



How the Wacom cordless, batteryless pen works

The Wacom stylus looks and feels like a pen yet contains no batteries or magnets. Instead it takes advantage of electro-magnetic resonance technology (induction) developed by Wacom Co. Ltd. in which radio waves are sent to the stylus and returned for position analysis. Below the TFT-display is a sensorboard with horizontal and vertical aligned grid wires. When operated, the grid wires alternate between transmit and receive mode about every 20 micro-seconds.

The electro-magnetic signal stimulates oscillation in the coil-and-capacitor resonant circuit in the pen. The resonant circuit in the pen's tip supplies the power and serves as transmitter too. The received signal goes through the modulator to the chip. The information of the pressure sensor (capacity) and of the side switch are going to the chip first. The Tool ID is then added and both are sent back to the modulator which in turn sends a signal to the resonant circuit in the tip. The sensorboard picks up the information in the pen's tip in order to determine position and other information like pressure and Tool ID.

Since the grid provides the power to the pen through resonant coupling, no batteries are required. Thus there are no consumables inside the pen that will run down and need to be replaced or that would make the pen top-heavy.

A simple analogy for this patented technology is of a piano tuner using a tuning fork to tune a piano. As the tuning fork is brought into proximity of the appropriate vibrating piano string (if the fork is of the same frequency) it will begin to borrow energy from the vibrating string and resonate, generating a tone. In much the same way, if the Wacom pen comes close to the display surface, it begins to resonate, generating its own frequency back to the sensorboard. When it „hears“ the pen, it tracks the pen's location with unprecedented accuracy. The tablet then sends location, pressure and tilt information to the computer along with a signal indicating whether the pen point or the eraser is being used.

