**Principle of Operation**

The Gladiator Acoustic Switch uses Acoustic Wave technology in a new Sender/Receiver form for blocked chute detection and anti collision for heavy machinery. The Gladiator Amplifier powers two AW Transducers which use special Hawk developed software where both units pulse & receive each others Acoustic echoes. When the path between the Transducers is blocked the units immediately detect the presence/absence change of the return signal and trigger a communications relay for indication or control purposes. The Transducers work both together and independently to detect pulse interference giving twice the application security.

Hawk’s Acoustic Wave Transducers are self cleaning. The Acoustic Switch is designed for continuous operation in dusty, wet environments where other technologies fail. The power of each pulse (pressure wave) blows the water, moisture and build-up off the face of the diaphragm.

**Typical Uses**

- Blocked chute detection in wet or dry environments
- Wet screen blocked chute detection
- Nucleonic/tilt switch replacement
- High level alarm / Low level alarm
- Truck/machine detection (ROM bins, Primary Crusher Dump Pockets)
- Sewage sludge handling

**Function**

Detection of objects or material between two points. Can be used for blockage detection, barrier detection, machine detection / protection and point level detection.

**Primary Areas of Application**

- Brewing
- Cement
- Chemical
- Fertilizer
- Food & Beverage
- Glass
- Mining & Metals
- Packaging
- Paper
- Pharmaceutical
- Plastics
- Power Generation (coal fired)
- Refining
- Sugar
- Water & Wastewater
- Sewage Sludge

**Features:**

- No contact with the product required
- Self cleaning transducers
- Heavy duty titanium version available
- Designed for dusty, wet environments
- LCD setup/diagnostics on remote amplifier
- Ranges up to 150m (500ft)
- Simple ‘1-minute’ setup
- 2 Relay outputs
- Adjustable ON and OFF delays
- Remote GSM connection option & support
- Remote amplifier to sensor separation up to 500 meters (1640 ft)
Typical Applications

Wet Screens Blocked Chute Detection
Water Sprays

ROM Bins Blocked Chute Detection
Wet / Dry Product / Truck Detection
Water Sprays
Process Protection - Blocked Chute

**Bulk Solids**
Material flow blockage detection.
Designed for wet & dusty environments.
Self cleaning Transducers dislodge & prevent build up.
Heavy duty Titanium version for product impact resistance.

Apron Feeder / reclaim conveyor blocked chute / jam protection.
Slurry / sludge product / stockpile detection.

Cyclone Bins
High/low presence/absence of wet product
Remote Amplifier Enclosure

Remote Transducer

15kHz

350mm 13.8"

75mm 3"

Blocked Chute Mounting

Hawk FA4A-4 Flange

Pipe Specification
4-00” Z40 ID
100-102mm Black Pipe

Pipe with 4” ANSI interface

UHMW Sleeve with O-ring

Locking Ring

4” ANSI FLANGE

Min. 400mm

STANDARD 4” ANSI FLANGE DIMENSIONS

<table>
<thead>
<tr>
<th>SIZE</th>
<th>FLANGE TYPE</th>
<th>A (PCD) mm</th>
<th>B (OD) mm</th>
<th>C (ID) mm</th>
<th>D (Hole) mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>4”</td>
<td>FA4A</td>
<td>190.5</td>
<td>7.5</td>
<td>228</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
<td>4</td>
<td>19</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Note: Other flange sizes available upon request.

C*: Interior diameter does not include Hawk’s threaded decoupled connection flange
SYSTEM COMPONENTS

Amplifier

Junction Box

Acoustic Switch
15kHz Remote Transducers with UHMW flush mount sleeve

GLADIATOR REMOTE AMPLIFIER WIRING

To Junction Box

AWRT-JB-01 Junction Box
Connect colour to colour

Amplifier
TRANSDUCER 1
TRANSDUCER 2

GLADIATOR REMOTE AMPLIFIER WIRING

RELAY 1
RELAY 2
NC
COM
NC
NC
DC-IN
AC-IN
SENSOR
COMMS
CURRENT
RELAY 1
RELAY 2
NC
COM
NC
NC

12-30VDC
90-260 VAC

Relay 1 - Output Relay
Relay 2 - FailSafe Relay
**Remote Amplifier**

**GSA** Remote Gladiator System Amplifier

**Housing**
- S Standard polycarbonate electronics housing

**Power Supply**
- U Universal Power Supply (90-260VAC & 12-30VDC)
- B 12-30 VDC
- C 30-48 VDC

**Output Options**
- S Switch, 1 level relay, 1 failsafe relay, with Modbus
- Z Special Request (Profibus, HART, Devicenet, FF)

<table>
<thead>
<tr>
<th>GSA</th>
<th>S</th>
<th>U</th>
<th>S</th>
</tr>
</thead>
</table>

**Junction Box**

**AWRT-JB-01** Hawk multi purpose junction box for dual transducer applications

**Mounting Flange**

**FA4A-4** Hawk 4” ANSI flange with decoupled connection flange for acoustic switch sleeve

**Connection Cable**

**Belden 3084A**
Contact Hawk for length availability & price
## Remote Transducer

**AWRT** Acoustic Wave Remote Transducer

15 15kHz for applications with heavy duty self cleaning requirements

### Transducer Diaphragm / Sleeve Material

<table>
<thead>
<tr>
<th>Code</th>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Teflon / UHMW</td>
<td>Applications suitable for Teflon (no sensor face wear)</td>
</tr>
<tr>
<td>Y</td>
<td>Titanium face / UHMW</td>
<td>Applications with possible sensor face wear e.g. crushers</td>
</tr>
</tbody>
</table>

### Transducer Housing Material

4 Polypropylene

### Thread Standards for End cap

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

### Mounting Thread

15kHz - GAWSLV-3-X sleeve mounted (3.5” BSP thread to suit FA4A-4 flange)

### Approval Standard

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>A0</td>
<td>IECEx Zone 0 (Ex ia IIA T4) / ATEX (Grp II Cat 1 GD IP67 EEx ia IIA T4)</td>
</tr>
<tr>
<td>A1</td>
<td>ATEX Encapsulated (Grp II Cat 2 GD EEx m II IP68)</td>
</tr>
<tr>
<td>A20</td>
<td>ATEX Dust (Grp II Cat 1 D T85C IP67)</td>
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<tr>
<td>A21</td>
<td>ATEX Dust (Grp II Cat 2 D T85C IP67)</td>
</tr>
<tr>
<td>A22</td>
<td>ATEX Dust (Grp II Cat 3 D T85C IP67)</td>
</tr>
<tr>
<td>GP</td>
<td>CSA Equip Class 2; Pollution deg 2; measurement II (ordinary locations)</td>
</tr>
<tr>
<td>RN</td>
<td>CSA Class I; Div 1/2; Group D; Zone 0; AEx/Ex ia IIA; T4</td>
</tr>
<tr>
<td>KN</td>
<td>CSA Class II; Div 2; Group F and G; Class III</td>
</tr>
</tbody>
</table>

### Connection

C IP68 Sealed unit with cable

### Cable Length

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>15</td>
<td>15m cable (standard)</td>
</tr>
<tr>
<td>30</td>
<td>30m cable</td>
</tr>
<tr>
<td>50</td>
<td>50m cable</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>UHMW sleeve</td>
</tr>
</tbody>
</table>

### Software Options

AS Gladiator Acoustic Switch

**AWRT 15 Y 4 X X X C 15 X AS**
Specifications

Operating Voltage
• 12-30VDC (residual ripple no greater than 100mV)
• 90-260VAC
• 30-48VDC

Power Consumption
• <0.8W @ 24VDC
• <5VA @ 240Vac
• <3VA @ 115Vac

Communications
• GosHawk, Modbus
• Multidrop mode can address 1-250 units over 4 wires

Relay Outputs: (2) Remote
• Form ‘C’ (SPDT) contacts, rated 5A at 240Vac resistive
• Remote fail-safe test facility for one relay.

Operating Temperature
• Remote Electronics -40°C (-40°F) to 80°C (176°F)
• Remote Transducers -20°C (-4°F) to 80°C (176°F)*

Fail-Safe
• Selectable - presence or absence of material
• High level fail-safe: relay is activated when material is present.
• Low level fail-safe: relay is activated when no material is present.

Maximum Range
• Blocked Chutes: Under ideal conditions: 15m (50ft)

Minimum Range
Blocked Chutes
• 15kHz 400mm (32")

Transducer to Amplifier Separation
• Up to 500m (1640ft) using specified extension cable (Belden 3084A)

Maximum Operating Pressure
• 2 BAR

Display
• 2 line x 12 character alphanumeric LCD
• Backlight standard

Memory - Remote
• Non-Volatile (No backup battery required)
• >10 years data retention

Enclosure Sealing
• Remote Electronics IP67 (Nema 4x)
• Remote Sensors IP68
• Junction Box IP67

Cable Entries
Remote Sensors
• 1 x M20 Gland/3/4" NPTF threaded adaptor
Remote Amplifier
• 4 x 20mm (0.8"), 1 x 16mm (0.6") knock outs.

Mounting
15kHz Blocked Chute
• Transducer 4" ANSI flange with decoupled thread piece
• Remote Amplifier Back mount, DIN rail mount
• Pipe Specification: 4-00” Z40 ID = 100mm Black Pipe

Additional product warranty and application guarantees upon request.

Technical data subject to change without notice.

Contact

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Represented by: