



A higher level of performance

Data Sheet

GLADIATOR

Admittance Smart Switch Series

- An all-round point level switch -

The Gladiator Smart Admittance Switch is a third generation, state-of-the-art level probe, designed to operate in tough industrial environments.

Principle of Operations

The probe of the Admittance Switch forms one plate of a capacitance circuit, with the vessel wall making the second plate. The dielectric constant of the product between the probe and the vessel wall will cause a change of capacitance as the level approaches the probe. The change is detected, amplified and used to switch a relay for indication or control purposes. A special circuit is used to ignore product build-up between the sensing probe (active element) and guard, and also between the guard and vessel wall.

Typical Uses

Failsafe high-level/low-level alarm
High-level alarm
Low-level alarm
Blocked chute/Plugged chute
Interface detection
Pump control

Function

Point level switch for liquids, solids and powders. High temperature version to 450°C (842°F). Suitable for a broad range of products and dielectric constants.

Primary Areas of Application

- | | |
|-------------------|----------------------|
| - Asphalt | - Packaging |
| - Brewing | - Paint |
| - Cement | - Paper |
| - Chemical | - Pharmaceutical |
| - Dairy | - Plastics |
| - Edible oil | - Power Generation |
| - Fertilizer | - Refining |
| - Food & Beverage | - Semiconductor |
| - Glass | - Sugar |
| - Mining & Metals | - Textile |
| - Oil & Gas | - Water & Wastewater |



Features:

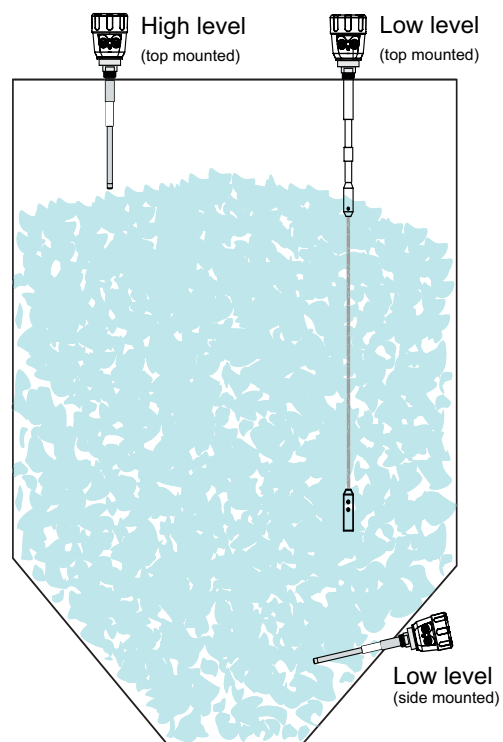
- Excellent immunity to product build-up
- Excellent temperature stability - no false trips
- Non contact switching possible with many products
- Simple '1-minute' setup
- Remote sensor or Smart 'all in one' types
- Relay outputs: Smart probe (1) Remote (2)
- Remote test function
- Adjustable ON and OFF delays (0-20 sec)
- Smart communication options: GosHawk, Modbus, HART, Profibus DP, DeviceNet
- Remote GSM Connection option
- Remote amplifier to probe separation up to 500 m (1640 ft)
- Bright visual status indication on Probe
- Independant housing alignment after mounting thread locked

Typical Applications

Continuous filling with build-up on probe



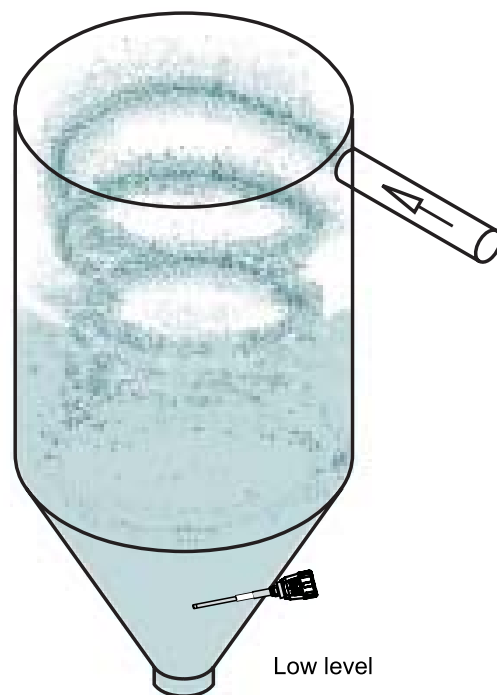
High and low-level switch in a hopper



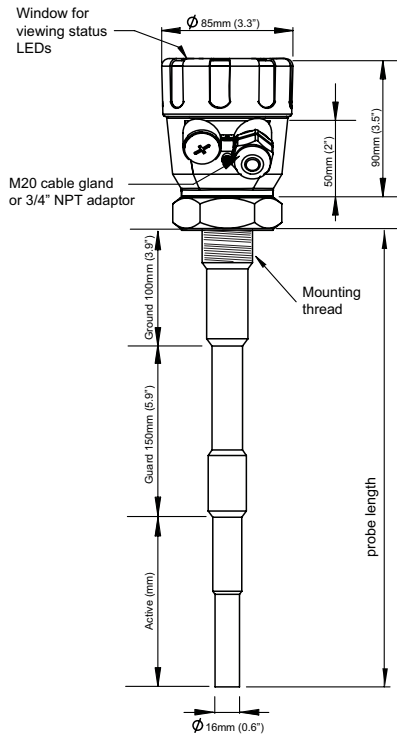
High level switch in grain application



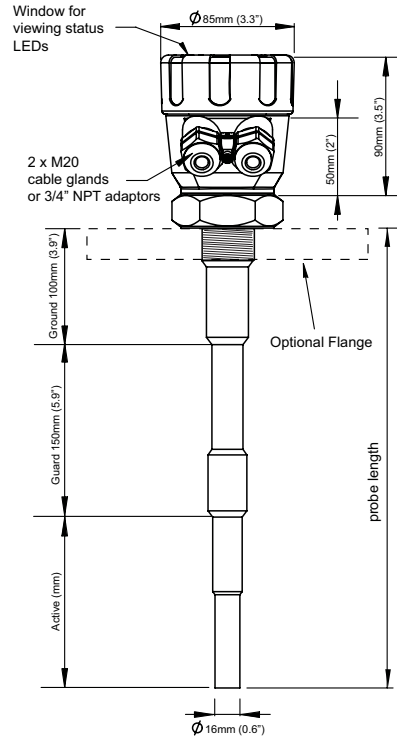
Cyclone bin level switch



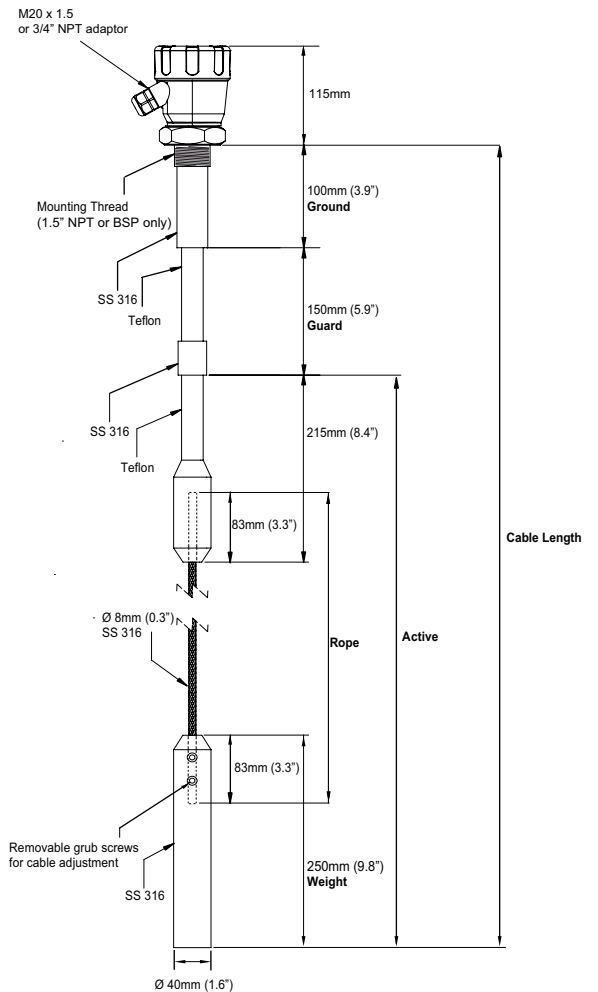
Remote Probe



Smart Probe



Flexible Cable Probe

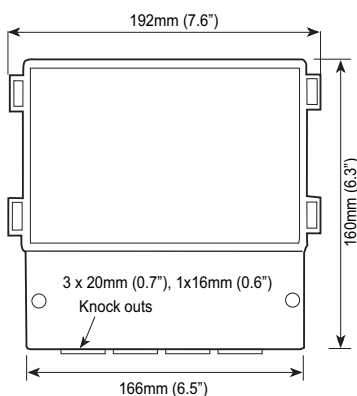


Probe Length (mm, inch)	Active	+	Guard + Ground
P30 (300mm, 11.8")	= 50mm, 2"	+	250mm, 9.8"
P50 (500mm, 19.7")	= 250mm, 9.8"	+	250mm, 9.8"
P100 (1000mm, 39.4")	= 750mm, 29.5"	+	250mm, 9.8"

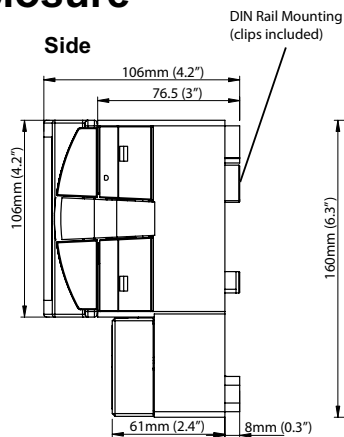
Cable Length (mm, inch)	Active	+	Guard + Ground	(Rope Length)
C100 (1000mm, 39.3")	= 750mm, 29.5"	+	250mm, 9.8"	451mm, 17.8"
C200 (2000mm, 78.7")	= 1750mm, 68.9"	+	250mm, 9.8"	1451mm, 57.1"
C300 (3000mm, 118.1")	= 2750mm, 108.3"	+	250mm, 9.8"	2451mm, 96.5"

Remote Amplifier Enclosure

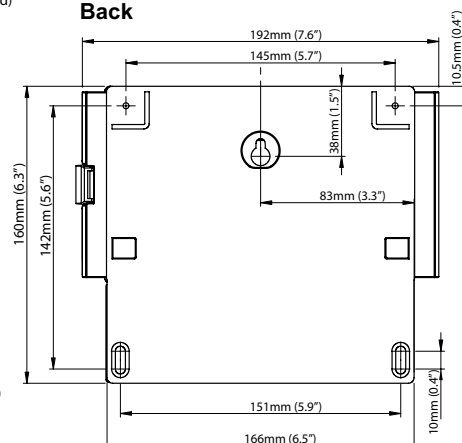
Front



Side

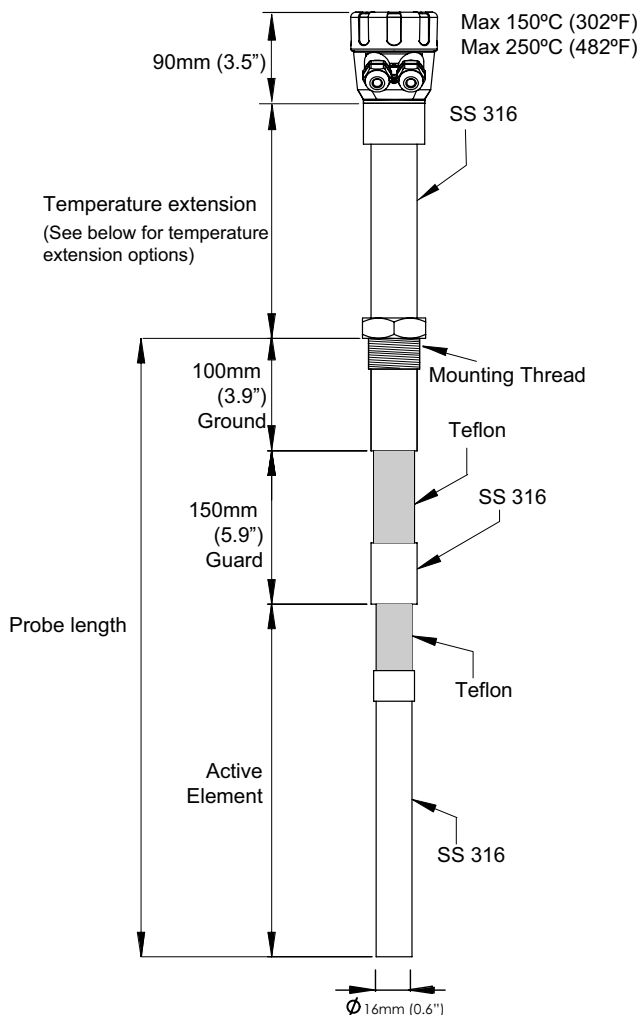


Back

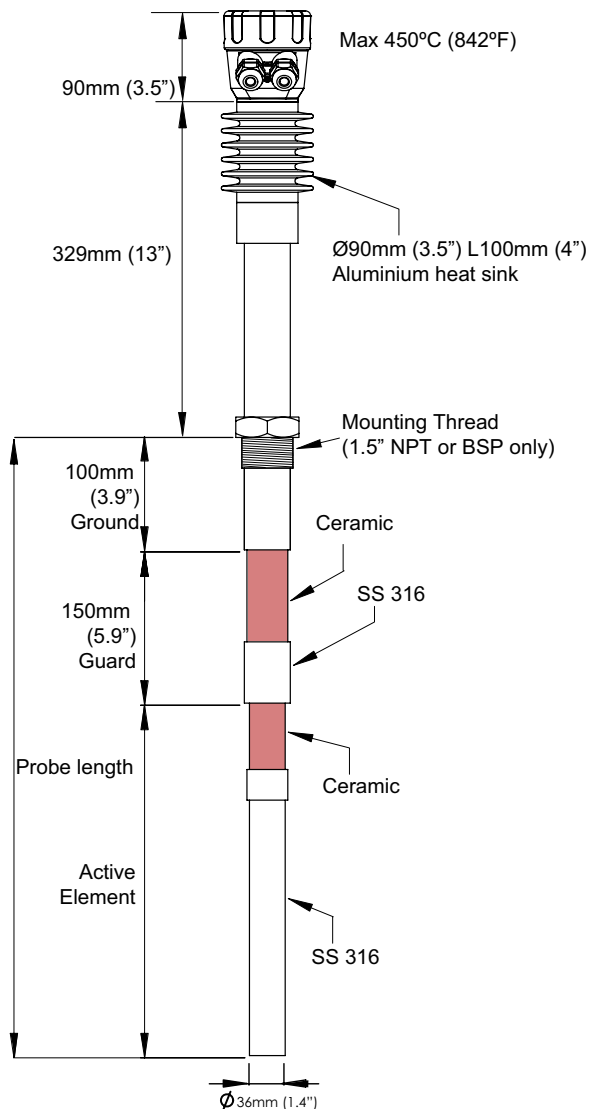


Dimensions

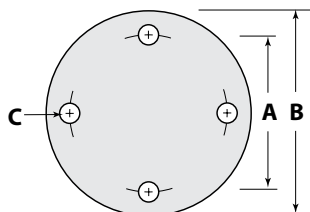
High Temperature Probe (<250°C, <482°F)



High Temperature Probe (450°C, 842°F)



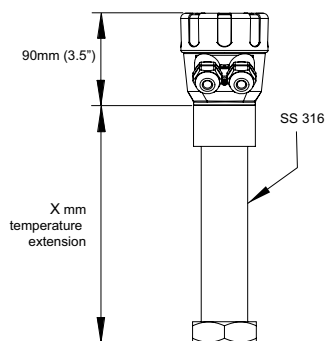
Optional Flange



Flange Dimensions - 50mm (2")			
	A	B	C
ANSI (Class 150)	120.7 4.75"	152.4 6"	19.1 0.75"
DIN (PN40)	125 4.9"	165 6.5"	18 0.7"
JIS (10K)	120 4.7"	155 6.1"	19 0.75"

High Temperature Extensions

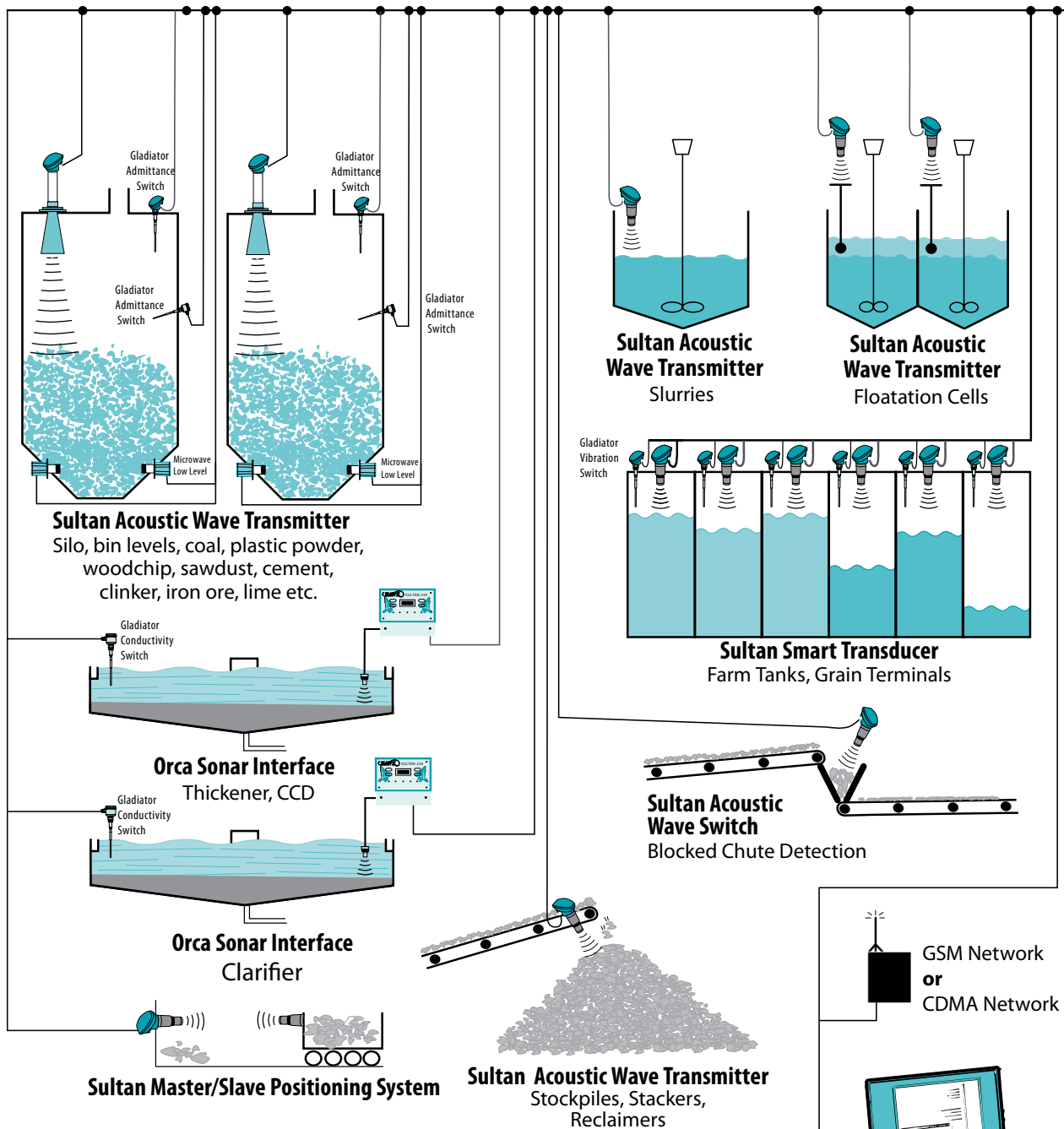
Remote Probe or Smart Probe (<250°C, 482°F)



X mm:
 Max. 80°C (176°F) ~ no temperature extension required.
 Max. 150°C (302°F) ~ 150mm (5.9")
 Max. 250°C (482°F) ~ 250mm (9.8")

For the 450°C (842°F) Probe, a different extension applies.

Multidrop Connections



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.

Laptop or PC Communications
or PLC / DCS with
MODBUS RTU Port
GosHawk Software for
inventory monitoring on PC

(Limited Modbus query rate for Switches only)

Smart Probe Wiring

Remove Plug-In terminal block for easier wiring.



The AC earth/ground cable must be connected to the ground screw inside the housing when using AC power.

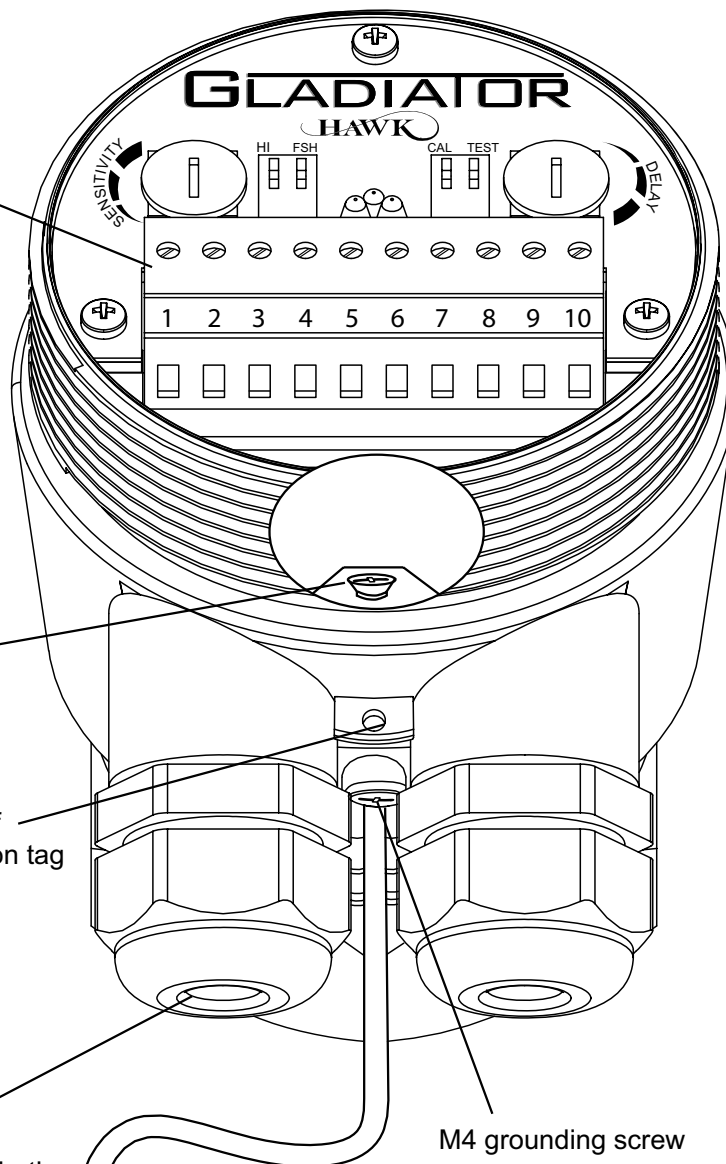
Hole for securing of optional identification tag

M4 grounding screw

If only one cable is used for both power and output signal, then the second entry port must be plugged or blinded. Every Smart unit is supplied with two M20 glands (or 3/4"NPT adaptors) mounted on the unit and one blind plug loose.



Ground the housing to vessel, if vessel is metallic.
Ground the housing to plant ground, if vessel is non-metallic.



GLADIATOR SMART PROBE TERMINAL LAYOUT

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		80-265 VAC	

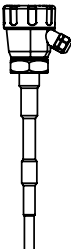
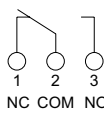
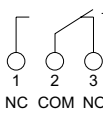


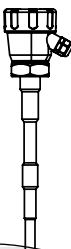
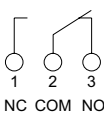
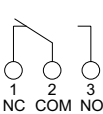


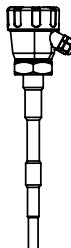
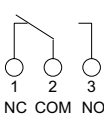
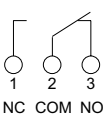


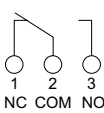
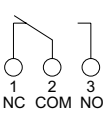


Relay Functions

Level Switch Contact Action

Relay - for Smart Probe Version
(Set Relay Action selection switch)

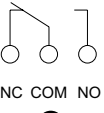
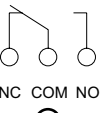
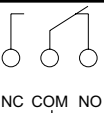
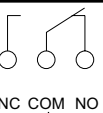


Relay 1 - for Remote Version
(Set 'Relay Action' parameter)

*It is possible for the Gladiator to switch state before actual product contact with the probe. State 2 represents product being detected by the probe, even if it occurs without contact.

		Relay Action	
		FailSafe Low FSL	FailSafe High FSH (default)
State 1  RISING LEVEL (not detected)	 1 2 3 NC COM NO	 1 2 3 NC COM NO	Relay Status Smart Probe terminal numbers Remote Amplifier terminal function labels LED Status
			
State 2  CONTACT LEVEL (detected)	 1 2 3 NC COM NO	 1 2 3 NC COM NO	
			
State 1  FALLING LEVEL (not detected)	 1 2 3 NC COM NO	 1 2 3 NC COM NO	
			
POWER FAILURE	 1 2 3 NC COM NO	 1 2 3 NC COM NO	
			

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.

POWER FAILURE OR INTERNAL FAILURE	 1 2 3 NC COM NO	 1 2 3 NC COM NO	
SYSTEM OPERATING NORMALLY	 1 2 3 NC COM NO	 1 2 3 NC COM NO	
			

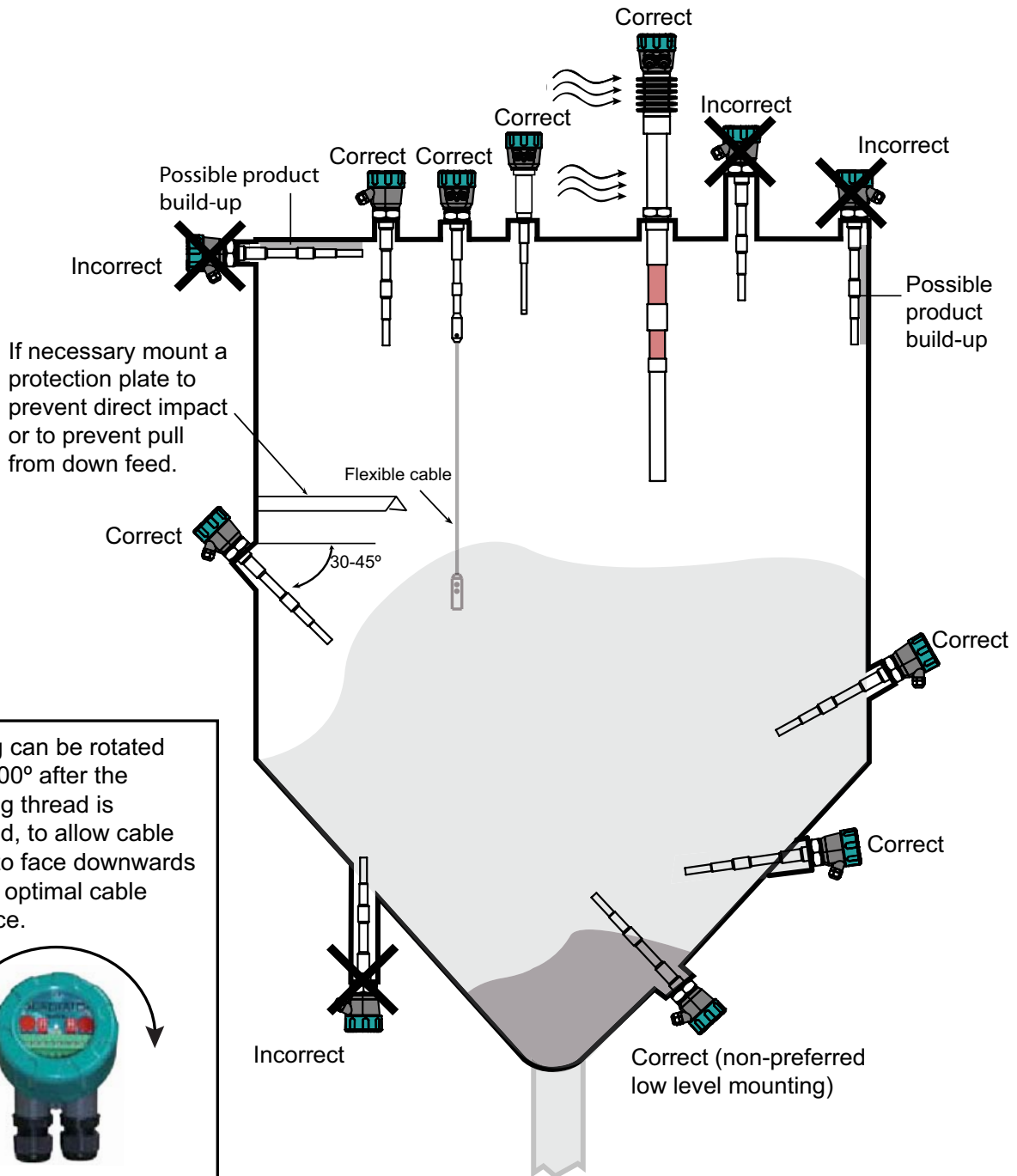
Mounting Examples

Mounting

Probes can be mounted from above or from the side.

Use a protection plate for side mounting where the probe may be subject to impact damage.

Install the Probe far enough away from the vessel wall to prevent the probe from coming into contact with the wall, and prevent build-up of product from bridging the probe to the wall over time.

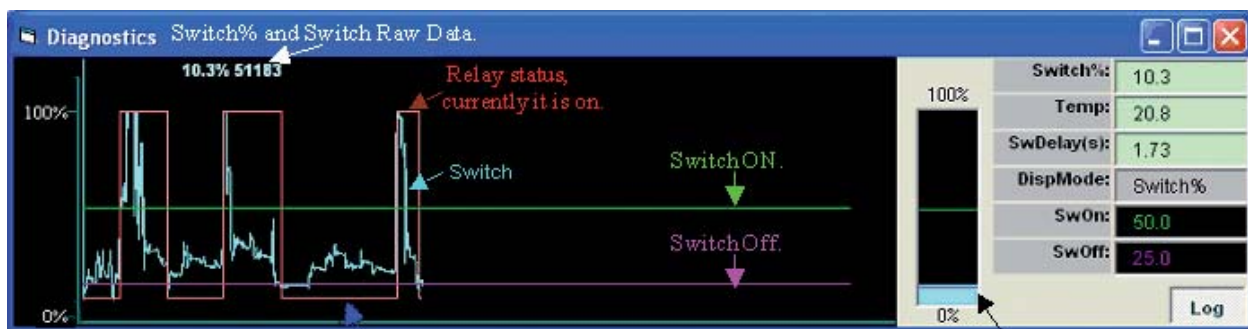


Advanced Remote Communication

GSM/CDMA Communication

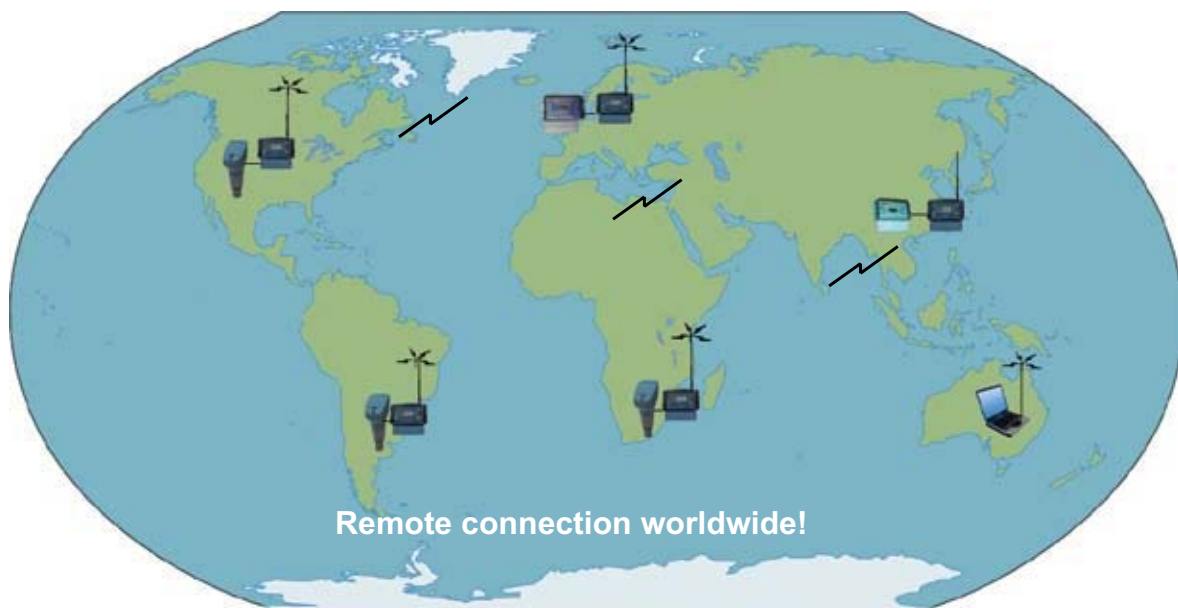
HawkLink GSM/CDMA communication device allows any authorized computer with a standard modem and GosHawk software to dial in and calibrate, test or check on the performance of the connected Hawk product. The HawkLink device can be wired to the standard communication terminals of the Hawk products.

Remote technical support and complete commissioning of equipment in applications via our GSM/CDMA module allows monitoring and adjustments of settings no matter what corner of the world.



Relay status currently is off

Switch status bar



Remote connection worldwide!

Smart Probe Version

Smart Probe

AS2100 Gladiator Admittance Switch - Smart Probe

Power Supply

- B** 24 Vdc standard (7-30Vdc)
- U** Universal AC power supply (80-260Vac input) and 7-30Vdc

Output Options

- S** Switch only, 1 level relay, Modbus
- Z** Special Request

Housing

- S** Standard Powder Coated, Diecast with glass lid
- C** Corrosion Resistant, Stainless Steel Housing

Guard Length (excludes 100mm ground length)

- 1** 150 mm (5.9")
- Z** Special Request

Temperature

- 1** Maximum 80°C (176 F)
- 2** Maximum 150°C (302 F), temperature extension length 150 mm (5.9"), Teflon insulation
- 3** Maximum 250°C (482 F), temperature extension length 250 mm (9.8"), Teflon insulation
- 4** Maximum 450°C (842 F), temperature extension length 350 mm (13.7"), Ceramic insulation

Probe Type

- 1** Standard rod (non-insulated)
- 2** Insulated rod
- 3** Cable (non-insulated)

Mounting

- TN07** 3/4" NPT Thread (not available with high temp ceramic version)
- TB07** 3/4" BSP Thread (not available with high temp ceramic version)
- TN10** 1" NPT Thread (not available with high temp ceramic version)
- TB10** 1" BSP Thread (not available with high temp ceramic version)
- TN15** 1.5" NPT Thread
- TB15** 1.5" BSP Thread
- TZ** Special Thread Request
- FA2** 2" Flange ANSI (Class 150)
- FD2** 2" Flange DIN 50 (PN 40)
- FJ2** 2" Flange JIS (10K)
- FZ** Special Flange Request

Approvals

- A22** ATEX 22 (Pending)
- X** Standard CE Approved

(P)Probe (C)Cable Length

- P30** - 300 mm (11.8")
- P50** - 500 mm (19.6")
- P100** - 1000 mm (39.3")
- C100** - 1000 mm (39.3")
- C200** - 2000 mm (78.7")
- C300** - 3000 mm (118.1")
- For longer consult factory

AS2100 **B** **S** **S** **1** **1** **1** **-** **TB15** **X** **P30**

Remote Version

Remote Probe

AS2200 Remote Gladiator Admittance Probe

Housing

- S** Standard Powder Coated, Diecast with glass lid
- C** Corrosion Resistant, Stainless Steel Housing

Guard Length (excludes 100mm ground length)

- 1** 150 mm (5.9")
- Z** Special Request

Temperature

- 1** Maximum 80°C (176 F)
- 2** Maximum 150°C (302 F), temperature extension length 150 mm (5.9"), Teflon insulation
- 3** Maximum 250°C (482 F), temperature extension length 250 mm (9.8"), Teflon insulation
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- TN10** 1" NPT Thread (not available with high temp ceramic version)
- TB10** 1" BSP Thread (not available with high temp ceramic version)
- TN15** 1.5" NPT Thread
- TB15** 1.5" BSP Thread
- TZ** Special Thread Request
- FA2** 2" Flange ANSI (Class 150)
- FD2** 2" Flange DIN 50 (PN 40)
- FJ2** 2" Flange JIS (10K)
- FZ** Special Flange Request

Approvals

- A22** ATEX 22
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(P)Probe (C)Cable Length

- P30** - 300 mm (11.8")
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- C200** - 2000 mm (78.7")
- C300** - 3000 mm (118.1")
- For longer consult factory

Remote Amplifier

GSA Remote Gladiator System Amplifier

Housing

- S** Standard polycarbonate electronics housing

Power Supply

- B** 24 Vdc standard (12-30Vdc)
- C** 48Vdc
- U** Universal AC power supply (80-260Vac input) and 7-30Vdc

Output Options

- S** Switch only, 1 level relay, 1 failsafe relay, Modbus
- I** HART Isolated, 1 level relay, 1 failsafe relay
- D** Profibus DP, 1 level relay, 1 failsafe relay
- P** DeviceNet, 1 level relay, 1 failsafe relay
- Z** Special Request

GSA **S** **B** **S**

AS2200 **S** **1** **1** **1** **-** **TB15** **X** **P30**

Specifications

Operating Voltage

- 7 - 30Vdc (residual ripple no greater than 100mV)
- 80 - 260Vac 50/60Hz

Power Consumption

- <0.8W @ 24Vdc
- <5VA @ 240Vac
- <3VA @ 115Vac

Communications

- GosHawk, Modbus
- Remote version also with HART, Profibus DP and DeviceNet (options)
- Multidrop mode can address 1-250 units over 4 wires

Relay Output: (1) SMART (2) Remote

- Form 'C' (SPDT) contacts, rated 5A at 240Vac resistive
- Remote failsafe test facility for one relay.

Measurement Range

- 0.2pF - 100nF

Resolution

- 0.01 pF

Electronic Accuracy

- 0.05 pF

Stability

- 0.01% / °C

Operating Temperature

- Remote electronics -40°C (-40°F) to 80°C (176°F)
- Smart Probe -40°C (-40°F) to 450°C (842°F)*
- Remote Probe -40°C (-40°F) to 450°C (842°F)*

Probe/Amplifier Separation

- up to 500m (1640ft) using specified extension cable

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 (1640 ft)
- Max: DEKORON IED183AA002 = 350m (1150 ft)

Maximum Operating Pressure

- 2 BAR

Display (Remote version only)

- 2 line x 12 character alphanumeric LCD
- Backlight standard

Memory - Remote

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

Enclosure Sealing

- Smart Probe IP67
- Remote Electronics IP65 (Nema 4x)
- Remote Probe IP67

Cable Entries

- BSP process mounting
- 2 x M20 Glands
- NPT process mounting
- 2 x 3/4" NPTF threaded adaptors
- Remote
- 3 x 20mm (0.8"), 1 x 16mm (0.6") knock outs.

Mounting

- 3/4" NPT or BSP Thread
- 1" NPT or BSP Thread
- 1.5" NPT or BSP Thread
- 50mm (2") Flange (ANSI, DIN or JIS patterns available)

Remote Test Input

Press to test (used to check for malfunction of unit from remote position, PLC, SCADA etc)

Dielectric Constants Table

Please see www.hawkmeasure.com or consult the Gladiator manual.

*correct temperature range probe must be specified when ordering

Additional product warranty and application guarantees upon request.

Technical data subject to change without notice.

Contact

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