



A higher level of performance

## Application Reference

### Power Industry

# 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 precip 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.

#### **Part Numbers:**

Remote System: GSASUS with AS2200S141TB15XP50 (500mm insertion, heavy duty ceramic insulated probe suitable for 450 deg. C)  
Smart Integral unit: AS2100USS141TB15XP50 (500mm insertion, heavy duty ceramic insulated probe suitable for 450 deg. C)



*Hawk is a world leader in level, positioning and flow measurement, providing cutting edge equipment to the global industrial market. We have 30 years of experience and a record of success in a wide range of areas including mining/mineral processing, water supply/waste water, bulk material handling and chemical. Our on-going commitment is to provide industry leading technology and cost effective solutions.*

## Contact

Hawk Measurement Systems Australia  
Phone: +61 3 9873 4750  
info@hawk.com.au

Hawk Measurement US  
Phone: +1 888 429 5538  
info@hawkmeasure.com

For global representatives:  
[www.hawkmeasure.com](http://www.hawkmeasure.com)