

**System Operation Description:** The three circuit boards are connected to the CAN BUS. Sensors on the sensor circuit board can get the vehicle's position data and calculate demanded power from the motors. The sensor circuit board transfers the motor power data to CAN BUS. The motor driver board receives the motor power data and then controls the servo motor to output demanded power. The man-machine circuit board is connected to the CAN BUS and monitors all kinds of transferring data and records these data to create a log. Also the man-machine circuit board is a message hub between the CAN BUS and external Wi-Fi resources, it also gives a visual and acoustic warning to the customers when any error occurs.

**Working Principals of INMOTION SCV:** INMOTION SCV mimics how human walks, if you lean forward, you take a step forward to keep your balance, if you lean back, you also step back. Likewise, on an INMOTION SCV when you lean forward or back, the vehicle powers the wheels precisely in the direction that you lean.

INMOTION SCV applies the latest dynamic self-balancing technology with the assistance of gyroscopes and accelerometers to sense your body movements while driving, and uses servo control system to precisely drive the motors to keep the INMOTION SCV always balanced.

When drivers push the Turning Shaft during driving, the system will controls the right and left wheels' speed difference to realize a turning. INMOTION SCV moves towards the direction that the drivers push the Turning Shaft. When the Turning Shaft is centered, INMOTION SCV will only move forward or backward. In a turning, the drivers will get a better driving experience if they synchronize their body movements with the turning directions.

The system consists of three circuit boards: Motor Driver Board, Man-machine Board and Sensor Circuit Board.

**Motor Driver Board:** it takes charge of the battery system, servo control and system monitoring.

**Sensor Circuit Board:** it is the essential part of the system. It get the vehicle's position data and control the motor power as well as it deals with the system errors.

**Man-machine Board:** it has Wi-Fi, GPS/GPRS modules and it deals with external devices or resources that connect to the vehicle. It communicates with the SmartKey at a 2.4G frequency.

**SmartKey Circuit Board:** it has a built-in lithium battery and a LCD, it communicates with the vehicles and visualize these information to the customers