

TOUGHSONIC[®] CHEM 14

LIQUID OR SOLID CHEMICAL SENSOR



DESCRIPTION

CHEM series sensors and WhitmanVIEW software put the power of ultrasonics in your hands. Adjust, optimize, save and clone your applications quickly without calibration! These sensors are contained in a rugged, chemically inert PVDF sealed housing for long life. They mount above the material surface and measure distance downward without contact. All outputs respond simultaneously to the measured distance. Applications include pump control, bulk inventory, flumes/weirs, batch processing, water management and high/low level alarms.

FEATURES

Level Measurement

- Long and short measurement
- Temperature compensation
- Unaffected by liquid color, density and transparency
- Remotely adjustable via PC

Packaging & Performance

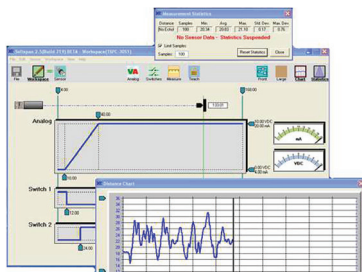
- Durable housing for long life
- Top and bottom thread mounts
- Short & overload protected I/O
- Adjustable filters compensate for tank mixers or turbulence
- Adjustable sensitivity

Functionality Beyond Sensing

Adjustable interface features like switch hysteresis and time delays offer solutions for basic level alarms and pump controls without additional hardware.

PC SETUP POWER!

Use Whitman VIEW software (see separate data sheet) to adjust all sensor features. View, analyze or log data to optimize your application. Setups are unaffected by power interruption.



Copy without Calibration

Application setups can be saved for future recall. From a single sensor inventory part you can quickly clone sensors, without recalibration, for any number of different field installations. replacement sensors for any number of applications with re-calibration!

CONNECTIONS

Serial Data Interface

Used for WhitmanVIEW setup or user device communication. Choose either an RS-232 or RS-485 model.

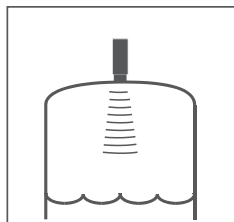
Analog Outputs (3)

Includes voltage (0-10 VDC) and two current loops (4-20 mA sinking and sourcing). Both output types have user-selectable voltage/ current ranges and endpoints for best resolution. The output slope is easily inverted.

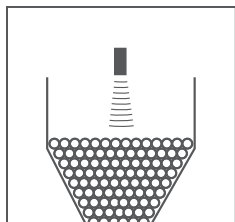
Switches (2)

Each switch is configurable as "PNP" or "NPN" type (sourcing or sinking), with adjustable set point, hysteresis, window, initial conditions, ON delay, OFF delay and loss of target response. These are commonly used for level controls and alarms.

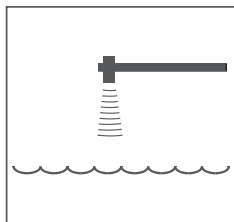
Level or Height



Solids Level



Environmental



PERFORMANCE SPECIFICATIONS

Optimum Range	10 ft. (3 m)	Max Range	14 ft. (4.3 m)
Deadband	Typ. < 3.5 in. (89 mm)	Adjustment	WhitmanVIEW software
Case Material	PVDF	Configuration	Stored in non-volatile memory
Temperature	-40 to 158 F (-40 to 70 C)	Outputs	Five selectable, plus serial data
Humidity	0 to 100% operating	Transducer	Rugged piezoelectric
Compensation	Temperature compensated	Protection	NEMA-4X, NEMA-6P, IP68
Resolution	Digital: 0.0034 in. (0.086 mm); Analog: 4099 steps (0-10 VDC), 3279 steps (4-20 mA)		
Repeatability	Closer than 50 in. (1.3m) ±0.008 in. (±0.2 mm); farther ±0.015% of range (flat perpendicular target)		
Update Rate	20 Hz (50 ms), WhitmanVIEW adjustable; affected by WhitmanVIEW filter selections		
Input Power	10-30 VDC, 50 mA maximum, not including switch and analog output currents when used		
Voltage Output	0-10, 0-5 VDC or PC customized; 10 mA max. (*)		
Current Loop #1	Current sourcing 4-20 mA or PC customized, max. loop 450Ω (*)		
Current Loop #2	Current sinking 4-20 mA or PC customized, max. loop 450Ω (*)		
Sinking Switch	150 mA max. @ 40 VDC max., teachable set point & polarity, fault indication		
Sourcing Switch	150 mA max. @ input voltage, teachable set point & polarity, fault indication		
RS-232, RS-485	Modbus and ASCII protocols, 9600-115200 baud (selectable), 8 data bits, 1 stop, no parity		

Target Requirements

Target	Detects flat or irregular surfaces. Target surface must reflect sound back to sensor.
Max. Distance	Affected by size, shape, orientation of target (sound level reflected back to sensor), environment Restrict use to Optimum Range when using over a wide range of environmental conditions
Granular Solids	De-rate max range by 50%; range affected by material density and orientation
Optical	Unaffected by target color, light level, transparency or other optical characteristics

CABLE CONNECTIONS

Cable	Wire	Description
Power	Brown	10-30 VDC, 50 mA maximum; Typical: 45 mA @ 24 VDC (**)
Ground	Blue	Power and interface common
Voltage Output *	Violet	0-10 VDC, 0-5 VDC or custom end values between 0 and 10 VDC
Current Loop Output *	Green	4-20 mA sourcing (adjustable end values between 4 and 20 mA)
Current Loop Output *	Orange	4-20 mA sinking (adjustable end values between 4 and 20 mA)
Switch #1 Output	Black	Sinking ("NPN") or Sourcing ("PNP"), user selected
Switch #2 Output	White	Sinking ("NPN") or Sourcing ("PNP"), user selected
RS-232 out / RS-485-	Gray	Serial data connection (depends on model - see model selection)
RS-232 in / RS-485+	Yellow	Serial data connection (depends on model - see model selection)

(*) Analog outputs share common distance endpoints. Both 4-20 mA outputs share the same adjustable max / min values.

The maximum loop resistance is derated below 15 VDC input voltage.

(**) At default update rate. Output currents not included. Sensitivity reduced below 15 VDC input voltage.

PART NUMBERS

Model Number	Description
LVL-140-232	RS-232 serial data interface
LVL-140	RS-485 serial data interface (allows addressable multi-sensor networks)
LVL-140-485A	RS-485 serial data only (allows addressable multi-sensor networks)

Whitman Controls offers accessories and special assembly options for OEM customers to suit specific needs.

DIMENSIONS

Mechanical

Mounting Threads:

Lower: 1.5 in. NPT

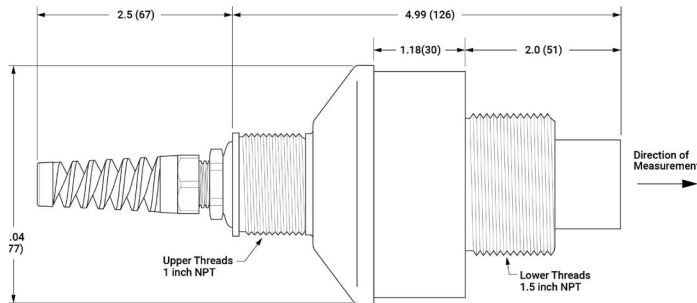
Upper: 1 in. NPT

Attached Cable:

PUR jacket, 6.5 ft. (2 m)
strain relieved

Weight:

21.2 oz. (0.60 kg)



All rights reserved. Specifications subject to change without notice. Whitman products are not recommended for applications with hazardous or explosive materials, or as a primary device for personal safety. Copyright 2024 Rev. 8_24

Whitman Controls, LLC

201 Dolphin Rd
Bristol, CT 06010

Phone: +860-583-1847

Fax: +1-860-583-5293

For Sales Inquiries, Contact:

sales@whitmancontrols.com

For Engineering Inquiries, Contact:

engineering@whitmancontrols.com

Call Toll Free Customer Service:

800-233-4401 Ext 120