Technical Overview
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Introduction

We are delighted to present EyeSeal, an exceptional solution designed to address the needs of authorities, customs, law enforcement agencies, and terminal operators in detecting container breaches both during transportation and at terminals.

This document aims to provide you with comprehensive technical specifications outlining how our innovative device can effectively transform containers into smart entities as they transit through the ports of Belgium, the Netherlands, and potentially other European ports.

EyeSeal is a compact and lightweight device that can be easily installed inside shipping containers. Equipped with an array of advanced sensors, it is capable of detecting any unauthorized access to the container, including door openings, light variations, temperature fluctuations, humidity levels, and dew points. As soon as a breach is detected, EyeSeal promptly sends an alert to the designated authorities or other relevant stakeholders.

These breach alerts offer invaluable assistance to law enforcement, customs agencies, and shipping companies. EyeSeal equips them with a competitive edge in combating criminal organizations attempting to smuggle narcotics from containers during the cargo voyage or at the terminal.

In the fight against organized drug crime related to cargo, EyeSeal emerges as the ideal solution. It is not only highly effective and impervious to hacking attempts but also proves to be cost-effective.

To assist you further, we have enclosed a detailed document providing the technical specifications of EyeSeal. Should you have any queries or require specific clarifications, please feel free to reach out to us. We would be more than happy to address your concerns.

We eagerly anticipate the opportunity to participate in the workshops planned for the summer. If there is a need for additional information or specific details, please do not hesitate to contact us.
Answers to your specific questions

We thought it might be useful to first provide a few short answers to the questions you shared with us.

**Shape and volume of the smart seal**
The EyeSeal device is compact and lightweight, offering convenience and portability. For detailed information, please refer to page 6.

**Method of fixing to the container**
Devices are easily installed inside shipping containers by installing them on the beam above the doors using the supplied magnets or a strong adhesive. They establish direct physical contact with both container doors. A step-by-step description of the installation process can be found on page 7.

**Sealing, locking**
After installing the EyeSeal device inside the container and activating it, the sealing is accomplished simply by closing both doors which is recognized by both door sensors and light sensor and logged as “Sealed”. A detailed description of this process can be found on page 7.

**Data collected (location, sealing status, movement, acceleration,...)**
EyeSeal monitors multiple data points, including door breaches, light variations, internal temperature, humidity, and geographic location. A comprehensive overview of sensor functionality can be found on page 7.

**Method of location determination and accuracy**
EyeSeal utilizes triangulation with the assistance of cell tower ID and locations to accurately determine its position. This method is auditable and verifiable and does not require line-of-sight access to GPS satellites. Location data is seamlessly captured and integrated into the EyeTrack application platform and can be shared with other applications as required.

**Method of sending the data**, EyeSeal ensures the highest level of data security by implementing industry-standard encryption for all the data it transmits to the EyeTrack platform. Additionally, comprehensive details about data handling can be found on pages 8 through 11.

**Battery and autonomy**
The device’s battery is designed to remain operational for a minimum of 120 days, assuming standard alert intervals are configured. The actual battery life will vary based on the user’s preferred frequency of alerts. For detailed information regarding the batteries, please refer to page 6.

**On the platform and data: configurability and security**
For detailed information about the configurability of the device, please refer to pages 8-11.

Moreover, EyeSeal provides the capability to share data with other platforms through APIs, allowing seamless integration and interoperability.

**Track record**
EyeSeal devices have been monitoring cargo shipments since 2018, passing through more than 75 countries. The device has also been tested and approved during the Gateway2Britain pilot project.

Please refer to page 12 for more detailed information about EyeSeal’s track record.
EyeSeal device installation

The EyeSeal device is installed inside the shipping container and activated.

EyeSeal regular updates and alerts are encrypted and transmitted via 3G GSM networks.

All vector, full stack endpoint security agent managed by an AI engine in real time.

Constant monitoring during entire voyage

Breach alerts can trigger drone deployment (optional).

EyeSeal generates a full detailed forensic report of the entire voyage.

Cargo arrives at destination

Location tracking

Breach and door monitoring

Advanced anti-hacking protection

Light detection

Temperature monitoring

Humidity monitoring

DIRECT DATA
# Technical Specifications

<table>
<thead>
<tr>
<th>Dimensions of the EyeSeal unit</th>
<th>Battery specifications</th>
<th>Cellular connectivity</th>
<th>Other specifications</th>
</tr>
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<tbody>
<tr>
<td><strong>Height</strong> 81.1mm</td>
<td><strong>Power</strong> 9.6Ahr</td>
<td><strong>2G</strong> 2G</td>
<td><strong>Export Control Classification</strong> # 5A991.g</td>
</tr>
<tr>
<td><strong>Width</strong> 216.8mm</td>
<td><strong>Battery Type</strong> High-capacity internal Lithium Thionyl Chloride</td>
<td><strong>3G</strong> 3G</td>
<td><strong>HSN Code (Harmonized Shipping Code)</strong> 8526.91.0040</td>
</tr>
<tr>
<td><strong>Depth</strong> 47.8mm</td>
<td><strong>Autonomy</strong> At least 120 days for standard signal configuration</td>
<td><strong>4G</strong> 4G</td>
<td><strong>Dangerous Goods designation</strong> Type 9 (Lithium Battery)</td>
</tr>
<tr>
<td><strong>Weight</strong> 15.2 ounces (430 grams)</td>
<td><strong>Operating Temperature</strong> -25°C to +70°C</td>
<td><strong>Countries with coverage</strong> 170</td>
<td></td>
</tr>
<tr>
<td><strong>Housing Material</strong> UL 940-V0 flame retardant plastic</td>
<td><strong>Storage Temperature</strong> -40°C to +85°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rubber door detector boots</strong> Height: 78.7 mm Width: 52.7mm Depth: 50 mm</td>
<td><strong>Environmental Rating</strong> IP67</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UN Battery Code</strong> 3091</td>
<td><strong>Environmental Rating</strong> IP67</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UN Battery Code</strong> 3091</td>
<td><strong>Environmental Rating</strong> IP67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Dimensions
- **Height**: 81.1mm
- **Width**: 216.8mm
- **Depth**: 47.8mm

## Batteries
- **Type**: High-capacity internal Lithium Thionyl Chloride
- **Power**: 9.6Ahr
- **Autonomy**: At least 120 days for standard signal configuration
- **Capacity**: 15.2 ounces (430 grams)

## Connectivity
- **2G**: GSM/GPRS, Quad band 850/900/1800/1900 MHz
- **3G**: UMTS/HSPA+, Global, 800/850/900/AWS/1700/1900/2100MHz
- **4G**: LTE CatM1(Rel.14), LTE Cat NB2 (Rel.14) w/EGPRS (2G Fallback)

## Environment
- **IP67**: Water and dust resistant
- **Operating Temperature** -25°C to +70°C
- **Storage Temperature** -40°C to +85°C
- **Environmental Rating** IP67
Align the mounting bracket on the top rail at the center of the doors. With the mounting bracket installed, attach EyeSeal Unit to the mounting bracket using the bolt and the washer. Adjust the EyeSeal Unit until the top of the unit is seated against the lintel.

Push the unit upward until the magnet/adhesive makes full contact with the top rail and tighten the bolt.

Once the unit has been fastened to the top rail, remove the activation slip to initiate the device. Alternatively, the device can also be activated before installation.

Close the left door. Make sure that the left “rubber boot” on the unit is compressed with the left door as shown. The unit is now correctly installed* and the container doors can be sealed for transport.

* Successful EyeSeal installation can be accomplished in minutes!
Sensor Data and Alerting

The EyeSeal Internal Container Breach Detector is a comprehensive solution that offers unparalleled security for cargo during shipping.

One of its key features is the EyeTrack user interface platform, which enables stakeholders to track the container’s location and door seal status, regardless of whether it’s being transported by truck, rail, sea, or a combination of the three.

Using the EyeTrack platform, stakeholders can access and monitor extensive sensor data captured and displayed by the Unit, including door position (open or closed), internal light values, temperature, humidity, and dew point.

By default, the Unit records this data every six hours during the entire voyage, and it’s displayed as an in-route “Scheduled Monitoring” communication for stakeholders to view.

In the event of any deviation from the container’s monitored data, the EyeTrack platform immediately issues an “Alert” to designated users, providing them with a date and time stamp, as well as location information. This ensures that stakeholders are notified promptly of any potential issues with the cargo, allowing them to take swift action to mitigate the situation.

The EyeTrack platform offers an ongoing full voyage “Report” that includes all the unit data collected from the origin point to the final destination. This report can be shared with all stakeholders in the supply chain, providing them with comprehensive and accurate information about the cargo's journey.

With its advanced technology, real-time data tracking, and immediate alert system, stakeholders can rest assured that their cargo is secure and protected throughout the entire journey.
Our EyeTrack® UI will allow you to provide access to as many individuals in your logistics chain that you wish to include. Including Security, Forwarders, Insurance, Consignee, Transport managers. Anyone that you allow access to the UI now has access to these reports and details.

Your team will have full details for the following key points:

- Date and time door originally closed after loading.
- Full history of container condition from loading unit inspection at warehouse exit.
- Exit Message prior to leaving the warehouse including full history from loading.
- Scheduled messages every six hours with full date time, and location stamp (including environmental parameters).
- Immediate alerts upon both authorized and unauthorized breaches.
- Notification of Temperature and Humidity alerts can be configured.
- When the 6 Hour scheduled messages are utilized – the Eye-Seal can provide this coverage for 120 days internationally.

With these key date, time, and locations stamps combined with the actions observed by the sensors, Law Enforcement and Insurance can define a specific timeline and location.

The Custody of the container will be known and thus responsibility properly assigned.

When thefts are undetected for several days, weeks, or months, the cargo has passed through the hands of several players along perhaps international borders and jurisdictions. At this point, it is nearly impossible to identify the Custodian of the Cargo when the said breach occurred.

However, In the Maritime field, a six-hour window is a short time frame to properly make an exchange of Custody. The Custodian will be identified with the Time and Date Stamp.
Connectivity & Data Transmission

Our devices employ an in-depth defensive framework to ensure maximum reliability and security during data transmission.

All device communications occur over a VPN from our cellular connectivity provider with no exposure of device traffic over the internet. Using private address space ensures that traffic is segregated, and devices cannot be accessed from the internet.

All device communications are encrypted with industry-standard DTLS encryption. This encryption is used by millions of devices around the world.

Our device secrets are provisioned at manufacturing with unique keys that are stored in an on-board secure element on the device and are securely provisioned in our cloud to ensure maximum identity protection.

We collect real-time network events from cellular operators to detect connectivity anomalies and potential network hijacking.

We employ technologies to maximize battery life and ensure efficient use of cellular bandwidth to optimize the costs associated with tracking containers.

Encrypted communication protocol between the EyeSeal device and the Multiplexer
The Eye-Seal architecture recognizes the need for real-time integration with 3rd party services and platforms to enable multiple consumers to process the critical container data in real-time. All data is securely collected by the Device Multiplexer and distributed to customer systems as events are received from devices.

Our solution has evolved and leverages many technical innovations to provide a highly secure and reliable service. Our devices have evolved from proprietary protocols and encryption to standards-based communications based on Lightweight M2M (LwM2M) over CoAP and DTLS. These technologies are well tested and extremely secure.

We have also migrated from using our own on-premise hosting facilities to leading hyper-cloud vendors allowing us to leverage their advanced security infrastructures to ensure our offering is able to scale while still providing industry leading security and functionality.

Device management data is forwarded by the Multiplexer to Eye-Seal’s servers to enable remote management and ease deployment of new devices in the field. By segregating the data feed at the Multiplexer, our customers are well insulated against changes and evolution of our management platform.
The G²B project selected and tested selected track-and-trace technologies, including EyeSeal.

- 38 shipments from Flanders to the UK were simulated and 29 shipments were followed up via T&T technologies.
- The data-sharing platform offered increased automation, and better visibility of data, resulting in time savings, fewer errors, and reduced emails.
- Track & trace technologies provided a better understanding of the location, conditions, and safety of goods.
- Combining the transparent trade lane and data-sharing pillars reinforced transparency in the logistics flow.
- The G²B platform offers benefits for both private and public parties such as customs and FASFC.

EyeSeal was selected as the best internal container monitoring solution during this project.
Countries visited in worldwide deployments since 2018

ALBANIA
ARGENTINA
AUSTRALIA
BAHAMAS
BELGIUM
BOLIVIA
BRAZIL
CAMBODIA
CANADA
CHILE
CHINA
COLOMBIA
CROATIA
DENMARK
DOMINICAN REPUBLIC
ECUADOR
EGYPT
FRANCE
GERMANY
GREECE
GUATEMALA
HONG KONG
INDIA
INDONESIA
IRELAND
ISRAEL
ITALY
KENYA
MALAYSIA
MALDIVES
MAURITIUS
MEXICO
MYANMAR
NICARAGUA
NORWAY
OMAN
PAKISTAN
PANAMA
PARAGUAY
PERU
PHILIPPINES
POLAND
PORTUGAL
QATAR
REUNION
ISLAND
RWANDA
SAUDI ARABIA
SEYCHELLES
SINGAPORE
SOUTH AFRICA
SPAIN
SRI LANKA
SWITZERLAND
TAIWAN
TANZANIA
THAILAND
THE NETHERLANDS
TRINIDAD & TOBAGO
TURKEY
U.S. VIRGIN ISLANDS
UGANDA
U.A.E.
UNITED KINGDOM
URUGUAY
U.S.A.
VENEZUELA
VIETNAM
Winner of the 2023 IoT Evolution Supply Chain and Cargo Monitoring Product of the Year Award

Fort Lauderdale, February 23, 2023
The solution for the entire value chain

Shipper
- Brand protection
- Increased efficiency
- Secure supply-chain

Surveyors & freight forwarders
- Streamlining of operations
- Revenue opportunity
- Positive for reputation

Cargo terminals
- Higher efficiency
- Reduced congestion
- Increased revenue

Insurance
- Improved risk assessment
- Efficient claims processing
- Increased profitability
- Reduced instances of fraud

Shipping companies
- Increased safety
- Reduced liability

Trade finance
- Reduced fraud
- Improved transparency
- Increased revenue

Law enforcement
- Rule of law
- Efficiency
- Less negative impact on society

Governments
- Homeland security
- Crime mitigation
- Increased tax revenue

Customs
- Higher efficiency
- Secure borders
- Increased data visibility

Final customer
- No surprises
- No disruptions
- Increased satisfaction

Digital platforms
- Lack of reliable devices
- Reliable data
- Added value services

Ground transportation
- More control
- Increased safety
- Increased efficiency