Communication networks and systems in substations –

Part 9-2:
Specific Communication Service Mapping (SCSM) – Sampled values over ISO/IEC 8802-3
CONTENTS

FOREWORD....................................................................................................................... ....4
INTRODUCTION................................................................................................................... ..6

1 Scope........................................................................................................................ .......7
2 Normative references........................................................................................................7
3 Terms and definitions .......................................................................................................9
4 Abbreviations................................................................................................................ ....9
5 Communication stack......................................................................................................10
  5.1 Overview of the protocol usage ..............................................................................10
  5.2 Client/server services and communication profiles .................................................11
  5.3 SV service and communication profile ....................................................................13
  5.4 Restrictions ...........................................................................................................15
6 Mapping of IEC 61850-7-2 and IEC 61850-7-3 Data Attributes.........................................16
7 Mapping of IEC 61850-7-2 classes and services .............................................................16
  7.1 Classes of SV data sets .........................................................................................16
  7.2 Definition of SV data sets .......................................................................................16
8 Mapping of the model for the transmission of sampled values .........................................16
  8.1 Overview ...............................................................................................................16
  8.2 Mapping of the multicast sampled value control block class and services ...............16
  8.3 Mapping of the unicast sampled value control block class and services ................17
  8.4 Mapping of the update of the sampled value buffer.................................................19
  8.5 Additional definitions for the transmission of sampled values.................................19
  8.6 Definitions for basic data types ..............................................................................21
9 Conformance.................................................................................................................. 21
  9.1 Notation.................................................................................................................21
  9.2 PICS ......................................................................................................................21
10 Substation Configuration language (SCL)........................................................................23

Annex A (informative) ISO/IEC 8802-3 frame format and ASN.1 basic encoding rules............ 24
Annex B (informative) Process bus architectures......................................................................27
Annex C (informative) Multicast address selection....................................................................28

Figure 1 – OSI reference model and profiles..........................................................................10
Figure 2 – Structure of the tag header ..................................................................................14
Figure 3 – Concatenation of several ASDU’s into one frame .................................................19
Figure A. 1 – ISO/IEC 8802-3 frame format ........................................................................24
Figure A.2 – Basic encoding rules format ...........................................................................25
Figure A.3 – Format of the tag octets ...................................................................................25
Figure A.4 – Example for an ASN.1 coded APDU frame structure........................................26
Figure B.1 – Alternative process bus architectures ..............................................................27
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Service requiring client/server communication profile</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Service and protocols for client/server communication A-Profile</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Service and Protocols for Peer TCP/IP T-Profile</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Service requiring SV communication profile</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>Service and protocols for SV communication A-Profile</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>SV T-Profile</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>Default Virtual LAN IDs and priorities</td>
<td>14</td>
</tr>
<tr>
<td>8</td>
<td>Assigned Ethertype values</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>MMS TypeDescription definition for MSVCB MMS structure</td>
<td>17</td>
</tr>
<tr>
<td>10</td>
<td>Mapping of multicast sampled value services</td>
<td>17</td>
</tr>
<tr>
<td>11</td>
<td>MMS TypeDescription definition for USVCB MMS Structure</td>
<td>18</td>
</tr>
<tr>
<td>12</td>
<td>Mapping of unicast sampled value services</td>
<td>18</td>
</tr>
<tr>
<td>13</td>
<td>Encoding for the transmission of the sampled value buffer</td>
<td>20</td>
</tr>
<tr>
<td>14</td>
<td>Encoding for the basic data types</td>
<td>21</td>
</tr>
<tr>
<td>15</td>
<td>PICS for A-Profile support</td>
<td>22</td>
</tr>
<tr>
<td>16</td>
<td>PICS for T-Profile support</td>
<td>22</td>
</tr>
<tr>
<td>17</td>
<td>SV conformance statement</td>
<td>22</td>
</tr>
<tr>
<td>18</td>
<td>Definitions for SV SCL</td>
<td>23</td>
</tr>
</tbody>
</table>
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.

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International Standard IEC 61850-9-2 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this standard is based on the following documents:

<table>
<thead>
<tr>
<th>FDIS</th>
<th>Report on voting</th>
</tr>
</thead>
<tbody>
<tr>
<td>57/690/FDIS</td>
<td>57/709/RVD</td>
</tr>
</tbody>
</table>

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.
IEC 61850 consists of the following parts, under the general title *Communication networks and systems in substations*:

Part 1: Introduction and overview  
Part 2: Glossary  
Part 3: General requirements  
Part 4: System and project management  
Part 5: Communication requirements for functions and device models  
Part 6: Configuration description language for communication in electrical substations related to IEDs  
Part 7-1: Basic communication structure for substation and feeder equipment – Principles and models  
Part 7-2: Basic communication structure for substation and feeder equipment – Abstract communication service interface (ACSI)  
Part 7-3: Basic communication structure for substation and feeder equipment – Common data classes  
Part 7-4: Basic communication structure for substation and feeder equipment – Compatible logical node classes and data classes  
Part 8-1: Specific Communication Service Mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3  
Part 9-1: Specific Communication Service Mapping (SCSM) – Sampled values over serial unidirectional multidrop point to point link  
Part 9-2: Specific Communication Service Mapping (SCSM) – Sampled values over ISO/IEC 8802-3  
Part 10: Conformance testing

The committee has decided that the contents of this publication will remain unchanged until 2005. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this document may be issued at a later date.

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1 Under consideration.
INTRODUCTION

This part of IEC 61850 defines the SCSM for sampled values over ISO/IEC 8802-3. The intent of this SCSM definition is to supplement IEC 61850-9-1 to include the complete mapping of the sampled value model.

This part of IEC 61850 applies to electronic current and voltage transformers (ECT and EVT having a digital output), merging units, and intelligent electronic devices for example protection units, bay controllers and meters.

Process bus communication structures can be arranged in different ways as described in Annex B and IEC 61850-1. In addition to the transmission of sampled value data sets, which are directly connected to ISO/IEC 8802-3, a selection of IEC 61850-8-1 services are necessary to support the access to the SV control block. References to the relevant IEC 61850-8-1 services are provided in this SCSM. For less complex devices (for example merging units) the sampled value control block can be pre-configured, in which case there is no need to implement IEC 61850-8-1 services based on the MMS-Stack.

This document defines the mapping of sampled value class model (IEC 61850-7-2) to ISO/IEC 8802-3. This SCSM, in combination with IEC 61850-7 and IEC 61850-6, allows interoperability between devices from different manufacturers.

This standard does not specify individual implementations or products, nor does it constrain the implementation of entities and interfaces within a computer system. This standard specifies the externally visible functionality of implementations together with conformance requirements for such functionalities.

Reading Guide

• This document is an extended mapping specification of IEC 61850-9-1 and IEC 61850-8-1 to cover sampled value transmission over ISO/IEC 8802-3.

• This document can best be understood if the reader is thoroughly familiar with IEC 61850-7-1, IEC 61850-7-2, IEC 61850-7-3 and IEC 61850-7-4.

• The ACSI services defined in IEC 61850-7-2 are not explained in this part of the standard.
1 **Scope**

This part of IEC 61850 defines the Specific Communication Service Mapping (SCSM) for the transmission of sampled values according to the abstract specification in IEC 61850-7-2. The mapping is that of the abstract model on a mixed stack using direct access to an ISO/IEC 8802-3 link for the transmission of the samples in combination with IEC 61850-8-1.

Each SCSM consists of three parts:

- a specification of the communication stack being used,
- the mapping of the abstract specifications of IEC 61850-7 on the real elements of the stack being used, and
- the implementation specification of functionality, that is not covered by the stack being used.

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.

IEC 60874-10-1, Connectors for optical fibres and cables – Part 10-1: Detail specification for fibre optic connector type BFOC/2,5 terminated to multimode fibre type A1

IEC 60874-10-2, Connectors for optical fibres and cables – Part 10-2: Detail specification for fibre optic connector type BFOC/2,5 terminated to single-mode fibre type B1

IEC 60874-10-3, Connectors for optical fibres and cables – Part 10-3: Detail specification for fibre optic adaptor type BFOC/2,5 for single and multimode fibre

IEC 61850-7-1, Communication networks and systems in substations – Part 7-1: Basic communication structure for substation and feeder equipment – Part 7-1: Principles and models

IEC 61850-7-2, Communication networks and systems in substations – Part 7-2: Basic communication structure for substation and feeder equipment – Abstract communication service interface (ACSI)

IEC 61850-7-3, Communication networks and systems in substations – Part 7-3: Basic communication structure for substation and feeder equipment – Common data classes

IEC 61850-7-4, Communication networks and systems in substations – Part 7-4: Basic communication structure for substation and feeder equipment – Compatible logical node classes and data classes

IEC 61850-8-1, Communication networks and systems in substations – Part 8-1: Specific Communication Service Mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3
IEC 61850-9-1, Communication networks and systems in substations – Part 9-1: Specific Communication Service Mapping (SCSM) – Sampled values over serial unidirectional multidrop point to point link


ISO/IEC 8802-3:2001, Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications


ISO/IEC 8825-1, Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)


IEEE 754:1985, IEEE Standard for Binary Floating-Point Arithmetic

IEEE 802.1Q:1998, IEEE Standards for Local and Metropolitan Area Networks: Virtual Bridged Local Area Networks


