

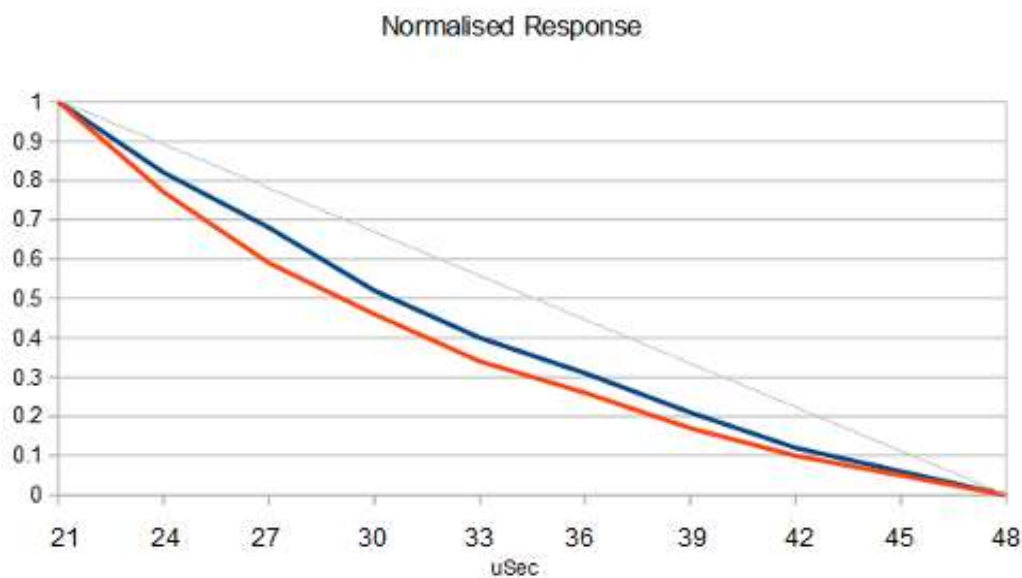
Better Discrimination

This technique applies to the mono coil Pulse Induction (PI) detector.

The chart below shows the normalised response of two typical targets.

An iron target (Red) and a non-iron target (Blue)

i.e This is the signal after the end of the pulse that is amplified and sampled.



In the next chart, below; a value for 'Conductivity' is on the X axis and an 'Iron' value is on the Y axis.

The X axis value is the slope of the first part of a target signal.

The Y axis is the slope of the later part of a target signal.

So, the chart is simply comparing the first part of the signal with the later part to get an idea of the shape of the response.

Specifically:

X axis = Sample at 27uSec / Sample at 21uSec

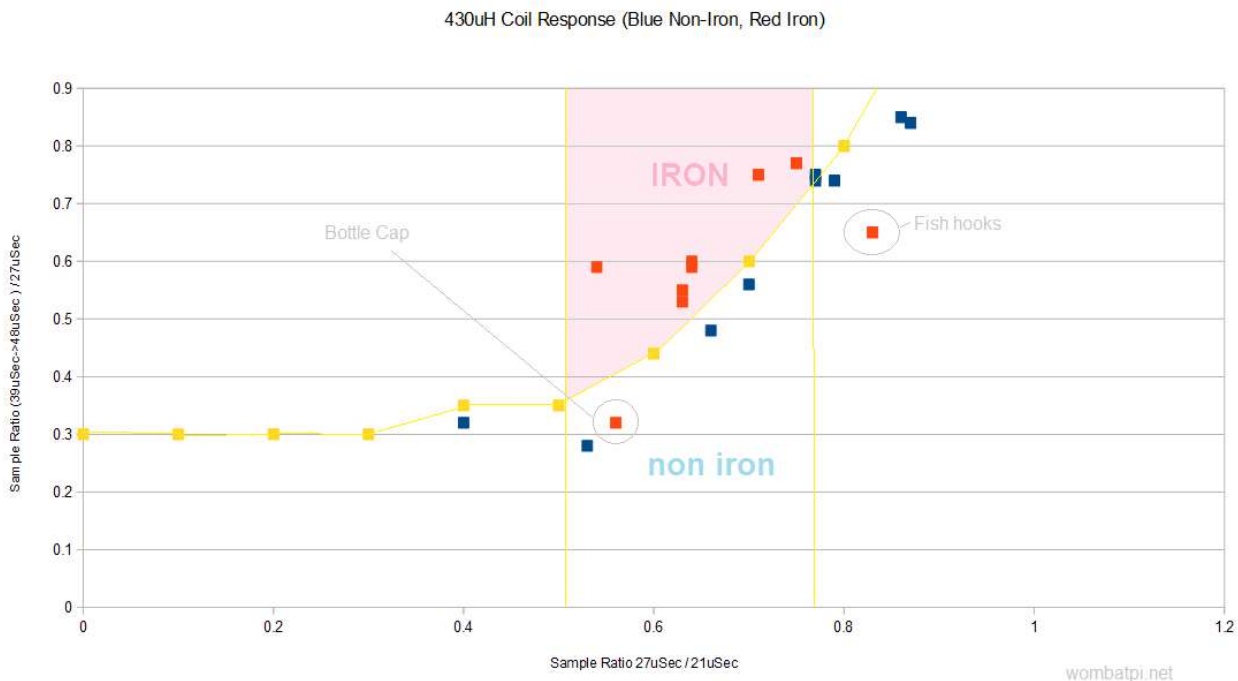
Y axis = (Sum of samples 39uSec to 48uSec) / Sample at 27uSec

Plotted below are 20 targets,

Iron targets are Red

Non-Iron targets are Blue

Observe the higher Y-axis value for iron targets due to the 'bowed-in' shape of the iron response curve.



The Yellow line is the 'IRON_TABLE' values set in the detector.

These 11 values are adjusted or 'tuned' for the particular coil.

If a target is below this line, it is considered non-iron.

Also, very low conductivity targets with a conductivity (X axis) below 0.5, are usually non iron.

Also, High conductivity targets, such as a silver coin, are also usually non iron.

So our discrimination algorithm in the above setup, classifies all targets with a conductivity between 0.50 and 0.77, above the yellow line, as IRON.

END.