

Application Note

Smart Water Metering

Advanced Connectivity Solutions for Next-Generation Water Infrastructure

Water utilities are under increasing pressure to reduce non-revenue water (NRW), improve billing accuracy, meet regulatory mandates, and modernize aging infrastructure all while controlling operational expenditure.

Smart water metering is no longer a pilot initiative. It is now a strategic infrastructure investment that directly impacts:

- Revenue assurance
- Network efficiency
- Customer satisfaction
- Long-term sustainability

To succeed at scale, utilities must deploy meters engineered for 15+ years of unattended operation, reliable underground connectivity, and secure lifecycle management.

The Business Challenge

Water networks face persistent operational constraints:

- ✓ 20–40% water loss in many municipalities due to leaks and theft
- ✓ Manual meter reading costs and human error
- ✓ Delayed leak detection
- ✓ Limited visibility into consumption patterns
- ✓ Infrastructure deployed in RF-challenged underground environments

Without reliable connectivity and long battery life, smart meter rollouts can result in premature device replacement, truck rolls, and escalating lifecycle costs.

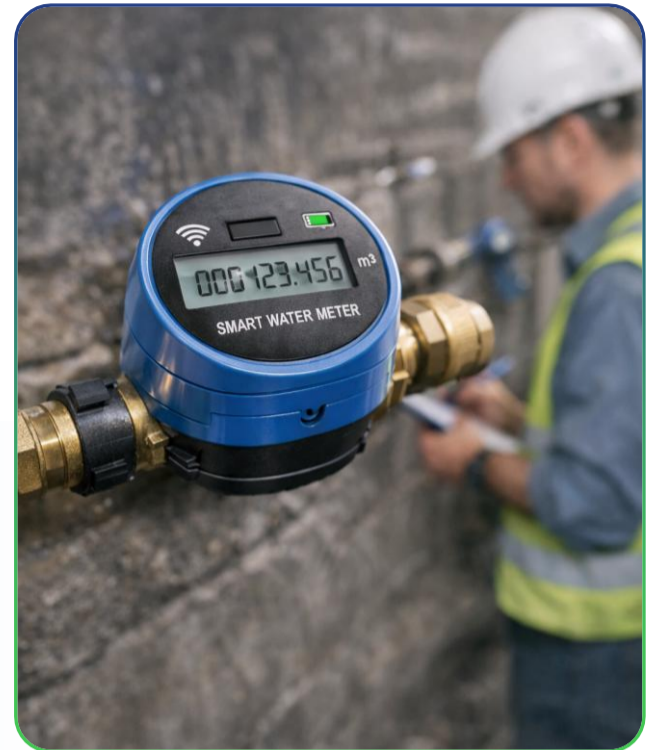
1. 15-Year Operational Lifetime

Battery replacement programs eliminate ROI.

Meters must be designed for ultra-low power operation with optimized reporting intervals and sleep modes.

Impact

- Reduced field maintenance
- Predictable lifecycle cost
- Higher asset reliability



2. Guaranteed Connectivity in Challenging Environments

Smart water meters are often deployed:

- Underground pits
- Basements
- Dense urban areas
- Rural or remote locations

Decision-makers should evaluate:

- Deep indoor penetration performance
- Multi-operator network support
- Long-term cellular technology roadmap



Cellular LPWA technologies such as, standardized by 3GPP, ensure ecosystem longevity and backward compatibility within evolving 5G frameworks.

3. Secure Infrastructure by Design

Water utilities manage critical infrastructure. Cybersecurity is not optional.

Key requirements:

- Secure boot and hardware root of trust
- Encrypted data transmission
- Remote firmware update capability
- Compliance with evolving regulatory frameworks

Security must be embedded at the module and system architecture level not added later.



4. Scalable Connectivity Strategy

A one-size-fits-all connectivity model rarely works across regions.

Utilities should adopt a flexible cellular approach:

Deployment Scenario	Recommended Technology
Underground / battery-powered	
Moderate data + OTA needs	
Limited LPWA coverage / global deployments	4G LTE Cat 1 bis

A multi-technology strategy ensures rollout resilience across geographies.

Use Case: Citywide Smart Water Rollout

Scenario: 250,000 residential meters across mixed-density urban zones.

Utility Objectives:

- Reduce NRW by 15–25%
- Eliminate manual meter reading
- Enable early leak detection alerts
- Achieve 15-year lifecycle target
- Maintain predictable OPEX

Expected Outcomes:

- Faster leak detection and isolation
- Improved revenue recovery
- Reduced truck rolls
- Improved customer transparency
- Data-driven consumption forecasting

Enabling Infrastructure with LTSCT LCC40

The **LTSCT LCC40 connectivity module family** is designed to support large-scale smart water meter deployments with:

- Ultra-low power operation for long battery life
- 4G LTE Cat 1 bis option for global or higher-throughput needs
- Compact footprint for constrained meter enclosures
- Secure architecture aligned with infrastructure-grade requirements
- Strong RF sensitivity for underground penetration



By supporting multiple cellular technologies within a single module family, **LCC40** allows utilities and OEMs to standardize hardware platforms while adapting connectivity per region.



Total Cost of Ownership (TCO) Considerations

When evaluating smart water metering programs, utilities should assess:

- Battery replacement frequency
- Network coverage reliability
- Certification and regulatory complexity
- Firmware update capability
- Long-term cellular technology viability
- Field maintenance requirements

The right connectivity platform directly impacts 10–15-year cost projections.

Strategic Recommendation

For sustainable smart water infrastructure:

- Deploy cellular LPWA where available for optimal power efficiency
- Maintain 4G LTE Cat 1 bis flexibility for coverage assurance
- Prioritize ultra-low-power module design
- Embed security at the hardware level
- Select connectivity vendors with long-term technology roadmap alignment



Conclusion

Smart water metering is not just a digital upgrade it is a foundational step toward intelligent, resilient utility infrastructure.

With disciplined engineering and flexible cellular connectivity options such as those offered by the LTSCCT LCC40 family, utilities can confidently deploy large-scale smart water meter networks that deliver measurable operational, financial, and sustainability benefits over a 15-year/long lifecycle.

Future. Made Together.

Ready to accelerate your connectivity roadmap?

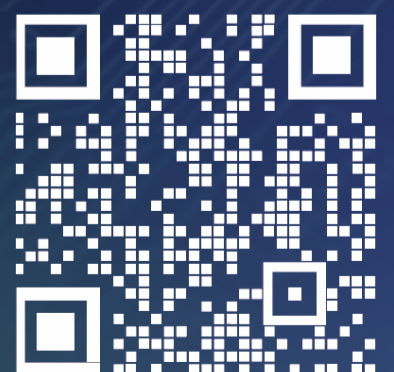
Partner with LTSCCT Modules to accelerate certification, reduce cost and launch globally.

Book a technical discussion /
sample evaluation request:

Email: jrn@ltsct.com | asha.kulkarni@ltsct.com

Follow us on  

L&T Semiconductor Technologies Limited is a wholly owned subsidiary of Larsen & Toubro Limited



www.ltsct.com