# Methodology to originate SIMO Reference

The methodology to be implemented aims to originate a sequential 11-digit numeric reference to be applied at SIMO network and FNBM POS and must comply with **ISO/IEC 7064, MOD 97-**10 for numeric strings with two check digits. Reference and entity validation is a process designed to minimize errors in the processing of payment orders, thereby increasing efficiency and safety.

**Structure of Entity**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *EEEEE* | | | | |
| **Subfield** | **Which identifies** | **Length** | **Type** | **Position** |
| **E** | SIMO Entity ID | 5 | Numerical | 1-5 |

**Structure of the Payment Reference**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *RRRRRRRRRXX* | | | | |
| **Subfield** | **Which identifies** | **Length** | **Type** | **Position** |
| **R** | Initial 9 Digits Reference number | 9 | Numerical | 1-9 |
| **X** | Reference check digits | 2 | Numerical | 10-11 |

* Initial 9 Digits Reference number

This is the reference originated by the FNB corporate client allocated to its ecosystem client's payment account.

* Reference check digits

The Reference's two check digits are calculated according to ISO / IEC 7064:2003, based on the MOD 97-10 algorithm.

**Validation Procedures**

The SIMO procedure for calculating the check digit

The procedure for calculating the check digit, which may be carried out automatically in a computer, is as follows:

|  |  |
| --- | --- |
| 1st Step | Originate Initial 9 Digits Reference number  RRRRRRRRR |
| **2nd Step** | Concatenate Entity (5 digits) and Originate Reference Initial (9 Digits)  EEEEERRRRRRRRR |
| **3rd Step** | Add 00 to the right  EEEEERRRRRRRRR00 |
| **4th Step** | Apply MOD 97-10 (ISO / IEC 7064:2003), which involves finding the remainder when the value obtained from the third step is divided by 97. Find the remainder from this division:  EEEERRRRRRRRR00 ÷ 97 = Remainder (YY) |
| **5th Step** | Calculate the modulus 97 and subtract the remainder from 97+1. If the result is one digit, then insert a leading zero.  97+1-YY = Reference Check digits (XX) |
| **6th Step** | The Reference  RRRRRRRRRXX |