

CONTINUOUS WATER PRESSURE MONITORING IN AUTOMOTIVE PRODUCTION

Background

To ensure the top quality of their vehicles leaving the manufacturing plant, automakers are conducting water “ingress” and leak detection tests.

Water ingress testing is used to help protect a variety of critical systems from dangerous contaminants. Water ingress leaks occur when water enters components through seams, holes or porosities. Water leaks can cause fires, degrade electronics and even create surface and structural defects.

Automakers are doing an incredible job of designing vehicles to go further with fewer repairs. However, the complexity of new generations of cars is putting greater pressure on engineers to ensure that components perform perfectly over the lifetime of the vehicle.

To create cars that do more, automakers must create water ingress testing systems that meet strict specifications and ensure that they adequately test the car prior to leaving the factory. Complex overbody and underbody spray systems have been created to test the limits of the vehicle. The specifications of these spray systems are tightly controlled to a pressure of +/- 2 psi. To ensure that systems are within specifications, a maintenance worker must routinely walk around and gather the critical pressure values and record them. In this vane, several challenges are created; is someone there frequently enough to capture the critical pressure values? Is it always the same person and are they getting repeatable measurements? Are there worker safety concerns in the environment or other access concerns?

Solution

By implementing a continuous pressure monitoring solution, the automakers can eliminate many, if not all, of the previous concerns.

Industrial Wireless Pressure sensors on the supply lines to the overbody and underbody spray systems can regularly gather information concerning the current pressure and send that data to a control unit. With the pressure continuously monitored, anomalies can be detected and action can be taken to review or upgrade the spray system. Additionally, an industrial wireless sensor backend allows the status to be transmitted to a control system or cloud without the need for expensive or complex wiring runs.

Sensata provides a complete solution. An Industrial Wireless Pressure Transmitter (IWPT) that converts the water signals into pressure data, which is encrypted and transmitted to an Industrial Wireless Receiver via a secure wireless network operating at 2.4GHz. There are two receiver options available to allow for flexibility by the user; an IoT Gateway or an IWR-PORT. Both options have the potential to aggregate up to 128 pressure transmitters and provide other I/O options. The IWR-PORT is generally used where there is a need to connect to local automation (such as a PLC). The IoT Gateway is generally used where there is a need to remotely monitor the status and an interest to either send data via cellular transmission to the cloud or via MQTT protocol to an on-premises server.




This solution keeps workers safe, ensures a high-quality product and eliminates the need for a walk-around.

Continuous Pressure Monitoring Eliminates the Walk-around



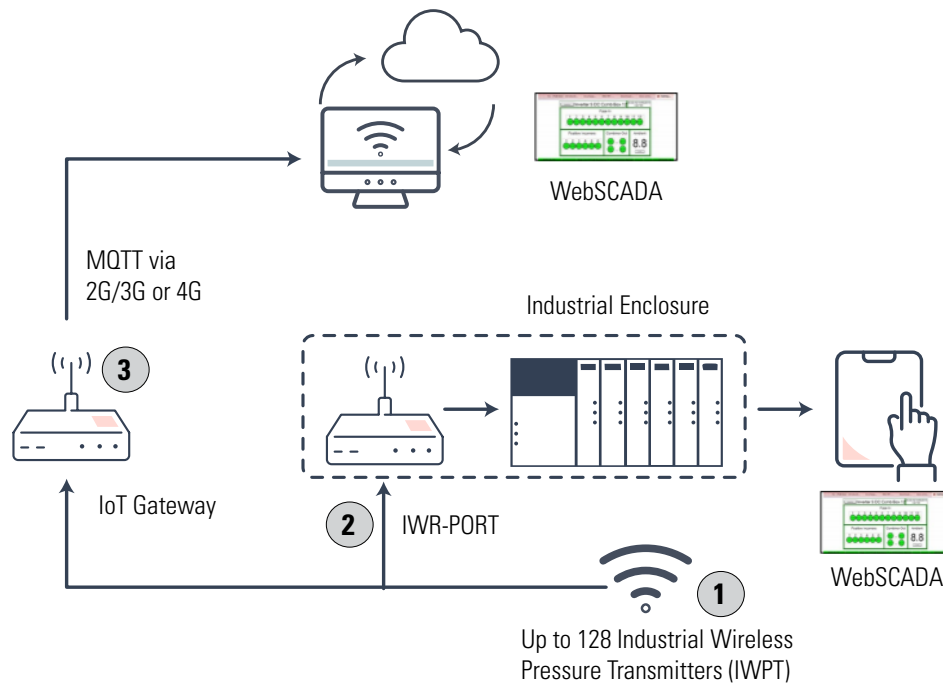


RECOMMENDED PRODUCTS

Reference on Diagram	Product	Features	Function	Brand
1	 IWPT	<ul style="list-style-type: none"> Configurable transmission rates (1 second to 5 minutes) 41 unique models. Complete offering provides the ability to meet specific application requirements across a wide variety of assets and media. 	Industrial Wireless Transmitter	Sensata Technologies
2	 IWR-PORT	<ul style="list-style-type: none"> Works seamlessly in any OT architecture RS-232/485 or Ethernet Communications 	Industrial Wireless Transmitter	Sensata Technologies
3	 IoT Gateway	<ul style="list-style-type: none"> Sends data via MQTT to on-premises servers or the cloud using the built-in 2G/3G or 4G modem. RS-232/485 or Ethernet Communications 	Industrial Wireless Transmitter	Sensata Technologies



PRESSURE MONITORING TOPOLOGY



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