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Protocol Implementation Conformance Statement (PICS) for IEC 61850 for SEL Real-Time Automation Controllers

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1 INTRODUCTION

This document specifies the Protocol Implementation Conformance Statement (PICS) of IEC 61850 for the SEL Real-Time Automation Controllers (RTAC).

This document applies specifically to the following RTAC models and firmware versions.

Model	Firmware Version
SEL-3530 RTAC	SEL-3530- R139-V1-Z001001-D20170628
SEL-3530-4 RTAC	SEL-3530-4- R139-V1-Z001001-D20170628
SEL-2241 RTAC	SEL-2241- R139-V1-Z001001-D20170628
SEL-3505 RTAC	SEL-3505- R139-V1-Z001001-D20170628
SEL-3505-3 RTAC	SEL-3505-3- R139-V1-Z001001-D20170628
SEL-3532 RTAC	SEL-3532-N- R139-V1-Z001001-D20170628
SEL-3555 RTAC	SEL-3555- R139-V1-Z001001-D20170628
SEL-3560 RTAC	SEL-3560- R139-V1-Z001001-D20170628

2 GENERAL

The following ACSI conformance statements are used to provide an overview and details about SEL Real-Time Automation Controllers (RTAC).

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

The statements specify the communications features mapped to IEC 61850-8-1. The SEL-3505 and SEL-3505-3 do not support client side functionality.

2.1 ACSI Basic Conformance Statement

Table 1 defines the basic conformance statement.

Table 1: Basic Conformance Statement

		Client/ Subscriber	Server/ Publisher
Client-Server Roles			
B11	Server side (of two-party application association)		Yes
B12	Client side (of two-party application association)	Yes	
SCSMs Supported			
B21	SCSM: IEC 61850-8-1 used	Yes	Yes



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		Yes
B32	Subscriber side	Yes	
Transmission of Sampled Value Model (SVC)			
B41	Publisher side		
B42	Subscriber side		
Yes = service is supported Empty = service is not supported			

2.2 ACSI Models Conformance Statement

Table 2 defines the ACSI models conformance statement.

Table 2: ACSI Models Conformance Statement

		Client/ Subscriber	Server/ Publisher
If Server or Client side (B11/12) supported			
M1	Logical device	Yes	Yes
M2	Logical node	Yes	Yes
M3	Data	Yes	Yes
M4	Data set	Yes	Yes
M5	Substitution		
M6	Setting Group Control		
	Reporting		
M7	Buffered report control	Yes	Yes
M7-1	sequence-number	Yes	Yes
M7-2	report-time-stamp	Yes	Yes
M7-3	reason-for-inclusion	Yes	Yes
M7-4	data-set-name	Yes	Yes
M7-5	data-reference	Yes	Yes
M7-6	buffer-overflow	Yes	Yes
M7-7	entryID	Yes	Yes



		Client/ Subscriber	Server/ Publisher
M7-8	BufTm	Yes	Yes
M7-9	IntgPd	Yes	Yes
M7-10	GI	Yes	Yes
M7-11	confRev	Yes	Yes
M8	Unbuffered Report Control	Yes	Yes
M8-1	sequence-number	Yes	Yes
M8-2	report-time-stamp	Yes	Yes
M8-3	reason-for-inclusion	Yes	Yes
M8-4	data-set-name	Yes	Yes
M8-5	data-reference	Yes	Yes
M8-6	BufTm	Yes	Yes
M8-7	IntgPd	Yes	Yes
M8-8	GI	Yes	Yes
M8-9	confRev	Yes	Yes
	Logging		
M9	Log control		
M9-1	IntgPd		
M10	Log		
M11	Control	Yes	Yes
If GSE (B31/32) is supported			
M12	GOOSE	Yes	Yes
M13	GSSE		
If SVC (41/42) is supported			
M14	Multicast SVC		
M15	Unicast SVC		
If Server or Client side (B11/12) supported			
M16	Time	Yes	Yes
M17	File Transfer	Yes	Yes
Yes = service is supported Empty = service is not supported			



2.3 ACSI Service Conformance Statement

Table 3 defines the ACSI service conformance statement (depending on the statements in Table 1).

Table 3: ACSI Service Conformance Statement

	Services	AA*: TP/MC	Client	Server	Comments
*Type of application association (AA)—Two Party (TP) or Multicast (MC)					
Server					
S1	GetServerDirectory	TP		Yes	
Application Association					
S2	Associate		Yes	Yes	
S3	Abort		Yes	Yes	
S4	Release		Yes	Yes	
Logical Device					
S5	GetLogicalDeviceDirectory	TP		Yes	
Logical Node					
S6	GetLogicalNodeDirectory	TP		Yes	
S7	GetAllDataValues	TP		Yes	
Data					
S8	GetDataValues	TP	Yes	Yes	
S9	SetDataValues	TP			
S10	GetDataDirectory	TP		Yes	
S11	GetDataDefinition	TP		Yes	
Data Set					
S12	GetDataSetValues	TP	Yes	Yes	
S13	SetDataSetValues	TP			
S14	CreateDataSet	TP			
S15	DeleteDataSet	TP			
S16	GetDataSetDirectory	TP		Yes	



	Services	AA*: TP/MC	Client	Server	Comments
Substitution					
S17	SetDataValues	TP			

Setting Group Control					
S18	SelectActiveSG	TP			
S19	SelectEditSG	TP			
S20	SetSGValues	TP			
S21	ConfirmEditSGValues	TP			
S22	GetSGValues	TP			
S23	GetSGCBValues	TP			

Reporting					
Buffered Report Control Block (BRCB)					
S24	Report	TP	Yes	Yes	
S24-1	data-change (dchg)		Yes	Yes	
S24-2	quality-change (qchg)		Yes	Yes	
S24-3	data-update (dupd)		Yes		
S25	GetBRCBValues	TP	Yes	Yes	
S26	SetBRCBValues	TP	Yes	Yes	
Unbuffered Report Control Block (URCB)					
S27	Report	TP	Yes	Yes	
S27-1	data-change (dchg)		Yes	Yes	
S27-2	quality-change (qchg)		Yes	Yes	
S27-3	data-update (dupd)		Yes		
S28	GetURCBValues	TP	Yes	Yes	
S29	SetURCBValues	TP	Yes	Yes	

Logging					
Log Control Block					
S30	GetLCBValues	TP			
S31	SetLCBValues	TP			



	Services	AA*: TP/MC	Client	Server	Comments
Log					
S32	QueryLogByTime	TP			
S33	QueryLogAfter	TP			
S34	GetLogStatusValues	TP			

Generic Substation Event Model (GSE)					
GOOSE Control Block					
S35	SendGOOSEMessage	MC	Yes	Yes	
S36	GetGoReference	TP			
S37	GetGOOSEElementNumber	TP			
S38	GetGoCBValues	TP			
S39	SetGoCBValues	TP			
GSSE Control Block					
S40	SendGSSEMessage	MC			
S41	GetGsReference	TP			
S42	GetGSSEDataOffset	TP			
S43	GetGsCBValues	TP			
S44	SetGsCBValues	TP			

Transmission of Sampled Value Model (SVC)					
Multicast SVC					
S45	SendMSVMessage	MC			
S46	GetMSVCBValues	TP			
S47	SetMSVCBValues	TP			
Unicast SVC					
S48	SendUSVMessage	TP			
S49	GetUSVCBValues	TP			
S50	SetUSVCBValues	TP			

Control					
S51	Select	TP	Yes	Yes	
S52	SelectWithValue	TP	Yes		



	Services	AA*: TP/MC	Client	Server	Comments
S53	Cancel	TP		Yes	Only supported for control model Select before Operate (SBO)
S54	Operate	TP	Yes	Yes	
S55	CommandTermination	TP	Yes	Yes	
S56	TimeActivatedOperate	TP			

File Transfer					
S57	GetFile	TP	Yes	Yes	
S58	SetFile	TP			
S59	DeleteFile	TP			
S60	GetFileAttributeValues	TP	Yes	Yes	

Time					
T1	Time resolution of internal clock		Up to 20	Up to 20	Nearest negative power of 2 (in seconds)
T2	Time accuracy of internal clock		T0	T0	T0 (10 ms) T1 (1 ms) T2 (100 μs) T3 (25 μs) T4 (4 μs) T5 (1 μs)
T3	Supported TimeStamp resolution		7 20	7 20	7 for NTP 20 for IRIG-B Nearest negative power of 2 (in seconds) The value of the TimeAccuracy attribute depends on the time-source accuracy of and variation of the internal clock relative to the time source.
			T0 or T1	T0 or T1	For SNTP and NTP, T0 or T1 is typical. If accuracy is less than 10 ms, it will be set to “Unspecified”.

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