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*Changes to legislation: There are currently no known outstanding effects for the Council Regulation (EEC) No 3821/85, Division 2.. (See end of Document for details)*

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Council Regulation (EEC) No 3821/85 of 20 December  
1985 on recording equipment in road transport

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## [<sup>F1</sup>]<sup>F2</sup>ANNEX I B

### REQUIREMENTS FOR CONSTRUCTION, TESTING, INSTALLATION AND INSPECTION

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#### Textual Amendments

- F1** Inserted by Council Regulation (EC) No 2135/98 of 24 September 1998 amending Regulation (EEC) No 3821/85 on recording equipment in road transport and Directive 88/599/EEC concerning the application of Regulations (EEC) No 3820/85 and (EEC) No 3821/85.
- F2** Substituted by Commission Regulation (EC) No 1360/2002 of 13 June 2002 adapting for the seventh time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport (Text with EEA relevance).

## Appendix 7

### DATA DOWNLOADING PROTOCOLS

#### 2. VU DATA DOWNLOADING

##### 2.1. Download procedure

In order to carry on a VU data download, the operator must perform the following operations:

- insert his tachograph card inside a card slot of the VU<sup>(1)</sup>,
- connect the IDE to the VU download connector,
- establish the connection between the IDE and the VU,
- select on the IDE the data to download and send the request to the VU,
- close the download session.

##### 2.2. Data download protocol

The protocol is structured on a master-slave basis, with the IDE playing the master role and the VU playing the slave role.

The message structure, types and flow are principally based on the Keyword Protocol 2000 (KWP) (ISO 14230-2 Road vehicles — Diagnostic systems — Keyword protocol 2000 — Part 2: Data link layer).

The application layer is principally based on the current draft to date of ISO 14229-1 (Road vehicles — Diagnostic systems — Part 1: Diagnostic services, version 6 of 22 February 2001).

##### 2.2.1. Message structure

All the messages exchanged between the IDE and the VU are formatted with a structure consisting of three parts:

- header composed by a format byte (FMT), a target byte (TGT), a source byte (SRC) and possibly a length byte (LEN),
- data field composed by a service identifier byte (SID) and a variable number of data bytes, which can include an optional diagnostic session byte (DS\_) or an optional transfer parameter byte (TRTP or TREP).
- checksum composed by a checksum byte (CS).

Header				Data field					Checksum
FMT	TGT	SRC	LEN	SID	DATA	...	...	...	CS
4 bytes				Max 225 bytes					1 byte

The TGT and SRC byte represent the physical address of the recipient and originator of the message. Values are F0 Hex for the IDE and EE Hex for the VU.

The LEN byte is the length of the data field part.

The checksum byte is the 8 bit sum series modulo 256 of all the bytes of the message excluding the CS itself.

FMT, SID, DS\_, TRTP and TREP bytes are defined later in this document.

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In the case where the data to be carried by the message is longer than the space available in the data field part, the message is actually sent in several submessages. Each submessage bears a header, the same SID, TREP and a 2-byte submessage counter indicating the submessage number within the total message. To enable error checking and abort the IDE acknowledges every submessage. The IDE can accept the submessage, ask for it to be re-transmitted, request the VU to start again or abort the transmission.

If the last submessage contains exactly 255 bytes in the data field, a final submessage with an empty (except SID TREP and submessage counter) data field must be appended to show the end of the message.

Example:

Header	SID	TREP	Message	CS
4 Bytes	Longer than 255 Bytes			

Will be transmitted as:

Header	SID	TREP	00	01	Submessage 1	CS
4 Bytes	255 Bytes					

Header	SID	TREP	00	01	Submessage 2	CS
4 Bytes	255 Bytes					

...

Header	SID	TREP	xx	yy	Submessage n	CS
4 Bytes	Less than 255 Bytes					

or as:

Header	SID	TREP	00	01	Submessage 1	CS
4 Bytes	255 Bytes					

Header	SID	TREP	00	02	Submessage 2	CS
4 Bytes	255 Bytes					

...

Header	SID	TREP	xx	yy	Submessage n	CS

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4 Bytes	255 Bytes				
Header	SID	TREP	xx	yy+1	CS
4 Bytes	4 bytes				

### 2.2.2. Message types

The communication protocol for data download between the VU and the IDE requires the exchange of eight different message types.

The following table summarises these messages.

Message Structure		Maximum 4 bytesHeader				Maximum 255 bytesData			1 byteChecksum
IDE ->	<- VU	FMT	TGT	SRC	LEN	SID	DS_/TRTP	DATA	CS
Start communication request		81	EE	F0		81			E0
Positive response start communication		80	F0	EE	03	C1		[ <sup>F3</sup> EA 8F]	9B
Start diagnostic session request		80	EE	F0	02	10	81		F1
Positive response start diagnostic		80	F0	EE	02	50	81		31
Link control service									
Verify Baud rate (stage 1)									
9 600 Bd		80	EE	F0	04	87		01,01,01	EC
19 200 Bd		80	EE	F0	04	87		01,01,02	ED
38 400 Bd		80	EE	F0	04	87		01,01,03	[ <sup>X1</sup> EE]
57 600 Bd		80	EE	F0	04	87		01,01,04	EF
115 200 Bd		80	EE	F0	04	87		01,01,05	F0
Positive response verify Baud rate		80	F0	EE	02	C7		01	28

Notes:

- Sid Req = the Sid of the corresponding request.
- TREP = the TRTP of the corresponding request.
- Dark cells denotes that nothing is transmitted.
- The term upload (as seen from the IDE) is used for compatibility with ISO 14229. It means the same as download (as seen from the VU).
- Potential 2-byte submessage counters are not shown in this Table.

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Transition baud rate (stage 2)	80	EE	F0	03	87		02,03	ED
Request Upload	80	EE	F0	0A	35		00,00,00,00,00,00,FF,FF,FF,FF	
Positive response request upload	80	F0	EE	03	75		00,FF	D5
Transfer data request								
Overview	80	EE	F0	02	36	01		97
Activities	80	EE	F0	06	36	02	Date	CS
Events and faults	80	EE	F0	02	36	03		99
Detailed speed	80	EE	F0	02	36	04		9A
Technical data	80	EE	F0	02	36	05		9B
Card download	80	EE	F0	02	36	06		9C
Positive response transfer data	80	F0	EE	Len	76	TREP	Data	CS
Request transfer exit	80	EE	F0	01	37			96
Positive response request transfer exit	80	F0	EE	01	77			D6
Stop communication request	80	EE	F0	01	82			E1
Positive response stop communication	80	F0	EE	01	C2			21
Acknowledge sub message	80	EE	F0	Len	83		Data	CS
Negative responses								
General reject	80	F0	EE	03	7F	Sid Req	10	CS
Service not supported	80	F0	EE	03	7F	Sid Req	11	CS
Subfunction not supported	80	F0	EE	03	7F	Sid Req	12	CS

Notes:

- Sid Req = the Sid of the corresponding request.
- TREP = the TRTP of the corresponding request.
- Dark cells denotes that nothing is transmitted.
- The term upload (as seen from the IDE) is used for compatibility with ISO 14229. It means the same as download (as seen from the VU).
- Potential 2-byte submessage counters are not shown in this Table.

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Incorrect message length	80	F0	EE	03	7F	Sid Req	13	CS
Conditions not correct or request sequence error	80	F0	EE	03	7F	Sid Req	22	CS
Request out of range	80	F0	EE	03	7F	Sid Req	31	CS
Upload not accepted	80	F0	EE	03	7F	Sid Req	50	CS
Response pending	80	F0	EE	03	7F	Sid Req	78	CS
Data not available	80	F0	EE	03	7F	Sid Req	FA	CS

Notes:

- Sid Req = the Sid of the corresponding request.
- TREP = the TRTP of the corresponding request.
- Dark cells denotes that nothing is transmitted.
- The term upload (as seen from the IDE) is used for compatibility with ISO 14229. It means the same as download (as seen from the VU).
- Potential 2-byte submessage counters are not shown in this Table.

#### Editorial Information

- X1** Substituted by [Corrigendum to Commission Regulation \(EC\) No 1360/2002 of 13 June 2002 adapting for the seventh time to technical progress Council Regulation \(EEC\) No 3821/85 on recording equipment in road transport \(Official Journal of the European Communities L 207 of 5 August 2002\)](#).

#### Textual Amendments

- F3** Substituted by [Commission Regulation \(EC\) No 432/2004 of 5 March 2004 adapting for the eighth time to technical progress Council Regulation \(EEC\) No 3821/85 of 20 December 1985 on recording equipment in road transport \(Text with EEA relevance\)](#).

#### 2.2.2.1. Start communication request (SID 81)

This message is issued by the IDE to establish the communication link with the VU. Initial communications are always performed at 9 600 baud (until baud rate is eventually changed using the appropriate Link control services).

#### 2.2.2.2. Positive response start communication (SID C1)

This message is issued by the VU to answer positively to a start communication request. It includes the 2 key bytes [<sup>F3</sup>'EA' '8F'] indicating that the unit supports protocol with header including target source and length information.

#### 2.2.2.3. Start diagnostic session request (SID 10)

The start diagnostic session request message is issued by the IDE in order to request a new diagnostic session with the VU. The sub function 'default session' (81 Hex) indicates a standard diagnostic session is to be opened.

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#### 2.2.2.4. Positive response start diagnostic (SID 50)

The positive response start diagnostic message is sent by the VU to answer positively to Diagnostic Session Request.

#### 2.2.2.5. Link control service (SID 87)

The link control service is used by the IDE to initiate a change in baud rate. This takes place in two steps. In step one the IDE proposes the baud rate change, indicating the new rate. On receipt of a positive message from the VU the IDE sends out confirmation of the baud rate change to the VU (step two). The IDE then changes to the new baud rate. After receipt of the confirmation the VU changes to the new baud rate

#### 2.2.2.6. Link control positive response (SID C7)

The link control positive response is issued by the VU to answer positively to Link Control Service request (step one). Note that no response is given to the confirmation request (step two).

#### 2.2.2.7. Request upload (SID 35)

The request upload message is issued by the IDE to specify to the VU that a download operation is requested. To meet the requirements of ISO14229 data is included covering address, the size and format details for the data requested. As these are not known to the IDE prior to a download, the memory address is set to 0, format is unencrypted and uncompressed and the memory size is set to the maximum.

#### 2.2.2.8. Positive response request upload (SID 75)

The positive response request upload message is sent by the VU to indicate to the IDE that the VU is ready to download data. To meet the requirements of ISO 14229 data is included in this positive response message, indicating to the IDE that further positive response transfer data messages will include 00FF hex bytes maximum.

#### 2.2.2.9. Transfer data request (SID 36)

The transfer data request is sent by the IDE to specify to the VU the type of data that are to be downloaded. A one byte transfer request parameter (TRTP) indicates the type of transfer.

There are six types of data transfer:

- overview (TRTP 01),
- activities of a specified date (TRTP 02),
- events and faults (TRTP 03),
- detailed speed (TRTP 04),
- technical data (TRTP 05),
- card download (TRTP 06).

It is mandatory for the IDE to request the overview data transfer (TRTP 01) during a download session as this only will ensure that the VU certificates are recorded within the downloaded file (and allow for verification of digital signature).

In the second case (TRTP 02) the transfer data request message includes the indication of the calendar day *TimeReal* format) to be downloaded.

#### 2.2.2.10. Positive response transfer data (SID 76)



The positive response transfer data is sent by the VU in response to the transfer data request. The message contains the requested data, with a transfer response parameter (TREP) corresponding to the TRTP of the request.

In the first case (TREP 01), the VU will send data helping the IDE operator to choose the data he wants to download further. The information contained within this message is:

- security certificates,
- vehicle identification,
- VU current date and time,
- minimum and maximum downloadable date (VU data),
- indication of cards presence in the VU,
- previous download to a company,
- company locks,
- previous controls.

#### 2.2.2.11. Request transfer exit (SID 37)

The request transfer exit message is sent by the IDE to inform the VU that the download session is terminated.

#### 2.2.2.12. Positive response request transfer exit (SID 77)

The positive response request transfer exit message is sent by the VU to acknowledge the Request Transfer Exit.

#### 2.2.2.13. Stop communication request (SID 82)

The stop communication request message is sent by the IDE to disconnect the communication link with the VU.

#### 2.2.2.14. Positive response stop communication (SID C2)

The positive response stop communication message is sent by the VU to acknowledge the stop communication request.

#### 2.2.2.15. Acknowledge submessage (SID 83)

The acknowledge sub message is sent by the IDE to confirm receipt of each part of a message that is being transmitted as several submessages. The data field contains the SID received from the VU and a 2-byte code as follows:

- MsgC +1 Acknowledges correct receipt of submessage number MsgC.
  - Request from the IDE to the VU to send next submessage,
- MsgC indicates a problem with the receipt of submessage number MsgC.
  - Request from the IDE to the VU to send the submessage again,
- FFFF requests termination of the message.

This can be used by the IDE to end the transmission of the VU message for any reason.

The last submessage of a message (LEN byte < 255) may be acknowledged using any of these codes or not acknowledged.

The VU responses that will consist of several sub messages are:

- positive response transfer Data (SID 76)

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### 2.2.2.16. Negative Response (SID 7F)

The negative response message is sent by the VU in response to the above request messages when the VU cannot satisfy the request. The data fields of the message contains the SID of the response (7F), the SID of the request, and a code specifying the reason of the negative response. The following codes are available:

- 10 general reject  
The action cannot be performed for a reason not covered below
- 11 service not supported  
The SID of the request is not understood
- 12 sub function not supported  
The DS\_ or TRTP of the request is not understood, or there are no further sub messages to be transmitted
- 13 incorrect message length  
The length of the received message is wrong
- 22 conditions not correct or request sequence error  
The required service is not active or the sequence of request messages is not correct
- 31 request out of range  
The request parameter record (data field) is not valid
- 50 upload not accepted  
The request cannot be performed (VU in a non appropriate mode of operation or internal fault of the VU)
- 78 response pending  
The action requested cannot be completed in time and the VU is not ready to accept another request
- FA data not available  
The data object of a data transfer request are not available in the VU (e.g. no card is inserted, ...)

### 2.2.3. Message flow

A typical message flow during a normal data download procedure is the following:

IDE		[ <sup>X1</sup> VU]
Start communication request	⇒	
	⇐	Positive response
Start diagnostic service request	⇒	
	⇐	Positive response

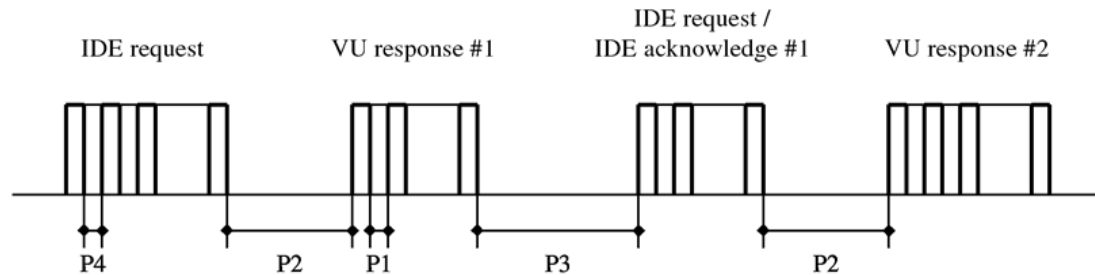
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Request upload	⇒	
	⇐	Positive response
Transfer data request overview	⇒	
	⇐	[ <sup>X1</sup> Positive response]
Data request #2	⇒	
	⇐	Positive response #1
Acknowledge submessage #1	⇒	
	⇐	Positive response #2
Acknowledge submessage #2	⇒	
	⇐	Positive response #m
Acknowledge submessage #m	⇒	
	⇐	Positive response (Data field < 255 Bytes)
Acknowledge submessage (optional)	⇒	
...		
Transfer data request #n	⇒	
	⇐	Positive response
Request transfer exit	⇒	
	⇐	Positive response
Stop communication request	⇒	
	⇐	Positive response

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#### 2.2.4. Timing

During normal operation the timing parameters shown in the following figure are relevant:



Where:

- P1 = Inter byte time for VU response.
- P2 = Time between end of IDE request and start of VU response, or between end of IDE acknowledge and start of next VU response.
- P3 = Time between end of VU response and start of new IDE request, or between end of VU response and start of IDE acknowledge, or between end of IDE request and start of new IDE request if VU fails to respond.
- P4 = Inter byte time for IDE request.
- P5 = Extended value of P3 for card downloading.

The allowed values for the timing parameters are showed in the following table (KWP extended timing parameters set, used in case of physical addressing for faster communication).

TimingParameter	Lower limitValue (ms)	Upper limit value (ms)
P1	0	20
P2	20	1 000 <sup>a</sup>
P3	10	5 000
P4	5	20
P5	10	20 minutes

<sup>a</sup> If the VU responds with a negative response containing a code meaning 'request correctly received, response pending', this value is extended to the same upper limit value of P3.

#### 2.2.5. Error handling

If an error occurs during the message exchange, the message flow scheme is modified depending on which equipment has detected the error and on the message generating the error.

In Figure 2 and Figure 3 the error handling procedures for the VU and the IDE are respectively shown.

##### 2.2.5.1. Start communication phase

If the IDE detects an error during the Start Communication phase, either by timing or by the bit stream, then it will wait for a period P3 min before issuing again the request.

If the VU detects an error in the sequence coming from the IDE, it shall send no response and wait for another Start Communication Request message within a period P3 max.

### 2.2.5.2. Communication phase

Two different error handling areas can be defined:

#### 1. **The VU detects an IDE transmission error.**

For every received message the VU shall detect timing errors, byte format errors (e.g. start and stop bit violations) and frame errors (wrong number of bytes received, wrong checksum byte).

If the VU detects one of the above errors, then it sends no response and ignores the message received.

The VU may detect other errors in the format or content of the received message (e.g. message not supported) even if the message satisfies the length and checksum requirements; in such a case, the VU shall respond to the IDE with a Negative Response message specifying the nature of the error.

#### 2. **The IDE detects a VU transmission error.**

For every received message the IDE shall detect timing errors, byte format errors (e.g. start and stop bit violations) and frame errors (wrong number of bytes received, wrong checksum byte).

The IDE shall detect sequence errors, e.g. incorrect sub message counter increments in successive received messages.

If the IDE detects an error or there was no response from the VU within a P2max period, the request message will be sent again for a maximum of three transmissions in total. For the purposes of this error detection a submessage acknowledge will be considered as a request to the VU.

The IDE shall wait at least for a period of P3min before beginning each transmission; the wait period shall be measured from the last calculated occurrence of a stop bit after the error was detected.

### 2.2.6. Response message content

This paragraph specifies the content of the data fields of the various positive response messages.

Data elements are defined in Appendix 1 data dictionary.

#### 2.2.6.1. Positive response transfer data overview

The data field of the 'positive response transfer data overview' message shall provide the following data in the following order under the SID 76 Hex, the TREP 01 Hex and appropriate sub message splitting and counting:

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Data element	Length (Bytes)	Comment
MemberStateCertificate	194	VU Security certificates
VUCertificate	194	
VehicleIdentificationNumber	17	Vehicle identification
VehicleRegistrationIdentification	1	
vehicleRegistrationNation vehicleRegistrationNumber	14	
CurrentDateTime	4	VU current date and time
VuDownloadablePeriod	4	Downloadable period
minDownloadableTime maxDownloadableTime	4	
CardSlotsStatus	1	Type of cards inserted in the VU
VuDownloadActivityData	4	Previous VU download
downloadingTime	18	
fullCardNumber companyOrWorkshopName	36	
VuCompanyLocksData	1	All company locks stored. If the section is empty, only noOfLocks = 0 is sent.
noOfLocks	1	
...	(98)	
Vu Company Locks Record	4	
lockInTime	4	
lockOutTime companyName companyAddress companyCardNumber	36 36 18	
...		
VuControlActivityData	1	All control records stored in the VU. If the section is empty, only noOfControls = 0 is sent.
noOfControls	1	
...	(31)	
Vu Control Activity Record	1	
controlType	4	
controlTime controlCardNumber downloadPeriodBeginTime downloadPeriodEndTime	18 4 4	
...		
Signature	128	RSA signature of all data (except certificates) starting from VehicleIdentificationNumber down to last byte of last VuControlActivityRecord.

#### 2.2.6.2. Positive response transfer data activities

The data field of the 'positive response transfer data activities' message shall provide the following data in the following order under the SID 76 Hex, the TREP 02 Hex and appropriate sub message splitting and counting:

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Data element		Length (Bytes)	Comment
TimeReal		4	Date of day downloaded
OdometerValueMidnight		3	Odometer at end of downloaded day
VuCardIWData			Cards insertion withdrawal cycles data.
noOfVuCardIWRecords		2	— If this section contains no available data, only noOfVuCardIWRecords = 0 is sent. — When a VuCardIWRecord lies across 00:00 (card insertion on previous day) or across 24:00 (card withdrawal the following day) it shall appear in full within the two days involved.
...		(129)	
VuCardIWRecord	cardHolderName	36	
	holderSurname	36	
	holderFirstNames	18	
	fullCardNumber	4	
	cardExpiryDate	4	
	cardInsertionTime	3	
	vehicleOdometerValueAtInsertion	1	
	cardSlotNumber	4	
	cardWithdrawalTime	3	
	vehicleOdometerValueAtWithdrawal	1	
	previousVehicleInfo	14	
	vehicleRegistrationIdentification	4	
	vehicleRegistrationNation	1	
vehicleRegistrationNumber	14		
cardWithdrawalTime	4		
manualInputFlag	1		
...			
VuActivityDailyData			Slots status at 00:00 and activity changes recorded for the day downloaded.
noOfActivityChanges		2	
...			
ActivityChangeInfo		2	
...			
VuPlaceDailyWorkPeriodData			Places related data recorded for the day downloaded. If the section is empty, only noOfPlaceRecords = 0 is sent.
noOfPlaceRecords		1	
...		(28)	
VuPlaceDailyWorkPeriodRecord	fullCardNumber	18	
	placeRecord	4	
	entryTime	1	
	entryTypeDailyWorkPeriod	1	
	dailyWorkPeriodCountry	1	
	dailyWorkPeriodRegion	1	
vehicleOdometerValue	3		
...			
VuSpecificConditionData			Specific conditions data recorded for the day downloaded. If the section is empty, only noOfSpecificConditionRecords = 0 is sent
noOfSpecificConditionRecords		2	
...		(5)	
SpecificConditionRecord			
EntryTime		4	
specificConditionType		1	
...			
Signature		128	RSA signature of all data starting from TimeReal down to last byte of last specific condition record.

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### 2.2.6.3. Positive response transfer data events and faults

The data field of the 'positive response transfer data events and faults' message shall provide the following data in the following order under the SID 76 Hex, the TREP 03 Hex and appropriate sub message splitting and counting:



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Data element		Length (Bytes)	Comment
VuFaultData			All faults stored or on-going in the VU. If the section is empty, only noOfVuFaults = 0 is sent.
NoOfVuFaults		1	
...		(82)	
VuFaultRecord	FaultType	1	
	FaultRecordPurpose	1	
	FaultBeginTime	4	
	FaultEndTime	4	
	CardNumberDriverSlotBegin	18	
	cardNumberCodriverSlotBegin	18	
	CardNumberDriverSlotEnd	18	
CardNumberCodriverSlotEnd	18		
...			
VuEventData			
NoOfVuEvents		1	
...		(83)	
VuEventRecord	EventType	1	
	EventRecordPurpose	1	
	EventBeginTime	4	
	EventEndTime	4	
	CardNumberDriverSlotBegin	18	
	cardNumberCodriverSlotBegin	18	
	CardNumberDriverSlotEnd	18	
	CardNumberCodriverSlotEnd	18	
	SimilarEventsNumber	1	
...			
VuOverSpeedingControlData			Data related to last over speeding control (default value if no data).
LastOverspeedControlTime		4	
FirstOverspeedSince		4	
NumberOfOverspeedSince		1	
VuOverSpeedingEventData			All over speeding events stored in the VU. If the section is empty, only noOfVuOverSpeedingEvents = 0 is sent.
NoOfVuOverSpeedingEvents		1	
...		(31)	
VuOverSpeedingEventRecord	EventType	1	
	EventRecordPurpose	1	
	EventBeginTime	4	
	EventEndTime	4	
	MaxSpeedValue	1	
	AverageSpeedValue	1	
	CardNumberDriverSlotBegin	18	
	SimilarEventsNumber	1	
...			
VuTimeAdjustmentData			
NoOfVuTimeAdjRecords		1	
...		(98)	
VuTimeAdjustmentRecord	OldTimeValue	4	
	NewTimeValue	4	
	WorkshopName	36	
	WorkshopAddress	36	
	WorkshopCardNumber	18	
...			
Signature		128	RSA signature of all data starting from noOfVuFaults down to last byte of last time adjustment record.

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2.2.6.4. Positive response transfer data detailed speed

The data field of the ‘positive response transfer data detailed speed’ message shall provide the following data in the following order under the SID 76 Hex, the TREP 04 Hex and appropriate sub message splitting and counterung:

Data element		Length (Bytes)	Comment
VuDetailedSpeedData			
NoOfSpeedBlocks		2	All detailed speed stored in the VU (one speed block per minute during which the vehicle has been moving) 60 speed values per minute (one per second).
...			
VuDetailedSpeedBlock		4	
SpeedBlockBeginDate		4	
speedsPerSecond		60	
...			
Signature		128	RSA signature of all data starting from noOfSpeedBlocks down to last byte of last speed block.

2.2.6.5. Positive response transfer data technical data

The data field of the ‘positive response transfer data technical data’ message shall provide the following data in the following order under the SID 76 Hex, the TREP 05 Hex and appropriate sub message splitting and counting:

**Changes to legislation:** There are currently no known outstanding effects for the Council Regulation (EEC) No 3821/85, Division 2.. (See end of Document for details)

Data element	Length (Bytes)	Comment
VuIdentification		
vuManufacturerName	36	
vuManufacturerAddress	36	
vuPartNumber	16	
vuSerialNumber	8	
vuSoftwareIdentification		
vuSoftwareVersion	4	
vuSoftInstallationDate	4	
vuManufacturingDate	4	
vuApprovalNumber	8	
SensorPaired		
sensorSerialNumber	8	
sensorApprovalNumber	8	
sensorPairingDateFirst	4	
VuCalibrationData		All calibration records stored in the VU.
noOfVuCalibrationRecords	1	
...	167	
VuCalibrationRecord		
calibrationPurpose	1	
workshopName	36	
workshopAddress	36	
workshopCardNumber	18	
workshopCardExpiryDate	4	
vehicleIdentificationNumber	17	
vehicleRegistrationIdentification		
vehicleRegistrationNation	1	
vehicleRegistrationNumber	14	
wVehicleCharacteristicConstant	2	
kConstantOfRecordingEquipment	2	
lTyreCircumference	2	
tyreSize	15	
authorisedSpeed	1	
oldOdometerValue	3	
newOdometerValue	3	
oldTimeValue	4	
newTimeValue	4	
nextCalibrationDate	4	
...		
Signature	128	RSA signature of all data starting from vuManufacturerName down to last byte of last VuCalibrationRecord.

### 2.3. ESM File storage

When a download session has included a VU data transfer, the IDE shall store within one physical file all data received from the VU during the download session within positive response transfer data messages. Data stored excludes message headers, sub-message counters, empty sub-messages and checksums but include the SID and TREP (of the first sub-message only if several sub-messages).]]

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**Changes to legislation:** There are currently no known outstanding effects for the Council Regulation (EEC) No 3821/85, Division 2.. (See end of Document for details)

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- (1) [<sup>F1</sup>]<sup>F2</sup>[The card inserted will trigger the appropriate access rights to the downloading function and to the data. It shall, however, be possible to download data from a driver card inserted into one of the VU slots when no other card is inserted in the other slot.]]

**Textual Amendments**

- F1** Inserted by Council Regulation (EC) No 2135/98 of 24 September 1998 amending Regulation (EEC) No 3821/85 on recording equipment in road transport and Directive 88/599/EEC concerning the application of Regulations (EEC) No 3820/85 and (EEC) No 3821/85.
- F2** Substituted by Commission Regulation (EC) No 1360/2002 of 13 June 2002 adapting for the seventh time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport (Text with EEA relevance).

**Changes to legislation:**

There are currently no known outstanding effects for the Council Regulation (EEC) No 3821/85, Division 2..