Open Metering System
Compliance Test

Volume 2
PHY (Radio Parameters)

Issue 1.0.0 / 2011-10-11

Release

Open Metering System - Compliance Test Vol. 2 - PHY (Radio Parameters)

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Document History

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1 Scope

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

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

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This document specifies the tests to show compliance for the Physical Layer (PHY) and the Medium Access Layer (MAC) covering radio parameters and basic timing.

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

Note:

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 compliance to the essential requirements of the
15   R&TTE directive (1999/5/EC), or other national or international standards.

2 References

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

20 # 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:

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Wireless M-Bus (wMBus)

4 General requirements

35 If the equipment under test has already been subject to other compliance tests (i.e. for R&TTE essential requirements) using [EN 300 220-1], test results from such a test report can be used, and it is not required to repeat those tests where they are overlapping.

4.1 [T21-GR1] Operating mode

The manufacturer shall state the operating mode; S1, S2, T1 and/or T2.

40 4.2 [T21-GR2] Receiver category

The manufacturer shall state the receiver performance class, LR, MR or HR.

4.3 [T21-GR3] Transmitter category

The manufacturer shall state the transmitter performance class, LT, MT or HT.

4.4 [T21-GR4] Temperature range

45 The manufacturer shall state the operating temperature range.

4.5 [T21-GR5] Power supply

The manufacturer shall state the power source.

In case of external power supply the manufacturer shall state nominal, minimum and maximum voltage and maximal current.

50 4.6 [T21-GR6] Antenna

The manufacturer shall state if the antenna is detachable or not, and if an antenna connector is available.

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5 Test conditions, power sources and ambient temperatures

Testing shall be performed under normal test conditions, and also, where stated, under extreme test conditions.

60   Extreme test conditions are as specified in 4.4 and 4.5.

Test conditions and procedures shall be as specified in [EN 300 220-1] clauses 5.2 to 5.4.

6 Transmitter parameters

6.1 [T21-TX1] Nominal frequency

S-mode nominal frequency: 868.3 MHz

65   T-mode meter nominal frequency: 868.95 MHz

Nominal frequency shall be calculated by (CW0 + CW1)/2,

CW0 and CW1 shall be committed in the radio test report or approved with a measurement
70   according to [EN 300 220-1].

Note:

There are no relevant pass / failt criterias listed here. The test conditions are covered by [T21-TX3].

75   ## 6.2 [T21-TX2] Frequency deviation

The frequency deviation, as defined in [EN 300 220-1] sub clause 8.4.1, shall comply with the following limits:

S-mode and T-mode: Minimum 40 kHz, maximum 80 kHz

80   Frequency deviation shall be calculated by (CW1-CW0)/2.

CW0 and CW1 shall be committed in the radio test report or approved with a measurement according to [EN 300 220-1].

85   ## 6.3 [T21-TX3] Frequency error or drift

The frequency error or frequency drift, as defined in [EN 300 220-1] sub clause 8.1.1, shall comply with the following limits:

S1 mode meter: Minimum 868.25 MHz, maximum 868.35 MHz (~60 ppm)

S2 mode meter or other: Minimum 868.278 MHz, maximum 868.322 MHz (~25 ppm)

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T1/T2 mode meter: Minimum 868.9 MHz, maximum 869.0 MHz (~60 ppm)

T-mode other nominal frequency: 868.3 MHz

T2 mode other: Minimum 868.278 MHz, maximum 868.322 MHz (~25 ppm)

95   The frequency error or frequency drift of Battery operated equipment, as defined in [EN 300 220-1] sub clause 8.9.1, shall not exceed the limits given above.

The test shall be performed at normal and extreme test conditions.

100   The drift of the nominal frequency shall be calculated using measured results of CW0 and CW1 under extreme test conditions.

Nominal frequency (Cond1)= (CW0(Cond1) + CW1(Cond1)) / 2

Nominal frequency (Cond2)= (CW0(Cond2) + CW1(Cond2)) / 2

105   Frequency Drift = ABS (Nominal Frequency (Cond1) – Nominal Frequency (Cond2))

6.4 Transmission power

110   Depending on the declaration of 4.6 (Antenna) transmission power has measured conducted or radiated

6.4.1 [T21-TX4] Carrier power (conducted)

The carrier power (conducted), as defined in [EN 300 220-1] sub clause 8.2.1, shall comply with the following limits after the antenna gain in taken into consideration:

Transmitter class LT: Minimum -5 dBm ERP

115   Transmitter class MT: Minimum 0 dBm ERP

Transmitter class HT, meter: Minimum +5 dBm ERP

Transmitter class HT, other: Minimum +8 dBm ERP

The test shall be performed at normal conditions.

120   The nominal value from test report according to[EN 300 220-1] shall exceed the minimum value of the declared transmitter class.

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6.4.2 [T21-TX5] Effective radiated power (ERP)

The effective radiated power, as defined in [EN 300 220-1] sub clause 8.3.1, shall comply with the following limits:

125   Transmitter class LT: Minimum -5 dBm ERP

Transmitter class MT: Minimum 0 dBm ERP

Transmitter class HT, meter: Minimum +5 dBm ERP

Transmitter class HT, other: Minimum +8 dBm ERP

130 The nominal value from test report according to [EN 300 220-1] shall exceed the minimum value of the declared transmitter class

6.5 [T21-TX6] Chip rate, Chip rate tolerance, Chip rate variation within the header, Bit jitter and Data rate

The manufacturer shall state compliance to [EN 13757-4] within [OMSCT-ManDec] .

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6.6 [T21-TX7] Preamble length and Postamble length

The manufacturer shall state compliance to [EN 13757-4] within [OMSCT-ManDec].

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

1. Test cases of Wireless M-Bus devices

Test case	Description	UDM[1]	BDM[2]	UDR[3]	MUC[4]
[T21-GR1]	Operating mode	X	X	X	X
[T21-GR2]	Receiver category		X	X	X
[T21-GR3]	Transmitter category	X	X	X	X
[T21-GR4]	Temperature range	X	X	X	X
[T21-GR5]	Power supply	X	X	X	X
[T21-GR6]	Antenna	X	X	X	X
[T21-TX1]	Nominal frequency	X	X	X	X

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[T21-TX2]	Frequency deviation	X	X	X	X
[T21-TX3]	Frequency error or drift	X	X	X	X
[T21-TX4]	Carrier power (conducted)	A1	A1	A1	A1
[T21-TX5]	Effective radiated power (ERP)	A1	A1	A1	A1
[T21-TX6]	Chip rate, Chip rate tolerance	X	X	X	X
[T21-TX7]	Preamble length and Postamble length	X	X	X	X

Note:

X   This Test case is mandatory

Ax   One of the Test cases marked with same number "x" shall be applied

[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

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