This is a preview - click here to buy the full publication

ISO/IEC 14543-3-4

Edition 1.0 2007-01

INTERNATIONAL STANDARD

Information technology – Home electronic system (HES) architecture – Part 3-4: System management – Management procedures for a network based control of HES Class 1

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 35.240.67

ISBN 2-8318-8953-7

Warning! Make sure that you obtained this publication from an authorized distributor.

This is a preview - click here to buy the full publication

CONTENTS

FOREWORD 7
INTRODUCTION 9
1 Scope 10
2 Normative references 10
3 Terms, definitions and abbreviations 11
3.1 Terms and definitions 11
3.2 Abbreviations 13
4 Conformance 13
5 Network management procedures 13
5.1 General 13
5.2 NM_IndividualAddress_Read 14
5.2.1 Description 14
5.2.2 Management service used 14
5.2.3 Sequence 14
5.2.4 Exception handling 14
5.3 NM_IndividualAddress_Write 14
5.3.1 Description 14
5.3.2 Management services used 15
5.3.3 Sequence 15
5.3.4 Exception handling 16
5.4 NM_SerialNumberDefaultIA_Scan 16
5.4.1 Description 16
5.4.2 Management service used 16
5.4.3 Sequence 17
5.4.4 Exception handling 17
5.5 NM_IndividualAddress_SerialNumber_Read 17
5.5.1 Description 17
5.5.2 Management service used 17
5.5.3 Sequence 17
5.5.4 Exception handling 18
5.6 NM_IndividualAddress_SerialNumber_Write 18
5.6.1 Description 18
5.6.2 Management services used 18
5.6.3 Sequence 18
5.6.4 Exception handling 18
5.7 NM_DomainAddress_Read 19
5.7.1 Description 19
5.7.2 Management service used 19
5.7.3 Sequence 19
5.7.4 Exception handling 19
5.8 NM_DomainAddress_Write 19
5.8.1 Description 19
5.8.2 Management services used 20
5.8.3 Sequence 20

This is a preview - click here to buy the full publication

5.8.4 Exception handling....21
5.9 NM_DomainAddress_Scan....21
5.9.1 Description....21
5.9.2 Management service used....21
5.9.3 Sequence....22
5.9.4 Exception handling....22
5.10 NM_Router_Scan....22
5.10.1 Description....22
5.10.2 Management service used....22
5.10.3 Sequence....23
5.11 NM_SubnetworkDevices_Scan....23
5.11.1 Description....23
5.11.2 Management service used....23
5.11.3 Sequence....23
5.12 NM_SubnetworkAddress_Read....24
5.12.1 Description....24
5.12.2 Management service used....24
5.12.3 Sequence....24
5.12.4 Exception handling....24
5.13 NM_IndividualAddress_Reset....24
5.13.1 Description....24
5.13.2 Management services used....24
5.13.3 Sequence....25
5.14 NM_IndividualAddress_Scan....25
5.14.1 Description....25
5.14.2 Management services used....25
5.14.3 Sequence....26
5.14.4 Possible reactions....26
5.15 NM_IndividualAddress_Check....26
5.15.1 Description....26
5.15.2 Management services used....26
5.15.3 Sequence....27
5.16 NM_IndividualAddress_Check_LocalSubnetwork....27
5.16.1 Description....27
5.16.2 Management service used....27
5.16.3 Sequence....28
5.17 NM_GroupAddress_Check....28
5.17.1 Description....28
5.17.2 Management service used....28
5.17.3 Sequence....28
5.17.4 Exception handling....29
5.18 NM_FunctionalBlock_Scan....29
5.18.1 Description....29
5.18.2 Management service used....29
5.18.3 Sequence....29
5.18.4 Exception handling....29
6 Device management procedures....30
6.1 General....30
6.2 General exception handling....30

This is a preview - click here to buy the full publication

6.3 DM_Connect 30
6.3.1 General Description 30
6.3.2 Procedure: DMP_Connect_RCo 30
6.3.3 Procedure: DMP_Connect_RCI 31
6.4 DM_Disconnect 32
6.4.1 General description 32
6.4.2 Procedure: DMP_Disconnect_RCo 32
6.4.3 Procedure: DMP_Disconnect_RCI 32
6.5 DM_Authorize 33
6.5.1 General description 33
6.5.2 Procedure: DMP_Authorize_RCo 33
6.6 DM_SetKey 33
6.6.1 General description 33
6.6.2 Procedure: DM_SetKey_RCo 34
6.7 DM_Restart 34
6.7.1 General description 34
6.7.2 Procedure: DM_Restart_RCo 34
6.8 DM_Delay 35
6.8.1 Description 35
6.8.2 Procedure: DMP_Delay 35
6.9 DM_IndividualAddressRead 35
6.10 DM_IndividualAddressWrite 35
6.11 DM_DomainAddressRead 36
6.12 DM_DomainAddressWrite 36
6.13 DM_ProgMode_Switch 36
6.13.1 Description 36
6.13.2 Procedure: DMP_ProgModeSwitch_RCo 36
6.14 DM_GroupObject_Link_Read 37
6.14.1 Description 37
6.14.2 Management service used 37
6.14.3 Sequence 37
6.14.4 Exception handling 37
6.15 DM_GroupObject_Link_Write 37
6.15.1 Description 37
6.15.2 Management services used 38
6.15.3 Sequence 38
6.15.4 Exception handling 38
6.16 DM_MemWrite 38
6.16.1 General description 38
6.16.2 Procedure: DMP_MemWrite_RCo 39
6.16.3 Procedure: DMP_MemWrite_RCoV 40
6.17 DM_MemVerify 41
6.17.1 General description 41
6.17.2 Procedure: DMP_MemVerify_RCo 42
6.18 DM_MemRead 42
6.18.1 General description 42
6.18.2 Procedure: DMP_MemRead_RCo 43
6.19 DM_UserMemWrite 43
6.19.1 General description 43

This is a preview - click here to buy the full publication

6.19.2 Procedure: DMP_UserMemWrite_RCo 44
6.19.3 Procedure: DMP_UserMemWrite_RCoV 45
6.20 DM_UserMemVerify 46
6.20.1 General description 46
6.20.2 Procedure: DMP_UserMemVerify_RCo 46
6.21 DM_UserMemRead 47
6.21.1 General description 47
6.21.2 Procedure: DMP_UserMemRead_RCo 47
6.22 DM_InterfaceObjectWrite 48
6.22.1 General description 48
6.22.2 Procedure: DMP_InterfaceObjectWrite_R 48
6.23 DM_InterfaceObjectVerify 49
6.23.1 General description 49
6.23.2 Procedure: DMP_InterfaceObjectVerify_R 50
6.24 DM_InterfaceObjectRead 51
6.24.1 General description 51
6.24.2 Procedure: DMP_InterfaceObjectRead_R 51
6.25 DM_InterfaceObjectScan 52
6.25.1 General description 52
6.25.2 Procedure: DMP_InterfaceObjectScan_R 53
6.26 DM_LoadStateMachineWrite 54
6.26.1 General description 54
6.26.2 Procedure: DMP_LoadStateMachineWrite_RCo_Mem 56
6.26.3 Procedure: DMP_LoadStateMachineWrite_RCo_IO 59
6.27 DM_LoadStateMachineVerify 62
6.27.1 General description 62
6.27.2 Procedure: DM_LoadStateMachineVerify_RCo_Mem 63
6.27.3 Procedure: DMP_LoadStateMachineVerify_R_IO 64
6.28 DM_LoadStateMachineRead 64
6.28.1 General description 64
6.28.2 Procedure: DMP_LoadStateMachineRead_RCo_Mem 65
6.28.3 Procedure: DMP_LoadStateMachineRead_R_IO 66
6.29 DM_RunStateMachineWrite 67
6.29.1 General description 67
6.29.2 Procedure: DMP_RunStateMachineWrite_RCo_Mem 67
6.29.3 Procedure: DMP_RunStateMachineWrite_R_IO 68
6.30 DM_RunStateMachineVerify 69
6.30.1 General description 69
6.30.2 Procedure: DMP_RunStateMachineVerify_RCo_Mem 70
6.30.3 Procedure: DMP_RunStateMachineVerify_R_IO 70
6.31 DM_RunStateMachineRead 71
6.31.1 General description 71
6.31.2 Procedure: DMP_RunStateMachineRead_RCo_Mem 72
6.31.3 Procedure: DMP_RunStateMachineRead_R_IO 72
6.32 DM_LCSlaveMemWrite 73
6.32.1 General description 73
6.32.2 Procedure: DMP_LCSlaveMemWrite_RCo 74
6.33 DM_LCSlaveMemVerify 75
6.33.1 General description 75

This is a preview - click here to buy the full publication

6.33.2 Procedure: DMP_LCSlaveMemVerify_RCo 75
6.34 DM_LCSlaveMemRead 76
6.34.1 General description 76
6.34.2 Procedure: DMP_LCSlaveMemRead_RCo 76
6.35 DM_LCExtMemWrite 77
6.35.1 General description 77
6.35.2 Procedure: DMP_LCExtMemWrite_RCo 78
6.36 DM_LCExtMemVerify 79
6.36.1 General description 79
6.36.2 Procedure: DMP_LCExtMemVerify_RCo 80
6.37 DM_LCExtMemRead 80
6.37.1 General description 80
6.37.2 Procedure: DMP_LCExtMemRead_RCo 81
6.38 DM_LCExtMemOpen 81
6.38.1 General description 81
6.38.2 Procedure: DMP_LCExtMemOpen_RCo 82
6.39 DM_LCRouteTableStateWrite 82
6.39.1 General description 82
6.39.2 Procedure: DMP_LCRouteTableStateWrite_RCo 82
6.40 DM_LCRouteTableStateVerify 83
6.40.1 General description 83
6.40.2 Procedure: DMP_LCRouteTableStateVerify_RCo 83
6.41 DM_LCRouteTableStateRead 84
6.41.1 General description 84
6.41.2 Procedure: DMP_LCRouteTableStateRead_RCo 84
Bibliography 86

Table 1 – Resulting states after each event 55
Table 2 – Overview state machine types and tables 55
Table 3 – Overview addresses for the load management controls 56
Table 4 – Addresses of the load state controls 63
Table 5 – Addresses of the load state controls 65
Table 6 – Run state events and resulting run states 67
Table 7 – Addresses of the run state controls 68

This is a preview - click here to buy the full publication

INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) ARCHITECTURE –

Part 3-4: System management – Management procedures for network based control of HES Class 1

FOREWORD

1) ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards. Their preparation is entrusted to technical committees; any ISO and IEC member body interested in the subject dealt with may participate in this preparatory work. International governmental and non-governmental organizations liaising with ISO and IEC also participate in this preparation.

2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

3) The formal decisions or agreements of IEC and ISO on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC and ISO member bodies.

4) IEC, ISO and ISO/IEC Publications have the form of recommendations for international use and are accepted by IEC and ISO member bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC, ISO and ISO/IEC Publications is accurate, IEC or ISO cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.

5) In order to promote international uniformity, IEC and ISO member bodies undertake to apply IEC, ISO and ISO/IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any ISO/IEC Publication and the corresponding national or regional publication should be clearly indicated in the latter.

6) ISO and IEC provide no marking procedure to indicate their approval and cannot be rendered responsible for any equipment declared to be in conformity with an ISO/IEC Publication.

7) All users should ensure that they have the latest edition of this publication.

8) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.

9) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

IEC and ISO draw attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning a particular way of using the Network Management Mechanism stated in this standard.

Hager Control SAS has informed IEC and ISO that it has the following patent that is not essential for the implementation of any particular clause of this standards but may concern specific combinations thereof:

EP 0817 423A1

ISO and IEC take no position concerning the evidence, validity and scope of this putative patent right. The holder of this putative patent right has assured IEC and ISO that they are willing to negotiate free licences or licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this putative patent right is registered with IEC and ISO. Information may be obtained from:

Hager Control SAS
33, rue Saint-Nicolas
PB 154
F-67704 Saverne Cedex
France

This is a preview - click here to buy the full publication

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC and ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 14543-3-4 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

This International Standard is a product family standard. It shall be used in conjunction with ISO/IEC 14543-2-1, 14543-3-1, 14543-3-2, 14543-3-3, 14543-3-5, 14543-3-6 and 14543-3-7.

This International Standard has been approved by vote of the member bodies, and the voting results may be obtained from the address given on the title page.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This is a preview - click here to buy the full publication

INTRODUCTION

The management procedures capture the dynamics of managing distributed resources on the network in terms of abstract procedures. On the network itself, a procedure consists of a sequence of telegrams, exchanged between two partners, the management client and the management server.

The management client is a powerful device with 'controller' function, typically, but not exclusively, PC-based. Except for network-oriented management, the server is always a 'target device'. In the former case, it is in fact the network as a whole which acts as partner or server. Ultimately, of course, the response to a client request is always generated by the individual devices connected to the network, either one or many. In addition to its run-time behaviour (based on group communication), every device moreover supports a rich management server profile for this purpose. An important objective of this part “Management Procedures” is to allow a concise description of such a profile. It is clear that the information about the full set of management procedures supported by a particular device or implementation tells us significantly more about the device than merely the list of services through which this is realised.

In general, one single device may well implement both client as well as server function. For and during the execution of a particular management procedure, however, one device takes on one single role.

Currently, ISO/IEC 14543, *Information technology – Home Electronic System (HES) architecture*, consists of the following parts:

Part 2-1: *Introduction and device modularity*
Part 3-1: *Communication layers – Application layer for network based control of HES Class 1*
Part 3-2: *Communication layers – Transport, network and general parts of data link layer for network based control of HES Class 1*
Part 3-3: *User process for network based control of HES Class 1*
Part 3-4: *System management – Management procedures for network based control of HES Class 1*
Part 3-5: *Media and media dependent layers – Power line for network based control of HES Class 1*
Part 3-6: *Media and media dependent layers – Twisted pair for network based control of HES Class 1*
Part 3-7: *Media and media dependent layers – Radio frequency for network based control of HES Class 1*
Part 4: *Home and building automation in a mixed-use building (technical report)*
Part 5-1: *Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Core protocol (under consideration)*
Part 5-2: *Intelligent grouping and resource sharing for HES Class 2 and Class 3 – Device certification (under consideration)*

Additional parts may be added later.

This is a preview - click here to buy the full publication

INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) ARCHITECTURE –

Part 3-4: System management – Management procedures for network based control of HES Class 1

1 Scope

This part of ISO/IEC 14543 establishes general principles for network and device management shared by all installation modes for network based control of HES Class 1 and independent of the installation mode used. The aim is to standardize the interaction between a management client and a management server which leads to the successful configuration of the devices. The management procedures thus specify the highest level communication requirements between a management client and a management server. These requirements specify

a) the **sequence** of messages that shall be exchanged between a management client and a management server,

b) the **contents** and **interpretation** of the transported data,

c) the **action** to take based on this data (setting internal resources, state machines, physical actions, …), and

d) the error and exception handling.

The management procedures are based on the application layer services.

Some management procedures are solely based on the use of one or a sequence of dedicated application layer services to achieve the required goal. For these, ISO/IEC 14543-3-1 and ISO/IEC 14543-3-2 provide sufficient information concerning the underlying mechanisms.

Other management procedures additionally use the application layer services to access internal data in the management server to achieve the required goal. This data is defined as objects as specified in ISO/IEC 14543-3-3.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 14543-2-1, *Information technology – Home electronic system (HES) architecture – Part 2-1: Introduction and device modularity*

ISO/IEC 14543-3-1, *Information technology – Home electronic system (HES) architecture – Part 3-1: Communication layers – Application layer for network based control of HES Class 1*

ISO/IEC 14543-3-2, *Information technology – Home electronic system (HES) architecture – Part 3-2: Communication layers – Transport, network and general parts of data link layer for network based control of HES Class 1*

ISO/IEC 14543-3-3, *Information technology – Home electronic system (HES) architecture – Part 3-3: User process for network based control of HES Class 1*

ISO/IEC 14543-3-5, *Information technology – Home electronic system (HES) architecture – Part 3-5: Media and media dependent layers – Power line for network based control of HES Class 1*

This is a preview - click here to buy the full publication

ISO/IEC 14543-3-6, *Information technology – Home electronic system (HES) architecture – Part 3-6: Media and media dependent layers – Twisted pair for network based control of HES Class 1*

ISO/IEC 14543-3-7, *Information technology – Home electronic system (HES) architecture – Part 3-7: Media and media dependent layers – Radio frequency for network based control of HES Class 1*