
**Road vehicles — Tachograph systems —
Part 7:
Parameters**

Véhicules routiers — Systèmes de tachygraphes —

Partie 7: Paramètres

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16844-7 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 16844 consists of the following parts, under the general title *Road vehicles — Tachograph systems*:

— Part 1: *Electrical connectors*

— Part 2: *Recording unit, electrical interface*

— Part 3: *Motion sensor interface*

— Part 4: *CAN interface*

— Part 5: *Secured CAN interface*

— Part 6: *Diagnostics*

— Part 7: *Parameters*

Introduction

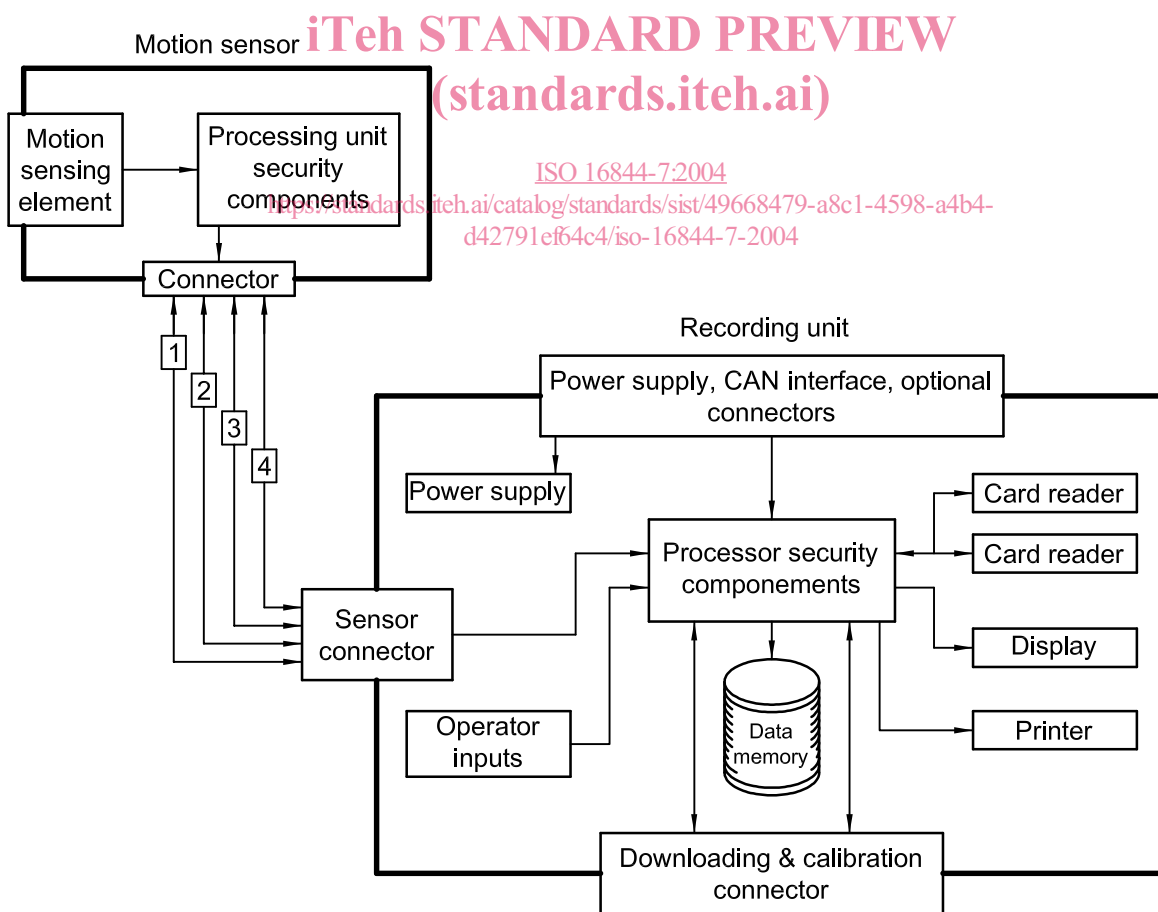
ISO 16844 supports and facilitates the communication between electronic units and a tachograph; the tachograph being based upon Council Regulations (EEC) No. 3820/85^[1] and No. 3821/85 and their amendments Council Regulation (EEC) No. 2135/98 and Commission Regulation (EC) No. 1360/2002 (see Clause 2).

Its purpose is to ensure the compatibility of tachographs from various tachograph manufacturers.

The basis of the digital tachograph concept is a recording unit (RU) that stores data related to the activities of the drivers of a vehicle on which it is installed. When the RU is in normal operational status, the data stored in its memory are made accessible to various entities such as drivers, authorities, workshops and transport companies in a variety of ways: they may be displayed on a screen, printed by a printing device or downloaded to an external device. Access to stored data is controlled by a smart card inserted in the tachograph.

In order to prevent manipulation of the tachograph system, the speed signal sender (motion sensor) is provided with an encrypted data link.

A typical tachograph system is shown in Figure 1.



Key

- | | |
|-------------------|---------------------------|
| 1 positive supply | 3 speed signal, real time |
| 2 battery minus | 4 data signal in/out |

Figure 1 — Typical tachograph system

Road vehicles — Tachograph systems —

Part 7: Parameters

1 Scope

This part of ISO 16844 specifies the parameters used in the interchange of digital information between a road vehicle's tachograph system and vehicle units or a diagnostic tester, or within the tachograph system itself. The parameters are applicable for real time communication and/or diagnostic services.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 8859 (all parts), *Information technology — 8-bit single-byte coded graphic character sets*

ISO 14230-3, *Road vehicles — Diagnostic systems — Keyword Protocol 2000 — Part 3: Application layer*

ISO 16844-4, *Road Vehicles — Tachograph systems — Part 4: CAN interface*

ISO 16844-6, *Road Vehicles — Tachograph systems — Part 6: Diagnostics*

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

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

Council Regulation (EEC) 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 Council Regulations (EEC) No. 3820/85 and (EEC) No. 3821/85

Council Directive 92/23/EEC relating to tyres for motor vehicles and their trailers and to their fitting

3 Abbreviated terms

| | |
|------|-------------------------|
| CAN | controller area network |
| Cvt. | convention |
| DTC | diagnostic trouble code |
| ECU | electronic control unit |
| KBD | keyboard |

- M** mandatory
- N/A not applicable
- R accessible in reading using diagnostic services
- RDI record data identifier¹⁾
- RMS registering member state
- R/W accessible in reading and writing, using diagnostic services
- SJW resynchronisation jump width
- Tq time quantum
- U user option
- UTC universal time co-ordinated
- VIN vehicle identification number
- VRN vehicle registration number

“Tachograph regulation” used throughout this part of ISO 16844 refers to Council Regulation (EEC) No. 1360/2002, Annex 1B.

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4 Identifier specifications

4.1 Record data identifiers

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The record data identifiers used in the diagnostic services specified in ISO 16844-6 shall be in accordance with Table 1.

Table 1 — Record data identifiers

| Hex | Identifier description | Cvt. | Simplified mnemonic | R or R/W |
|------|---|------|---------------------|----------|
| F187 | VehicleManufacturerSparePartNumber | U | VMSPN | R/W |
| F188 | VehicleManufacturerECUSoftwareNumber | U | VMECUSWN | R/W |
| F189 | VehicleManufacturerECUSoftwareVersionNumber | U | VMECUSWVN | R/W |
| F18A | SystemSupplierIdentifier | M | SSID | R |
| F18B | ECUManufacturingDate | M | ECUMD | R |
| F18C | ECUSerialNumber | M | ECUSN | R |
| F190 | VehicleIdentificationNumber | M | VIN | R/W |
| F191 | VehicleManufacturerECUHardwareNumber | M | VMECUHWN | R/W |
| F192 | SystemSupplierECUHardwareNumber | M | SSECUHWN | R |
| F193 | SystemSupplierECUHardwareVersionNumber | M | SSECUHWVN | R |
| F194 | SystemSupplierECUSoftwareNumber | M | SSECUSWN | R |

1) RecordDataIdentifier with 262144 values available and, for instance, used in ReadDataByIdentifier, WriteDataByIdentifier InputOutputControlByIdentifier services.

Table 1 (continued)

| Hex | Identifier description | Cvt. | Simplified mnemonic | R or R/W |
|-----------|---|------|---------------------|----------|
| F195 | SystemSupplierECUSoftwareVersionNumber | M | SSECUSWVN | R |
| F196 | ExhaustRegulationOrTypeApprovalNumber | M | EROTAN | R |
| F197 | SystemNameOrEngineType | U | SNOET | R/W |
| F198 | RepairShopCodeOrTesterSerialNumber | U | RSCOTSN | R/W |
| F199 | ProgrammingDate | U | PD | R/W |
| F19A | CalibrationRepairShopCodeOrCalibrationEquipmentSerialNumber | M | CRSCOCESN | R/W |
| F19B | CalibrationDate | M | CD | R/W |
| F19C | CalibrationEquipmentSWNumber | M | CESWN | R/W |
| F19D | ECUInstallationDate | M | EID | R/W |
| F19E | ODXFileIdentifier | M | OFID | R/W |
| F900-F9FF | Reserved for tachograph systems | M | — | — |
| F902 | TachographVehicleSpeed | M | TVS | R |
| F903 | Driver1WorkingState | M | D1WS | R |
| F904 | Driver2WorkingState | M | D2WS | R |
| F905 | DriveRecognize | M | DR | R |
| F906 | Driver1TimeRelatedStates | M | D1TRS | R |
| F907 | DriverCardDriver1 | M | DCD1 | R |
| F908 | OverSpeed | M | OS | R |
| F909 | Driver2TimeRelatedStates | M | D2TRS | R |
| F90A | DriverCardDriver2 | M | DCD2 | R |
| F90B | TimeDate | M | TD | R/W |
| F90C | ResetHeartbeatMessage | M | RHM | R/W |
| F90D | AdjustLocalMinuteOffset | M | ALMO | R/W |
| F90E | AdjustLocalHourOffset | M | ALHO | R/W |
| F90F | PriorityLevelOfTCO1Message | M | PLOTM | R/W |
| F912 | HighResolutionTotalVehicleDistance | M | HRTVD | R/W |
| F913 | HighResolutionTripDistance | M | HRTD | R/W |
| F914 | ServiceComponentIdentification | M | SCI | R |
| F915 | ServiceDelayCalendarTimeBased | M | SDCTB | R |
| F916 | Driver1Identification | M | D1I | R |
| F917 | Driver2Identification | M | D2I | R |
| F918 | KFactor | M | KF | R/W |
| F919 | SpeedMeasurementRange | M | SMR | R |
| F91A | NumberOfTeethOnPhonicWheel | U | NOTOPW | R/W |
| F91B | TachographOutputShaftSpeed | M | TOSS | R |
| F91C | LFactorTyreCircumference | M | LFTC | R/W |
| F91D | WVehicleCharacteristicFactor | M | WVCF | R/W |

Table 1 (continued)

| Hex | Identifier description | Cvt. | Simplified mnemonic | R or R/W |
|------|---|------|---------------------|----------|
| F91E | PulsesPerRevolutionOfOutputShaft | M | PPROOS | R/W |
| F91F | SecurityViolation | M | SV | R |
| F920 | TransmissionRepetitionRateOfTCO1Message | M | TRROTM | R/W |
| F921 | TyreSize | M | TS | R/W |
| F922 | NextCalibrationDate | M | NCD | R/W |
| F923 | Driver1ContinuousDrivingTime | M | D1CDT | R |
| F924 | Driver2ContinuousDrivingTime | M | D2CDT | R |
| F925 | Driver1CumulativeBreakTime | M | D1CBT | R |
| F926 | Driver2CumulativeBreakTime | M | D2CBT | R |
| F927 | Driver1Current DurationOfSelectedActivity | M | D1CDOSA | R |
| F928 | Driver2Current DurationOfSelectedActivity | M | D2CDOSA | R |
| F92C | SpeedAuthorised | M | SA | R/W |
| F930 | TachographCardSlot1 | M | TCS1 | R |
| F931 | Driver1Name | M | D1N | R |
| F932 | Driver2Name | M | D2N | R |
| F933 | TachographCardSlot2 | M | TCS2 | R |
| F936 | OutOfScopeCondition | M | OOSC | R |
| F937 | ModeOfOperation | M | MOO | R |
| F938 | Driver1CumulatedDrivingTimePreviousAndCurrentWeek | M | D1CDTPACW | R |
| F939 | Driver2CumulatedDrivingTimePreviousAndCurrentWeek | M | D2CDTPACW | R |
| F940 | RealTimeSpeedPulses | M | RTSP | R/W |
| F95A | EngineSpeed | U | ES | R/W |
| F960 | CalibrationInputOutput | M | CIO | R/W |
| F979 | SynchronizationJumpWidth | M | SJW | R/W |
| F97A | SamplePoint | M | SP | R/W |
| F97B | TimeOutMessageErrorDelay | M | TOMED | R/W |
| F97C | ErrorManagementInitialisationInhibition | M | EMII | R/W |
| F97D | RegisteringMemberState | M | RMS | R/W |
| F97E | VehicleRegistrationNumber | M | VRN | R/W |
| F97F | VehicleRegistrationDate | M | VRD | R/W |

4.2 Routine identifiers

The routine identifiers used in the diagnostic services specified in ISO 16844-6 shall be in accordance with Table 2.

Table 2 — Routine identifiers

| Hex | Routine identifier | Cvt. | Simplified mnemonic |
|------|--------------------------------|------|---------------------|
| 014F | MotionSensorVehicleUnitPairing | M | MSVUP |
| 0150 | DisplayTest | M | DT |
| 0151 | LCDNegativeModeTest | M | LNMT |
| 0152 | PrinterTest | M | PT |
| 0153 | HardwareTest | M | HT |
| 0154 | CarderReaderTest | M | CRT |
| 0155 | Reserved by document | U | RBD |
| 0156 | ButtonTestLoop | M | BTL |

5 Parameters and values

5.1 Transmitted signal ranges

For the ranges used to determine the validity of a transmitted signal, see Table 3.

For the ranges used to denote the state of a discrete parameter, see Table 4.

For the ranges used to denote the state of a control mode command, see Table 5.

The values of the error indicator range provide a means for a module to immediately indicate that valid parameter data are currently not available due to error in the sensor, sub-system or module.

The values in the *not available* range provide a means for a module to transmit a message which contains a parameter not available or not supported in the module. The values in the *not requested* range provide a means for a device to transmit a command message and identify those parameters where no response is expected from the receiving device.

If a component failure prevents the transmission of valid data of a parameter, the error indicator as specified in Tables 3 and 4 shall be used instead of the parameter data. However, the error indicator shall not be used if the measured or calculated data have yielded a value but exceed the specified parameter range. Instead, the data shall be transmitted using the appropriate minimum or maximum parameter value.

When a specified parameter of this part of ISO 16844 is transmitted using diagnostic services, padding bits shall be added to increase its length to the next integer number of bytes in the case where its length is not an integer number of bytes. This padding shall be made by setting the relevant most significant bits to zero.

EXAMPLE Driver1WorkingStates, RDI F903₁₆, 3 bit length: when this parameter value is 010, it is transmitted as one byte of the value of 02₁₆.

Table 3 — Transmitted signal ranges

| Range name | 1 byte | 2 bytes | 4 bytes | ASCII |
|--|---|--|--|---|
| Valid signal | 0 to 250 | 0 to 64 255 | 0 to 4 211 081 215 | 1 to 254 |
| | 00 ₁₆ to FA ₁₆ | 0000 ₁₆ to FAFF ₁₆ | 00000000 ₁₆ to FFFFFFFF ₁₆ | 01 ₁₆ to FE ₁₆ |
| Parameter specific indicator | 251 | 64 256 to 64 511 | 4 211 081 216 to 4 227 858 431 | none |
| | FB ₁₆ | FB00 ₁₆ to FBFF ₁₆ | FBxxxxxx ₁₆ | |
| Reserved range for future indicator bits | 252 to 253 | 64 512 to 65 023 | 4 227 858 432 to 4 261 412 863 | none |
| | FC ₁₆ to FD ₁₆ | FC00 ₁₆ to FDFF ₁₆ | FC000000 ₁₆ to FFFFFFFF ₁₆ | |
| Error indicator | 254 | 65 024 to 65 279 | 4 261 412 864 to 4 278 190 079 | 0 |
| | FE ₁₆ | FExx ₁₆ | FExxxxxx ₁₆ | 00 ₁₆ |
| Not available or not requested | 255 | 65 280 to 65 535 | 4 278 190 080 to 4 294 967 294 | 255 |
| | FF ₁₆ | FFxx ₁₆ | FFxxxxxx ₁₆ | FF ₁₆ |

Table 4 — Transmitted values of discrete parameters (measured)

| Range name | Transmitted value |
|--------------------------------|-------------------|
| Disabled (off, passive, etc.) | 00 |
| Enabled (on, active, etc.) | 01 |
| Error indicator | 10 |
| Not available or not installed | 11 |

Table 5 — Transmitted values of control commands (status)

| Range name | Transmitted value |
|--|-------------------|
| Command to disable function (turn off, etc.) | 00 |
| Command to enable function (turn on, etc.) | 01 |
| Reserved | 10 |
| Don't care/take no action (leave function as is) | 11 |

The data type may be either *status* or *measured*.

- **Status** specifies the present state of a multi-state parameter or function as a result of action taken by the transmitting node. This action is the result of a calculation which uses local and/or network measured and/or status information.
- **Measured** data convey the current value of a parameter as measured or observed by the transmitting node to determine the condition of the specified parameter.

5.2 Parameter specifications

5.2.1 Seconds

The UTC parameter part Seconds shall provide

| | |
|-----------------|-----------------------------|
| data length | 1 byte |
| resolution | 0,25 s/bit gain, 0 s offset |
| operating range | 0 to 59,75 s |
| type | measured |

The RDI is not used. The parameter part Seconds may be addressed through RDI attached to Time/Date.

5.2.2 Minutes

The UTC parameter part Minutes shall provide

| | |
|------------------|------------------------------|
| data length: | 1 byte |
| resolution: | 1 min/bit gain, 0 min offset |
| operating range: | 0 to 59 min |
| type: | measured |

The RDI is not used. The parameter part Minutes may be addressed through RDI attached to Time/Date.

5.2.3 Hours

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The UTC parameter part Hours shall provide

| | |
|------------------|--------------------------|
| data length: | 1 byte |
| resolution: | 1 h/bit gain, 0 h offset |
| operating range: | 0 to 23 h |
| type: | measured |

The RDI is not used. The parameter part Hours may be addressed through RDI attached to Time/Date.

5.2.4 Month

The UTC parameter part Month shall provide

| | |
|------------------|----------------------------------|
| data length: | 1 byte |
| resolution: | 1 month/bit gain, 0 month offset |
| operating range: | 1 to 12 months |
| type: | measured |

The RDI is not used. The parameter part Month may be addressed through RDI attached to Time/Date.

NOTE A value of 0 for the month is null. The value 1 identifies January; 2 identifies February; etc.