



# OmniCycle<sup>®</sup> Elite

## Motorized Therapeutic Exercise System 7" Screen User Manual Supplement

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## Introduction

The OmniCycle® is a motorized cycling therapeutic exercise device and not a medical instrument for diagnostic purposes. The OmniCycle is for medical purposes, such as strengthening muscles, the restoration of motion to joints or for increasing aerobic capacity. The OmniCycle can be used both as a lower body exerciser or an upper body exerciser. Each exerciser has a separate motor. The motors cannot be used simultaneously and are suitable for assisted exercise as well as active therapeutic exercise.

## Monitor Screen Size Feature Comparison

The OmniCycle® Elite may have a 10" Screen or a 7" Screen. Depending upon the screen the following features and benefits include:

Hardware	OmniCycle Elite 10"	OmniCycle Elite 7"
Screen size and orientation	10" Square Screen	7" Rectangle Screen
Improved Pixelation / Vivid graphics	No	Yes
Streaming data for Virtual Cycling	No	Yes
Software		
Ortho	Yes	Yes
Neuro – Upper Extremity (UE) Smiley face, Lower Extremity (LE) Road/Bar Graph	Yes	Yes
Soccer	Yes	Yes
Isokinetic – UE Smiley face, LE Symmetry Road/Bar Graph	No	Yes
Cardio	Yes	No
Traffic Jam	Yes	No
Porcupine	Yes	No
Select UE vs LE Training prior to start	No	Yes
Start button prior to crank rotation	No	Yes
LE Easy entry & UE release instruction Pop-ups	No	Yes
Distance Units	Kilometers	Miles
Summary Calories	Measured Calories Energy measured (Kcal) by OmniCycle®	Calculated Calories Energy measured (Cal) by OmniCycle® multiplied by 5.3 to estimate Calories burned by patient
QR code integration - Results	Yes	Yes
QR code integration Intervention points	No	Yes

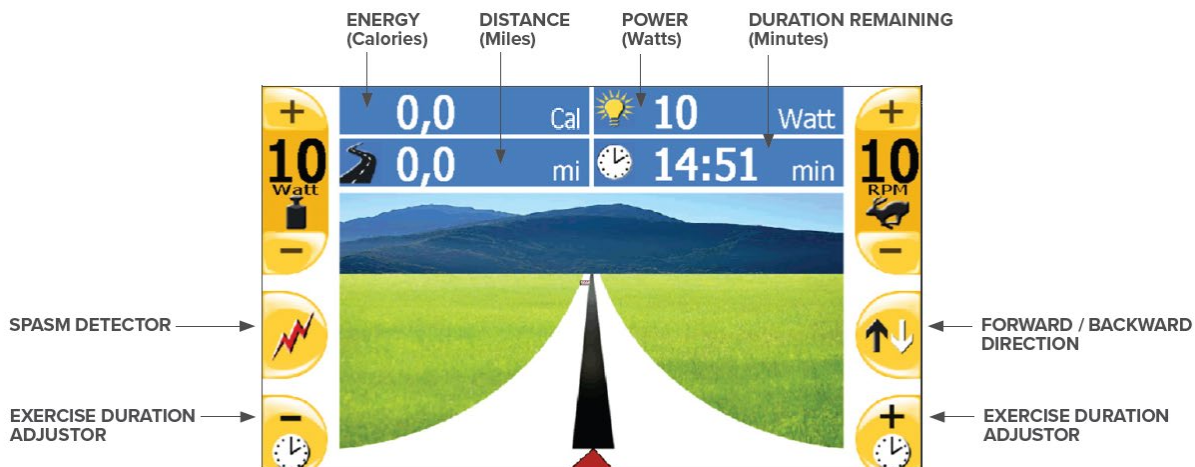
## Calculated Calories (available on 7" screen only)

Consistent with other cycle manufactures the energy in calories is a calculated estimate. Published research shows gross inefficiencies between the amount of energy measured by power meters vs. human output energy expenditure (Calories burned). Therefore, the measured calories are multiplied by a factor of 5.3 to estimate the calories burned by the individual.<sup>1</sup> This data can be used to establish baseline and monitor treatment progress for the patient.

## Main Start Screen Functions



## Exercise Run Screen Functions



### Once exercise has started:

- System Settings icon becomes Spasm Detector icon.
- Reset to Default icon becomes Forward/Backward Direction icon.
- Exercise Selector icon becomes Exercise Duration Adjustor (-).
- Assisted Entry icon becomes Exercise Duration Adjustor (+).

## Exercise Modes

Proper exercise dosimetry includes frequency, intensity (resistance level, speed), time, and type (exercise mode, biofeedback). Monitoring vital signs and analyzing the data summary allows the therapist to adjust the plan of treatment.

		INDICATIONS	DESCRIPTION
MODE	Neuro	Exercise for patients with neurological conditions (e.g., post-stroke, MS, PD, Alzheimer's disease)	Therapist sets a resistance level. The resistance level remains constant regardless of pedaling speed. Higher pedaling speeds mean greater power output.
	Ortho	Exercise for orthopedic patients (e.g., status post total knee, total shoulder, hip fracture)	Therapist sets a power level. Resistance varies automatically according to the pedaling speed so the set power output remains the same. Therefore, the resistance decreases when the patient pedals faster and the resistance increases when the patient pedals slower.
	Isokinetic	Exercise for deconditioned or post injury patients (e.g., frail, orthopedic)	Therapist sets a constant speed (RPM). To maintain a constant speed, resistance varies to match the muscle force at that speed of movement. As the patient's muscle force input changes, device resistance changes to maintain a constant speed.
	Soccer	Exercise for all patients (e.g., neuro, orthopedic, frail, cardiopulmonary, cognitive)	Pedaling faster or slower (RPMs), the patient controls the position of a goalie to prevent a soccer ball from going into the goal net. The RPMs required to position the goalie are pre-set at minimal, moderate, or maximum levels of difficulty. When the RPMs (patient effort) fall below the set parameter range, the goalie drops below the goal area. When the RPMs exceed the set upper parameter range, the goalie moves above the goal area.
	Virtual Cycling	Exercise for all patients (e.g., neuro, orthopedic, frail, cardiopulmonary, cognitive)	An immersive cycling experience engages patients. Software consists of numerous pre-recorded global routes through which to travel. Individuals select a country, city, or location of interest on the <b>OmniTour</b> while pedaling on the OmniCycle.

## Isokinetic Exercise Mode

A new feature on the OmniCycle® Elite with the 7" monitor is the isokinetic exercise mode. Isokinetic exercise is a well-established type of strength training in which the speed of the movement remains constant, but the resistance varies.

On the OmniCycle® Elite, when using the isokinetic exercise mode, the clinician sets the target speed (RPM), and the device resistance adjusts to maintain that constant speed. If the patient cycles at a faster RPM, the system increases the resistance, which requires more muscle force – this helps guide the speed back down to the target RPM. If the patient cycles at a slower RPM, the system decreases the resistance, which requires less muscle force – this helps guide the speed back up to the target RPM.

Isokinetic exercise is a well-established exercise mode that can increase mobility, range of motion, strength, and muscular endurance following injuries. A significant advantage of isokinetic exercise is increased safety for the individual. The device enforces a constant speed throughout the entire performance, whereas traditional/isotonic exercise has uneven speed, without control and consistency. Isokinetic exercise is a safe and effective way to strengthen muscles, with less strain and complications (e.g., delayed onset muscle soreness). As early as 1975 research has demonstrated a clear superiority of the isokinetic training procedures over the isotonic procedures relative to strength, anthropometric measures, and motor performance tasks.<sup>2</sup>

Isokinetic devices provide a corresponding resistance to maintain the target velocity, allowing the individual to exert their maximum force throughout the range of motion.<sup>3</sup> Isokinetic exercise is the only way to optimally load a dynamically contracting muscle to its maximum capacity throughout all degrees of range of motion. This mode was verified using electromyogram data, in which a large load was effectively applied to the gluteal muscles while protecting the ACL.<sup>4</sup>

Clinicians should consider isometric training as an alternative for isotonic training to gain muscle mass, and isokinetic training to improve functional performance of daily activities and/or sports.<sup>5</sup>

## Advanced QR Code Integration

The OmniCycle Elite 10" and 7" screens both have the basic exercise summary metrics embedded in QR codes for transmission to the clients Electronic Health Record via the ACPlus® Application. The OmniCycle 7" screen software has an additional feature, which allows up to 5 Intervention points where changes made by the clinician, to be recorded, time stamped and embed into the QR Code to enhance and support the skilled therapy documentation. The Exercise summary is cleared with the start of the next treatment. Note: Neither the OmniCycle Elite 10" or 7" has a patient data base.

## References

### Calculated Calories

1. Haakonssen, E. C., Martin, D. T., Burke, L. M., & Jenkins, D. G. (2013). Energy expenditure of constant- and variable-intensity cycling: Power meter estimates. *Medicine and Science in Sports and Exercise*, 45(9), 1833-1840. <https://doi.org/10.1249/MSS.0b013e31828e18e6>

### Isokinetic Exercise

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