UE ViewPoint

# Are Switches are Still Relevant? Transmitter-Switches Drives Adoption

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## Summary

Despite the introduction of new measurement technologies encroaching on electromechanical pressure and temperature switches, switches are more relevant today than ever driven by demand from developing countries and new switch technologies that have expanded its uses for safety, alarm, and shutdown applications.

Switches are self-contained devices that do an admirable job in the protection against high or low pressure and temperature to protect the equipment from catastrophic damage of itself, people and the environment.

## Issues

As a manufacturer of switches and transmitters an affirmative answer to this question is a foregone conclusion but let's explore the facts that support this claim. It is a well-known fact that the global market for switches has declined ever since the adoption of transmitters for safety system sensors in process safety applications replacing the previous switch stronghold. For not the huge demand for industrial equipment needed for new projects in developing countries the decline would have continued to this day. Additionally, progressive switch manufacturers have been quietly revamping its products to improve reliability and added transmitter-switch functionality that makes transitioning to transmitters unnecessary. Other than this not much had changed in electromechanical switches, as the switches deployed by your grandfather can be strikingly similar to the ones used today.

## Switches are Preferred in Many Applications

Traditional electromechanical switches can't be beat in critical equipment protection and non-critical control applications. These self-contained devices do an admirable job in the protection against high or low pressure and temperature to protect the equipment from catastrophic damage of itself, surrounding equipment, people and the environment. Switches are preferred in the protection of rotating equipment such as compressors, pumps, and blowers and other auxiliary applications such as fire protection, burner management, and mechanical seal systems.

Simple and compact electromechanical switches that do not require external power with embedded sensor and trip functions makes it easy for OEMs to install anywhere on a piece of equipment or skid. The alternative of utilizing an expensive three component system comprising of a sensor (pressure transmitter), logic solver (PLC), and final control element (relay) is way overkill for equipment protection.

Switches can also be used for coarse control functions by using the trip threshold and dead band to turn on and off a variety of industrial equipment to control level, flow, and reduce energy cost.

However, smart pressure transmitters with diagnostics have replaced electromechanical switches for process safety application and are beginning to encroach on equipment protection applications due to its ability to determine the heath of these devices while reliably measuring an abnormal situation.

| Switch Applications |
| --- |
| Over & Under Pressure |
| High & Low Temperature |
| High & Low DP |
| Overflow Level Protection |
| Flow Detection |
| On-off Control |
| Alarm & Shutdown |
| Safety System Sensors |
| Equipment Safety Protection |
| Fire Protection Systems |
| Burner Management |
| Other Skid Mounted Applications |

**Switches are Broadly Applied**

## Transmitter-Switch Diagnostics Changes the Game

In a typical process plant both switches and transmitters are used, which requires the user to stock double the amount of devices to adequately cover potential failures and minimize plant downtime. There was clearly a technical gap between smart transmitters and non-smart electromechanical switches that remained so for decades until a new class of product emerged; the transmitter-switch. The One Series transmitter-switch has all the features of a smart pressure transmitter with a display and local programming without needing

additional hardware or software. Plus it has embedded switch functions and complete device diagnostics and even some process diagnostics.

It functions just as well as a transmitter or a switch and equally well as both. The flexibility of the transmitter-switch concept provides users with a choice to upgrade old switch technology with one that do not need checking since it will alert you when the device is not right. This allows users to forgo preventative maintenance tasks and deploy a predictive maintenance strategy where technicians only check on the unit when alerted to do so.

| Diagnostics |
| --- |
| Plugged Pressure Transmitter Impulse Lines |
| Trip Ability of Switches |
| Measurement Faults |
| Electronic Component Faults |
| Software Fault |
| Process Over-range Damage |
| Mechanical Faults |

**Switch Intelligence Reduces Maintenance Cost & Increases Safety**

Additionally, the 0-100 percent adjustability of dead band allows broad applicability further reducing the inventory requirements and allows better coarse control applications by fine tuning the dead band and trip points.

In safety system applications the transmitter-switch can be applied to legacy systems that tend use switches and/or new safety systems that use transmitters but at a lower price point and further reducing inventory levels. Replacing failed electromechanical or even digital switches with intelligent transmitter-switches may be an excellent strategy for upgrading safety system sensors, the second most failure prone component in a safety system, without the downtime needed for conversion to transmitters.

## Recommendations

- Research the benefits of transmitter-switches.
- Solicit help from suppliers with transmitter-switch products and expertise in supporting safety system applications to deploy appropriate strategies.
- Consider the SIL suitable One Series Transmitter-Switch with multi-outputs and get a free copy of the One Series FMEDA report: http://www.ueonline.com/whatnew/fmeda_sil.shtml

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