

ISO 14230-2:2016-08 (E)

Road vehicles - Diagnostic communication over K-Line (DoK-Line) - Part 2: Data link layer

| Contents | | Page |
|--|--|-------------|
| Foreword | | v |
| Introduction | | vi |
| 1 Scope | | 1 |
| 2 Normative references | | 1 |
| 3 Terms, definitions, symbols and abbreviated terms | | 1 |
| 3.1 Terms and definitions..... | | 1 |
| 3.2 Symbols and abbreviated terms..... | | 2 |
| 4 Conventions | | 3 |
| 5 Document overview | | 4 |
| 6 Physical bus topology | | 5 |
| 7 Data link layer overview | | 7 |
| 7.1 General..... | | 7 |
| 7.2 Format description of data link layer services..... | | 7 |
| 7.3 Services provided by the data link layer to higher layers..... | | 7 |
| 7.4 Specification of DoK-Line data link layer service primitives..... | | 8 |
| 7.4.1 DL_Data.request..... | | 8 |
| 7.4.2 DL_Data.confirm..... | | 8 |
| 7.4.3 DL_Data_FB.indication..... | | 9 |
| 7.4.4 DL_Data.indication..... | | 9 |
| 7.4.5 DoK-Line_Init.request..... | | 9 |
| 7.4.6 DoK-Line_Initialize.confirm..... | | 9 |
| 7.4.7 DoK-Line_ChangeParameter.request..... | | 10 |
| 7.4.8 DoK-Line_ChangeParameter.confirm..... | | 10 |
| 7.5 Service data unit specification..... | | 10 |
| 7.5.1 SA, Source Address..... | | 10 |
| 7.5.2 TA, Target Address..... | | 10 |
| 7.5.3 TAtype, target address type..... | | 11 |
| 7.5.4 <Length>..... | | 11 |
| 7.5.5 <MessageData>..... | | 11 |
| 7.5.6 <Result_DoK-Line>..... | | 11 |
| 7.5.7 <InitializationModeIdentifier>..... | | 12 |
| 7.5.8 <InitializationResultData>..... | | 12 |
| 7.5.9 <Result_Initialization>..... | | 12 |
| 7.5.10 <Parameter_Value>..... | | 13 |
| 7.5.11 <Result_ChangeParameter>..... | | 13 |
| 8 Protocol initialization | | 14 |
| 8.1 General..... | | 14 |
| 8.2 Timing parameters for 5-BAUD_INIT..... | | 14 |
| 8.3 Protocol determination..... | | 14 |
| 8.3.1 5-BAUD_INIT according to ISO 9141..... | | 14 |
| 8.3.2 5-BAUD_INIT according to this document..... | | 16 |
| 8.3.3 FAST_INIT according to this document..... | | 17 |
| 8.3.4 FAST_INIT according to ISO 14230-4..... | | 19 |
| 8.3.5 Client protocol determination by server (ECU) key bytes..... | | 20 |
| 8.3.6 Initial data exchange after successful completion of initialization..... | | 22 |
| 8.4 Protocol specific key bytes..... | | 22 |
| 8.4.1 Format of key bytes..... | | 22 |
| 8.4.2 Key bytes for emissions-related OBD protocols of ISO 9141-2..... | | 23 |
| 8.4.3 Key bytes for emissions-related OBD protocol ISO 14230-4..... | | 23 |
| 8.4.4 Key bytes for enhanced diagnostics with support of ISO 14230-4..... | | 24 |
| 8.4.5 Calculation of decimal value of key bytes..... | | 25 |

| | | |
|-----------|--|-----------|
| 9 | Message definition | 25 |
| 9.1 | Message structure..... | 25 |
| 9.2 | Message header..... | 26 |
| 9.2.1 | Format byte (FMT)..... | 26 |
| 9.2.2 | Target address byte (TA)..... | 26 |
| 9.2.3 | Source address byte (SA)..... | 27 |
| 9.2.4 | Length byte (LEN)..... | 27 |
| 9.2.5 | Message header configurations..... | 27 |
| 9.3 | Protocol data unit (PDU)..... | 28 |
| 9.4 | Checksum byte (CS)..... | 28 |
| 10 | Protocol timing requirements | 29 |
| 10.1 | General timing measurement requirements..... | 29 |
| 10.2 | Protocol timing parameter definition..... | 29 |
| 10.2.1 | Inter-byte and inter-message timing parameters..... | 29 |
| 10.2.2 | Inter-byte timing parameter set..... | 29 |
| 10.3 | Inter-byte message timing..... | 30 |
| 10.4 | Data link layer timing at T-Data interface..... | 32 |
| 11 | Communication services | 34 |
| 11.1 | StartCommunication service..... | 34 |
| 11.1.1 | Service definition..... | 34 |
| 11.1.2 | Implementation..... | 35 |
| 11.2 | StopCommunication service..... | 36 |
| 11.2.1 | Service definition..... | 36 |
| 11.2.2 | Implementation..... | 36 |
| 11.3 | AccessTimingParameter service..... | 37 |
| 11.3.1 | Service definition..... | 37 |
| 11.3.2 | Implementation..... | 38 |
| 11.4 | SendData service..... | 40 |
| 11.4.1 | Service definition..... | 40 |
| 12 | Data collisions | 41 |
| 13 | Error handling | 41 |
| 13.1 | Error handling during physical/functional 5-BAUD initialization..... | 41 |
| 13.1.1 | Client (external test equipment) error handling during physical/ functional 5-BAUD-INIT..... | 41 |
| 13.1.2 | Server (ECU) error handling during physical/functional 5-BAUD_INIT..... | 42 |
| 13.2 | Error handling during physical/functional FAST_INIT..... | 42 |
| 13.2.1 | Client (external test equipment) error handling during physical/ functional FAST_INIT..... | 42 |
| 13.2.2 | Server (ECU) error handling during physical FAST_INIT..... | 43 |
| 13.2.3 | Server (ECU) error handling during functional FAST_INIT (normal timing only)..... | 43 |
| 13.3 | Error handling after physical/functional initialization..... | 44 |
| 13.3.1 | Client (external test equipment) communication error handling (after physical/functional initialization)..... | 44 |
| 13.3.2 | Server (ECU) communication error handling after physical initialization..... | 44 |
| 13.3.3 | Server (ECU) error handling after functional initialization..... | 45 |
| | Annex A (normative) Server and client addresses for 5-BAUD_INIT | 46 |
| | Annex B (informative) Recommended server and client addresses | 47 |
| | Annex C (informative) Protocol comparison of initialization sequence | 48 |
| | Bibliography | 49 |