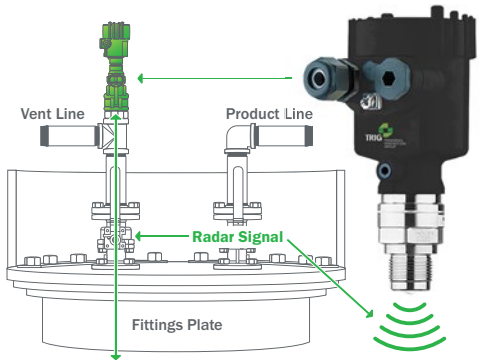
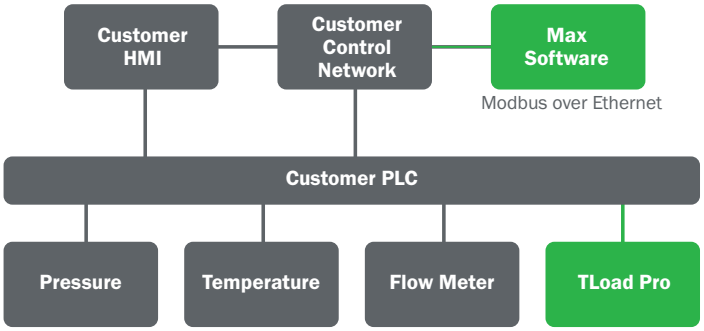
TLoad MAX: Accurate and Continuous Volume Measurement for Rail Tank Car

Visibility, from the inside out.

TRIG TRANSRAIL INNOVATION GROUP

TLoad MAX Configuration





Green: Components of the TLoad Max Solution
Grey: Existing customer infrastructure

Rail Tank Car Transloading Challenges

Closed loop loading is the standard for maximizing worker safety and minimizing environmental impacts, but many solutions and processes are not able to achieve this, as measurement of volume in a tank car during loading and unloading poses several challenges around corporate policies, operator processes, and available measurement technology:

- Typical manual measurement processes for measuring heel, such as dipping, require venting of the tank car and opening of the manway which release gases into the atmosphere, increases the wear and tear on gaskets, and is physically demanding for operators.
- Avoiding heel measurement through the manway by manually measuring through a port on the fittings plate requires that an operator knows the offset between the start of the strapping table and the reference point for each individual tank car.

Operator processes and uncertainty in manual volume measurement further increases safety margins and reduces operational efficiency of terminals:

- Manual measurements depend on a human to perform a consistent process, read the level, then handoff the information through multiple automated and manual processes.
- When the uncertainties from human factors and manual measurement instruments are combined uncertainties can be > 1.3% on volume.

TLoad MAX Solution for Loading and Unloading

TLoad Max is an automated solution that fuses sensor data from the TLoad PRO and an existing flow meter to provide accurate heel measurement without the operator.

- **TLoad PRO:** leading-edge level probing radar which enables non-contact outage readings and high-level alarms through the vent line.
- **TLoad Control Software:** exchanges and processes data with the existing PLC to provide heel, total gross or net volume in the tank car, and the offset of the TLoad PRO above the strapping table.

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By utilizing a sensor fusion algorithm, we can remove variations in vent line height and tank car nozzle heights to give an accurate offset of the radar sensor above the strapping table. This translates into a volume measurement that includes heel and relieves the operators from performing any manual volume measurements.

Operational efficiency increases by allowing operators to focus on other tasks and reduces the total measurement uncertainty so more volume can be loaded into the tank car.

Lastly, Increased worker safety and reduced environmental impact are realized through a closed loop system.

As part of our solution we will:

- Perform a site visit to analyze existing process performance;
- Engage with key stakeholders to determine appropriate configuration for TLoad installation, including reconfiguring your vent line to accommodate the sensor and RADAR signal;
- Work with your engineering team to implement and commission the sensors, integrated with existing terminal processes and data communication;
- Using insights gathered from sensor data, work with your operations team to benchmark existing processes and adjust to enhance your transloading efficiency.

Technical Data

Measuring range up to	30 m (98.42 ft)
Deviation	≤ 1 mm*
Process Fitting	1.5” NPT, 2” Camlock (Typical)
Process Pressure	-1 ... 25 bar (-100 ... 2500 kPa/- 14.5 ... 362.6 psig)
Process Temperature	-196 ... +200 °C (-321 ... +392 °F)
Storage Temperature	-40 ... +80 °C (-40 ... +176 °F)
Operating Voltage	12 ... 35 V DC
Approvals	Hazardous Locations (ia), FCC
Communication	4 ... 20 mA/HART
Materials	Wetted parts: 316L, PP, PTFE or PEEK Process seal: FKM, FFKM, EPDM or PTFE

* Actual accuracy is dependent on fleet consistency and vent line fittings

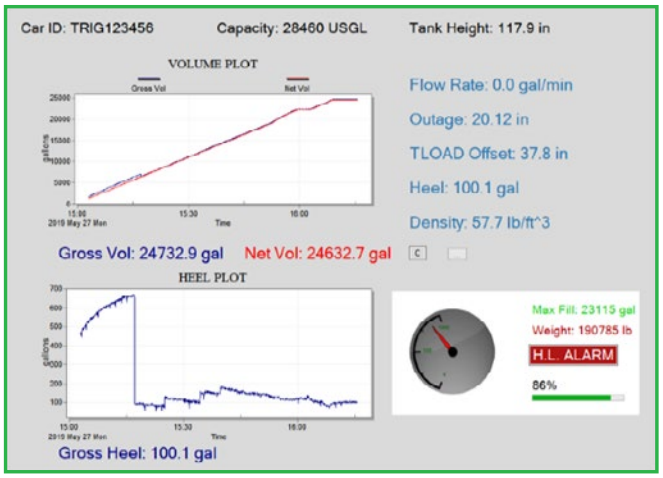
Max Software Variables

Data Inputs

- Tank Car Serial #
- Strapping table
- Accumulated volume
- Flowing temperature
- Flowing pressure
- TLoad Pro Level

Output

- Heel
- Gross / Net Volume
- TLoad Pro Offset from strapping table



Contact Us

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