DIN EN 13757-2:2024-12 (E)

Communication systems for meters - Part 2: Wired M-Bus communication (includes Amendment A1:2023)

Contents

Page

European foreword 5

Introduction 7

1 Scope 8

2 Normative references 8

3 Terms, definitions !and abbreviations" 8
3.1 !Terms and definitions" 8
3.2 !Abbreviations" 9

4 Physical layer specifications 9
4.1 General 9
4.2 Electrical requirements slave 10
4.2.1 Master to slave bus voltages 10
4.2.2 Slave bus current and multiple unit loads 11
4.2.3 Dynamic requirements 12
4.3 Electrical requirements master 12
4.3.1 Parameters 12
4.3.2 Function types 13
4.3.3 Requirements 13
4.4 Electrical requirements mini-master 15
4.4.1 Definition of a mini-master 15
4.4.2 Requirements 15
4.5 Repeaters 15
4.5.1 General requirements 15
4.5.2 Additional requirements 16
4.6 Burst and surge requirements 16
4.6.1 General 16
4.6.2 Requirements for devices intended for domestic use 16
4.6.3 Requirements for devices intended for industrial use 16

5 Link Layer (master and slave) 16
5.1 General 16
5.2 Baud rate 16
5.2.1 Required baud rate 16
5.2.2 Recommended additional baud rates 16
5.2.3 Special baud rates 17
5.2.4 Baud rate after reset 17
5.2.5 Baud rate set 17
5.2.6 Auto speed mode 17
5.2.7 Transmit baud rate accuracy 17
5.3 Bit position 17
5.3.1 Synchronous transmit bit distortion 17
5.3.2 Gross transmit bit distortion and minimum signal element 17
5.3.3 Character interval requirement 18
5.3.4 Practical receive margin and character interval requirement 18
5.3.5 Minimum signal element 18
5.4 Byte format 18
5.5 Block format 18

5.5.1 Transmission interbyte gaps ... 18
5.5.2 Reception interbyte gaps ... 18
5.5.3 Idle time between datagrams ... 18
5.6 Datagram abort on collision ... 18
5.7 Datagram description ... 19
5.7.1 General ... 19
5.7.2 Data integrity ... 19
5.7.3 !Communication types" ... 19
5.7.4 Datagram coding ... 20
5.7.5 Addressing ... 20
5.7.6 Link layer time schedule ... 20
5.7.7 Datagram sequencing ... 20

6 Tables and figures ... 22

Annex B (informative) !Examples of protection techniques for M-Bus meters against surge/lightning" ... 28

Annex C (informative) Slave powering options ... 33

Annex D (informative) Slave collision detect ... 34

Annex E (informative) Wire installation ... 35

E.1 General ... 35
E.2 Type A: small in house installation ... 35
E.2.1 Description ... 35
E.2.2 Usage ... 35
E.3 Type B: large in house installation ... 35
E.3.1 Description ... 35
E.3.2 Usage ... 35
E.4 Type C: small wide area net ... 35
E.4.1 Description ... 35

Annex A (informative) Schematic implementation of slave ... 27
E.4.2 Usage ... 36
E.5 Type D: large wide area net ... 36
E.5.1 Description ... 36
E.5.2 Usage ... 36
E.6 Type E: mini installation (meter cluster) ... 36
E.6.1 Description ... 36
E.6.2 Usage ... 36

Annex F (informative) Protocol examples ... 37

F.1 Startup ... 37
F.2 Slave (meter) readout ... 37

Bibliography ... 38

Table 1 -- Signal quality characteristics for slaves and masters ... 22

Figure 2 -- Start stop distorsion (example for bit 4), minimum signal element (example for bit 7) (Transmit) ... 23

Figure 3 -- Character interval requirement (Transmit) ... 23

Figure 4 -- Practical receive margin (example for two falling slopes) ... 24

Figure 5 -- Character interval requirement (Receive) ... 24

Figure 6 -- Minimum duration start element (Receive) ... 25

Figure 7 -- Reception of datagram packets 25

Figure 8 -- Quiescent time after reception 26

Figure A.1 -- Slave transceiver 27

Figure 1 -- Representation of bits on the M-Bus 10