G3-PLC CERTIFIED CEN A

C E R T I F I C A T E

Certificate registration number: G3.1709.159.1.A3

Certificate holder: Renesas Electronics Corporation

Platform designation: REL-G3PLC-CPX2,
Hardware version uPD809508K8, Firmware version CENELEC A 2.02.01

Certification date: September 13th, 2017

This certificate indicates the above mentioned platform successfully completed certification testing with regards to the reference specification ITU G.9903 (02-2014) plus the changes listed in an annex to this certificate. The optional feature coherent mode of the G3-PLC protocol is also covered by this certification.

The certificate applies to certification profile Metering Cenelec A and the device was configured as a PAN-Device.

Test cases have been performed as described in the test report referred to below. This certificate is granted on account of tests conducted by TÜVRheinland in Yokohama, Japan in August 2017. The results and remarks can be found in the complete test report.

Applied tests	Performed by	Document evidence
Conformance and interoperability testing according to the test specification referenced by the test report	TÜVRheinland	Test report #50096097 001

The device tested is a G3-PLC platform: a solution providing an implementation of the G3-PLC specification. This certificate is valid from September 13th, 2017.

The certificate is only applicable to the platform described above and permits the use of the G3-PLC™ logo as laid down in the G3-PLC 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-PLC. 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, September 13th, 2017

For the G3-PLC Alliance:

Bernard Lassus
Chairman

Madeleine Francillard
Chair Certification Program

G3-PLC Alliance

Annex 1:
Reference Version for Certification

The reference version for this certificate is published in 'Narrowband OFDM PLC specifications for G3-PLC network, March 2017'.

The reference version for this certification is: ITU-T G.9903 (02-2014) +

- CCTT #24-25-30: Implementation of MAC security (anti-replay) solution F1
- CCTT #61: ADPM-Buffer behavior clarification
- CCTT #143: AC Phase Detection v2
- CCTT #144: Hop Limit usage during route repair v3
- CCTT #145: Value of RCCoord when the node is at adpMaxHops hops from the coordinator
- CCTT #146: Pilot tone generation
- CCTT #147: Link-cost computation for Path discovery v2
- CCTT #148: Path discovery frame routing v3
- CCTT #152: Scrambler reset
- CCTT #154: Clarification of PANCount and PANDescriptor
- CCTT #156: Clarification of ADPM-NETWORK-STATUS.indication
- CCTT #157: Interleaver Equation v2
- CCTT #158: Unicast Routing Process
- CCTT #159: Correct the windowing function description
- CCTT #160: Clarify 16QAM quantisation and optionality
- CCTT #161: Correct aMaxFrameSize and aMinFrameSize for FCC/ARIB bandplans
- CCTT #162: Interleaver co-prime number clarification v2
- CCTT #163: CRC5 and CRC8 packing order
- CCTT #164: Route Repair v2
- CCTT #165: Clarification Neighbour Table v2
- CCTT #167: HOP COUNT metric identifier v2
- CCTT #169: Clarification on PLME_GET v4
- CCTT #170: Clarification to Frame Counter Handling Mechanism v2
- CCTT #172: Windowing in coherent mode
- CCTT #173: Clarification of LOADng mechanism used to detect bidirectional links
- CCTT #174: Avoiding duplicated MAC packets
- CCTT #175: LOADng - subsequent RREP generation
- CCTT #176: Link cost function of LQI v3
- CCTT #177: Broadcast routing - filtering frames on the source
- CCTT #178: Coexistence of G3-PLC with other PLC technologies v3
- CCTT #179: RREP Filtering v3
- CCTT #181: Route Repair v2
- CCTT #182: Lowering the modulation order for transmission v3
- CCTT #183: Destination Address Set v5
- CCTT #186: TXGAIN / TXCOEF Definition
- CCTT #187: Route Advertisement after Association v3
- CCTT #188: Maximum CSMA Window for normal priority broadcast packets v2
- CCTT #189: Updated default values of MAC and ADP attributes v2
- CCTT #191: Phase detection and MAC repetitions v3
- CCTT #192: Device network leave behaviour in case of LBP KICK failure v2
- CCTT #193: Frame Counter Preservation after kick leave v2
- CCTT #194: Limiting the output level v3
- CCTT #195: Removing the S-FSK notching mechanism
- CCTT #196: Destination Address Set (addendum)
- CCTT #198: Convolutional Encoder clarification
- CCTT #199: Route Repair mechanism clarification
- CCTT #200: Neighbour table storing only device information issued from unicast communications v2
- CCTT #201: Annex D title
- CCTT #203/203R: Transferring the spectral flatness section from G.9901 to G.9903
- CCTT #204/204R: Detecting and removing loops v3
- CCTT #205: Remove Limit on RERR generation v2
- CCTT #206: Reset of TMRValidTime after macMaxFrameRetries attempts v3
- CCTT #207: Rounding definition for Link Cost v2
- CCTT #208: Creation of a POS table v3
- CCTT #209: Clarification of PN sequence for 2 RS Blocks

Annex 2: Protocol Implementation Conformance Statement (PICS)

Feature implementation statement

Name	Value	Description
BAND_PLAN	CENELEC A	Indicate the band-plan supported by the device.
FEATURE_PAN_COORDINATOR	FALSE	Indicate if the device is a PAN-Coordinator (true) or a normal device (false).
FEATURE_COHERENT_MODULATION	TRUE	Indicate if coherent modulation is supported.
FEATURE_EAP_SERVER	FALSE	Indicate if an EAP-PASK server is implemented by the DUT. Apply only if FEATURE_PAN_COORDINATOR = true.
FEATURE_D8PSK_MODULATION	TRUE	True / False
FEATURE_ROUTING	TRUE	Indicate if the routing is implemented by the IUT.
FEATURE_SECURITY	F1	Indicate the security implemented by the device. Possible values are: F1, F2.
FEATURE_ACTIVE_SCAN	TRUE	Indicate if the active scan process is done by the IUT after power-up.
FEATURE_PREAMBLE_COEXISTENCE_MECHANISM	FALSE	Indicate if the preamble-based coexistence mechanism is used by the IUT.

Annex 3:
Copy of test report cover sheet

Produkte
Products

TÜVRheinland®

Prüfbericht - Nr.: *Test Report No*	**50096097 001**	Seite *Page* 1	von *of* 24
Auftraggeber: *Client*	**Renesas Electronics Corporation** **5-20-1,Josuihon-cho, Kodaira-shi, Tokyo, 187-8588, Japan**		
Gegenstand der Prüfung: *Test Item*	**G3-PLC CENELEC-A Platform (PAN Device)**		
Bezeichnung: *Identification*	**REL-G3PLC-CPX2**	**Serien-Nr.:** *Serial No.*	**0200264**
Wareneingangs-Nr.: *Receipt No.*	**A000611739**	**Eingangsdatum:** *Date of receipt*	**2017-08-28**
Zustand des Prüfgegenstandes bei Anlieferung: *Condition of test item at delivery*	**Test item complete and undamaged**		
Prüfort: *Testing location*	**TÜV Rheinland Japan Ltd.** Global Technology Assessment Center 4-25-2 Kita-Yamata, Tsuzuki-ku Yokohama 224-0021, Japan		
Prüfgrundlage: *Test specification*	**G3-PLC Conformance L1-L2 Tests Suite Specification v0.24** **G3-PLC 1-to-1 Interoperability Tests Suite Specification v0.9** **G3-PLC Certification Test Procedures v1.10**		
Prüfergebnis *Test Result*	**Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).** *The test item passed the test specification(s)*		
Prüflaboratorium: *Testing Laboratory*	**TÜV Rheinland Japan Ltd.** Global Technology Assessment Center 4-25-2 Kita-Yamata, Tsuzuki-ku Yokohama 224-0021, Japan		

geprüft/ *tested by:*

Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*
2017-09-01	**Tam Tran Thanh**	

kontrolliert/ *reviewed by:*

Datum *Date*	**Name/Stellung** *Name/Position*	**Unterschrift** *Signature*
2017-09-05	**Shuji Saito**	

Sonstiges / *Other Aspects:*

Abkürzungen		Abbreviations	
OK, Pass	= entspricht Prüfgrundlage	OK, Pass	= passed
Fail	= entspricht nicht Prüfgrundlage	Fail	= failed
N/A	= nicht anwendbar	N/A	= not applicable

Dieser Prüfbericht bezieht sich nur auf den o.g. Prüfgegenstand und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
This test report relates to the a. m. test item. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark on this or similar products.

Annex 4: Additional details of the certified platform

Platform model name:	REL-G3PLC-CPX2
Platform hardware version:	uPD809508K8
Platform firmware version:	CENELEC A 2.02.01
Exact part number of all the chips running G3-PLC stack in the certified platform:	uPD809508K8-711-BAA-A
What each part number runs: lower MAC (incl. CSMA/CA) or PHY or other parts of the stack:	6LOWPAN, Lower MAC & PHY
Hardware version of this chip:	uPD809508K8
Software version running on this chip:	CENELEC A 2.02.01
Internal CPU frequency:	80 MHz