

Protocol Implementation Conformance Statement (PICS)

for
“Ekip Com IEC 61850”

Based on IEC 61850-7-2

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Document Versions

Version	Ekip COM IEC 61850 SW version	Modifications	Release Date	Author
1.0	2.01	First emission	11 Sep, 2014	M. Stucchi
1.1	2.02	Adapted to new SW version	13 Oct, 2014	M. Stucchi
1.2	2.02	First corrections after test in Baden: S51 (Select) unsupported S54 (Operate) supported Enabled GetDataSetDirectory service support	20 Jan, 2015	M. Stucchi
1.3	2.06	S27-3 Unbuffered Report: Enabled data-update (dupd) trigger for report generation Time accuracy (T2) adjusted	5 Feb, 2015	M. Stucchi
1.4	2.09	Updated SW version	2 Jul, 2015	M. Stucchi
1.5	2.10	Alignment improvement, “voice” changed into “term”.	14 Jul, 2015	M. Stucchi
1.6	3.00, 3.01	B32 - Subscriber side for Generic substation event model is now supported (GOOSE)	21 Nov, 2016	M. Stucchi
1.7	3.02	Removed reference to Emax2, transformed into reference to the module itself “Ekip Com IEC 61850”	21 Nov, 2017	M. Stucchi
1.8	3.02 3.04 3.05 3.06	S55 - Command-Termination set to true according to direct-with-enhanced-security ctrlModel for CSWI Pos.	15 Jan, 2018	M. Stucchi

Introduction

This document specifies the Protocol Implementation Conformance Statement (PICS) of the Ekip Com IEC 61850 communication module. This document applies to the SW version specified in the table above and all subsequent versions, until a modification happens in this document.

Together with the PIXIT (Protocol Implementation eXtra Information for Testing) and the MICS (Model Implementation Conformance Statement), the PICS forms the basis for a conformance test according to IEC 61850-10.

Library

“Ekip Com IEC 61850” communication module is an IEC 61850 server and was implemented by integrating a third part library, specific for IEC 61850 communication. This document builds on the PICS supplied by the manufacturer, and specializes such a document for whatever application-specific feature. The provider of the IEC 61850 library is TMW (Triangle MicroWorks, INC – www.trianglemicroworks.com).

We integrated the **Base** and the **GOOSE** libraries. We didn't integrate the **Client** library. These three libraries will be cited in the document in the comment field in order to indicate which library provides the supported (or unsupported) functionality.

Another term that is present in the document is User. This means that the functionality implementation is left to the User.

Document template

As IEC 61850-10 specifies, a standard PICS, also known as PICS proforma is supplied directly from the standard (IEC 61850-7-2, Annex A). From this point on, this document is based on the PICS proforma.

ACSI conformance statement

A.1 General

The following ACSI conformance statements shall be used to provide an overview and details about a device claiming conformance with ACSI:

- ACSI basic conformance statement;
- ACSI models conformance statement; and
- ACSI service conformance statement

to specify the communication features mapped to an SCSM.

NOTE 1 The conformance statements of this annex are abstract in the sense that the ACSI models and their services are mapped to application layer models, services, and protocols. Additional details on the conformance are defined in the SCSM.

NOTE 2 For several features, the conformance requirement is implicitly defined with the common data class contained in IEC 61850-7-3 and the compatible **logical-node** classes and data object classes contained in IEC 61850-7-4. For example, a TrgOp (trigger option) of the value qchg (quality change) of **DataAttribute** requires the support of the TrgOps (trigger option) qchg of the **BRCB** or **URCB**.

A.2 ACSI basic conformance statement

The basic conformance statement shall be as defined in Table A.1.

Table 1 - A.1 – Basic conformance statement

		Client/ subscriber	Server/ publisher	Value/ comments
Client-server roles				
B11	Server side (of TWO-PARTY-APPLICATION-ASSOCIATION)	-	c1	Y/Base
B12	Client side (of TWO-PARTY-APPLICATION-ASSOCIATION)	c1	-	N/Client
SCSM supported				
B21	SCSM : IEC 61850-8-1 used			Y/Base
B22	SCSM : IEC 61850-9-1 used			
B23	SCSM : IEC 61850-9-2 used			
B24	SCSM : other			
Generic substation event model (GSE)				
B31	Publisher side	-	O	Y/GOOSE
B32	Subscriber side	O	-	Y/GOOSE
Transmission of sampled value model (SVC)				
B41	Publisher side	-	O	
B42	Subscriber side	O	-	
c1 – shall be 'M' if support for logical-device model has been declared. O – Optional M – Mandatory				

A.3 ACSI models conformance statement

The ACSI models conformance statement shall be as defined in Table A.2.

Table 2 - A.2 – Basic conformance statement

		Client/ subscriber	Server/ publisher	Value/ comments
If Server side (B11) supported				
M1	Logical device	c2	c2	Y/Base
M2	Logical node	c3	c3	Y/Base
M3	Data	c4	c4	Y/Base
M4	Data set	c5	c5	Y/Base
M5	Substitution	O	O	N/User
M6	Setting group control	O	O	N/User
	Reporting			
M7	Buffered report control	O	O	N
M7-1	sequence-number			
M7-2	report-time-stamp			
M7-3	reason-for-inclusion			
M7-4	data-set-name			
M7-5	data-reference			
M7-6	buffer-overflow			
M7-7	entryID			
M7-8	BufTm			
M7-9	IntgPd			
M7-10	GI			
M8	Unbuffered report control	O	O	Y/Base
M8-1	sequence-number			Y/Base
M8-2	report-time-stamp			Y/Base
M8-3	reason-for-inclusion			Y/Base
M8-4	data-set-name			Y/Base
M8-5	data-reference			N/Base
M8-8	BufTm			N/Base
M8-9	IntgPd			Y/Base
M8-10	GI			Y/Base
	Logging	O	O	N/Base
M9	Log Control	O	O	N/Base
M9-1	IntgPd			
M10	Log	O	O	N/Base
M11	Control	M	M	Y/Base

		Client/ subscriber	Server/ publisher	Value/ comments
If GSE (B31/B32) is supported				
	GOOSE	O	O	Y/GOOSE
M12-1	IntgPd			
M12-2	DataRefInc			
M13	GSSE			N/deprec.
If SVC (B41-B42) is supported				
M14	Multicast SVC	O	O	-
M15	Unicast SVC	O	O	-
For all IEDs				
M16	Time	M	M	Y
M17	File Transfer	O	O	N
<p>c2 – shall be 'M' if support for logical-node model has been declared. c3 – shall be 'M' if support for data model has been declared. c4 – shall be 'M' if support for data-set, Substitution, Report, Log Control, or Time model is declared. c5 – shall be 'M' if support for Report, GSE, or SV models has been declared.</p> <p>M – Mandatory O – Optional</p>				

A.4 ACSI service conformance statement

The ACSI service conformance statement shall be as defined in Table A.3 (depending on the statements in Table A.1).

Table 3 - A.3 – ACSI service conformance statement

Services		AA: TP/MC	Client/ subscriber	Server/ publisher	Value/ comments
Server (Clause 6)					
S1	ServerDirectory	TP		M	Y/Base
Application Association (Clause 7)					
S2	Associate	TP	M	M	Y/Base
S3	Abort	TP	M	M	Y/Base
S4	Release	TP	M	M	Y/Base
Logical device (Clause 8)					
S5	LogicalDeviceDirectory	TP	M	M	Y/Base
Logical node (Clause 9)					
S6	GetLogicalNodeDirectory	TP	M	M	Y/Base
S7	GetAllDataValues	TP	O	M	Y/Base
Data (Clause 10)					
S8	GetDataValues	TP	M	M	Y/Base
S9	SetDataValues	TP	O	O	Y/Base
S10	GetDataDirectory	TP	O	M	Y/Base
S11	GetDataDefinition	TP	O	M	Y/Base
Data Set (Clause 11)					
S12	GetDataSetValues	TP	O	M	Y/Base
S13	SetDataSetValues	TP	O	O	N/Base
S14	CreateDataSet	TP	O	O	N/Base
S15	DeleteDataSet	TP	O	O	N/Base
S16	GetDataSetDirectory	TP	O	O	Y/Base
Substitution (Clause 12)					
S17	SetDataValues	TP	M	M	N/Base
Setting Group Control (Clause 13)					
S18	SelectActiveSG	TP	O	O	N/Base
S19	SelectEditSG	TP	O	O	N/Base
S20	SetSGValues	TP	O	O	N/Base
S21	ConfirmEditSGValues	TP	O	O	N/Base
S22	GetSGValues	TP	O	O	N/Base
S23	GetSGCBValues	TP	O	O	N/Base

Table 3 - A.3 – ACSI service conformance statement (continued)

Services		AA: TP/MC	Client/ subscriber	Server/ publisher	Value/ comments
Reporting (Clause 14)					
Buffered report control block (BRCB)					
S24	Report	TP	c6	c6	N/Base
S24-1	data-change (dchg)				
S24-2	quality-change (qchg)				
S24-3	data-update (dupd)				
S25	GetBRCBValues	TP	c6	c6	N/Base
S26	SetBRCBValues	TP	c6	c6	N/Base
Unbuffered report control block (URCB)					
S27	Report	TP	c6	c6	Y/Base
S27-1	data-change (dchg)				Y/Base
S27-2	quality-change (qchg)				Y/Base
S27-3	data-update (dupd)				Y/Base
S28	GetURCBValues	TP	c6	c6	Y/Base
S29	SetURCBValues	TP	c6	c6	Y/Base
c6 – shall declare support for at least one (BRCB or URCB)					
Logging (Clause 17)					
Log control block					
S30	GetLCBValues	TP	M	M	N/Base
S31	SetLCBValues	TP	O	M	N/Base
Log					
S32	QueryLogByTime	TP	c7	M	N/Base
S33	QueryLogAfter	TP	c7	M	N/Base
S34	GetLogStatusValue	TP	M	M	N/Base
c7 – shall declare support for at least one (QueryLogByTime or QueryLogAfter)					
Generic substation event model (GSE)					
GOOSE (Clause 18)					
S35	SendGOOSEMessage	MC	c8	c8	Y/GOOSE
S36	GetGoReference	TP	O	c9	N/GOOSE
S37	GetGOOSEElementNumber	TP	O	c9	N/GOOSE
S38	GetGoCBValues	TP	O	O	N/GOOSE
S39	SetGoCBValues	TP	O	O	N/GOOSE
GSSE (Annex C)					
S40	SendGSSEMessage	MC	c8	c8	N/GOOSE
S41	GetGsReference	TP	O	c9	N/GOOSE
S42	GetGSSEElementNumber	TP	O	c9	N/GOOSE
S43	GetGsCBValues	TP	O	O	N/GOOSE
S44	SetGsCBValues	TP	O	O	N/GOOSE
c8 – shall declare support for at least one (SendGOOSEMessage or SendGSSEMessage).					
c9 – shall declare support if TP association is available.					

Table 3 - A.3 – ACSI service conformance statement (continued)

Services		AA: TP/MC	Client/ subscriber	Server/ publisher	Value/ comments
Transmission of sampled value model (SVC) (Clause 19)					
Multicast SVC					
S45	SendMSVMessage	MC	c10	c10	N
S46	GetMSVCBValues	TP	O	O	N
S47	SetMSVCBValues	TP	O	O	N
Unicast SVC					
S48	SendUSVMessage	TP	c10	c10	N
S49	GetUSVCBValues	TP	O	O	N
S50	SetUSVCBValues	TP	O	O	N
c10 – shall declare support for at least one (SendMSVMessage or SendUSVMessage).					
Control (Clause 20)					
S51	Select		M	O	N
S52	SelectWithValue	TP	M	O	N
S53	Cancel	TP	O	O	N
S54	Operate	TP	M	M	Y
S55	Command-Termination	TP	M	O	Y
S56	TimeActivated-Operate	TP	O	O	N
File Transfer (Clause 23)					
S57	GetFile	TP	O	M	N
S58	SetFile	TP	O	O	N
S59	DeleteFile	TP	O	O	N
S60	GetFileAttributeValues	TP	O	M	N
Time (5.5)					
T1	Time resolution of internal clock			15	Nearest negative power of 2 in s
T2	Time accuracy of internal clock			Y	T0
				Y (SNTP)	T1
				N	T2
				N	T3
				N	T4
				N	T5
T3	Supported timestamp resolution			15	Nearest value of 2^{-n} in s