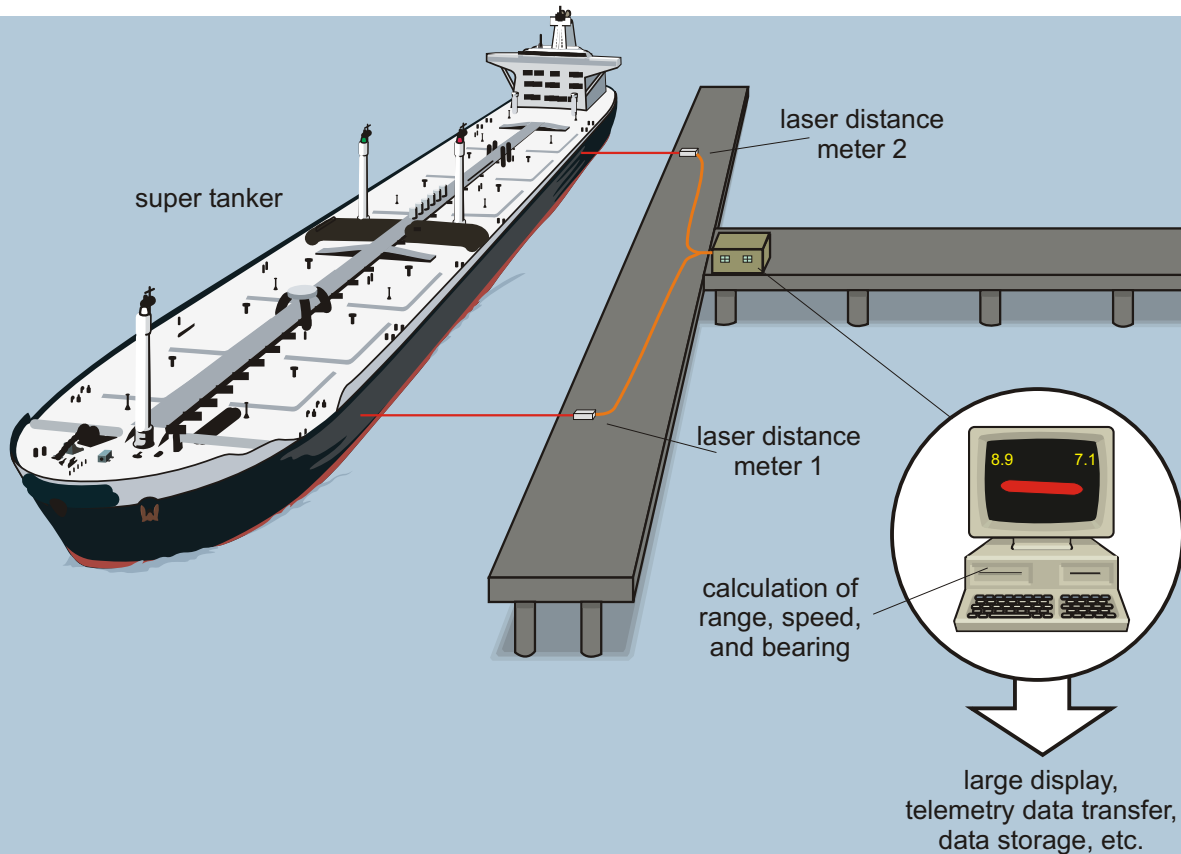


# Applications of **RIEGL** Laser Instruments

**Problem:** Docking & Driftwarning for super tankers.

**Solution:** Two laser distance meters, mounted on a terminal, continuously measure the distance to the ship's hull. The data are transferred to a computer which evaluates and displays the distance, speed and bearing of the ship.



## Key features:

- ✓ Highly precise
- ✓ Highly reliable
- ✓ Explosionproof
- ✓ Drift warning, environmental and mooring management control possible

## Performance of Laser Distance Meter:

- ✗ Range up to 100 m for LD90-3200HiP-ATEX or LD90-3200HiP-ATEX "GAS ONLY" even with badly reflecting targets

## Possible configurations:

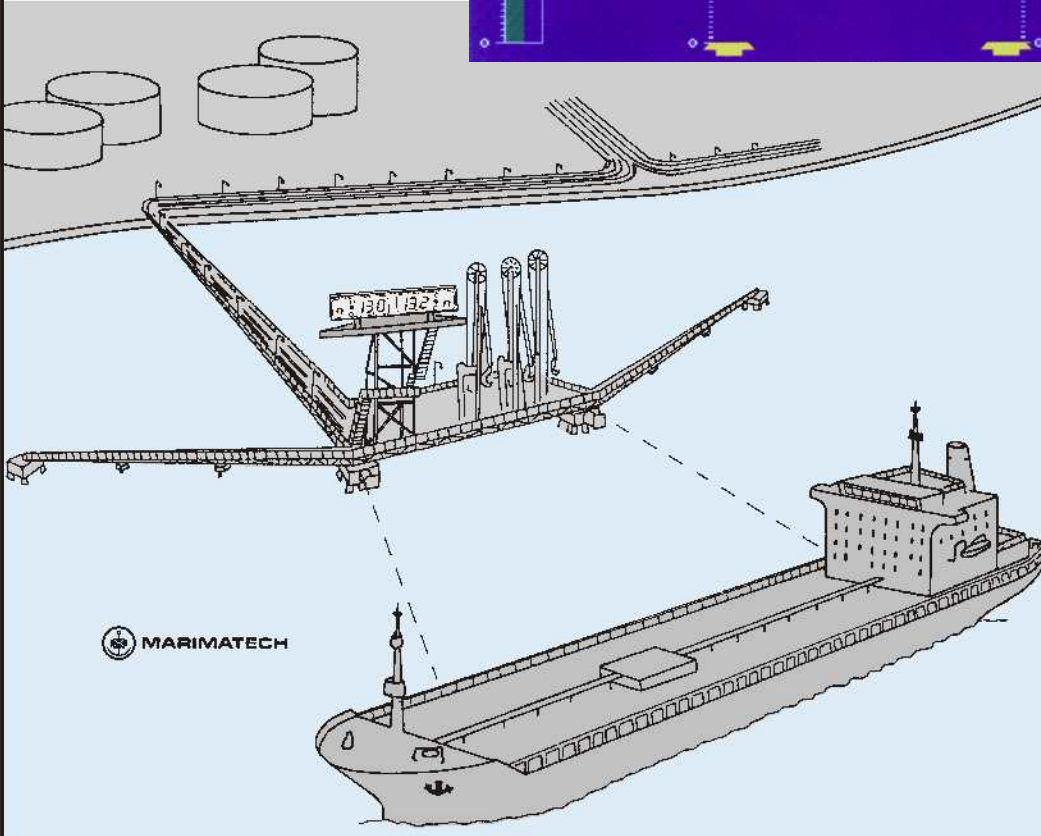
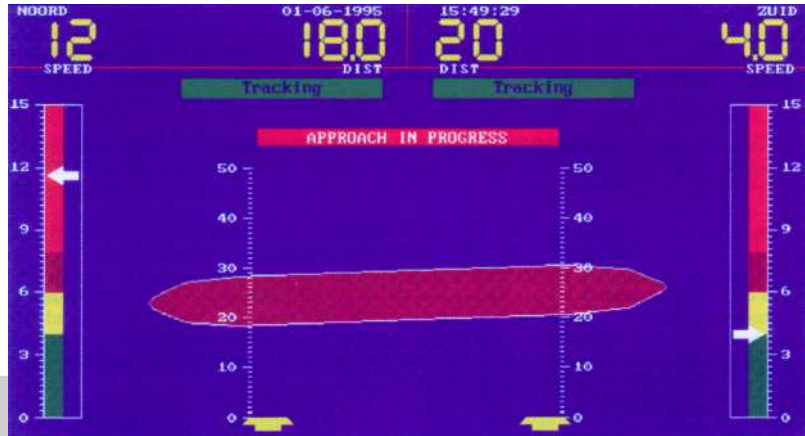
- ☞ LD90-3200HiP-ATEX specified
  - II 2G EEx de IIC T6 and
  - II 2D IP65 T85°C
 for zones 1 and 2 as well as for zones 21 and 22
- ☞ LD90-3200HiP-ATEX "GAS ONLY" equipped with red laser pointer specified
  - II 2 G EEx de IIC T6
 for zones 1 and 2 only

(Continued on the next page)

# Applications of **RIEGL** Laser Instruments

## DOCKING:

DockMaster on-line  
Screen Display



## DRIFTWARNING:

The driftwarning is another important issue being just as important as the approach. When being moored along side the pier the lasers now take over the driftwarning. Basically it is the same procedure taking place like the approach, but the display on the computer has now a different scale and the printout protocol is different.

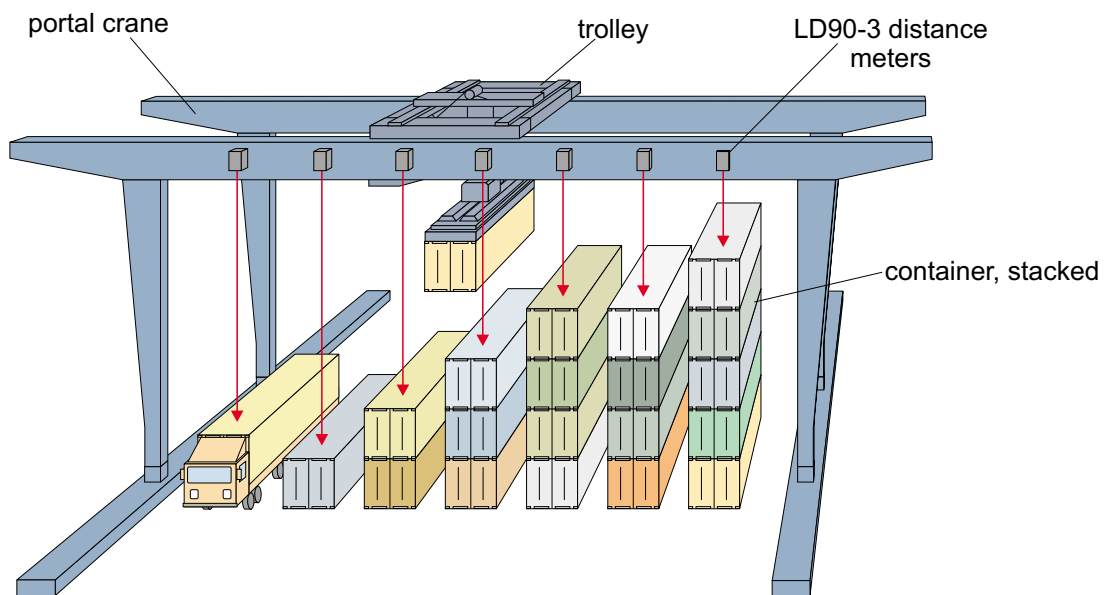


Driftwarning Display

# Applications of **RIEGL** Laser Instruments

*Problem:* Stacking profile sensor for portal crane

*Solution:* Mounting of several LD90-3 distance sensors looking downwards from the portal crane, providing an exact profile of the stacked containers.



## *Key features:*

- ✓ Quicker and cheaper handling of the containers
- ✓ Automatic positioning of containers
- ✓ Collision avoidance
- ✓ Automatic inventory registration
- ✓ Unsophisticated, reliable measuring system

## *Performance:* for LD90-3100HS

- ✗ Range up to 100 m
- ✗ Accuracy typically 2 cm
- ✗ Measurement speed up to 100 Hz

## *Related applications:*

- Automatic crane positioning (AN-IA041)

(Continued on the next page)

# Applications of **RIEGL** Laser Instruments

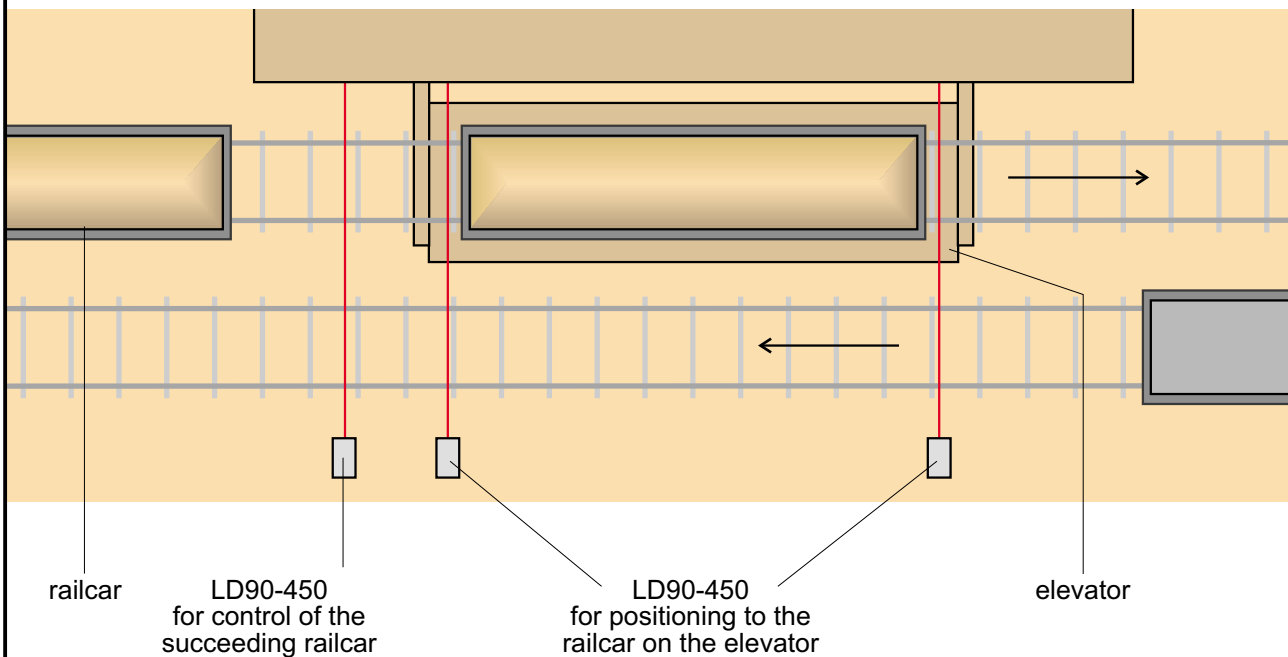
8 x LD90-3 distance sensors mounted in protecting case looking downwards from the portal crane



# Applications of **RIEGL** Laser Instruments

**Problem:** Accurately position railcars on an elevator lift under dusty or heavy rainfall conditions.

**Solution:** Employ two Laser Distance Meters LD90-450 to determine the correct position of the railcar on the elevator and a third LD90-450 for monitoring the position of the succeeding railcar. With no railcar present each LD90-450 measures distance to a passive target. As a railcar moves in front of the LD90-450 its presence is detected as a change in distance measurement. A railcar in the line of sight to two LD90-450's is properly positioned on the elevator.



## Key features:

- ✓ "High Penetration" feature offers reliable operation in dusty or rainy environments
- ✓ Narrow measurement beam (3 cm) offers very accurate performance in "break the beam" type applications
- ✓ Transmitter / receiver are co-located so misalignment is never a problem. Reference target is passive
- ✓ False detections are extremely unlikely as the sensor offers actual "distance" information and not simply discrete PRESENT / NOT PRESENT output.
- ✓ Fast real-time output available.

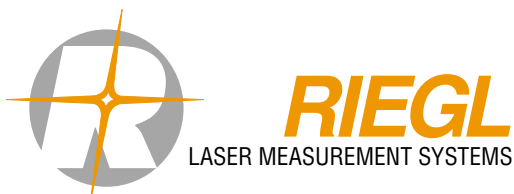
## Performance: LD90-450 LD90-3200HiP

	LD90-450	LD90-3200HiP
Measuring range	up to 150 m	up to 150 m
Distance measurement accuracy	±25 mm	±50 mm
Lateral Positioning Accuracy (funktion of beamwidth)	2 cm	3 cm

## Accessories:

- ☞ Industrial enclosure featuring pan/tilt mount for easy aiming, lens protection tube with fittings for air purge, 12 guage steel construction and NEMA 12 classification
- ☞ 110 VAC, 220 VAC, 24 VDC optional power supplies
- ☞ Visible beampointer to facilitate alignment

(Continued on the next page)



Application Note  
**AN-TA053**

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# Applications of **RIEGL** Laser Instruments



LD90-450  
in industrial enclosure  
with lens protection tube



LD90-450  
in industrial enclosure (open)  
with lens protection tube

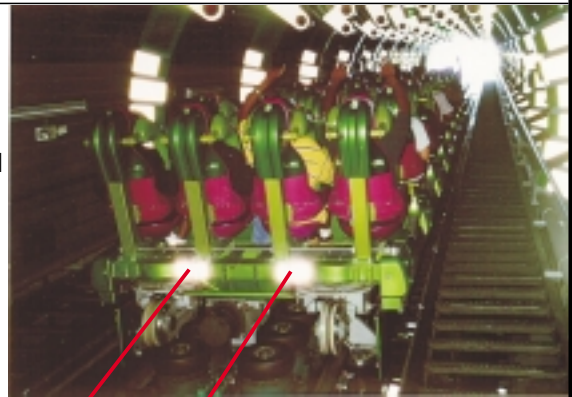
# Applications of **RIEGL** Laser Instruments

*Problem:* Monitor position & velocity during launch of high performance roller coaster.

*Solution:*



cars with  
reflecting foil



Laser distance & speed meter  
LD90-3100VHS-FLP



*Description:*

The "Hulk" roller coaster is one of the newest and perhaps the only roller coaster launched "UP" the hill. In order to continuously monitor the launch velocity profile, *RIEGL* developed the unique Velocity Measurement System (VMS). Comprised of a rack mount PC and *RIEGL* LD90-3100VHS-FLP rangefinder, the VMS provides accurate position and velocity measurement throughout the launch. Two VMS systems were mounted side by side for redundancy.

*Performance:*

- ✗ accuracy of velocity:  $\pm 0.1$  ft/sec. (one sigma, steady state velocity)
- ✗ accuracy of position:  $\pm 0.05$  ft (one sigma)
- ✗ update time: 400 Hz
- ✗ I/O: 4-20 mA analog output, 8 discrete inputs, 8 discrete relay outputs