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## Introduction

This model implementation conformance statement is applicable for ElectroIndustries, S200(Electro Industries Shark 200) , with firmware 3.35 .

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	3.35

## Logical Device list

**Logical Device Instances within IED TEMPLATE (Electro Industries Shark 200); AccessPoint: S1(); Server: ():**

Instance	Description	Default Namespace
<a href="#">Meas</a>	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)**

<b>L: System Logical Nodes</b>		
<b>Name</b>	<b>LN Type</b>	<b>Description</b>
LLN0	<a href="#">SHK2_LLN0</a>	Logical Device Description
LPHD1	<a href="#">SHK2_LPHD</a>	Physical Device Description

<b>M: Metering and Measurement</b>		
<b>Name</b>	<b>LN Type</b>	<b>Description</b>
nsMMXU1	<a href="#">SHK2_MMXU</a>	Basic Measurements
nsMHAI1	<a href="#">SHK2_MHAI</a>	Harmonic Measurements
eneMMTR1	<a href="#">SHK2_MMTR</a>	Energy Metering

<b>T: Instrument Transformer (Transducers)</b>		
<b>Name</b>	<b>LN Type</b>	<b>Description</b>
setTCTR1	<a href="#">SHK2_TCTR</a>	CT Ratio Phase A
setTCTR2	<a href="#">SHK2_TCTR</a>	CT Ratio Phase B
setTCTR3	<a href="#">SHK2_TCTR</a>	CT Ratio Phase C
setTCTR4	<a href="#">SHK2_TCTR</a>	CT Ratio Neutral
setTVTR1	<a href="#">SHK2_TVTR</a>	VT Ratio Phase A
setTVTR2	<a href="#">SHK2_TVTR</a>	VT Ratio Phase B
setTVTR3	<a href="#">SHK2_TVTR</a>	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	
	<a href="#">Meas/LLN0.Mod</a>	[ST]
	<a href="#">Meas/LLN0.Beh</a>	[ST]
	<a href="#">Meas/LLN0.Health</a>	[ST]
	<a href="#">Meas/nsMMXU1.PhV.phsA.instCVal</a>	[MX]
	<a href="#">Meas/nsMMXU1.PhV.phsB.instCVal</a>	[MX]
	<a href="#">Meas/nsMMXU1.PhV.phsC.instCVal</a>	[MX]
	<a href="#">Meas/nsMMXU1.PPV.phsAB.instCVal</a>	[MX]
	<a href="#">Meas/nsMMXU1.PPV.phsBC.instCVal</a>	[MX]
	<a href="#">Meas/nsMMXU1.PPV.phsCA.instCVal</a>	[MX]
	<a href="#">Meas/nsMMXU1.A.phsA</a>	[MX]
	<a href="#">Meas/nsMMXU1.A.phsB</a>	[MX]
	<a href="#">Meas/nsMMXU1.A.phsC</a>	[MX]
	<a href="#">Meas/nsMMXU1.A.neut</a>	[MX]
	<a href="#">Meas/nsMMXU1.TotVA.instMag</a>	[MX]
	<a href="#">Meas/nsMMXU1.TotVAr.instMag</a>	[MX]
	<a href="#">Meas/nsMMXU1.TotW.instMag</a>	[MX]
	<a href="#">Meas/nsMMXU1.Hz.instMag</a>	[MX]
	<a href="#">Meas/nsMHAI1.ThdPhV.phsA.q</a>	[MX]
Meas/LLN0	BasicsForUBR	
	<a href="#">Meas/LLN0.Mod</a>	[ST]
	<a href="#">Meas/LLN0.Beh</a>	[ST]
	<a href="#">Meas/LLN0.Health</a>	[ST]
	<a href="#">Meas/nsMMXU1.PhV.phsA.instCVal</a>	[MX]
	<a href="#">Meas/nsMMXU1.PhV.phsB.instCVal</a>	[MX]

<a href="#">Meas/nsMMXU1.PhV.phsC.instCVal</a> [MX]
<a href="#">Meas/nsMMXU1.PPV.phsAB.instCVal</a> [MX]
<a href="#">Meas/nsMMXU1.PPV.phsBC.instCVal</a> [MX]
<a href="#">Meas/nsMMXU1.PPV.phsCA.instCVal</a> [MX]
<a href="#">Meas/nsMMXU1.A.phsA</a> [MX]
<a href="#">Meas/nsMMXU1.A.phsB</a> [MX]
<a href="#">Meas/nsMMXU1.A.phsC</a> [MX]
<a href="#">Meas/nsMMXU1.A.neut</a> [MX]
<a href="#">Meas/nsMHA11.ThdPhV.phsA</a> [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	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	<a href="#">SHK2_INS_Health</a>	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_LLN0</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Device Nameplate					
NamPlt.configRev: (Template) (Spec)1.0					

NamPlt.IdNs: (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	<a href="#">SHK2_DPL</a>	O	Physical device name plate		
PhyHealth	<a href="#">SHK2_INS_Health</a>	O	Physical device health		
PhyHealth.stVal: (Template) (RO)Ok					
PhyHealth.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
Proxy	<a href="#">SPS</a>	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	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	<a href="#">SHK2_INS_Health</a>	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
TotW	<a href="#">MV</a>	O	Total Active Power (Total P)		
TotW.db: (Instance) (RO)75000					

TotW.d: (Instance) (RO)instantaneous Total Watts					
TotVAr	<a href="#">MV</a>	O	Total Reactive Power (Total Q)		
TotVAr.db: (Instance) (RO)100000					
TotVAr.d: (Instance) (RO)instantaneous Total VArS					
TotVA	<a href="#">MV</a>	O	Total Apparent Power (Total S)		
TotVA.db: (Instance) (RO)100000					
TotVA.d: (Instance) (RO)instantaneous Total VAs					
TotPF	<a href="#">MV</a>	O	Average Power factor (Total PF)		
TotPF.db: (Instance) (RO)100000					
TotPF.d: (Instance) (RO)instantaneous Total Power Factor					
Hz	<a href="#">MV</a>	O	Frequency		
Hz.db: (Instance) (RO)0					
Hz.d: (Instance) (RO)instantaneous Frequency					
PPV	<a href="#">DEL_ABC_mag_noDC</a>	O	Phase to phase voltages (VL1VL2, ...)		
PPV.d: (Instance) (RO)instantaneous normal speed Phase-to-Phase voltage					
PhV	<a href="#">WYE_ABC_mag_noDC</a>	O	Phase to ground voltages (VL1ER, ...)		
PhV.d: (Instance) (RO)instantaneous normal speed Phase-to-Neutral(ground) voltage					
A	<a href="#">WYE_ABCN_mag_noDC</a>	O	Phase currents (IL1, IL2, IL3)		
A.d: (Instance) (RO)instantaneous normal speed Per-Phase Amperes					
W	<a href="#">WYE_ABC_mag_noDC</a>	O	Phase active power (P)		
W.d: (Instance) (RO)instantaneous normal speed Per-Phase watts					
VAr	<a href="#">WYE_ABC_mag_noDC</a>	O	Phase reactive power (Q)		
VAr.d: (Instance) (RO)instantaneous normal speed Per-Phase VArS					
VA	<a href="#">WYE_ABC_mag_noDC</a>	O	Phase apparent power (S)		
VA.d: (Instance) (RO)instantaneous normal speed Per-Phase VAs					
PF	<a href="#">WYE_ABC_mag_noDC</a>	O	Phase power factor		
PF.d: (Instance) (RO)instantaneous normal speed Per-Phase Power Factor					

**Logical node TEMPLATEMeas/nsMHAI1: type= SHK2\_MHAI, base class= MHAI: Harmonic Measurements**

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



Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
TotVAh	<a href="#">BCR</a>	O	Net apparent energy since last reset		
TotVAh.pulsQty: (Instance) (RO)1000					
TotVAh.d: (Instance) (RO)Total VA-hours per pulsQty units					
SupWh	<a href="#">BCR</a>	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	<a href="#">BCR</a>	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	<a href="#">BCR</a>	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	<a href="#">BCR</a>	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	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					

Mod.d: (Template) (RO)Operating Mode				
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour	
Beh.stVal: (Template) (RO)on				
Beh.d: (Template) (RO)Operating Mode Behavior				
Health	<a href="#">SHK2_INS_Health</a>	M	Health	
Health.stVal: (Template) (RO)Ok				
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm				
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate	
NamPlt.vendor: (Template) (RO)Electro Industries				
NamPlt.swRev: (Template) (RO)				
NamPlt.d: (Template) (RO)Logical Node Nameplate				
Amp	<a href="#">SHK2_SV</a>	O	Dummy sampled value	
Amp.d: (Instance) (RO)Dummy SV value				
Rat	<a href="#">ASG_Rat</a>	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	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	<a href="#">SHK2_INS_Health</a>	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					

NamPlt.d: (Template) (RO)Logical Node Nameplate					
Amp	<a href="#">SHK2_SV</a>	O	Dummy sampled value		
Amp.d: (Instance) (RO)Dummy SV value					
Rat	<a href="#">ASG_Rat</a>	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	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	<a href="#">SHK2_INS_Health</a>	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Amp	<a href="#">SHK2_SV</a>	O	Dummy sampled value		
Amp.d: (Instance) (RO)Dummy SV value					
Rat	<a href="#">ASG_Rat</a>	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	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	<a href="#">SHK2_INS_Health</a>	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Amp	<a href="#">SHK2_SV</a>	O	Dummy sampled value		
Amp.d: (Instance) (RO)Dummy SV value					
Rat	<a href="#">ASG_Rat</a>	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	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	<a href="#">SHK2_INS_Health</a>	M	Health		

Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Vol	<a href="#">SHK2_SV</a>	O	Dummy sampled value		
Vol.d: (Instance) (RO)Dummy SV value					
Rat	<a href="#">ASG_Rat</a>	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	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctlModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	<a href="#">SHK2_INS_Health</a>	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Vol	<a href="#">SHK2_SV</a>	O	Dummy sampled value		
Vol.d: (Instance) (RO)Dummy SV value					
Rat	<a href="#">ASG_Rat</a>	O	Winding ratio of external voltage transformer (transducer) if applicable		

Rat.d: (Instance) (RO)VT Ratio Phase B
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**Logical node TEMPLATEMeas/setTVTR3: type= SHK2\_TVTR, base class= TVTR: VT Ratio Phase C**

DATA	Type	M/O	Description	Transient	Access Control
Mod	<a href="#">SHK2_INC_Mod</a>	M	Mode		
Mod.stVal: (Template) (RO)on					
Mod.ctIModel: (Template) (RO)status-only					
Mod.d: (Template) (RO)Operating Mode					
Beh	<a href="#">SHK2_INS_Beh</a>	M	Behaviour		
Beh.stVal: (Template) (RO)on					
Beh.d: (Template) (RO)Operating Mode Behavior					
Health	<a href="#">SHK2_INS_Health</a>	M	Health		
Health.stVal: (Template) (RO)Ok					
Health.d: (Template) (RO)1=Ok,2=Warning,3=Alarm					
NamPlt	<a href="#">SHK2_LPL_STD</a>	M	Name plate		
NamPlt.vendor: (Template) (RO)Electro Industries					
NamPlt.swRev: (Template) (RO)					
NamPlt.d: (Template) (RO)Logical Node Nameplate					
Vol	<a href="#">SHK2_SV</a>	O	Dummy sampled value		
Vol.d: (Instance) (RO)Dummy SV value					
Rat	<a href="#">ASG_Rat</a>	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)
<b>Measurand</b>					
instMag	<a href="#">AnalogueValue</a>	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 <a href="#">Beh</a>	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 <a href="#">Health</a>	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	<a href="#">AnalogueValue</a>	MX			
mag	<a href="#">AnalogueValue</a>	MX		dchg	
q	Quality	MX		qchg	
t	Timestamp	MX			
Configuration, Description					
db	INT32U	CF			
rangeC	<a href="#">RangeConfig</a>	CF			
d	VisString255	DC	Text		

**Common DATA class CMV of variant CMV\_mag:**

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

**Common DATA class CMV of variant CMV\_mag\_noDC:**

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

**Common DATA class WYE of variant WYE\_ABC\_mag:**

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsA	<a href="#">CMV_mag</a>				
phsB	<a href="#">CMV_mag</a>				
phsC	<a href="#">CMV_mag</a>				
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	<a href="#">CMV_mag_noDC</a>				
phsB	<a href="#">CMV_mag_noDC</a>				
phsC	<a href="#">CMV_mag_noDC</a>				
Configuration, Description					
d	VisString255	DC	Text		

**Common DATA class WYE of variant WYE\_ABCN\_mag:**

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsA	<a href="#">CMV_mag</a>				
phsB	<a href="#">CMV_mag</a>				
phsC	<a href="#">CMV_mag</a>				
neut	<a href="#">CMV_mag</a>				
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	<a href="#">CMV_mag_noDC</a>				
phsB	<a href="#">CMV_mag_noDC</a>				
phsC	<a href="#">CMV_mag_noDC</a>				
neut	<a href="#">CMV_mag_noDC</a>				
Configuration, Description					
d	VisString255	DC	Text		

**Common DATA class DEL of variant DEL\_ABC\_mag:**

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsAB	<a href="#">CMV_mag</a>				
phsBC	<a href="#">CMV_mag</a>				
phsCA	<a href="#">CMV_mag</a>				
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	<a href="#">CMV_mag_noDC</a>				
phsBC	<a href="#">CMV_mag_noDC</a>				
phsCA	<a href="#">CMV_mag_noDC</a>				
Configuration, Description					
d	VisString255	DC	Text		

**Common DATA class DEL of variant DEL\_ABCN\_mag:**

Attribute	Type	FC	Description	TrgOp	R/W(value)
phsAB	<a href="#">CMV_mag</a>				
phsBC	<a href="#">CMV_mag</a>				
phsCA	<a href="#">CMV_mag</a>				
Configuration, Description					
d	VisString255	DC	Text		

**Common DATA class INC of variant SHK2\_INC\_Mod:**

Attribute	Type	FC	Description	TrgOp	R/W(value)
<b>Status</b>					
stVal	Enum <a href="#">Beh</a>	ST		dchg	RO(on)
q	Quality	ST		qchg	
t	Timestamp	ST			
<b>Configuration, Description</b>					
ctlModel	Enum <a href="#">CtlModels</a>	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)
<b>Settings</b>					
setMag	<a href="#">AnalogueValue</a>	SP			
<b>Configuration, Description</b>					
d	VisString255	DC	Text		

**Common DATA class DPL of variant SHK2\_DPL:**

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

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	<a href="#">AnalogueValue_RCconst</a>	Not Used	
hLim	<a href="#">AnalogueValue_RCconst</a>	Not Used	
lLim	<a href="#">AnalogueValue_RCconst</a>	Not Used	
llLim	<a href="#">AnalogueValue_RCconst</a>	Not Used	
min	<a href="#">AnalogueValue_RCvar</a>	Minimum process measurement used for %deadband.	Spec
max	<a href="#">AnalogueValue_RCvar</a>	Maximum process measurement used for %deadband.	Spec

### Attribute structure Vector\_mag:

Attribute	Type	Description	R/W
mag	<a href="#">AnalogueValue</a>	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	

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## 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 begin 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)**