DIN EN 15969-1:2023-01 (E)

Tanks for transport of dangerous goods - Digital interface for the data transfer between tank vehicle and with stationary facilities - Part 1: Protocol specification - Control, measurement and event data

Contents

Page

European foreword 4

Introduction 6

1 Scope 7

2 Normative references 7

3 Terms and definitions, abbreviations and conventions 7
3.1 Terms and definitions 7
3.2 Abbreviations 9
3.3 Conventions 9

4 Hardware interface 10

5 Basic protocol layer 10
5.1 FTL-frame (frame) 10
5.2 Frame flow (handshake) 11
5.3 Delay and timeout 16
5.4 CRC16 Checksum 16

6 Data protocol layer (FTL-data protocol) 16
6.1 Client (OBC) and server (TVE) 16
6.2 Syntax of data in datagrams 17
6.3 Nodes, subnodes, variables 17
6.4 Format identifiers 17
6.5 Types of variable values 20
6.6 Kinds of nodes 21

7 FTL-Data 22
7.1 General 22
7.2 Record and field types 22
7.3 Systemwide variables (subnode SYSTEM) 23
7.4 Variables related to global positioning system (subnode GPS) 27
7.5 Accessing a printer on TVE-side (subnode PRN) 27
7.6 Compartment information (subnode COMP) 30
7.7 Notification about changes (subnode NOTIFY) 32
7.8 Information about driver (subnode DRIVER) 33
7.9 Information about the vehicle (variable VEHICLE_ID) 34
7.10 Information about current operation (subnode OPERATION) 34
7.11 Access to filesystem on TVE (subnode FS) 36
7.12 Auxiliary (subnode AUX) 41
7.13 Order management (subnode ORDER) 42
7.14 Goods and service database (subnode PRODUCT) 46
7.15 FTL--logfile (subnodes LOG) 49
7.16 Required variables 81
7.17 NAK ID 82

8 Routing for multiple TVE 83

8.1 Purpose ... 83
8.2 Routing solution ... 83
8.3 Routing example ... 84

9 Communication with office ... 84
9.1 General ... 84
9.2 Simple file transfer ... 85
9.3 FTL over TCP/IP ... 87

10 Communication Examples ... 89
10.1 Examples for Basic Protocol Layer level ... 89
10.2 Examples for data protocol layer ... 91

Annex A (normative) Node tree ... 94

Annex B (normative) Test FTL ...

B.1 Overview ... 95
B.2 Basic Protocol Layer ... 95
B.2.1 Frame Tests ... 95
B.2.2 CRC-error ... 96
B.2.3 Delay and Timeout ... 96
B.3 Data Protocol Layer ... 96
B.3.1 Test of Toggling ... 96
B.3.2 Test of the FTL data layer ... 98
B.3.3 Test of the required FTL nodes ... 98
B.3.4 Optional System Subnodes ... 101
B.3.5 Optional Node Prn ... 103
B.3.6 Node Comp ... 105
B.4 Application Layer ... 111
B.4.1 Test of the L-File ... 111
B.4.2 Test of the LH-File ... 111
B.4.3 Test for the Filling of the NodeList ... 111
B.4.4 Sequence Test ... 112

Bibliography ... 114