Active RFID Technology

Savi - EJ Brooks Reusable e-Seal Tag

Savi SensorTag™ ST-662-001

Key Features:

- Electronically secures ocean containers, trailers, rail cars and air cargo containers.
- Barrier-type bolt seal that communicates ID number and integrity via Radio Frequency Identification (RFID).
- Tamper signal is transmitted when attempt is made to violate the seal.
- Seal complies with ISO/PAS 17712:2003.
- Seal provides more than 2,000 lbs. (907 kgs; kN) of pull-out strength.
- Each seal contains a unique seal number, which is electronically hard-coded into the seal's data bank.
- Three methods of tracking and inspection: Visually, Radio Frequency (RF) and Bar Code.
- Real-time clock for time stamping events.
- Bolt is made of 5/16" steel.
- Steel lock nut is encased in a durable, impact-resistant, plastic housing.

The Savi SensorTag ST-662, also called the Savi-EJ Brooks Reusable eSeal, combines the proven RFID technology of Savi and mechanical seal design of EJ Brooks Company, to ensure both the safe delivery and the prevention of any unauthorized use or misuse of the cargo in transport.

The Savi SensorTag ST-662 is a small, battery operated, bolt seal Active RFID tag that attaches to containers via a bolt through the container's security hasp or other location. Used to monitor assets such as cargo containers and other types of equipment, the Savi SensorTag ST-662 provides a new level of security monitoring, with active RFID tracking and inspection and real-time tamper alarms to help detect potential theft and prevent terrorist threats.

The Savi SensorTag ST-662 incorporates a reusable case/bolt design, along with Ultra High Frequency (UHF) transceiver and Low Frequency (LF) receiver to proactively relay its status throughout facilities or other secured areas. Applications for the Savi SensorTag ST-662 tags include securing, monitoring and access control of containers (virtually any container incorporating a hasp) through loading docks to truck trailers, where precise positional data incorporating Low Frequency is required. The Savi SensorTag ST-662 tag uses a single circuit card assembly (CCA) incorporating UHF and LF RF characteristic, allowing for interface to several types of tag readers.

Mechanical Seal Standards

The Savi SensorTag ST-662 is installed on a container's security hasp using a special ISO 17712 compliant bolt and cap, meeting specified mechanical seal standards for seal strength, approved seal methods, specifications and testing.

Savi's EchoPoint® Technology

The Savi SensorTag ST-662 is built on Savi's innovative EchoPoint technology. EchoPoint Technology employs a unique multi-frequency design and three-element system architecture to achieve both reliable long-range communication, and short-range locating capability.

Specifications

Physical	Dimensions:	2.65 in. x 1.25 in x 2.5 in (6.73 cm x 3.18 cm x 6.35 cm)
	Weight:	6.4 oz. (181 g)
Environmental	Temperature:	-40°C (-40 °F) to +70°C (158 °F) Operating -40°C (-40 °F) to +85 °C (185 °F) Storage
	Humidity:	100% Condensing
	Vibration:	Vibration and Loose cargo test per MIL STD 810F
	Shock:	Testing per MIL STD 810F, 4 feet (1.22 meters)
	Altitude:	Testing per MIL-STD-810F, Low Pressure (Altitude) Procedure I (Max. Altitude =40,000 feet)
LF Receiver	Frequency:	123 kHz
	Range:	12 ft. (4 m) from Savi Signposts; Up to 3.5 ft.(1.07 m) from Savi Mobile Readers
	Modulation:	ASK on-off keying
	Data Rate:	Average 1.6 Kbps, 50% duty cycle
	Data Coding:	Pulse Width Modulation
	Air Protocol:	Savi EchoPoint LF Air Protocol 1.1
UHF Transmit/ Receiver	Frequency:	433.92 MHz
	Range:	Up to 300 feet (91 m) line of sight when mounted to a container to Savi Fixed Readers; Up to 200 feet (61 m) to Savi Mobile Readers
	Air Protocol:	Savi's EchoPoint Air Protocol 2.2
	Modulation:	FSK, deviation +/- 50 KHz
	Data Rate:	27.8 Kbps; 50% duty cycle
	Data Coding:	Manchester
	Max. Transmit Power:	-7 dBm; 0.6 mW peak
	Antenna:	Internal Loop
Tag Identification	EchoPoint Air Protocol 2.1:	32-bit tag identification supported
Digital	Tag Memory:	On board non-volatile EEPROM 32K Byte; User Memory 16 KB
	Interfaces:	Wireless (RF Read/Write Capable)
Approval	Safety Approval:	European EN 60950
	Radiated Emission:	U.S. emission standards as contained in FCC Part 15.231a, Part 15.231e. European Community emission standards as contained in EN 300 220-1 (433 MHz) EN 300 330 (123KHz Receiver)
	ESD compliance:	Exposed to 8 kV air discharge or 4 kV contact discharge in accordance with EN 301 489-1.
	Radiated Immunity:	U.S. emission standards as contained in FCC Part 15/EN 300-220-1, EN 300 330 and European Community Standards as contained in EN 301 489-1
Power	Battery Type:	'AA' size 3.6 volt primary lithium (Li-SOCI2), non-chargeable and non-replaceable.
	Battery Life:	Approximately 4 years, depending on usage

About Savi
With over 16 years experience, Savi is a proven leader in RFID solutions for the management and security of supply chain assets, shipments and consignments. Savi's integrated RFID hardware and software solutions drive business value, such as reducing supply chain assets, inventory and operational costs. Founded in 1989, Savi Technology is a wholly-owned subsidiary of Lockheed Martin, with headquarters in Sunnyvale, California, and offices in Johannesburg, London, Melbourne, Singapore, and Washington D.C. For more information, visit www.savi.com.

About Lockheed Martin
Headquartered in Bethesda, Md., Lockheed Martin employs about 135,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The corporation reported 2005 sales of $37.2 billion.

Contact Savi
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