

Austrian HGV Tolling System

EETS DSRC Transaction for Tolling and Enforcement

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Abbreviations and Glossary

Abbreviation, Term	Description
AID	DSRC-Application Entity Identifier
AttrID	Attribute Identifier
AuKey_Iss	(Issuer) Authentication Key
BST	Beacon Service Table
CI	Contract Issuer = Toll Service Provider (TSP) = EETS Provider
DSRC	Dedicated Short Range Communication
EFC	Electronic Fee Collection
EID	Element Identifier
EP	EETS Provider
FCS	Frame Check Sequence
HGV	Heavy Goods Vehicle
HMI	Human-Machine Interface
HV	Heavy Vehicle (> 3.5 tons)
IID	Invoker Identifier
KeyRef_CI	Key reference for TSP- (CI-) authenticator key
KeyRef_OP	Key reference for TC- (OP-) authenticator key
L1	Layer 1 of DSRC (Physical Layer)
L2	Layer 2 of DSRC (Data Link Layer)
L7	Layer 7 of DSRC (Application Layer)
LID	Link Identifier
LLC	Logical Link Control
LPN	Licence Plate Number
MAC	Medium Access Control
MMI	Man Machine Interface
OBE	On-Board Equipment
OBU	On-Board Unit

PDU	Protocol Data Unit
RSE	Roadside Equipment
TC	Toll Charger
TSP	Toll Service Provider = Contract Issuer (CI) = EETS Provider
UI	User Interface (= MMI)
VST	Vehicle Service Table

References

All references are listed in Annex A - References of this document. For dated references, subsequent amendments to or revisions of any of these publications apply only when incorporated in it by amendment or revision. For undated references, the latest edition of the referenced publication applies.

1 General

1.1 Purpose of the document

This specification provides the definition for the DSRC transactions used in EETS context according to [IAP].

This specification applies for post-pay transactions for communication between OBE and tolling RSE and in case of multilane free flow systems for combined tolling and enforcement RSE.

In general, the transaction is based on the “pick what you like” idea, meaning it is up to the Toll Charger which attribute must be read to allow correct charging. This chapter gives an exemplary definition of the DSRC transactions, between the EETS-OBE and the RSE.

The table below provides an overview of the attributes involved in the data exchanges of DSRC transactions associated with the EETS-OBE.

ATTRIBUTES (EID>0)	AttrID	Tolling & enforcement	Enforcement only	Passage transaction
EFC Context Mark	0	X	X	X
VehicleLicencePlateNumber	16	X	X	X
VehicleClass	17	X	X	X
VehicleDimensions	18	*)	*)	*)
VehicleAxles	19	X	X	X
VehicleWeightLimits	20	*)	*)	*)
VehicleSpecificCharacteristics	22	X	X	X
EquipmentOBUID	24	X	X	X
EquipmentStatus	26	X		X
PaymentMeans (including PAN)	32	X	X	X
ReceiptData1	33	X	X	X
ReceiptData2	34	X	X	

Table 1: Overview of attributes involved in data exchanges of DSRC transactions associated with the EETS-OBE

*) Attributes 18 and 20 are currently not used within the ASFINAG toll domain, so these attributes are not mentioned in this exemplary description.

1.2 EETS Tolling and enforcement transaction

A tolling and enforcement transaction is performed for the purpose of charging and, if applicable, enforcing the due tolling fee.

The following table shows an example for such a transaction. A dedicated implementation has to be tailored to the toll chargers needs.

Phase	Roadside Equipment		On-board unit	Remarks
<i>Initialisation</i>	INITIALISATION.request (BST)	→		RSE periodically sends BST.
<i>(BST – VST)</i>		←	INITIALISATION.response (VST) <ul style="list-style-type: none"> EFC-ContextMark AC_CR-KeyReference RndOBE 	A newly arrived OBE answers with VST. According to the information in the VST, the RSE decides whether the OBE/Contract is acceptable or not. If not the presentation phase is not started.
<i>Presentation</i>	GET_STAMPED.request AC_CR <ul style="list-style-type: none"> PaymentMeans, including PersonalAccountNumber (RndRSE, KeyRef_OP) GET.request <ul style="list-style-type: none"> EquipmentOBUId ReceiptData1 EquipmentStatus Vehicle data: <ul style="list-style-type: none"> VehicleClass VehicleAxles VehicleSpecificCharacteristics 	→		Read PaymentMeans (including Personal Account Number) and request the OBE to calculate the operator authenticator. Read data that serves as a basis for calculating the fee (i.e. VehicleClass, VehicleAxles, VehicleSpecificCharacteristics) and data for diagnostics, auditing and controlling (i.e. EquipmentOBUId, ReceiptData1, EquipmentStatus). The Attribute VehicleLicencePlateNumber is read out in the Receipt Phase in order to provide a better distribution of data in uplink frames between the Presentation and the Receipt Phases.
		←	GET_STAMPED.response <ul style="list-style-type: none"> Authenticator (Auth_OP) GET.response	OBE responds with the requested data, plus the Operator Authenticator computed over Payment Means (including Personal Account Number).
<i>Receipt</i>	GET_STAMPED.request AC_CR <ul style="list-style-type: none"> PaymentMeans, including PersonalAccountNumber (RndRSE, KeyRef_CI) GET.request AC_CR <ul style="list-style-type: none"> Vehicle data: <ul style="list-style-type: none"> VehicleLicencePlateNumber SET.request AC_CR <ul style="list-style-type: none"> ReceiptData1 ReceiptData2 EquipmentStatus SET_MMI.request	→		Read Payment Means (including Personal Account Number) and request the OBE to calculate an authenticator for the TSP. Write new receipt (or entry ticket) to ReceiptData1. Copy old receipt to ReceiptData2. Write new status information and increment transaction counter. Signal the transaction's result via the OBE's HMI: OK, Warning or NOK
		←	GET_STAMPED.response <ul style="list-style-type: none"> Authenticator (Auth_CI) GET.response SET.response SET_MMI.response	OBE responds with the requested data, plus the authenticator for the TSP computed over Payment Means (including Personal Account Number).
<i>Tracking</i>	ECHO.request	→		Track OBE by exchanging dummy information. The usage of Echo is optional, at the discretion of the RSE, and may be repeated (used e.g. at enforcement equipment in multilane free flow systems).
<i>And</i>		←	ECHO.response	
<i>Closing</i>	EVENT_REPORT.request (Release)	→		RSE closes transaction and releases OBE.

1.3 EETS Enforcement only transaction

An enforcement transaction is performed for enforcement purposes only, for example by mobile enforcement equipment.

Phase	Roadside Equipment		On-board unit	Remarks
<i>Initialisation</i> (BST – VST)	INITIALISATION.request (BST)	→		RSE sends BST.
		←	INITIALISATION.response (VST)	OBE answers with VST. According to the information in the VST, the RSE decides whether the OBE/Contract is acceptable or not. If not the presentation phase is not started.
<i>Presentation 1</i>	GET.request AC_CR <ul style="list-style-type: none"> • EquipmentOBUID • EquipmentStatus (transaction counter) • Vehicle data: <ul style="list-style-type: none"> - VehicleLicencePlateNumber - VehicleClass - VehicleAxles - VehicleSpecificCharacteristics 	→		Read data that serves as a basis for calculating the fee (i.e. VehicleClass, VehicleAxles, VehicleSpecificCharacteristics) and data for diagnostics, auditing and controlling (i.e. VehicleLicencePlateNumber, EquipmentOBUID, EquipmentStatus).
		←	GET.response	OBE responds with the requested data.
<i>Presentation 2</i>	GET.request AC_CR ReceiptData1 ReceiptData2	→		Read additional data for controlling (i.e. ReceiptData1, ReceiptData2).
		←	GET.response	OBE responds with the requested data.
<i>Closing</i>	EVENT_REPORT.request (Release)	→		RSE closes transaction and releases OBE.

1.4 EETS Passage transaction

A passage transaction is performed at tolling and enforcement stations for light vehicle distance based tolling sections in the ASFINAG toll domain. It is based on the EETS Tolling and enforcement transaction but does not perform tolling for HGV.

Phase	Roadside Equipment		On-board unit	Remarks
<i>Initialisation</i> (BST – VST)	INITIALISATION.request (BST)	→		RSE periodically sends BST.
		←	INITIALISATION.response (VST) <ul style="list-style-type: none"> • EFC-ContextMark • AC_CR-KeyReference • RndOBE 	A newly arrived OBE answers with VST. According to the information in the VST, the RSE decides whether the OBE/Contract is acceptable or not. If not the presentation phase is not started.
<i>Presentation</i>	GET_STAMPED.request AC_CR <ul style="list-style-type: none"> • PaymentMeans, including PersonalAccountNumber (RndRSE, KeyRef_OP) GET.request <ul style="list-style-type: none"> • EquipmentOBUID • ReceiptData1 • EquipmentStatus • Vehicle data: <ul style="list-style-type: none"> - VehicleClass - VehicleAxles - VehicleSpecificCharacteristics 	→		Read PaymentMeans (including Personal Account Number) and request the OBE to calculate the operator authenticator. Read data that serves for diagnostics and auditing (i.e. EquipmentOBUID, ReceiptData1, EquipmentStatus, VehicleClass, VehicleAxles, VehicleSpecificCharacteristics). The Attribute VehicleLicencePlateNumber is read out in the Receipt Phase in order to provide a better distribution of data in uplink frames between the Presentation and the Receipt Phases.
		←	GET_STAMPED.response <ul style="list-style-type: none"> • Authenticator (Auth_OP) GET.response	OBE responds with the requested data, plus the Operator Authenticator computed over Payment Means (including Personal Account Number).

Phase	Roadside Equipment		On-board unit	Remarks
<i>Receipt</i>	GET_STAMPED.request AC_CR <ul style="list-style-type: none"> PaymentMeans, including PersonalAccountNumber (RndRSE, KeyRef_CI) GET.request AC_CR <ul style="list-style-type: none"> Vehicle data: <ul style="list-style-type: none"> VehicleLicencePlateNumber 	→		Read Payment Means (including Personal Account Number) and request the OBE to calculate an authenticator for the TSP.
		←	GET_STAMPED.response <ul style="list-style-type: none"> Authenticator (Auth_CI) GET.response	OBE responds with the requested data, plus the authenticator for the TSP computed over Payment Means (including Personal Account Number).
<i>Tracking</i>	ECHO.request	→		Track OBE by exchanging dummy information. The usage of Echo is optional, at the discretion of the RSE, and may be repeated (used e.g. at enforcement equipment in multilane free flow systems).
<i>And</i>		←	ECHO.response	
<i>Closing</i>	EVENT_REPORT.request (Release)	→		RSE closes transaction and releases OBE.

1.5 Security features

The EETS DSRC transaction comprises the following security features:

- **Transaction counter**, increased by the RSE, allowing detection of transaction sequencing anomalies in the central system.
- **Authentication to the EETS Provider (Contract Issuer)**, i.e. challenge-response of PaymentMeans data using the GET_STAMPED function with the CI Key.
- **Authentication to the Toll Charger**, i.e. challenge-response of PaymentMeans data using the GET_STAMPED function with the Operator Key.
- **Protected access** to the OBE's data, through the implementation of Access Credentials (Security level 1 according to [IAP]).

1.6 Data specification

The data definition (attribute data) is given in the document [EETS_data].

2 EETS Tolling and enforcement transaction

2.1 Decision flow

Each time the RSE receives a VST from an OBE it analyses the attribute EFC-ContextMark and optionally the data elements EquipmentClass and ManufacturerID in order to decide which application to use. If those elements correspond to one of the entries in the RSE's Contract Issuer List the RSE will proceed with the associated application to perform a

suitable transaction. In case of an EETS-OBE the Tolling and Enforcement Transaction has to apply.

If the VST contains a list of (more than one) EFC-ContextMark, the first entry that can be matched with an entry in the Contract Issuer List of the RSE will be used.

Access Credentials are used in the further transaction steps in the ASFINAG toll domain, i.e. security level 1.

The first GET_STAMPED.request is performed with the suitable authenticator key for the toll charger (operator) authentication as listed in the Contract Issuer List for that EFC-ContextMark.

Note: The SET_MMI command is used with a container type compliant to the OBE, which can be controlled by an appropriate entry in the Contract Issuer List. According to [EFC API] container type 69 (decimal) shall be used.

If the PaymentMeans.ExpiryDate is older than the RSE's current station date, the OBE shall be handled like an OBE with invalid PaymentMeans (SET_MMI.request: 4 beep code, transaction not clearable).

If the 15th bit of EquipmentStatus (meaning the Blacklist-Bit) is set to 1 the OBE shall be handled as a "blacklisted OBE", if the Contract Issuer List indicates to do so (SET_MMI.request: 4 beep code, transaction not clearable).

The second GET_STAMPED.request is performed with the suitable authenticator key for the toll service provider (contract issuer) authentication as listed in the Contract Issuer List for that EFC-ContextMark.

The RndRSE number is the same for both GET_STAMPED.request.

2.2 Bit level specification

The specification is valid for the complete frame content (excluding the zero-bit insertions) of the data exchanged, including protocol information related to DSRC-L1, -L2 and -L7, in order to ensure unambiguity.

Note: This bit-level specification has been written with the following constraints:
EquipmentOBUID with length 4+1 Byte and VehicleLicencePlateNumber with length 13 Byte (LPN with 10 characters – minimal length). The bit-level changes accordingly, when

these attributes have different length (see [EETS_data]). As the transaction according to [IAP] is based on the idea to read only attribute data needed for the tolling functionality in the specific tolling context, the following tables are only representing examples.

In the following tables, lines for octets only present or valid for security level 1 (Access credentials) are marked by grey colour and numbered (most left column) by letters (A, B, C,).

2.2.1 Initialization

2.2.1.1 Initialization request (BST)

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Broadcast \$	1111 1111	Link address for broadcast
3	MAC control field	1010 0000	The frame contains a command LPDU
4	LLC control field	0000 0011	UI command
5	Fragmentation header	1xxx x001	No fragmentation. PDU # shall never be set to 0000 ₂ or 0001 ₂ .
6	BST SEQUENCE {	1000	INITIALISATION.request
	OPTION indicator	0	NonmandApplications not present.
7	BeaconId.ManufacturerId INTEGER (0..65535)	000	Manufacturer identifier: 1 (=Kapsch). See [AVI No register] for value assignment.
8		0000 0000	
9		0000 1	
10	BeaconId.IndividualId INTEGER (0..134217727)	000	27 bit ID available for manufacturer. Example: Id=1052
11		0000 0000	
12		0000 0100	
13		0001 1100	
12	Time INTEGER (0..4294967295)	0100 0001	32 bit UNIX System Time, the number of seconds passed since 1st January 1970, 00:00 (UTC). Example: 1103790512 ₁₀
13		1100 1010	
14		1000 0001	
15		1011 0000	
16	Profile INTEGER (0..127,...)	0000 0000	Profile (p=0 ₁₀ : 1,5 MHz sub-carrier, p=1 ₁₀ : 2,0 MHz sub-carrier). Example: No extension, Profile 0
17	MandApplications SEQUENCE (0..127,..) OF {	0000 0001	No extension, Number of mandApplications= 1
18	OPTION indicator	0	EID not present
	OPTION indicator	0	Parameter not present
	AID_DSRCApplicationEntityID }	00 0001	No extension. AID = 1 ₁₀ =EFC
19	ProfileList SEQUENCE (0..127,..) OF Profile }	0000 0000	No extension, number of profiles in list = 0.
20	FCS	xxxx xxxx	Frame check sequence
21		xxxx xxxx	
22	FLAG	0111 1110	End Flag

2.2.1.2 Private window request

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	0110 0000	Private window request
7	FCS	xxxx xxxx	Frame check sequence
8		xxxx xxxx	
9	FLAG	0111 1110	End Flag

2.2.1.3 Private window allocation

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	0010 s000	Private window allocation
7	FCS	xxxx xxxx	Frame check sequence
8		xxxx xxxx	
9	FLAG	0111 1110	End Flag

2.2.1.4 Initialization response (VST)

Note: The present VST is an example of a VST containing only one application and EFC-ContextMark. VSTs with more EFC-ContextMarks (within the L2 frame length limit) shall also be correctly interpreted by the RSE.

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description	
1	FLAG	0111 1110	Start Flag	
2	Private LID	xxxx xxx0	Link address of a specific OBE	
3		xxxx xxx0		
4		xxxx xxx0		
5		xxxx xxx1		
6	MAC control field	1100 0000	The frame contains a command LPDU	
7	LLC control field	0000 0011	UI command	
8	Fragmentation header	1xxx x001	No fragmentation. PDU # shall never be set to 0000 ₂ or 0001 ₂ .	
9	VST	SEQUENCE {	INITIALISATION.response	
	Fill	BIT STRING (SIZE(4))		0000
10	Profile	INTEGER (0..127,...)	0000 0000	No extension, profile p. Example : 0 ₁₀
11	Applications	SEQUENCE (0..127,...) OF {	0000 0001	No extension, 1 application
12	OPTION indicator		1	EID present
	OPTION indicator		1	Parameter present
	AID	DSRCApplicationEntityID	00 0001	No extension, AID = 1 (EFC)
13	EID		0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
14	Parameter	CONTAINER {	0000 0010	Choice 2 ₁₀ = Octet string
15			0000 0110	No extension, octet string length = 6 ₁₀
16	EFC-ContextMark	SEQUENCE {		
	ContractProvider	SEQUENCE {		
	CountryCode	BIT STRING (SIZE(10))	0111 0100	As Specified in [EETS_data]
17			01	
	IssuerIdentifier	INTEGER (0..16383) }	00 0000	As Specified in [EETS_data]
18			0000 0001	
19	TypeOfContract	OCTET STRING (SIZE(2))	0000 0011	Type of contract. As Specified in [EETS_data]
20			0000 0000	
21	ContextVersion	INTEGER (0..127,...) }	0000 0001	No extension, context version. As Specified in [EETS_data]
A	CONTAINER {		0000 0010	No extension, Container Choice = 2 ₁₀ , Octet string
B	OCTET STRING		0000 0010	No extension, octet string length = 2 ₁₀
C	AC_CR-Reference	SEQUENCE {		AC_CR-Reference to, consisting of AC_CR-MasterKeyRef and AC_CR-Diversifier, used for the computation of AC_CRKey and AC_CR.
D	AC-MasterKeyRef	Int1	0000 0001	
E	AC_CR-Diversifier	Int1	0000 0001	
F	CONTAINER {		0000 0010	No extension, Container Choice = 2 ₁₀ , Octet string
G			0000 0100	No extension, octet string length = 4 ₁₀
H	RndOBE	Int4	0000 0000	Random Number (nonce) used together with AC_CRKey to calculate AC_CR. Example : 640 ₁₀
I			0000 0010	
J			1000 0000	
22	ObeConfiguration	SEQUENCE {		
	OPTION indicator		1	ObeStatus present
	EquipmentClass	INTEGER (0..32767)	000 0000	Example : 3 ₁₀
23			0000 0011	
24	ManufacturerId	INTEGER (0..65535)	0000 0000	Manufacturer identifier. See [AVI No register]
25			0000 0001	for value assignment. Kapsch = 1 ₁₀ .
26	ObeStatus	INTEGER (0..65535)	0000 0011	Example : 768 ₁₀
27			0000 0000	

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
28	FCS	xxxx xxxx	Frame check sequence
29		xxxx xxxx	
30	FLAG	0111 1110	End Flag

2.2.2 Presentation

2.2.2.1 Presentation request

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	1010 s000	The frame contains a command LPDU
7	LLC control field	n111 0111	Polled ACn command, n bit
8	Fragmentation header	1xxx x001	No fragmentation. First service of chain.
9	GET_STAMPED.request SEQUENCE {	0000 0101	ACTION.request (GET Stamped, AccessCredential not present, ActionParameter present, IID not present and Reply expected) or alternatively:
		0000 1101	ACTION.request (GET Stamped, AccessCredentials, ActionParameter present, IID not present and Reply expected)
10	EID	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
11	ActionType	0000 0000	No extension, GET_STAMPED.request = 0
A	AccessCredential	0000 0100	No extension, octet string length = 4 ₁₀
B	AC_CR	0000 0100	Access credential calculated by RSE using RndOBE and the
C		1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D		1111 1000	04 94 F8 97'H
E		1001 0111	
12	ActionParameter	0001 0001	No extension, Choice 17 ₁₀ = GetStampedRq
13	AttributeldList SEQUENCE (0..127,...) OF {	0000 0001	No extension, number of attribute IDs = 1
	INTEGER (0..127,...) Attributeld		
14	PaymentMeans	0010 0000	Attributeld = 32 ₁₀ = PaymentMeans
15	Nonce	0000 0100	No extension, octet string length = 4 ₁₀
16	RndRSE	rrrr rrrr	Random number from RSE, containing SessionTime, needed to calculate the Authenticator
17		rrrr rrrr	
18		rrrr rrrr	
19		rrrr rrrr	
20	KeyRef	0111 0011	KeyRef_OP (e.g. =115 ₁₀)
21	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as before (concatenation).
22	GET.request SEQUENCE {	0110	GET.request
	OPTION indicator	0	AccessCredential not present or alternatively:
		1	AccessCredential present
	OPTION indicator	0	IID not present
	OPTION indicator	1	AttributeldList present
	Fill BIT STRING(SIZE(1))	0	Set to 0
23	EID	0000 0101	Uniquely associated with a context mark in the OBE. Example : 5 ₁₀
A	AccessCredential	0000 0100	No extension, octet string length = 4 ₁₀
B	AC_CR	0000 0100	Access credential calculated by RSE using RndOBE and the
C		1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D		1111 1000	04 94 F8 97'H
E		1001 0111	
24	AttributeldList SEQUENCE (0..127,...) OF {		
	INTEGER (0..127,...) Attributeld {	0000 0110	No extension, number of attribute Ids = 6 ₁₀
25	VehicleClass	0001 0001	Attributeld = 17 ₁₀ = VehicleClass
26	VehicleAxles	0001 0011	Attributeld = 19 ₁₀ = VehicleAxles
27	VehicleSpecificCharacteristics	0001 0110	Attributeld = 22 ₁₀ = VehicleSpecificCharacteristics
28	EquipmentOBUID	0001 1000	Attributeld = 24 ₁₀ = EquipmentOBUID
29	EquipmentStatus	0001 1010	Attributeld = 26 ₁₀ = EquipmentStatus
30	ReceiptData1	0010 0001	Attributeld = 33 ₁₀ = ReceiptData1
31	FCS	xxxx xxxx	Frame check sequence
32		xxxx xxxx	
33	FLAG	0111 1110	End Flag

2.2.2.2 Presentation response

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	1101 0000	The frame contains a response LPDU
7	LLC control field	n111 0111	Response available, Acn command n bit
8	LLC status field	0000 0000	Response available and command accepted
9	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.
10	GET_STAMPED.response SEQUENCE {	0001 0100	ACTION.response (Get Stamped rs)
11	EID INTEGER (0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
12	ResponseParameter CONTAINER {	0001 0010	No extension. Choice 18 ₁₀ = GetStampedRs
13	AttributeList SEQUENCE (0..127,...) OF {	0000 0001	No extension, number of attributes: 1
14	Attributes SEQUENCE { AttributeId	0010 0000	PaymentMeans = 32 ₁₀
15	AttributeValue CONTAINER {	0100 0000	Container Choice: 64 ₁₀ = PaymentMeans
16	PersonalAccountNumber	xxxx xxxx	PersonalAccountNumber
17		xxxx xxxx	
18		xxxx xxxx	
19		xxxx xxxx	
20		xxxx xxxx	
21		xxxx xxxx	
22		xxxx xxxx	
23		xxxx xxxx	
24		xxxx xxxx	
25		xxxx xxxx	
26	PaymentMeansExpiryDate	0001 1110	DateCompact. Example : 2005-03-01
27		0110 0001	
28	PaymentMeansUsageControl	0000 0000	Example : Not specified 0 ₁₀
29	}	0000 0000	
30	Authenticator OCTET STRING {	0000 0100	No extension, octet string size = 4 ₁₀
31	Authenticator	xxxx xxxx	Authenticator over AttributeList (containing PaymentMeans) and RndRSE (containing SessionTime) calculated using AuKey
32		xxxx xxxx	
33		xxxx xxxx	
34		xxxx xxxx	
35	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.
36	GET.response SEQUENCE	0111 0100	GET.response
37	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
38	AttributeList SEQUENCE (0..127,...) OF {	0000 0110	No extension, 6 attributes in list.
39	AttributeId INTEGER(0..127,...)	0001 0001	AttributeId = 17 ₁₀ = VehicleClass
40	Attribute Value CONTAINER {	0011 0001	Container choice = 49 ₁₀
41	VehicleClass }	1000 1001	VehicleClass Trailer present, CCC=000, class 3 (HV with 4 axles).
42	AttributeId INTEGER(0..127,...)	0001 0011	AttributeId = 19 ₁₀ = VehicleAxles
43	Attribute Value CONTAINER {	0011 0011	Container choice = 51 ₁₀
44	VehicleAxles	0000 0000	VehicleAxles value. Example: vehicle first axle height = not specified, tyre type = not specified, 3 axles (without trailer).
45		0000 0011	
46	AttributeId INTEGER(0..127,...)	0001 0110	AttributeId = 22 ₁₀ = VehicleSpecificCharacteristics
47	Attribute Value CONTAINER {	0011 0110	Container choice = 54 ₁₀
48	EnvironmentalCharacteristics(Euro type, Cop type)	0000	Example : no entry = 0
49	EngineCharacteristics	0000 0000	Example : no entry = 0
50	DescriptiveCharacteristics	0000 0000	Example : no entry = 0
51	FutureCharacteristics	0000 0000	Example : no entry = 0
52	AttributeId INTEGER(0..127,...)	0001 1000	AttributeId = 24 ₁₀ = EquipmentOBUId
53	Attribute Value CONTAINER {	0011 1000	Container choice = 56 ₁₀
54	Equipment OBU Id	0000 0100	OCTET STRING. Example: Kapsch's format (length indicator = 4, manufacturing year = 03, manufacturing month = 05, Serial number = 640)
55		0000 0011	
56		0000 0101	
57		0000 0010	
58		1000 0000	
59	AttributeId INTEGER(0..127,...)	0001 1010	AttributeId = 26 ₁₀ = EquipmentStatus
60	Attribute Value CONTAINER {	0011 1010	Container choice = 58 ₁₀
61	EquipmentStatus	0000 0000	EquipmentStatus (transaction counter). Example : Local use = Not specified = 0 ; transaction counter = 58.
62	}	0011 1010	
63	AttributeId INTEGER(0..127,...)	0010 0001	AttributeId = 33 ₁₀ = ReceiptData1
64	Attribute Value CONTAINER {	0100 0001	Container choice = 65 ₁₀
65	ReceiptData1	0001 1010	ReceiptData1.SessionTime. Example : 2003-03-01, 21:12:10
66		0110 0001	
67		1010 1001	
68		1000 0101	

Octet#	Attribute / Field	Bits in Octet b ₇ b ₀	Description
69		xxxx xxxx	ReceiptData1.SessionServiceProvider
70		xxxx xxxx	
71		xxxx xxxx	
72		xxxx xxxx	ReceiptData1.StationLocation
73		xxxx xxxx	
74		1000 0111	
75	xxxx xxxx	ReceiptData1.SessionType	
76	xxxx xxxx	ReceiptData1.SessionResult	
77	xxxx xxxx	ReceiptData1.SessionTariffClass	
78	xxxx xxxx	ReceiptData1.ClaimedClass	
79		xxxx xxxx	ReceiptData1.SessionFee
80		xxxx xxxx	
81		xxxx xxxx	
82		xxxx xxxx	
83		1100 0000	ReceiptData1.SessionServiceProvider (from EFC-ContextMark). Example: Austria, 1 ₁₀ , ASFINAG
84		0100 0000	
85		0000 0001	
86		0000 0011	ReceiptData1.SessionType of contract (from EFC-ContextMark). Example = 3 ₁₀
87		0000 0000	
89		0000 0000	ReceiptData1.SessionContext version (from EFC-ContextMark).
90		xxxx xxxx	ReceiptData1.SessionAuthenticator
91		xxxx xxxx	
92		xxxx xxxx	
93		xxxx xxxx	
94	FCS	xxxx xxxx	Frame check sequence
95		xxxx xxxx	
96	FLAG	0111 1110	End Flag

2.2.3 Receipt

2.2.3.1 Set receipt request

Octet#	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	1010 s000	The frame contains a command LPDU
7	LLC control field	n111 0111	Polled ACn command, n bit
8	Fragmentation header	1xxx x001	No fragmentation. First service of chain.
9	GET_STAMPED.request SEQUENCE {	0000 0101	ACTION.request (GET Stamped, AccessCredential not present, ActionParameter present, IID not present and Reply expected) or alternatively: ACTION.request (GET Stamped, AccessCredentials, ActionParameter present, IID not present and Reply expected)
		0000 1101	
10	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example : 5 ₁₀
11	ActionType INTEGER(0..127,...)	0000 0000	No extension, GET_STAMPED.request = 0
A	AccessCredential OCTET STRING { AC_CR	0000 0100	No extension, octet string length = 4 ₁₀
B		0000 0100	Access credential calculated by RSE using RndOBE and the
C		1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D		1111 1000	04 94 F8 97H
E		1001 0111	
12	ActionParameter CONTAINER {	0001 0001	No extension, Choice 17 ₁₀ = GetStampedRq
13	AttributeIdList SEQUENCE (0..127,...) OF { INTEGER (0..127,...) AttributeId {	0000 0001	No extension, number of attribute IDs = 1
14	PaymentMeans } }	0010 0000	AttributeId = 32 ₁₀ = PaymentMeans
15	Nonce OCTET STRING {	0000 0100	No extension, octet string length = 4 ₁₀
16	RndRSE	rrrr rrrr	Random number from RSE, containing SessionTime, needed to calculate the Authenticator
17		rrrr rrrr	
18		rrrr rrrr	
19		rrrr rrrr	
20	KeyRef } }	0110 1111	KeyRef CI (e.g. =111 ₁₀)
21	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as before (concatenation).

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Octet#	Attribute / Field	Bits in Octet b ₇ b ₀	Description
22	GET.request SEQUENCE {	0110	GET.request
	OPTION indicator	0	AccessCredential not present or alternatively:
		1	AccessCredential present
	OPTION indicator	0	IID not present
	OPTION indicator	1	AttributeldList present
	Fill BIT STRING(SIZE(1))	0	Set to 0
23	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
A	AccessCredential OCTET STRING {	0000 0100	No extension, octet string length = 4 ₁₀
B	AC_CR	0000 0100	Access credential calculated by RSE using RndOBE and the
C		1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D		1111 1000	04 94 F8 97'H
E		1001 0111	
24	AttributeldList SEQUENCE (0..127,...) OF {		
	INTEGER (0..127,...) Attributeld {	0000 0001	No extension, number of attribute lds = 1 ₁₀
25	VehicleLicencePlateNumber } }	0001 0000	Attributeld = 16 ₁₀ = VehicleLicencePlateNr
26	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as before (concatenation).
27	SET.request SEQUENCE {	0100 0001	SET.request (No AccessCredential, no IID, fill, reply expected) or
		0100 1001	alternatively: SET.request (AccessCredential, no IID, fill, reply expected)
28	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
A	AccessCredential OCTET STRING {	0000 0100	No extension, octet string length = 4 ₁₀
B	AC_CR	0000 0100	Access credential calculated by RSE using RndOBE and the
C		1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D		1111 1000	04 94 F8 97'H
E		1001 0111	
29	AttributeList SEQUENCE ((0..127,...) OF {		
	Attributes SEQUENCE {	0000 0011	No extension, number of attributes in list = 3 ₁₀
30	Attributeld INTEGER (0..127,...)	0001 1010	Attributeld = 26 ₁₀ = EquipmentStatus
31	Attribute Value CONTAINER {	0011 1010	Container choice = 58 ₁₀
32	EquipmentStatus	0000 0000	EquipmentStatus (transaction counter). Example : Local use =
33		0011 1011	Not specified =0 ; transaction counter = 59 (58 + 1).
34	Attributeld INTEGER(0..127,...)	0010 0001	Attributeld = 33 ₁₀ = ReceiptData1
35	Attribute Value CONTAINER {	0100 0001	Container choice = 65 ₁₀
36	ReceiptData1	xxxx xxxx	ReceiptData1.SessionTime
37		xxxx xxxx	
38		xxxx xxxx	
39		xxxx xxxx	
40	ReceiptData1.SessionServiceProvider	xxxx xxxx	
41		xxxx xxxx	
42		xxxx xxxx	
43	ReceiptData1.StationLocation	xxxx xxxx	
44		xxxx xxxx	
45	ReceiptData1.SessionLocation.	xxxx xxxx	
46	ReceiptData1.SessionType	xxxx xxxx	
47	ReceiptData1.SessionResult	xxxx xxxx	
48	ReceiptData1.SessionTariffClass	xxxx xxxx	
49	ReceiptData1.ClaimedClass	xxxx xxxx	
50	ReceiptData1.SessionFee	xxxx xxxx	
51		xxxx xxxx	
52		xxxx xxxx	
53		xxxx xxxx	
54	ReceiptData1.SessionContractProvider	xxxx xxxx	
55		xxxx xxxx	
56		xxxx xxxx	
57	ReceiptData1.SessionTypeOfContract	xxxx xxxx	
58		xxxx xxxx	
59	ReceiptData1.SessionContextVersion	xxxx xxxx	
60	ReceiptData1.Authenticator	xxxx xxxx	
61		xxxx xxxx	
62		xxxx xxxx	
63		xxxx xxxx	
64	Attributeld INTEGER (0..127,...)	0010 0010	Attributeld = 34 ₁₀ = ReceiptData2
65	Attribute Value CONTAINER {	0100 0010	Container choice = 66 ₁₀
66	ReceiptData2	xxxx xxxx	ReceiptData2. Same format as ReceiptData1
67		xxxx xxxx	
68		xxxx xxxx	
69		xxxx xxxx	
70		xxxx xxxx	
71		xxxx xxxx	
72		xxxx xxxx	
73		xxxx xxxx	
74		xxxx xxxx	
75		xxxx xxxx	
76		xxxx xxxx	
77		xxxx xxxx	
78		xxxx xxxx	
79		xxxx xxxx	
80		xxxx xxxx	
81		xxxx xxxx	
82		xxxx xxxx	
83		xxxx xxxx	
84		xxxx xxxx	
85		xxxx xxxx	
86		xxxx xxxx	
87		xxxx xxxx	
88		xxxx xxxx	
89		xxxx xxxx	
90		xxxx xxxx	
91		xxxx xxxx	
92		xxxx xxxx	
93		xxxx xxxx	
94	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as before (concatenation).
95	SET_MMI.request SEQUENCE {	0000 0101	ACTION.request (no AccCred, ActionPar, no IID, confirmed, reply)
96	EID INTEGER(0..127,...)	0000 0000	No extension, EID = 0 (system element)
97	ActionType INTEGER(0..127,...)	0000 1010	No extension, SET_MMI.request = 10 ₁₀
98	ActionParameter CONTAINER	xxxx xxxx	No extension, Use Type 69 (preferred) or Type 0 depending on setting in issuer list at RSE
99	SetMMI INTEGER }	0000 0000	Example : ok (0 ₁₀)

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
100	FCS	xxxx xxxx	Frame check sequence
101		xxxx xxxx	
102	FLAG	0111 1110	End Flag

2.2.3.2 Set receipt response

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	1101 0000	The frame contains a response LPDU
7	LLC control field	n111 0111	Acn command n bit
8	LLC status field	0000 0000	Response available and command accepted
9	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.
10	GET_STAMPED.response SEQUENCE {	0001 0100	ACTION.response (Get Stamped rs)
11	EID INTEGER (0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
12	ResponseParameter CONTAINER {	0001 0010	No extension. Choice 18 ₁₀ = GetStampedRs
13	AttributeList SEQUENCE (0..127,...) OF {	0000 0001	No extension, number of attributes: 1
14	Attributes SEQUENCE { AttributeId	0010 0000	PaymentMeans = 32 ₁₀
15	AttributeValue CONTAINER {	0100 0000	Container Choice: 64 ₁₀ = PaymentMeans
16	PersonalAccountNumber	xxxx xxxx	PersonalAccountNumber
17		xxxx xxxx	
18		xxxx xxxx	
19		xxxx xxxx	
20		xxxx xxxx	
21		xxxx xxxx	
22		xxxx xxxx	
23		xxxx xxxx	
24		xxxx xxxx	
25		xxxx xxxx	
26	PaymentMeansExpiryDate	0001 1110	DateCompact. Example : 2005-03-01
27		0110 0001	
28	PaymentMeansUsageControl	0000 0000	Example : Not specified 0 ₁₀
29		0000 0000	
30	Authenticator OCTET STRING {	0000 0100	No extension, octet string size = 4 ₁₀
31	Authenticator	xxxx xxxx	Authenticator over AttributeList (containing PaymentMeans) and RndRSE (containing SessionTime) calculated using AuKey
32		xxxx xxxx	
33		xxxx xxxx	
34		xxxx xxxx	
35	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.
36	GET.response SEQUENCE	0111 0100	GET.response
37	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
38	AttributeList SEQUENCE (0..127,...) OF {	0000 0001	No extension, 1 attributes in list.
39	AttributeId INTEGER (0..127,...)	0001 0000	AttributeId = 16 ₁₀ = VehicleLicencePlateNo
40	Attribute Value CONTAINER {	0010 1111	Container choice = 47 ₁₀
41	Vehlpn {SEQUENCE countryCode, AlphabetIndicator, LicencePlateNumber	1010 0100	VehicleLicencePlateNumber. Example : Country: SE, 00 0000 alphabet indicator no 1 length indicator = 10 chars OCD560, padded with 4 'NUL'-characters
42		00	
43		00 0000	
44		0000 1010	
45		0100 1111	
46		0100 0011	
47		0100 0100	
48		0011 0101	
49		0011 0110	
50		0011 0000	
51		0000 0000	
52		0000 0000	
53		0000 0000	
54	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.
55	SET.response SEQUENCE {	0101	SET.response
	OPTION indicator	0	IID not present
	OPTION indicator	0	ReturnStatus not present
	Fill BIT STRING (SIZE(2))	00	Set to 0
56	EID INTEGER (0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
57	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.
58	ACTION.response SEQUENCE {	0001	SET_MMI.response

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
	OPTION indicator	0	IID not present
	OPTION indicator	0	ResponseParameter not present
	OPTION indicator	0	ReturnStatus not present
	Fill	0	Set to 0
59	EID INTEGER (0..127,...)	0000 0000	No extension, System Element EID = 0
60	FCS	xxxx xxxx	Frame check sequence
61		xxxx xxxx	
62	FLAG	0111 1110	End Flag

2.2.4 Tracking and closing

2.2.4.1 Tracking request (Echo.request)

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6		MAC control field	
7	LLC control field	n111 0111	Polled ACn command n bit
8	Fragmentation header	1xxx x001	No fragmentation.
9	ECHO.request SEQUENCE {	0000	ACTION.request
	OPTION indicator	0	No Access Credentials
	OPTION indicator	1	ActionParameter present
	OPTION indicator	0	IID not present
	Mode	1	Reply expected
10	EID	0000 0000	No extension, EID = 0
11	ActionType	0000 1111	No extension, ECHO.request = 15
12	ActionParameter	0000 0010	No extension, Choice 2 ₁₀ = Octet string
13	}	0000 0000	No extension. String length = 0 octets
14	FCS	xxxx xxxx	Frame check sequence
15		xxxx xxxx	
16	FLAG	0111 1110	End Flag

2.2.4.2 Tracking response (Echo.response)

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6		MAC control field	
7	LLC control field	n111 0111	ACn command n bit
8	LLC status field	0000 0000	Response available and command accepted
9	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.
10	ECHO.response SEQUENCE {	0000	ACTION.response
	OPTION indicator	0	No IID
	OPTION indicator	1	ResponseParameter present
	OPTION indicator	0	ReturnStatus not present
	FILL	1	Set to 0.
11	EID	0000 0000	No extension, EID = 0
12	ResponseParameter	0000 0010	No extension, Choice 2 ₁₀ = Octet string
13	}	0000 0000	No extension. String length = 0 octets
14	FCS	xxxx xxxx	Frame check sequence
15		xxxx xxxx	

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
16	FLAG	0111 1110	End Flag

2.2.4.3 Closing

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	1000 0000	The frame contains a command LPDU
7	LLC control field	0000 0011	UI command
8	Fragmentation header	1xxx x001	No fragmentation.
9	RELEASE.request SEQUENCE {	0010	EVENT_REPORT.request
	OPTION indicator	0	AccessCredential not present
	OPTION indicator	0	EventParameter not present
	OPTION indicator	0	IID not present
	Mode BOOLEAN	0	No reply expected
10	EID INTEGER (0..127,...)	0000 0000	No extension, EID = 0 (system element)
11	EventType INTEGER (0..127,...) }	0000 0000	No extension, RELEASE = 0.
12	FCS	xxxx xxxx	Frame check sequence
13		xxxx xxxx	
14	FLAG	0111 1110	End Flag

3 EETS Enforcement only transaction

The EETS enforcement only transaction will be used by dedicated enforcement equipment where no tolling functionality is needed, for example by mobile enforcement equipment. In contrast to the combined “tolling and enforcement transaction”, only a subset of attributes and the receipt data are read.

3.1 Bit-level specification

3.1.1 Initialization

The Initialization Phase is the same as for the EETS Tolling and Enforcement Transaction, see chapter 2.2.1.

3.1.2 Presentation 1

Similar to the Presentation Phase for the EETS Tolling and Enforcement Transaction, but only a subset of data is read-out.

3.1.2.1 Presentation 1 request

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description	
1	FLAG	0111 1110	Start Flag	
2	Private LID	xxxx xxx0	Link address of a specific OBE	
3		xxxx xxx0		
4		xxxx xxx0		
5		xxxx xxx1		
6	MAC control field	1010 s000	The frame contains a command LPDU	
7	LLC control field	n111 0111	Polled ACn command, n bit	
8	Fragmentation header	1xxx x001	No fragmentation. First service of chain.	
9	GET.request	SEQUENCE {	0110	GET.request
	OPTION indicator		0	AccessCredential not present or alternatively:
			1	AccessCredential present
	OPTION indicator		0	IID not present
	OPTION indicator		1	AttributeldList present
	Fill	BIT STRING(SIZE(1))	0	Set to 0
10	EID	INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
A	AccessCredential	OCTET STRING {	0000 0100	No extension, octet string length = 4 ₁₀
B	AC_CR		0000 0100	Access credential calculated by RSE using RndOBE and the
C			1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D			1111 1000	04 94 F8 97'H
E			1001 0111	
	AttributeldList	SEQUENCE (0..127,...) OF {		
11		INTEGER (0..127,...) Attributeld {	0000 0110	No extension, number of attribute Ids = 6 ₁₀
12	VehicleLicencePlateNumber		0001 0000	Attributeld = 16 ₁₀ = VehicleLicencePlateNr
13	VehicleClass		0001 0001	Attributeld = 17 ₁₀ = VehicleClass
14	VehicleAxles		0001 0011	Attributeld = 19 ₁₀ = VehicleAxles
15	VehicleSpecificCharacteristics		0001 0110	Attributeld = 22 ₁₀ = VehicleSpecificCharacteristics
16	EquipmentOBUId		0001 1000	Attributeld = 24 ₁₀ = EquipmentOBUId
17	EquipmentStatus	} } }	0001 1010	Attributeld = 26 ₁₀ = EquipmentStatus
18	FCS		xxxx xxxx	Frame check sequence
19			xxxx xxxx	
20	FLAG		0111 1110	End Flag

3.1.2.2 Presentation 1 response

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description	
1	FLAG	0111 1110	Start Flag	
2	Private LID	xxxx xxx0	Link address of a specific OBE	
3		xxxx xxx0		
4		xxxx xxx0		
5		xxxx xxx1		
6	MAC control field	1101 0000	The frame contains a response LPDU	
7	LLC control field	n111 0111	Response available, Acn command n bit	
8	LLC status field	0000 0000	Response available and command accepted	
9	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.	
10	GET.response	SEQUENCE	0111 0100	GET.response
11	EID	INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
12	AttributeldList	SEQUENCE (0..127,...) OF {	0000 0111	No extension, 7 attributes in list.
13	Attributeld	INTEGER(0..127,...)	0001 0000	Attributeld = 16 ₁₀ = VehicleLicencePlateNo
14	Attribute Value	CONTAINER {	0010 1111	Container choice = 47 ₁₀
15	Vehlpn { AlphabetIndicator, LicencePlateNumber	SEQUENCE countryCode,	1010 0100	VehicleLicencePlateNumber. Example : Country: SE,
16			00	
			00 0000	alphabet indicator no 1
17			0000 1010	length indicator = 10 ₁₀ chars
18			0100 1111	OCD560, padded with 4 'NUL'-characters
19			0100 0011	
20			0100 0100	
21			0011 0101	
22			0011 0110	
23			0011 0000	
24			0000 0000	
25			0000 0000	
26			0000 0000	
27		0000 0000		
28	Attributeld	INTEGER(0..127,...)	0001 0001	Attributeld = 17 ₁₀ = VehicleClass
29	Attribute Value	CONTAINER {	0011 0001	Container choice = 49 ₁₀

Octet#	Attribute / Field	Bits in Octet b ₇ b ₀	Description
30	VehicleClass }	1000 1001	VehicleClass Trailer present, CCC=000, class 3 (HV with 4 axles).
31	AttributeId INTEGER (0..127,...)	0001 0011	AttributeId = 19 ₁₀ = VehicleAxles
32	Attribute Value CONTAINER {	0011 0011	Container choice = 51 ₁₀
33	VehicleAxles	0000 0000	VehicleAxles value. Example: vehicle first axle height = not
34		0000 0011	specified, tyre type = not specified, 3 axles (without trailer).
35	AttributeId INTEGER (0..127,...)	0001 0110	AttributeId = 22 ₁₀ = VehicleSpecificCharacteristics
36	Attribute Value CONTAINER {	0011 0110	Container choice = 54 ₁₀
37	EnvironmentalCharacteristics (Euro type, Cop type)	0000	Example : no entry = 0
38	EngineCharacteristics	0000 0000	Example : no entry = 0
39	DescriptiveCharacteristics	0000 0000	Example : no entry = 0
40	FutureCharacteristics	0000 0000	Example : no entry = 0
41	AttributeId INTEGER (0..127,...)	0001 1000	AttributeId = 24 ₁₀ = EquipmentOBUId
42	Attribute Value CONTAINER {	0011 1000	Container choice = 56 ₁₀
43	Equipment OBU Id	0000 0100	OCTET STRING. Example: Kapsch's format (length indicator = 4,
44		0000 0011	manufacturing year = 03, manufacturing month = 05,
45		0000 0101	Serial number = 640)
46		0000 0010	
47		1000 0000	
48	AttributeId INTEGER(0..127,...)	0001 1010	AttributeId = 26 ₁₀ = EquipmentStatus
49	Attribute Value CONTAINER {	0011 1010	Container choice = 58 ₁₀
50	EquipmentStatus	0000 0000	EquipmentStatus (transaction counter). Example : Local use =
51		0011 1010	Not specified =0 ; transaction counter = 58.
52	FCS	Xxxx xxxx	Frame check sequence
53		xxxx xxxx	
54	FLAG	0111 1110	End Flag

3.1.3 Presentation 2

Similar to the Presentation Phase for the EETS Tolling and Enforcement Transaction, but only receipts are read-out.

3.1.3.1 Presentation 2 request

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	1010 s000	The frame contains a command LPDU
7	LLC control field	n111 0111	Polled ACn command, n bit
8	Fragmentation header	1xxx x001	No fragmentation. First service of chain.
9	GET.request SEQUENCE {	0110	GET.request
	OPTION indicator	0	AccessCredential not present or alternatively:
		1	AccessCredential present
	OPTION indicator	0	IID not present
	OPTION indicator	1	AttributeIdList present
	Fill BIT STRING(SIZE(1))	0	Set to 0
10	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
A	AccessCredential OCTET STRING {	0000 0100	No extension, octet string length = 4 ₁₀
B	AC_CR	0000 0100	Access credential calculated by RSE using RndOBE and the
C		1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D		1111 1000	04 94 F8 97'H
E		1001 0111	
	AttributeIdList SEQUENCE (0..127,...) OF {		
11	INTEGER (0..127,...) AttributeId {	0000 0010	No extension, number of attribute Ids = 2 ₁₀
12	ReceiptData1	0010 0001	AttributeId = 33 ₁₀ = ReceiptData1
13	ReceiptData2 } } }	0010 0010	AttributeId = 34 ₁₀ = ReceiptData1
14	FCS	xxxx xxxx	Frame check sequence
15		xxxx xxxx	
16	FLAG	0111 1110	End Flag

3.1.3.2 Presentation 2 response

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description	
1	FLAG	0111 1110	Start Flag	
2	Private LID	xxxx xxx0	Link address of a specific OBE	
3		xxxx xxx0		
4		xxxx xxx0		
5		xxxx xxx1		
6	MAC control field	1101 0000	The frame contains a response LPDU	
7	LLC control field	n111 0111	Response available, Acn command n bit	
8	LLC status field	0000 0000	Response available and command accepted	
9	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as in the corresponding request.	
10	GET.response SEQUENCE	0111 0100	GET.response	
11	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀	
12	AttributeList SEQUENCE (0..127,...) OF {	0000 0010	No extension, 2 attributes in list.	
13	AttributeId INTEGER(0..127,...)	0010 0001	AttributeId = 33 ₁₀ = ReceiptData1	
14	Attribute Value CONTAINER {	0100 0001	Container choice = 65 ₁₀	
15	ReceiptData1	0001 1010	ReceiptData1.SessionTime. Example : 2003-03-01, 21:12:10	
16		0110 0001		
17		1010 1001		
18		1000 0101		
19		xxxx xxxx		ReceiptData1.SessionServiceProvider
20		xxxx xxxx		
21		xxxx xxxx		
22		xxxx xxxx		ReceiptData1.StationLocation
23	xxxx xxxx			
24	1000 0111	ReceiptData1.SessionLocation. Example: Ascending kilometrage and passage station type.		
25	xxxx xxxx	ReceiptData1.SessionType		
26	xxxx xxxx	ReceiptData1.SessionResult		
27	xxxx xxxx	ReceiptData1.SessionTariffClass		
28	xxxx xxxx	ReceiptData1.ClaimedClass		
29	xxxx xxxx	ReceiptData1.SessionFee		
30	xxxx xxxx			
31	xxxx xxxx			
32	xxxx xxxx			
33	1100 0000		ReceiptData1.SessionServiceProvider. Example: Austria, 1 ₁₀ (ASFINAG)	
34	0100 0000			
35	0000 0001	Type of contract. Example : HGV post pay contract = 3 ₁₀		
36	0000 0011			
37	0000 0000			
38	0000 0000	Security key version 0,version 1.0 of the Austrian HGV transaction		
39	}	xxxx xxxx	ReceiptData1.Authenticator	
40		xxxx xxxx		
41		xxxx xxxx		
42		Xxxx xxxx		
43	AttributeId INTEGER (0..127,...)	0010 0010	AttributeId = 34 ₁₀ = ReceiptData2	
44	Attribute Value CONTAINER {	0100 0010	Container choice = 66 ₁₀	
45	ReceiptData2	xxxx xxxx	ReceiptData2. Same format as ReceiptData1	
....			
72	}	xxxx xxxx		
73	FCS	xxxx xxxx	Frame check sequence	
74		xxxx xxxx		
75	FLAG	0111 1110	End Flag	

3.1.4 Closing

The closing phase is the same as for the EETS Tolling and Enforcement Transaction, see chapter 2.2.4.3.

4 EETS Passage transaction

A passage transaction is performed at tolling and enforcement stations for light vehicle distance based tolling sections in the ASFINAG toll domain. It is based on the EETS Tolling and enforcement transaction but does not perform tolling for HGV.

4.1 Bit-level specification

4.1.1 Initialization

The Initialization Phase is the same as for the EETS Tolling and Enforcement Transaction, see chapter 2.2.1.

4.1.2 Presentation

The Presentation Phase is the same as for the EETS Tolling and Enforcement Transaction, see chapter 2.2.2

4.1.3 Receipt

4.1.3.1 Receipt request

Octet #	Attribute / Field	Bits in Octet b ₇ b ₀	Description
1	FLAG	0111 1110	Start Flag
2	Private LID	xxxx xxx0	Link address of a specific OBE
3		xxxx xxx0	
4		xxxx xxx0	
5		xxxx xxx1	
6	MAC control field	1010 s000	The frame contains a command LPDU
7	LLC control field	n111 0111	Polled ACn command, n bit
8	Fragmentation header	1xxx x001	No fragmentation. First service of chain.
9	GET_STAMPED.request SEQUENCE {	0000 0101 0000 1101	ACTION.request (GET Stamped, AccessCredential not present, ActionParameter present, IID not present and Reply expected) or alternatively: ACTION.request (GET Stamped, AccessCredentials, ActionParameter present, IID not present and Reply expected)
10	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example : 5 ₁₀
11	ActionType INTEGER(0..127,...)	0000 0000	No extension, GET_STAMPED.request = 0
A	AccessCredential OCTET STRING { AC_CR	0000 0100	No extension, octet string length = 4 ₁₀
B		0000 0100	Access credential calculated by RSE using RndOBE and the
C		1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D		1111 1000	04 94 F8 97'H
E		1001 0111	
12	ActionParameter CONTAINER {	0001 0001	No extension, Choice 17 ₁₀ = GetStampedRq
13	AttributeIdList SEQUENCE (0..127,...) OF { INTEGER (0..127,...) AttributeId {	0000 0001	No extension, number of attribute IDs = 1
14	PaymentMeans } }	0010 0000	AttributeId = 32 ₁₀ = PaymentMeans
15	Nonce OCTET STRING {	0000 0100	No extension, octet string length = 4 ₁₀
16	RndRSE	rrrr rrrr	Random number from RSE, containing SessionTime, needed to calculate the Authenticator
17		rrrr rrrr	
18		rrrr rrrr	
19		rrrr rrrr	
20	KeyRef } }	0111 0110	KeyRef_CI (e.g. =111 ₁₀)

Octet#	Attribute / Field	Bits in Octet b ₇ b ₀	Description
21	Fragmentation header	1xxx x001	No fragmentation. Same PDU # as before (concatenation).
22	GET.request SEQUENCE {	0110	GET.request
	OPTION indicator	0	AccessCredential not present or alternatively:
		1	AccessCredential present
	OPTION indicator	0	IID not present
	OPTION indicator	1	AttributeIdList present
	Fill BIT STRING(SIZE(1))	0	Set to 0
23	EID INTEGER(0..127,...)	0000 0101	Uniquely associated with a context mark in the OBE. Example 5 ₁₀
A	AccessCredential OCTET STRING {	0000 0100	No extension, octet string length = 4 ₁₀
B	AC_CR	0000 0100	Access credential calculated by RSE using RndOBE and the
C		1001 0100	Access Credential Key AC_CRKey. Example: AC_CR(0) =
D		1111 1000	04 94 F8 97'H
E		1001 0111	
24	AttributeIdList SEQUENCE (0..127,...) OF {		
	INTEGER (0..127,...) AttributeId {	0000 0001	No extension, number of attribute Ids = 1 ₁₀
25	VehicleLicencePlateNumber } } }	0001 0000	AttributeId = 16 ₁₀ = VehicleLicencePlateNr
26	FCS	xxxx xxxx	Frame check sequence
27		xxxx xxxx	
28	FLAG	0111 1110	End Flag

4.1.4 Closing

The closing phase is the same as for the EETS Tolling and Enforcement Transaction, see chapter 2.2.4.3.

5 Annex A - References

Reference	Document Ref	Date / Version	Document title
[EETS_acc]			EETS Acceptance Procedures
[EETS_DSRC]			EETS-DSRC Transaction for Tolling and Enforcement (this document)
[EETS_data]			EETS DSRC Data Specification
[EETS_OBE-req]			EETS-OBE Requirements Specification
[IAP]	EN 15509	2014	Road Traffic and Transport Telematics (RTTT) – Electronic Fee Collection – Interoperability application profile for DSRC
[EFC API]	EN ISO 14906:2018/ Amd1:2020	2018/ Amd1:2020	Road Traffic and Transport Telematics (RTTT) – Electronic Fee Collection – Application interface definition for dedicated short range communication
[GSS]	GSS	V3.2:2003	Global Specification for Short Range Communication (Kapsch TrafficCom AB, Kapsch Telecom GmbH, Thales e-Transactions CGA SA, version 3.2, 2003- 08, http://profesores.elo.utfsm.cl/~agv/elo326/1s06/ETC/GSS_32.pdf , link valid at 01.04.2021)
[L1]	EN 12253	2004	Road Transport and Traffic Telematics (RTTT) – Dedicated Short-Range Communication (DSRC) – Physical layer using microwave at 5.8 GHz
[L2]	EN 12795	2003	Road Transport and Traffic Telematics (RTTT) – Dedicated Short-Range Communication (DSRC) – DSRC data link layer: Medium access and logical link control

Reference	Document Ref	Date / Version	Document title
[L7]	EN 12834 (ISO 15628)	2003	Road Transport and Traffic Telematics (RTTT) – Dedicated Short-Range Communication (DSRC) – Application Layer
[Profiles]	EN 13372	2004	Road Transport and Traffic Telematics (RTTT) – Dedicated Short-Range Communication (DSRC) – Profiles for RTTT applications
[AVI No]	EN ISO 14816	2005	Road Traffic and Transport Telematics (RTTT) – Automatic Vehicle and Equipment Identification – Numbering and Data Structures
[AVI No register]			https://www.itsstandards.eu/registries/ , link valid at 01.04.2021