**A Secure Access Module** is the essential device for a secure and interoperable teleticketing system.

The security of a contactless system is based on secret keys used to authenticate transactions between the terminals and the cards. These keys are stored into the cards or tickets and into a Secure Access Module. A SAM is a smartcard installed permanently in the equipment interacting with the cards or tickets.

ASK is a pioneer of SAM management in Calypso and Mifare environments. Secure Access Modules contain cryptographic keys that are being generated during ASK’s keys ceremonies and personalized for your specific application.

**SAM**
Secure Access Module

### Personalization of a full range of SAM
- CSAM-F
- SAM S1D4, S1D6, S1D7
- SAM S1E1, S20
- NXP Mifare SAM AV2

### Management of cards and tickets
- Calypso Rev1 / Rev2/ Rev 3 cards:
  - TanGO, CD21 (in all emulations)
  - CTS, CTM, SRT
- Mifare Classic™, DESFire, DESFire EV1, Mifare™ UL C, Mifare Plus™

### Key ceremony
- Ceremonies for Calypso systems
- Ceremonies for Mifare systems
- Security architecture definition
- Interoperability management
- Secure storage of master secret keys
### CSAM-F features

#### Main features
- DES, DESX and TDES cryptographies
- Supports Cryptosys Rev1 / Rev2 and Rev3 cards
- Cryptographic keys management
- Data ciphering and unciphering
- Key usage counters and ceilings
- CTM anti-cloning algorithm

#### Standards
- ISO 9797-1 MAC
- Designed to resist EAL4+ attacks

#### Other functions
- 26 event counters + PME
- Up to 255 work keys
- Lock/unlock keys diversification
- Variable signature size (2, 4, 6, 8 bytes)

#### Communication protocols
- ISO/IEC T=0 protocol
- High Speed Protocol (HSP)

#### Characteristics
- ISO format with removable MicroSIM (ID000)
- Voltage supply: 2.7 to 5.5V
- Working temperature: -25°C to 60°C
- Storage temperature: -65°C to 60°C

### NXP Mifare SAM AV2 features

#### Main features
- Secure download and storage of keys
- Supports MIFARE Ultralight, MIFARE Ultralight C, MIFARE 1K, MIFARE 4K, MIFARE Plus, MIFARE DESFire, MIFARE DESFire EV1
- Simultaneous multiple card support (up to 4 parallel sessions)
- MIFARE Crypto1
- TDEA (Triple DES encryption algorithm), AES-128, AES-192 cryptography
- RSA cryptography

#### Standards
- SHA-1, SHA-224, SHA-226

#### Other functions
- MACing / Encipherment / SAM communication / Offline cryptography
- Signature generation and verification, RSA decryption for symmetric key updates
- 128 symmetric key entries, 3 RSA key entries
- 16 key usage counters and ceilings

#### Communication protocols
- ISO 7816 T=1 protocol
- Support high speed baud rates up to 1,5Mbit/s

#### Characteristics
- ISO format with removable MicroSIM (ID000)
- Voltage supply: 3V or 5V
- Working temperature: -25°C to 60°C
- Storage temperature: -65°C to 60°C