



Issued to:
ENTEC Electric & Electronic Co., Ltd.
225-38, Choerubaek-ro, Bongdam-eup,
Hwaseong-si, Gyeonggi-do, 18329
Republic of Korea

For the server product:
ETCPU650
DC protection relay
Firmware version: 1.0.2.5
Software version: 2.0.6.0



Issued by:

**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 2.0.5 with product's protocol, model and technical issue implementation conformance statements: "Protocol Implementation Conformance Statement for the IEC 61850 Edition 2 server interface in ETCPU650, version 1.0", "Model Implementation Conformance Statement (MICS) for the IEC 61850 Edition 2 server interface in ETCPU650, version 1.0", "TISSUES Implementation Conformance Statement for the IEC 61850 interface in ETCPU650, version 1.0" and product's extra information for testing: "Protocol Implementation eXtra Information for Testing (PIXIT) for the IEC 61850 Edition 2 server interface in ETCPU650, version 1.0".

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

1 Basic Exchange (21/26)	9a GOOSE Publish (8/13)
2 Data Sets (4/7)	9b GOOSE Subscribe (17/20)
2+ Data Set Definition (24/24)	12a Direct Control (5/19)
4 Setting Group Selection (4/4)	12d Enhanced SBO Control (13/29)
5 Unbuffered Reporting (21/23)	13 Time Synchronization (4/7)
6 Buffered Reporting (29/33)	14 File Transfer (5/8)

This certificate includes a summary of the test results as carried out at UL Solutions Korea with SimFlex Client Simulator 4.2.8139 with test suite 3.12.20210808 and Wireshark Version 3.4.8. This document has been issued for information purposes only, and the original copy of UL report: No. 4790686613-20221219 will prevail.

The test has been carried out on one single specimen of the product as referred above and submitted to UL Solutions by ENTEC Electric & Electronic Co., Ltd. The manufacturer's production process has not been assessed. This certificate does not imply that UL Solutions has certified or approved any product other than the specimen tested.

Dec 19, 2022

Sjoerd Willemsen
Program Manager
¹ Level A - Independent Test lab with certified ISO/IEC 17025 Quality System
UCA International User Group P.O. Box 315, Shell Knob, MO 65747 USA

JunYoung Cho
Test Engineer



Applicable Test Procedures from the UCA International Users Group Edition 2 Server Test Procedures version 2.0.5

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, sSrvN1e, sSrvN2, sSrvN3
2: Data Sets	sDs1, sDs10a, sDsN1ae	sDs15
2+: Data Set Definition	sDs2, sDs3, sDs4, sDs5, sDs6, sDs7, sDs8, sDs9, sDs13, sDs14, sDsN1cd, sDsN2, sDsN3, sDsN4, sDsN5, sDsN6, sDsN7, sDsN8, sDsN9, sDsN10	sDs11, sDs12, sDsN11, sDsN12
4: Setting Group Selection	sSg1, sSg3, sSgN1	sSg11
5: Unbuffered Reporting	sRp1, sRp2, sRp3, sRp4, sRp5, sRp9, sRp14, sRp16, sRpN1, sRpN2, sRpN3, sRpN4, sRpN8	sRp6, sRp7, sRp8, sRp10, sRp11, sRp12, sRp15, sRpN5
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	sBr6, sBr7, sBr8, sBr10, sBr11, sBr12, sBr15
9a: GOOSE publish	sGop2a, sGop3, sGop4, sGop9, sGop10, sGop11, sGop12	sGop1
9b: GOOSE subscribe	sGos1, sGos2, sGos3, sGos5, sGos6a, sGos7, sGos8, sGos9, sGos10, sGos11, sGos12, sGosN1, sGosN2, sGosN3, sGosN4, sGosN5, sGosN6	
12a Direct control	sCtl5, sCtl10, sDOns1, sDOns2	sCtl16
12d Enhanced SBO control	sCtl5, sCtl8, sCtl9, sCtl10, sCtl11, sCtl25, sSBOes1, sSBOes2, sSBOes6, sSBOes8	sCtl4, sCtl16, sCtl26
13 Time sync	sTm1, sTm2, sTmN1	sTmN2
14 File transfer	sFt1, sFt2ab, sFt4, sFt5, sFtN1ab	