

Protocol Implementation Conformance Statement
for the IEC 61850 interface in SEL-487E-5, SEL-451-6, SEL-
421-7 and SEL-401

Version 1
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based upon UCAIug PICS Template version 3.0

UCA International Users Group
Testing Sub Committee

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1. General

The following ACSI conformance statements are used to provide an overview and details about
SEL-451-6 with firmware R411,
SEL-487E-5 with firmware R411,
SEL-421-7 with firmware R414,
SEL-401 with firmware R414:

- ACSI basic conformance statement,
- ACSI models conformance statement,
- ACSI service conformance statement

The statements specify the communication features mapped to IEC 61850-8-1 and IEC 61850-9-2.

2. ACSI basic conformance statement

The basic conformance statement is defined in Table A.1.

Table A.1 – Basic conformance statement

		Client/ Subscriber	Server/ Publisher	Value/ Comments
Client-Server roles				
B11	Server side (of TWO-PARTY-APPLICATION-ASSOCIATION)	N/A	Yes	
B12	Client side of (TWO-PARTY-APPLICATION-ASSOCIATION)	-	N/A	
SCSMs supported				
B21	SCSM : IEC 61850-8-1 used	-	Yes	
B22	SCSM : IEC 61850-9-1 used	N/A	N/A	Deprecated Ed2
B23	SCSM : IEC 61850-9-2 used	-	Yes	
B24	SCSM : other	-	-	
Generic substation event model (GSE)				
B31	Publisher side	N/A	Yes	
B32	Subscriber side	Yes	N/A	
Transmission of sampled value model (SVC)				
B41	Publisher side	N/A	Yes	
B42	Subscriber side	-	N/A	
N/A = not applicable Yes = supported No or empty = not supported				

3. ACSI model conformance statement

The ACSI models conformance statement is defined in Table A.2.

Table A.2 – ACSI models conformance statement

		Client/Subscriber	Server/Publisher	Value/ Comments
If Server side (B11) and/or Client side (B12) supported				
M1	Logical device		Yes	
M2	Logical node		Yes	
M3	Data		Yes	
M4	Data set		Yes	
M5	Substitution		-	
M6	Setting group control		Yes	
	Reporting		Yes	
M7	Buffered report control		Yes	
M7-1	sequence-number		Yes	
M7-2	report-time-stamp		Yes	
M7-3	reason-for-inclusion		Yes	
M7-4	data-set-name		Yes	
M7-5	data-reference		Yes	
M7-6	buffer-overflow		Yes	
M7-7	entryID		Yes	
M7-8	BufTm		Yes	
M7-9	IntgPd		Yes	
M7-10	GI		Yes	
M7-11	conf-revision		Yes	
M8	Unbuffered report control		Yes	
M8-1	sequence-number		Yes	
M8-2	report-time-stamp		Yes	
M8-3	reason-for-inclusion		Yes	
M8-4	data-set-name		Yes	
M8-5	data-reference		Yes	
M8-6	BufTm		Yes	
M8-7	IntgPd		Yes	
M8-8	GI		Yes	
M8-9	conf-revision		Yes	
	Logging		No	
M9	Log control		No	
M9-1	IntgPd		No	
M10	Log		No	
M11	Control		Yes	

		Client/Subscriber	Server/Publisher	Value/ Comments
M17	File Transfer		Yes	
M18	Application association		Yes	
M19	GOOSE Control Block		Yes	
M20	Sampled Value Control Block		Yes	
If GSE (B31/32) is supported				
M12	GOOSE		Yes	
M13	GSSE		-	Deprecated since Ed2
If SVC (B41/42) is supported				
M14	Multicast SVC		Yes	
M15	Unicast SVC		No	
For all IEDs				
M16	Time		Yes	Time source with required accuracy shall be available. Only Time Master are SNTP (Mode 4 response) time server. All other Client / Server devices are SNTP (Mode 3 request) clients
Yes = service is supported No or empty = service is not supported				

The ACSI service conformance statement is defined in Table A.3 (depending on the statements in Table A.1 and in Table A.2).

Table A.3 – ACSI service conformance statement

	Ed.	Services	AA: TP/MC	Client (C)	Server (S)	Comments
Server						
S1	1,2,A1	GetServerDirectory (LOGICAL-DEVICE)	TP		Yes	

Application association						
S2-1	1,2,A1	Associate_Request	TP		No	
S2-2	A1	Associate_Response			Yes	
S3-1	1,2,A1	Abort_Request	TP		Yes	
S3-2	A1	Abort_Processing			Yes	
S4-1	A1	Release_Request			No	
S4-2	1,2,A1	Release_Response	TP		Yes	

Logical device						
S5	1,2,A1	GetLogicalDeviceDirectory	TP		Yes	

Logical node						
S6	1,2,A1	GetLogicalNodeDirectory	TP		Yes	
S7	1,2,A1	GetAllDataValues	TP		Yes	

Data						
S8	1,2,A1	GetDataValues	TP		Yes	
S9	1,2,A1	SetDataValues	TP		No	
S10	1,2,A1	GetDataDirectory	TP		Yes	
S11	1,2,A1	GetDataDefinition	TP		Yes	

Data set						
S12	1,2,A1	GetDataSetValues	TP		Yes	
S13	1,2,A1	SetDataSetValues	TP		No	
S14	1,2,A1	CreateDataSet	TP		No	
S15	1,2,A1	DeleteDataSet	TP		No	
S16	1,2,A1	GetDataSetDirectory	TP		Yes	

Substitution						
S17	1	SetDataValues	TP		No	

	Ed.	Services	AA: TP/MC	Client (C)	Server (S)	Comments
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Setting group control

S18	1,2,A1	SelectActiveSG	TP		Yes	
S19	1,2,A1	SelectEditSG	TP		No	
S20	1,2,A1	SetEditSGValues	TP		No	
S21	1,2,A1	ConfirmEditSGValues	TP		No	
S22	1,2,A1	GetEditSGValues	TP		No	
S23	1,2,A1	GetSGCBValues	TP		Yes	

Reporting

Buffered report control block (BRCB)

S24	1,2,A1	Report	TP		Yes	
S24-1	1,2,A1	data-change (dchg)			Yes	
S24-2	1,2,A1	quality-change (qchg)			Yes	
S24-3	1,2,A1	data-update (dupd)			Yes	
S25	1,2,A1	GetBRCBValues	TP		Yes	
S26	1,2,A1	SetBRCBValues	TP		Yes	

Unbuffered report control block (URCB)

S27	1,2,A1	Report	TP		Yes	
S27-1	1,2,A1	data-change (dchg)			Yes	
S27-2	1,2,A1	quality-change (qchg)			Yes	
S27-3	1,2,A1	data-update (dupd)			Yes	
S28	1,2,A1	GetURCBValues	TP		Yes	
S29	1,2,A1	SetURCBValues	TP		Yes	

Logging

Log control block

S30	1,2,A1	GetLCBValues	TP		-	
S31	1,2,A1	SetLCBValues	TP		-	

Log

S32	1,2,A1	QueryLogByTime	TP		-	
S33	1,2,A1	QueryLogAfter	TP		-	
S34	1,2,A1	GetLogStatusValues	TP		-	

Generic substation event model (GSE)

GOOSE

S35	1,2,A1	SendGOOSEMessage	MC		Yes	
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GOOSE-CONTROL-BLOCK

S36	1,2,A1	GetGoReference	TP		-	
S37	1,2,A1	GetGOOSEElementNumber	TP		-	
S38	1,2,A1	GetGoCBValues	TP		Yes	
S39	1,2,A1	SetGoCBValues	TP		-	

	Ed.	Services	AA: TP/MC	Client (C)	Server (S)	Comments
GSSE						
S40	1	SendGSSEMessage	MC		N/A	Deprecated in Edition 2
GSSE-CONTROL-BLOCK						
S41	1	GetReference	TP		N/A	Deprecated in Edition 2
S42	1	GetGSSEElementNumber	TP		N/A	Deprecated in Edition 2
S43	1	GetGsCBValues	TP		N/A	Deprecated in Edition 2
S44	1	SetGsCBValues	TP		N/A	Deprecated in Edition 2

Transmission of sampled value model (SVC)						
Multicast SV						
S45	1,2,A1	SendMSVMessage	MC		Yes	
Multicast Sampled Value Control Block						
S46	1,2,A1	GetMSVCBValues	TP		Yes	
S47	1,2,A1	SetMSVCBValues	TP		No	
Unicast SV						
S48	1,2,A1	SendUSVMessage	TP		No	
Unicast Sampled Value Control Block						
S49	1,2,A1	GetUSVCBValues	TP		No	
S50	1,2,A1	SetUSVCBValues	TP		No	
Control						
S51	1,2,A1	Select			No	
S52	1,2,A1	SelectWithValue	TP		Yes	
S53	1,2,A1	Cancel	TP		Yes	
S54	1,2,A1	Operate	TP		Yes	
S55	1,2,A1	CommandTermination	TP		Yes	
S56	1,2,A1	TimeActivatedOperate	TP		No	
File Transfer						
S57	1,2,A1	GetFile	TP		Yes	
S58	1,2,A1	SetFile	TP		Yes	Unique file names are not supported
S59	1,2,A1	DeleteFile	TP		Yes	MMS DeleteFile service is allowed at the protocol level. However, for security purposes, only GetFile and SetFile services are allowed.
S60	1,2,A1	GetFileAttributeValues	TP		Yes	
S61	1,2,A1	GetServerDirectory (FILE-SYSTEM)	TP		Yes	

5. 61869-9 Communication Profile conformance statement

The A-Profile conformance statement shall be as defined in Table 912.

Table 912 – PICS for A-Profile support: 61869-9

	Ed.	Services	Client (C)	Server (S)	Comments
A0	2	Conformance class supported	-	Yes	Class D
A1	2	Client/Server A-Profile	-	Yes	
A2	2	GOOSE mgmt A-Profile	-	No	
A3	2	GOOSE A-Profile	-	Yes	
A4	2	TimeSync A-Profile	-	Yes	
A5	2	Security for client/server A-Profile	-	-	
A6	2	Security for GOOSE/GSE mgmt A-Profile	-	-	
A7	2	SV A-Profile per IEC 61850-9-2:2011	-	Yes	

The T-Profile conformance statement shall be as defined in Table 913.

Table 913 – PICS for T-Profile support: 61869-9

	Ed.	Services	Client (C)	Server (S)	Comments
T1	2	TCP/IP T-Profile per IEC 61850-8-1	-	-	
T2	2	SV T-Profile per IEC 61850-9-2	-	-	
T3	2	GOOSE T-Profile per IEC 61850-8-1	-	-	
T4	2	GSSE T-Profile	-	-	
T5	2	TimeSync T-Profile per IEC 61850-8-1	-	-	

6. 61850-9-3 Clock Profile conformance statement

The capabilities and options supported by the PTP clock is shown in Table 22

Table 22 – PICS for A-Profile support: 61850-9-3

PICS proforma reference	Ed.	Capability	Client (C)	Server (S)	Comments
CLOCK_TYPE_OC	2	clock is OC according to this base	-	Yes	
CLOCK_TYPE_TC	2	clock is TC according to this base	-	No	
CLOCK_TYPE_BC	2	clock is BC according to this base	-	No	
NR_PORTS	2	number of clock ports (total)	-	4	5A, 5B, 5C and 5D
PORTS_STEP	2	1: all ports support 1-step on egress 2: all ports support 2-step on egress 3: all ports support both 1-step and 2.	-	2	
SLAVE_ONLY	2	all ports of the clock are slave-only	-	Yes	
TIME_TRACEABLE	2	connectable to a time reference outside of PTP (e.g. GPS)	-	Yes	IRIG-B, SNTP, DNP, Mirrored Bits, ASCII command, HMI and Modbus
FREQ_TRACEABLE	2	connectable to a frequency reference outside of PTP (e.g. GPS)	-	No	
DAC	2	doubly attached OC	-	No	
PORTS_PAISED	2	paired clock ports for redundancy (e.g. {3-4})	-	{5A-5B} {5C-5D}	
REDBOX_DATC	2	Redbox as Transparent Clock	-	No	
REDBOX_SLTC	2	Redbox as Stateless Transparent Clock	-	No	
REDBOX_TWBC	2	Redbox as three-way Boundary Clock	-	No	
REDBOX_DABC	2	Redbox as DAC BC	-	No	
MIB_SNMP	2	supports MIB of IEC 62439-3 Annex E	-	No	
MIB_61850	2	supports IEC 61859-90-4 Clock Objects	-	No	
MIB_OTHER	2	clock supports fixed values or a mechanism defined by the manufacturer (If True, this list is appended to this PICS)	-	No	
ATOI	2	A master clock attaches the ALTERNATE_TIME_OFFSET_INDICATOR TLV as defined in IEC 61588 as set by its application. A slave clock makes this TLV information available to the application if it receives it. A BC forwards the ATOI TLV from the slave port to the master ports	-	No	