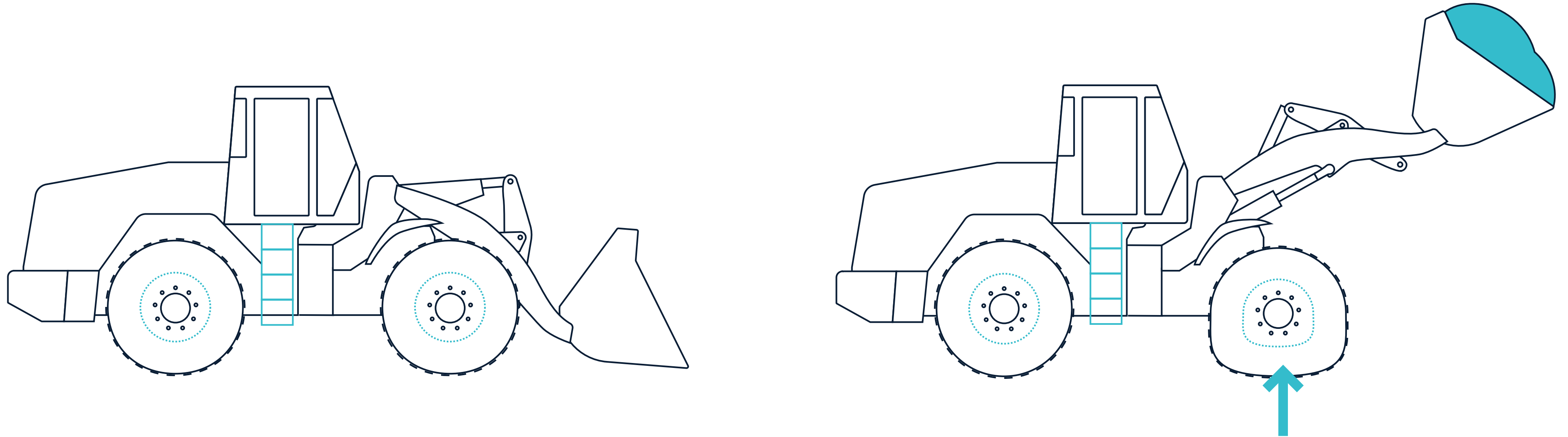


CASE STUDY

# Smart SlipControl: Reduced tire wear, Example: wheel loaders

## / "Smart SlipControl": optimized traction drives taking the effective tire diameter into account

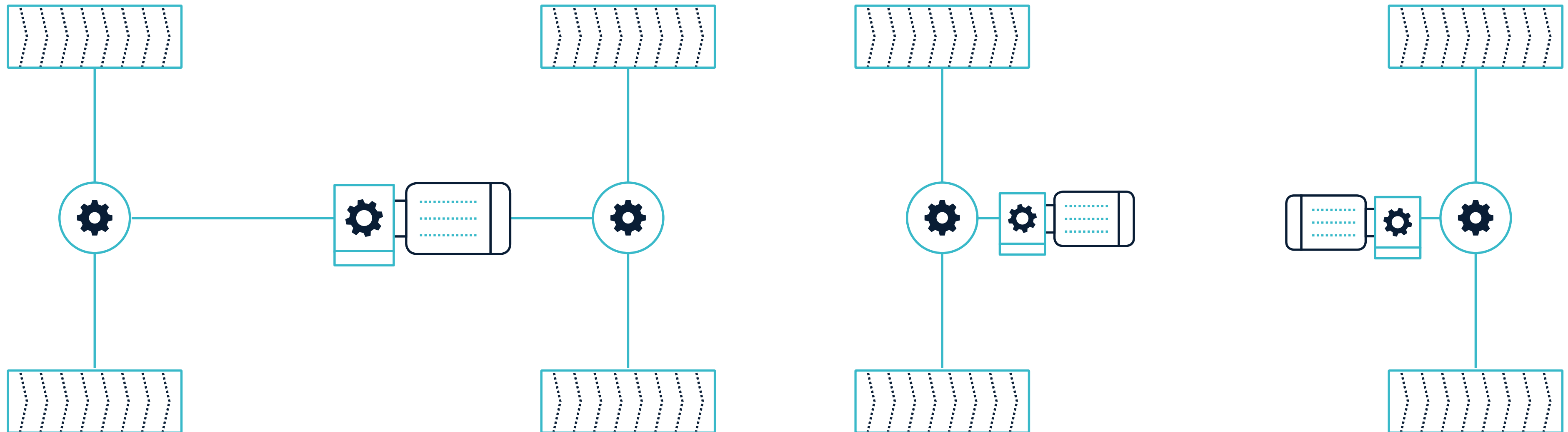


### **The effective tire diameter of the front tires is significantly reduced when lifting heavy loads**

- The effective tire diameter at the front can be significantly reduced with heavy loads
- The torque requirement when driving empty is around 50% / 50% front/rear. But over 90% front when picking up a load
- For this reason, the front and rear axles are often coupled in terms of drive technology and operate at the same speed
- As a consequence, there is considerably too much slip on the lighter rear-wheel drive with heavy tire wear

## /"Smart SlipControl": traction drives optimized

Front and rear drives together or separately



### Classic structure

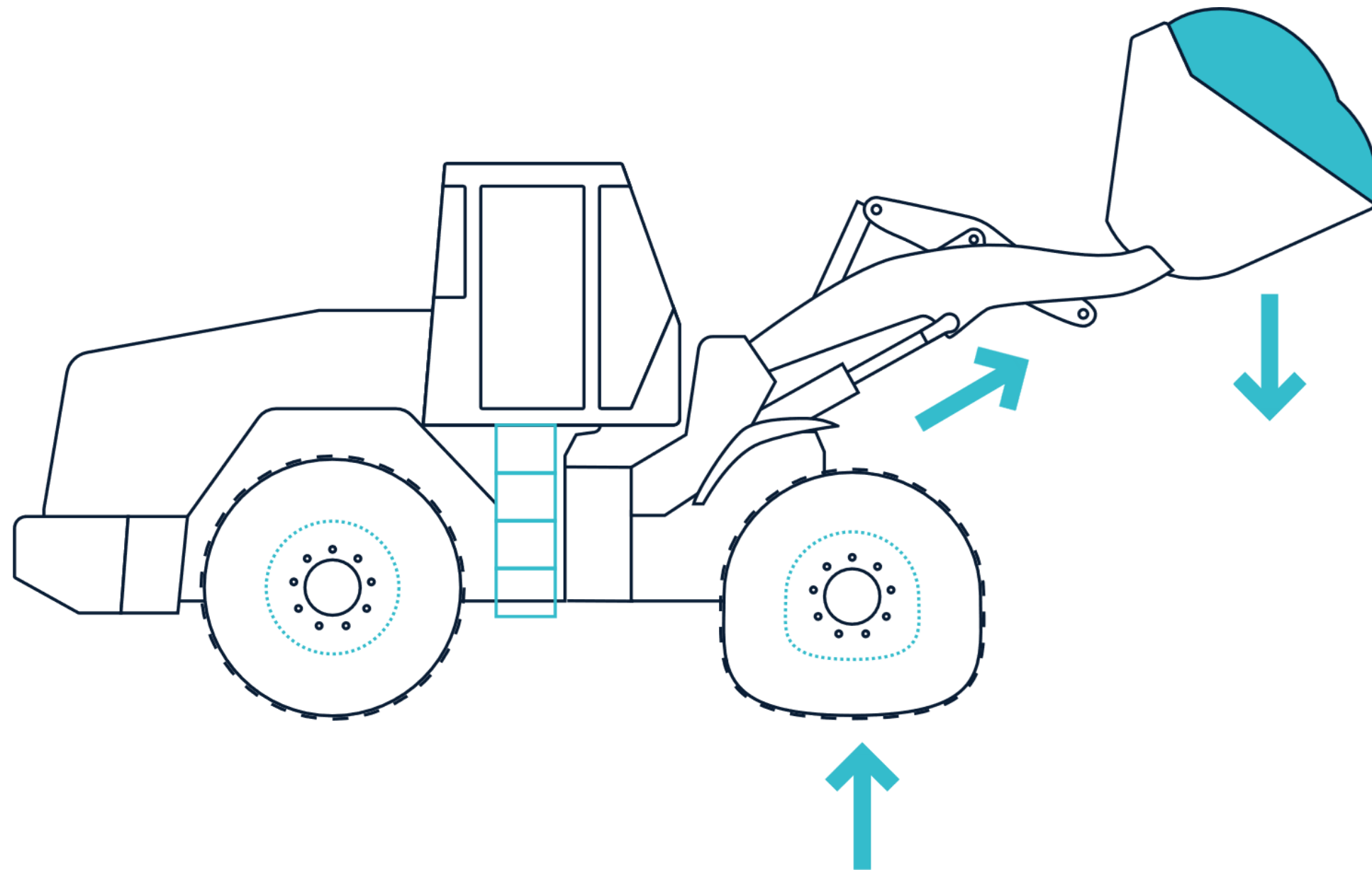
- Front and rear speed the same
- High tire wear
- Only one motor required

### Our approach

- 2 drives, front-wheel drive with higher overload capacity
- Optimized speeds possible for both drives
- Task: Estimation of the effective tire diameters

## / "Smart SlipControl": traction drives optimized

Determine the effective tire diameter



### Determination of the effective tire diameter

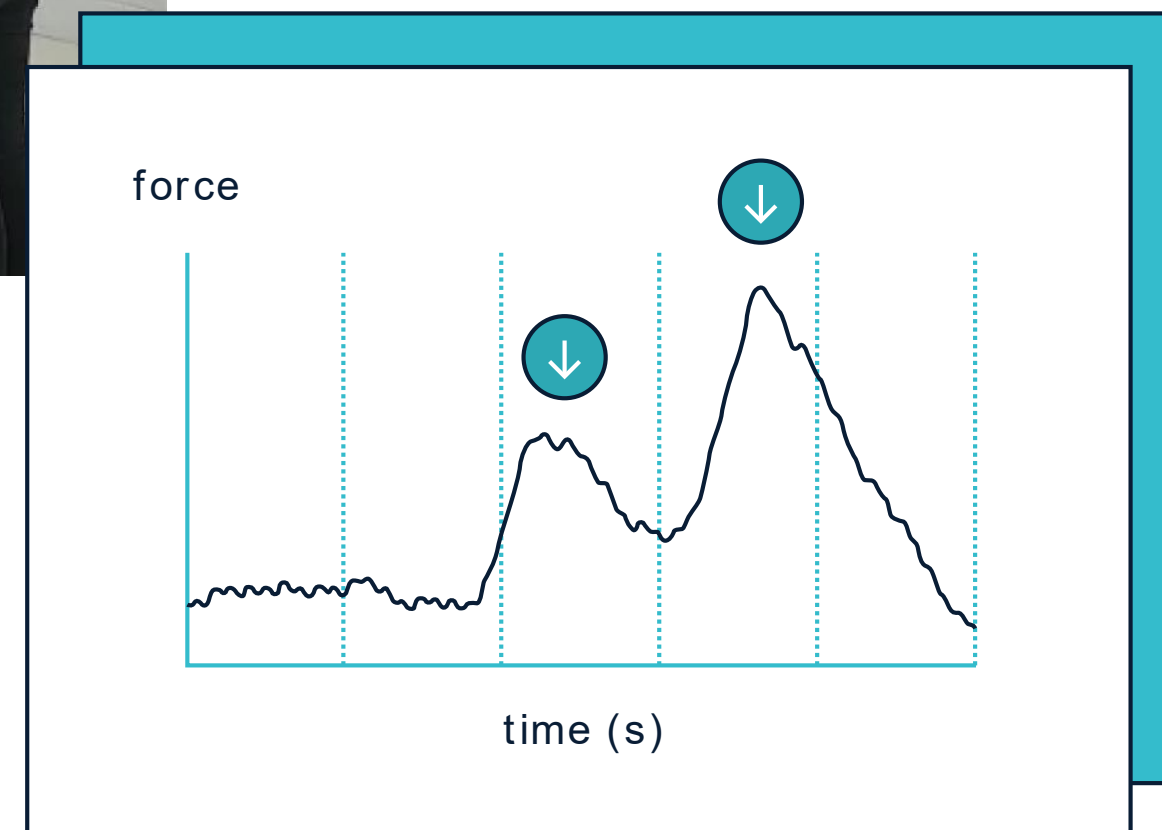
- Option 1: Determine diameter with ground distance sensor: rather expensive and prone to failure.
- Option 2: Measure the lift load with sensors and calculate the diameter together with the tire pressure.
- Option 3: As "2", but determination of the lifting load without additional sensors by using VirtualSensor and a direct e-hydraulic system with inverter control for the lifting cylinder

**Does the VirtualSensor technology provide sufficiently qualified information on the lifting load via the hydraulic pump and lifting cylinder?**

-> Let's find out and make this technology usable for your application

## / VirtualSensor: our experience advantage

Application: Force measurement on electrified vehicle



### Application: E-transporter

We have been successfully using VirtualSensor technology in our customers' production machines for years.

The experiment now shows a real measurement on a mobile application:

- The van moves at a regulated speed of 2 km/h
- We push against the movement with 2 times with little but different force
- The VECTOWER inverter provides us with the effect of these minimal forces in impressive resolution

**Our sales team has more information and impressive videos on the potential of VirtualSensor ready for you!**

## / VirtualSensor for mobile machinery



### "VirtualSensor" ready for your applications

... also especially for mobile applications and work machines in "heavy" environments.

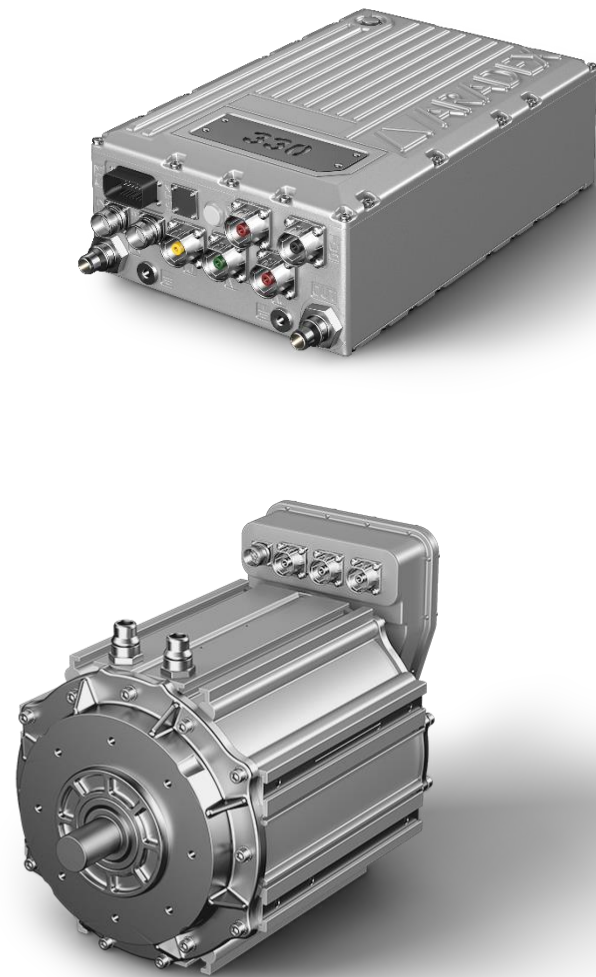
VECTOPOWER inverters offer you:

- Determination of the torque of electric motors in extremely high resolution and in real time, without any potentially interference-prone sensors.
- Integrated PLC functionality for processing these measured variables in real time.
- Synergy of inverter and machine controller: by combining the machine function in your controller with the extremely fast signal processing in the inverter.
- Integrated oscilloscope functions and log files for optimization, documentation etc.....

## / ARADEX's contribution to your project

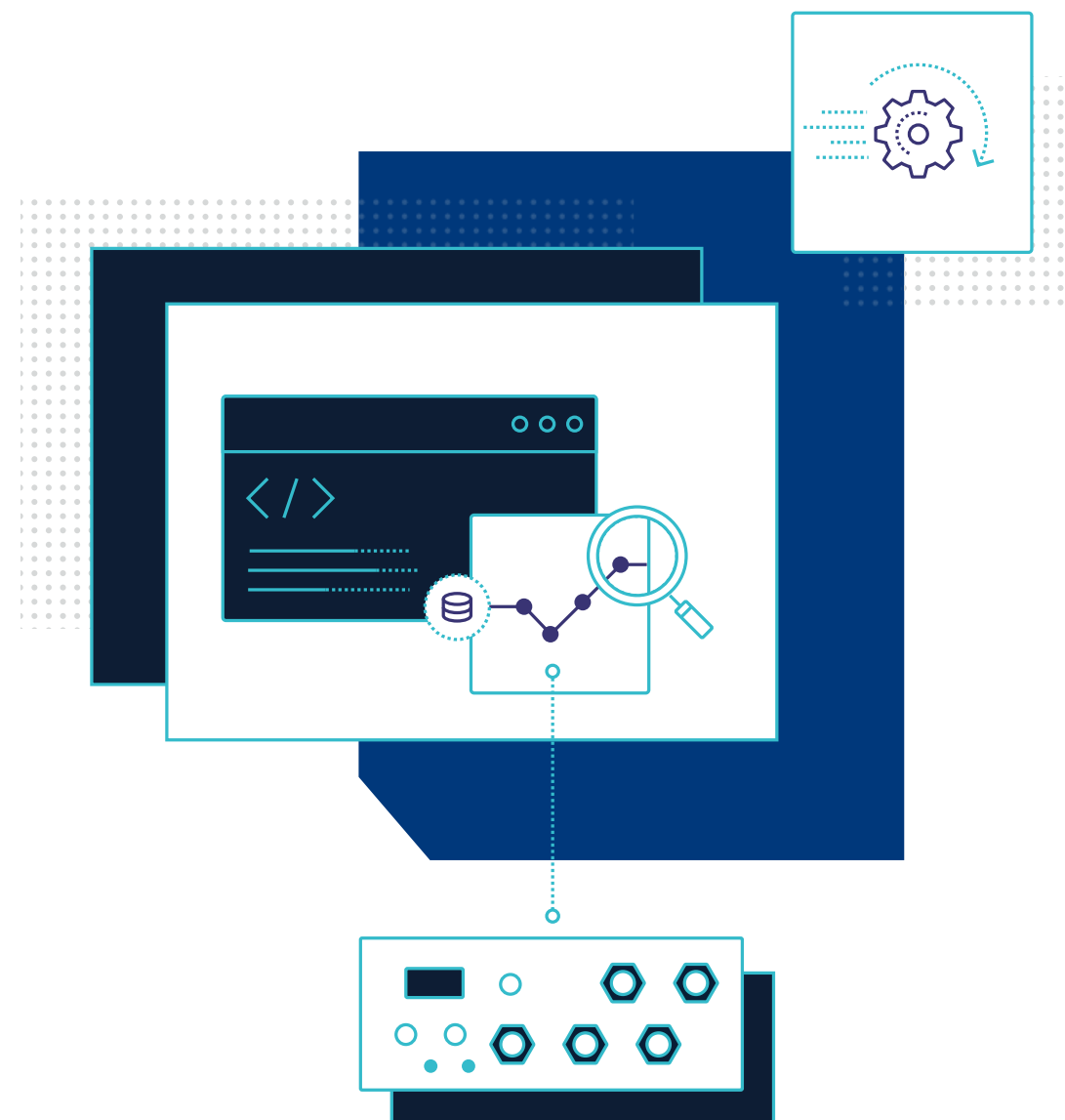
Hardware, software, tools

### HARDWARE



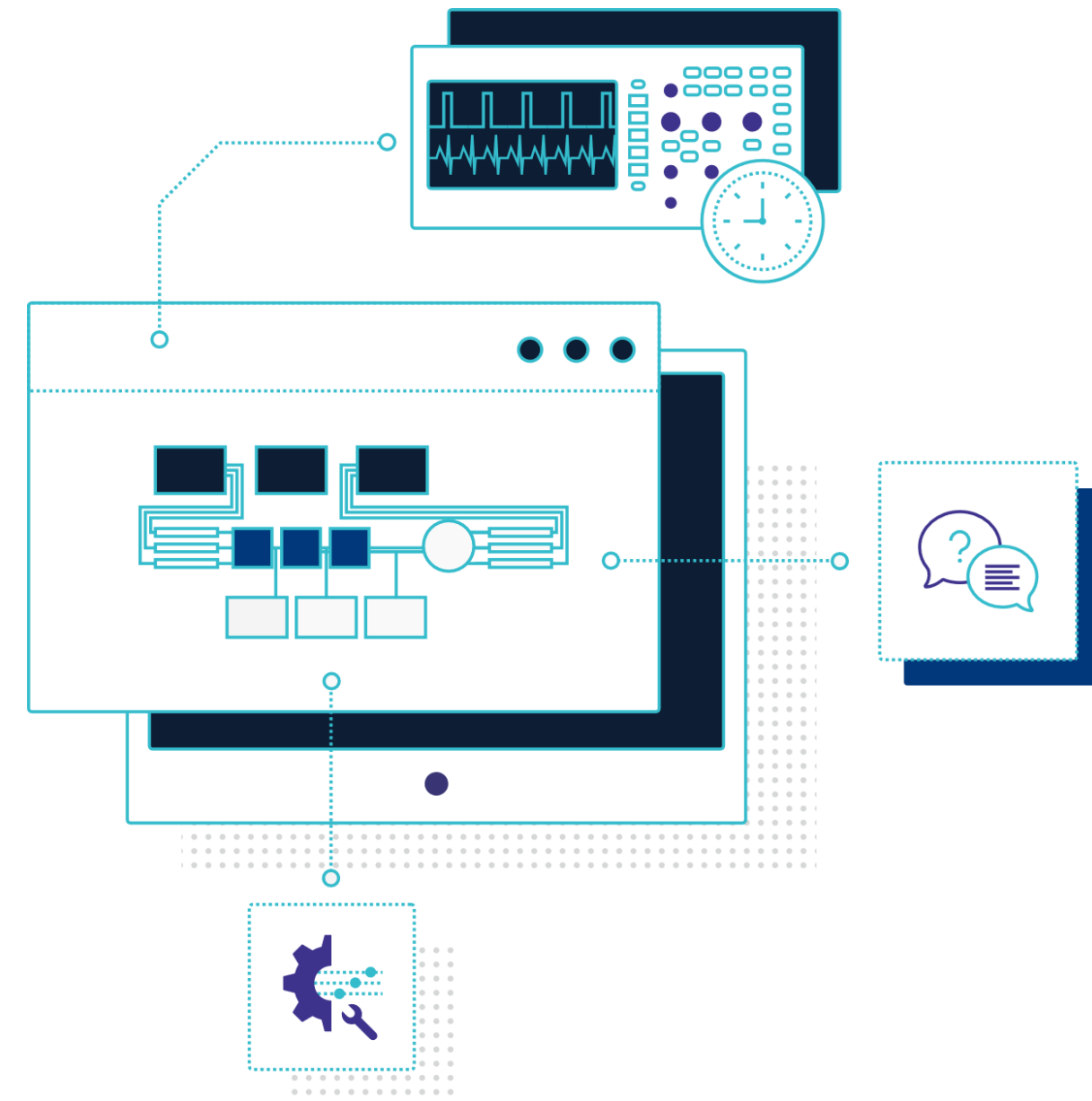
- Inverter
- E-motors
- Accessories

### INTEGRATED SPS FUNCTION



- Sophisticated real-time PLC
- For function and diagnostics
- Your know-how, your USPs

### TOOLS






- Programming
- Parameterization
- Oscilloscope function



Challenge us with your application!

## Proven added-value mobile drive technology



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-  +49 / (0)7172 / 9181-0