STS Association

STS 203-1

Edition 1.1 2022

STANDARD TRANSFER SPECIFICATION –

METERING – PAYMENT SYSTEMS –

Method for default Payment Meter values for conformance testing

CONTENTS

Revision History

Edition	Clause	Date	Change details from previous edition
Ed 1.1		Jan 2022	Added this table Changed to new STS logo

INTRODUCTION

The Conformance Test Specifications (CTS) require that payment meters be supplied in a particular state depending on the entity type being tested and the EncryptionAlgorithm (EA) and DecoderKeyGenerationAlgorithm (DKGA)supported.

For a full set of conformance tests, multiple payment meters are normally required, each with a predefined set of initial values for each utility type submitted for testing. This becomes expensive when shipping meters to the test house.

If a manufacturer also requires meters to be certified against the STS531-9 specification (TCT=08), then a further set of meters would be required for a full CTS certification test - per TCT port.

This specification outlines a method for reducing the number of payment meters required for CTS testing to 1 meter.

1 Scope

The implementation of this specification is not mandatory. However, should a manufacturer wish to implement a method of reverting a payment meter destined for compliance testing to the initial states as required for compliance testing as defined in the STS 531 series, then the method used shall conform with the requirements of this specification.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62055-41 *Electricity metering – Payment systems – Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems*

IEC 62051:1999, *Electricity metering – Glossary of terms*

STS 531 Series

IEC 62055-52 - *Part 52: Standard transfer specification (STS) –Physical layer protocol for a two-way virtual token carrier for direct local connection*

STS 201-15.1.2 - *Companion specification – Meter function object: RegisterTable for payment meters*

IEC 62055-31:2005, *Electricity metering – Payment systems – Part 31: Particular requirements – Static payment meters for active energy (classes 1 and 2)*

IEC 60050-300, *International Electrotechnical Vocabulary (IEV) – Electrical and electronic measurements and measuring instruments – Part 311: General terms relating to measurements – Part 312: General terms relating to electrical measurements – Part 313: Types of electrical measuring instruments – Part 314: Specific terms according to the type of instrument*

STS531-9-1-07: Entity Type I - Physical layer protocol for a two-way virtual token carrier for direct local connection for Port types A and B for EA=07

STS531-9-1-11: Entity Type I - Physical layer protocol for a two-way virtual token carrier for direct local connection for Port types A and B for EA=11

3 Terms, definitions and abbreviations

3.1 General

For the purposes of this standard, the terms and definitions given in IEC 60050-300, IEC 62051, IEC 62055-31, IEC 62055-41 and the following terms apply.

Where there is a difference between the definitions in this standard and those contained in other referenced IEC standards, then those defined in this standard shall take precedence.

The term “meter” is used interchangeably with “payment meter”, “prepayment meter” and “decoder”, where the decoder is a sub-part of an electricity payment meter or a multi-part payment meter.

The implementation of this specification is not mandatory. However, should a manufacturer wish to implement a method of reverting a payment meter destined for compliance testing to

the initial states as required for compliance testing as defined in the STS531 series, then the method used shall conform with the requirements of this specification.

3.2 Abbreviations

DITK	DecoderInitialisationTransferKey
DKGA	DecoderKeyGenerationAlgorithm
DRN	DecoderReferenceNumber
CTS	Compliance Test Specification
EA	EncryptionAlgorithm
SGC	SupplyGroupCode
UUT	Unit Under Test

4 Initial states

4.1 CTS test mode state diagram

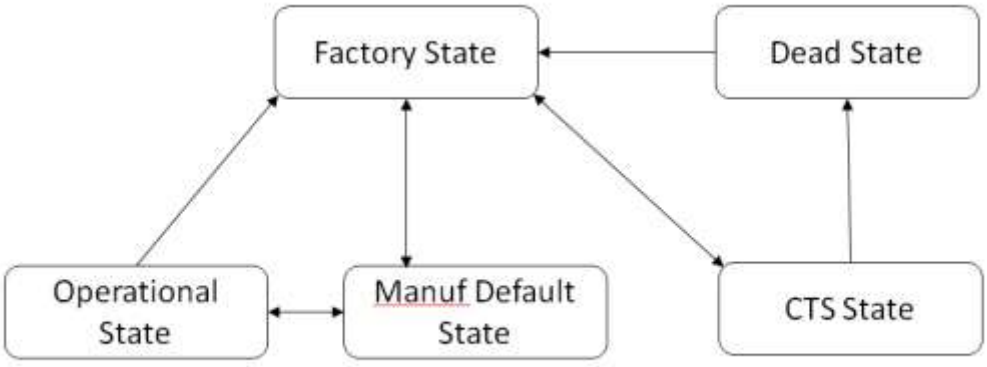

Figure 1 - Meter State Diagram

Figure 1 illustrates the various states that a payment meter may assume from its factory initialised state.

4.2 Register initial values

DITK and register values shall be initialized as given in STS531-9-07 Table 1 and Table 2, and STS531-9-11 Table 1 and Table 2 .

4.3 Reserved DRN numbers

The STS Association has reserved two DRN values for compliance testing. These DRN values are:

For 11 digit DRN numbers (2 digit manufacturer codes): DRN_1 = 00000000000 and,

For 13 digit DRN numbers (4 digit manufacturer codes): DRN_2 = 0100000000008.

No payment meter shall leave the manufacturer's premises with either of these two reserved DRN values unless destined for compliance testing.

4.4 CTS test mode

CTS test mode shall refer to payment meters placed into an initial state as defined in 4.1 and 4.2.

4.5 Entering CTS mode

4.5.1 General

A payment meter shall only be allowed to enter CTS test mode if the DRN number of the payment meter is one of the DRN numbers given in 4.2.

4.5.2 Using Short codes

One method of entering any of the initial states given in 4.1 is to define a set of keypad short codes. The short codes are not specified and it is left to the manufacturer to decide the keypad sequence.

4.5.3 Using predefined registers

Alternatively, writing to a predefined register may be used as a method of setting the payment meter into CTS test mode. The register defined for this operation is given in STS201-1 Clause 6, Table 2, and functions in the following manner.

A Write command is issued to the register with a 2 digit number in the data portion of the command. The 2 digit number specifies the UUT number that the default applies to (See STS 201- 7.43). This allows for up to 99 default values to be specified - currently only 4 are defined.

This is the preferred method as it allows for automated testing to be done at some future point in time.

4.5.4 CTS test timer

Upon entering into CTS test mode, the payment meter shall initiate a powered-up timer. This timer shall increment continuously while the UUT is powered up. When the timer value reaches 24 hours, the payment meter shall exit CTS test mode automatically. The accuracy of this timer shall be at least 5%.

The update period of the powered-up timer shall be no longer than 5 seconds.

There shall be no method to reset the value of this timer.

4.6 Exiting CTS test mode

Exiting CTS test mode shall be by way of the powered-up timer reaching a value of 24 hours as given in 4.4.4. Alternately, a short code or register may be defined to exit CTS test mode irrespective of the value of the powered-up timer. Once CTS test mode is disabled by either the powered-up timer or a short code, it shall not be possible to re-enter CTS test mode by any means other than taking the meter back to the factory for initialization.

When exiting CTS test mode, the payment meter shall be placed into a state where it is not able to dispense any utility service (for example an electricity meter shall open its load switch), even if credit is available, and shall not accept any further tokens or short codes.