- ## How does CoMoveIT Smart work?

CoMoveIT Smart is equipped with **high-tech pressure sensors** that are built-in at maximum 5 locations (sensor pads) on the complete head-foot steering system. A maximum of 4 individual sensor pads can be used simultaneously when they are connected to the Electronic Control Unit (ECU), which is the heart of the highly advanced control system of this steering device. The sensor itself is a complex array of multiple sensor elements.

The **Electronic Control Unit** (ECU) captures the sensor signals at high rate, we can state that the system measures the use of each sensor every second. The signal that is captured represents the way the user is working with the pad at that very moment: pressure is very hard or soft, over the entire surface or just a part of it, continuous or interrupted. The built-in microprocessor memorizes a window of the measured signal during a limited time period. The command at that very moment is being sent to the wheelchair motor controller while it is processed through the **CoMoveIT algorithm**.

This leads to the most important and unique characteristics of the CoMoveIT Smart: the system auto-calibrates and adapts the wheelchair control to the way the user is driving the system.

In general, it can be stated that CoMoveIT applies a basic level of artificial intelligence. Although it doesn't build up and hold intelligence, the processing of the signals is done by a sophisticated software algorithm running on a microprocessor within the system.

Auto-calibrating. Good to note is that the microprocessor does not keep the memory when switched off, and thus restarts from the default start level every time, all over again. Since involuntary movements are hardly predictable and have no constant pattern over multiple days or even hours, the autocalibration after restarting is seen as one of the most valuable features. Having that characteristic as a standard way of working immediately eliminates the need for programming, adjusting or manual calibrating by users, therapists or technicians. That's why CoMoveIT refers to the Smart system as a 'plug & drive' and 'zero maintenance' system.

Adapting to the user & relaxed driving. We can state that the main characteristic is that the algorithm adapts to the user, even from the very first moment of driving the powered wheelchair. If the driver steers to the right for example but pushes the right sensor pad in a very interrupted way, the algorithm will still allow a fluent turn to the right. This provides a high level of control to the person driving the wheelchair, even with severe spasticity or high frequency of unvoluntary movements. The high level of control allows these users to easily combine forward/backward driving with turning at the same time at a speed which is nicely in pace with normal wheelchair driving. After a very short learning time, users go to intuitive and relaxed driving, which allows them to eliminate the "thinking how to drive" and concentrate on leisure, participation, etc.