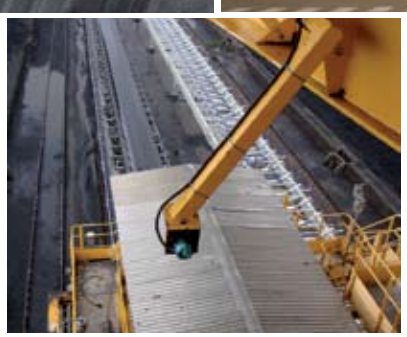
Level, Positioning and Flow Solutions

Level Measurement for: Water I Sewerage I Mining I Chemical I Food I Power Stations I Plastic I Oil & Gas

Hawk has over 30 years of experience from level, positioning and flow solutions.

Product Overview.

For more information
www.hawkmeasure.com



A higher level of performance

HAWK





About Hawk

Hawk is a world leader in level measurement, providing cutting edge equipment to the global industrial market. We have 30 years of experience and provide industry leading technology and cost effective solutions.

The company`s purpose built factory and head office is located in Melbourne, Australia. The facility provides production, research and development activities. Hawk produces its own products and has developed an efficient production process.

The company has a distinguished record of success in the application of level measurement technology, and the provision of expert services which range from the provision of instrumentation and technical assistance, through to implementation and ongoing asset management.

Hawk systematically monitors and evaluates its projects and employs the best practice and quality assurance procedures. Application examples are addressed by experts of the highest calibre who are selected for their experience and are trained in our factory to assure proper application of the instruments and ultimate customer satisfaction.

We provide extensive training for our worldwide users on a progressive basis so when new products are introduced, training is carried out prior to release to ensure optimum product acceptance and performance.

Photo: Irawan Widyanto

APPLICATION GUARANTEE

HAWK

Hawk is the only manufacturer in the world to provide a 24-month performance guarantee or money back refund. Ask your sales representative for terms and conditions.





Product Range - Overview

Sultan Level

The Sultan 234 is a non intrusive acoustic wave transmitter with flexibility used for level measuring liquids, slurries and solids. The transmission of acoustic waves ensures minimal losses through the environment where the sensor is located.

More information on page 4 »

Sultan Flow

Real time flow measurement of liquid materials. Capable of monitoring liquid flow under the most difficult conditions. Suits a broad range of flumes, wiers and flow control structures.

More information on page 7 »

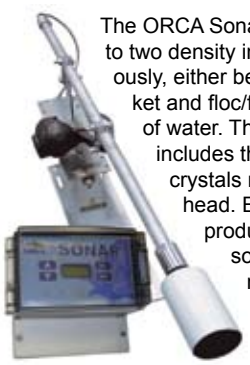
Sultan Liquid

The Sultan Liquid specializes in liquid level & water/sewage monitoring applications. Low cost per measuring point.

More information on page 8 »

ORCA Sonar Level System

The ORCA Sonar will measure up to two density interfaces simultaneously, either bed level or RAS blanket and floc/fluff layer or clarity of water. The transducer design includes three to seven sonar crystals mounted in a single head. Each sonar array produces a concentrated sonar beam, providing more emitted power and collecting more returned signals.



More information on page 9 »

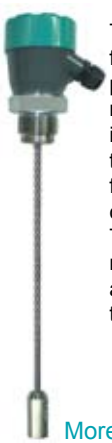
Gladiator Microwave Beam Blockage/Doppler Movement

The Gladiator Microwave provides point level switching for presence or absence of most solid and liquid materials. Used in any application where microwave energy is absorbed by the material being monitored, including replacement of traditional contact switching devices.

More information on page 11 »

Guided Radar - TDR

The Guided Radar range is ideal for the measurement of liquids, powders and granules to a range of 20m. This technology is not affected by pressure, temperature, viscosity, vacuum, foam, dust, changes in dielectric constant or coating of the probe. The Guided Radar series can measure virtually any product with a dielectric constant (Dk) greater than 1.3.



More information on page 18 »

Gladiator Admittance Switch Pump Protection Switch

The Gladiator Admittance switch is an all-round point level switch for detecting 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.

The Pump Protection switch can be used in applications where pipe or wall mounting with minimal protrusion is required. It can also be used to detect the presence of liquids to ensure the pump will never run dry.

More information on page 14 »

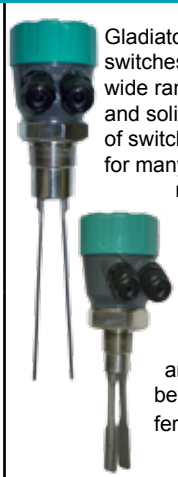
Gladiator Conductivity Switch

Gladiator Conductivity switches are suitable for most applications that involve a conductive liquid, including food and beverage processing, chemical, oil and gas, paint, paper, pharmaceutical and water/wastewater treatment plants.

More information on page 15 »

Gladiator Vibration Switch

Gladiator Vibration switches are for a wide range of liquids and solids. This type of switch is suitable for many situations requiring level detection, including pump control, high or low-level alarms, and detection of an interface between two different materials.



More information on page 16 »

Rotation Switch

The Rotating Switch vane is driven by a slow speed synchronous geared motor. For safe and multi-purpose level monitoring in all types of containers and silos. It can be used with all bulk materials and powders as a point switch.

More information on page 19 »





SULTAN Acoustic Wave Technology

- Level, Flow, Positioning, Collision Protection -

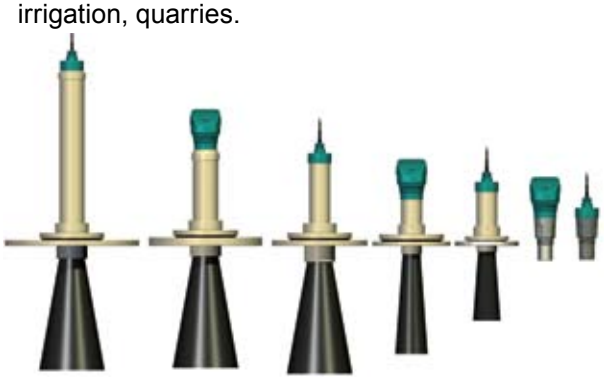
Principle of Operation

The SULTAN 234 emits a high powered **acoustic wave** transmit pulse which is subsequently reflected from the surface of the material being measured. The reflected signal is processed using specially developed software to enhance the correct signal and reject false or spurious echoes.

The transmission of high powered acoustic waves ensures minimal losses through the environment where the sensor is located. Due to the high powered emitted pulse, any losses have far less effect than would be experienced by traditional ultrasonic devices. More energy is transmitted hence more energy is returned. Advanced receiver circuitry is designed to identify and monitor low level return signals even when noise levels are high. The measured signal is temperature compensated to provide maximum accuracy to the outputs and display.

Primary Areas of Application

- **Water:**
  River level, wet wells, inlet screens, tanks, sumps, pump stations, water towers, dams, basin levels, chemical storage, etc.
- **Mining:**
  Crushers, surge bins, ore passes, conveyor profile, blocked chute, stockpile, stackers, reclaimers, storage silos etc.
- **Power Stations:**
  Boiler bunkers, raw coal bunkers, ash pits, fly ash silos, etc.
- **Others:**
  Food, cement, plastics, grain, chemicals, paper, irrigation, quarries.



Features:

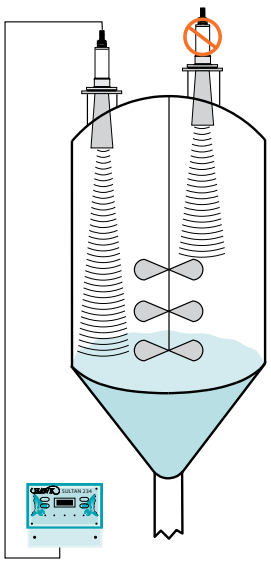
- Non-contact measurement
- High power even with two wire loop supply
- Low cost per measuring point
- Wide range of communications:
  DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus & Profibus PA
- Up to 5 pumps per unit
- Auto compensation for dust, steam and losses
- Protection class IP67, NEMA 4x (IP68 Transducer)
- Programmable fail-safe mode
- High temperature applications on request
- GSM/CDMA/GPRS/TCP remote setup options
- Differential and average level control (2 transducers)



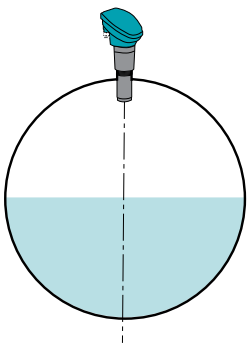


Typical Applications - Sultan

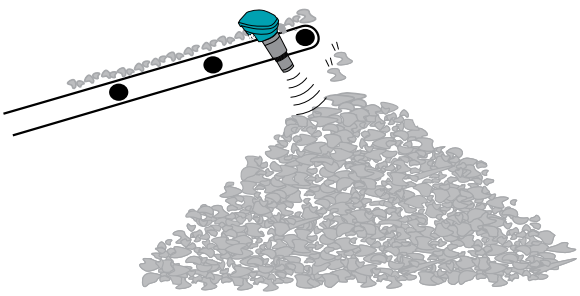
Conical Shape Vessels



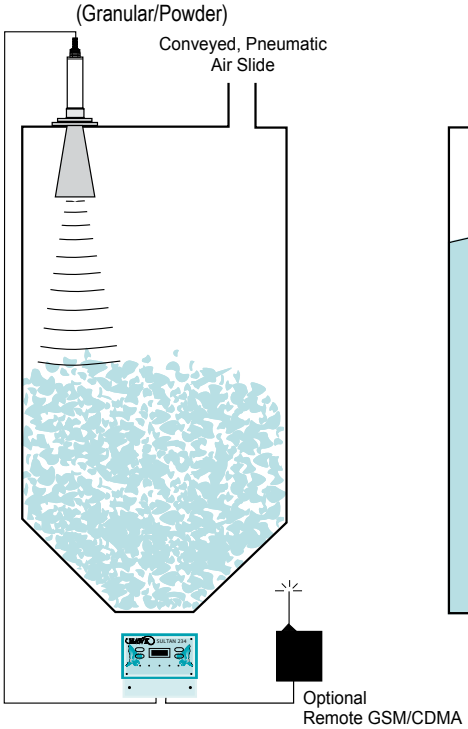
Horizontal Cylindrical/Ball Tanks



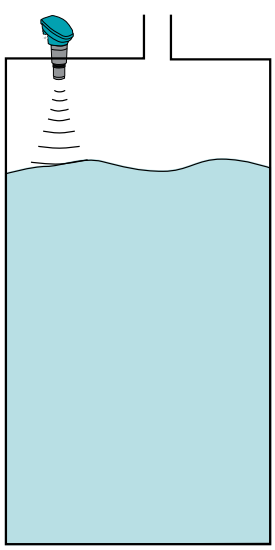
Sultan Acoustic Wave Transmitter
Stockpiles, Stackers, Reclaimers



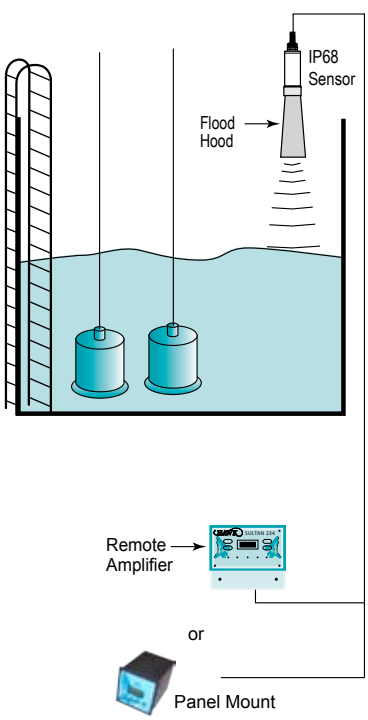
Solids Vessels
High/Low/Continous Level
(Granular/Powder)



Storage Tanks
High/Low/Continous Level
(Liquid/Chemical)



Sewage Wet Well
High/Low/Continous Level
Up to 5 Pumps



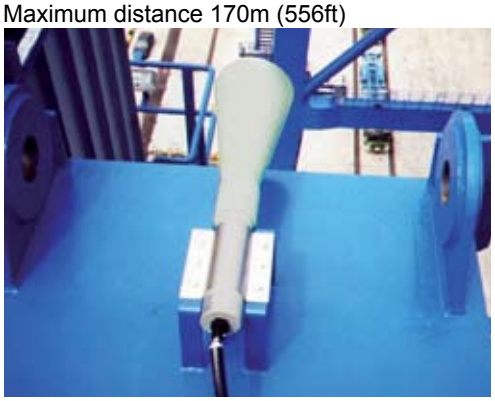




Typical Applications - Sultan

Crane Anti-Collision

Maximum distance 170m (556ft)



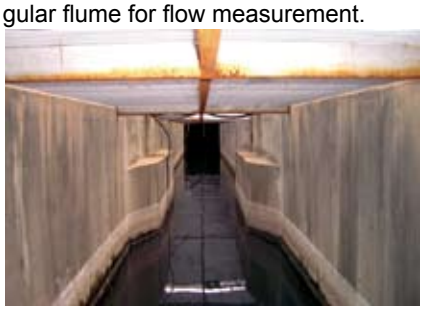
Machinery Positioning

Maximum distance 170m (556ft)

Flow Measurement

Sewerage inlet channel with parshall flume for flow measurement.

Waste water channel, with a rectangular flume for flow measurement.



Irrigation channel, with a rectangular sharp crested weir for flow measurement.

Sultan Flow

- Real Time Flow Measurement for Liquids -

Principle of Operation

The Sultan Flow measurement system operates by transmitting an acoustic wave signal from its transducer towards the liquid being monitored. The reflected signal or echo is received by the transducer and processed. The time between transmission of the acoustic signal and reception of the echo is measured, and using the speed of sound through air, the distance from the transducer to the liquid level is calculated. Flow through the channel or structure is then calculated from the level measurement and the user entered properties of the channel.

The Sultan Flow system uses sophisticated software to locate and track the correct echo without being affected by echos from fixed objects or changes in the liquid surface. When the liquid level or surface conditions change, the system follows preselected signal tracking parameters. In the event of a total loss of signal, the system adopts signal recovery routines to relocate the correct liquid level.

The system employs automatic gain control to compensate for changes in echo amplitude due to variations in environmental conditions. Continuous current, voltage and relay outputs are provided. These outputs can be programmed for fail-safe conditions in the event of a loss of signal or system malfunction.

Primary Areas of Application

- Open channel flow
- Water treatment
- Sewage treatment
- Irrigation
- Industrial waste
- Power waste
- Environmental monitoring
- Special flow requirements for unusual flow channels

Features:

- Optimized frequency selections to suit the application environment
- Capable of monitoring liquid flow under the most difficult conditions
- Real time diagnostic display
- Flexible, multi-point or calculated scaling of display and outputs
- Suits a broad range of flumes, weirs and flow control structures
- Programmable, resettable totalizer
- Programmable pulse per flow output
- Programmable fail-safe mode
- Fast acting temperature compensation
- GSM/CDMA/GPRS/TCP remote setup options
- Wide range of communications: DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus and Profibus PA





Sultan *Liquid* Acoustic Wave Technology

- Liquids Level and Position Measurements to 10m (33ft) -

Principle of Operation

The Sultan Liquid series emits a high powered acoustic wave transmit pulse which is reflected from the surface of the liquid to be measured. The reflected signal is processed using specially developed software to enhance the correct signal and reject false or spurious echoes. Due to the high powered emitted pulse, any losses have a far less effect than traditional ultrasonic devices.

Primary Areas of Application

The Sultan Liquid specializes in liquid level monitoring applications including:

- Simple level applications
- Conveyor profiling
- Water towers
- Dam level
- Chemical tanks
- Water tanks

...and any other application where constant liquid level monitoring is required.

Typical Applications

Tanks

Chemical Storage

Features:

- Non contact measurement
- Low installation costs
- High power & signal clarity
- Low cost per point
- Impact resistant
- Enclosure rating IP67, NEMA 4x
- Programmable fail-safe mode
- GSM/CDMA/GPRS/TCP remote setup options





ORCA Sonar Level System

- Sonar Interface -

- Sludge Level Monitoring -

2008 Plant Engineering PRODUCT of the YEAR Gold Award

Processing's Breakthrough Product of 2008

Principle of Operation

The ORCA Sonar Series transducer emits a high powered acoustic pulse, which is reflected from the interface density selected. The reflected signal is processed using specially developed software algorithms that eliminate lighter floating densities and stratified layers, allowing measurement of “RAS” or “BED” levels. It can be calibrated to measure lighter densities like “FLOC” or one of the outputs could be used for a “CLARITY” output, similar to a basic turbidity transmitter measuring solids in suspension.

By choosing the correct sonar transducer frequency, the ORCA sonar guarantees the optimized performance when measuring both light and heavy density interfaces.

Primary Areas of Application

Sewage & Wastewater

- Primary Sedimentation – Blanket level
- Secondary and final Clarifiers – RAS Blanket and fluff/pin floc layer
- Thickeners and DAF – Bed level and clarity of water
- Sequential Batch Reactors – Blanket monitoring (floating sonar)
- Lagoons – Bed sludge level
- Lamella Clarifier – Bed level and floc level

Mining / Process

- Clarifiers, tailings thickeners, concentrate thickeners, hi-rate thickeners, lamella thickeners, CCD’s, settling ponds/lagoons, water treatment, carbon columns

Features:

- Dual independent analogue outputs to track two different interfaces, or clarity simultaneously, with the one sonar sensor
- Full range of sonar transducers to optimize detection of heavy and light density interfaces
- Widest range of sonar frequencies to optimize performance
- Easy calibration to track specific density interfaces. eg: RAS blanket - 4g/l, floc/fluff layer - 1g/l
- Industrial scum cleaning mechanisms - no regular maintenance required
- No wiper blade assemblies
- Control room graphics of tanks and interfaces
- Wide range of communications: DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus and Profibus PA
- GSM/CDMA/GPRS/TCP remote setup options
- Relay alarms

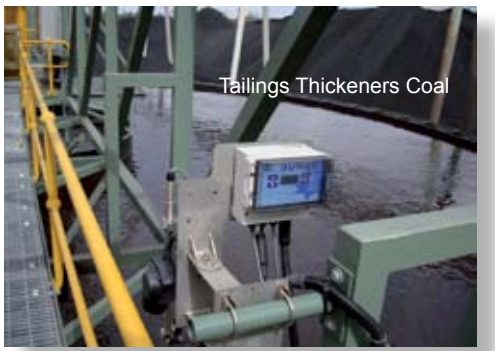


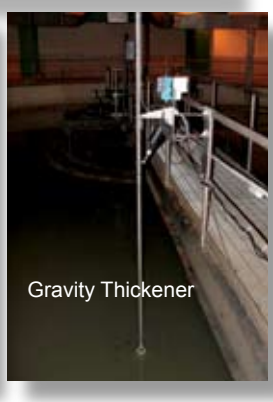


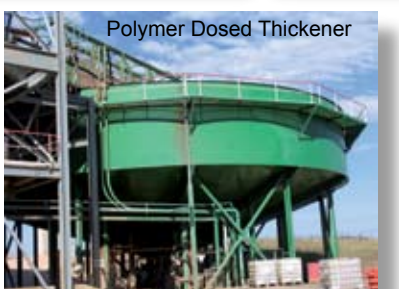
Typical Applications - ORCA

Hawk has produced the ORCA sonar range, to **control** process tanks in the water and waste water industry. Most other sonar products are good for monitoring purposes only. Hawk has the largest range of sonar transducers that guarantee performance from water treatment, waste water treatment through to heavy industrial mining applications. Hawk can demonstrate that by using the ORCA sonar range to control RAS blankets in secondary clarifiers or bed levels in thickeners, that the payback on the equipment and savings to the plant happen very quickly.

Area	Functions
Water Treatment Plant	
Primary Sedimentation Tank	Floc level / sludge blanket level
Sludge Thickener Tank	Sludge bed level / clarity suspended solids / floc level
Calcium Hydroxide Reactor	Sand/pellet bed level
Sodium Hydroxide Reactor	Sand/pellet bed level
Sewage Treatment Plant	
Primary Sedimentation Tank	Sludge blanket level
Secondary / Final Clarifier	RAS blanket level / rag/pinfloc layer / clarity suspended solids
Sludge Thickener Tank	Sludge bed level / clarity suspended solids
“DAF” Tank	Sludge bed level / floating sludge level
Sequential Batch Reactor (SBR)	Settling bed level / RAS blanket level
Industrial (Food, Paper etc.)	
Primary Sedimentation Tank	Sludge blanket level
Secondary Clarifier Tank	RAS blanket level / clarity suspended solids / rag/pinfloc layer
Thickener Tank	Sludge bed level / clarity suspended solids / floc level
“DAF” Tank	Sludge bed level / floating sludge level
Sequential Batch Reactor (SBR)	Settling blanket level / RAS bed level
Carbon Column	Carbon bed level
Mining/Mineral Processing	
Clarifier Tank	Blanket level / clarity suspended solids / stratified floc layers
Thickener Tank	Bed level / clarity suspended solids / stratified floc layers
CCD’s Tank	Bed level / clarity suspended solids / stratified floc layers
Settling Ponds	Sludge bed level









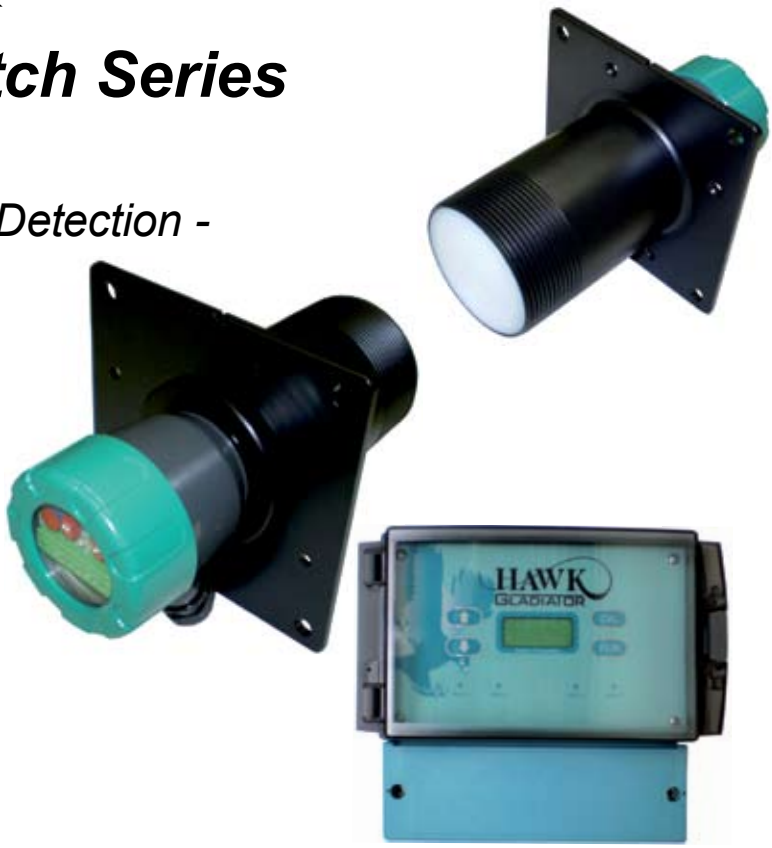


GLADIATOR

Microwave Smart Switch Series

- Beam Blockage Detection -

- Doppler Movement / Solid Flow Detection -



Principle of Operation

Beam blockage
A beam of microwave energy passes from a sender unit to a separate receiver in bursts approximately 200 times per second. If the path between the sender and receiver is blocked by any object or material which absorbs or reflects microwave energy, then the receiver will not be able to detect the signal. The presence or absence of the signal at the receiver is used to switch a relay for indication or control purposes.

Doppler movement
A beam of microwave energy is emitted from a transceiver unit. Tiny amounts of energy from the beam are reflected back from any object or material in the view of the sensor. If the object or material is moving or flowing, there will be a 'Doppler' frequency shift of the reflected signal. Frequency shift will not occur if the object or material is stationary, or does not reflect any microwave energy. Any frequency shift is detected by the transceiver unit and used to switch a relay for indication or control purposes.

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:

- Wide beam pattern for easy alignment
- LCD setup/diagnostics on remote amplifier
- Ranges up to 200 meters (656ft)
- 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)
- Wide range of communications: DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus and Profibus PA
- GSM/CDMA/GPRS/TCP remote setup options
- Remote amplifier to sensor separation up to 500 meters (1640ft)
- Bright visual status indication on sensors
- Independant housing alignment after mounting thread locked

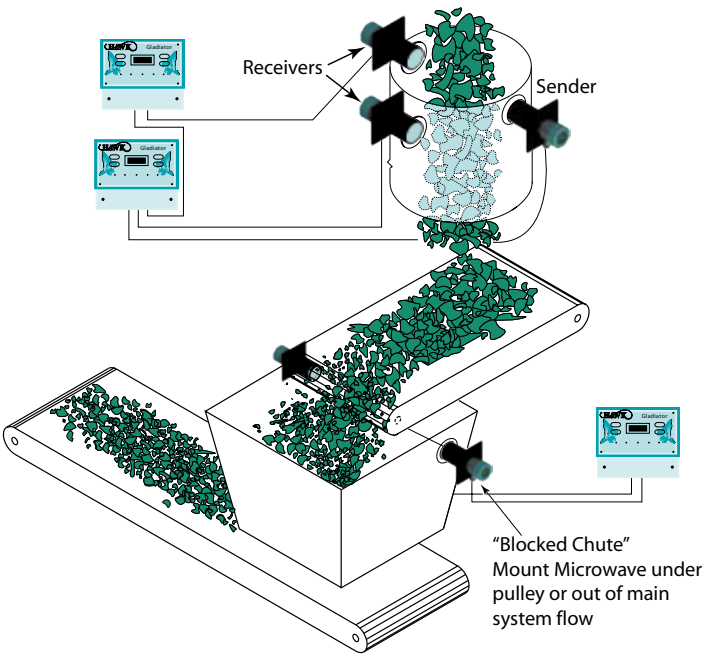




Typical Applications - Microwave Switch

Coal Fired Power Station, Bulk Material Handling

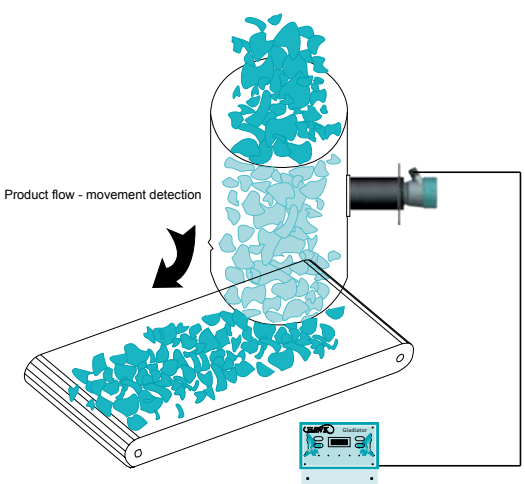
High/low blocked chute detection




Microwave Blocked Chute Detection - Iron Ore


Microwave Blocked Chute Protection - Flange Mounted

Coal Feeder Flow Detection

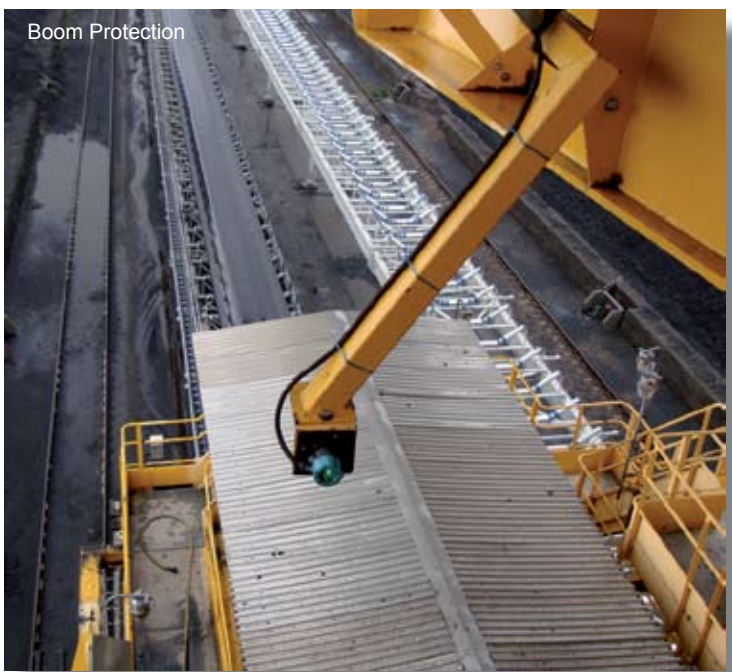



Microwave Blocked Chute Detection in a Aluminium Smelter



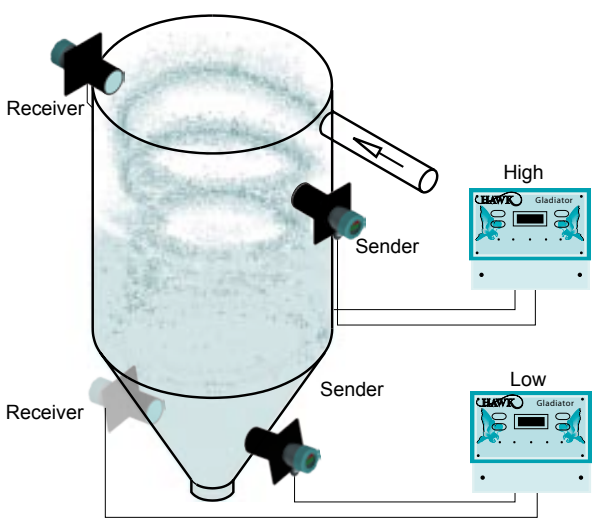


Machine Protection

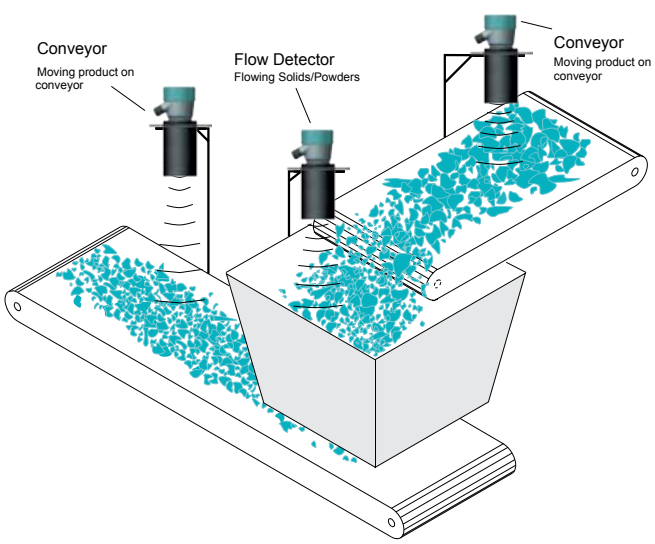


Cement Plants

Solid Level - Cyclone Bin
High/low Level



Conveyor Flow Detection







GLADIATOR

Admittance Smart Switch Series

- An all-round point level switch -

The Gladiator Smart Admittance Switch is a third generation, state-of-the-art level probe, designed to operate in tough industrial environments.

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)
- Wide range of communications: DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus and Profibus PA
- GSM/CDMA/GPRS/TCP remote setup options
- Remote amplifier to probe separation up to 500 meters (1640ft)
- Bright visual status indication on probe
- Independant housing alignment after mounting thread locked

GLADIATOR

Conductivity Smart Switch Series

- A level switch for liquids and slurrys -

The Gladiator Smart Conductivity Switch is a third generation, state-of-the-art level probe, designed to operate in tough industrial environments.

Principle of Operation

A low voltage AC signal is applied between the probe electrode and the tank wall or reference electrode in the case of a non-metallic tank. When the liquid comes into contact with the electrode tip, a conductive path is established between the sense electrode and the metallic tank wall/reference electrode. Current flow due to the conductive path is sensed, amplified and used to switch a relay for indication or control purposes.

Primary Areas of Application

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

Features:

- No moving parts - low maintenance
- Low voltage on probe for operational safety
- 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)
- Wide range of communications: DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus and Profibus PA
- GSM/CDMA/GPRS/TCP remote setup options
- Remote amplifier to probe separation up to 500 meters (1640ft)
- Bright visual status indication on probe
- Independent housing alignment after mounting thread locked





GLADIATOR

Vibration Smart Switch Series

- A level switch for liquids and solids -

The Gladiator Smart Vibration Switch is a third generation, state-of-the-art level probe, designed to operate in tough industrial environments.

Principle of Operation

A stainless steel tuning fork is driven by piezo ceramic elements, causing it to vibrate at its resonant frequency. When the material to be detected covers the fork, vibrations are damped. The changed vibration is sensed electronically, and the processed signal is used to switch a relay for indication or control purposes.

Primary Areas of Application

- 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:

- Suitable for a wide range of solids and liquids
- Heavy duty construction
- 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)
- Wide range of communications: DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus and Profibus PA
- GSM/CDMA/GPRS/TCP remote setup options
- Remote amplifier to probe separation up to 500 meters (1640ft)
- Bright visual status indication on probe
- Independent housing alignment after mounting thread locked

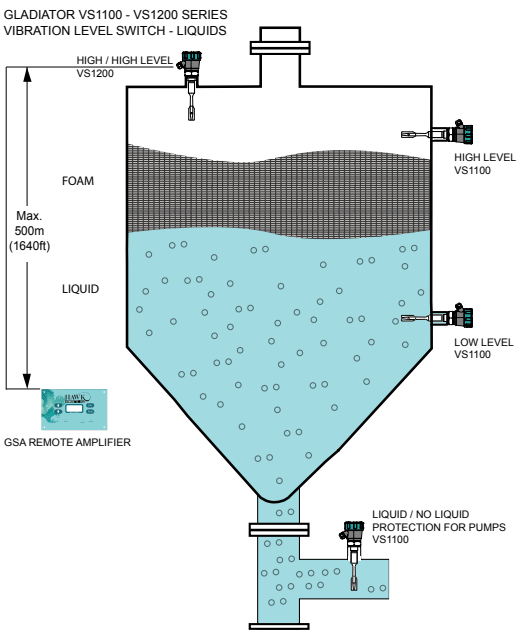




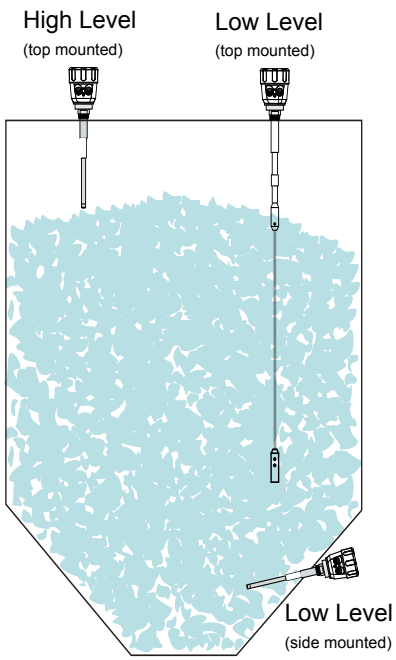
Typical Applications - Gladiator Series

Coal Chute Blockage Detection

High and Low Liquid Level Switch in Tanks



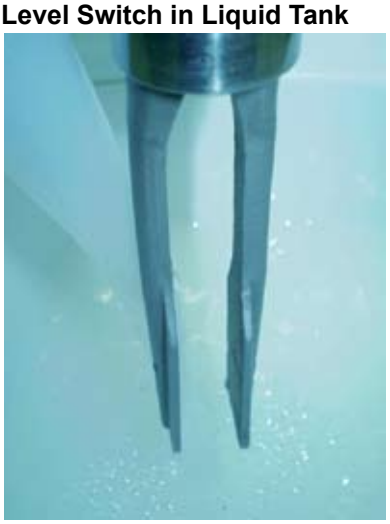
High and Low-Level Switch in a Hopper



Sump Pump Control

High Level Switch in Water Tank

Level Switch in Liquid Tank



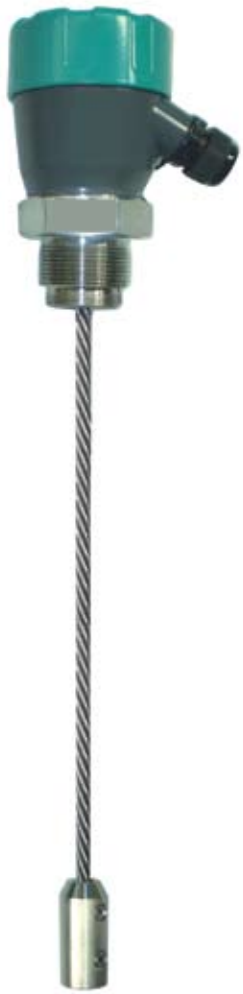
Level Switch in a Plastic Pellet Silo





Guided Radar Series (TDR)

- Continous level detection for solids and liquids -



Principle of Operation

Pulses of low power microwaves are sent along a cable and is used as a measuring system. At the point where the wave meets the product surface it is reflected by the product. A software and hardware system is used to measure the distance between the product surface and the sensor mounting position. The intensity of the reflection depends on the dielectric constant of the product. The higher the dielectric constant, the stronger the reflection will be e.g up to 80% reflection for water. The instrument measures the time between emission and reception of the signal which is proportional to the distance.

Products with a dielectric constant equal to or greater than 1.3 will work, which means the reflection from the product surface is used directly for the measurement of the level.

Primary Areas of Application

- Chemicals / Petrochemicals
- Energy
- Food & Beverages
- Minerals & Mining
- Oil & Gas
- Pharmaceutical
- Pulp & Paper
- Wastewater

Function

The Guided Radar range is ideal for the measurement of liquids, powders and granules to a range of 20m. This technology is not affected by pressure, temperature, viscosity, vacuum, foam, dust, changes in dielectric constant or coating of the probe, the Guided Radar series can measure virtually any product with a dielectric constant (Dk) greater than 1.3.

Features:

- 20m measuring range
- 4 wire AC/DC, 2 wire 4-20mA
- Wide range of communications (Devicenet, GosHawk, HART, Modbus, Profibus (Foundation Fieldbus and Profibus PA pending)
- Protection class IP67, NEMA4x
- High temperature applications
- GSM/CDMA remote communication options
- Capable of measuring low dielectric product (1.3)
- Programmable fail safe mode





Rotation Switch Series

- Point Level Switch -

Principle of Operation

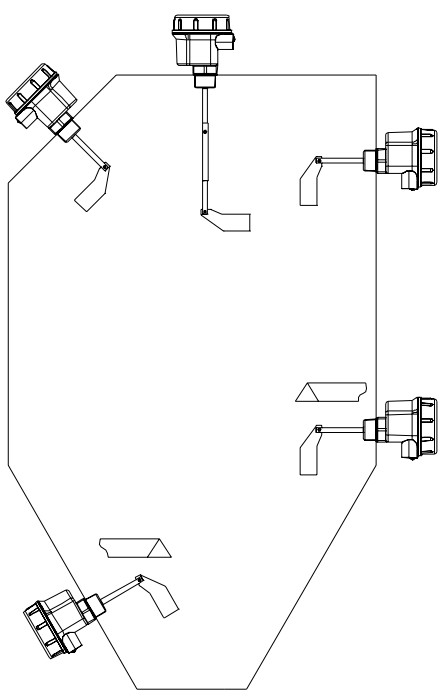
The rotating measuring vane is driven by a brushless synchronous motor. Once the material level reaches the vane, it stops rotating, which is detected by a micro switch to stop the motor and switch the level output. Once the material level begins to fall and the vane is free of material the motor will restart and the vane will rotate again.

Primary Areas of Application

- Plastic Industry - powder, granular, pellets etc
- Building Industry - lime, Styrofoam, molding sand, urea, cement, gypsum, crushed rock
- Food Industry - milk powder, flour, salt, sugar, minerals, herbs, grain
- Paper & Pulp Industry - wood chips, saw dust etc
- Chemical Industry - rubber, coating, foam
- Steel Industry - iron ore, coal, coke, sand, fluxes

Typical Applications

High or low level detector in containers and silos.



Features:

- ATEX and FM approvals for use in dust explosion areas
- No calibration
- High reliability
- Robust
- Wide range of applications
- Enclosure rating IP66/NEMA 4
- Friction clutch - protects gears against mechanical blows to the vane
- Two different probe lengths
- Selectable sensitivity for low density powders





Application References - Mining

Some successful examples commonly found within the mining and mineral processing are:

Mine:
- Truck detection for water spray trigger/stop light control above dump area
- Level in dump hopper (under grizzly)
- Level and chute blockage switch in primary crusher
- Level in ROM bin
- Material on conveyor belt detection or profiling (height on belt)
- Decision of ore or water on conveyors (to control water removal systems)
- Sump levels, pump control switch points
- Secondary crusher feed chute blockage detection
- Secondary crusher level control (choke feeding control)
- Stockpile level under stacker
- Stacker/Reclaimer positioning, boom protection detectors, anti-collision detectors
- Level or pump control switching in liquid tanks, ponds, sumps and pits
- Settling solids level in sludge ponds
- Primary crusher level control
- Tertiary crusher level control (choke feed control)
- Thickener bed level transmitter
- Conveyor material on belt,velocity (Doppler microwave transmitter)
- Conveyor transfer chute, (blocked chute detector, microwave fail-safe switch)
- Surge bin level transmitter
- Train load out bin level
- Train lockout position switch

Process Plant:
- Chute blockage detection (mill feeds, conveyor transfer chutes etc, microwave fail-safe switch)
- Water treatment chemical tanks (liquids, lime silo)
- Process chemical storage and mixing tanks (flocculants, additives, reagents etc, solid/liquid/powder)
- Floatation cell (level interface)
- CCD's bed level, floc layer, clarity output transmitter
- Thickener bed level, floc layer, clarity output transmitter
- Process water and waste water clarifier
- Drainage sumps and pits (level and switch)
- Filter press sumps (level and switch)
- Slurry and concentrate mixing and storage tank levels
- Diesel/fuel oil tank levels for power generation
- Rail/truck loading and unloading (position detection, filling levels)

Bulk Handling and Ship loading/unloading:
- Rail car dumper hopper level
- Rail car presence detection
- Rail loadout bin level
- Rail car position detection
- Rail car speed detection transmitter (microwave)
- Stockpile level (under stacker/reclaimer)
- Stacker/Reclaimer boom and collision protection
- Stacker/Reclaimer positioning detection
- Material on conveyor detection or profiling (height on belt)
- Material on belt velocity transmitter (microwave)
- Tripper/shuttle conveyor positioning
- Hopper, silo or bin levels and switches
- Ship loader/unloader boom collision protection
- Ship loader height (luffing) control (tracking fill level)
- Sump and pump level control


Mining Thickeners


Crusher Level

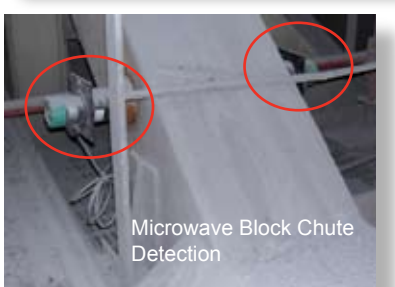

Stacker Boom, Luffing Control and Boom Protection


Surge Bin Level


Train Unload Control


Reclaimer Boom Protection


Shiploader Luffing Control/Boom Protection


Microwave Block Chute Detection


Coal Chute Blockage Detection





Application References - Water

Some successful examples commonly found within the water industry are:

ORCA Sonar applications:
- Primary Sedimentation Clarifiers
Controlling floc level and clarity of water

- Thickener Tank (Polymer Dosed)
Controlling bed level and clarity of water polymer dosing

- Primary Sedimentation
Controlling bed level

- Secondary / Final Clarifier
Controlling RAS blanket, fluff/RAG layer and clarity of water

- Thickener (Gravity)
Controlling bed level, clarity of water

- Thickener (Polymer dosed)
Controlling bed level, clarity of water polymer dosing

- SBR (Sequential Batch Reactor)
Controlling decant start time, polymer dosing if required

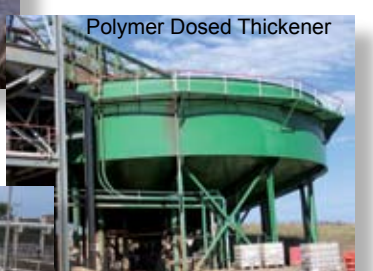
Sultan level and Gladiator switches applications:
- All water continous and point level measurements
- Monitoring sand filter bed tanks
- High and low level switches in water tanks
- Sewer main overlow level
- Sump pump control
- High/low/continous level in sewage wet well
- Irrigation channels
- Flow measurements in open flumes
- Waste water channels
- Sewerage inlet channels
- Pump protection
- Sediment tanks and sludge pumping
- Chemical dosing and processing systems


High Level Switch in Water Tank

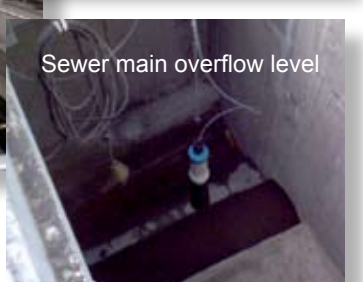

Sump Pump Control


Secondary Clarifier


SBR Tank

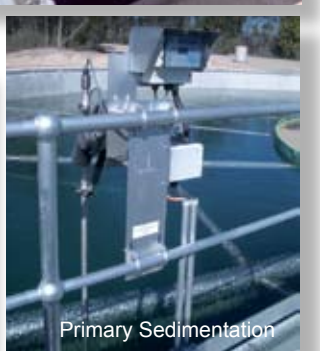

Polymer Dosed Thickener


Primary Clarifier


Sewer main overflow level


For more successful references in industries like Power, Food, Chemical and Cement etc, please go to **www.hawkmeasure.com**


Monitoring sand filter bed tanks


Primary Sedimentation

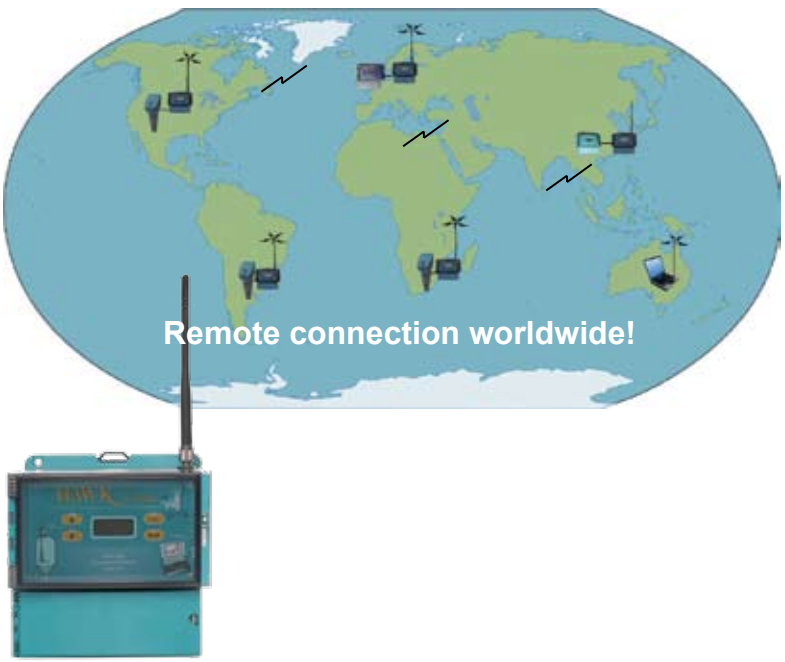


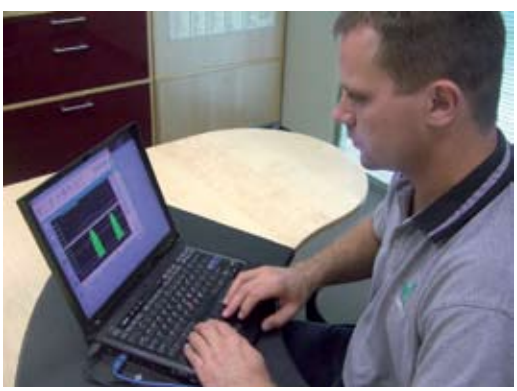


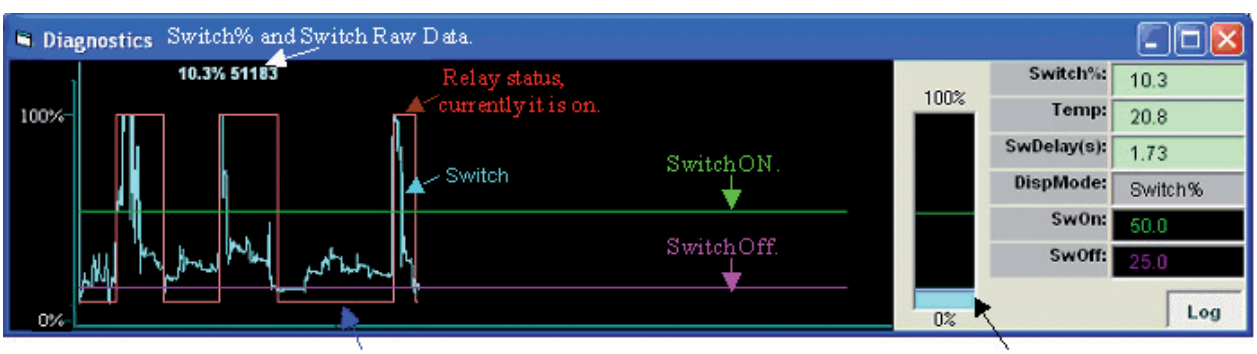
Advanced Remote Communication

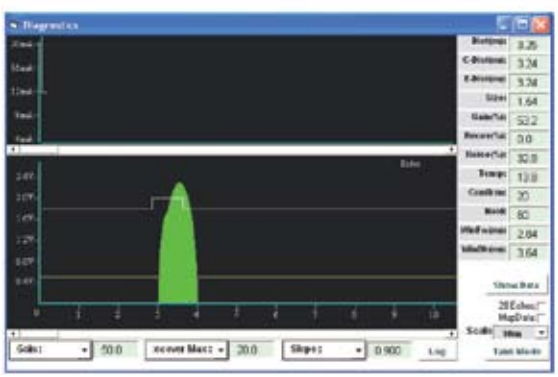
HawkLink GSM/CDMA communication device allows any authorized computer with a standard modem and GosHawk software to dial in and calibrate, test or check on the performance of the connected Hawk product. The HawkLink device can be wired to the standard communication terminals of the Hawk products.

Remote technical support and complete commissioning of equipment in applications via our GSM/CDMA module allows monitoring and adjustments of settings no matter what corner of the world.





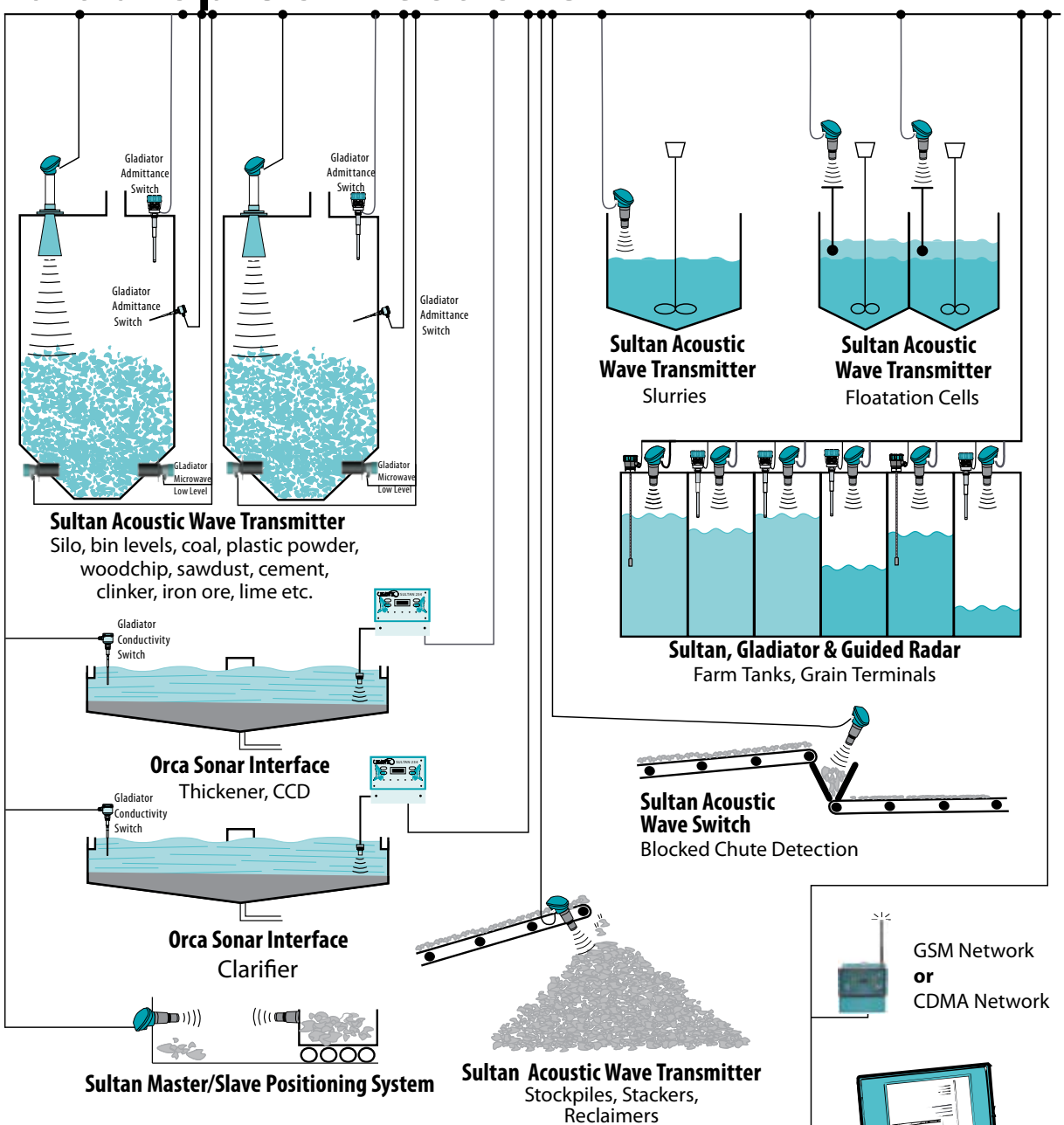








Multidrop Connections



GSM or CDMA Network

- Typically up to 31 transmitters or switches per string.
- Maximum 250 transmitters or switches.
- Using GSM/CDMA network, transmitters and switches can be monitored, calibrated remotely.
- Alarm status, diagnostics can be monitored.
- Support from factory engineering for customer application problems.

(Limited Modbus query rate for Switches only)





Level, Positioning and Flow Solutions

Services

» Training
We provide extensive training for our worldwide customers and distributors on a progressive basis so when new products are introduced, training is carried out prior to release to ensure optimum product acceptance and performance.

» Installation/Commissioning
Our experienced service personnel reduce commissioning time to a minimum, saving time, money and resources.

» Repair Service/Field Service/Pre-maintenance
Hawk provides customers with excellent after-sales service and guarantee the ongoing function of our products by delivering high quality instruments.

» Remote Technical Support
Remote technical support and complete commissioning of equipment in applications via our GSM/CDMA module can monitor and adjust settings no matter what corner of the world.

Certifications and Approvals

- Electrical Safety
- Dust Ignition Protection
- Explosive Atmosphere (Gas)
- Radio Frequency (EMI and RFI)

Communication Protocols

- GosHawk
- HART
- Modbus
- Profibus DP
- Profibus PA
- Foundation Fieldbus
- DeviceNet

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