

**ERASMUS +**

**HIGHER EDUCATION CAPACITY BUILDING**

**Erasmus+ Project**

**New curricula in Precision Agriculture using GIS technologies and sensing data**

**(CUPAGIS)**

**Invitation to Tender for Equipment Procurement**

**#CUPAGIS/12.10/2020**

Prepared by:

EXOLAUNCH GmbH

Address: Reuchlin Str. 10, 10553 Berlin, Germany

Email: info@ecm-academy.de

Website:
<https://ecm-academy.de/index.php/en/>

Dear Sir/Madam,

We kindly invite you to submit your **tender for the supply of Equipment to the project partner universities in Algeria** (see the technical specifications provided in the Part-III of this document) within the framework of the Project “*New curricula in Precision Agriculture using GIS technologies and sensing data*”- (*CUPAGIS)*, co-funded by the **ERASMUS+ Programme of the European Union**.

When preparing your tender, please be guided by this invitation to tender.

**Please note** that in the tender procedure may also participate commercial offers for some of the items presented in the technical specifications of equipment required provided in the Part-III of this document.Partial delivery of equipment is possible.

The tenderer must complete all annexes and provide all information. Only completed annexes will be accepted for consideration.

Tenders should be submitted in English **by email to** info@ecm-academy.denot later than **Monday, November 9, 2020 at 17:00 (Berlin local time)**.

We kindly ask you to be ensure that the tender is signed, stamped and in the **PDF** format. An acknowledgement of receipt will be sent to you accordingly.

*In all cases, please add the below reference:* ***#CUPAGIS/12.10/2020 “Invitation to Tender for Equipment Procurement (Algeria)”.***

*For any additional information, please, contact us* ***only*** *by email.*

Sincerely yours,

EXOLAUNCH GmbH

**Contents**

[Annex 1: Company Information Sheet 4](#_Toc53351025)

[Annex 2: Equipment Description 5](#_Toc53351026)

[Annex 3: Commercial Offer 16](#_Toc53351027)

# **Annex 1: Company Information Sheet**

#CUPAGIS/12.10/2020 “Invitation to Tender for Equipment Procurement (Algeria)”

*Please, fill in all fields.*

|  |
| --- |
| **Bidderʼs Information** |
|  | **Company legal name**  |  |
|  | **Company legal address**  |  |
|  | **Company website** |  |
|  | **Company e-mail** |  |
|  | **Company authorized representative**(name, address, telephone number(s), fax number(s) and e-mail address) |  |
|  | **Attached are copies of the following documents:*** A photocopy of the trade name registration papers
 |

#

# **Annex 2: Equipment Description**

#CUPAGIS/12.10/2020 “Invitation to Tender for Equipment Procurement (Algeria)”

*Please, fill in all fields.*

|  |
| --- |
| **The table of equipment required** |
| **#** | **Required Technical Specifications and Standards** | **Quantity** |
| ***#PAGIS 1*** | ***DJI Phantom 4 Multispectral drone*** |  ***1 pc*** |
| **1** | **Diagonal distance (propeller excluded):** 350 mm |  |
| **2** | **Max. Altitude above sea level:** 6,000 m |  |
| **3** | **Max. Rate of climb:** 6 m / s (automatic flights); 5 m / s (manual control) |  |
| **4** | **Max. Rate of descent:** 3 m / s |  |
| **5** | **Max. Airspeed:** 50 km / h (mode "P"); 58 km / h (mode "A") |  |
| **6** | **Operating temperature:** 0 ° C to 40 ° C |  |
| **7** | **Radiated Power (EIRP):** 2.4 GHz: <20 dBm (CE / MIC / KCC) 5.8 GHz: <26 dBm (FCC / SRRC / NCC) |  |
| **8** | **Hover accuracy:**RTK is enabled and working properly:* Vertical: ± 0.1 m; Horizontal: ± 0.1 m

RTK is deactivated:* Vertical: ± 0.1 m (with active visual positioning); ± 0.5 m (with GNSS positioning)
* Horizontal: ± 0.3 m (with active visual positioning); ± 1.5 m (with GNSS positioning)
 |   |
| **9** | **Highly sensitive single frequency GNSS** |  |
| **10** | **High-precision multi-frequency multi-system RTK GNSS:*** Frequencies used
* GPS: L1 / L2; GLONASS: L1 / L2; BeiDou: B1 / B2; Galileo [2] : E1 / E5
* First fixed time: <50 s
* Positioning accuracy: Vertical 1.5 cm + 1 ppm (RMS); Horizontal 1 cm + 1 ppm (RMS).
* 1 ppm indicates an error with an increase of 1 mm over 1 km.
* Speed ​​accuracy: 0.03 m / s
 |  |
| **11** | **Ground resolution (GSD):**(H / 18.9) cm / pixel, H stands for the altitude in relation to the mapped area (unit: m) |  |
| **12** | **Controllable area:** Tilt: -90 ° to + 30 ° |  |
| **13** | **Speed ​​range:** ≤ 50 km / h at 2 m above the ground with adequate lighting |  |
| **14** | **Altitude range:** 0 m to 10 m |  |
| **15** | **Operating area:** 0 m to 10 m |  |
| **16** | **Range of obstacle detection:** 0.7 m to 30 m |  |
| **17** | **Camera Sensors:** Six 1 / 2.9-inch CMOSs, including an RGB sensor for imaging visible light and five monochrome sensors for multispectral imaging. Per sensor: Effective pixels 2.08 MP (2.12 MP total) |  |
| **18** | **Camera Lenses:** Field of view (FOV): 62.7 ° Focal length: 5.74 mm (35 mm format equivalent: 40 mm) Auto focus set to ∞ Aperture: f / 2.2 |  |
| **19** | **Maximum image size:** 1600 × 1300 (4: 3.25) |  |
| **20** | **Photo format:** JPEG (visible light recording) + TIFF (multispectral recording) |  |
| **21** | **Supported SD memory cards:** microSD with min. Write speed of 15 MB / s. Max. Storage capacity: 128 GB. Speed ​​class 10 or UHS-I specification required |  |
| **22** | **Remote control****Operating frequencies:**2.400 GHz to 2.4835 GHz (Europe, Japan, Korea) 5.725 GHz to 5.850 GHz (other countries / regions)**Radiated Power (EIRP):**2.4 GHz: <20 dBm (CE / MIC / KCC) 5.8 GHz: <26 dBm (FCC / SRRC / NCC)**Max. Transmission range:**FCC / NCC: 7 km; CE / MIC / KCC / SRRC: 5 km (without obstacles and interference)**Integrated battery:**6,000 mAh LiPo 2S**Operating current / operating voltage:**1.2 A at 7.4 V.**Mobile device holder:**Tablet PCs and Smartphones**Operating temperature:**0 ° C to 40 ° C |  |
| **23** | **AC power adapter** |  |
|  |
| ***#PAGIS 2*** | ***PAL 1 A – Wireless solar panel and battery powered data logger*** |  ***1 pc*** |
| **1** | Durable and flexible data logger for all climatic conditions, powered by rechargeable batteries and a solar panel. The logger is equipped with: * rain gauge
* global radiation sensor
* combined air temperature and relative humidity sensor

wind speed sensor  |  |
| **2** | **Sensors layout:** **5 digital inputs:** automatic sensor recognition, supporting sensor chains (max. 600 sensors) |  |
| **3** | Extension connector: Radio access point or Sentek Drill & Drop or ultrasonic wind sensor or two extra chain connectors – Pessl Instruments bus cable nodes |  |
| **4** | **Memory:** 8 MB flash memory |  |
| **5** | **Internet connectivity:** GPRS, HDSPA, UMTS, WiFi, LTE class 1, LTE class M (Q2/2020) |  |
| **6** | **Alert:** SMS, user configurable via website |  |
| **7** | **Dimensions without sensors:** 41 cm L x 13 cm W x 7 cm H |  |
| **8** | **Weight without sensors:** 2.2 kg |  |
| **9** | **Measuring interval:** 5 minutes (by default) |  |
| **10** | **Logging interval:** 10-120 min (user selectable) |  |
| **11** | **Transmission frequency:** User selectable |  |
| **12** | **Battery:** 6V, 4.5AH, Operating range: -35 °C to 80 °C |  |
| **13** | **Solar panel:** Dimensions: 13.5 x 13.5 cm, 2-Watt solar panel |  |
| **14** | **Rain gauge -** The mechanic consists of a magnet, which moves past a reed switch and opens or closes the circuit. The double spoon tips left or right and does not lose any water due to a very fast switching mechanics. The resolution with a surface of 200 cm2 is 0.2 mm

|  |  |
| --- | --- |
| Sensor Type | Double tipping bucket rain gauge |
| Output | Switch signal |
| Switch | Reed contact, solid state |
| Sensitivity | 1 tip per 0.2 mm or 1 tip per 0.5 mm |
| Collector Surface | 200 cm2 |
| Evaluation | Digital |
| Maximum Rain | 12 mm/minute |
| Dimensions | 185 mm diameter x 250 mm H |
| Accuracy | ±5% |

 |  |
| **15** | Global radiation sensor - The IM506D Pyranometer is designed for field measurements of global solar radiation in agricultural, meteorological and solar energy studies. In clear, unobstructed daylight, the Pessl Instruments pyranometer has favourable results compared to the first-class thermopile-type pyranometers but is priced at just a fraction of the cost.Sensor - LI-200SZCalibration - Calibration against Kipp and Zonen CMP3 under daylight.Absolute error max. 5%, typically 3%Stability - 2% drift on 2-year useTime to measure - 10 µsTemperature dependency - 0.15% per °CCosines correction - Sensor corrects up to 80° degreesAzimuth - 1% error over 360 degree at 45-degree elevationOperating temperature range - -20°C to 65°COperating relative humidity range - 0 to 100%Sensor - PhotodiodeHousing - Weatherproof PAS case with acrylic diffuser, stainless steel hardwareSize - 35 mm diameter, 45 mm heightWeight - 114 gEvaluation - Pulse Wide Modulation 0-80% = 0-2000 W/m²Spectral range - 300-1100 nm |  |
| **16** | Combined air temperature and relative humidity sensorMeasures relative humidity and temperature with outstanding accuracy and repeatability. It has an integrated data acquisition and calibration history. Dew point, VPD and delta T calculations available.Temperature sensor - PT1000 1/3 Class BHumidity sensor -ROTRONIC Hygromer® IN-1Accuracy with standard adjustment profile at 23°C and 10, 35, 80 % rh ± 0.8% rh / ± 0.1 °CAccuracy with high precision adjustment profile at 23 °C and 10, 20, 30, 40, 50, 60, 70, 80, 90 % rh ± 0.5% rh / 0.1 °CResolution, AirChip3000 Typically 0.02 % rh, 0.01 °CLong-term stability < 1 % rh, 0.1°C / yearHumidity response time t 63 - 3 secondsMeasurement range - 0…100 % rh, -100…200 °CElectronics operating range -50-100 °C and 0-100 % rhOutput signals Serial port RS485Audit trail & electronic records FDA 21CFR Part 11 and GAMP compliantPower supply & consumption 3.2 V / 4 mAHousing/probe material PolycarbonateFilter Polyethylene insert, polycarbonate cageStandards CE-compliant 2007/108/EG |  |
| **17** | **Wind speed sensor -** IM512CD is a cup type anemometer for low cost and long term, accurate wind measurements for all kinds of use. It calculates average wind speed in the specific time period.Range - 0 to 50 m/s, gust survival 60m/sSensor - 12 cm diameter cup wheel assembly, 40 mm diameter hemispherical cupsTurning Factor - 75 cmDistance Constant (63% recovery) - 2.3 mThreshold - 1.1 m/sTransducer - Stationary CoilTransducer Output - AC sine wave signal induced by rotating magnet on cup wheel shaft. 100 mVpp at 60 rpm. 6 Vpp at 3600 rpmOutput Frequency - 1 cycle per cup wheel revolution. 0.75 m/s per Hz |  |
| **18** | **The software license should be unlimited (!)** |  |
|  |
| ***#PAGIS 3*** | ***PAL 4 B – Soil Temperature Sensor*** |  ***1 pc*** |
| **1** | **Temperature sensor**The Soil Temperature Sensor is a PT1000 in a waterproof stainless-steel housing.The sensor output is a duty-cycle signal. |  |
| **2** | **Operating temperature range:** -30°C to +75°C |  |
| **3** | **Supply DC Voltage (range):** 4,57 – 7 V |  |
| **4** | Accuracy: ±0.1 °C (-30 °C to +75 °C) |  |
| **5** | Supply current max. 200 μA |  |
| **6** | Calibration error max. 0.25 °C (23 °C) |  |
| **7** | Long term drift max. 0.1 °C |  |
| **8** | **Data transmission:** Rs 485 Digital signal (temperature data sent on demand of iMETOS main board) |  |
|  |
| ***#PAGIS 4*** | ***PAL 7 C – Soil Moisture Sensor*** | ***1 pc*** |
| **1** | **PI54-D** |  |
| **2** | **Size:** 2.2 cm diameter x 5 cm length |  |
| **3** | **Measuring Principle:** Soil water tension correlated with electrical resistance in granular matrix |  |
| **4** | **Working range:** 0−0.57 m3/m3 (0%−57% VWC) |   |
| **5** | **Resolution**: 0.0008 m³/m³ (0.08% VWC) in mineral soils from 0−0.50 m³/m³ (0%−50% VWC) |   |
| **6** | **Accuracy:** With standard calibration equation, 0.03 m³/m³ (3% VWC) typical in mineral soils that have solution electrical conductivity <10 dS/m |   |
| **7** | **Operating temperature range:** -40 to 50 °C |  |
| **8** | **Supply voltage (VIN to GND):** * Minimum: 3.6 VDC at 12 mA
* Maximum: 15 VDC at 20 mA
 |  |
| **9** | **Measurement duration:** Maximum 10 ms |  |
| **10** | **Output:** Analog and digital |  |
|  |
| ***#PAGIS 5*** | ***NDVI Drone*** | ***1 pc*** |
| **1** | **Phantom 4 Pro V2.0 NDVI** |  |
| **2** | **High Precision 1.2MP Sentera Single sensor** |  |
| **3** | Aids in identifying stressed areas of a field, measuring overall crop health |  |
| **4** | See exactly how crops are performing in real-time and recommend or take action while still in the field — no need for an internet connection |  |
| **5** | Accurately helps growers apply fertilizers, pesticides, and herbicides based on near real-time data |  |
| **6** | Capture RGB, NIR and True NDVI imagery simultaneously in a single flight |  |
| **7** | Integrates seamlessly with FieldAgent to further augment efficiencies |  |
| **8** | FieldAgent Mobile for iOS allows you to autonomously fly a field of any size while removing any worry that may have existed about capturing enough data overlap to create the perfect QuickTile or stitched image |  |
|  |
| ***#PAGIS 6*** | ***AgroCam*** | ***1 pc*** |
| **1** | **DJI Phantom 4 NDVI upgrade - single camera NDVI** |  |
| **2** | AgroCam Geo NDVI camera |  |
| **3** | GPS module |  |
| **4** | Tiltable camera mounting adapter |  |
| **5** | Camera integration module |  |
| **6** | Free and unlimited access to the image processing software |  |
| **7** | **Image resolution:** 12 MP (CMOS sensor with 4000x3000 effective pixels) |  |
| **8** | **Optics:** 43 mm, f/2.8 aperture, extreme low distortion (non-fisheye) lens |  |
| **9** | **Capture speed:** Max. 2 pictures per seconds (12 MP) |  |
| **10** | **Ground sample distance:** 4.3 cm/px at 120 m (cca. 400 ft) AGL |  |
| **11** | **Weight:** 78g (2.54 oz) |  |
| **12** | **Dimensions:** 59mm×41.5mm×36mm |  |
| **13** | **Battery:** Removable 1200mAh lithium-ion battery |  |
| **14** | **Storage:** Micro SD Card (up to 64GB) |  |
| **15** | **Connectivity:** USB, microHDMI, WiFi, Bluetooth 4.0, external shutter by flight controller |  |
|  |
| ***#PAGIS 7*** | ***Greenseeker – Handheld Crop Sensor*** | ***1 pc*** |
| **1** | **Key Benefits:*** Addresses field variability
* Determines fertilizer rates by using the current crop condition
* Adjusts application rates automatically based on readings taken by the sensors as applicator travels through the field
* Can often be used with existing rate control systems
* Works in any weather condition—day or night

Easy to install, easy to calibrate, easy to use |  |
| **2** | **Trimble Display Compatibility:*** TMX-2050™ display

FmX® integrated display |  |
| **3** | **The sensor emits brief bursts of red and infrared light and then measures the amount of each type of light that is reflected back from the plant** |  |
| **4** | **The sensor continues to sample the scanned area as long as the trigger remains engaged** |   |
| **5** | **The sensor displays the measured value in terms of an NDVI reading (ranging from 0.00 to 0.99) on its LCD display screen** |  |
| **6** | **High-quality optical sensor to instantly measure plant vigor** |   |
| **7** | **Easy-to-read display, even in sunlight** |  |
| **8** | **Simple pull-type trigger and comfortable hand grip** |  |
| **9** | **Micro USB charging port** |   |
|  |
| ***#PAGIS 8*** | ***Tablet Android*** | ***1 pc*** |
| **1** | **DJI CrystalSky monitor** |  |
| **2** | **\* 5.5”/7.85” 1000 cd/m²; 7.85” Ultra Bright 2000 cd/m²****Resolution:** 2048x1536 (7.85”) / 1920x1080 (5.5”) |  |
| **3** | **Smoother video display**  |  |
| **4** | **Customized system and DJI GO/DJI GO 4** |   |
| **5** | **Dual SD Card slots** |  |
| **6** | **HDMI port; Micro USB and USB-C ports** |  |
| **7** | **Built-in dual band Wi-Fi** |  |
| **8** | **Operates in as low as -4°F (-20°C) and, with its internal cooling system, functions normally in temperatures as high as 104°F (40°C)** |  |
| **9** | **Must incl. a compatible charger (!)** |  |
|  |
| ***#PAGIS 9*** | ***Arduino Kit*** | ***6 pcs*** |
| **1** | **RPI SET JOYPI Raspberry Pi - Joy-Pi Experimental / Education Case** |  |
| **2** | **The built-in sensors include:*** a light sensor for measuring brightness
* a sound sensor to detect noises
* a motion sensor
* an ultrasonic sensor for measuring distances
* one inclination sensor
* a touch sensor
* a temperature and humidity sensor

an infrared sensor with which, for example, you can also receive commands from an infrared remote control (included in the scope of delivery) |  |
| **3** | **The modules include:*** a GPIO LED display
* one 16x2 LCD module
* an 8x8 LED matrix
* a 7-segment LED display
* a buzzer
* one relay
* a key matrix
* independent buttons
* an RFID module
* a 5 V stepper motor
* one servo motor
* a 7-inch touch screen display

a camera mounted above the display in the lid |  |
| **4** | **Compatible with the models:*** Raspberry 2 B
* Raspberry 3 B
* Raspberry 3 B+
* Raspberry Pi 4 B

Raspberry Zero |  |
| **5** | **Must incl. Raspberry Pi (!)** |  |
|  |
|  | ***#PAGIS 10*** | ***Guidance system*** | ***1 pc*** |
|  | **1** | **SunNav guidance system AG100** |  |
|  | **2** | **Professional GNSS smart antenna, large display and LS guidance software** |  |
|  | **3** | **Intuitive interface** |  |
|  | **4** | **GNSS receiver supports GPS/GLONASS or GPS/BeiDou** |  |
|  | **5** | **System** * CPU:4 cores ,1.5GHz
* Storage:2GB RAM+16GB ROM,(64GB ROM optional)
* Microphone: built-in
* Speaker:4ohm, 2W speaker
* Operation system: Android 6.0.1
 |  |
|  | **6** | **Display** * 7-inch LCD screen, resolution: 1024\*600
* Capacitive touch screen, support 5 finger touch
* 750nits high brightness display
 |  |
|  | **7** | **I/O** * RS232 serial port\*2
* RS485\*1
* CAN\*2 (supports J1939, CANOpen, ISO15765 protocol)
* USB 2.0\*1 (supports host and debug mode)
* DC in\*1
* 12V DC external power supply\*2
* Analog camera input\*2
 |  |
|  | **8** | **Environment** * Dustproof waterproof grade: IP65
* Vibration standard (working): MIL-STD-810
* Impact standard (working): MIL-STD-810
* Road vehicle standard: ISO16750
* Working temperature: -20 ° C ~ +70 ° C, humidity: 0% ~ 90% RH
* Storage temperature: -40 ° C ~ +85 ° C, humidity: 30% ~ 95% RH
 |  |
|  | **9** | **Power** * 9-36V DC input
* Support power failure detection
* Built-in battery option
* Dimensions (W\*H\*D): 194\*127\*29 mm
* Weight: 0.7 kg
 |  |

# **Annex 3: Commercial Offer**

Note –

*The Company must accomplish the commercial offer for equipment on its letterhead clearly showing the companies complete name and address.*

To: EXOLAUNCH GmbH, address: Reuchlin Str. 10, 10553 Berlin, Germany

|  |
| --- |
| ***Commercial offer for the equipment supply within the framework of the project***  ***New curricula in Precision Agriculture using GIS technologies and sensing data******(CUPAGIS)***#CUPAGIS/12.10/2020 “Invitation to Tender for Equipment Procurement (Algeria)” |

Name of Company \_\_ **\_\_\_\_\_\_\_\_\_**\_\_\_\_

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Description** | **Quantity****(pcs) for 1 University** | **Unit Price (EUR)** | **Total Price per item (EUR) for 1 University** | **Grand Total Price per item (EUR) for 5 Universities** |
| **1** | **2** | **4** | **5** | **6=4 х 5** | **7** |
| #PAGIS 1 | DJI Phantom 4 Multispectral drone | 1 |  |  |  |
| #PAGIS 2 | Wireless solar panel and battery powered data logger | 1 |  |  |  |
| #PAGIS 3 | Soil Temperature Sensor | 1 |  |  |  |
| #PAGIS 4 | Soil Moisture Sensor | 1 |  |  |  |
| #PAGIS 5 | NDVI Drone | 1 |  |  |  |
| #PAGIS 6 | AgroCam | 1 |  |  |  |
| #PAGIS 7 | Greenseeker – Handheld Crop Sensor | 1 |  |  |  |
| #PAGIS 8 | Tablet Android | 1 |  |  |  |
| #PAGIS 9 | Arduino Kit | 6 |  |  |  |
| #PAGIS 10 | Guidance system | 1 |  |  |  |
| **Total Amount (Euro) excluding VAT** |  |  |

Total amount in words (for 1 University): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Grand total amount in words (for 5 Universities): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If there is a discrepancy between words and figures, the amount in words shall prevail

Warranty conditions:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Delivery conditions:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Delivery period:

\_\_\_\_\_\_ days from the date of signature of the contract

Name

In the capacity of

Signed

Duly authorized to sign the company for and on behalf of

Date

Stamp