DIN EN 15969-1:2011-11 (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

Foreword 4

Introduction 5

1 Scope 6

2 Normative references 6

3 Terms and definitions, abbreviations and conventions 6
3.1 Abbreviations 6
3.2 Terms and definitions 7
3.3 Conventions 8

4 Hardware interface 9

5 Basic protocol layer 9
5.1 FTL-frame (frame) 9
5.2 Frame flow (handshake) 10
5.3 Delay and timeout 16
5.4 CRC16 Checksum 16

6 Data protocol layer (FTL-data protocol) 17
6.1 Client (OBC) and server (TVE) 17
6.2 Syntax of data in datagrams 17
6.3 Nodes, subnodes, variables 17
6.4 Format identifiers 18
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) 26
7.5 Accessing a printer on TVE-side (subnode PRN) 26
7.6 Compartment information (subnode COMP) 30
7.7 Notification about changes (subnode NOTIFY) 31
7.8 Information about driver (subnode DRIVER) 32
7.9 Information about the vehicle (variable VEHICLE_ID) 33
7.10 Access to filesystem on TVE (subnode FS) 33
7.11 Auxiliary (subnode AUX) 39
7.12 Order management (subnode ORDER) 39
7.13 Goods and service database 43
7.14 FTL--logfile (subnodes LOG) 45
7.15 Required variables 73
7.16 NAK ID 73

8 Routing for multiple TVE 74
8.1 Purpose 74

8.2 Routing solution 74
8.3 Routing example 74

9 Communication with office 75
9.1 General 75
9.2 Simple file transfer 76
9.3 FTL over TCP/IP 77

10 Communication Examples 79
10.1 Examples for Basic Protocol Layer level 79
10.2 Examples for data protocol layer 81

Annex A (normative) Node tree 83

Annex B (normative) Test FTL 84

B.1 Overview 84
B.2 Basic Protocol Layer 84
B.2.1 Frame Tests 84
B.2.2 CRC-error 85
B.2.3 Delay and Timeout 85
B.3 Data Protocol Layer 86
B.3.1 Test of Toggling 86
B.3.2 Test of the FTL data layer 87
B.3.3 Test of the required FTL nodes 87
B.3.4 Optional System Subnodes 91
B.3.5 Optional Node Prn 92
B.3.6 Node Comp 94
B.4 Application Layer 100
B.4.1 Test of the L-File 100
B.4.2 Test of the LH-File 100
B.4.3 Test for the Filling of the NodeList 101
B.4.4 Sequence Test 101