Quickstart

Gladiator Conductivity Switch Series

The probe of the Conductivity Switch forms one part of an electric circuit, with the vessel wall or a reference probe making another part. A conductive liquid between the probe and the vessel wall (or between the probe and the reference probe) links the two parts of the circuit and the output will switch in response. The output has adjustable hysteresis and delays for 'on' or 'off' switching.

A test function is available to remotely confirm the probe integrity by switching the relay contacts.

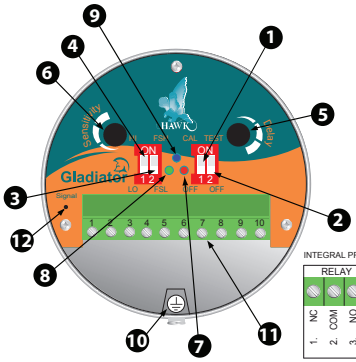
The Gladiator Smart Switch Series includes communications capability for remote adjustment, control and monitoring.

Principle of Operation

A low voltage AC signal is applied between the probe electrode and the tank wall (or reference electrode in case of a non-metallic tank). When the liquid comes in 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.

Integral Probe Functionality Layout



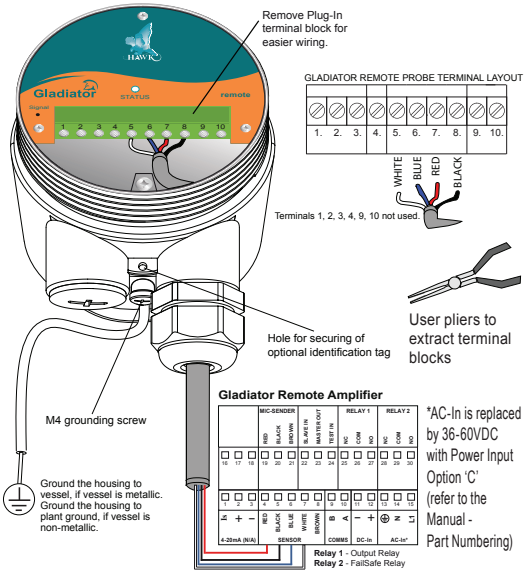
INTEGRAL PROBE REMOVABLE TERMINAL BLOCK

RELAY				COMMS		DC-IN		AC-IN	
1. NC	2. COM	3. NO	4. Test	5. A	6. B	7. +	8. -	9. N	10. L1
				RS 485		12-30VDC		80-260VAC	

Functionality Description (bold is default)

1. Mounting Calibration switch CAL/**OFF**
2. Test input function select TEST/**OFF**
3. Relay action selection switch
   FSH - FailSafe High
   FSL - FailSafe Low
4. **HI** / LO sensitivity switch
5. Delay Potentiometer (0-20 sec) (Default 0 sec. at minimum position)
6. Sensitivity Potentiometer Default **50% = 12 o'clock**
7. RED LED: Relay status
   ON when relay coil is energised
8. GREEN LED: Power / Status
   Blinks to indicate the functioning is correct and no media is detected.
   Continuously ON when media is detected.
9. BLUE LED:
   Blinking indicates calibration function is on.
   Continuously ON indicates failed calibration.
10. AC Ground - must be used for AC powered installations
11. Removable terminal block - plug in type
12. Signal voltage test point
    - Not used in Gladiator Conductivity products

Remote Probe to Amplifier Wiring



*AC-In is replaced by 36-60VDC with Power Input Option 'C' (refer to the Manual - Part Numbering)

Cable type between Amplifier and Probe

- 4 conductor shielded twisted pair instrument cable
- Conductor size dependent on cable length
- BELDEN 3084A, DEKORON or equivalent
- Max: BELDEN 3084A = 500m (1640ft)
- Max: DEKORON IED183AA002 = 350m (1150ft).

Setup Procedure

Smart Probe Version

1. Mount the unit in its actual position. Make sure that external ground wire is connected between the outside ground screw on the Gladiator housing and the roof/wall/side of the silo/tank/vessel/chute. (For non metallic tanks make sure that external ground wire is connected between the same outside ground screw on the housing and the general plant ground potential).

2. Check where the actual level is relative to the probe. Make sure that the liquid is not touching the probe or probes.

3. Turn the power on. The green LED will either stay on for 2 seconds then begin flashing or stay on permanently to indicate operation.

4. Select the required relay contact action. The Relay can switch 'ON' or 'OFF' as the product approaches the probe and switch 'ON' or 'OFF' in response to an instrument failure. Set the relay action selection switch position (FSL or FSH) depending on your requirements.

5. Cancel influence of mounting. Do not proceed with this step unless the liquid is not touching the probe or probes.

Switch the Mounting Calibration switch to 'CAL' (ON) position. The Blue LED will blink to indicate that mounting calibration is now in progress.

Wait for at least 10 sec. then switch the mounting calibration switch to 'OFF' position. The blue LED should turn off after a short time. The blue LED will stay on if there was a calibration error. If this is the case please check that the probe is not touching the product or the mounting, then try the calibration again. If mounting calibration was successful the blue LED should be off and the Green LED should blink every 2 sec.

Unit is now able to cancel influence of mounting and probe history has been cleared.

6. Select the sensitivity. There are two adjustments controlling the sensitivity of the switch point:

6.1. The 'HI/LO' sensitivity switch is used to set your unit depending on the conductivity of the product to be measured. This switch sets the range of adjustment possible with the sensitivity potentiometer.

If the material to be detected has a lower conductivity than 1750µS/cm (4400µS/inch) - set the switch to 'HI' (ON) - default. If material to be detected has a higher conductivity than 1750µS/cm (4400µS/inch) - you may set the switch to 'LO'. If you are not aware of your material's conductivity – set the switch to 'HI' (ON) - default.

6.2 The sensitivity potentiometer. Set the potentiometer according to your requirements. A 12 o'clock setting (50%) - default, will cover the majority of instances - for the remaining instances, turning the potentiometer clockwise will increase sensitivity. Increasing sensitivity maybe necessary if the liquid is not detected when touching the probe.

7. Select the time delay. Set the required delay using the Delay potentiometer. (Default is 0 sec. at minimum position) Turn the potentiometer clockwise if any delay is required. Maximum rotation is ¾ of a revolution. Max delay is 20 sec. The selected delay will be used for both an ON delay and an OFF delay.*

8. Test function (used to check for malfunction of unit from remote position, PLC, SCADA etc). Select the desired Test function by switching the 'Test' switch (Default = 'OFF').

'TEST' (ON) Position: Test function is selected. Test terminal (terminal number 4 of Smart probe) is used as an input to the unit. The test function allows you to check the functionality of the unit. Applying a ground wire to the Test terminal will change the state of the relay. It will hold this state until the ground is removed, then it will change back to the standard running mode. If the unit was in a Fail mode then the relay will not change status.

'OFF' (Default) Position: Fail safe output function is selected. Test terminal (terminal number 4 of Smart probe) will function as an open drain drive. This can be used to drive a relay or an active low PLC input to detect a Fail condition. In normal operation mode the Test terminal will output Zero Volts (Short to GND). In Fail or unpowered mode the Test terminal will be open circuit.

*See the manual for further information.

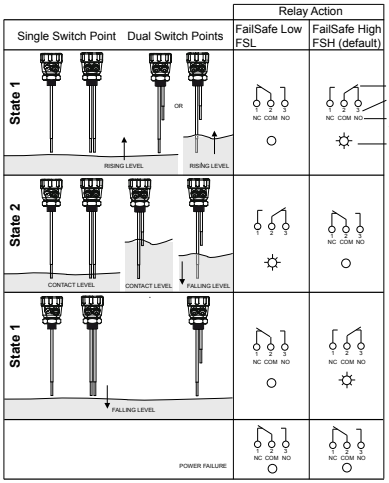
Wiring

Relay Functions

Level Switch Contact Action

Relay - for Smart Probe version

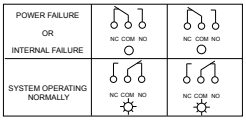
Relay 1 - for Remote version



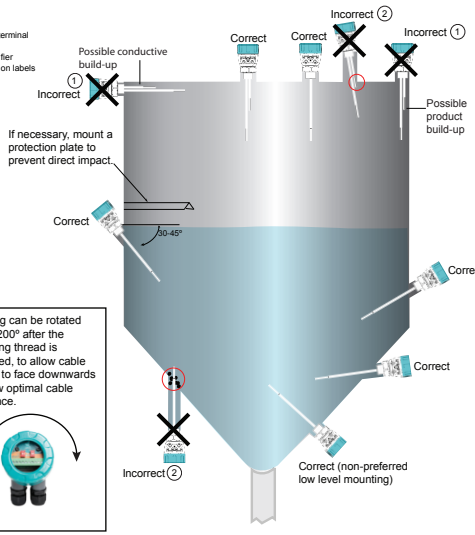
FailSafe Switch Contact Action

Relay 2 - Remote version only.

For Smart Probes the 'Test' terminal can act as a solid state output with a similar function.



Mounting



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