

FLATROCK

TLV Sensor

Tank Level Vision — non-contact optical level & distance sensor

0.02 m to 4 m range

±15 mm typical accuracy

1 mm resolution • 10 Hz update

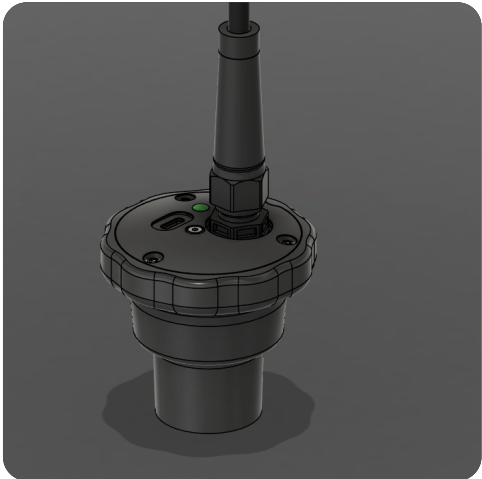
4-20mA • 0-20mA • 0-5V • 0-10V

1in NPT • -40 °C to 85 °C

The Flatrock Tank Level Vision (TLV) Sensor is a compact, non-contact level and distance sensor for tanks and vessels. It threads into a 1in NPT process connection on the top of the vessel, looks down at the liquid (or other target) surface, and reports the measured distance as a standard analogue process signal — no controller-side maths required.

Direct time-of-flight ranging over a narrow central cone is conditioned on-board by outlier rejection and adaptive (Kalman) filtering, yielding one stable distance value per update. That distance is mapped linearly onto the selected output span between a user-defined near point (DMIN) and far point (DMAX), clamped and invertible.

A USB-C port drives configuration from the Windows TLV Configurator app, or hosts a USB drive for standalone CSV logging. Settings persist in non-volatile memory.



Shown: TLV-S-N1-BK-1B

Housing, electronics, firmware, and software — all designed and assembled in-house in Albany, Oregon.

Key features

- **0.02 m to 4 m** non-contact range, 1 mm resolution, 10 Hz update rate.
- **Four selectable outputs** — 4-20mA, 0-20mA, 0-5V, or 0-10V.
- **On-board conditioning** — outlier rejection plus adaptive filtering for a stable reading.
- **USB-C configuration** via virtual COM port; no drivers required.
- **Standalone CSV logging** to a USB mass-storage drive when no host is connected.
- **Class 1 eye-safe** 940 nm infrared source (IEC 60825-1).
- **-40 °C to 85 °C** operating range in a splash-resistant polycarbonate enclosure.

At a glance

RANGE 0.02 m to 4 m	ACCURACY ±15 mm	RESOLUTION 1 mm	UPDATE RATE 10 Hz
SUPPLY 18 V to 36 V DC	FIELD OF VIEW 11° central	PROCESS CONN. 1in NPT	MASS 118 g

Typical applications

- Tank and vessel liquid-level measurement
- Continuous level feed to a PLC or DCS analogue input
- Bulk-storage inventory monitoring
- Non-contact standoff / presence sensing on equipment
- Retrofit level sensing on existing 1in NPT ports
- Field diagnostics via standalone CSV data logging

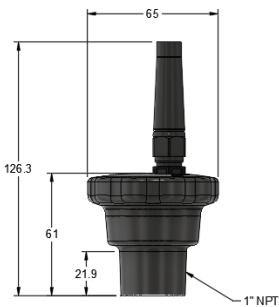
The TLV Sensor is not a safety device and must not be the sole means of preventing an overfill, collision, or other hazardous condition.

Specifications

Unless otherwise stated, values apply at 24 V DC supply and 25 °C ambient. Operate the sensor within the limits stated below.

Measurement		Configuration & logging	
Principle	Non-contact optical, direct time-of-flight (multi-zone)	Interface	USB-C virtual COM port (CDC), 115 200 baud, 8-N-1
Range	0.02 m to 4 m	Data logging	CSV to USB mass-storage drive; PC-side CSV also available
Resolution	1 mm	Settings retention	Non-volatile; restored on power-up
Ranging accuracy	±15 mm typical	Status indication	Single LED (solid green = fault-free)
Update rate	10 Hz nominal		
Signal conditioning	Outlier rejection + adaptive (Kalman) filtering		
Optical		Mechanical & materials	
Effective field of view	Approx. 11° (16° diagonal), central zones only	Process connection	1 in NPT (≈ 21.9 mm engagement)
Illumination source	Invisible infrared, 940 nm	Dimensions	65 mm × 65 mm × 61 mm (W × D × H) body, excl. gland
Laser safety	Class 1 per IEC 60825-1	Overall height	126.3 mm incl. gland and strain relief
Optical window	Polyetherimide (PEI)	Mass	118 g without cable
		Enclosure	Polycarbonate (PC), black or clear
		Wetted materials	PEI (window), PC (enclosure)
		Output cable	3-conductor 24 AWG (0.205 mm ²), shielded, 6.1 mm OD, igus chainflex
Analogue output		Cable length	1 m or 2 m; hardwired, bare end or connector
Output types	4-20mA, 0-20mA, 0-5V, 0-10V (user-selectable)		
Current-loop drive	Max. loop resistance 320 Ω at 20 mA		
Voltage-mode load	Min. 1000 Ω, high-impedance receiver		
Power supply		Environmental	
Nominal supply	24 V DC	Operating temperature	−40 °C to 85 °C
Operating range	18 V to 36 V DC (full performance)	Storage temperature	−40 °C to 85 °C, non-condensing
Absolute max. input	36 V — do not exceed	Ingress protection	Not formally rated; splash-resistant by design. Do not submerge
Supply current	≈ 100 mA at 24 V	Years of manufacture	From 2026
Surge immunity	Designed to IEC 61000-4-5 (not verified to the standard)		

Dimensions



All dimensions in millimetres.

Ordering information

TLV - S - N1 - BK - 1B		
Field	Code	Description
Family	TLV	Tank Level Vision Sensor
Variant	S	Standard
Process	N1	1 in NPT
Enclosure	BK	Black (polycarbonate)
	CL	Clear (polycarbonate)
	1B	1 m, bare end
Cable	2B	2 m, bare end
	1C	1 m, custom connector
	2C	2 m, custom connector

All combinations of the shipping options above are orderable (8 configurations). Example: TLV-S-N1-CL-2B is a clear-bodied unit with a 2 m bare-end cable.

FLATROCK	Contact	Document
626 Queen Ave SW Albany, OR, 97322, United States	Phone: +1 (971) 599-7164 Email: info@flatrocksystems.dev Web: flatrocksystems.dev	TLV Sensor datasheet, Rev 1.0 (2026-07-15) For installation, configuration, and service procedures, see the <i>TLV Sensor User Manual</i> .

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