SGL-FS10 Frequency-Sweep Smart Level Switch

Point level detection unaffected by foam, build-up, flow, turbulence or suspended solids



SGL-FS10 uses frequency-sweep measurement to detect whether a medium is present at the probe, based on its dielectric constant (DK). It works in liquids, solids and slurries. The PEEK probe with G1/2 thread can be fitted anywhere on a tank or pipe for high / low level alarms and pump dry-run protection.

Key facts

- Frequency-sweep principle; detects media with DK ⩾ 1.5
- Response time 0.2 s, repeatability ±1 mm
- Process temperature −40 to 115 °C (heat-sink version −40 to 150 °C)
- Process pressure −0.1 to 10 MPa
- 12–30 VDC supply; NPN / PNP / PWM output
- IP67; M12 4-pin connector or 4-core cable

Advantages

Wide application Liquids, solids and slurries

Ignores foam Foam layers can be set to be ignored

Build-up immune Works with sticky conductive slurries and viscous media

Compact Short probe for tight spaces

Wetted materials PEEK probe with 304 / 316L stainless steel, Ra < 0.8 µm

Easy setup Set switch points and read process values with a handheld programmer

Media recognition PWM output tracks changes in the medium's DK value

Wide temperature Standard 115 °C, heat-sink version 150 °C

Mounting versions

ID 0 • Standard
G1/2 thread behind the probe, hex S22, overall length 99 mm

ID 1 • Reverse
G1/2 thread on the rear body; Ø27 shoulder with 24 mm flats at the probe base, overall length 99 mm

ID 2 • Heat sink
G1/2 thread with heat-sink section, process up to 150 °C

Factory alarm points (AL1) and process value

Medium	Factory AL1	Note
Low-DK media	**250**	Alarm when process value PV ⩾ AL1
Water-based media	**550**	Default alarm point (order code D)
Conductive slurry	**720**	Can be set for your medium (order code C)

PV range 0–1000, factory-calibrated to about 100 with the probe in air and about 900 in tap water; alarm hysteresis 25.

Typical applications

Phase and interface detection
Detect different phases, such as oil on water, or set the sensor to ignore a foam layer.

Tank, buffer and pipe level
High / low alarms and filling control with a 0.2 s response time.

Contamination detection
Continuous DK monitoring shows when a product is diluted by cleaning fluid or water.

Pump dry-run protection
Alarms when the pipe runs empty, also with viscous or crystallising media.

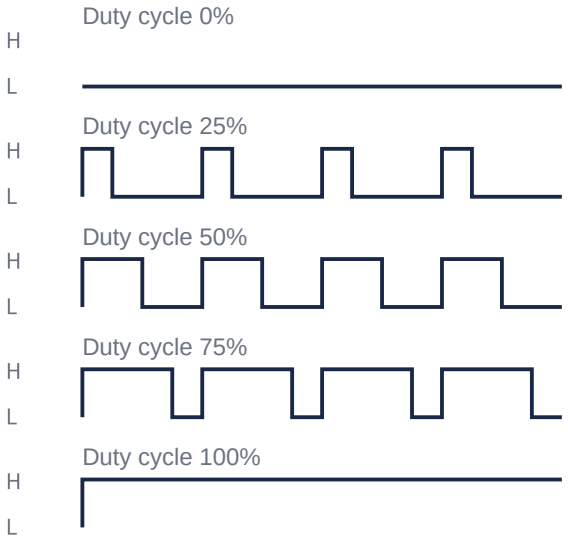
Principle and outputs

One sensor, several media

In PWM mode (software mode 4) the sensor outputs the medium's DK value as a duty cycle. Different media in the same line or tank — products, cleaning fluid, water — can be told apart for continuous measurement and product changeover.

Example: product changeover in a pipe

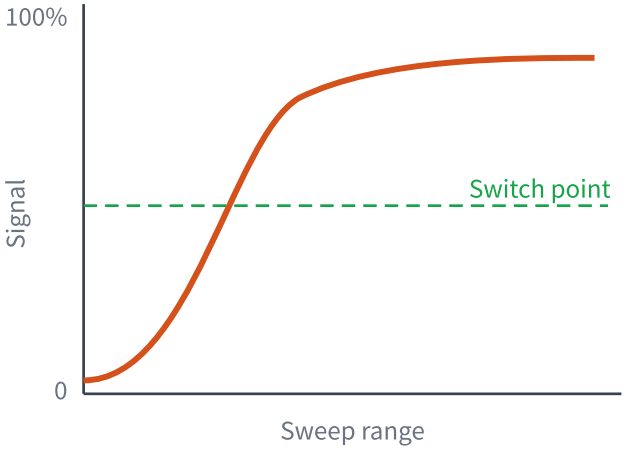
Dairy and beverage lines often separate two products with water. Because the PWM output tracks DK continuously, only the water-mixed section is drained and undiluted product is not wasted.



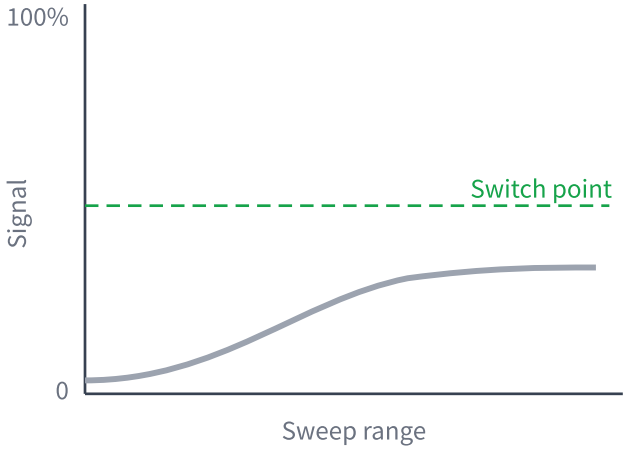
PWM output duty cycle (illustration)

Two media with similar DK

When two media have similar DK values, two switch points alone may not separate them. SGL-FS10 analyses how signal strength changes across the sweep, so it switches on the target medium and stays off on the other.



Medium A: switched (illustration)



Medium B: not switched (illustration)

Specifications

General	
Measuring principle	Frequency sweep
Hysteresis	±1 mm
Medium	DK ⩾ 1.5
Response time	0.2 s
Damping	0–5 s (adjustable)
Repeatability	±1 mm
Process conditions	
Process temperature (standard)	−40 to 115 °C
Process pressure (standard)	−0.1 to 10 MPa
Other connections	See operating conditions
Mounting position	Top, bottom, side
Materials	
Wetted parts	PEEK; 304 or 316L stainless steel
Wetted surface roughness	Ra < 0.8 µm
Housing	Stainless steel
Environment	
Ingress protection	IP67
Humidity	< 98 % RH, condensing
Ambient temperature	Cable −25 to 70 °C; M12 −40 to 85 °C
Storage temperature	Cable −25 to 70 °C; M12 −40 to 85 °C

Electrical connection	
Connection	4 × 0.5 mm² cable / M12 4-pin connector
Power supply	
Voltage	12–30 VDC
Start-up time	< 1 s
Current (no load)	8 mA typ., 40 mA max.
Reverse polarity protection	Yes
Dielectric strength	500 VAC
Output	
Output type	NPN / PNP / relay (external module)
Output logic	NO / NC
Voltage drop (typ.)	1.5 ± 0.5 V (Rload = 10 kΩ)
Output current	20 mA max.
Leakage current	< 100 µA
Short-circuit protection	Yes
Factory settings	
Damping	0 s
Alarm point AL1	Low-DK media 250; water-based 550; conductive slurry 720; alarm when PV ⩾ AL1
Process value PV	0–1000; calibrated to 100 in air and 900 in tap water
Alarm hysteresis	25
Parameter lock	Parameters cannot be changed until unlocked

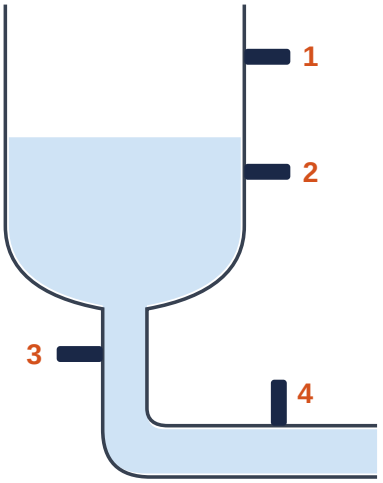
Operating conditions

Process connection	ID	Continuous temperature (ambient < 50 °C)	Continuous pressure	Max. temperature, 1 h (ambient < 50 °C)	Max. pressure, 1 h
G1/2 thread, standard	0	−40 to 115 °C	−0.1 to 10 MPa	135 °C	−0.1 to 10 MPa
G1/2 thread, reverse	1	−40 to 115 °C	−0.1 to 10 MPa	135 °C	−0.1 to 10 MPa
G1/2 thread, heat sink	2	−40 to 150 °C	−0.1 to 10 MPa	—	−0.1 to 10 MPa

Installation

- Can be fitted anywhere on a pipe or tank
- Tighten with a torque wrench at the chosen measuring point

① High level (tank wall, side-mounted)
② Low level (tank wall, side-mounted)
③ Dry-run protection (vertical outlet pipe, side-mounted)
④ Dry-run protection (horizontal pipe, top-mounted)



Ordering code

Example: SGL-FS10-P-0D-6LNM-G0

Field	Code	Description
Product	SGL-FS10	Frequency-sweep smart level switch
Output	N / P / R	NPN / PNP / relay (external module)
Software mode	0 / 1 / 2 / 4	Single alarm / dual alarm (NO + NC) / dual alarm (NO + NO) / PWM
Alarm point	D / C	Default (water) / customer-specified
Wetted material	04 / 6L	304 stainless / 316L stainless
Seal	N / C	No seal / specified seal material
Electrical	M / W	M12 A-coded 4-pin / 4-core cable 1 m
Process connection	G0 / S	G1/2 thread with standard probe / custom size

Reading the example: SGL-FS10 → P: PNP → 0: single alarm → D: default alarm point (water) → 6L: 316L → N: no seal → M: M12 connector → G0: G1/2 standard probe.

Selection and setup

Which media can it detect?

Liquids, solids and slurries with DK ⩾ 1.5. Alarm points are preset by medium class and can be specified with the order.

Will foam or build-up cause false alarms?

The frequency sweep tells foam and build-up apart from the real medium, and foam can be set to be ignored; use the 720 alarm point for conductive slurries.

Standard or heat-sink version?

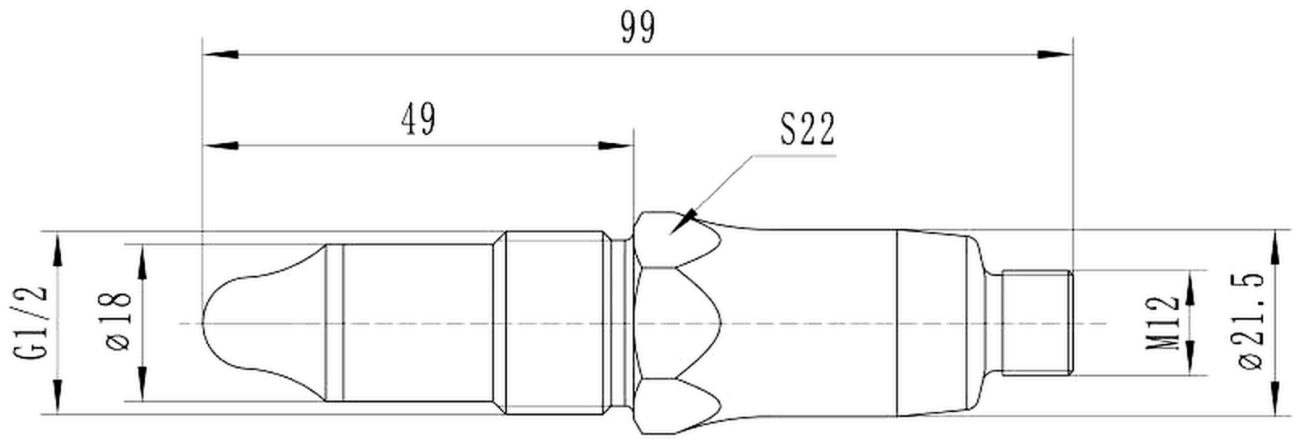
Up to 115 °C continuous, choose standard or reverse mounting (ID 0 / 1); up to 150 °C, choose the heat-sink version (ID 2).

Which output?

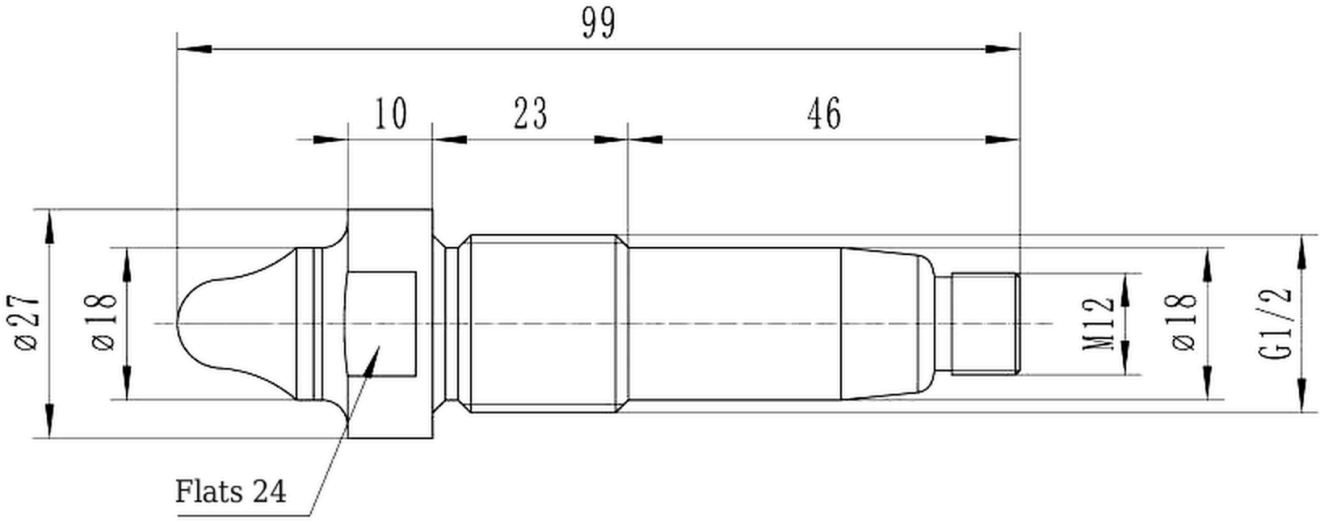
For high / low alarms choose single or dual alarm (software mode 0 / 1 / 2); to track a changing medium or separate several media, choose PWM (mode 4).

Dimensions (mm)

Standard mounting (ID 0)



Reverse mounting (ID 1)



Dimensions are for selection reference; the factory drawing applies. Other sizes and process connections on request.

Supply and service

- Samples of 1–5 pcs in 5–7 working days
- Volume lead time and MOQ confirmed with the quotation
- Selection and quotation within 24 hours on working days
- Private label and custom versions; 12-month warranty

Segmen Industrial Development Co., Ltd.
B01-306, Taizhong Industrial Zone, No. 5 Xinfeng Road, Longgang District, Shenzhen, China
www.segmensensor.com • info@segmensensor.com • +86 138 2870 4591

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