



# **Open Metering System Conformance Test**

## **Volume 3 Data Link Layer**

**Issue 1.0.1 / 2012-10-04**

**Release**



## Document History

Version	Date	Comment	Editor
1.0.0	2011-10-11	Final version	J. Feuchtmeier
1.0.1	2012-10-04	Correction of test items [T31-TIM1] and [T31-ACN1] according to OMS AG3 results	J. Feuchtmeier



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# 1 Scope

The present document is a part of the Conformance Test Specification used for certification of equipment according to the Open Metering System (OMS) specification.

This issue is applicable only together with [OMSCT-GEN].

- 5 This document specifies the tests to show conformance for the Data Link layer.

The parameters to be tested, and the test limits are based on OMS Specification Volume 2, Primary Communication [OMSS-Vol2], section 2, *Physical Layer*, section 3, data link layer, section 4, application layer, and the referenced Wireless M-Bus specification [EN 13757-4].

Note:

- 10 This version of test specification does not cover all items of the current OMS Specification.

It is not the scope of this document to show conformance to the essential requirements of the R&TTE directive (1999/5/EC), or other national or international standards.



## 2 References

The used references are listed in [OMSCT-GEN].

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## 3 Definitions, symbols and abbreviations

The used term definitions, symbols and abbreviations are defined in [OMSCT-GEN] (OMS Open Metering System – Conformance Test Volume 1 – General Part).



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## **Part 1:**

# **wireless M-Bus (wMBus)**

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## 4 Test item

All tests shall be done in a low collision scenario. Transmissions of other devices than DUT shall be less than 2% channel occupation.

### 4.1 [T31-MAC1] MAC Test

The following items shall be tested:

- L-Field
- CRC
- Channel coding
- Bit Order
- Frame Format and Synchronization sequence
- Preamble length
  - Mode T1, T2, S1: short and long preamble
  - Mode S2: long preamble

All items shall be conform to [EN 13757-4].

### 4.2 [T31-ADR1] Address structure

**Applies to: unidirectional meter, bidirectional meter, unidirectional repeater, MUC**

[T31-AD1] is identical to [T41-AD1], refer to [OMSCT-APL].

### 4.3 [T31-C1] Supported C-fields

**Applies to: unidirectional meter, bidirectional meter**

The devices shall support C-field 44h.

If installation telegrams are supported (see [OMSCT-ManDec]) C-Field 46h shall be used to transmit installation telegrams.

All C-Fields shall used only in context with message types according [OMSS-Vol2] Tab4.

### 4.4 [T31-DC1] Duty Cycle

**Applies to: unidirectional meter**

The duty cycle, as defined in [EN 300 220-1] sub clause 8.10.1, shall comply with the following limits:

S1 mode (meter): Maximum 0,02 %

S2 mode (other): Maximum 1 %

T1 mode (meter): Maximum 0,1 %

T2 mode (other): Maximum 1 %

The Duty Cycle of the meter shall be observed over a period of exact 1 h.





The Time Period shall be started with a telegram transmission.

- 60 The telegram length determination shall include preamble, coded message part and checksum's of all telegrams within the observation period.

## 4.5 Transmission intervals of meters

### 4.5.1 [T31-TIM1] Data telegram

**Applies to: unidirectional meter, bidirectional meter**

65 It shall be verified by using a sniffer tool that:

- the device under test sends meter data (C-field = 44h) at least every (7,5, 30 or 240) minutes (depending on media) (refer to [OMSS-Vol2], Tab 1)
- The maximum tolerance of 10 received individual transmissions are  $\leq 40\%$  of the stated transmission interval (refer to [OMSCT-ManDec]):

$$70 \quad \frac{MAX(T\_1...T\_9) - MIN(T1...T9)}{T\_set} \leq 40\%$$

- The typical tolerance of 10 received individual transmissions is  $\geq 1\%$  of the stated transmission interval (refer to [OMSCT-ManDec]):

$$\frac{\sum_{i=1}^9 T_i}{9} * \frac{1}{T\_set} \geq 1\%$$

- 75 The standard deviation of 10 received individual transmissions is  $\geq 12\%$  of the stated transmission interval (refer to [OMSCT-ManDec]):

$$StdDev(T\_1...T\_n) * \frac{1}{0,2 * T\_set} \geq 12\%$$

Abbreviation's for all calculations of [T31-TIM1]:

T_set:	stated transmission interval in [OMSCT-ManDec]
80 T_n:	measured transmission interval ( n= 1...9) (over 10 transmissions)
StdDev:	standard deviation
MIN:	minimal value
85 MAX:	maximal value

### 4.5.2 [T31-TIM2] Installation telegram

**Applies to: unidirectional meter, bidirectional meter**

If the [OMSCT-ManDec] defines Installation telegram as active this test has to be passed.

It shall be verified by using a sniffer tool that:

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  - the device under test sends installation telegram (C-field = 46h) within (30 ... 60) s



- installation telegrams shall be transmitted a least 6 times, stopping no later than 60 minutes after the manual start event

## 4.6 Access number

### 4.6.1 [T31-ACN1] Access number meter generic

95 **Applies to: unidirectional meter, bidirectional meter**

It shall be verified using a sniffer tool that the access number of at least 6 transmissions in a row of the device under test is incremented by 1 from one new transmission to the next.

100 It has to be verified, that each of the transmissions with changed application layer from the previous transmission will result in an incremented access number by exactly one.

It has to be verified that the Access Number is increased by at least one at least once in the visualisation interval given in [OMSS-Vol2] Table 1.

105 It shall be verified using a sniffer tool that all SND-IR messages sent after a manual installation start event are using the same access number as used in the latest new telegram.



## Appendix A: Applicable Test cases of OMS-CT (Normativ)

### 1. Test cases of Wireless M-Bus devices

Test case	Description	UDM <sup>1)</sup>	BDM <sup>2)</sup>	UDR <sup>3)</sup>	MUC <sup>4)</sup>
[T31-MAC1]	MAC Test	X	X	X	X
[T31-ADR1]	Address structure	X	X	X	X
[T31-C1]	Supported C fields	X	X		
[T31-DC1]	Duty Cycle	X			
[T31-TIM1] [T31-TIM2]	Data transmission intervals of meters	X	X		
[T31-ACN1]	Access number generic	X	X		X
Note: X This Test case is mandatory 1) UDM = Unidirectional Meter 2) BDM = Bidirectional Meter 3) UDR = Unidirectional Repeater 4) MUC = Multi utility communication controller					

**Table 1: Test Cases related to DUT type**

