

HPLR

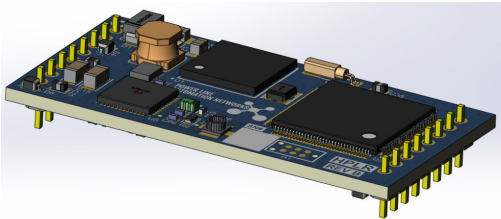
Hybrid G3-PLC + RF Power Line Modem

ARG's plug-in G3-PLC power-line communication module — OFDM narrowband PLC with a sub-1 GHz RF hybrid path, over the ARG Common Host API.



Overview

The HPLR is ARG's G3-PLC power-line communication module (the "G3-PLC Module" in the ARG product line). It adds robust narrowband PLC networking over existing AC wiring — CENELEC-B OFDM built on the Microchip PL460 — plus an integrated sub-1 GHz radio for G3-PLC Hybrid (PLC + RF) operation. Data moves to and from the host over the ARG Common Host API, so the HPLR is interchangeable with ARG cellular and Wi-Fi modules at production time with no host firmware changes.



Key Features

- G3-PLC CENELEC-B OFDM power-line networking on the Microchip PL460 modem.
- Integrated sub-1 GHz RF transceiver enables G3-PLC Hybrid (PLC + RF) mesh.
- Self-healing, auto-commissioning mesh — up to 255 nodes per network.
- Couples to 80–305 VAC lines (single & three phase); draws zero active power from the AC line.
- ARG Common Host API over UART — drop-in interchangeable with cellular and Wi-Fi modules.
- Onboard PIC32CX-MTG processor runs the full G3-PLC stack; zero host CPU burden.

255
Nodes / network

95–125 kHz
CENELEC-B band

40 kbps
G3-PLC data rate

PLC + RF
Hybrid mesh

Power Line Communication (G3-PLC)

PLC Modem	Microchip PL460 OFDM power-line modem
Standard	G3-PLC, CENELEC-B band (95–125 kHz)
Modulation	OFDM (G3-PLC narrowband)
Data Rate	Up to 40 kbps
Networking	IPv6 (6LoWPAN); up to 255 nodes per network
Topology	Auto-commissioning, self-healing mesh
Security	Network PAN ID + private PSK; optional ECC 256-bit encryption

RF — Hybrid (PLC + RF)

RF Transceiver	Microchip AT86RF215, sub-1 GHz
Mode	G3-PLC Hybrid (PLC + RF) per IEEE 802.15.4 SUN
Antenna	u.FL connector

Host Interface — ARG Common Host API

Protocol	ARG Common Host API (binary frame protocol)
Physical	UART — 460,800 baud, 8N1, hardware flow control (RTS/CTS)
Signals	TX, RX, RTS, CTS, nRST (active-low), PWR_EN
Frame Format	SOF (0xAA) + VER + TYPE + LEN[2] + PAYLOAD[0–512] + CRC16-CCITT[2]; max frame 519 B
CPU Burden	Zero — DMA + hardware flow control; host wakes only on a complete frame
Onboard Processor	Microchip PIC32CX-MTG (512 KB flash / 128 KB SRAM) running the G3-PLC stack
Compatibility	Protocol-identical across all ARG comm modules — cellular, Wi-Fi, G3-PLC

Electrical & Power

AC Input	80–305 VAC, 50/60 Hz (single & three phase)
AC Coupling	Capacitive coupling + isolation transformer; zero active power drawn from the AC line
Analog Rail	12 V nominal, ~150 mA (PL460 analog front end)
Digital Rail	3.3 V, ~65 mA (digital section)
Power Budget	~1.9 W typical

Mechanical & Environmental

Form Factor	Plug-in module; mates with Samtec SLW-108-01-T-S (8-pin PWR + 8-pin IO headers)
Debug	SWD via Tag-Connect TC2030 (PICKit)
Operating Temperature	–40 °C to +85 °C
Storage Temperature	–40 °C to +120 °C

Used across ARG products

The HPLR shares a common footprint and Host API with ARG's cellular and Wi-Fi modules, so a product can select or swap connectivity at build time. It is used in:

DC3 Edge Gateway	Multi-protocol industrial edge gateway
PM3 / PM1 Power Analyzers	Three-phase and single-phase energy monitoring
iAQ-Wall / iAQ-Duct	Indoor air-quality instruments