

# TETIS

> Monitoring Solutions for  
Dry and Refrigerated  
Containers



## Tetis

In Greek mythology, ruler of the seas



## The Monitoring Solution for ensuring Safe Delivery of Containers from Origin to Destination

Tetis R is a sophisticated tracking system, designed for the purpose of monitoring and tracking dry and reefer containers, from the moment the container is sealed and until the container is opened when reaching its final destination.

Information about the location, condition and temperature of containers is presented in Real-Time, based on the settings and scheduling defined by the user and sent as an email or text message.

Tetis R has also been especially designed for refrigerated cargo and integrates multiple sensors, including a highly sensitive temperature sensor which measures accuracy up to  $\pm 0.2^{\circ}\text{C}$ . The system gathers accurate records of temperature, humidity and light at any desired time interval (e.g. once a day, every half hour or every 10 mins), which is stored and transmitted in parallel to the real-time data provided.

By being able to monitor and manage the storage environment of containers and reefers, risk of damage and loss of freight can be significantly reduced.

Additionally, in a situation where an unexpected or significant event occurs, or one that deviates from a predefined setting, the system triggers an alert, so that all persons directly involved or interested in the shipment are informed of the event by receiving a notification in real-time. One can choose to receive alerts either by text message, by email or both. This feature enables all interested parties to address and problem-solve any issues that could affect the supply chain process.

Records of historical sensor conditions and alerts to special events can help to explain any incidents experienced during its journey from the moment the container was sealed, while allowing you to view its route on a map - All from the comfort of a computer or mobile device.

### Information available:

- Position of the container is provided by the GPS function; shown as a landmark on the map, an address or coordinate.
- Door open/closed.
- Battery charge level.
- Lighting level in the container; may indicate that the container door has been left open or imply that there has been an attempt to break-in.
- Temperature; mostly significant for temperature sensitive shipments.
- Humidity; mostly significant for humidity sensitive shipments.
- Impact; in order to warn about possible events of force or impact brought upon the container, including during loading and unloading.



## Key Features of the system:

- **A standalone unit** operated by rechargeable batteries.
- **Fast and easy installation** by attaching the unit to the container door frame with a magnet.
- **A flexible system** that can be fully configured to meet customer requirements, with regards to information, times and significant events in real time:
  - Examples of real time alerts include: door open/closed, temperature high/low, humidity high/low, light on/off, battery charge level, location status and any combination of these.
  - The system can also be configured to automatically transmit an audit trail, which gives a complete history of all the stored events including deviations beyond configured ranges, or choose specific information details at specific locations/time frames, in addition to receiving alert notifications in real time.
- **The audit trail feature** allows for tracking the entire journey on a map and includes a detailed report of all the recordings. Data cross-referencing has been made possible, so that one can easily switch between the data presented on the map and report if needed.
- **Geo-fencing function** raises notifications when a container has entered or left a location.
- **The built-in accelerometer** keeps you informed about changes in movement or events of impact.
- **When the unit is out of coverage**, all location and sensor information is saved to the memory and later transmitted once the unit is back in cellular coverage.
- **A convenient option** for forwarding information to authorized persons only.
- **A web based system** requiring a simple and easy installation process.
- **A global system** developed for multi-lingual users.

The Tetis R system serves and provides real time data to all parties interested in the delivery of a shipment, such as: logistics personnel, supply chain managers, sales, security, insurance, finance, suppliers, customers, shipping companies and customs. It allows all those involved, to coordinate their efforts to ensure that shipment obligations are being met, or in times of need, to take action immediately and in an orderly manner.

The features and functions made available by the Tetis R provide access to information that is reliable, accurate and delivered in real time, allowing them to keep track and monitor a wide array of parameters and situations. Ultimately, its performance gives full control over dry containers and reefers worldwide.



## Applications

Tetis R's unique capabilities allows you to **react quickly and confidently to unforeseen situations**; preventing delays, or damage to shipments, which may lead to a loss of merchandise and ultimately a loss of money.

Here are just a few examples of its many unique applications:

### High Risk/Value Cargo

These are goods that demand a higher standard of security:

- High value items such as computer equipment, metals and electronic equipment.
- Items that have a high chance of being stolen owing to their physical attributes; being small, lightweight and easy to transport such as perfumes, cigarettes and smartphones.
- Security related cargo such as firearms or confidential equipment.

### Temperature Sensitive and Special Handling cargo

These are goods that require monitoring and maintaining in special environmental conditions.

- Perishable Cargo such as chilled fruits and vegetables or frozen meat and fish, all require a reefer with the utmost in system reliability in order to avoid spoilage.
- Healthcare and Chemical Supplies such as medical syringes or hazardous substances all require special handing to ensure safe delivery.

### Time Sensitive cargo

These are shipments where the date of delivery is of particular importance and can include exhibition equipment, goods for a limited time (sales) or season related items.

### Prohibited items

These are shipments that are considered unsafe or are items that are banned from entering the country, examples include drug and human trafficking. Tetis R can also be useful for preventing "customs avoidance" schemes.

### Security

Tetis R can serve as your electronic seal, monitoring and ensuring that your container and cargo arrive safely to its destination.

Tetis R lends itself uniquely to all these applications, as it allows you to observe and reach your goods from a distance. It enables you to have a true understanding of what is happening with your cargo – as and when it happens, and to overcome issues in real time if needed, so that the most reliable and efficient delivery from origin to destination, is made possible.



# Benefits

## Maximum Control

of a wide range of possible events and situations with its built in sensors, system stability and continuity and its unique ability to remotely protect your cargo 24/7.

## You can Manage

and prepare for those unpredictable supply chain disruptions. By being able to prevent any further delays or damage, you can inhibit any possible loss of merchandise, and ultimately loss of money.

## You Gain a Competitive Edge

in customer service; with real time technology and information at your fingertips at all times, Tetis R increases operational efficiency and keeps your customers satisfied.

## You can Rely on the built-in sensors

to operate simultaneously to collect data regarding various aspects of your cargo’s position and condition, allowing you to stay well informed about your containers' status in real time.

## You can be Sure that you will be alerted

to all significant events or unusual situations in real time. The system is automatically activated, allowing you react swiftly and confidently to overcome any challenges or obstacles during the container's journey.

## You Maintain Stability

due to the state of the art OTA ability to remotely upgrade the unit with new features and also change settings within the existing firmware of the unit.

## You Enjoy the User-Friendliness

of the system, due to its all-in-one solution base and its fast and easy installation. In only a few simple steps, you can also define the alerts, reports and destinations you need through the On-line system.

The monitoring device is available in three different models to perfectly meet different usage requirements:

**Tetis R;** for dry and refrigerated containers



**Tetis;** for dry containers only



## Tetis Hybrid

### Hybrid monitoring solution For dry & refrigerated containers

Tetis Hybrid unit tracks the status of dry and reefer containers from the moment they are sealed until they are opened at their final destination. Combining satellite and cellular connectivity, Tetis Hybrid is always on the lookout, always monitoring, even in remote areas or far away at sea. Real-time tracking information is presented according to user preferences and can be sent as email and/or text message, keeping you up to speed with your containers conveniently at every moment.





## Main Specifications

|                        |                                                                                    |                                                                                                                                        |
|------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Supply                 | Voltage                                                                            | 3.7V                                                                                                                                   |
| Temperature            | Operational<br>Storage                                                             | -20°C to +60°C<br>-40°C to +85°C                                                                                                       |
| Operating Humidity     |                                                                                    | Up to 90%                                                                                                                              |
| Measurement            |                                                                                    | 40 x 25 x 4 cm (15.7 x 9.8 x 1.6 inch)                                                                                                 |
| Cellular Communication | GSM/GPRS - default<br>Optional Modems<br>Antenna type<br>Data channels<br>Protocol | Quad Band (850, 900, 1800, 1900)<br>UMTS/HSPA+, CDMA/1xRTT/EV-DO, LTE<br>Built-in (concealed)<br>SMS & TCP/IP<br>Propriety – encrypted |
| Location               | Type<br>Time to First Fix (TTFF)<br>Positioning Accuracy<br><br>Antenna type       | GPS, GLONASS (optional)<br>2 sec (hot start)<br>10m CEP (50%)<br>Velocity: 0.2m/s (50%)<br>Built in (concealed)                        |
| CPU Capacity           | Static RAM<br>Nonvolatile memory<br>Flash Memory                                   | 128 Kb<br>34 Kb<br>2048 Kb                                                                                                             |
| Sensors                |                                                                                    |                                                                                                                                        |
| Temperature            | Range<br>Accuracy                                                                  | -45°C to +125°C<br>± 0.2°C                                                                                                             |
| Relative Humidity      | Range<br>Accuracy                                                                  | 0% to 100%<br>± 1.8 %                                                                                                                  |
| Accelerometer          | Scale<br>Accuracy                                                                  | ± 8g<br>± 2.5%                                                                                                                         |
| Light                  | Resolution<br>Sensitivity                                                          | 0.025 LUX<br>0 - 104,448 LUX (Sunlight)                                                                                                |
| Inputs                 | Push-button<br>Door Switch                                                         | 1<br>1                                                                                                                                 |
| Battery Pack           | Type<br>Capacity                                                                   | Li-Ion<br>5200 mAh                                                                                                                     |
| Power Consumption      | Sleep/Idle<br>GPS only<br>GPRS only<br>GPS and GPRS                                | 0.05mAh<br>75 mAh<br>100mAh<br>165 mAh                                                                                                 |
| Access Port            | TYPE                                                                               | TTL                                                                                                                                    |



## Key Features

### Management

- ◉ **Programmable Events:** Events can be defined to both transmit and act on complex events. For example, you'll be alerted if the container is broken into - even if the break-in bypasses the door.
- ◉ **Perimeter based alerts:** Geo-fencing alerts when a container is entering/leaving a specified designated area at a specified time.
- ◉ **Values Monitoring:** Monitoring of analog inputs to alert when temperatures, humidity or light exceed limits.
- ◉ **Mileage Transmissions:** Periodic mileage transmissions for the container's needed maintenance.
- ◉ **Automated Tracking:** Automatic support for container tracking at specified time, without sending additional commands.

### Container Protection

- ◉ **Accident and falling:** Built-in accelerometer serves as both accident and a harsh braking detector.
- ◉ **Door monitoring:** Detects and alerts about opening/closing of the container's door.

### Communication

- ◉ **Cellular Connectivity:** Support for GSM networks (GPRS or optional 3G), while using both the SMS channel and the data channel. Supported bands are 850/900/1800/1900 MHz. Optional support for CDMA and HSDPA networks.
- ◉ **TCP Connectivity:** Support for the GPRS/1x TCP/IP networks by either staying online at all times, or coming online when a transmission is initiated.

- ◉ **DNS Support:** Connection to a server by its host name.
- ◉ **Backup Server:** Backup host name support in case of main server has gone offline.
- ◉ **Encryption:** Protocol encryption to provide maximum security between the container and the center.
- ◉ **Compact Protocol:** Less than 70 bytes per message enables very small bandwidth usage and saves communication costs.

### Over-The-Air commands

- ◉ **Firmware Upgrade:** Over the air firmware upgrade to apply new features to already-installed units.
- ◉ **Tracking:** Option to remotely set periodic transmissions from the unit in intervals between 10 seconds to 5 days.

### Miscellaneous

- ◉ **Internal Logging:** Whenever a transmission fails to be sent, the entire message is saved to the memory for later transmission. 50,000 complete messages including statuses can be recorded this way.
- ◉ **Fully Certified:** Fully certified and complies with the highest standards of the industry.

### Location

- ◉ **GPS Receiver:** Built in GPS receiver connected to the unit, allowing real-time tracking and on-board location-based analysis.
- ◉ **Last Location Saving:** Saving of the container's last position, in case of going out of GPS coverage.



## Starcom Systems

Starcom Systems is a leading global company, specializing in advanced automated real-time systems for remote tracking and management of vehicles, containers, assets and people. All systems are characterized in strength, stability and continuous performance.

Starcom Systems is publically traded on the AIM Market of the London Stock Exchange, conforming to the highest and most strict regulations in the market, proving its stability and reliability.

Starcom's systems provide a complete solution, consisting of innovative equipment and unique software. Thanks to the user-friendliness of the system, it provides useful and effective solutions, based on each user's settings and requirements.

With more than 15 years of experience and expertise, Starcom Systems distributes and sells its products through 110 technology partners and independent operators in more than 53 countries, and its application operates in 32 languages. As a global company, Starcom Systems' products include certifications from all the leading standards in the world, including E 24 certification, Safety certification, EMC test certification, Tuv-Rheinland certification and more.