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LOW VOLTAGE AC DRIVES

# Crane control and safety with ACS880 drives



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## **Safety. Performance. Efficiency. Speed.**

Everything counts

**Overhead cranes need to be carefully designed to operate efficiently and safely whether they are moving containers, buckets of liquid metal, rolls of paper, or waste. You know that every detail matters when selecting crane control for hoist, trolley and long travel movements. Our ACS880 industrial drives with built-in crane control software and a range of safety functions help you achieve excellent crane performance while minimizing your engineering time. Because everything counts.**



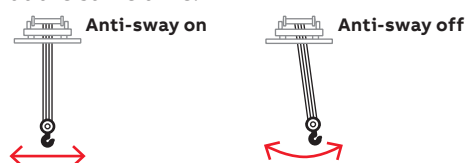
# ACS880 drives with built-in crane control software

## Minimizing your engineering time

### Crane control highlights

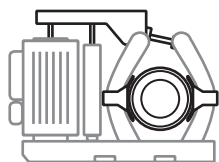
#### Sensorless anti-sway for indoor cranes

Damps load sway in trolley and long travel directions at the same time.



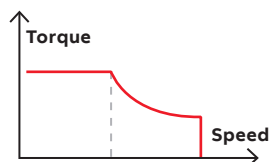
#### Mechanical brake control

Integrated mechanical brake control with crane system check and torque memory.



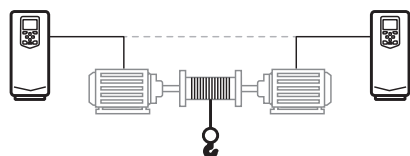
#### Hoist speed optimization

Optimizes hoist speed in the motor field weakening area.



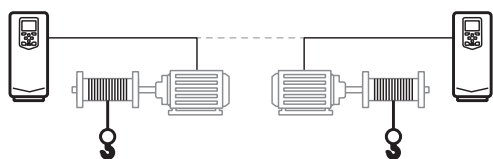
#### Master/follower

Drive-to-drive link allows fast communication between drives in master/follower operation in speed-torque or speed-speed control modes.



#### Synchro control

Synchronizes position of multiple hooks while moving.



#### Direct torque control (DTC)

ABB's signature motor control technology provides precise speed and torque control.



The ACS880 product family is available with power range from 0.55 to 5,600 kW and voltages of 230, 400, 500 and 690 V. Enclosure class options are IP20, IP21 and IP55.

#### Speed matching and overspeed protection



Makes sure that crane speed is always safe and within desired limits.

#### Brake matching



Detects mechanical brake slips and holds the load electrically in case of brake failure.

#### Smooth lifting

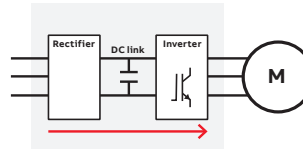


Decreases mechanical stress on the bridge and ropes caused by starting to hoist with slack ropes.

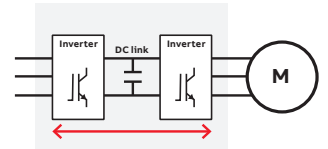


## Braking options

### Dynamic braking/resistors



### Regenerative braking



## Extensive list of add-ons

### Crane control via I/O and fieldbus interfaces

Wide range of interfaces for connecting crane controls like joysticks, radio control and pendant controllers.



### Speed and position feedback

I/O extension modules enable connecting speed feedback interfaces, like incremental and absolute encoders.

### Removable memory unit

Stores the drive's software and settings for fast and easy commissioning and maintenance.



### Flexible setup and monitoring

Start up, configure and monitor your drive with a control panel, computer, or smartphone.



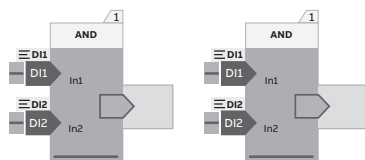
### Control interface options

Joystick, pendant controller, wireless radio control, motor potentiometer, or fieldbus.



### Adaptive programming

Flexibility to add tailored functionality with logical blocks.



### ABB Ability™ Condition Monitoring for Drives

Accurate, real-time information about drive events, and data-based analytics.



### Virtual reality

Virtual commissioning and modelling of the crane behavior.



### Custom crane solutions with a PLC

Our AC500 range of PLCs lets you develop custom crane solutions, even complex ones with multiple inputs and outputs.

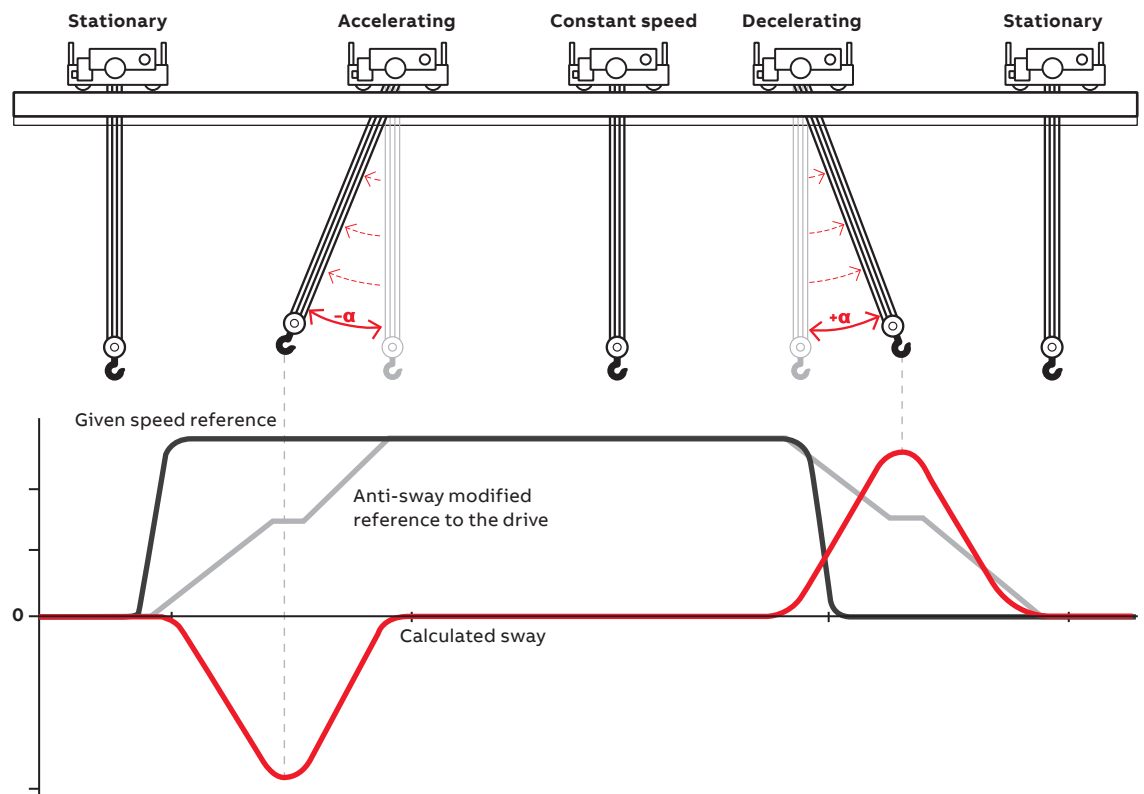


## Sensorless anti-sway for indoor cranes

### Operating mechanics of the anti-sway control program

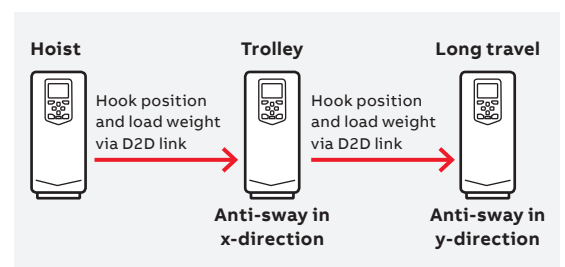
Load sway can occur in trolley and long travel movements. The ACS880 drive's anti-sway control program automatically compensates for it when it happens. The control program creates a mathematical model of the crane's pendulum. It estimates the pendulum's time constant by continually measuring the hoist position and

load properties, and then factors in the swing velocity and angle. When the operator changes the speed of the crane's travel, the drive instantly recalculates the required speed reference to compensate for the crane's speed change, preventing the load from swaying.



### Key benefits of anti-sway control

- Improves productivity by letting the crane operator fully focus on moving the goods rather than manually controlling the sway.
- Lowers the risk of accidents and damage to the load caused by uncontrolled sway.
- Built into the drive. Works without external anti-sway sensors and trolley/long travel motor encoders.
- Works simultaneously with bridge and trolley movements in diagonal runs.



The drives communicate with each other via a D2D link. The hook position can also be transmitted with fieldbus or analog communication.

# Certified safety solutions

- 01 Safety functions modules FSO-12, FSO-21 and safety pulse encoder module FSE-31
- 02 AC500-S Safety PLC

The safe torque off (STO) safety function comes integrated into ACS880 drives. Optional safety functions modules (FSO-12 and -21) provide an easy way to extend safety functions. This plug-in module is installed and cabled inside the drive, enabling safety functions and diagnostics in one compact and reliable module.



01



02

Both safety functions modules have SIL 3/PL e capability and conform to the European Union Machinery Directive 2006/42/EC. The safety functions modules are certified by TÜV Nord.

You can enable PROFIsafe over PROFINET connectivity between your ACS880 drive and the safety PLC by adding a PROFIsafe fieldbus adapter module to your drive.

**Inside the FSO-12/FSO-21:**

- Safe stop 1 (SS1)
- Safe stop emergency (SSE)
- Safe brake control (SBC)
- Safely limited speed (SLS)
- Safe maximum speed (SMS)
- Prevention of unexpected startup (POUS)

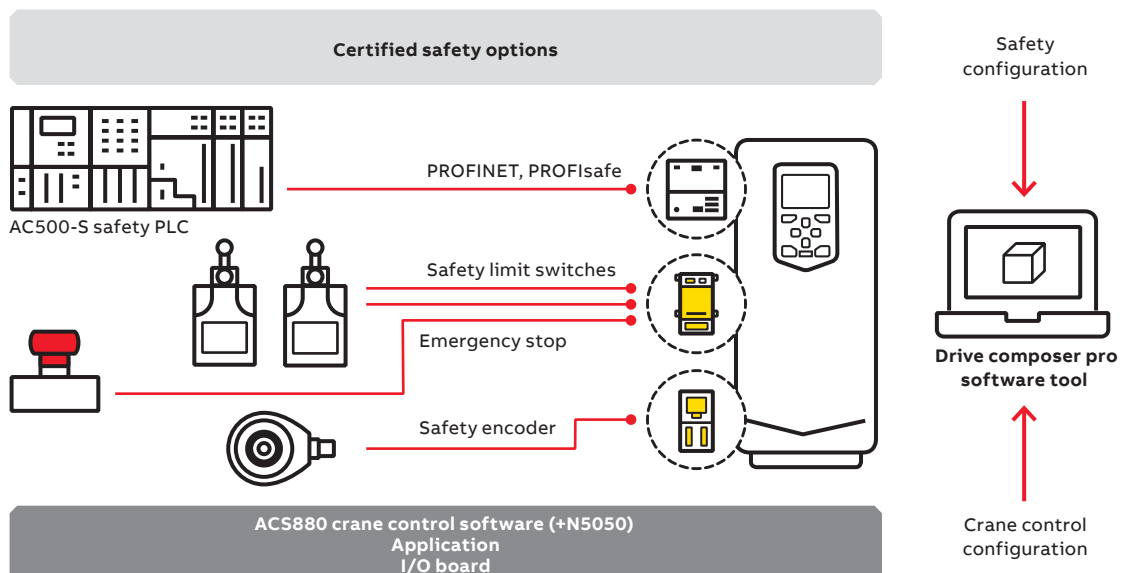
**Additional safety functions inside the FSO-21:**

- Safe direction (SDI), requires a safety pulse encoder interface module FSE-31
- Safe speed monitor (SSM)

**When even more is needed**

The AC500-S safety PLC offers a flexible platform for extending crane safety even further. In crane systems with several ABB drives, the AC500-S safety PLC can control the overall crane safety system, activating the drive-based safety functions over PROFINET/PROFIsafe.

## How it's all connected



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For more information, please contact  
your local ABB representative or visit

[www.abb.com/drives/cranes](http://www.abb.com/drives/cranes)  
[www.abb.com/drivespartners](http://www.abb.com/drivespartners)

