G3-Hybrid CERTIFIED CEN A

C E R T I F I C A T E

Certificate registration number: G3.2406.610.1.A7

Certificate holder: Qingdao Eastsoft Communication Technology Co., Ltd.

Platform designation: ESPLC-CEN-HYB,
Hardware version ES-G3-HYB-EV-kit(v1.0),
Firmware version ESG3SC-V004213

Certification date: June 12th 2024

This certificate indicates the above-mentioned platform successfully completed certification testing with regards to the G3-Alliance reference specification ITU G.9903 (08-2017) including Amendment 1 (05/21), Amendment 2 (03/23) and Corrigendum 1 (03/23), as published on https://www.itu.int/rec/T-REC-G.9903, plus the three changes listed in Annex 1.

The device is certified for both G3-PLC and G3-Hybrid. The optional features of the G3 protocol coherent mode and frequency hopping also covered by this certification. This certificate applies to certification profile CENELEC A and the device was configured as a PAN-Coordinator.

Test cases have been performed as described in the test report referred to below. This certificate is granted on account of tests conducted by TÜV Rheinland in Yokohama, Japan in March 2024. The results and remarks can be found in the complete test report.

Applied tests	Performed by	Document evidence
Conformance, interoperability and performance testing according to the test specification referenced by the test report	TÜV Rheinland Japan	JP237IAP 001

The device tested is a G3-Hybrid PLC+RF platform: a solution providing an implementation of the G3 specification. The Protocol Implementation Conformance Statement in the Annex includes the PICS related to performance and is an integral part of this certificate. This certificate is valid from June 12th 2024.

The certificate is only applicable to the platform described above and permits the use of the G3-Hybrid logo as laid down in the G3-Alliance logo license agreement.

This certificate does not imply assessment of the production. This certificate shall not be defined, or used as a guarantee covering quality of a product which includes G3-Hybrid. The liability of the Alliance and the test laboratory or any of her representatives is excluded for any damages or losses of the certified company.

Paris, June 12th 2024

For the G3-Alliance:

Marc Delandre
Chairman

Madeleine Francillard
Chair Certification Program

G3-Alliance

Annex 1:
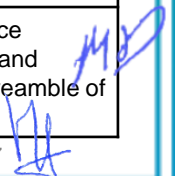# Reference Version for Certification

The reference version for this certificate is ITU G.9903 (08-2017) including Amendment 1 (05/21), Amendment 2 (03/23) and Corrigendum 1 (03/23), as published on https://www.itu.int/rec/T-REC-G.9903, plus the following three changes:

– HYB_C_067: Clarification on Media Probing for PLC with valid tone-map
– HYB_C_068: Guard time for broadcast and slot alignment
– HYB_C_069: 802.15.4 Cor1 Reference

Annex 2: Protocol Implementation Conformance Statement (PICS)

Feature implementation statement

Name	Value	Description
BAND_PLAN	CENELEC A	Indicates the band-plan supported by the device
BAND_PLAN_RF	863_Mode#1 866_Mode#1 870_Mode#1 915_Mode#1 915-a_Mode#1 915-b_Mode#1 915-c_Mode#1 919_Mode#1 920_Mode#1 920-b_Mode#1	Indicates the RF band plan(s) supported by the device
FEATURE_PAN_COORDINATOR	TRUE	Indicates whether the device is a PAN-Coordinator (true) or a normal device (false)
FEATURE_COHERENT_MODULATION	TRUE	Indicates whether coherent modulation is supported
FEATURE_D8PSK_MODULATION	TRUE	Indicates whether D8PSK modulation is supported
FEATURE_EAP_SERVER	TRUE	Indicates whether an EAP-PASK server is implemented by the DUT. Applies only if FEATURE_PAN_COORDINATOR = true
FEATURE_ROUTING	TRUE	Indicates whether the routing is implemented by the IUT
FEATURE_SECURITY	F1	Indicates the security implemented by the device. Possible values are: F1, F2
FEATURE_ACTIVE_SCAN	TRUE	Indicates whether the active scan process is done by the IUT after power-up
FEATURE_PREAMBLE_COEXISTENCE_MECHANISM	FALSE	Indicates whether the preamble-based coexistence mechanism is used by the IUT
FEATURE_HYBRID_RF	TRUE	Indicates whether Hybrid PLC+RF feature is supported
FEATURE_FREQUENCY_HOPPING	TRUE	Indicates whether the Frequency Hopping mechanism is supported
FEATURE_PREAMBLE_12_SYNCP	FALSE	Indicates whether the device supports the transmission and reception of frames with preamble of 12 SYNCP symbols

Annex 3: Protocol Implementation Conformance Statement (PICS)

PICS related to PLC performance

The device tested is a G3-Hybrid PLC+RF CENELEC A platform. Testing was performed on phase 1.
Operating voltage applied for certification testing was AC230V/50Hz .

Name	Value	Unit	Description

PICS related to performance are available through manufacturer only.

Annex 3: Protocol Implementation Conformance Statement (PICS)

PICS related to RF performance
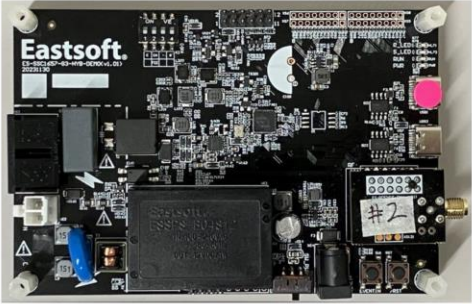
The device tested is a G3-Hybrid PLC+RF CENELEC A platform.
Operating voltage applied for certification testing was AC230V / 50Hz.

Name	Value	Unit	Description

PICS related to performance
are available
through manufacturer only.

* Note: The values for [HYB_MESH_XXX] have been determined on a fixed RF channel. With Frequency Hopping enabled, these values may be different.

Annex 4:
Copy of test report cover sheet

Test Report – Products
Prüfbericht - Produkte

△ TÜVRheinland®

Test report no.: *Prüfbericht-Nr.:*	**JP237IAP 001**	**Order No.:** *Auftragsnr.:*	150284326 10	Page 1 of 69 *Seite 1 von 69*

Client reference no.: *Kunden-Referenz-Nr.:*	ESPLC-CEN-HYB	**Order date:** *Auftragsdatum:*	2023-11-21

Client:
Auftraggeber:
Qingdao Eastsoft Communication Technology Co., Ltd.
16A Shangqing Road, Qingdao 266023, China

Test item:
Prüfgegenstand:
G3-Hybrid Platform
(CENELEC-A PAN Coordinator)

Identification / Type no.:
Bezeichnung / Typ-Nr.:
ESPLC-CEN-HYB

Order content:
Auftrags-Inhalt:
G3 Certification Test

Test specification
Prüfgrundlage:
Certification Test Procedures for G3-Alliance Certification - v7.2
G3 Conformance Tests Suite Specification - v0.39
G3 PLC 1-to-1 Interoperability Tests Suite Specification - v0.15
Performance test suite for G3 device certification - v0.28
Hybrid PLC+RF - Conformance Tests Suite Specification - v0.13
G3-Hybrid RF 1-to-1 Interoperability Tests Suite Specification version - v0.8
Performance test suite for G3-Hybrid PLC&RF device certification - v0.4

Date of sample receipt:
Wareneingangsdatum:
2024-01-22

Test sample no:
Prüfmuster-Nr.:
A003648596-002

Testing period:
Prüfzeitraum:
2024-03-14 - 2024-03-18

Place of testing:
Ort der Prüfung:
4-25-2 Kita-Yamata,
Tsuzuki-ku Yokohama
224-0021, Japan

Testing laboratory:
Prüflaboratorium:
TÜV Rheinland Japan Ltd.

Test result*:
Prüfergebnis:*
Pass

tested by: *geprüft von:*		**authorized by:** *genehmigt von:*
Date: 2024-03-18 *Datum:*	Martin Zietz	**Issue date:** 2024-03-19 *Ausstellungsdatum:* Shuji Saito
Position / *Stellung:*	Tester	**Position** / *Stellung:* Authorizer

Other:
Sonstiges:

Condition of the test item at delivery: *Zustand des Prüfgegenstandes bei Anlieferung:*	Test item complete and undamaged Prüfmuster vollständig und unbeschädigt

Annex 5: Additional details of the certified platform

Platform model name:	ESPLC-CEN-HYB	
Platform hardware version:	ES-G3-HYB-EV-kit(v1.0)	
Platform firmware version:	ESG3SC-V004213	
Exact part number of all the chips running G3 stack in the certified platform:	Chip #1: SSC1657	Chip #1: RFT5361E
What each part number runs: lower MAC (incl. CSMA/CA) or PHY or other parts of the stack:	PLC PHY, PLC MAC, RF MAC and 6LowPAN	RF PHY
Hardware version of this chip:	Version A	V3B
Software version running on this chip:	ESG3SC-V004213	n/a
Internal CPU frequency:	48 MHz	n/a