IEC 61850-8-1

Edition 2.1 2020-02
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Communication networks and systems for power utility automation –
Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3

Réseaux et systèmes de communication pour l'automatisation des systèmes électriques –
Partie 8-1: Mise en correspondance des services de communication spécifiques (SCSM) – Mises en correspondance pour MMS (ISO 9506-1 et ISO 9506-2) et pour l'ISO/IEC 8802-3

iTeh Standards
(https://standards.iteh.ai)
Document Preview
https://standards.iteh.ai/catalog/standards/sist/iec-61850-8-1-2011

IEC 61850-8-1:2011-06+AMD1:2020-02 CSV(en-fr)

THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2020 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
67 000 electrotechnical terminology entries in English and French extracted from the Terms and definitions clause of IEC publications issued between 2002 and 2015. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/e765016d-849e-408c-921c-4798b838e1f4/iec-61850-8-1-2011

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et définitions des publications IEC parues entre 2002 et 2015. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

IEC 61850-8-1

Edition 2.1 2020-02
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Communication networks and systems for power utility automation – Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3

Réseaux et systèmes de communication pour l'automatisation des systèmes électriques – Partie 8-1: Mise en correspondance des services de communication spécifiques (SCSM) – Mises en correspondance pour MMS (ISO 9506-1 et ISO 9506-2) et pour l'ISO/IEC 8802-3

iTeh Standards
(https://standards.iteh.ai)
Document Preview
https://standards.iteh.ai/catalog/standards/sist/...-61850-8-1-2011

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.200

ISBN 978-2-8322-7913-7

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

® Registered trademark of the International Electrotechnical Commission
Marque déposée de la Commission Electrotechnique Internationale

CONTENTS

FOREWORD 12
INTRODUCTION 15
1 Scope 16
1.1 General 16
1.2 Namespace name and version 16
1.3 Code Component distribution 17
2 Normative references 18
3 Terms and definitions 22
4 Abbreviations 24
5 Overview 26
5.1 General 26
5.2 MMS communication profiles 27
5.3 Non-MMS communication profiles 27
5.4 MMS objects being used 28
6 Communication stack 28
6.1 Overview of the protocol usage 28
6.2 Client/server services and communication profiles 29
6.2.1 Client/server services 29
6.2.2 A-Profile 31
6.2.3 TCP/IP T-Profile 33
6.3 GSE management and GOOSE services communication profiles 34
6.3.1 GSE mapping overview 34
6.3.2 A-Profile 34
6.3.3 T-Profile 35
6.4 Time sync 36
6.4.1 Conformance statement 36
6.4.2 A-Profile 37
6.4.3 T-Profile 37
6.5 Sampled value management and Sampled value services communication profiles 38
6.5.1 Sampled value mapping overview 38
6.5.2 A-Profile 38
6.5.3 T-Profile 39
7 Objects of IEC 61850 41
7.1 Server 41
7.2 Logical device (LD) 41
7.3 Logical node (LN) 41
7.3.1 General 41
7.3.2 Mapping of LNReference to VariableAccessSpecifications 44
7.3.3 Mapping of DataObjects reference to VariableAccessSpecifications 44
7.3.4 Mapping of DataAttributes (DataAttr) reference to VariableAccessSpecifications 44
8 Mapping of IEC 61850-7-2 data attributes 45
8.1 Mapping of Attributes specified in IEC 61850-7-2 45
8.1.1 BasicTypes 45
8.1.2 Additional definitions of BasicType 45

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/e765016d-849e-408c-921c-4798b838e1f4/iec-61850-8-1-2011

8.1.3 Common ACSITypes 47
8.2 Mapping of quality common data attribute type specified in IEC 61850-7-2 68
9 Server class model 69
9.1 Server mapping 69
9.2 Server class attributes 69
9.2.1 ServiceAccessPoint 69
9.2.2 Logical devices 70
9.2.3 Files 70
9.2.4 Client associations 70
9.3 Server class service GetServerDirectory 70
10 Association model 72
10.1 Association relation to communication profiles 72
10.2 Two party association model for client/server communication profile 72
10.2.1 Association mapping 72
10.2.2 Association services 73
10.3 Two party association model for GSE management communication profile 74
10.4 Two party association model for time sync 74
10.5 Multicast association model 74
11 Logical device model 74
12 Logical node model 74
12.1 GenLogicalNodeClass 74
12.2 GenLogicalNodeClass attributes 74
12.3 GenLogicalNodeClass services 75
12.3.1 GetLogicalNodeDirectory 75
12.3.2 GetAllDataValues 76
13 DataObject, DataAttribute, SubDataAttribute model 77
13.1 GenDataObjectClass 77
13.2 GenDataAttributeClass 77
13.3 GenSubDataAttributeClass 77
13.4 GenDataObjectClass services 78
13.4.1 GetDataValues 78
13.4.2 SetDataValues 78
13.4.3 GetDataDirectory 79
13.4.4 GetDataDefinition 79
14 Data set class model 79
14.1 Data set class 79
14.2 Data set attributes 79
14.3 Data set services 79
14.3.1 GetDataSetValues 79
14.3.2 SetDataSetValues 80
14.3.3 CreateDataSet 80
14.3.4 DeleteDataSet 81
14.3.5 GetDataSetDirectory 81
15 ServiceTracking model 82
15.1 General 82
15.2 Common Service Tracking – CST 82
15.3 Mapping of the Buffered Report Tracking Service – BTS 84
15.4 Mapping of the Unbuffered Report Tracking Service – UTS 85

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/e765016d-849e-408c-921c-47986838e1f4/iec-61850-8-1-2011

15.5 Mapping of the Log Control Block Tracking Service Tracking – LTS 85
15.6 Mapping of the Log Tracking Service – OTS 86
15.7 Mapping of the GOOSE Control Block Tracking Service – GTS 86
15.8 Mapping of the Setting Group Control Block Tracking Service – STS 87
15.9 Mapping of the tracking service for MSVCB control block – MTS 87
15.10 Mapping of the tracking service of the deprecated USVCB control block – NTS 87
16 Setting group control class model 88
16.1 Setting group control block definition 88
16.2 Setting group control class services 88
16.2.1 SelectActiveSG 88
16.2.2 SelectEditSG 88
16.2.3 SetEditSGValue 89
16.2.4 ConfirmEditSGValues 89
16.2.5 GetEditSGValue 89
16.2.6 GetSGCBValues 89
17 Reporting and logging class model 89
17.1 Report model – Report control blocks 89
17.1.1 Functional Constraint for Report Control Blocks 89
17.1.2 Buffered report control block 89
17.1.3 Unbuffered report control block 91
17.2 Reporting services 93
17.2.1 Report service 93
17.2.2 GetBRCBValues 95
17.2.3 SetBRCBValues 95
17.2.4 GetURCBValues 95
17.2.5 SetURCBValues 95
17.3 Log model 95
17.3.1 General 95
17.3.2 Mapping of log control class 95
17.3.3 Mapping of log class 95
17.3.4 Mapping of log and log control services 100
17.3.5 Conformance 102
18 Mapping of the generic substation event model (GSE) 102
18.1 Generic object oriented substation event (GOOSE) 102
18.1.1 GOOSE control definition 102
18.1.2 GOOSE services 104
19 Transmission of sampled values class model 112
19.1 Sampled value 112
19.1.1 Sampled value control block 112
19.1.2 Sampled value services 113
20 Control class model 117
20.1 General 117
20.2 Control service parameters 117
20.3 Mapping of control objects and CO_CtrlObjectRef 118
20.4 Mapping of control services 120
20.5 Select 120
20.5.1 Select service parameter mapping 120

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/7665016d-840c-408c-921c-4709b038c4ff/iec-61850-8-1-2011

20.5.2 Mapping of the select service 121
20.5.3 Select request 121
20.5.4 Select response+ 121
20.5.5 Select response– 121
20.6 SelectWithValue 121
20.6.1 SelectWithValue service parameter mapping 121
20.6.2 Mapping of the SelectWithValue service 122
20.6.3 SelectWithValue request 123
20.6.4 SelectWithValue response+ 123
20.6.5 SelectWithValue response– 124
20.7 Cancel 124
20.7.1 Cancel service parameter mapping 124
20.7.2 Mapping of the Cancel service 124
20.7.3 Cancel request 125
20.7.4 Cancel response+ 125
20.7.5 Cancel response– 126
20.8 Operate 126
20.8.1 Operate service parameter mapping 126
20.8.2 Mapping of the Operate service 126
20.8.3 Operate request 127
20.8.4 Operate response+ 127
20.8.5 Operate response– 128
20.9 CommandTermination 128
20.9.1 CommandTermination service parameter mapping 128
20.9.2 Mapping of the CommandTermination service 128
20.10 TimeActivatedOperate 129
20.10.1 TimeActivatedOperate service parameter mapping 129
20.10.2 Mapping of the TimeActivatedOperate service 129
20.10.3 Mapping of the TimeActivatedOperateTermination service 131
20.11 AdditionalCauseDiagnosis in negative control service responses 132
20.12 Tracking of control services 134
20.12.1 General 134
20.12.2 Mapping of the Control service tracking (CTS) 134
21 Time and time synchronization model 135
22 Naming conventions 135
23 File transfer 135
23.1 File transfer model 135
23.2 File services 137
23.2.1 GetFile 137
23.2.2 SetFile 140
23.2.3 DeleteFile 141
23.2.4 GetFileAttributeValues 141
24 Conformance 142
24.1 Notation 142
24.2 PICS 142
24.2.1 Profile conformance 142
24.2.2 MMS conformance 144
24.3 PICS Statement 163

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/...-61850-8-1-2011

24.3.1 General 163
24.3.2 Logical device 163
24.3.3 GOOSE Services 164
24.3.4 Substation configuration language 164
24.3.5 Sampled value Services 164
25 Substation Configuration Language (SCL) 165
25.1 SCL file and SCL extensions 165
25.2 General 165
25.3 SCSM specific address element definitions 165
25.3.1 Client/server addressing – element “address” 165
25.3.2 GOOSE layer 2 addressing 167
25.3.3 GOOSE/SMV UPD/IP addressing 167
25.3.4 GSSE definition 169
25.4 Subnetwork protocol type 169
25.5 SCSM NameSpace 169
Annex A (normative) Application protocol specification for GOOSE and GSE management 170
A.1 ASN.1 Definitions 170
A.2 BER Encoding rules 172
A.3 Fixed-length encoded GOOSE message 173
A.4 Conformance 177
Annex B (informative) Multicast address selection 178
Annex C (normative) Overview of ISO/IEC 8802-3 frame structure for GSE management and GOOSE 179
C.1 PDU 179
C.2 PDU fields 183
C.2.1 Address fields: 183
C.2.2 Priority tagging/Virtual LAN: 183
C.2.3 TPID (Tag Protocol Identifier) Field: 183
C.2.4 TCI (Tag Control Information) Fields: 183
C.2.5 Ethertype and other header information 184
Annex D (informative) SCL conformance 186
Annex E (informative) Time scales and epochs 187
Annex F (normative) Type extensions to ISO 9506-1:2003 and ISO 9506-2:2003 188
F.1 General 188
F.2 ISO 9506-1 (Service definitions) 188
F.3 ISO 9506-2 (Protocol specification) 188
Annex G (informative) Example SCL File 191
Annex H (informative) Generic Substation State Event (GSSE) – Deprecated 204
Annex I (informative) Certificate management 205
Annex J (normative) Routable GOOSE and SV 206
J.1 General 206
J.2 A-Profiles 206
J.3 A-Profile GOOSE, SV, and Management A-Profile 206
J.3.1 Application Layer 206
J.3.2 Session Layer 207
J.3.3 Common T-Profile Standards 215
Annex K (normative) Compatibility of the different revisions of the standard 218

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/1d1c840a-408e-421e-4709b938-1ff4/iec-61850-8-1-2011

K.1 General 218
K.2 Compatibility rules for IEC 61850-8-1 218
K.3 Special compatibility rules 223
K.3.1 Inhereted from ACSI model 223
K.3.2 Commom format for transient data exchange (COMTRADE) 223
Bibliography 224

Figure 1 – Overview of functionality and profiles 27
Figure 2 – OSI reference model and profiles 29
Figure 3 – Algorithm for logical node mapping 42
Figure 4 – Ordered list of functional constraints 43
Figure 5 – Relationship of LCB attributes to IEC 61850-7-2 log definitions 96
Figure 6 – GetGoReference service primitives 104
Figure 7 – GetGOOSEElementNumber service primitives 107
Figure 8 – Transmission time for events 109
Figure 9 – SendGooseMessage message service primitives 109
Figure 10 – Publisher state machine for GOOSE service 110
Figure 11 – Subscriber state machine for GOOSE service 110
Figure 12 – GetMsvReference service primitives 113
Figure 13 – GetMsvElementNumber service primitives 115
Figure 14 – Mapping of ACSI GetFile to MMS FileOpen, FileRead, FileClose 138
Figure 15 – Mapping of ACSI SetFile service 140
Figure A.1 – Basic encoding rules format 172
Figure A.2 – Format of the tag octets 173
Figure C.1 – ISO/IEC 8802-3 frame format of the GOOSE publisher 180
Figure C.2 – ISO/IEC 8802-3 frame format of the GOOSE publisher with HSR link redundancy 181
Figure C.3 – ISO/IEC 8802-3 frame format of the GOOSE publisher with PRP link redundancy 182
Figure C.4 – Virtual LAN tag 183
Figure C.5 – Reserved 1 185
Figure J.1 – General Byte Ordering of Session Protocol 207
Figure J.2 – Structure of Routable GOOSE / SV Session Protocol 208
Figure J.3 – Format of IP Header 216
Figure J.4 – ToS Byte Field Definition RFC-2474 and RFC-3168 216

Table 1 – MMS objects and services in use within this SCSM 28
Table 2 – Services requiring client/server Communication Profile 30
Table 3 – Service and protocols for client/server communication A-Profile 31
Table 4 – Service and protocols for client/server TCP/IP T-Profile 33
Table 5 – Services requiring GSE Management and GOOSE communication profile 34
Table 6 – Service and protocols for GSE Management and GOOSE communication A-Profile 34
Table 7 – RFC 1240 A-Profile Options 35
Table 8 – GOOSE/GSE T-Profile 35

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/e765016d-849e-408c-921c-479b838e1f4/iec-61850-8-1-2011

Table 9 – UDP Field Implementation Requirements 36
Table 10 – Time sync A-Profile 37
Table 11 – Time sync T-Profile 38
Table 12 – Services requiring sampled value Management and sampled value communication profile 38
Table 13 – Service and protocols for Sampled value Management and Multicast sampled value communication A-Profile 39
Table 14 – MSV T-Profile 40
Table 15 – Mapping of ACSI BasicTypes 45
Table 16 – PhyComAddr structure for Layer 2 communication 48
Table 17 – Associate ACSI service error mappings 50
Table 18 – Release service error mappings 50
Table 19 – GetNameList conflicting IEC 61850 objectClass and objectScope 51
Table 20 – GetNameList service error mappings 51
Table 21 – Read of NamedVariableList object error mappings 52
Table 22 – Write of NamedVariableList object error mappings 53
Table 23 – DefineNamedVariableList service error mappings 54
Table 24 – GetNamedVariableListAttributes service error mappings 55
Table 25 – DeleteNamedVariableList service error mappings 56
Table 26 – Read service error mappings 57
Table 27 – Write service error mappings 58
Table 28 – GetVariableAccessAttributes service error mappings 59
Table 29 – ServiceError mappings for Log services 59
Table 30 – FileDirectory service error mappings 60
Table 31 – Mappings of ACSI ServiceErrors to ObtainFile Service Errors 61
Table 32 – Mappings of ACSI ServiceErrors to FileOpen Service Errors 61
Table 33 – Mappings of ACSI ServiceErrors to FileRead Service Errors 62
Table 34 – Mappings of ACSI ServiceErrors to FileClose Service Errors 62
Table 35 – Mappings of ACSI ServiceErrors to FileDelete Service Errors 63
Table 36 – Encoding of IEC 61850-7-2 TimeQuality 64
Table 37 – Encoding of the TriggerConditions 65
Table 38 – Encoding of the ReasonForInclusionInReport 65
Table 39 – Encoding of the ReasonForInclusionInLog 65
Table 40 – PhyComAddr for UPD/IP communication 66
Table 41 – Encoding of the RCBReportOptions 67
Table 42 – Encoding of the SVMessageOptions 67
Table 43 – Encoding of the CheckConditions 68
Table 44 – Encoding of IEC 61850-7-2 quality 69
Table 45 – Mapping of ACSI GetServerDirectory (LOGICAL DEVICE) to MMS 71
Table 46 – Mapping of ACSI GetServerDirectory(FILE) to MMS 71
Table 47 – Association model versus communication profiles 72
Table 48 – Mapping of ACSI Associate service to MMS 73
Table 49 – Mapping of ACSI Release service to MMS 73
Table 50 – GetNameList classes for GetLogicalNodeDirectory service 75

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/e765016d-849e-408c-921c-4798b838e1f4/iec-61850-8-1-2011

Table 51 – Mapping of ACSI GetLogicalNodeDirectory (DataObject) service to MMS 76
Table 52 – Mapping of ACSI GetAllDataValues service to MMS 77
Table 53 – Mapping of GetDataValues service parameters 78
Table 54 – Mapping of SetDataValues service parameters 78
Table 55 – Mapping of GetDataDirectory service parameters 79
Table 56 – Mapping of GetDataSetValues service parameters 80
Table 57 – Mapping of SetDataSetValues service parameters 80
Table 58 – Mapping of CreateDataSet service parameters 81
Table 59 – Mapping of DeleteDataSet service parameters 81
Table 60 – Mapping of GetDataSetDirectory service parameters 82
Table 61 – Mapping of CDC CST to MMS type definition 82
Table 62 – Mapping of ACSI ServiceType values 83
Table 63 – Mapping of ACSI ServiceError values 84
Table 64 – Mapping of CDC BTS to MMS type definition 85
Table 65 – Mapping of CDC UTS to MMS type definition 85
Table 66 – Mapping of CDC LTS to MMS type definition 86
Table 67 – Mapping of CDC GTS to MMS type definition 86
Table 68 – Mapping of CDC STS to MMS type definition 87
Table 69 – Mapping of CDC MTS to MMS type definition 87
Table 70 – Mapping of CDC NTS to MMS type definition 88
Table 71 – Mapping of SGCB to MMS type definition 88
Table 72 – Mapping of BRCB to MMS type definition 90
Table 73 – Mapping of URCB to MMS type definition 92
Table 74 – Order of AccessResults for variableListName report 93
Table 75 – Definition of an MMS log control block 97
Table 76 – Mapping of values for LogEna 97
Table 77 – Mapping of ACSI LogEntries 98
Table 78 – General mappings of ACSI log model services 100
Table 79 – Mapping of QueryLogByTime request parameters 101
Table 80 – Mapping of response parameters 101
Table 81 – Mapping of QueryLogAfter request parameters 102
Table 82 – Log conformance requirements 102
Table 83 – MMS TypeDescription definition for GoCB MMS structure 103
Table 84 – Mapping of GetGoReference service 105
Table 85 – GetGoReference 105
Table 86 – Mapping of GetGOOSEElementNumber service 107
Table 87 – GetGOOSEElementNumber 108
Table 88 – GOOSE service parameter mapping 111
Table 89 – Mapping of GetMsvReference service 114
Table 90 – GetMsvReference 114
Table 91 – Mapping of GetMsvElementNumber service 116
Table 92 – GetMsvElementNumber 116
Table 93 – Controllable service parameters 118
iTeh Standards
(https://standards.iteh.ai)
Document Preview

Table 94 – Mapping of IEC 61850-7-2 control model to MMS control components 119
Table 95 – Mapping of control services 120
Table 96 – Select service parameter mapping 121
Table 97 – Mapping of the Select service 121
Table 98 – SelectWithValue service parameter mapping 122
Table 99 – Mapping of the SelectWithValue service 123
Table 100 – SelectWithValue, Oper and Cancel AccessResult specification 124
Table 101 – Cancel service parameter mapping 124
Table 102 – Mapping of the Cancel service 125
Table 103 – Operate service parameter mapping 126
Table 104 – Mapping of the Operate service 127
Table 105 – Mapping of the CommandTermination service 128
Table 106 – TimeActivatedOperate service parameter mapping 129
Table 107 – Mapping of the TimeActivatedOperate service 130
Table 108 – Mapping of the TimeActivatedOperateTermination service 131
Table 109 – Definition of LastApplError variable structure 132
Table 110 – Mapping of ACSI AddCause values 134
Table 111 – Mapping of CDC CTS to MMS type definition 135
Table 112 – Mapping of ACSI file class to MMS file object 135
Table 113 – Reserved file suffixes 136
Table 114 – Mapping of ACSI GetFile service parameters 138
Table 115 – Mapping of ACSI GetFile service 139
Table 116 – Mappings of GetFile ServiceErrors to MMS Service Errors 139
Table 117 – Mapping of ACSI SetFile parameters 140
Table 118 – Mapping of ACSI DeleteFile service 141
Table 119 – Mapping of ACSI GetFileAttributeValues parameters 142
Table 120 – Mapping of ACSI ListOfDirectoryEntry 142
Table 121 – PICS for A-Profile support 143
Table 122 – PICS for Time Sync A-Profile support 143
Table 123 – PICS for T-Profile support 144
Table 124 – MMS InitiateRequest general parameters 145
Table 125 – MMS InitiateResponse general parameters 145
Table 126 – MMS InitiateError general parameters 146
Table 127 – MMS service supported conformance table 146
Table 128 – MMS Parameter CBB 149
Table 129 – GetNameList conformance statement 149
Table 130 – GetCapabilityList conformance statement 150
Table 131 – GetDomainAttributes conformance statement 150
Table 132 – Status conformance statement 151
Table 133 – Cancel conformance statement 151
Table 134 – Identify conformance statement 152
Table 135 – Environment and general management conformance statement 152
Table 136 – Conclude conformance statement 153

iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/7659161-849e-408c-921c-4798b838e1f4/iec-61850-8-1-2011

Table 137 – AlternateAccess conformance statement 153
Table 138 – AlternateAccessSelection conformance statement 154
Table 139 – VariableSpecification for LDevice/MHAI1.HA.phsAHar(7).cVal.mag.f 155
Table 140 – VariableSpecification for LDevice/MHAI1.HA.phsAHar(7).cVal.mag.f 155
Table 141 – Non conformant VariableSpecification I 156
Table 142 – Non conformant VariableSpecification II 156
Table 143 – VariableSpecification for LDevice/MHAI1.HA.phsAHar(7) [MX] 157
Table 144 – VariableSpecification for LDevice/MHAI1.HA.phsAHar(7) [MX] 157
Table 145 – VariableAccessSpecification conformance statement 158
Table 146 – VariableSpecification conformance statement 158
Table 147 – Read conformance statement 158
Table 148 – Write conformance statement 159
Table 149 – InformationReport conformance statement 159
Table 150 – GetVariableAccessAttributes conformance statement 159
Table 151 – DefineNamedVariableList conformance statement 160
Table 152 –GetNamedVariableListAttributes conformance statement 160
Table 153 – DeleteNamedVariableList conformance statement 160
Table 154 – ReadJournal conformance statement 161
Table 155 – EntryContent conformance statement 162
Table 156 – FileDirectory conformance statement 162
Table 157 – FileOpen conformance statement 163
Table 158 – FileRead conformance statement 163
Table 159 – FileClose conformance statement 163
Table 160 – GOOSE conformance statement 164
Table 161 – Multicast Sampled value conformance statement 165
Table 162 – Allowed P-Type definitions for client/server addressing 166
Table 163 – Definitions for GSE over Layer 2 SCL 167
Table 164 – Definitions for GSE/SMV over UDP/IP SCL 168
Table A.1 – Encoding the GOOSE Header in Fixed-length GOOSE message 174
Table A.2 – Encoding allData in Fixed-length GOOSE message – the basic data types 175
Table A.3 – Encoding example for Data 176
Table B.1 – Recommended multicast addressing example 178
Table C.1 – Default virtual LAN IDs and priorities 184
Table C.2 – Assigned Ethertype values 184
Table D.1 – SCL conformance degrees 186
Table D.2 – Supported ACSI services for SCL.2 186
Table J.1 – Example encodings of SPDU Length 210
Table J.2 – Network Protocol Conformance Implementation Statement (PICS) for IPv4 based T-Profiles 216
iTeh Standards
(https://standards.iteh.ai)
Document Preview
IEC 61850-8-1:2011
https://standards.iteh.ai/catalog/standards/iec/4798b838e1f4/iec-61850-8-1-2011

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC 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 National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees 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, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) 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.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC Standards
Document Preview
IEC 61850-8-1:2011

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 61850-8-1 edition 2.1 contains the second edition (2011-06) [documents 57/2150/FDIS and 57/2168/RVD] and its amendment 1 (2020-02) [documents 57/2150/FDIS and 57/2168/RVD].