Data Sheet

Sultan

Sonar System

Sludge and Submerged Interface Level Measurement

Principle of Operation

The HAWK Sultan Sonar uses Advanced Sonar Technology to measure and control Waste Water Clarifiers and Thickeners. The system is easy to use and the innovative design provides critical plant control to optimize performance.

In the water, wastewater industry process conditions will vary greatly between a primary sedimentation tank, secondary / final clarifier and a gravity thickener. Thickener bed levels, secondary RAS blanket, flocculent blanket etc, all have different densities and the water above these interface levels are subject to different process conditions that change.

To optimize performance in each interface application under all process environments:

HAWK has developed a powerful low frequency transducer to penetrate through the suspended solids and capable of measuring the sludge bed level at the bottom of a clarifier or the lightest flocculent layer.

To optimize performance under all process environments in each interface application:

HAWK uses one transducer with a frequency and power level that is applicable to the density of the interface and process conditions expected in the tank. HAWK can guarantee performance for controlling pumps etc, rather than for monitoring purposes only.

Value Added Benefits

- Improved efficiency and control of the treatment process
- Fully automated plant systems with reliable sludge blanket level monitoring
- Advanced warning of biological upset or hydraulic imbalance
- Reduced maintenance with 5 year cleaning mechanism warranty (no blades to replace)
- Reduced site operational costs significantly with improved process control for downstream operations
- Improved health and safety on site with compliance to OSHA regulations (no manual dips required).

Primary Application Areas

Water & Wastewater:

- Primary Sedimentation – Blanket level
- Secondary and Final Clarifiers – RAS Blanket layer
- Sequential Batch Reactors – Blanket monitoring (floating sonar)
- Lagoons – Sludge Bed Level
- Lamella Clarifier – Sludge Bed Level
- Filtration
- Gravity Filtration
- Gravity Settling.

Features

- User friendly configuration to track specific densities
- Tune Sensor to 5 preset factory densities or fine tune to the required density in-situ
- Sonar transducer developed to optimize detection of heavy and light density interfaces
- Easy calibration to track specific density interfaces, eg: RAS blanket - 4g/l, floc / fluff layer - 1g/l, Bed 10g/l+
- Industrial scum cleaning mechanisms that do not require maintenance
- No wiper blade assemblies
- Wide range of communications: Modbus, HART, Foundation Fieldbus, DeviceNet, Profibus DP and Profibus PA
- 3G remote support capability for calibration, commissioning or technical back-up from HAWK Service Engineer
- 5 Relay alarms
- 1640 feet (500 metre) separation possible between transducer and Sultan Sonar transmitter.
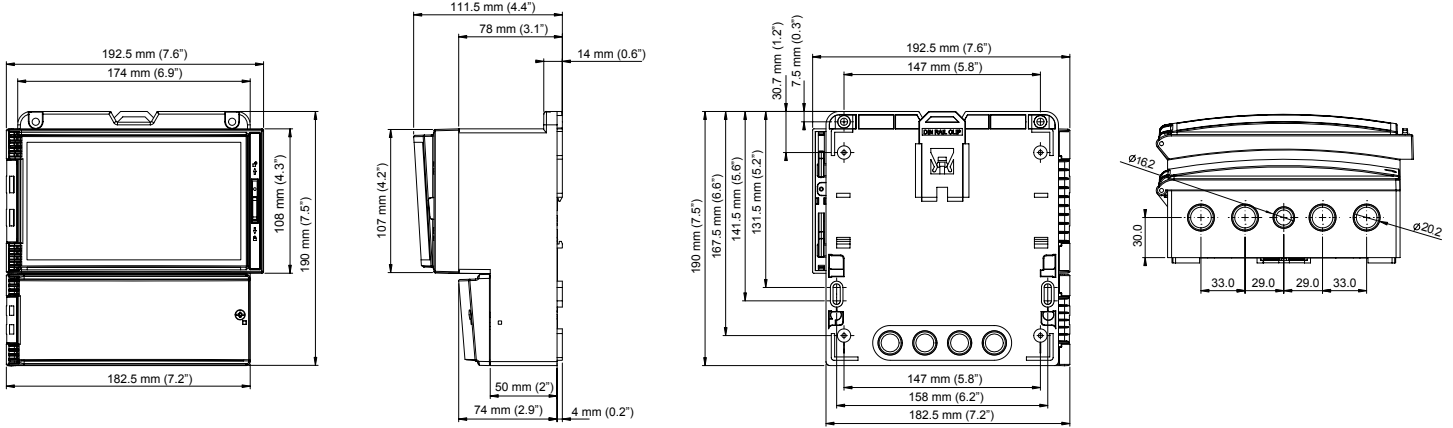
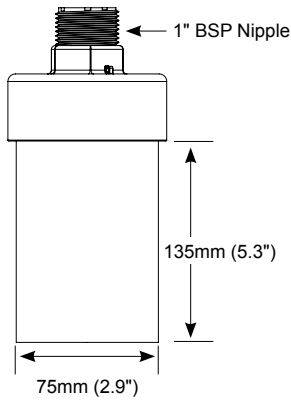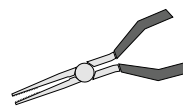| Area	Functions
Water Treatment Plant	
Primary Sedimentation Tank	Floc level / sludge blanket level
Sludge Thickener Tank	Sludge bed level / suspended solids / floc level
Calcium Hydroxide Reactor	Sand / pellet bed level
Sodium Hydroxide Reactor	Sand / pellet bed level
Sewage Treatment Plant	
Primary Sedimentation Tank	Sludge blanket level
Secondary / Final Clarifier	RAS blanket level / rag/pinfloc layer / suspended solids
Sludge Thickener Tank	Sludge bed level / 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 / suspended solids / rag/pinfloc layer
Thickener Tank	Sludge bed level / clarity suspended solids / floc level
Sequential Batch Reactor (SBR)	Settling blanket level / RAS bed level
Carbon Column	Carbon bed level

AWR234 Remote Amplifier

Remote Transducer

1" BSP Nipple

135mm (5.3")

75mm (2.9")

AWR234 Wiring

RELAY 1			RELAY 2			RELAY 3			RELAY 4			RELAY 5		
NC	COM	NO	NC	COM	NO	NC	COM	NO	NC	COM	NO	NC	COM	NO
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Is	+	−	RED	BLACK	BLUE	WHITE	Test In	B	A	−	+	⏚	N	L1
4-20mA			TRANSDUCER					COMMS		DC-In		AC-In*		

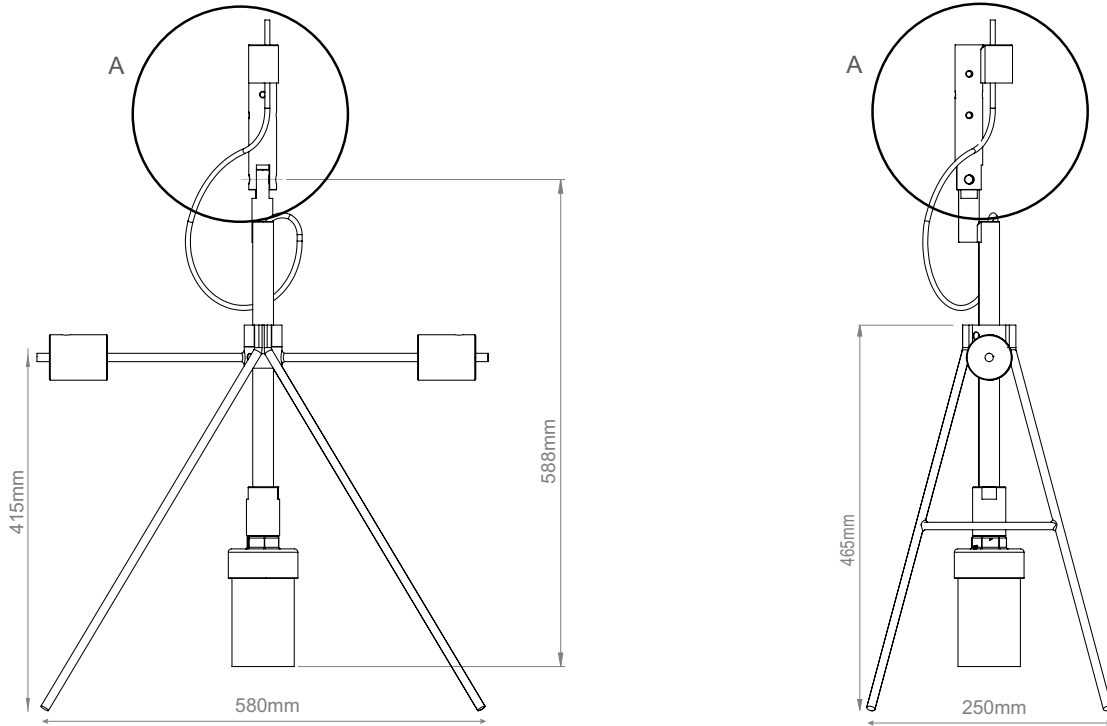Sinking 4-20mA from user device

OR

Sourcing 4-20mA from Sultan

***48VDC Sultan version will have these terminals marked as the 30-48VDC input**

Use long nose pliers to extract terminals

Dimensions & Mounting

Sultan Sonar System

Impact Plate

415mm · 588mm · 580mm · 465mm · 250mm

A · A
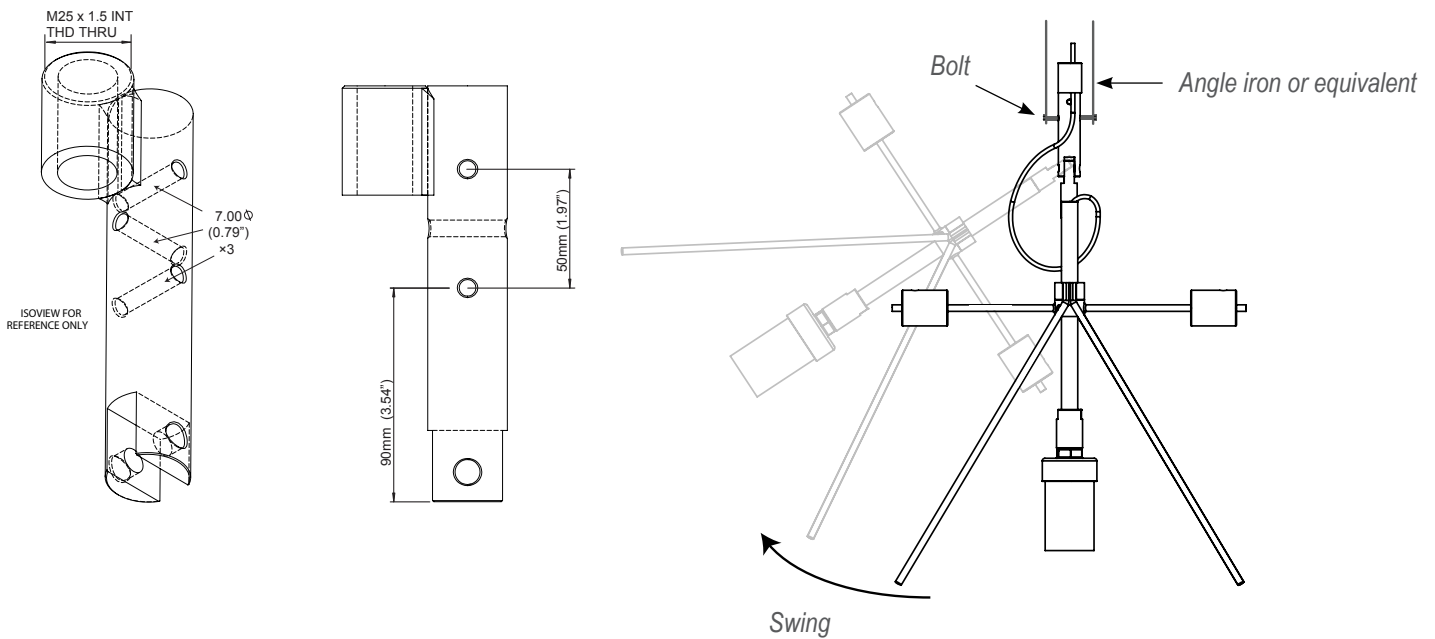
Mounting Connection (A)

The top of the Impact Plate has 3 x 7mm bolt holes which can be secured to an angle iron or equivalent bracket. The Impact Plate is designed to swing parallel with the counter weights. The surface sweeper must come in contact with the legs of the Impact Plate which swings the bracket lifting the transducer out of the liquid. When the sweeper has cleared, it will drop back in and use the counter weights to re-center.

M25 x 1.5 INT THD THRU

7.00⌀ (0.79") ×3

ISOVIEW FOR REFERENCE ONLY

50mm (1.97")

90mm (3.54")

Bolt

Angle iron or equivalent

Swing

Remote Amplifier

Model

AWR234   Remote 3 / 4 Wire, 5 relays, Modbus

Housing

S   Polycarbonate

Power Supply

B   12-30VDC
C   30-48VDC and 48-90VAC
U   12-30VDC and 90-260VAC

Additional Communications (PC comms GosHawk standard)

S   Switch only. 5 relays
X   4-20mA analogue
I   4-20mA analogue with HART Isolated 4 wire
A   Profibus PA
P   Profibus DP
F   Foundation Fieldbus
D   DeviceNet

Accessory

X   Not Required

Approval Standard

X   Not Required
A22 ATEX Grp II Cat 3 GD T85°C IP67 Tamb -40°C to 70°C
GP   CSA Equip Class 2; Pollution deg 2; Tamb -20°C to 75°C (Ordinary Locations)

Additional Software

X Not Required

AWR234   S   U X X X   X

Remote Sonar Transducer

AWRTS Sultan Sonar Transducer

Transducer
002   151kHz
003   300kHz
004   450kHz
005   700kHz

Facing & Housing material
S4 Fiberglass face with Polypropylene housing (max 50°C / 122°F)

Approval Standard
X   Not Required
RN   CSA Class I; Div 1/2; Group D; Zone 0; AEx/Ex ia IIA; T4
GP   CSA Equip Class 2; Pollution deg 2; Tamb -20°C to 75°C (Ordinary Locations)
i0   IECEx Zone 0 (Ex ia IIA T4 IP68 Tamb -20°C to 70°C)
A0   ATEX Grp II Cat 1 GD EEx ia IIA T4 IP68 (Tamb -20°C to 65°C)
A1   ATEX Grp II Cat 2 GD EEx m II IP68 T5 (Tamb -20°C to 65°C) T6 (Tamb -20°C to 50°C)
i1   IECEx Zone 1 (Ex mb II IP68 T5(Tamb -20°C to 65°C) T6 (Tamb -20°C to 50°C))
A22 ATEX Grp II Cat 3 GD T85°C IP67 Tamb -40°C to 70°C

Connection
C   IP68 Sealed cable
        6   6m
        15 15m

AWRTS	002		S4	X	C	6

Scum Cleaner

IMPACT-PLATE: Single direction auto scum cleaner (requires contact with surface sweeper)

IMPACT-PLATE-2: Dual direction auto scum cleaner (requires contact with surface sweeper)

Accessories

HAWKLink Data Modem

HLR   Remote stand alone HAWKLink system

Power Supply
B   12-30VDC
U   12-30VDC and 90-260VAC

Network Type
G3   3G Autoband

Sim Card
S3   3 month Australian Sim Card
S12 12 month Australian Sim Card
X   Not Required

HAWKLink USB PC connector for GosHawkII
HAWKLink-USB

Stainless Steel Sunhood
SUNHOOD

Extra Cable (Belden 3084A)
CA-TXCC-R-C15	15m cable
CA-TXCC-R-C30	30m cable
CA-TXCC-R-C50	50m cable
CA-TXCC-R-C100	100m cable

HLR	U	G3	S3

Consult local representation for international sim card support.

Sonar Frequency Selection

- 151kHz
- 300kHz
- 450kHz
- 700kHz

Operating Voltage

- 12 - 30VDC (residual ripple no greater than 100mV)
- 90 - 265VAC 50 / 60Hz
- 48Vdc, 48VAC-90VAC 50 / 60Hz.

Power Consumption

- <3W @ 24VDC
- <10VA @ 240VAC
- <4W @ 48VAC, <7VA @ 48VAC - 90VAC.

Analogue Output

- 4 – 20mA (750 Ohm@ 24VDC User Voltage supply) or Internal driven 250 Ohm.

Communications

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

Relay Output

- 5 x Form 'C' (SPDT) contacts, rated 0.5A at 240VAC non-inductive
- All relays have independently adjustable dead bands

Maximum Range

- 15m (50 ft)

Blanking Distance

- 350mm

Resolution

- 1mm

Accuracy

- +/- 0.25%

Operating Temperature

- Remote Electronics -40°C (-40°F) to 80°C (176°F)
- Sonar Transducer: -40°C (-40°F) to 50°C (122°F)

Transducer Material

- Polypropylene Housing, Fibreglass Face

Impact Plate Material

- 316L Stainless Steel.

Transducer / Transmitter Separation

- >500m

Note: Must be BELDEN 3084A.

Display

- 2 line x 12 digit alphanumeric LCD.

Memory

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

Enclosure Sealing

- Remote Electronics IP65 (Nema 4x)
- Remote Transducer IP68.

Cable Entries

- Remote: 3 x 20mm, 1 x 16mm knock outs.

Cable (Sonar Transducer)

- 4 conductor shielded twisted pair instrument cable
- Conductor size dependent on cable length
- BELDEN 3084A, DEKORON or equivalent
- Max: BELDEN 3084A = 500m (1640 ft)
- Max: DEKORON IED183AA002 = 350m (980 ft).

Typical Weight

- Remote Electronics 1kg
- Remote Transducer 1kg
- Impact Plate 5kg.