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## 1. Requirements

- 1) The supplier shall provide the samples as per the above table:
- 2) Details regarding the make, model number and firmware version of all items offered shall be provided
- 3) Data sheets, brochures and detailed product manuals for all offered devices.
- 4) All submitted test samples shall be configured with the following LLS password (Table 1 below).

**Table 1: DLMS configuration**

Security parameter	Value	DLMS Client
LLS password	12345678	1 (Management)


- 5) The STS application layer implemented for all submitted test samples shall be configured as stated below to enable the use of test tokens:
  - A MeterInterface connected to a meter loaded with the DITK 1 as specified in Table1 below. The meter's entire TID stack shall, with the exception of the tokens used to fill up the meter with credit, be preloaded with the TID 5A45A116; this TID corresponds to the token issue date and time of **2025-04-01 09:05**.
  - If the payment meter stores its manufacturing date in non-volatile RAM and uses this to determine the validity of a token, then the meters submitted must have this date set to **1st January 2014 00h00**.
  - The meters to be supplied are listed in Table 2 below.

**Table 2: STS parameters**

<b>DUK1</b>	ABABABABABABABAB
<b>Algorithm Type</b>	EA07
<b>Tariff Index (TI)</b>	01
<b>Key Revision no.</b>	1
<b>Meter no.</b>	Defined by smart meter manufacturer.

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<b>Current Limit</b>	20 A or 60 A (for single phase meters)  80 A (for polyphase meters)
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- 6) All samples NOT configured according to Table 1 and 2 above shall be disqualified from further testing.
- 7) HDLC optical port is used for PHASE II testing. This port is mandatory for all smart meter samples, IEC 1107 (Mode E) shall not be accepted for PHASE II testing
- 8) Where a data concentrator/gateway sample is submitted, the following information shall be declared:
  - 3-PLC PSK authentication / encryption keys
  - G3-PLC MAC address
  - G3-PLC frequency (CENELEC A BAND)
  - Data concentrator/gateway web interface log in credentials (at least with administrator account)
- 9) **Where a product does not meet requirements stipulated in the specifications (240-126910106), the product will not be evaluated further. The feedback report for such a product will be compiled accordingly.**

## 2. Security keys for testing for DLMS Security Suite 0

Security parameter	Default value (hex)
LLS default password	12345678
Global Authentication key	0xD0 D1 D2 D3 D4 D5 D6 D7 D8 D9 DA DB DC DD DE DF
Global Broadcast key	0x0F 0E 0D 0C 0B 0A 09 08 07 06 05 04 03 02 01 00
Global Encryption key	0x00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
Master key	0X00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF


## 3. Testing approach

Each smart meter sample's communication interface is connected to a common DLMS Client (i.e., a software application that simulates a Head End System or Central Acquisition System or Data Concentrator).

The simulated system then generates a sequence of DLMS messages that invoke the smart meter's functionality that supports Eskom test cases specified in Table 3 below.

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This enables the evaluation team to determine the smart meter’s compliance to the Eskom’s smart meter specification at use case level and, at communication protocol level.

The DNV GV Test Facility is used as the common DLMS Client (or simulated Head End System), informative reference [1].

Primarily, the HDLC optical port is used for PHASE II testing. This port is mandatory for all smart meter samples, IEC 1107 (Mode E) will not be accepted for PHASE II testing.

The Management Client association is used over the HDLC optical port to ensure access to the entirety of the object model implemented in the smart meter under test.

For test case number TC01, a G3-PLC sniffer is used to monitor and capture G3-PLC traffic between the smart meter under test and its data concentrator. The evaluation team uses the captured G3-PLC traffic to determine compliance with security requirements defined in the G3-PLC specification.


The tests defined for below shall be conducted by the Eskom technical team and not the tenderers.

**Table 3: DLMS Test Cases for functional evaluation.**

Test Case No.	Test case name	Description	References
TC01	Meter registration	<p>Test that meter implements all COSEM objects and functionality that supports automatic meter registration.</p> <p>Check that <i>System Title</i> and <i>COSEM Logical Device Name</i> formats are according to IDIS 2.</p> <p>Check that DLMS security is implemented in meter firmware is at least <i>Suite 0</i>.</p> <p>For Items 1, 2 and/or 4 only - Check that smart meter and Data Concentrator comply with G3-PLC specification join process.</p>	Eskom 240-126910106 clause 3.3.2 and 3.3.3
TC02	Remote tariff programming	Load Eskom approved tariff (e.g., Homeflex) into meter, and set energy	Eskom 240-126910106 clause 3.3.2 and 3.3.3

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Test Case No.	Test case name	Description	References
		rate (Rand/kWh) in prepayment charge tables according to tariff.	
TC03	Meter reading (On demand)	<p>Read import and export total energy registers and rate registers.</p> <p>NOTE 1: At its discretion, the Eskom technical team may inject import and export energy into smart meter to verify four quadrant measurement capability.</p> <p>Read available credit.</p> <p>Read STS data elements (i.e., DRN, TI, KRN, KT and SGC) from IEC 62055-41 attributes IC.</p> <p>Read Load Profile 1 and Load Profile 2, default profile entries, capture objects and capture period.</p> <p>Set LP1 and LP2 integration period to 5, 10-, 15-, 30- and 60-minutes capture period.</p>	<p>Eskom 240-126910106 clause 3.3.2 and 3.3.3</p> <p>DLMS UA 1000-1 Part 2 clause 4.6.6</p>
TC4	Meter reading (For billing)	Read Billing Profile, default profile entries, capture objects and capture period.	Eskom 240-126910106 clause 3.3.2 and 3.3.3
TC5	Disconnection and reconnection	Disconnect meter and re-connect it.	Eskom 240-126910106 clause 3.3.2 and 3.3.3

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Test Case No.	Test case name	Description	References
		<p>NOTE 2: Disconnect Arbitrator or IDIS 2 disconnecter objects may be implemented.</p> <p>Set smart meter power limit and verify that it disconnects when limit is exceeded.</p>	
TC6	Clock synchronisation	Synchronize meter's clock to a preselected date and time.	Eskom 240-126910106 clause 3.3.2 and 3.3.3
TC7	Quality of supply reporting	Test that meter implements all objects and functionality that supports quality of supply reporting.	Eskom 240-126910106 clause 3.3.2 and 3.3.3
TC9	Firmware update	Test that meter implements all objects and functionality that supports firmware upgrade.	Eskom 240-126910106 clause 3.3.2 and 3.3.3
TC10	Meter supervision	Test that meter implements all objects and functionality that supports event / alarm detection and reporting.	Eskom 240-126910106 clause 3.3.2 and 3.3.3
TC11	Consumer information	Check that CIU provides relevant information during all test cases.	Eskom 240-126910106 clause 3.3.2 and 3.3.3
TC21	Prepayment	<p>Change meter to post-payment (credit) mode.</p> <p>Change meter to prepayment mode (monetary currency and energy).</p>	<p>Eskom 240-126910106 clause 3.3.2 and 3.3.3</p> <p>Annex B and C herein</p>

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Test Case No.	Test case name	Description	References
		Insert STS credit token via communication interface (monetary and energy credit).  Set period and amount for standing charge collection.	
TC100	Object list	Read meter's object list using <i>Management Client</i> and check that all objects specified in Eskom 240-126910106 clause are implemented in the meter firmware.	Eskom 240-126910106 clause 3.3.3
TC200	Data concentrator administration	Log into data concentrator web interface using admin password via local interface (e.g., LAN port).  View list of meters connected to data concentrator.	

#### **4. Testing of products listed on TEAP database**

Eskom reserves the right not to perform a technical/ functional evaluation on a product that has been added to the Technically Evaluated Accepted Product (TEAP)/ product database as this product has previously been found to be technically compliant.


Where the manufacturer's product is on the TEAP list and the listed product is still valid, technical evaluation (mandatory, functionality, sample verification /factory assessment) shall be waived, and only the manufacturer's products that are not on the TEAP list shall undergo the full technical evaluation process.

The following are the mandatory tender returnable for all the TEAP listed products:

- a) The tenderers are requested to submit the letter issued by Eskom confirming that their products have been approved and listed on the TEAP listing.

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- b) Where OEM does not have a letter issued by Eskom for the TEAP listed product, the OEM must submit a letter on their company's letterhead which must include all the Eskom approved products (TEAP listed) and the applicable model numbers/product codes.
- c) Where the tenderer is not the OEM of the product, Over and above the letter indicated on item (a) or (b) above, the tenderers must ensure that they submit the Authorisation letter that confirms the agreement with the OEM.
- d) It should be noted that the tenderers submitting the TEAP listed products ARE NOT required to submit any technical submission, but the requirements as listed on item (a) to (b) above

## **5. Certificates & Reports required for listing of products on TEAP database.**

DLMS UA certificate (for Eskom approved firmware version)
G3-PLC certificate (for meters with G3-PLC modems only)
STS certificate for currency and energy (for Eskom approved firmware version)
IDIS 2 certificate or object model listing (for Eskom approved firmware version)
Type test reports (SANS/IEC62055-31 or SANS1524-1 and SANS/IEC 62053-23 or SANS/IEC62053-24)
ICASA Radio Equipment Type Approval Certificate (for Cellular Network modem)

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