IEC 61850 Standard Application Guide

For the Shark® 200 Meter

V.1.05
October 19, 2021

Electro Industries/GaugeTech™

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Published by:

Electro Industries/GaugeTech

1800 Shames Drive

Westbury, NY 11590

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1: Introduction

This application guide contains detailed information on the IEC 61850 Standard implementation for the Electro Industries' Shark® 200 meter. This information is intended as a supplemental aid for using this meter's IEC 61850 feature. For detailed information concerning the meter and the IEC 61850 Standard implementation for it, please refer to the *Shark® 200 Meter Installation and Operation Guide*.

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2: Protocol Implementation Conformance Statement (PICS)

This chapter explains how the IEC 61850 interface in the Shark® 200 device adheres to the IEC 61850 Standard.

2.1: Overview

The following Abstract Communications Service Interface (ACSI) conformance statements are used to provide an overview and details about the INP300S network card for Shark® products:

- ACSI basic conformance statement
- ACSI models conformance statement
- ACSI service conformance statement

The statements specify the communication features mapped to IEC 61850-8-1.

2.2: ACSI Basic Conformance Statement

The basic conformance statement is defined in Table 2.1.

		Client/ Subscriber	Server/ Publisher	Value/ Comments
Client-Server roles				
B11	Server side (of TWO-PARTY-APPLICATION-ASSOCIATION)	___	Y	
B12	Client side of (TWO-PARTY-APPLICATION-ASSOCIATION)		___	
SCSMs supported				
B21	SCSM: IEC 61850-8-1 used		Y	
B22	SCSM: IEC 61850-9-1 used			
B23	SCSM: IEC 61850-9-2 used			
B24	SCSM: other			
Generic substation event model (GSE)				
B31	Publisher side	___		
B32	Subscriber side		___	
Transmission of sampled value model (SVC)				
B41	Publisher side	___		
B42	Subscriber side		___	
Y = supported N or empty = not supported ___ = not applicable				

Table 2.1: ACSI Basic Conformance Statement

2.3: ACSI Models Conformance Statement

The ACSI models conformance statement is defined in Table 2.2.

		Client/ Subscriber	Server/ Publisher	Value/ Comments
If Server or Client side (B11/12) supported				
M1	Logical device		Y	
M2	Logical node		Y	
M3	Data		Y	
M4	Data set		Y	
M5	Substitution		N	
M6	Setting group control		N	
	Reporting		Y	
M7	Buffered report control		Y	
M7-1	sequence-number		Y	
M7-2	report-time-stamp		Y	
M7-3	reason-for-inclusion		Y	
M7-4	data-set-name		Y	
M7-5	data-reference		Y	
M7-6	buffer-overflow		Y	
M7-7	entryID		Y	
M7-8	BufTim		Y	
M7-9	IntgPd		Y	
M7-10	GI		Y	
M7-11	conf-revision		Y	
M8	Unbuffered report control		Y	
M8-1	sequence-number		Y	
M8-2	report-time-stamp		Y	
M8-3	reason-for-inclusion		Y	
M8-4	data-set-name		Y	
M8-5	data-reference		Y	
M8-6	BufTim		Y	
M8-7	IntgPd		Y	

		Client/ Subscriber	Server/ Publisher	Value/ Comments
M8-8	GI		Y	
M8-9	conf-revision		Y	
	Logging		N	
M9	Log control		N	
M9-1	IntgPd		N	
M10	Log		N	
M11	Control		Y	Status Only
If GSE (B31/32) is supported				
M12	GOOSE		N	
M13	GSSE		N	
If SVC (41/42) is supported				
M14	Multicast SVC		N	
M15	Unicast SVC		N	
If Server or Client side (B11/12) supported				
M16	Time	Y		
M17	File Transfer		N	
Y = service is supported N or empty = service is not supported				

Table 2.2: ACSI Models Conformance Statement

2.4: ACSI Service Conformance Statement

The ACSI service conformance statement is defined in Table 2.3 (dependent on the statements in Table 2.1).

	Services	AA: TP/MC	Client (C)	Server (S)	Comments
Server					
S1	ServerDirectory	TP		Y	
Application association					
S2	Associate			Y	
S3	Abort			Y	
S4	Release			Y	
Logical device					
S5	LogicalDevice-Directory	TP		Y	
Logical node					
S6	LogicalNodeDi-rectory	TP		Y	
S7	GetAllDataVal-ues	TP		Y	
Data					
S8	GetDataValues	TP		Y	
S9	SetDataValues	TP		N	
S10	GetDataDirec-tory	TP		Y	
S11	GetDataDefini-tion	TP		Y	
Data set					
S12	GetDataSetVal-ues	TP		Y	

	Services	AA: TP/MC	Client (C)	Server (S)	Comments
S13	SetDataSetVal-ues	TP		N	
S14	CreateDataSet	TP		N	
S15	DeleteDataSet	TP		N	
S16	GetDataSetDi-rectory	TP		Y	
Substitution					
S17	SetDataValues	TP		N	
S18	SelectActiveSG	TP		N	
S19	SelectEditSG	TP		N	
S20	SetSGValues	TP		N	
S21	ConfirmEditS-GValues	TP		N	
S22	GetSGValues	TP		N	
S23	GetSGCBValues	TP		N	
Reporting					
Buffered report control block (BRCB)					
S24	Report	TP		Y	
S24-1	data-change (dchg)			Y	
S24-2	qchg-change (qchg)			Y	Quality attribute does not change after power up, so even though this bit is writable no quality events will be generated.
S24-3	data-update (dupd)			Y	This bit is writable, but no attribute of Trgop = dupd is supported by the device model
S25	GetBRCBValues	TP		Y	
S26	SetBRCBValues	TP		Y	

	Services	AA: TP/MC	Client (C)	Server (S)	Comments
Unbuffered report control block (URCB)					
S27	Report	TP		Y	
S27-1	data-change (dchg)			Y	
S27-2	qchg-change (qchg)			Y	Quality attribute does not change after power up, so even though this bit is writable no quality events will be generated.
S27-3	data-update (dupd)			Y	This bit is writable, but no attribute of Trgop = dupd is supported by the device model
S28	GetURCBValues	TP		Y	
S29	SetURCBValues	TP		Y	
Logging					
Log control block					
S30	GetLCBValues	TP		N	
S31	SetLCBValues	TP		N	
Log					
S32	QueryLogBy-Time	TP		N	
S33	QueryLog-ByEntry	TP		N	
S34	GetLogSta-tusValues	TP		N	
Generic substation event model (GSE)					
GOOSE-CONTROL-BLOCK					
S35	SendGOOSE-Message	MC	N	N	
S36	GetReference	TP		N	

	Services	AA: TP/MC	Client (C)	Server (S)	Comments
S37	GetGOOSEEle-ment-Number	TP		N	
S38	GetGoCBValues	TP	N	N	
S39	SetGoCBValues	TP	N	N	
GSSE-CONTROL-BLOCK					
S40	SendGSSEMes-sage	MC	N	N	
S41	GetReference	TP	N	N	
S42	GetGSSEEle-mentNumber	TP	N	N	
S43	GetGsCBValues	TP	N	N	
S44	SetGsCBValues	TP	N	N	
Transmission of sampled value model (SVC)					
Multicast SVC					
S45	SendMSVMes-sage	MC	N	N	
S46	GetMSVCBVal-ues	TP	N	N	
S47	SetMSVCBVal-ues	TP	N	N	
Unicast SVC					
S48	SendUSVMes-sage	TP	N	N	
S49	GetUSVCBVal-ues	TP	N	N	
S50	SetUSVCBVal-ues	TP	N	N	
Control					
S51	Select			N	
S52	SelectWithValue	TP		N	
S53	Cancel	TP		N	
S54	Operate	TP		N	

	Services	AA: TP/MC	Client (C)	Server (S)	Comments
S55	Command-Termination	TP		N	
S56	TimeActivated-Operate	TP		N	
File transfer					
S57	GetFile	TP		N	
S58	SetFile	TP		N	
S59	DeleteFile	TP		N	
S60	GetFileAt-tributeValues	TP		N	
Time					
T1	Time resolution of internal clock			9	nearest negative power of 2 in seconds
T2	Time accuracy of internal clock			1	T0
T3	Supported TimeStamp resolution			9	nearest negative power of 2 in seconds
Y = service is supported N or empty = service is not supported					

Table 2.3: ACSI Service Conformance Statement

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3: Protocol Implementation Extra Information for Testing (PIXIT)

This chapter specifies the PIXIT of the IEC 61850 interface in the Shark® 200 meter. The table in each section specifies the PIXIT for the applicable ACSI service model as structured in IEC 61850-10.

3.1: Overview

Together with the PICS (see Chapter 2) and the MICS (see Chapter 5), the PIXIT forms the basis for a conformance test according to IEC 61850-10.

3.2: PIXIT for Association Model

ID	Description	Value / Clarification
As1	Maximum number of clients that can set up an association simultaneously	5
As2	TCP_KEEPALIVE value	3600 seconds
As3	Lost connection detection time	7200 seconds
As4	Is authentication supported?	N
As5	What association parameters are necessary for successful association?	Transport Selector Y Session selector Y Presentation selector Y AP Title N AE Qualifier N
As6	If association parameters are necessary for association, describe the correct values	Transport Selector * Session selector * Presentation selector * *=As specified in ICD file
As7	What is the maximum and minimum MMS PDU size?	Max MMS PDU size 32717 Min MMS PDU size 512
As8	What is the maximum start up time after a power supply interrupt?	30 seconds

3.3: PIXIT for Server Model

ID	Description	Value / Clarification
Sr1	Which analog value (MX) quality bits are supported (can be set by server)?	Validity: Y Good N Invalid N Reserved N Questionable detailQual: N Overflow N OutofRange N BadReference N Oscillatory N Failure Y OldData N Inconsistent N Inaccurate Source: N Process N Substituted Test: N OperatorBlocked: N
Sr2	Which status value (ST) quality bits are supported (can be set by server)?	Validity: Y Good N Invalid N Reserved N Questionable detailQual: N Overflow N OutofRange N BadReference N Oscillatory N Failure N OldData N Inconsistent N Inaccurate Source: N Process N Substituted Test: N OperatorBlocked: N
Sr3	What is the maximum number of data values in one GetDataValues request?	Limited only by PDU size
Sr4	What is the maximum number of data values in one SetDataValues request?	SetDataValues is not supported

ID	Description	Value / Clarification
Sr5	Which Mode / Behavior values are supported?	Y On N Blocked N Test N Test/Blocked N Off

NOTE: All the MX measurements and ST values are updated based on a 1-second fixed scan period.

3.4: PIXIT for Data Set Model

ID	Description	Value / Clarification
Ds1	What is the maximum number of data elements in one data set (compare ICD setting)?	256
Ds2	How many persistent data sets can be created by one or more clients?	8 (only through configuration file)
Ds3	How many non-persistent data sets can be created by one or more clients?	0

3.5: PIXIT for Reporting Model

ID	Description	Value / Clarification
Rp1	The supported trigger conditions are (compare PICS)	Y integrity Y data change Y quality change N data update Y general interrogation
Rp2	The supported optional fields are	Y sequence-number Y report-time-stamp Y reason-for-inclusion Y data-set-name Y data-reference Y buffer-overflow Y entryID Y conf-rev Y segmentation
Rp3	Can the server send segmented reports?	Y
Rp4	Mechanism on second internal data change notification of the same analogue data value within buffer period (Compare IEC 61850-7-2 $14.2.2.9)	Send report immediately

ID	Description	Value / Clarification
Rp5	Multi client URCB approach (compare IEC 61850-7-2 $14.2.1)	Each URCB is visible to all clients
Rp6	What is the format of EntryID?	X000YYYY for octets 1..8 YYYY values increment by random amount, X increments when YYYY rolls to its maximum value
Rp7	What is the buffer size for each BRCB or how many reports can be buffered?	20000 octets
Rp8	Pre-configured RCB attributes that cannot be changed online when RptEna = FALSE (see also the ICD report settings)	cbName (*) datSet (*) (*) these can be changed only by loading a new .cid file
Rp9	May the reported data set contain: - structured data objects? - data attributes?	 Y Y
Rp10	What is the scan cycle for binary events? Is this fixed, configurable?	Fixed 1 second
Rp11	Does the device support pre-assigning an RCB to a specific client in the SCL?	N

3.6: PIXIT for Time and Time Synchronization Model

ID	Description	Value / Clarification
Tm1	What quality bits are supported (may be set by the IED)	Y LeapSecondsKnown Y ClockFailure Y ClockNotSynchronized
Tm2	Describe the behavior when the time synchronization signal/messages are lost	Time is kept by an internal clock, but this clock is not accurate
Tm3	When is the time quality bit "ClockFailure" set?	After power up, if there are no trustable sources for setting time at least once
Tm4	When is the time quality bit "Clock not synchronized" set?	After power up, if the only clock source is the internal battery backed up clock After 150 seconds of losing contact with the time server

ID	Description	Value / Clarification
Tm5	Is the timestamp of a binary event adjusted to the configured scan cycle?	Y
Tm6	Does the device support time zone and day-light saving?	Y
Tm7	Which attributes of the SNTP response packet are validated?	Y Leap indicator not equal to 3? Y Mode is equal to SERVER Y OriginateTimestamp is equal to value sent by the SNTP client as Transmit Timestamp N RX/TX timestamp fields are checked for reasonableness Y SNTP version 3 and/or 4 Y Server must be Synchronized

3.7: PIXIT Models Not Supported

The following models are not supported for the Shark® 200 meter's IEC 61850 interface:

- Substitution model
- Setting group control model
- Logging model
- Generic substation events model
- Control model
- File transfer model

4: Data Objects List

This chapter provides detailed tables of the data objects for the Shark® 200 meter's IEC 61850 implementation.

4.1: Overview

The Logical Nodes (LN) implemented in the Shark® 200 IEC 61850 server are listed below:

- The node LLN0 keeps common information for the entire logical device. In this node Datasets and Reports can be defined, based on the limitations provided in the ICD file.
- The node LPHD1 defines physical parameters such as vendor, serial number, device name plate and the software revision number.
- The node nsMMXU1 contains the "normal-speed" basic electrical measurements.
- The node nsMHAI1 groups together the THD per phase measurements taken at normal speed.
- The node eneMMTR1 groups together all measurements related to energy counters, like +/- Watt-hours, +/- VAr-hours and Total VA-hours.
- The nodes setTCTR1, setTCTR2, setTCTR3 and setTCTR4 contain the ratio of the current used by the measuring device, for phases A,B,C and Neutral, respectively. In this way, the user can take the IEC measurements (primary) and convert them to Secondary using the ratios contained in these nodes.
- The nodes setTVTR1, setTVTR2 and setTVTR3 contain the ratio of the voltage used by the measuring device.

NOTE: The normal-speed in the Shark® 200 meter are measurements taken every second.

4.2: Detailed Data Object Tables

The following tables show the data objects for each logical node.

Logical Node: SHARK200IECMeas/LLN0

Object Path	Sample Value	Comment
SHARK200IECMeas/LLN0CFMod$ctlModel	0=Default Model	Constant. Read Only.
SHARK200IECMeas/LLN0DCBeh$d	"Operating Mode Behavior"	Read Only
SHARK200IECMeas/LLN0DCHealth$d	1=OK,2=Warning,3=Alarm	Read Only
SHARK200IECMeas/LLN0DCMod$d	"Operating Mode"	Read Only
SHARK200IECMeas/LLN0DCNamPlt$configRev	Electro Industries	Read Only. Constant
SHARK200IECMeas/LLN0DCNamPlt$d	"Logical Node Nameplate"	Read Only. Constant
SHARK200IECMeas/LLN0DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/LLN0DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/LLN0EXNamPlt$ldNs	IEC 61850-7-4:2003	Read Only. Constant
SHARK200IECMeas/LLN0STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/LLN0STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/LLN0STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/LLN0STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/LLN0STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/LLN0STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/LLN0STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/LLN0STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/LLN0STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

Logical Node: SHARK200IECMeas/LPHD1

Object Path	Sample Value	Comment
SHARK200IECMeas/LPHD1DCPhyHealth$d	1=OK,2=Warning,3=Alarm	Read Only
SHARK200IECMeas/LPHD1DCPhyNam$model	Shark200	Read Only. Constant
SHARK200IECMeas/LPHD1DCPhyNam$serNum	Serial Number	Read only. Constant
SHARK200IECMeas/LPHD1DCPhyNam$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/LPHD1DCPhyNam$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/LPHD1DCProxy$d	True if this LD is a proxy for an external device	Read Only. Constant
SHARK200IECMeas/LPHD1STPhyHealth$q	(Good) 0000000000000	Read only. Constant
SHARK200IECMeas/LPHD1STPhyHealth$stVal	(Good) 0000000000000	Read only. Constant
SHARK200IECMeas/LPHD1STPhyHealth$t	Meter Time Stamp	Populated when server is up.
SHARK200IECMeas/LPHD1STProxy$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/LPHD1STProxy$stVal	0 (false)	Read only. Constant
SHARK200IECMeas/LPHD1STProxy$t	Meter Time Stamp	Populated when server is up.

Logical Node: SHARK200IECMeas/eneMMTR1

Object Path	Sample Value	Comment
SHARK200IECMeas/eneMMTR1CFDmdVArh$pulsQty	1	Read Only
SHARK200IECMeas/eneMMTR1CFDmdWh$pulsQty	1	Read Only
SHARK200IECMeas/eneMMTR1CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/eneMMTR1CFSupVArh$pulsQty	1	Read Only
SHARK200IECMeas/eneMMTR1CFSupWh$pulsQty	1	Read Only
SHARK200IECMeas/eneMMTR1CFTotVAh$pulsQty	1	Read Only
SHARK200IECMeas/eneMMTR1DCBeh$d	"Operating Mode Behavior"	Read Only
SHARK200IECMeas/eneMMTR1DCDmdVArh$d	Generated VAr-hours	Read Only
SHARK200IECMeas/eneMMTR1DCDmdWh$d	Generated Watt-hours	Read Only
SHARK200IECMeas/eneMMTR1DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only
SHARK200IECMeas/eneMMTR1DCMod$d	"Operating Mode"	Read Only
SHARK200IECMeas/eneMMTR1DCNamPlt$d	"Logical Node Nameplate"	Read Only
SHARK200IECMeas/eneMMTR1DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Firmare Version for Boot/Run/IEC61850
SHARK200IECMeas/eneMMTR1DCNamPlt$vendor	"Electro Industries"	Read Only
SHARK200IECMeas/eneMMTR1DCSupVArh$d	Consumed VAr-hours	Read Only
SHARK200IECMeas/eneMMTR1DCSupWh$d	Consumed Watt-hours	Read Only
SHARK200IECMeas/eneMMTR1DCTotVAh$d	Total VA-hours	Read Only
SHARK200IECMeas/eneMMTR1STBeh$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/eneMMTR1STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/eneMMTR1STBeh$t	Meter Ttime Stamp	Populated when server is up.
SHARK200IECMeas/eneMMTR1STDmdVArh$actVal	Meter Demand Var-h current value	Integer
SHARK200IECMeas/eneMMTR1STDmdVArh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/eneMMTR1STDmdVArh$t	Meter Time Stamp	UTC time of last current measure
SHARK200IECMeas/eneMMTR1STDmdWh$actVal	Meter Demand Wh current value	Integer
SHARK200IECMeas/eneMMTR1STDmdWh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/eneMMTR1STDmdWh$t	Meter Ttime Stamp	UTC time of last current measure
SHARK200IECMeas/eneMMTR1STHealth$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/eneMMTR1STHealth$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/eneMMTR1STHealth$t	Meter Time Stamp	Populated when server is up.
SHARK200IECMeas/eneMMTR1STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/eneMMTR1STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/eneMMTR1STMod$t	Meter timestamp / UTC-Time	Populated when server is up.
SHARK200IECMeas/eneMMTR1STSupVArh$actVal	Meter Supplied Var-h current value	Integer
SHARK200IECMeas/eneMMTR1STSupVArh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/eneMMTR1STSupVArh$t	Meter Time Stamp	UTC time of last current measure
SHARK200IECMeas/eneMMTR1STSupWh$actVal	Meter Supplied Wh current value	Integer
SHARK200IECMeas/eneMMTR1STSupWh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/eneMMTR1STSupWh$t	Meter Time Stamp	UTC time of last current measure
SHARK200IECMeas/eneMMTR1STTotVAh$actVal	Meter Total VA-h current value	Integer
SHARK200IECMeas/eneMMTR1STTotVAh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/eneMMTR1STTotVAh$t	Meter Time Stamp	UTC time of last current measure

Logical Node: SHARK200IECMeas/nsMHAI1

Object Path	Sample Value	Comment
SHARK200IECMeas/nsMHAI1CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/nsMHAI1CFThdPhV$phsA$rangeC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMHAI1CFThdPhV$phsA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMHAI1CFThdPhV$phsA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMHAI1CFThdPhV$phsA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMHAI1CFThdPhV$phsA$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMHAI1CFThdPhV$phsA$rangeCmaxf	100.00	Populated when server is up.
SHARK200IECMeas/nsMHAI1CFThdPhV$phsA$rangeCminf	1.00	Populated when server is up.
SHARK200IECMeas/nsMHAI1CFThdPhV$phsB$rangeC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMHAI1CFThdPhV$phsB$rangeC$hhLim$f	0.00	Read Only. Constant
SHARK200IECMeas/nsMHAI1CFThdPhV$phsB$rangeC$hLim$f	0.00	Read Only. Constant
SHARK200IECMeas/nsMHAI1CFThdPhV$phsB$rangeC$lLim$f	0.00	Read Only. Constant
SHARK200IECMeas/nsMHAI1CFThdPhV$phsB$rangeC$llLim$f	0.00	Read Only. Constant
SHARK200IECMeas/nsMHAI1CFThdPhV$phsB$rangeCmaxf	99.99	Populated when server is up.
SHARK200IECMeas/nsMHAI1CFThdPhV$phsB$rangeCminf	1.00	Populated when server is up.
SHARK200IECMeas/nsMHAI1CFThdPhV$phsC$rangeC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMHAI1CFThdPhV$phsC$rangeC$hhLim$f	0.00	Read Only. Constant
SHARK200IECMeas/nsMHAI1CFThdPhV$phsC$rangeC$hLim$f	0.00	Read Only. Constant
SHARK200IECMeas/nsMHAI1CFThdPhV$phsC$rangeC$lLim$f	0.00	Read Only. Constant
SHARK200IECMeas/nsMHAI1CFThdPhV$phsC$rangeC$llLim$f	0.00	Read Only. Constant
SHARK200IECMeas/nsMHAI1CFThdPhV$phsC$rangeCmaxf	99.99	Populated when server is up.
SHARK200IECMeas/nsMHAI1CFThdPhV$phsC$rangeCminf	1.00	Populated when server is up.
SHARK200IECMeas/nsMHAI1DCBeh$d	"Operating Mode Behavior"	Read Only
SHARK200IECMeas/nsMHAI1DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only
SHARK200IECMeas/nsMHAI1DCMod$d	"Operating Mode"	Read Only

SHARK200IECMeas/nsMHAI1DCNamPlt$d	"Logical Node Nameplate"	Read Only. Constant
SHARK200IECMeas/nsMHAI1DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/nsMHAI1DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/nsMHAI1DCThdPhV$d	"THD for 3 phases"	Read Only. Constant
SHARK200IECMeas/nsMHAI1MXThdPhV$phsA$cValmagf	normal sampling current THD of phase A	Read Only. Updated when deadband is hit
SHARK200IECMeas/nsMHAI1MXThdPhV$phsA$instCValmagf	normal sampling current THD of phase A	Read Only
SHARK200IECMeas/nsMHAI1MXThdPhV$phsA$q	Quality, (Good) 0000000000000	Read Only. Current quality of THD reading.
SHARK200IECMeas/nsMHAI1MXThdPhV$phsA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMHAI1MXThdPhV$phsB$cValmagf	normal sampling current THD of phase B	Read Only. Updated when deadband is hit
SHARK200IECMeas/nsMHAI1MXThdPhV$phsB$instCValmagf	normal sampling current THD of phase B	Read Only
SHARK200IECMeas/nsMHAI1MXThdPhV$phsB$q	Quality, (Good) 0000000000000	Read Only. Current quality of THD reading.
SHARK200IECMeas/nsMHAI1MXThdPhV$phsB$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMHAI1MXThdPhV$phsC$cValmagf	normal sampling current THD of phase C	Read Only. Updated when deadband is hit
SHARK200IECMeas/nsMHAI1MXThdPhV$phsC$instCValmagf	normal sampling current THD of phase C	Read Only
SHARK200IECMeas/nsMHAI1MXThdPhV$phsC$q	Quality, (Good) 0000000000000	Read Only. Current quality of THD reading.
SHARK200IECMeas/nsMHAI1MXThdPhV$phsC$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMHAI1STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/nsMHAI1STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/nsMHAI1STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/nsMHAI1STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/nsMHAI1STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/nsMHAI1STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/nsMHAI1STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/nsMHAI1STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/nsMHAI1STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

Logical Node: SHARK200IECMeas/nsMMXU1

Object Path	Sample Value	Comment
SHARK200IECMeas/nsMMXU1CFA$neut$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFA$neut$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$neut$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$neut$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$neut$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$neut$rangeCmaxf	10.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFA$neut$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFA$phsA$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFA$phsA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsA$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsA$rangeCmaxf	10.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFA$phsA$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFA$phsB$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFA$phsB$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsB$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsB$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsB$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsB$rangeCmaxf	10.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFA$phsB$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFA$phsC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFA$phsC$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsC$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsC$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsC$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFA$phsC$rangeCmaxf	10.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFA$phsC$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFHz$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFHz$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFHz$rangeC$hLim$f	0.00	Read Only

SHARK200IECMeas/nsMMXU1CFHz$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFHz$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFHz$rangeC$max$f	65.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFHz$rangeC$min$f	45.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsA$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPF$phsA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsA$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsA$rangeCmaxf	1.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPF$phsA$rangeCminf	-1.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPF$phsB$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPF$phsB$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsB$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsB$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsB$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsB$rangeCmaxf	1.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPF$phsB$rangeCminf	-1.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPF$phsC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPF$phsC$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsC$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsC$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsC$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPF$phsC$rangeCmaxf	1.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPF$phsC$rangeCminf	-1.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPhV$phsA$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPhV$phsA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsA$rangeC$llLim$f	0.00	Read Only

SHARK200IECMeas/nsMMXU1CFPhV$phsA$rangeCmaxf	600.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPhV$phsA$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPhV$phsB$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPhV$phsB$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsB$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsB$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsB$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsB$rangeCmaxf	600.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPhV$phsB$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPhV$phsC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPhV$phsC$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsC$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsC$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsC$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPhV$phsC$rangeCmaxf	600.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPhV$phsC$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPPV$phsAB$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPPV$phsAB$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsAB$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsAB$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsAB$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsAB$rangeCmaxf	600.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPPV$phsAB$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPPV$phsBC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPPV$phsBC$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsBC$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsBC$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsBC$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsBC$rangeCmaxf	600.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPPV$phsBC$rangeCminf	0.00	Populated when server is up.

SHARK200IECMeas/nsMMXU1CFPPV$phsCA$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFPPV$phsCA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsCA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsCA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsCA$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFPPV$phsCA$rangeCmaxf	600.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFPPV$phsCA$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFTotPF$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFTotPF$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotPF$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotPF$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotPF$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotPF$rangeC$max$f	1.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFTotPF$rangeC$min$f	-1.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFTotVA$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFTotVA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotVA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotVA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotVA$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotVA$rangeC$max$f	18000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFTotVA$rangeC$min$f	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFTotVAr$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFTotVAr$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotVAr$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotVAr$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotVAr$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotVAr$rangeC$max$f	18000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFTotVAr$rangeC$min$f	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFTotW$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFTotW$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotW$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotW$rangeC$lLim$f	0.00	Read Only

SHARK200IECMeas/nsMMXU1CFTotW$rangeC$lLLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFTotW$rangeC$max$f	18000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFTotW$rangeC$min$f	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVA$phsA$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFVA$phsA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsA$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsA$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVA$phsA$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVA$phsB$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFVA$phsB$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsB$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsB$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsB$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsB$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVA$phsB$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVA$phsC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFVA$phsC$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsC$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsC$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsC$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVA$phsC$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVA$phsC$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVAr$phsA$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFVAr$phsA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsA$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsA$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVAr$phsA$rangeCminf	0.00	Populated when server is up.

SHARK200IECMeas/nsMMXU1CFVAr$phsB$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFVAr$phsB$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsB$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsB$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsB$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsB$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVAr$phsB$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVAr$phsC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFVAr$phsC$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsC$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsC$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsC$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFVAr$phsC$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFVAr$phsC$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFW$phsA$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFW$phsA$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsA$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsA$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsA$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsA$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFW$phsA$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFW$phsB$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFW$phsB$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsB$rangeC$hLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsB$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsB$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsB$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFW$phsB$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFW$phsC$db	100000 = 100%	Deadband Unsigned Integer, configured through CID
SHARK200IECMeas/nsMMXU1CFW$phsC$rangeC$hhLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsC$rangeC$hLim$f	0.00	Read Only

SHARK200IECMeas/nsMMXU1CFW$phsC$rangeC$lLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsC$rangeC$llLim$f	0.00	Read Only
SHARK200IECMeas/nsMMXU1CFW$phsC$rangeCmaxf	6000.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1CFW$phsC$rangeCminf	0.00	Populated when server is up.
SHARK200IECMeas/nsMMXU1DCA$d	instantaneous normal speed Per-Phase Amperes	Read Only
SHARK200IECMeas/nsMMXU1DCBeh$d	Operating Mode Behavior	Read Only
SHARK200IECMeas/nsMMXU1DCHealth$d	Health of the Meter. 1=Ok,2=Warning,3=Alarm	Read Only
SHARK200IECMeas/nsMMXU1DCHz$d	instantaneous normal speed Frequency	Read Only
SHARK200IECMeas/nsMMXU1DCMod$d	Operating Mode	Read Only
SHARK200IECMeas/nsMMXU1DCNamPlt$d	Logical Node Nameplate	Read Only
SHARK200IECMeas/nsMMXU1DCNamPlt$swRev	B:0002/R:0028/N:BF	Read Only
SHARK200IECMeas/nsMMXU1DCNamPlt$vendor	Electro Industries	Read Only
SHARK200IECMeas/nsMMXU1DCPF$d	instantaneous normal speed Per-Phase Power Factor	Read Only
SHARK200IECMeas/nsMMXU1DCPhV$d	instantaneous normal speed Phase-to-Neutral(ground) voltage	Read Only
SHARK200IECMeas/nsMMXU1DCPPV$d	instantaneous normal speed Phase-to-Phase voltage	Read Only
SHARK200IECMeas/nsMMXU1DCTotPF$d	instantaneous normal speed Total Power Factor	Read Only
SHARK200IECMeas/nsMMXU1DCTotVA$d	instantaneous normal speed Total VAs	Read Only
SHARK200IECMeas/nsMMXU1DCTotVAr$d	instantaneous normal speed Total VArs	Read Only
SHARK200IECMeas/nsMMXU1DCTotW$d	instantaneous normal speed Total Watts	Read Only
SHARK200IECMeas/nsMMXU1DCVA$d	instantaneous normal speed Per-Phase VAs	Read Only
SHARK200IECMeas/nsMMXU1DCVAr$d	instantaneous normal speed Per-Phase VArs	Read Only
SHARK200IECMeas/nsMMXU1DCW$d	instantaneous normal speed Per-Phase watts	Read Only
SHARK200IECMeas/nsMMXU1MXA$neut$cValmagf	0.00	Read Only, Neutral current. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXA$neut$instCValmagf	0.78	Current Neutral Current
SHARK200IECMeas/nsMMXU1MXA$neut$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXA$neut$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXA$phsA$cValmagf	0.00	Read Only, Phase A current. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXA$phsA$instCValmagf	0.00	Current Phase A Current
SHARK200IECMeas/nsMMXU1MXA$phsA$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXA$phsA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXA$phsB$cVal$mag	0.00	Read Only, Phase B current. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXA$phsB$instCValmagf	0.99	Current Phase B Current

SHARK200IECMeas/nsMMXU1MXA$phsB$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXA$phsB$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXA$phsC$cValmagf	0.00	Read Only, Phase C current. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXA$phsC$instCValmagf	1.03	Current Phase C Current
SHARK200IECMeas/nsMMXU1MXA$phsC$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXA$phsC$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXHz$instMag$f	60.07	Read Only, Frequency. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXHzmagf	0.00	Current Line Frequency
SHARK200IECMeas/nsMMXU1MXHz$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXHz$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXPF$phsA$cValmagf	0.00	Read Only, Phase A Power Factor. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPF$phsA$instCValmagf	1.00	Current Phase A Power Factor
SHARK200IECMeas/nsMMXU1MXPF$phsA$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPF$phsA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXPF$phsB$cValmagf	0.00	Read Only, Phase B Power Factor. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPF$phsB$instCValmagf	1.00	Current Phase B Power Factor
SHARK200IECMeas/nsMMXU1MXPF$phsB$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPF$phsB$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXPF$phsC$cValmagf	0.00	Read Only, Phase C Power Factor. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPF$phsC$instCValmagf	1.00	Current Phase C Power Factor
SHARK200IECMeas/nsMMXU1MXPF$phsC$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPF$phsC$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXPhV$phsA$cValmagf	120.30	Read Only, Phase-A-Neutral Voltage. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPhV$phsA$instCValmagf	119.85	Current Phase-A-Neutral Voltage
SHARK200IECMeas/nsMMXU1MXPhV$phsA$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPhV$phsA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXPhV$phsB$cValmagf	0.00	Read Only, Phase-B-Neutral Voltage. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPhV$phsB$instCValmagf	120.39	Current Phase-B-Neutral Voltage
SHARK200IECMeas/nsMMXU1MXPhV$phsB$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPhV$phsB$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXPhV$phsC$cValmagf	0.00	Read Only, Phase-C-Neutral Voltage. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPhV$phsC$instCValmagf	120.15	Current Phase-C-Neutral Voltage
SHARK200IECMeas/nsMMXU1MXPhV$phsC$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPhV$phsC$t	UTC_Time	Read Only. Updated when deadband is hit.

SHARK200IECMeas/nsMMXU1MXPPV$phsAB$cValmagf	0.00	Read Only, Phase-A-to-B Voltage. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPPV$phsAB$instCValmagf	201.38	Current Phase-A-to-B
SHARK200IECMeas/nsMMXU1MXPPV$phsAB$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPPV$phsAB$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXPPV$phsBC$cValmagf	0.00	Read Only, Phase-B-to-C Voltage. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPPV$phsBC$instCValmagf	221.45	Current Phase-B-to-C
SHARK200IECMeas/nsMMXU1MXPPV$phsBC$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPPV$phsBC$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXPPV$phsCA$cValmagf	0.00	Read Only, Phase-A-to-A Voltage. Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXPPV$phsCA$instCValmagf	199.11	Current Phase-C-to-A
SHARK200IECMeas/nsMMXU1MXPPV$phsCA$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXPPV$phsCA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXTotPF$instMag$f	1.00	Read Only, Total Power Factor Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXTotPFmagf	0.00	Current Total Powre Factor
SHARK200IECMeas/nsMMXU1MXTotPF$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXTotPF$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXTotVA$instMag$f	242.47	Read Only, Total VA Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXTotVAmagf	0.00	Current Total VA
SHARK200IECMeas/nsMMXU1MXTotVA$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXTotVA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXTotVAr$instMag$f	7.65	Read Only, Total VAr Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXTotVArmagf	0.00	Current Total Var
SHARK200IECMeas/nsMMXU1MXTotVAr$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXTotVAr$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXTotW$instMag$f	242.25	Read Only, Total Watts Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXTotWmagf	0.00	Current Total Watts
SHARK200IECMeas/nsMMXU1MXTotW$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXTotW$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXVA$phsA$cValmagf	0.00	Read Only, Phase A VA Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXVA$phsA$instCValmagf	0.00	Current Phase A VA
SHARK200IECMeas/nsMMXU1MXVA$phsA$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXVA$phsA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXVA$phsB$cValmagf	0.00	Read Only, Phase B VA Updated by deadbanding

SHARK200IECMeas/nsMMXU1MXVA$phsB$instCValmagf	119.07	Current Phase B VA
SHARK200IECMeas/nsMMXU1MXVA$phsB$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXVA$phsB$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXVA$phsC$cValmagf	0.00	Read Only, Phase C VA Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXVA$phsC$instCValmagf	123.40	Current Phase C VA
SHARK200IECMeas/nsMMXU1MXVA$phsC$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXVA$phsC$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXVAr$phsA$cValmagf	0.00	Read Only, Phase A VAr Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXVAr$phsA$instCValmagf	0.00	Current Phase A VAr
SHARK200IECMeas/nsMMXU1MXVAr$phsA$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXVAr$phsA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXVAr$phsB$cValmagf	0.00	Read Only, Phase B VAr Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXVAr$phsB$instCValmagf	6.29	Current Phase B VAr
SHARK200IECMeas/nsMMXU1MXVAr$phsB$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXVAr$phsB$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXVAr$phsC$cValmagf	0.00	Read Only, Phase C VAr Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXVAr$phsC$instCValmagf	1.35	Current Phase C VAr
SHARK200IECMeas/nsMMXU1MXVAr$phsC$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXVAr$phsC$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXW$phsA$cValmagf	0.00	Read Only, Phase A Watts Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXW$phsA$instCValmagf	0.00	Current Phase A Watts
SHARK200IECMeas/nsMMXU1MXW$phsA$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXW$phsA$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXW$phsB$cValmagf	0.00	Read Only, Phase B Watts Updated by deadbanding

SHARK200IECMeas/nsMMXU1MXW$phsB$instCValmagf	118.88	Current Phase B Watts
SHARK200IECMeas/nsMMXU1MXW$phsB$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXW$phsB$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1MXW$phsC$cValmagf	0.00	Read Only, Phase C Watts Updated by deadbanding
SHARK200IECMeas/nsMMXU1MXW$phsC$instCValmagf	123.37	Current Phase C Watts
SHARK200IECMeas/nsMMXU1MXW$phsC$q	Quality, (Good) 0000000000000	Read Only. Current quality reading.
SHARK200IECMeas/nsMMXU1MXW$phsC$t	UTC_Time	Read Only. Updated when deadband is hit.
SHARK200IECMeas/nsMMXU1STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/nsMMXU1STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/nsMMXU1STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/nsMMXU1STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/nsMMXU1STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/nsMMXU1STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/nsMMXU1STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/nsMMXU1STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/nsMMXU1STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

SHARK200IECMeas/setTCTR1

Object Path	Sample Value	Comment
SHARK200IECMeas/setTCTR1CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/setTCTR1DCBeh$d	Operating Mode Behavior	Read Only. Constant
SHARK200IECMeas/setTCTR1DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only. Constant
SHARK200IECMeas/setTCTR1DCMod$d	"Operating Mode"	Read Only. Constant
SHARK200IECMeas/setTCTR1DCNamPlt$d	Logical Node Nameplate	Read Only. Constant
SHARK200IECMeas/setTCTR1DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/setTCTR1DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/setTCTR3DCRat$d	CT Ratio Phase A	Read Only. Constant
SHARK200IECMeas/setTCTR1SPRat$setMag$f	1.00	CT Ratio for Phase A
SHARK200IECMeas/setTCTR1STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/setTCTR1STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTCTR1STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTCTR1STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTCTR1STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTCTR1STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTCTR1STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/setTCTR1STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTCTR1STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

SHARK200IECMeas/setTCTR2

Object Path	Sample Value	Comment
SHARK200IECMeas/setTCTR2CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/setTCTR2DCBeh$d	Operating Mode Behavior	Read Only. Constant
SHARK200IECMeas/setTCTR2DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only. Constant
SHARK200IECMeas/setTCTR2DCMod$d	"Operating Mode"	Read Only. Constant
SHARK200IECMeas/setTCTR2DCNamPlt$d	Logical Node Nameplate	Read Only. Constant
SHARK200IECMeas/setTCTR2DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/setTCTR2DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/setTCTR3DCRat$d	CT Ratio Phase B	Read Only. Constant
SHARK200IECMeas/setTCTR2SPRat$setMag$f	1.00	CT Ratio for Phase B
SHARK200IECMeas/setTCTR2STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/setTCTR2STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTCTR2STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTCTR2STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTCTR2STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTCTR2STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTCTR2STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/setTCTR2STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTCTR2STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

SHARK200IECMeas/setTCTR3

Object Path	Sample Value	Comment
SHARK200IECMeas/setTCTR3CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/setTCTR3DCBeh$d	Operating Mode Behavior	Read Only. Constant
SHARK200IECMeas/setTCTR3DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only. Constant
SHARK200IECMeas/setTCTR3DCMod$d	"Operating Mode"	Read Only. Constant
SHARK200IECMeas/setTCTR3DCNamPlt$d	Logical Node Nameplate	Read Only. Constant
SHARK200IECMeas/setTCTR3DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/setTCTR3DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/setTCTR3DCRat$d	CT Ratio Phase C	Read Only. Constant
SHARK200IECMeas/setTCTR3SPRat$setMag$f	1	CT Ratio for Phase C
SHARK200IECMeas/setTCTR3STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/setTCTR3STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTCTR3STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTCTR3STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTCTR3STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTCTR3STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTCTR3STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/setTCTR3STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTCTR3STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

SHARK200IECMeas/setTCTR4

Object Path	Sample Value	Comment
SHARK200IECMeas/setTCTR4CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/setTCTR4DCBeh$d	Operating Mode Behavior	Read Only. Constant
SHARK200IECMeas/setTCTR4DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only. Constant
SHARK200IECMeas/setTCTR4DCMod$d	"Operating Mode"	Read Only. Constant
SHARK200IECMeas/setTCTR4DCNamPlt$d	Logical Node Nameplate	Read Only. Constant
SHARK200IECMeas/setTCTR4DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/setTCTR4DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/setTCTR4DCRat$d	CT Ratio Neutral	Read Only. Constant
SHARK200IECMeas/setTCTR4SPRat$setMag$f	1	CT Ratio Neutral
SHARK200IECMeas/setTCTR4STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/setTCTR4STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTCTR4STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTCTR4STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTCTR4STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTCTR4STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTCTR4STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/setTCTR4STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTCTR4STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

SHARK200IECMeas/setTVTR1

Object Path	Sample Value	Comment
SHARK200IECMeas/setTVTR1CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/setTVTR1DCBeh$d	Operating Mode Behavior	Read Only. Constant
SHARK200IECMeas/setTVTR1DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only. Constant
SHARK200IECMeas/setTVTR1DCMod$d	"Operating Mode"	Read Only. Constant
SHARK200IECMeas/setTVTR1DCNamPlt$d	Logical Node Nameplate	Read Only. Constant
SHARK200IECMeas/setTVTR1DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/setTVTR1DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/setTVTR1DCRat$d	VT Ratio Phase A	Read Only. Constant
SHARK200IECMeas/setTVTR1SPRat$setMag$f	1	VT Ratio for Phase A
SHARK200IECMeas/setTVTR1STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/setTVTR1STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTVTR1STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTVTR1STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTVTR1STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTVTR1STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTVTR1STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/setTVTR1STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTVTR1STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

SHARK200IECMeas/setTVTR2

Object Path	Sample Value	Comment
SHARK200IECMeas/setTVTR2CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/setTVTR2DCBeh$d	Operating Mode Behavior	Read Only. Constant
SHARK200IECMeas/setTVTR2DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only. Constant
SHARK200IECMeas/setTVTR2DCMod$d	"Operating Mode"	Read Only. Constant
SHARK200IECMeas/setTVTR2DCNamPlt$d	Logical Node Nameplate	Read Only. Constant
SHARK200IECMeas/setTVTR2DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/setTVTR2DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/setTVTR2DCRat$d	VT Ratio Phase B	Read Only. Constant
SHARK200IECMeas/setTVTR2SPRat$setMag$f	1	VT Ratio for Phase B
SHARK200IECMeas/setTVTR2STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/setTVTR2STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTVTR2STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTVTR2STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTVTR2STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTVTR2STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTVTR2STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/setTVTR2STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTVTR2STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

SHARK200IECMeas/setTVTR3

	Sample Value	Comment
SHARK200IECMeas/setTVTR3CFMod$ctlModel	0=Default Model	Read Only
SHARK200IECMeas/setTVTR3DCBeh$d	Operating Mode Behavior	Read Only. Constant
SHARK200IECMeas/setTVTR3DCHealth$d	1=Ok,2=Warning,3=Alarm	Read Only. Constant
SHARK200IECMeas/setTVTR3DCMod$d	"Operating Mode"	Read Only. Constant
SHARK200IECMeas/setTVTR3DCNamPlt$d	Logical Node Nameplate	Read Only. Constant
SHARK200IECMeas/setTVTR3DCNamPlt$swRev	"B:bbb/R:rrr/N:nnn"	Read Only. Constant
SHARK200IECMeas/setTVTR3DCNamPlt$vendor	"Electro Industries"	Read Only. Constant
SHARK200IECMeas/setTVTR3DCRat$d	VT Ratio Phase C	Read Only. Constant
SHARK200IECMeas/setTVTR3SPRat$setMag$f	1	VT Ratio for Phase C
SHARK200IECMeas/setTVTR3STBeh$q	(Good) 0000000000000	Bit stream quality
SHARK200IECMeas/setTVTR3STBeh$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTVTR3STBeh$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTVTR3STHealth$q	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTVTR3STHealth$stVal	(Good) 0000000000000	Read Only
SHARK200IECMeas/setTVTR3STHealth$t	Meter time Stamp	Populated when server is up.
SHARK200IECMeas/setTVTR3STMod$q	(Good) 0000000000000	Populated when server is up.
SHARK200IECMeas/setTVTR3STMod$stVal	1 = "ON"	Read only. Constant
SHARK200IECMeas/setTVTR3STMod$t	Meter timestamp / UTC-Time	Populated when server is up.

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5: Links to Supporting Files

This chapter provides links to files related to the Shark® 200 meter's IEC 61850 implementation.

5.1: Link to MICS File

This is the link to the Model Implementation Conformance Statement (MICS) html file: http://www.electroind.com/products/Shark200/IEC%2061850%20Standard%20Support/Shark-INP300-IEC61850_MICS.pdf.

5.2: Link to .ICD File

This is the link to the Shark® 200 meter's .icd file: http://www.electroind.com/products/Shark200/IEC%2061850%20Standard%20Support/shk200_embedded.icd.

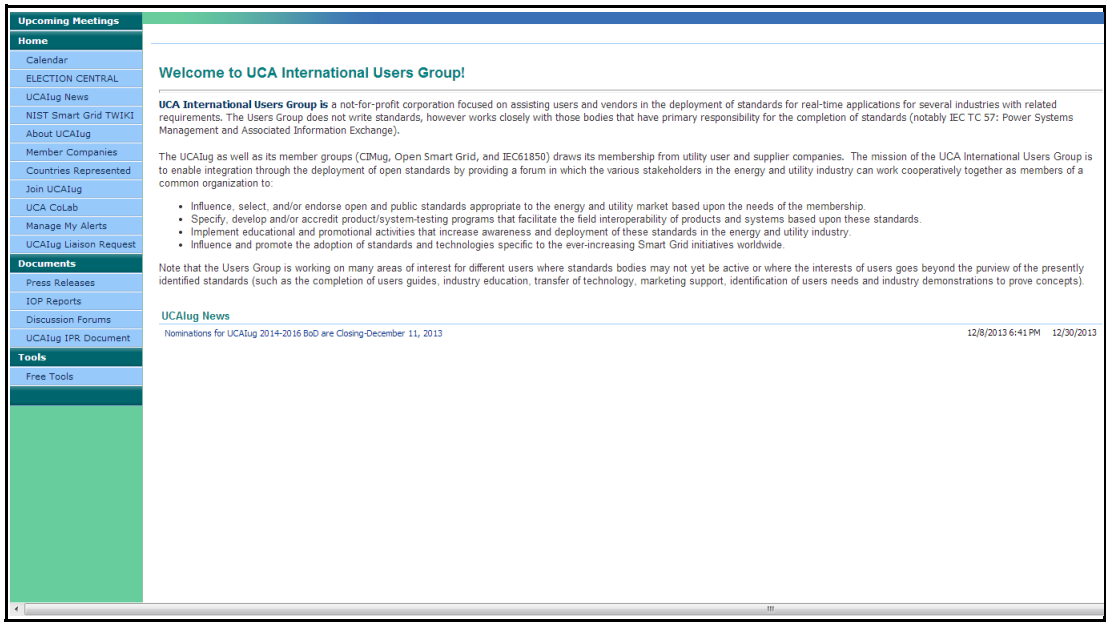
5.3: .CID File

The Shark® 200 meter's .cid file can be downloaded directly from the meter. See the *Shark® 200 Meter Installation and Operation Manual* for instructions.

5.4: Link to SCD to CID Converter

You can access a free SCD to CID converter tool through the Internet. Follow these steps:

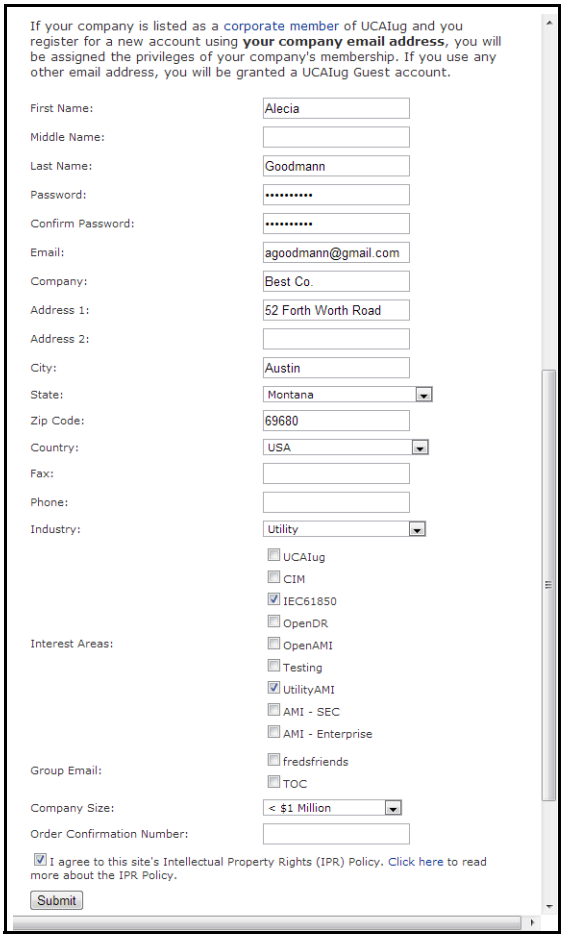
1. Go to the website http://www.ucaiug.org.



2. If this is your first time logging in, follow the steps below; otherwise, proceed to step 3.

   a. Fill in the information needed to create an account in the Register for an Account section in the right bottom side of the webpage.

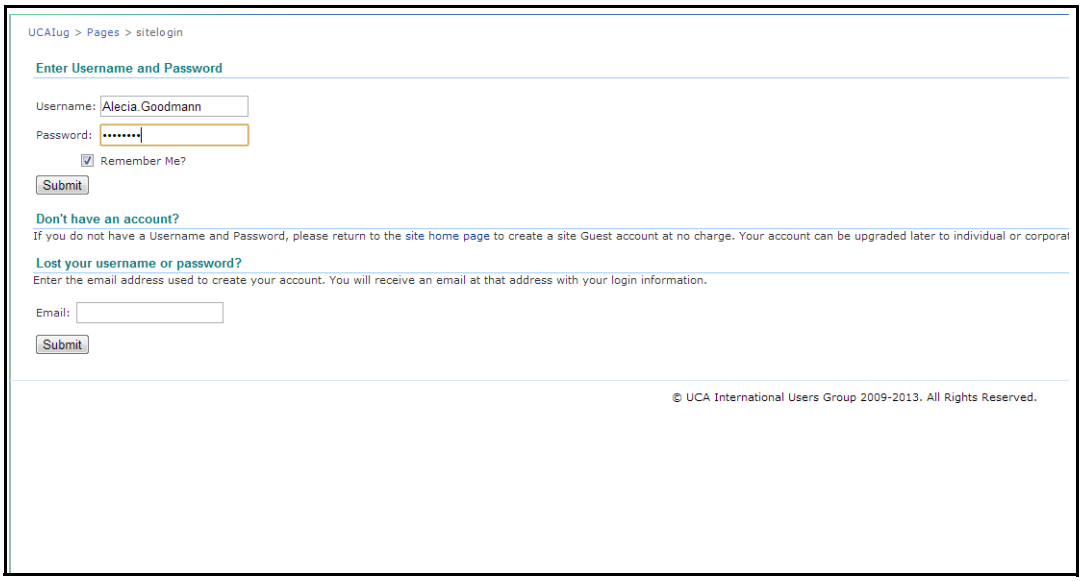
   NOTE: The password you enter must be at least six characters in length.



   b. Click Submit. Once the information is processed the webpage shows the message User Successfully Created above the Register for an Account section.

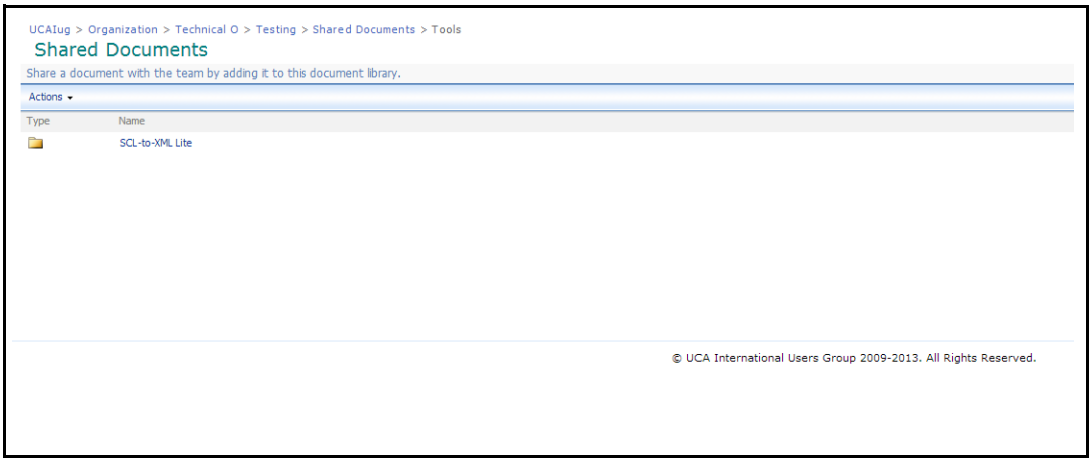
   NOTE: If your company is registered with this site and you use your company email when you register, you will have a registered account rather than a guest account. This will give you access to more than just the free application.

3. Click Free Tools on the bottom left side of the webpage. You will see the screen shown below.



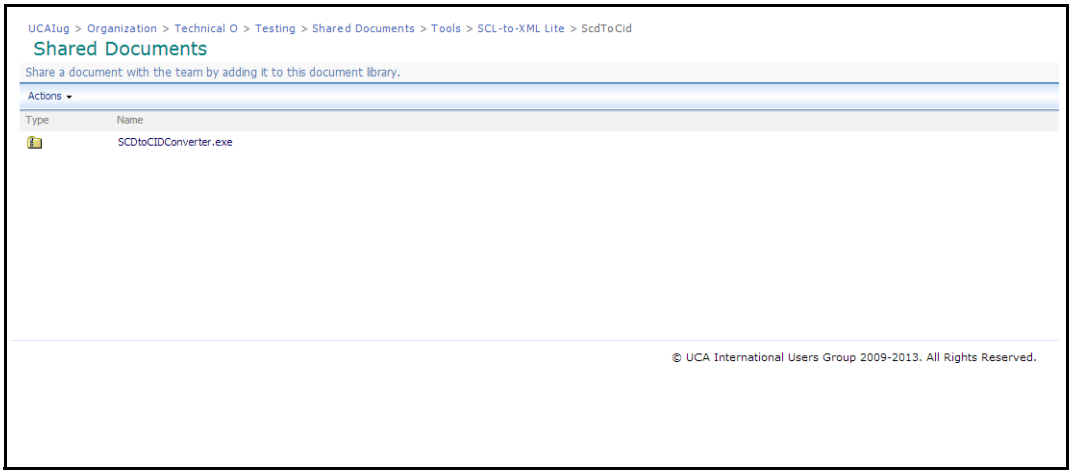
4. Log in with your username, which is your First Name.Last Name, and the password you used to create the account, and click Submit.

5. You will see the screen shown below. Click on SCL-to-XML Lite.



6. You will see the screen shown below. Click on ScdToCid.

7. You will see the screen shown below. Click on SCDtoCIDconverter.exe to download the application.



NOTE: If you log in with a paid account, you can see the source code for the CSD-to-CID converter and you get the full version of the SCL-viewer.

6: TISSUES (Technical Issues) Implementation Conformance Statement (TICS)

According to the UCA IUG QAP the TICS is required to perform a conformance test and is referenced on the certificate.

6.1: Mandatory IntOp TISSUES

The table below mandatory IntOp TISSUES that are either implemented or not applicable to the Shark® INP300S IEC 61850 server Edition 1.

Part	TISSUE Number	Description	Implemented Y/NA
8-1	116 165 183	GetNameList with empty response? Improper Error Response for GetDataSetValues GetNameList error handling	Y Y Y
7-4	None		
7-3	28 54 55 63 65 219 270	Definition of APC Point def xVal, not cVal Ineut = Ires ? mag in CDC CMV Deadband calculation of a Vector and trigger option operTm in ACT WYE and DEL rms values	NA NA Y Y NA NA Y

Part	TISSUE Number	Description	Implemented Y/NA
7-2	30	control parameter T	Y
	31	Typo	NA
	32	Typo in syntax	NA
	35	Typo Syntax Control time	NA
	36	Syntax parameter DSet-Ref missing	NA
	37	Syntax GOOSE "T" type	NA
	39	Add DstAddr to GoCB	NA
	40	GOOSE Message "AppID" to "GoID"	NA
	41	GsCB "AppID" to "GsID"	NA
	42	SV timestamp: "EntryTime" to "TimeStamp"	NA
	43	Control "T" semantic	NA
	44	AddCause - Object not sel	NA
	45	Missing AddCauses (neg range)	NA
	46	Synchro check cancel	NA
	47	"." in LD Name?	Y
	49	BRCB TimeOfEntry (part of #453)	NA
	50	LNName start with number?	Y
	51	ARRAY [0..num] missing	NA
	52	Ambiguity GOOSE SqNum	NA
	53	Add DstAddr to GsCB, SV	NA
	151	Name constraint for control blocks etc.	Y
	166	DataRef attribute in Log	NA
	185	Logging - Integrity period	NA
	189	SV Format	NA
	190	BRCB: EntryId and TimeOfEntry (part of #453)	NA
	191	BRCB: Integrity and buffering reports (part of #453)	NA
	234	New type CtxInt (Enums are mapped to 8 bit integer)	Y
	275	Confusing statement on GI usage (part of #453)	NA
	278	EntryId not valid for a server (part of #453)	NA
6	1	Syntax	Y
	5	tExtensionAttributeNameEnum is restricted	Y
	8	SIUnit enumeration for W	NA
	10	Base type for bitstring usage	Y
	17	DAI/SDI elements syntax	Y
	169	Ordering of enum differs from 7-3	NA

6.2: Optional IntOp TISSUES

The table below optional IntOp TISSUES that are either implemented or not applicable to the Shark® INP300S IEC 61850 server Edition 1.

Part	TISSUE Number	Description	Implemented Y/NA
8-1	246	Control negative response (SBOns) with LastApplError	NA
8-1	545	Skip file directories with no files	NA
7-2	333	Enabling of an incomplete GoCB	N
7-2	453	Combination of all reporting and logging tissues	N
6	245	Attribute RptId in SCL	N
6	529	Replace sev - Unknown by unknown	NA

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