

SMARTER TRACKING OF EXPLOSIVES

Radio Frequency Identification Device (RFID) technology is the explosives industry's new best friend. RFID tags are Automatic Identification and Data Capture (AIDC) devices with the capacity for safe, fast, and robust reading/writing, storage, and remote retrieval of data via radio waves.

RFID can:

- Provide explosives manufacturers and major mining companies with a technological and business advantage, especially those trading with EU countries
- Seamlessly integrate a Explosive Tracking Code into your current inventory system
- Improve security and accountability of explosives between manufacturing and field application
- Improve tracking of explosives and detonators in the field for better post-blast analysis

EU Regulations – Commercial Explosives Accountability and Tracking

In April this year the European Union (EU) group of countries established regulations requiring all 27 EU countries to possess commercial explosives accountability and tracking at a unit level by April 2012. The leading-edge RFID-ETC remedy from Global Tracking Solutions Pty Ltd (GTS) will enable both explosives manufacturers and mining companies to fulfil and easily exceed these requirements.

Adding Explosives Tracking Code (ETC) to Existing Manufacturing Systems

GTS has developed a single set of protocols—the Explosives Tracking Code (ETC)—for the layout of an RFID tag that all manufacturers and users of RFID technology in explosives can adopt as an industry standard. The key advantage to manufacturers is that current barcode information can be embedded into the RFID tag without the redesign of existing inventory management systems.

The RFID-ETC protocol meets the requirements of EPC Gen 2 and ISO standards and is currently being reviewed by the Australian ISO working group. This protocol surpasses the minimum criteria for data accountability and recording requirements, and can be used virtually indefinitely in both civilian and military applications. For example, in a typical manufacturing plant, 268,777,216 combinations can be used in a single RFID tag for 16 product types within a 24 hour period without duplication in 99 years.

RFID can provide both an inventory tagging process along with product traceability throughout every stage of the manufacturing process. PREtrack® is the RFID-ETC system currently provided by GTS.

Johnex Explosives, Australia's leading innovator in high-tech explosives technology, implemented this solution at their Kalgoorlie plant in Western Australia in May this year. An RFID tag added to all boxes allows for individual box tracking and can be upgraded to individual explosives unit level, in a controlled and systematic manner.

Furthermore, the 13.56 MHz read/write RFID Johnex Explosives implemented meets important safety considerations because:

- It is below the power required to reach the minimum no fire zone for an electric detonator
- It is a magnitude greater than the Australian Standards (AS 2187.2-2006), where it states that no mobile phone devices in the 800 to 2100MHz range are allowed within 20 metres of explosives

Ensuring Security of Explosives from Manufacturing to Field Application

RFID can provide the magazine keeper with new resources to perform key tasks better and achieve higher work efficiency while meeting all new and future regulations. For the first time, both stock management and risk reporting can be generated in both paper-based and electronic formats. The continuity of smarter explosives tracking between manufacturing and field application is provided by GTS's MAGsafe® system.

MAGsafe® provides new systems to ensure the security and accountability of explosives in the form of:

- Bio-reader access controls
- Electronic and paper-based reporting systems
- 5 x 5 Risk Matrix based around preset field generating Red Flag reporting
- Stock management at a unit level across the range of tagged products
- Alerts on out-of-date stock based on the date of opening and not on the date of manufacturing
- The generation of new RFID tags

MAGsafe® can also be used in both Electronic Proof of Delivery (EPOD) and consignment stock management with live reporting on actual stock movement and stock on hand. This speeds up the process and efficiency of ordering and manufacturing for both consumers and suppliers.

Precision Tracking of Explosives in the Field and Better Post-blast Analysis

RFID's live electronic data capture provides a whole new range of tools and options to track explosives and detonators in the field with precision to each blast hole, and removes limitations of today's identification system.

For example, paper-based systems provide a lack of traceability once the explosive leaves the box, restricting personnel from fully understanding what is being loaded into each blast hole. ITracker® by GTS is an RFID-ETC device that collects electronic data on hole by hole explosives usage as well as general blast patterns, thus enabling both manufacturers and

GTS flow chart on traceability



Global
Tracking Solutions Pty Ltd



Above left: John Moore Global tracking Solutions.
 Right: Jim Cash and John Moore Global Tracking Solutions

consumers to pinpoint faulty units or the source of misfires. The blast engineer can upload each hole's data back into his mining/blasting software and review a range of options for continual process improvement to maintain high quality and safety standards.

When MAGsafe® and Ietracker® management systems are used within the same operation the data is independently cross-referenced for an instant and accurate report of exactly what has been removed from a magazine and what has been placed down a hole at a unit level.

GTS is currently talking with major international mining companies on both underground and surface implementation of MAGsafe® and Ietracker®.

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