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ENPI CBCMED CROSS-BORDER COOPERATION IN THE MEDITERRANEAN

STAZIONE ZOOLOGICA ANTON DOHRN · Napoli ·

STAZIONE ZOOLOGICA ANTON DOHRN
VILLA COMUNALE
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Special Conditions relating to the Contract for
Supply and assistance in installation of oceanographic buoys for automatic measurement of marine weather parameters with system of remote control, management and data transmission.

Lot 1: IGC 635699670C
Lot 2: IGC 6357002BFE
CUP: C63J13001100005

ARTICLE 1 - SUBJECT OF THE CONTRACT

The subject of the contract is the "Supply and assistance in installation of oceanographic buoys for automatic measurement of marine weather parameters with system of remote control, management and data transmission".

ARTICLE 2 - AMOUNT OF THE CONTRACT FOR TENDER

The assumed amount, subject to reduction, on which tenders for the supply of good and services as described in Article 1 are based is €406,140.00 plus VAT, of which for Lot 1: €286,140.00 plus VAT and for Lot 2: €120,000.00 plus VAT.
The tender amount is subject to VAT at 15%

ARTICLE 3 - SUPPLY SPECIFICATIONS

The buoys shall have the minimum characteristics indicated below.

LOT 1

1. TWO SYSTEMS MOORED TO THE SEABED, non-invasive, being the buoys intended for the Protected Marine Areas situated at AQABA (Jordan) (Lat N 34° 58' 24'' Long E 29° 25' 49'', depth 8 m) and MAHDIA (Tunisia) (Lat N 35° 30' 14" Long E 11° 04' 27", depth 10 m). The systems shall each have a) a floating body in plastic of a shape and dimensions such as to allow easy access for maintenance of the sensors, suitable power and remote control systems, as well as real time transmission of recorded data to the corresponding land station;
   b) a self-powered flashing light;
   c) X-shaped aluminium topmark radar reflector;
   d) sensor power supply as specified in Tab 1 and consisting of an adequate number of photovoltaic panels, rechargeable 12V batteries, energy management unit and charge regulator allowing continuous operation of the entire system;
   e) mooring cable including transmission cable for the signal from the camera(s) and chain.

2. Conductivity sensor with a measuring range between 0 and 7 S/m, accuracy at least ±0.005 S/m and resolution at least 0.0002 S/m
3. Temperature sensor with a measuring range from -2 ºC to +35 ºC, accuracy at least ±0.1ºC, resolution at least 0.01 ºC
4. Turbidity sensor with a measuring range from 0 to 100 NTU
5. Chlorophyll sensor with a measuring range from 0 to 20 microg/ml, resolution 0.05 microg of chlorophyll a/l
6. Meteorological unit for with a measuring range for air temperature from -52 to +60 ºC and resolution of 0.1 ºC; wind speed 0-60 m/s and 0.1 m/s; wind direction 0-360 degrees and 1 degree; atmospheric pressure 600-1100 hPa and 0.1 hPa; humidity 0-100% RH and 0.1% RH.
7. An underwater camera including full HD 1080p high definition cable, internal DVR and 64 GB memory, able to record 30 frames a second, interfaced with the system of management and control, communication and transfer to land.
8. A subaerial digital camera including cable to connect with the sensor management unit described in point 9), with full HD 1080p high definition image sensor, IP66 protection, infrared LED with 35 m effective coverage for night surveillance.
9. Unit for management and control of the sensors and cameras and data storage with 64-bit processor and ample internal capacity for accumulation of data. Real time operating system with high reliability using Windows (2012R2 or 8.1). 64 bit Quad Core computer with 2 terabytes HD with at least external backup unit, 8 Gb of RAM memory, HD monitor, mouse, SSD Cache video card with at least 4 Gb of RAM memory, wireless and bluetooth, keyboard.
10. System to transfer data provided by the sensors and cameras and by the management system to the land station by means of a GSM/4G connection and point to point WiFi depending on the site, complete with software for data transmission.
11. IT system consisting of at least 1 computer workstation per site for data acquisition and transfer to the central unit located at SZN (Stazione Zoologica Anton Dohrn) and equipped with a screen for real time viewing of the data with visualisation software. Screen at least 27 inches, Full HD with resolution 1920 x 1080 and video card with at least 4 Gb of RAM memory. Complete software system for data presentation to allow remote monitoring of the buoy. It must allow the generation of reports and the automatic export of various file formats (including Microsoft Excel, Text format, XmII/HTML, Jpg, Png), so as to be able to transmit them via Internet to the SZN station.
12. Preparedness and hardware for transfer of data from the sensors and cameras from the land station to the Naples control station.
13. IT system of at least 2 computer workstations for the Naples control station with screens and software for data and graphics processing of the data transmitted. If Macs, the computers must have at least the following characteristics: Intel Xeon E5 6-core Processor at 3.5GHz, 16GB of ECC DDR3 memory at 1866MHz, two AMD FirePro D500s, each with 3GB of VRAM GDDR5 memory, 256GB PCIe flash unit, HD monitor, wireless and bluetooth, keyboard and mouse. If PC, they must have the following minimum characteristics: 2 Tera HD with external back-up unit, Quad Core, 64 bit, 8 Gb of RAM memory, SSD Cache, video card with at least 4 Gb of RAM memory, HD monitor, wireless and bluetooth, keyboard, mouse, Windows 8.1 Pro.
14. Advanced hardware and software system for the management, calculation, visualisation and printing of the parameters from the sensors, the derived variables and the cameras, with intuitive, simple and immediate graphical interface,with the possibility of interrogation via web navigation.
15. Upgrading of the software provided for at least 10 (ten) years
16. Preparedness for at least two sensors from Table 2

17. 12 month guarantee on all the parts offered
18. Technical assistance on demand for a period of 5 years after the guarantee period Such assistance must maintain the characteristics of the instruments and guarantee adequate performance levels.

Tab 1: Table summarising the sensors required and specifications

	Measuring Range	Accuracy	Resolution
Conductivity	from 0 to 7 S/m	±0.005 S/m	0.0002 S/m
Temperature	from -2 to +35 °C	±0.1 °C	0.01 °C
Turbidity	from 0 to 100 NTU	5% of the full scale	0.5% of the full scale
Chlorophyll a	From 0 to 20 microg chl/l	±0.03 microg chl/l	0.1 microg chl/l
Air temperature	-52/+60 °C		0.1 °C
Wind speed	0-60 m/s		0.1 m/s
Wind direction	0-360		1°
Atmospheric pressure	600-1100 hPa		0.1 hPa
Air humidity	0-100% RH		0.1% RH

PROPOSALS FOR IMPROVEMENTS relating to Specifications (10 POINTS)

P.1 for conductivity sensor referred to in point 2): 1 point for accuracy value below ±0.0005 (greater accuracy);
P.2 for temperature sensor referred to in point 3): 1 point for accuracy value below ±0.05 (greater accuracy);
P.3 for preparedness for sensors as in Table 2 in addition to the 2 referred to in point 16: 0.5 points for each additional preparedness for a possible maximum of 3 points;
P.4 extension of the duration of the guarantee beyond the required 12 months: 5 points for 12 additional months.

PROPOSALS FOR IMPROVEMENTS relating to Specifications (60 POINTS)

P.5 Spectrofluorometer with a measuring range from 1 a 200 microg of chlorophyll a/l, resolution 0.01 microg chla/l, including cables, flow cell, with temperature and turbidity correction for measuring chlorophyll and different algae classes: 15 POINTS
P.6 INTEGRATION WITH THE WEATHER SENSORS of a solar irradiance sensor (measuring range 0-1250 W/m²) and UV-A and UV-B sensors (measuring range from 2 a 20 mW/cm²) 5 POINTS
P.7 pH SENSOR with measuring range 2-12 pH, accuracy 0.01 5 POINTS
P.8 UNDERWATER CAMERA with the same characteristics as those described in point 7) 5 POINTS
P.9 SUBAERIAL CAMERA with the same characteristics as those described in point 8) 5 POINTS
P.10 DISSOLVED OXYGEN SENSOR with measuring range 0-10 ml/l, resolution 0.1 ml/l 5 POINTS
P.11 CURRENT METER, acoustic, single-point, for measuring current, with a measuring range for speed from 0 to 300 m/sec, resolution 0.1 mm/sec, accuracy ±0.15 cm/sec; measuring range for direction 0-360°, resolution 0.01°, accuracy ±8° including wave meter with measuring range from 0 a 400 kPa (58 psia), resolution <0.0001 % FSO, accuracy ±0.02 % FSO. 15 POINTS
P.12 HYDROCARBON DETECTION SENSOR 5 POINTS

Tab 2: Additional sensors or instruments

	Measuring Range	Accuracy	Resolution
SPECTROFLUOROMETER including cables, flow cell, with temperature and turbidity correction for the measurement of chlorophyll and various algae classes	from 1 to 200 microg of chlorophyll a/l,		0.01 microg chla/l
SOLAR IRRADIANCE SENSOR	0-1250 W/m²		
UV-A and UV-B SENSORS	from 2 to 20 mW/cm²		
pH SENSOR	2-12 pH	0.01	
UNDERWATER CAMERA with the same characteristics referred to in point 7)			
SUBAERIAL CAMERA with the same characteristics referred to in point 8)			
DISSOLVED OXYGEN SENSOR	0-10 ml/l		0-1 ml/l
CURRENT METER acoustic single-point for measuring current including wave meter (58 psia), resolution <0.0001 % FSO, accuracy ±0.02 % FSO.	Speed from 0 to 300 m/sec, direction from 0 to 360° wave meter from 0 to 400 kPa (58 psia)	±0.15 cm/sec ±8° ±0.02 % FSO.	0.1 mm/sec 0.01° <0.0001 % FSO
HYDROCARBON DETECTION SENSOR			

LOT 2

Monitoring system of the ELASTIC MEDA type to be located in Sardinia, in the Gulf of Oristano, on the site with coordinates Lat N 39° 52' 26'', Long E 8° 28' 14'', depth 11.70 m
The meda must consist of:

1. Turret, disconnectable from the bearing structure, to accommodate instruments, with a square base and total height of 4 m including the passive radar reflector and ODAS lamp conforming to IALA standards. The structure must be composed as follows:

a. base with perimetral accommodation for a non-slip plane with a hatch to allow a person through;
b. angular railing;
c. flat platform and intermediate crosspieces, all mounted on a tube of suitable length comprising an access staircase and appropriate protection;
d. N° 1 stainless steel box large enough to accommodate batteries provided with holes to allow cables to pass through and vented to allow the dispersal of any gases emitted by the battery.
e. Supports for the controls and the antennae to be integrated into the turret.
f. N° 2 segments of suitable length of tube flanged and appropriately reinforced at the ends, having on two opposite sides two stainless steel cable conduit tubes which run from the base of the turret to approximately 50 cm below the flotation devices. Every submerged tube shall be equipped with sacrificial anodes fixed to suitable brackets.
g. Float to be situated approximately 3 m from the surface in plastic
h. Device connecting to the ballast by means of handles
i. Handles and fixing chains to the dead weight.
j. Fixing screws for the tube flanges and clamping kit for the stainless steel cable conduit tubes in the central tube
k.) sensor power supply as specified in Tab 1 and Tab 2 consisting of an adequate number of photovoltaic panels, rechargeable 12V batteries, energy management unit and charge regulator allowing continuous operation of the entire system;

2. Acquisition and Communication system consisting of the following apparatus integrated with Ethernet networking:
- a CPU interfaced through serial ports with the Diagnostic State card or the sensor requested, or a GPS receiver
- a network switch with 8 ports which allows the construction of the network with remotely manageable PoE ethernet ports and which makes available to the user a web interface enabling him to control and govern the devices linked to it;

3. Communication equipment which allows fast verification of the state of the system and transfer to the reception centre of the data files using FTP (File Transfer Protocol). The system shall be of Wireless type with dual band equipment including a high gain omnidirectional antenna and shall also provide for a GPRS modem with Ethernet interface to be used in the event of the failure of the principal wireless link

4. IT system consisting of at least 1 computer workstation for data acquisition and transmission to the main station located at SZN equipped with a screen for real time visualisation of data with visualisation software, and including software for the presentation of data and to allow remote monitoring of the buoy. It must allow the

generation of reports and the automatic export of various file formats (including Microsoft Excel, Text format, XmII/HTML, Jpg, Png), so as to be able to transmit them via Internet to the SZN station.

4. Weather station equipped with sonic wind speed and direction sensors, air temperature and humidity sensors and a barometric pressure sensor as described in Table 1.1; heading, pitch and roll sensor to be able to determine the true wind direction independently of the station's orientation in relation to North. It must also include a custom card which will provide internal tension, current, temperature and pressure to the electronic framework.

5. An underwater camera including high definition full HD cable 1080p, with internal DVR and 64 GB memory, able to record 30 frames a second, interfaced with the system of management and control, communication and transfer to land.

6. A subaerial digital camera including cable to connect with the sensor management unit described in point 9), with full HD 1080p high definition image sensor, IP66 protection, infrared LED with 35 m effective coverage for night surveillance.

7. Upgrading of the software provided for at least 10 (ten) years

8. multiparameter probe with sensors for temperature, conductivity, pressure, turbidity and chlorophyll, with the technical specifications given in Table 1.1

9. 12 month guarantee on all the parts offered

10. Technical assistance on demand for a period of 5 years after the guarantee period Such assistance must maintain the characteristics of the instruments and guarantee adequate performance levels.

Tab 1.1: Table summarising the sensors required and specifications

	Measuring Range	**Accuracy**	**Resolution**
Conductivity	from 0 to 7 S/m	±0.001 S/m	0.002 S/m
Temperature	from -2 to +35 °C	±0.01 °C	0.01 °C
Turbidity	from 0 to 100 NTU	5% of the full scale	0.5% of the full scale
Chlorophyll a	From 0 to 20 microg chl/l	±0.03 microg chl/l	0.1 microg chl/l
Air temperature	-52/+60 °C		0.1 °C
Wind speed	0-60 m/s		0.1 m/s
Wind direction	0-360		1°
Atmospheric pressure	600-1100 hPa		0.1 hPa
Humidity	0-100% RH		0.1% RH

PROPOSALS FOR IMPROVEMENTS relating to Specifications (10 POINTS)

P.1 for conductivity sensor referred to in Table 1: 1 point for accuracy above 0.001;
P.2 for temperature sensor referred to in Table 1: 1 point for accuracy above 0.05;

P.3 for chlorophyll sensor referred to in Table 1: 3 points for measurement limits above 20 microg/l and/or accuracy above 0.03 microg/l and/or resolution above 0.1 microg ch/l
P.4 extension of the guarantee period beyond the required 12 months: 5 points for 12 additional months.

PROPOSALS FOR IMPROVEMENTS relating to Specifications (60 POINTS)

P.5 INTEGRATION IN THE WEATHER SENSORS of a solar irradiance sensor (measuring range 0-1250 W/m²) and UV-A and UV-B sensors (measuring range from 2 to 20 mW/cm²) 5 POINTS;
P.6 pH SENSOR with a measuring range 2-12pH, accuracy 0.01 or above 5 POINTS
P.7 UNDERWATER CAMERA with the same characteristics as those described in point 5) 5 POINTS
P.8 SUBAERIAL CAMERA with the same characteristics as those described in point 6) 5 POINTS
P.9 DISSOLVED OXYGEN SENSOR with measuring range 0-10 ml/l resolution 0.1 ml/l or above 5 POINTS
P.10 pH SENSOR with measuring range 1-13, accuracy ±0.05 and resolution 0.01 5 POINTS
P.11 PAR SENSOR with accuracy ±1% and resolution 0.5 micromol/s/m2 10 POINTS
P.12 CURRENT METER acoustic single-point for current measurements with a measuring range for speed from 0 to 300 m/sec, resolution 0.1 mm/sec, accuracy ±0.15 cm/sec; measuring range for direction 0-360°, resolution 0.01°, accuracy ±8° including wave meter with measuring range from 0 to 400 kPa (58 psia), resolution <0.0001 % FSO, accuracy ±0.02 % FSO. 15 POINTS
P.13 HYDROCARBON DETECTION SENSOR 5 POINTS

Tab 2.2: Additional sensors or instruments

	Measuring Range	Accuracy	Resolution
SOLAR IRRADIANCE SENSOR	0-1250 W/m²		
UV-A and UV-B SENSORS	from 2 to 20 mW/cm²		
pH SENSOR	2-12 pH	0.01	
UNDERWATER CAMERA with the same characteristics referred to in point 5)			
SUBAERIAL CAMERA with the same characteristics referred to in point 6)			
DISSOLVED OXYGEN SENSOR	0-10 ml/l		0.1 ml/l
CURRENT METER acoustic single-point for current measurements including wave meter (58 psia), resolution <0.0001 % FSO, accuracy ±0.02 % FSO.	Speed from 0 to 300 m/sec, direction from 0 to 360°	±0.15 cm/sec ±8°	0.2 mm/sec 0.01°

	wave meter from 0 to 400 kPa (58 psia)	±0.02 % FSO.	<0.0001 % FSO
HYDROCARBON DETECTION SENSOR			

Naples, 04/08/2015

President
Prof. Roberto Danovaro