

INTRODUCING

# SMARTBOOST™

The smart way to get the best eBike ride



# What is **SMARTBOOST™?**

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Superior eBike performance at a ridiculously low cost

- Patented combination of sensors  
(accelerometer and wind sensor)  
intelligently control the eBike motor
- Intelligent sensor processing algorithms  
deliver a smooth, easy eBike ride,  
*independent of slope, wind,  
and speed conditions*
- Located in the eBike display  
(not motor or bottom bracket)
- Superior to torque, cadence or  
throttle control methods
- Compatible with most eBike  
controllers and motors

# How does SMARTBOOST™ work?

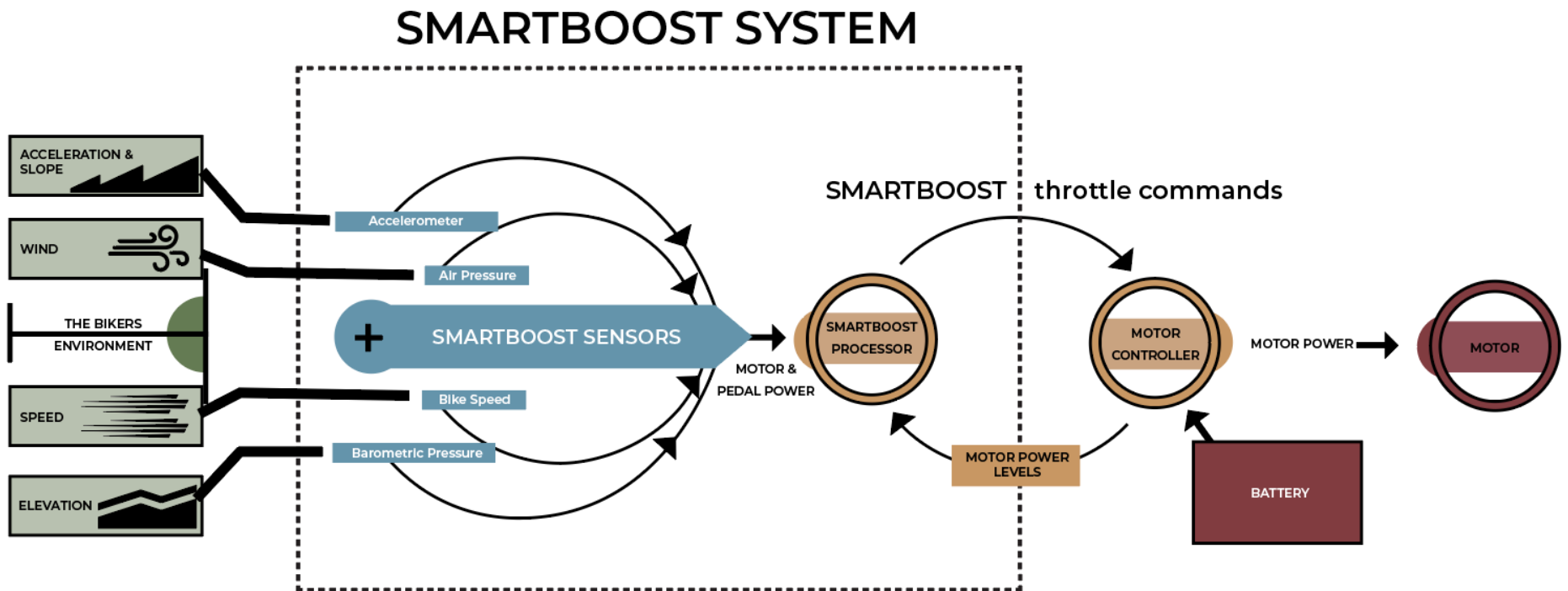
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**SmartBoost** sensors measure total power produced by pedals *and* motor

**SmartBoost** determines cyclist's pedal power by subtracting motor power from total power

**SmartBoost** controls motor to keep cyclist's pedal power easy and constant, *irrespective of changes in slope, wind, speed, and acceleration*

# SMARTBOOST™ block diagram





## What does riding with SMARTBOOST™ feel like?

“Like Riding A Bicycle. Just easier.”



**To start, push on the pedals; the motor responds instantly, accelerating the bike**

- Easy, constant pedal effort by the cyclist during acceleration
- When desired bike speed is reached the cyclist “backs off” the pedals



**To accelerate the bike while in motion, the cyclist pushes gently on the pedals**

- Motor output goes up *without cyclist pedaling harder*
- Speed increases until cyclist backs off on the pedals; bike speed maintained until cyclist stops pedaling



**SmartBoost measures slope**

- Automatically increases motor output as needed
- *The cyclist does not pedal harder when slope increases*



**SmartBoost measures headwinds**

- Automatically increases motor output as needed
- *The cyclist does not pedal harder when wind increases*



**To slow down, stop pedaling.**

- The motor shuts off instantly

The background of the slide features a technical drawing of mechanical parts, including gears and chains, rendered in a light blue color. A large, solid yellow arrow points from the left side of the slide towards the right, partially overlapping the technical drawing.

# TECH

LEARN WHAT **SMARTBOOST™** DOES

## How does SmartBoost™ integrate into production eBikes?

- Sensors and electronics are located in new display modules from AVS Electronics
  - Displays are compatible with most eBike controllers and motors
  - Communicate with eBike controller/motor/battery through CAN/CANopen, UART, RS-232, RS-485 and LIN Bus
- Display modules are configurable and modular
  - VRC8, VRC9, VRC10, VCD8
  - **SmartBoost** sensors/electronics located in button control modules
- Modules are available with/without **SmartBoost** control





# **SMARTBOOST™ is superior to other eBike control sensors**



- **Torque sensor:**
  - Significantly lower BOM cost, lower factory assembly cost
  - Motor performance characteristics are customer-defined and independent of the eBike motor controller selected
  - Motor performance can be customized in real-time to respond to changing slope and wind conditions
- **Cadence sensor:**
  - Smoother/more refined/more natural motor response and performance
- **Throttle control sensor:**
  - Automatic; no "thumb pressing" needed
  - Smoother/more refined motor response and performance

# SmartBoost™ display modules

**SmartBoost** sensors and electronics are located inside new display modules from AVS Electronics

- Displays are compatible with most eBike controllers and motors
- Communicate with controller/motor through CAN/CANopen, UART, RS-232, RS-485 and LIN Bus



## VRC8 | Entry Level

Handlebar mounted  
Works as stand-alone eBike control, or in combination with VCD8



## VRC9 | Mid Level

LED-based display on button control,  
handlebar mounted  
Works as a stand-alone eBike control, or in combination with VCD8



## VRC10 | Premier Level

High brightness, high resolution 1.22" IPS LCD, handlebar mounted  
Displays speed, BLE status, assist mode status, battery status, more  
Works as a stand-alone eBike control, or in combination with VCD8

# SmartBoost™ Displays cont.



## VCD8 DISPLAY UNIT

VCD8 is a center display connecting to VRC8 or VRC9 control, Mounts in center of eBike, High res/brightness 2.0" LCD, Displays speed, assist mode, battery status, slope, wind speed, assist power, more

# Does SMARTBOOST™ really work?

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**Velocomp premiered a SmartBoost prototype at Eurobike 2022**

- 01.** Eurobike test course included 10% incline, headwinds, tailwinds, varied bike speeds, bike acceleration
- 02.** Test included start-from-rest on a 9% uphill grade
- 03.** Speed, slope, wind speed, cadence and pedal power readings were recorded, second-by-second
- 04.** SmartBoost™ was programmed to hold cyclist pedal-power to about 100W, *irrespective of slope, wind, speed, and acceleration conditions*

# Test ride results: easy (100W), constant pedal effort over varying hills, winds, bike speeds



Pedal Set point ~100W

Cyclist pedal power vs time

Zero power: not pedaling

Slope vs time

Wind speed vs time

Bike speed vs time



**What did Eurobike  
test riders  
say about  
SmartBoost?**

**“Magical”**

**“Innovative”**

**“Exciting”**

**“A fantastic improvement over torque sensors”**

**“Significant savings compared to torque sensors”**



**SmartBoost™ demo eBikes  
are available for testing in  
Europe and USA**

**(Taiwan coming soon)**

A man with a beard, wearing a dark suit and a white helmet, is focused on adjusting a black metal bicycle rack. He is using both hands to secure a component. The background is a bright, hazy outdoor setting, possibly a street or park, with a warm, golden light suggesting late afternoon or early morning. A large, solid yellow triangle is positioned on the left side of the image, partially overlapping the man and the bicycle rack.

# THANK YOU

Look forward to talking soon