

1. *ANNEX II + III*: TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

Contract title: Supply of densitometer for the project AREeCcDev

p 1/3

Publication reference: HUSRB/1602/31/0075-5/densitometer 6.1.2

Columns 1-2 should be completed by the Project partner

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 Project partner 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.

The requirements set out in the technical specifications represent the minimum technical characteristics which offered goods must satisfy, unless stated otherwise, and tenderers are not allowed to modify technical specification in any way.

For each item for which it is not explicitly stated that it is allowed to offer goods of the equal characteristics, i.e. for each item where it is not stated “or equivalent”, for the purposes of this tender documentation it is assumed that words “or equivalent” are stated, and tenderer is allowed to offer equivalent goods / goods of equivalent characteristics.

1. Item Number	2. Specifications Required	3. Specifications Offered	4. Notes, remarks, ref to documentation	5. Evaluation Committee's decision (Y/N)
1	<p>4U Chasis – 1 piece must have next characteristics:</p> <ul style="list-style-type: none"> - 4U Chassis for motherboard support size: (12" x 10") (13.68" x 13") (9.6" x 9.6") - 36 x 3.5" hot-swap SAS/SATA drive bay with SES3, optional 2 x 2.5" hot-swap drive bay - 12-port 2U SAS3 12Gbps single-expander backplane, support up to 8x 3.5-inch SAS3/SATA3 HDD/SSD and 4x NVMe/SAS3/SATA3 storage devices - 24-port 4U SAS3 12Gbps single-expander backplane, support up to 24x 3.5-inch SAS3/SATA3 HDD/SSD - 1U 1200W/1000W Titanium Power Supply W/PMbus W76xL360xH40mm - 7 low-profile expansion slot(s) - 7 x 80mm high-performance fan(s) <p>4U Chassis should have characteristics similar to SuperChassis 847BE1C4-R1K23LPB or equivalent models</p>			
2	<p>Internal Mini-SAS HD to Mini-SAS HD – 4 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - min. 80cm, -min. 30AWG, - min. 12Gb/s - [FCI], RoHS/REACH <p>It should have similar characteristics to CBL-SAST-0531-01 or other equivalent models</p>			
3	<p>RAM memory 64 GB ECC – 4 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - RAM 64 GB ECC adequate for installation on H11DSi-NT) - DRAM 64GB DDR4 2666 MT/s (PC4-21300) CL19 QR x4 Load Reduced DIMM 288 pin 			
4	<p>4U Active CPU heatsink – 1 piece must have next characteristics:</p>			

	<p>- 4U Active CPU heatsink must be adequate for use in communication with 7000 and 7002 Series Processors (Socket SP3)</p> <p>It should have characteristics similar to Supermicro 4U Active CPU Heat Sink Socket OLGA4094 – SNK-P0064AP4 or equivalent models</p>			
5	<p>2U Passive CPU Heat Sink – 1 piece must have next characteristics:</p> <p>- 2U Passive CPU Heat Sink adequate for Socket OLGA4094</p> <p>It should have characteristics similar to SNK-P0063P or equivalent models</p>			
6	<p>RAID controller – 1 piece must have next characteristics:</p> <p>- PCIe 3.1 x8 LP, SAS/SATA/NVMe, - RAID 0,1,5,6,10,50,60, 16 port (4 * int SFF8643), - min. 4GB Cache, - 3516 ROC</p> <p>It should have characteristics similar to LSI MegaRAID 9460-16I or equivalent models</p>			
7	<p>SAS HDD – 14 pieces must have next characteristics:</p> <p>- SAS HDD 3.5”, - min. 12 TB, - min. 256 MB cache</p> <p>It should have characteristics similar to Exos ST12000NM0027 or equivalent models</p>			
8	<p>PCIe Add-On Card – 2 pieces must have next characteristics:</p> <p>- PCIe Add-On Card for up to two NVMe SSDs</p> <p>It should have characteristics similar to Supermicro AOC-SLG3-2M2 or equivalent models</p>			
9	<p>Wireless ruter – 1 piece must have next characteristics:</p> <p>Wireless network</p> <p>- Type: Ruter - Standards: IEEE 802,11a, IEEE 802,11b, IEEE 802,11g, IEEE 802,11n, - Wi-Fi flow: 900Mbps - Frequency range: 2,4 GHz, 5 GHz - Antene - Tip: Outdoor - Number: 3</p>			

	<p>Cable network</p> <ul style="list-style-type: none"> - Standards: IEEE 802,3 (10Base-T Ethernet) - Flow: 10/100/1000 Mbps - Protection - WEP: 128 bit, 64 bit WPA: PSK WPA2: PSK WPS: Yes, - Firewall - Additional: DMZ, L2TP, PPTP connection / Slots - RJ-45: 5 (4xLAN, 1xWAN (Internet)) - USB including: 2, Type A Rest – Additional function: DDNS, DHCP -Technologies supported: UPnP - Rest: Parental control, WPS taster - Physical characteristics <p>It should have characteristics similar to Asus RT-N66U or equivalent models</p>			
10	<p>10 G PCIe card – 1 piece must have next characteristics:</p> <ul style="list-style-type: none"> - 10 G PCIe card 2 x RJ45 - low profile server card 			
11	<p>Pre-voltage protection – 6 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - Pre-voltage protection with 5 (or more) socket, >= 3500W, cable length min. 1,5 m 			
12	<p>Monitor IPS LED – 6 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - Monitor size: 23,8" - Resolution: 1,920 x 1,080 - Display type: TFT LCD - Panel type: IPS - Backlight: LED - Screen aspect ratio: 16:9 - Native contrast: 1,000:1 - Lighting: 250cd/m - Response: 5ms - View angles: 178 horizontal - Vertical refreshment: 50Hz - 76Hz - Horizontal refreshment: 30kHz - 83kHz - Pixel size: 0,274 mm - Colour pallet: 16,7 milion - DisplayPort: 1x DisplayPort HDMI connection: 1x HDMI VGA D-sub: 1 			

	<ul style="list-style-type: none"> - Audio input: 3,5 mm - Additional connections/ Slots: Kensington security lock slot - Speakers: 2x 1W RMS - Supported technologies: HDCP, - Scroll: Tilt - Wall mounting: 100 mm x 100 mm - Colour: Black or White or Grey <p>It should have characteristics similar to Benq GW2480 IPS or equivalent models</p>			
13	<p>USB camera – 1 piece must have next characteristics:</p> <ul style="list-style-type: none"> - 2 Megapiksel - Additional functions: Autofokus, - Automatic low-light correction - Video recording – Native resolution: Full HD 1080p (1.920 x 1.080) - Brzina kadrova: 30 fps - Supported formats: H.264 <p>Additional characteristics</p> <ul style="list-style-type: none"> - Mikrofon: integrated - Connectiability: USB 2.0, USB 3.0 <p>It should have characteristics similar to Logitech C922 Pro stream or equivalent models</p>			
14	<p>Headphones - 1 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - Headphones with microphones - System: 7,1, Surround - Type of connectivity: Cable - Connectivity: 2 x 3,5 mm audio (Headphones + microphone), - USB type A - Construction: Close Frequent range: 15Hz - 25KHz - Sensibility: 98dB ± 3dB pri 1kHz - Maximum input power: 150mW <p>Impedans: 60Ω</p> <ul style="list-style-type: none"> - Microphone – Frequency range: 50Hz - 18kHz -Sensibility: -39dB ±3dB - Impedans: 2,2kΩ - Supported technologies Noise-cancelling <p>It should have characteristics similar to Kingston HyperX Cloud II - Pro Headset KHX-HSCP-RD or equivalent models</p>			

15	<p>Combo set – 6 sets must have next characteristics:</p> <ul style="list-style-type: none"> - combo set must contain keyboard, mouse, headphones and mousepad) - Keyboard type – with rubber membrane - connectivity – USB - backlit keyboard 			
16	<p>USB Flash – 4 pieces must have next characteristics: USB Flash drive 3.1, memory free space min. 128 GB</p>			
17	<p>Keyboard and mouse set – 1 set must have next characteristics:</p> <ul style="list-style-type: none"> - Keyboar with numeric Keypad - Serbian latin - Colour Space Grey, Grey, White <p>It should have characteristics similar to Apple Magic Keyboard with Numeric Keypad and Apple Magic Mouse 2, Space grey or equivalent sets of Keyboard and mouse</p>			
18	<p>MicroSDXC – 5 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - Capacity: 128 GB Flow: up to 45MB/s, Red up to 90MB/s - Class: 10, UHS-I U3 - Additional – adapter included Use: 4K video, Action camera, Drone <p>It should have characteristics similar to Kingston UHS-I U3 MicroSDXC 128GB V30 or equivalent</p>			
19	<p>USB 3.0 HUB – 8 pieces must have next characteristics: USB 3.0 HUB with 4 holes</p>			
20	<p>DDR memory – 8 pieces must have next characteristics: - 8 GB SODIM, DDR4 2400</p>			
21	<p>DDR memory – 1 piece must have next characteristics: 16 GB SODIM, DDR4 2666</p>			
22	<p>Processor – 4 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - procesor with 4 cores - Foothil Socket AM4, - Processor speed 3.5 GHz, - Number of cores - 4 (3.5 GHz/3.7 GHz turbo), - 4 Threads, 2MB L2 cache, 4MB L3 cache, 65W, - with integrated graphics (AM4), 			

	<ul style="list-style-type: none"> - with Wraith Stealth cooler <p>It should have similar characteristics to AMD Ryzen 3 2200G or equivalent models</p>			
23	<p>Motherboard – 4 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - AM4 motherboard - PCIe 3.0 x16 1, - M.2 nvme, PCIe x1 1, - SATA3 4, RAID 0, 1 <p>It should have characteristics similar to Asus PRIME A320M-K or equivalent models</p>			
24	<p>Computer case – 4 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - Case must be appropriate for installation of AM4 motherboard or equivalent, as well as procesor and power supply 			
25	<p>Computer case – 1 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - to suit 265mm cooler <p>It should have characteristics similar to COOLER MASTER MasterBox TD500L or equivalent models</p>			
26	<p>DDR memory – 8 pieces must have next characteristics:</p> <p>DDR4 8 GB 2666 compatible with motherboard AM4 or equivalent motherboards</p>			
27	<p>Power supply – 4 pieces must have next characteristics:</p> <p>Power supply $\geq 700W$, gold or platinum or equivalent</p>			
28	<p>Power supply – 1 piece must have next characteristics:</p> <ul style="list-style-type: none"> - Power supply 1250W, Power Smart Series, - Modular, 140mm fan, AFC, Active PFC, - 80 Plus Gold <p>It should have characteristics similar to Chieftec GPS-1250C or equivalent models</p>			
29	<p>Processor – 2 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - Foothill Socket AM4 or equivalent - processor speed 3.6 GHz. L2 cashe 6 MB, L3 cashe 64 MB - Production process 7 nm - Number of cores 12 			

	It should have characteristics similar to R9 3900x or equivalent			
30	<p>Cooler – 2 pieces must have next characteristics:</p> <ul style="list-style-type: none"> - AM4 silent cooler or equivalent - cooper, aluminium, nickel, - 1500 rpm, <p>Weight up to 1350 g,</p> <ul style="list-style-type: none"> - 19, 2/24, 6 dBA, low noise adapter, <p>Fan dimensions max. 165 x 155 x 30 mm, Culler dimensions max. 18 x 17 x 15 cm, 150000 h It should have characteristics similar to NOCTUA NH-D15 or equivalent models</p>			
31	<p>DDR memory – 2 pieces must have next characteristics:</p> <p>DDR4 64GB (4x16) 3600 Mhz</p> <p>It must be compatible for installation on AM4 type of motherboards or equivalent models</p>			
32	<p>Motherboard – 1 piece must have next characteristics:</p> <ul style="list-style-type: none"> - type of board similar to MB AM4 x570 - it must be compatible for work with minimum 1 x Intel I211-AT Gigabit - it must be compatible for work with min. 1 x Aquantia AQC111C 5GbE - 8 x SATA3 - 2 x M.2 - 4th generation <p>It must have similar characteristics to Asus CROSSHAIR VIII FORMULA or equivalent models</p>			
33	<p>Motherboard – 1 piece must have next characteristics:</p> <ul style="list-style-type: none"> - type of board similar to MB AM4 x570, - ATX motherboard with PCIe 4.0, 14 DrMOS power stages, - min. memory DDR4 4400MHZ, - dual M.2, HDMI, SATA 6Gb/s, USB 3.2 Gen 2 front-panel connector - Aura Sync RGB lighting must be included <p>It must have similar characteristics to Asus Prime x570 or equivalent models</p>			

34	Switch – 1 piece must have next characteristics: - Switch 10g 8 port			
35	Switch – 3 pieces must have next characteristics: - Switch 1G 8 port			
36	Hard disk SSD – 2 pieces must have next characteristics: - M.2, 2Tb, NVMe, 3500/3300MB/s It should have characteristics similar to Samsung 2TB 970 EVO Plus Series MZ-V7S2T0BW or equivalent models			
37	Hard disc SATA – 2 pieces must have next characteristics: - 512 GB – professional series, - Solid-State Drive, - SATA 3, 2.5, - 560/530MB/s It should have characteristics similar to Samsung 512GB 860 MZ-76P512B or equivalent models			
38	Hard disc – 6 pieces must have next characteristics: - 1 Tb, generation 3 NVME or equivalent - Sequential Read Speed Max. 3,500 MB/s - Sequential Write SpeedMax. 3,300 MB/s It should have characteristics similar to Samsung M.2 PCIe 3.0 x4 1TB 970 EVO PLUS or equivalent models			
39	Hard disc – 2 pieces must have next characteristics: - 1Tb, generation 4 NVME, AData XPG GAMMIX S5 or equivalent models			
40	Hard disc – 1 pieces must have next characteristics: - SSD 512 GB It must have characteristics similar to Adata ASU800SS-512GT-C or equivalent models			
41	Network cable – 4 pieces must have next characteristics: - network CAT6 lenght equal to 10 m			
42	Network cable – 4 pieces must have next characteristics: - network CAT6 lenght equal to 20 m			
43	Operation system OS – 5 pieces must have next characteristics: Firewall and network protection included, Internet protection			

	<p>Secure boot WIP Digital pen and touch Battery saver mode Mobile Voice Mobile device management Group policy Assigned Access Dynamic Provisioning It should have similar characteristics to Windows 10 Pro or equivalent OS models</p>			
44	<p>Operation system OS – 2 pieces must have next characteristics: Firewall and network protection included, Internet protection Secure boot WIP Digital pen and touch Battery saver mode Mobile Voice It should have similar characteristics to Win 10 Pro FPP licence or equivalent OS models</p>			
45	<p>Graphic card – 2 pieces must have next characteristics: - 8GB 256bit - Type of memory: GDDR6, - support to CUDA technology It should have similar characteristics to GeForce RTX 2060 8GB 256bit or equivalent models</p>			
46	<p>DDR4 memory 16 GB – 12 pieces must have next characteristics: - 16GB DDR4-2400 2Rx8 LP ECC - REG RoHs RDIMM with installation on server - it must be adequate to install on server which already have 12 x 16 GB memory slots It should be compatible for installation on Skhynixna board SM X10DRC-LN4+</p>			
	<p>Warranty period must be one year after the date of the provisional acceptance</p>			

	Delivery and installation place must be Antona Čehova no. 13D, 21000 Novi Sad			
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