Innovative Smart Water Metering in a Multi-Utility Environment

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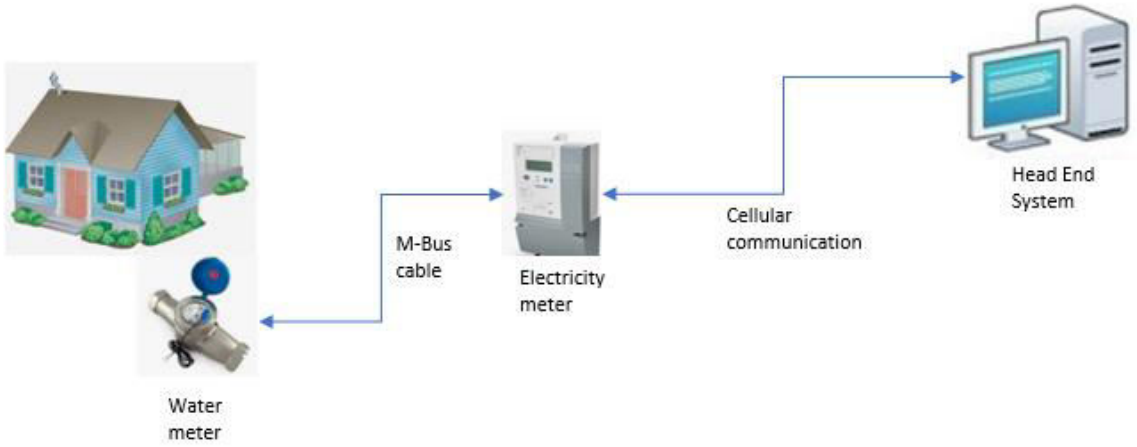
Introduction

- Abu Dhabi Distribution Company (ADDC) is the national electricity and water distribution company of Abu Dhabi, UAE
- ADDC has a complex metering landscape having 70 electricity and water meter models with numerous communication protocols such as DLMS, M-Bus, Euridis, ModBus, Severn Trent etc.
- From the deployment perspective, numerous scenarios exist including villas, shops, buildings, etc. which are deployed in different configurations such as 1:1, 1:2, 1: Many and Point-to-Point (P2P).
- A significant proportion of meters are P2P meters

Context - Issues in multi-utility environment

- With electricity and water meter models (varied meter profiles / registers) working over multiple communication protocols, HES solution design becomes complex
- Powering the water gateway for remote communication is a big issue
- Available options:-
  - **Option 1:** Use separate gateway for electricity and water meter. But providing an AC power source for the water gateway is a challenge in most scenarios.
  - **Option 2:** Consider cellular communication modules for water meters (P2P configuration). But they are power intensive nature and drain the meter battery.
  - **Option 3: Connect electricity meter to water meter using M-Bus cable, hence using electricity meter as a gateway for the water meter**

Innovative Solution Architecture



Water meter registers sent over M-Bus to electricity meter

This solution required changes in:

Procurement due to upgrade in meter design

- M-Bus port included in E-Meter specification
- E-Meter firmware has additional 4 registers of W-Meter (battery life, total vol, max flow, error status)
- On HES pull request, E-Meter would append the W-Meter registers

Re-configuring the HES

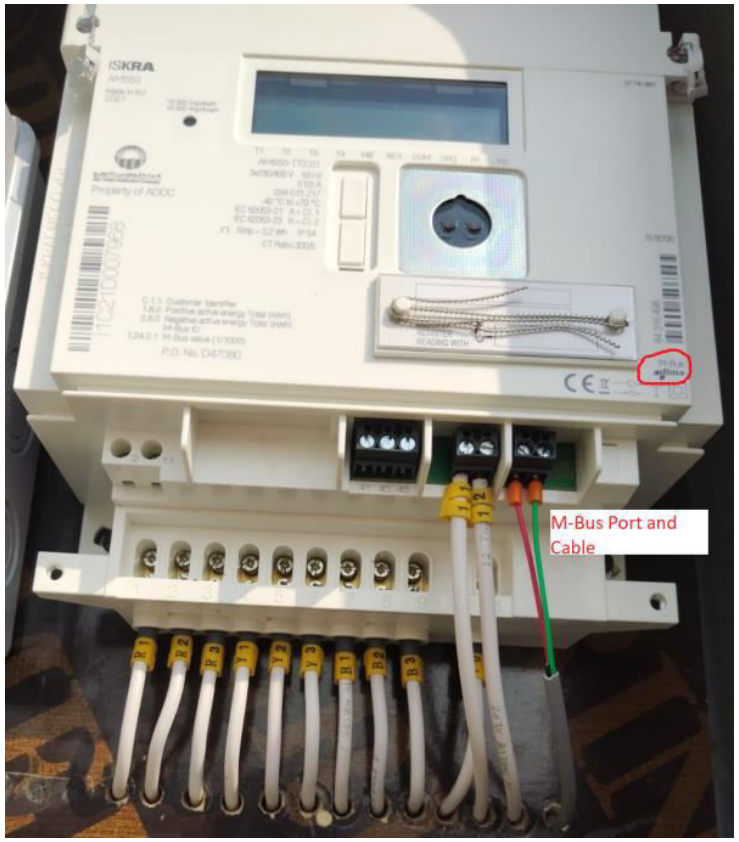
As meter datagram was upgraded (additional load), HES data capturing schedule and data processing was updated

Updating the field installation processes

- Re-drafted field installation processes
- Training provided to O&M teams

ADDC Case Study (1/2)

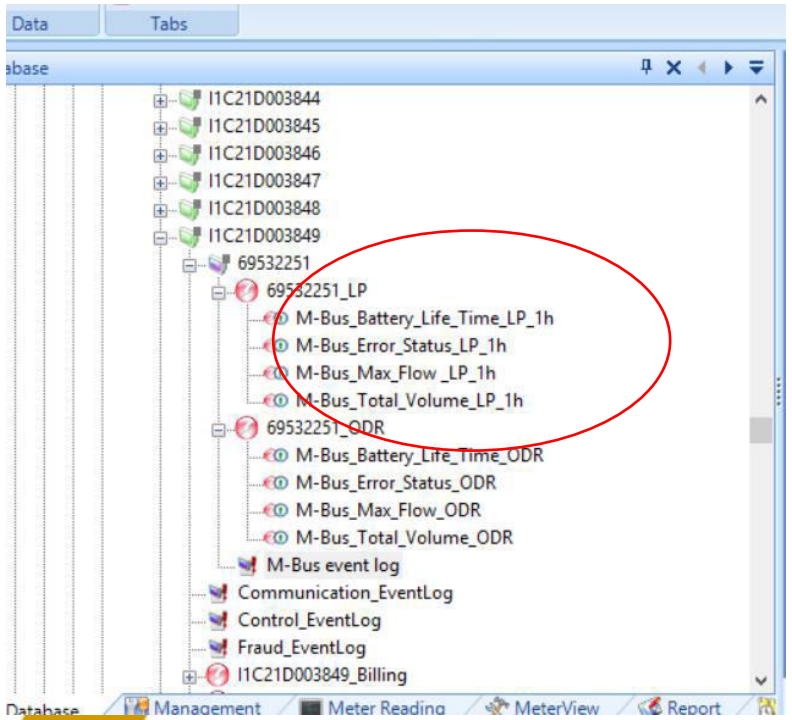
M-Bus cable connected using M-Bus port of E-Meter on the field

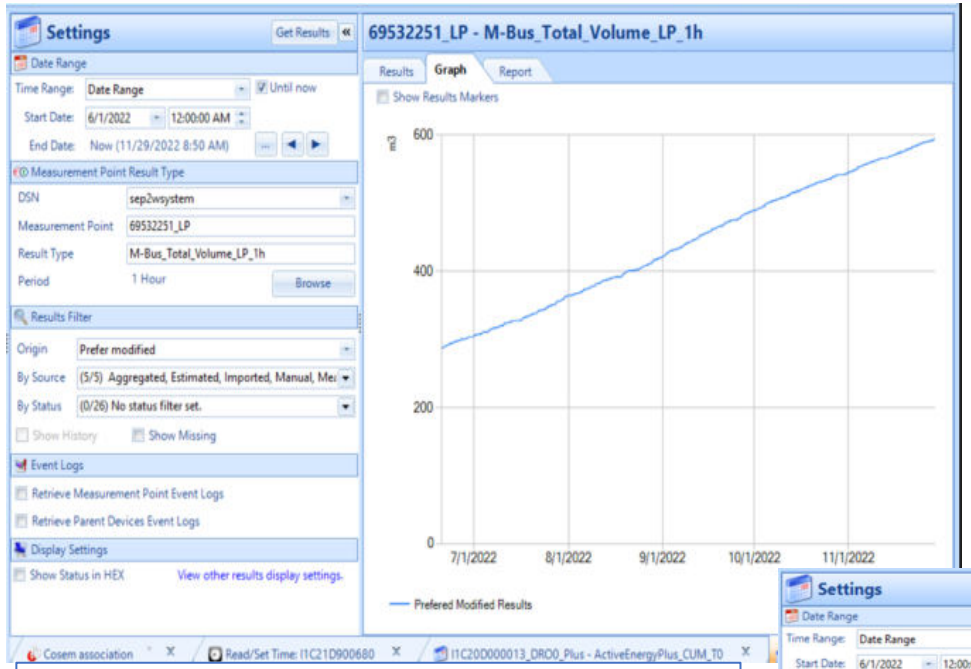


M-Bus cable connected to W-Meter on the field

ADDC Case Study (2/2)

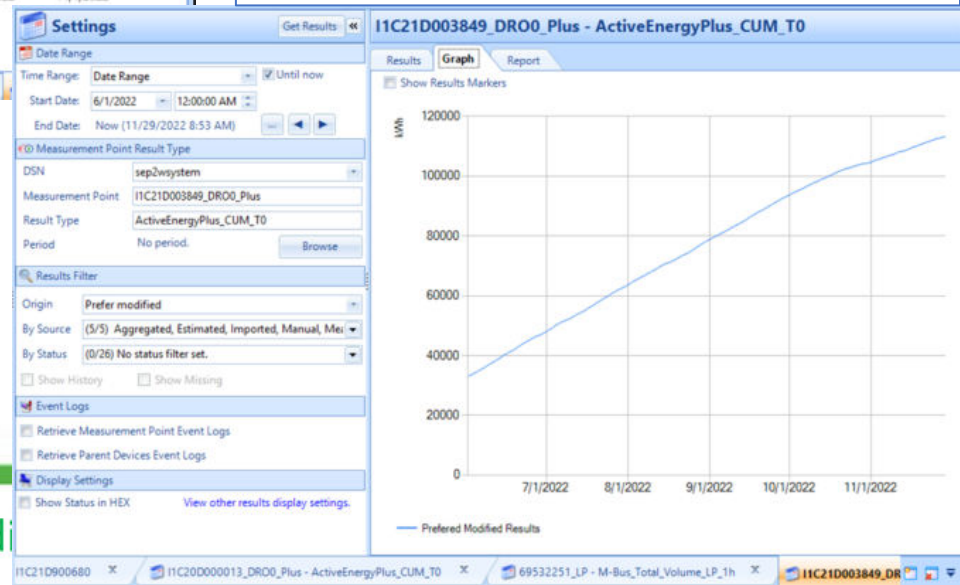
HES showing additional W-Meter registers (appended to E-Meter)





Cumulative volume from water meter as captured in HES

Cumulative active energy (import) from electricity meter as captured in HES



Key Takeaways & Conclusion

- Benefits of multi-utility metering using M-Bus
  - Reduced CAPEX as additional W-Meter gateway is not needed
  - Reduced O&M cost as solution architecture is less complex
  - Reduced load on telecom network as second telecom channel is avoided (in same premise)
  - Scalable solution with moderate changes
- Way Forward
  - Apart from M-Bus, other technologies such as RF can also be tested
  - Apart from 4 W-Meter registers, meter firmware and meter memory can be updated for having more E-Meter registers

This solution achieves the envisaged smart metering performance. Furthermore, this solution can be improvised and other meter communication protocols and telecommunication technologies.

Thank You

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