



## Gladiator Admittance Smart Switch Series

### Description

The Gladiator Admittance Smart Level Switch is designed to detect the level of liquid, slurry or powder in a tank or vessel.

The unit measures the capacitance or “admittance” between a probe and the wall of the container. Operates in tough industrial environments and has an excellent immunity to product build-up.

### Points of Difference

#### HAWK's Gladiator Admittance Switch

The dielectric constant of the material in the vessel will be different to that of air.

When the material comes near or in contact with the probe an admittance change will occur.

The resonant frequency of the internal oscillator will then change. The relay will switch when the frequency reaches the user selected Switch Point value.

#### Why Use Gladiator Admittance Switch?

##### Advantages

- Simple calibration
- Suitable for abrasive media
- Very robust probe
- Suitable for a wide range of materials.

### Principle of Operation

The probe of the Admittance Switch forms one plate of a capacitance circuit, with the vessel wall making the second plate. The dielectric constant of the product between the probe and the vessel wall will cause a change of capacitance as the level approaches the probe.

The change is detected, amplified and used to switch a relay for indication or control purposes. A special circuit is used to ignore product build-up between the sensing probe (active element) and guard, and also between the guard and vessel wall.

### Primary Areas of Application

- Asphalt
- Brewing
- Cement
- Chemical
- Dairy
- Edible oil
- Fertilizer
- Food & Beverage
- Glass
- Mining & Metals
- Oil & Gas
- Packaging
- Paint
- Paper
- Pharmaceutical
- Plastics
- Power Generation
- Refining
- Semiconductor
- Sugar
- Textile
- Water & Wastewater

### Features

- Excellent immunity to product build-up
- Excellent temperature stability - no false trips
- Non contact switching possible with many products
- Simple '1-minute' setup
- Remote sensor or Smart 'all in one' types
- Relay outputs: Smart probe (1) Remote (2)
- Remote test function
- Adjustable ON and OFF delays (0-20 sec)
- Remote 3G Connection option
- Remote amplifier to probe separation up to 500m (1640ft)
- Bright visual status indication on Probe
- Independent housing alignment after mounting thread locked.
- Temperature to 450°C (842°F)

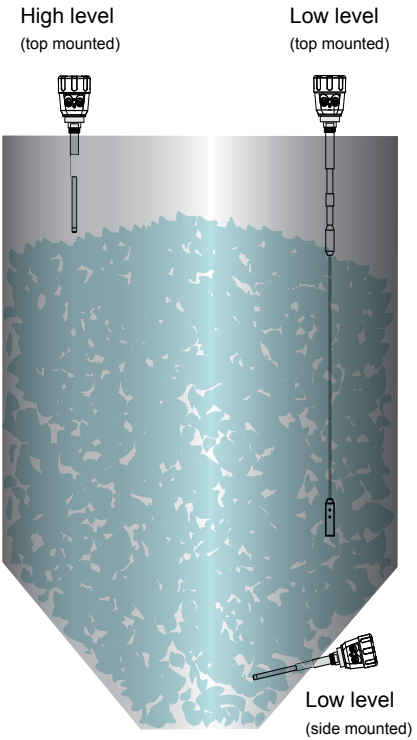




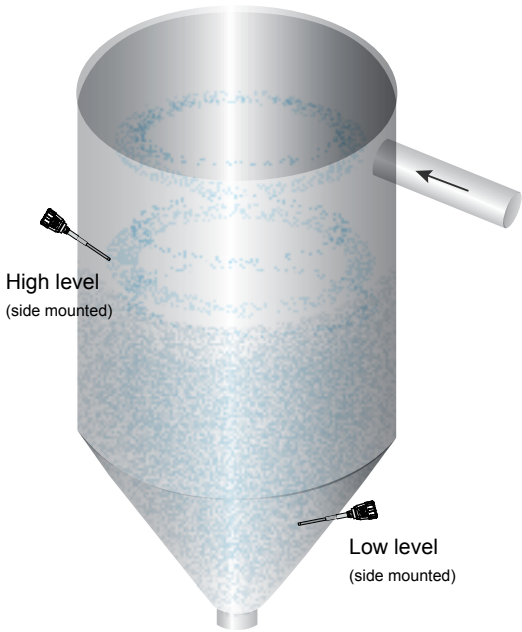
# Typical Applications



High and Low Level Switch In A Hopper



Cyclone Bin Level Switch



- 1 Continuous filling with build-up on probe
- 2 High level switch in grain application



## Application Reference - Gladiator Admittance Switch



### Reliable Level Measurement In Dusty Fly Ash Hoppers.

#### Application Problem

There is a need in the power industry to measure the bin level inside fly ash hoppers under an electrostatic precipitator. These hoppers are usually ganged together per generating unit, in arrays from 4 to 32 depending on unit capacity. It is important that a properly maintained level monitoring system be implemented to prevent material from backing up in the hopper and damaging the precipitator, reducing precipitator efficiency or both. Several properties of fly ash present difficulties in applying process instrumentation correctly: repose angle, temperature, dielectric constant, material buildup and space limitations are the most prominent.

#### Solution

##### Historical Solutions

Typically the power industry has focused on using radiometric (gamma) or capacitance type devices. The radiometric device provides a non-contact method of measurement, the radiation passes through the sidewall of the hopper to a detector on the opposite side. This eliminates material properties from affecting the level measurement and gives a relatively simple installation. The drawback to radiometric devices centers around the cost of ownership – documentation, periodic testing, training and maintaining a site Radiation Safety Officer (RSO) is normally required, along with disposal costs which can exceed original purchase price.

Traditional capacitance devices provided a lower cost alternative with limited success. The low dielectric constant of Fly Ash and the temperature extremes make reliable setting of a traditional capacitance probe difficult. The sensitivity needed for low dielectric product detection often leaves the probes in a state where false triggers can be caused with changes of temperature.

HAWK uses the Gladiator Admittance switch product line to provide a reliable and robust solution to the problem of detecting fly ash levels, without the need for the regulatory, safety and administrative concerns which are raised when using radiometric (gamma / nuclear) devices.

The Gladiator Admittance series extends the performance of capacitance and RF probes greatly through use of an extremely stable oscillator core which exhibits almost no drift with process temperature changes. High stability allows higher sensitivity to be used when setting switch points, and so greatly improves the ability to reliably detect products having lower dielectric constants. High temperature ceramic insulation is used in the construction of the Gladiator heavy duty probe for fly ash applications, and the rugged 36mm stainless steel sensing element will withstand heavy impact loads without bending or damage. Lighter duty versions and Teflon insulated versions are also available for less demanding process conditions.

#### Ordering Information

**Remote System:** GSASUS with AS2200S141TB15XP60  
(500mm insertion, heavy duty ceramic insulated probe suitable for 450 deg. C)

**Smart Integral unit:** AS2100USS141TB15XP60  
(500mm insertion, heavy duty ceramic insulated probe suitable for 450 deg. C)