Model Implementation Conformance Statement
for the IEC 61850 interface in SEL-311C

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UCA International Users Group
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4. Introduction

This model implementation conformance statement is applicable for SEL-311C-3 firmware R503:

This MICS document specifies the modelling extensions compared to IEC 61850 edition 1. For the exact details on the standardized model please compare the ICD substation configuration file: “0311C-3 004.ICD”, version R502.

Clause 2 contains the list of implemented logical nodes.
Clause 3 describes the new and extended logical nodes.

5. Logical Nodes List

The following table contains the list of logical nodes implemented in the device:

L: System Logical Nodes
LPHD (Physical device information)
LLN0 (Logical node zero)
P: Logical Nodes for protection functions
PDIS (Distance)
PIOC (Instantaneous overcurrent)
PSCH (Protection scheme)
PTOC (Time overcurrent)
PTOF (Overfrequency)
PTOV (Overvoltage)
PTRC (Protection trip conditioning)
PTUF (Underfrequency)
PTUV (Undervoltage)
R: Logical nodes for protection related functions
RBRF (Breaker failure)
RDIR (Directional element)
RFLO (Fault locator)
G: Logical Nodes for generic references
GGIO (Generic process I/O)
M: Logical Nodes for metering and measurement
MDST (Demand metering statistics)
MMXU (Measurement)
MSQI (Sequence and imbalance)
S: Logical nodes for sensors and monitoring
SCBR (Circuit breaker supervision)
C: Logical Nodes for control
CSWI (Switch controller)

X: Logical Nodes for switchgear
XCBR (Circuit breaker)
Z: Logical Nodes for further power system equipment
ZBAT (Battery)

6. Logical Node Extensions

The following table use

- M : Data is mandatory in the IEC-61850-7-4.
- O: Data is optional in the IEC-61850-7-4 and is used in the device.
- E: Data is an extension to the IEC-61850-7-4.

6.1. New Logical Nodes

New logical nodes have the lnNs attribute in the Name plate. The value of lnNs is a reference to the MICS document.

6.1.1 MDST Demand Metering Statistics

This LN shall be used for calculation of demand currents and energy in a three-phase system.

MDST class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
LNName		The name shall be composed of the class name, LN-Prefix and LN-Instance-ID according to IEC 61850-7-2.		
Data				
Common Logical Node Information				
Mod	INC	Mode	M	Status-only
Beh	INS	Behaviour	M	
Health	INS	Health	M	
NamPlt	LPL	Name plate	M	
Measured Values				
DmdA	WYE	Demand currents	O	
PkDmdA	WYE	Peak demand currents	O	
SupWh	MV	Energy, real (MWh), supply direction toward busbar	O	

SupVArh	MV	Energy, reactive (MVARh), supply direction toward busbar	O	
DmdWh	MV	Energy, real (MWh), supply direction away from busbar	O	
DmdVArh	MV	Energy, reactive (MVARh), supply direction away from busbar	O	

6.1.2 SCBR Circuit Breaker Supervision

This LN shall be used for supervision of circuit breakers.

SCBR class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
LNName		The name shall be composed of the class name, LN-Prefix and LN-Instance-ID according to IEC 61850-7-2.		
Data				
Common Logical Node Information				
Mod	INC	Mode	M	Status-only
Beh	INS	Behaviour	M	
Health	INS	Health	M	
NamPlt	LPL	Name plate	M	
Status Information				
ColOpn	SPS	Open command of trip coil	M	
OpTmAlm1	SPS	Switch operating time exceeded—electrical close time	O	
OpTmAlm2	SPS	Switch operating time exceeded—electrical open time	O	
OpCnt	INS	Switch operating time exceeded counter	E	
Measured Values				

OpTmOpn	MV	Operation time open	O	
OpTmCls	MV	Operation time close	O	
AbrPrt	MV	Calculated or measured wear (e.g., of main contact), expressed in % where 0% corresponds to new condition	E	

6.2. Extended Logical Nodes

The following logical nodes have been extended with extra data. All extra data has been highlighted in the tables and marked as “E” (Extended), these data contains the “dataNs” attribute.

6.2.1 MMXU Measurement

MMXU class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
LNName		The name shall be composed of the class name, LN-Prefix and LN-Instance-ID according to IEC 61850-7-2.		
Data				
Common Logical Node Information				
Mod	INC	Mode	M	Status-only
Beh	INS	Behaviour	M	
Health	INS	Health	M	
NamPlt	LPL	Name plate	M	
Measured Values				
TotW	MV	Total active power	O	
TotVAr	MV	Total reactive power	O	
TotVA	MV	Total apparent power	O	

TotPF	MV	Average power factor	O	
Hz	MV	Frequency	O	
PPV	DEL	Phase-to-phase voltages	O	
PhV	WYE	Phase-to-ground voltages	O	
VSyn	CMV	Synchronous voltage	E	
A	WYE	Phase currents	O	
W	WYE	Phase active power	O	
VAr	WYE	Phase reactive power	O	
PF	WYE	Phase power factor	O	

6.2.2 PTUV Undervoltage

PTUV class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
LNName		The name shall be composed of the class name, LN-Prefix and LN-Instance-ID according to IEC 61850-7-2.	M	
Data				
Common Logical Node Information				
Mod	INC	Mode	M	Status-only
Beh	INS	Behaviour	M	
Health	INS	Health	M	
NamPlt	LPL	Name plate	M	
Status Information				
Str	ACD	Start (pickup)	M	
Op	ACT	Operate	M	
LOP4	SPS	LOP reset condition based on healthy voltages	E	

LOP3	SPS	Breaker VT LOP logic asserted	E	
LOP2	SPS	LOP—latched	E	
LOP1	SPS	Drop-in voltage without change in current LOP logic asserted	E	
LOPRST	SPS	Breaker closing LOP logic asserted	E	

6.2.3 RFLO Fault locator

RFLO class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
LNName		The name shall be composed of the class name, LN-Prefix and LN-Instance-ID according to IEC 61850-7-2.	M	
Data				
Common Logical Node Information				
Mod	INC	Mode	M	Status-only
Beh	INS	Behaviour	M	
Health	INS	Health	M	
NamPlt	LPL	Name plate	M	
Measured Values				
FltZ	CMV	Fault impedance	M	
FltDiskm	MV	Fault distance	M	
A	WYE	Fault currents	E	

6.2.4 XCBR Circuit breaker

XCBR class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
LNName		The name shall be composed of the class name, LN-Prefix and LN-Instance-ID according to IEC 61850-7-2.	M	
Data				
Common Logical Node Information				
Mod	INC	Mode	M	Status-only
Beh	INS	Behaviour	M	
Health	INS	Health	M	
NamPlt	LPL	Name plate	M	
Loc	SPS	Local control behavior	M	
OpCnt	INS	Operation counter	M	
Controls				
Pos	DPC	Switch position	M	
BlkOpn	SPC	Block opening	M	
BlkCls	SPC	Block closing	M	
Status Information				
CBOpCap	INS	Circuit breaker operating capability	M	
OpCntEx	INS	Operation counter—external	E	

7. Enum Types Extensions

7.1. New Enum types

7.1.1 ACDdir

Value	Description	Remarks
0	unknown	
1	forward	
2	backward	
3	both	

7.1.2 angRef

Value	Description	Remarks
0	Va	
1	Vb	
2	Vc	
3	Aa	
4	Ab	
5	Ac	
6	Vab	
7	Vbc	
8	Vca	
9	Vother	
10	Aother	

7.1.3 dirGeneral

Value	Description	Remarks

0	unknown	
1	forward	
2	backward	
3	both	

7.1.4 orCat

Value	Description	Remarks
0	not-supported	
1	bay-control	
2	station-control	
3	remote-control	
4	automatic-bay	
5	automatic-station	
6	automatic-remote	
7	maintenance	
8	process	

7.1.5 SboClasses

Value	Description	Remarks
0	operate-once	
1	operate-many	

7.2. Extended Enum types

7.2.1 setCharact

Value	Description	Remarks
1	ANSI Extremely Inverse	
2	ANSI Very Inverse	
3	ANSI Normal Inverse	
4	ANSI Moderate Inverse	
5	ANSI Definite Time	
6	Long-Time Extremely Inverse	
7	Long-Time Very Inverse	
8	Long-Time Inverse	
9	IEC Normal Inverse	
10	IEC Very Inverse	
11	IEC Inverse	
12	IEC Extremely Inverse	
13	IEC Short-Time Inverse	
14	IEC Long-Time Inverse	
15	IEC Definite Time	
16	Reserved	
17	Definable curve 1	
18	Definable curve 2	
19	Definable curve 3	
20	Definable curve 4	
21	Definable curve 5	
22	Definable curve 6	
23	Definable curve 7	
24	Definable curve 8	
25	Definable curve 9	
26	Definable curve 10	
27	Definable curve 11	
28	Definable curve 12	
29	Definable curve 13	

30	Definable curve 14	
31	Definable curve 15	
32	Definable curve 16	
33	Vendor specific curve 1	
34	Vendor specific curve 2	
35	Vendor specific curve 3	
36	Vendor specific curve 4	
37	Vendor specific curve 5	
38	Vendor specific curve 6	
39	Vendor specific curve 7	
40	Vendor specific curve 8	
41	Vendor specific curve 9	
42	Vendor specific curve 10	
43	Vendor specific curve 11	
44	Vendor specific curve 12	
45	Vendor specific curve 13	
46	Vendor specific curve 14	
47	Vendor specific curve 15	
48	Vendor specific curve 16	