

INTRODUCING

# SMARTBOOST™

The smart way to get the best eBike ride



# What is **SMARTBOOST™?**

---

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?

---

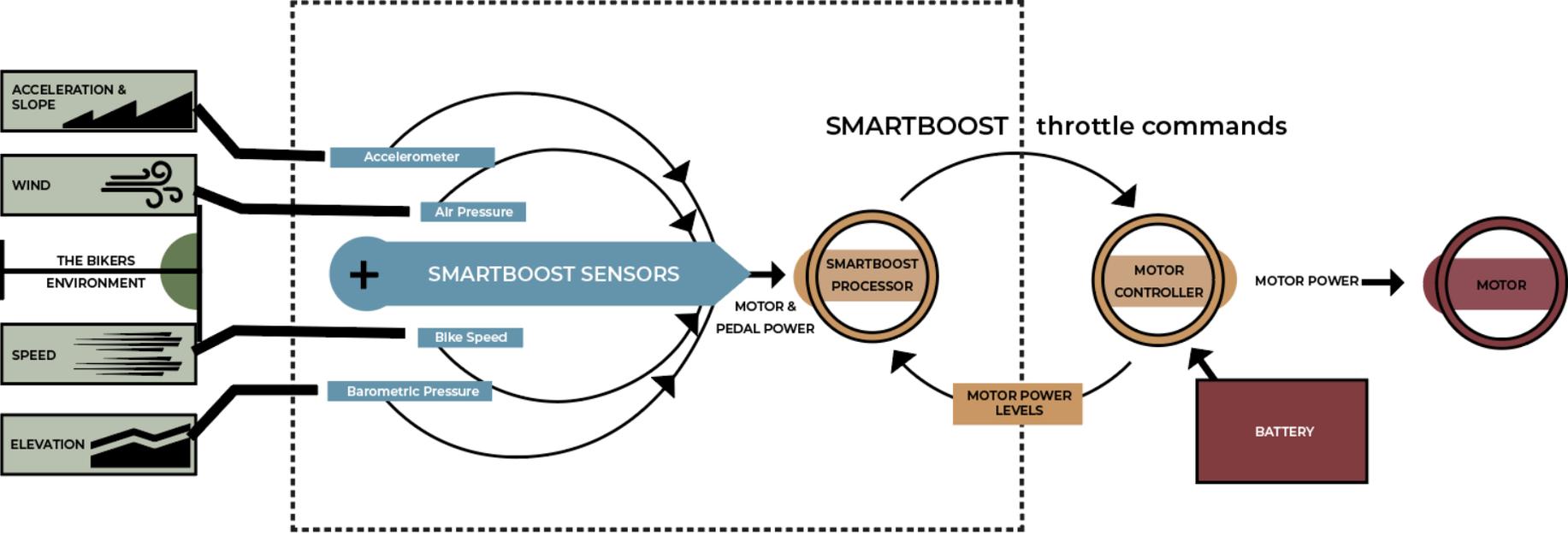
**SmartBoost** sensors measure total power produced by pedals *and* motor

**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

## SMARTBOOST SYSTEM



## 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*



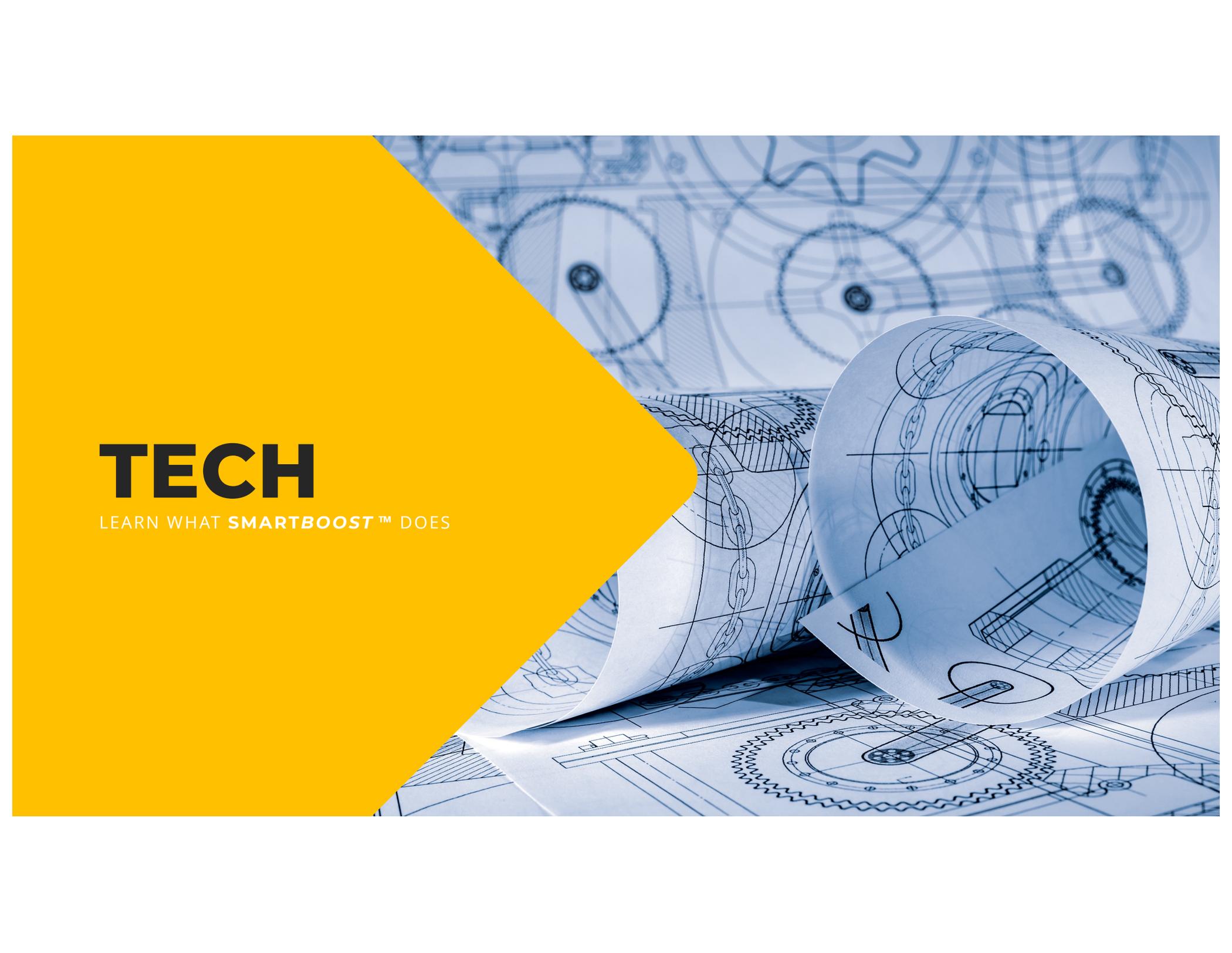
**SmartBoost measures headwinds**

- 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



# 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

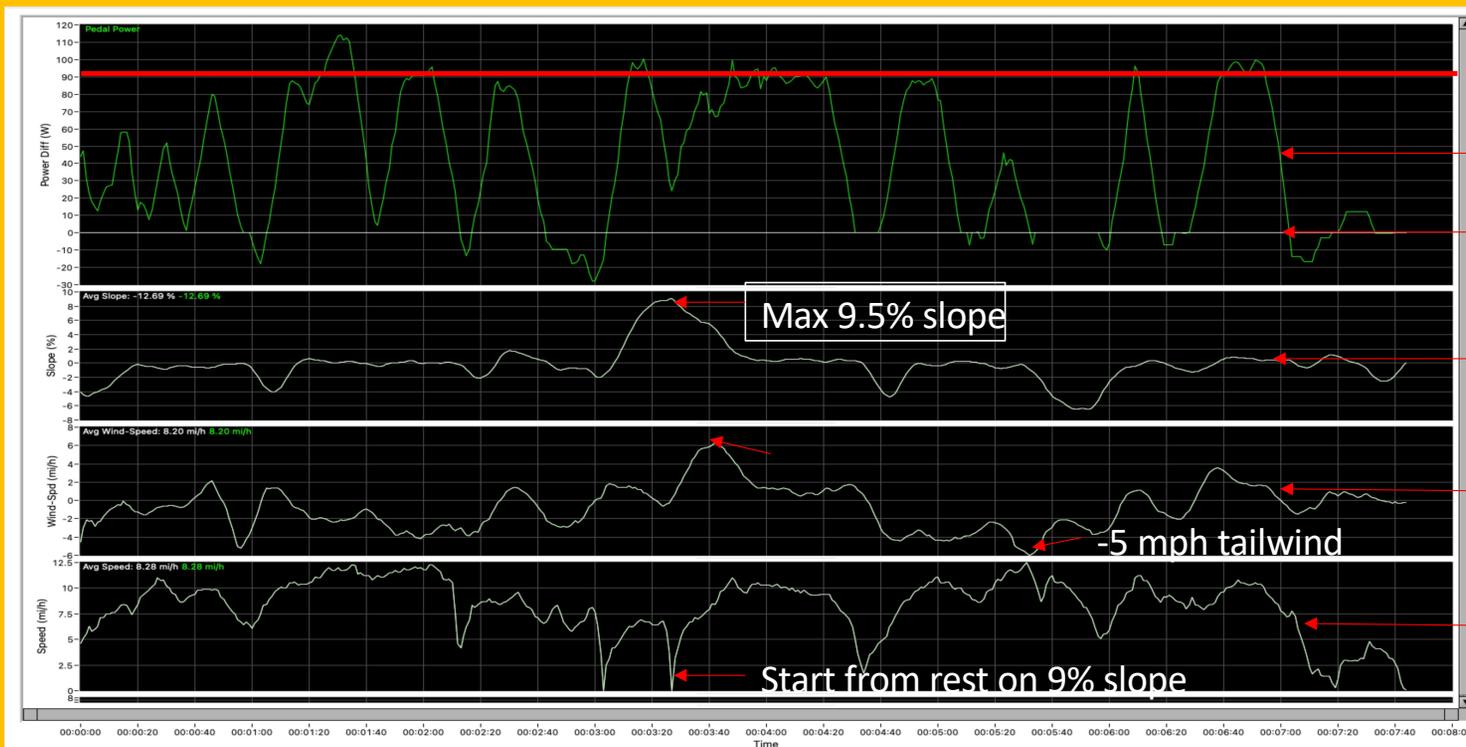
# Does SMARTBOOST™ really work?

---

**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 close-up photograph of a man with a beard, wearing a brown hard hat and safety glasses, focused on adjusting a black metal bicycle rack. He is wearing a dark suit jacket. The background is a bright, sunlit outdoor area, possibly a construction site or a parking lot, with a blurred building and a paved surface. The lighting is warm and golden, suggesting late afternoon or early morning. A large yellow triangle is overlaid on the left side of the image, containing the text.

# THANK YOU

Look forward to talking soon