

# DATA SHEET

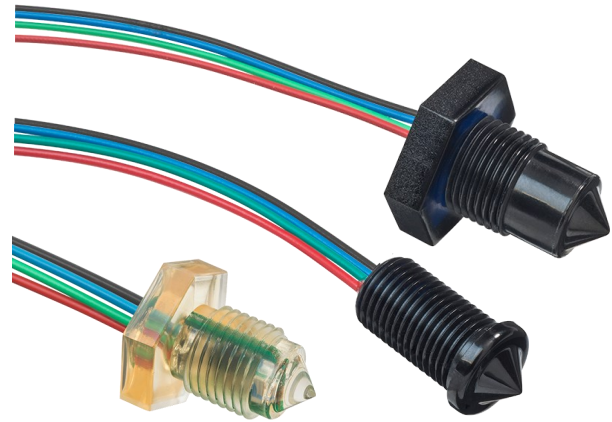
## Liquid Level Switches

### Optomax Digital 4-Wire Series



#### FEATURES

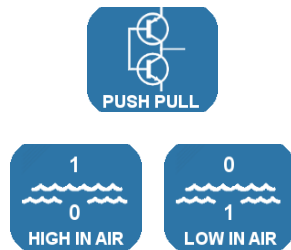
- Liquid level switches that can detect almost any liquid type; oil or water based
- Choice of material; Polysulfone (standard) or Trogamid®
- Choice of threads
- Separate LED wire allows auto test of sensor



#### Housing/ Mounting

- M10x1
- M12x1
- 1/4" NPT
- 1/2"-20 UNF

#### Output Type / Logic



#### Supply Voltage

4.5 - 15.4 V  
VOLTAGE

#### Output Current

UP TO 100mA  
CURRENT

#### Temp

-25°C to  
+80°C  
TEMPERATURE

#### BENEFITS

- Low power
- Low cost
- Compact design

#### OUTPUT VALUES

**Output Voltage<sup>c</sup> (Vout):** Iout = 100mA  
Output High Vout = Vs - 1.5V max  
Output Low Vout = 0V + 0.5V max

#### TECHNICAL SPECIFICATIONS

Supply voltage (Vs)	4.5V <sub>DC</sub> to 15.4V <sub>DC</sub>
Supply current (Is)	20mA max. (Vs = 15.4V <sub>DC</sub> )
Output sink and source current (Iout)	100mA
Operating temperatures	Standard: -25°C to +80°C
Storage temperatures	Standard: -30°C to +85°C
Housing material <sup>a, b</sup>	Polysulfone or Trogamid®
Sensor termination	24AWG, 250mm PTFE wires, 8mm tinned

Other sensor options available on request, email: [technical@sstsensing.com](mailto:technical@sstsensing.com)

**Need help? Ask the expert**  
Tel: + 44 (0)1236 459 020  
and ask for "Technical"



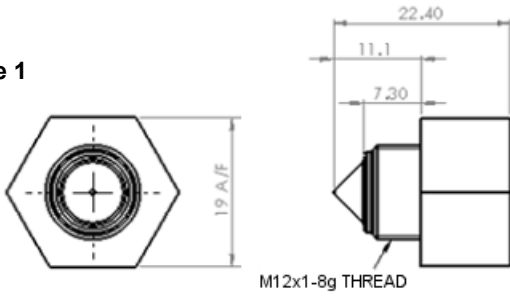
#### NOTES

- Above +85°C, Trogamid is suitable for use in water based liquids. Oil based liquids can cause deformation of the sensing tip and must be tested for compatibility.
- Before use check that the fluid in which you wish to use these devices is compatible either with Polysulfone or Trogamid®.
- Voltages applicable to output value stated.

## OUTLINE DRAWING

All dimensions shown in mm. Tolerances =  $\pm 1$ mm.

**Type 1**



**Type 2**



**Type 3**



**Type 5**



**Type 6**



**Type 7**



## HOUSING SPECIFICATIONS

	Housing Series		
	Type 1	Type 2	Type 3
Thread	M12x1-8g <sup>d</sup>		
Pressure <sup>g</sup>	7 bar / 101 psi maximum		
Tightening Torque	1.5 Nm / 13.26 in-lbs maximum		

	Housing Series		
	Type 5	Type 6	Type 7
Thread	M10x1	1/2"-20 UNF <sup>e</sup>	1/4" NPT <sup>f</sup>
Pressure <sup>g</sup>	20 bar / 209 psi max.	7 bar / 101 psi maximum	
Tightening	1.5 Nm / 13.26 in-lbs maximum		



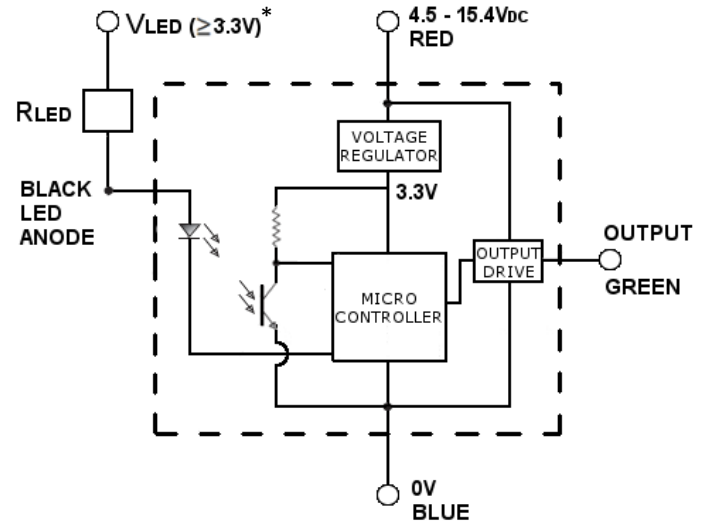
- d) Types 1, 2 and 3 can be sealed with washers and locknuts.
- e) Type 6 should be sealed with Parker 3-905 type o-ring.
- f) Type 7 should be sealed with PTFE tape.
- g) When correctly sealed.

Wire	Designation
Red	Vs
Green	Output
Blue	0V
Black	LED Anode

The black LED wire allows direct access to the anode of the sensor's infra-red LED. It must be connected via a suitable resistor (see NOTE 2 below) to  $V_{LED}$ .

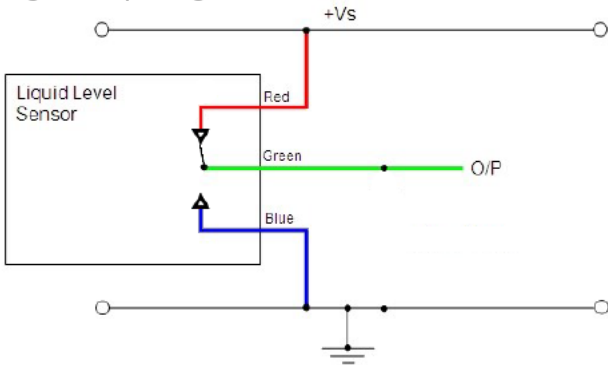
In normal operation, the sensor is operated with the 3.3V supply switched ON. However, in order to test that sensor is operating correctly when in air, the supply to the LED can be turned OFF ( $0V_{DC}$ ). When this happens, the LED produces no light and, because the internal detector receives no reflected light, the sensor behaves as if it is in liquid (the output voltage drops to  $0V_{DC}$ ).

In order to suit any application, these sensors have been designed with various output circuit configurations.

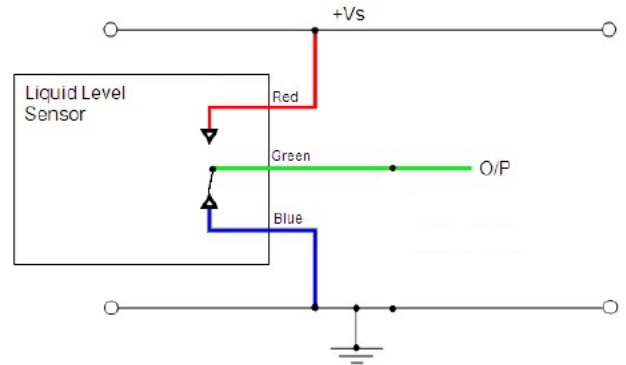


\* Capable of driving greater than or equal to 10mA.

**Digital Output High in Air**



**Digital Output Low in Air**



**CAUTION:** Take care when connecting loads.

The minimum load impedance should not be less than  $V_s/\text{max output current}$ .

**NOTE 1:** Shorting the output to  $V_s$  or  $0V$  may result in irreparable damage to the sensor.

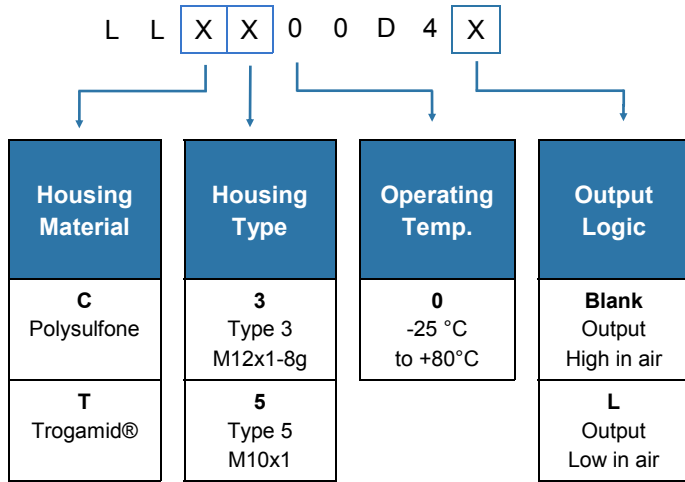
**NOTE 2:** You must select a suitable resistor for your chosen LED supply voltage. Forward voltage of LED is 1.3V and LED current should be 10mA (depending on application liquid). Therefore, for a supply of  $V_s = 5V$  for example:

$$R_{LED} = \frac{(V_s - 1.3)V}{10mA} = \frac{5 - 1.3}{0.01} = 370\Omega \approx 360\Omega \text{ (standard value)}$$

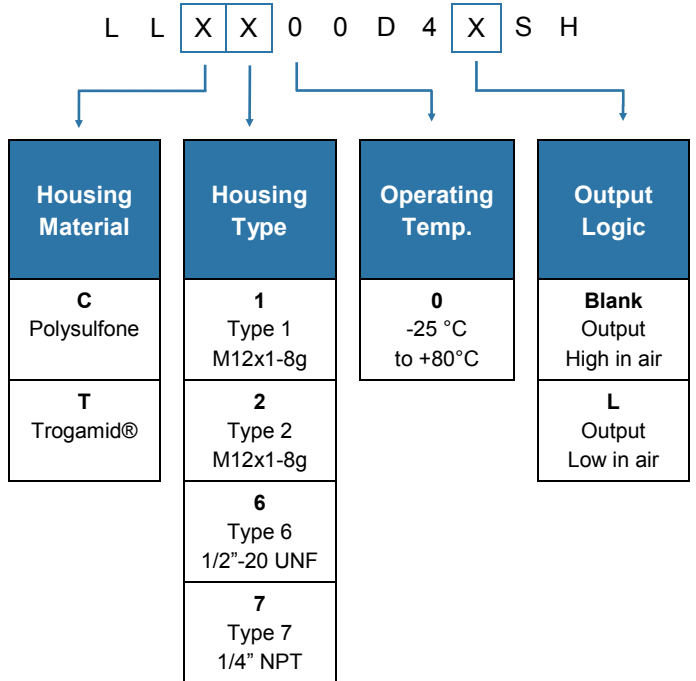
# ORDER INFORMATION

Generate your specific part number using the convention shown opposite. Use only those letters and numbers that correspond to the sensor and output options you require — omit those you do not.

## Sensor mounted from inside vessel



## Sensor mounted from outside vessel



### NOTES:

- Type 3 and Type 5 sensors are mounted internally.
- Types 1, 2, 6 & 7 sensors are mounted externally.
- SH suffix applicable to Types 1, 2, 6 & 7 sensors only; omit from Type 3 and Type 5 sensor part numbers.

Please contact SST Sensing for details; email: [technical@sstsensing.com](mailto:technical@sstsensing.com)

### CAUTION

Do not exceed maximum ratings and ensure sensor(s) are operated in accordance with their requirements.

Carefully follow all wiring instructions. Incorrect wiring can cause permanent damage to the device.

SST Sensing Ltd recommend using alcohol based cleaning agents. Do NOT use chlorinated solvents such as trichloroethane as these are likely to attack the sensor material.

**Failure to comply with these instructions may result in product damage.**

### INFORMATION

As customer applications are outside of SST Sensing Ltd.'s control, the information provided is given without legal responsibility. Customers should test under their own conditions to ensure that the equipment is suitable for their intended application. Before use, check that the fluid in which you wish to use these devices is compatible with Polysulfone or Trogamid®.

**For technical assistance or advice, please email:**  
[technical@sstsensing.com](mailto:technical@sstsensing.com)

**General Note:** SST Sensing Ltd. reserves the right to make changes to product specifications without notice or liability. All information is subject to SST Sensing Ltd.'s own data and considered accurate at time of going to print.