

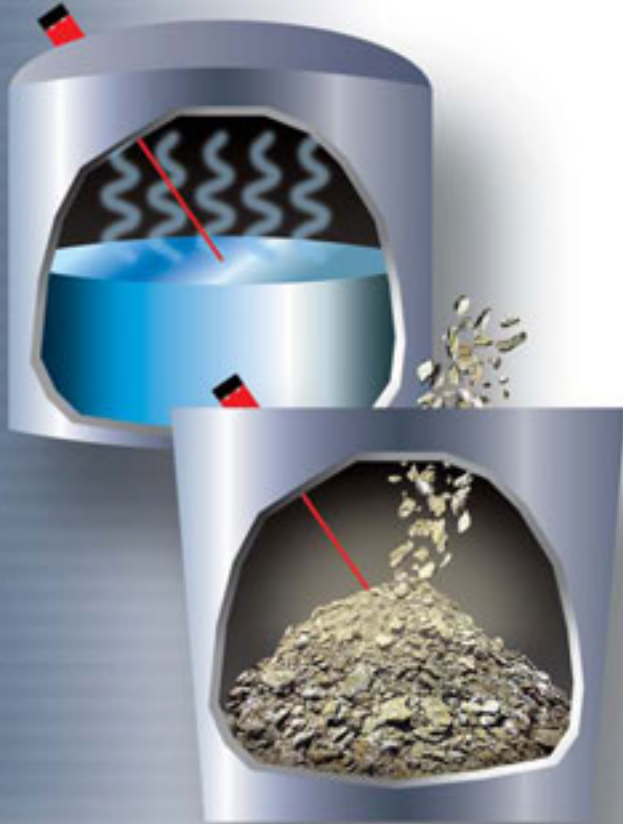
Optech 

HIGH PERFORMANCE LASER  
**LEVEL MONITORS**  
**OBJECT POSITIONERS**

Non-Contact  
**INDUSTRIAL  
LASER  
SOLUTIONS**



## THE LASER ADVANTAGE



The ultimate solution for industrial process challenges, Optech's laser rangefinders exploit the unique properties of light to produce precise, reliable, fast measurements. High update rates provide accurate measurements even when objects move quickly or material levels change rapidly. "Last-pulse logic" and internal windowing software filter out any false returns from obstacles passing between the rangefinder and the object or material.

### Optech Technology

- Rapid measurements, up to 15 readings per second
- Accurate, with absolute accuracies of 2-4 cm depending on the model
- Non-contact, non-intrusive measurements
- Measure through moderate amounts of dust, by using advanced software
- Narrow beam divergence for long-range tracking of small targets, accurate unit location/alignment, and to aim past obstacles

### Laser Measurements Are Unaffected By...

- Moderate amount of dust
- Mounting angle or orientation
- High temperature or temperature variations
- Background noise
- Vehicle vibration
- Vapor pressure
- Off-gas layers or steam
- Vacuum barriers
- Low dielectric constant of material

### Made to Measure!

- Factory-calibrated, ready to measure
- Quick to set up, easy to service – no plant down-time
- Low maintenance, no moving parts
- Completely eyesafe
- RS-232C, RS-422, and analog output compatible
- Rugged, industrial-rated, explosion-proof enclosures
- CSA, CE, and FM approved



**Typical Applications – Monitoring Liquids**

In the chemical, petrochemical, pharmaceutical and other industries, gauge tank levels are used for inventory control on low-dielectric crude and refined products such as:

- Liquid asphalt
- Polymerization reactor vessels (under high pressure)
- Reactor vessels (under vacuum)
- Molten glass
- Ferrous and non-ferrous metals and alloys

**Features/Benefits – Monitoring Liquids**

- Monitor turbulent or agitated slurries even when the unit is mounted at a high incident angle
- Ignore agitator blades and other obstacles with Optech's windowing software
- Detect the surface of a foam layer – unique capability
- High-accuracy inventory control without density correction
- Measure through narrow openings and limited views

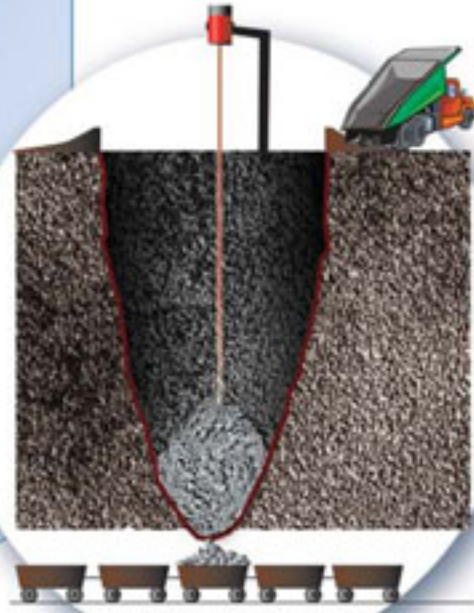
**Typical Applications – Monitoring Solids**

Report material levels for solids in bins, silos and stockpiles such as:

- Polystyrene, nylon and PRVC pellets
- Talc and lime powders
- Ore and muck in ore passes
- Wet or dry wood chips
- Stockpiled coal

**Features/Benefits – Monitoring Solids**

- Measure directly to any surface of a stockpile, cone or inverted cone profile
- Monitor virtually any bin or silo configuration
- Ideal for tall, narrow bins or tricky geometry, where internal structures impede other non-contact technologies
- Measure diffuse surfaces at oblique angles – Optech units are unaffected by angle of repose
- Measure reflective and non-reflective surfaces, ranging to the full extreme of bunker geometry
- Superior dust penetration in ranging to darker coarse mesh solids (e.g., coal) – use advanced software to penetrate dust, steam and other difficult environments
- Eliminate inferred readings from complex systems that change characteristics after commissioning



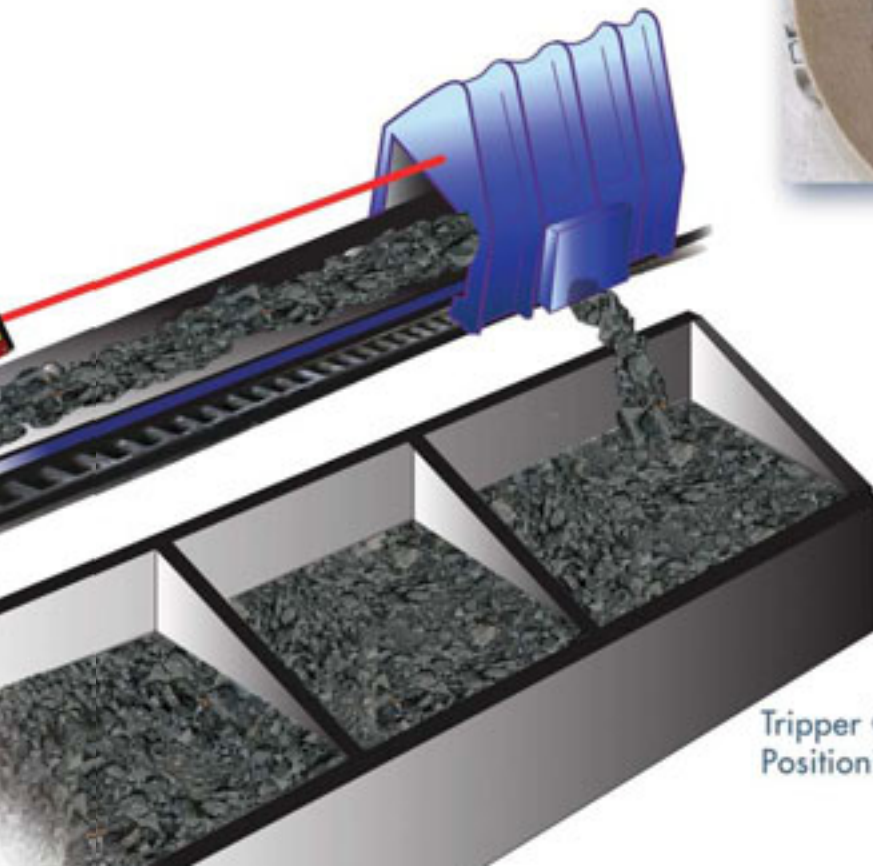
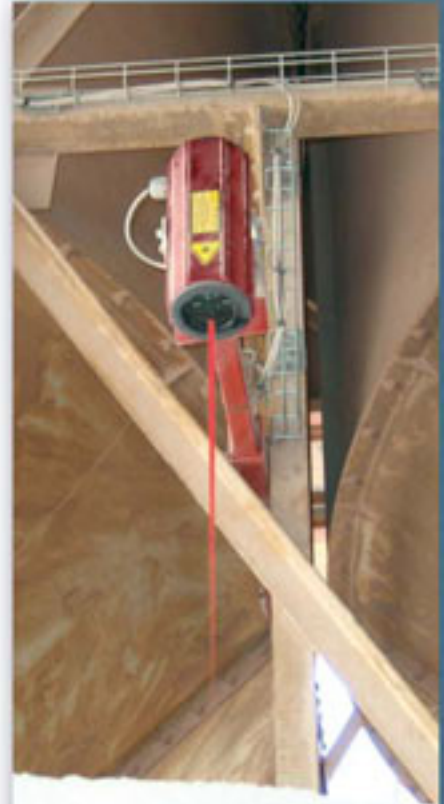
**Typical Applications**

Track the position of bulk material-handling equipment such as:

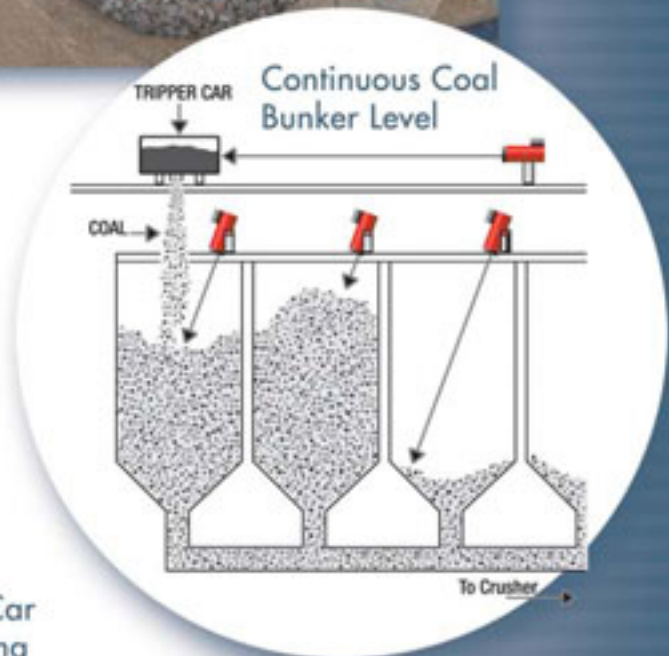
- Tripper cars
- Torpedo cars
- Plough feeders
- Cranes
- Stacker/reclaimers
- Ship loaders

**Features/Benefits**

- Track moving industrial objects such as conveyers and tripper cars
- Operate accurately and continuously in noisy, dusty, hot/cold environments
- Filter out obstacles in high-traffic areas between the unit and the tracked object
- Measure ranges from 0.4 meters to 250 meters – up to 1,500 meters with a retro-reflector
- Measure small targets at long range – narrow beam divergence keeps the focus tightly on your target
- Reduce costs by eliminating moving parts
- Increase safety by eliminating errors due to human intervention



Tripper Car Positioning



### The Optech Advantage

Optech is the global market leader in advanced laser-based rangefinding instruments, with clients world-wide. Optech has over 30 years of experience in pulsed laser radar (lidar) applications. We offer industry-tested solutions in topographic mapping, hydrographic applications, laser imaging, space-based atmospheric monitors and landing/docking systems, as well as industrial rangefinders.



### Sentry Series

The Sentry SR series is the latest in laser technology, designed for both level monitoring and object positioning. It operates at short ranges of up to 25 meters (82 feet), and is housed in a rugged, explosion-proof enclosure.

### Watchman Series

The Watchman series of non-contact object positioners measures reliably in extreme conditions and at long ranges of up to 250 meters (820 feet), or 1,500 meters with a co-operative target (using reflectors). High-speed data acquisition technology tracks fast-moving objects accurately even at long range.

### Sentinel Series

The Sentinel series of non-intrusive, non-contact level monitors meets inventory control challenges reliably and accurately. The Sentinel monitors material levels in simple or complex vessel applications, providing high performance at ranges of up to 150 meters (500 feet).



## SENTRY

<b>Range<sup>1</sup></b>		
Maximum	25 m	
To reflector	Not applicable	
Minimum	0.4 m	
<b>Accuracy</b>		
	<b>CP Model</b>	<b>DV Model</b>
Absolute <sup>2</sup>	≤ 2 cm	≤ 4 cm
Operation <sup>3</sup>	≤ 5 mm	≤ 25 mm
Repeatability <sup>4</sup>	≤ 3 mm	≤ 4 mm
Resolution	1 mm	
<b>Laser</b>		
Infrared (IR)	905 nm wavelength	
Visible pointer	650 nm wavelength	
Eyesafety (IR)	Class 1 (US FDA 21 CFR 1040) Class 1M (IEC 60825)	
Beam divergence	4 mrad (0.23°)	
<b>Environmental</b>		
Operating temperature	0°C to 50°C, Options: 150°C, -40°C	
Storage temperature	-40°C to 70°C	
<b>Power</b>		
Input consumption @ 24 VDC	24 VDC, 120 VAC, 220 VAC 10 W max	
With heater	101 W max	
<b>Output</b>		
Maximum update	5 readings per sec	
Minimum update	1 reading per 60 sec	
Digital	RS-232C, HART <sup>6</sup>	
Analog <sup>5</sup>	4-20 mA, max load 1,500 ohms; 1,500 VDC isolation	
Relays	Programmable for range (set/reset/alarms)	
<b>Enclosure</b>		
Protection	NEMA 4 IP65	
Approvals	FM, CE, CSA, ATEX <sup>6</sup>	
Hazardous area classifications		
Class I, Div 1 & Div 2 Grps B,C,D		
Class II, Div 1 Grps E,F,G - Class III, Div 1 & 2		
Class 1, Zone 1 & 2, Grps IIB + Hydrogen		

<b>Physical</b>	
Dimensions	305 (L) x 127 (W) x 127 (D) (mm)
Weight	6.2 kg

- (1) Maximum range is typical and depends upon target reflectance, vessel and environmental conditions (e.g., dust), background radiation, and any sightglass rating. Consult factory for details.
- (2) At a measurement rate of 1 reading per second, the specified accuracy is absolute over the full temperature range, with a variety of materials and at any distance, within 1 standard deviation.



## WATCHMAN and SENTINEL

<b>Range<sup>1</sup></b>		<b>Watchman</b>	<b>Sentinel</b>
Maximum		250 m	150 m
To reflector		1,500 m	n/a
Minimum		0.2 m	0.2 m
<b>Accuracy</b>		<b>Watchman/ Sentinel CP Model</b>	<b>Sentinel DV Model</b>
Absolute <sup>2</sup>		≤ 2 cm	≤ 4 cm
Operation <sup>3</sup>		≤ 5 mm	≤ 25 mm
Repeatability <sup>4</sup>		≤ 3 mm	≤ 4 mm
Resolution		1 mm	
<b>Laser</b>		905 nm wavelength	
Infrared (IR)		635 nm wavelength	
Visible pointer		Class 1	
Eyesafety (IR)		(US FDA 21 CFR 1040)	
Beam divergence		5 mrad (0.28°)	
<b>Environmental</b>		-10°C to 50°C, Options: 150°C, -40°C	
Operating temperature		-40°C to 70°C	
Storage temperature		-40°C to 70°C	
<b>Power</b>		24 VDC, 120 VAC 36 W max	
Input consumption @ 24 VDC		101 W max	
With heater		101 W max	
<b>Output</b>		15 readings per sec	
Maximum update		1 reading per 5 sec	
Minimum update		RS-232C, RS-422	
Digital		4-20 mA, max load 1,000 ohms; 1,000 VDC isolation	
Analog <sup>5</sup>		1,000 VDC isolation	
<b>Enclosure</b>		NEMA 4 IP67	
Protection		FM, CE, CSA	
Approvals		FM, CE, CSA	
Hazardous area classifications		Class I Div 2 Grps A,B,C,D	
Class I Div 2 Grps A,B,C,D		Class II Div 1 Grps E,F,G, Class III	
Class II Div 1 Grps E,F,G, Class III			

<b>Physical</b>	
Dimensions	280 (L) x 205 (W) x 155 (D) (mm)
Weight	7 kg

- (3) At a measurement rate of 1 reading per second, the specified accuracy depends on limited variations in temperature, material and distance associated with the installation.
- (4) At a measurement rate of 1 reading per second, under steady state conditions, and within one standard deviation.
- (5) Analog accuracy is equal to absolute or operating accuracy ± 0.1% of range.
- (6) Pending

Now ATEX approved



II 2 GD Ex d II B + H<sub>2</sub> T6 T85°C IP66

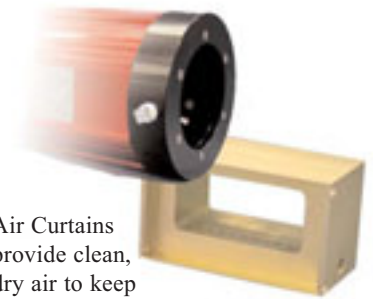
## ACCESSORIES and OPTIONS



Hand-Held Remote Display



Sentry Cooling Plate: For high temperature applications.



Air Curtains provide clean, dry air to keep window clean.



Flange Kit: Sightglass, mounting brackets and spray ring.



Articulating Bracket: Facilitates alignment in two axes.



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