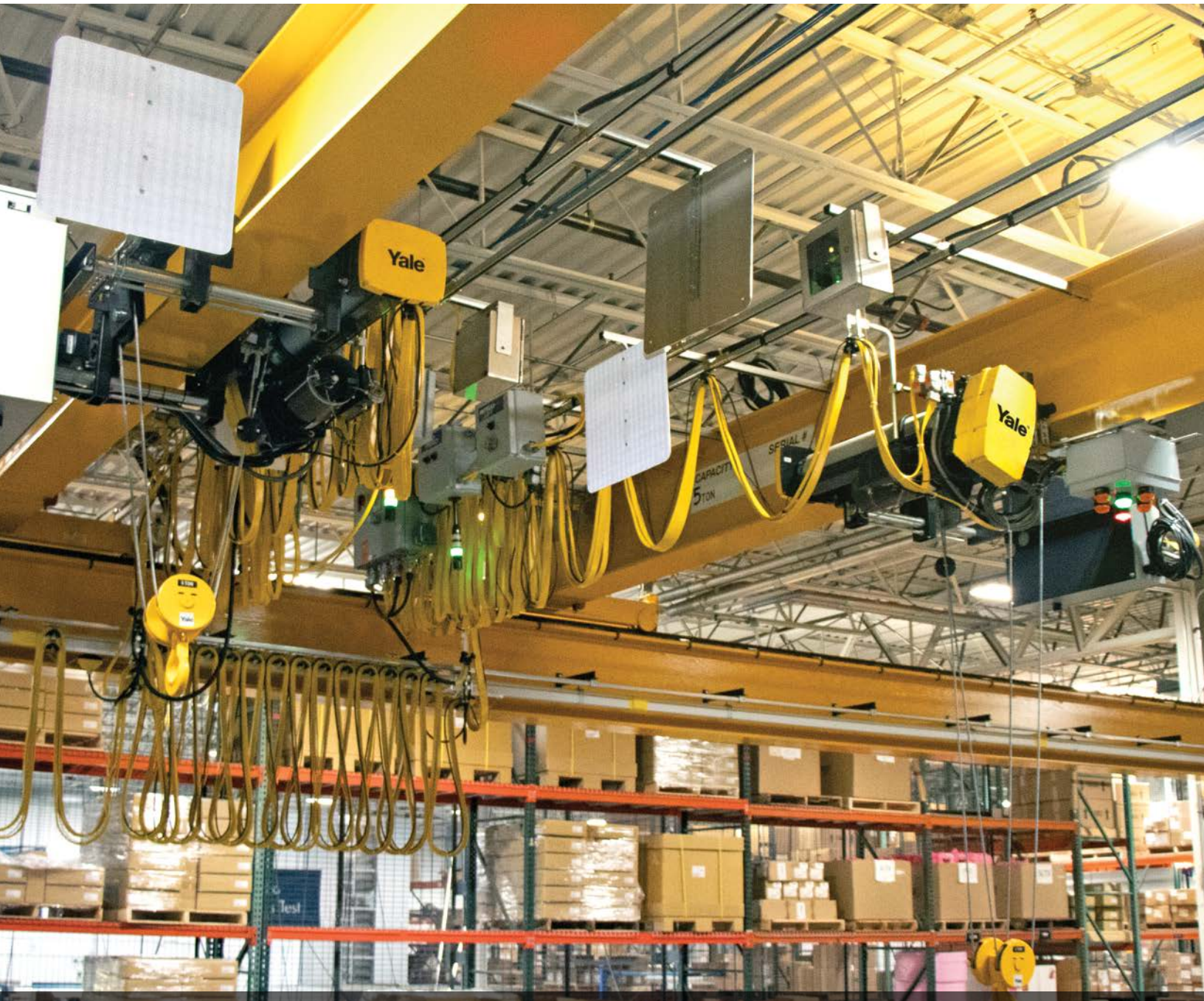




CRANE SOLUTIONS

INTELLIGENT CRANE COMPONENTS
FOR OPTIMAL PERFORMANCE



Yale®



SHAW-BOX®



MAGNETEK

STAHL
Crane Systems



COFFING®
HOISTS

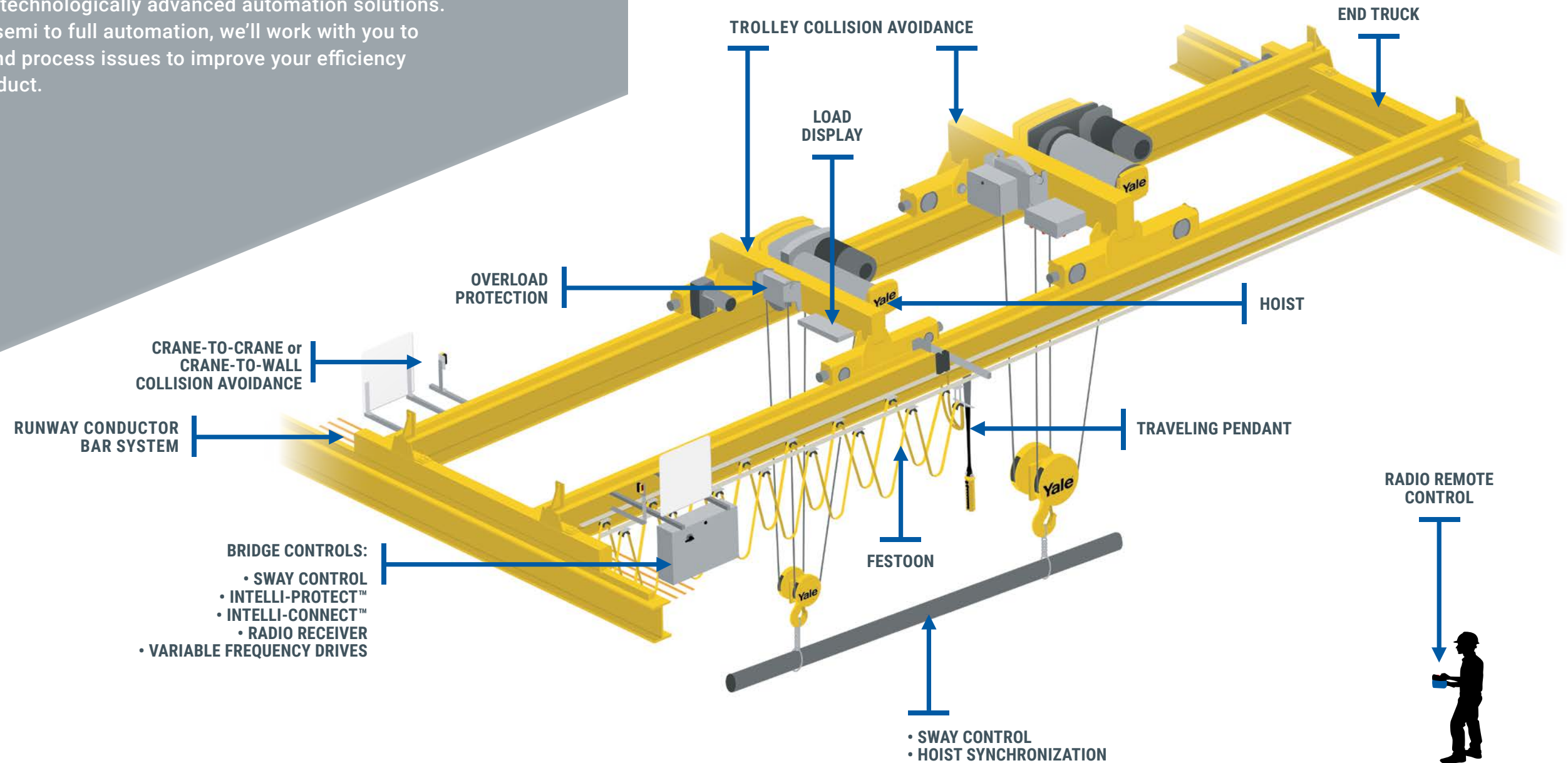
BUDGIT®
Hoists

Whether lifting molten metal in a steel production facility or utilizing a full crane system in automotive manufacturing, Columbus McKinnon's crane solutions can help. With a comprehensive portfolio of high-tech crane controls, components, wire rope hoists, and automation technology, we provide everything you need for a complete intelligent lifting system. Our crane components and technology are specially designed to work together for optimal performance, easy integration, and quick installation.

We are the trusted crane experts, combining the power of industry-leading brands, such as Yale®, CM®, Shaw-Box®, Magnetek®, STAHL CraneSystems®, and more. Working together, our high-quality components, specialized overhead material handling controls, and best-in-class engineering services allow us to provide custom-built solutions for the most challenging applications. We also offer technologically advanced automation solutions. With options ranging from semi to full automation, we'll work with you to transform problem areas and process issues to improve your efficiency and produce a superior product.



CRANE SOLUTIONS



WIRE ROPE AND CHAIN HOISTS

Available with a wide range of capacities, features, and specifications, Columbus McKinnon's portfolio of powered wire rope and chain hoists are known throughout the material handling industry for their strength, safety, performance, and reliability. Whether you need a top-running wire rope hoist or a variable speed electric chain hoist, we have what you need.

	WIRE ROPE HOISTS	CHAIN HOISTS
Configurations	Under-running monorail, top-running, base-mount, deck-mount	Lug mount to motorized trolley
Capacities*	Up to 35 tons (monorail) Up to 160 tons (top-running, double-girder)	Up to 20 tons
Lifts*	Up to 131 ft.	Varies based on application
Speeds	Single speed, 2-speed, and VFD	Single speed, 2-speed, and VFD
Voltages	190, 208, 230, 380, 460, and 575 volt, 3 phase, 50-60 Hz.	115-230 single phase or 208-575 volt 3 phase
Brands	Yale, Shaw-Box, STAHL CraneSystems	CM, Coffing, Budgit, STAHL CraneSystems

*Standard lifts and capacities listed. Extended lifts and capacities available upon request.

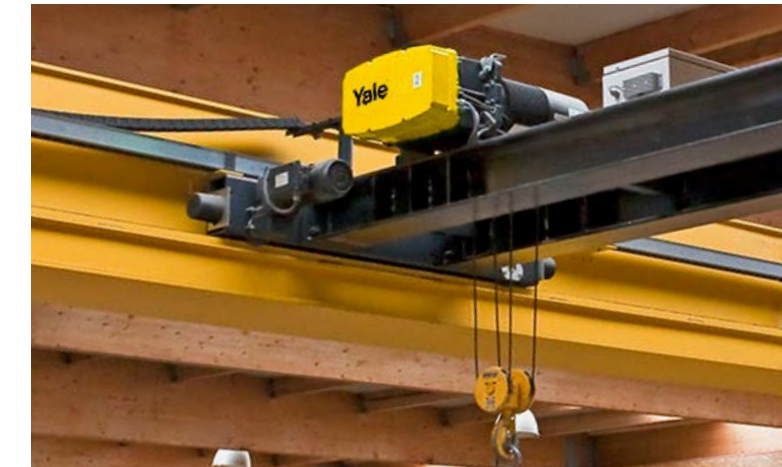


END TRUCKS

Preferred by crane builders for both single- and double-girder applications, our end trucks are known for their durability and dependability. These popular end trucks are available in underhung and top-running configurations for CMAA Class C and D service requirements. Our end trucks are also available in standard bogie configurations that are economical and easy to install.

Choose from end trucks with wheelbases from 36" to 150" in 6" increments and spans up to 100 feet. Our end trucks accommodate all standard rail sizes, including square bar. We can also customize the wheel tread, depending on your application needs.

When it comes to control, Columbus McKinnon offers end trucks with variable speed on all motions with our Magnetek IMPULSE®-G+ Mini Variable Frequency Drives (VFD). Speeds range from 75-250 feet per minute (FPM), with 100 FPM as standard.



INDUSTRY-LEADING CONTROL

Specifically designed for crane applications, the IMPULSE-G+ Mini is our easiest-to-program VFD, with user-friendly standard programming for basic applications and advanced programming capabilities for high-performance environments. Other features of the IMPULSE-G+ Mini include:

- Built-in keypad display for easy programming and navigation
- Compact design for smaller control enclosures
- Expanded horsepower (HP) range from ½ to 20 HP in 400-480V AC or ¼ to 20 HP in 200-240V AC three-phase ratings
- Energy Engineered® for reduced energy costs



RUNWAY CONDUCTOR BAR

Our conductor bar systems are a practical, proven, and economical way to deliver power to overhead cranes and hoists. Whether you need power for a standard top-running hoist application, a curved monorail, or a special lifting or positioning application, our versatile range of conductor bar systems can help.

Magnetek ELECTROBAR® Elite, our most advanced conductor bar system, is a cost-effective option. ELECTROBAR Elite requires less installation time than traditional conductor bar and has minimal maintenance requirements for a lower total cost of ownership. With a compact design, this system is easy to install in tight spaces where other systems will not fit.

Other conductor bar systems include our **Magnetek ELECTROBAR Finger Safe (FS) System¹** with patented anchor hanger assembly. Designed with safety in mind, the FS system features a finger-safe design to minimize the potential for electrical contact. The **Magnetek ELECTROBAR 8-Bar System** features a figure 8 design that allows you to use it interchangeably with common bottom-entry, 8-bar systems for simple top-running applications or curved monorails.



CRANE CONTROLS

Innovative, low-cost controls, including application-specific software and hardware, can be added to your crane to meet unique application requirements and enhance performance, safety, and production throughput. Whether you want to prevent load sway, avoid collisions, or synchronize hoists to lift in tandem, we have crane control options to meet your needs.

COLLISION AVOIDANCE

Limiting the risk of collisions means increased operator safety, lower maintenance costs, and improved productivity and uptime. Magnetek collision avoidance systems, such as our well-known LaserGuard™ Mini, allow you to choose the exact functionality, size, and style to fit your specific application needs, helping to prevent crane-to-crane or crane-to-wall collisions. These systems are ideal for all types of cranes equipped with VFDs or contactor controls.

LaserGuard Mini is a simple-to-install system that enables you to program distances directly on the laser or with a PC application, allowing for easy installation and adjustments in the field. With a dual set-point sensor, an initial slowdown point, and a stop point, the system effectively protects against collisions in your facility. LaserGuard Mini comes complete with flexible bracketry to accommodate most application requirements.

For a more technologically advanced option, our **LaserGuard™2** system features self-monitoring optical lasers that automatically check and relay required adjustment information to cranes.



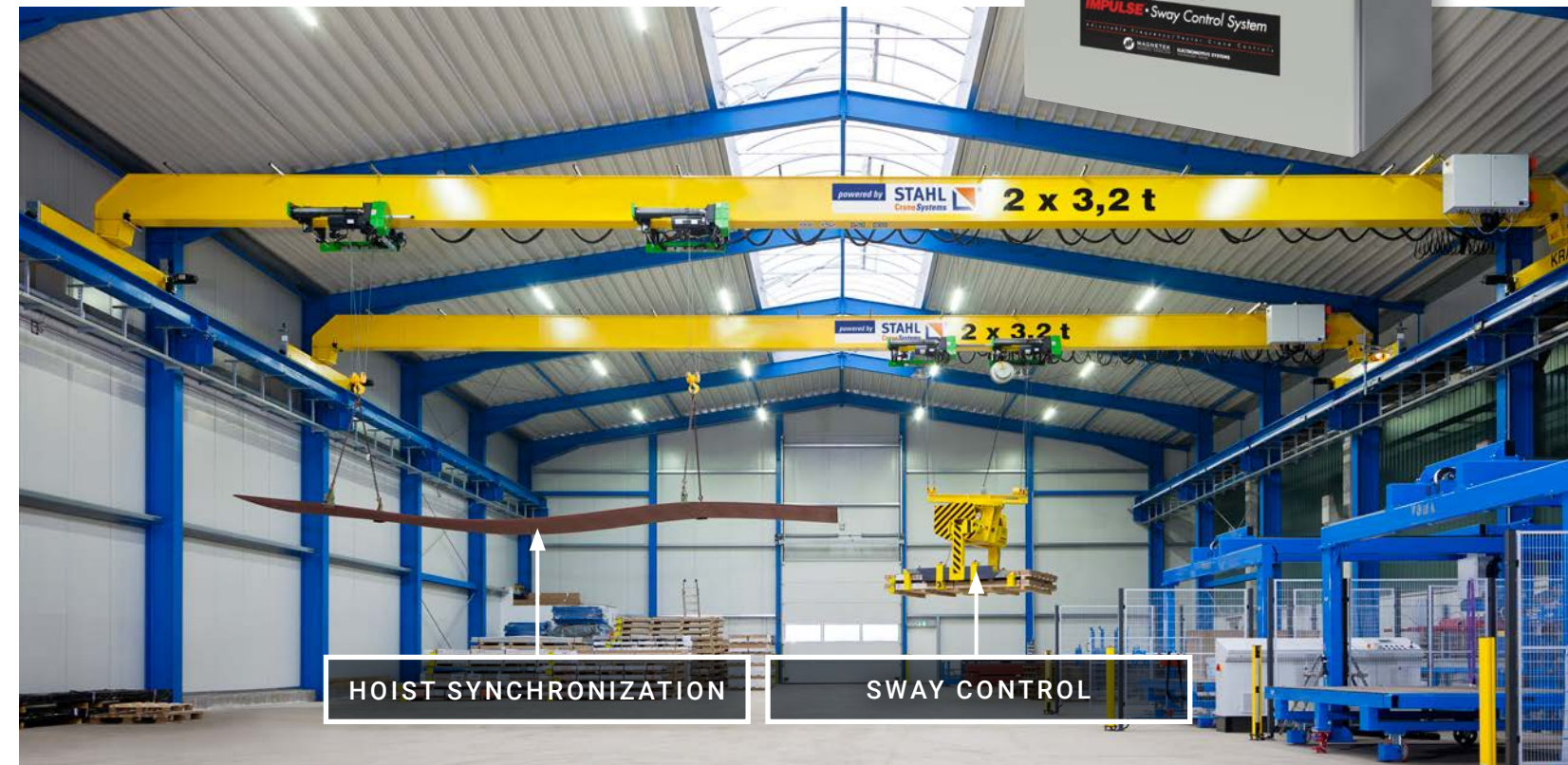
FEATURES	LASERGUARD MINI	LASERGUARD2
Distance*	8"–164 ft. (0.2-50 m)	8"–150 ft. (0.2-45.7 m)
Sensor Rating**	IP65	IP65
Voltage Rating	85–264 VAC, 120–370 VDC	85–264 VAC, 120–370 VDC or 9–36 VDC (optional)
Components	Laser, mounting bracket, DIN-mount power circuit, 2x2 ft. reflector, sensor cable	Laser, mounting bracket, 2x2 ft. reflector, sensor cable, laser support unit
Certifications	cULus	None
Distance Set Points	Two	Three
Diagnostic Indicators	LEDs for power and status	LEDs for power and status
Options	NEMA 4X configuration	NEMA 4X configuration

* Runway length may be greater than detection range.
 ** System may not operate properly in direct sunlight or inclement weather conditions.

SWAY CONTROL

The **Magnetek Sway Control System (SCS®)** helps improve productivity by preventing load swing. The system also improves the accuracy of load placement and reduces material damage caused by incidental contact of swinging loads. This custom software is embedded in our IMPULSE•G+ Mini VFDs when purchased as part of a complete crane system, providing you with an economical VFD package with sway control built right in.

Installation is easy. With intuitive parameters and programming, our sway control system is easy to get up and running without the need for external programmable logic controllers (PLC). Our new Intelli-Connect™ Diagnostic and Analytics Mobile and Mobile+ apps make it easier than ever to set up and monitor your hoist and/or travel VFDs right from your mobile device on the plant floor.



HOIST SYNCHRONIZATION FOR TANDEM APPLICATIONS

When there's a need to synchronize multiple hoists on a single bridge, our patented **Magnetek Drive Synchronization Software^{2,3}** makes it easy. This customized software allows you to synchronize IMPULSE•VG+ Series 4 VFDs to precisely control motion and prevent the operator from making an uneven lift, increasing operator and facility safety. It also helps improve productivity by eliminating the need for the operator to manually level the hoists. This software is ideal for operating a multiple hoist application independently or synchronized, as well as synchronizing multiple trolleys on a single bridge or multiple motions between two or more cranes.

CRANE-SPECIFIC SOFTWARE CAPABILITIES

IMPULSE drives are specially designed for material handling applications, providing a complete package of crane-specific capabilities far beyond a general-purpose drive's functionality. Some of these key features include:

BRAKE TEST CAPABILITIES

Our patented brake test feature⁴ verifies brake torque with the press of a button, capturing breakaway torque with a monitor parameter on the keypad. This valuable tool determines the condition of the brake so you can perform preventative maintenance and quickly commission the crane.

ELECTRONIC PROGRAMMABLE LIMIT SWITCH (EPLS)

Our patented electronically programmable upper and lower limit switches (EPLS)⁵ allow users to configure slowdown and stop limits using motor rotation feedback instead of physical limit switches. Limits can be easily set and modified with the user-friendly keypad or through our Magnetek Intelli-Connect Mobile and Mobile+ apps.

ADAPTIVE ULTRA-LIFT™

This software allows for hoist operation above base speed with a light load or empty hook. Adaptive Ultra-Lift continuously monitors motor torque and adjusts motor speed to operate at peak performance, improving plant safety and maximizing throughput.

SAFE LIFTING FEATURES

We build safety features right into our software. Torque Proving confirms the motor is providing enough torque to safely lift a load prior to releasing the brake. Torque Limiting prevents the crane from performing a lift that could overload the motor and cause mechanical fatigue. Our Brake Integrity Check tests the primary and emergency brakes to ensure they are mechanically capable of holding the load.

RADIO REMOTE CONTROLS

With a proven history of durability and performance, Magnetek radio remote controls ensure accurate control and safe operation of equipment throughout a shift. They are designed to work seamlessly with other Columbus McKinnon products, such as powered hoists and motor controls, to provide complete crane solutions.

Our pre-engineered line of feature-rich **Flex EX2** radio remote controls are a cost-effective way to introduce radio remote control into your crane system. Available in 6- and 8-button configurations, these ergonomic transmitters are ideal for use in material handling and overhead crane applications. You can also choose from our innovative **Flex VUE**[®] transmitters that combine an informative graphic display, showing everything from hook load to hoist speed, with stepless or two-step technology.

If you prefer lever and joystick control, our engineered **MLTX2™** and **XLTX™** bellybox transmitters provide comfort, durability, and flexibility. Available with an informative graphic display, similar to the Flex VUE, and numerous customizable options, these bellybox transmitters give you the latest technology in a lightweight, comfortably contoured design.

FLEX EX2



FLEX VUE



MLTX2



XLTX



INTELLI-CRANE™ AUTOMATION SOLUTIONS

Implementing automation in your crane system can have a big impact on your facility. Not only can automation help increase productivity and maximize the uptime and performance of your operations, it can also improve product quality, optimize labor, increase energy efficiency, and provide numerous safety benefits. Columbus McKinnon's pre-engineered automation solutions, built with Magnetek technology, are designed for ease of use, quick configuration, and feature short lead times to get your system up and running quickly. These systems are ideal for both new installations and retrofit applications.

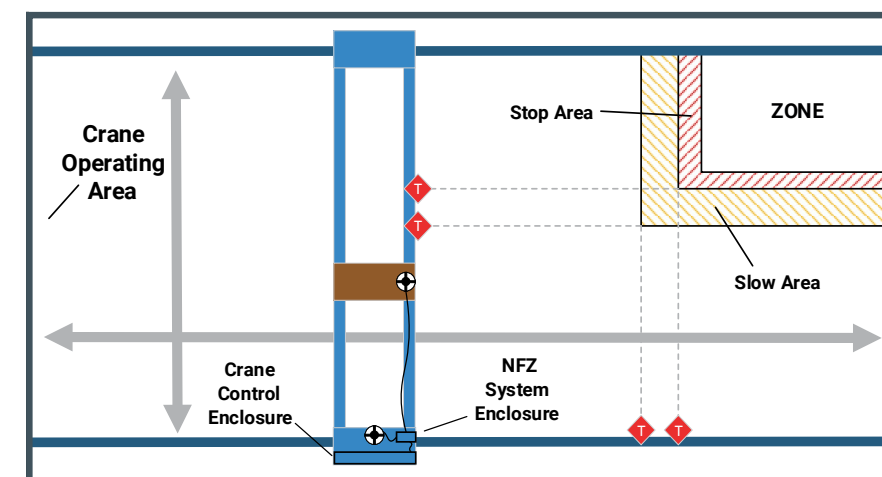


INTELLI-PROTECT™ NO-FLY ZONE TECHNOLOGY

Implementing no-fly zones limits the risk of collisions, increases safety for equipment and personnel, and improves facility throughput. The **Magnetek Intelli-Protect** system allows you to designate locations where a crane is programmed to slow down or stop, using motion control products such as VFDs, radio remote controls, limit switches, and sensors. A Portable Electronic Device (PED), such as a laptop, smartphone, or tablet, allows for full configuration of Intelli-Protect systems, while also allowing you to easily make modifications as changing process, plant, and crane conditions require.

Intelli-Protect is available as a plug-and-play package when you order a complete Columbus McKinnon crane system for reduced installation and setup time. These versatile systems are available in multiple configurations, ranging from simple two, three, and four-sided configurations to more complex systems with up to 31 protected areas, depending on your application needs.

SYSTEM DIAGRAM

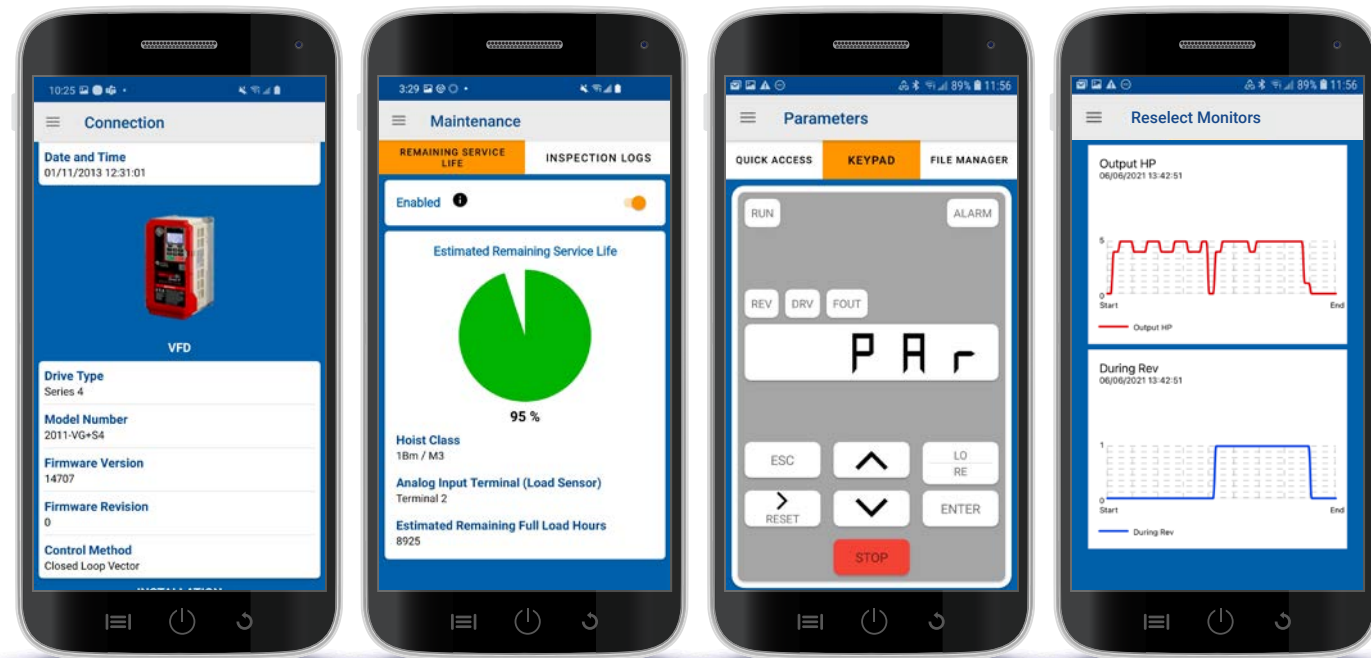


Two-Sided Fixed Location Example



INTELLI-CONNECT™ DIAGNOSTICS AND ANALYTICS

Downtime due to unexpected maintenance or equipment failure is expensive. **Intelli-Connect Diagnostics and Analytics** enables predictive maintenance and helps minimize downtime. Intelli-Connect allows for quick and easy programming, maintenance, monitoring, and troubleshooting of overhead cranes and hoists equipped with Magnetek VFDs. Using the Intelli-Connect Mobile and Mobile+ apps, you can access detailed information right from the plant floor. With diagnostic information available at your fingertips, you can address issues more quickly, plan maintenance, and ultimately reduce downtime.



TRAINING & AFTERMARKET SUPPORT

Columbus McKinnon and its network of authorized Channel Partners are committed to supporting you long after the sale. Whether you need replacement parts, quick response on a warranty claim, or simply have a question about the operation or maintenance of your crane, we are here to help. With parts and service readily available to you, wherever you are located, we'll help ensure your equipment stays up and running with minimal downtime.

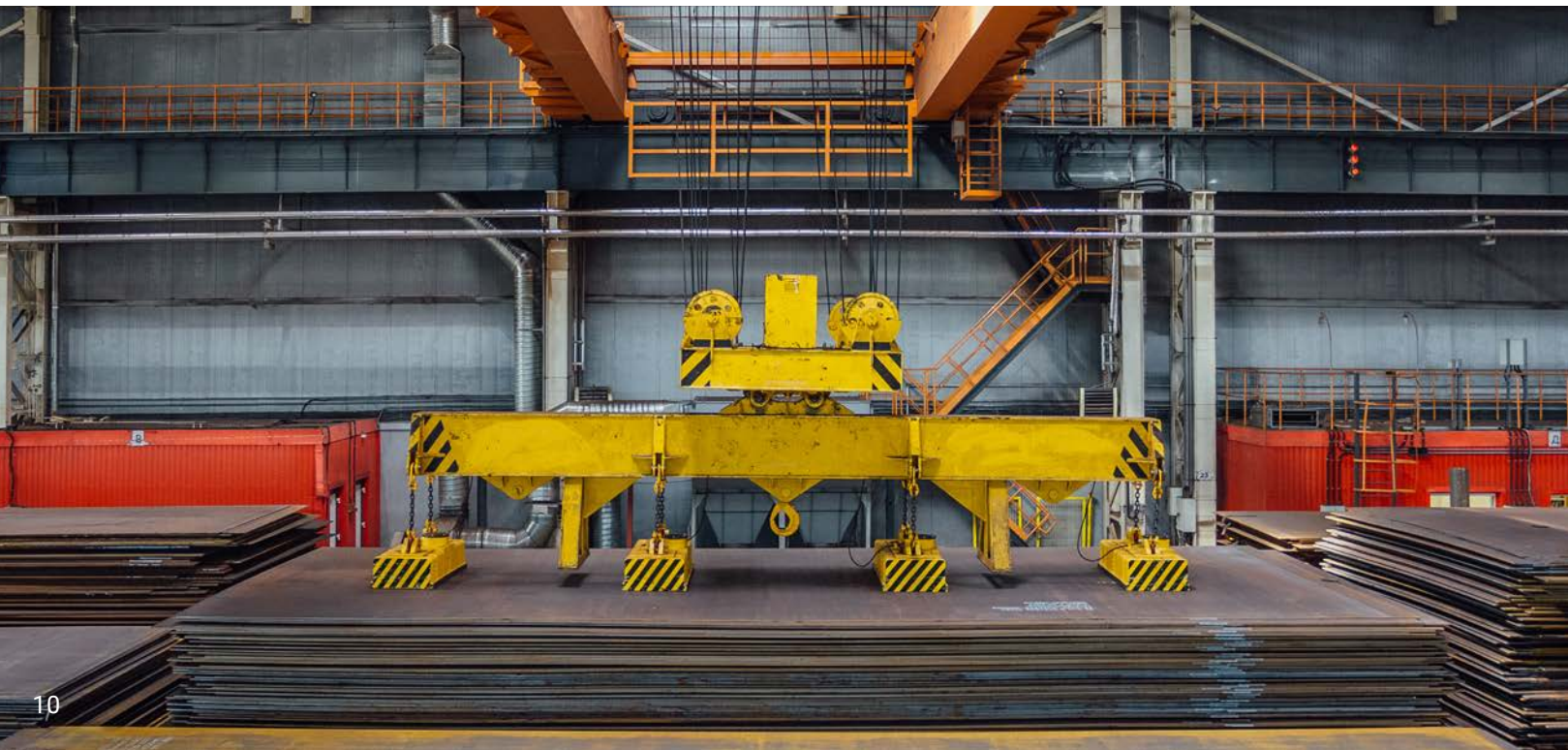
We are dedicated to promoting the safe and efficient use of overhead cranes, hoists, and rigging equipment to keep your business running and increase your workers' safety. With a team of expert trainers, comprehensive and challenging curriculum, and state-of-the-art training centers, we bring you professionally developed courses that highlight safe operation and installation as well as accurate and timely product maintenance.

Some of our most popular courses include:

- Overhead Crane & Hoist Inspection Certification
- Overhead Crane & Hoist Frequent Inspection
- Rigging & Crane Operator Safety Training
- Static Stepless Crane Controls Training
- IMPULSE AC Drive Training
- OmniPulse™/MagnePulse™ DC Drive Training
- Radio Remote Control Training

We also offer application-specific training upon request.

To learn more or register for one of our training programs, visit training.cmworks.com.



Patents:

1. Patent No. 6,588,713 (ELECTROBAR® Finger Safe Anchor Assembly for Electrified Conductor Bar)
2. Patent No. 6,956,339 (IMPULSE®-VG+ Drive Sync Multiple Hoist Synchronization Apparatus and Method)
3. Patent No. 6,598,859 (IMPULSE®-VG+ Drive Sync System and Method for Synchronizing Multiple Hoist Motors)
4. Patent No. 8,686,670 (IMPULSE®-VG+ Method and Apparatus for Calibrating and Testing Brake Holding Torque)
5. Patent No. 8,401,814 (IMPULSE®-VG+ Hoist System with an Electronic Programmable Limit Switch)



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