

Model Implementation Conformance Statement
for the IEC61850 Ed 1 interface in Shark INP300 Network Card ICD
21-Feb-2014, 1.0

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Introduction

This model implementation conformance statement is applicable for ElectroIndustries, S200(Electro Industries Shark 200) , with firmware 1.00 .

This MICS document specifies the modelling extensions compared to IEC 61850 edition 1. For the exact details on the standardized model please compare the ICD substation configuration file: [filename.icd], version [version].

Clause 2 contains the list of implemented logical nodes.

Clause 3 describes the new and extended logical nodes.

Clause 4 describes the new and extended common data classes (if any).

Clause 5 describes the new and extended enum types.

Clause 6 describes any other extensions.

IEC 61850 Data Model Definitions

IEDs within Shark 200 ICD

IED Name	Type	Manufacturer	Config Version
TEMPLATE	S200	ElectroIndustries	1.00

Logical Device list

Logical Device Instances within IED TEMPLATE (Electro

Industries Shark 200); AccessPoint: S1(); Server: ():

Instance	Description	Default Namespace
Meas	Measurement Unit	IEC 61850-7-4:2003

Proprietary Logical Nodes

Proprietary Logical Nodes within IED TEMPLATE:

Logical Device TEMPLATEMeas (Instance Meas of TEMPLATE): Measurement Unit

Name	LN Type	Description	InNs
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Proprietary Data Objects

Proprietary Data Objects within IED TEMPLATE:

Logical Device TEMPLATEMeas (Instance Meas of TEMPLATE): Measurement Unit

LDevice	LN	DO	dataNs	cdcNs
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Subscribed GOOSEs for IED TEMPLATE

No GOOSE subscriptions in IEDTEMPLATE

Published GOOSEs for IED TEMPLATE

No GOOSE publications in IEDTEMPLATE

Logical Node list

Logical Nodes within Logical Device TEMPLATEMeas (Instance Meas of TEMPLATE)

L: System Logical Nodes		
Name	LN Type	Description
LLN0	SHK2_LLNO	Logical Device Description

LPHD1 | SHK2_LPHD | Physical Device Description

M: Metering and Measurement		
Name	LN Type	Description
nsMMXU1	SHK2_MMXU	Basic Measurements
nsMHAI1	SHK2_MHAI	Harmonic Measurements
eneMMTR1	SHK2_MMTR	Energy Metering

T: Instrument Transformer (Transducers)		
Name	LN Type	Description
setTCTR1	SHK2_TCTR	CT Ratio Phase A
setTCTR2	SHK2_TCTR	CT Ratio Phase B
setTCTR3	SHK2_TCTR	CT Ratio Phase C
setTCTR4	SHK2_TCTR	CT Ratio Neutral
setTVTR1	SHK2_TVTR	VT Ratio Phase A
setTVTR2	SHK2_TVTR	VT Ratio Phase B
setTVTR3	SHK2_TVTR	VT Ratio Phase C

DataSet List

DataSets within Logical Device Instance Meas of AccessPoint S1 of IED TEMPLATE

(Note: all datasets within this IED are identically configured)
 2 pre-defined datasets exist within this Logical Device/AccessPoint.
 Datasets are read-only
 Dataset directory services are supported
 Datasets cannot be created at runtime.

Logical Node	Name	Description
Meas/LLN0	BasicsForBR	
	Meas/LLN0.Mod	[ST]
	Meas/LLN0.Beh	[ST]
	Meas/LLN0.Health	[ST]
	Meas/nsMMXU1.PhV.phsA.instCVal	[MX]
	Meas/nsMMXU1.PhV.phsB.instCVal	[MX]
	Meas/nsMMXU1.PhV.phsC.instCVal	[MX]
	Meas/nsMMXU1.PPV.phsAB.instCVal	[MX]
	Meas/nsMMXU1.PPV.phsBC.instCVal	[MX]
	Meas/nsMMXU1.PPV.phsCA.instCVal	[MX]
	Meas/nsMMXU1.A.phsA	[MX]
	Meas/nsMMXU1.A.phsB	[MX]

Meas/nsMMXU1.A.phsC [MX]
Meas/nsMMXU1.A.neut [MX]
Meas/nsMMXU1.TotVA.instMag [MX]
Meas/nsMMXU1.TotVAr.instMag [MX]
Meas/nsMMXU1.TotW.instMag [MX]
Meas/nsMMXU1.Hz.instMag [MX]
Meas/nsMHAI1.ThdPhV.phsA.q [MX]
Meas/LLN0
BasicsForUBR
Meas/LLN0.Mod [ST]
Meas/LLN0.Beh [ST]
Meas/LLN0.Health [ST]
Meas/nsMMXU1.PhV.phsA.instCVal [MX]
Meas/nsMMXU1.PhV.phsB.instCVal [MX]
Meas/nsMMXU1.PhV.phsC.instCVal [MX]
Meas/nsMMXU1.PPV.phsAB.instCVal [MX]
Meas/nsMMXU1.PPV.phsBC.instCVal [MX]
Meas/nsMMXU1.PPV.phsCA.instCVal [MX]
Meas/nsMMXU1.A.phsA [MX]
Meas/nsMMXU1.A.phsB [MX]
Meas/nsMMXU1.A.phsC [MX]
Meas/nsMMXU1.A.neut [MX]
Meas/nsMHAI1.ThdPhV.phsA [MX]

Logical Node Definitions based upon IED declarations

Logical Nodes within: TEMPLATE, LD inst=Meas

Logical node TEMPLATEMeas/LLN0: type= SHK2_LLN0, base class= LLN0:
Logical Device Description

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	SHK2_INS_Health	M	Health		

Health.stVal: (Template) (RO)Ok
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm
NamPlt SHK2_LPL_LLN0 M Name plate
NamPlt.vendor: (Template) (RO)Electro Industries
NamPlt.swRev: (Template) (RO)
NamPlt.configRev: (Template) (Spec)1.0
NamPlt.d: (Template) (RO)Logical Device Nameplate
NamPlt.ldNs: (Template) (RO)IEC 61850-7-4:2003

**Logical node TEMPLATEMeas/LPHD1: type= SHK2_LPHD, base class= LPHD:
Physical Device Description**

DATA	Type	M/O	Description	Transient	Access Control
PhyNam	SHK2_DPL	O	Physical device name plate		
PhyHealth	SHK2_INS_Health	O	Physical device health		
PhyHealth.stVal: (Template) (RO)Ok					
PhyHealth.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
Proxy	SPS	M	Indicates if this LN is a proxy		
Proxy.stVal: (Instance) (Set>false					
Proxy.d: (Instance) (RO)True if this LD is a proxy for an external device					

Logical node TEMPLATEMeas/nsMMXU1: type= SHK2_MMXU, base class= MMXU: Basic Measurements

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	SHK2_INS_Health	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	SHK2_LPL_STD	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
PhV	WYE_ABC_mag_noDC	O	Phase to ground voltages		

			(VL1ER, ...)
PhV.d: (Instance) (RO)instantaneous normal speed Phase-to-Neutral(ground) voltage			
A	WYE ABCN mag noDC	O	Phase currents (IL1, IL2, IL3)
A.d: (Instance) (RO)instantaneous normal speed Per-Phase Amperes			
PPV	DEL ABC mag noDC	O	Phase to phase voltages (VL1VL2, ...)
PPV.d: (Instance) (RO)instantaneous normal speed Phase-to-Phase voltage			
VA	WYE ABC mag noDC	O	Phase apparent power (S)
VA.d: (Instance) (RO)instantaneous normal speed Per-Phase VAs			
TotVA	MV	O	Total Apparent Power (Total S)
TotVA.db: (Instance) (RO)100000			
TotVA.d: (Instance) (RO)instantaneous Total VAs			
VAr	WYE ABC mag noDC	O	Phase reactive power (Q)
VAr.d: (Instance) (RO)instantaneous normal speed Per-Phase VARs			
TotVAr	MV	O	Total Reactive Power (Total Q)
TotVAr.db: (Instance) (RO)100000			
TotVAr.d: (Instance) (RO)instantaneous Total VARs			
W	WYE ABC mag noDC	O	Phase active power (P)
W.d: (Instance) (RO)instantaneous normal speed Per-Phase watts			
TotW	MV	O	Total Active Power (Total P)
TotW.db: (Instance) (RO)75000			
TotW.d: (Instance) (RO)instantaneous Total Watts			
Hz	MV	O	Frequency
Hz.db: (Instance) (RO)0			
Hz.d: (Instance) (RO)instantaneous Frequency			
PF	WYE ABC mag noDC	O	Phase power factor
PF.d: (Instance) (RO)instantaneous normal speed Per-Phase Power Factor			
TotPF	MV	O	Average Power factor (Total PF)
TotPF.db: (Instance) (RO)100000			
TotPF.d: (Instance) (RO)instantaneous Total Power Factor			

Logical node TEMPLATEMeas/nsMHAI1: type= SHK2_MHAI, base class= MHAI: Harmonic Measurements

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		

Beh.stVal: (Template) (RO)on			
Beh.d: (Template) (RO)Operating Mode Behavior			
Health	SHK2_INS_Health	M	Health
Health.stVal: (Template) (RO)Ok			
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm			
NamPlt	SHK2_LPL_STD	M	Name plate
NamPlt.vendor: (Template) (RO)Electro Industries			
NamPlt.swRev: (Template) (RO)			
NamPlt.d: (Template) (RO)Logical Node Nameplate			
ThdPhV	WYE_ABC_mag_noDC	O	Voltage Total Harmonic or Interharmonic Distortion (different methods) for phase to ground

Logical node TEMPLATEMeas/eneMMTR1: type= SHK2_MMTR, base class= MMTR: Energy Metering

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	SHK2_INS_Health	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	SHK2_LPL_STD	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
TotVAh	BCR	O	Net apparent energy since last reset		
TotVAh.pulsQty: (Instance) (RO)1000					
TotVAh.d: (Instance) (RO)Total VA-hours per pulsQty units					
SupWh	BCR	O	Real energy supply (default supply direction: energy flow towards busbar)		
SupWh.pulsQty: (Instance) (RO)100					
SupWh.d: (Instance) (RO)Consumed Watt-hours per pulsQty units					
SupVARh	BCR	O	Reactive energy supply (default supply direction: energy flow towards busbar)		
SupVARh.pulsQty: (Instance) (RO)1					

SupVARh.d: (Instance) (RO)Consumed VAR-hours per pulsQty units			
DmdWh	BCR	O	Real energy demand (default demand direction: energy flow from busbar away)
DmdWh.pulsQty: (Instance) (RO)1			
DmdWh.d: (Instance) (RO)Generated Watt-hours per pulsQty units			
DmdVARh	BCR	O	Reactive energy demand (default demand direction: energy flow from busbar away)
DmdVARh.pulsQty: (Instance) (RO)1			
DmdVARh.d: (Instance) (RO)Generated VAR-hours per pulsQty units			

Logical node TEMPLATEMeas/setTCTR1: type= SHK2_TCTR, base class= TCTR: CT Ratio Phase A

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	SHK2_INS_Health	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	SHK2_LPL_STD	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Amp	SHK2_SV	O	Dummy sampled value		
Amp.d: (Instance) (RO)Dummy SV value					
Rat	ASG_Rat	O	Winding ratio of an external current transformer (transducer) if applicable		
Rat.d: (Instance) (RO)CT Ratio Phase A					

Logical node TEMPLATEMeas/setTCTR2: type= SHK2_TCTR, base class= TCTR: CT Ratio Phase B

DATA	Type	M/O	Description	Transient	Access Control

Mod	SHK2_INC_Mod	M	Mode
Mod.stVal: (Template) (RO)on			
ModctlModel: (Template) (RO)status-only			
Mod.d: (Template) (RO)Operating Mode			
Beh	SHK2_INS_Beh	M	Behaviour
Beh.stVal: (Template) (RO)on			
Beh.d: (Template) (RO)Operating Mode Behavior			
Health	SHK2_INS_Health	M	Health
Health.stVal: (Template) (RO)Ok			
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm			
NamPlt	SHK2_LPL_STD	M	Name plate
NamPlt.vendor: (Template) (RO)Electro Industries			
NamPlt.swRev: (Template) (RO)			
NamPlt.d: (Template) (RO)Logical Node Nameplate			
Amp	SHK2_SV	O	Dummy sampled value
Amp.d: (Instance) (RO)Dummy SV value			
Rat	ASG_Rat	O	Winding ratio of an external current transformer (transducer) if applicable
Rat.d: (Instance) (RO)CT Ratio Phase B			

Logical node TEMPLATEMeas/setTCTR3: type= SHK2_TCTR, base class= TCTR: CT Ratio Phase C

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
ModctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	SHK2_INS_Health	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	SHK2_LPL_STD	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Amp	SHK2_SV	O	Dummy sampled value		
Amp.d: (Instance) (RO)Dummy SV value					

Rat	ASG_Rat	O	Winding ratio of an external current transformer (transducer) if applicable
Rat.d: (Instance) (RO)CT Ratio Phase C			

Logical node TEMPLATEMeas/setTCTR4: type= SHK2_TCTR, base class= TCTR: CT Ratio Neutral

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	SHK2_INS_Health	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	SHK2_LPL_STD	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Amp	SHK2_SV	O	Dummy sampled value		
Amp.d: (Instance) (RO)Dummy SV value					
Rat	ASG_Rat	O	Winding ratio of an external current transformer (transducer) if applicable		
Rat.d: (Instance) (RO)CT Ratio neutral					

Logical node TEMPLATEMeas/setTVTR1: type= SHK2_TVTR, base class= TVTR: VT Ratio Phase A

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	SHK2_INS_Health	M	Health		

Health.stVal: (Template) (RO)Ok				
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm				
NamPlt	SHK2_LPL_STD	M	Name plate	
NamPlt.vendor: (Template) (RO)Electro Industries				
NamPlt.swRev: (Template) (RO)				
NamPlt.d: (Template) (RO)Logical Node Nameplate				
Vol	SHK2_SV	O	Dummy sampled value	
Vol.d: (Instance) (RO)Dummy SV value				
Rat	ASG_Rat	O	Winding ratio of external voltage transformer (transducer) if applicable	
Rat.d: (Instance) (RO)VT Ratio Phase A				

**Logical node TEMPLATEMeas/setTVTR2: type= SHK2_TVTR, base class= TVTR:
VT Ratio Phase B**

DATA	Type	M/O	Description	Transient	Access Control
Mod	SHK2_INC_Mod	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	SHK2_INS_Beh	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	SHK2_INS_Health	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	SHK2_LPL_STD	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Vol	SHK2_SV	O	Dummy sampled value		
Vol.d: (Instance) (RO)Dummy SV value					
Rat	ASG_Rat	O	Winding ratio of external voltage transformer (transducer) if applicable		
Rat.d: (Instance) (RO)VT Ratio Phase B					

**Logical node TEMPLATEMeas/setTVTR3: type= SHK2_TVTR, base class= TVTR:
VT Ratio Phase C**

DATA	Type	M/O	Description	Transient	Access
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				Control
Mod	SHK2_INC_Mod	M	Mode	
Mod.stVal: (Template) (RO)on				
Mod.ctlModel: (Template) (RO)status-only				
Mod.d: (Template) (RO)Operating Mode				
Beh	SHK2_INS_Beh	M	Behaviour	
Beh.stVal: (Template) (RO)on				
Beh.d: (Template) (RO)Operating Mode Behavior				
Health	SHK2_INS_Health	M	Health	
Health.stVal: (Template) (RO)Ok				
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm				
NamPlt	SHK2_LPL_STD	M	Name plate	
NamPlt.vendor: (Template) (RO)Electro Industries				
NamPlt.swRev: (Template) (RO)				
NamPlt.d: (Template) (RO)Logical Node Nameplate				
Vol	SHK2_SV	O	Dummy sampled value	
Vol.d: (Instance) (RO)Dummy SV value				
Rat	ASG_Rat	O	Winding ratio of external voltage transformer (transducer) if applicable	
Rat.d: (Instance) (RO)VT Ratio Phase C				

Common Data Class Definitions

Common DATA class SAV of variant SHK2_SV:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Measurand					
instMag	AnalogueValue	MX			
q	Quality	MX			
Configuration, Description					
d	VisString255	DC			RO(Dummy SV value)

Common DATA class SPS of variant SPS:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Status					
stVal	BOOLEAN	ST	TRUE FALSE	dchg	
q	Quality	ST		qchg	
t	Timestamp	ST			
Configuration, Description					
d	VisString255	DC	Text		

Common DATA class INS of variant SHK2_INS_Beh:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Status					
stVal	Enum Beh	ST		dchg	RO(on)
q	Quality	ST		qchg	
t	Timestamp	ST			
Configuration, Description					
d	VisString255	DC	Text		RO(Operating Mode Behavior)

Common DATA class INS of variant SHK2_INS_Health:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Status					
stVal	Enum Health	ST		dchg	RO(Ok)
q	Quality	ST		qchg	
t	Timestamp	ST			
Configuration, Description					
d	VisString255	DC	Text		RO(1=Ok,2=Warning,3=Alarm)

Common DATA class BCR of variant BCR:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Status					
actVal	INT32	ST		dchg	
q	Quality	ST		qchg	
t	Timestamp	ST			
Configuration, Description					
pulsQty	FLOAT32	CF	Energy Multiplier		RO(1)
d	VisString255	DC			

Common DATA class MV of variant MV:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Measurand					
instMag	AnalogueValue	MX			
mag	AnalogueValue	MX		dchg	
q	Quality	MX		qchg	
t	Timestamp	MX			
Configuration, Description					
db	INT32U	CF			
rangeC	RangeConfig	CF			
d	VisString255	DC	Text		

Common DATA class CMV of variant CMV_mag:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Measurand					
instCVal	Vector_mag	MX			
cVal	Vector_mag	MX		dchg	
q	Quality	MX		qchg	
t	Timestamp	MX			
Configuration, Description					
db	INT32U	CF			
rangeC	RangeConfig	CF			
d	VisString255	DC	Text		

Common DATA class CMV of variant CMV_mag_noDC:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Measurand					
instCVal	Vector_mag	MX			
cVal	Vector_mag	MX		dchg	
q	Quality	MX		qchg	
t	Timestamp	MX			
Configuration, Description					
db	INT32U	CF			
rangeC	RangeConfig	CF			

Common DATA class WYE of variant WYE_ABC_mag:

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsA	CMV_mag				
phsB	CMV_mag				
phsC	CMV_mag				
Configuration, Description					
d	VisString255	DC	Text		

Common DATA class WYE of variant WYE_ABC_mag_noDC:

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsA	CMV_mag_noDC				
phsB	CMV_mag_noDC				
phsC	CMV_mag_noDC				
Configuration, Description					

d	VisString255	DC	Text
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Common DATA class WYE of variant WYE_ABCN_mag:

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsA	CMV_mag				
phsB	CMV_mag				
phsC	CMV_mag				
neut	CMV_mag				
Configuration, Description					
d	VisString255	DC	Text		

Common DATA class WYE of variant WYE_ABCN_mag_noDC:

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsA	CMV_mag_noDC				
phsB	CMV_mag_noDC				
phsC	CMV_mag_noDC				
neut	CMV_mag_noDC				
Configuration, Description					
d	VisString255	DC	Text		

Common DATA class DEL of variant DEL_ABC_mag:

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsAB	CMV_mag				
phsBC	CMV_mag				
phsCA	CMV_mag				
Configuration, Description					
d	VisString255	DC	Text		

Common DATA class DEL of variant DEL_ABC_mag_noDC:

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsAB	CMV_mag_noDC				
phsBC	CMV_mag_noDC				
phsCA	CMV_mag_noDC				
Configuration, Description					
d	VisString255	DC	Text		

Common DATA class DEL of variant DEL_ABCN_mag:

Attribute	Type	FC	Description	TrgOp	R/W(value)

phsAB	CMV_mag
phsBC	CMV_mag
phsCA	CMV_mag
Configuration, Description	
d	VisString255 DC Text

Common DATA class INC of variant SHK2_INC_Mod:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Status					
stVal	Enum Beh	ST		dchg	RO(on)
q	Quality	ST		qchg	
t	Timestamp	ST			
Configuration, Description					
ctlModel	Enum CtlModels	CF			RO(status-only)
d	VisString255	DC	Text		RO(Operating Mode)

Common DATA class ASG of variant ASG_Rat:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Settings					
setMag	AnalogueValue	SP			
Configuration, Description					
d	VisString255	DC	Text		

Common DATA class DPL of variant SHK2_DPL:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Configuration, Description					
vendor	VisString255	DC			RO(Electro Industries)
swRev	VisString255	DC			RO
serNum	VisString255	DC			RO
model	VisString255	DC			RO

Common DATA class LPL of variant SHK2_LPL_LLN0:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Configuration, Description					
vendor	VisString255	DC			RO(Electro Industries)
swRev	VisString255	DC			RO
configRev	VisString255	DC			Spec(1.0)
d	VisString255	DC			RO(Logical Device Nameplate)

Extension				
ldNs	VisString255	EX	shall be included in LLN0 only;	RO(IEC 61850-7-4:2003)

Common DATA class LPL of variant SHK2_LPL_STD:

Attribute	Type	FC	Description	TrgOp	R/W(value)
Configuration, Description					
vendor	VisString255	DC			RO(Electro Industries)
swRev	VisString255	DC			RO
d	VisString255	DC			RO(Logical Node Nameplate)

Data Attribute Definitions

Attribute structure AnalogueValue:

Attribute	Type	Description	R/W
f	FLOAT32	The value of f shall be the FLOAT representation of the measured value. f shall represent the technological value in SI units.	

Attribute structure AnalogueValue_RCconst:

Attribute	Type	Description	R/W
f	FLOAT32		RO(0.0)

Attribute structure AnalogueValue_RCvar:

Attribute	Type	Description	R/W
f	FLOAT32	The value of f shall be the FLOAT representation of the measured value. f shall represent the technological value in SI units.	Spec (0.0)

Attribute structure ScaledValueConfig:

Attribute	Type	Description	R/W
scaleFactor	FLOAT32	Scaling factor	
offset	FLOAT32	Offset	

Attribute structure RangeConfig:

Attribute	Type	Description	R/W
hhLim	AnalogueValue_RCconst	Not Used	
hLim	AnalogueValue_RCconst	Not Used	
lLim	AnalogueValue_RCconst	Not Used	
llLim	AnalogueValue_RCconst	Not Used	

min	AnalogueValue_RCvar	Minimum process measurement used for %deadband.	Spec
max	AnalogueValue_RCvar	Maximum process measurement used for %deadband.	Spec

Attribute structure Vector_mag:

Attribute	Type	Description	R/W
mag	AnalogueValue	The magnitude of the complex value.	

Enumeration Definitions

Enumeration definition CtlModels:

Enum string	Value	Description
status-only	0	
direct-with-normal-security	1	
sbo-with-normal-security	2	
direct-with-enhanced-security	3	
sbo-with-enhanced-security	4	

Enumeration definition Beh:

Enum string	Value	Description
on	1	
blocked	2	
test	3	
test/blocked	4	
off	5	

Enumeration definition Health:

Enum string	Value	Description
Ok	1	
Warning	2	
Alarm	3	

Enumeration definition Mod:

Enum string	Value	Description
on	1	
blocked	2	
test	3	
test/blocked	4	
off	5	

Annex A - Notes on Contents

Logical Device list:

This section lists the Logical Devices within the IED. The "Default NameSpace" should point to an IEC standard (for example, "IEC61850-7-4:2003")

New Logical Node list

This section lists the proprietary Logical Nodes (i.e., those whose namespace differ from the Default Namespace of the Logical device)

Logical Device list

This section lists all of the Logical Nodes grouped by Logical Device then by function (for example, all "L" logical nodes are listed first)

Logical Node Definitions

This section lists the Data Objects within each Logical Node. It has two options depending upon the setting of a variable within the XSLT file:

- based upon IED declarations: Lists each Logical Node found within the Instance section (the <IED> section).
- based upon DataTypeTemplates declarations: Lists each of the Logical Nodes found in the templates section once. It is shorter than the full Logical Node list.

Within this section are entries for pre-defined and configuration-defined values. They are listed as:

- Name (DataObject.attribute.attribute...)
- (DefinitionLocation) where the location is either "Instance" (IED section) or "Template" (DataTypeTemplates section)
- (valKind) which is either "Set" (read/write at runtime) or "Conf" (assignable at configuration startup time) or "RO" (read-only)
- Value (The actual value of the attribute). Note that attributes may be marked as read-only without a value (for example, the device serial number is of this type)

Common Data Class Definitions

This section lists the Data Object definitions found within the dataTypeTemplates section. The "Common Data Class" (CDC) name is listed as well as the specific variant name. The attributes are grouped by function and NOT necessarily by the order of the variables (although the resulting order is very close to the definitions).

Enumeration Definitions

This section list the named attribute values as well as the associated integer. The "Enumeration string" is the value appearing in the SCL file while the integer is the value served "on-the-wire"

Contents of ReadMe.txt File

The SCL-to-MICS converter is an XSLT (eXtensible Style Language for Transformation). It executes within a browser without needing additional "plug-ins" (IE 9 and FireFox 15.0.1 tested).

To use it, follow these instructions:

- Place the file IcdToMisc.xslt in the same folder as the ICD file
- Open the file IcdToMisc.xslt in NotePad (or your favorite text editor) and copy the line `<?xml-stylesheet type="text/xsl" href="IcdToMics.xslt"?>` to the Windows clipboard. Close the file.
- Open the ICD or CID or SCD file with a text editor and paste the line just after first line `<?xml version="1.0" encoding="UTF-8"?>`

The resulting file should now beign with:

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<?xml-stylesheet type="text/xsl" href="IcdToMics.xslt"?>
```

...

- Save the file with an extension "XML" in place of the original extension
- Open the file with a browser (in Windows, this means right-click on file, select "Open with" and select your browser)
- Wait a few seconds and view the file with embedded links

The XSLT file transforms the XML file into an appropriate HTML file which approximates the format of the MICS template.

The file is plain text if you wish to modify it, but be aware that it is VERY complex.

Also, please be aware that portions of this translator were "borrowed" from Wolfgang Wimmer (ABB Switzerland).

The translator is still in draft form with a list of enhancements listed near the top of the document.

The sample file in this folder "WIMMER_FILE_ExampleFDIS2_BAM_fixed.xml" is based upon the example in Annex D.2 of 61850-6 (Edition 1).

If you find this program useful, please include the name of the authors in any derived works:

Bruce Muschlitz (EnerNex)

Wolfgang Wimmer (ABB Baden)

(unannounced company)