



High**PROTEC**

IEC 61850 | MICS

MRU4

Software-Version: 2.2.e

IEC 61850 MICS

Model Implementation Conformance Statement (MICS)

UCA International Users Group Testing Sub Committee

English

INDEX

1.	Introduction.....	5
2.	Logical Nodes.....	6
2.1.	Logical Nodes List.....	6
2.2.	Logical Node definitions.....	7
2.2.1	WW_CILO1.....	9
2.2.2	WW_CSW1.....	9
2.2.3	WW_GGIO1.....	10
2.2.4	WW_GGIO2.....	11
2.2.5	WW_IHMI1.....	12
2.2.6	WW_LLNOCON.....	12
2.2.7	WW_LLNOMEA.....	13
2.2.8	WW_LLNOPRO.....	13
2.2.9	WW_LLNOREC.....	13
2.2.10	WW_LLNOSYS.....	14
2.2.11	WW_LPHDCON.....	14
2.2.12	WW_LPHDMEA.....	15
2.2.13	WW_LPHDPRO.....	15
2.2.14	WW_LPHDREC.....	16
2.2.15	WW_LPHDSYS.....	16
2.2.16	WW_MMXU2.....	16
2.2.17	WW_PFRC1.....	17
2.2.18	WW_PPAM1.....	17
2.2.19	WW_PTOF1.....	18
2.2.20	WW_PTOV1.....	19
2.2.21	WW_PTOV2.....	19
2.2.22	WW_PTOV3.....	20
2.2.23	WW_PTUF1.....	20
2.2.24	WW_PTUV1.....	21
2.2.25	WW_PTUV2.....	21
2.2.26	WW_RBRF1.....	22
2.2.27	WW_RDRE1.....	22
2.2.28	WW_RSYN1.....	23
2.2.29	WW_XCBR2.....	23
2.2.30	WW_XSWI1.....	24
3.	Logical Node Extensions.....	26
3.1.	New Logical Nodes	26
3.2.	Extended Logical Nodes.....	26
3.2.1	WW_MSTA2 Metering Statistics	26
4.	Common Data Class.....	28

4.1.	Common Data Class definitions.....	28
4.1.1	WW_ACD1.....	29
4.1.2	WW_ACT1.....	29
4.1.3	WW_CMV1.....	30
4.1.4	WW_DEL1.....	30
4.1.5	WW_DPC1.....	30
4.1.6	WW_DPC2.....	31
4.1.7	WW_DPL1.....	31
4.1.8	WW_INC1.....	31
4.1.9	WW_INS1.....	32
4.1.10	WW_INS2.....	32
4.1.11	WW_INS3.....	32
4.1.12	WW_INS5.....	33
4.1.13	WW_LPL1.....	33
4.1.14	WW_LPL2.....	33
4.1.15	WW_MV1.....	34
4.1.16	WW_SPC1.....	34
4.1.17	WW_SPS1.....	34
4.1.18	WW_WYE1.....	35
4.2.	Common Data Attributes type definitions.....	35
4.2.1	WW_analogValue1.....	35
4.2.2	WW_Cancel1.....	35
4.2.3	WW_Oper1.....	36
4.2.4	WW_origin1.....	36
4.2.5	WW_units1.....	36
4.2.6	WW_vector1.....	36
5.	Enumerated type definitions.....	38
5.1.	Enum types.....	38
5.1.1	Beh.....	38
5.1.2	CBOpCap.....	38
5.1.3	ctlModel.....	38
5.1.4	Dbpos.....	38
5.1.5	dir.....	39
5.1.6	Health.....	39
5.1.7	Mod.....	39
5.1.8	multiplier.....	39
5.1.9	orCategory.....	40
5.1.10	sboClass.....	41
5.1.11	SIUnit.....	41
6.	Appendix – Register Maps.....	44

6.1.	Device Planing Dependencies.....	72
------	----------------------------------	----

1. Introduction

This model implementation conformance statement is applicable to the device MRU4, Version 2.2.e (Firmware-Build 21029).

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
PFRC (Rate of change of frequency)
PPAM (Phase angle or out-of-step protection)
PTOF (Overfrequency)
PTOV (Overvoltage)
PTUF (Underfrequency)
PTUV (Undervoltage)
R : Logical Nodes for protection related functions
RBRF (Breaker failure)
RDRE (Disturbance recorder function)
RSYN (Synchronism-check or synchronising)
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	LLN0	Logical Node device
WW_LLNOMEA	LLN0	Logical Node device
WW_LLNOPRO	LLN0	Logical Node device
WW_LLNOREC	LLN0	Logical Node device
WW_LLNOSYS	LLN0	Logical Node device

LN Type	LN Class	Description
WW_LPHDCON	LPHD	Physical device
WW_LPHDMEA	LPHD	Physical device
WW_LPHDPRO	LPHD	Physical device
WW_LPHDREC	LPHD	Physical device
WW_LPHDSYS	LPHD	Physical device
WW_MMXU2	MMXU	Measurement
WW_MSTA2	MSTA	Metering Statistics
WW_PFRC1	PFRC	Rate of change of frequency
WW_PPAM1	PPAM	Phase angle or out-of-step protection
WW_PTOF1	PTOF	Overfrequency
WW_PTOV1	PTOV	Overvoltage
WW_PTOV2	PTOV	Overvoltage
WW_PTOV3	PTOV	Overvoltage
WW_PTUF1	PTUF	Underfrequency
WW_PTUV1	PTUV	Undervoltage
WW_PTUV2	PTUV	Undervoltage
WW_RBRF1	RBRF	Breaker failure
WW_RDRE1	RDRE	Disturbance recorder function
WW_RSYN1	RSYN	Synchronism-check or synchronising
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

LLN0		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_LLN0SYS

LLN0 class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
LLN0		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_LPHDCON

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_LPHDMEA

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_MMXU2

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				
PPV	WW_DEL1	Phase to phase voltages (UL12, UL23, UL31)	O	
PhV	WW_WYE1	Phase to ground voltages (UL1, UL2, UL3)	O	

2.2.17 WW_PFRC1

PFRC class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PFRC		Rate of change of frequency		
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_PPAM1

PPAM class

Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PPAM1		Phase angle measuring		
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_PTOF1

PTOF class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTOF		Overfrequency		
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_PTOV1

PTOV class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTOV		Overvoltage		
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	

2.2.21 WW_PTOV2

PTOV class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTOV		Overvoltage		
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	
----	---------	---------	---	--

2.2.22 WW_PTOV3

PTOV class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTOV		Overvoltage		
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	

2.2.23 WW_PTUF1

PTUF class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTUF		Underfrequency		
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	

2.2.24 WW_PTUV1

PTUV class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTUV		Undervoltage		
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	

2.2.25 WW_PTUV2

PTUV class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PTUV		Undervoltage		
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	

2.2.26 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	

2.2.27 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	

2.2.28 WW_RSYN1

RSYN class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
RSYN		Synchronism-check or synchronising		
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				
Rel	WW_SPS1	Release	M	

2.2.29 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	

2.2.30 WW_XSWI1

XSWI class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
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	
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.

3.2. 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_MSTA2 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				
MaxVPhsAB	WW_MV1	Maximum voltage UL12	E	
MaxVPhsBC	WW_MV1	Maximum voltage UL23	E	
MaxVPhsCA	WW_MV1	Maximum voltage UL31	E	
MinVPhsAB	WW_MV1	Minimum voltage UL12	E	
MinVPhsBC	WW_MV1	Minimum voltage UL23	E	
MinVPhsCA	WW_MV1	Minimum voltage UL31	E	
MaxVPhsA	WW_MV1	Maximum voltage UL1	E	

Logical Node Extensions

MaxVPhsB	WW_MV1	Maximum voltage UL2	E	
MaxVPhsC	WW_MV1	Minimum voltage UL3	E	
MinVPhsA	WW_MV1	Minimum voltage UL1	E	
MinVPhsB	WW_MV1	Minimum voltage UL2	E	
MinVPhsC	WW_MV1	Minimum voltage UL3	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_DEL1	DEL	Delta
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_INS5	INS	Integer Status
WW_LPL1	LPL	Logical node name plate
WW_LPL2	LPL	Logical node name plate
WW_MV1	MV	Measured Value
WW_Oper1	Oper	Start/Select operating

CDC Type	CDC Class	Description
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_DEL1

DEL class						
Attribute Name	Attribute Type	FC	TrgOp	Value/Value range	M/O/E	Remarks
phsAB	WW_CMV1					
phsBC	WW_CMV1					
phsCA	WW_CMV1					

4.1.5 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	

4.1.6 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	

4.1.7 WW_DPL1

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

4.1.8 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	

4.1.9 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	

4.1.10 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	

4.1.11 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	
---	-----------	----	--	--	---	--

4.1.12 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_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	

4.1.16 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	

4.1.17 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	

4.1.18 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						
--------------	--	--	--	--	--	--

Common Data 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 Beh

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

5.1.2 CBOpCap

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

5.1.3 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

5.1.4 Dbpos

Ordinal	Semantic
---------	----------

Enumerated type definitions

1	intermediate
2	off
3	on
4	bad

5.1.5 dir

Ordinal	Semantic
1	unknown
2	forward
3	backward
4	both

5.1.6 Health

Ordinal	Semantic
1	Ok
2	Warning
3	Alarm

5.1.7 Mod

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

5.1.8 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

5.1.9 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

5.1.10 sboClass

Ordinal	Semantic
0	operate-once
1	operate-many

5.1.11 SIUnit

Ordinal	Semantic
1	
2	m
3	kg
4	s
5	A
6	K
7	mol
8	cd
9	deg
10	rad
11	sr
21	Gy
22	q
23	°C
24	Sv
25	F
26	C
27	S
28	H

Enumerated type definitions

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
50	W/m K
51	J/K
52	ppm
53	1/s
54	rad/s
61	VA
62	Watts
63	VAr
64	phi

Enumerated type definitions

65	$\cos(\phi)$
66	Vs
67	V ²
68	As
69	A ²
70	A ² t
71	VAh
72	Wh
73	VArh
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

Appendix – Register Maps

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_LLN0SYS)		
	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_MMXU2)		
	Mod	
	Beh	
	Health	
	NamPlt	

	PPV	Voltage.VL12 RMS Voltage.phi VL12 Voltage.VL23 RMS Voltage.phi VL23 Voltage.VL31 RMS Voltage.phi VL31
	PhV	Voltage.VL1 RMS Voltage.phi VL1 Voltage.VL2 RMS Voltage.phi VL2 Voltage.VL3 RMS Voltage.phi VL3 Voltage.VX meas RMS Voltage.phi VX meas Voltage.VG calc RMS Voltage.phi VG calc
MSTA1 (WW_MSTA2)		
	Mod	
	Beh	
	Health	
	NamPit	
	MaxVPhsAB	Voltage.VL12 max
	MaxVPhsBC	Voltage.VL23 max
	MaxVPhsCA	Voltage.VL31 max
	MinVPhsAB	Voltage.VL12 min
	MinVPhsBC	Voltage.VL23 min
	MinVPhsCA	Voltage.VL31 min

	MaxVPhsA	Voltage.VL1 max
	MaxVPhsB	Voltage.VL2 max
	MaxVPhsC	Voltage.VL3 max
	MinVPhsA	Voltage.VL1 min
	MinVPhsB	Voltage.VL2 min
	MinVPhsC	Voltage.VL3 min

LDevice::PROT

Logical Node	Data Object	Module.Name
IHMI1 (WW_IHMI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
LLN0 (WW_LLN0PRO)		
	Mod	
	Beh	
	Health	
	NamPlt	
LPHD1 (WW_LPHDPRO)		
	PhyNam	
	PhyHealth	
	Proxy	
PFRC1* (WW_PFRC1)		

	Mod	df/dt.active df/dt.Blo TripCmd df/dt.ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	df/dt.Alarm
	Op	df/dt.Trip
PFRC2* (WW_PFRC1)		
	Mod	delta phi.active delta phi.Blo TripCmd delta phi.ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	delta phi.Alarm
	Op	delta phi.Trip
PFRC3* (WW_PFRC1)		
	Mod	f[1].active f[1].Blo TripCmd f[1].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[1].Alarm

	Op	f[1].Trip
PFRC4* (WW_PFRC1)		
	Mod	f[2].active f[2].Blo TripCmd f[2].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[2].Alarm
	Op	f[2].Trip
PFRC5* (WW_PFRC1)		
	Mod	f[3].active f[3].Blo TripCmd f[3].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[3].Alarm
	Op	f[3].Trip
PFRC6* (WW_PFRC1)		
	Mod	f[4].active f[4].Blo TripCmd f[4].ExBlo TripCmd
	Beh	
	Health	

	NamPlt	
	Str	f[4].Alarm
	Op	f[4].Trip
PFRC7* (WW_PFRC1)		
	Mod	f[5].active f[5].Blo TripCmd f[5].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	f[5].Alarm
	Op	f[5].Trip
PFRC8* (WW_PFRC1)		
	Mod	f[6].active f[6].Blo TripCmd f[6].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	f[6].Alarm
	Op	f[6].Trip
PPAM1* (WW_PPAM1)		
	Mod	df/dt.active df/dt.Blo TripCmd df/dt.ExBlo TripCmd

	Beh	
	Health	
	NamPlt	
	Str	df/dt.Alarm
	Op	df/dt.Trip
PPAM2* (WW_PPAM1)		
	Mod	delta phi.active delta phi.Blo TripCmd delta phi.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	delta phi.Alarm
	Op	delta phi.Trip
PPAM3* (WW_PPAM1)		
	Mod	f[1].active f[1].Blo TripCmd f[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	f[1].Alarm
	Op	f[1].Trip
PPAM4* (WW_PPAM1)		

	Mod	f[2].active f[2].Blo TripCmd f[2].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[2].Alarm
	Op	f[2].Trip
PPAM5* (WW_PPAM1)		
	Mod	f[3].active f[3].Blo TripCmd f[3].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[3].Alarm
	Op	f[3].Trip
PPAM6* (WW_PPAM1)		
	Mod	f[4].active f[4].Blo TripCmd f[4].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[4].Alarm

	Op	f[4].Trip
PPAM7* (WW_PPAM1)		
	Mod	f[5].active f[5].Blo TripCmd f[5].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[5].Alarm
	Op	f[5].Trip
PPAM8* (WW_PPAM1)		
	Mod	f[6].active f[6].Blo TripCmd f[6].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[6].Alarm
	Op	f[6].Trip
PTOF1* (WW_PTOF1)		
	Mod	df/dt.active df/dt.Blo TripCmd df/dt.ExBlo TripCmd
	Beh	
	Health	

	NamPIt	
	Str	df/dt.Alarm
	Op	df/dt.Trip
PTOF2* (WW_PTOF1)		
	Mod	delta phi.active delta phi.Blo TripCmd delta phi.ExBlo TripCmd
	Beh	
	Health	
	NamPIt	
	Str	delta phi.Alarm
	Op	delta phi.Trip
PTOF3* (WW_PTOF1)		
	Mod	f[1].active f[1].Blo TripCmd f[1].ExBlo TripCmd
	Beh	
	Health	
	NamPIt	
	Str	f[1].Alarm
	Op	f[1].Trip
PTOF4* (WW_PTOF1)		
	Mod	f[2].active f[2].Blo TripCmd f[2].ExBlo TripCmd

	Beh	
	Health	
	NamPlt	
	Str	f[2].Alarm
	Op	f[2].Trip
PTOF5* (WW_PTOF1)		
	Mod	f[3].active f[3].Blo TripCmd f[3].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	f[3].Alarm
	Op	f[3].Trip
PTOF6* (WW_PTOF1)		
	Mod	f[4].active f[4].Blo TripCmd f[4].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	f[4].Alarm
	Op	f[4].Trip
PTOF7* (WW_PTOF1)		

	Mod	f[5].active f[5].Blo TripCmd f[5].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[5].Alarm
	Op	f[5].Trip
PTOF8* (WW_PTOF1)		
	Mod	f[6].active f[6].Blo TripCmd f[6].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	f[6].Alarm
	Op	f[6].Trip
PTOV1* (WW_PTOV2)		
	Mod	V[1].active V[1].Blo TripCmd V[1].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	V[1].Alarm

	Op	V[1].Trip
PTOV10 (WW_PTOV3)		
	Mod	V012[4].active V012[4].Blo TripCmd V012[4].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	V012[4].Alarm
	Op	V012[4].Trip
PTOV11 (WW_PTOV3)		
	Mod	V012[5].active V012[5].Blo TripCmd V012[5].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	V012[5].Alarm
	Op	V012[5].Trip
PTOV12 (WW_PTOV3)		
	Mod	V012[6].active V012[6].Blo TripCmd V012[6].ExBlo TripCmd
	Beh	
	Health	

	NamPIt	
	Str	V012[6].Alarm
	Op	V012[6].Trip
PTOV2* (WW_PTOV2)		
	Mod	V[2].active V[2].Blo TripCmd V[2].ExBlo TripCmd
	Beh	
	Health	
	NamPIt	
	Str	V[2].Alarm
	Op	V[2].Trip
PTOV3* (WW_PTOV2)		
	Mod	V[3].active V[3].Blo TripCmd V[3].ExBlo TripCmd
	Beh	
	Health	
	NamPIt	
	Str	V[3].Alarm
	Op	V[3].Trip
PTOV4* (WW_PTOV2)		
	Mod	V[4].active V[4].Blo TripCmd V[4].ExBlo TripCmd

	Beh	
	Health	
	NamPlt	
	Str	V[4].Alarm
	Op	V[4].Trip
PTOV5* (WW_PTOV2)		
	Mod	V[5].active V[5].Blo TripCmd V[5].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	V[5].Alarm
	Op	V[5].Trip
PTOV6* (WW_PTOV2)		
	Mod	V[6].active V[6].Blo TripCmd V[6].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	V[6].Alarm
	Op	V[6].Trip
PTOV7 (WW_PTOV3)		

	Mod	V012[1].active V012[1].Blo TripCmd V012[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	V012[1].Alarm
	Op	V012[1].Trip
PTOV8 (WW_PTOV3)		
	Mod	V012[2].active V012[2].Blo TripCmd V012[2].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	V012[2].Alarm
	Op	V012[2].Trip
PTOV9 (WW_PTOV3)		
	Mod	V012[3].active V012[3].Blo TripCmd V012[3].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	V012[3].Alarm

	Op	V012[3].Trip
PTUF1* (WW_PTUF1)		
	Mod	df/dt.active df/dt.Blo TripCmd df/dt.ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	df/dt.Alarm
	Op	df/dt.Trip
PTUF2* (WW_PTUF1)		
	Mod	delta phi.active delta phi.Blo TripCmd delta phi.ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	delta phi.Alarm
	Op	delta phi.Trip
PTUF3* (WW_PTUF1)		
	Mod	f[1].active f[1].Blo TripCmd f[1].ExBlo TripCmd
	Beh	
	Health	

	NamPIt	
	Str	f[1].Alarm
	Op	f[1].Trip
PTUF4* (WW_PTUF1)		
	Mod	f[2].active f[2].Blo TripCmd f[2].ExBlo TripCmd
	Beh	
	Health	
	NamPIt	
	Str	f[2].Alarm
	Op	f[2].Trip
PTUF5* (WW_PTUF1)		
	Mod	f[3].active f[3].Blo TripCmd f[3].ExBlo TripCmd
	Beh	
	Health	
	NamPIt	
	Str	f[3].Alarm
	Op	f[3].Trip
PTUF6* (WW_PTUF1)		
	Mod	f[4].active f[4].Blo TripCmd f[4].ExBlo TripCmd

	Beh	
	Health	
	NamPlt	
	Str	f[4].Alarm
	Op	f[4].Trip
PTUF7* (WW_PTUF1)		
	Mod	f[5].active f[5].Blo TripCmd f[5].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	f[5].Alarm
	Op	f[5].Trip
PTUF8* (WW_PTUF1)		
	Mod	f[6].active f[6].Blo TripCmd f[6].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	f[6].Alarm
	Op	f[6].Trip
PTUV1* (WW_PTUV2)		

	Mod	V[1].active V[1].Blo TripCmd V[1].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	V[1].Alarm
	Op	V[1].Trip
PTUV2* (WW_PTUV2)		
	Mod	V[2].active V[2].Blo TripCmd V[2].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	V[2].Alarm
	Op	V[2].Trip
PTUV3* (WW_PTUV2)		
	Mod	V[3].active V[3].Blo TripCmd V[3].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	V[3].Alarm

	Op	V[3].Trip
PTUV4* (WW_PTUV2)		
	Mod	V[4].active V[4].Blo TripCmd V[4].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	V[4].Alarm
	Op	V[4].Trip
PTUV5* (WW_PTUV2)		
	Mod	V[5].active V[5].Blo TripCmd V[5].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	V[5].Alarm
	Op	V[5].Trip
PTUV6* (WW_PTUV2)		
	Mod	V[6].active V[6].Blo TripCmd V[6].ExBlo TripCmd
	Beh	
	Health	

Appendix – Register Maps

	NamPlt	
	Str	V[6].Alarm
	Op	V[6].Trip
RBRF1 (WW_RBRF1)		
	Mod	CBF.active CBF.ExBlo CBF.ExBlo
	Beh	
	Health	
	NamPlt	
	Str	CBF.running
	OpEx	CBF.Alarm
RSYN1 (WW_RSYN1)		
	Mod	Sync.active Sync.ExBlo Sync.ExBlo
	Beh	
	Health	
	NamPlt	
	Rel	Sync.Ready to Close
VePTOV1* (WW_PTOV1)		
	Mod	VG[1].active VG[1].Blo TripCmd VG[1].ExBlo TripCmd
	Beh	

	Health	
	NamPlt	
	Str	VG[1].Alarm
	Op	VG[1].Trip
VePTOV2* (WW_PTOV1)		
	Mod	VG[2].active VG[2].Blo TripCmd VG[2].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	VG[2].Alarm
	Op	VG[2].Trip
VePTUV1* (WW_PTUV1)		
	Mod	VG[1].active VG[1].Blo TripCmd VG[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	VG[1].Alarm
	Op	VG[1].Trip
VePTUV2* (WW_PTUV1)		

	Mod	VG[2].active VG[2].Blo TripCmd VG[2].ExBlo TripCmd
	Beh	
	Health	
	NamPit	
	Str	VG[2].Alarm
	Op	VG[2].Trip

* 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	
	Monitored SG

Module.Name	Value
	Controlled SG
PFRC1	
df/dt.Mode	f< and df/dt
	f> and df/dt
	f< and DF/DT
	f> and DF/DT
	df/dt
	use
PFRC2	
delta phi.Mode	f< and df/dt
	f> and df/dt
	f< and DF/DT
	f> and DF/DT
	df/dt
	use
PFRC3	
f[1].Mode	f< and df/dt
	f> and df/dt
	f< and DF/DT
	f> and DF/DT
	df/dt
	use
PFRC4	

Module.Name	Value
f[2].Mode	f< and df/dt
	f> and df/dt
	f< and DF/DT
	f> and DF/DT
	df/dt
	use
PFRC5	
f[3].Mode	f< and df/dt
	f> and df/dt
	f< and DF/DT
	f> and DF/DT
	df/dt
	use
PFRC6	
f[4].Mode	f< and df/dt
	f> and df/dt
	f< and DF/DT
	f> and DF/DT
	df/dt
	use
PFRC7	
f[5].Mode	f< and df/dt
	f> and df/dt

Module.Name	Value
	f< and DF/DT
	f> and DF/DT
	df/dt
	use
PFRC8	
f[6].Mode	f< and df/dt
	f> and df/dt
	f< and DF/DT
	f> and DF/DT
	df/dt
	use
PPAM1	
df/dt.Mode	delta phi
	use
PPAM2	
delta phi.Mode	delta phi
	use
PPAM3	
f[1].Mode	delta phi
	use
PPAM4	
f[2].Mode	delta phi
	use

Module.Name	Value
PPAM5	
f[3].Mode	delta phi
	use
PPAM6	
f[4].Mode	delta phi
	use
PPAM7	
f[5].Mode	delta phi
	use
PPAM8	
f[6].Mode	delta phi
	use
PTOF1	
df/dt.Mode	f>
PTOF2	
delta phi.Mode	f>
PTOF3	
f[1].Mode	f>
PTOF4	
f[2].Mode	f>
PTOF5	
f[3].Mode	f>
PTOF6	

Module.Name	Value
f[4].Mode	f>
PTOF7	
f[5].Mode	f>
PTOF8	
f[6].Mode	f>
PTOV1	
V[1].Mode	V>
PTOV2	
V[2].Mode	V>
PTOV3	
V[3].Mode	V>
PTOV4	
V[4].Mode	V>
PTOV5	
V[5].Mode	V>
PTOV6	
V[6].Mode	V>
PTUF1	
df/dt.Mode	f<
PTUF2	
delta phi.Mode	f<
PTUF3	
f[1].Mode	f<

Module.Name	Value
PTUF4	
f[2].Mode	f<
PTUF5	
f[3].Mode	f<
PTUF6	
f[4].Mode	f<
PTUF7	
f[5].Mode	f<
PTUF8	
f[6].Mode	f<
PTUV1	
V[1].Mode	V<
	use
	V(t)<
PTUV2	
V[2].Mode	V<
	use
	V(t)<
PTUV3	
V[3].Mode	V<
	use
	V(t)<
PTUV4	

Module.Name	Value
V[4].Mode	V<
	use
	V(t)<
PTUV5	
V[5].Mode	V<
	use
	V(t)<
PTUV6	
V[6].Mode	V<
	use
	V(t)<
VePTOV1	
VG[1].Mode	V>
VePTOV2	
VG[2].Mode	V>
VePTUV1	
VG[1].Mode	V<
	use
VePTUV2	
VG[2].Mode	V<
	use