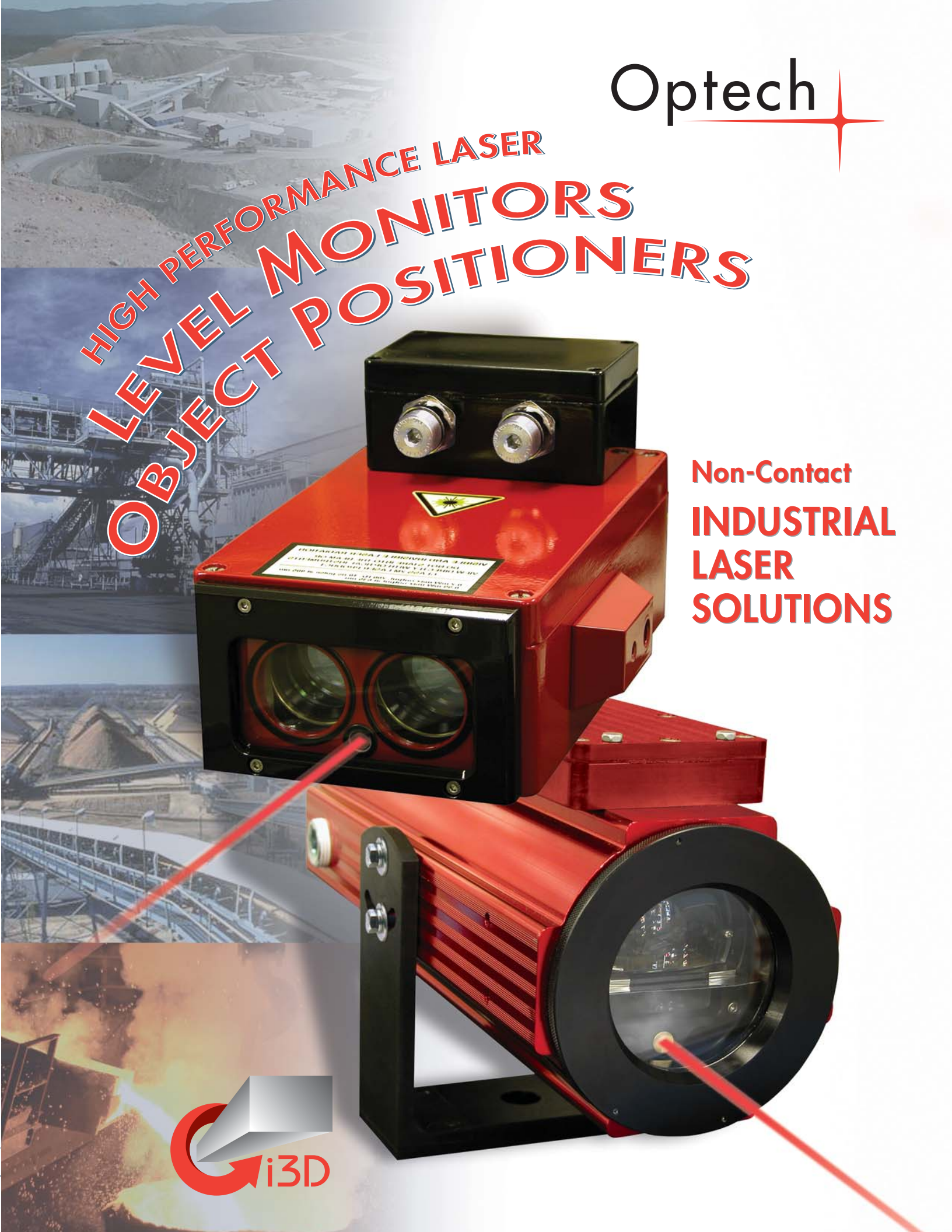
Optech

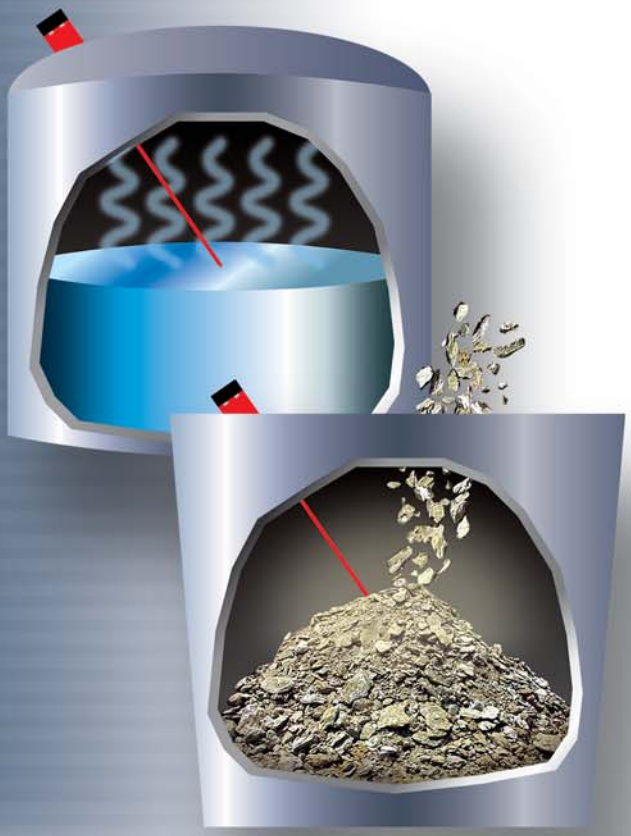
HIGH PERFORMANCE LASER

LEVEL MONITORS
OBJECT POSITIONERS



Non-Contact
INDUSTRIAL LASER SOLUTIONS

i3D



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

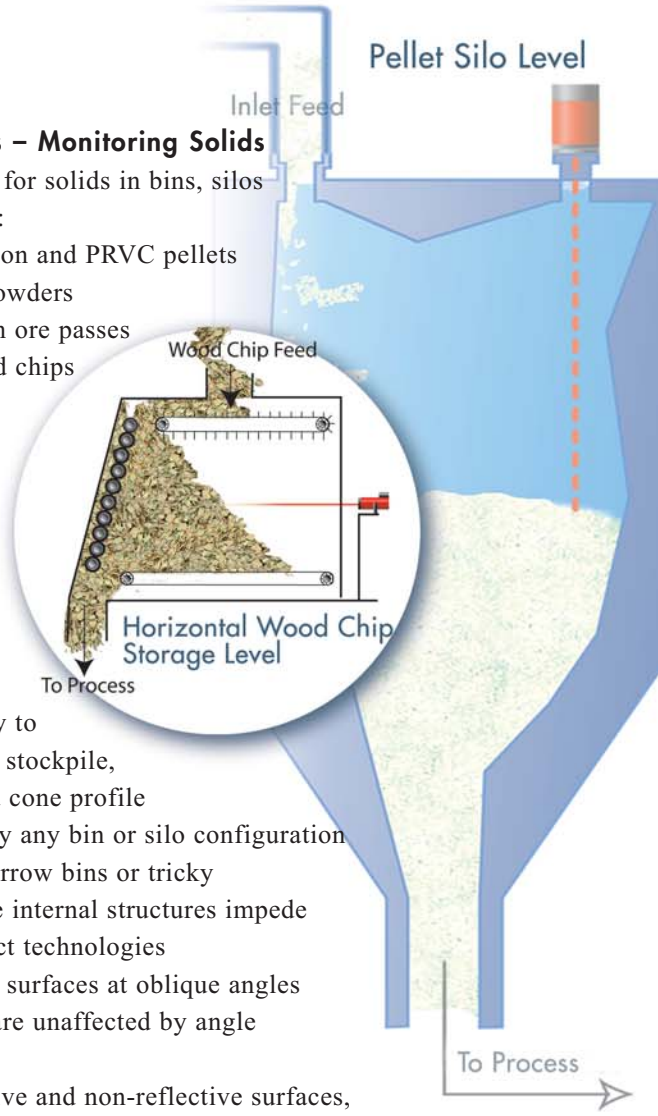
In the chemical, petrochemical, pharmaceutical and other industries, gauge tank levels are used for inventory control on low-dielectric crude and refined products such as:

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

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

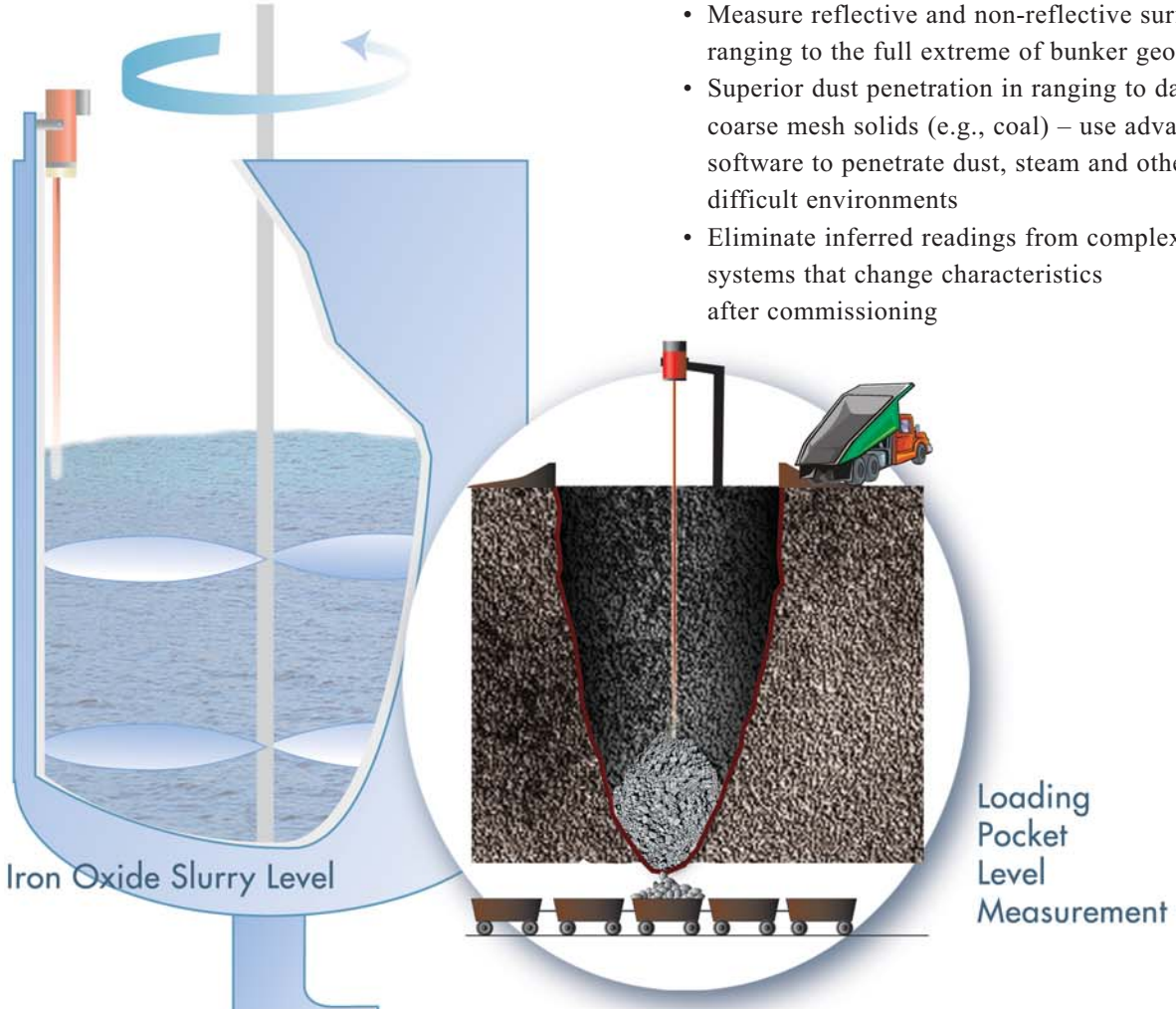


Features/Benefits – Monitoring Liquids

- 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

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



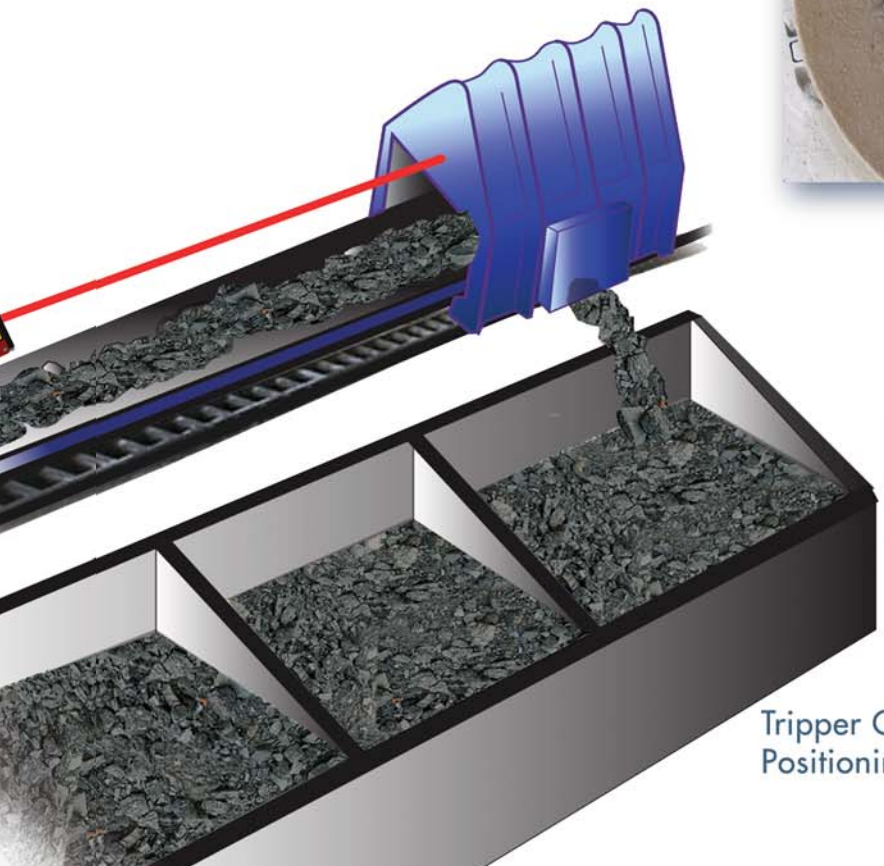
Typical Applications

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

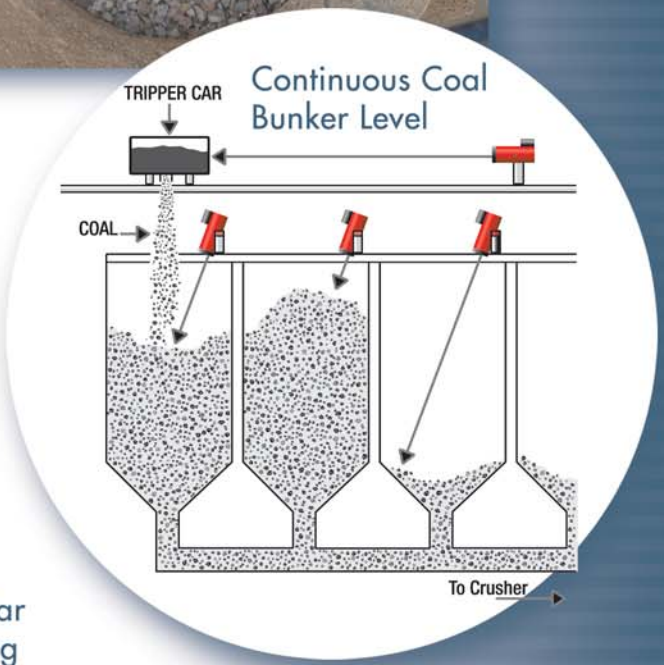
- Tripper cars
- Torpedo cars
- Plough feeders
- Cranes
- Stacker/reclaimers
- Ship loaders

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



Industrial Laser Solutions

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

Range[1]

Maximum	25 m
To reflector	Not applicable
Minimum	0.4 m

Accuracy	**CP Model**	**DV Model**
Absolute[2]	≤ 2 cm	≤ 4 cm
Operation[3]	≤ 5 mm	≤ 25 mm
Repeatability[4]	≤ 3 mm	≤ 4 mm
Resolution	1 mm	

Laser

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°)

Environmental

Operating temperature	0°C to 50°C, Options: 150°C, -40°C
Storage temperature	-40°C to 70°C

Power

Input consumption	24 VDC, 120 VAC, 220 VAC
@ 24 VDC	10 W max
With heater	101 W max

Output

Maximum update	5 readings per sec
Minimum update	1 reading per 60 sec
Digital	RS-232C, HART[6]
Analog[5]	4-20 mA, max load 1,500 ohms; 1,500 VDC isolation
Relays	Programmable for range (set/reset/alarms)

Enclosure

Protection	NEMA 4 IP65
Approvals	FM, CE, CSA, ATEX[6]

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

Physical

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.

FM CSA® CE

Watchman and Sentinel

Range[1]	**Watchman**	**Sentinel**
Maximum	250 m	150 m
To reflector	1,500 m	n/a
Minimum	0.2 m	0.2 m

Accuracy	**Watchman/ Sentinel CP Model**	**Sentinel DV Model**
Absolute[2]	≤ 2 cm	≤ 4 cm
Operation[3]	≤ 5 mm	≤ 25 mm
Repeatability[4]	≤ 3 mm	≤ 4 mm
Resolution	1 mm	

Laser

Infrared (IR)	905 nm wavelength
Visible pointer	635 nm wavelength
Eyesafety (IR)	Class 1 (US FDA 21 CFR 1040)
Beam divergence	5 mrad (0.28°)

Environmental

Operating temperature	-10°C to 50°C, Options: 150°C, -40°C
Storage temperature	-40°C to 70°C

Power

Input consumption	24 VDC, 120 VAC
@ 24 VDC	36 W max
With heater	101 W max

Output

Maximum update	15 readings per sec
Minimum update	1 reading per 5 sec
Digital	RS-232C, RS-422
Analog[5]	4-20 mA, max load 1,000 ohms; 1,000 VDC isolation

Enclosure

Protection	NEMA 4 IP67
Approvals	FM, CE, CSA

Hazardous area classifications
Class I Div 2 Grps A,B,C,D
Class II Div 1 Grps E,F,G, Class III

Physical

Dimensions	280 (L) x 205 (W) x 155 (D) (mm)
Weight	7 kg

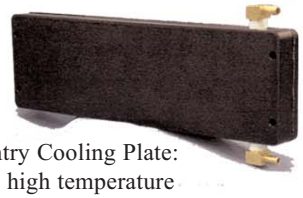
(3) At a measurement rate of 1 reading per second, the specified accuracy depends on limited variations in temperature, material and distance associated with the installation.
(4) At a measurement rate of 1 reading per second, under steady state conditions, and within one standard deviation.
(5) Analog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

Now Atex approved

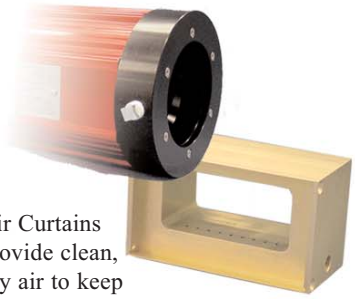
Ex **II 2 GD Ex d II B + H_2 T6 T85°C IP66**

Accessories and Options

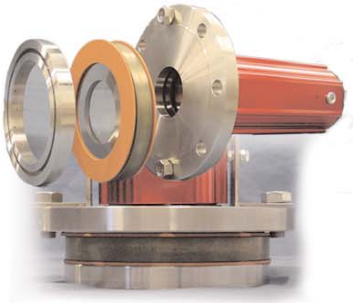
Hand-Held Remote Display



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.

Optech

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