WOODWARD

HighPROTEC

IEC 61850 | MICS

MCDTV4

Software-Version: 2.3.b

IEC 61850 MICS

Model Implementation Conformance Statement (MICS)

UCA International Users Group Testing Sub Committee

English

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1. Introduction

This model implementation conformance statement is applicable to the device MCDTV4, Version 2.3.b (Firmware-Build 21064).

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
PDIF (Differential)
PDOP (Directional overpower)
PDUP (Directional underpower)
PFRC (Rate of change of frequency)
PHAR (Harmonic restraint)
PPAM (Phase angle or out-of-step protection)
PSOF (Switch Onto Fault)
PTOC (Time overcurrent)
PTOF (Overfrequency)
PTOV (Overvoltage)
PTTR (Thermal overload protection)
PTUF (Underfrequency)
PTUV (Undervoltage)
PUPF (Underpower factor)
PVPH (Volts per Hz)
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

Logical Nodes

LN Type	LN Class	Description
WW_CSWI1	CSWI	Switch controller
WW_GGIO3	GGIO	Generic process I/O
WW_GGIO4	GGIO	Generic process I/O
WW_IHMI1	IHMI	Human machine interface
WW_LLN0CON	LLN0	Logical Node device
WW_LLN0MEA	LLN0	Logical Node device
WW_LLN0PRO	LLN0	Logical Node device
WW_LLN0REC	LLN0	Logical Node device
WW_LLN0SYS	LLN0	Logical Node device
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_MMXU1	MMXU	Measurement
WW_MMXU2	MMXU	Measurement
WW_MMXU3	MMXU	Measurement
WW_MSTA1	MSTA	Metering Statistics
WW_MSTA2	MSTA	Metering Statistics
WW_MSTA3	MSTA	Metering Statistics
WW_PDIF1	PDIF	Differential
WW_PDIF2	PDIF	Differential

Logical Nodes

LN Type	LN Class	Description
WW_PDIF3	PDIF	Differential
WW_PDIF4	PDIF	Differential
WW_PDOP1	PDOP	Directional overpower
WW_PDUP1	PDUP	Directional underpower
WW_PFRC1	PFRC	Rate of change of frequency
WW_PHAR1	PHAR	Harmonic restraint
WW_PPAM1	PPAM	Phase angle or out-of-step protection
WW_PSOF1	PSOF	Switch Onto Fault
WW_PTOC1	PTOC	Time overcurrent
WW_PTOC3	PTOC	Time overcurrent
WW_PTOC4	PTOC	Time overcurrent
WW_PTOF1	PTOF	Overfrequency
WW_PTOV1	PTOV	Overvoltage
WW_PTOV2	PTOV	Overvoltage
WW_PTOV3	PTOV	Overvoltage
WW_PTTR1	PTTR	Thermal overload protection
WW_PTTR3	PTTR	Thermal overload protection
WW_PTUF1	PTUF	Underfrequency
WW_PTUV1	PTUV	Undervoltage
WW_PTUV2	PTUV	Undervoltage
WW_PUPF1	PUPF	Underpower factor
WW_PVPH1	PVPH	Volts per Hz

LN Type	LN Class	Description
WW_RBRF1	RBRF	Breaker failure
WW_RDRE1	RDRE	Disturbance recorder function
WW_RSYN2	RSYN	Synchroncheck
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_GGIO3

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	
Ind17	WW_SPS1	General indication (binary input)	O	
Ind18	WW_SPS1	General indication (binary input)	O	
Ind19	WW_SPS1	General indication (binary input)	O	
Ind20	WW_SPS1	General indication (binary input)	O	
Ind21	WW_SPS1	General indication (binary input)	O	
Ind22	WW_SPS1	General indication (binary input)	O	
Ind23	WW_SPS1	General indication (binary input)	O	
Ind24	WW_SPS1	General indication (binary input)	O	
Ind25	WW_SPS1	General indication (binary input)	O	
Ind26	WW_SPS1	General indication (binary input)	O	
Ind27	WW_SPS1	General indication (binary input)	O	
Ind28	WW_SPS1	General indication (binary input)	O	
Ind29	WW_SPS1	General indication (binary input)	O	
Ind30	WW_SPS1	General indication (binary input)	O	
Ind31	WW_SPS1	General indication (binary input)	O	
Ind32	WW_SPS1	General indication (binary input)	O	

2.2.4 WW_GGIO4

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	
Ind17	WW_SPS1	General indication (binary input)	O	
Ind18	WW_SPS1	General indication (binary input)	O	

Ind19	WW_SPS1	General indication (binary input)	O	
Ind20	WW_SPS1	General indication (binary input)	O	
Ind21	WW_SPS1	General indication (binary input)	O	
Ind22	WW_SPS1	General indication (binary input)	O	
Ind23	WW_SPS1	General indication (binary input)	O	
Ind24	WW_SPS1	General indication (binary input)	O	
Ind25	WW_SPS1	General indication (binary input)	O	
Ind26	WW_SPS1	General indication (binary input)	O	
Ind27	WW_SPS1	General indication (binary input)	O	
Ind28	WW_SPS1	General indication (binary input)	O	
Ind29	WW_SPS1	General indication (binary input)	O	
Ind30	WW_SPS1	General indication (binary input)	O	
Ind31	WW_SPS1	General indication (binary input)	O	
Ind32	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_LLN0CON

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	

2.2.7 WW_LLN0MEA

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	

2.2.8 WW_LLN0PRO

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	

2.2.9 WW_LLN0REC

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	

2.2.10 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_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_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	

2.2.18 WW_MMXU3

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				
TotW	WW_MV1	Total Active Power (Total P)	O	
TotVAr	WW_MV1	Total Reactive Power (Total Q)	O	
TotVA	WW_MV1	Total Apparent Power (Total S)	O	
TotPF	WW_MV1	Total Power factor (Total PF)	O	

2.2.19 WW_MSTA1

MSTA class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
MSTA	WW_MSTA1	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				
AvAPhA	WW_MV1	Average current IL1	O	
AvAPhB	WW_MV1	Average current IL2	O	
AvAPhC	WW_MV1	Average current IL3	O	
MaxAPhA	WW_MV1	Maximum current IL1	O	
MaxAPhB	WW_MV1	Maximum current IL2	O	
MaxAPhC	WW_MV1	Maximum current IL3	O	
MinAPhA	WW_MV1	Minimum current IL1	O	
MinAPhB	WW_MV1	Minimum current IL2	O	
MinAPhC	WW_MV1	Minimum current IL3	O	

2.2.20 WW_MSTA2

MSTA class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
MSTA	WW_MSTA2	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				
AvVPhAB	WW_MV1	Average voltage UL12	O	
AvVPhBC	WW_MV1	Average voltage UL23	O	
AvVPhCA	WW_MV1	Average voltage UL31	O	
MaxVPhAB	WW_MV1	Maximum voltage UL12	O	
MaxVPhBC	WW_MV1	Maximum voltage UL23	O	
MaxVPhCA	WW_MV1	Maximum voltage UL31	O	
MinVPhAB	WW_MV1	Minimum voltage UL12	O	
MinVPhBC	WW_MV1	Minimum voltage UL23	O	
MinVPhCA	WW_MV1	Minimum voltage UL31	O	
AvVPhA	WW_MV1	Average voltage UL1	O	

AvVPhB	WW_MV1	Average voltage UL2	O	
AvVPhC	WW_MV1	Average voltage UL3	O	
MaxVPhA	WW_MV1	Maximum voltage UL1	O	
MaxVPhB	WW_MV1	Maximum voltage UL2	O	
MaxVPhC	WW_MV1	Maximum voltage UL3	O	
MinVPhA	WW_MV1	Minimum voltage UL1	O	
MinVPhB	WW_MV1	Minimum voltage UL2	O	
MinVPhB	WW_MV1	Minimum voltage UL3	O	

2.2.21 WW_MSTA3

MSTA class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
MSTA	WW_MSTA3	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				
AvVA	WW_MV1	Average apparent power	O	
MaxVA	WW_MV1	Maximum apparent power	O	
MinVA	WW_MV1	Minimum apparent power	O	
Avw	WW_MV1	Average real power	O	
MaxW	WW_MV1	Maximum real power	O	
MinW	WW_MV1	Minimum real power	O	
AvVAr	WW_MV1	Average reactive power	O	
MaxVAr	WW_MV1	Maximum reactive power	O	
MinVAr	WW_MV1	Minimum reactive power	O	

2.2.22 WW_PDIF1

PDIF class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PDIF	WW_PDIF1	Differential		
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_PDIF2

PDIF class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PDIF	WW_PDIF2	Differential		
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_PDIF3

PDIF class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PDIF	WW_PDIF3	Differential		
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_PDIF4

PDIF class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PDIF	WW_PDIF4	Differential		
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_PDOP1

PDOP class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PDOP		Directional overpower		
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	

2.2.27 WW_PDUP1

PDUP class				
Attribute Name	Attribute Type	Explanation	M/O/E	Remarks
PDUP		Directional underpower		
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	

2.2.28 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	

2.2.29 WW_PHAR1

PHAR class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PHAR	WW_PHAR1	Harmonic restraint		
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 (Active)	M	

2.2.30 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	

2.2.31 WW_PTOC1

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	

2.2.32 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	

2.2.33 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	

2.2.34 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	

2.2.35 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	

2.2.36 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	

2.2.37 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	

2.2.38 WW_PTTR1

PTTR class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PTTR	WW_PTTR1	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	

2.2.39 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	

2.2.40 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	

2.2.41 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	

2.2.42 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	

2.2.43 WW_PUPF1

PUPF class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PUPF		Underpower factor		
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	

2.2.44 WW_PVPH1

PVPH class				
Attribute Name	**Attribute Type**	**Explanation**	**M/O/E**	**Remarks**
PVPH	WW_PVPH1	Volts per Hz		
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	

2.2.45 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	

2.2.46 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	

2.2.47 WW_RSYN2

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	
AngInd	WW_SPS1	Phase Angle difference to high	E	
HzInd	WW_SPS1	Frequency difference to high	E	
VInd	WW_SPS1	Voltage difference to high	E	
Measured Values				
DifAngClc	WW_MV1	Phase Angle difference value	E	
DifHzClc	WW_MV1	Frequency difference value	E	

DifVClc	WW_MV1	Voltage difference value	E	

2.2.48 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	

2.2.49 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 lnNs attribute in the Name plate. The value of lnNs 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	

3.2.2 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				
AvVPhsAB	WW_MV1	Average voltage UL12	E	
AvVPhsBC	WW_MV1	Average voltage UL23	E	
AvVPhsCA	WW_MV1	Average voltage UL31	E	
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	
AvVPhsA	WW_MV1	Average voltage UL1	E	
AvVPhsB	WW_MV1	Average voltage UL2	E	
AvVPhsC	WW_MV1	Average voltage UL3	E	
MaxVPhsA	WW_MV1	Maximum voltage UL1	E	
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	

3.2.3 WW_MSTA3 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				
AvVA	WW_MV1	Average apparent power	O	
MaxVA	WW_MV1	Maximum apparent power	O	
MinVA	WW_MV1	Minimum apparent power	O	
AvW	WW_MV1	Average real power	E	
MaxW	WW_MV1	Maximum real power	E	
MinW	WW_MV1	Minimum real power	E	
AvVAr	WW_MV1	Average reactive power	E	
MaxVAr	WW_MV1	Maximum reactive power	E	
MinVAr	WW_MV1	Minimum reactive power	E	

3.2.4 WW_RSYN2 Synchrocheck

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	
AngInd	WW_SPS1	Phase Angle difference to high	E	

HzInd	WW_SPS1	Frequency difference to high	E	
VInd	WW_SPS1	Voltage difference to high	E	
Measured Values				
DifAngClc	WW_MV1	Phase Angle difference value	E	
DifHzClc	WW_MV1	Frequency difference value	E	
DifVClc	WW_MV1	Voltage difference value	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_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_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	**Attribute**	**FC**	**TrgOp**	**Value/Value range**	**M/O/E**	**Remarks**

Name	Type					
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	
IdNs	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 Attribiutes 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 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
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	ºC
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
50	W/m K
51	J/K
52	ppm
53	1/s
54	rad/s

61	VA
62	Watts
63	VAr
64	phi
65	cos(phi)
66	Vs
67	V²
68	As
69	A²
70	A²t
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
CILO2* (WW_CILO1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	EnaOpn	SG[2].Interl OFF
	EnaCls	SG[2].Interl ON
CILO3* (WW_CILO1)		
	Mod	
	Beh	
	Health	
	NamPlt	

	EnaOpn	SG[3].Interl OFF
	EnaCls	SG[3].Interl ON
CILO4* (WW_CILO1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	EnaOpn	SG[4].Interl OFF
	EnaCls	SG[4].Interl ON
CILO5* (WW_CILO1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	EnaOpn	SG[5].Interl OFF
	EnaCls	SG[5].Interl ON
CILO6* (WW_CILO1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	EnaOpn	SG[6].Interl OFF
	EnaCls	SG[6].Interl ON

CSWI1* (WW_CSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	Pos	SG[1].Pos
CSWI2* (WW_CSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	Pos	SG[2].Pos
CSWI3* (WW_CSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	Pos	SG[3].Pos
CSWI4* (WW_CSWI1)		
	Mod	

	Beh	
	Health	
	NamPlt	
	Loc	
	Pos	SG[4].Pos
CSWI5* (WW_CSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	Pos	SG[5].Pos
CSWI6* (WW_CSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	Pos	SG[6].Pos
LLN0 (WW_LLN0CON)		
	Mod	
	Beh	
	Health	

	NamPlt	
LPHD1 (WW_LPHDCON)		
	PhyNam	
	PhyHealth	
	Proxy	
XCBR1* (WW_XCBR2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[1].Pos
	BlkOpn	
	BlkCls	
	CBOpCap	
XCBR2* (WW_XCBR2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	

	Pos	SG[2].Pos
	BlkOpn	
	BlkCls	
	CBOpCap	
XCBR3* (WW_XCBR2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[3].Pos
	BlkOpn	
	BlkCls	
	CBOpCap	
XCBR4* (WW_XCBR2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[4].Pos

	BlkOpn	
	BlkCls	
	CBOpCap	
XCBR5* (WW_XCBR2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[5].Pos
	BlkOpn	
	BlkCls	
	CBOpCap	
XCBR6* (WW_XCBR2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[6].Pos
	BlkOpn	

	BlkCls	
	CBOpCap	
XSWI1* (WW_XSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[1].Pos
	BlkOpn	
	BlkCls	
	SwTyp	
	SwOpCap	
XSWI2* (WW_XSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[2].Pos
	BlkOpn	

	BlkCls	
	SwTyp	
	SwOpCap	
XSWI3* (WW_XSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[3].Pos
	BlkOpn	
	BlkCls	
	SwTyp	
	SwOpCap	
XSWI4* (WW_XSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[4].Pos

	BlkOpn	
	BlkCls	
	SwTyp	
	SwOpCap	
XSWI5* (WW_XSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	
	Pos	SG[5].Pos
	BlkOpn	
	BlkCls	
	SwTyp	
	SwOpCap	
XSWI6* (WW_XSWI1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Loc	
	OpCnt	

	Pos	SG[6].Pos
	BlkOpn	
	BlkCls	
	SwTyp	
	SwOpCap	

LDevice::DR

Logical Node	Data Object	Module.Name
LLN0 (WW_LLN0REC)		
	Mod	
	Beh	
	Health	
	NamPlt	
LPHD1 (WW_LPHDREC)		
	PhyNam	
	PhyHealth	
	Proxy	
RDRE1 (WW_RDRE1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	RcdMade	Disturb rec.recording
	FltNum	

	GriFltNum	
	RcdStr	Disturb rec.recording

LDevice::EXT

Logical Node	Data Object	Module.Name
InGGIO1 (WW_GGIO3)		
	Mod	
	Beh	
	Health	
	NamPlt	
	Ind1	
	Ind2	
	Ind3	
	Ind4	
	Ind5	
	Ind6	
	Ind7	
	Ind8	
	Ind9	
	Ind10	
	Ind11	
	Ind12	
	Ind13	
	Ind14	

	Ind15	
	Ind16	
	Ind17	
	Ind18	
	Ind19	
	Ind20	
	Ind21	
	Ind22	
	Ind23	
	Ind24	
	Ind25	
	Ind26	
	Ind27	
	Ind28	
	Ind29	
	Ind30	
	Ind31	
	Ind32	
LLN0 (WW_LLN0SYS)		
	Mod	
	Beh	
	Health	
	NamPlt	
LPHD1 (WW_LPHDSYS)		

	PhyNam	
	PhyHealth	
	Proxy	
OutGGIO1 (WW_GGIO4)		
	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
	Ind13	IEC61850.VirtOut13-I
	Ind14	IEC61850.VirtOut14-I
	Ind15	IEC61850.VirtOut15-I
	Ind16	IEC61850.VirtOut16-I

	Ind17	IEC61850.VirtOut17-I
	Ind18	IEC61850.VirtOut18-I
	Ind19	IEC61850.VirtOut19-I
	Ind20	IEC61850.VirtOut20-I
	Ind21	IEC61850.VirtOut21-I
	Ind22	IEC61850.VirtOut22-I
	Ind23	IEC61850.VirtOut23-I
	Ind24	IEC61850.VirtOut24-I
	Ind25	IEC61850.VirtOut25-I
	Ind26	IEC61850.VirtOut26-I
	Ind27	IEC61850.VirtOut27-I
	Ind28	IEC61850.VirtOut28-I
	Ind29	IEC61850.VirtOut29-I
	Ind30	IEC61850.VirtOut30-I
	Ind31	IEC61850.VirtOut31-I
	Ind32	IEC61850.VirtOut32-I

LDevice::MEAS

Logical Node	Data Object	Module.Name
LLN0 (WW_LLN0MEA)		
	Mod	
	Beh	
	Health	
	NamPlt	

LPHD1 (WW_LPHDMEA)		
	PhyNam	
	PhyHealth	
	Proxy	
MMXU1 (WW_MMXU2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	PPV	VT.VL12 RMS VT.phi VL12 VT.VL23 RMS VT.phi VL23 VT.VL31 RMS VT.phi VL31
	PhV	VT.VL1 RMS VT.phi VL1 VT.VL2 RMS VT.phi VL2 VT.VL3 RMS VT.phi VL3 VT.VX meas RMS VT.phi VX meas VT.VG calc RMS VT.phi VG calc
MMXU2 (WW_MMXU1)		

	Mod	
	Beh	
	Health	
	NamPlt	
	A	CT W1.IL1 RMS CT W1.phi IL1 CT W1.IL2 RMS CT W1.phi IL2 CT W1.IL3 RMS CT W1.phi IL3 CT W1.IG meas RMS CT W1.phi IG meas CT W1.IG calc RMS CT W1.phi IG calc
MMXU3 (WW_MMXU1)		
	Mod	
	Beh	
	Health	
	NamPlt	

	A	CT W2.IL1 RMS CT W2.phi IL1 CT W2.IL2 RMS CT W2.phi IL2 CT W2.IL3 RMS CT W2.phi IL3 CT W2.IG meas RMS CT W2.phi IG meas CT W2.IG calc RMS CT W2.phi IG calc
MMXU4 (WW_MMXU3)		
	Mod	
	Beh	
	Health	
	NamPlt	
	TotW	PQSCr.P RMS
	TotVAr	PQSCr.Q RMS
	TotVA	PQSCr.S RMS
	TotPF	PQSCr.cos phi RMS
MSTA1 (WW_MSTA2)		
	Mod	
	Beh	
	Health	
	NamPlt	
	MaxVPhsAB	VT.VL12 max

	MaxVPhsBC	VT.VL23 max
	MaxVPhsCA	VT.VL31 max
	MinVPhsAB	VT.VL12 min
	MinVPhsBC	VT.VL23 min
	MinVPhsCA	VT.VL31 min
	MaxVPhsA	VT.VL1 max
	MaxVPhsB	VT.VL2 max
	MaxVPhsC	VT.VL3 max
	MinVPhsA	VT.VL1 min
	MinVPhsB	VT.VL2 min
	MinVPhsC	VT.VL3 min
MSTA2 (WW_MSTA1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	AvAPhsA	CT W1.IL1 avg
	AvAPhsB	CT W1.IL2 avg
	AvAPhsC	CT W1.IL3 avg
	MaxAPhsA	CT W1.IL1 max
	MaxAPhsB	CT W1.IL2 max
	MaxAPhsC	CT W1.IL3 max
	MinAPhsA	CT W1.IL1 min
	MinAPhsB	CT W1.IL2 min

	MinAPhsC	CT W1.IL3 min
MSTA3 (WW_MSTA1)		
	Mod	
	Beh	
	Health	
	NamPlt	
	AvAPhsA	CT W2.IL1 avg
	AvAPhsB	CT W2.IL2 avg
	AvAPhsC	CT W2.IL3 avg
	MaxAPhsA	CT W2.IL1 max
	MaxAPhsB	CT W2.IL2 max
	MaxAPhsC	CT W2.IL3 max
	MinAPhsA	CT W2.IL1 min
	MinAPhsB	CT W2.IL2 min
	MinAPhsC	CT W2.IL3 min
MSTA4 (WW_MSTA3)		
	Mod	
	Beh	
	Health	
	NamPlt	
	AvVA	PQSCr.S avg
	MaxVA	PQSCr.S max
	MinVA	PQSCr.S min
	AvW	PQSCr.P avg

	MaxW	PQSCr.P max
	MinW	PQSCr.P min
	AvVAr	PQSCr.Q avg
	MaxVAr	PQSCr.Q max
	MinVAr	PQSCr.Q 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	
PDIF1 (WW_PDIF1)		

	Mod	Id.active Id.Blo TripCmd Id.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	Id.Alarm
	Op	Id.TripCmd
PDIF2 (WW_PDIF4)		
	Mod	IdH.active IdH.Blo TripCmd IdH.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	IdH.Alarm
	Op	IdH.TripCmd
PDIF3 (WW_PDIF2)		
	Mod	IdG[1].active IdG[1].Blo TripCmd IdG[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	IdG[1].Alarm

	Op	IdG[1].Trip
PDIF4 (WW_PDIF3)		
	Mod	IdGH[1].active IdGH[1].Blo TripCmd IdGH[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	IdGH[1].Alarm
	Op	IdGH[1].TripCmd
PDIF5 (WW_PDIF2)		
	Mod	IdG[2].active IdG[2].Blo TripCmd IdG[2].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	IdG[2].Alarm
	Op	IdG[2].Trip
PDIF6 (WW_PDIF3)		
	Mod	IdGH[2].active IdGH[2].Blo TripCmd IdGH[2].ExBlo TripCmd
	Beh	
	Health	

	NamPlt	
	Str	IdGH[2].Alarm
	Op	IdGH[2].TripCmd
PDOP1* (WW_PDOP1)		
	Mod	P.active P.Blo TripCmd P.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	P.Alarm
	Op	P.Trip
PDOP2* (WW_PDOP1)		
	Mod	Q.active Q.Blo TripCmd Q.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	Q.Alarm
	Op	Q.Trip
PDOP3* (WW_PDOP1)		
	Mod	PQS[1].active PQS[1].Blo TripCmd PQS[1].ExBlo TripCmd

	Beh	
	Health	
	NamPlt	
	Str	PQS[1].Alarm
	Op	PQS[1].Trip
PDOP4* (WW_PDOP1)		
	Mod	PQS[2].active PQS[2].Blo TripCmd PQS[2].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[2].Alarm
	Op	PQS[2].Trip
PDOP5* (WW_PDOP1)		
	Mod	PQS[3].active PQS[3].Blo TripCmd PQS[3].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[3].Alarm
	Op	PQS[3].Trip
PDOP6* (WW_PDOP1)		

	Mod	PQS[4].active PQS[4].Blo TripCmd PQS[4].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[4].Alarm
	Op	PQS[4].Trip
PDOP7* (WW_PDOP1)		
	Mod	PQS[5].active PQS[5].Blo TripCmd PQS[5].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[5].Alarm
	Op	PQS[5].Trip
PDOP8* (WW_PDOP1)		
	Mod	PQS[6].active PQS[6].Blo TripCmd PQS[6].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[6].Alarm

	Op	PQS[6].Trip
PDUP1* (WW_PDUP1)		
	Mod	P.active P.Blo TripCmd P.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	P.Alarm
	Op	P.Trip
PDUP2* (WW_PDUP1)		
	Mod	Q.active Q.Blo TripCmd Q.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	Q.Alarm
	Op	Q.Trip
PDUP3* (WW_PDUP1)		
	Mod	PQS[1].active PQS[1].Blo TripCmd PQS[1].ExBlo TripCmd
	Beh	
	Health	

	NamPlt	
	Str	PQS[1].Alarm
	Op	PQS[1].Trip
PDUP4* (WW_PDUP1)		
	Mod	PQS[2].active PQS[2].Blo TripCmd PQS[2].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[2].Alarm
	Op	PQS[2].Trip
PDUP5* (WW_PDUP1)		
	Mod	PQS[3].active PQS[3].Blo TripCmd PQS[3].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[3].Alarm
	Op	PQS[3].Trip
PDUP6* (WW_PDUP1)		
	Mod	PQS[4].active PQS[4].Blo TripCmd PQS[4].ExBlo TripCmd

	Beh	
	Health	
	NamPlt	
	Str	PQS[4].Alarm
	Op	PQS[4].Trip
PDUP7* (WW_PDUP1)		
	Mod	PQS[5].active PQS[5].Blo TripCmd PQS[5].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[5].Alarm
	Op	PQS[5].Trip
PDUP8* (WW_PDUP1)		
	Mod	PQS[6].active PQS[6].Blo TripCmd PQS[6].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PQS[6].Alarm
	Op	PQS[6].Trip
PFRC1* (WW_PFRC1)		

	Mod	df/dt.active df/dt.Blo TripCmd df/dt.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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
PHAR1 (WW_PHAR1)		
	Mod	IH2[1].active
	Beh	

	Health	
	NamPlt	
	Str	IH2[1].3-ph Blo
PHAR2 (WW_PHAR1)		
	Mod	IH2[2].active
	Beh	
	Health	
	NamPlt	
	Str	IH2[2].3-ph Blo
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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	Str	f[6].Alarm
	Op	f[6].Trip
PSOF1 (WW_PSOF1)		
	Mod	SOTF.active SOTF.ExBlo SOTF.Ex rev Interl
	Beh	
	Health	
	NamPlt	
	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	
	NamPlt	

	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	Str	IG[3].Alarm

	Op	IG[3].Trip
PTOF1* (WW_PTOF1)		
	Mod	df/dt.active df/dt.Blo TripCmd df/dt.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	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	
	NamPlt	
	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	

	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	

	NamPlt	
	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
PTTR1 (WW_PTTR3)		
	Mod	ThR.active ThR.Blo TripCmd ThR.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Op	ThR.Trip
PTTR2 (WW_PTTR1)		
	Mod	RTD.active RTD.Blo TripCmd RTD.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Op	RTD.Trip
PTUF1* (WW_PTUF1)		

	Mod	df/dt.active df/dt.Blo TripCmd df/dt.ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	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	
	NamPlt	
	Str	V[6].Alarm

	Op	V[6].Trip
PUPF1 (WW_PUPF1)		
	Mod	PF[1].active PF[1].Blo TripCmd PF[1].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PF[1].Alarm
	Op	PF[1].Trip
PUPF2 (WW_PUPF1)		
	Mod	PF[2].active PF[2].Blo TripCmd PF[2].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	PF[2].Alarm
	Op	PF[2].Trip
PVPH1* (WW_PVPH1)		
	Mod	V/f>[1].active V/f>[1].Blo TripCmd V/f>[1].ExBlo TripCmd
	Beh	
	Health	

	NamPlt	
	Str	V/f>[1].Alarm
	Op	V/f>[1].Trip
PVPH2* (WW_PVPH1)		
	Mod	V/f>[2].active V/f>[2].Blo TripCmd V/f>[2].ExBlo TripCmd
	Beh	
	Health	
	NamPlt	
	Str	V/f>[2].Alarm
	Op	V/f>[2].Trip
RBRF1 (WW_RBRF1)		
	Mod	CBF[1].active CBF[1].ExBlo CBF[1].ExBlo
	Beh	
	Health	
	NamPlt	
	Str	CBF[1].running
	OpEx	CBF[1].Alarm
RBRF2 (WW_RBRF1)		
	Mod	CBF[2].active CBF[2].ExBlo CBF[2].ExBlo

	Beh	
	Health	
	NamPlt	
	Str	CBF[2].running
	OpEx	CBF[2].Alarm
RSYN1 (WW_RSYN2)		
	Mod	Sync.active Sync.ExBlo Sync.ExBlo
	Beh	
	Health	
	NamPlt	
	Rel	Sync.Ready to Close
	AngInd	Sync.AngleDiffTooHigh
	HzInd	Sync.SlipTooHigh
	VInd	Sync.VDiffTooHigh
	DifAngClc	Sync.Angle Diff
	DifHzClc	Sync.Slip Freq
	DifVClc	Sync.Volt Diff
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	
	NamPlt	
	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
CILO2	
SG[2].SwitchgearType	Controlled SG
	Controlled Make Break SG
CILO3	
SG[3].SwitchgearType	Controlled SG
	Controlled Make Break SG
CILO4	
SG[4].SwitchgearType	Controlled SG

Module.Name	Value
	Controlled Make Break SG
CILO5	
SG[5].SwitchgearType	Controlled SG
	Controlled Make Break SG
CILO6	
SG[6].SwitchgearType	Controlled SG
	Controlled Make Break SG
CSWI1	
SG[1].SwitchgearType	Controlled SG
	Controlled Make Break SG
CSWI2	
SG[2].SwitchgearType	Controlled SG
	Controlled Make Break SG
CSWI3	
SG[3].SwitchgearType	Controlled SG
	Controlled Make Break SG
CSWI4	
SG[4].SwitchgearType	Controlled SG
	Controlled Make Break SG
CSWI5	
SG[5].SwitchgearType	Controlled SG
	Controlled Make Break SG
CSWI6	

Module.Name	Value
SG[6].SwitchgearType	Controlled SG
	Controlled Make Break SG
XCBR1	
SG[1].SwitchgearType	Monitored Make Break SG
	Controlled Make Break SG
XCBR2	
SG[2].SwitchgearType	Monitored Make Break SG
	Controlled Make Break SG
XCBR3	
SG[3].SwitchgearType	Monitored Make Break SG
	Controlled Make Break SG
XCBR4	
SG[4].SwitchgearType	Monitored Make Break SG
	Controlled Make Break SG
XCBR5	
SG[5].SwitchgearType	Monitored Make Break SG
	Controlled Make Break SG
XCBR6	
SG[6].SwitchgearType	Monitored Make Break SG
	Controlled Make Break SG
XSWI1	
SG[1].SwitchgearType	Monitored SG
	Controlled SG

Module.Name	Value
XSWI2	
SG[2].SwitchgearType	Monitored SG
	Controlled SG
XSWI3	
SG[3].SwitchgearType	Monitored SG
	Controlled SG
XSWI4	
SG[4].SwitchgearType	Monitored SG
	Controlled SG
XSWI5	
SG[5].SwitchgearType	Monitored SG
	Controlled SG
XSWI6	
SG[6].SwitchgearType	Monitored SG
	Controlled SG
PDOP1	
P.Mode	P>
	Pr>
	Q>
	Qr>
	S>
	P>
	Pr>

Module.Name	Value
	Q>
	Qr>
PDOP2	
Q.Mode	P>
	Pr>
	Q>
	Qr>
	S>
	P>
	Pr>
	Q>
	Qr>
PDOP3	
PQS[1].Mode	P>
	Pr>
	Q>
	Qr>
	S>
	P>
	Pr>
	Q>
	Qr>
PDOP4	

Module.Name	Value
PQS[2].Mode	P>
	Pr>
	Q>
	Qr>
	S>
	P>
	Pr>
	Q>
	Qr>
PDOP5	
PQS[3].Mode	P>
	Pr>
	Q>
	Qr>
	S>
	P>
	Pr>
	Q>
	Qr>
PDOP6	
PQS[4].Mode	P>
	Pr>
	Q>

Module.Name	Value
	Qr>
	S>
	P>
	Pr>
	Q>
	Qr>
PDOP7	
PQS[5].Mode	P>
	Pr>
	Q>
	Qr>
	S>
	P>
	Pr>
	Q>
	Qr>
PDOP8	
PQS[6].Mode	P>
	Pr>
	Q>
	Qr>
	S>
	P>

Module.Name	Value
	Pr>
	Q>
	Qr>
PDUP1	
P.Mode	P<
	Q<
	S<
	P<
	Pr<
	Q<
	Qr<
PDUP2	
Q.Mode	P<
	Q<
	S<
	P<
	Pr<
	Q<
	Qr<
PDUP3	
PQS[1].Mode	P<
	Q<
	S<

Module.Name	Value
	P<
	Pr<
	Q<
	Qr<
PDUP4	
PQS[2].Mode	P<
	Q<
	S<
	P<
	Pr<
	Q<
	Qr<
PDUP5	
PQS[3].Mode	P<
	Q<
	S<
	P<
	Pr<
	Q<
	Qr<
PDUP6	
PQS[4].Mode	P<
	Q<

Module.Name	Value
	S<
	P<
	Pr<
	Q<
	Qr<
PDUP7	
PQS[5].Mode	P<
	Q<
	S<
	P<
	Pr<
	Q<
	Qr<
PDUP8	
PQS[6].Mode	P<
	Q<
	S<
	P<
	Pr<
	Q<
	Qr<
PFRC1	
df/dt.Mode	f< and df/dt

Module.Name	Value
	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	
f[2].Mode	f< and df/dt
	f> and df/dt
	f< and DF/DT

Module.Name	Value
	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
	f< and DF/DT
	f> and DF/DT
	df/dt

Module.Name	Value
	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
PPAM5	
f[3].Mode	delta phi
	use

Module.Name	Value
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	
f[4].Mode	f>
PTOF7	
f[5].Mode	f>

Module.Name	Value
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<
PTUF4	
f[2].Mode	f<
PTUF5	

Module.Name	Value
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	
V[4].Mode	V<
	use
	V(t)<

Module.Name	Value
PTUV5	
V[5].Mode	V<
	use
	V(t)<
PTUV6	
V[6].Mode	V<
	use
	V(t)<
PVPH1	
V/f>[1].Mode	use
PVPH2	
V/f>[2].Mode	use
VePTOV1	
VG[1].Mode	V>
VePTOV2	
VG[2].Mode	V>
VePTUV1	
VG[1].Mode	V<
	use
VePTUV2	
VG[2].Mode	V<
	use