

ISO/IEC 14543-4-301:2020-06 (E)

Information technology - Home Electronic System (HES) architecture - Part 4-301: Application protocols for home air conditioners and controllers

| Contents | Page |
|--|------|
| FOREWORD..... | 4 |
| INTRODUCTION..... | 5 |
| 1 Scope..... | 6 |
| 2 Normative references | 6 |
| 3 Terms, definitions and abbreviated terms | 6 |
| 3.1 Terms and definitions..... | 6 |
| 3.2 Abbreviated terms..... | 8 |
| 4 Conformance | 9 |
| 5 Connection configuration | 9 |
| 6 Application layer | 10 |
| 6.1 General..... | 10 |
| 6.2 NECD objects | 10 |
| 6.3 NECD services..... | 10 |
| 6.4 Object-specific NECD properties..... | 11 |
| 6.5 Application operation | 12 |
| 6.5.1 General | 12 |
| 6.5.2 Continuous requests..... | 12 |
| 6.5.3 Response wait timer value for controllers | 12 |
| 6.5.4 Resending a frame | 13 |
| 6.5.5 Processing object property counter..... | 13 |
| 6.5.6 Property values of write requests..... | 13 |
| 7 Normal operation | 13 |
| 7.1 General..... | 13 |
| 7.2 Start-up operation | 14 |
| 7.2.1 General | 14 |
| 7.2.2 Start-up processing of NECD nodes | 14 |
| 7.2.3 Search processing | 15 |
| 7.2.4 Obtaining NECD attribute information | 15 |
| 7.2.5 Obtaining home air conditioner attribute information | 16 |
| 7.3 Periodical operation | 16 |
| 7.4 Occasional operation | 16 |
| 7.4.1 General | 16 |
| 7.4.2 Obtaining home air conditioner status..... | 16 |
| 7.4.3 Controlling home air conditioners..... | 17 |
| 7.5 Operation during fault status | 18 |
| 8 Remote control | 19 |
| 8.1 General..... | 19 |
| 8.2 Processes to be carried out by controllers on remote control | 19 |

| | | |
|-----------------------|---|----|
| 9 | Considerations on controllers | 22 |
| 9.1 | General..... | 22 |
| 9.2 | Restrictions by home air conditioner implementations | 22 |
| 9.3 | Processable number of object property counter..... | 24 |
| 9.4 | Status synchronization by controllers (periodical operation) | 24 |
| 9.5 | Reading fault status | 26 |
| | | |
| Annex A (informative) | Terms and NECD frame format on ISO/IEC 14543-4-3 and IEC 62394..... | 27 |
| A.1 | Terms correspondence between ISO/IEC 14543-4-3 and IEC 62394..... | 27 |
| A.2 | NECD frame format..... | 27 |
| | | |
| Figure 1 | – Relationship between IEC 62394, ISO/IEC 14543-4-3 and ISO/IEC 14543-4-301 ... | 5 |
| Figure 2 | – Connection configurations | 9 |
| Figure 3 | – Assumed network stack..... | 10 |
| Figure 4 | – Example of normal operation sequences | 14 |
| Figure 5 | – Example of sequence for obtaining NECD attribute information | 15 |
| Figure 6 | – Sequence to obtain status of home air conditioners..... | 17 |
| Figure 7 | – Sequence to control home air conditioners | 18 |
| Figure 8 | – Remote control..... | 19 |
| Figure 9 | – Remote control sequence (properties are written one by one) | 21 |
| Figure 10 | – Remote control sequence (properties are written in a batch) | 22 |
| Figure 11 | – Status synchronization flow by controllers | 25 |
| Figure 12 | – Obtaining detailed fault status information..... | 26 |
| Figure A.1 | – NECD frame format..... | 28 |
| | | |
| Table 1 | – NECD objects..... | 10 |
| Table 2 | – NECD services | 11 |
| Table 3 | – NECD properties of device object (super class)..... | 11 |
| Table 4 | – NECD properties of device object..... | 12 |
| Table 5 | – Response wait timer value for controllers | 12 |
| Table A.1 | – Terms correspondence table between ISO/IEC 14543-4-3 and IEC 62394 | 27 |