

# AGRICULTURAL MACHINERY TAPS BENEFITS OF REED AND HALL EFFECT SWITCHES AND SENSORS





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From farming tractors and balers to fertilizer spreaders and seed planters, Reed and Hall effect switches, relays and sensors are enabling a host of heavy machinery to work effectively and efficiently on farms across the globe.

These tractors rely on complex circuitry to manage functions from navigation to power distribution. A critical aspect is safely connecting and disconnecting high-voltage circuits, isolating unused systems, and ensuring safety during maintenance.

Standex Electronics, a leader in custom magnetics and sensor solutions, partnered with the customer to address these challenges using our KT Series Reed Relays. The collaboration aimed to develop a robust solution for harsh agricultural environments while providing precise control for high-voltage systems.





## Introduction

As the worldwide population continues to increase, farming operations are becoming more productive and increasingly complex and vast to feed billions of people around the world. In addition, technological advances are further aiding these agricultural operations to deliver higher production per unit area while yielding better quality food grains.

Reed and Hall effect switches, relays and sensors are playing an important role in this technological revolution in the agricultural world. From farming tractors and balers to fertilizer spreaders and seed planters, reed and Hall effect switches, relays and sensors are enabling a host of heavy machineries to work effectively and efficiently on the farms across the globe. Thus, ensuring efficient productivity from farming fields globally.

Because these switches, relays and sensors are free from mechanical wear and tear, and are hermetically sealed, they deliver reliable service within harsh and hostile environments, normally faced by equipment used on the farmlands. Moreover, many of these

product assemblies are also UL and c-UL recognized, as well as RoHS/REACH compliant.

Some of the agricultural machineries targeted by reed and Hall effect switches, relays and sensors include:

- Measuring the flow rate of fertilizer spreader behind tractors
- Flow meter sensors for irrigation and fertigation
- Determining shaft and gear overspeed and underspeed conditions
- Measuring shaft rotational speed and direction
- Smart Sensors for controlling relay status based on speed and direction of motion
- Resolving rotational position of shafts and gears
- Measuring speed and direction of winch shaft
- Measuring the height of a saw blade in the timber industry
- Measuring reel speed and direction
- Measuring conveyor belt speed and position
- Shaft run out detection determining fan shut down (motor stall)

Sensors targeting the above applications include:

- Precision calibrated gear tooth sensors as part of flow meter systems for irrigation and fertilization equipment
- Gear tooth sensors for tracking the position actuating arms on spreaders and other implements
- Gear tooth sensors for providing feedback into GPS systems mounted to tractors
- Gear tooth sensors for speed detection on commercial and consumer lawn tractors
- Valve position sensors for providing feedback into agricultural implements
- Passive magnetic pickups for monitoring tractor engine speeds
- Quadrature gear tooth sensors for monitoring PTO output shaft speeds

Taking a closer look at some of the applications mentioned above reveals that calibration is a critical part of the equipment, which in this case is the fertilizer spreader. It will ensure that correct rate of flow of the fertilizer is going out of the spreader. In farming, it is crucial that the fertilizer is applied efficiently and uniformly across the farm and the calibration ensures that process.

Likewise, water irrigation is necessary for agriculture, gardening, and other farming applications where water resource is becoming more expensive. Thus, it is essential to install a flow measurement device to know precisely the water rate you have used, and avoid any wastage. From reed switch-based flow sensors to Hall effect devices, there are a variety of standard flow sensors available for the application (Figure 1).

Next, there are applications that require determining shaft and gear overspeed and underspeed conditions of a rotating machinery. Speed sensors and switches address this application by sensing rotating shaft speed, and comparing it to a settable overspeed, underspeed or zero speed trip-point. Similarly, several farming tools and equipment require accurate measurement of shaft rotational speed and direction. Hall effect sensors and switches address these needs.



Figure 1 Standex offers a variety of fluid level and flow sensors.

Meanwhile, farmers are using the latest technology to keep farming safe, secure, and sustainable. From IoT sensors to sensor networks, they are using state-of-the-art technologies to keep yield and productivity high on farmlands around the world. Standex Detect is a magnetic sensing expert, and we use proprietary magnetic mapping equipment to design an optimum sensor solution. Partner with the company and generate smart solutions for your unique needs.

Likewise, some agricultural machineries benefiting from reed switches include:

- Haybalers and Combines
- Gate and door position indicators
- Other heavy machinery and equipment
- Ignition switch actuation Safety switches
- On-board lighting systems and consoles
- Fuel level indicators
- Power steering
- Motors and drives

In addition to providing switches and sensors for new OEM applications, the company can also provide

drop-in replacements for sensors on equipment where the manufacturer is no longer supporting the products.

If unable find a switch, relay or a sensor you need in the company's standard catalog products, Standex engineers can provide custom solutions for applications where you need special attention on speed, position, count, feed, or alignment. The company engineers have the capabilities to solve any problem and deliver a solution in the shortest possible time. Besides a variety of electrical options, customized solutions also offer many housing and connection options, including, but not limited to, molded, aluminum, stainless steel, threaded, flange mount, and customer specific packages (Figure 2). Additional connection types include integral connectors, Deutsch, Amphenol, many other brands, pigtails, and free-end wires, any length.



Figure 2 Custom solutions have many housing and connection options.



## Dependable and Reliable Supplier

Because of its vast portfolio of high quality and reliable reed switches, relays, and sensors tailored for a wide variety of equipment, Standex Detect can play a vital role in selecting the right and the best product for any agricultural machinery, including creating a custom design. From sensing motion in tractors to detecting gear, Standex Detect can deliver the right product with the required safety and reliability, while consuming very little to no power. They are available in a wide range of connection options, housing forms, and mounting choices, and all its products meet international safety standards, and the company facilities are certified to ISO, Mil-Std 202, Mil-Std 981, Mil-PRF 27, NASA standard NHB 8739.3, AS9100, and more.

In short, selecting the right reed/Hall effect switch,

relay or sensor for any agricultural machinery is not a trivial task. Only an experienced engineer with knowledge of the products can select and guide you through this maze of 6000+ products.

While there are several suppliers serving this market, there is only one that stands out as a leader. With over 50 years of experience, Standex Detect is the world's largest manufacturer of reed/Hall effect switches, relays, and sensors with >50% market share, and offering the most comprehensive listing of reed/Hall effect switches, relays and sensors that covers all sensing and switching requirements in the agricultural world. For applications that need a custom solution, Standex Detect has the capability and experience to deliver a custom solution that is optimized for a farmer's specific and unique job.

## Summary

In summary, Standex Detect is a one-stop shop for any company, small or big, that is looking for the best, most reliable, and cost-effective solution for any specific machinery in the agricultural space. With its cutting-edge manufacturing facilities, and

reliable and compliant products, Standex Detect is the preferred worldwide source for reed/Hall effect switches, relays, and sensor products.

Think of Standex Detect as your partner in solving your farming needs.



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