (0.. 64255), --increment: 1min--
360     driver1MaximumDailyPeriod INTEGER (0..250), --increment: 1h--
361     driver2MaximumDailyPeriod INTEGER (0..250), --increment: 1h--
362     driver1MaximumDailyDrivingTime BIT STRING (SIZE(4)),
363     driver2MaximumDailyDrivingTime BIT STRING (SIZE(4)),
364     driver1NumberOfUsedReducedDailyRestPeriods INTEGER (0..13),
365     driver2NumberOfUsedReducedDailyRestPeriods INTEGER (0..13),
366     driver1RemainingCurrentDrivingTime INTEGER (0.. 64255), --increment:
367 1min--
368     driver2RemainingCurrentDrivingTime INTEGER (0.. 64255), --increment:
369 1min--
370     ...
371 }
372
373 GNSSDataSheet ::= SEQUENCE {
374     gnssPosition GeoCoordinates
375     --See Sub-appendix 1 for definition of GeoCoordinates--
376 }
377
378 StandardEventDataSheet ::= SEQUENCE{
379     events SEQUENCE OF StandardEvent
380 }
381
382 PersonalEventDataSheet ::= SEQUENCE{
383     events SEQUENCE OF PersonalEvent
384 }
385 END
386
387 EventsModule DEFINITIONS AUTOMATIC TAGS ::= BEGIN
388     EXPORTS ALL;
389     IMPORTS NationAlpha FROM Sub-appendix1; --See Sub-appendix 1 for more
390 information about NationAlpha--
391
392     SecurityBreachEvent ::=SEQUENCE{
393     --See Appendix 1B for more information--
394 }
395
396     RecordingEquipmentFaultType ::= SEQUENCE{
397     --See Appendix 1B for more information--
398 }
399
400     StandardEvent ::= CHOICE{
401         insertionInvalidCard InsertionOfANonValidCard,
402         cardConflict CardConflict,
403         timeOverlap TimeOverlap,
404         previousSessionNotClosed LastCardSessionNotCorrectlyClosed,
405         overSpeeding OverSpeeding,
406         powerSupplyInterruption PowerSupplyInterruption,
407         comErrorWithRemoteFacility
408 CommunicationErrorWithTheRemoteCommunicationFacility,
409         absenceGNSSPosition
410 AbsenceOfPositionInformationFromGNSSReceiver,
410a         comErrorWithExternalGNSSFacility
410b CommunicationErrorWithTheExternalGNSSFacility,
411         positionDataError PositionDataError,
412         motionDataError MotionDataError,

```

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418         vehicleMotionConflict VehicleMotionConflict,
419         securityBreachAttempt SecurityBreachAttempt,
420         timeConflict TimeConflict,
421         ...
422     }
423
424     PersonalEvent ::= CHOICE{
425         lackOfAppropriateCard DrivingWithoutAnAppropriateCard,
426         cardInsertionWhileDriving CardInsertionWhileDriving,
427         overSpeeding OverSpeeding,
428         ...
429     }
430
431     StandardFault ::= CHOICE{
432         cardFault CardFault,
433         recordingEquipmentFault RecordingEquipmentFault,
434         ...
435     }
436
437     -----
438     --EVENTS LIST--
439     -----
440
441     InsertionOfANonValidCard ::= SEQUENCE{
442         beginDate GeneralizedTime,
443         endDate GeneralizedTime,
444         carsdType SEQUENCE OF UTF8String,
445         cardsNumber SEQUENCE OF INTEGER,
446         issuingMemberState SEQUENCE OF NationAlpha,
447         cardsGeneration SEQUENCE OF INTEGER
448     }
449
450     CardConflict ::= SEQUENCE{
451         beginDate GeneralizedTime,
452         endDate GeneralizedTime,
453         carsdType SEQUENCE OF UTF8String,
454         cardsNumber SEQUENCE OF INTEGER,
455         issuingMemberState SEQUENCE OF NationAlpha,
456         cardsGeneration SEQUENCE OF INTEGER
457     }
458
459     TimeOverlap ::= SEQUENCE{
460         beginDate GeneralizedTime,
461         endDate GeneralizedTime,
462         carsdType SEQUENCE OF UTF8String,
463         cardsNumber SEQUENCE OF INTEGER,
464         issuingMemberState SEQUENCE OF NationAlpha,
465         cardsGeneration SEQUENCE OF INTEGER,
466         numberSimilarEvent INTEGER
467     }
468
469     DrivingWithoutAnAppropriateCard ::= SEQUENCE{
470         beginDate GeneralizedTime,
471         endDate GeneralizedTime,
472         carsdType SEQUENCE OF UTF8String,
473         cardsNumber SEQUENCE OF INTEGER,
474         issuingMemberState SEQUENCE OF NationAlpha,
475         cardsGeneration SEQUENCE OF INTEGER,
476         numberOfSimilarEvent INTEGER

```

```

477     }
478
479     CardInsertionWhileDriving ::= SEQUENCE{
480         date GeneralizedTime,
481         carsdType SEQUENCE OF UTF8String,
482         cardsNumber SEQUENCE OF INTEGER,
483         issuingMemberState SEQUENCE OF NationAlpha,
484         numberOfSimilarEvents INTEGER
485     }
486
487     LastCardSessionNotCorrectlyClosed ::=SEQUENCE{
488         beginDate GeneralizedTime,
489         endDate GeneralizedTime,
490         carsdType SEQUENCE OF UTF8String,
491         cardsNumber SEQUENCE OF INTEGER,
492         issuingMemberState SEQUENCE OF NationAlpha,
493         cardsGeneration SEQUENCE OF INTEGER,
494         oldSession SEQUENCE{
495             beginDate GeneralizedTime,
496             endDate GeneralizedTime,
497             vrn UTF8String,
498             issuingMemberState NationAlpha,
499             cardsGeneration INTEGER,
500         }
501     }
502
503     OverSpeeding ::=SEQUENCE{
504         beginDate GeneralizedTime,
505         endDate GeneralizedTime,
506         maximumSpeed INTEGER,
507         averageSpeed INTEGER,
508         cardType UTF8String,
509         cardNumber INTEGER,
510         issuingMemberState NationAlpha,
511         cardGeneration INTEGER,
512         numberOfSimilarEvents INTEGER
513     }
514
515     PowerSupplyInterruption ::=SEQUENCE{
516         beginDate GeneralizedTime,
517         endDate GeneralizedTime,
518         carsdType SEQUENCE OF UTF8String,
519         cardsNumber SEQUENCE OF INTEGER,
520         issuingMemberState SEQUENCE OF NationAlpha,
521         cardsGeneration SEQUENCE OF INTEGER,
522         numberOfSimilarEvent INTEGER
523     }
524
525     CommunicationErrorWithTheRemoteCommunicationFacility ::=SEQUENCE{
526         beginDate GeneralizedTime,
527         endDate GeneralizedTime,
528         carsdType SEQUENCE OF UTF8String,
529         cardsNumber SEQUENCE OF INTEGER,
530         issuingMemberState SEQUENCE OF NationAlpha,
531         cardsGeneration SEQUENCE OF INTEGER,
532         numberOfSimilarEvent INTEGER
533     }
534
535     AbsenceOfPositionInformationFromGNSSReceiver ::= SEQUENCE{

```

```

536         beginDate GeneralizedTime,
537         endDate GeneralizedTime,
538         carsdType SEQUENCE OF UTF8String,
539         cardsNumber SEQUENCE OF INTEGER,
540         issuingMemberState SEQUENCE OF NationAlpha,
541         cardsGeneration SEQUENCE OF INTEGER,
542         numberOfSimilarEvent INTEGER
543     }
544
539a CommunicationErrorWithTheExternalGNSSFacility ::= SEQUENCE{
539b     beginDate GeneralizedTime,
539c     endDate GeneralizedTime,
539d     carsdType SEQUENCE OF UTF8String,
539e     cardsNumber SEQUENCE OF INTEGER,
539f     issuingMemberState SEQUENCE OF NationAlpha,
539g     cardsGeneration SEQUENCE OF INTEGER,
539h     numberOfSimilarEvent INTEGER
539i }
539j
545 PositionDataError ::= SEQUENCE{
546     beginDate GeneralizedTime,
547     endDate GeneralizedTime,
548     carsdType SEQUENCE OF UTF8String,
549     cardsNumber SEQUENCE OF INTEGER,
550     issuingMemberState SEQUENCE OF NationAlpha,
551     cardsGeneration SEQUENCE OF INTEGER,
552     numberOfSimilarEvent INTEGER
553 }
554
555 MotionDataError ::= SEQUENCE{
556     beginDate GeneralizedTime,
557     endDate GeneralizedTime,
558     carsdType SEQUENCE OF UTF8String,
559     cardsNumber SEQUENCE OF INTEGER,
560     issuingMemberState SEQUENCE OF NationAlpha,
561     cardsGeneration SEQUENCE OF INTEGER,
562     numberOfSimilarEvent INTEGER
563 }
564
565 VehicleMotionConflict ::= SEQUENCE{
566     beginDate GeneralizedTime,
567     endDate GeneralizedTime,
568     carsdType SEQUENCE OF UTF8String,
569     cardsNumber SEQUENCE OF INTEGER,
570     issuingMemberState SEQUENCE OF NationAlpha,
571     cardsGeneration SEQUENCE OF INTEGER,
572     numberOfSimilarEvent INTEGER
573 }
574
575 SecurityBreachAttempt ::= SEQUENCE{
576     beginDate GeneralizedTime,
577     endDate GeneralizedTime OPTIONAL,
578     carsdType SEQUENCE OF UTF8String,
579     cardsNumber SEQUENCE OF INTEGER,
580     issuingMemberState SEQUENCE OF NationAlpha,
581     numberOfSimilarEvent INTEGER,
582     typeOfEvent SecurityBreachEvent
583 }
584

```



```

585
586 TimeConflict ::= SEQUENCE{
587     beginDate GeneralizedTime,
588     endDate GeneralizedTime,
589     carsdType SEQUENCE OF UTF8String,
590     cardsNumber SEQUENCE OF INTEGER,
591     issuingMemberState SEQUENCE OF NationAlpha,
592     cardsGeneration SEQUENCE OF INTEGER,
593     numberOfSimilarEvent INTEGER
594 }
595
596 -----
597 --FAULTS LIST--
598 -----
599
600 CardFault ::= SEQUENCE{
601     beginDate GeneralizedTime,
602     endDate GeneralizedTime,
603     carsdType SEQUENCE OF UTF8String,
604     cardsNumber SEQUENCE OF INTEGER,
605     issuingMemberState SEQUENCE OF NationAlpha,
606     cardsGeneration SEQUENCE OF INTEGER,
607 }
608
609 RecordingEquipmentFault ::= SEQUENCE{
610     beginDate GeneralizedTime,
611     endDate GeneralizedTime,
612     faultType RecordingEquipmentFaultType,
613     carsdType SEQUENCE OF UTF8String,
614     cardsNumber SEQUENCE OF INTEGER,
615     issuingMemberState SEQUENCE OF NationAlpha,
616     cardsGeneration SEQUENCE OF INTEGER,
617 }
618 END

```