

# HYCONTROL



SONARFLEX  
SLUDGE BLANKET LEVEL & INTERFACE MONITORING



# SLUDGE BLANKET LEVEL & INTERFACE MONITORING

## EQUIPMENT DESCRIPTION

The Sonarflex Sonar, sludge blanket and interface controller is a microprocessor based transmitter combined with the appropriate RVS sonar transducer and its associated cleaning mechanism. It is programmed via an easy menu-driven keypad or remotely via COMMS, GSM interface.

It is used to control the blanket level in primary sedimentation tanks or the RAS Blanket and FLOC /FLUFF layers in secondary and final clarifiers.

Ease of installation and ease of set-up for the instrument were the major design criteria in the development of the Sonarflex.

Setting the Instrument is achieved by selecting the 'Density' of the interface level to be monitored and this is then tracked. It is much easier and quicker to commission than existing Instrument designs. Dual analogue outputs are available, one for Bed or Sludge Level and the second for Floc/Fluff layers or clarity.

Cleaning mechanisms are available for a wide range of applications but NO wiper blade assemblies to foul and wear out with their high replacement costs.

A full range of RVS Sonar Transducers are available to cater for detection of light to heavy density interfaces.

A GSM modem is available for remote technical and diagnostic support.

## PRINCIPLE OF OPERATION

The Sonarflex transmitter initiates a sound pulse from the RVS transducer through the water (liquid) towards the blanket/interface at the bottom of the tank. The pulse is reflected off the blanket/interface back to the Sonar Transducer, and is then processed by the Sonarflex where it is compensated for temperature, and provides either a distance reading to the blanket/interface level or a height of blanket/interface from the bottom of the tank.

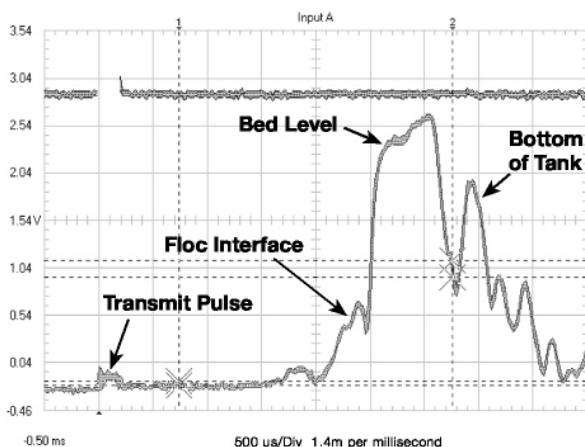
An analogue output or COMMS based output, tracks this blanket/interface and can be communicated to the control room.

The Sonarflex also provides a second independent output that can be programmed to track either the CLARITY of the water (liquid) monitoring the change of suspended solids, or to identify other stratified interfaces or the fluff/floc layer (where such an interface moves independent of the sludge blanket/bed level and needs to be monitored to prevent overflow into the launders).



## FEATURES

- Dual independent analogue outputs track two different interfaces simultaneously.
- Full range of transducers to optimize detection of heavy and light density interfaces.
- Calibration using DENSITY input to track specific density interfaces ranging from 4g/l to <1000 mg/l.
- Control room graphics of tanks and interface position.
- Industrial scum cleaning mechanism's that do not require maintenance. **No wiper blade assemblies.**
- Range to 30 meters.
- 500 metre separation possible between transducer and Sonarflex transmitter.
- Modbus, Profibus, HART Comms capability.
- 3 Relays plus indication of cleaner operation.
- GSM module enables remote diagnostic support from Hycontrol Service Engineer.



### Sonarflex Sonar with GSM or CDMA Network

Using the GSM or CDMA modem with the Sonar Interface allows for technical assistance from our factory trained experts and design engineers.

The Sonarflex can be commissioned, re-programmed, monitored and supported anywhere in the world where GSM or CDMA networks are found, by factory specialists.

This provides customers in remote locations the highest possible level of support.

### Bed Level Monitoring / Floc Control

Using a specially chosen low frequency transducer guarantees that the bed level will always be the largest echo. This is very important for floc control.

## TYPICAL APPLICATIONS

### SEWAGE and WASTE WATER TREATMENT

Primary Sedimentation Blanket level.  
Secondary and final Clarifiers RAS Blanket and Floc/Fluff layer.  
Thickeners and DAF Bed level and clarity of water.  
Sequential Batch Reactors Blanket monitoring (floating sonar).  
Lagoons Bed sludge level.

### WATER TREATMENT

Primary Sedimentation Floc blanket level and clarity.  
Thickener Bed level and clarity of water.  
Lamella Clarifiers Bed level and floc level.

### MINING / QUARRYING / PROCESS

Clarifiers Bed level and clarity of liquid.  
Thickeners Bed level and clarity of liquid.  
Settling Ponds/Lagoons Bed sludge level.  
Water Treatment Floc level and clarity.  
Carbon Columns Carbon granular level.

**Circular or Rectangular, moving bridges or fixed bridge installations can all be accommodated.**



## SONAR TRANSDUCER SELECTION GUIDELINES

Typically, the most difficult task when determining the level of an interface is the correct selection of the Sonar transducer for satisfactory performance. There are many variables to consider including mounting position, particle size, flow, velocity, material, air bubble retention, etc..

High frequency, short wavelength, transducers respond better to lighter densities and smaller particle sizes but lack penetration and are more susceptible to air bubbles forming on the sensor face, creating impedance to the transmit and received signals. Low frequency, long wavelength responds better to heavier densities and larger particle sizes.

## APPLICATION FREQUENCIES

The following is intended as a guide to Transducer selection but consult Hycontrol for advice on your individual application.

Application	Transducer	Frequency
Mineral Processing Clarifier	RVS001	70kHz
Waste Water Final Settlement	RVS002	150 kHz
Waste Water Primary Settlement	RVS002	150kHz
Waste Water Thickener	RVS002	150kHz
Water Treatment Thickener	RVS003	300kHz
Waste Water SBR	RVS003	300kHz
Water Treatment Clarifier	RVS004	450kHz
Mixed Processing Thickener	RVS007	30kHz

## CLEANING METHODS

The major problem experienced with reliable long term operation of a sonar interface level transmitter is that of keeping the Transducer clean. Air bubbles, algae growth, fats, scum, rising flocs, etc. all cause problems with Transducer performance. Some form of cleaning must be used to enable the Transducer to operate for long periods without maintenance. Sonarflex has an integrated sensing system which monitors signal strength and automatically actuates the cleaning process to ensure optimum performance.

### Automatic Cleaner

This complete assembly, suitable for mounting on a bridge handrail, incorporates an electric or pneumatic actuator which can either operate automatically or on a timed basis. It sweeps the transducer through the water dislodging the interfering matter so restoring the transducer performance. This is the preferred method of cleaning.

### Brush Cleaner

Where space is limited the brush cleaner can be used. A motor driven at a slow speed, is attached with a brush and positioned so that any deposits are removed from the transducer face.

### Impact Cleaner

In applications where a fixed bridge and moving Scum Board or Picket Fence is used, an impact plate cleaner is used. This has the same action as the Automatic Cleaner, but operates every revolution or half revolution depending on the design of the Scum Board or Picket Fence.

***Please consult Hycontrol for advice on cleaning mechanisms for your particular application.***

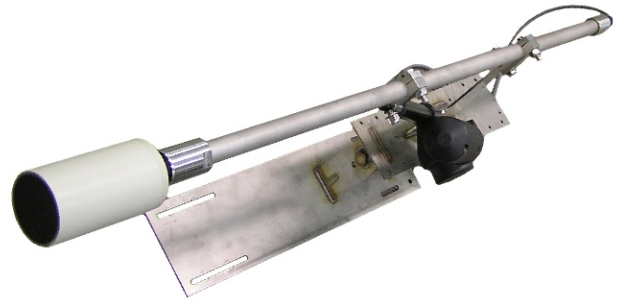
# SPECIFICATIONS

## SONARFLEX TRANSMITTER



<b>Instrument Type</b>	: Sonarflex 2DC - 2 wire Loop Powered
	: Sonarflex 234 - 234 wire ac/dc
<b>Measurement range</b>	: 0 to 30 meters (60 meter option)
<b>Minimum Density range</b>	: <100mg/l
<b>Accuracy</b>	: ±0.25% of span
<b>Temperature</b>	: -20 °C to +70 °C
<b>Display</b>	: 2 x 8 digit LCD display
<b>Echo processing</b>	: Advanced Hycontrol algorithms
<b>Outputs</b>	: 2 x Analogue 4-20mA (Isolated) max 60 ohms
	: Relays: 3 x S.P.D.T. 0.5Amp
	: Power driver for Auto scum cleaner
	: Modbus, Profibus, RS485 Comms
<b>Diagnostics</b>	: Full operational diagnostics display
<b>Sealing</b>	: IP65
<b>Options</b>	: Reduced blanking distances
	: Sun hood
<b>Voltage</b>	: 90 - 260vac / 24vdc
<b>Approval Options</b>	: Sonarflex 2DC is ATEX EEx ia

## RVS TRANSDUCER & CLEANING MECHANISM



<b>Transducer selection</b>	: See Sonar Transducer selection guidelines
	RVS001 – 70kHz
	RVS002 – 150 kHz
	RVS003 – 300 kHz
	RVS004 – 450 kHz
	RVS007 – 30 kHz
<b>Housing</b>	: Polypropylene, PVDF (Kynar), Teflon and PVC
<b>Sealing</b>	: IP68 (Fully encapsulated)
<b>Special Blanking</b>	: 150mm minimum
<b>Temperature Sensor</b>	: Internal (max. 70 °C Standard) high temperature
	: 150 °C with external pre-amp
<b>Mounting</b>	: 1.00 inch BSP/NPT nipple
<b>Cable</b>	: Belden 3084A
<b>Weight</b>	: 3.5kg
<b>Approval Options</b>	: ATEX EEx ia when connected to Sonarflex 2DC. or ATEX EExm

## AUTO CLEANER

<b>Construction</b>	: Stainless Steel
<b>Mounting</b>	: Base mount x 4 holes (See drawing)
<b>Actuator</b>	: Electric 24Vdc
	: Pneumatic Contact factory
<b>Weight</b>	: 5Kg

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