GE VERNOVA

MiCOM P40 Agile

Px4x

PICS
Protocol Implementation Conformance Statement - IEC 61850 Edition 2.1

Software Version: 20, 61, 70, 80, 82, 91, 92, AA, AB, AC
Publication Reference: Px4x-PC2-EN-M



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1 PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS)

1.1 INTRODUCTION

This specification is the Protocol Implementation Conformance Statement (PICS) and presents the ACSI conformance statements as defined in Annex A of Part 7-2 of the IEC 61850 standard specifications.

1.2 APPLICABILITY TO SOFTWARE

This PICS is applicable to the following software versions and should be read in conjunction with the MICS documents listed below:

Product	Software Version	MICS Document Reference
P14D	70	P14DL-MC2-EN-11
P14N	70	P14NB-MC2-EN-12
P141	61 91	P141-MC2-EN-2.2 P141-MC2-EN-3.2
P142	61 91	P142-MC2-EN-2.2 P142-MC2-EN-3.2
P143	61 91 AC	P143-MC2-EN-2.2 P143-MC2-EN-3.2 P143-MC2-EN-AC-1
P144	61	P143-MC2-EN-2.2
P145	61 91	P145-MC2-EN-2.2 P145-MC2-EN-3.2
P243	70	P243/EN MC2/J82
P345	91	P345-MC2-EN-1.1
P44	AA	P443-MC2-EN-AA-1 P446-MC2-EN-AA-1
P44	AB	P443-MC2-EN-AB-1 P446-MC2-EN-AB-1
P443	91 92	P443-MC2-EN-2.1 P443-MC2-EN-3
P446	80	P446-MC2-EN-1
P44T	91	P44T-EN-MC2-E
P54	AA	P543-MC2-EN-AA-1 P546-MC2-EN-AA-1
P54	AB	P543-MC2-EN-AB-1 P546-MC2-EN-AB-1
P543	91 92	P54x1Z-MC2-EN-2.1 P543-MC2-EN-3
P545	91 92	P54x1Z-MC2-EN-2.1 P545-MC2-EN-3
P546	80 82	P546-MC2-EN-1 P546-MC-EN-1
P54xMED	91	P54A-MC2-EN-2 P54B-MC2-EN-2 P54C&E-MC2-EN-2
P64	AB	P642-MC2-EN-AB-1 P643-MC2-EN-AB-1 P645-MC2-EN-AB-1
P642	91	P642-MC2-EN-4
P643	21 91	P643-MC2-EN-3 P643-MC2-EN-4

Product	Software Version	MICS Document Reference
P645	20 91	P645-MC2-EN-1 P645-MC2-EN-4.2
P741	70 91	P741-EN-MC2-Pc7 P741-EN-MC2-Pd8
P743	70 91	P743-EN-MC2-Pc7 P743-EN-MC2-Pd8
P746	91	P746-EN-MC2-J43.1
P84	AA	P841A-MC2-EN-AA-1 P841B-MC2-EN-AA-1
P84	AB	P841A-MC2-EN-AB-1 P841B-MC2-EN-AB-1
P841	80	P841-MC2-EN-1
P94V	70	P94VR-MC2-EN-12

1.3 ACSI BASIC CONFORMANCE STATEMENT

The basic conformance statement is defined in the table below.

Client-Server Roles		Client/ Subscriber	Server/ Publisher	Value/Comments
B11	Server side (of TWO-PARTY-APPLICATION-ASSOCIATION)		Y	
B12	Client side of (TWO-PARTY-APPLICATION-ASSOCIATION)			
SCSMs supported				
B21	SCSM: IEC 6185-8-1 used		Y	
B22	SCSM: IEC 6185-9-1 used			Deprecated Ed2
B23	SCSM: IEC 6185-9-2 used			
B24	SCSM: other			
Generic substation event model (GSE)				
B31	Publisher side		Y	
B32	Subscriber side	Y		
Transmission of sampled value model (SVC)				
B41	Publisher side			
B42	Subscriber side	Y		Depends on IED order code
– Y = supported N or empty = not supported				

Table 1: Basic conformance statement

1.4 ACSI MODELS CONFORMANCE STATEMENT

The ACSI models conformance statement is defined in the table below.

		Client/ Subscriber	Server/ Publisher	Value/Comments
If Server or Client side (B1) is supported				
M1	Logical Device		Y	
M2	Logical Node		Y	
M3	Data		Y	
M4	Data set		Y	
M5	Substitution		Y	Version AB and later
M6	Setting group control		Y	
	Reporting			
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	
M8-8	GI		Y	
M8-9	conf-revision		Y	
	Logging			
M9	Log control			
M9-1	IntgPd			
M10	Log			
M11	Control		Y	
M17	File Transfer		Y	
M18	Application association		Y	
M19	GOOSE Control Block		Y	
M20	Sampled Value Control Block			
If GSE (B31/32) is supported				
M12	GOOSE	Y	Y	
M13	GSSE			Deprecated Ed2
If SVC (B41/42) is supported				
M14	Multicast SVC	Y		Depends on IED order code
M15	Unicast SVC			

		Client/ Subscriber	Server/ Publisher	Value/Comments
For all IEDs				
M16	Time	Y	Y	Time source with required accuracy shall be available. Only Time Master are SNTP (Mode 4 response) time server. All other Client/Server devices require SNTP (Mode 3 request) clients
Y = service is supported N or empty = service is not supported				

Table 2: Models conformance statement

1.5 ACSI SERVICE CONFORMANCE STATEMENT

The ACSI service conformance statement is defined in the table below (depending on the statements in Table 1).

	Ed.	Services	AA: TP/MC	Client (C)	Server (S)	Comments
Server						
S1	1, 2, A1	GetServerDirectory	TP		Y	
Application Association						
S2-1	1, 2, A1	Associate Request	TP			
S2-2	A1	Associate_Response			Y	
S3-1	1, 2, A1	Abort_Request	TP		Y	
S3-2	A1	Abort_Processing			Y	
S4-1	A1	Release_Request				
S4-2	1, 2, A1	Release_Response	TP		Y	
Logical Device						
S5	1, 2, A1	GetLogicalDeviceDirectory	TP		Y	
Logical Node						
S6	1, 2, A1	GetLogicalNodeDirectory	TP		Y	
S7	1, 2, A1	GetAllDataValues	TP		Y	
Data						
S8	1, 2, A1	GetDataValues	TP		Y	
S9	1, 2, A1	SetDataValues	TP		Y	
S10	1, 2, A1	GetDataDirectory	TP		Y	
S11	1, 2, A1	GetDataDefinition	TP		Y	
Data set						
S12	1, 2, A1	GetDataSetValues	TP		Y	
S13	1, 2, A1	SetDataSetValues	TP			
S14	1, 2, A1	CreateDataSet	TP			
S15	1, 2, A1	DeleteDataSet	TP			
S16	1, 2, A1	GetDataSetDirectory	TP		Y	
Substitution						

	Ed.	Services	AA: TP/MC	Client (C)	Server (S)	Comments
S17	1, 2, A1	SetDataValues	TP		Y	Version AB and later
Setting group control						
S18	1, 2, A1	SelectActiveSG	TP		Y	
S19	1, 2, A1	SelectEditSG	TP			
S20	1, 2, A1	SetSGValues	TP			
S21	1, 2, A1	ConfirmEditSGValues	TP			
S22	1, 2, A1	GetSGValues	TP			
S23	1, 2, A1	GetSGCBValues	TP		Y	
Reporting						
Buffered report control block (BRCB)						
S24	1, 2, A1	Report	TP		Y	
S24-1	1, 2, A1	data-change (dchg)			Y	
S24-2	1, 2, A1	qchg-change (qchg)			Y	
S24-3	1, 2, A1	data-update (dupd)				
S25	1, 2, A1	GetBRCBValues	TP		Y	
S26	1, 2, A1	SetBRCBValues	TP		Y	
Unbuffered report control block (URCB)						
S27	1, 2, A1	Report	TP		Y	
S27-1	1, 2, A1	data-change (dchg)			Y	
S27-2	1, 2, A1	qchg-change (qchg)			Y	
S27-3	1, 2, A1	data-update (dupd)				
S28	1, 2, A1	GetURCBValues	TP		Y	
S29	1, 2, A1	SetURCBValues	TP		Y	
Logging						
Log control block						
S30	1, 2, A1	GetLCBValues	TP			
S31	1, 2, A1	SetLCBValues	TP			
Log						
S32	1, 2, A1	QueryLogByTime	TP			
S33	1, 2, A1	QueryLogByEntry	TP			
S34	1, 2, A1	GetLogStatusValues	TP			
Generic substation event model (GSE)						
GOOSE-CONTROL-BLOCK						
S35	1, 2, A1	SendGOOSEMessage	MC	Y	Y	IED supports GOOSE publish & subscription.
S36	1, 2, A1	GetReference	TP			
S37	1, 2, A1	GetGOOSEElementNumber	TP			
S38	1, 2, A1	GetGoCBValues	TP		Y	
S39	1, 2, A1	SetGoCBValues	TP		Y	
GSSE-CONTROL-BLOCK						
S40	1	SendGSSEMessage	MC			Deprecated in Edition 2
S41	1	GetReference	TP			Deprecated in Edition 2

	Ed.	Services	AA: TP/MC	Client (C)	Server (S)	Comments
S42	1	GetGSSEElementNumber	TP			Deprecated in Edition 2
S43		GetGsCBValues	TP			Deprecated in Edition 2
S44		SetGsCBValues	TP			Deprecated in Edition 2
Transmission of sampled value model (SVC)						
Multicast SVC						
S45	1, 2, A1	SendMSVMessage	MC	Y		Depends on IED order code
S46	1, 2, A1	GetMSVCBValues	TP			
S47	1, 2, A1	SetMSVCBValues	TP			
Unicast SVC						
S48	1, 2, A1	SendUSVMessage	TP			
S49	1, 2, A1	GetUSVCBValues	TP			
S50	1, 2, A1	SetUSVCBValues	TP			
Control						
S51	1, 2, A1	Select			Y	
S52	1, 2, A1	SelectWithValue	TP		Y	
S53	1, 2, A1	Cancel	TP		Y	
S54	1, 2, A1	Operate	TP		Y	
S55	1, 2, A1	Command-Termination	TP		Y	
S56	1, 2, A1	TimeActivated-Operate	TP			
File transfer						
S57	1, 2, A1	GetFile	TP		Y	
S58	1, 2, A1	SetFile	TP			
S59	1, 2, A1	DeleteFile	TP		Y	Only from /dr_unextracted/ Operation may only be performed on .cfg files.
S60	1, 2, A1	GetFileAttributeValues	TP		Y	
S61	1, 2, A1	GetServerDirectory (FILE-SYSTEM)	TP		Y	
Time						
T1	1, 2, A1	Time resolution of internal clock			10	Nearest negative power of 2 in seconds.
T2	1, 2, A1	Time accuracy of internal clock			T1	TL (ms) (low accuracy), T3 < 7 T0 (ms) (<= 10 ms), 7 <= T3 < 10 T1 (µs) (<= 1 ms), 10 <= T3 < 13 T2 (µs) (<= 100 µS), 13 <= T3 < 15 T3 (µs) (<= 25 µS), 15 <= T3 < 18 T4 (µs) (<= 4 µS), 18 <= T3 < 19 T5 (µs) (<= 1 µS), T3 >= 20

	Ed.	Services	AA: TP/MC	Client (C)	Server (S)	Comments
T3	1, 2, A1	Supported TimeStamp resolution	-		10	Nearest negative power of 2 in seconds.

Table 3: Service conformance statement

1.6 61850-9-3 CLOCK PROFILE CONFORMANCE STATEMENT

The capabilities and options supported by the PTP clock are shown in Table 4.

PICS Proforma Reference	Ed.	Capability	Client (C)	Server (S)	Comments
CLOCK_TYPE_OC	2	Clock is OC according to this base	Yes		
CLOCK_TYPE_TC	2	Clock is TC according to this base	No		
CLOCK_TYPE_BC	2	Clock is BC according to this base	No		
NR_PORTS	2	Number of clock ports (total)	2		Or 1 depending on IED order code
PORTS_STEP	2	1: All ports support 1-step on egress 2: All ports support 2-step on egress 3: All ports support both 1-step and 2	3		IED accepts step 1 and step 2 synchronization messages, but does not have send any replies
SLAVE_ONLY	2	All ports of the clock are slave-only	Yes		
TIME_TRACEABLE	2	Connectable to a time reference outside of PTP (e.g. GPS)	Yes		
FREQ_TRACEABLE	2	Connectable to a frequency reference outside of PTP (e.g. GPS)	Yes		
DAC	2	Doubly attached OC	Yes		Depending on IED order code
PORTS_PAIRED	2	Paired clock ports for redundancy (e.g. {3-4})	{A,B}		Depending on IED order code
REDBOX_DATC	2	Redbox as Transparent Clock	No		
REDBOX_SLTC	2	Redbox as Stateless Transparent Clock	No		
REDBOX_TWBC	2	Redbox as Three-way Boundary Clock	No		
REDBOX_DABC	2	Redbox as DAC BC	No		
MIB_SNMP	2	Supports MIB of IEC 62439-3 Annex E	Yes		
MIB_61850	2	Supports IEC 61859-90-4 Clock Objects	No		
MIB_OTHER	2	Clock supports fixed values or a mechanism defined by the manufacturer (If True, this list is appended to this PICS)	No		
ATOI	2	A master clock attaches the ALTERNATE_TIME_OFFSET_INDICATOR TLV as defined in IEC 61588 as set by its application. A slave clock makes this TLV information available to the application if it receives it. A BC forwards the ATOI TLV from the slave port to the master ports	No		

Table 4: PICS for A-Profile support: 61850-9-3

AA: Application Association Type

TP: Two Part (for MMS)

MC: Multicast (for GOOSE and SMV)

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