

THE EVOLUTION OF STS

THE CONVERGENCE OF PROVEN STS AND SMART METERING

27 JULY 2021





PART 1

The Evolution of the Standard Transfer Specification (STS)



OVERVIEW

- The STS standard (IEC62055-41) has been in place around for over 20 years and during this time, the DLMS User Association published their set of standards (IEC62056 series) for use in smart metering devices
- DLMS = **D**evice **L**anguage **M**essage **S**pecification
- DLMS defines a “standard language” for smart devices – and just like STS prepayment meters, smart devices need a globally accepted standard language that ensures interoperability and peace of mind for utilities using metering technology developed according to these standards



THE EVOLUTION OF STS

- With more than 70 million STS prepayment meters deployed worldwide, the rapid advancement of two-way communications between metering devices has enabled the ongoing evolution of the STS technology to form part of an Advanced Metering Infrastructure (AMI)
- While the STS 20-digit prepayment token has traditionally been entered into the keypad of the prepayment meter or customer interface unit, the advancement in communications now makes it possible for STS tokens to be transmitted remotely from AMI systems to the STS meter via AMI communication gateways

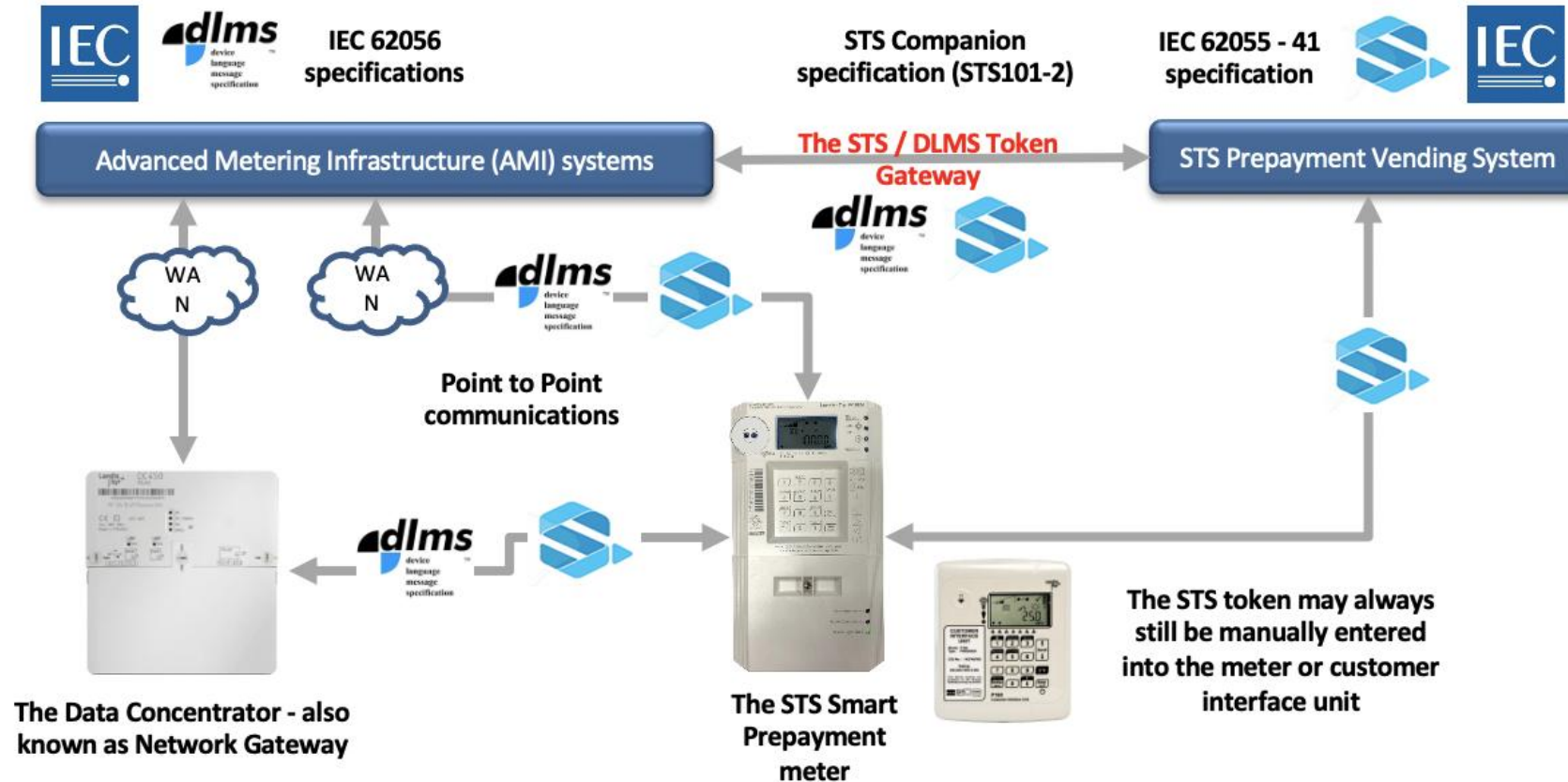


THE DLMS TOKEN GATEWAY

- For users of STS to make use of smart metering standards, the STSA has developed a companion specification (STS101-2) for the integration of STS into DLMS
- To this end, the STSA approached the DLMS User Association to include a **DLMS token gateway COSEM Class** that supports the STS protocol
- As a result, the DLMS standards now include a token gateway (Class 115) for use in developing STS Smart Prepayment meters



THE DLMS TOKEN GATEWAY



SMART STS PREPAYMENT METERS

- Offer an extensive range of valuable benefits for utilities and electricity service providers worldwide, including:
 - Flexible account modes (prepayment or post-payment)
 - Remote transmission of the STS credit or engineering tokens
 - Load profiles
 - Remote auditing / reading of meter data (enhanced revenue protection)
 - Fraud events, prepayment and other events
 - Remote meter firmware updates
 - Remote disconnect and reconnect of the meter's supply control switch
 - Remote transmission of the STS tokens, with the benefit of improved operational efficiency and improved revenue collection and protection

VALUES & BENEFITS

STS & DLMS are both international open standards and the convergence supports the development of smart STS solutions with two-way communications, powerful smart meter functionality while retaining proven STS standards that will continue to ensure secure and upfront collection of revenue for electricity service providers for many years to come

The DLMS token gateway also supports the efficient & remote transmission of the TID Rollover key changes

**** TID Rollover deadline is 24th November 2024 ****





PART 2

The applicable
international open
standards that make
this possible



RELEVANT STANDARDS

- IEC 62055-41 : STS meter functionality
- IEC 62055-51 : STS numeric token carrier
- STS 101-2 : STS token transfer over DLMS
- STS 201-2 : STS Attributes COSEM interface class
- IEC 62056-5-3 : DLMS application layer protocol
- IEC 62056-6-1 : DLMS OBIS codes
- IEC 62056-6-2 : DLMS/COSEM interface classes
- IDIS Pack 3 : Companion specification for Smart Meters
- NRS 049 : Companion specification for Smart Metering Systems



IEC 62055-41 and -51

- These are the current STS standards we are all familiar with
 - Part 41 specifies the transfer of credit between a POS and a meter
 - Part 51 specifies the 20-digit numeric token carrier for entering via the keypad
- Publication status: current

STS 101 -2

- Specifies a new virtual token carrier to transfer standard STS tokens from the POS to the meter over an on-line connection to a remote DLMS-compliant meter
- Uses the DLMS/COSEM Token Gateway interface class
- Note that the traditional keypad can still be used for off-line credit transfers as a backup channel
- Publication status: current



STS 201-2

- Specifies a DLMS/COSEM interface class for remotely reading the STS status of a smart meter having STS functionality
- Also specifies a DLMS/COSEM interface class to support the STS token extensions as specified in STS 202-5
- Still needs to be ratified by the DLMS User Association
- Publication status: Q3/Q4 2021



IEC 62056-5-3, -6-1, -6-2

- Part 5-3 specifies the DLMS protocol and application layer services
- Part 6-1 specifies the Object Identification Codes of the instantiated COSEM interface classes
- Part 6-2 specifies a generic suite of COSEM interface classes as building blocks for implementing smart meter functions
- Publication status: current



IDIS Pack 3

- Published by the IDIS Industry Association as an open companion specification that specifies a set of particular COSEM building blocks as the “ingredients” and “recipe” for implementing a DLMS/COSEM – compliant smart meter
- Recommended for countries to use as an open standard to ensure certifiable interoperability of smart devices for country-wide smart meter implementations
- Publication status: under review to include payment metering functions



NRS 049

- South African industry standard for a smart metering system and includes payment metering functions for integrated STS/DLMS/COSEM meters
 - Traditional keypad for STS 20 digit numeric tokens
 - Remote STS token transfer via an AMI/DLMS connection
 - TOU tariff with consumption blocks
 - Import and export energy prepayment
 - Post payment and prepayment mode
 - Auxiliary charges
 - Emergency credit
- Publication status: under review to reference IDIS Pack 3





PART 3

Certifying STS meters
according to the
DLMS token gateway



CERTIFICATION & STS TOOLS

Current work in progress includes:

- Virtual meter simulator supporting the DLMS protocol
- A test suite to certify meters that use the STS token gateway
- Compliance test documents to be used for certification testing – STS531-9-3-07 for EA07, and STS531-9-3-11 for EA11.
- A companion specification (STS201-2) defining a set of STS attributes
- Availability – Q3/Q4 2021



CONCLUSION

- The role of the STS Association is to continually maintain and enhance the specifications for the benefits our STS members and users of STS technology
- While the Key Management system, certification of the STS products and the ongoing technical support offers peace of mind, our communications on all forms of social media and YouTube video content aims to keep users of STS technology up to date with important news and announcements
- We sincerely hope that this latest enhancement will offer great benefits and value to the industry and the world-wide users of the STS prepayment standards and technology



CONTACT THE STS ASSOCIATION

STS Association Website:

<https://www.sts.org.za/>

Specific support in respect of TID Rollover:

<http://www.tidrollover.com> or email tid@sts.org.za

