

Metering

- [Metering Evalutation](#)
- [Wired vs Wireless meters](#)
- [CalinMeter](#)

Metering Evalutation

Attribute	Cost (money)	Interoperability	long term relationship	Deployment Readiness	Build Quality
Inhemeter	3	5	3	3	5
Gomelong Meter (no PLC meter with built-in relay)					
Sagewood Meters					
Calin Meter	?	5	5	?	5
Spark Meter	3	1	3	1	5
China Brandless Meter	5	1	3	3	1
iSmart Meter	1	5	3	1	3
Hoptele Meter	3	5	5	5	3

Inhemeter

China/UG based OEM. Edwin Cho is our contact. 0 774 667667, +86 135 3210 1631. 1way Meter boxed FOB 46Usd

Cloud Vending System 100 USD per month up to 1000 meters

Free On Board (FOB)

Which means not including shipping and inland transport and any clearance fees

Sagewood

Sagewood is a UK based logistics supplier. +44 7831 135528 - Manoj

Got some feedback on this one . Here goes... Hi Hilary, all good am still in china snd heading back tomrrow to uk. China was on national holidays from 30 April to today May 5. Now working on it. I have discussed with the team - Due to small number of meters for the system, we suggest a cloud

version so you don't have to invest in hardware. Many endusers are doing this. Meters we can handle but MOQ is around 2000 metres. Or we can manufacture them to very with other orders. So you don't have to worry about MOQ. Allow me few days and I revert back.

Hoptele

China supplier / OEM. Single phase PLC meter. Wall mount with PLC support and inbuilt relay. DIN rail mount with PLC support but no inbuilt relay. 70 US per meter. No vending system.

Gomelong

China based supplier, has a local distributor in Uganda. Gomelong Meter (no PLC meter with built-in relay). May have none PLC option. Pricing for "digital meter" (probably with no relay) 127k UGX per unit.

Spark Meter

Kenya based. Proprietary system (Meters + AMI). 70 USD per meter. Comes with a DTU that requires line of sight to meters. 1 DTU per 2000 meters max. 600 USD per year per DTU.

Calinmeter

Have a DIN rail PLC with built-in relay. Waiting on quote. May also have AMI

iSmart

Found these ones online. They also have a [PLC with built-in relay](#).

The meter sample fee: 10pcs*600USD/pc; the DCU will need 7500USD/pc; the PC software for testing is 5000USD/pc; the optical head is 300USD/pc; the pilot system will need 30000USD; the technical assistance fee is 1500USD; DHL shipping cost is around 5500USD.

Wired vs Wireless meters

Wireless open standards

Comparison

Protocol	Frequency	Range	Data Rate	Topology	Power Usage
Zigbee	2.4 GHz, 915/868 MHz	Short	Up to 250 kbps	Mesh, Star	Very Low
LoRaWAN	868/915 MHz	Long	0.3-50 kbps	Star	Extremely Low
Wi-SUN	868/915 MHz	Medium to Long	50-300 kbps	Mesh	Low to Medium
Bluetooth LE	2.4 GHz	Short	125 kbps-2 Mbps	Star, Mesh	Very Low
IEEE 802.11ah	Sub-GHz (~900 MHz)	Medium	Up to Mbps	Star, Tree	Low
IEEE 802.15.4	Various	Short-Medium	20-250 kbps	Mesh, Star	Very Low
Thread	2.4 GHz	Short	250 kbps	Mesh	Very Low

Recommended for Residential Microgrid Applications in Uganda:

- **LoRaWAN:** If covering a large geographical area (kilometers), due to its excellent range, penetration, and low power use.
- **Wi-SUN:** For robust, medium-to-large-scale smart metering networks, especially if a mesh topology is desirable.
- **Zigbee/Thread:** Ideal for dense residential areas where devices (meters) are closer together, benefiting from low power and reliable mesh networking.

Wired Open standards

Comparison

Protocol	Standard	OSI Layers	Medium	Topology	Range	Data Rate	Typical Applicati on Areas	Remarks
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G3-PLC	ITU-T G.9903	Layers 1-2	Power Lines	Mesh, Star	Up to several km	2.4–35 kbps	Smart grids, AMI, smart meters	Robust, designed for noisy environments; supports IPv6, strong security
PRIME	ITU-T G.9904	Layers 1-2	Power Lines	Mesh, Star	Up to several km	21–128 kbps	Smart metering, distribution automation	Optimized for higher-speed PLC, widely used in European smart meter rollouts
IEEE 1901.2 PLC	IEEE 1901.2	Layers 1-2	Power Lines	Mesh, Star	Up to several km	2.4–500 kbps	Smart grids, smart cities	High interoperability, IPv6 support; ideal for utility and smart city deployments
M-Bus (Meter-Bus)	EN 13757	Layers 1-2	Twisted pair cable	Bus	Up to ~1 km	0.3–38.4 kbps	Meter reading (water, heat, gas)	Widely used in Europe; reliable, low-cost wired solution
KNX	ISO/IEC 14543-3	Layers 1-2	Twisted pair cable	Bus, Star, Tree	Up to ~1 km	9.6 kbps	Building automation, home control	Open standard for building automation, popular in Europe
BACnet MS/TP	ASHRAE 135	Layers 1-2	RS-485 twisted pair	Bus	Up to ~1.2 km	9.6–115.2 kbps	Building automation, HVAC controls	Common in building and industrial automation; robust, scalable

Ethernet	IEEE 802.3	Layers 1-2	CAT5/CAT 6 cable	Star, Tree	Up to ~100 m	10 Mbps–100 Gbps	Networking backbone, smart buildings	High-speed, standard networking; widely supported across industries
RS-485 (EIA-485)	EIA-485	Layers 1-2	Twisted pair cable	Bus	Up to ~1.2 km	Up to 10 Mbps	Metering, industrial control systems	Simple, robust, widely used for serial data transmission
CAN Bus	ISO 11898	Layers 1-2	Twisted pair cable	Bus	Up to ~1 km	Up to 1 Mbps	Automotive, industrial automation	High reliability, robust error detection, common in harsh environments

Recommended Wired Protocols for Residential Microgrid Metering (Uganda)

- **PLC-based (e.g., G3-PLC or IEEE 1901.2):**
 - Ideal due to existing infrastructure (power lines).
 - Good for scalable, reliable deployments.
- **RS-485:**
 - Robust, simple wiring suitable for smaller clusters.
 - Common for direct-wired connections (local clusters).
- **M-Bus:**
 - Suitable if integrating gas, water, or heat metering alongside electricity

Comparison between wired and wireless

Aspect	Wireless Option (Wi-SUN/LoRaWAN)	Wired Option (G3-PLC, RS-485)	Recommendation
Installation Cost	☐ Lower	☐ Higher (cabling, labor)	Wireless ☐
Maintenance Cost	☐ Moderate (battery replacements)	☐ Low (no batteries required)	Wired ☐
Reliability	☐ Medium (environment dependent)	☐ High (consistent, stable)	Wired ☐

Aspect	Wireless Option (Wi-SUN/LoRaWAN)	Wired Option (G3-PLC, RS-485)	Recommendation
Scalability	✅ High (easy additions)	✅ Moderate to low (harder additions)	Wireless ✅
Range/ Coverage	✅ Good (with repeaters)	✅ Excellent (using PLC)	Wired (PLC) ✅
Security	✅ Good (depends on setup)	✅ Very Good	Wired ✅
Installation Time	✅ Short	✅ Longer	Wireless ✅
Physical disruption	✅ Minimal	✅ High (trenching, wiring)	Wireless ✅

? Recommended Choice: Hybrid or G3-PLC

? Primary Recommendation: G3-PLC (Wired)

Given your scenario (dense apartment blocks with existing electrical infrastructure and meters located closely on the ground floor), **G3-PLC** offers significant advantages:

- **Low Ongoing Maintenance:** No batteries to manage.
- **High Reliability:** Stable signal leveraging existing wiring.
- **Cost-effective (long-term):** Minimal ongoing costs after initial installation.
- **Robust & secure:** Highly suited for apartment complexes.

? Alternate Recommendation: Hybrid (PLC Backbone + Wireless Endpoints)

If flexibility or future expansions matter, consider a hybrid setup:

- Use **G3-PLC** within each block to connect meters reliably to a local gateway.
- Connect block gateways to a central system via wireless (**Wi-SUN or LoRaWAN**). This reduces physical disruption between buildings while maintaining the reliability within each block.

This hybrid method provides the best of both worlds—flexibility and low maintenance.

Links

[Chatgpt detailed thread](#)

CalinMeter

We got the API docs [here](#)