

ISO/IEC 14543-3-10:2020-03 (E)

Information technology - Home electronic systems (HES) architecture - Part 3-10: Wireless short-packet (WSP) protocol optimized for energy harvesting - Architecture and lower layer protocols

Contents

	Page
FOREWORD	4
INTRODUCTION	6
1 Scope	8
2 Normative references	8
3 Terms, definitions and abbreviated terms	8
3.1 Terms and definitions.....	8
3.2 Abbreviated terms.....	13
4 Conformance	13
5 Architecture	13
5.1 Generic protocol description	13
5.1.1 Overview	13
5.1.2 Physical layer	14
5.1.3 Data link layer	14
5.1.4 Network layer	14
5.1.5 Transport layer	15
5.1.6 Session layer.....	15
5.1.7 Presentation layer	15
5.1.8 Application layer	15
5.2 Data unit description	15
6 Layer 1 – Physical layer	16
6.1 Overview.....	16
6.2 General description.....	16
6.3 Requirements for the 315 MHz AMWSP protocol	18
6.4 Requirements for the 868,3 MHz AMWSP protocol.....	21
6.5 Frame structure	23
7 Layer 2 – Data link layer.....	25
7.1 Overview.....	25
7.2 Subtelegram timing	25
7.3 Data integrity	26
7.3.1 General	26
7.3.2 4 bit summation hash function algorithm	27
7.3.3 8 bit summation hash function algorithm	27
7.3.4 8 bit cyclic redundancy check (CRC) hash function algorithm	27
7.4 Listen before talk	28
8 Layer 3 – Network layer.....	28
8.1 Overview.....	28
8.2 Switch telegram	28
8.3 Repeater.....	29
8.3.1 General	29
8.3.2 Time response for collision avoidance	29
8.3.3 Bits of a repeater level in the STATUS byte	30

8.4	Addressing.....	30
8.4.1	General	30
8.4.2	Encapsulation.....	31
Annex A (informative)	Examples of how to evaluate the hash values	32
Bibliography.....		34

Figure 1 – Structure of a subtelegram	15
Figure 2 – Illustration of an ASK envelope and various physical parameters	17
Figure 3 – Complete frame structure for the 868,3 MHz AMWSP protocol	23
Figure 4 – Encoded subframe	24
Figure 5 – TX maturity time divided into four 10 ms time ranges	25
Figure 6 – Conversion of a switch telegram to a normal telegram.....	29
Figure 7 – Example of an encapsulation	31
Figure A.1 – Example of a C code program of the 4 bit long summation hash value	32
Figure A.2 – Example of a C code program of the 8 bit long summation hash value	32
Figure A.3 – Efficient C code program for the evaluation of an 8 bit long CRC type hash value	33
 Table 1 – AMWSP protocol stack structure (OSI)	14
Table 2 – Transmitter requirements for the 315 MHz AMWSP protocol	19
Table 3 – Receiver requirements for the 315 MHz AMWSP protocol	20
Table 4 – Minimum required link budget for the 315 MHz AMWSP protocol.....	20
Table 5 – Maximum RX power for the 315 MHz AMWSP protocol	21
Table 6 – Transmitter requirements for the 868,3 MHz AMWSP protocol.....	21
Table 7 – Receiver requirements for the 868,3 MHz AMWSP protocol	22
Table 8 – Minimum required link budget for the 868,3 MHz AMWSP protocol.....	22
Table 9 – Maximum RX power for the 868,3 MHz AMWSP protocol	23
Table 10 – Frame definition for the 315 MHz AMWSP protocol	24
Table 11 – Frame definition for the 868,3 MHz AMWSP protocol	24
Table 12 – Maturity time parameters.....	25
Table 13 – Allocation of time slots to the different subtelegrams	26
Table 14 – Identification of the hash function used in the telegram	27
Table 15 – Conversion of the telegram type and STATUS fields from a switch telegram to a telegram	29
Table 16 – STATUS byte with repeater level bits	30
Table 17 – Repeating bits in STATUS byte	30