



*Knowledge to Shape Your Future*

## Securing your Prepayment Solution from the Potential Threat of Ghost Vending

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## Introduction

### ■ **Standard Transfer Specification (STS) Overview**

- > Managed by the STS user association
- > From inception in 1993 to the current globally accepted standard for pre-payment (STS association from 1997)
- > Utilized in more than 30 countries
- > Becoming accepted international standard

### ■ **Securing your System**

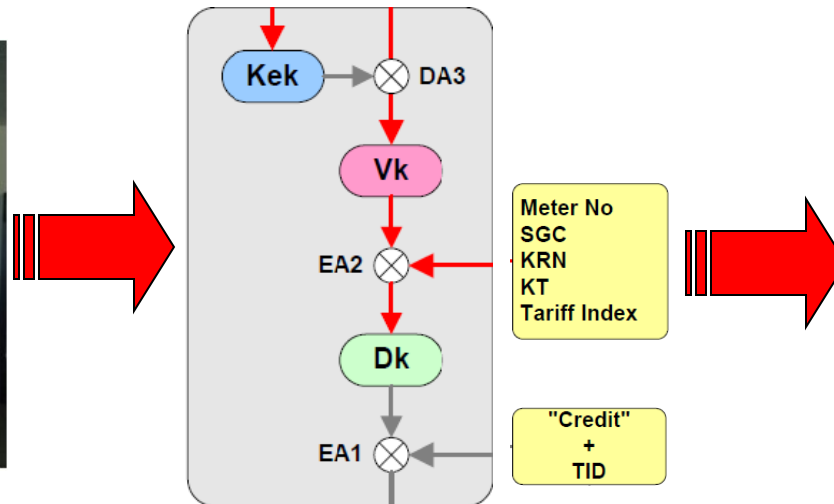
- > Understand STS security
- > Eliminate potential threats
- > Invest in correct solutions
- > Follow best practices
- > Process is secure & independent



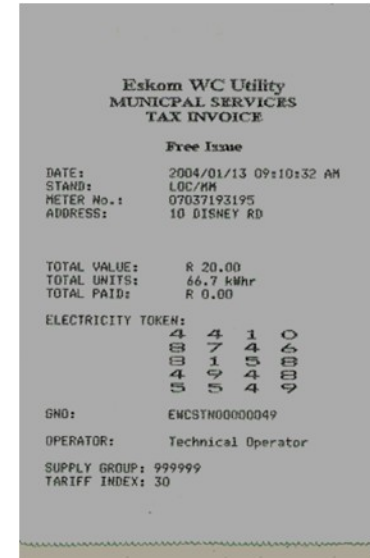
## The STS Process - Vending



Vending Point



Security Module

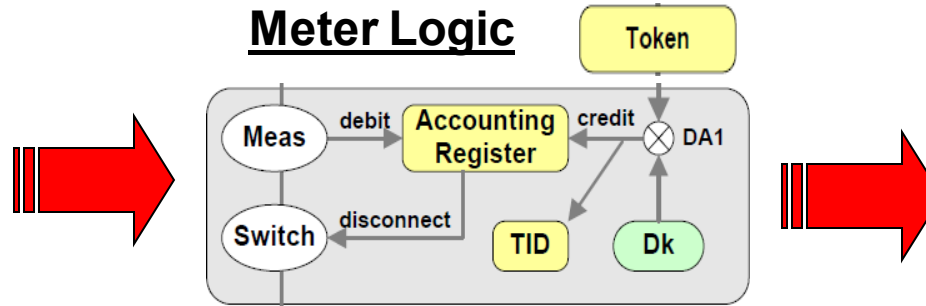


Credit Token

### ■ Key Concepts

- > Encryption of token happens on security module
- > Physically secure module stores 3 “levels” of security keys – Key Exchange Key, Vending Key, Meter Key
- > Unique Token Identifier (TID) generated & encoded

# The STS Process – Token Entry



## Token Message Elements & Validations

METER SERIAL NUMBER

e.g. 01 02504705 9

SUPPLY GROUP CODE (SGC)

e.g. 100600 = Cape Town

TARIFF INDEX - 2 Digits

e.g. 01 = Tariff Code 1

Key Revision Number (KRN)

e.g. 1234

UNITS OF ELECTRICITY

e.g. 50.00 kWh

Token Identifier (TID)

Unique date time stamp

**Meter will ONLY accept Tokens generated from Security Module with the specific Vending Key for its SGC & KRN**

## STS Process – Key Management Centre

- **Features & processes of the KMC**

- > Centred in Eskom's Mega Park Headquarters
- > SM can only be initialized inside KMC (Master Kek)
- > Vending Key may be request for an allocated SGC handled through KMC with a formal process
- > Vending keys generated in secure KMC environment and transported to SM by an encrypted key load file

- **Neither Supplier nor Utility Controls Process**



## Understanding Ghost Vending

- **Illegal sale of tokens from rogue vending stations not linked to supply utility**
  - > Need a SM with Vk(s) for specific meter groups
  - > Syndicates with technical knowledge suspected
  
- **Key Risk – Offline vending points**
  - > Credit limits give some security
  - > Not always implemented/managed
  - > Software feature – can be circumvented



**SM critical hardware – Security starts at correct management**

## Ensuring your System is Secure

- **Protection of the Security Module**

- > Modern vending solutions & communication infrastructure means security modules can be removed from the field
- > Diverse online vending channels available

- **Best Practices & Good Management**

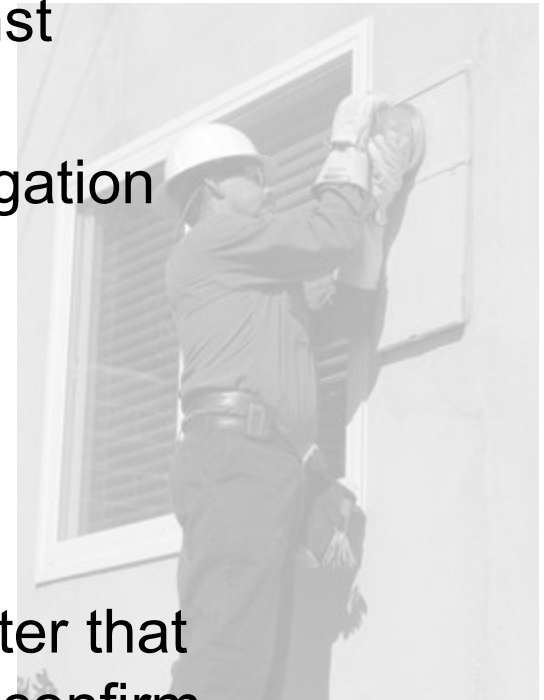
- > Correct management of SGC & Vending Keys critical
- > Supplier must have experience, best practices & solutions to ensure security





## Recognising Ghost Vending

- **Revenue Protection Program**
  - > Capture Credit Register & Readings electronically on HHU
  - > Software to statistically compare against vending transaction history
  - > Exceptions flagged for detailed investigation
  
- **Confirm Ghost Vending**
  - > Remove/replace suspect meter
  - > Download tokens entered into meter
  - > Any token record in memory of the meter that do not to match vending database will confirm





## Combating Ghost Vending

- **Broader social intervention required**
- **Find the stolen Security Module**
  - > Security Module only work on meters programmed with same SCG
  - > With proof that client purchased from illegal vending station; may be possible to trace
  - > Unfortunately syndicates move frequently
  - > Utility needs complete record to account for all SM's
- **Re-Program all affected meters in field**
  - > Request new Vending Key with new SCG
  - > Security Module issue special key change token
  - > Field program systematically update meters (HHU recommended)

**Recent Success – Eskom secures 18 year conviction of 2 syndicate masterminds for R10m fraud (Johannesburg high court 16 March 2011)**

## Conclusions

- Invest in a proven & secure vending system
- When partnering with vending supplier – ensure they have correct processes & highest possible security around protection of security modules
- Move away from offline vending stations to a fully online solution
- ALL security modules must be accounted for (Note old vending stations & SM's in storerooms)
- Ensure RP program has the business intelligence & analytical tools to quickly highlight potential problems



Thank You