

## IEC 61850 Certificate Level A<sup>1</sup>

**Issued to:**

Hitachi Energy Sweden AB  
GA Products  
S-721 59 Västerås  
Sweden

**For the server product:**

REC670 Bay control  
Product version 2.2.6  
Software version: 2.2.19.1  
S/N: T2037237

The server product has not been shown to be non-conforming to:

### IEC 61850 Edition 2 Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1

Communication networks and systems for power utility automation

The conformance test has been performed according to IEC 61850-10 Edition 2, the UCA International Users Group Edition 2 Server Test Procedures version 2.0.6 with product's protocol, model and technical issue implementation conformance statements: "Protocol Implementation Conformance Statement for the IEC 61850 Edition 2 & 2.1 interface in Relion® 670 and 650 series and SAM600-IO Version 2.2.6, Rev.A, Date 2023-02-21", "Relion® 670 650 series and SAM600-IO version 2.2.6 Ed2-MICS, Rev.A, Date 2023-02-22" and "Relion® 670 650 series and SAM600-IO version 2.2.6 Ed2-TICS, Rev.A, Date 2023-02-21" and product's extra information for testing: "Relion® 670 650 series and SAM600-IO version 2.2.6 Ed2 and Ed2.1-PIXIT, Rev.A, Date 2023-02-21".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases):

1 Basic Exchange (25/26)	9a GOOSE Publish (9/13)
2 Data Sets (4/7)	9b GOOSE Subscribe (21/21)
3 Substitution (3/3)	12a Direct Control (10/18)
4 Setting Group Selection (4/4)	12c Enhanced Direct Control (13/20)
4+ Setting Group Definition (13/13)	12d Enhanced SBO Control (19/28)
5 Unbuffered Reporting (19/23)	13 Time Synchronization (7/7)
6 Buffered Reporting (28/33)	14 File Transfer (7/8)
	15 Service Tracking (11/17)

This certificate includes a summary of the test results as carried out at DNV in Madrid with UniGrid SA Simulator 2.0.2 with test suite 20230109.2 and UniCA 61850 Analyzer 6.44.01. This document has been issued for information purposes only, and the archived DNV verification report No. 10383467-DSO 23-2629 rev 3 will prevail.

The test has been carried out on one single specimen of the product as referred above and submitted to DNV by Hitachi Energy Sweden AB. The manufacturer's production process has not been assessed. This certificate does not imply that DNV has approved any product other than the specimen tested.

Arnhem, March 13, 2023



**G. Akse**  
Business Development Manager  
Interoperability of Smart Power Systems

**Issued by:**




**R. Schimmel**  
Verification Manager

<sup>1</sup> Level A - Independent test lab with certified ISO 9001 Quality System

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Applicable Test Procedures from the UCA International Users Group Edition 2 Server Test Procedures version 2.0.6

Conformance Block	Mandatory	Conditional
1: Basic Exchange	sAss1, sAss2, sAss3, sAss4, sAssN2, sAssN3, sAssN4, sAssN5, sSrv1, sSrv2, sSrv3, sSrv4, sSrv5, sSrv8, sSrvN1abcd, sSrvN4	sAssN6, sSrv6, sSrv9, sSrv10, sSrv11, sSrv12, sSrv13, sSrvN1e, sSrvN3
2: Data Sets	sDs1, sDs10a, sDsN1ae	sDs15
3: Substitution	sSub1, sSub2, sSub3	
4: Setting Group Selection	sSg1, sSg3, sSgN1	sSg11
4+: Setting Group Definition	sSg2, sSg4, sSg6, sSg7, sSg8, sSg10, sSg12, sSgN2, sSgN3, sSgN4, sSgN5	sSg5, sSg9
5: Unbuffered Reporting	sRp1, sRp2, sRp3, sRp4, sRp5, sRp9, sRp14, sRp16, sRpN1, sRpN2, sRpN3, sRpN4, sRpN8	sRp8, sRp10, sRp11, sRp12, sRp13, sRp15
6: Buffered Reporting	sBr1, sBr2, sBr3, sBr4, sBr5, sBr9, sBr14, sBr16, sBr20, sBr21, sBr22, sBr25, sBr26, sBr27, sBr28, sBr29, sBrN1, sBrN2, sBrN3, sBrN4, sBrN5, sBrN8	sBr8, sBr10, sBr11, sBr12, sBr13, sBr15
9a: GOOSE publish	sGop2a, sGop3, sGop4, sGop9, sGop10, sGop11, sGop12	sGop1, sGopN1
9b: GOOSE subscribe	sGos1, sGos2, sGos3, sGos5, sGos6a, sGos7, sGos8, sGos9, sGos10, sGos11, sGos12, sGos23, sGosN1, sGosN2, sGosN3, sGosN4, sGosN5, sGosN6	sGos4, sGos6b, sGos13
12a: Direct control	sCtl5, sCtl10, sDOes1, sDOes2	sCtl7, sCtl13, sCtl15, sCtl16, sCtl17, sCtl28
12c: Enhanced Direct Control	sCtl5, sCtl10, sDOes1, sDOes2	sCtl7, sCtl13, sCtl14, sCtl15, sCtl16, sCtl17, sCtl18, sCtl26, sCtl28
12d: Enhanced SBO Control	sCtl5, sCtl8, sCtl9, sCtl10, sCtl11, sCtl25, sSBOes1, sSBOes2, sSBOes6, sSBOes8	sCtl4, sCtl6, sCtl7, sCtl15, sCtl16, sCtl17, sCtl18, sCtl26, sCtl28
13: Time sync	sTm1, sTm2, sTmN1	sTm3, sTm4, sTm5, sTmN2
14: File transfer	sFt1, sFt2ab, sFt4, sFt5, sFtN1ab	sFt2c, sFtN1c
15: Service tracking		sTrk1, sTrk2, sTrk4, sTrk7, sTrk8, sTrk9, sTrk10, sTrk11, sTrk13, sTrk14, sTrk17

All configuration file and data model tests have been successfully performed for the product variants using the same communication hardware and software version:

- SAM600-IO Switchgear control
- REB650 Busbar protection
- REC650 Bay control
- RED650 Line differential protection
- REL650 Line distance protection
- REQ650 Breaker protection
- RET650 Transformer protection
- REB670 Busbar protection
- RED670 Line differential protection
- REG670 Generator protection
- REL670 Line distance protection
- RER670 Railway application
- RES670 Phasor Measurement unit
- RET670 Transformer protection