

Table of Contents

Preface.....	7
Introduction.....	9
1. Scope.....	11
2. References.....	12
2.1. The HART Field Communications Protocol Specifications.....	12
2.2. Related Documents	12
3. Definitions	14
4. Symbols/Abbreviations.....	15
5. Logical Link Control	18
5.1. The HART PDU (Frame Format).....	18
5.1.1. Delimiter Field.....	19
5.1.2. Address Field	20
5.1.3. Expansion Bytes	20
5.1.4. Command.....	20
5.1.5. Byte Count	20
5.1.6. Data.....	20
5.1.7. Check Byte.....	21
5.2. Framing.....	21
5.3. Device Addresses.....	22
5.3.1. Master Addresses and the Burst Mode Flag.....	22
5.3.2. Unique Addresses	22
5.3.3. Broadcast Address	23
5.3.4. Polling Addresses	23
5.4. Error Detection Coding.....	24
5.4.1. Slave Response to Communication Errors	25
6. Data Link Layer Services	27
6.1. Physical Layer SAPs.....	27
6.2. Data Link Layer SAPs	30
6.2.1. Message SAPs.....	30
6.2.2. Management SAPs.....	33
7. Medium Access Control	37

- 7.1. MAC Operation 38
- 7.2. Device Requirements 41
 - 7.2.1. Primitive Receive Machine 42
 - 7.2.2. Primitive Transmit Machine 43
 - 7.2.3. Slave and Burst-Mode MAC 43
 - 7.2.4. Master MAC 46
- 8. Physical Layer-Specific Requirements 49
 - 8.1. FSK Physical Layer 50
 - 8.1.1. Preamble and Start of Message Detection 51
 - 8.1.2. Character formats 51
 - 8.2. RS-485 52
 - 8.2.1. Preamble and Start of Message Detection 53
 - 8.2.2. Character formats 53
 - 8.3. C8PSK Physical Layer 54
 - 8.3.1. Preamble and Start of Message Detection 55
 - 8.3.2. Character formats 55
- Annex A Model for Service Specifications 56
- Annex B State Transition Diagram Notation 58
- Annex C Derivation of Time-Out Constants 59
 - C.1 FSK Physical Layer Timer Values 60
 - C.1.1 Link Grant Timer (RT2) Derivation 61
 - C.1.2 Link Quiet Timer (RT1) Derivation 62
 - C.2 HART over RS-485 63
 - C.3 PSK Physical Layer Timer Values 64
 - C.3.1 PSK Link Grant Timing 64
 - C.3.2 RT1 Derivation 65
- Annex D Revision History 66
 - D.1 Changes from Revision 8.1 to Revision 8.2 66
 - D.2 Changes from Revision 8.0 to Revision 8.1 66
 - D.3 Changes from Revision 7.1 to Revision 8.0 66
 - D.4 Changes from Revision 7.0 to Revision 7.1 67