Model Implementation Conformance Statement for Testing

MICS for Server Test Procedures for Edition 2

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Table of Contents

1 INTRODUCTION

This model implementation conformance statement is applicable for C264 with firmware system version DS Agile V7.

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: “C264.icd”.

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).

2 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 device information)
LDBI (Database information)
LDIA (Physical device diagnostic)
C: Logical nodes for control
CILO (Interlocking)
CSWI (Switch controller)
G: Logical nodes for generic references
GAPC (Generic automatic process control)
GBAY (Generic bay information)
GGIO (Generic process I/O)
GGSS (Generic substation information)
M: Logical Nodes for metering and measurement
MMXU (Measurement)
R: Logical nodes for protection related functions
RDRE (Disturbance recorder function)
X: Logical Nodes for switchgear

XCBR (Circuit breaker)
XSWI (Circuit switch)
Y : Logical nodes for power transformers
YLTC (Tap changer)

3 LOGICAL NODE EXTENSIONS

The following table use

- M: Data is mandatory in the IEC 61850-7-4 Ed.2.
- O: Data is optional in the IEC 61850-7-4 Ed.2 and is used in the device.
- C: Data is conditional in the IEC 61850-7-4 Ed.2 and is used in the device.
- E: Data is an extension to the IEC 61850-7-4 Ed.2.

3.1 NEW LOGICAL NODES

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

3.1.1 LDBI Database information

This logical node is used to get information on the databases of the IED. It contains version and status of the DB1, DB2 and transient DB.

LDBI class				
Data object name	**Common data class**	**Explanation**	**M/O/C/E**	**Remarks**
LDBI		Database information.	M	
Data Objects				
Common Logical Node Information				
Mod	ENC (BehaviourModeKind)	Operating mode of the logical node.	M	Status-only
Beh	ENS (BehaviourModeKind)	Behaviour of the logical node.	M	
Health	ENS (HealthKin	Health of the logical node.	M	

	d)			
NamPlt	LPL	Name plate of the logical node.	M	
Status Information				
DB1	VSS	Database 1 version.	M	
DB1St	ENS (DatabaseStatusEnum)	Database 1 status.	M	
DB2	VSS	Database 2 version.	M	
DB2St	ENS (DatabaseStatusEnum)	Database 2 status.	M	
TrsDB	VSS	Transient database version.	M	
Control				
ODDBSw	SPC	Database switch control	M	

3.1.2 LDIA Diagnostic information

This logical node is used to get information on the databases of the IED. It contains version and status of the DB1, DB2 and transient DB.

LDIA class				
Data object name	**Common data class**	**Explanation**	**M/O/C/E**	**Remarks**
LDIA		Database information.	M	
Data Objects				

Common Logical Node Information				
Mod	ENC (BehaviourModeKind)	Operating mode of the logical node.	M	Status-only
Beh	ENS (BehaviourModeKind)	Behaviour of the logical node.	M	
Health	ENS (HealthKind)	Health of the logical node.	M	
NamPlt	LPL	Name plate of the logical node.	M	
Status Information				
AIUSt1	ENS (C26xLDIAEnum)	Analog Input Board 1 status.	M	Instance from 0 to 5
AOUSt1	ENS (C26xLDIAEnum)	Analog Output Board 1 status.	M	Instance from 0 to 3
AllAIUSt	SPS	Summary of all AIU status.	M	If stVal is set to true, at less one AIU is in fault.
AllAOUSt	SPS	Summary of all AOU status.	M	If stVal is set to true, at less one AOU is in fault.
AllCCUSt	SPS	Summary of all I/O status.	M	If stVal is set to true, at less one CCU is in fault.
AllCommSt	SPS	Summary of all communication status.	M	If stVal is set to true, at less one AOU is in fault.
AllDIUSt	SPS	Summary of all DIU status.	M	If stVal is set to true, at less one DIU is in fault.

AllDOUSt	SPS	Summary of all DOU status.	M	If stVal is set to true, at less one DOU is in fault.
AllDPUSt	SPS	Summary of all DPU status.	M	If stVal is set to true, at less one DPU is in fault.
AllHBUSt	SPS	Summary of all HBU status.	M	If stVal is set to true, at less one HBU is in fault.
AllIEDSt	SPS	Summary of all IED status.	M	If stVal is set to true, at less one IED is in fault.
AllSVUSt	SPS	Summary of all SVU status.	M	If stVal is set to true, at less one SVU is in fault.
AllTMUSt	SPS	Summary of all TMU status.	M	If stVal is set to true, at less one TMU is in fault.
ArrSt1	SPS	SV Arrangement 1 status	M	Instance from 1 to 16
BIUS1St	SPS	Voltage source 1 status used for BIU	M	If stVal is set to true, main power supply source is available.
BIUS2St	SPS	Voltage source 2 status used for BIU	M	If stVal is set to true, backup power supply source is available.
BIUSCur	SPS	Current voltage source used for BIU	M	If stVal is set to false, source 1 is used. If stVal is set to true, source 2 is used.
BIUSt	ENS (C26xLDIA Enum)	Basic Interface Board status	M	
CCUSt1	ENS (C26xLDIA Enum)	I/O Board 1 status	M	Instance from 0 to 14

DIStop	SPS	DI acquisition stopped	M	
DIUSt1	ENS (C26xLDIAEnum)	Digital Input Board 1 Status	M	Instance from 0 to 14
DOUSt1	ENS (C26xLDIAEnum)	Digital Output Board 1 Status	M	Instance from 0 to 14
DPUSt	ENS (C26xLDIAEnum)	Digital Process Unit Status	M	
ErrReadInstr	SPS	Error reading instruction detected	M	
FailSt	ENS (DiagnosticFailStatusEnum)	Diagnostic of failure	M	
GHUSt	ENS (C26xLDIAEnum)	Graphical Human Unit Status	M	
GoCon1	SPS	GOOSE Connection 1	M	Instance from 1 to 8
GoRedCon1	SPS	Redundant GOOSE Connection 1	M	Instance from 1 to 8
GoRedSel1	SPS	Redundant GOOSE Selector 1	M	Instance from 1 to 8
GoSel1	SPS	GOOSE Selector 1	M	Instance from 1 to 8
HBUSt1	ENS (C26xLDIAEnum)	High-break Unit 1 Status	M	Instance from 0 to 14
PLCSt	ENS (PLCSt)	PLC status	M	

PortASt	SPS	DPU Port A status	M	
PortBSt	SPS	DPU Port B status	M	
PrintSt	ENS (C26xLDIA Enum)	Printer status	M	
RedSt	SPS	Device Redundancy mode status	M	If stVal is set to true, IED is active. If stVal is set to false, IED is stand-by.
SVUSt	ENS (C26xLDIA Enum)	Sampled Value Board status	M	
SetDisc	SPS	Setting discordance detected	M	
SetDone	SPS	Setting done	M	
SetInPrg	SPS	Setting in progress	M	
SetIncoher	SPS	Setting incoherency detected	M	
SyncDPUSt	SPS	DPU Synchronization status	M	
SyncSt	SPS	Device Synchronization status	M	
TMUSt	ENS (C26xLDIA Enum)	CT/VT Board status	M	
Control				
LEDId	SPC	LED Identification control	M	
MdbEna	SPC	Enable Modbus control	M	

3.1.3 GBAY Generic Bay information

This logical node is used to get information of the bay.

LDBI class				
Data object name	**Common data class**	**Explanation**	**M/O/C/E**	**Remarks**
GBAY		Bay information.	O	
Data Objects				
Common Logical Node Information				
Mod	ENC (BehaviourModeKind)	Operating mode of the logical node.	M	Status-only
Beh	ENS (BehaviourModeKind)	Behaviour of the logical node.	M	
Health	ENS (HealthKind)	Health of the logical node.	M	
NamPlt	LPL	Name plate of the logical node.	M	
Status Information				
OrdRun	SPS	Order running.	M	
Control				
EnaSBMC	SPC	SBM enable	M	
LocBay	DPC	Local/remote bay mode	M	

3.1.4 GGSS Generic Substation information

This logical node is used to get information of the substation.

LDBI class				
Data object name	**Common data class**	**Explanation**	**M/O/C/E**	**Remarks**
GBAY		Bay information.	O	
Data Objects				
Common Logical Node Information				
Mod	ENC (BehaviourModeKind)	Operating mode of the logical node.	M	Status-only
Beh	ENS (BehaviourModeKind)	Behaviour of the logical node.	M	
Health	ENS (HealthKind)	Health of the logical node.	M	
NamPlt	LPL	Name plate of the logical node.	M	
Control				
LocSubst	DPC	Local/remote substation mode	M	

3.2 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).
NOTE: If the extended data object is already used in other logic nodes in IEC 61850-7-4 Ed.2, dataNs is not mandatory, but it's still recommended.

3.2.1 CSWI Switch controller

Following is an example of extending PIOC with a few extra data object.

CSWI class				
Data object name	**Common data class**	**Explanation**	**M/O/C/E**	**Remarks**
CSWI				
Data objects				
Common Logical Node Information				
Mod	ENC (BehaviourModeKind)	Operating mode of the logical node.	M	Status-only
Beh	ENS (BehaviourModeKind)	Behaviour of the logical node.	M	
Health	ENS (HealthKind)	Health of the logical node.	M	
NamPlt	LPL	Name plate of the logical node.	M	
Status Information				
IndSys1	SPS	Internal close order	E	

IndSys2	SPS	Internal open order	E	
Control				
Pos	DPC	Circuit breaker / switch position.	M	

4 ENUM TYPES EXTENSIONS

4.1 NEW ENUM TYPES

New enum types are listed in this clause.

4.1.1 DatabaseStatusEnum

Value	Description	Remarks
1	missing	
2	stand-by	
3	current	
4	stand-by/modified	
5	urrent/modified	

4.1.2 PLCSt

Value	Description	Remarks
0	ISaGRAF is running normally	
1	ISaGRAF is not activated	
2	ISaGRAF cycle has overreached the maximum time defined in database	
3	ISaGRAF queue has reached overflow limit	
4	ISaGRAF POU is faulty	

4.1.3 C26xLDIAEnum

Value	Description	Remarks
0	OK	
1	self-check-fault	
2	configured but missing	
3	not configured but present	
4	missing	

4.1.4 DiagnosticFailStatusEnum

Value	Description	Remarks
0	No error	
1	Board in error: AIU	
2	Board in error: BIU	
3	Boards in error: AIU and BIU	
4	Board in error: DIU	
5	Boards in error: AIU and DIU	
6	Boards in error: BIU and DIU	
7	Boards in error: AIU, BIU and DIU	
8	Board in error: CTVT	
9	Boards in error: AIU and CTVT	
10	Boards in error: BIU and CTVT	

11	Boards in error: AIU, BIU and CTVT	
12	Boards in error: DIU and CTVT	
13	Boards in error: AIU, DIU and CTVT	
14	Boards in error: BIU, DIU and CTVT	
15	Boards in error: AIU, BIU, DIU and CTVT	
16	Board in error: AOU	
17	Boards in error: AIU and AOU	
18	Boards in error: BIU and AOU	
19	Boards in error: AIU, BIU and AOU	
20	Boards in error: DIU and AOU	
21	Boards in error: AIU, DIU and AOU	
22	Boards in error: BIU, DIU and AOU	
23	Boards in error: AIU, BIU, DIU and AOU	
24	Boards in error: CTVT and AOU	
25	Boards in error: AIU, CTVT and AOU	
26	Boards in error: BIU, CTVT and AOU	
27	Boards in error: AIU, BIU, CTVT and AOU	
28	Boards in error: DIU, CTVT and AOU	
29	Boards in error: AIU, DIU, CTVT and AOU	
30	Boards in error: BIU, DIU, CTVT and AOU	

31	Boards in error: AIU, BIU, DIU, CTVT and AOU	
32	Board in error: CCU	
33	Boards in error: AIU and CCU	
34	Boards in error: BIU and CCU	
35	Boards in error: AIU, BIU and CCU	
36	Boards in error: DIU and CCU	
37	Boards in error: AIU, DIU and CCU	
38	Boards in error: BIU, DIU and CCU	
39	Boards in error: AIU, BIU, DIU and CCU	
40	Boards in error: CTVT and CCU	
41	Boards in error: AIU, CTVT and CCU	
42	Boards in error: BIU, CTVT and CCU	
43	Boards in error: AIU, BIU, CTVT and CCU	
44	Boards in error: DIU, CTVT and CCU	
45	Boards in error: AIU, DIU, CTVT and CCU	
46	Boards in error: BIU, DIU, CTVT and CCU	
47	Boards in error: AIU, BIU, DIU, CTVT and CCU	
48	Boards in error: AOU and CCU	
49	Boards in error: AIU, AOU and CCU	
50	Boards in error: BIU, AOU and CCU	

51	Boards in error: AIU, BIU, AOU and CCU	
52	Boards in error: DIU, AOU and CCU	
53	Boards in error: AIU, DIU, AOU and CCU	
54	Boards in error: BIU, DIU, AOU and CCU	
55	Boards in error: AIU, BIU, DIU, AOU and CCU	
56	Boards in error: CTVT, AOU and CCU	
57	Boards in error: AIU, CTVT, AOU and CCU	
58	Boards in error: BIU, CTVT, AOU and CCU	
59	Boards in error: AIU, BIU, CTVT, AOU and CCU	
60	Boards in error: DIU, CTVT, AOU and CCU	
61	Boards in error: AIU, DIU, CTVT, AOU and CCU	
62	Boards in error: BIU, DIU, CTVT, AOU and CCU	
63	Boards in error: AIU, BIU, DIU, CTVT, AOU and CCU	
64	Board in error: DOU	
65	Boards in error: AIU and DOU	
66	Boards in error: BIU and DOU	
67	Boards in error: AIU and BIU and DOU	
68	Boards in error: DIU and DOU	
69	Boards in error: AIU and DIU and DOU	
70	Boards in error: BIU and DIU and DOU	

71	Boards in error: AIU, BIU and DIU and DOU	
72	Boards in error: CTVT and DOU	
73	Boards in error: AIU and CTVT and DOU	
74	Boards in error: BIU and CTVT and DOU	
75	Boards in error: AIU, BIU and CTVT and DOU	
76	Boards in error: DIU and CTVT and DOU	
77	Boards in error: AIU, DIU and CTVT and DOU	
78	Boards in error: BIU, DIU and CTVT and DOU	
79	Boards in error: AIU, BIU, DIU and CTVT and DOU	
80	Boards in error: AOU and DOU	
81	Boards in error: AIU and AOU and DOU	
82	Boards in error: BIU and AOU and DOU	
83	Boards in error: AIU, BIU and AOU and DOU	
84	Boards in error: DIU and AOU and DOU	
85	Boards in error: AIU, DIU and AOU and DOU	
86	Boards in error: BIU, DIU and AOU and DOU	
87	Boards in error: AIU, BIU, DIU and AOU and DOU	
88	Boards in error: CTVT and AOU and DOU	
89	Boards in error: AIU, CTVT and AOU and DOU	
90	Boards in error: BIU, CTVT and AOU and DOU	

91	Boards in error: AIU, BIU, CTVT and AOU and DOU	
92	Boards in error: DIU, CTVT and AOU and DOU	
93	Boards in error: AIU, DIU, CTVT and AOU and DOU	
94	Boards in error: BIU, DIU, CTVT and AOU and DOU	
95	Boards in error: AIU, BIU, DIU, CTVT and AOU and DOU	
96	Boards in error: CCU and DOU	
97	Boards in error: AIU and CCU and DOU	
98	Boards in error: BIU and CCU and DOU	
99	Boards in error: AIU, BIU and CCU and DOU	
100	Boards in error: DIU and CCU and DOU	
101	Boards in error: AIU, DIU and CCU and DOU	
102	Boards in error: BIU, DIU and CCU and DOU	
103	Boards in error: AIU, BIU, DIU and CCU and DOU	
104	Boards in error: CTVT and CCU and DOU	
105	Boards in error: AIU, CTVT and CCU and DOU	
106	Boards in error: BIU, CTVT and CCU and DOU	
107	Boards in error: AIU, BIU, CTVT and CCU and DOU	
108	Boards in error: DIU, CTVT and CCU and DOU	
109	Boards in error: AIU, DIU, CTVT and CCU and DOU	

110	Boards in error: BIU, DIU, CTVT and CCU and DOU	
111	Boards in error: AIU, BIU, DIU, CTVT and CCU and DOU	
112	Boards in error: AOU and CCU and DOU	
113	Boards in error: AIU, AOU and CCU and DOU	
114	Boards in error: BIU, AOU and CCU and DOU	
115	Boards in error: AIU, BIU, AOU and CCU and DOU	
116	Boards in error: DIU, AOU and CCU and DOU	
117	Boards in error: AIU, DIU, AOU and CCU and DOU	
118	Boards in error: BIU, DIU, AOU and CCU and DOU	
119	Boards in error: AIU, BIU, DIU, AOU and CCU and DOU	
120	Boards in error: CTVT, AOU and CCU and DOU	
121	Boards in error: AIU, CTVT, AOU and CCU and DOU	
122	Boards in error: BIU, CTVT, AOU and CCU and DOU	
123	Boards in error: AIU, BIU, CTVT, AOU and CCU and DOU	
124	Boards in error: DIU, CTVT, AOU and CCU and DOU	
125	Boards in error: AIU, DIU, CTVT, AOU, CCU and DOU	
126	Boards in error: BIU, DIU, CTVT, AOU, CCU and DOU	

127	Boards in error: AIU, BIU, DIU, CTVT, AOU, CCU and DOU	

4.2 EXTENDED ENUM TYPES

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

REVISION HISTORY

Version	Date	Author	Remarks
1.0	17102016	Christophe.Camélis	Initial version for final conformance test