Request for Quotations (RFQ)

RFQ Number:	ICTEC-2021-051
Issuance Date:	13.12.2021
Deadline for Offers:	28.12.2021, 15:00 Chisinau time
Description:	Supply of Drones and mechatronics equipment for AGTech (4 LOTs)
For:	Moldova ICT Excellence Center Project (ICTEC)
Funded By:	United States Agency for International Development (USAID), Contract No. AID-117-A-15-00002
Issued by:	National Association of Private ICT Companies (ATIC)
ATIC Point of Contact:	achirita@ict.md – Ana Chirita, Strategic Projects Director.

Section 1: Instructions to Offerors

Introduction: The Moldova ICT Excellence Center (ICTEC) Project is a USAID program implemented by the National Association of Private ICT Companies (ATIC).
As part of the ICTEC project, in the context of AgTech concept implementation, ATIC is seeking to purchase various equipment that will support educational, research and development activities in AgTech among university and college students with an agriculture, engineering and IT background by stimulating the infusion of digital and engineering elements into agricultural production:

LOT 1: DRONES, ACCESSORIES, SPARES, AND SOFTWARE
LOT 2: MECHATRONICS MANUFACTURING MACHINES, MEASURING DEVICES AND TOOLS
LOT 3: MECHATRONICS ARDUINO KITS, PNEUMATIC TRAINING KIT, SENSORS, COMMUNICATION TOOLS
LOT 4: FARMING BOT MACHINES.

For more details please refer to Section 3 – Technical Specifications and Annex 1 – AgTech Concept.

Offerors are responsible for ensuring that their offers are received by ATIC in accordance with the instructions, terms, and conditions described in this RFQ. Failure to adhere with instructions described in this RFQ may lead to disqualification of an offer from consideration.

1. **Offer Deadline and Protocol**:
Offers must be submitted **not later than 15:00, local Chisinau time, on December 28, 2021** electronically only .

Electronic submission only: Any email offers must be sent to the following address:
to: achirita@ict.md Ana Chirita, Strategic Projects Director
cc: llivadari@ict.md Liuba Livadari, Procurement Consultant

Offers must be submitted in one package in pdf format files, including the Forms A-F and other mandatory documents required by this solicitation documents – details in Section 3 - Technical Specifications. *The Quotation for the requested goods shall follow the FORM F – quotation form.*

Please reference the RFQ number in any response to this RFQ. Offers received after the specified time and date will be considered late and will be considered only at the discretion of ATIC.

2. **Questions**: Questions regarding the technical or administrative requirements of this RFQ may be submitted **no later than 15:00 local Chisinau time on December 24, 2021 by email to llivadari@ict.md.** Questions must be submitted in writing; phone calls will not be accepted. Questions and requests for clarification—and the responses thereto—that ATIC believes may be of interest to other offerors will be circulated to all RFQ recipients who have indicated an interest in bidding.

   Only the written answers issued by ATIC will be considered official and carry weight in the RFQ process and subsequent evaluation. Any verbal information received from employees of ATIC or any other entity should not be considered as an official response to any questions regarding this RFQ.

3. **Specifications**: *Section 3 contains* the technical specifications of the required items. All commodities offered in response to this RFQ must be new and unused.
   Please note that, unless otherwise indicated, stated brand names or models are for illustrative description only. An equivalent substitute, as determined by the specifications, is acceptable.

4. **Quotations**: Quotations in response to this RFQ must be priced on a fixed-price, all-inclusive basis, including delivery and all other costs required in Section 3. Offerors are requested to provide quotations guided by the Quotation format (FORM F) using company's letterhead.

   During the validity of the quotation, ATIC shall not accept any changes in unit prices, due to escalation, inflation, exchange rates fluctuation, or other market factors, after the receipt of the quotation. At the time of Contract award, ATIC reserves the right to increase or decrease the quantity of services and/or goods, by up to a maximum twenty-five per cent (25%) of the total offer, without changes in the unit price or other terms and conditions.

   Currency of Quotation: Pricing must be presented in USD (VAT 0%, and exempt of customs taxes).

   Quotation validity: Offers must remain valid for not less than 90 calendar days after the offer deadline.
   In exceptional circumstances, ATIC may request Companies to extend the validity of the Quotation beyond what has been initially indicated in this RFQ. The Proposal shall then confirm the extension in writing, without any modification whatsoever on the Quotation.

   Partial Quotes: Allowed per LOT; partial quote inside LOT 2 and LOT 3 allowed.

5. **Mandatory documents to be submitted:** Offerors responding to this RFQ are requested to submit the following documents:
   - Application form (FORM A)
   - Letter of Transmittal (see FORM B)
   - Offeror's Summary Sheet (see FORM C)
   - Certification Regarding Responsibility Matters (see FORM D)
   - Evidence Regarding Responsibility Matters (see FORM E)
   - Dully filled in Quotation form (FORM F), in line with the requirements in Section 3;
   - Company profile (brief information);
   - Copy of Company's Registration Certificate;
   - Detailed technical description of the offered goods;
   - Certificates of quality for the offered goods (where applicable);
   - Statement or certificate of origin for the offered equipment;

- A statement whether any import or export licenses are required in respect of the goods to be purchased including any restrictions on the country of origin, use/dual use nature of goods or services, including and disposition to end users (where applicable);
- Confirmation that licenses of this nature have been obtained in the past and an expectation of obtaining all the necessary licenses should the quotation be selected (where applicable);
- Quality Certificate (e.g., ISO, CE, etc.) and/or other similar certificates, accreditations, awards and citations received by the Bidder, if any;
- Accreditations, Markings/Labels, Environmental Compliance Certificates, and other evidences of the Bidder's practices which contributes to the ecological sustainability and reduction of adverse environmental impact (e.g., use of non-toxic substances, recycled raw materials, energy-efficient equipment, reduced carbon emission, etc.), either in its business practices or in the goods it manufactures;
- Manufacturer's Authorization of the Company as a Sales Agent (if Supplier is not the manufacturer);
- Description of warranty arrangements, name and address of the authorized service situated in or in close proximity to the Republic of Moldova (please describe the procedure).
- 2 Reference Letters (proof of satisfactory performance) from Clients in terms of (3) years;
- **In case the Offeror's cost proposal exceeds the equivalent of USD 50.000, the Offeror shall provide a bank guarantee in amount of 2% per item Annex No.2 below. The bank guarantee must be annexed to the quotation form.**

6. **Delivery**: DAP Chisinau. The delivery location for the items described in this RFQ is Chisinau, Moldova. As part of its response to this RFQ, each offeror is expected to provide an estimate (in calendar days) of the delivery timeframe (after receipt of order). The delivery estimate presented in an offer in response to this RFQ must be upheld in the performance of any resulting contract.

7. **Customs clearance** of goods shall be done by the supplier: Foreign companies are encouraged to contact a local brokerage company to manage the customs clearance procedure (costs to be included in/covered by the quotation).

8. **Source/Nationality/Manufacture**: All goods and services offered in response to this RFQ or supplied under any resulting award must meet **USAID Geographic Code 110** in accordance with the United States Code of Federal Regulations (CFR), 22 CFR §228. The cooperating country for this RFQ is Moldova.

   Offerors may not offer or supply any commodities or services that are manufactured or assembled in, shipped from, transported through, or otherwise involving any of the following countries: Burma (Myanmar), Cuba, Iran, North Korea, (North) Sudan, Syria.

9. **Warranty**: Warranty service and repair within the cooperating country is required for all commodities under this RFQ. The warranty coverage must be valid on all commodities for a minimum of period of 1 year, after delivery and acceptance of the commodities, unless otherwise specified in the technical specifications. At the time that any commodity is transferred to the Government of Moldova/Beneficiary, the ATIC, or another entity within the cooperating country, all rights to warranty support and service shall be transferred with the commodity to that entity's end-user.

10. **Taxes and VAT**:
    The agreement under which this procurement is financed does not permit the financing of any taxes, VAT, tariffs, duties, or other levies imposed by any laws in effect in the Cooperating Country. No such Cooperating Country taxes, VAT, charges, tariffs, duties or levies will be paid under an order resulting from this RFQ.

11. **Eligibility**: By submitting an offer in response to this RFQ, the offeror certifies that it and its principal officers are not debarred, suspended, or otherwise considered ineligible for an award.

12. **Evaluation and Award**: The award will be made to a responsible offeror whose offer follows the RFQ instructions, meets the eligibility requirements, and is **lowest-priced, technically acceptable approach**: meets or exceeds the minimum required technical specifications, and is judged to be the best value based on a lowest-price, technically-acceptable basis.

Evaluation Criteria:

☒ Technical responsiveness to technical requirements (and lowest price);
☒ Company's minimum 3-year experience in the field of supply of similar equipment;
☒ Availability of certificates of quality and origin for the offered equipment;
☒ Full acceptance of the RFQ conditions;
☒ Maximum delivery period not to exceed 45 calendar days upon signature of contract;
☒ Warranty on parts and labor - as required per item; (If warranty requirement is not specified, a standard minimum 1-year warranty shall be offered);
☒ After-Sales services:
a) Service Center in Moldova or in close proximity to Moldova *(Mandatory information on the Service Center Company name, address, contact person, e-mail, phone number).*
b) Technical Support
c) Brand new replacement if purchased unit is beyond repair (under Warrantee period)
☒ Validity of Quotation - 60 calendar days from tender deadline.

Please note that if there are significant deficiencies regarding responsiveness to the requirements of this RFQ, an offer may be deemed "non-responsive" and thereby disqualified from consideration. ATIC reserves the right to waive immaterial deficiencies at its discretion.

Best-offer quotations are requested. It is anticipated that award will be made solely on the basis of these original quotations. However, ATIC reserves the right to conduct any of the following:

- ATIC may conduct negotiations with and/or request clarifications from any offeror prior to award.
- While preference will be given to offerors who can address the full technical requirements of this RFQ, ATIC may issue a partial award or split the award among various suppliers, if in the best interest of the Project.
- ATIC may cancel this RFQ at any time.

Please note that in submitting a response to this RFQ, the offeror understands that USAID is not a party to this solicitation and the offeror agrees that any protest hereunder must be presented—in writing with full explanations—to the ICTEC Project for consideration, as USAID will not consider protests regarding procurements carried out by implementing partners. ATIC, at its sole discretion, will make a final decision on the protest for this procurement.

13. **Terms and Conditions**: This is a Request for Quotations only. Issuance of this RFQ does not in any way obligate ATIC or ICTEC Project to make an award or pay for costs incurred by potential offerors in the preparation and submission of an offer.

This solicitation is subject to ATIC's standard terms and conditions. Any resultant award will be governed by these terms and conditions; a copy of the full terms and conditions is available upon request. Please note the following terms and conditions will apply:

(a) ATIC's standard **payment terms** are 100% net 15 business days after receipt, installation, testing, training and acceptance of any commodities and/or deliverables and upon submission of payment documents (Invoice). Payment will only be issued to the entity submitting the offer in response to this RFQ and identified in the resulting award; payment will not be issued to a third party.
(b) **Other Payment Terms**: Advance payment allowed up to 20% of the contract amount.
(c) Any award resulting from this RFQ will be **firm fixed price**, in the form of a Contract for goods.
(d) No commodities or services may be supplied that are manufactured or assembled in, shipped from, transported through, or otherwise involving any of the following countries: Burma (Myanmar), Cuba, Iran, North Korea, (North) Sudan, Syria.
(e) Any international air or ocean transportation or shipping carried out under any award resulting from this RFQ must take place on U.S.-flag carriers/vessels.
(f) United States law prohibits transactions with, and the provision of resources and support to, individuals and organizations associated with terrorism. The supplier under any award resulting from this RFQ must ensure compliance with these laws.
(g) The title to any goods supplied under any award resulting from this RFQ shall pass to ATIC following delivery and acceptance of the goods by ATIC. Risk of loss, injury, or destruction of the goods shall be borne by the offeror until title passes to ATIC.
(h) **Penalty for delays: 0.5%** of the value of undelivered goods for every day of delay, up to a maximum duration of 1 calendar month. Thereafter, the contract may be terminated.

Section 2: Offer Checklist

To assist offerors in preparation of proposals, the following checklist summarizes the documentation to include an offer in response to this RFQ: the list of documents as per *Section 1, p.5 Mandatory documents to be submitted:*

Section 3: Specifications and Technical Requirements

The table below contains the technical requirements of the commodities/services. Offerors are requested to provide quotations containing the information below on official letterhead or official quotation format, guided by the Form F – Quotation Form

Line Item	Description and Specifications	Qty
LOT 1	**DRONES, ACCESSORIES, SPARES, AND SOFTWARE**	
1	**Drone type 1** **Aircraft** Weight (Battery & Propellers Included) – up to 1375 g Diagonal Size (Propellers Excluded) - 350 mm Max Ascent Speed - S-mode: 6 m/s; P-mode: 5 m/s Max Descent Speed - S-mode: 4 m/s; P-mode: 3 m/s Max Speed - S-mode: 45 mph (72 kph); A-mode: 36 mph (58 kph); P-mode: 31 mph (50 kph) Max Wind Speed Resistance - 10 m/s Max Flight Time - Approx. 30 minutes Satellite Positioning Systems - GPS/GLONASS Hover Accuracy Range - Vertical: ±0.1 m (with Vision Positioning) ±0.5 m (with GPS Positioning); Horizontal: ±0.3 m (with Vision Positioning) - ±1.5 m (with GPS Positioning) **Vision System** Vision System: Forward Vision System, Backward Vision System, Downward Vision System Velocity Range - ≤31 mph (50 kph) at 6.6 ft (2 m) above ground Altitude Range - 0-33 ft (0-10 m) Operating Range - 0-33 ft (0-10 m) Obstacle Sensory Range - 2-98 ft (0.7-30 m) Measuring Frequency - Forward: 10 Hz; Backward: 10 Hz; Downward: 20 Hz Operating Environment - Surface with clear pattern and adequate lighting (lux>15) **Camera** Sensor - 1-inch CMOS; Effective pixels: 20M Lens - FOV 84° 8.8 mm/24 mm (35 mm format equivalent) f/2.8-f/11 auto focus at 1 m-∞ Mechanical Shutter Speed - 8-1/2000 s Electronic Shutter Speed - 8-1/8000 s Image Size - 3:2 Aspect Ratio: 5472×3648; 4:3 Aspect Ratio: 4864×3648; 16:9 Aspect Ratio: 5472×3078 Still Photography Modes - Single Shot; Burst Shooting: 3/5/7/10/14 frames; Auto Exposure Bracketing (AEB): 3/5 bracketed frames at 0.7 EV Bias; Interval: 2/3/5/7/10/15/20/30/60 s Max Video Bitrate - 100 Mbps Supported File Systems - FAT32 (≤32 GB); exFAT (>32 GB) Photo - JPEG, DNG (RAW), JPEG + DNG Video - MP4/MOV (AVC/H.264; HEVC/H.265) Supported SD Cards – microSD; Max Capacity: 128 GB; Write speed ≥15MB/s, Class 10 or UHS-1 rating required **Remote Controller** Operating Frequency - 2.400-2.483 GHz and 5.725-5.850 GHz Max Transmission Distance - 2.400-2.483 GHz, 5.725-5.850 GHz Operating Temperature Range - 32° to 104°F (0° to 40°C) Battery - 6000 mAh LiPo 2S Transmitter Power (EIRP) - 2.400-2.483 GHz Operating Current/Voltage - 1.2 A@7.4 V	1

	Video Output Port - GL300K: HDMI; GL300L: USB Mobile Device Holder - GL300K: Built-in display device (5.5-inch screen, 1920×1080, 1000 cd/m2, Android system, 4 GB RAM＋16 GB ROM); GL300L: Tablets and smart phones **Charger** Voltage - 17.4 V Rated Power - 100 W Intelligent Flight Battery Capacity - 5870 mAh Voltage - 15.2 V Energy - 89.2 Wh Net Weight – up to 480 g Max Charging Power - 160 W **App / Live View** Mobile App – for life view Live View Working Frequency - 2.4 GHz ISM, 5.8 GHz ISM Live View Quality - 720P @ 30fps, 1080P @ 30fps Warranty period – min. 2 years	
2	**Drone type 2: RTK** **Aircraft** Takeoff Weight- up to 1400 g Diagonal Distance- 350 mm Max Ascent Speed – 6 m/s (automatic flight); 5 m/s (manual control) Max Descent Speed -3 m/s Max Speed – 31 mph (50 kph) (P-mode); 36 mph (58 kph) (A-mode) Max Flight Time – Approx. 30 minutes Operating Frequency 2.400 GHz to 2.483 GHz Transmission Power (EIRP) – 2.4 GHz **Mapping Functions** Mapping Accuracy – Mapping accuracy meets the requirements of the ASPRS Accuracy Standards for Digital Orthophotos Class Ⅲ Ground Sample Distance (GSD) – (H/36.5) cm/pixel, **Vision System** Velocity Range - ≤31 mph (50 kph) at 6.6 ft (2 m) above ground with adequate lighting; Altitude Range- 0-33 ft(0 – 10 m) Operating Range- 0-33 ft(0 – 10 m) Obstacle Sensing Range-2-98 ft(0.7-30 m) Measuring Frequency – Forward/Rear ： 10 Hz; Downward ： 20 Hz Operating Environment – Surfaces with clear patterns and adequate lighting (＞ 15 lux) **Camera** Sensor – 1” CMOS; Effective pixels: 20 M Lens – FOV 84°； 8.8 mm / 24 mm (35 mm format equivalent:24 mm); f/2.8 – f/11, auto focus at 1 m - ∞ ISO Range – Video:100-3200 (Auto); 100-6400(Manual); Photo:100-3200(Auto); 100-12800(Manual) Mechanical Shutter Speed – 8 – 1/2000 s Electronic Shutter Speed – 8 – 1/8000 s Max Image Size - 4864×3648（4:3)； 5472×3648（3:2） Video Recording Modes – H.264, 4K ： 3840×2160 30p Photo Format – JPEG Video Format – MOV Supported File Systems – FAT32（≤ 32 GB)； exFAT（> 32 GB） Supported SD Cards – MicroSD, Max Capacity: 128 GB.	1

	Intelligent Flight Battery Capacity - 5870 mAh Voltage - 15.2 V Energy - 89.2 Wh Net Weight – up to 480 g Max charging Power – 160 W **Intelligent Battery Charing Hub** Input Voltage – 17.3…26.2 V Output Voltage and Current – 8.7 V, 6 A ; 5 V, 2 A **SDK Remote Controller** Operating Frequency – 2.400 GHz to 2.483 GHz Max Transmission Distance – 7 km); Built-in Battery – 6000 mAh Operating Current / Voltage – 1.2 A/7.4 V Mobile Device Holder – Tablets and smartphones **GNSS** First-Fixed Time - < 50 s Positioning Accuracy: - Vertical 1.5 cm + 1 ppm(RMS); Horizontal 1 cm + 1 ppm (RMS) **Remote Controller** Operating Frequency – 2.400 GHz-2.483 GHz Transmission Power – 2.4 GHz Max Transmission Distance – 7 km Power Consumption- 16 W Display – 5.5inch screen; 1920×1080, 1000 cd/m²; Android System Memory – 4G RAM+16G ROM **Intelligent Flight Battery Charging Hub** Voltage -17.5 V Capacity - 4920 mAh Voltage - 7.6 V Energy - 37.39 Wh **AC Power Adapter** Voltage – 17.4 V Rated Power – 160 W Warranty period – min. 2 years	
3	**Drone type 3: Multispectral drone** **Aircraft** Takeoff Weight - up to 1500 g Diagonal Distance (Propellers Excluded) - 350 mm Max Ascent Speed - 6 m/s (automatic flight); 5 m/s (manual control) Max Descent Speed - 3 m/s Max Speed - 31 mph (50 kph) (P-mode); 36 mph (58 kph) (A-mode) Max Flight Time - Approx. 27 minutes Operating Frequency - 2.4000 GHz to 2.4835 GHz **Mapping Functions** Ground Sample Distance (GSD) - (H/18.9) cm/pixel Rate of Data Collection - Max operating area of approx. 0.63 km2 for a single flight at an altitude of 180 m, i.e., GSD is approx. 9.52 cm/pixel, with a forward overlap rate of 80% and a side overlap ratio of 60%, during a flight that drains the battery from 100% to 30%. **Vision System** Velocity Range b- ≤ 31 mph (50 kph) at 6.6 ft (2 m) above ground with adequate lighting Altitude Range - 0 - 10 m Operating Range - 0 - 10 m	1

	Obstacle Sensory Range - 0.7 - 30 m Operating Environment - Surfaces with clear patterns and adequate lighting (> 15 lux) **Camera** Sensors - Six 1/2.9" CMOS, including one RGB sensor for visible light imaging and five monochrome sensors for multispectral imaging. Each Sensor: Effective pixels 2.08 MP (2.12 MP in total) Filters - Blue (B): 450 nm ± 16 nm; Green (G): 560 nm ± 16 nm; Red (R): 650 nm ± 16 nm; Red edge (RE): 730 nm ± 16 nm; Near-infrared (NIR): 840 nm ± 26 nm Lenses - FOV (Field of View): 62.7°; Focal Length: 5.74 mm (35 mm format equivalent: 40 mm), autofocus set at ∞; Aperture: f/2.2 RGB Sensor ISO Range - 200 - 800 Monochrome Sensor Gain - 1 - 8x Electronic Global Shutter - 1/100 - 1/20000 s (visible light imaging); 1/100 - 1/10000 s (multispectral imaging) Max Image Size - 1600×1300 (4:3.25) Photo Format - JPEG (visible light imaging) + TIFF (multispectral imaging) Supported File Systems - FAT32 (32 GB); exFAT (> 32 GB) Supported SD Cards - microSD with a minimum write speed of 15 MB/s. Max Capacity: 128 GB. Class 10 or UHS-1 rating required **Remote Controller** Operating Frequency - 2.4000 GHz to 2.4835 GHz Transmission Power (EIRP) - 2.4 GHz: < 20 dBm (CE / MIC / KCC) 5.8 GHz: < 26 dBm (FCC / SRRC / NCC) Max Transmission Distance - FCC / NCC: 4.3 mi (7 km) CE / MIC / KCC / SRRC: 3.1 mi (5 km) (Unobstructed, free of interference) Built-in Battery - 6000 mAh Operating Current / Voltage - 1.2 A / 7.4 V Mobile Device Holder - Tablets and smartphones **Intelligent Flight Battery** Capacity - 5870 mAh Voltage - 15.2 V Energy - 89.2 Wh Net Weight -up to 480 g Max Charging Power - 160 W **Intelligent Flight Battery Charging Hub** Voltage - 17.5 V AC Power Adapter – Voltage - 17.4 V; Rated Power - 160 W Warranty period – min 2 years	
4	**Drone type 4: Radiocontroled MiniDrone** Radiocontrol drone similar to XK-Innovations Alien X250 RTF WiFi FPV 2.4GHz with videocamera, Size: 194x194x61мм Motor: 8520 coreless Batery: 3.7V 800mAh 20C Li Flight time: 8 - 12 min Charging time: apr 60 min Control distance: 300 м Warranty period – min. 2 years	10
	Drone accessories and spares	
5	**Mobile Station for RTK drones (compatible with the drones models provided above)** Supports: GPS: L1 C/A, L2, L5; BEIDOU: B1, B2, B3; GLONASS: F1, F2; Galileo: E1, E5A, E5B,	1

	Connect multiple drones to conduct coordinated operations, IP65 Ingress Protection. Mobile Station supports communication via 4G, OcuSync, WiFi, and LAN, ensuring uninterrupted, stable data transmission under any application scenario. Up to 5 remote controllers* can be connected to the Mobile Station simultaneously Drome Type 1, Type 2, Type 3. Warranty period – min. 2 years	
6	**Low-Noise Propellers for drones (compatible with the drone type 1 and drone type 4)** Diameter × Thread: 9.4 x 5.5 inch (24 × 13.97 cm) Weight: up to 15 g Warranty period – min. 1 year	20
7	**Propeller Guard (compatible with the drone type 1)** Weight (1 PC): up to 15 g Angle: 85° Radius: 138.5 mm Installation Circumference: 521 mm Warranty period – min. 1 year	8
8	**Battery Charging Hub** Compatible Battery Charger: for the models of drones described above Type 1, 2, 3. Compatible Battery Model: 5350mAh…5870mAh/15.2V Operating Voltage: 17.5 V Charging Time (Three Batteries): 3 hr 30 min Weight: up to 170 g Warranty period – min. 2 years	1
9	**Additional Battery (compatible with the drones models provided above)** Capacity: 5870 mAh Voltage: 15.2 V Energy: 89.2 Wh Net Weight: up to 480 g Max Charging Power: 160 W Warranty period – min 1 years	4
10	**Advanced All-In-One Virtual Reality Headset** TYPE Standalone Tethered Resolution - 1,832 by 1,920 (per eye) 1,440 by 1,280 (per eye) Refresh rate- 90 Hz…80 Hz Motion detection - 6DOF Warranty period – min. 2 years	4
	Software	
11	**Pix4D** PIX4D mapper educational professor, perpetual license	1
12	**Agisoft Metashape Professional** Educational license	1
13	**RealFlight 9.5 Sim w/Spektrum Controller with the simulator software**	4
LOT 2	**MECHATRONICS MANUFACTURING MACHINES, MEASURING DEVICES AND TOOLS**	
1	**Computer Numerical Control (CNC) 3 axes (option expand ports to 4/5 axes)** Net Weight – up to 65KG Gross Weight – up to 90KG Product Dimension - 520(H)X660(L)X580(W) mm Effective work area - 300x400x(150)mm XYZ rail material Hard chrome shaft	1

	XY rail diameter 20mm Z rail diameter 16mm XYZ axis torque - 57*78 250 OZ/IN (2.2N/CM) 4th and 5th - 57*56 4th and 5th transmission ratio -1:6 Repeat positioning accuracy - 0.01mm Working precision - 0.02mm Processing speed – 0…4000 mm/Min A-axis B-axis rotation speed - 0…180 rpm/min XY table maximum load - 50kg XY+A+B axis table maximum load - 15kg Switching Power Supply Integrated - 350W Spindle power - 1500W water-cooled frequency spindle Spindle converter - 1500W Input Voltage - 220V / 110V Output Current Drive - 4.5A (peak 5A) Drive motor - 57*78 stepper motors (two-phase 4 wire) Outside packing - 80*70*85 (cm) Warranty period – min. 2 years	
2	**Digital Oscilloscope** 50 MHz Digital Oscilloscope with 4 channels plus 12 Mpt memory and 1 GSa/sec sampling UltraVision: Deeper memory 12 Mpts upgradable to 24 Mpts via a software key Warranty period – min. 2 years	2
3	**Electrical digital multimeter** VAC Range - 0.1mV to1000V MAX. Accuracy - ±(1.0%+3) Frequency Response - 40Hz to 500Hz VDC Range - 0.1mV to1000V MAX. Accuracy - ±(0.5%+3) Ohms Range - O.1Ω to 40MΩ MAX. Accuracy - ±(0.5%+2 AAC Range O.1µA to10A MAX. Accuracy - ±(1.5%+3 Frequency Response - 40Hz to200Hz ADC Range - O.1µA to10A MAX. Accuracy - ±(1.5%+3) Capacitance Range - 0.01nF to100µF MAX. Accuracy - ±(2.0%+5) Others Dimension - 180mmx89mmx51.5mm (With Soft case) Weight up to430g Battery 2pcs AA " Warranty period – min. 2 years	9
4	**Voltage source** Kind of display used - 4x LED 3 digits Number of channels - 2 Output voltage - 0...30V DC Output current - 0...3A Output voltage 2 - 0...30V DC Output current 2 - 0...3A Output voltage resolution - 100mV	5

	Output current resolution - 10mA Voltage load regulation - ≤0,01% + 3mV Voltage (regulated) ripple and noise - ≤1mVrms Dimensions - 255 x 145 x 265mm Power supply - 110/120/220/230V, ±10%, 50/60Hz Kind of power supply - linear, multi-channel Protection - anti-overload, against reverse polarity Warranty period – min. 2 years	
5	**Multifunction I/O Device** 8 AI (14-Bit, 48 kS/s), 2 AO (150 Hz), 13 DIO USB Multifunction I/O Device It offers analog I/O, digital I/O, and a 32-bit counter. It provides basic functionality for applications such as simple data logging, portable measurements, and academic lab experiments. The device features a lightweight mechanical enclosure and is bus powered for easy portability. Can easily connect sensors and signals to Multifunction I/O Device the with screw-terminal connectivity. The included NI-DAQmx driver and configuration utility simplify configuration and measurements. Warranty period – min. 2 years	2
6	**Servomotors** Lead shine 2 phase Stepper, Length - 95mm Shaft 7.5mm Features: 2 phase Closed loop servomotor NEMA37 frame size. 2.. 4A phase current, 2. Suitable for various automation equipment, such as engraving machine, marking machine, cutting machine, CNC machine tool, etc. Current - 5A Holding torque - 2.3N.m Step angle -1.8° Wiring method: A+(Black), A-(Green), B+(Red), B-(Blue) Shaft diameter - 7.5mm Weight - up to 1000g Warranty period – min 1 year	10
7	**DC motors** Continuous Current(A) – 5…50A Commutation- Brush Model Number: 200W 300W 400W 500W Type-Tubular Motor Protect Feature-Drip-proof Output Power-200W…500W Construction-Permanent Magnet Torque-300mN.m, 400mN.m, 500mN.m, 550mN.m Usage - Home Appliance Efficiency, IE 3 Warranty period – min 1 year	5
8	**Soldering Machine with Reflow Oven Infrared IC Heater** Rated power - 800W; Effective Soldering max area - 7 x 9 inch Reflow soldering machine power supply - AC110V/ 50Hz; Cycle Time - 1～8 min; Rated Duty Cycle - 100% ; Certification: CE	1

	Warranty period – min 2 years	
9	**Hot air solder station** PID Programmable Temperature Control Technology Centigrade/Fahrenheit Programmable Total Power Consumption -1270 Watts Soldering Iron - 70 Watts Temperature Range - 200°C ~ 480°C Soldering Iron Temperature Stability: +-1.0°C Hot Air Gun - 500 Watts Temperature Range 100°C ~ 480°C with Auto Cool Down Safety Feature Preheating Station Circuit Board Bracket Size - Holds a circuit board up to 6.50" Wide Preheating Station Temperature Range - 50°C ~ 400°C Preheating Station Heating Bed Size - 4.75" x 4.75" Preheating Station Telescopic Adjustment Arm: Up to 7.00" AC 220V - 50Hz Warranty period – min 2 years	1
10	**Hot air solder station** Voltage - 230 V / 50 Hz Power - 1450 W Display - 4 x LED Working Temperature - 0 ~ 40 °C Storage Temperature -20 ~ 80 °C **Infrared Lamp** Voltage - 230 V / 50 Hz Power - 150 W Temperature Range - 50 – 350 °C max. Lighting Area - 30 x 30 mm Pre-Heating Plate Voltage - 230 V / 50 Hz Power - 600 W Temperature Range50 – 200 °C max. Heating Area130 x 130 mm Soldering Iron Voltage AC 26 V Power 75 W Temperature Range 200 – 480 °C Temperature Stability +/- 1°C Soldering Tip Impedance< 2 Ω Soldering Tip Voltage < 2 mV Hot Air Gun Voltage 230 V / 50 Hz Power 650 W Air Flow 120 L/min Temperature Range 100 – 480 °C Temperature Stability +/-1 °C Measurements Measurements (LxWxH) 29.00 x 36.00 x 33.00 cm Weight up to 7.20 kg Shipping Measurements (LxWxH) 46.00 x 35.00 x 31.00 cm Shipping Weight up to 9.70 kg Warranty period – 1 years	1
11	**Soldering Station** 80 W soldering station with soldering iron, storage and soldering tip chisel 1.6mm 100gr leaded solder wire Sn60Pb40 Top reactor TR01	2

	Soldering tip 0102PDLF04 pencil sharpener 0,4mm Soldering tip 0102PDLF10 pencil sharpener 1,0mm Soldering tip 0102CDLF24 chisel shaped 2,4mm 3x soldering tip mounting 3IT1040-00 or 3IT1045-00 Tweezers Assortment of 8 different shapes Warranty period – min 1 years	
12	**Solder vacuum** Dimensions - 8.1 x 3.4 x 0.7 inches Weight – up to 55 g Cylinder Capacity - 9cc	1
13	**Desktop magnifier with backlight** Magnification - 5 dpt (x2.25) Lens dimensions -120mm Lamp dimensions - 230 x 200mm Power supply - 230VAC 50Hz Arm length - 900mm Kind of fluorescent lamp - 22W / T5 Warranty period – min 1 year	1
14	**Solder** Solder Spool - 1/4 lb SAC305 RoHS lead-free / 0.031" rosin-core - 0.25 lb / 100 g Sn 96.5%, Ag %3.0, Cu %0.5 (96.5/3/0.5).	1
15	**Solder paste** Maker Paste Lead-Free Prototyping Solder Paste Bi57 42Sn Ag1 ~10 grams Liquidus at 140 °C	1
16	**Multi-Colored Heat Shrink Pack** Pack - 3/32" + 1/8" + 3/16" Diameters 2:1 shrink ratio High-grade flexible polyolefin material UL approved Each strip is 6" long.	1
17	**Silicone Rework Mat** Insulated Silicone Rework Mat - 34cm x 23cm x 4mm Work Surface	1
18	**Replacement Tubes** Replacement Tubes for Professional Silicone-Tip Solder Sucker - SS-02	1
19	**SMD Component Testing Tweezers** Max Dimensions - 32mm x 175mm x 20mm Weight: up to 55g Multimeter specifications: Auto Scanning (detects component type), Auto ranging & Manual ranging 3000 Display Count Resistance Range- 300Ω/3K/30K/300KΩ/3MΩ/30MΩ Resolution- 0.1Ω Accuracy: - ± 1.0% Capacitance Range-3nF/30nF/300nF/3µF/30µF/300µF/3mF/30mF Best Resolution-1pF Accuracy- ± 3% Continuity Buzzer sounds when - < 50Ω Auto off, low battery indication Powered by single battery Warranty period – min. 1 year	1
20	**Chip Quik Tack Flux**	1

	Flux Type - Synthetic No-Clean (for Leaded and Lead-Free applications) Flux Classification - REL0 Packaging - 10cc/10g Syringe Shelf Life - Refrigerated >24 months, Unrefrigerated >24 months	
21	**Sponge Solder Tip Cleaner** Diameter 70×71mm	1
22	**Antistatic mat** Protective bench kit - L:600mm; W:400mm; D:2mm; Variant: ESD;	2
LOT 3	**MECHATRONICS ARDUINO KITS, PNEUMATIC TRAINING KIT, SENSORS, COMMUNICATION TOOLS**	
1	**Arduino Starter Kit Classroom Pack** 1 Projects Book (170 pages), 1 Arduino Uno, 1 USB cable, 1 Breadboard 400 points, 70 Solid core jumper wires, 1 Easy-to-assemble wooden base, 1 9v battery snap, 1 Stranded jumper wires (black), 1 Stranded jumper wires (red), 6 Phototransistor, 3 Potentiometer 10kOhms, 10Pushbuttons, 1 Temperature sensor [TMP36], 1 Tilt sensor, 1 alphanumeric LCD (16x2 characters), 1 LED (bright white), 1 LED (RGB), 8 LEDs (red), 8 LEDs (green), 8 LEDs (yellow), 3 LEDs (blue), 1 Small DC motor 6/9V, 1 Small servo motor, 1 Piezo capsule [PKM17EPP-4001-B0], 1 H-bridge motor driver [L293D], 1 Optocouplers [4N35], 2 Mosfet transistors [IRF520], 5 Capacitors 100uF, 5 Diodes [1N4007], 3 Transparent gels (red, green, blue), 1 Male pins strip (40x1), 20 Resistors 220 Ohms, 5 Resistors 560 Ohms, 5 Resistors 1 kOhms, 5 Resistors 4.7 kOhms, 20 Resistors 10 kOhms, 5 Resistors 1 MOhms, 5 Resistors 10 MOhms	2
2	**Arduino Engineering Kit** Arduino Nano 33 IoT Nano Motor Carrier with IMU and battery charger Three sets of mechanical pieces to assemble the projects Li Ion 18650 battery Two geared motors with encoders DC motor with encoders Servo motor USB cable Two whiteboard markers Two wheels Allen key Webcam Nylon thread Screws, nuts, and bolts A hard plastic, stackable toolbox ideal for storage and years of use A one-year individual license for MATLAB and Simulink Specific online content for educators.	2
3	**The Most Complete MEGA2560 Project Starter Kit**	5

	25pcs LED (white, yellow, blue, red, green) 1pcs RGB LED 10pcs Ceramic Capacitor(22pf & 104pf) 2pcs Photoresistor 1pcs Thermistor 5pcs Diode Rectifier (1N4007) 4pcs Electrolytic Capacitor (10UF 50V & 100UF 50V) 10pcs NPN Transistor (PN2222 & S8050) 1pcs Tilt Switch 5pcs Button (small) 1pcs 1 digit 7-segment Display 1pcs 4 digit 7-segment Display 1pcs Sound Sensor Module 1pcs LCD1602 Blue Backlight with Soldering 1pcs IC L293D 1pcs IC 74HC595 1pcs Active Buzzer 1pcs Passive Buzzer 1pcs RTC Module 1pcs DHT11 Temperature and Humidity Module 2pcs Potentiometer 1pcs Rotary Encoder Module 1pcs Joystick Module 1pcs Keypad Module 1pcs 5V Relay 1pcs IR Receiver Module 1pcs MEGA2560 Controller Board 1pcs Breadboard 1pcs Servo Motor (SG90) 1pcs Stepper Motor 1pcs ULN2003 Stepper Motor Driver Board 1pcs Prototype Expansion 1pcs Power Supply Module WARNING: Pls. do not use the voltage higher than 9V 1pcs HC-SR501 PIR Motion Sensor 1pcs Ultrasonic Sensor 1pcs GY-521 Module (with pin header) 1pcs 3V Servo Motor 1pcs MAX7219 Module 1pcs Remote 1pcs 9V 1A Power Supply 1pcs 65 Jumper Wire 1pcs Water Lever Sensor 1pcs USB Cable 1pcs 9V Battery with DC 1pcs RC522 RFID Module 120pcs Resistor (10R/100R/220R/330R/1K/2K/5K1/10K/100K/1M) 20pcs Female-to-male Dupont Wire	
4	**37pcs Sensor Starters Kit For Arduino** Tutorial CD PS2 Game Joystick Module Infrared Receiver Module Laser Sensor Module DHT11 Temperature and Humidity Sensor Module Infrared Transmit Sensor Module 1 Channel 5v Relay Module IR Obstacle Avoidance Sensor Module Touch Sensor Module	5

	Sound Sensor Module DIP 3 Color LED Module Flame Sensor Module SMD 3 color LED Module Linear Magnetic Hall Sensor Blue Rotary Encoder Module Digital Temperature Sensor Module Active Buzzer Module Passive Buzzer Module Broken Light Module Digital Temperature Sensor Module Broken Light Module DS18B20 Temperature Sensor Module 5mm Two-Color LED Module Tilt Switch Module 7 Color Flashing LED module Photosensitive Resistance module Vibration switch module The Knock sensor module TCRT5000 Tracking Module Tachile Switch Module HC-SR04 Ultrasonic Sensor 4 Pin GY-521 MPU6050 with Soldering HC-SR501 PIR Motion Sensor Green LCD1602 Blue Backlight with Soldering DS3231 AT24C32 IIC Module without battery MB102 Breadboard Power Supply Module 3.3V 5V 4*4 Membrane Switch Matrix Keypad Rain Water Level Detection Sensor	
5	**Basic pneumatics training set (basic level)** 3/2-Way-Panel mounted with Pushbutton Actuator, normally closed 3/2-Way- Panel mounted Valve with Pushbutton Actuator, normally open 5/2-Way Panel Mounted Valve with Selector Switch 3/2-way valve with selector switch, normally closed 3/2-way roller lever valve, normally closed Proximity sensor, pneumatic, with cylinder attachment Pneumatic timer, normally closed Pressure sequence valve 3/2-way valve, pneumatically actuated on one side 5/2-way pneumatic valve, pneumatically actuated, one side 5/2-way double pilot valve, pneumatically actuated on both sides Shuttle valve Dual-pressure valve Quick-exhaust valve One-way flow control valve Single-acting cylinder Double-acting cylinder Start-up valve with filter control valve Pressure regulator valve with pressure gauge Pressure gauge Manifold Plastic tubing Warranty – min. 2 years	1
6	**Mechatronics Kit - "FTC Starter Kit"** **Structure**	2

Name	Qty.
15mm Plastic Motion Bracket	16
15mm Plastic Rod End Bracket	8
15mm Plastic 90 Degree Bracket	32
15mm Plastic 60 Degree Bracket	8
15mm Plastic 45 Degree Bracket	8
15mm Plastic 30 Degree Bracket	8
15mm Plastic 120 Degree Bracket	6
15mm Plastic Indexable Motion Bracket	4
15mm Gearbox Motion Bracket	4
15mm Plastic Variable Angle Bracket	4
15mm Plastic Servo Bracket	2
15mm Plastic Inside Corner Bracket	32
15mm Plastic Lap Corner Bracket	16
15mm Extrusion, 150mm - 45° Ends	4
15mm Extrusion, 225mm - 90° Ends	8
15mm Extrusion, 420mm - 90° Ends	16
15mm Metal Bent Core Hex Motor Bracket V2	4
15mm Metal Bent Servo Bracket V2	4
450mm x 300mm x 4mm Corrugated Plastic Sheet	2
15mm Metal 90 Degree Bracket V2	16
M3 Standoff, 40mm	8
Ultraplanetary Outside Mounting Bracket	4
Ultraplanetary Bent Mounting Bracket	4
U Channel Endcap	4
45mm x 15mm C Channel, 408mm	4
45mm x 15mm C Channel, 248mm	2
Hardware and Tools	
5.5mm Nut Driver	1
M3 x 35mm Hex Cap Screws	50
Zipties, Black, 160mm	50
Surgical Tubing, 3mm	1
M3 x 8mm Hex Cap Screws	200
M3 x 16mm Hex Cap Screws	100
M3 Nyloc Nuts	300
5.5mm Combination Wrench	1
#25 Chain Tool	1
M3 x 8mm T-Slot Screws	50
Allen Wrench Kit	1
Transmitting and Transforming Motion	
High Strength Hex Hub	8
15mm Hex Pillow Block	4
Servo Shaft Adapter	4
15 Tooth Gear	8
30 Tooth Gear	4

	125 Tooth Gear	2	
	45 Tooth Gear	4	
	60 Tooth Gear	8	
	72 Tooth Gear	4	
	90 Tooth Gear	6	
	10 Tooth #25 Sprocket	8	
	15 Tooth #25 Sprocket	4	
	20 Tooth #25 Sprocket	4	
	40 Tooth #25 Sprocket	2	
	5mm X 75mm Hex Shaft	12	
	5mm X 90mm Hex Shaft	8	
	5mm X 135mm Hex Shaft	4	
	5mm X 400mm Hex Shaft	4	
	#25 Roller Chain, 10 Ft	1	
	#25 Master Links	5	
	Tensioning Bushing, 39mm	8	
	Servo Gear Adapter	4	
	Supporting Motion		
	15mm Bearing Pillow Block	32	
	End Cap Bearing	32	
	Through Bore Bearing, Short	24	
	Through Bore Bearing, Long	24	
	Motion Pattern Spacer	8	
	Constraining Motion		
	15mm Spacer	24	
	3mm Spacer	48	
	1.5mm Spacers	28	
	Shaft Collars	40	
	Control System		
	Battery Charger	1	
	36" PWM Cable	4	
	12V Slim Battery	1	
	Battery Holder Plate	2	
	Drivetrain Types		
	90mm Omni Wheel	2	
	90mm Grip Wheel	4	
	30mm Traction Wheel	4	
	90mm Traction Wheel	2	
	Actuators		
	Core Hex Motor	2	
	Ultraplanetary Gearbox Kit & HD Hex Motor	2	
	SRS Programmer	1	
	Smart Robot Servo	4	
	Aluminum Double Servo Arm	2	
	Aluminum Servo Horn	2	
	Packaging		
	Plastic Storage Bin	1	
	FTC Starter Kit Guide	1	

7	**Mechatronics Kit "FIRST Global-Specific Components"** **Description** — **QTY** **Bearings and High Strength Hex Hubs** Through Bore Bearing - Long - 12 Pack — 2 15mm Bearing Pillow Block - 8 Pack — 1 15mm Hex Pillow Block - 4 Pack — 1 High Strength Hex Hub - 2 Pack — 2 15mm Metal 12mm Ball Bearing Mount V2 - 4 Pack — 2 8mm x 12mm x 3.5mm Flanged Bearing - 10 Pack — 1 5mm Hex Bearing Block — 4 5mm Hex to 8mm Round Bearing Insert - 20 Pack — 1 Small Pulley Bearings - 10 Pack — 2 **Belt and Pulley** 90mm Pulley - 2 Pack — 1 60mm Pulley - 4 Pack — 2 30mm Pulley - 4 Pack — 1 Barb for Polyurethane Hollow Belt - 8 Pack — 1 Polyurethane Round Belt, 6mm, 6ft — 2 **Electronics** Control Hub — 1 REV Robotics Expansion Hub — 1 Driver Hub — 1 12V Slim Battery — 1 Etpark Wired Controller for PS4 — 2 JST VH 2-pin Motor Cable, 100cm - 4 Pack — 1 JST PH 3-pin Communication Cable, 50cm - 2 Pack — 1 JST VH 2-pin Motor Cable, 50cm - 4 Pack — 1 JST VH 2-pin Motor Cable, 30cm - 4 Pack — 1 JST PH 4-pin Sensor Cable, 100cm - 4 Pack — 1 JST PH 4-pin Sensor Cable, 50cm - 4 Pack — 1 JST PH 4-pin Sensor Cable, 30cm - 4 Pack — 1 XT30 Extension Cable, 50cm - 2 Pack — 1 XT30 Extension Cable, 30cm - 2 Pack — 1 JST PH 4-pin Joiner Board - 4 Pack — 1 Switch Cable and Bracket — 1 36" PWM Cable - 4 Pack — 1 **Extrusion** 15mm Extrusion - 420mm - 90° Ends - 4 Pack — 4 15mm Extrusion - 150mm - 45° Ends - 2 Pack — 4 45mm x 15mm C Channel - 248mm — 2 45mm x 15mm C Channel - 408mm — 2 **Gears** 90 Tooth Plastic Gear - 2 Pack — 1 72 Tooth Plastic Gear - 4 Pack — 1	2

	45 Tooth Plastic Gear - 4 Pack	1	
	125 Tooth Plastic Gear - 2 Pack	1	
	30 Tooth Plastic Gear - 4 Pack	1	
	22 Tooth Plastic Right Angle Rack Gear - 8 Pack	2	
	Hardware		
	M3 X 8MM T-Slot Screw - 25 Pack	2	
	M3 Nyloc Nuts - 100 Pack	3	
	M3 x 8mm Hex Cap Screws - 100 Pack	2	
	Miscellaneous		
	Hook and Loop Fastener, 13.5mm x 2m	2	
	Grasper, Claw Assembly	1	
	Storage Tote - Orange	1	
	Surgical Tubing, 3mm	5	
	1.2mm UHMWPE Cord - 10M	2	
	Zip Ties, Black, 160mm - 50 Pack	3	
	15mm Extrusion Slot Cover - 2m, RED	1	
	15mm Gearbox Motion Bracket - 4 Pack	1	
	15mm Plastic Motion Bracket - 8 Pack	2	
	UltraPlanetary Gearbox Kit & HD Hex Motor	3	
	Core Hex Motor	3	
	UltraPlanetary Long Reach Mounting Bracket - 2 Pack	1	
	UltraPlanetary Flat Mounting Bracket - 4 Pack	1	
	UltraPlanetary Hardware Pack	1	
	Color Sensor V3	2	
	2m Distance Sensor	1	
	Magnetic Limit Switch	2	
	Touch Sensor	2	
	Servo Shaft Adapter - 4 Pack	2	
	15mm Plastic Servo Bracket - 2 Pack	2	
	Aluminum Servo Horn V2	2	
	Replacement Gear Set for Smart Robot Servo	2	
	Smart Robot Servo	2	
	Servo Gear Adapter - 4 Pack	1	
	15mm Metal Offset Servo Bracket V2 - 4 Pack	1	
	5mm x 400mm Hex Shaft - 4 Pack	1	
	5mm x 135mm Hex Shaft - 4 Pack	3	
	5mm x 90mm Hex Shaft - 4 Pack	2	
	Shaft Collars - 10 Pack	1	
	15mm Linear Motion Kit V2	4	
	15mm Hinge Kit	2	
	#25 Master Links - 5 Pack	1	
	#25 Roller Chain - 10 ft	1	
	26 Tooth #25 Sprocket - 4 Pack	2	
	54 Tooth #25 Sprocket - 2 Pack	1	
	20 Tooth #25 Sprocket - 4 Pack	1	
	15 Tooth #25 Sprocket - 4 Pack	1	

8	**LoRa RAK Developer Kit 7** Based on Semtech SX1301 Supports 8 channels LoRaWAN® Stack 1.0.2 Rx Sensitivity down to -139 dBm (@293bps) Tx Power up to 23 dBm Full band support: 433MHz, 470MHz, 865MHz, 868MHz, 915MHz, 920MHz, 923MHz Range up to 15km Line of Sight, 2km+ in Dense Urban	3
9	**Antena 8dBi Fiberglass Antenna** Bundle 3 Frequency 868MHz Gain 8.0 dBi (±1dBi) VSWR ≤1.5 Beamwidth 360 degrees Impedance 50 Ohms Polarization Vertical Radome Body Fiberglass Connector Type N-Type Male Antenna Dimensions 1300 ± 15mm Operation Temperature -30°C~65°C Storage Temperatures -30°C~75°C	2
10	**WisBlock Base Board** Easy Plug'n'Play slots for WisBlock Core MCU, WisBlock Sensor, and WisBlock Interface, WisBlock Wireless, WisBlock Display, WisBlock Extra, WisBlock Storage and WisBlock Power modules Small form factor Supports 3 different power supply sources Optimized for low power consumption applications I2C, UART, GPIO's an analog input accessible with solder contacts 2 user-definable LED's Reset button USB debug port 1 slot for WisBlock Core MCU 4 slots for WisBlock Sensor sensor modules 1 slot for another WisBlock categories extension modules	5
11	**WisBlock LPWAN Module** Frequency 868MHz LoRaWan® 1.0.2 protocol stack (supports Class A & C) Bluetooth Low Energy 5.0 protocol stack Nordic nRF52840: Ultra-low-power MCU 32-bit ARM® Cortex-M4F CPU 64MHz CPU clock 1 MB Flash, 256 KB RAM Wide range of connections: I2C, SPI, Analog inputs, Digital inputs and outputs Semtech SX1262: Low power high range LoRa® transceiver	5
12	**WisBlock Temperature and Humidity Sensor** Using the Sensirion SHTC3 temperature & humidity sensor Low power consumption Small form factor ±2.0 °C temperature accuracy -40 to +125 °C temperature range	5

	±2.0 % RH humidity accuracy 0 to 100% humidity range	
13	**WisBlock Environmental Sensor** Using the Bosch BME680 environment sensor Low power consumption Small form factor Temperature range: -40°C to +85°C Humidity range: 0% to 100% Pressure range: 300 to1100 hPa Gas sensor response time < 1s Gas sensor direct output of IAQ: Index for Air Quality	5
14	**WisBlock Ambient Light Sensor** Using the TI OPT3001DNPR light sensor Low power consumption Small form factor Measurement range from 0.01 lux to 83865 lux Optical filtering to match the human eye Low power consumption of 1.8uA	5
15	**WisBlock Infrared Temperature Sensor Module** 2C interface Object temperatures between -20 °C and 100 °C Accuracy ±0.2° C within the narrow object temperature range from 35˚C to 42 ˚C (medical applications) Factory calibrated 50 ° field of view -20 °C to 85 °C operational temperature range Refresh rate configurable between 0.5 Hz to 64 Hz Sleep current: < 2.5 µA Module size: 10 x 10mm	5
16	**WisBlock Rain Sensor** 3.3V input voltage, on/off control by the WisBlock Core module Comes with a rain sensor that can be deployed distanced from the WisBlock module	5
17	**WisBlock SD Card Module** 3.3V input voltage Micro SD card socket 4-lines SPI interface SD card insertion/removal detection Module size: 25X35mm	5
18	**RAKBox-B2 Enclosure with solar panel** Dimensions W x L x H: 95mm x 65mm x 58mm Weight: up to 215g) Material thickness: 3mm Pole and wall-mounting: 60~75mm pole diameter Logo customization possibility Support opening as required.	5
19	**RAKDAP1** Debug Tool USB interface to the computer MSC - drag-n-drop programming flash memory CDC - virtual com port for log, trace, and terminal emulation HID - CMSIS-DAP compliant debug channel WEBUSB HID - CMSIS-DAP compliant debug channel SEO	5
20	**RAK811** Frequency: EU868 Based on Semtech SX1276 Full LoRaWAN 1.0.2 stack support	20

	Output power: 5 to 20dBm adjustable High sensitivity: down to -148dBm Easy to use AT Command Set via UART interface with configurable baud rate. Theoretical max range of 2km in Urban and 15km in open areas Operating temperature: -30°C ~ 85°C (industrial grade) Storage temperature: -40°C ~ 85°C (non-condensing)	
LOT 4	**FARMING BOT MACHINES**	
21	**FarmBot Express XL** Max serviceable area -~2.3m x ~5.7m Max plant height - ~0.5m Machine width - Up to 2.4m Machine length - Up to 6m Machine height - 0.5 to 1.5m Hardware version -v1.1 Warranty period – 3 years	2

*The equipment shall be assembled safely and well packed, ready to use, or provided components and accessories to be assembled by the Beneficiary.
A Brochure and Instructions Manual/User Guide shall be included for each item (EN and RO/RU).

Other Requirements:

Delivery Lead Time (up to 45 calendar days)
Delivery - DAP Chisinau (including the services of a local brokerage company) - preferable.
Warrantee and After-sales Requirements

a) Warranty – as required per each item (If warranty requirement is not specified, a standard min 1-year warranty shall be offered);
b) Brand new replacement of items if the items are beyond repair (under warrantee period)
c) Availability of Service Center in Moldova (or in close proximity to Moldova). *Mandatory information on the Service Center Company name, address, contact person, e-mail, phone* number).
d) Technical support

Validity of Quotation - 60 calendar days from tender deadline.

ANNEX 1

AgTech Vertical CONCEPT

AgTech Lab – Ag. Mechatronics & Drones

at State Agrarian University of Moldova (SAUM) and Technical University of Moldova (TUM)

Background

With global population growth, the demand for food is expected to rise 70 percent by 2020. Current productivity improvements are not sufficient to meet this demand. Furthermore, agriculture faces the uncertainty posed by climate change and finite land, water, and other key resources. Moldova is also facing the impact of climate change with each year presenting a new challenge – such as severe drought in 2020, and higher-than-average precipitation and lower-than-average temperatures in 2021. Land degradation, namely soil erosion, and worsening seasonal labor shortages, are additional problems facing Moldovan agriculture.

Given that we must produce more food in the next forty years than during the entire course of human history to date, and must do so on a planet showing signs of severe environmental stress, innovations in agricultural technologies (AgTech) will be absolutely essential. Innovations are needed across the value chain – from inputs and production, to transport, processing, distributions, storage, marketing, and waste disposal.

AgTech is helping to transform agriculture, dramatically increasing the productivity of the agriculture system while reducing the environmental and social costs of current agricultural production practices. The use of technological innovations in the areas of Robotics, Data Collection and Analysis, Earth Observation and Areal Mapping the agriculture industry, Is helping to address mounting challenges stemming from limited access to land and water, as well as climate change.

As such, Tekwill has partnered with USAID/HVAA project to support the integration of technology and agriculture. The combined efforts have already resulted in increased awareness of AgTech through the organization of the AgTech Academy and AgTech Conference. In addition, support has been directed towards the development of tools like BeeProtect that could help protect bees from pesticide poisoning helping both beekeepers and farmers (as farmers need bees for pollination).
More sustained attention, significant investment, and AgTech-specific education and entrepreneur support systems to help spur innovation, are needed. Currently, however, agricultural students and young professionals are not familiar with digital and engineering tools. At the same time, IT and engineering students and young professionals are not familiar with agriculture. As such, there is little adoption, let alone innovation, of new technologies. To facilitate closer and sustained integration of Tech into non-Tech, a partnership with the State Agrarian University (SAUM), North Carolina State University (NC State), and other stakeholders is needed.

This could be achieved with the creation of an AgTech Lab, focusing on mechatronics, at the Multifactional Mechanical Center at the SAUM; while integrating ongoing facilities, activities and initiatives such as the Irrigation Laboratory at the SAUM, MicroLab, NGA Infoconsulting (GPS systems for orchard design), Agrobiznes.md to name a few. In addition, AgTech Lab will involve collaboration and support of Department of Biological and Agricultural Engineering, the Spatial Information Research Laboratory, Data Analytics and Integrated Modeling Lab, Precision Agriculture and Machine Systems, and Controlled Environments at North Caroline State University (NCSU).

Purpose

The purpose of the project is to stimulate the infusion of digital and engineering elements into agricultural production through educational, research and development activities in AgTech among university and college students with an agriculture, engineering and IT background.

Objectives:

- Catalyze interdisciplinary research to identify issues and challenges facing the agricultural sector in Moldova and propose innovative solutions to address them.
- Create innovative partnerships among Agricultural and Technical universities of Moldova and industries in the country and abroad.
- Promote the integration of research, teaching and outreach in AgTech programs internationally.

Activities:

The activities will be implemented in several major directions:

1. Training and research programs for undergraduate students, MSc and doctoral students, including potentially internships at the NCSU;
2. Retraining and continuing education for personnel of agricultural companies and providing specialized courses, including through joint workshops and training programs implemented in collaboration with the NCSU;
3. Disseminating the use of modern IoT and drone technologies in agriculture of Moldova;
4. Income generation activities as result of implementing services such as: small scale production of components in partnership with the industries, prototype testing, ensuring technical control of installations, maintenance of mechatronic systems for operation in accordance with specifications and regulations, estimation of material quantities and costs of any project, training of personnel of ag. companies etc.

The activities that will be implemented in the lab will intend to integrate both components: Mechatronics and Drones. Both institutions will sign and Partnership agreement containing a detailed action plan for 3 years period and will be a precondition for receiving the support for infrastructure development at their sites.

Infrastructure and Human Resource:
The indoor Multifunctional Mechanical Center at SAUM is currently being refurbished with funds from Livada Moldovei. The Center covers an area of 700 m_2 + at the ground floor of the Department of Agricultural Engineering at SAUM. Besides this, SAUM has agriculture production demo plots: multiannual plantations (orchards, grapes), dairy farm, irrigated field, greenhouse, large outdoor terrain for practicing UAV piloting.
SAUM also has necessary human resources to implement such a project, taking into account that, several faculties have been involved in an earlier eDrone Project financed by Erasmus +, and having international certificates for Drone operations and training of operators. As a result of eDrone implementation, SAUM is part of a specialized international network of universities, Drones centers from EU and CIS.

Proposal:

As total area of the multifunctional Center located at State Agricultural University of Moldova is 700 m_2+, it could house a smaller (200 m_2) AgTech Laboratory, which can be dedicated to Drone systems in Agriculture. As Drones component, the Lab may be equipped with safety cage for flights, Control Workstation with radio telemetry module, set of drones for different purpose, Ultra-wideband time-of-flight system, optical tracking

system, laser tracking system, gimbal camera, LiPoly Battery Charger, Flight Simulator, safety and components assembling tools.

The Mechatronics component of the laboratory will be located at Technical University of Moldova. It will be equipped with: electrical sources, programmable software and testing platforms, mini-teaching robots (fambots-CNC farming machines), Multifunction I/O Devices, Arduino kits and platforms, PC and Notebooks, general and specialized software, 3D printers, VR googles and gloves, electro pneumatic testing kits, auto steering kits. [pls describe the proposed venue]

In case it is necessary to use specialized manufacturing machines for manufacture different spare parts and components, the Lab may also rent the FabLab Infrastructure, which is located adjacent to Tekwill. Similarly, for specialized expertise and technical assistance, the Lab may involve consultants from Tekwill, FabLab.
In this respect, it is intended that the Lab infrastructure and available equipment and tools will allow students to use and produce computer-controlled products which will ultimately lead to the development of numerically controlled technological systems. The lab can also help the students to perform technical tasks of installation, operating, maintenance, and repair of mechatronic systems.

Potential Partners:

MicroLab. This NGO, already collaborating with USAID/HVAA in order to establish an AgTech Academy. In frame of the project a group of mixed agricultural and technical students will be formed to provide diverse IoT solutions for agriculture production.

*Centre for Development of Industrial Drone systems (*https://cds-idf.fr/en/cdsi). The company is based in France and is representing one of the most known Drones producers of Drones for all the industries, including agriculture. Recently the company designed an specialized drone for agriculture sector with a 25 kg load. First collaboration with SAUM accrued as part of an eDrone project, hosting an internship of a faculty from SAUM. SAUM already has the company confirmation to collaborate within part of the eventual project.

Elit Agrotehnologie ltd and Vadalex Agro ltd. These companies are already providing UAV services in agriculture and autonomous driving systems that supports different types of vehicles, including tractors, sprayers, and harvesters driven autonomously. Also, they have been in close collaboration with SAUM.

Studioul Sistemelor Agricole (SAS). The company is one of the leaders in integrating intelligent platforms in agriculture production of Moldova, such as CROPIO for farm management.

Agribiznes portal. Is an agrobusiness information portal that are disseminating the information about modern technologies in agriculture. It will serve as communication partner in this project.

North Carolina State University (NCSU). The Department of Biological and Agricultural Engineering (BAE) at NC State, ranked consistently in the top 10 of programs in the United State of America. NCSU's high-impact research analyzes biological and agricultural systems for the sustainable management and preservation of our natural resources. Biological and agricultural engineers find ways to preserve and protect our natural environment while sustaining food and fiber production, clean water and air, and sustainable energy production and management. Research Specialties:

- Bioprocess Engineering
- Controlled Environments for Agriculture
- Data Analytics and Integrated Modeling
- Ecological Engineering
- Environmental Engineering
- Precision Agriculture and Machine Systems
- Sustainable Waste Management.