Application Note

Limitless™ Wireless Solutions in Anti-Two Block Warning Systems for Cranes, Stationary and on Trucks

Background

Anti-two block warning systems are used on cranes to halt or caution operators of unsafe upward movement of the hook. Without anti-two block protection, operators can pull the hook and load through the crane body, damaging the crane or causing safety risks.

Essentially, anti-two block systems prevent events caused by unintentional contact between the hook block (ball) and the boom point, often referred to as two-blocking. One type of two-blocking, often described as “booming down into the block,” occurs on cranes because of the location of the hoist drum, which is typically mounted on the revolving superstructure. Through this arrangement, the distance between the hoist drum and the boom tip sheaves increases as the boom is lowered, causing the lower block (hook block) to move closer to the upper block (boom tip sheaves).

An anti-two block system consists of a sliding weight, which hangs on a switch. If the crane’s hook travels too far upward, it pushes up the weight and releases tension on the switch. This ‘change of state’ issues a warning and/or stops the upward movement.

Not only is crane operation with an anti-two blocking system safer, it is required by OSHA on cranes dated 1992 or newer, that have previously had an anti-two block system, or are used to lift personnel. According to the American National Standards for Mobile and Locomotive Cranes ASME/ANSI B30.5c-1992, the Addenda in Section 5-1.9.0(B) states that “Lattice boom cranes manufactured after February 28, 1992 shall be equipped with a two-block warning feature which functions for all points of two blocking. Lattice boom cranes manufactured before February 28, 1992 should be equipped with a two-block warning feature.
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which functions for all points of two-blocking.” In addition, cranes used on projects under a government contract typically require an anti-two block warning system.

Digger derrick trucks, the multi-purpose line of utility vehicles used primarily in the communications industry for installing telephone poles, are now characterized as a crane by OSHA. These vehicles are required to have anti-two block protection as of November 2011, as stated in OSHA 29 CRF, part 1926. Because the trucks are electrically insulated, using metal wired switches is not possible.

Solutions
All cranes require a crane reel for operation. Wired anti-two block systems require powered reels to draw power for the switch. Powered reels cost significantly more (approximately $1000) than non-powered reels. The wire integrity of powered reels is regularly threatened due to the constant rolling and unrolling of the wire during crane operation. A downed crane can lead to thousands of dollars in lost productivity.

By choosing Honeywell’s Limitless™ platform of wireless limit switches, crane operators can get anti-two blocking with a viable, dependable and cost-effective product – all without the need for an expensive powered reel with wires. A Limitless™ wireless switch is used and communicates directly with the Limitless™ receiver in the crane or truck cab, sending a warning signal or halting the upward movement as determined by the operator.
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**Benefits**

- Enables wireless presence/absence detection in applications/machinery where wiring is challenging or not feasible
- Integration of existing wireless technology with the superior reliability of Honeywell’s MICRO SWITCH™ limit switch series
- Ability to reconfigure and network multiple switches, easily allowing addition, subtraction or relocation of Limitless™ switches
- Reduces installation/maintenance costs with no wires, conduit, strain relief, clips, connectors or connection boxes
- RF board operating in 2.4 GHz globally license-free frequency band; WPAN 802.15.4
- In excess of 305 m [1000 ft] line-of-sight communication

- EN50041 metal enclosure
- IP67; NEMA 1, 4, 12, 13
- Multiple operating heads and lever options
- -40 °C to 85 °C operating temperature (side rotary);
-25 °C to 85 °C operating temperature (all other actuators)
- EN50041 metal enclosure
- IP67/IP68; NEMA 1, 3, 4, 6, 6P, 12, 13
- Unique all-metal drive train
- Twin shaft seals (rotary)
- Zinc head and body are phosphate treated and epoxy finished making it less susceptible to effects from environmental exposure
- Full complement of operating heads and levers
- -40 °C to 85 °C operating temperature; -30 °C to 85 °C operating temperature (wobble sticks)
- Provides a visual, audio and NPN, PNP, totem pole, or relay output based on a signal received from a Limitless™ input
- Up to sixteen configurable outputs for up to 16 Limitless™ inputs
- Field pairing allows for rapid configuration
- Snaph-in panel or screw-mount design
- -40 °C to 85 °C operating temperature
- Selectable NPN, PNP, totem pole or relay output
- 14 configurable normally open or normally closed outputs for up to 14 Limitless™ inputs
- Field pairing allows for rapid adding or subtracting inputs for quick configuration
- DIN-Rail or screw-mount design
- -20 °C to 70 °C operating temperature (all other actuators)

Find Out More
To learn more about Limitless™ wireless limit switches, contact a Honeywell representative today at 1-800-537-6945 or visit www.honeywell.com/limitless

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