ProSoft TECHNOLOGY

Where Automation Connects.

ProLinx®

PLX IEC 61850

PICS Statement

Version 1.4

March 27, 2017

PICS STATEMENT

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ProSoft Technology® Product Documentation

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Contents

1 PICS – Protocol Implementation Conformance Statement

In This Chapter

This section presents the Protocol Implementation Conformance Statement (PICS) for the ProSoft IEC 61850 Protocol Drivers.

The following ACSI Conformance Statements shall be used to provide an overview and details about the 61850 drivers' claiming conformance with ACSI.

Conformance is to Edition 1 of IEC 61850, though some Edition 2 features are supported.

This PICS describes two separate lines of ProSoft products:

(1) The ProLinx gateway products (PLX81-MNET-61850, PLX82-MNET-61850, PLX81-EIP-61850, and PLX82-EIP-61850), that implement only the client/subscriber side of the protocol.

(2) The InRAx MVI56E-61850S module, that implements only the server/publisher side of the protocol.

For brevity and convenience, both product lines are described in this single PICS. It shall be understood, however, that in these tables:

(a) The "Client/subscriber" column describes only product line (1) and the "Server/publisher" column describes only product line (2), for which the opposite column for the product line shall be read as "not applicable"; and

(b) In lines M1 through M11 of the Models Conformance Statement that are captioned "If Server side (B11) supported", the "Client/subscriber" column interprets that caption to refer to the support that is present on the servers being called and to be unrelated to the B11 line in the Basic Conformance Statement given here.

Legend:

- "Y" – Supported.
- "N" – Not supported.
- "-" – Not applicable, due to prerequisite features or conditions that are not supported or not present.

1.1 ACSI Basic Conformance Statement

		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)	Y	-	
SCSMs supported				
B21	**SCSM**: IEC 61850-8-1 used	Y	Y	
B22	**SCSM**: IEC 61850-9-1 used	N	N	
B23	**SCSM**: IEC 61850-9-2 used	N	N	
B24	**SCSM**: other	N	N	
Generic substation event model (GSE)				
B31	**Publisher** side	-	N	
B32	**Subscriber** side	Y	-	
Transmission of sampled value model (SVC)				
B41	**Publisher** side	-	N	
B42	**Subscriber** side	N	-	

1.2 ACSI Models Conformance Statement

		Client / Subscriber	Server / Publisher	Value / Comments
If **Server** side (B11) supported				
M1	Logical device	Y	Y	
M2	Logical node	Y	Y	
M3	Data	Y	Y	
M4	Data set	Y	Y	
M5	Substitution	N	N	
M6	Setting group control	N	N	
	Reporting	Y	Y	
M7	**Buffered report control**	Y	Y	
M7-1	Sequence-number	Y	Y	
M7-2	Report-time-stamp	Y	Y	
M7-3	Reason-for-inclusion	Y	Y	
M7-4	Data-set-name	Y	Y	
M7-5	Data-reference	Y	Y	
M7-6	Buffer-overflow	Y	Y	
M7-7	entryID	Y	Y	
M7-8	BufTm	Y	Y	
M7-9	IntgPd	Y	Y	
M7-10	GI	Y	Y	
M8	**Unbuffered report control**	Y	Y	
M8-1	Sequence-number	Y	Y	
M8-2	Report-time-stamp	Y	Y	
M8-3	Reason-for-inclusion	Y	Y	
M8-4	Data-set-name	Y	Y	
M8-5	Data-reference	Y	Y	
M8-6	BufTm	Y	Y	
M8-7	IntgPd	Y	Y	
M8-8	GI	Y	Y	
	Logging			
M9	**Log control**	N	N	
M9-1	IntgPd	-	-	
M10	**Log**	N	N	
M11	**Control**	Y	Y	
If **GSE** (B31/B32) is supported				
M12	**GOOSE**	Y	-	
M12-1	entryID			Ed1 unclear; Ed2 removed
M12-2	DataReflnc			Ed1 unclear; Ed2 removed
M13	GSSE	N	-	
If **SVC** (B41/B42) is supported				
M14	Multicast SVC	-	-	
M15	Unicast SVC	-	-	
M16	Time	Y	Y	
M17	File Transfer	N	N	

1.3 ACSI Service Conformance Statement

	Services	AA: TP / MC	Client / Subscriber	Server / Publisher	Comments
Server (Clause 6)					
S1	ServerDirectory	TP	N	Y	
Application association (Clause 7)					
S2	Associate		Y	Y	
S3	Abort		Y	Y	
S4	Release		Y	Y	
Logical device (Clause 8)					
S5	Logical Device Directory	TP	N	Y	Client: see SCL.1
Logical node (Clause 9)					
S6	Logical Node Directory	TP	N	Y	Client: see SCL.1
S7	Get All Data Values	TP	N	Y	
Data (Clause 10)					
S8	GetDataValues	TP	Y	Y	
S9	SetDataValues	TP	Y	Y	
S10	GetDataDirectory	TP	Y	Y	
S11	GetDataDefinition	TP	Y	Y	
Data set (Clause 11)					
S12	GetDataSetValues	TP	N	Y	
S13	SetDataSetValues	TP	N	Y	
S14	CreateDataSet	TP	N	N	
S15	DeleteDataSet	TP	N	N	
S16	GetDataSetDirectory	TP	N	Y	
Substitution (Clause 12)					
S17	SetDataValues	TP	-	-	
Setting group control (Clause 13)					
S18	SelectActiveSG	TP	-	-	
S19	SelectEditSG	TP	-	-	
S20	SetSGValues	TP	-	-	
S21	ConfirmEditSGValues	TP	-	-	
S22	GetSGValues	TP	-	-	
S23	GetSGCBValues	TP	-	-	
Reporting (Clause 14)					
Buffered report control block (BRCB)					
S24	Report	TP	Y	Y	
S24-1	data-change (dchg)		Y	Y	
S24-2	qchg-change (qchg)		Y	Y	
S24-3	data-update (dupd)		Y	N	
S25	GetBRCBValues	TP	Y	Y	
S26	SetBRCBValues	TP	Y	Y	
Unbuffered report control block (URCB)					
S27	Report	TP	Y	Y	
S27-1	data-change (dchg)		Y	Y	
S27-2	qchg-change (qchg)		Y	Y	
S27-3	data-update (dupd)		Y	N	
S28	GetURCBValues	TP	Y	Y	

	Services	AA: TP / MC	Client / Subscriber	Server / Publisher	Comments
S29	SetURCBValues	TP	Y	Y	
Logging (Clause 14)					
Log control block					
S30	GetLCBValues	TP	-	-	
S31	SetLCBValues	TP	-	-	
Log					
S32	QueryLogByTime	TP	-	-	
S33	QueryLogAfter	TP	-	-	
S34	GetLogStatusValues	TP	-	-	
Generic substation event model (GSE) (14.3.5.3.4)					
GOOSE-CONTROL-BLOCK					
S35	SendGOOSEMessage	MC	Y	-	
S36	GetGoReference	TP	N	-	
S37	GetGOOSEElementNumber	TP	N	-	
S38	GetGoCBValues	TP	Y	-	Client reads confRev only
S39	SetGoCBValues	TP	N	-	
GSSE-CONTROL-BLOCK					
S40	SendGSSEMessage	MC	-	-	
S41	GetGsReference	TP	-	-	
S42	GetGSSEElementNumber	TP	-	-	
S43	GetGsCBValues	TP	-	-	
S44	SetGsCBValues	TP	-	-	
Transmission of sampled value model (SVC) (Clause 16)					
Multicast SVC					
S45	SendMSVMessage	MC	-	-	
S46	GetMSVCBValues	TP	-	-	
S47	SetMSVCBValues	TP	-	-	
Unicast SVC					
S48	SendUSVMessage	TP	-	-	
S49	GetUSVCBValues	TP	-	-	
S50	SetUSVCBValues	TP	-	-	
Control (17.5.1)					
S51	Select	TP	Y	Y	
S52	SelectWithValue	TP	Y	Y	
S53	Cancel	TP	N	Y	
S54	Operate	TP	Y	Y	Client does not support sboClass operate-many
S55	Command-Termination	TP	Y	Y	
S56	TimeActivated-Operate	TP	N	N	
File transfer (Clause 20)					
S57	GetFile	TP	-	-	
S58	SetFile	TP	-	-	
S59	DeleteFile	TP	-	-	
S60	GetFileAttributeValues	TP	-	-	
Time (5.5)					
T1	Time resolution of internal clock		0.1s (3b)	0.1s (3b)	“b” means “significant bits of fractional part”
T2	Time accuracy of internal clock		+/- 0.1s	+/- 0.1s	Not intended for high-accuracy messaging
T3	Supported TimeStamp resolution		1ms (10b)	1ms (10b)	of storage, not source

1.4 Profile Conformance

		Client / Subscriber	**Server / Publisher**	**Value / Comments**
PICS for A-Profile Support				
A1	Client/Server A-Profile	Y	Y	
A2	GOOSE/GSE Management A-Profile	Y	N	
A3	GSSE A-Profile	N	N	
A4	TimeSync A-Profile	Y	Y	Server obtains time from PLC, assumes that the PLC's TimeSync is compliant
PICS for T-Profile Support				
T1	TCP/IP T-Profile	Y	Y	
T2	OSI T-Profile	N	N	
T3	GOOSE/GSE T-Profile	Y	N	
T4	GSSE T-Profile	N	N	
T5	TimeSync T-Profile	Y	Y	Server's TimeSync connectivity is over the PLC backplane

1.5 SCL Conformance

		Client / Subscriber	**Server / Publisher**	**Value / Comments**
SCL Conformance Degrees				
SCL.1	SCL File for Implementation Available (offline)	Y	Y	Client configured from separate CIDs for each server, available only separately. Server configured by validating a non-SCL “CFG” file, generating a CID from it, and downloading both to the server via a non-61850 protocol.
SCL.2	SCL File available from implementation online	N	N	
SCL.3	SCL implementation reconfiguration supported online	N	N	This removed Ed 2
Supported ACSI services for SCL.2 and SCL.3				
	ACSI Services			
	GetFileAttributeValues	-	-	
	GetFile	-	-	
	SetFile	-	-	This removed Ed 2
	DeleteFile	-	-	This removed Ed 2
	GetDataValues	-	-	
	SetDataValues	-	-	This and all below removed Ed 2
	SCL Control Block	-	-	
	SCL File Structure	-	-	
	Remote Creation of SCL File	-	-	
Additional MMS services for SCL.2 and SCL.3				
	MMS Services			
	GetCapabilityList	-	-	
	GetDomainAttributes	-	-	
	LoadDomainContent	-	-	
	StoreDomainContent	-	-	
Definition of SCL control block				
	Validate	-	-	
	ValState	-	-	
	Activate	-	-	Server reconfiguration causes the actions of 61850-8-1 D.2.3 to be performed.

1.6 Logical Nodes Conformance

		Client / Subscriber	Server / Publisher	Value / Comments
IEC61850-7-4 Logical Nodes Required for Servers				
(L) System Logical Nodes				
LLNO	Common Logical Node Zero	Y	Y	
LPHD	Physical Device	Y	Y	
(P) Protection Functions				
PDIF	Differential	Y	N	
PDI	Directional	Y	N	
PDOP	Directional Over Power	Y	N	
PDUP	Directional Under Power	Y	N	
PFRC	Rate of Frequency Change	Y	N	
PHAR	Harmonic Constraint	Y	N	
PHIZ	Ground Detection	Y	N	
PIOC	Instantaneous Over Current	Y	N	
PMRI	Motor Restart Inhibition	Y	N	
PMSS	Motor Starting Time Supervision	Y	N	
POPF	Over power Factor	Y	N	
PPAM	Phase Angle Measuring	Y	N	
PSC	Protection Scheme	Y	N	
PSDE	Sensitive Directional Earth Fault	Y	N	
PTEF	Transient Earth Fault	Y	N	
PTOC	Time Over Current	Y	N	
PTOF	Over Frequency	Y	N	
PTOV	Over Voltage	Y	N	
PTRC	Protection Trip Conditioning	Y	N	
PTTR	Thermal Overload	Y	N	
PTUC	Under Current	Y	N	
PTUV	Under Voltage	Y	N	
PUPF	Under Power Factor	Y	N	
PTUF	Under Frequency	Y	N	
PVOC	Voltage Controlled Time Over Current	Y	N	
PVPH	Volts per Hertz	Y	N	
PZSU	Zero Speed or Under Speed	Y	N	
(R) Protection Related Functions				
RDRE	Disturbance Recorder Function	Y	N	
RADR	Disturbance Recorder Channel Analogue	Y	N	
RBDR	Disturbance Recorder Channel Binary	Y	N	
RDRS	Disturbance Record Handling	Y	N	
RBRF	Breaker Failure	Y	N	
RDIR	Directional Element	Y	N	
RFLO	Fault Locator	Y	N	
RPSB	Power Swing Detection/Blocking	Y	N	
RREC	Auto Reclosing	Y	N	
RSYN	Synchronism Check or Synchronizing	Y	N	
(C) Control				

		Client / Subscriber	Server / Publisher	Value / Comments
CALH	Alarm Handling	Y	N	
CCGR	Cooling Group Control	Y	N	
CILO	Interlocking	Y	N	
CPOW	Point on Wave Switching	Y	N	
CSWI	Switch Controller	Y	N	
(G) Generic References				
GAPC	Generic Automatic Process Control	Y	N	
GGIO	Generic Process I/O	Y	Y	
GSAL	Generic Security Application	Y	N	
(I) Interfacing and Archiving				
IARC	Archiving	Y	N	
IHMI	Human Machine Interface	Y	N	
ITCI	Telecontrol Interface	Y	N	
ITMI	Telemonitoring Interface	Y	N	
(A) Automatic Control				
ANCR	Neutral Current Regulator	Y	N	
ARCO	Reactive Power Control	Y	N	
ATCC	Automatic Tap Changer Controller	Y	N	
AVCO	Voltage Control	Y	N	
(M) Metering and Measurement				
MDIF	Differential Measurements	Y	N	
MHAI	Harmonics or Interharmonics	Y	N	
MHAN	Non-Phase Related Harmonics or Interharmonics	Y	N	
MMTR	Metering	Y	N	
MMXU	Measurement	Y	N	
MSQI	Sequence and Imbalance	Y	N	
MSTA	Metering Statistics	Y	N	
(S) Sensors and Monitoring				
SARC	Monitoring and Diagnostics for arcs	Y	N	
SIMG	Insulation Medium Supervision (gas)	Y	N	
SIML	Insulation Medium Supervision (liquid)	Y	N	
SPDC	Monitoring and Diagnostics for Partial Discharges	Y	N	
(X) Switchgear				
XCBR	Circuit Breaker	Y	N	
XSWI	Circuit Switch	Y	N	
(T) Instrument Transformers				
TCTR	Current Transformer	Y	N	
TVTR	Voltage Transformer	Y	N	
(Y) Power Transformers				
YEFN	Earth Fault Neutralizer	Y	N	
YLTC	Tap Changer	Y	N	
YPSH	Power Shunt	Y	N	
YPTR	Power Transformer	Y	N	
(Z) Further Power System Equipment				

		Client / Subscriber	Server / Publisher	Value / Comments
ZAXN	Auxilliary Network	Y	N	
ZBAT	Battery	Y	N	
ZBSN	Bushing	Y	N	
ZCAB	Cable	Y	N	
ZCAP	Capacitor Bank	Y	N	
ZCON	Converter	Y	N	
ZGEN	Generator	Y	N	
ZGIL	Gas Insulated Line	Y	N	
ZLIN	Power Overhead Line	Y	N	
ZMOT	Motor	Y	N	
ZREA	Reactor	Y	N	
ZTCF	Thyristor Controlled Frequency Converter	Y	N	
ZTCR	Thyristor Controlled Reactive Component	Y	N	
Logical Nodes for Hydro Power Plants (LNs specific for Hydro are in bold text)				
Hydro Power: Logical nodes for control functions				
CALH	Alarm handling	Y	N	
CSWI	Switch controller	Y	N	
Hydro Power: Logical nodes representing functional blocks				
FCNT	Counter function	Y	N	
FCSD	Curve shape description	Y	N	
FFIL	Filter function	Y	N	
FLIM	Limiter function	Y	N	
FPID	Proportional, integral and derivative regulator function	Y	N	
FRMP	Ramp control function	Y	N	
FSPT	Setpoint control function	Y	N	
FXOT	Action at over threshold	Y	N	
FXUT	Action at under threshold	Y	N	
Hydro Power: Hydropower specific logical nodes				
HBRG	Turbine – generator shaft bearing	Y	N	
HBRK	Braking system for the generator shaft	Y	N	
HCOM	Combinator (3D-CAM or 2D-CAM)	Y	N	
HDAM	Hydropower dam, water reservoir	Y	N	
HDLS	Dam leakage supervision	Y	N	
HGPI	Gate position indicator	Y	N	
HGTE	Dam gate	Y	N	
HITG	Intake gate	Y	N	
HJCL	Power plant joint control function	Y	N	
HLKG	Leakage supervision	Y	N	
HLVL	Dam water level indicator	Y	N	
HNDL	Needle control	Y	N	
HNHD	Net head data	Y	N	
HOTP	Dam overtopping protection	Y	N	
HSEQ	Start / stop sequencer	Y	N	
HSPD	Speed monitoring	Y	N	

		Client / Subscriber	Server / Publisher	Value / Comments
HUNT	Hydropower production unit	Y	N	
HWCL	Water control function	Y	N	
Hydro Power: Logical nodes for interface and archiving				
IARC	Generic archiving function	Y	N	
IHMI	Generic human – machine interface	Y	N	
ISAF	Generic safety device	Y	N	
Hydro Power: Logical nodes for mechanical and non-electric primary equipment				
KFAN	Fan	Y	N	
KFIL	Filter	Y	N	
KPMP	Pump	Y	N	
KTNK	Tank	Y	N	
KVLV	Valve or aperture gate	Y	N	
Hydro Power: Logical nodes for metering and measurement				
MDIF	Differential current measurement	Y	N	
MENV	Environmental data	Y	N	
MHAI	Harmonics measurement	Y	N	
MHYD	Hydrological measurement	Y	N	
MMDC	DC current and voltage measurement	Y	N	
MMET	Meteorological measurement	Y	N	
MMXN	Single-phase measurement	Y	N	
MMXU	Three-phase measurement	Y	N	
Hydro Power: Protection functions				
PDIF	Generator differential, restricted earth-fault	Y	N	
PDOP	Reverse power	Y	N	
PDUP	Loss of field (excitation system failure)	Y	N	
PHIZ	Residual over-voltage	Y	N	
PIOC	Phase over-current	Y	N	
PPAM	Phase angle, out-of-step	Y	N	
PRTR	Rotor protection	Y	N	
PSDE	Directional earth-fault	Y	N	
PTHC	Thyristor failure protection	Y	N	
PTOC	Time over-current, rotor earth-fault, bearing current, stator earth-fault	Y	N	
PTOF	Over-frequency	Y	N	
PTOV	Over- / under-voltage	Y	N	
PTUF	Under-frequency	Y	N	
PTTR	Overload	Y	N	
PVOC	Under impedance	Y	N	
PVPH	Over-fluxing	Y	N	
PZSU	Energising at stand-still	Y	N	
Hydro Power: Logical nodes for protection related functions				
RBRF	Breaker-fail protection	Y	N	
RPSB	Power swing detection	Y	N	
RSYN	Synchronizing	Y	N	
Hydro Power: Logical nodes for supervision and monitoring				
SPDC	Partial discharge sensor	Y	N	

		Client / Subscriber	Server / Publisher	Value / Comments
STMP	Temperature supervision	Y	N	
SVBR	Vibration supervision	Y	N	
Hydro Power: Logical nodes for sensors				
TANG	Angle	Y	N	
TAXD	Axial displacement	Y	N	
TCTR	Current transformer	Y	N	
TDIS	Distance	Y	N	
TFLW	Liquid flow	Y	N	
TFRQ	Frequency	Y	N	
THUM	Humidity	Y	N	
TLEV	Media level	Y	N	
TMGF	Magnetic field	Y	N	
TPOS	Position indicator	Y	N	
TPRS	Pressure	Y	N	
TRTN	Rotation	Y	N	
TSND	Sound pressure	Y	N	
TTMP	Temperature	Y	N	
TTNS	Mechanical tension / stress	Y	N	
TVBR	Vibration sensor	Y	N	
TVTR	Voltage transformer	Y	N	
TWPH	Water acidity	Y	N	
Hydro Power: Logical nodes for power system equipment				
ZAXN	Auxiliary network (power plant supply)	Y	N	
ZBAT	DC battery	Y	N	
ZMOT	Motor	Y	N	
ZREA	Reactor	Y	N	
ZRES	Neutral resistor	Y	N	
ZSCR	Semi-conductor controlled rectifier	Y	N	
ZSMC	Synchronous machine	Y	N	
Logical Nodes for Wind Power Plants (LNs specific for Wind Power are in bold text)				
Wind Power specific logical nodes				
WTUR	Wind turbine general information	Y	N	
WALM	Wind power plan alarm information	Y	N	
WMET	Wind power plant meteorological information	Y	N	
WAPC	Wind power plant active power control information	Y	N	
WRPC	Wind power plant reactive power control information	Y	N	
Wind Turbine specific logical nodes				
WTUR	Wind turbine general information	Y	N	
WROT	Wind turbine rotor information	Y	N	
WTRM	Wind turbine transmission information	Y	N	
WGEN	Wind turbine generator information	Y	N	
WCNV	Wind turbine converter information	Y	N	
WTRF	Wind turbine transformer information	Y	N	
WNAC	Wind turbine nacelle information	Y	N	

		Client / Subscriber	Server / Publisher	Value / Comments
WYAW	Wind turbine yawing information	Y	N	
WTOW	Wind turbine tower information	Y	N	
WALM	Wind power plant alarm information	Y	N	
WSLG	Wind turbine state log information	Y	N	
WALG	Wind turbine analogue log information	Y	N	
WREP	Wind turbine report information	Y	N	

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