SMART GRID COMMUNICATIONS

Reliable data connectivity over the power network

APPLICATION BRIEF

Smart-grid devices need dependable two-way data exchange across networks built for power, not communications. Semitech combines adaptive PLC technology with G3-PLC, G3-Hybrid, IEEE 1901.2, and proprietary communications modes to connect distributed assets over existing low- and medium-voltage power lines.

THE UTILITY COMMUNICATION CHALLENGE AND THE SEMITECH APPROACH

Grid communication challenges

- Noise and network impedance change as loads switch
- Dedicated communication wiring adds field work and cost
- Distributed assets need addressing, routing, and recovery
- Monitoring and control traffic must be predictable and secure

Semitech solution

Semitech offers standards-based PLC options for G3-PLC, G3-Hybrid, and IEEE 1901.2, with CEN-A, FCC, and ARIB band support. For medium-voltage deployments, XXR enables multi-kilometer links in one hop.

- ✓ G3-PLC, G3-Hybrid, IEEE 1901.2, and XXR options
- ✓ CEN-A, FCC, and ARIB regional band support
- ✓ Semitech EVK, portable SDK, APIs, and tools

CUSTOMER BENEFITS

01 Reuse installed wiring
Avoid a separate communication cable where the power network can carry data.

02 Use open standards
Select G3-PLC, G3-Hybrid, or IEEE 1901.2 for the deployment.

03 Support regional bands
Address CEN-A, FCC, and ARIB operating requirements.

04 Reach across MV lines
Use XXR for multi-kilometer medium-voltage links in one hop.

05 Evaluate and integrate faster
Start with the Semitech EVK, portable SDK, APIs, and tools.

06 Work with specialists
Engage directly with Semitech engineering for application support.

SEMITECH ADVANTAGES

Reliable communication in challenging environments

- ✓ Noise-adaptive modes for industrial power lines
- ✓ Validated by major metering customers

Direct engineering support through integration

- ✓ Comprehensive evaluation tools, reference designs, and customer board reviews

Flexible technology and application tailored protocols

- ✓ Standard protocols and custom firmware on a common platform

COMPREHENSIVE EVALUATION TOOLS

FROM GRID-EDGE DEVICES TO UTILITY SYSTEMS

A scalable communications foundation for distributed monitoring and control

SMART GRID COMMUNICATION ARCHITECTURE

Select standards-based PLC networking or Point-to-Point XXR, then choose the regional frequency band for the deployment.

AMI	TX	SW	FI	MV
Smart meters	Transformer monitors	Feeder controls	Fault indicators	Medium-voltage links

SM2400
PLC platform

Standards-Based PLC Networking
G3-PLC • G3-Hybrid • IEEE 1901.2

Point-to-Point XXR
Alternative long-reach mode

Adaptive PLC Modem
CEN-A • FCC • ARIB

Low- and Medium-Voltage Power Lines
XXR supports multi-kilometer MV links in one hop

TYPICAL SMART GRID USE CASES

AMI Advanced metering Meter reads, events, commands, and network status	**TX Transformer monitoring** Loading, temperature, condition, and alarms	**DA Distribution automation** Switchgear and feeder monitoring and control
FI Fault monitoring Distributed indicators, sensors, and event reporting	**DER Grid-edge energy** Solar, storage, inverter, and microgrid coordination	**MV Medium-voltage links** Multi-kilometer MV connectivity

WHY SEMITECH AND HOW TO GET STARTED

Why utilities and OEMs choose Semitech

- ✓ Reliable communications in challenging environments
- ✓ Noise-adaptive modes for industrial power lines
- ✓ Validated by major metering and transportation customers
- ✓ Direct engineering support through integration

Integration path

1. Select G3-PLC, G3-Hybrid, or IEEE 1901.2
2. Choose CEN-A, FCC, or ARIB band support
3. Prototype the application with the Semitech EVK
4. Validate low- or medium-voltage links and prepare deployment

MEDIUM VOLTAGE REACH WITH XXR

Multi-kilometer links in one hop

XXR extends PLC connectivity across medium-voltage lines without requiring multiple communication hops.

- ✓ Long-reach MV communication
- ✓ Multi-kilometer link distance
- ✓ Single-hop network design

Evaluate your Smart Grid application with Semitech

Use the Semitech EVK to evaluate the standard, band, and power-line channel for your deployment.

SEMITECH EVK

LEARN MORE