

**CENTRAAL LABORATORIUM VOOR ELEKTRICITEIT (C.L.E.)  
LABORATOIRE CENTRAL D'ELECTRICITE (L.C.E.)**

**Rodestraat, 125 – B-1630 Linkebeek**


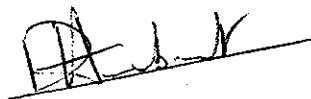
**Electromagnetic compatibility**

**REPORT OF TEST**

Purpose of the test	Measurement of radio-disturbances.
Trade mark and type	ELECTRICAL BOARD provided with an electronic meter ELSTER A1500 and a Modem Bausch Indubox GSM IV
Delivered to	ELSTER Messtechnik GmbH Otto-Hahn-Strasse 25 D-68623 Lampertheim
Performed on	05/11/2007 – 14/11/2007
Delivered on	22/11/2007
CLE task no.	07EM102
CLE report no.	61441/116
Contents	7 pages
Archive no.	-
Applicant reference no.	3150486 / 1210

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This report concerns type tests on one or a series of specimens.

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## A. Specification of the Equipment Under Test

Product name : ELECTRICAL BOARD

Type : Electronic energy meter ELSTER A1500 and a Modem Bausch Indubox GSM IV

Manufacturer : ELSTER (energy meter) and Bausch Datacom (Modem)

Trade mark : ELSTER

Serial number : -

Samples Date of entrance : 15/10/2007  
Number of samples : 1  
CLE Number : 07EM102/1

Description : ELECTRICAL BOARD provided with an electronic energy meter ELSTER A1500-W025-744-OSL-4165S-V0000 (firmware V4.30, sn. 00331325) and a Modem Bausch Indubox GSM IV provided with a RS485 communication port and supplied in 230V 50 Hz.  
The energy meter ELSTER and the modem Bausch are connected with a RS485 interface. The connecting cable between the modem and the energy meter is not shielded. Pictures of the appliance and the antenna are given in appendix 1.  
All the tests and measurements have been practised on sample 07EM102/1.  
The Radio-interference measurements between 30 MHz and 1000 MHz according to EN 55022 have been sub-contracted to ANPI, which is BELAC accredited.

## B. Program of the tests

### Program :

Verification of compliance with the EMC standards EN 55022 (radio disturbance characteristics), All EMC tests against the above mentioned EMC standards are covered by the quality system EN-ISO 17025.

The measurements have been performed on the meter only, on the modem only and, on the meter and modem together.

### Reference documents :

EN 55022 (1998)

### Sub-contracting

ANPI : Measurement of radio-disturbances between 30 MHz and 1000 MHz  
See Report ANPI No: EMC/TRE/744

## C. Method

For the tests, the EUT is electrically supplied in 230V 50Hz single phase.

The GSM IV modem INDUBOX has been connected to an electronic energy meter ELSTER type A1500 with a RS-485 interface and placed in an insulated material board.

Test methods and the instrumentation used are in accordance with the basic standards.

### **C.1. Radio-interference measurements according to EN 55022**

Disturbance voltages are measured at the terminals of the 50  $\mu$ H/50  $\Omega$  artificial mains network from 0,15 to 30 MHz (between each conductor L or N and earth) with a CISPR radio-receiver.

Those methods and the instrumentation used are in accordance with CISPR 16.

Measurement of radio-disturbances between 30 MHz and 1000 MHz by ANPI  
See Report ANPI No : EMC/TRE/744

The EUT has been tested as table-top equipment.

## D. Results

### D.1. Radio-interference measurements between 0,15 and 30 MHz

The table gives the results of terminal voltages between each input conductor (L or N) and earth in dB with reference to 0 dB corresponding to 1  $\mu$ V.  
Unless otherwise specified, the test voltage is 230 V - 50 Hz.  
It is checked that radio-interference does not exceed the limits at any intermediate frequency between 0,15 and 30 MHz.

Energy meter and modem with a communication established

Tested equipment	Frequency (MHz)	Disturbance voltages (dB/ $\mu$ V) QP		Disturbance voltages (dB/ $\mu$ V) AV	
		L	N	L	N
See part A	0.15	-	36	14	-
	0.20	-	41	35	-
	0.30	-	41	36	-
	0.55	43	-	37	-
	1.0	40	-	34	-
	2.0	42	-	36	-
	5.0	44	-	37	-
	10	-	41	-	36
	20	41	-	40	-
	30	29	-	29	-

Energy meter

Tested equipment	Frequency (MHz)	Disturbance voltages (dB/ $\mu$ V) QP		Disturbance voltages (dB/ $\mu$ V) AV	
		L	N	L	N
See part A	0.15	-	30	-	< 5
	0.20	29	-	-	< 5
	0.30	14	-	-	< 5
	0.55	28	-	14	-
	1.0	-	42	-	22
	2.0	-	38	-	17
	5.0	-	36	-	19
	10	-	28	-	11
	20	42	-	41	-
	30	< 5	-	27	-

Modem

Tested equipment	Frequency (MHz)	Disturbance voltages (dB/μV) QP		Disturbance voltages (dB/μV) AV	
		L	N	L	N
See part A	0.15	-	39	-	11
	0.20	-	39	32	-
	0.30	37	-	30	-
	0.55	36	-	34	-
	1.0	33	-	31	-
	2.0	35	-	32	-
	5.0	35	-	32	-
	10	33	-	-	28
	20	40	-	39	-
	30	35	-	31	-

Ambient temperature : 22 °C

**D.2. Radio-interference measurements between 30 and 1000 MHz**

See ANPI report N° EMC/TRE/744

## E. Conclusion

For the tested appliance (see part A - Description of the appliance) the following results are obtained:

EN 55022 - see test results in parts D.1 and D.2	Complies
- Limits of terminal voltages according to the standard (in quasi-peak)	Complies
66 to 56 dB	0.15 to 0.5 MHz
56 dB	0.5 to 5 MHz
60 dB	5 to 30 MHz
- Limits of terminal voltages according to the standard (in average)	Complies
56 to 46 dB	0.15 to 0.5 MHz
46 dB	0.5 to 5 MHz
50 dB	5 to 30 MHz
- Limits for radiated disturbance (in quasi-peak)(see ANPI report N° EMC/TRE/744)	Complies
40 dB	30 to 230 MHz
47 dB	230 to 1000 MHz

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APPENDIX 1

Pictures of the EUT

