

G3-Alliance

G3-Hybrid: Two powerful communication technologies in one single solution!

Introduction to the G3-Hybrid

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G3 provides proven technologies offering lowest total cost of ownership and independency on telco operators

Cost effective, reliable and secure communication...

Cost-effective		Long range communication	Real-time communication
ITU standard	Supports IPv6	Secure	
	High robustness	High data rate	Future proof
Routing		Plug and play	

... in a wide range of applications

E-Mobility & Renewables

Smart Metering 

 Grid control / Monitoring 

Smart Cities & Street Lighting 

 Building & Industrial Automation 

Railway Applications

G3 is a mature technology with over 80 million products in operation in more than 30 countries worldwide

Known pilots and roll-outs of worldwide



In France over 35 million G3-PLC meters have been successfully installed by Enedis (part of EDF group)



An industrial program for a massive roll-out

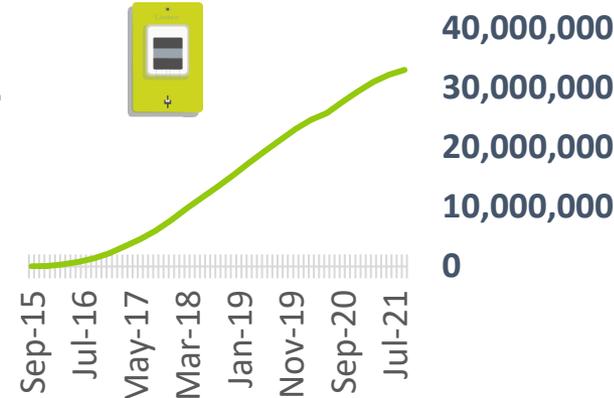


- **2 million** remote operations per month
- **99%** of successful remote operations

6 years



2015 → 2021



1 billion remote readings of consumption data per month
98% of successful remote readings



7 million people follow their consumption online

G3-PLC 100% G3-PLC communication



6 MANUFACTURERS WITH FACTORIES BASED IN FRANCE



45 ELECTRICAL INSTALLATION COMPANIES AND RECYCLING COMPANIES

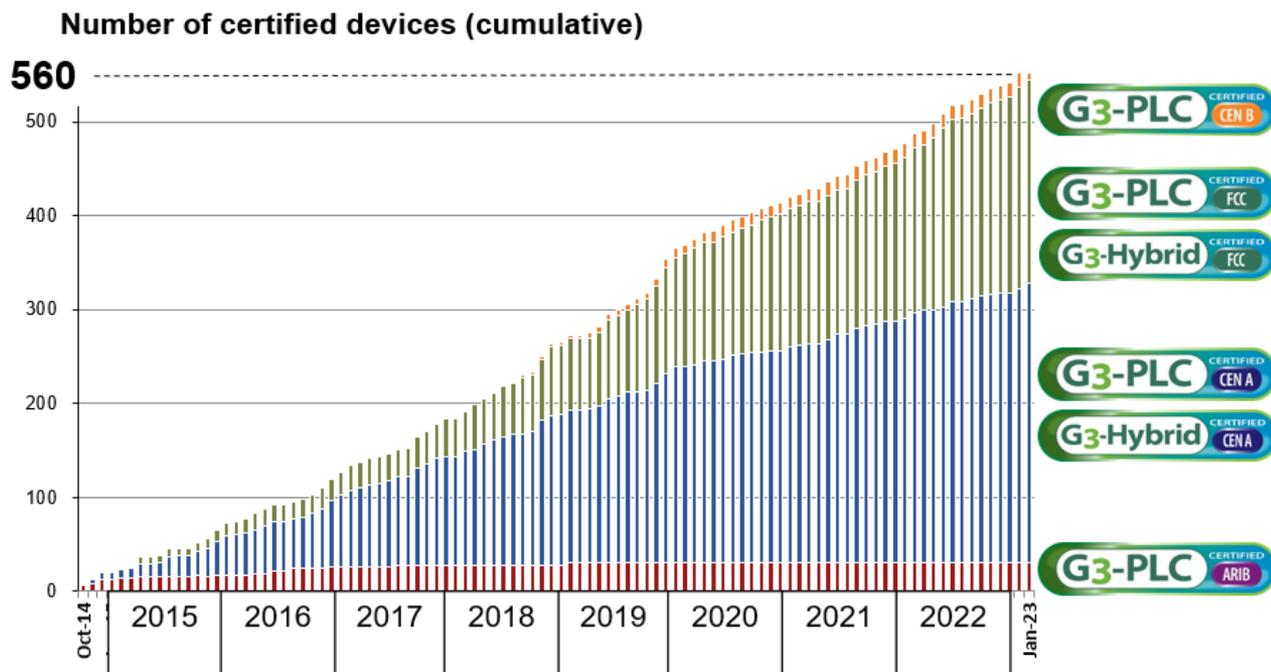
- Linky mass roll-out in France is completed
- Linky roll-out started or is in preparation in French foreign territories such as French Guyana, Martinique, Mayotte, etc. and in Haiti
- Experimentation started in France with the hybrid solution

G3-Alliance is supported by a international group of nearly 100 utilities and industrial players from over 30 countries



G3-Alliance operates a successful certification program enabling multi-vendor implementations

- Two certification labs in France and Japan
- Certification covers conformance, interoperability and performance
- Certification for platforms as well as products
- Over 500 devices certified since opening of certification

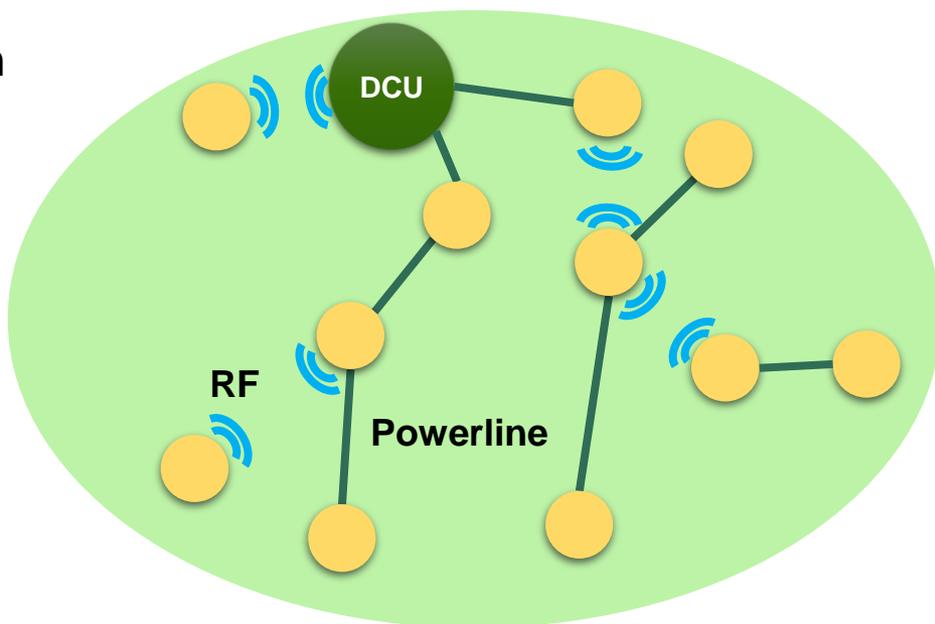


For list of all certified devices: <https://g3-plc.com/g3-plc-certification/certified-products/>

What is G3-Hybrid: Two powerful communication technologies in one single solution!

- RF mesh and power line communication in one *single* solution
- Each device can use PLC as well as RF for communication
- Open standard adopted by ITU
- Strong certification program
- Enables multi-vendor interoperability
- Complies to FCC and regulatory requirements globally

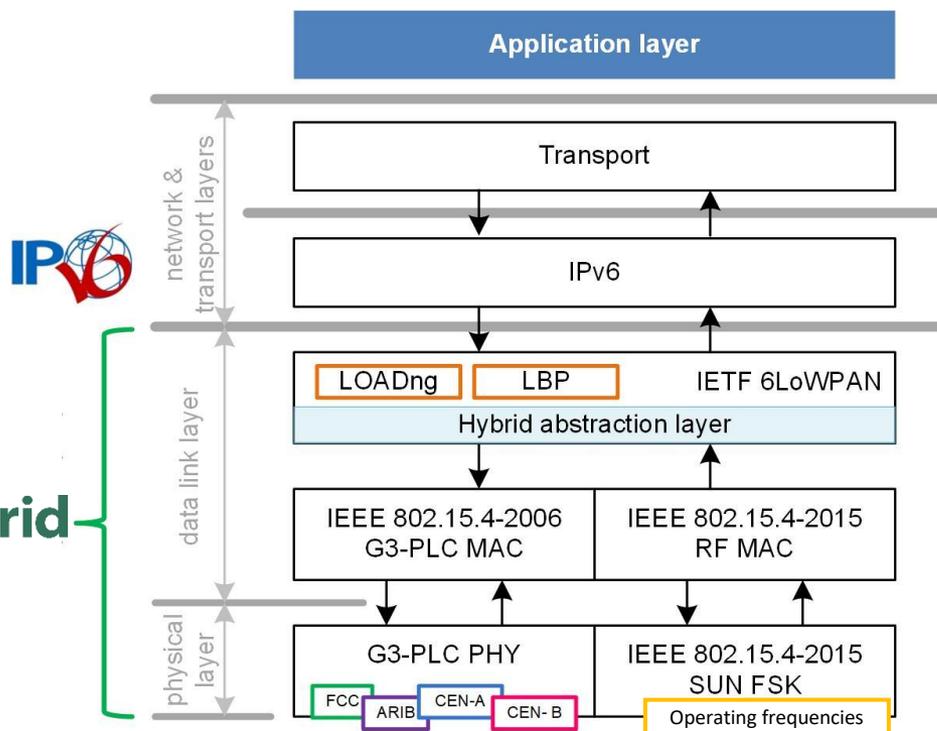
G3-Hybrid



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The G3-Hybrid unifies powerline and radio frequency technology creating one, seamlessly managed network using both media

Unified G3-Hybrid PLC+RF protocol stack



- Unifies wireless RF and wired power line communication
- One, seamlessly managed network over both media
- The hybrid protocol stack is built using open standards IEEE 802.15.4-2015 in addition to the existing G3-PLC protocol
- Switching between PLC and RF is decided above the hybrid abstraction layer

G3-Hybrid benefits: Maximises coverage and connectivity and strongly reduces the complexity of the roll-out and the cost



Cost of Ownership

- Avoids high cost of last 1% connectivity
- Reduces complexity of the roll-out
- No OPEX for using the network



Flexibility

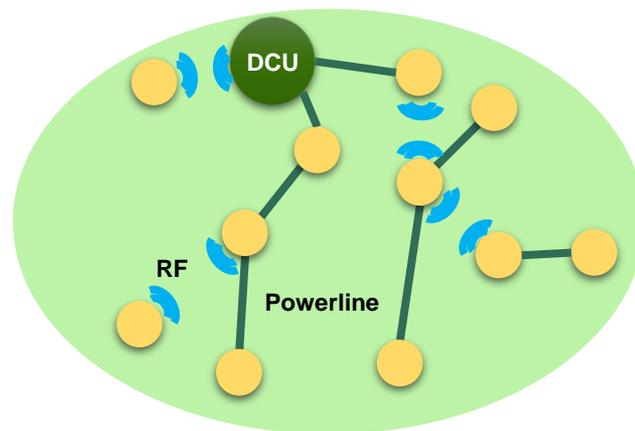
PLC and RF work hand-in-hand and complement each other, maximising coverage and connectivity



Performance

- Higher communication success rate
- Higher data rate as more nodes use best available channel
- Opens other IoT applications such as sensors, gas and water meters

G3-Hybrid



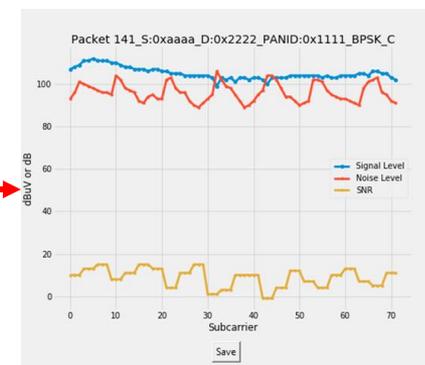
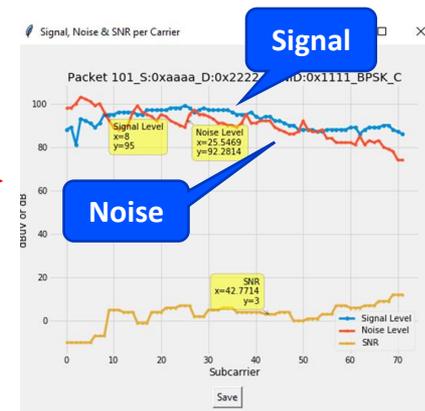
G3-Hybrid is a full-fledged RF solution with all mechanisms in place to meet regulatory requirements in any part of the world

- Based on open standard IEEE 802.15.4-2020
- Supports a wide range of RF frequencies bands
- Supported mechanisms include:
 - Frequency Hopping
 - Adaptive power control (APC)
 - Duty-cycle handling
- Last gasp mechanism supported
- Certification program includes conformance, interoperability and performance testing
- Interoperable solution enabling multi vendor implementations

ISM band designation	RF frequency bands
863	863-870 MHz
866	865-867 MHz
870	870-876 MHz
915	902-928 MHz
915-a	902-928 MHz (alt.)
915-b	902-907.5 MHz & 915-928 MHz
915-c	915-928 MHz
919	919-923 MHz
920-b	920-923 MHz
920	920-928 MHz

Trials for example in India by Sagemcom show G3-Hybrid is performing well under very harsh conditions

- Location represents a challenging environment for both RF & PLC communications:
 - Very high level of PLC noise



Sagemcom

Trials for example in India by Sagemcom show G3-Hybrid is performing well under very harsh conditions

- Location represents a challenging environment for both RF & PLC communications:
 - Very high level of PLC noise
 - Obstacles create a very harsh environment for back meters to communicate in RF with the front Meters



Sagemcom

1 H collect with Retry and recovery	30-sept	01-oct	02-oct	03-oct	Today AVG
LP1(2690 Bytes)- Daily KPI %	100	98	97	100	98.5
Billing (76 Bytes) Daily KPI %	100	98	99	100	99

G3-Alliance

G3-Hybrid communication: A global solution extending the capabilities for the smart grid and IoT!

- ✓ Offers both RF mesh and Powerline communication in a single solution
- ✓ Standards based and interoperable solution
- ✓ Maximises coverage and connectivity and strongly reduces complexity of roll-out
- ✓ Complies to regulatory requirement in any part of the world
- ✓ Opens up new use cases like multi-utility metering

If you have any questions,
please visit www.g3-alliance.com or
contact generalsecretary@g3-alliance.com