**ELECTRONIC SOLUTIONS** 



## Forget Limits!

### With revolutionary sensorless motor control.

# Sensorless control of synchronous motors with the KOSTAL pulse injection method

Using the innovative pulse injection method, KOSTAL has developed a solution to operate all types of synchronous motors (BLDC/ EC) without a position sensor across the entire speed range. A particular challenge here is to determine the exact rotor position of a synchronous motor without using a position sensor, especially at low speeds or when stationary. This is where KOSTAL's solution comes into play, ensuring precise rotor position determination even when the motor is at a standstill.

**Cost Savings:** Up until now, synchronous motors required a position sensor. These are costly and complex to implement. KOSTAL's pulse injection method eliminates the need for such components.

> **Robustness:** The pulse injection method reduces system complexity and space requirements while maintaining the operational reliability necessary for demanding industrial applications.

Versatile Applications: Sensorless operation enables compact applications in areas such as automation technology, electric drives, and robotics that previously required position sensing.

Through this innovation, KOSTAL can now efficiently and effectively implement many applications that previously required a position sensor.

## KOSTALize

### your power

## **All Benefits at a Glance**

#### Cost Savings

- Elimination of position sensors (encoders/hall sensors)
- No need for cable connections
- No effort required for assembly, adjustment or maintenance

#### Overload

- Highest sensorless overload capability
- Conventional load limitation (anisotropy stability criterion) has been overcome

#### Motor Types

- BLDC / EC motors
- Synchronous motors
- Low voltage range
- Power range up to 2 kW

#### Robustness

- Higher product lifespan
- Fewer components
- Reduced cable connections
- No configuration errors

#### Reduced Motor Size

- No space required for position sensors
- Both shaft ends can be used

#### Sensorless Positioning

- No overshooting
- Fully configurable S-curve and ramps

#### Control Method Features

- Extended speed control range down to standstill
- No switching (faceover) between control methods
- No open loop control
- Sinusoidal commutation
- Maximum energy efficiency by selecting the optimal operating point (MTPA)

#### Acoustics

 Pulse injection in a non-audible frequency range with patented evaluation (noise-free)

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## Welling .