

## Why is leak detection important?

It is estimated that 14% of the average American household's water use is actually due to household leaks. According to Water Sense (EPA water program) the average household's leaks waste more than 1 trillion gallons annually nationwide. Just fixing leaks can save multi-family property owners about 10-20% on their water bills.

Water leaks affect the water bill and the sewer bill. Sewer rates are based on the amount of water consumed.

## Where is the most prevalent leak?

Toilets are the number one fixture that leaks water. Often times, since a toilet leak may not be seen, it can go undetected for weeks if not months. Causes of toilet leaks include damaged flappers, cracked fill valves and hung up flapper chains.

## How can the multi-family property owner both submeter water consumption and stop leaks?

It is highly recommended to install water meters from H2O Degree that are designed to both submeter water consumption in apartments and are able to provide metering data to a server that can send an email of daily leak reports to the property owner's maintenance team.

## How do the H2O Degree water meters work and why can't other water meters detect leaks?

There are three basic types of water meters used to submeter water in multi-family housing; small turbine water meters, pulse water meters and encoded register meters. Only the H2O Degree water meters can detect and report water leaks.

## H2O Degree Small Turbine Water Meters

This category of water meter was invented by H2O Degree over 10 years ago. This water meter has a small turbine which spins inside of a capsule as water flows through the water meter. A microprocessor counts the number of revolutions. The turbine may rotate 1800 revolutions for every gallon. Each revolution of the turbine equates to a predetermined fractional gallon. In addition to counting the gallons, the microprocessor also counts events. Events are the number of times the flow of water starts and then stops. Finally, the microprocessor counts the number of seconds water was flowing.

Leaks are detected by looking at daily water consumption (gallons), the daily number of events and the daily total water flow time.

### Daily Gallons Per Day

For a one to two bedroom apartment the daily number of gallons should be less than 200 gallons.

### Daily Gallons Per Event

If the total number of events is very high (hundreds or thousands) then the gallons per event will be very low (typically 0.1 gallon per event.) This is very indicative of a flapper leak. The flapper allows water to flow into the bowl, the fill valve refills the tank and the cycle starts all over again. Each stop and start of water flow is recorded by the water meter.

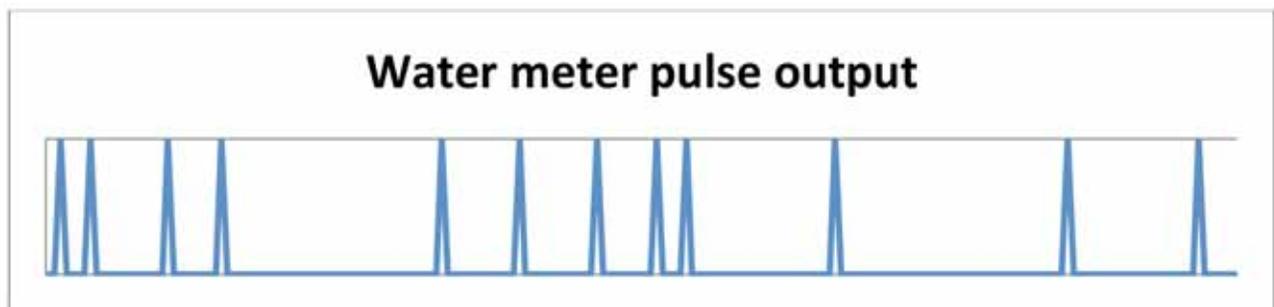
## Daily Total Water Flow Time

If the number of seconds the water was flowing to the apartment is high, and the number of events is low or even zero, then water is flowing continuously. This is indicative of a cracked fill valve or a hung up flapper chain. Water is constantly running into the toilet bowl.

The H2O Degree system reports water consumption (gallons) for each apartment for billing purposes.

## Pulse Water Meters

Most water meters used in submetering generate a pulse each time a fixed amount of water passes through the water meter. A pulse water meter outputs one pulse every 1 gallon or every 10 gallons. In the example below, the pulse output is 1 pulse for every 10 gallons so the 12 pulses represent 120 gallons.



## Encoded Register Meters

Most water meters used in utility metering applications have a mechanical register. An interface board in the meter reads the mechanical register and encodes the data in order to send the data over a three-conductor cable.

As shown below, the encoded register starts at 10,000 and every ten gallons that passes through the water meter increases the mechanical register by 10. The graph shows the same data as the "Water meter pulse output." Over the time period shown, 120 gallons flowed through the water meter and the mechanical register shows 10120 at the end of the time period.

