LOW VOLTAGE DRIVES

Safety and accuracy in crane control

ACS880 with crane control



Optimize Your System
System optimization is important for any application, but likely more so where the inherent risks are higher. VFDs enable efficiency by only running drives based on real time demand vs running full speed 100% of the time, which not only saves energy, but also minimizes stress on mechanical equipment. The ACS880's **Load Speed Control** function enables you to maximize hoist speed for a given load and ensures that there is sufficient motor torque in the field weakening area to optimize crane capacity and minimize operating time. The ACS880 has an ultra-low harmonic offering, which also inherently helps to maintain power quality to meet the strictest harmonic standards (i.e., IEEE519) without any need for filtering equipment.

Flexibility
Because every application is unique, it's important to have flexibility. Function block AP Programming provides the flexibility to quickly and easily customize the system using integral relay control logic without the cost of adding a PLC to the system.

You also have the flexibility to optimize your design to your specific needs and the ability to scale your solution as your needs change, because the ACS880 with Crane Control can operate in either standalone mode or as a lead/follower.

Connectivity
A wide range of connectivity data is available for start, stop, references and actual data signals. The ACS880 with Crane Control connects easily to all major industrial communications protocols, such as Modbus RTU, Modbus TCP/IP, Profibus DP, Profinet I/O, DeviceNet, Ethernet/IP, ControlNet, EtherCAT and CANopen, with simple data communication between drives or Fieldbus Controllers (PLCs). The ability to communicate on just about any Fieldbus communication network will reduce start-up time and crane maintenance. Integrating into existing systems is not a problem, as the ACS880 provides the flexibility to interface with analog or digital communications, as well.



It's all about control.

You have to have it. It has to be precise and it has to be safe. That’s why you work with a company that understands your needs and can provide you with the results you require.

Historically, crane control was done by creating a custom program in the drive. This approach required system integrators to employ dedicated, in-house programmers with crane control knowledge and skill who would devote extensive time and effort to each project. As you might imagine, this was very costly. By leveraging decades of crane application experience, ABB can help you achieve these same goals using the ACS880 with Crane Control, which provides an ideal solution for the hoist, trolley and long-travel movements of cranes, regardless of voltage or horsepower needs and without the need for extensive in-house programming.

Crane movements can happen quickly. Direct torque control (DTC) enables the ACS880 to respond swiftly and accurately to these movements to ensure that your load is stable and under control. Because lifting the load requires high torque levels, DTC within the ACS880 is also ideal for lifting operations to augment operational safety as well as the accuracy of slow speed control. The ACS880’s DTC enables full torque at zero speed, with and without feedback from an encoder.

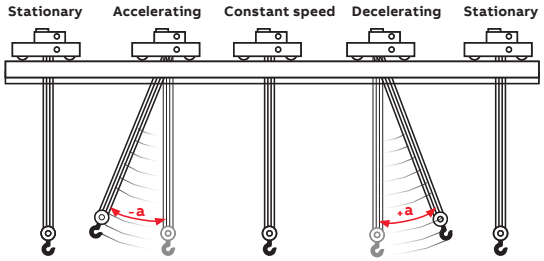
Safety

Operating cranes inherently involves risk. Even the slightest mistake can be catastrophic, making safety a primary concern. ABB's ACS880 with Crane Control was specifically designed for crane applications with critical crane safety features and functions that add to operational safety:

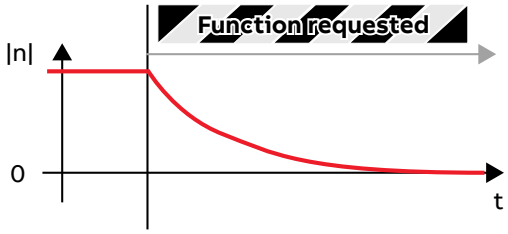
- The **Torque Proving** function ensures that the drive and motor are able to produce torque and that the mechanical brake does not slip before the drive releases the brake to start operating the crane.

- Integral brake control logic leverages the **Torque Memory** function to open and close the mechanical brake safely and reliably. This ensures smooth transition from non-operational to operational mode, making sure load does not jerk when the mechanical brake is released.

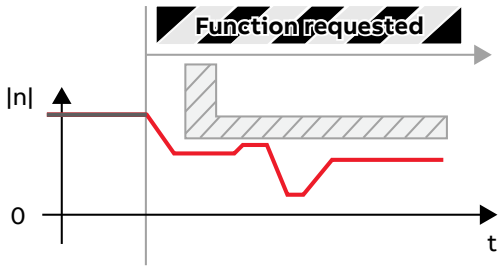
- The **Anti-Sway Control** function ensures that your load is under control while the load is moving or when the operator changes the crane's travel speed. The drive quickly recalculates the required speed reference to compensate for the crane's speed change, preventing the load from swaying.



The **Safe Torque Off (STO)** function removes torque from the motor, preventing movement, until the fault is removed, and an operator manually restarts the motor. This eliminates the need for input contactors, reducing the cost of your system.



- 'Slow down' **Safety Limits Speeds (SLS)** can be set for critical zones and limit sensors can be applied to govern the range in which the crane will operate.



- The **Safe Speed Monitor** (SSM)* function controls the motor speed, keeping it within safe limits and preventing over-speed and other unsafe conditions.

- The **Safe Direction (SDI)*** function makes sure the direction of rotation is correct, preventing mechanical damage to the crane or causing a maintenance work order.

- The **Speed Matching** function constantly compares the speed reference to the actual motor shaft speed to detect any inconsistencies after the brake is closed. If a fault should occur in the operation of the brake, this function will restart the drive to hold the load immediately.

- If an emergency situation does occur, the **Fast Stop Safety Control** function can be engaged to control the crane to perform a safe stop.

Because it's been rigorously tested and industry-proven, the ACS880 with Crane Control gives you one less thing to worry about.

* FSO-21 safety module.

Accuracy/precision
In any crane application, precision is key. With its zero-speed torque control, the ACS880 gives you the accuracy you demand. The built-in anti-sway control ensures that your load is doing precisely what it should be, when it should be. The crane control program automatically compensates for load sway by leveraging a mathematical model of the crane's pendulum and using the built-in drive to drive communication network to send speed commands to the bridge and trolly. When the operator changes the crane's speed, the drive recalculates and quickly adjusts to compensate for the change and prevents the load from swaying.

Easy to use
The ACS880's intuitive control panel and PC tools will aid in a faster start-up, reduce downtime with better troubleshooting tools, and provide a simplified system configuration with built-in safety features.

ABB offers a common drive platform and provides features and functionality specific to cranes. Common communication protocols, assistants, and macros make it easy to use and minimize the need for training. Help keys are available and fault descriptions are written in plain English, so you don't have to look up codes. If you need additional help, local technical support is available 24/7/365, at no cost.

Easy to Install: Fewer components –
Traditional crane control requires PLCs, input contactors, and separate safety relays. When you use the ACS880 with Crane Control, you can eliminate the PLC, and the programing that goes with it, as well as the contactors and relays. In addition, the ACS880 also provides color-coded terminal blocks make connecting input /output terminals foolproof.

Easy to Use: Removable Memory Unit –
The removable memory unit stores the software that includes user settings, parameter settings and motor data. Situated on the control unit, the memory unit can easily be removed for maintenance, firmware updates or replacement, without the need to download parameters. System parameters and motor data can be uploaded to the panel and the panel can be removed and reinstalled in a new drive using the same system parameters.

Easy on the Budget: Regenerative Drive Solution –
The ACS880 with Crane Control can be a complete regenerative drive solution and doesn't require an external dynamic breaking resistor. The braking energy of the motor returns to the drive and is distributed forward to the supply network, thus saving energy.



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