

# EMC TEST REPORT

**Megatec AB**

**Internet Station**

**IS650**

**Report no: 07141**



Prepared by Tobias Gustavsson <i>Tobias Gustavsson</i>	Approved by Ulf Heiding <i>Ulf Heiding</i>	Date 2007-05-31
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## Head information

<i>Report no</i> 07141	<i>Date</i> 2007-05-31	<i>Prepared by</i> Tobias Gustavsson
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<i>Customer</i> Megatec AB	<i>Contact person</i> Bernt Hellqvist
<i>Postal address</i> Skridskovägen 29, SE-17545 Järfälla, Sweden	
<i>Tel</i> +46 (0)8-58026620	<i>Fax</i>

<i>Type of apparatus</i> Internet Station			
<i>Type no</i> IS650			
<i>Voltage</i> 230 Vac	<i>No of phases</i> 1	<i>Current</i> - A	<i>Power</i> < 400 W
<input checked="" type="checkbox"/> Class I, earthed <input type="checkbox"/> Class II, double insulated <input type="checkbox"/> DC application			

<i>Tested acc to</i> Emission: SS-EN 61000-6-3:2007, SS-EN 55022:2006 Class B SS-EN 61000-3-2:2006  Immunity: SS-EN 61000-6-2:2005, SS-EN 61000-4-2, -3, -4, -5, -6, -8, -11
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<i>Test result</i> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not approved
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<p><i>Note</i></p> <p>The test results in this report apply only to the tested sample of EUT.</p> <p><b>Criteria for normal performance:</b> No flickering of screen, full visibility of camera picture, video and audio playback continuously during test.</p>
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## Test summary

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<b>Emission according to SS-EN 61000-6-3:2007 *</b>			
<b>Environmental phenomena</b>	<b>Basic Standard</b>	<b>Result</b>	<b>Comments</b>
<b>Conducted disturbance</b>	SS-EN 55022:2006 Class B	<b>Passed</b>	
<b>Radiated disturbance</b>	SS-EN 55022:2006 Class B	<b>Passed</b>	
<b>Harmonics</b>	SS-EN 61000-3-2: 2006	<b>Passed</b>	
<b>Flicker</b>	EN 61000-3-3: 1995, A1: 2001	<b>Not applicable</b>	*

<b>Immunity according to SS-EN 61000-6-2:2005 *</b>				
<b>Environmental phenomena</b>	<b>Basic Standard</b>	<b>Test specifications</b>	<b>Result</b>	<b>Comments</b>
<b>Electrostatic discharge (ESD)</b>	SS-EN 61000-4-2: 1995	Contact discharge 2, 4 kV Air discharge 2, 4, 8 kV	<b>Passed</b> <b>Passed</b>	
<b>Radio-frequency electromagnetic field</b>	SS-EN 61000-4-3: 1997	80 - 2 700 MHz 10 V/m AM 80%, 1 kHz sinus	<b>Passed</b>	* Tested with + 20 %
<b>Fast transients</b>	SS-EN 61000-4-4: 1995	Coupling network 2 kV Capacitive clamp 1 kV	<b>Passed</b> <b>Passed</b>	
<b>Surges</b>	SS-EN 61000-4-5: 1995	Line to line 1 kV Line to earth 2 kV	<b>Passed</b> <b>Passed</b>	
<b>Induced radio-frequency field</b>	SS-EN 61000-4-6: 1996	0.15 - 80 MHz 10 V <sub>RMS</sub> AM 80%, 1 kHz sinus	<b>Passed</b>	* Tested with + 20 %
<b>Power frequency magnetic field</b>	SS-EN 61000-4-8: 1994	10 A/m 50 Hz	<b>Passed</b>	*
<b>Voltage dips and interruptions</b>	SS-EN 61000-4-11: 1995	Residual voltage Time 0 % 20 ms 40 % 200 ms 70 % 500 ms 0 % 5 s	<b>Passed</b> <b>Passed</b> <b>Passed</b> <b>Passed</b>	

\* Test not within the scope of the accreditation.

## Measurements uncertainties

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The reported expanded uncertainty  $U_{lab}$  is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%.

The uncertainty evaluation has been carried out in accordance with the documents CISPR16-4-2 and UKAS LAB34.

Conducted disturbance, mains terminals  $\pm 2,9$  dB

Radiated disturbance measured in Semi Anechoic Chamber (SAC)

30-200 MHz	horizontal polarisation	$\pm 9,0$ dB
	vertical polarisation	$\pm 7,7$ dB
200-1 000 MHz	horizontal polarisation	$\pm 3,7$ dB
	vertical polarisation	$\pm 5,3$ dB

Radiated disturbance measured in Weather Protected Open Area Test Site (OATS)

30-200 MHz	horizontal polarisation	$\pm 3,5$ dB
	vertical polarisation	$\pm 5,6$ dB
200-1 000 MHz	horizontal polarisation	$\pm 3,9$ dB
	vertical polarisation	$\pm 5,1$ dB

Compliance or non-compliance with a disturbance limit is determined according to the following, quoted from CISPR 16-4-2:2003.

If  $U_{lab}$  is less or equal to  $U_{cispr}$  then:

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  then:

- compliance is deemed to occur if no measured disturbance, increased by  $(U_{lab}-U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance,  $(U_{lab}-U_{cispr})$ , exceeds the disturbance limit.

The expanded uncertainty  $U_{cispr}$  is for:

- conducted disturbance, mains port 150 kHz – 30 MHz  $\pm 3,6$  dB
- radiated disturbance, 30 – 1 000 MHz  $\pm 5,2$  dB

## Conducted disturbance test set-up

Report no: 07141

### Internet Station IS650

Measuring performed in Semi Anechoic Chamber (SAC)



## Radiated disturbance test set-up

Report no: 07141

Internet Station IS650



Measuring is performed in Semi Anechoic Chamber (SAC) with antenna distance 3 m.

Picture shows front view and corresponds to azimuth 0°. Rotation is made clockwise up to 360° at peak search.

Pre-scan with PK-detector is made at antenna height 1.3 m, 0° and 90° azimuth and horizontal and vertical antenna polarisation. Worst-case is shown in graph.

The reported QP-values in the table represents worst-case found by rotating the EUT between 0° and 360° azimuth and varying the antenna height between 1 and 4 m and changing the antenna polarisation between horizontal and vertical.

### *Deviation from standard:*

The used SAC is non-compliant with the NSA requirements of  $\pm 4$  db according to CISPR 16-1 in the frequency range 30-200 MHz.

## Immunity test equipment

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**Used**

Signal generator 9 kHz - 2.4 GHz	Marconi 2024	<input checked="" type="checkbox"/>
Signal generator 9 kHz - 3.3 GHz	Rohde & Schwarz SML03	<input checked="" type="checkbox"/>
RF power amplifier 10 kHz - 250 MHz, 75 W	Amplifier Research 75A250	<input checked="" type="checkbox"/>
RF power amplifier 25 - 1 000 MHz, 30 W	Amplifier Research 30W1000M7	<input checked="" type="checkbox"/>
HF power amplifier dual band 1 - 4 GHz, 30/17 W	Milmega AS0104-3017	<input checked="" type="checkbox"/>
Electromagnetic field strength meter 20 Hz - 18 GHz	PMM 8051	<input checked="" type="checkbox"/>
Optical repeater	PMM 8051 OR-1	<input checked="" type="checkbox"/>
E-field probe 500 kHz - 3 GHz, max 120 V/m	PMM BA-01	<input checked="" type="checkbox"/>
E-field probe 10 MHz - 1 GHz, max 30 V/m	PMM BA-05	<input checked="" type="checkbox"/>
Level control 10 kHz - 1 GHz	Amplifier Research 888	<input checked="" type="checkbox"/>
Bilog antenna 30 MHz - 1GHz	Chase CBL 6111B	<input type="checkbox"/>
Bilog antenna 30 MHz - 3 GHz	Chase CBL 6112A	<input checked="" type="checkbox"/>
Double ridged broadband horn antenna 0.7 – 6.5 GHz	Schwarzbeck BBHA 9120 LFA	<input type="checkbox"/>
ESD simulator 0.2 - 16.5 kV (EN 61000-4-2)	Schaffner NSG 435	<input checked="" type="checkbox"/>
Fast transient/burst generator (EN 61000-4-4)	Schaffner NSG 2025	<input checked="" type="checkbox"/>
Capacitive clamp (EN 61000-4-4)	Schaffner CDN 126	<input checked="" type="checkbox"/>
Surge pulse generator, 1.2/50, 8/20 (EN 61000-4-5)	Schaffner NSG 2050 / PNW 2050	<input checked="" type="checkbox"/>
Pulse coupling network, 1 & 3 phase (EN 61000-4-5)	Schaffner CDN 131/133	<input checked="" type="checkbox"/>
Pulse coupling network, signal line 40 Ω (EN 61000-4-5)	Schaffner CDN 116	<input type="checkbox"/>
Coupling network 150 kHz - 230 MHz (EN 61000-4-6)	Schaffner CDN 516S	<input checked="" type="checkbox"/>
EM injection clamp 10 kHz - 1 GHz (EN 61000-4-6)	FCC F2031 S/N 215	<input checked="" type="checkbox"/>
Power frequency and pulse magnetic field (EN 61000-4-8/9)	Magnetic coil / Schaffner NSG 2050	<input checked="" type="checkbox"/> / <input type="checkbox"/>
Combi generator, burst, surge, voltage dips (EN 61000-4-11)	Schaffner Best Plus	<input checked="" type="checkbox"/>
Pulse coupling network (EN 61000-4-4, -5)	Schaffner CDN 135	<input type="checkbox"/>
5 kVA AC power source (EN 61000-3-13)	Schaffner NSG 1007	<input type="checkbox"/>
Load dump pulse generator (ISO 7637-2 test pulse 5)		<input type="checkbox"/>
Temperature and humidity measurement instrument	Testo 615	<input checked="" type="checkbox"/>
Oscilloscope DC - 100 MHz, 500Ms	Tektronix THS720 STD	<input type="checkbox"/>
Oscilloscope DC - 300 MHz, 2,5 Gs	Tektronix TDS 3032	<input checked="" type="checkbox"/>
Linear power supply 24 Vdc 10 A	SF 10A-230	<input type="checkbox"/>
Rotating table / Moving antenna	±180°/ 1-4 m, hor & vert polarisation	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>
Screen room 1.8 x 1.8 x 2.4 m for measuring equipment	Siemens	<input checked="" type="checkbox"/>
SAC, Semi Anechoic Chamber	10 x 5 x 5 m	<input checked="" type="checkbox"/>
OATS, Open Area Test Site	8 x 15 x 5 m	<input type="checkbox"/>
In situ measurement at .....		<input type="checkbox"/>

## Emission test equipment

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**Used**

Measuring system 5 Hz - 1 GHz	Rohde & Schwarz ESS	<input checked="" type="checkbox"/>
Measuring system 9 kHz – 2.5 GHz	Rohde & Schwarz ESPC	<input type="checkbox"/>
Spectrum analyser 9 kHz - 1.8 GHz	Tektronix 2712	<input type="checkbox"/>
Mains equivalent 5 $\mu$ H//50 $\Omega$ , 160 A	Rohde & Schwarz ESH 3-Z6	<input type="checkbox"/>
Mains equivalent 50 $\mu$ H//50 $\Omega$ , 2 x 16 A	Rohde & Schwarz ESH 3-Z5	<input type="checkbox"/>
Mains equivalent 50 $\mu$ H//50 $\Omega$ , 4 x 25 A	Rohde & Schwarz SH 2-Z5	<input checked="" type="checkbox"/>
Mains equivalent 50 $\mu$ H//50 $\Omega$ , 4 x 100 A	FCC-LISN-50-100-4	<input type="checkbox"/>
Absorbing clamp 30 - 1000 MHz	Rohde & Schwarz MDS-21, s/n 893668/012	<input type="checkbox"/>
Absorbing clamp 30 - 300 MHz	R&S MDS 9, s/n 69087	<input type="checkbox"/>
Bilog antenna 30 MHz - 1 GHz	Chase CBL6111B	<input type="checkbox"/>
Bilog antenna 30 MHz - 3 GHz	Chase CBL6112A	<input checked="" type="checkbox"/>
Double ridged broadband horn antenna 0,7 – 6,5 GHz	Schwarzbeck BBHA 9120 LFA	<input type="checkbox"/>
Active antenna 30Hz - 50 MHz	Emco 3301B	<input type="checkbox"/>
Triple loop antenna 2M, 9 kHz - 30 MHz	Rohde & Schwarz HM 020	<input type="checkbox"/>
Control unit	Rohde & Schwarz BG 020	<input type="checkbox"/>
Balance-to-unbalance transformer, 150 kHz - 1.605 MHz	Acc to CISPR 15 Fig A.2a	<input type="checkbox"/>
Pulse limiter 10 dB	Rohde & Schwarz ESH 3-Z2	<input checked="" type="checkbox"/>
Current probe, 9 kHz - 30 MHz	Rohde & Schwarz ESH 2-Z1	<input type="checkbox"/>
Voltage probe 1500 $\Omega$ , 9 kHz - 30 MHz, -29 dB	Emco 3701 Line Probe acc. to CISPR	<input type="checkbox"/>
Harmonics & flicker test system (EN 61000-3-2, -3)	Schaffner ProfLine 2100 (CCN 1000 + NSG1007)	<input checked="" type="checkbox"/>
Harmonic current meter (EN 61000-3-2)	Fluke 41 / 43	<input type="checkbox"/> / <input type="checkbox"/>
Measuring receiver 85 kHz - 30 MHz	Schwarzbeck FSME 1515	<input type="checkbox"/>
Discontinuous interference analyzer	Chase DIA 1500, Ser. No. 1523	<input type="checkbox"/>
Oscilloscope DC - 100 MHz, 500 Ms	Tektronix THS720STD	<input type="checkbox"/>
Oscilloscope DC - 300 MHz, 2,5 Gs	Tektronix TDS 3032	<input type="checkbox"/>
Linear DC power supply 0 - 350 V, 7 A	NT-97	<input type="checkbox"/>
Power supply 0-30 Vdc 10 A (SMPS)	Delta Elektronika MST 030-10	<input type="checkbox"/>
Power supply 24 Vdc 10 A (Linear)	SF 10A-230	<input type="checkbox"/>
Battery	12 V 60 Ah / 12 V 60 Ah	<input type="checkbox"/> / <input type="checkbox"/>
Rotating table / Moving antenna	$\pm 180^\circ$ / Height 1-4 m, hor & vert polarization	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>
Screen room 1.8 x 1.8 x 2.4 m for measuring equipment	Siemens	<input checked="" type="checkbox"/>
SAC, Semi Anechoic Chamber	10 x 5 x 5 m	<input checked="" type="checkbox"/>
OATS, Open Area Test Site	8 x 15 x 5 m	<input type="checkbox"/>
In situ measurement at .....		<input type="checkbox"/>

## EN 61000-4-2: Electrostatic discharge (ESD) immunity test

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<i>EUT</i>	<b>Internet Station IS650</b>
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Test voltage (kV) Contact discharge	Test voltage (kV) Air discharge	Note
<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2	10 discharges each of positive and negative polarity.  Temperature      23 °C      (15-35 °C) Relative humidity    48 %      (30-60 %)
<input checked="" type="checkbox"/> 4	<input checked="" type="checkbox"/> 4	
<input type="checkbox"/> 6	<input checked="" type="checkbox"/> 8	
<input type="checkbox"/> 8	<input type="checkbox"/> 15	
<input type="checkbox"/> Special	<input type="checkbox"/> Special	

### Test result

The test results may be classified on the basis of the operating conditions and the functional specifications of the equipment under test, according to the following performance criteria:

- A. Normal performance within the specification limits.
- B. Temporary degradation or loss of function or performance, which is recoverable.
- C. Temporary degradation or loss of function or performance, which requires operator intervention or system reset.
- D. Degradation or loss of function, which is not recoverable, due to damage of equipment (components).

Required criterion for compliance: B                       Passed                       Not passed

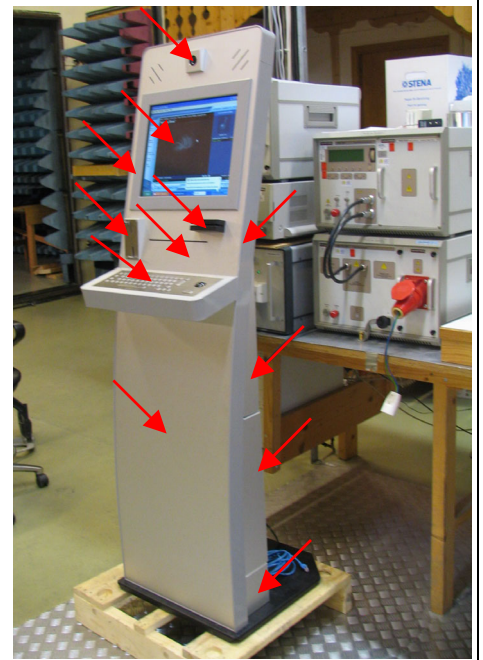
### Notes

It has been demonstrated that the ESD generator meets the specified requirements in the standard with at least a 95% confidence.

Visual control of function of EUT.

Criteria for normal performance: See head note

Test points shown in picture.



<i>Tested by</i> Ulf Heiding	<i>Date</i> 2007-05-31
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## EN 61000-4-3: Radiated radio frequency electromagnetic field immunity test

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<i>EUT</i>	<b>Internet Station IS650</b>
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Test field strength	Frequency range	Frequency step	Dwell time
10 V/m	80 - 2 700 MHz	1 %	3 s

<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Vertical and horizontal polarisation. Amplitude modulation 80 %, 1 kHz, sinusoidal. Pulse modulation 100 %, 200 Hz (850 - 950 MHz, GSM). Level 20 V/m. Pulse modulation 100 %, 1 Hz, 50% duty cycle.
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### *Test result*

The test results may be classified on the basis of the operating conditions and the functional specifications of the equipment under test, according to the following performance criteria:

- A. Normal performance within the specification limits.
- B. Temporary degradation or loss of function or performance, which is recoverable.
- C. Temporary degradation or loss of function or performance, which requires operator intervention or system reset.
- D. Degradation or loss of function, which is not recoverable, due to damage of equipment (components).

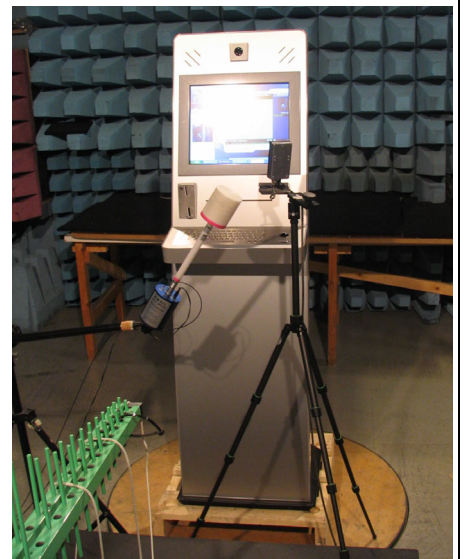
Required criterion for compliance: A                       Passed                       Not passed

### *Notes*

All tests performed with 2 V/m above specified test level.

Visual control of function of EUT with video camera.

Criteria for normal performance: See head note



<i>Tested by</i> Tobias Gustavsson	<i>Date</i> 2007-05-31
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## EN 61000-4-4: Electrical fast transient/burst immunity test

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<i>EUT</i>	<b>Internet Station IS650</b>
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Test voltage	Couplers	Note
2 kV	PE, N, L1, PE+N+L1	Duration 1 min Frequency 5 kHz Repetition rate 300 ms Positive and negative polarity
1 kV	Capacitive clamp	

### Test result

The test results may be classified on the basis of the operating conditions and the functional specifications of the equipment under test, according to the following performance criteria:

- A. Normal performance within the specification limits.
- B. Temporary degradation or loss of function or performance, which is recoverable.
- C. Temporary degradation or loss of function or performance, which requires operator intervention or system reset.
- D. Degradation or loss of function, which is not recoverable, due to damage of equipment (components).

Required criterion for compliance: B                       Passed                       Not passed

### Notes

It has been demonstrated that the burst generator meets the specified requirements in the standard with at least a 95% confidence.

Visual control of function of EUT.

Criteria for normal performance: See head note.

Mains input tested in coupling unit.

Signal TP-Ethernet cable tested in capacitive clamp.



<i>Tested by</i> Tobias Gustavsson	<i>Date</i> 2007-05-31
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## EN 61000-4-5: Surge immunity test

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Test voltage	Couplers	Note
1 kV (line to line, $R_1$ 2 $\Omega$ )	L1-N	5 positive and 5 negative surges Synchronous at 90, 180 and 270 degrees Repetition rate 10 s * (* deviation from standard)
2 kV (line to earth, $R_1$ 12 $\Omega$ )	L1-PE, N-PE, L1+N-PE	

### *Test result*

The test results may be classified on the basis of the operating conditions and the functional specifications of the equipment under test, according to the following performance criteria:

- A. Normal performance within the specification limits.
- B. Temporary degradation or loss of function or performance, which is recoverable.
- C. Temporary degradation or loss of function or performance, which requires operator intervention or system reset.
- D. Degradation or loss of function, which is not recoverable, due to damage of equipment (components).

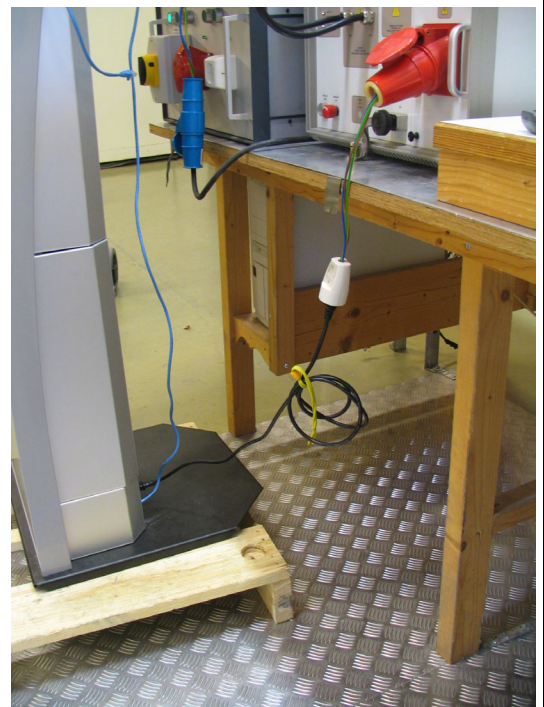
Required criterion for compliance: B                       Passed                       Not passed

### *Notes*

It has been demonstrated that the surge generator meets the specified requirements in the standard with at least a 95% confidence.

Visual control of function of EUT.

Criteria for normal performance: See head note.



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## EN 61000-4-6: Induced radio frequency field immunity test

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*EUT* **Internet Station IS650**

Test field strength	Frequency range	Frequency step	Dwell time
10 V	0,15 - 80 MHz	1 %	3 s

- Continuous wave.  
 Amplitude modulation 80 %, 1 kHz, sinusoidal.  
 Pulse modulation 100 %, 1 Hz, 50% duty cycle.

### Test result

The test results may be classified on the basis of the operating conditions and the functional specifications of the equipment under test, according to the following performance criteria:

- A. Normal performance within the specification limits.  
 B. Temporary degradation or loss of function or performance, which is recoverable.  
 C. Temporary degradation or loss of function or performance, which requires operator intervention or system reset.  
 D. Degradation or loss of function, which is not recoverable, due to damage of equipment (components).

Required criterion for compliance: A                       Passed                       Not passed

### Notes

- All tests performed with 2 V above chosen test level.  
 Visual control of function of EUT.  
 Criteria for normal performance: See head note  
 Mains input tested in CDN516.  
 Signal TP-Ethernet cable tested in EM clamp.



Tested by Tobias Gustavsson

Date 2007-05-31

## EN 61000-4-8: Power frequency magnetic field immunity test

Report no **07141**

<i>EUT</i>	<b>Internet Station IS650</b>
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Level	Magnetic field strength A/m	Note
<input type="checkbox"/> 1	1	
<input type="checkbox"/> 2	3	
<input checked="" type="checkbox"/> 3	10	
<input type="checkbox"/> 4	30	
<input type="checkbox"/> 5	100	
<input type="checkbox"/> Special		

Test equipment: Induction coil, 1 x 1 m, test generator 50 Hz with thyristor converter (50 %)

### Test result

The test results may be classified on the basis of the operating conditions and the functional specifications of the equipment under test, according to the following performance criteria:

- A. Normal performance within the specification limits.
- B. Temporary degradation or loss of function or performance, which is recoverable.
- C. Temporary degradation or loss of function or performance, which requires operator intervention or system reset.
- D. Degradation or loss of function, which is not recoverable, due to damage of equipment (components).

Required criterion for compliance: A                       Passed                       Not passed

### Notes

Visual control of function of EUT. Tested in x-, y-, and z-position.

Criteria for normal performance: Full functionality of magnetic card reader.

<i>Tested by</i> Ulf Heiding	<i>Date</i> 2007-05-31
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## EN 61000-4-11: Voltage dips and short interruptions immunity test

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<i>EUT</i>	<b>Internet Station IS650</b>
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Residual voltage	Cycles	Time	Required performance criterion	Test result criterion
0 %	1	20 ms	B	A
40 %	10	200 ms	C	A
70 %	25	500 ms	C	A
0 %	250	5 s	C	C

Each test repeated 3 times with 30 seconds interval.

### Test result

The test results may be classified on the basis of the operating conditions and the functional specifications of the equipment under test, according to the following performance criteria:

- A. Normal performance within the specification limits.
- B. Temporary degradation or loss of function or performance, which is recoverable.
- C. Temporary degradation or loss of function or performance, which requires operator intervention or system reset.
- D. Degradation or loss of function, which is not recoverable, due to damage of equipment (components).

Required criterion for compliance: See above       Passed       Not passed

### Notes

Visual control of function of EUT.

Criteria for normal performance: See head note.

*Tested by* Ulf Heiding

*Date* 2007-05-31

## EN 61000-3-2: Harmonic current emissions

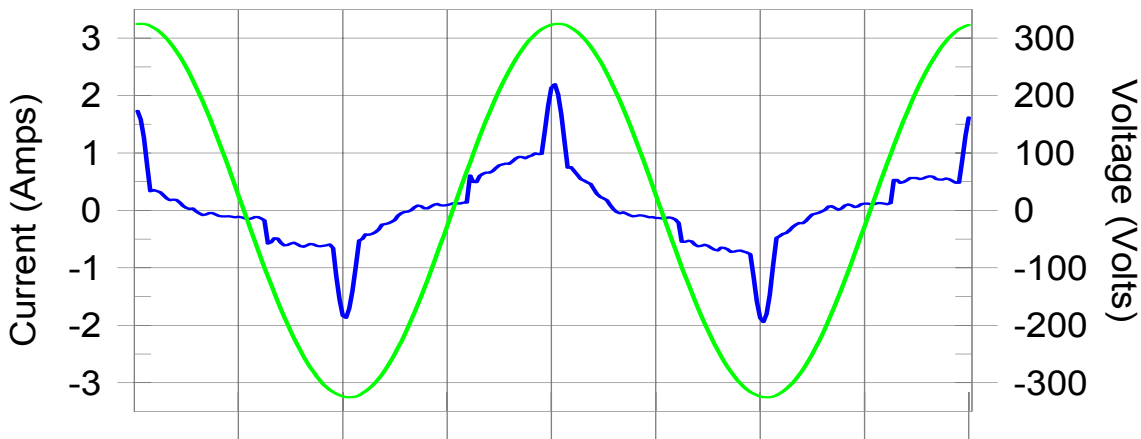
### Harmonics – Class-A per A-14(Run time)

EUT: IS650	Tested by: Tobias Gustavsson
Test category: Class-A per A-14 (European limits)	Test Margin: 100
Test date: 2007-05-31	Start time: 13:43:40
Test duration (min): 5	End time: 13:48:43
Comment: Rp no 07141-3-2, start up to active ready mode	Data file name: H-000309.cts_data
Customer: Megatec AB	

Test Result: Pass

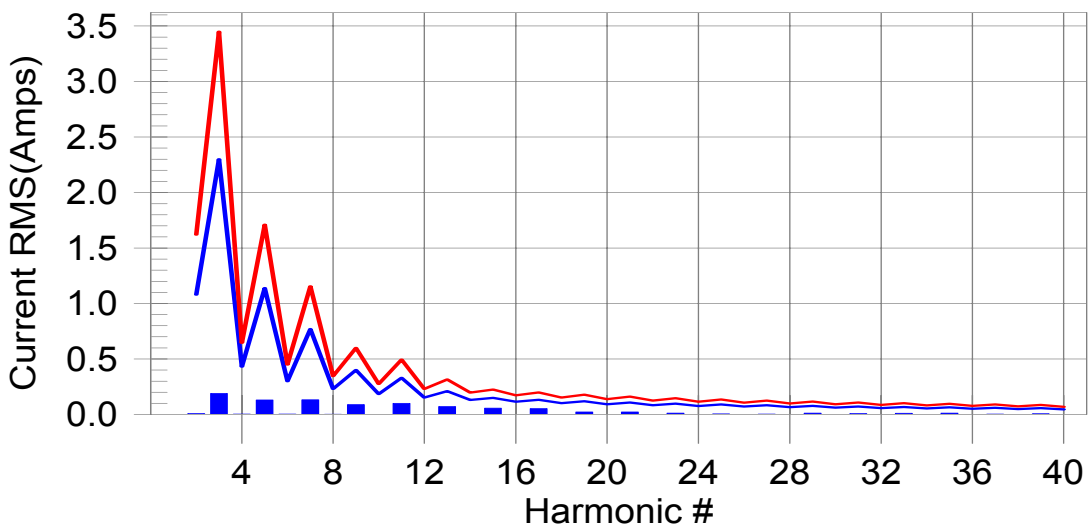
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass

Worst harmonic was #17 with 26.46 % of the limit.

## Current Test Result Summary (Run time)

EUT: IS650	Tested by: Tobias Gustavsson
Test category: Class-A per A-14 (European limits)	Test Margin: 100
Test date: 2007-05-31	Start time: 13:43:40
Test duration (min): 5	End time: 13:48:43
Comment: Rp no 07141-3-2, start up to active ready mode	Data file name: H-000309.cts_data
Customer: Megatec AB	

Test Result: Pass

Source qualification: Normal

Highest parameter values during test:

V_RMS (Volts):	230.04	I_RMS (Amps):	0.692
I_Peak (Amps):	2.196	Crest Factor:	3.533
I_Fund (Amps):	0.681	Power Factor:	0.828
Power (Watts):	132		

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.1	0.009	1.620	0.57	Pass
3	0.166	2.300	7.2	0.190	3.450	5.50	Pass
4	0.001	0.430	0.2	0.004	0.645	0.64	Pass
5	0.123	1.140	10.8	0.131	1.710	7.66	Pass
6	0.001	0.300	0.3	0.004	0.450	0.81	Pass
7	0.132	0.770	17.1	0.133	1.155	11.50	Pass
8	0.001	0.230	0.4	0.003	0.345	0.86	Pass
9	0.087	0.400	21.9	0.089	0.600	14.87	Pass
10	0.001	0.184	0.4	0.002	0.276	0.61	Pass
11	0.099	0.330	30.0	0.101	0.495	20.48	Pass
12	0.001	0.153	0.6	0.002	0.230	0.71	Pass
13	0.072	0.210	34.2	0.072	0.315	23.00	Pass
14	0.001	0.131	0.7	0.001	0.197	0.63	Pass
15	0.053	0.150	35.2	0.057	0.225	25.39	Pass
16	0.001	0.115	0.8	0.001	0.173	0.73	Pass
17	0.052	0.132	39.4	0.053	0.199	26.46	Pass
18	0.001	0.102	1.0	0.001	0.153	0.93	Pass
19	0.023	0.118	19.3	0.023	0.178	13.17	Pass
20	0.001	0.092	0.8	0.001	0.138	0.85	Pass
21	0.022	0.107	20.3	0.023	0.161	14.40	Pass
22	0.001	0.084	1.0	0.001	0.125	0.99	Pass
23	0.012	0.098	12.1	0.012	0.147	8.30	Pass
24	0.001	0.077	1.0	0.001	0.115	1.09	Pass
25	0.005	0.090	5.6	0.005	0.135	3.98	Pass
26	0.001	0.071	0.8	0.001	0.106	1.05	Pass
27	0.001	0.083	1.4	0.004	0.125	3.53	Pass
28	0.001	0.066	1.0	0.001	0.099	1.13	Pass
29	0.013	0.078	16.4	0.013	0.116	11.30	Pass
30	0.000	0.061	0.8	0.001	0.092	1.01	Pass
31	0.009	0.073	11.8	0.009	0.109	8.15	Pass
32	0.001	0.058	0.9	0.001	0.086	1.09	Pass
33	0.008	0.068	12.2	0.011	0.102	10.76	Pass
34	0.000	0.054	0.7	0.001	0.081	0.93	Pass
35	0.012	0.064	18.0	0.012	0.096	12.35	Pass
36	0.000	0.051	0.8	0.001	0.077	1.24	Pass
37	0.001	0.061	2.3	0.005	0.091	5.31	Pass
38	0.000	0.048	0.8	0.001	0.073	1.18	Pass
39	0.007	0.058	11.6	0.007	0.087	8.03	Pass
40	0.001	0.046	1.3	0.001	0.069	1.29	Pass

## Voltage Source Verification Data (Run time)

EUT: IS650

Tested by: Tobias Gustavsson

Test category: Class-A per A-14 (European limits)

Test Margin: 100

Test date: 2007-05-31

Start time: 13:43:40

End time: 13:48:43

Test duration (min): 5

Data file name: H-000309.cts\_data

Comment: Rp no 07141-3-2, start up to active ready mode

Customer: Megatec AB

Test Result: Pass

Source qualification: Normal

### Highest parameter values during test:

Voltage (Vrms): 230.04

I\_Peak (Amps): 2.196

I\_Fund (Amps): 0.681

Power (Watts): 132

I\_RMS (Amps): 0.692

Crest Factor: 3.533

Power Factor: 0.828

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.119	0.460	25.90	OK
3	0.462	2.070	22.33	OK
4	0.062	0.460	13.37	OK
5	0.045	0.920	4.88	OK
6	0.023	0.460	5.08	OK
7	0.073	0.690	10.51	OK
8	0.030	0.460	6.44	OK
9	0.044	0.460	9.61	OK
10	0.023	0.460	5.03	OK
11	0.058	0.230	25.19	OK
12	0.017	0.230	7.33	OK
13	0.008	0.230	3.69	OK
14	0.014	0.230	6.13	OK
15	0.009	0.230	3.83	OK
16	0.021	0.230	9.27	OK
17	0.008	0.230	3.47	OK
18	0.021	0.230	9.16	OK
19	0.004	0.230	1.86	OK
20	0.025	0.230	11.04	OK
21	0.005	0.230	2.01	OK
22	0.014	0.230	6.28	OK
23	0.004	0.230	1.92	OK
24	0.012	0.230	5.08	OK
25	0.001	0.230	0.60	OK
26	0.017	0.230	7.36	OK
27	0.002	0.230	0.88	OK
28	0.016	0.230	6.78	OK
29	0.025	0.230	10.94	OK
30	0.014	0.230	5.99	OK
31	0.011	0.230	4.72	OK
32	0.012	0.230	5.15	OK
33	0.019	0.230	8.25	OK
34	0.012	0.230	5.23	OK
35	0.023	0.230	9.80	OK
36	0.012	0.230	5.17	OK
37	0.015	0.230	6.37	OK
38	0.011	0.230	4.90	OK
39	0.019	0.230	8.35	OK
40	0.022	0.230	9.35	OK

RFI Voltage Report No: 07141-01

EUT: IS650  
 Manuf: Megatec AB  
 Op Cond: 230 Vac 50 Hz, < 200 W  
 Operator: Tobias Gustavsson  
 Test Spec: EN 55022 B  
 Comment: Active ready mode

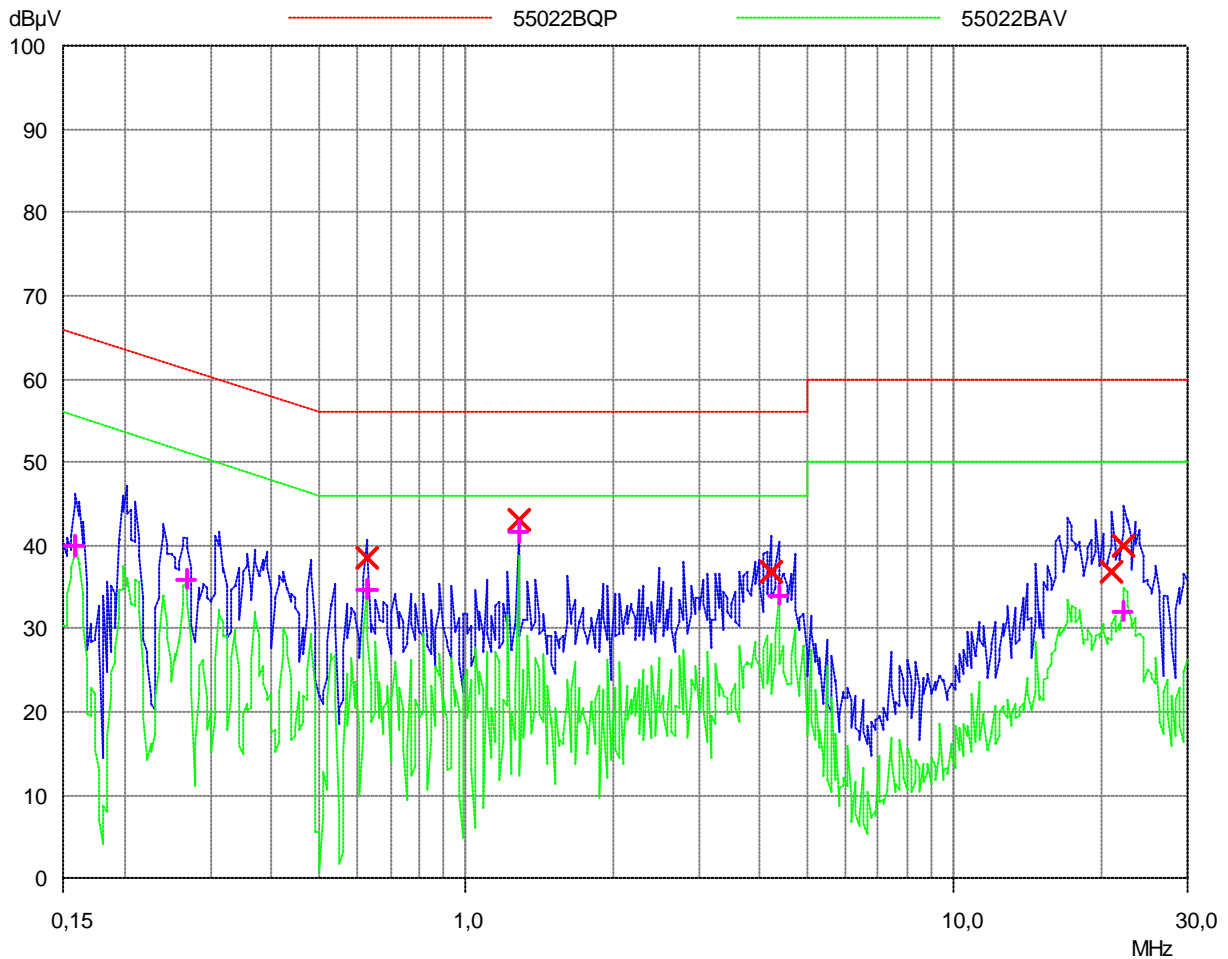
Result File: 07141-01.dat : Megatec, IS650, cond

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	0,8%	10kHz	PK+AV	2msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	1	9kHz	30MHz	P_limiter_11
	2	9kHz	30MHz	Cable_46_48
	21	9kHz	30MHz	LISN_14_1_fas

Final Measurement: Detectors: X QP / + AV  
 Meas Time: 1sec  
 Subranges: 16  
 Acc Margin: 16 dB



Dectron EMC-Lab  
RFI Voltage Report No: 07141-01

31 maj 2007 09:02

EUT: IS650  
Manuf: Megatec AB  
Op Cond: 230 Vac 50 Hz, < 200 W  
Operator: Tobias Gustavsson  
Test Spec: EN 55022 B  
Comment: Active ready mode

Result File: 07141-01.dat : Megatec, IS650, cond

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	0,8%	10kHz	PK+AV	2msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	1	9kHz	30MHz	P_limiter_11
	2	9kHz	30MHz	Cable_46_48
	21	9kHz	30MHz	LISN_14_1_fas

Final Measurement: Detectors: X QP / + AV  
Meas Time: 1sec  
Subranges: 16  
Acc Margin: 16 dB

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase	PE
0,61953	38,43	56,00	17,57	L1	gnd
1,26915	43,16	56,00	12,84	N	gnd
4,19366	36,96	56,00	19,04	N	gnd
21,13886	36,95	60,00	23,05	L1	gnd
22,35143	40,09	60,00	19,91	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase	PE
0,1586	40,07	55,54	15,47	N	gnd
0,26622	35,83	51,24	15,41	L1	gnd
0,61953	34,68	46,00	11,32	L1	gnd
1,26915	41,65	46,00	4,35	N	gnd
4,36411	33,88	46,00	12,12	L1	gnd
22,35143	32,02	50,00	17,98	L1	gnd

\* limit exceeded

Indicated Phase/PE shows Configuration of max. Emission

Dectron EMC-Lab  
RFI Field Report No: 07141-11

31 maj 2007 10:12

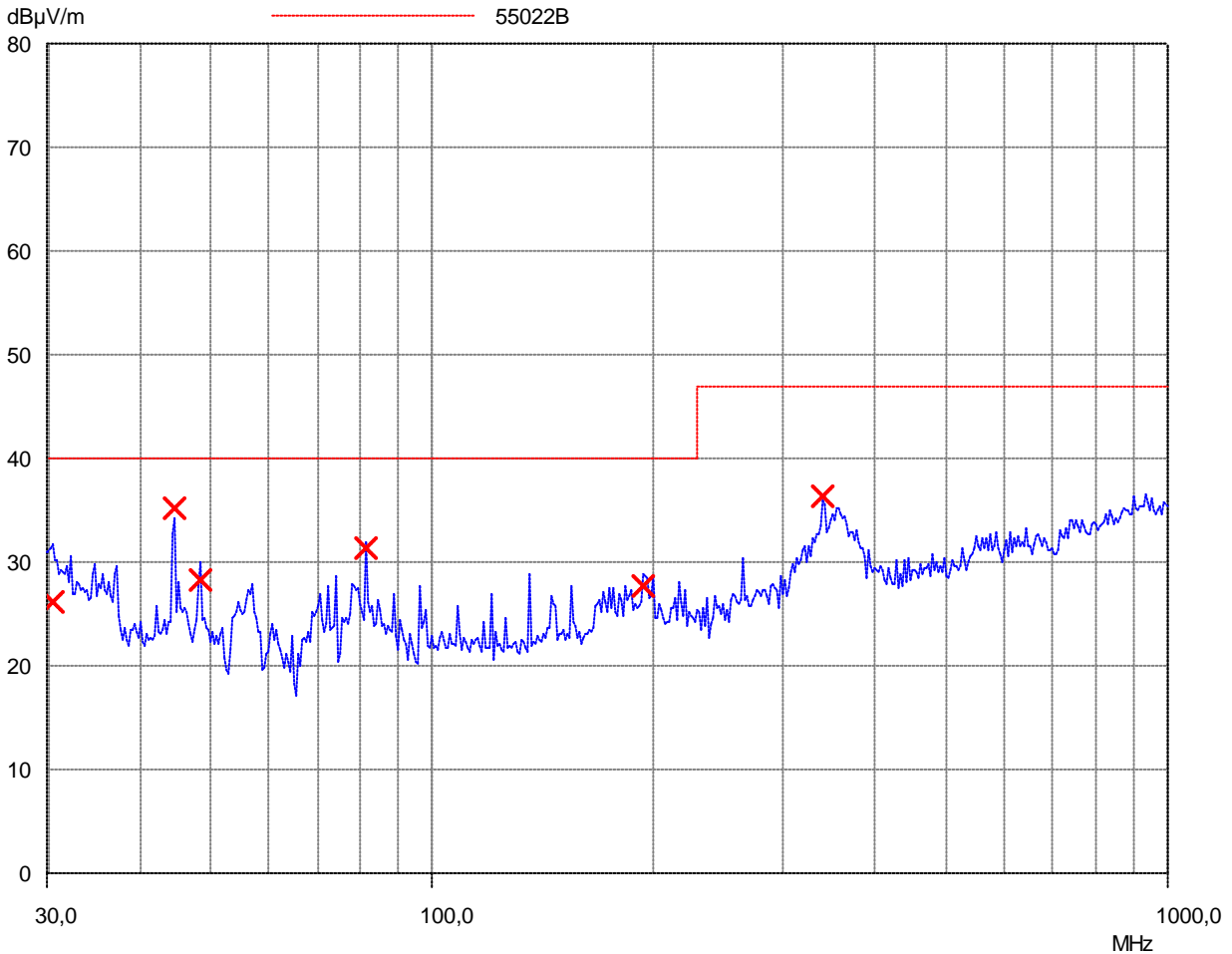
EUT: IS650  
 Manuf: Megatec AB  
 Op Cond: 230 Vac 50 Hz, <200 W, active ready mode  
 Operator: Tobias Gustavsson  
 Test Spec: EN 55022 B  
 Comment: QP-values are measured at worst case regarding to antenna height, polarization and EUT azimuth.  
 Field measuring in screened room damped with ferrites and absorbers. Dist. 3 m.  
 Result File: 07141-11.dat : Megatec, IS650, rad

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	0,1%	120kHz	PK	1msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	1	30MHz	1000MHz	Cables_47_49
	21	30MHz	1000MHz	CBL6112_a

Final Measurement:      Detector:      X QP  
                                  Meas Time:      1sec  
                                  Subranges:      25  
                                  Acc Margin:      12 dB



Dectron EMC-Lab  
RFI Field Report No: 07141-11

31 maj 2007 10:12

EUT: IS650  
 Manuf: Megatec AB  
 Op Cond: 230 Vac 50 Hz, <200 W, active ready mode  
 Operator: Tobias Gustavsson  
 Test Spec: EN 55022 B  
 Comment: QP-values are measured at worst case regarding to antenna height, polarization and EUT azimuth.  
 Field measuring in screened room damped with ferrites and absorbers. Dist. 3 m.  
 Result File: 07141-11.dat : Megatec, IS650, rad

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	1000MHz	0,1%	120kHz	PK	1msec	Auto	ON	60dB

Transducer	No.	Start	Stop	Name
1	1	30MHz	1000MHz	Cables_47_49
	21	30MHz	1000MHz	CBL6112_a

Final Measurement:      Detector:      X QP  
                                  Meas Time:      1sec  
                                  Subranges:      25  
                                  Acc Margin:      12 dB

Final Measurement Results

Frequency MHz	QP Level dBµV/m	QP Limit dBµV/m	QP Delta dB	EUT Azimuth deg	Ant. height m	Ant. pol.
30,2408	26,30	40,00	13,70	0	1,0	ver
44,2565	35,28	40,00	4,72	220	1,0	ver
47,9886	28,35	40,00	11,65	300	1,3	ver
81,1014	31,43	40,00	8,57	350	1,0	ver
193,3044	27,74	40,00	12,26	10	1,4	ver
340,0129	36,48	47,00	10,52	350	2,1	ver

\* limit exceeded