

# The technology behind the PROPRIO FOOT<sup>®</sup> from Össur

By recognizing even the subtlest changes in movement, the sensor technology in the PROPRIO FOOT enables an appropriate and immediate response to variations in ground surface and activity.

Terrain Logic™, the patented artificial intelligence (AI) that is the ‘brain’ of the device, helps to replace the function that the body’s central nervous system would normally play in processing information about changes occurring inside and outside the limb if it was still intact.

A high precision linear actuator receives commands in the form of signals via a control board, which contain precise instructions concerning when and how fast to move to achieve the best possible response to any situation.

## SENSE

### Sensor Technology

Accelerometers and an angle sensor sample ankle motion over 1,000 times per second, identifying specific ankle motion events such as heel strike (the precise moment that the prosthetic heel touches the ground). Motion is analyzed continuously, with gait pattern recognition algorithms detecting when a user is walking on slopes, stairs (up or down), as well as stationary or seated. This wide-ranging data is fed into a patented form of artificial intelligence, Terrain Logic.

## THINK

### Artificial Intelligence

Based on what is happening at any given second, Terrain Logic determines the most appropriate move. If it senses that the user is on an incline, for example, it directs ankle flexion proportional to the slope before the foot touches ground. Always learning from the user’s previous stride, ankle movement parameters are constantly adapted for the next step.

## ACT

### Active Ankle Motion

The actuator movements are generated by a lightweight, precision stepper motor designed to operate fast and accurately. The movements are those that would normally be performed by muscles on the front of the shin and the calf muscle. Movements include dorsiflexion (toe lift) as the leg swings forward; the adjustment of ankle angle on varying terrain and in relaxed mode; and heel height adjustment when changing shoes.