ISO/IEC 15067-3:2024-09 (E)

Information technology - Home Electronic System (HES) application model - Part 3: Model of an energy management system for HES

Contents

Page

FOREWORD 4
INTRODUCTION 6
1 Scope 8
2 Normative references 8
3 Terms, definitions and abbreviated terms 9
3.1 Terms and definitions 9
3.2 Abbreviated terms 12
4 Conformance 12
5 HES framework for energy management 13
5.1 HES energy management elements and model 13
5.2 HES energy management protected environment 16
5.3 HES energy management agent (EMA) 16
5.4 Electrical energy measurement system (EEMS) 16
5.5 EMA and EEMS functionality 17
5.6 Location of an EMA 17
6 Energy management methods for the EMA 17
6.1 Range of methods 17
6.2 Consumer-centric energy management 18
6.2.1 Framework for consumer-centric energy management 18
6.2.2 Energy management agent (EMA) parameters 19
6.2.3 EMA functions 20
6.2.4 EMA control of appliances and PER 21
6.2.5 EMA protection of privacy 22
6.2.6 EMA and gateway 22
6.2.7 EMA and transactive energy 23
6.2.8 EMA benefits 23
6.2.9 Additional EMA services 25
6.3 Accommodating legacy energy management 25
6.3.1 Utility-centric energy management 25
6.3.2 Local load control 26
6.3.3 Direct load control 26
6.3.4 Prices-to-devices 27
7 HES energy management use-case models and messages 28
7.1 Introduction to energy management use-case models and messages 28
7.2 Logical and physical models for utility-centric HES energy management 29
7.2.1 Structure of utility-centric management models 29
7.2.2 Case 1: local control 29
7.2.3 Case 2: direct control without supervision 30
7.2.4 Case 3: direct control with supervision 31
7.2.5 Case 4: utility telemetry services 32

7.3 Logical and physical models for consumer-centric HES energy management 33
7.3.1 Structure of consumer-centric management models 33
7.3.2 EMA information flows 34
7.4 Messages for HES energy management 36
7.4.1 Overview of HES energy management messages 36
7.4.2 HES message list 36
Annex A (informative) Building energy management 40
Annex B (informative) Premises equipment for grid energy management 42
B.1 On-premises equipment 42
B.2 Demand response – hours 42
B.3 Demand response – minutes 42
B.4 Demand response – seconds 43
B.5 Demand response – milliseconds 43
Annex C (informative) Demand-side management 44
C.1 Demand-side management overview 44
C.2 Demand-side management incentives 44
C.3 Peak clipping 44
C.4 Demand response 45
C.4.1 Demand response via direct load control 45
C.4.2 Time-of-use pricing 45
C.4.3 Real-time pricing 46
C.4.4 Demand response via distributed load control 46
C.4.5 Demand response and customer privacy 46
Annex D (informative) Value-added services 47
Bibliography 48

Figure 1 – HES energy management framework model 14
Figure 2 – HES energy management architecture 18
Figure 3 – Energy management agent (EMA) inputs and outputs 19
Figure 4 – Simple consumer choices 24
Figure 5 – Direct load control 27
Figure 6 – Price-to-devices 28
Figure 7 – Case 1: local control, physical model 29
Figure 8 – Case 1: local control, logical model 29
Figure 9 – Case 2: direct control, physical model 30
Figure 10 – Case 2: direct control, logical model 30
Figure 11 – Case 3: direct control with supervision, physical model 31
Figure 12 – Case 3: direct control with supervision, logical model 31
Figure 13 – Case 4: utility telemetry services, physical model 32
Figure 14 – Case 4: utility telemetry services, logical model 33
Figure 15 – Customer-centric HES energy management, physical model 34
Figure 16 – Customer-centric HES energy management, logical model 34
Figure A.1 – Example of building energy management 41