



High**PROTEC**

IEC 61850 | MICS

MRI4

Software-Version: 2.2.c

IEC 61850 MICS

Model Implementation Conformance Statement (MICS)

UCA International Users Group Testing Sub Committee

English

INDEX

1.	Introduction.....	4
2.	Logical Nodes.....	5
2.1.	Logical Nodes List.....	5
2.2.	Logical Node definitions.....	6
2.2.1	WW_CILO1.....	7
2.2.2	WW_CSW1.....	8
2.2.3	WW_GGIO1.....	8
2.2.4	WW_GGIO2.....	9
2.2.5	WW_IHMI1.....	10
2.2.6	WW_LLNOCON.....	11
2.2.7	WW_LLNOMEA.....	11
2.2.8	WW_LLNOPRO.....	12
2.2.9	WW_LLNOREC.....	12
2.2.10	WW_LLNOSYS.....	13
2.2.11	WW_LPHDCON.....	13
2.2.12	WW_LPHDMEA.....	13
2.2.13	WW_LPHDPRO.....	14
2.2.14	WW_LPHDREC.....	14
2.2.15	WW_LPHDSYS.....	15
2.2.16	WW_MMXU1.....	15
2.2.17	WW_PTOC1.....	15
2.2.18	WW_PTOC3.....	16
2.2.19	WW_PTOC4.....	17
2.2.20	WW_PTTR3.....	17
2.2.21	WW_RBRF1.....	18
2.2.22	WW_RDRE1.....	18
2.2.23	WW_RREC1.....	19
2.2.24	WW_XCBR2.....	19
2.2.25	WW_XSW1.....	20
3.	Logical Node Extensions.....	22
3.1.	New Logical Nodes	22
3.1.1	WW_PSOFF1 Switch Onto Fault Protection.....	22
3.2.	Extended Logical Nodes.....	22
3.2.1	WW_MSTA1 Metering Statistics	22
4.	Common Data Class.....	24
4.1.	Common Data Class definitions.....	24
4.1.1	WW_ACD1.....	25
4.1.2	WW_ACT1.....	25
4.1.3	WW_CMV1.....	26

4.1.4	WW_DPC1.....	26
4.1.5	WW_DPC2.....	26
4.1.6	WW_DPL1.....	27
4.1.7	WW_INC1.....	27
4.1.8	WW_INS1.....	27
4.1.9	WW_INS2.....	28
4.1.10	WW_INS3.....	28
4.1.11	WW_INS4.....	28
4.1.12	WW_INS5.....	29
4.1.13	WW_LPL1.....	29
4.1.14	WW_LPL2.....	29
4.1.15	WW_LPL3.....	30
4.1.16	WW_MV1.....	30
4.1.17	WW_SPC1.....	30
4.1.18	WW_SPS1.....	31
4.1.19	WW_WYE1.....	31
4.2.	Common Data Attributes type definitions.....	31
4.2.1	WW_analogValue1.....	31
4.2.2	WW_Cancel1.....	32
4.2.3	WW_Oper1.....	32
4.2.4	WW_origin1.....	32
4.2.5	WW_units1.....	33
4.2.6	WW_vector1.....	33
5.	Enumerated type definitions.....	34
5.1.	Enum types.....	34
5.1.1	AutoRecSt.....	34
5.1.2	Beh.....	34
5.1.3	CBOpCap.....	34
5.1.4	ctlModel.....	34
5.1.5	Dbpos.....	35
5.1.6	dir.....	35
5.1.7	Health.....	35
5.1.8	Mod.....	35
5.1.9	multiplier.....	36
5.1.10	orCategory.....	37
5.1.11	sboClass.....	37
5.1.12	SIUnit.....	37
6.	Appendix – Register Maps.....	40
6.1.	Device Planing Dependencies.....	53

1. Introduction

This model implementation conformance statement is applicable to the device MRI4, Version 2.2.c (Firmware-Build 19707).

This MICS document specifies the modelling extensions compared to IEC 61850 edition 1.

Clause 2 contains the list of implemented logical nodes.

Clause 3 describes the new and extended logical nodes.

Clause 4 describes the existing common data classes.

Clause 5 describes the existing enum types.

2. Logical Nodes

2.1. Logical Nodes List

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

L : System Logical Nodes
LLN0 (Logical Node device)
LPHD (Physical device)
P : Logical Nodes for protection functions
PSOF (Switch Onto Fault)
PTOC (Time overcurrent)
PTTR (Thermal overload protection)
R : Logical Nodes for protection related functions
RBRF (Breaker failure)
RDRE (Disturbance recorder function)
RREC (Autoreclosing)
G : Logical Nodes for generic references
GGIO (Generic process I/O)
M : Logical Nodes for metering and measurement
MMXU (Measurement)
MSTA (Metering Statistics)
X : Logical Nodes for switchgear
XCBR (Circuit Breaker)
XSWI (Circuit Switch)
C : Logical Nodes for control
CILO (Interlocking)

CSWI (Switch controller)
I : Logical Nodes for interfacing and archiving
IHMI (Human machine interface)

2.2. Logical Node definitions

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.

LN Type	LN Class	Description
WW_CILO1	CILO	Interlocking
WW_CSWI1	CSWI	Switch controller
WW_GGIO1	GGIO	Generic process I/O
WW_GGIO2	GGIO	Generic process I/O
WW_IHMI1	IHMI	Human machine interface
WW_LLNOCON	LLNO	Logical Node device
WW_LLNOMEA	LLNO	Logical Node device
WW_LLNOPRO	LLNO	Logical Node device
WW_LLNOREC	LLNO	Logical Node device
WW_LLNOSYS	LLNO	Logical Node device
WW_LPHDCON	LPHD	Physical device
WW_LPHDMEA	LPHD	Physical device

LN Type	LN Class	Description
WW_LPHDPRO	LPHD	Physical device
WW_LPHDREC	LPHD	Physical device
WW_LPHDSYS	LPHD	Physical device
WW_MMXU1	MMXU	Measurement
WW_MSTA1	MSTA	Metering Statistics
WW_PSOFF1	PSOF	Switch Onto Fault
WW_PTOC1	PTOC	Time overcurrent
WW_PTOC3	PTOC	Time overcurrent
WW_PTOC4	PTOC	Time overcurrent
WW_PTTR3	PTTR	Thermal overload protection
WW_RBRF1	RBRF	Breaker failure
WW_RDRE1	RDRE	Disturbance recorder function
WW_RREC1	RREC	Autoreclosing
WW_XCBR2	XCBR	Circuit Breaker
WW_XSWI1	XSWI	Circuit Switch

2.2.1 WW_CILO1

CILO class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
CILO		Interlocking		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only

Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				
EnaOpn	WW_SPS1	Enable Open	M	
EnaCls	WW_SPS1	Enable Close	M	

2.2.2 WW_CSWI1

CSWI class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
CSWI		Switch Controller		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Loc	WW_SPS1	Local operation	O	
Controls				
Pos	WW_DPC2	Switch position	M	

2.2.3 WW_GGIO1

GGIO class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
GGIO		Generic process I/O		
Data				

Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status information				
Ind1	WW_SPS1	General indication (binary input)	O	
Ind2	WW_SPS1	General indication (binary input)	O	
Ind3	WW_SPS1	General indication (binary input)	O	
Ind4	WW_SPS1	General indication (binary input)	O	
Ind5	WW_SPS1	General indication (binary input)	O	
Ind6	WW_SPS1	General indication (binary input)	O	
Ind7	WW_SPS1	General indication (binary input)	O	
Ind8	WW_SPS1	General indication (binary input)	O	
Ind9	WW_SPS1	General indication (binary input)	O	
Ind10	WW_SPS1	General indication (binary input)	O	
Ind11	WW_SPS1	General indication (binary input)	O	
Ind12	WW_SPS1	General indication (binary input)	O	
Ind13	WW_SPS1	General indication (binary input)	O	
Ind14	WW_SPS1	General indication (binary input)	O	
Ind15	WW_SPS1	General indication (binary input)	O	
Ind16	WW_SPS1	General indication (binary input)	O	

2.2.4 WW_GGIO2

GGIO class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
GGIO		Generic process I/O		

Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status information				
Ind1	WW_SPS1	General indication (binary input)	O	
Ind2	WW_SPS1	General indication (binary input)	O	
Ind3	WW_SPS1	General indication (binary input)	O	
Ind4	WW_SPS1	General indication (binary input)	O	
Ind5	WW_SPS1	General indication (binary input)	O	
Ind6	WW_SPS1	General indication (binary input)	O	
Ind7	WW_SPS1	General indication (binary input)	O	
Ind8	WW_SPS1	General indication (binary input)	O	
Ind9	WW_SPS1	General indication (binary input)	O	
Ind10	WW_SPS1	General indication (binary input)	O	
Ind11	WW_SPS1	General indication (binary input)	O	
Ind12	WW_SPS1	General indication (binary input)	O	
Ind13	WW_SPS1	General indication (binary input)	O	
Ind14	WW_SPS1	General indication (binary input)	O	
Ind15	WW_SPS1	General indication (binary input)	O	
Ind16	WW_SPS1	General indication (binary input)	O	

2.2.5 WW_IHMI1

IHMI class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks

IHMI		Human machine interface		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	

2.2.6 WW_LLNOCON

LLNO class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LLNO		Logical Node device		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Direct-with-normal-security
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL2	Name plate	M	

2.2.7 WW_LLNOMEA

LLNO class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LLNO		Logical Node device		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Direct-with-normal-security

Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL2	Name plate	M	

2.2.8 WW_LLNOPRO

LLNO class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LLNO		Logical Node device		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Direct-with-normal-security
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL2	Name plate	M	

2.2.9 WW_LLNOREC

LLNO class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LLNO		Logical Node device		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Direct-with-normal-security
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL2	Name plate	M	

2.2.10 WW_LLNO SYS

LLNO class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LLNO		Logical Node device		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Direct-with-normal-security
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL2	Name plate	M	

2.2.11 WW_LPHD CON

LPHD class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LPHD		Physical device information		
Data				
Common Logical Node Information				
PhyNam	WW_DPL1	Physical device name plate	M	
PhyHealth	WW_INS3	Physical Device Health	M	
Proxy	WW_SPS1	Indicates if this LN is a proxy	M	

2.2.12 WW_LPHD MEA

LPHD class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LPHD		Physical device information		

Data				
Common Logical Node Information				
PhyNam	WW_DPL1	Physical device name plate	M	
PhyHealth	WW_INS3	Physical Device Health	M	
Proxy	WW_SPS1	Indicates if this LN is a proxy	M	

2.2.13 WW_LPHDPRO

LPHD class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LPHD		Physical device information		
Data				
Common Logical Node Information				
PhyNam	WW_DPL1	Physical device name plate	M	
PhyHealth	WW_INS3	Physical Device Health	M	
Proxy	WW_SPS1	Indicates if this LN is a proxy	M	

2.2.14 WW_LPHDREC

LPHD class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LPHD		Physical device information		
Data				
Common Logical Node Information				
PhyNam	WW_DPL1	Physical device name plate	M	
PhyHealth	WW_INS3	Physical Device Health	M	
Proxy	WW_SPS1	Indicates if this LN is a proxy	M	

2.2.15 WW_LPHDSYS

LPHD class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LPHD		Physical device information		
Data				
Common Logical Node Information				
PhyNam	WW_DPL1	Physical device name plate	M	
PhyHealth	WW_INS3	Physical Device Health	M	
Proxy	WW_SPS1	Indicates if this LN is a proxy	M	

2.2.16 WW_MMXU1

MMXU class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
MMXU		Measurement		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Measured values				
A	WW_WYE1	Phase currents (IL1, IL2, IL3)	O	

2.2.17 WW_PTOC1

PTOC class				
Attribute	Attribute	Explanation	M/O/E	Remarks

Name	Type			
PTOC		Time overcurrent		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				
Str	WW_ACD1	Start	M	
Op	WW_ACT1	Operate	M	

2.2.18 WW_PTOC3

PTOC class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTOC		Time overcurrent		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				
Str	WW_ACD1	Start	M	
Op	WW_ACT1	Operate	M	

2.2.19 WW_PTOC4

PTOC class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTOC		Time overcurrent		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				
Str	WW_ACD1	Start	M	
Op	WW_ACT1	Operate	M	

2.2.20 WW_PTTR3

PTTR class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTTR		Thermal overload		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				
Op	WW_ACT1	Operate	M	

2.2.21 WW_RBRF1

RBRF class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
RBRF		Breaker failure		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				
Str	WW_ACD1	Start	M	
OpEx	WW_ACT1	Breaker failure trip	M	

2.2.22 WW_RDRE1

RDRE class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
RDRE		Disturbance recorder function		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				

RcdMade	WW_SPS1	Recording made	M	
FltNum	WW_INS2	Fault Number	M	
GriFltNum	WW_INS2	Grid Fault Number	O	
RcdStr	WW_SPS1	Recording startet	O	

2.2.23 WW_RREC1

RREC class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
RREC		Autoreclosing		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				
Op	WW_ACT1	Operate (used here to provide close to XCBR)	M	
AutoRecSt	WW_INS4	Auto Reclosing Status	M	

2.2.24 WW_XCBR2

XCBR class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
XCBR		Circuit Breaker		
Data				
Common Logical Node Information				

Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Loc	WW_SPS1	Local operation	M	
OpCnt	WW_INS2	Operation counter	M	
Controls				
Pos	WW_DPC1	Switch position	M	
BlkOpn	WW_SPC1	Block opening	M	
BlkCls	WW_SPC1	Block closing	M	
Status Information				
CBOpCap	WW_INS5	Circuit breaker operating capability	M	

2.2.25 WW_XSWI1

XSWI class				
Attribute	Attribute	Explanation	M/O/E	Remarks
Name	Type			
XSWI		Circuit switch		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Loc	WW_SPS1	Local operation	M	
OpCnt	WW_INS2	Operation counter	M	
Controls				
Pos	WW_DPC1	Switch position	M	

Logical Nodes

BlkOpn	WW_SPC1	Block opening	M	
BlkCls	WW_SPC1	Block closing	M	
Status Information				
SwTyp	WW_INS5	Switch type	M	
SwOpCap	WW_INS5	Switch operating capability	M	

3. Logical Node Extensions

3.1. New Logical Nodes

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

3.1.1 WW_PSOF1 Switch Onto Fault Protection

PSOF class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PSOF		Protection Switch Onto fault		
Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Status Information				
Str	WW_ACD1	Start	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), these data contains the “dataNs” attribute.

3.2.1 WW_MSTA1 Metering Statistics

MSTA class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
MSTA		Metering Statistics		

Data				
Common Logical Node Information				
Mod	WW_INC1	Mode	M	Status-only
Beh	WW_INS1	Behaviour	M	
Health	WW_INS3	Health	M	
NamPlt	WW_LPL1	Name plate	M	
Metered Values				
AvAPhsA	WW_MV1	Average current IL1	E	
AvAPhsB	WW_MV1	Average current IL2	E	
AvAPhsC	WW_MV1	Average current IL3	E	
MaxAPhsA	WW_MV1	Maximum current IL1	E	
MaxAPhsB	WW_MV1	Maximum current IL2	E	
MaxAPhsC	WW_MV1	Maximum current IL3	E	
MinAPhsA	WW_MV1	Minimum current IL1	E	
MinAPhsB	WW_MV1	Minimum current IL2	E	
MinAPhsC	WW_MV1	Minimum current IL3	E	

4. Common Data Class

4.1. Common Data Class definitions

The following table contains the list of Common Data Class implemented in the device:

CDC Type	CDC Class	Description
WW_ACD1	ACD	Directional Protection activation information
WW_ACT1	ACT	Protection Activation Information
WW_analogValue1	analogValue	Analogue value
WW_Cancel1	Cancel	Cancel operating
WW_CMV1	CMV	Complex measured value
WW_DPC1	DPC	Controllable Double Point
WW_DPC2	DPC	Controllable Double Point
WW_DPL1	DPL	Device name plate
WW_INC1	INC	Controllable Integer Status
WW_INS1	INS	Integer Status
WW_INS2	INS	Integer Status
WW_INS3	INS	Integer Status
WW_INS4	INS	Integer Status
WW_INS5	INS	Integer Status
WW_LPL1	LPL	Logical node name plate
WW_LPL2	LPL	Logical node name plate
WW_LPL3	LPL	Logical node name plate
WW_MV1	MV	Measured Value

CDC Type	CDC Class	Description
WW_Oper1	Oper	Start/Select operating
WW_origin1	origin	Originator
WW_SPC1	SPC	Controllable Single Point
WW_SPS1	SPS	Single Point Status
WW_units1	units	Unit definition
WW_vector1	vector	Vector definition
WW_WYE1	WYE	Phase to ground related measured values of a three phase system

4.1.1 WW_ACD1

ACD class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
general	BOOLEAN	ST	dchg		M	
dirGeneral	Enum	ST	dchg	ACDdir	M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	

4.1.2 WW_ACT1

ACT class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
general	BOOLEAN	ST	dchg		M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	

4.1.3 WW_CMV1

CMV class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
instCVal	Struct	MX		WW_vector1	O	
cVal	Struct	MX		WW_vector1	M	
q	Quality	MX	qchg		M	
t	Timestamp	MX			M	
units	Struct	CF		WW_units1	O	
db	INT32U	CF			O	

4.1.4 WW_DPC1

DPC class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	Dbpos	ST	dchg	Dbpos	M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	
ctlModel	Enum	CF		ctlmodel	M	

4.1.5 WW_DPC2

DPC class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
SBOw	Struct	CO		WW_Oper1	M	
Oper	Struct	CO		WW_Oper1	M	
Cancel	Struct	CO		WW_Cancel1	M	
origin	Struct	ST		WW_origin1	O	

ctlNum	INT8U	ST			O	
stVal	Dbpos	ST	dchg	Dbpos	M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	
stSeld	BOOLEAN	ST	dchg		O	
ctlModel	Enum	CF		ctlmodel	M	
sboTimeout	INT32U	CF			O	
sboClass	Enum	CF		sboClass	O	

4.1.6 WW_DPL1

DPL class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
vendor	VisString255	DC			M	

4.1.7 WW_INC1

INC class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	Enum	ST	dchg	Mode	M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	
ctlModel	Enum	CF		ctlModel	M	

4.1.8 WW_INS1

INS class

Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	Enum	ST	dchg	Behaviour	M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	

4.1.9 WW_INS2

INS class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	INT32	ST	dchg		M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	

4.1.10 WW_INS3

INS class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	Enum	ST	dchg	Health	M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	

4.1.11 WW_INS4

INS class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	Enum	ST	dchg	AutoRecSt	M	
q	Quality	ST	qchg		M	

t	Timestamp	ST			M	
---	-----------	----	--	--	---	--

4.1.12 WW_INS5

INS class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	Enum	ST	dchg	CBOpCap	M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	

4.1.13 WW_LPL1

LPL class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
vendor	VisString255	DC			M	
swRev	VisString255	DC			M	
d	VisString255	DC			M	

4.1.14 WW_LPL2

LPL class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
vendor	VisString255	DC			M	
swRev	VisString255	DC			M	
d	VisString255	DC			M	
ldNs	VisString255	EX				

4.1.15 WW_LPL3

LPL class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
vendor	VisString255	DC			M	
swRev	VisString255	DC			M	
d	VisString255	DC			M	
ldNs	VisString255	EX				

4.1.16 WW_MV1

MV class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
mag	Struct	MX		WW_analogValue1	M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	
units	Struct	CF		WW_units1	O	
db	INT32U	CF			O	
d	VisString255	DC			O	
dataNs	VisString255	DC			O	

4.1.17 WW_SPC1

SPC class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	BOOLEAN	ST	dchg		M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	

ctlModel	Enum	CF		ctlModel	M	
----------	------	----	--	----------	---	--

4.1.18 WW_SPS1

SPS class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
stVal	BOOLEAN	ST	dchg		M	
q	Quality	ST	qchg		M	
t	Timestamp	ST			M	

4.1.19 WW_WYE1

WYE class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
phsA	WW_CMV1					
phsB	WW_CMV1					
phsC	WW_CMV1					
neut	WW_CMV1					

4.2. Common Data Attributes type definitions

4.2.1 WW_analogValue1

analogvalue class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
f	FLOAT32	MX			M	

4.2.2 WW_Cancel1

Cancel class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
ctlval	BOOLEAN	CO			M	
origin	Struct	ST		WW_origin1	O	
ctlNum	INT8U	ST			O	
T	Timestamp	CO			O	
Test	BOOLEAN	CO			O	

4.2.3 WW_Oper1

Oper class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
ctlval	BOOLEAN	CO			M	
origin	Struct	ST		WW_origin1	O	
ctlNum	INT8U	ST			O	
T	Timestamp	CO			O	
Test	BOOLEAN	CO			O	
Check	Check	CO			O	

4.2.4 WW_origin1

origin class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
orCat	Enum	ST		orCategory	M	
orIdent	Octet64	ST			M	

4.2.5 WW_units1

unit class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/ E	Remarks
SIUnit	Enum			SIUnit	M	
multiplier	Enum			multiplier	O	

4.2.6 WW_vector1

vector class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/ E	Remarks
mag	Struct			WW_analogValue1	M	
ang	Struct			WW_analogValue1	O	

5. Enumerated type definitions

5.1. Enum types

5.1.1 AutoRecSt

Ordinal	Semantic
1	Ready
2	InProgress
3	Successful

5.1.2 Beh

Ordinal	Semantic
1	on
2	blocked
3	test
4	test/blocked
5	off

5.1.3 CBOpCap

Ordinal	Semantic
1	None
2	Open
3	Close-Open
4	Open-Close-Open
5	Close-Open-Close-Open

5.1.4 ctlModel

Ordinal	Semantic
1	status-only

2	direct-with-normal-security
3	sbo-with-normal-security
4	direct-with-enhanced-security
5	sbo-with-enhanced-security

5.1.5 Dbpos

Ordinal	Semantic
1	intermediate
2	off
3	on
4	bad

5.1.6 dir

Ordinal	Semantic
1	unknown
2	forward
3	backward
4	both

5.1.7 Health

Ordinal	Semantic
1	Ok
2	Warning
3	Alarm

5.1.8 Mod

Ordinal	Semantic
1	on
2	blocked

3	test
4	test/block
5	off

5.1.9 multiplier

Ordinal	Semantic
-24	y
-21	z
-18	a
-15	f
-12	p
-9	n
-6	μ
-3	m
-2	c
-1	d
0	
1	da
2	h
3	k
6	M
9	G
12	T
15	P
18	E
21	Z
24	Y

5.1.10 orCategory

Ordinal	Semantic
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

5.1.11 sboClass

Ordinal	Semantic
0	operate-once
1	operate-many

5.1.12 SIUnit

Ordinal	Semantic
1	
2	m
3	kg
4	s
5	A
6	K
7	mol
8	cd
9	deg
10	rad

Enumerated type definitions

11	sr
21	Gy
22	q
23	°C
24	Sv
25	F
26	C
27	S
28	H
29	V
30	ohm
31	J
32	N
33	Hz
34	lx
35	Lm
36	Wb
37	T
38	W
39	Pa
41	m ²
42	m ³
43	m/s
44	m/s ²
45	m ³ /s
46	m/m ³
47	M
48	kg/m ³
49	m ² /s

Enumerated type definitions

50	W/m K
51	J/K
52	ppm
53	1/s
54	rad/s
61	VA
62	Watts
63	VA _r
64	phi
65	cos(phi)
66	V _s
67	V ²
68	A _s
69	A ²
70	A ² _t
71	VA _h
72	Wh
73	VA _{rh}
74	V/Hz

6. Appendix – Register Maps

LDevice::CTRL

Logical Node	Data Object	Module.Name
CILO1* (WW_CILO1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	EnaOpn	SG[1].Interl OFF
	EnaCls	SG[1].Interl ON
CSWI1* (WW_CSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	Pos	SG[1].Pos
LLN0 (WW_LLNOCON)		
	Mod	
	Beh	
	Health	
	NamPlt	
LPHD1 (WW_LPHDCON)		

Appendix – Register Maps

	PhyNam	
	PhyHealth	
	Proxy	
XCBR1* (WW_XCBR2)		
	Mod	
	Beh	
	Health	
	NamPIt	
	Loc	
	OpCnt	
	Pos	SG[1].Pos
	BlkOpn	
	BlkClS	
	CBOpCap	
XSWI1* (WW_XSWI1)		
	Mod	
	Beh	
	Health	
	NamPIt	
	Loc	
	OpCnt	
	Pos	SG[1].Pos
	BlkOpn	
	BlkClS	

Appendix – Register Maps

	SwTyp	
	SwOpCap	

LDevice::DR

Logical Node	Data Object	Module.Name
LLN0 (WW_LLNOREC)		
	Mod	
	Beh	
	Health	
	NamPIt	
LPHD1 (WW_LPHDREC)		
	PhyNam	
	PhyHealth	
	Proxy	
RDRE1 (WW_RDRE1)		
	Mod	
	Beh	
	Health	
	NamPIt	
	RcdMade	Disturb rec.recording
	FltNum	
	GriFltNum	
	RcdStr	Disturb rec.recording

LDevice::EXT

Logical Node	Data Object	Module.Name
InGGIO1 (WW_GGIO1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Ind1	
	Ind2	
	Ind3	
	Ind4	
	Ind5	
	Ind6	
	Ind7	
	Ind8	
	Ind9	
	Ind10	
	Ind11	
	Ind12	
	Ind13	
	Ind14	
	Ind15	
	Ind16	
LLN0 (WW_LLNO0SYS)		
	Mod	

	Beh	
	Health	
	NamPlt	
LPHD1 (WW_LPHDSYS)		
	PhyNam	
	PhyHealth	
	Proxy	
OutGGIO1 (WW_GGIO2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Ind1	IEC61850.VirtOut1-I
	Ind2	IEC61850.VirtOut2-I
	Ind3	IEC61850.VirtOut3-I
	Ind4	IEC61850.VirtOut4-I
	Ind5	IEC61850.VirtOut5-I
	Ind6	IEC61850.VirtOut6-I
	Ind7	IEC61850.VirtOut7-I
	Ind8	IEC61850.VirtOut8-I
	Ind9	IEC61850.VirtOut9-I
	Ind10	IEC61850.VirtOut10-I
	Ind11	IEC61850.VirtOut11-I
	Ind12	IEC61850.VirtOut12-I

Appendix – Register Maps

	Ind13	IEC61850.VirtOut13-I
	Ind14	IEC61850.VirtOut14-I
	Ind15	IEC61850.VirtOut15-I
	Ind16	IEC61850.VirtOut16-I

LDevice::MEAS

Logical Node	Data Object	Module.Name
LLN0 (WW_LLNOMEA)		
	Mod	
	Beh	
	Health	
	NamPlt	
LPHD1 (WW_LPHDMEA)		
	PhyNam	
	PhyHealth	
	Proxy	
MMXU1 (WW_MMXU1)		
	Mod	
	Beh	
	Health	
	NamPlt	

	A	Current.IL1 RMS Current.phi IL1 Current.IL2 RMS Current.phi IL2 Current.IL3 RMS Current.phi IL3 Current.IG meas RMS Current.phi IG meas Current.IG calc RMS Current.phi IG calc
MSTA1 (WW_MSTA1)		
	Mod	
	Beh	
	Health	
	NamPIt	
	AvAPhsA	Current.IL1 avg
	AvAPhsB	Current.IL2 avg
	AvAPhsC	Current.IL3 avg
	MaxAPhsA	Current.IL1 max
	MaxAPhsB	Current.IL2 max
	MaxAPhsC	Current.IL3 max
	MinAPhsA	Current.IL1 min
	MinAPhsB	Current.IL2 min
	MinAPhsC	Current.IL3 min

LDevice::PROT

Logical Node	Data Object	Module.Name
IHMI1 (WW_IHMI1)		
	Mod	
	Beh	
	Health	
	NamPit	
LLN0 (WW_LLN0PRO)		
	Mod	
	Beh	
	Health	
	NamPit	
LPHD1 (WW_LPHDPRO)		
	PhyNam	
	PhyHealth	
	Proxy	
PSOF1 (WW_PSOF1)		
	Mod	SOTF.active SOTF.ExBlo SOTF.Ex rev Interl
	Beh	
	Health	
	NamPit	
	Str	SOTF.enabled
PTOC1 (WW_PTOC1)		

	Mod	I[1].active I[1].Blo TripCmd I[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	I[1].Alarm
	Op	I[1].Trip
PTOC10 (WW_PTOC3)		
	Mod	IG[4].active IG[4].Blo TripCmd IG[4].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	IG[4].Alarm
	Op	IG[4].Trip
PTOC11 (WW_PTOC4)		
	Mod	I2>[1].active I2>[1].Blo TripCmd I2>[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	I2>[1].Alarm

	Op	I2>[1].Trip
PTOC12 (WW_PTOC4)		
	Mod	I2>[2].active I2>[2].Blo TripCmd I2>[2].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	I2>[2].Alarm
	Op	I2>[2].Trip
PTOC2 (WW_PTOC1)		
	Mod	I[2].active I[2].Blo TripCmd I[2].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	I[2].Alarm
	Op	I[2].Trip
PTOC3 (WW_PTOC1)		
	Mod	I[3].active I[3].Blo TripCmd I[3].ExBlo TripCmd
	Beh	
	Health	

	NamPit	
	Str	I[3].Alarm
	Op	I[3].Trip
PTOC4 (WW_PTOC1)		
	Mod	I[4].active I[4].Blo TripCmd I[4].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	I[4].Alarm
	Op	I[4].Trip
PTOC5 (WW_PTOC1)		
	Mod	I[5].active I[5].Blo TripCmd I[5].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	I[5].Alarm
	Op	I[5].Trip
PTOC6 (WW_PTOC1)		
	Mod	I[6].active I[6].Blo TripCmd I[6].ExBlo TripCmd

	Beh	
	Health	
	NamPlt	
	Str	I[6].Alarm
	Op	I[6].Trip
PTOC7 (WW_PTOC3)		
	Mod	IG[1].active IG[1].Blo TripCmd IG[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	IG[1].Alarm
	Op	IG[1].Trip
PTOC8 (WW_PTOC3)		
	Mod	IG[2].active IG[2].Blo TripCmd IG[2].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	IG[2].Alarm
	Op	IG[2].Trip
PTOC9 (WW_PTOC3)		

	Mod	IG[3].active IG[3].Blo TripCmd IG[3].ExBlo TripCmd
	Beh	
	Health	
	NamPIt	
	Str	IG[3].Alarm
	Op	IG[3].Trip
PTTR1 (WW_PTTR3)		
	Mod	ThR.active ThR.Blo TripCmd ThR.ExBlo TripCmd
	Beh	
	Health	
	NamPIt	
	Op	ThR.Trip
RBRF1 (WW_RBRF1)		
	Mod	CBF.active CBF.ExBlo CBF.ExBlo
	Beh	
	Health	
	NamPIt	
	Str	CBF.running
	OpEx	CBF.Alarm

RREC1 (WW_RREC1)		
	Mod	AR.active AR.ExBlo AR.ExBlo
	Beh	
	Health	
	NamPlt	
	Op	AR.CB ON Cmd
	AutoRecSt	AR.ARRecCState

* Logical Node is dependent from settings in the “Device Planing”. (See 6.1 Device Planing Dependencies)

6.1. Device Planing Dependencies

Depending on the settings in the Device Planing section Logical Node instances will be available in the generated ICD file. The following list will give you an overview about the different selections for each Module which have an effect on the existence of a Logical Node.

Module.Name	Value
CILO1	
SG[1].SwitchgearType	Controlled SG
	Controlled Make Break SG
CSWI1	
	Controlled SG
	Controlled Make Break SG
XCBR1	
	Monitored Make Break SG
	Controlled Make Break SG
XSWI1	

Module.Name	Value
	Monitored SG
	Controlled SG