TURNKEY PLC CHIPSET

For smart-energy infrastructure

Multi-standard, programmable and ultra-low power powerline communication solution

Smart grid networks of the future will need to be multi-layered and multi-dimensional to cope with bidirectional communication and power exchange between suppliers and consumers in complex smart energy systems that connect large-scale, time-varying, renewable sources to national power grids and markets.

With more than 20 years' experience in PLC and millions of field installations, ST leads the technological race in future-proof smart grids with its fully programmable PLC platform for multi-standard/multi-band powerline solutions offering highest possible performance and efficiency.

KEY FEATURES & BENEFITS

- Fully programmable real-time 400 MHz DSP and 200 MHz ARM® Cortex®-M4F core, for current and future processing requirements
- Ultra-low power-supply consumption <100 mW in Receive mode
- Embedded AES cryptography engine, supporting up to 256-bit key and multi-security modes to satisfy the most stringent security standards
- Full 500kHz bandwidth support to exploit global bandwidth (CENELEC, ARIB, FCC)
- Small footprint QFN package for compact and cost-effective applications

IDEAL FOR

- Smart metering and smart grid applications such as:
  - Smart meters and concentrators
  - Gateways and smart home energy systems
  - Street lighting and smart city solutions
  - Smart solar panels and inverters

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**Simply the best**

ST’s new powerline communication (PLC) platform consists of the ST8500 system-on-chip with powerline modem, higher layer communication stack, PLC analog front end and various other peripherals, and the STLD1 companion chip providing the line driver (power amplifier) function.

The ST8500 SoC embeds a programmable high performing DSP engine able to run up to 400 MHz, with dedicated code and data SRMA memories capable of supporting current and future demands of Powerline Communication protocols. A standard SRAM ARM® 32-bit Cortex® M4F core with dedicated SRAM memories for code and data is embedded for the protocol upper layer stack, peripherals and system management. The integrated differential Analog Front End ensures exceptional performance in the receiving path and drives the external line driver companion chip STLD1, suitable for differential and single-ended configurations.

The ST8500 SoC is complete with a dedicated set of peripherals designed for smart grid applications, including an AES cryptography engine supporting up to 256-bit security keys and multi-security modes to satisfy the most stringent data security and protection requirements. All this functionality with a power consumption of less than 100 mW in receive mode guarantees ultra-low-power performance.

Its full programmability allows customers to deliver multiple product variants with the same design and comply with different PLC standards (G3-PLC ITU G.9903, PRIME ITU T G. 9904, etc.) to target different market or application scenarios.

The inter-operable, certified and field proven libraries provided by ST with ST8500/STLDA drastically reduce time to market.

The STLD1 features very high linearity, with an output range up to 18 V in single-ended or 36 V in differential mode, and up to 1.5 A max. current guaranteeing EMC compliance and outstanding communication performance even in noisy and low impedance networks. Compact packages allow small footprint and cost-effective application boards and communication modules able to tolerate temperatures up to 105°C, making them suitable for even the most critical operating conditions.

### Application main blocks

![Application main blocks diagram](image)

### Product table

<table>
<thead>
<tr>
<th>Partnumber</th>
<th>Description</th>
<th>Package</th>
<th>Certified PLC protocols</th>
<th>Regulation compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST8500</td>
<td>System-on-chip including powerline modem, higher layer communication stack, PLC analog front end and other peripherals</td>
<td>QFN56 (7 x 7 mm)</td>
<td>G3-PLC ITU G.9903, PRIME ITU-T G. 9904</td>
<td>CENELEC, FCC and ARIB</td>
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<tr>
<td>STLD1</td>
<td>Line Driver, ST8500 companion chip</td>
<td>QFN24 (4 x 4 mm)</td>
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