

ANNEX II + III: TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

Contract title: Supply of Equipment Necessary for Improving of Conformity Assessment (CA) Services in the Republic of Serbia

1 /20

LOT 2: EQUIPMENT FOR RADIO FREQUENCIES MEASUREMENTS

Publication reference: EuropeAid/135592/IH/SUP/RS

Columns 1-2 should be completed by the Contracting Authority

Columns 3-4 should be completed by the tenderer

Column 5 is reserved for the evaluation committee

Annex III - the Contractor's technical offer

The tenderers are requested to complete the template on the next pages:

- Column 2 is completed by the Contracting Authority shows the required specifications (not to be modified by the tenderer);
- Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words “compliant” or “yes” are not sufficient);
- Column 4 allows the tenderer to make comments on its proposed supply and to make eventual references to the documentation.

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offered specifications.

Unless otherwise specified, the requirements in these Technical Specifications are presented as a minimum standard which the offered goods must meet.

Unless otherwise stated, the following requirements shall also apply:

A - Documentation

Upon delivery of the goods a technical documentation for equipment (such as instruction manual for the use, maintenance, calibration, etc.), in English shall be provided, unless otherwise stipulated by Serbian technical regulations. If available, an additional manual in the Serbian language would be welcomed.

B – Compliance to safety rules and regulations

When submitting a tender, the tenderer must state expressly that all of the proposed equipment meet the safety requirements of the applicable rules and regulations in force in the Republic of Serbia. Upon delivery, the tendered equipment shall include proof of compliance.

C - Certificate of calibration

The Contractor shall deliver the equipment with the certificates of calibration for the equipment contributing to the uncertainty of the final test result for which they are intended to be used. The certificates of calibration should be issued by an accredited calibration laboratory, unless otherwise specified.

D – Installation

The Contractor shall install the equipment in the premises of the user and demonstrate after the installation of the equipment that it is capable of performing the functions required of it.

E - Training

When applicable, the Contractor shall provide on-the-job training to ensure the correct operation and maintenance of the equipment, at the time of installation, with additional training, to be provided by the Contractor within the following 6-month period. Tenderer shall submit training programme. The length of the training shall be adequate to the technical characteristics and maintenance requirements of the equipment supplied and shall allow the final user to properly handle the instrument(s). The training material must be provided on minimum 1 (one) electronic media and in minimum 1 (one) hard copy per trainee. The training should be in Serbian language (or interpretation must be provided by the supplier). The performance of the equipment against the required technical specifications shall be verified as part of the training.

F – Warranty

The Contractor shall provide a warranty for the equipment supplied in line with the Special Conditions. This warranty shall remain valid for one year after provisional acceptance.

G - Commercial Warranty

Commercial warranty must remain valid for two years (after the end of one year standard warranty) in accordance with the conditions laid down in Article 32 of the Special and General Conditions. Tenderer must provide a detailed description of the organisation of the proposed service.

LOT 2: EQUIPMENT FOR RADIO FREQUENCIES MEASUREMENTS

1. Item Number	2. Specifications Required	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's notes
1	PORTABLE TV CABLE AND SATELLITE SIGNALS ANALYSER			
	QUANTITY: 2			
	Manufacturers name:			
	Product model:			
	<p>The equipment is able to perform tests according to the following standards: EN 50083-2: 2012, EN 50083-8: 2013, EN 60728-1:2008.</p> <p>Intended use: Measurement of immunity of cable networks in field conditions, according the above-mentioned standard requirements, i.e. measurement of immunity to electromagnetic disturbances of network installation in buildings (field strength level, signal level, carrier/noise, signal power, bit error ration, etc.).</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - Able to work in both field and laboratory conditions - Be robust (mechanically resistant), light (weight $\leq 5\text{kg}$), and easy to use - Able to measure signal voltage, signal power, and electromagnetic field (with I/O: Universal 			

	<p>RF input “F” 75 Ohm and Optical measurement),</p> <ul style="list-style-type: none"> - Possess common interface, HDMI output, TS-ASI in/out, IP input, Dolby digital plus - Able to analysis cable TV signals (CATV), terrestrial and satellite digital signals (MATV and SMATV), analog radio FM and TV signals - Able to work with external power supply connected to the main (220-230 V – 50 Hz) - Autonomous via an internal build-in power supply powered by a rechargeable battery (included), and supplied with a charger and an adapter to the main (220-230 V – 50 Hz) - Equipped with a colour screen with graphical interface (touch screen) for operating the instrument, and allowing display of TV images, graphic images, numerical data - Programming the operations, storing the measured data and communicating with a computer via an appropriate interface and software enabled - Equipped with an internal built-in speaker, with volume control, for monitoring TV or FM programs, and providing information on the instrument - Frequency range for terrestrial signals: 5 to 1000 MHz - Frequency range for satellite digital signals: 950 to 2150 MHz - Digital Level range: 15 to 130 dBμV - Analog level range: 10 to 130 dBμV - Spectrum analysis frequency: 5 to 2150 MHz, with the option for 2500 MHz provided. <p>The equipment shall automatically detect and measure the amplitude and power of RF signals according to the following standards:</p> <ul style="list-style-type: none"> - Digital terrestrial TV first generation (DVB-T) 			
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	<ul style="list-style-type: none"> - Digital terrestrial TV second generation (DVB-T2) - Digital terrestrial TV first generation (DVB-S) - Digital terrestrial TV second generation (DVB-S2) - Digital cable TV first generation (DVB-C) - Digital cable TV second generation (DVB-C2) - Analog terrestrial TV - Analog cable TV - Analog satellite TV - Analog terrestrial FM radio signal - Audio (MPEG-1, Dolby, Dolby Digital Plus) - Audio-Video (MPEG-2, MPEG-4). <p>The equipment should have the possibility to measure optic fiber systems (factory built):</p> <ul style="list-style-type: none"> - Selective Optical Performance Monitoring (OPM) for Fiber To The Home (FTTH) - Frequency range: 5-2500 MHz with optical to RF converter - Physical Contact (PC) or Angle Physical Contact (APC). <p>The equipment should be able to perform:</p> <ul style="list-style-type: none"> - Constellation diagrams - Echoes analysis. <p>The equipment should possess an USB interface and a data logger, and the tools allowing the comparison of signal quality of digital TV channels with and without LTE filter (HD LTE filter HW & SW for built-in & selectable rejection filters to attenuate LTE)</p> <p>The following additional requirements apply:</p>			
	A - Documentation			

	B – Compliance to safety rules and regulations			
	C - Certificate of calibration The equipment should be supplied with calibration certificates for the signal measurements of the following standards: DVB-T2, DVB-C, DVB-C2, DVB-S, DVB-S2, analog terrestrial FM, and analog cable TV.			
	F - Warranty			
	G - Commercial Warranty			
2	ELECTROMAGNETIC INTERFERENCES (EMI) RECEIVER QUANTITY: 1			
	Manufacturers name:			
	Product model:			
	<p>The equipment is able to perform tests according to the following standards: CISPR 16-1-1 Ed 3.2:2014, EN 55011:2009+A1:2010, EN 55012:2007+A1:2009, EN55013:2013, EN 55014-1:2006+A2:2011, EN 55015:2013, EN 55022:2010/AC:2011</p> <p>Intended use: Equipment for measurement of radiated and conducted disturbances complying with the requirements of the above-mentioned standards.</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - Frequency range: 10 Hz to 26.5 GHz - Equipped with a preamplifier - Analysis bandwidth: 10 Hz to 25 MHz - Video bandwidth: 1 Hz to 3 MHz - CISPR bandwidths: 200 Hz, 9 kHz, 120 kHz, 1 			

	<p>MHz</p> <ul style="list-style-type: none"> - Bandwidths at 6 dB: 10 Hz to 1 kHz in decade steps - Measurement detectors: Normal, peak, negative peak, sample, log power average, RMS average, and voltage average - CISPR detectors: quasi-peak, EMI-avg, RMS-avg) - Scale units: dBm, dBmV, dBμV, dBmA, dBμA, V, W, A, dBuV/m, dBuA/m, dBpT, dBG, dBpW - Sweep points: 1 to 500001 - Displayed average noise level (DANL): <ul style="list-style-type: none"> • DANL normalized to 1 Hz RBW (RF attenuator=0 dB / preamplifier OFF / preselector ON): <ul style="list-style-type: none"> • 10 Hz: ≤-90 dBm • 20 Hz: ≤-100 dBm • 100 Hz: ≤-110 dBm • 1 kHz to <9 kHz: ≤-120 dBm • 9 kHz to <100 kHz: ≤-130 dBm • 100 kHz to <1000 kHz: ≤-145 dBm • 1000 kHz to <1 GHz: ≤-150 dBm • 1 GHz to <26,5 GHz: ≤-140 dBm • DANL normalized to 1 Hz RBW (RF attenuator=0 dB / preamplifier ON / preselector ON): <ul style="list-style-type: none"> • 1 kHz to <9 kHz: ≤-130 dBm • 9 kHz to <100 kHz: ≤-150 dBm • 100 kHz to <1000 kHz: ≤-155 dBm • 1000 kHz to <1 GHz: ≤-160 dBm • 1 GHz to <26,5 GHz: ≤-150 dBm. - Amplitude accuracy: ± 0.75 dB - Third-order intermodulation (TOI) distortion (preselector and preamplifier on): - 9 dBm at 1 GHz - Enhanced diagnostics using spectrum analysis, 			
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	Strip Chart, marker functions, span zoom, zoom span and spectrograms, time domain scan - VSWR: Meets CISPR requirements - Inputs: <ul style="list-style-type: none"> ○ Input 1: Full range ○ Input 2: 1 GHz maximum - pulse protected ○ Be able to pass product immunity test at 3 V/m - Power supply: 220-230 V - 50 Hz. The following additional requirements apply:				
	A - Documentation				
	B – Compliance to safety rules and regulations				
	C - Certificate of calibration				
	D - Installation				
	E – Training:	The training should include conducted and radiated emission testing according to the above-mentioned standards.			
		Number of persons to be trained: 3			
		Duration: minimum 1 (one) working day			
3	F - Warranty				
	G - Commercial Warranty				
	HANDHELD SPECTRUM ANALYSER				
	QUANTITY: 1				
	Manufacturers name:				
	Product model:				
	The equipment is able to perform tests according to the following standard: EN 50413:2009 - Basic standard on measurement and calculation				

	<p>procedures for human exposure to electric, magnetic and electromagnetic fields (0 Hz - 300 GHz)</p> <p>Intended use: Measurement of DC and AC magnetic fields with regard to human exposure according to the above-mentioned standard.</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - Handheld model - Frequency range: 9 kHz – 6 GHz - Able to perform: spectrum analysis, safety evaluation, level 1 recorder, LTE demodulation - Scale unit without antenna: dBm, dBV, dBmV, dBµV - Scale unit with antenna: % of standard, V/m, A/m, W/m², mW/cm², dBV/m, dBmV/m, dBA/m, dBmA/m, dBuV/m - Resolution Bandwidth: 10Hz to 20MHz - Phase noise (SSB): < -100 dBc/Hz at 300 kHz carrier offset, verified at 57.5, 2140.5 and 4500.5 MHz - DANL (Displayed Average Noise Level): <ul style="list-style-type: none"> ○ 0Hz < f ≤30 MHz : <-160 dBm/Hz (noise figure <14 dB) ○ 30 MHz < f ≤2 GHz : <-156 dBm/Hz (noise figure <18 dB) ○ 2 GHz < f ≤4 GHz <-155 dBm/Hz (noise figure <19 dB) ○ 4 GHz < f ≤6 GHz <-150 dBm/Hz (noise figure <24 dB) - Measurement range: -30 dBm to 20 dBm in steps of 1 dB - RF Input attenuation: 0 dB to 50 dB in steps of 1 dB - RF Input type: N-connector, 50 Ω, female - Maximum RF power level: +27dBm 			
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	<ul style="list-style-type: none"> - RF Immunity field: up to 200 V/m - RF input: maximum DC voltage ± 50 V - Sweep Time: 500 ns to 24 h (time span) - Probe type: Tri-axial design, E-Field: <ul style="list-style-type: none"> o Frequency range: 420 MHz to 6 GHz o Sensor type: E-field antenna scanned axes o RF connector: N connector, 50 Ohm o Dynamic range: 0.15mV/m to 160V/m - Carrying case <p>Rechargeable batteries for a minimum of eight hour's autonomy (included), battery charger and AC adapter (220-230 V - 50 Hz).</p> <p>The following additional requirements apply:</p>				
	A - Documentation				
	B – Compliance to safety rules and regulations				
	C - Certificate of calibration				
	D - Installation				
	E– Training:	Number of persons to be trained: 3			
		Duration: minimum 1 (one) working day			
	F - Warranty				
	G - Commercial Warranty				
4	SPECTRUM ANALYZER				
	QUANTITY: 1				
	Manufacturers name:				
	Product model:				
	<p>The equipment is able to perform tests according to the following standards: CISPR 16-1-1:2003 (Ed. 3.1), CISPR 16-1-2:2003 and CISPR 16-1-4:2004 for Class A and B equipment, using Peak,</p>				

	<p>Quasi-Peak and Average detectors (EMI full compliance)</p> <p>The equipment shall also allow the measurements according to the specifications of the following product standards:</p> <ul style="list-style-type: none"> - EN 55011:2009+A1:2010 (Scientific equipment) - EN 55012:2007+A1:2009 (Vehicles, boats and internal combustion engines) - EN 55013:2013 (Home electronics) - EN 55014-1:2006+A1:2009+A2:2011 (Household appliances and portable tools) - EN 55015:2013 (Luminaries,) - EN 55022:2010+AC:2011 (IT equipment) <p>Intended use: Disturbance and immunity Radio frequency voltage and current measurements meeting the above-mentioned standards requirements.</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - Frequencies range: 9kHz to 26GHz. - EMI resolution bandwidths and resolution bandwidths in decade steps (for example to enable measurements ICNIRP guidelines on exposure limits) - Preamplifier and preselector for the whole frequency range: 9kHz to 26GHz - DANL (Displayed Average Noise Level): <-150dBm/Hz, at frequencies \leq4GHz, with the preamplifier on - RF Input type: N-connector, 50Ω, female - Including accessories and associated cables allowing to perform the measurements according to the above mentioned standards/specifications 			
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	- Including the corresponding ElectroMagnetic Compatibility (EMC) test software. - Power supply: 220-230V–50Hz. The following additional requirements apply:			
	A - Documentation			
	B – Compliance to safety rules and regulations			
	C - Certificate of calibration			
	D - Installation			
	E – Training:	Number of persons to be trained: 3		
		Duration: minimum 7 (seven) working days		
	F - Warranty			
	G - Commercial Warranty			
5	RADIO FREQUENCY AMPLIFIER FOR RADIATED IMMUNITY TEST QUANTITY: 1			
	Manufacturers name:			
	Product model:			
	The equipment is able to perform tests according to the following standards: EN 61000-4-3:2006 + A1: 2008 + A2: 2010, SRPS EN 55024:2011 Intended use: Amplifier for radio frequency radiated immunity tests according to the above-mentioned standards. The equipment (one, or a set, or a dual band amplifier as stated in EN 61000-4-3 Clause 6) shall, also, meet the following requirements: - Frequencies range: 1-6 GHz			

	<ul style="list-style-type: none"> - Field amplitude: up to 30V/m (test level 4, of EN 61000-4-3:2006, table 1), when using a double-ridged guide antenna from EATON™ model 96001 or equivalent from another manufacturer, in a 3m semi-anechoic chamber from ECCOSORB™ mod VHP-45-NRL or equivalent from another manufacturer, equipped of absorbers, where the measuring area has been validated by an accredited laboratory - Able to support infinite load VSWR without shutdown or damage - Including a set of adapted dual directional couplers, connected to the output of the amplifier and covering the frequency range: 80MHz – 6GHz - Including a power meter and power head compatibles with the directional couplers, covering the frequency range: 80MHz – 6GHz, and with sufficient dynamic range to measure up to 30V/m. An attenuator can be used to cover the range, and shall be supplied. - The power meter shall be dual channel for receiving two power sensors (to be procured). The GPIB, LAN or USB connections, should allow a remote control of the power meter by automatic measurement software developed using Matlab. - two cables RG–214/U, one of 6m, and one of 9 m. - The amplifier shall have a communication interface GPIB, LAN or USB allowing its remote control. The control software has been developed using Matlab. 			
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	<ul style="list-style-type: none"> - The RF generator is not to be procured. - The amplifier shall be used with the following equipment provided by the beneficiary: <ul style="list-style-type: none"> - A double ridged guide antenna 96001, - A broadband field meter NBM-550, <p>Power supply: 220-230V – 50Hz.</p> <p>The following additional requirements apply:</p>				
	A - Documentation				
	B – Compliance to safety rules and regulations				
	C - Certificate of calibration				
	D - Installation				
	E – Training:	Number of persons to be trained: 3			
		Duration: minimum 7 (seven) working days			
	F - Warranty				
	G - Commercial Warranty				
6	SET OF IMMUNITY TEST EQUIPMENT				
	One set of immunity test equipment composed of the five following test equipment				
	Manufacturers name:				
	Product model:				
	1. ELECTROSTATIC DISCHARGE IMMUNITY TEST EQUIPMENT				
	QUANTITY: 1				

	<p>The equipment is able to perform tests according to the following standard: EN 61000-4-2:2009</p> <p>The equipment shall also allow the measurements according to the specifications of the following product standards requirements: EN 55025: 2008, ISO 11451-4: 2013, ISO 11452-9:2012</p> <p>Intended use: Electrostatic discharge immunity test equipment meeting the above mentioned standards requirements.</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - Amplitude pic: up to 8kV for contact discharge (EN 61000-4-2:2009 Clause 6) - Amplitude peak up to 15kV for air discharge (Test Level 4 in Table 1 of EN 61000-4-2, test level 4 of table 1) - Supplied with a laptop and the associated test software for conducting the tests - Including coupling devices, associated cables, calibration kits and accessories allowing to perform the test as described in the above mentioned standards - Power supply: 220-230V – 50Hz. <p>2. ELECTRICAL FAST TRANSIENT (EFT)/BURST IMMUNITY TEST EQUIPMENT</p> <p>QUANTITY: 1</p> <p>The equipment is able to perform tests according to the following standards: EN 61000-4-4:2004</p> <p>The equipment shall also allow the measurements</p>			
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	<p>according to the specifications of the following product standards: EN 55025: 2008, ISO 11451-4: 2013, ISO 11452-9:2012</p> <p>Intended use: Electrical fast transient (EFT)/Burst immunity test equipment meeting the above mentioned standards requirements.</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - Amplitude pic: up to 4kV according to clause 6 of EN 61000-4-4:2004 (test level 4 of table 1) - With both 5kHz and 100kHz PRF settings - Supplied with a laptop and the associated test software for conducting the tests - Including coupling devices, associated cables, calibration kits and accessories - Power supply: 220-230V – 50Hz. <p>3. SURGE IMMUNITY TEST EQUIPMENT</p> <p>QUANTITY: 1</p> <p>The equipment is able to perform tests according to the following standards: EN 61000-4-5:2006</p> <p>The equipment shall also allow the measurements according to the specifications of the following product standards requirements: EN 55025: 2008, ISO 11451-4: 2013, ISO 11452-9:2012</p> <p>Intended use: Surge immunity test equipment meeting the above mentioned standards requirements.</p> <p>The equipment shall also meet the minimum following requirements:</p>			
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	<ul style="list-style-type: none"> - Amplitude pic: up to 6kV according to clause 6 of EN 61000-4-5:2006 (test level X of table 1) - Up to 16A pic under single phase power supply - Supplied with a PC and the associated test software for conducting the tests - Including coupling devices, associated cables, calibration kits and accessories - Power supply: 220-230V – 50Hz. <p>4. MAGNETIC FIELD IMMUNITY TEST EQUIPMENT</p> <p>QUANTITY: 1</p> <p>The equipment is able to perform tests according to the following standards: EN 61000-4-8:2010</p> <p>The equipment shall also allow the measurements according to the specifications of the following product standards requirements: EN 55025: 2008, ISO 11451-4: 2013, ISO 11452-9:2012</p> <p>Intended use: Magnetic field immunity test equipment meeting the above mentioned standards requirements.</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - Amplitude pic: up to 30A/m according to clause 6 of EN 61000-4-8:2010 (test level 4 of table 1) - Magnetic field coil of 1m x 1m - Supplied with a laptop and the associated test software for conducting the tests - Including devices, associated cables, calibration kits and accessories - Power supply: 220-230V – 50Hz. 			
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	<p>5. VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST EQUIPMENT</p> <p>QUANTITY: 1</p> <p>The equipment is able to perform tests according to the following standards: EN 61000-4-11:2004</p> <p>The equipment shall also allow the measurements according to the specifications of the following product standards requirements: EN 55025: 2008, ISO 11451-4: 2013, ISO 11452-9:2012</p> <p>Intended use: Voltage dips, short interruptions and voltage variations immunity tests meeting the above mentioned standards requirements.</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - Up to a maximum of 16A peak under single phase power supply according to clause 6 of EN 61000-4-11:2004 - Supplied with a PC and the associated test software for conducting the tests - Including devices, associated cables, calibration kits and accessories <p>Power supply: 220-230V – 50Hz.</p> <p>The following additional requirements apply:</p>			
	A - Documentation			
	B – Compliance to safety rules and regulations			
	C - Certificate of calibration			

	D - Installation			
	E – Training:	Number of persons to be trained: 3		
		Duration: minimum 7 (seven) working days		
	F - Warranty			
	G - Commercial Warranty			
7	ELECTROMAGNETIC EXPOSURE LEVEL TESTER			
	QUANTITY: 1			
	Manufacturers name:			
	Product model:			
	<p>The equipment is able to perform tests according to the following standard: EN 62233:2008</p> <p>Intended use: Measurement of electromagnetic fields produced by household appliances and similar apparatus with regard to human exposure, according to the requirements of the above-mentioned standard.</p> <p>The equipment shall also meet the minimum following requirements:</p> <ul style="list-style-type: none"> - B-field measurements in the frequency range from 10 Hz to 400 kHz - Measuring probe: cross-sectional area: 100 cm², in line with the above mentioned standard - Supplied by rechargeable batteries for a minimum of eight hour's autonomy (included), a battery charger and AC adapter (220-230 V – 50Hz) <p>Handled in a carrying case.</p> <p>The following additional requirements apply:</p>			

	A - Documentation			
	B – Compliance to safety rules and regulations			
	C - Certificate of calibration			
	D - Installation			
	F - Warranty			
	G - Commercial Warranty			