

Gatex Smart Fuel Tanker

The only method to protect your tanker truck is to apply all methods of protection. So, if you are looking to converting your tanker to a smart one, make it smarter; and don't leave any points unwatched.



A tanker truck comes with multiple outlet pipes, vents and manholes, and if it is a multi-compartment tanker, the vulnerable points triple. Adding sensors and alarms to each of them is easy but keeping them under one watch is difficult but necessary.

Think of tanker protection system as a human mind - one mind and one brain should watch all the sensors to take control of all possible theft scenarios; and this artificial brain should run those advanced algorithms locally, on the tanker, and independent of central monitoring cloud computers, as those time-sensitive events need instant analysis and machine-made decisions taken by the artificial brain.

This Artificially Intelligent brain of our system is called the "Messenger" and the paired sensors to that are called the "Observers".

Observers are not necessarily built by us. We select best in class Observers & Detectors from our OEM partners, such as TRAK's Smart Fuel Seal or the Range Observer, Gatex CloudLink or FuelX: The Advanced Fuel-Theft Detector. All of them communicate with one Messenger which then delivers the detected and confirmed events to your GPS tracking platform. And the story goes beyond: indeed, we have provisioned and covered many, if not all, scenarios to provide you with this ultimate theft-proof system. If any new case happens, we will be happy to easily code that into the Messenger's embedded scenarios.

Messenger detects abnormal activities around the tanker, say in case an intruder tampers the power of the sensors or interferes with their communication signals. The Observers also broadcast their presence every 10 seconds, ensuring that they are at work for you. Detaching or an attempt to tamper them will generate alerts for the Messenger to check and analyze. Whether or not your GPS platform is in place, Messenger remembers the event and informs you once it finds your network present.

Both Messenger and Observers are Explosion Proof by design to eliminate any risk to your fuel operations.

Protecting Vulnerable Points

Manhole Covers

Manhole covers are monitored by advanced wireless sensors to generate open/close alerts on your mobile devices along with the manhole number and truck location.

All these sensors communicate wirelessly with "Messenger", and any attempt to detach or tamper them will end to alerts.



Fueling Cabinet

For the tankers with a fueling cabinet, the position of their door is monitored by an Observer to make sure they've been opened only at the delivery points and for a reasonable delivery time. The Observer understands the abnormal activity of the cabinet door by machine learning techniques.



Outlet Pipes

The activity of the pipes is under Messenger's watch. The moment any amount of fuel flows in the outlet pipes while the tanker has moved out from your customer's place, you will receive a notification.

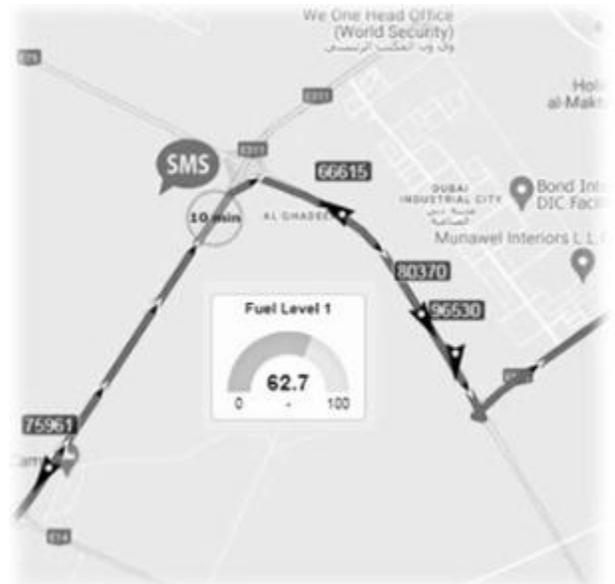
The system can also measure the amount of fuel passed through the pipes and report it to you. If you'd like to receive volume information, include Gatex CloudLink in your order.



Route Deviation

Smart Fuel Tanker is equipped with location-based systems which allow you to track the movements of the tanker trucks in real-time and receive automatic alerts for "Route Deviation".

If a tanker truck deviates from the planned route, the system generates immediate notifications and pinpoints the incident's location for the control room's personnel.



Fuel Compartments

If the final goal of fuel protection in a tanker truck is to prevent theft cases, monitoring the vulnerable points by the Observers would suffice. But if you need documented evidence for the records or actions, plan to equip each compartment with a level sensor that reports the fuel volume in real-time. Such reports are presentable to the authorities for legal proceedings.



FuelX: The Advanced Fuel-Theft Detector

If you've decided to install level sensors for online fuel inventory monitoring, order FuelX too.

FuelX utilizes a comprehensive algorithm and advanced filters to detect the fuel theft events without the need to make any change in your operations or apply any special configuration to the level sensors.

Lack of such algorithms impose complicated settings on the fuel sensors or the data-loggers and require repeated maintenance services to keep the sensors calibrated or eventually leads to project failure.

FuelX algorithm works on moving objects the same way as it works on stationary tanks.

FuelX utilizes Edge-Computing and Event-Streaming concepts. No need to implement large queries and overload the cloud servers to extract the events.



Remote Control

The system is capable of automatic or remote control of the outlet valves upon entering delivery zones, like your customer locations, fuel stations or terminals, to allow fuel unloading.

The automatic valves can be controlled remotely by the control room personnel. All open/close events are logged and reported along with the timestamp and location information.

Observers and Detectors

The peripherals utilized in Smart Fuel Tanker package meet below technical specifications:

Certification	CE, FCC
Operating Temperature	-20°C to +60°C
Communication	BLE 5.2
Range	Up to 40 meters line of sight
Battery Life	2 years (user-replaceable)
Housing	Flame-retardant, waterproof polymer
Detection Events	Open/close, tampering, vandalism, Machine Learning AI
Heartbeat Interval	10-second
Installation	Universal mounting

Range Observer

The Range Observer measures distance using a time-of-flight sensor and runs an internal algorithm to generate events. It provides precise distance measurement by observing the object continually regardless of target reflectance. It can measure absolute distances up to 2000 mm, setting a new benchmark in ranging performance and enabling a variety of new applications.



The Range Observer uses BLE iBeacon protocol to do event streaming every 10 seconds to the receptors. The receptor, being the Messenger, utilizes the standard iBeacon protocol to receive status or events from the Range Observer.

Angle Observer

The Angle Observer is designed to monitor the angles of the objects such as tanker chassis, caps or manhole covers with reference to ground to detect the events.

Angle Observer checks the object every 10 seconds and reports the status by iBeacon protocol to the Messenger which analyses the data and communicates events with your GPS platform as mentioned earlier.



Gatex CloudLink

CloudLink is your universal gateway that can connect any measurement instrument such as a flow meter, level sensor, environmental sensors with an industry standard output protocol to GateX Cloud for monitoring and reporting purposes.

CloudLink is equipped with a 2G/3G or 4G/LTE M2M data connection to the Internet to upload the data.

CloudLink PLUS supports NBIoT, WIFI and LoraWAN connectivity and reduces the data transmission charges significantly.

CloudLink can store 22000 packets in its internal memory in case of net unavailability for future upload to the servers. CloudLink PLUS can store millions of packets in its internal database and automatically upload them to the cloud servers upon network availability.

You need a CloudLink if you'd like to receive the amount of fuel unloaded from each compartment of your tanker.



It's worth noting that you can choose any of the peripherals mentioned (Detectors or Observers) and connect them to the Messenger to build a Smart Fuel Tanker but remember that more peripherals ensure more security.