



THE WATERfactor

Wireless Water Meter Reading,
Billing and Management System

Bringing the Internet of Things (IoT)
to your Water Consumption

Battery Powered, Ultra Low Voltage,
High Density Wireless Mesh Network



WATER
factor

clean cut
ENERGY

www.cleancutenergy.ca



A Product of Canada

The Water Factor samples hourly meter readings and makes them available to you 24 hours per day through a web enabled and mobile friendly user interface.

How WATERfactor Benefits your customers also benefits you

Imagine a water meter reading, billing and management system that is so reliable that you can count on it to look out for your customers' best interests. What if the utility provided a system that was capable of empowering its customers to use water more effectively?

WATERfactor is such a system. It collects hourly meter readings and makes them available to users, 24 hours per day, through a web enabled and mobile friendly user interface. Customers have access to their water meter consumption information online via their personal account on an hourly basis.

Wireless Water Meter Reading, Billing and Management System

- Wireless Mesh Network
- 20 year battery life
- no towers
- no repeaters
- no additional personnel

JUST WATER DATA



WATERfactor

The WATERfactor system provides the functionality of fixed infrastructure, hourly, automatic meter reading for the cost of a mobile, automatic meter reading system. Most municipalities count on expanding their payroll when they start using an automatic meter reading system. With the WATERfactor a municipality doesn't have to add extra personnel to manage the system. The WATERfactor is a cloud based, turnkey system that includes network and infrastructure management, billing and administration, collections, automatic payment processing and more. Most municipalities find that the WATERfactor actually enables them to better focus on the water and waste water supply since it simplifies the data and billing and account management for users and administrators alike.

How the System Works

- Each wireless node is directly connected to the existing meter already installed in a house or business:
- The nodes service all existing major meter manufacturers (Sensus, Badger, Elster, Neptune, etc.)
- A central gateway can be mounted on a local pump station or lamp post to collect hourly readings from each node (Each gateway services up to 1,000 nodes)
- CCE manages the operation of the network, performs VEE activities on each reading and ensures all data is received and re-transmitted to the local utility for billing and meter management.
- Billing and payment processing can be provided as options eliminating all IT requirements. No additional personnel
- WATERfactor provides user warnings and GIS mapping of leak and water loss events so that they can be quickly identified for repair.
- The system Includes all required capital equipment as well as wireless system maintenance and repair for the life of the system

**The Alternative
to AMR Systems
Developed by
Clean Cut Energy**

20 year battery life

wireless mesh network

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JUST WATER DATA

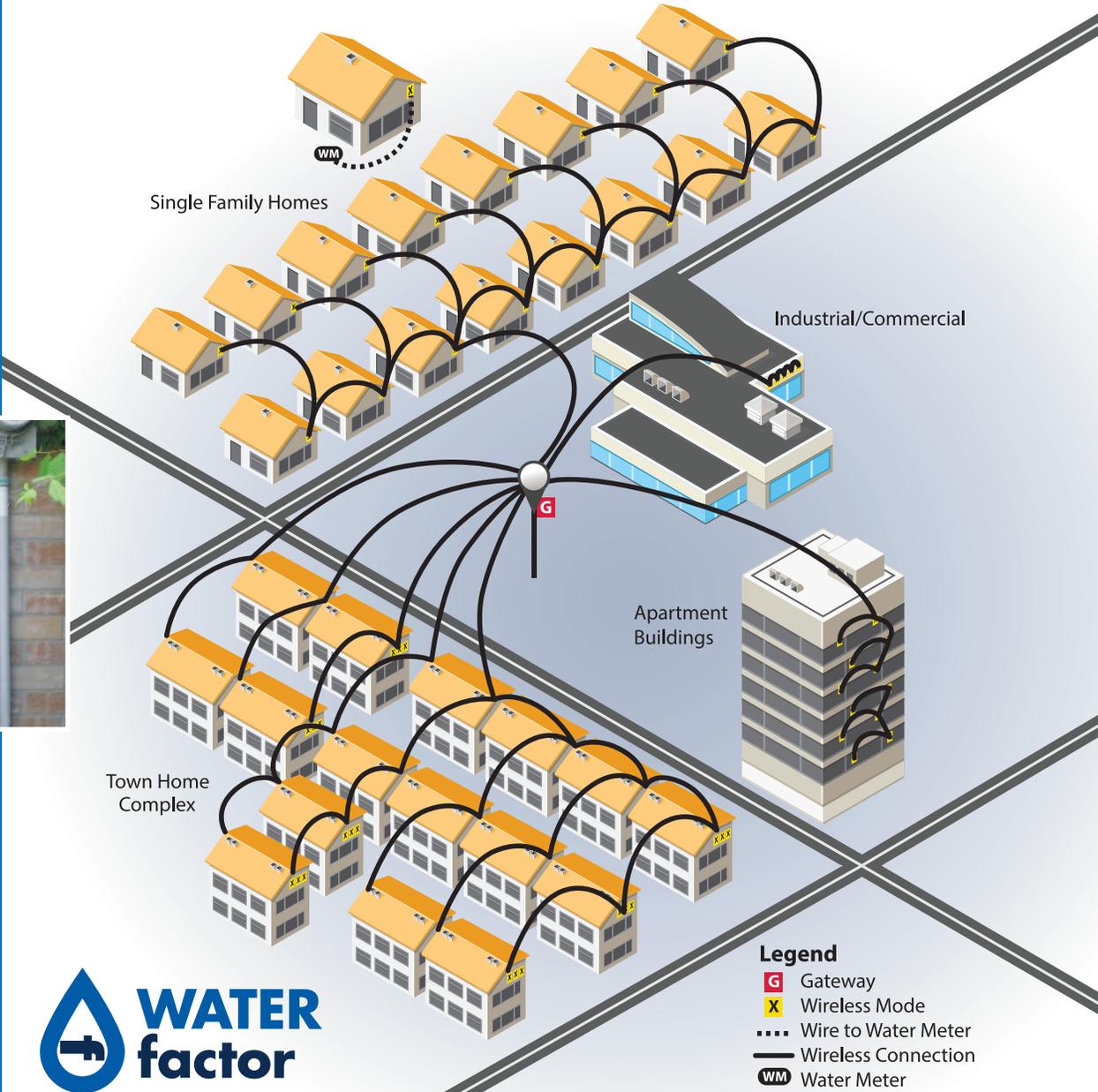


Water Factor can service up to 6 water meters with a single wireless node. This makes the Water factor significantly cheaper to implement in high density housing complexes where touch reading systems are in very close proximity

WATERfactor Infrastructure Comparison

The WATERfactor wireless node has been specifically designed to exploit the fact that in medium and high density housing units multiple touch pads are located in close proximity to each other. Most AMR / AMI systems require a single wireless node for each touch pad. Each WATERfactor node can service up to 6 water meters, making the WATERfactor system significantly cheaper to implement in medium and high density housing complexes, where touch pads are in very close proximity. In some municipalities, this encompasses 20% or more of the total installed meter base.

Compare the infrastructure required to service 1000 individual water meters by a mobile AMR system, a fixed AMI system and the WATERfactor system.



Mobile System	Typical Fixed AMR System	Water Factor System
1000 Water Meters 1000 Wireless Nodes 1 Mobile AMR Vehicle Download data troubleshoot communication issues, return to recapture units that did not report return to sites to troubleshoot issues repair / replace units Resources Required <ul style="list-style-type: none"> • Water meter nodes (1000) • Reading frequency (weekly, monthly) • Additional personnel • Additional vehicles with AMR reading system mounted on the vehicle 	1,000 Water Meters 1,000 Wireless Nodes 1 Wireless Repeaters 1 Tower 1 Cellular or Lan connection 1 Ethernet 1 Server Personnel for infrastructure management and training Resources Required <ul style="list-style-type: none"> • Wireless nodes (1000) • Wireless Repeaters (100+) • 1 Tower • Reading frequency (hourly) • Additional personnel to manage the system • Additional vehicles 	1,000 Water Meters 167 Wireless Nodes 1 Gateway 1 Internet connection Processing data for billing No Additional Resources Required

The Water Factor Comparison Chart

Feature Set	Water Factor	ltron	Neptune	Sensus	Badger/ Elster
Capable of 8 Digit meter reading resolution	Yes	Yes	Yes	Yes	Yes
Tampering Alarms	Yes	Yes	Yes	Yes	Yes
Leak Alarms	Yes	Yes	Yes	Yes	Yes
Reverse flow detection	Yes	Yes	Yes	Yes	Yes
Data logging Capability	Yes	Yes	Yes	Yes	Yes
Time-synchronized hourly readings	Yes	Yes	Yes	Yes	Yes
ISM 902-928 Mhz Unlicensed Band	Yes	Yes	Yes	No	Yes
20 year Battery Life	Yes	Yes	Yes	Yes	Yes
Capable of Over the Air Updates	Yes	Yes	No	Yes	No
AES Security Encryption of wireless data	Yes	Yes	Yes	Yes	Yes
Reliable data delivery and system Management	Yes	Yes	Yes	Yes	Yes
Optional Remote valve shutoff and control systems	Yes	Yes	Yes	No	No
Optional 2-wire readings	Yes	Yes	No	No	Yes
Optional Branch Pressure Monitoring	Yes	Yes	No	No	Yes
A single node can read from multiple meters	Yes	No	No	No	No
Inexpensive Gateway installations	Yes	No	No	No	No
Fixed network does not require repeaters	Yes	No	No	No	No
Fixed network does not require tower infrastructure	Yes	No	No	No	No
Low Installation Cost	Yes	No	No	No	No
Managed network and Billing services included	Yes	No	No	No	No
Lifetime network maintenance and software management	Yes	No	No	No	No



The Water factor administration interface has been designed to enable municipalities to respond immediately to system failures by tracking the operation of the distribution system.

Benefits of WATERfactor

Maintenance and Administration Interface

The WATERfactor administration interface has been designed to enable municipalities to respond immediately to system failures by tracking the operation of the distribution system. GIS mapping software integrated into the WATERfactor control console allows administrators to immediately diagnose issues and dispatch maintenance personnel to perform system or meter repairs all from the same management interface.

Improved Leak Management using GIS Mapping Technology

The WATERfactor system, employs GIS mapping technology and network modelling to perform a continuous water balance on the system. It can track water loss and usage for district areas and compare consumption to pump house supply. This can be combined with pressure measurements at various points in the system to isolate and react quickly to non-revenue infrastructure leaks.

Detailed scheduling and routing algorithms let administrators optimize service call routing and travel times in order to ensure that the maximum benefit is derived from limited resources.



Benefits of WATERfactor

Early Leak Warnings for Consumers

- Consumers can register online for a high water use warning.
- An email, phone call or text is sent to registered users so they can respond within hours to high water use events at their property
- This results in reduced administration costs for municipalities by creating a record of contact about high water use long before a bill is sent.

Low Lifecycle Cost

- Wireless network management and automatic software upgrades performed "over the air"
- Firmware updates can be remotely pushed out to nodes as required to support new meter types for example
- WATERfactor nodes are never out of contact because network redundancy ensures communication stability



Message from the President



I believe that access to water data is a critical tool in changing societies' attitude toward water use. Too often water has been relegated to the back shelf of our social consciousness as the cheapest and least appreciated utility. I firmly believe this sentiment is short sighted, outdated and needs to change.

When I founded Clean Cut Energy it was with the vision of empowering users with more information so they can make smart decisions about how to use the resources they purchase more efficiently. Clean Cut Energy has built a framework that gives more information to users so that we can all move forward together empowered by the idea that together we can encourage each other to make better choices for the benefit of our planet.

With that in mind the Clean Cut Energy family has dedicated our time and resources to creating a product that we believe will solve for many utilities and municipalities the problem of getting access to water meter data on an hourly basis, at an affordable price. Most AMR systems are built by companies that are interested in selling products. They want to sell as many as possible. We believe that it is the data that is important not the product and we designed the WATERfactor system to collect the data as efficiently as possible even if it means we sell fewer units. Many of the key design features that set our product apart from others on the market come from our core belief that the data is what matters and getting it into the hands of the people who use the water for less than the cost of a cup of coffee is its own reward.

To do that our team asked questions like:

- Would it make the cost per unit cheaper if we could remove the towers and the repeaters, and put that functionality into the node?
- Is it possible to read multiple water meters with a single wireless node and exploit the fact that in many places water meter readers are grouped together on a building?
- Can we make each node remotely upgradable, so that when we promise a 20 year battery life we can actually deliver a product that is as relevant in 20 years as it is the day it is installed, despite the inevitable changes in technology that will occur?

It is this kind of thinking that constitutes the basis for WATERfactor, an Internet of Things system that makes water data as accessible as, . . . well water.

If we make the world a more efficient place one drop at a time, then we have succeeded beyond our wildest dreams. If you share this sentiment then I hope you will consider us when you want to help your community make better use of its water.

Sincerely,
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