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Smart Solar solutions with G3-PLC and Hybrid connectivity

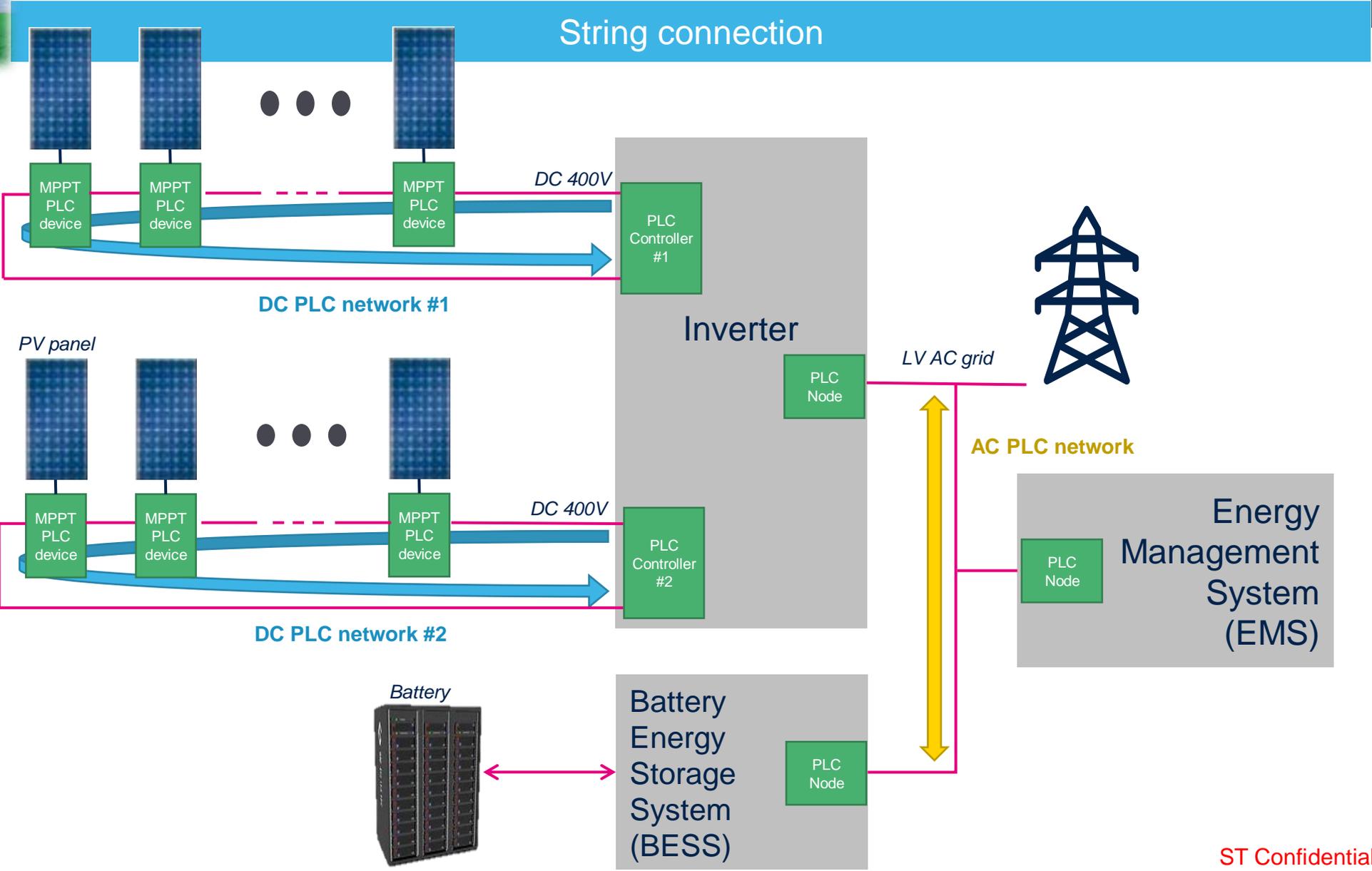
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Why using G3-PLC for Smart Solar applications?

- Robust, field-proven PLC and RF technology
- Adding flexible, state-of-the-art communication to **enable key functions**:
 - **Energy efficiency** (e.g. MPPT)
 - **Safety** (e.g. Rapid Shut Down)
 - **Integration** with Energy Management System (home / building / aggregated)
- Enabling local and remote DER management to support **grid digitalization**

PV optimizer Smart Solar System



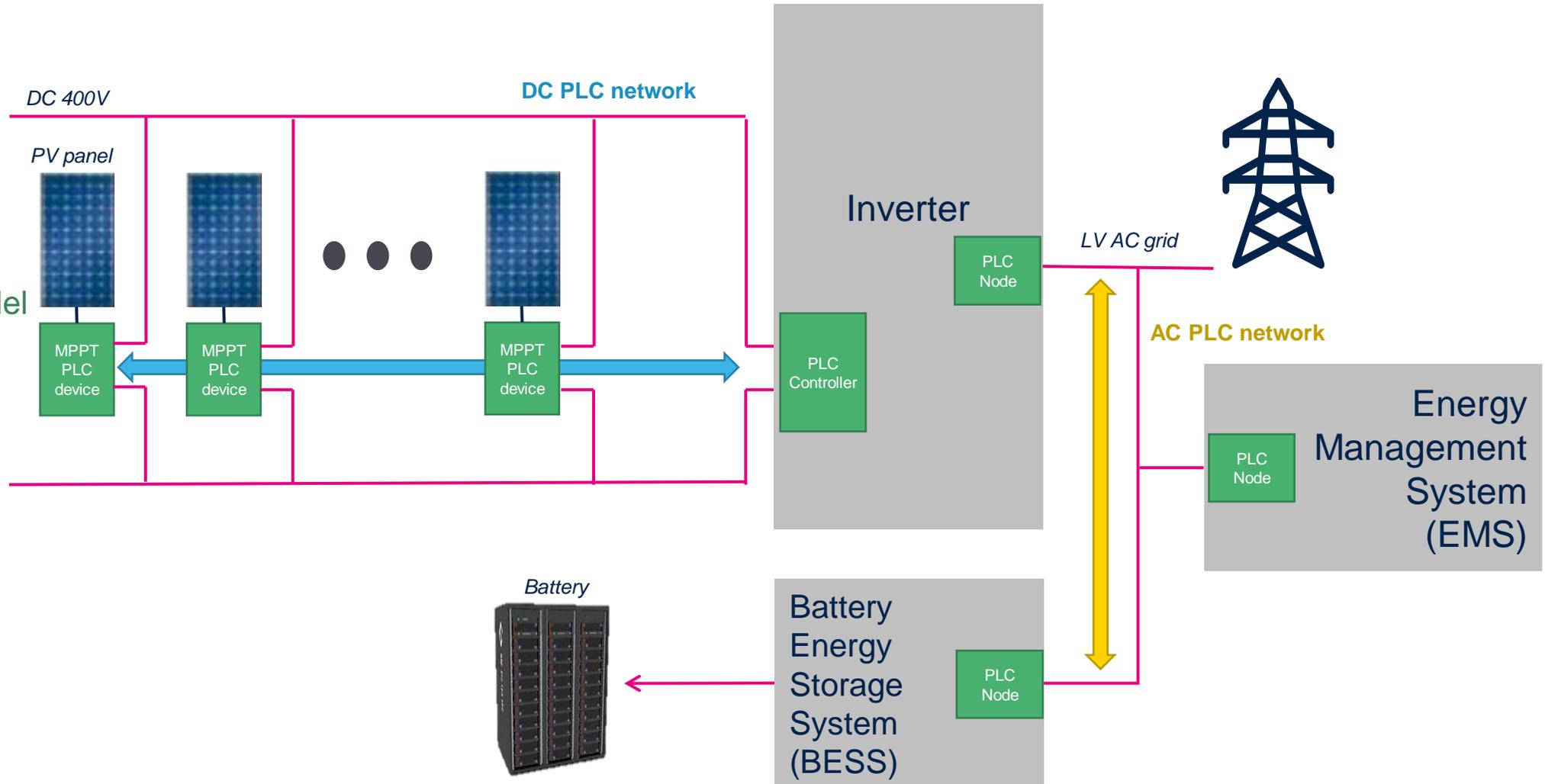
DC PLC nodes communicating in series (current coupling)



PV optimizer Smart Solar System

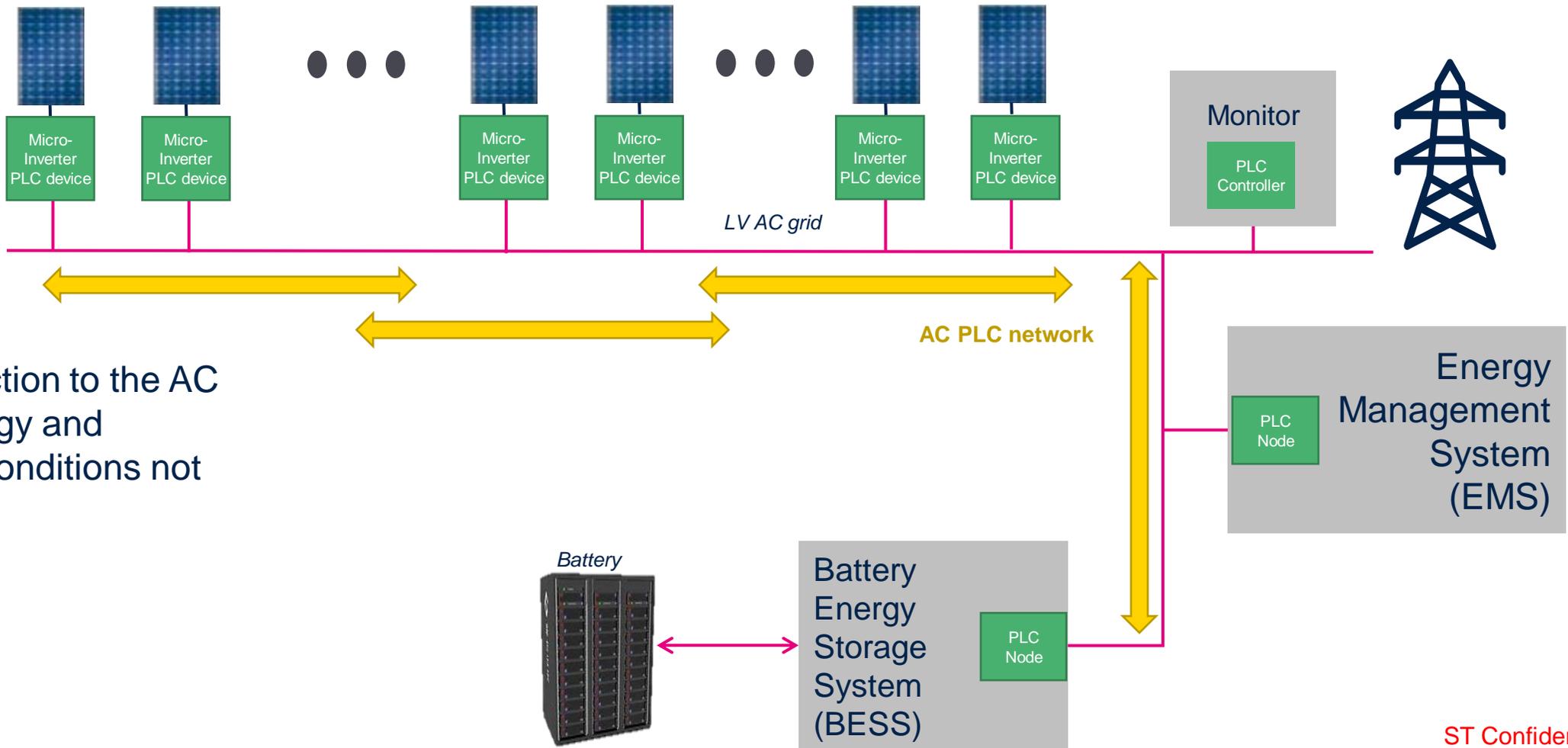
Parallel connection

DC PLC nodes communicating in parallel (voltage coupling)



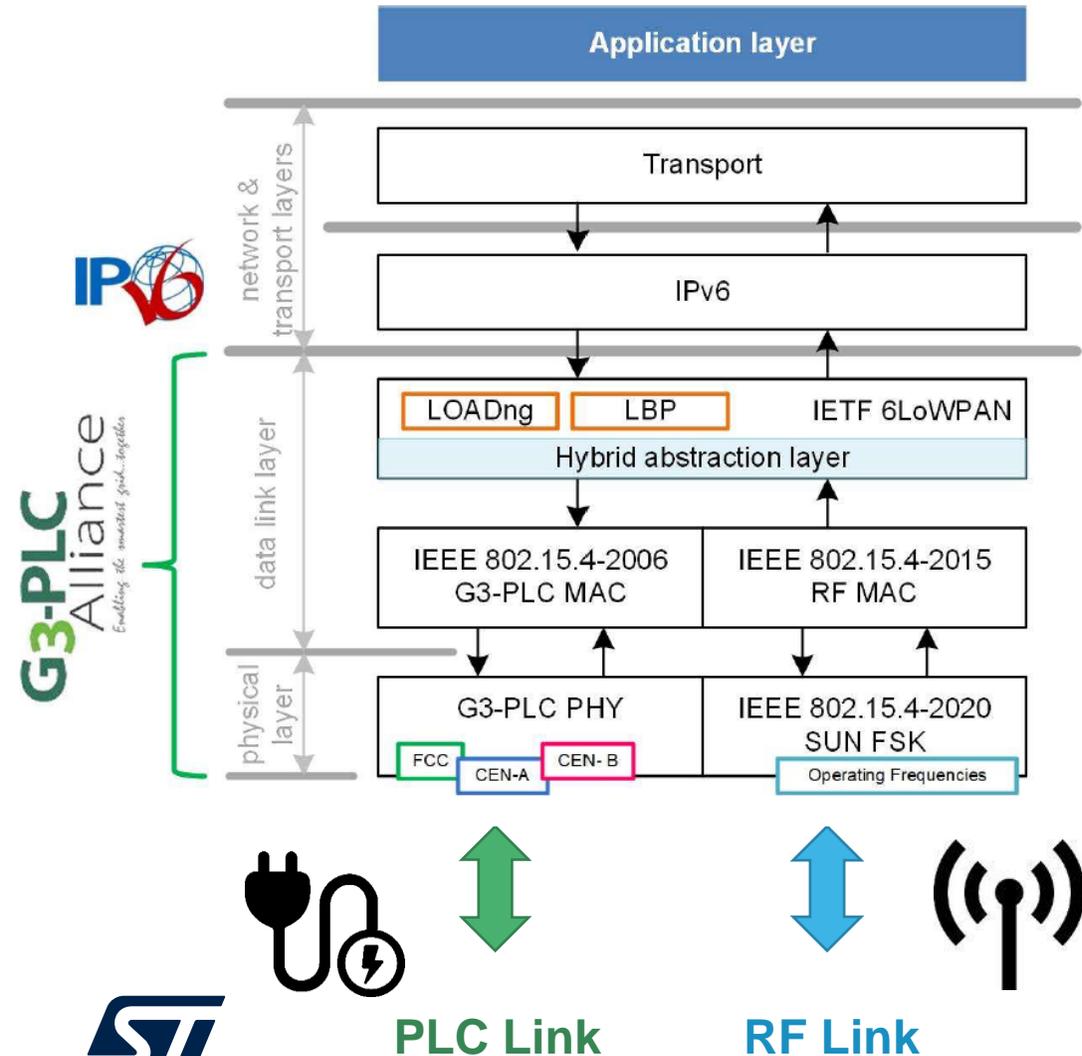
Micro-inverter based Smart Solar System

AC connection



Direct connection to the AC line → topology and disturbance conditions not predictable

G3-PLC and RF Hybrid technology: optimal integration choice



- First approach on G3-PLC technology
 - Already based on IEEE 802.15.4-2007 standard
- **Layer 1 extension:** added Sub-GHz FSK RF PHY from 802.15.4-2020
- **Layer 2 integration:**
 - 2 separate MAC Layers (CSMA, ACK, ...)
 - **Hybrid Abstraction Layer** to deal with common lower-layer procedures
 - PLC or RF media selection done **automatically** on a **hop-by-hop** basis

Thank you

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