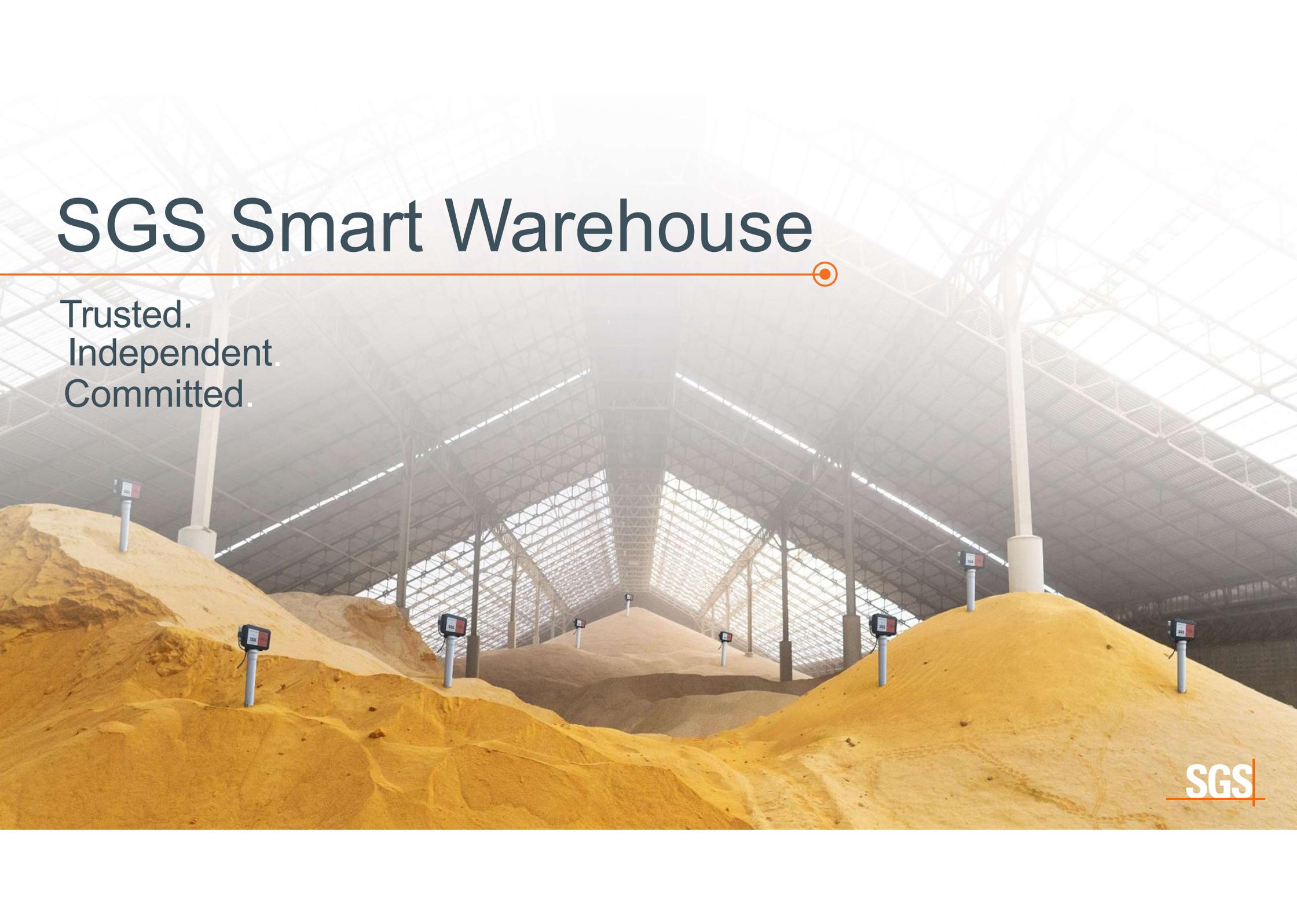**ETSI** IoT Week 2022

Achieving Sustainability Goals Through SGS IoT Grain Condition Monitoring Solution

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11/10/2022

SGS Smart Warehouse

Trusted.
 Independent.
Committed.

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Commodities long-term storage challenges

Temperature and moisture levels, play a key role, when it comes to degradation of grains, oilseeds and other agricultural commodities while they are in storage.

Temperature depends on climatic conditions and biochemical changes that are produced inside a grain mass, provoking undesirable natural heating of the stored products.	Moisture depends on grain or oilseeds seasonal characteristics and relative air humidity. In addition, moisture migration can occur.	Luckily, when the grain biochemical activity change, the CO_2 level increases at a very early stage. It's a predictive indicator that every warehouse operator should measure.
But, how to detect hot spots?	**But, how to detect excess of moisture within the stockpile?**	**But, how to know the CO2 evolution?**

During storage, **all these parameters** have a direct influence on the development of insects and microorganisms as molds, yeasts and bacteria, and on the premature or unseasonal grain germination.

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What is SGS Smart Warehouse?

SGS Smart Warehouse is a robust, accurate and easy-to-understand product that automates and simplifies temperature, humidity and CO_2 monitoring, ensuring the value of stored products in an efficient, innovative and affordable way.

Watch the video to learn more >>

SGS Smart Warehouse offers

Real time information

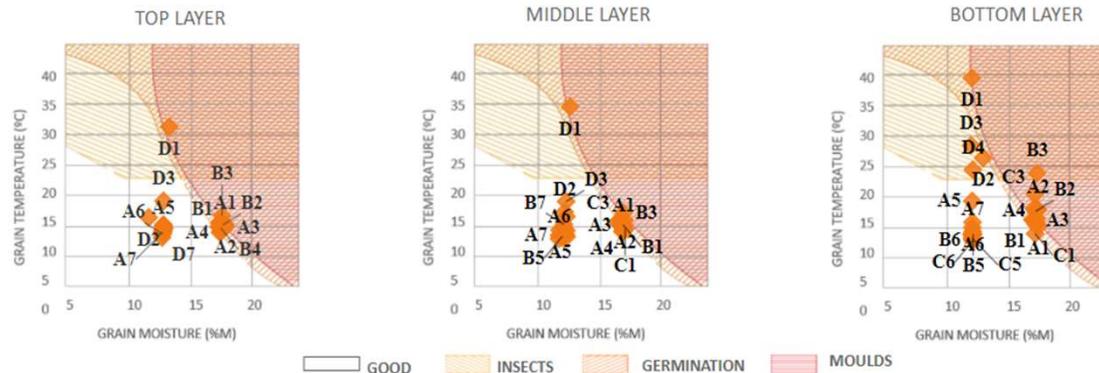**Cargo measurements at 3 different levels up to 6 meters**

Unique mix of air relative humidity, moisture, temperature and carbon dioxide measurements

Configurable alerts and notifications for quick actions
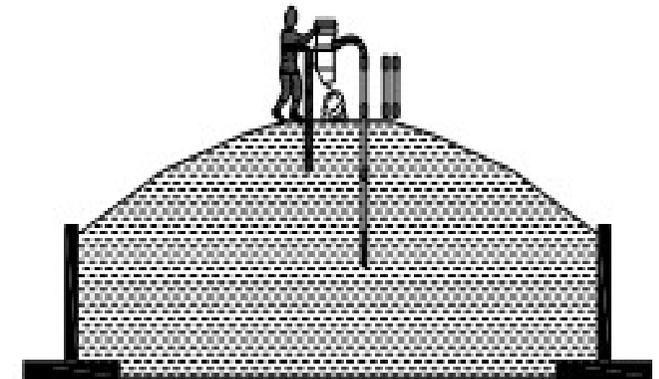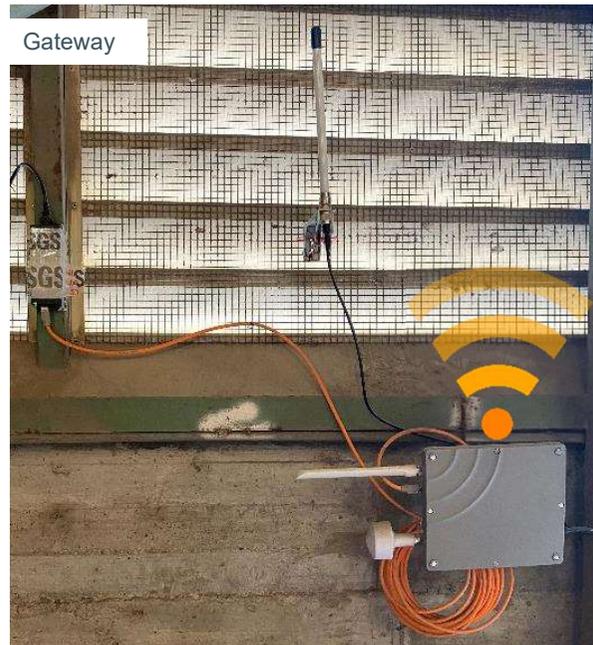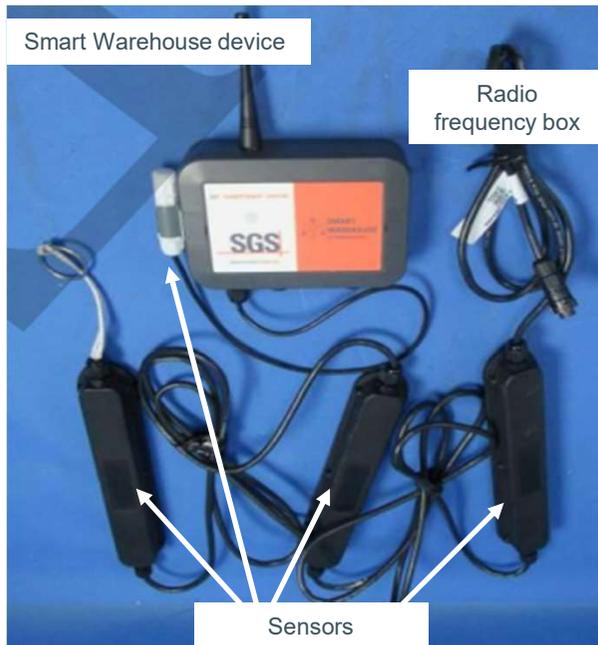
Quick overview of all 3 cargo levels

TOP LAYER

MIDDLE LAYER

BOTTOM LAYER

GOOD   INSECTS   GERMINATION   MOULDS

Customer success story

- **Customer:** one of the largest beer producers in the world

- **Challenge**: they used to experience challenges with the barley stored in one of their warehouses, due to the increase in temperature and the associated degradation (germination)

- **How SGS helped:** Thanks to SGS Smart Warehouse solution, the customer was able to use an additional 6-7K MT, which represents avoiding a loss of raw material valued by the client at approximately 350K EUR
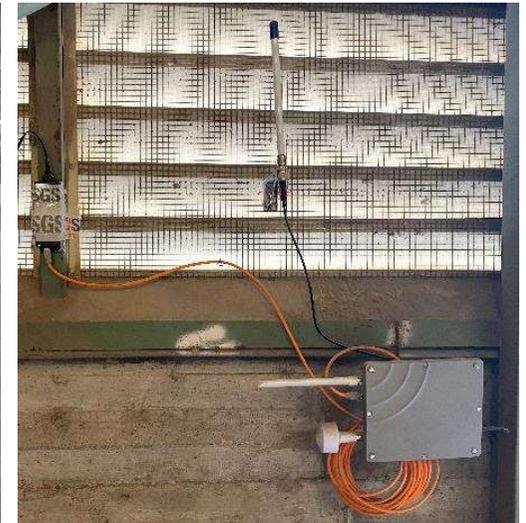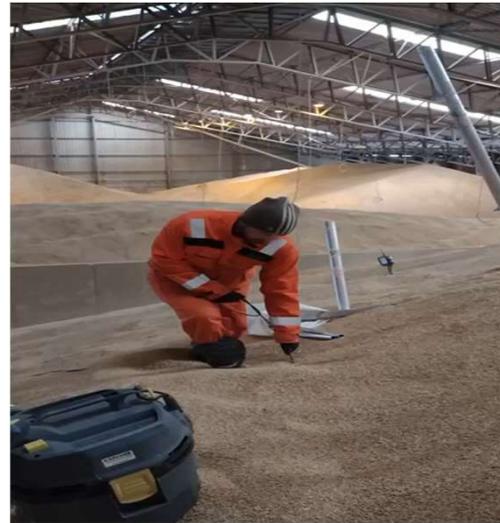
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What does Smart Warehouse consist of?

- **Smart Warehouse device**. Each device has 3 set of sensors + radio frequency box with CO_2 sensor and batteries
  - Recommended set up: 3 devices per 1000 MT
- **One gateway per warehouse.** To transmit the data from devices to the cloud server

Smart Warehouse device

Radio frequency box

Sensors

Gateway

SGS

Smart Warehouse installation process

- Installation of SGS Smart Warehouse is carried out with a pneumatic probe, which:
  - Provides a good estimation of the quality of the cargo, provides information on each layer of the stored merchandise, revealing any hidden problems in the stored cargo
  - Prevents cargo movement or damage during sampling

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Data analysis and reporting

Data analysis and reporting
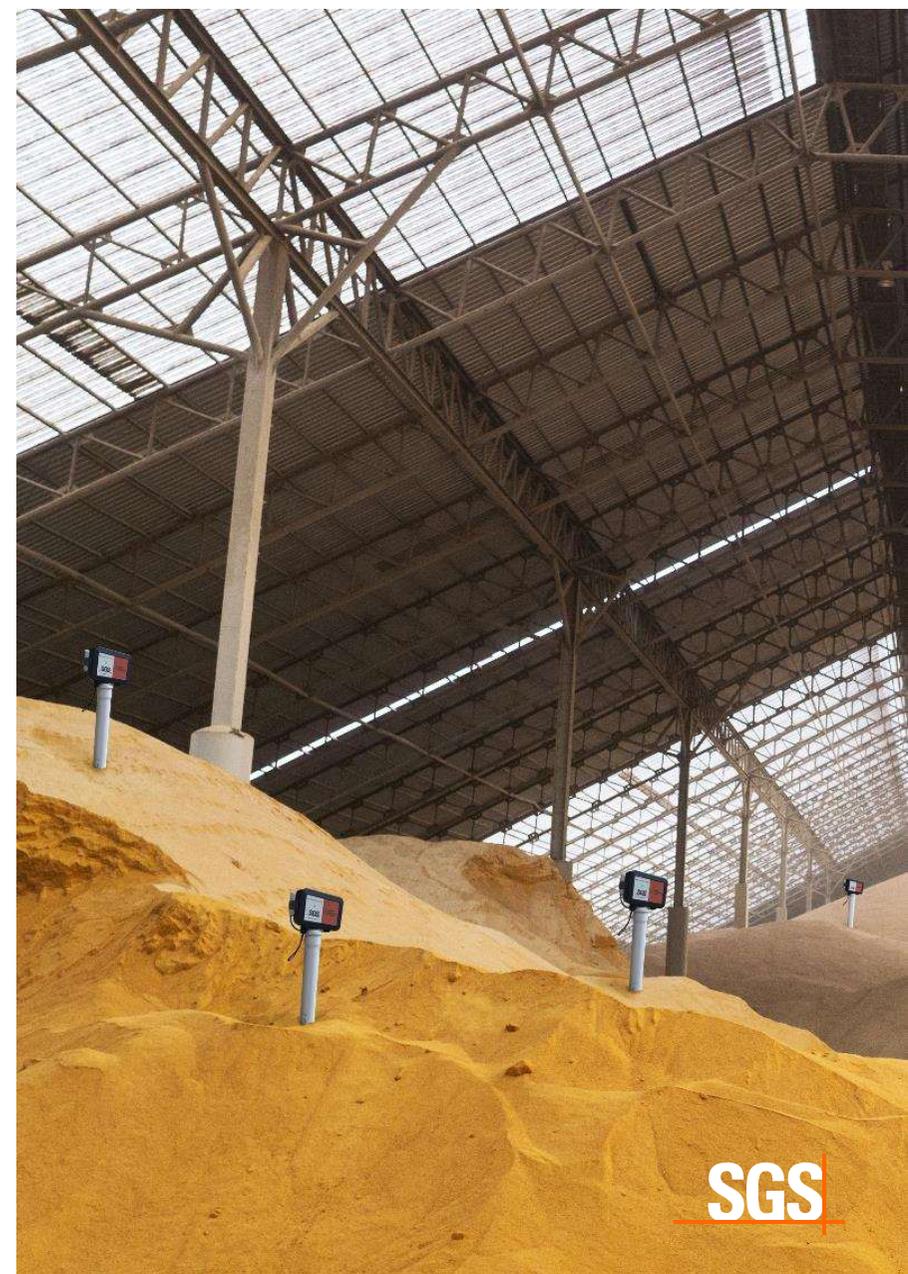
Our unique value proposition

SGS Smart Warehouse provides insights to divide the stockpile, differentiating areas by cargo's condition. This enables a warehouse operator to focus on the affected areas and not on the entire stored volume, which leads to cost savings and preserve condition of the cargo to the optimal level.

Besides the CO_2, sensors detect when a combustion engine (truck, mechanical shovel) is working inside a warehouse. This feature, through an alarm, can reveal unauthorized releases of the cargo.

Features	SGS	Competitors
Attributes	Temperature, humidity, CO_2	Temperature
Meassure	Three different levels	superficial
Max dept	6 meters	1-2 meters
Frequency	Almost real time	1/month
Meassure points	9 per 1000 MT	1 per 1000 MT
Theft detection	Yes	No

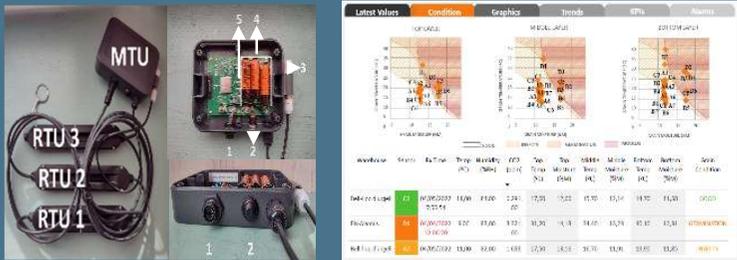**SGS**

Frequently asked questions

- What certifications does the device have? *CE, FCC, IECEx*

- Do I need to remove the devices to fumigate? *No, it is not necessary*

- Can the customers remove the devices themselves? *Yes, by pulling on the cable, not on the rigid elements of the device*

- How many people will have access to the control panel? *As many people as the client requests, there is no user limitation*

Product roadmap

Smart Warehouse - conditions monitoring

New device V3.0. – Sep 2022.
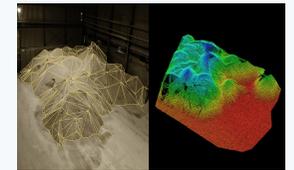Design and operations improvements, battery and connectivity upgrade.

New product version

Web/mobile app, new rigid device to facilitate installations.

Volume monitoring

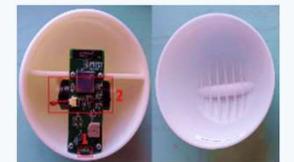Integrate stockpile volume information obtained via the use of drones, lidars, smart phones etc.

Vessel monitoring

Monitor the temperature and humidity conditions of the cargo during a route.

Movement monitoring

Device that detects movements of the cargo allowing theft detection.

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Our **Mission** is to lead and support our customers towards the Next Generation Monitoring Services through providing the state-of-the art IoT solutions

Our **Vision** is to become the globally recognized point of reference in providing the innovative, sustainable and cost efficient IoT solutions

DOING THINGS THE SMART WAY

Please contact us or visit our web page

https://www.sgs.com/en/digital-solutions/general-internet-of-things-IoT-services

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Trusted.
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We are SGS - we bring trust
and integrity to your supply chain,
and help protect your business globally.

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