Securing of Base Stations with mechanical keys

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About Sterna

- Sterna is a Singapore (www.sterna.sg) based company that develops, manufactures and distributes Cloud-based security products and monitoring devices for market segments like the Telecom, Petroleum, Utility, Transport, Finance, Medical, Defense and Governmental.
  We also distribute products for smart and efficient meetings.
- Our main products are all managed and controlled via The Cloud with 24/7 status in real time and all event data is collected centrally:
  - Sterna RIKE, Electronic Locks to IP-rated steel cabinets.
  - Sterna MONIT, Monitored Padlocks and Transport Monitoring Systems.
  - Sterna KIMS, Key Management Systems and Deposit Boxes.
  - ALTERO, Reading mechanical utility meters (www.altero.com).

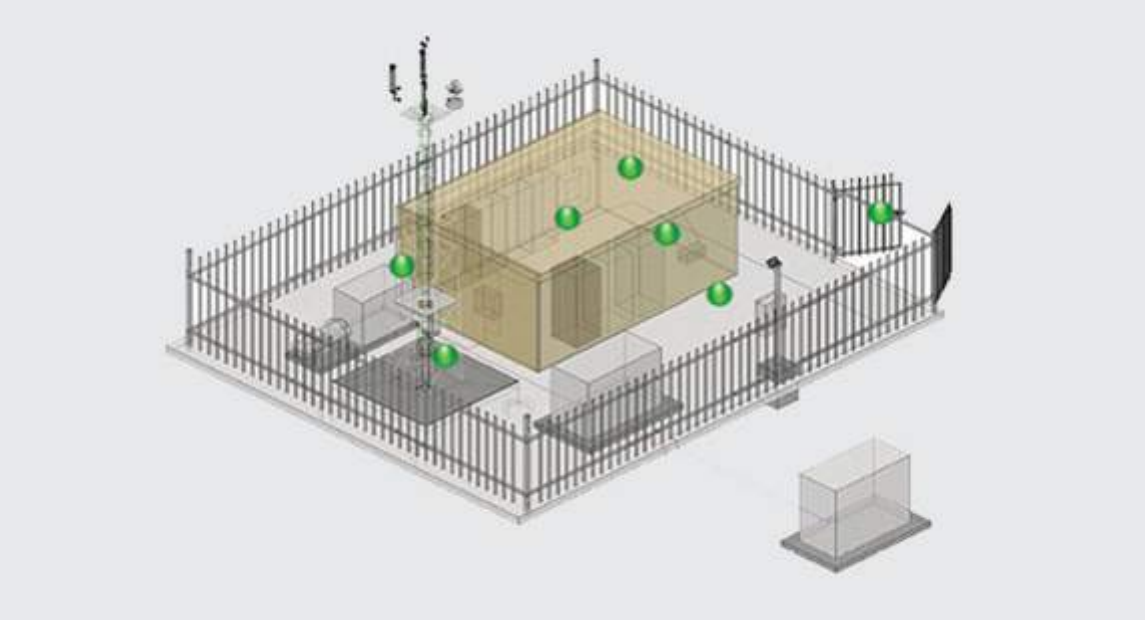
We also represent EVOKO, Meeting room products. (www.evoko.se)

Current Status of Sterna

- Sterna RIKE electronic motor locks have been installed in over 250,000 telecom sites of and is operating in one on-line Cloud based system in the Indian telecom market controlling the IP-rated steel cabinets in base stations eliminating battery theft and monitoring service staff performance.
- Sterna MONIT Padlocks are being implemented when we upgrade the existing 8,000 petrol trucks that already are using our system. These trucks are now being upgraded to our new INTERGRA system, which ensures that the tank trucks can only be opened by an authorized person in a certain geographical area.
- Sterna KIMS Key Management Systems and Deposit boxes are being developed to the next generation introducing cloud based monitoring.
- Altero MeterCam readers are going through POC's (Proof Of Concept) projects on mechanical gas and water meters in several markets.
- EVOKO is a market leader in modern meeting management products with an extensive international reference list.

Base Stations today

- Existing facts and problems:
  - Not a high security site.
  - A site could be landed sites, roof tops, bill boards, equipment rooms.
  - Majority of sites has multiple tenants.
  - Mechanical keys hard to administrate and no control of floating keys.



- Site equipment include e.g. Telco equipment, Rectifiers, Batteries, Gen-sets, Power system switchboards and RF Cables.
- Battery and diesel theft is a is an existing problem.
- Site access by Telco's, Site owners, Vendors, Contractors.
- No real time status of locks or who is accessing and no recording of audit trail.

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Key management issues today

- Different keys to Gate, Cabins, Steel Cabinets and Gen sets.
- Key sets for each site kept centrally and manual key management procedure to keep track of who has the keys to a certain site.
- Loose records or duplicated keys, master keys or reassigning of keys.
- All logs are manual and cumbersome to administrate.
- Online access approval of Permit To Work, but then it is all manual.
- Sites with multiple tenants have multiple padlocks that are linked together at the main gate.
- Basically all keys can be copied in todays world of 3D-printers.
- No verification of activities on sites.

The Sterna Proposal

- One major trend in the security and management systems is that one wants to know at all times what the status is on your installation and allowing access only when needed.
- The reason why this is getting more attention is that the major draw backs with simple mechanical keys are that:
  - They can all be copied and in todays world it can be done quicker.
  - The key management / administration is time consuming and it is hard to motivate people with this bureaucracy, so people are bypassing the rules. This means that “floating keys” (keys not under control) are longer time outside key management control.
- Therefore we must reduce the importance of the key and instead Monitor and Predict the usage of the keys.

HOW IS THIS DONE?

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The Sterna Proposal - Monitoring

- With the Sterna MONIT Padlocks, which are online, one can in Real Time see the status of every lock on all sites. It tells you when opened, when locked, when tampered, when shackle cut and when physically removed.
- The PTW (Permit To Work) issued by the Telco is an access approval that someone is allowed to access a certain site and a certain date and time span and that is the initiator for the system.
- The site should not be accessed unless there has been a PTW issued, so if the gate padlock is opened when there is no PTW issued, the management software sends you an alert by SMS/Email.
- We don’t know who is opening (unless we use electronic keys), but we know that someone who is not supposed to be there are in fact there.
- This means that you don’t need a high security key and all the staff can have their own key at all times.
- The PTW for a site visit states which locks can be opened, including gate, diesel tank, gen-set, cabins or any other lock.

Components we use on site

MONIT - Padlock

- Sterna MONIT MPL-04 Padlock

Abloy Mechanical key

- Abloy Protec2 Mechanical key

Gateway

- Sterna MONIT Gateway MCU-01

Cabinet Lock – Electronic (See separate info)

- Sterna SHE-01 Swing Handle or MBS-01 Motor Lock to lock the steel cabinets.
  See separate presentation

Brief explanation of application

- Service person always has an Abloy key. After PTW is issued they can access a certain MONIT Padlock without generating an alarm.

Service person

- Sterna MONIT Padlock is used on the Site and tells you when opened, locked, tampered or removed.

Security system at site

- All MONIT unit communicates in real time with a Sterna MONIT Gateway
- The Management software collects all data and can send real time alerts.

Communication

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Real Time Communication

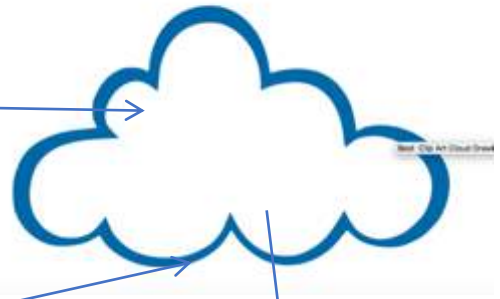
Gate lock

Diesel tank lock

Sterna MONIT MPL-04 Padlock

Sterna MONIT Gateway MCU-01 with SIM card

Sterna MBS-01 Motor Lock with built in Control Unit inside IP-rated steel cabinets.



All Sterna MONIT Padlocks communicates with their status to the MONIT Gateway in real time. Then this data is transferred to The Cloud to with a central server is connected. The Motor Locks in the steel cabinet communicates in a separate system.

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The Sterna MONIT - Monitoring Padlock

- The Sterna MONIT Padlocks the only padlocks on the market with built in sensors which can indicate in real time when opened, locked, shackle cut, tampered or being removed from site.
- It is an on-line system and it is powered by an internal battery.
- The Sterna MONIT Padlocks communicates with the Sterna MCU-01 Gateway, which sends all the events back to a central server.
- Standard version uses an Abloy mechanical key, but can be upgraded to the Abloy Cliq Electronic Cylinder and then we know Who was there to open and lock.

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The Sterna MONIT Gateway

- The Sterna MONIT Gateway is placed in a secure area and it reads the status of all the MONIT Padlocks on the site and sends all data via a built in SIM card to the server.
- The Sterna MCU-01 Gateway can communicate about 100 meters in a built up area and 400 meters in an open area.

- The Sterna MONIT Gateway MCU-01 is tested and approved for vibration/chock (MIL STD 810D), ATEX, PESO and all the required CE standards.

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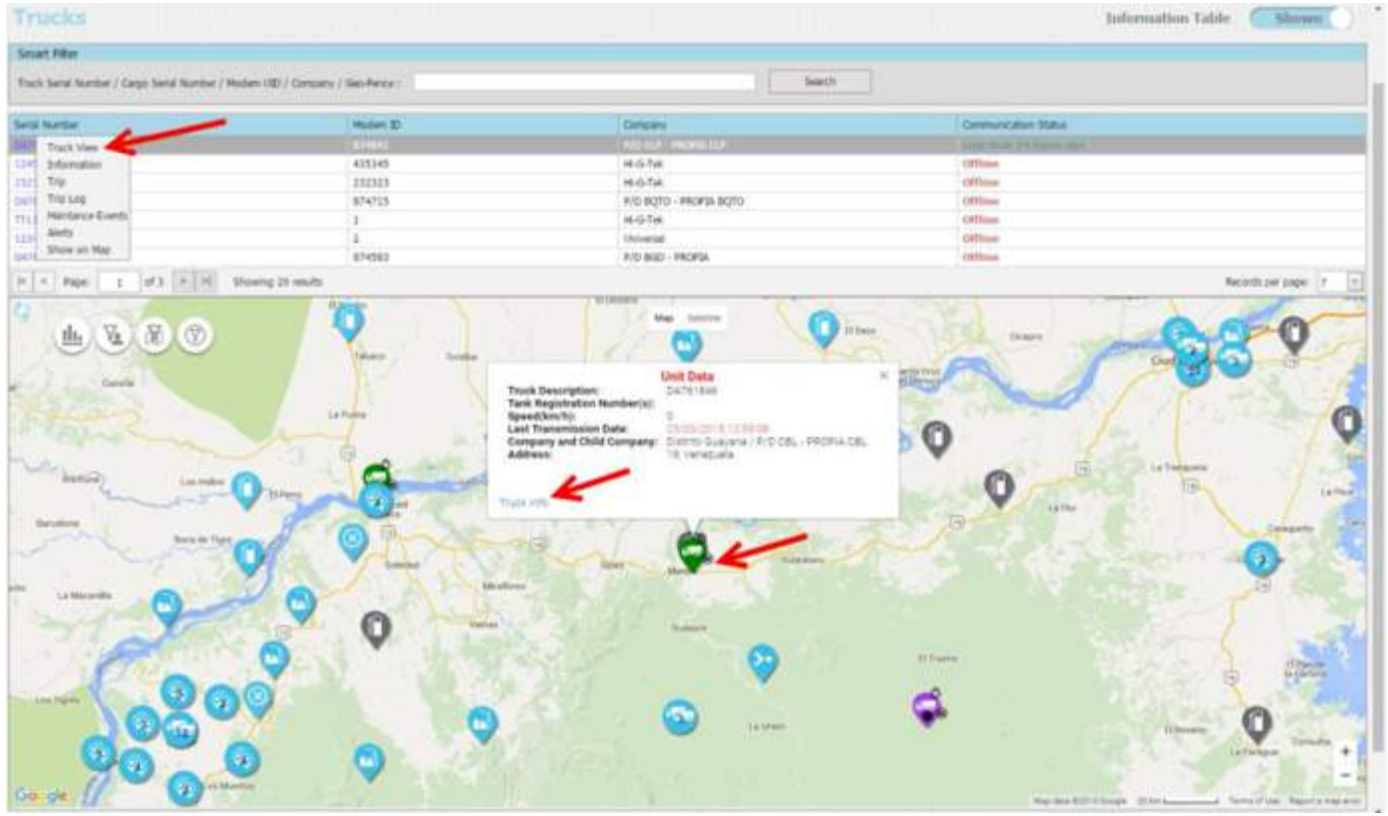
The Sterna Monitoring Software

- The Monitoring Software:
  - Status of Monitoring Devices.
  - Flexible user account.
  - Detailed site data.
  - Settings of alerts.
  - Detailed event information.
  - Maintenance dashboard.
  - Operational dashboard.
  - SDK for communicating with clients management software.



- The Sterna Monitoring Software also allows you to pull out any form of data and via an SDK this data can be controlled centrally from the Customers own management software

The Operation Dashboard

Operation dashboard presents: Offline sites - Sites by location – Sites by Regio
- Alerts by severity (Low Medium High) – Statistics – Sites activity summary

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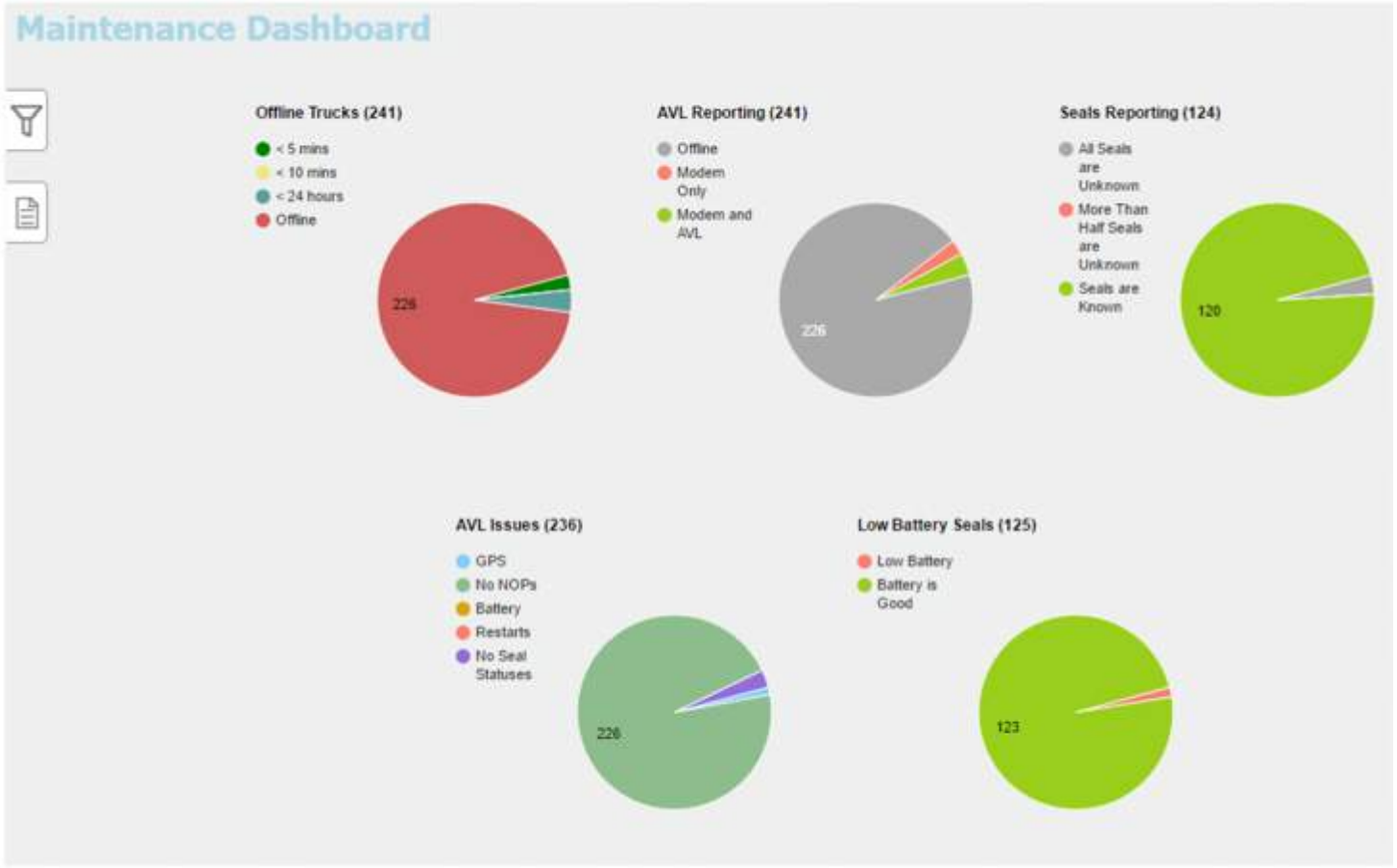
The Maintenance Dashboard



Maintenance Dashboard presents: Offline Sites –
AVL Reporting (Control Unit) – Monitoring Devices reporting –
AVL communication issues – Low battery Monitoring Devices

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End of Presentation

Thank You

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