



# C E R T I F I C A T E

**Certificate registration number:** G3.1702.128.1.C2

**Certificate holder:** Vango Technologies Inc.

**Platform designation:** Vango PLC V630x+V600x,  
Hardware version VT\_PLC-Magpie\_Demo\_Board\_V2.0,  
Firmware version v6.1.0.65\_0.0.0

**Certification date:** February 14<sup>th</sup>, 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 FCC Multipurpose Worldwide 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 TÜV Rheinland in Yokohama, Japan in January 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	TÜV Rheinland Japan	Test report # 50068533 002

The device tested is a G3-PLC platform: a solution providing an implementation of the G3-PLC specification. This certificate is valid from February 14<sup>th</sup>, 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, February 14<sup>th</sup>, 2017  
For the G3-PLC Alliance:

**Bernard Lassus**  
Chairman

**Madeleine Francillard**  
Chair Certification Program





## Annex 1: Reference Version for Certification

The reference version for this certificate is published in 'Narrowband OFDM PLC specifications for G3-PLC network, April 2015'.

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



## Annex 2: Protocol Implementation Conformance Statement (PICS)

### Feature implementation statement

Name	Value	Description
BAND_PLAN	FCC	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



<b>Prüfbericht - Nr.:</b> 50068533 002 <i>Test Report No.</i>		Seite Page		1	von of	24
<b>Auftraggeber:</b> <i>Client</i>	Vango Technologies, Inc. 2F-6, No.1, Taiyuan 2nd St., Zhubei City, Hsinchu County, Taiwan (R.O.C.), 30288.					
<b>Gegenstand der Prüfung:</b> <i>Test item</i>	G3-PLC FCC platform					
<b>Bezeichnung:</b> <i>Identification</i>	Vango PLC V630x+V600x	<b>Serien-Nr.:</b> <i>Serial No.</i>	6			
<b>Wareneingangs-Nr.:</b> <i>Receipt No.</i>	A000494740		<b>Eingangsdatum:</b> <i>Date of receipt</i>	2017-01-19		
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of test item at delivery</i>	Test item complete and undamaged					
<b>Prüfört:</b> <i>Testing location</i>	TÜV Rheinland Japan Ltd. Global Technology Assessment Center 4-25-2 Kita-Yamata, Tsuzuki-ku Yokohama 224-0021, Japan					
<b>Prüfgrundlage:</b> <i>Test specification</i>	G3-PLC Conformance L1-L2 Tests Suite Specification v0.19 G3-PLC 1-to-1 Interoperability Tests Suite Specification v0.7 G3-PLC Certification Test Procedures v1.8					
<b>Prüfresultat:</b> <i>Test Result</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test item passed the test specification(s).</i>					
<b>Prüflaboratorium:</b> <i>Testing Laboratory</i>	TÜV Rheinland Japan Ltd. Global Technology Assessment Center 4-25-2 Kita-Yamata, Tsuzuki-ku Yokohama 224-0021, Japan					
<b>geprüft/ tested by</b>			<b>kontrolliert/ reviewed by</b>			
2017-01-27, Tam Tran Thanh			2017-01-31, Shuji Saito			
<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>	<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>	
<b>Sonstiges / Other Aspects</b>						
<b>Abkürzungen</b>	OK, Pass = entspricht Prüfgrundlage Fail = entspricht nicht Prüfgrundlage NAK = nicht anwendbar	<b>Abkürzungen</b>	OK, Pass = passed Fail = failed N/A = not applicable			
Dieser Prüfbericht bezieht sich nur auf den o.g. Prüfgegenstand und darf ohne Genehmigung der Prüfstelle nicht auszugswise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>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</i>						

*Handwritten initials/signature*



## Annex 4: Additional details of the certified platform

<b>Platform model name:</b>	Vango PLC V630x+V600x	
<b>Platform hardware version:</b>	VT_PLC-Magpie_Demo_Board_V2.0	
<b>Platform firmware version:</b>	v6.1.0.65_0.0.0	
<b>Exact part number of all the chips running G3-PLC stack in the certified platform:</b>	Chip #1: V6300 (package type 68L-QFN)	Chip #2: V6000
<b>What each part number runs: lower MAC (incl. CSMA/CA) or PHY or other parts of the stack:</b>	PHY, MAC and 6LowPAN	AFE
<b>Hardware version of this chip:</b>	Revision A1	Revision A1
<b>Software version running on this chip:</b>	v6.1.1.64	v6.0.0.1
<b>Internal CPU frequency:</b>	128 MHz	24 MHz

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