**SULTAN**

Dual Transducer Acoustic Wave Series  
*Level, Flow, Positioning, Collision Protection*

**Principle of Operation**  
The SULTAN Dual 34 unit emits high powered *acoustic wave* transmit pulses from two transducers which is reflected from the surface of the material(s) being measured. The reflected signals are 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 sensors are 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 signals are temperature compensated to provide maximum accuracy to the outputs and display.

**Primary Areas of Application**  
- **Waste water / water:**  
  River level, wet wells, inlet screens, tanks, sumps, pump stations, water towers, dams, basin levels, chemical storage, etc.
- **Others:**  
  Food, Plastics, Grain, Chemicals, Paper, Irrigation.

**Function**  
The Sultan 34 Dual is a non contact acoustic wave transmitter with flexibility, used for measuring level of liquids, slurries and solids with the versatility of measuring two different applications at once.

**Universal Supply**  
- 3 Wire DC
- 4 Wire AC/DC

**Certifications**  
ATEX, SAA/IECEEx, CE, CSA (FM pending)

**Features:**
- One amplifier controls and powers two transducers.
- Differential and average level control
- Measures two different applications at once
- Non contact measurement
- Wide range of communications: DeviceNet, GosHawk, HART, Modbus, Profibus DP, Foundation Fieldbus & Profibus PA
- Pump Control x5 pumps
- Auto compensation for dust, steam and losses
- Protection class IP67, NEMA 4x (IP68 Transducer)
- Programmable fail safe mode
- High temp applications on request
- GSM/CMDA remote setup options/config
Typical Applications

Storage Tanks
High/Low/Continuous level
(Liquid/Chemical)

Sewage Wet Well
High/Low/Continuous level

Dual Outfeed

Flood
Hood
Remote Amplifier

Remote Transducers

All horns must protrude into the main volume of the vessel by at least 50 mm (2 inches) past the lower end of the mounting nozzle.

<table>
<thead>
<tr>
<th>Sensor Frequency</th>
<th>Selected Flange</th>
<th>A mm</th>
<th>B mm</th>
<th>C mm</th>
<th>D mm</th>
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</thead>
<tbody>
<tr>
<td>5 kHz</td>
<td>10&quot;</td>
<td>236</td>
<td>9.2</td>
<td>455</td>
<td>17.9</td>
</tr>
<tr>
<td></td>
<td>*8&quot;</td>
<td>195</td>
<td>7.6</td>
<td>280</td>
<td>11.1</td>
</tr>
<tr>
<td>10 kHz</td>
<td>10&quot;</td>
<td>236</td>
<td>9.2</td>
<td>415</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>*8&quot;</td>
<td>195</td>
<td>7.6</td>
<td>280</td>
<td>11.1</td>
</tr>
<tr>
<td>15 kHz</td>
<td>10&quot;</td>
<td>236</td>
<td>9.2</td>
<td>455</td>
<td>17.9</td>
</tr>
<tr>
<td></td>
<td>*8&quot;</td>
<td>195</td>
<td>7.6</td>
<td>280</td>
<td>11.1</td>
</tr>
<tr>
<td>20 kHz</td>
<td>4&quot;/6&quot;</td>
<td>98.5</td>
<td>3.9</td>
<td>280</td>
<td>11.0</td>
</tr>
<tr>
<td>30 kHz</td>
<td>4&quot;/6&quot;</td>
<td>98.5</td>
<td>3.9</td>
<td>280</td>
<td>11.0</td>
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</table>

*"8" and "6" are non standard. Please contact factory before selecting.

STANDARD ANSI/DIN/JIS FLANGE DIMENSIONS

<table>
<thead>
<tr>
<th>SIZE</th>
<th>FLANGE TYPE</th>
<th>E (PCD) mm</th>
<th>F (OD) mm</th>
<th>G (ID) mm</th>
<th>H (Hole) mm</th>
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</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>FA4</td>
<td>190.5</td>
<td>228</td>
<td>100</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>FD4</td>
<td>180</td>
<td>220</td>
<td>100</td>
<td>18</td>
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<tr>
<td></td>
<td>F4</td>
<td>175</td>
<td>210</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td>10&quot;</td>
<td>FA10</td>
<td>362</td>
<td>406</td>
<td>250</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>FD10</td>
<td>355</td>
<td>400</td>
<td>250</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>FJ10</td>
<td>355</td>
<td>400</td>
<td>250</td>
<td>23</td>
</tr>
<tr>
<td>8&quot;</td>
<td>FA8</td>
<td>298.5</td>
<td>343</td>
<td>200</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>FD8</td>
<td>295</td>
<td>340</td>
<td>200</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>FJ8</td>
<td>299</td>
<td>330</td>
<td>200</td>
<td>19</td>
</tr>
</tbody>
</table>

Note: Other flange sizes available upon request.

FLANGE TYPE:
FA = ANSI Flange
FJ = JIS Flange
FD = DIN Flange
Sultan Dual 34 Series

Wiring Diagrams

Sultan 34 Dual Remote Wiring Terminal

Diagram showing wiring connections for RELAY 1 to RELAY 5, 4-20mA Output 1, 4-20mA Output 2, TRANSDUCER, and various other components. Arrows indicate the flow of 4-20mA signals: Driving 4-20mA from Sultan to user PLC, Modulating 4-20mA from PLC input, and Modulating 4-20mA only from Output 2.

Junction Box AWRT-JB-01 Wiring Terminals

Diagram showing wiring connections for AMPLIFIER, TRANSDUCER 1, and TRANSDUCER 2.
MULTIDROP CONNECTION

Sultan Acoustic Wave Transmitter
Silo, bin levels, coal, plastic powder, woodchip, sawdust, cement, clinker, iron ore, lime etc.

Orca Sonar Interface
Thickener, CCD

Orca Sonar Interface
Clarifier

Sultan Master/Slave Positioning System

Sultan Acoustic Wave Transmitter
Stockpiles, Stackers, Reclaimers

Sultan Acoustic Wave Switch
Blocked Chute Detection

Sultan, Gladiator & Guided Radar
Farm Tanks, Grain Terminals

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.

GSM or CDMA Network

(Limited Modbus query rate for Switches only)
SULTAN DUAL 34 REMOTE ELECTRONICS
AWRD34  Dual Remote 3/4 Wire, Dual Input with 2 analogues. Housing Facia Display Connection Board/ Process Module, 2 Relays

HOUSING
S Standard polycarbonate electronics housing

POWER SUPPLY
B 24 VDC standard
C 48 VDC
U Universal DC or AC power supply (12-30 VDC or 90-265 VAC input)*

ADDITIONAL COMMUNICATIONS
S Switch only. 5 relays
X 2 x 4-20mA analogue outputs, includes Modbus comms
   Analog 1: 4-20mA analogue driving/modulating output module
   Analog 2: 4-20mA modulating output module

INTERNAL HAWKLINK MODEM (not available with ATEX 0/20 approval)
X Not required

APPROVAL STANDARD
X Not required
A22 ATEX Dust (Grp II Cat 3 D T85C IP67)

*Universal AC power supply has CSA
   General Locations approval.
SULTAN AW REMOTE TRANSDUCER

AWRT Acoustic Wave Remote Transducer

**TRANSUDER FREQUENCY**

- **50** 50kHz for applications 0-5m, available 2" only
- **40** 40kHz for applications 0-7m, available 2" only
- **30** 30kHz for applications up to 11m for 2" and 15m for 3" (4" cone is required for 3" units)
- **20** 20kHz for applications up to 20m, available in 3" only (4" cone is required)
- **15** 15kHz for applications up to 30m, available in 3" only (10" cone is required)
- **10** 10kHz for applications up to 40m, available in 3.5" only (10" cone is required)
- **05** 5kHz for applications up to 60m maximum, available in 3.5" only (10" cone is required)

**PROCESS TEMPERATURE - Facing material selection**

- **T** Standard Temperature Wet or dry atmosphere (teflon face)
- **Z** Special Request

**TRANSUDER HOUSING MATERIAL**

- **4** Polypropylene
- **6** Tefzel for 2" (standard). For 3" Teflon please contact us

**THREAD STANDARDS (cone mounting thread does not need to be specified)**

- **X** Not Required (see flange & cone selection)
- **TB** BSP (Must be used for thread sizes 30 or 50. For back cap mounting of flange.)
- **TN** NPT

**THREAD SIZES**

- **X** Not Required
- **20** 2" thread for 50, 40, 30 kHz in Tefzel housing only
- **30** 3" thread on the back cap for 30 & 20kHz only (For back cap mounting of flange, use TB option)

**APPROVAL STANDARD**

- **X** Not required
- A0 ATEX 0 (Areas II I GD IP67 Ex ia IIA T4) / IECEx Ex ia IIA T4 (Tamb -20C to +70C) (Intrinsically Safe)
- A1 ATEX Encapsulated (Areas II 2 GD EE xe II IP68)
- A20 ATEX Dust (Areas II 1 D T85C IP67)
- A21 ATEX Dust (Areas II 2 D T85C IP67)
- A22 ATEX Dust (Areas II 3 D T85C IP67)
- GP CSA Equip Class 2, Pollution Deg.2, Meas. Cat.II (Ordinary locations)
- RN CSA Class I, Div. 1/2, Group D; Zone 0; AEx/Ex ia IIA; T4, (Intrinsically Safe)
- QN CSA Class II, Div. 1 Grp E,F,G; Ex mb II; T5(T100),T6(T85)
- KN CSA Class II, Div. 2 Grp F,G; Class III

**CONNECTION**

- **S** Screwtop unit with integral junction box (available only for 2" units)
- **C** IP68 Sealed unit with 6 metre cable

**Cable Length**

- **6** 6m cable standard
- **15** 15m cable
- **30** 30m cable
- **50** 50m cable
- **X** Not Required

**MOUNTING ACCESSORIES**

- **X** Not Required
- CS Cable Suspension for remote 50/40/30/20kHz

**POSITION UNIT / CRANE MASTER SOFTWARE OPTIONS**

- **X** Not required
**FLANGE SELECTION**

**FLANGE**
F Flange Selection

**DIMENSION STANDARD**
A ANSI
D Din
J JIS
Z Special Request

**FLANGE SIZES**
2N 2" NPT flange
2B 2" BSP flange
4 4" acoustically isolated flange
6 6" acoustically isolated flange
8 8" acoustically isolated flange
10 10" acoustically isolated flange
Z Special Request

**FLANGE MOUNTING POSITION**
A Cone Mounted
B Transducer Body Mounted
C Angle Flange

**FLANGE MATERIAL**
4 Polypropylene
6 Teflon
Z Special Request

**CONE SELECTION**

**CONE**
C Focalizer Cone

**CONE SIZE**
02N Adaptor for 2" NPT Sensor to fit into 4" cone (included)
02B Adaptor for 2" BSP sensor to fit into 4" cone (included)
03 3" cone for 30,20 and 15kHz transducers with TB30 or TN30 threads
04 4" cone, 30 and 20kHz 3" transducer
08-15 8" cone, for 15kHz
08-10 8" cone for 10kHz
10-15 10" cone for 15kHz
10-10 10" cone for 10kHz
10-05 10" cone for 5kHz

**CONE MATERIAL**
4 Polypropylene
6 Teflon
7 Carbon Fibre. Must be used with Carbon Fibre flange
7A Carbon Fibre - comes attached to Carbon Fibre ANSI flange
7D Carbon Fibre - comes attached to Carbon Fibre DIN flange
7J Carbon Fibre - comes attached to Carbon Fibre JIS flange
8 Polyurethane*
Z Special Request

**REMOTE COMMUNICATIONS**

**HL** HawkLink

**TYPE**
R Remote stand alone system with antenna

**POWER SUPPLY**
B 24VDC
U Universal 90-265VAC
X No power supply for E selection

**NETWORK TYPE**
G6 GPRS/TCP and CSD compatible, Quadband capability. GSM frequency 850, 900/1800,1900MHz

**SIM CARD**
S3 Australian Sim Card expires after 3 months
S12 Australian Sim Card expires after 12 months
Z Special Request

**LOCKING RING**
LR Not Required

**Material**
4 Polypropylene

**LOCKING RING**
LR 4 - 4

* Polyurethane can be compressed to fit into the next smaller nozzle mounting size, e.g., 8" polyurethane cone will compress into a 6" nozzle and so is 10" polyurethane in to 8" nozzle. Please confirm the maximum nozzle height allowed.
Specifications

**Inputs**
- 2 inputs

**Frequency**
- 5kHz, 10kHz, 15kHz, 20kHz, 30kHz, 40kHz, 50kHz

**Operating Voltage**
- 12 – 30Vdc (residual ripple no greater than 100mV)
- 90 – 265Vac 50/60Hz (optional)

**Power Consumption**
- <4W @ 24Vdc
- <10VA @ 240Vac

**Isolated Analog Outputs**
- Analog 1: 4 – 20mA driving/modulating output module (750ohms @ 24Vdc User Voltage supply) or Internal driven 250ohms
- Analog 2: 4 – 20mA modulating output module (750ohms @ 4Vdc User Voltage supply only) (passive)

**Communications**
- Goshawk II

**Relay Output**: 2 Relays
- Form 'C' SPDT contacts, rated 0.5A @ 240V AC non-inductive. All relays have independently adjustable dead bands

**Blanking Distance**
- 50kHz = 0.25 m (10")
- 40kHz = 0.30 m (12")
- 30kHz = 0.35 m (14")
- 20kHz = 0.45 m (17")
- 15kHz = 0.60 m (24")
- 10kHz = 1.0 m (39")
- 5kHz = 1.5 m (59")

**Maximum Range**
- 5m (16ft) 50kHz liquids
- 7m (22ft) 40kHz liquids
- 10m (33ft) 30kHz liquids, 5m (16ft) solids
- 20m (65ft) 20kHz liquids/slurries, 10m (33ft) solids
- 30m (98ft) 15kHz liquids/slurries, 20m (65ft) solids
- 50m (165ft) 10kHz liquids/slurries/powders/solids
- 60m (196ft) 5kHz liquids/slurries/powders/solids

**Resolution**
- 1 mm (0.04")

**Sensor Accuracy**
- +/- 0.25% of measured range

**Operating Temperature**
- Remote electronics -40°C (-40°F) to 80°C (176°F)
- Remote transducer -40°C (-40°F) to 80°C (176°F)

**Display**
- 1 line x 1 digit alphanumeric LCD with backlight

**Keypad**
- 4 keys = CAL, RUN, UP, DOWN

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

**Enclosure Sealing**
- Remote Electronics IP65 (Nema 4x)
- Remote Transducer IP68

**Cable Entries**
- Remote: 0 x 0mm, 1 x 16mm knockouts

**Mounting**
- Electronics Screw mount
- Din Rail
- Transducer ANSI, JIS or DIN Flange 4 in/100mm to 10 in/250mm 1” BSP Nipple Mount

**Typical Weight**
- Sultan AW System with appropriate flange and cone
  - 5kHz Transducer 13kg, 28.6lb
  - 10kHz Transducer 10kg, 22lb
  - 15kHz Transducer 8kg, 17.6lb
  - 20 or 30kHz (3") Transducer 3kg, 6.6lb
  - 30 (2”), 40 or 50kHz Transducer 1kg, 2.2lb

Additional product warranty and application guarantees upon request. Technical data subject to change without notice.

Contact

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