

# Irish Water meters and **AMR technology**

If you have any questions or require further information please contact Irish Water:

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**Safeguarding your water for your future**

# What is a water meter?

A water meter is a device that measures the amount of water supplied from the mains water supply to your home. The meter is fitted to the pipe supplying water to your home and measures the volume of water that goes into your home in cubic metres (1 cubic metre = 1m<sup>3</sup> = 1,000 litres = approximately 220 gallons).

Irish Water is installing water meters at residential properties around Ireland. Where possible, the water meters are fitted underground in a meter box in the footpath or verge outside your house or garden. Water meters are in common use in Ireland (for business properties) and across Europe. The water meters being installed at residential properties in Ireland are manufactured by Itron and Diehl in accordance with the EU Measuring Instruments Directive and all applicable technical standards.

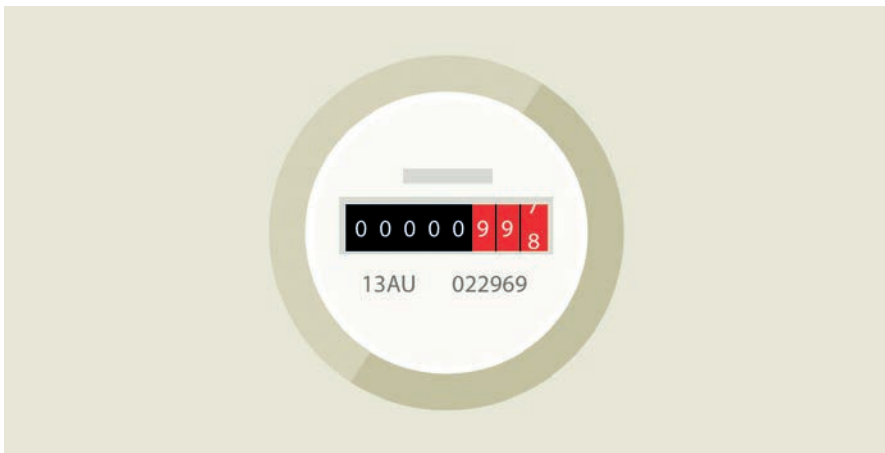


Figure. 1: Graphic of the dial on a water meter

## How will my water meter be read?

Your water meter will be read remotely using 'drive-by' technology. Irish Water meters feature Automatic Meter Reading (AMR) technology where a transmitter sends meter readings to a receiver unit in one of our meter reading vehicles. This means we won't usually need to open the meter box or lift the meter lid to take a meter reading as it can be read remotely. Your meter will usually be read every three months.

Irish Water meters use two types of AMR technology. One type sends a message only when requested while the other sends periodic short messages. Irish Water meters emit an extremely low level radio signal. According to one UK water utility, signals from water meters featuring AMR technology are comparable to the signal strength required to open your car door<sup>1</sup>.

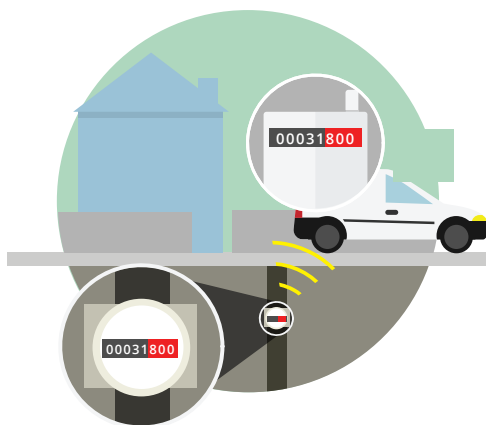


Figure. 2: Drive-by meter reading

<sup>1</sup> [www.yorkshirewater.com](http://www.yorkshirewater.com) - Automated Meter Reading FAQ

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## How safe are Irish Water meters?

Irish Water meters are very safe when measured against international safety limits for radio wave energy. The International Commission for Non-Ionizing Radiation Protection (ICNIRP) is the independent body responsible for advising on non-ionizing radiation. ICNIRP has established scientific-based safe limits on human exposure to radio frequency (RF) waves which have been recommended by the European Commission to its Member States<sup>2</sup>.

RF waves are a form of electromagnetic energy and are present all around us both from natural sources such as the sun and other stars, movement of the earth's crust and from man-made devices that utilise RF waves, such as microwave ovens, mobile phones and other wireless devices.

The effect from the RF waves from Irish Water meters is **88,000 times lower**<sup>3</sup> than the ICNIRP safety limit at a distance of 15cm (6 inches) and 2.2 million times lower at a distance of 1m as shown in Figure 3.

<sup>2</sup> Department of Communications, Marine and Natural Resources, 2007

<sup>3</sup> Professor Max Ammann, PhD SMIEEE, 2013

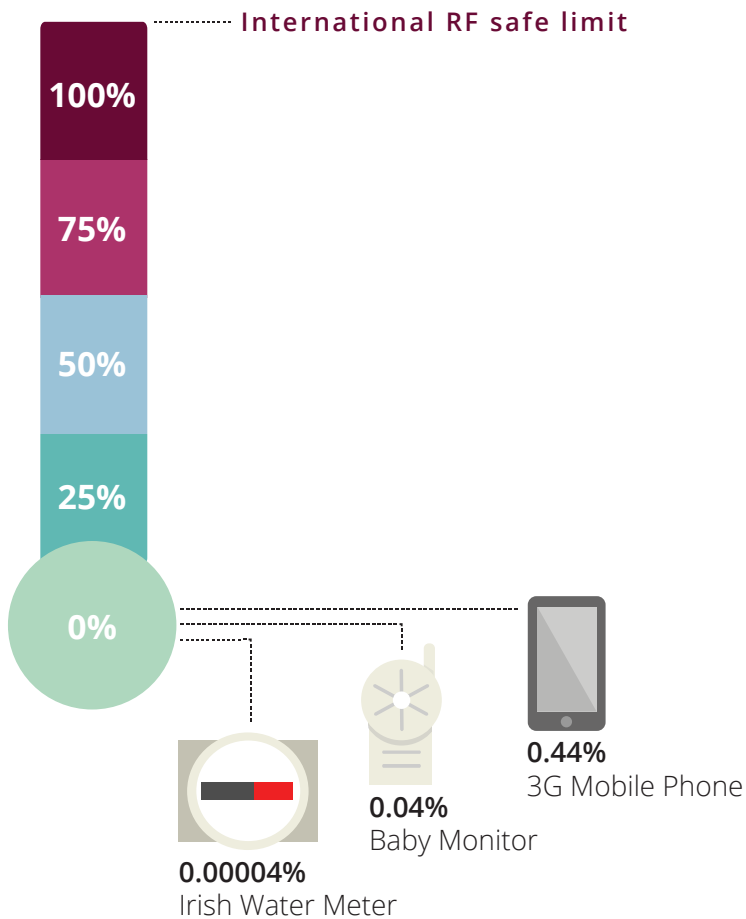


Figure. 3: Illustration of how far Irish Water meters and other RF devices are below the ICNIRP safe limits at a distance of 1m

# How safe are Irish Water meters compared with other items in my home?

Every day, people use and are close to devices that use RF waves. Figure 4 compares Irish Water meters to typical household items in terms of RF energy at a distance of 1m.

This is measured as power density, or the rate of energy flow through a given surface area (measured in microWatts per square metre,  $\mu\text{W}/\text{m}^2$ ).

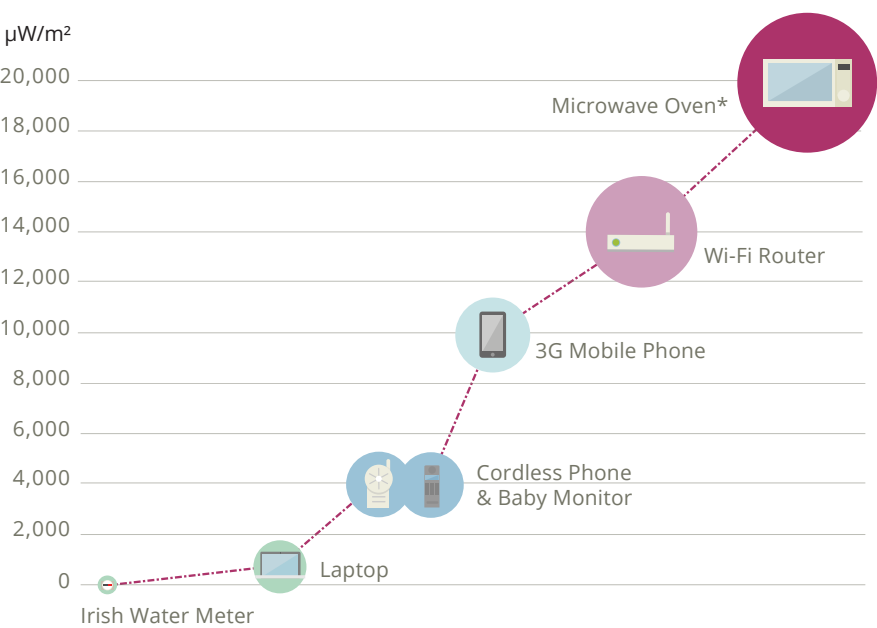


Figure. 4: Exposure to RF energy at 1m distance

\*maximum allowable leakage from microwave oven

An Irish Water meter exposes you to 4,500 times less RF energy than a baby monitor or cordless phone and 11,000 times less than a mobile phone at 1m away from you. To put this in perspective, if you placed **4,500 water meters** on a table 1m away from you and **one baby monitor\*** on another table at the same distance, the exposure from the content of each table would be the same. You would need to place **11,000 water meters** 1m away from you to equal your maximum exposure from **one 3G mobile phone** at the same distance.

\*Please note that a baby monitor is in itself 2,500 times lower than the international safety limit.

Figure 5 shows how much greater is the exposure to RF energy from everyday household items than from the Irish Water meter.



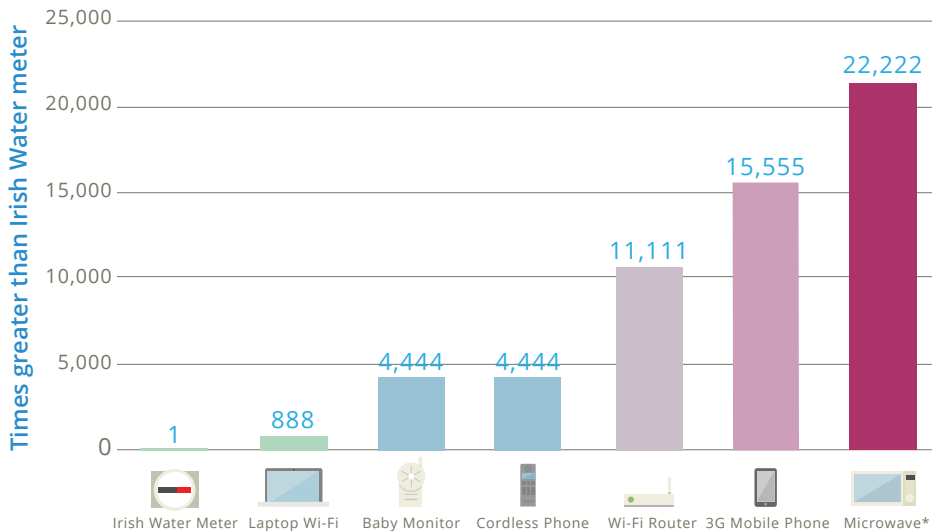


Figure. 5: RF emissions of household items compared to Irish Water meters

\*maximum allowable leakage from microwave oven

The exposure from an **Irish Water meter** is **4.5 million times less than the total exposure from the existing devices in your home.**

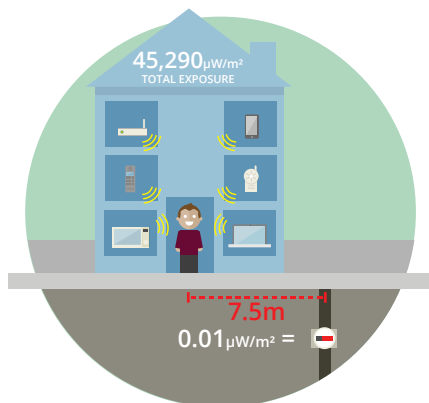


Figure. 6: Total exposure from typical household items is 4.5 million times greater than your Irish Water meter

Even if you do not have a 3G mobile phone, wi-fi router, laptop wi-fi, cordless phone or baby monitor, you are still exposed to RF waves from any such devices in your neighbour's home.

The RF exposure from your Irish Water meter is **50,000** times less than the exposure from a typical collection of wireless devices in your neighbour's home.

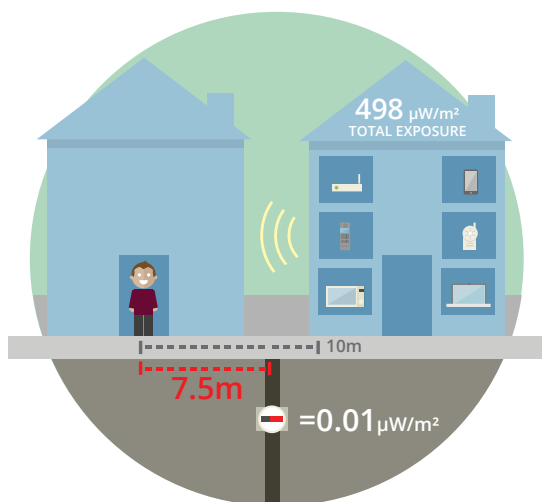


Figure 7: Irish Water meter = 50,000 times less than RF exposure from neighbour's home

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## How safe are Irish Water meters in built up areas?

Irish Water meters are very safe when measured against international safety limits for radio wave energy, even in built up areas. The power density experienced from RF devices fades away very quickly. For example, power density drops by 100,000 times at just 10m away from an RF device. This means that even in a very built up area (like a housing estate) the exposure from nearby meters is almost negligible.

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## Conclusion

Irish Water meters are well below international safety limits with negligible amounts of radio frequency (RF) energy even in built up areas. The exposure from your Irish Water meter is almost 4.5 million times lower than the sum of typical household items in your home and 50,000 times lower than from your neighbour's home.

The effect from the RF waves from Irish Water meters is 88,000 times lower than international RF exposure safe limits, at a distance of 15cm and 2.2 million times lower at a distance of 1m.

Irish Water meters are an important step in providing information about household water usage. By knowing a bit more about how much you use water, it will hopefully make it easier to manage your usage better. The Irish Water Metering Programme is the most ambitious programme of its kind in Europe, with a target installation of 27,000 meters per month. Through the use of AMR technology, Irish Water is able to read water meters more efficiently, accurately and safely.