



**Homeland
Security**

Science and Technology

U.S. Department of Homeland Security



System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective assessments and validations on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, contact the SAVER Program Support Office.

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TechNote

RFID Evidence Management

Law enforcement agencies maintain an extensive inventory of crime scene evidence such as blood stains, hair, fibers and threads, firearm evidence, fingerprints, and documents. The proper tagging, labeling, and marking of evidence provides a chain of custody that supports the claim that evidence presented in court is the same evidence that was collected at a crime scene.

Radio frequency identification (RFID) technology can help facilitate, standardize, and automate inventory and asset tracking tasks for law enforcement evidence management.

RFID Technology for Evidence Management

An RFID system has three basic components: RFID tags, RFID readers, and a database to store and access information obtained from the tags and readers. Tags are classified as passive, active, or semi-active. Passive tags are the most common, and the most applicable to evidence management. An enlargement of a sample passive RFID tag is shown in Figure 1. Passive tags have no battery and can be very small. They consist of a printed antenna and an integrated circuit, or chip, which has a unique ID number. In addition, some tags have the capability to store data directly on the tag. Passive tags only transmit information if queried by a reader and have a limited read range, which is usually less than 10 feet. Active tags, on the other hand, have an onboard battery used to increase read range and power any onboard sensors. Active tags transmit data on a regular schedule without waiting for a reader's signal. Semi-active tags have a battery but, like passive tags, only transmit when queried by a reader. In addition, some RFID tags can be fitted with security measures that can detect attempts to remove or tamper with the tags. One example is a security strap, which is an RFID tag that is similar to a zip tie, but once tightened will emit a signal if cut or stretched.

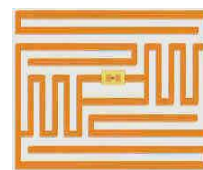


Figure 1. Example RFID Tag
Courtesy of the
Wikimedia Commons

RFID readers come in many styles with the most common being handheld readers, as shown in Figure 2.

RFID readers enable the user to rapidly scan the information from multiple nearby RFID tags. In addition to handheld readers there are doorway mounted readers similar to those seen at department store exits.



Figure 2. RFID Tag and Reader
Courtesy of the
Wikimedia Commons

There are also specialized location readers that can be mounted throughout a room. These readers use signal analysis methods to indicate the physical location of RFID tags within their range.

Finally, RFID systems require a database to store tag data as well as information associated with the tagged item. Agencies can use an existing database, but translation software needs to be used to read and write the data from the RFID system.

The database records all transactions in the system, and can record actions taken with the tagged evidence, such as evidence check out or inventory transactions.

Application of RFID Evidence Management

RFID evidence management systems can be simple or complex depending upon the needs of the agency. A basic system consists of passive tags and handheld readers. RFID evidence management systems operate on the same principle as barcode systems, but have the advantage of being able to read multiple tags simultaneously rather than one at a time. This allows agencies to complete inventories faster. Personnel can quickly locate misplaced items by sweeping the room with the reader until the desired tag is read, significantly reducing the search area. In addition, multiple pieces of evidence can be checked out of the room quickly, because one pass of the reader will capture all of the tag IDs for the transaction.

This basic system can be expanded to meet additional needs of the agency. Door readers can be incorporated at entry and exit points to set off an alarm if evidence is removed without proper authorization. Location readers can be mounted throughout the evidence room to provide continuous physical location information for all evidence. Active tags attached to high value evidence allow for constant item monitoring. Security straps and ruggedized tags can be used to prevent unauthorized access to, or tampering with, evidence.

Benefits of RFID Evidence Management

RFID evidence management systems can streamline and automate the evidence inventory process, increasing overall accuracy, credibility, and control of evidence.

Since RFID readers do not require direct contact with the tags in order to read and update them, RFID technology is often used to track large inventories such as evidence stored in property rooms. By using a handheld reader, law enforcement personnel can easily inventory a property room without opening storage containers or physically touching evidence. This eliminates the need to handle evidence and reduces inventory time.

RFID readers can be installed at entry and exit points providing timestamps for the tags' entry and exit from the controlled area. The management system can include exit alarms that provide alerts if evidence is removed from the premises without proper authorization. Security measures can be incorporated into RFID tags to provide alerts if the tag is tampered with. These capabilities aid in maintaining evidence control and accountability.

References

The following references provide useful information for consideration in the purchase of RFID evidence management systems.

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