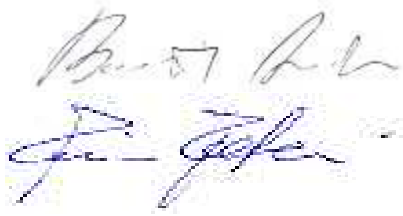
TEST REPORT

APPLICANT:	POLITEC S.r.l. Via Adda, 66/68 – 20040 Bellusco (MI) – ITALY Tel. +39 039 6883019 E-mail: info@politecsrl.it
EUT DESCRIPTION	Security barrier
EUT TRADEMARK	Politec s.r.l.
EUT MODEL	MANA IR 25
REFERENCE STANDARDS :	**EN 50130-4 (1995) + A1 (1998) + A2 (2003)** **EN 61000-6-3 (2007)**
TEST REPORT NUMBER	**EMCTR_111365_0**
TEST REPORT ISSUE DATE	15/11/2011
TESTING LABORATORY	Prima Ricerca & Sviluppo S.r.l. Via Campagna, 92 -22020 Faloppio (Co) –Italy
TESTING LOCATION	As Above
DATE OF TEST SAMPLE RECEIPT	14/11/2011
DATE OF TEST	15/11/2011
TESTED BY	Andrea Bortolotti
APPROVED BY	Massimo Maltempi



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0. CONTENTS

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1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 Identification EUT

Description	SECURITY BARRIER
Trademark	POLITEC S.R.L.
Model :	MANA IR 25
Serial No.:	Not present
Manufactured	POLITEC S.R.L.

1.2 Technical data

Electromagnetic enviroment class:	Components of fire, intruder and social alarm system
Supply voltage:	230Vac 50Hz
Current :	Max 2A
External voltage:	-----
EUT standing:	Floor
EUT single or system:	System
EUT dimensions :	See photographic documentation

1.3 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test :

- none

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1.4 Ports identification

This section contains descriptions of all ports, the length and the type of the cable provided by manufacturer needed for the tests.

Moreover it is specified if the ports are ever or optionally connected.

Port		Description	Connection
1	Enclosure	Plastic & metallic	Screw
2	AC power input/output ports	230Vac 50Hz	Internal connector
3	DC power input/output ports	12Vdc internal battery	Internal connector
4	Signals ports, Telecommunication port	+S.in -S.in +S.out -S.out Camera Antiaccecamento Disqualifica Esclusione raggio 1 AND raggio 1+2 Bypass	Internal connector
Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.			

1.5 Auxiliary equipment

- None

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1.6 Primary functions of the EUT

The following table describes the primary functions and the representative parameter of the equipment under test according the manufacturer specifications:

Primary function	*Representative parameter*
Security barrier	Alarm status, TX/RX synchronization

1.7 Performance of equipment under test

With reference to the above specified primary functions, the following table defines the acceptable level of the performance or permissible loss of function and the observation mode for each representative parameter of the equipment under test according to the technical instructions by the manufacturer.

Representative parameter	*Acceptable level of performance*	*Observation mode*		
		Acquisition	*Test equipment*	*Test n.*
Alarm status, TX/RX synchronization	No performance degradation	❍ Monitoring system by camera ❍ Operator	❍ camera	All immunity test

1.8 Performance criteria

With reference to the par. ***6*** of the Standard **EN 50130-4**, the verification of compliance is based on the following performance criteria :

Performance criterion
There shall be no damage, malfunction or change of status due to conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

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2. Operating test modes and test conditions

The equipment has been tested according to the operative conditions described in the user/installation manual provided by the manufacturer and by following reference standards :

Reference European Standards:

- EN 50130-4, Par. 5
- EN 61000-6-3, par. 4
- CEI EN 50130-4, Par. 5
- CEI EN 61000-6-3, par. 4

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item “Operating condition of the equipment under test” of all technical sheets of the tests (see Section 4)

Operating condition	***Description***
#1	Link between TX and RX, verifying alarm status

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3. SUMMARY OF TEST RESULTS

3.1 Emission tests

Port		Phenomenon	Basic standard	Operating condition	Test result
1	Enclosure	Radiated emission	EN 55022 (1998) + its Amendments	#1	Within the limits
2	AC mains input	RF Disturbance voltage: • continuous	EN 55022 (1998) + its Amendments	#1	Within the limits
	AC mains input	Harmonic current emissions	EN 61000-3-2 (2000)	For the equipment with a rated power of 75W or less, other than lighting equipment, the limits are not specified in this edition of the standard.	
	AC mains input	Voltage fluctuations and flicker	EN 61000-3-3 (1995) + A1 (2001)	Tests need not be made on this equipment because by examination of the circuit diagrams and specification of the equipment and by a short functional test, we have determined that it is unlikely to produce a significant voltage fluctuation or flicker during the use of this system	
3	DC Power port	RF conducted common mode disturbance • Current method	EN 55022 (1998) + its Amendments	Not applicable : internal battery	
4	Telecommunication port	RF conducted common mode (asymmetric mode) disturbance • Current method	EN 55022 (1998) + its Amendments	Not applicable : port not present	

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3.2 Immunity tests

Port		Phenomena	Basic standard	Operating condition[1]	Result
1	Enclosure	EM radiated field, AM 80%	EN 61000-4-3 (1996)	#1	Within the limits
		EM radiated field, PM 1 Hz	EN 61000-4-3 (1996)	#1	Within the limits
		Electrostatic Discharge (ESD)	EN 61000-4-2 (1995)	#1	Within the limits
2	AC mains	Fast transients	EN 61000-4-4 (1995)	#1	Within the limits
		RF common mode	EN 61000-4-6 (1996)	#1	Within the limits
		Surge	EN 61000-4-5 (1995)	#1	Within the limits
		Voltage dips/interruptions	EN 61000-4-11 (1994)	#1	Within the limits
3	DC Power port	Fast transients	EN 61000-4-4 (1995)	Not applicable : internal battery	
		RF common mode	EN 61000-4-6 (1996)		
		Surge	EN 61000-4-5 (1995)		
4	Signal & Telecommunication port	Fast transients	EN 61000-4-4 (1995)	#1	Within the limits
		RF common mode	EN 61000-4-6 (1996)	#1	Within the limits
		Surge	EN 61000-4-5 (1995)	Not applicable : cable < 30mt	

[1] Ref. Tab. of Section 2

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4. TEST RESULTS

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TEST 1.

EMISSION OF MAINS TERMINAL DISTURBANCE VOLTAGE (CONTINUOUS DISTURBANCE)

REFERENCE DOCUMENT

EN 55022
"Limits and methods of measurement of radio interference characteristics of information technology equipment"

- **TEST SETUP:** Acc. to par. 5.2 of reference document
- **TEST LOCATION:** Semianechoic chamber
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESU40
  Artificial Network Rohde & Schwarz Mod. ESH3-Z5

- **TESTED PORT:** AC Mains Input Port
- **FREQUENCY RANGE:** 0.15 - 30 MHz
- **EMISSION LIMITS:** Acc. to Tab. 2 of reference document
- **MEASUREMENT UNCERTAINTY:** Total uncertainty (k=2) ± 2.5 dB

TEST CONDITIONS:			**MEASURED**
Ambient temperature :	15 - 35 ℃		24 ± 3 ℃
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage : (15Vac powered by dedicated AC/AC adapter)			230 Vac ± 3%

OPERATING CONDITION (Rif. Section. 2) : *#2*

RESULT: WITHIN THE LIMITS

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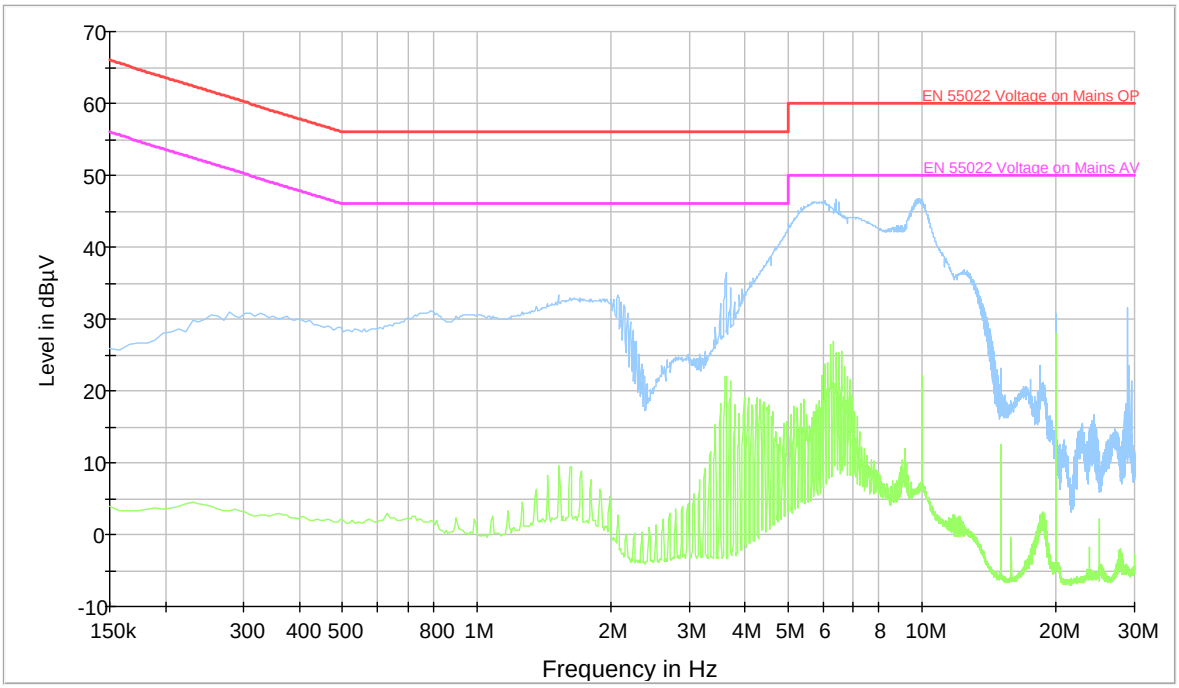
EN 55022 with 2-Line-LISN_ESMI



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TEST 2.

ELECTROMAGNETIC RADIATED FIELD DISTURBANCE EMISSION TEST

REFERENCE DOCUMENT CISPR 16-2-3

- **TEST SETUP:** Acc. To Par. 7.4 of the ref. Std.
- **TEST LOCATION:** Semi-anechoic chamber (CISPR 16-1 :1993)
  Siemens+Matsushita type B84117-D6019-T232
  Measure distance 3 meters
- **TEST EQUIPMENT USED FOR TEST:** EMI receiver Rohde & Schwarz Mod. ESMI
  Chase Antenna Mod. CBL 6111 A

- **TESTED PORT:** Enclosure
- **FREQUENCY RANGE:** 30 - 6000 MHz
- **EMISSION LIMITS:** Acc. to Tab. 1 of EN 61000-6-3
- **UNCERTAINTY OF MEASURE:** Level of confidence = 95%
  Degree of freedom = 10
  Coverage factor kp= 2,28
  Combined uncertainty = 4,49 dB

TEST CONDITIONS:			**MEASURED**
Ambient temperature :	15 - 35 ℃		24 ± 3 ℃
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage : (15Vac powered by dedicated AC/AC adapter)			230 Vac ± 3%

OPERATING CONDITION (Rif. Section. 2) : *#1*

RESULT: WITHIN THE LIMIT

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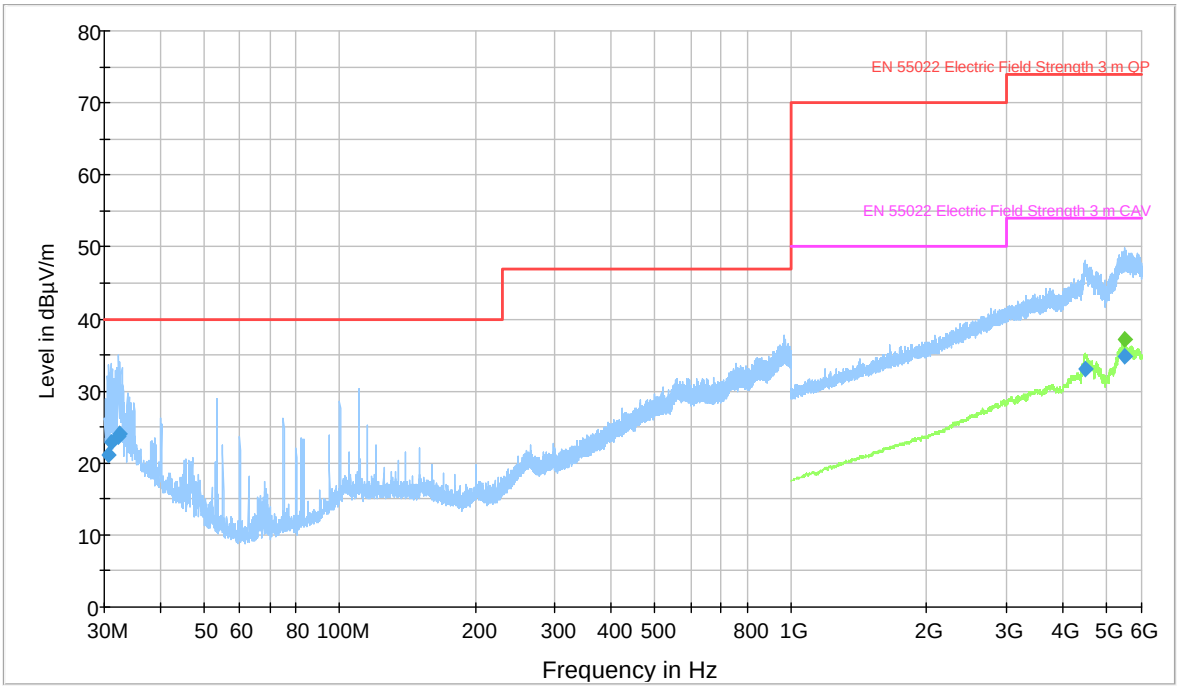
Electric Field Strength with Scans OSP



Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.760000	21.2	1000.0	120.000	100.0	V	100.0	19.3	18.8	40.0
31.000000	22.9	1000.0	120.000	100.0	V	117.0	19.1	17.1	40.0
32.320000	23.8	1000.0	120.000	100.0	V	102.0	18.4	16.2	40.0
32.560000	24.1	1000.0	120.000	100.0	V	103.0	18.3	15.9	40.0
4500.000000	33.1	1000.0	1000.000	135.0	H	22.0	7.7	40.9	74.0
5490.800000	34.9	1000.0	1000.000	100.0	V	201.0	10.9	39.1	74.0

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
5504.400000	37.1	1000.0	1000.000	100.0	V	-15.0	10.8	16.9	54.0

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TEST 3. IMMUNITY TO RADIATED RF ELECTROMAGNETIC FIELD

REFERENCE DOCUMENT

EN 61000-4-3
Electromagnetic Compatibility (EMC) - Part 4 Testing and measuring techniques
Section 3 : Radiated radio-frequency electromagnetic field - Immunity test

- **TEST SETUP:** Acc. to par. 7 of Basic standard
- **TEST LOCATION:** Semi-anechoic chamber (CISPR 16-1 :1993)
  Siemens+Matsushita type B84117-D6019-T232
  Measure distance 3 meters
- **TEST EQUIPMENT USED FOR TEST:**

RF Signal generator	R&S mod. SMB 100 A	9kHz - 6GHz
RF Amplifiers	AR 250L 250W	150kHz - 220MHz
	AR100W 100W	220MHz - 1000MHz
	25S1G4	800MHz-4200MHz
Directional Coupler	AR-DC2500	10 kHz – 220 MHz
	AR-DC6180	80 – 1000 MHz
	AR-DC7144A	0,8 – 4,2 GHz
Transmitting antenna	FSA mod. S13014/1	80MHz - 1GHz
	Electro Metrics mod. 6961	1GHz - 18GHz
Software	EMC32S	

- **TESTED PORT:** Enclosure
- **FREQUANCY RANGE:** 80 MHz - 2700MHz 10 V/m, 80% AM (1kHz)
  80 MHz - 2700MHz 10 V/m, PM (1Hz)
- **SCAN DATA:** 1s - 1% log.
- **IMMUNITY LEVEL:** 10 V/m, 80% AM (1kHz) - 10 V/m, PM (1Hz)
- **PERFORMANCE CRITERION** A
- **MEASUREMENT UNCERTAINTY:** Level of confidence = 95% Degree of freedom = 10
  Coverage factor kp= 2,28 Combined uncertainty = 10,5 %

TEST CONDITIONS:	**MEASURED**
Ambient temperature : 15 - 35 ℃	24 ± 3 ℃
Ambient humidity : 25 - 75 %rH	40 ± 5 %rH
Pressure : 85 - 106 kPa (860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage : (15Vac powered by dedicated AC/AC adapter)	230 Vac ± 3%

OPERATING CONDITION (Rif. Section. 2) : *#2*

RESULT: COMPLIANT

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TEST RESULTS

80-2700 MHz AM, 80% 1kHz, 10V/m

POLAR.	VERTICAL			HORIZONTAL			
PORT	*WITHIN THE LIMIT*	*OUT OF LIMIT*		*WITHIN THE LIMIT*	*OUT OF LIMIT*		NOTES
	A	B	C	A	B	C	
ENCLOSURE **front side**	√			√			**No performance degradation**
ENCLOSURE **rear side**	√			√			**No performance degradation**

80-2700 MHz PM 1Hz, 10V/m

POLAR.	VERTICAL			HORIZONTAL			
PORT	*WITHIN THE LIMIT*	*OUT OF LIMIT*		*WITHIN THE LIMIT*	*OUT OF LIMIT*		NOTES
	A	B	C	A	B	C	
ENCLOSURE **front side**	√			√			**No performance degradation**
ENCLOSURE **rear side**	√			√			**No performance degradation**

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TEST 4.

IMMUNITY TO ELECTROSTATIC DISCHARGE (ESD)

REFERENCE DOCUMENT EN 61000-4-2
Electromagnetic Compatibility (EMC) - Part 4 Testing and measuring techniques
Section 2 - Electrostatic discharge immunity test.

- **TEST SETUP:** Acc. to par. 7 of Basic standard
- **TEST LOCATION:** Transitory phenomena area
- **TEST EQUIPMENT USED FOR TEST:** ESD generator EM Test Mod. Dito
  Discharge impedance 330 ohm / 150 pF

- **TESTED PORT:** Enclosure
- **IMMUNITY LEVEL:** ± 2kV, ± 4kV ± 6kV (direct and indirect contact);
  ± 2kV, ± 4kV , ± 8kV (direct air)
- **NUMBER OF DISCHARGES** 10 positive and 10 negative for each point of discharge
- **TIME BETWEEN SUCCESSIVE PULSES:** 1 s
- **MEASUREMENT UNCERTAINTY:**
  Level of confidence = 95%
  Degree of freedom = 10
  Coverage factor kp= 2,28
  Combined uncertainty of peak voltage level = 3,09 %
  Combined uncertainty of peak current level = 8,52 %
  Combined uncertainty of rise time = 5,45 %
  Combined uncertainty of curve decay points at 30 and 60 ns = 10,22 %

TEST CONDITIONS:			**MEASURED**
Ambient temperature :	15 - 35 ℃		24 ± 3 ℃
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage : (15Vac powered by dedicated AC/AC adapter)			230 Vac ± 3%

OPERATING CONDITION (Rif. Section. 2) : *#2*

RESULT: COMPLIANT

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TEST RESULTS

DIRECT CONTACT DISCHARGE (FOR CONDUCTIVE SURFACES)

- **Level : 2, 4 and 6 kV**
- **For each voltage and polarity, apply 10 discharges.**

TEST RESULTS			PERFORMANCE CRITERIA		NOTES
Discharge point		Pol.	WITHIN THE LIMIT	OUT OF LIMIT	
1	Enclosure	+	10		No performance degradation
		-	10		

DIRECT AIR DISCHARGE (FOR NOT CONDUCTIVE SURFACES)

- **Level : 2, 4 and 8 kV**
- **For each voltage and polarity, apply 10 discharges.**

TEST RESULTS			PERFORMANCE CRITERIA		NOTES
Discharge point		Pol.	WITHIN THE LIMIT	OUT OF LIMIT	
2	Enclosure Front Side	+	H		No performance degradation
		-	H		
3	Enclosure Rear Side	+	H		No performance degradation
		-	H		
4	Enclosure Top Side	+	H		No performance degradation
		-	H		
5	Enclosure Bottom Side	+	H		No performance degradation
		-	H		
6	Enclosure Left Side	+	H		No performance degradation
		-	H		
7	Enclosure Right Side	+	H		No performance degradation
		-	H		

NOTES : H = HIGH IMPEDENCE SURFACE, ESD CANNOT BE REPRODUCED.

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INDIRECT DISCHARGE TO VCP (VERTICAL COUPLING PLANE)

- **Level : 2, 4 and 6 kV**
- **For each voltage and polarity, apply 10 discharges.**

TEST RESULTS			PERFORMANCE CRITERIA		NOTES
Discharge point		Pol.	WITHIN THE LIMIT	OUT OF LIMIT	
8	Enclosure front side	+	10		No performance degradation
		-	10		
9	Enclosure rear side	+	10		No performance degradation
		-	10		
10	Enclosure right side	+	10		No performance degradation
		-	10		
11	Enclosure left side	+	10		No performance degradation
		-	10		

INDIRECT DISCHARGE TO HCP (HORIZONTAL COUPLING PLANE)

- **Level : 2, 4 and 6 kV**
- **For each voltage and polarity, apply 10 discharges.**

TEST RESULTS			PERFORMANCE CRITERIA		NOTES
Discharge point		Pol.	WITHIN THE LIMIT	OUT OF LIMIT	
12	Enclosure lower side	+	10		No performance degradation
		-	10		

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TEST 5.

IMMUNITY TO FAST TRANSIENTS / BURSTS

REFERENCE DOCUMENT EN 61000-4-4
Electromagnetic Compatibility (EMC) - Part 4 Testing and measuring techniques
Section 4 - Electrical fast transient burst immunity test.

- **TEST SETUP:** Acc. to par. 7 of Basic standard
- **TEST LOCATION:** Transitory phenomena area
- **TEST EQUIPMENT USED FOR TEST:** Burst Generator EMTest Mod. UCS 500N
  Capacitive Clamp Hilo Test mod. EFTC-105

- **TESTED PORT:** AC Ports
- **IMMUNITY LEVEL:** AC ports : ± 0,5kV, 1kV, 2kV

- **MEASUREMENT UNCERTAINTY:**
  Level of confidence = 95%
  Degree of freedom = 10
  Coverage factor kp= 2,28
  Combined uncertainty of peak voltage level = 10,16 %
  Combined uncertainty of rise time = 20,08 %
  Combined uncertainty of frequency 5 kHz = 1,82 %
  Combined uncertainty of duration = 20,08 %

TEST CONDITIONS:			**MEASURED**
Ambient temperature :	15 - 35 ℃		24 ± 3 ℃
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage : (15Vac powered by dedicated AC/AC adapter)			230 Vac ± 3%

OPERATING CONDITION (Rif. Section. 2) : *#2*

RESULT: COMPLIANT

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TEST RESULTS:

PORT N. 2 : AC PORT

TEST	COUPLING MODE	IMMUNITY LEVEL	POLAR.	DISTURB. DURATION	REPETITION FREQ.	TEST DURATION
TEST 1	*L1 - Ref. ground*	*0,5kV*	*±*	*15 ms*	*5 kHz*	*60 s*
TEST 2	*N - Ref. ground*	*0,5kV*	*±*	*15 ms*	*5 kHz*	*60 s*
TEST 3	*PE - Ref. ground*	*0,5kV*	*±*	*15 ms*	*5 kHz*	*60 s*
TEST 4	*L1 - Ref. ground*	*1kV*	*±*	*15 ms*	*5 kHz*	*60 s*
TEST 5	*N - Ref. ground*	*1kV*	*±*	*15 ms*	*5 kHz*	*60 s*
TEST 6	*PE - Ref. ground*	*1kV*	*±*	*15 ms*	*5 kHz*	*60 s*
TEST 7	*L1 - Ref. ground*	*2kV*	*±*	*15 ms*	*5 kHz*	*60 s*
TEST 8	*N - Ref. ground*	*2kV*	*±*	*15 ms*	*5 kHz*	*60 s*
TEST 9	*PE - Ref. ground*	*2kV*	*±*	*15 ms*	*5 kHz*	*60 s*

TEST RESULT		PERFORMANCE CRITERIA		NOTE
N°TEST	Pol.	WITHIN THE LIMIT	OUT OF LIMIT	
TEST 1	+ -	√		*No performance degradation*
TEST 2	+ -	√		*No performance degradation*
TEST 3	+ -	√		*No performance degradation*
TEST 4	+ -	√		*No performance degradation*
TEST 5	+ -	√		*No performance degradation*
TEST 6	+ -	√		*No performance degradation*
TEST 7	+ -	√		*No performance degradation*
TEST 8	+ -	√		*No performance degradation*
TEST 9	+ -	√		*No performance degradation*

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TEST 6.

IMMUNITY TO SURGE

REFERENCE DOCUMENT EN 61000-4-5
Electromagnetic Compatibility (EMC) - Part 4 Testing and measuring techniques
Section 5 - Surge immunity test.

- **TEST SETUP:** Acc. to par. 7 of ref. Std.
- **TEST LOCATION:** Transitory phenomena area
- **TEST EQUIPMENT USED FOR TEST:** Surge Generator EM Test Mod. UCS 500N

- **TESTED PORT:** AC Ports
- **IMMUNITY LEVEL:** AC: ± 0.5kV e ±1kV (diff. mode.); ± 0.5kV, ±1kV ±2kV (comm. mode)

- **NUMBER OF PULSES:** 5 positive and 5 negative at the selected points
- **TIME INTERVAL BETWEEN SUCCESSIVE PULSES:** 1 minute

- **MEASUREMENT UNCERTAINTY:**
  Level of confidence = 95%
  Degree of freedom = 10
  Coverage factor kp= 2,28
  Combined uncertainty of peak voltage level = 9,36 %
  Combined uncertainty of rise time = 22,62 %
  Combined uncertainty of short-circuit current = 8,92 %
  Combined uncertainty of duration = 22,32 %

TEST CONDITIONS:			**MEASURED**
Ambient temperature :	15 - 35 ℃		24 ± 3 ℃
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage : (15Vac powered by dedicated AC/AC adapter)			230 Vac ± 3%

OPERATING CONDITION (Rif. Section. 2) : *#2*

RESULT: COMPLIANT

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TEST RESULTS

PORT N. 2 : AC PORT

TEST	TIPO DI ACCOPPIAMENTO	TEST VOLTAGE	IMPEDENCE COUPLING	TEST FREQUENCY	PHASES ANGLE (φ)
TEST 1	*L1 - N (DIFF. MODE.)*	*± 0.5 kV*	*18 µF*	*1pul./min.*	*0°.315°(i=90°)*
TEST 2	*L1 - N (DIFF. MODE.)*	*± 1 kV*	*18 µF*	*1pul./min.*	*0°.315°(i=90°)*
TEST 3	*L1 - PE (COMMON MODE)*	*± 0.5 kV*	*10 Ω+ 9 µF*	*1pul./min.*	*0°.315°(i=90°)*
TEST 4	*L1 - PE (COMMON MODE)*	*± 1.0 kV*	*10 Ω+ 9 µF*	*1pul./min.*	*0°.315°(i=90°)*
TEST 5	*L1 - PE (COMMON MODE)*	*± 2.0 kV*	*10 Ω+ 9 µF*	*1pul./min.*	*0°.315°(i=90°)*
TEST 6	*N - PE (COMMON MODE)*	*± 0.5 kV*	*10 Ω+ 9 µF*	*1pul./min.*	*0°.315°(i=90°)*
TEST 7	*N - PE (COMMON MODE)*	*± 1.0 kV*	*10 Ω+ 9 µF*	*1pul./min.*	*0°.315°(i=90°)*
TEST 8	*N - PE (COMMON MODE)*	*± 2.0 kV*	*10 Ω+ 9 µF*	*1pul./min.*	*0°.315°(i=90°)*

N° *TEST*	φ (°)	Performance Criteria		NOTE
		WITHIN THE LIMIT	OUT OF LIMIT	
TEST 1 and 2	*0°*	√		*No performance degradation*
	90°	√		
	180°	√		
	270°	√		
TEST 3, 4 and 5	*0°*	√		*No performance degradation*
	90°	√		
	180°	√		
	270°	√		
TEST 6, 7 and 8	*0°*	√		*No performance degradation*
	90°	√		
	180°	√		
	270°	√		

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TEST 7.

IMMUNITY TO VOLTAGE DIPS / SHORT INTERRUPTIONS

REFERENCE DOCUMENT EN 61000-4-11
Electromagnetic Compatibility (EMC) - Part 4 Testing and measuring techniques
Section 11 - Voltage dips, short interruptions and voltage variations -

- **TEST SETUP:** Acc. to par.7 of Basic Std.
- **TEST LOCATION:** Low frequency phenomena area
- **TEST EQUIPMENT USED FOR TEST:** Power Network Simulator Spitzenberger + Spies Mod. PHE 5000/PAS/D

- **TESTED PORT:** AC Ports
- **TIME INTERVAL BETWEEN SUCCESSIVE PULSES:** 10s
- **IMMUNITY LEVEL (reduction of the supply voltage)**

DIPS:
0 % residual voltage for 0,5 cycle;
0 % residual voltage for 1 cycle;
70 % residual voltage for 25 cycles;

INTERRUPTIONS:
0 % residual voltage for 250 cycles

- **MEASUREMENT UNCERTAINTY:**

Level of confidence = 95%
Degree of freedom = 10
Coverage factor kp= 2,28

Combined uncertainty of interruption voltage = 3,86 %
Combined uncertainty of reduction voltage = 3,86 %
Combined uncertainty of duration = 3,02 %

TEST CONDITIONS:			**MEASURED**
Ambient temperature :	15 - 35 ℃		24 ± 3 ℃
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage : (15Vac powered by dedicated AC/AC adapter)			230 Vac ± 3%

OPERATING CONDITION (Rif. Section. 2) : *#2*

RESULT: COMPLIANT

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TEST RESULTS

VOLTAGE DIPS

TEST LEVEL			TEST CRITERIA		NOTE
%residual voltage	T (ms)	φ (°)	WITHIN THE LIMIT	OUT OF LIMIT	
0%	*10*	*0°*	√		*No performance degradation (internal backup service battery)*
		90°	√		
		180°	√		
		270°	√		
0%	*20*	*0°*	√		*No performance degradation (internal backup service battery)*
		90°	√		
		180°	√		
		270°	√		
70%	*500*	*0°*	√		*No performance degradation (internal backup service battery)*
		90°	√		
		180°	√		
		270°	√		

SHORT INTERRUPTIONS

TEST LEVEL			TEST CRITERIA		NOTE
%residual voltage	T (ms)	φ (°)	WITHIN THE LIMIT	OUT OF LIMIT	
0%	*5000*	*0°*	√		*No performance degradation (internal backup service battery)*
		90°	√		
		180°	√		
		270°	√		

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TEST 8.

IMMUNITY TO CONDUCTED RF-DISTURBANCES (COMMON MODE)

REFERENCE DOCUMENT: EN 61000-4-6
Electromagnetic Compatibility (EMC) - Part 4 Testing and measuring techniques
Section 6 - Conducted disturbances induced by radio frequency fields immunity test - Electromagnetic compatibility.

- TEST SETUP: Acc. to par.7 of Basic std.
- TEST LOCATION: Semi-anechoic chamber
- TEST EQUIPMENT USED FOR TEST:

RF signal Gen	EM Test CWS 500	10kHz - 230MHz
CDN	M2/M3 (16 A)	150kHz - 230MHz
	M5 (25 A)	150kHz - 230MHz
EM Clamp	Mod. F-2031	150kHz - 80MHz
RF Attenuator	6dB	50 ohm 250 Watt

- TESTED PORT: AC Ports, DC Ports and signal control lines
- FREQUENCY RANGE: 150kHz - 100MHz
- SCAN DATA: 1% log.
- IMMUNITY LEVEL: 10V (rms unmod.) AM 80%, 1kHz
  10V (rms unmod.) PM 1Hz (0,5 s ON : 0,5 s OFF)
- MEASUREMENT UNCERTAINTY: Level of confidence = 95%
  Degree of freedom = 10
  Coverage factor kp= 2,28
  Combined uncertainty = 2,24 %

TEST CONDITIONS:			MEASURED
Ambient temperature :	15 - 35 ℃		24 ± 3 ℃
Ambient humidity :	25 - 75 %rH		40 ± 5 %rH
Pressure :	85 - 106 kPa	(860 mbar - 1060 mbar)	950 ± 50 mbar
Voltage : (15Vac powered by dedicated AC/AC adapter)			230 Vac ± 3%

OPERATING CONDITION (Rif. Section. 2) : *#2*

RESULT: COMPLIANT

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TEST RESULTS

AM, 80% 1kHz 10V

	PERFORMANCE CRITERION		
N. PORT	**WITHIN THE LIMIT**	**OUT OF LIMIT**	**NOTE**
2 (AC Ports)	√		***No performance degradation***
4 (Control / Signal lines)	√		***No performance degradation***
5 (Telecomm. Ports)	---		***Port not present***

PM 1 Hz 10V

	PERFORMANCE CRITERION		
N. PORT	**WITHIN THE LIMIT**	**OUT OF LIMIT**	**NOTE**
2 (AC Ports)	√		***No performance degradation***
4 (Control / Signal lines)	√		***No performance degradation***
5 (Telecomm. Ports)	---		***Port not present***

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5. EUT PHOTOGRAPHIC DOCUMENTATION

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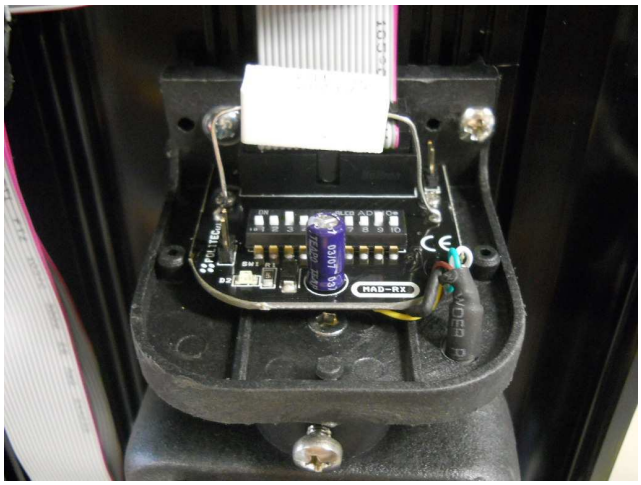
PHOTO N°1 – EUT IDENTIFICATION



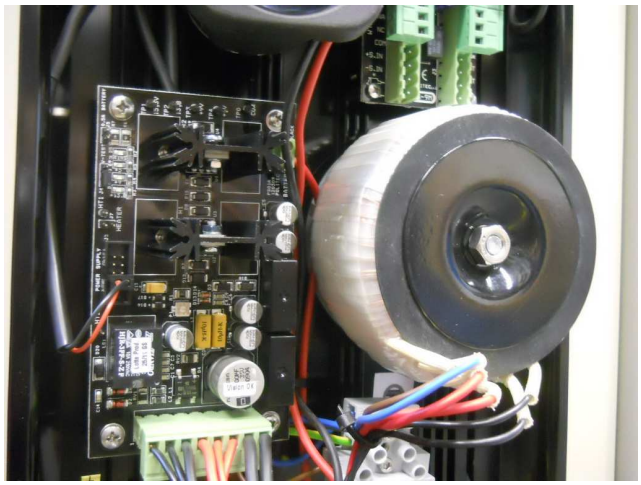


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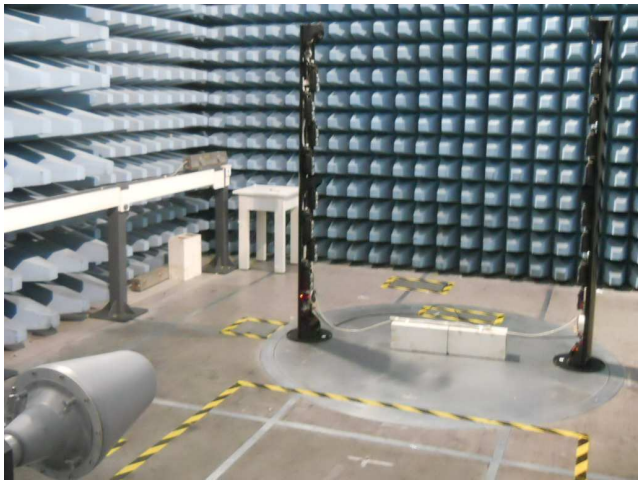
PHOTO N°2– SET UP RADIATED EMISSION



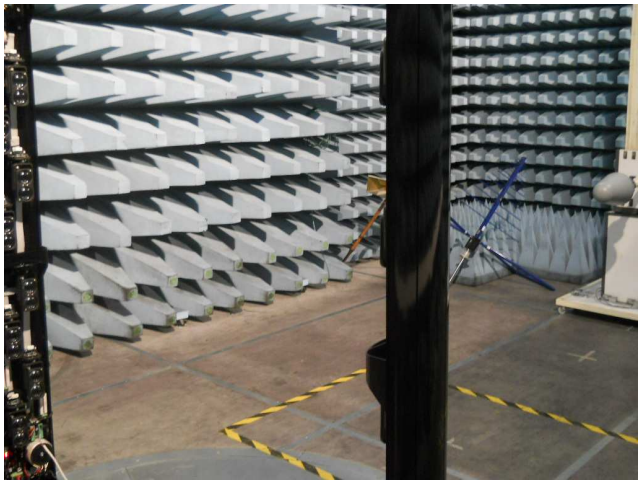


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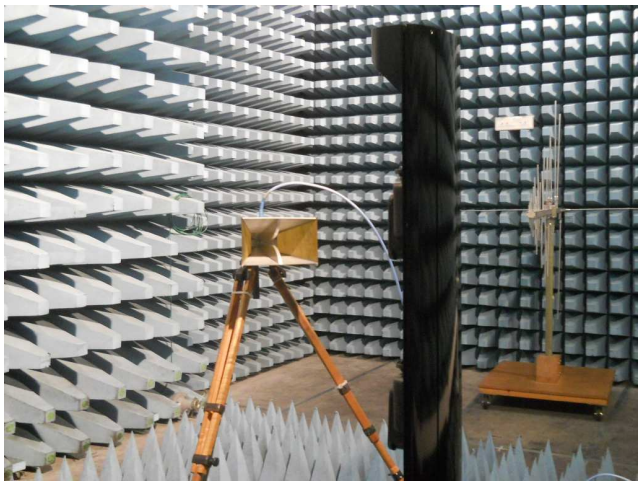
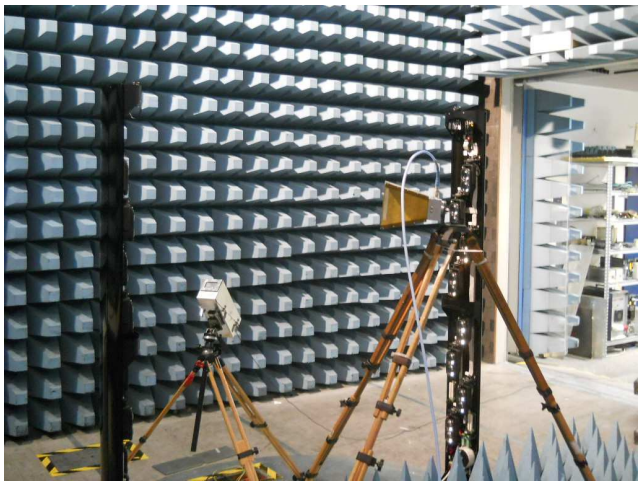
PHOTO N°3 – SET UP RADIATED IMMUNITY





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