

Model Implementation Conformance Statement for the IEC
61850 Edition 2 Amendment 1 server interface in SEL-451-5,
SEL-451-A, SEL-487B-1, SEL-487E-3, SEL-487E-4, SEL-421-
4, SEL-421-5, SEL-487V-0 and SEL-487V-1

Version 1
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Introduction

This model implementation conformance statement is applicable for:

SEL-451-5 with firmware version R332 and data model name space 2007B4,
SEL-451-A with firmware version R332 and data model name space 2007B4,
SEL-487B-1 with firmware R321 and data model space 2007B4,
SEL-487E-3 with firmware R325 and data model name space 2007B4,
SEL-487E-4 with firmware R325 and data model name space 2007B4,
SEL-421-4 with firmware R335 and data model name space 2007B4,
SEL-421-5 with firmware R335 and data model name space 2007B4,
SEL-487V-0 with firmware R112 and data model name space 2007B4 and
SEL-487V-1 with firmware R112 and data model name space 2007B4.

This MICS document specifies the modelling extensions compared to IEC 61850 edition 2. For the exact details on the standardized model please compare the ICD substation configuration file:

“0451 011 R332.ICD”, version R409,

“0487B 011 R321.ICD”, version R406,

“0487E 011 R325.ICD”, version R409,

“0421 011 R335.ICD”, version R408 and

“0487V 011 R112.ICD”, version R204.

Clause 2 contains the list of implemented logical nodes.

Clause 3 describes the new and extended logical nodes (if any).

Clause 4 describes the new and extended enum types (if any).

Logical Nodes List

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

C: Logical Nodes for control	Name space when not <2007B4>
CILO (Interlocking) ⁽²⁾ ⁽³⁾ ⁽⁴⁾ ⁽⁵⁾	
CSWI (Switch controller) ⁽¹⁾	
G: Logical Nodes for generic references	
GGIO (Generic process I/O) ⁽¹⁾	
L: System Logical Nodes	
LCCH (Physical communication channel supervision) ⁽¹⁾	
LGOS (GOOSE subscription) ⁽¹⁾	
LLNO (Logical device LN) ⁽¹⁾	
LPHD (Physical device LN) ⁽¹⁾	
LTIM (Time management) ⁽¹⁾	
LTMS (Time master supervision) ⁽¹⁾	
LTRK (Service tracking) ⁽¹⁾	
M: Logical Nodes for metering and measurement	
MDST (Demand and Peak Demand Values) ⁽²⁾ ⁽⁴⁾	
MMTR (Metering 3 phase) ⁽²⁾ ⁽³⁾ ⁽⁴⁾	
MMXN (Non-phase-related AC measurement) ⁽³⁾ ⁽⁶⁾	
MMXU (Measurement) ⁽²⁾ ⁽³⁾ ⁽⁴⁾ ⁽⁵⁾	
MSQI (Sequence and imbalance) ⁽²⁾ ⁽³⁾ ⁽⁴⁾ ⁽⁵⁾	
MTHR (RTD Temperature Metering) ⁽⁵⁾	
P: Logical Nodes for protection functions	
PDIF (Differential) ⁽³⁾ ⁽⁵⁾ ⁽⁶⁾	
PDIS (Distance) ⁽³⁾ ⁽⁴⁾	
PDOP (Directional overpower) ⁽⁵⁾	
PDUP (Directional underpower) ⁽⁵⁾	

PHAR (Harmonic restraint) ⁽³⁾	
PHIZ (Ground detector) ⁽²⁾	
PIOC (Instantaneous overcurrent) ^{(2) (3) (4) (5)}	
PSCH (Protection scheme) ^{(2) (4)}	
PTOC (Time overcurrent) ^{(2) (3) (4) (5)}	
PTOF (Over frequency) ^{(4) (5)}	
PTOV (Overvoltage) ^{(2) (3) (4) (5)}	
PTRC (Protection trip conditioning) ⁽¹⁾	
PTTR (Thermal overload) ^{(2) (3) (4)}	
PTUF (Underfrequency) ^{(4) (5)}	
PTUV (Undervoltage) ^{(2) (3) (4) (5)}	
PVPH (Volts per Hz) ⁽³⁾	
R: Logical nodes for protection related functions	
RBRF (Breaker Failure) ⁽¹⁾	
RDIR (Directional element) ^{(2) (4)}	
RDRE (Disturbance recorder function) ⁽¹⁾	
RFLO (Fault Locator) ^{(2) (3) (4)}	
RPSB (Power swing detection/blocking) ^{(3) (4)}	
RREC (Autoreclosing) ^{(2) (3) (4)}	
RSYN (Synchronism check) ⁽⁴⁾	
S: Logical Nodes for supervision and monitoring	
SCBR (Circuit breaker supervision) ^{(2) (3) (4)}	
X: Logical Nodes for switchgear	
XCBR (Circuit breaker) ⁽¹⁾	
XSWI (Circuit switch) ⁽¹⁾	
Z: Logical Nodes for further power system equipment	
ZBAT (Battery) ⁽¹⁾	

- (1) Supported by all SEL-400 relays in this document.
- (2) Supported by SEL-451-5 and SEL-451-A.
- (3) Supported by SEL-487E-3 and SEL-487E-4.
- (4) Supported by SEL-421-4 and SEL-421-5.
- (5) Supported by SEL-487V-0 and SEL-487V-1.
- (6) Supported by SEL-487B-1.

Logical Node Extensions

The following table use

- M: Data object is mandatory in the IEC 61850-7-4 Ed2 Amd1.
- O: Data object is optional in the IEC 61850-7-4 Ed2 Amd1 and is used in the device.
- E: Data object is an extension to the IEC 61850-7-4 Ed2 Amd1.

New Logical Nodes

Newly created logical nodes are listed in this clause, with lnNs attribute in the Name plate.

MDST1 Demand Metering

MDST class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data Objects				
Common Logical Node Information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it 'LLN0.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
NamPlt	LPL	Name plate of the logical node.	MONamPlt	
Measured and metered values				
A	WYE	Current	E	
W	WYE	Real power	E	
VAr	WYE	Reactive power	E	
VA	WYE	Apparent power	E	
SeqA	SEQ	Sequence currents	E	

TotW	MV	Total real power	E	
TotVAr	MV	Total reactive power	E	
TotVA	MV	Total apparent power	E	
SupWh	BCR	Real energy supply (default direction: energy flow towards busbar)	E	
DmdWh	BCR	Real energy demand (default direction: energy flow from busbar)	E	

MDST2 Peak Demand Metering

MDST class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data Objects				
Common Logical Node Information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it 'LLNO.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
NamPlt	LPL	Name plate of the logical node.	O	
Measured and metered values				
A	WYE	Current	E	
W	WYE	Real power	E	
VAr	WYE	Reactive power	E	
VA	WYE	Apparent power	E	
SeqA	SEQ	Sequence currents	E	
TotW	MV	Total real power	E	
TotVAr	MV	Total reactive power	E	
TotVA	MV	Total apparent power	E	

MTHR RTD Temperature Metering

MTHR class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data Objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it 'LLNO.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
NamPlt	LPL	Name plate of the logical node.	O	
Measured and metered values				
Tmp	MV	RTD temperature Value n.	E	

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).

NOTE: If the extended data object is already used in other logic nodes in IEC 61850-7-4 Ed.2 Amd1, dataNs is not mandatory, but it's still recommended.

LCCH Physical communication channel supervision

LCCH class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLNO.Mod'). Processing of the quality status	M	

		('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.		
NamPlt	LPL	Name plate of the logical node.	MONamPlt	
Status information				
ChLiv	SPS	Physical channel status	M	
RedChLiv	SPS	Physical channel status of redundant channel	MFcond(2)	
FerCh	INS	Frame error rate on this channel	O	
RedFerCh	INS	Frame error rate on redundant channel	OF(RedChLiv)	
Measured and metered values				
RxCnt	BCR	Number of received messages	O	
RedRxCnt	BCR	Number of received messages on redundant channel	OF(RedChLiv)	
TxCnt	BCR	Number of sent messages	O	
Controls				
RsStat	SPC	Reset device statistics	E	
Settings				
NetMod	ENG	Network Mode	E	

LGOS GOOSE Subscription

LGOS class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLN0.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
NamPlt	LPL	Name plate of the logical node.	MONamPlt	

Status information				
NdsCom	SPS	Subscription needs commissioning	O	
St	SPS	Status of the subscription	M	
SimSt	SPS	Status showing really that Sim messages are received and accepted	O	
LastStNum	INS	Last state number received	O	
LastSqNum	INS	Last sequence number received	E	
LastTal	INS	Last time-allowed-to-live received	E	
ConfRevNum	INS	Expected configuration revision number	O	
RxConfRevNum	INS	Configuration revision number of the received messages	O	
ErrSt	ENS	Current error status of the subscription	E	
OosCnt	INS	Number of out-of-sequence (OOS) errors	E	
TalCnt	INS	Number of time-allowed-to-live violations	E	
DecErrCnt	INS	Number of messages that failed decoding	E	
BufOvflCnt	INS	Number of messages lost due to buffer overflow	E	
MsgLosCnt	INS	Number of messages lost due to OOS errors (estimated)	E	
MaxMsgLos	INS	Max. number of sequential messages lost due to OOS error (estimated)	E	
InvQualCnt	INS	Number of mapped incoming GOOSE data with invalid quality	E	
Measured and metered values				
TotDwnTm	MV	Total downtime in seconds	E	
MaxDwnTm	MV	Maximum continuous downtime in seconds	E	
Controls				
RsStat	SPC	Reset/clear statistics	E	
Settings				

GoCBRef	ORG	Reference to the subscribed GOOSE control block	M	
DatSet	ORG	Configured dataset reference	E	
GoID	VSG	Configured GOOSE ID	E	
Addr	VSG	Configured multicast MAC address	E	
VlanID	ING	Configured VLAN ID	E	
VlanPri	ING	Configured VLAD priority	E	
AppID	ING	Configured APPID	E	

LPHD Physical device LN

LPHD class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
NamPlt	LPL	Name plate information of LPHD	MONamPlt	
PhyNam	DPL	Physical device name plate.	M	
Status information				
PhyHealth	ENS (HealthKind)	Reflects the state of the physical device related hardware and software.	M	
Proxy	SPS	If true, the physical device is a proxy (i.e., the logical device embedding this logical node is representing another physical device).	M	
SellibId	VSD	SEL 61850 Library (LIB61850ID) value	E	
Controls				
Sim	SPC	(controllable) If true, IED will be using simulated GOOSE values or simulated sampled measurand values (instead of original ones) as soon as they are received. See part 7-1, clause 7.8.	O	

LTMS Time master supervision

LTMS class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLNO.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
NamPlt	LPL	Name plate of the logical node.	O	
Status information				
TmAcc	INS	Number of significant bits in fraction of second in the time accuracy part of the time stamp	O	
TmSrc	VSS	Current time source identity	M	
TmSrcTyp	ENS	Type of the clock source	M	
TmSyn	ENS	Actual time synchronization applied	O	
TmSynLkd	ENS	Locked status of clock synchronization	O	
Measured and metered values				
TmTosPer	MV	Duration, in milliseconds, between two consecutive top-of-second points on the synchronized time	E	

RDRE Disturbance Recorder Function

RDRE class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLN0.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
Status information				
RcdMade	SPS	If true, new disturbance recording has been completed and corresponding file is available.	M	
FltNum	INS	Fault number; number allocation is a local issue.	M	
FltTyp	ENS	Affected phases for the latest event	E	
FltCaus	ENS	Event cause for the latest event	E	

RFLO Fault locator

RFLO class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLN0.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
Status information				

FltTyp	ENS	Affected phases for the latest event	E	
FltCaus	ENS	Event cause for the latest event	E	
Measured and metered values				
FltZ	CMV	Impedance to fault	O	
FltDiskm	MV	Distance to fault	O	
A	WYE	Fault current	E	
Anseq	CMV	Negative-sequence fault current in primary amperes	E	

SCBR Circuit Breaker Supervision

SCBR class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLN0.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
Status information				
ColOpn	SPS	If true, the opening coil has been operated through the open command	M	
AbrAlm	SPS	If true, the contact abrasion exceeded alarm trigger level setting 'AbrAlmLev'.	O	
MechTmAlm	SPS	Mechanical Slow Operation Alarm	E	
OpTmAlm	SPS	inherited from: SwitchgearSupervisionLN	O	
Measured and metered values				
AccmAbr	MV	Cumulated abrasion	O	

XCBR Circuit Breaker

XCBR class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLN0.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
Status information				
Loc	SPS	If true, the control behaviour is allowed at this level.	M	
LockKey	SPS	If true, the operation has been switched (from remote) to local. This changeover is always done locally with a physical key or toggle switch, which may have a set of contacts from which the position can be read.	OF(Loc)	
OpCnt	INS	Count of operations; not resettable from remote, but may be reset from local.	M	
CBOpCap	ENS	Physical capability of the circuit breaker to operate, which reflects the available energy in the drive.	O	
TukRackPos ⁽¹⁾	SPS	Circuit breaker rack/truck position	E	
TukTestPos ⁽¹⁾	SPS	Circuit breaker rack/truck test position	E	
Controls				
Pos	DPC	(controllable) Circuit breaker/switch position.	M	
BlkOpn	SPC	(controllable) If true, 'open' action has been blocked; can be set from another logical node. Operating capability ('XCBR.CBOpCap' and 'XSWI.SwOpCap' for circuit breaker and switch, respectively) does not reflect the blocked opening.	M	
BlkCls	SPC	(controllable) If true, 'close' action has been blocked; can be set from another logical node. Operating capability ('XCBR.CBOpCap' and 'XSWI.SwOpCap' for circuit breaker and switch, respectively) does not reflect the blocked closing.	M	

⁽¹⁾ Data Object supported by SEL-451-5 and SEL-451-A.

XS WI Circuit Switch

XS WI class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLN0.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
Status information				
Loc	SPS	If true, the control behaviour is allowed at this level.	M	
LockKey	SPS	If true, the operation has been switched (from remote) to local. This changeover is always done locally with a physical key or toggle switch, which may have a set of contacts from which the position can be read.	O	
OpCnt	INS	Count of operations; not resettable from remote, but may be reset from local.	M	
SwTyp	ENS	Type of the switch.	M	
SwOpCap	ENS	Physical capability of the switch to operate. It includes additional blocking due to some local problems.	O	
SwBayCtlEn ⁽¹⁾	SPS	Disconnect switch front-panel control enable status	E	
Controls				
Pos	DPC	(controllable) Circuit breaker/switch position.	M	
BlkOpn	SPC	(controllable) If true, 'open' action has been blocked; can be set from another logical node. Operating capability ('XC BR.CB OpCap' and 'XS WI.SwOpCap' for circuit breaker and switch, respectively) does not reflect the blocked opening.	M	
BlkCls	SPC	(controllable) If true, 'close' action has been blocked; can be set from another logical node. Operating capability ('XC BR.CB OpCap' and 'XS WI.SwOpCap' for circuit breaker and switch,	M	

		respectively) does not reflect the blocked closing.		
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⁽¹⁾ Data Object supported by SEL-451-5 and SEL-451-5A.

ZBAT Battery

ZBAT class				
Data object name	Common data class	Explanation	M/O/E	Remarks
Data objects				
Common logical node information				
Beh	ENS	Read-only value, describing the behaviour of a domain logical node. It depends on the current operating mode of the logical node ('DomainLN.Mod'), and the current operating mode of the logical device that contains it ('LLN0.Mod'). Processing of the quality status ('q') of the received data is the prerequisite for correct interpretation of 'DomainLN.Beh'.	M	
Measured and metered values				
Vol	MV	External battery DC voltage.	O	
Status information				
BatWrn	SPS	DC Monitor warning alarm	E	
BatFail	SPS	DC Monitor fail alarm	E	
BatGndFit	SPS	DC Monitor ground fault alarm	E	
BatDvAlm	SPS	DC Monitor alarm for ac ripple	E	

Enum types Extensions

New Enum types

New enum types are listed in this clause.

FltCauseKind_SEL

Value	Description	Remarks
0	No fault summary	
1	Trigger	
2	Trip	
3	Event Report	
4	Differential Trip ⁽¹⁾	
5	Breaker Failure Trip ⁽¹⁾	
6	87 Zone 1 Differential Trip ⁽²⁾	
7	87 Zone 2 Differential Trip ⁽²⁾	
8	Restricted Earth Fault Trip ⁽²⁾	

⁽¹⁾ Supported by SEL-487B-1.

⁽²⁾ Supported by SEL-487E-3 and SEL-487E-4.

FltCauseKind_SEL⁽³⁾

Value	Description	Remarks
0	No fault summary	
1	Trigger Command	
2	Trip Element	
3	Event Report Element	
5	87 Differential Element Trip	
6	60 Unbalance Element Trip	

⁽³⁾ Supported by SEL-487V-0 and SEL-487V-1

FltTypeKind_SEL

Value	Description	Remarks
0	Undefined	
1	AG ⁽¹⁾	
2	BG ⁽¹⁾	
3	CG ⁽¹⁾	

4	AB ⁽¹⁾	
5	BC ⁽¹⁾	
6	CA ⁽¹⁾	
7	ABG ⁽¹⁾	
8	BCG ⁽¹⁾	
9	CAG ⁽¹⁾	
10	ABC ⁽¹⁾	

⁽¹⁾ Supported by SEL-451-5, SEL-451-A, SEL-421-4 and SEL-421-5,

FltTypeKind_SEL⁽¹⁾

Value	Description	Remarks
0	No fault type identified or present	
1	87 Phase Differential A Phase Top Section	
2	87 Phase Differential A Phase Bottom Section	
3	87 Phase Differential B Phase Top Section	
4	87 Phase Differential B Phase Bottom Section	
5	87 Phase Differential C Phase Top Section	
6	87 Phase Differential C Phase Bottom Section	
7	87 Phase Differential	
8	87 Ground Differential Element 1 Phase A Left Section	
9	87 Ground Differential Element 1 Phase A Right Section	
10	87 Ground Differential Element 1 Phase B Left Section	
11	87 Ground Differential Element 1 Phase B Right Section	
12	87 Ground Differential Element 1 Phase C Left Section	
13	87 Ground Differential Element 1 Phase C Right Section	
14	87 Ground Differential Element 1	
15	87 Ground Differential Element 2 Phase A Left Section	
16	87 Ground Differential Element 2 Phase A Right Section	
17	87 Ground Differential Element 2 Phase B Left Section	
18	87 Ground Differential Element 2 Phase B Right Section	
19	87 Ground Differential Element 2 Phase C Left Section	
20	87 Ground Differential Element 2 Phase C Right Section	
21	87 Ground Differential Element 2	
22	87 Ground Differential Element 3 Phase A Left Section	

23	87 Ground Differential Element 3 Phase A Right Section	
24	87 Ground Differential Element 3 Phase B Left Section	
25	87 Ground Differential Element 3 Phase B Right Section	
26	87 Ground Differential Element 3 Phase C Left Section	
27	87 Ground Differential Element 3 Phase C Right Section	
28	87 Ground Differential Element 3	
29	60 Phase Unbalance A Phase Left Section	
30	60 Phase Unbalance A Phase Right Section	
31	60 Phase Unbalance B Phase Left Section	
32	60 Phase Unbalance B Phase Right Section	
33	60 Phase Unbalance C Phase Left Section	
34	60 Phase Unbalance C Phase Right Section	
35	60 Phase Unbalance	
36	60 Neutral Unbalance Element 1 Phase A Left Section	
37	60 Neutral Unbalance Element 1 Phase A Right Section	
38	60 Neutral Unbalance Element 1 Phase B Left Section	
39	60 Neutral Unbalance Element 1 Phase B Right Section	
40	60 Neutral Unbalance Element 1 Phase C Left Section	
41	60 Neutral Unbalance Element 1 Phase C Right Section	
42	60 Neutral Unbalance Element 1	
43	60 Neutral Unbalance Element 2 Phase A Left Section	
44	60 Neutral Unbalance Element 2 Phase A Right Section	
45	60 Neutral Unbalance Element 2 Phase B Left Section	
46	60 Neutral Unbalance Element 2 Phase B Right Section	
47	60 Neutral Unbalance Element 2 Phase C Left Section	
48	60 Neutral Unbalance Element 2 Phase C Right Section	
49	60 Neutral Unbalance Element 2	
50	60 Neutral Unbalance Element 3 Phase A Left Section	
51	60 Neutral Unbalance Element 3 Phase A Right Section	
52	60 Neutral Unbalance Element 3 Phase B Left Section	
53	60 Neutral Unbalance Element 3 Phase B Right Section	
54	60 Neutral Unbalance Element 3 Phase C Left Section	
55	60 Neutral Unbalance Element 3 Phase C Right Section	
56	60 Neutral Unbalance Element 3	

⁽¹⁾ Supported by SEL-487V-0 and SEL-487V-1

GOOSEErrSt_SEL

Value	Description	Remarks
0	OK	
1	Device Disabled	
2	ConfRev Mismatch	
3	Needs Commissioning	
4	Message Corrupted	
5	TTL Expired	
6	Out of Sequence	
7	Invalid Data Quality	

NetMod_SEL

Value	Description	Remarks
1	Fixed	
2	Failover	
3	Switched	
4	PRP	
5	IsolateIP	

Extended Enum types

Enum types with extended negative values are listed in this clause. Semantic of these negative values are described.

AutoReclosingKind_SEL⁽¹⁾

Value	Description	Remarks
1	Ready	
2	InProgress	
5	TripFromProtection	
6	FaultDisappeared	
7	WaitToComplete	
8	CBclosed	
12	NotReady	

-2	SinglePoleInProgress	
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⁽¹⁾ Supported by SEL-451-5, SEL-451-A, SEL-487E-3, SEL-487E-4, SEL-421-4 and SEL-421-5.

ClockSyncKind ⁽¹⁾

Value	Description	Remarks
0	InternalClock	
1	LocalAreaClock	
2	GlobalAreaClock	

⁽¹⁾ According to TISSUE 1726.

OutputSignalKind_SEL

Value	Description	Remarks
0	pulse	
1	persistent	