

ABB PROTECTION AND CONTROL

REX600

Protocol Implementation Conformance Statement for
the IEC 61850 interface in REX600



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1 About this document

1.1 Read it first!

Before attempting any operation with REX600, read carefully the device documentation first.

This document is addressed to anyone who needs to interact with REX600 and its IEC 61850 features in more detail.

1.2 Document information

Revision History

Revision	Date	Note
A	13 Feb 2026	REX600 Product Version: 1.0

Applicability

This manual is applicable to all REX600 Smart Substation Control and Protection device versions mentioned in document Revision History above or newer versions if document update is not required.

2 Safety Information

There are safety warnings and notes in the following text. They are in a different format to distinguish them from normal text.

Safety warning

The safety warnings should always be observed. Non-observance can result in death, personal injury or substantial damages to property. Guarantee claims might not be accepted when safety warnings are not respected. They look like below:



Do not make any changes to the REX600 configuration unless you are familiar with the REX600 and its configuration tool. This might result in disoperation and loss of warranty.

Note

A note contains additional information worth noting in the specific context, and looks like below:



The selection of this control mode requires caution, because operations are allowed both from the HMI and remotely.

3 Abbreviations, Definitions and Conventions

3.1 Abbreviations

HMI	Human Machine Interface
LCD	Liquid Crystal Display
SLD	Single Line Diagram
LED	Light Emitting Diode
GPS	Global Positioning System
SCADA	Supervision, Control and Data Acquisition
CT	Current Transformer
VT	Voltage Transformer
SI	Sensor Input
Y	Yes
N	No

3.2 Definitions

Operational State:	the unit is active and it is protecting and controlling the switchgear.
Stand-alone:	the unit is not connected to a Scada system.
M/m:	mandatory support. The item shall be implemented.
C/c:	conditional support. The item shall be implemented if the stated condition exists.
O/o:	optional support. The implementation may decide to implement the item.
x:	excluded: The implementation shall not implement this item.
i:	out-of-scope: The implementation of the item is not within the scope of this product.
F/S:	Functional Standard. Should be applied.
Base:	Shall be applied in any application claiming conformance to this standard.

4 Reference Documents

Ref	Document id	Rev	Document title
[1]	IEC 61850-7-2 Edition 2.1 2020-02		Communication networks and systems for power utility automation – Part 7-2: Basic information and communication structure – Abstract communication service interface (ACSI)
[2]	IEC 61850-8-1 Edition 2.1 2020-02		Communication networks and systems for power utility automation – Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3

5 Introduction

This document defines the compliance to IEC 61850 in terms of service, modeling and engineering interfaces. Also, exceptions and local adaptations are described.

The conformance statements and documents are referred as PICS (Protocol Implementation Conformance Statement), MICS (Model Implementation Conformance Statement) and local adaptations to be published are described in PIXIT (Protocol Implementation eXtra Information for Testing). ACSI conformance statement describes the abstract services interfaces, which are normally mapped to certain SCSM and therefore indirectly stated in PICS.

The purpose of the information in this document is to give a user, to a system integrator a detailed explanation of IEC 61850 capabilities of a product.

5.1 Scope of this statement

The scope of this document is one product/software module. This is identified as follows:

Product family / name:

Product designation: REX600

Product version: See Document Revision History

Role(s) in two-party association (TP, c/s): Server

Role(s) in multicast association (MC, GOOSE, GSSE): GOOSE

Notes, exceptions: MMS conformance statement is not filled

6 ACSI conformance statement

6.1 General

These tables are according to IEC 61850-7-2. [1]

6.2 ASCII basic conformance statement

Table 6-1– 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)	N	—	
SCSMs supported				
B21	SCSM: IEC 61850-8-1 used	N	Y	
B22	SCSM: IEC 61850-9-1 used	N	N	
B23	SCSM: IEC 61850-9-2 used	N	Y	
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	—	Y	
B42	Subscriber side	N	—	

6.3 ACSI models conformance statement

Table 6-2– ACSI models conformance statement

		Client/ Subscriber	Server/ Publisher	Val- ue/Comments
If Server side (B1) supported				
M1	Logical device	N	Y	
M2	Logical node	N	Y	
M3	Data	N	Y	
M4	DATA-SET	N	Y	
M5	Substitution	N	N	
M6	Setting group control	N	Y	
	Reporting			
M7	Buffered report control	N	Y	
M7-1	OptFlds.sequence-number	N	Y	
M7-2	OptFlds.report-time-stamp	N	Y	
M7-3	OptFlds.reason-for-inclusion	N	Y	
M7-4	OptFlds.data-set-name	N	Y	
M7-5	OptFlds.data-reference	N	Y	
M7-6	OptFlds.buffer-overflow	N	Y	
M7-7	OptFlds.entryID	N	Y	
M7-8	BufTim	N	Y	
M7-9	IntgPd	N	Y	
M7-10	GI	N	Y	
M7-11	OptFlds.conf-revision	N	Y	
M8	Unbuffered report control	N	Y	
M8-1	OptFlds.sequence-number	N	Y	
M8-2	OptFlds.report-time-stamp	N	Y	
M8-3	OptFlds.reason-for-inclusion	N	Y	
M8-4	OptFlds.data-set-name	N	Y	
M8-5	OptFlds.data-reference	N	Y	
M8-6	BufTim	N	Y	
M8-7	IntgPd	N	Y	
M8-8	GI	N	Y	
M8-9	OptFlds.conf-revision	N	Y	
	Logging	N	N	
M9	Log control	N	N	
M9-1	IntgPd			
M10	Log	N	N	
M11	Control	N	Y	
If GSE (B31/32) is supported				
M12	GOOSE	Y	Y	

		Client/ Subscriber	Server/ Publisher	Val- ue/Comments
M13	GSSE	N	N	
If SVC (41/42) is supported				
M14	Multicast SVC	N	Y	
M15	Unicast SVC	N	N	
M16	Time	Y	N	SNTP and IEEE 1588 (PTP)
M17	File Transfer	N	Y	
M18	Application association	N	Y	
M19	GOOSE Control Block	N	Y	
M20	Sampled Value Control Block	N	N	

6.4 ACSI service conformance statement

The ACSI service conformance statement shall be as defined in Table 6-3 (depending on the statements in Table 6-2).

Table 6-3 – ACSI service Conformance statement

	Services	AA: TP/MC	Client (C)	Server (S)	Comments
Server					
S1	GetServerDirectory	TP	N	Y	
Application association					
S21	Associate_Request		N	Y	
S22	Associate_Response		N	Y	
S31	Abort_Request		N	Y	
S32	Abort_Response		N	Y	
S41	Release_Request		N	Y	
S42	Release_Response		N	Y	
Logical device					
S5	GetLogicalDeviceDirectory	TP	N	Y	
Logical node					
S6	GetLogicalNodeDirectory	TP	N	Y	
S7	GetAllDataValues	TP	N	Y	
Data					
S8	GetDataValues	TP	N	Y	
S9	SetDataValues	TP	N	Y	
S10	GetDataDirectory	TP	N	Y	
S11	GetDataDefinition	TP	N	Y	

	Services	AA: TP/MC	Client (C)	Server (S)	Comments
Data set					
S12	GetDataSetValues	TP	N	Y	
S13	SetDataSetValues	TP	N	N	
S14	CreateDataSet	TP	N	N	
S15	DeleteDataSet	TP	N	N	
S16	GetDataSetDirectory	TP	N	Y	

Substitution					
S17	SetDataValues	TP	N	N	

Setting group control					
S18	SelectActiveSG	TP	N	Y	
S19	SelectEditSG	TP	N	Y	
S20	SetSGValues	TP	N	Y	
S21	ConfirmEditSGValues	TP	N	Y	
S22	GetSGValues	TP	N	Y	
S23	GetSGCBValues	TP	N	Y	

Reporting					
Buffered report control block (BRCB)					
S24	Report	TP	N	Y	
S24-1	data-change (dchg)		N	Y	
S24-2	quality-change (qchg)		N	Y	
S24-3	data-update (dupd)		N	N	
S25	GetBRCBValues	TP	N	Y	
S26	SetBRCBValues	TP	N	Y	
Unbuffered report control block (URCB)					
S27	Report	TP	N	Y	
S27-1	data-change (dchg)		N	Y	
S27-2	quality-change (qchg)		N	Y	
S27-3	data-update (dupd)		N	N	
S28	GetURCBValues	TP	N	Y	
S29	SetURCBValues	TP	N	Y	

Logging					
Log control block					
S30	GetLCBValues	TP	N	N	
S31	SetLCBValues	TP	N	N	
Log					
S32	QueryLogByTime	TP	N	N	
S33	QueryLogAfter	TP	N	N	
S34	GetLogStatusValues	TP	N	N	

Generic substation event model (GSE)					
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	Services	AA: TP/MC	Client (C)	Server (S)	Comments
GOOSE					
S35	SendGOOSEMessage	MC	Y	Y	
GOOSE Control Block					
S36	GetReference	TP	N	N	
S37	GetGOOSEElementNumber	TP	N	N	
S38	GetGoCBValues	TP	N	Y	
S39	SetGoCBValues	TP	N	Y	
GSSE					
S40	SendGSSEMessage	MC	N	N	
GSSE Control Block					
S41	GetGsReference	TP	N	N	
S42	GetGSSEElementNumber	TP	N	N	
S43	GetGsCBValues	TP	N	N	
S44	SetGsCBValues	TP	N	N	

Transmission of sampled value model (SVC)					
Multicast SVC					
S45	SendMSVMessage	MC	Y	Y	<i>Server: Routable only</i>
Multicast Sampled Value Control Block					
S46	GetMSVCBValues	TP	N	Y	
S47	SetMSVCBValues	TP	N	N	
S62	GetMSVReference	TP	N	N	
S63	GetMSVElementNumber	TP	N	N	
Unicast SVC					
S48	SendUSVMessage	TP	N	N	
Unicast Sampled Value Control Block					
S49	GetUSVCBValues	TP	N	N	
S50	SetUSVCBValues	TP	N	N	

Control					
S51	Select		N	N	
S52	SelectWithValue	TP	N	Y	
S53	Cancel	TP	N	Y	
S54	Operate	TP	N	Y	
S55	CommandTermination	TP	N	Y	
S56	TimeActivatedOperate	TP	N	N	

File transfer					
S57	GetFile	TP	N	Y	
S58	SetFile	TP	N	N	
S59	DeleteFile	TP	N	Y	
S60	GetFileAttributeValues	TP	N	Y	
S61	GetServerDirectory	TP	N	Y	

Time					
T1	Time resolution of internal clock			2^{-10} (1ms)	nearest negative power of 2 in seconds
T2	Time accuracy of internal clock			T1	T0 (10ms) T1 (1ms) T2 (100μs) T3 (25μs) T4 (4μs) T5 (1μs)
T3	supported TimeStamp resolution	-		2^{-10} (1ms)	nearest negative power of 2 in seconds according to IEC61850-7-2, paragraph 5.5.3.7.3.3

7 SCL conformance statement

Defines several degrees of conformance for which implementations may declare support of the substation configuration language.

These tables are according to IEC 61850-8-1. [2]

Table 7-1 – SCL conformance degrees

	SCL Conformance	Client-CR			Server-CR		
		Base	F/S	Value/Range	Base	F/S	Value/Range
SCL.1	SCL file for implementation available (offline)				m	m	<i>Supported, SCL file export from tool</i>
SCL.2	SCL file available from implementation online	O	o		o	o	<i>Not Supported</i>
SCL.3	SCL file contains a communication section according to clause 25.3	O	c		o	o	<i>Supported</i>

c Shall be 'm' if the client can be called

8 PICS – Protocol conformance statement

8.1 Profile conformance

Table 8-1 and Table 8-2 define the basic conformance statement.

These tables are according to IEC 61850-8-1. [2]

Table 8-1 – PICS for A-Profile support

	Profile Description	Client		Server		Value/Comment
		F/S		F/S		
A1	Client/Server A-Profile		N		Y	
A2	GOOSE/GSE Management A-Profile		Y		Y	
A3	GSSE A-Profile		N		N	
A4	TimeSync A-Profile		Y		N	
A5	Security for Client/server A-Profile		N		N	
A6	Security for GOOSE /GSE management services A-Profile		N		N	
A7	SV / SV management services A-Profile		N		Y	
A8	Security for SV / SV management services A-Profile		N		N	

Tm1	Simple Network Time Protocol		Y		N	
Tm2	PTP Profile for Power Utility Automation		Y		N	

Table 8-2 – PICS for T-Profile support

		Client		Server		Value/Comment
		F/S		F/S		
T1	TCP/IP T-Profile		N		Y	
T2	OSI T-Profile		N		N	
T3	GOOSE/GSE management services T-Profile		Y		Y	
T4	GSSE T-Profile		N		N	
T5	TimeSync T-Profile		Y		N	
T6	SV / SV management services T-Profile		N		Y	
T7	Security for TCP/IP T-Profile		N		N	
T8	Routable GOOSE T-Profile		N		N	
T9	Routable SV T-Profile		N		N	

8.2 MMS Conformance

MMS conformance guaranteed by MMS stack vendor, ie. Cisco Inc.

All needed services supporting the ACSI services stated to be supported in paragraph 2. are supported by the MMS stack used.

9 PIXIT

In this chapter, the essentials for device communication configuration and integration are described. PIXIT is given as a separate document.

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