Technical Specifications

CPP-0846-2018

Robotic and Microcontroller Kits

Digital Labs

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1. INTRODUCTION

Within the framework of *Plan Ceibal* and from the Digital Labs sector, the aim is to promote the use of technology from the educational point of view. Therefore, there is the need to acquire equipment to continue the expansion of Robotics and Microcontroller projects in Educational Centers of Primary Education and Middle Education.

The document is divided into 3 categories:

a- Robotic kits, TYPE I.

b- Robotic kits, TYPE II.

c- Microcontrollers

The bidder may submit bids in one or more categories.

Centro Ceibal may award in one or several categories according to the convenience of the products offered to the objectives of the project.

2. PRODUCTS TO BE QUOTED

The specifications of the products of all categories are described below.

2.1 Robotic kits, TYPE I

These robotic kits include pieces and are aimed at primary and middle education.

A- Mandatory Specifications	
# Spec.	Description
A.2.1.1	The kit must be programmable through some functional tool in LTS versions of Ubuntu 14.04 and 16.04, at the time of arrival of the first batch awarded.
A.2.1.2	At least 1 DC motor with adjustable speed and at least 2 sensors that in total offer at least 2 different functionalities.

	The kit must allow engines and sensors to be used simultaneously.
A.2.1.3	All motors and sensors must be able to connect to a single piece (controller) that provides an interface for the control and / or reading of them.
A.2.1.4	Connection USB and / or Bluetooth and / or Wifi for communication between controller and computer. Through this communication it must be possible to obtain readings from the sensors and control motors from the computer.
A.2.1.5	The kit must have parts that allow the assembly of various mechanisms, including wheels, axles and gears. It is of particular interest that the kit provides quantity and diversity of pieces that allow different assembly possibilities.
A.2.1.6	Cables, connectors and adapters that allow the interconnection of all the parts of the kit.
A.2.1.7	Rechargeable batteries for the complete use of compatible kits and chargers. The connector of the charger to the 220V supply must be Europlug (CEE 7/16) and the pines for connection to the electrical network must have insulation in the base (see photo).
A.2.1.8	Container boxes that allow to store and organize all the elements corresponding to the kit in optimal conditions. They should be easily opened, closed and transported.

B- Desirable Specifications	
# Spec.	**Description**
B.2.1.1	It will be valued that the device is multiplatform (Linux, Windows, Android and IOS)
B.2.1.2	It will be valued that the controller of point A.2.1.3 has the option of including SD memory to store multiple programs in it.
B.2.1.3	It will be valued that the engines offer step-by-step control.
B.2.1.4	It will be valued that the communication protocols of the controller with sensors and motors are open and there is documentation detailing them.
B.2.1.5	The presentation of extensions of the offered kits will be valued (set of additional pieces that allow to expand the possibilities of assembly).
B2.1.6	The delivery of user manuals, technical specifications or other documents that contribute to the knowledge of the technical characteristics and features of the product will be valued. Likewise, it is desirable that these materials be available in Spanish.

2.2 Robotic kits, TYPE II.

These kits are robots of fixed structure, and they allow connection of accessories and / or sensors, and are programmed by blocks for the resolution of challenges.

A- Mandatory specifications	
# Spec.	Description
A.2.2.1	At least 3 sensors and 1 motor.
A.2.2.2	All motors and sensors must be assembled or already assembled to a controller simultaneously forming a single robot.
A.2.2.3	Possibility of performing different challenges and / or games proposed by the same robot by block programming.
A.2.2.4	Connection USB and / or Bluetooth and / or Wifi for communication with other devices. Through this communication it should be possible to obtain readings of the sensors and control of the engines, as well as the compilation of the program carried out.
A.2.2.5	Rechargeable batteries for the complete use of compatible kits and chargers. The connector of the charger to the 220V supply must be Europlug (CEE 7/16) and the pines for connection to the electrical network must have insulation in the base (see photo).
A.2.2.6	In case the operation of the kit is subject to any type of accessory for the interconnection of all its parts, these should be part of the kit (cables, connectors, adapters, etc.).
A.2.2.7	Container boxes that allow to store and organize all the elements corresponding to the kit in optimal conditions. They should be easily opened, closed and transported.

B- Desirable specifications	
# Spec.	Description
B.2.2.1	It will be valued that the device is multiplatform (Linux, Windows, Android and IOS)
B.2.2.2	It will be valued that the programming interface is in Spanish.
B.2.2.3	It will be valued the inclusion of a curriculum and / or pack of activities / challenges / games to be performed.
B2.2.4	The delivery of user manuals, technical specifications or other documents that contribute to the knowledge of the technical characteristics and features of the product will be valued. Likewise, it is desirable that these materials be available in Spanish.

2.3 Microcontrollers

2.3.1 Wearables

A- Mandatory specifications	
# Spec.	**Description**
A.2.3.1	Microcontroller with: minimum 8 programmable leds motion sensor temperature sensor light sensor sound sensor mini buzzer minimum 2 push buttons Slide switch (on / off) Infrared receiver and transmitter minimum 7 input / output pins I2C minimum 8 pins of analog inputs with at least 4 PWM outputs minimum 6 pads led indicator light Reset button Processor with minimum clock speed of 45 MHz minimum 2 MB SPI flash storage Micro USB port
A.2.3.2	The kit must have all the parts that are detailed as a minimum: 1 micro USB cable. Thin conductor wire of at least 25 m more than 10 needles more than 30 snaps (button type) Magnetic pin back Conductive copper tape, 6mm x 15m More than 10 crocodile cables. More than 5 crocodile cables with pin male connector 1 micro servo 4 RGB smart neopixel 5 multicolor led Battery extender cable JST 50 cm Battery holder for 3 AAA batteries with JST connector with on / off switch Battery holder for 3 AA batteries with JST connector with on / off switch 3 AAA rechargeable batteries with charger, 3 rechargeable AA batteries with charger. The connector of each charger to the 220V supply must be Europlug (CEE 7/16) and the pines for connection to the electrical network must have insulation in the base (see photo).
A.2.3.3	Container boxes that allow to store and organize all the elements corresponding to the kit in optimal conditions. They should be easily opened, closed and transported.

B- Desirable specifications	
# Spec.	Description
B.2.3.1	It will be valued that the device is multiplatform (Linux, Windows, Android and IOS)
B.2.3.2	Compatible with the following software: Makecode CircuitPython, Arduino IDE

2.3.2. Educational Robotics

A- Mandatory specifications	
# Spec.	Description
A.2.3.1	Microcontroller with: Accelerometer and integrated gyroscope USB to computer connection Bluetooth connection I / O pins (analog):> 5 I / O pins (digital):> 10 Flash Memory:> 190 kb SRAM. 9V battery and corresponding charger. The connector of the charger to the 220V supply must be Europlug (CEE 7/16) and the pines for connection to the electrical network must have insulation in the base (see photo).
A.2.3.2	Accessories. Minimum: 1 USB cable for connection to computer 1 Cable connecting the board to the 9V battery 1 Protoboard 830 pins 30 jumper cables male / male 2 10-wire flat cables (male / male, female / female) 3 LDR 3 Potentiometers 10 Kilohm 5 Push buttons 1 Temperature sensor 1 Tilt Sensor 1 Alphanumeric LCD display (16x2 characters) 3 white LEDs 3 RGB LEDs 3 red LEDs 3 green LEDs 3 yellow LEDs 3 blue LEDs 2 6V or 9V DC motors 2 Micro Servo motors

	1 Piece element (passive buzzer) 1 H bridge motor driver 1 H bridge optocoupler 1 Transistor 1 Mosfet transistor 1 100nF x 50v capacitor 1 Rectifier diode 1000V / 1A 1 Male contacts strip (40x1) 10 Resistors 220 ohm 5 Resistors 560 ohm 5 Resistors 1 Kilohm 5 Resistors 4.7 Kilohm 10 Resistors 10 Kilohm 10 Resistances 330 Ohm 1 Gyroscopic sensor 2 Stepper motors 5V 2 Ultrasound sensor modules 1 Joystick module PS2 1 Relay module 1 Infrared sensor
A.2.3.3	Software: Multiplataform (Linux, Windows) that includes IDE of programming by blocks
A.2.3.4	Container boxes that allow to store and organize all the elements corresponding to the kit in optimal conditions. They should be easily opened, closed and transported.

B- Desirable specifications		
# Spec.	Description	
B.2.3.1	Wifi Connection Ethernet Connection	

Requirements A.2.1.7, A2.2.5, A.2.3.2 and A.2.3.1 connector to the electrical network:

3. OFFER

3.1 Presentation

The offer must be presented completing the tables included in Annexes I and II, as appropriate for each item offered. In case of presenting some of the desirable requirements or any additional item to those requested, you must specify if they have additional costs separately, and quote them separately.

Together with the offer, it will be valued that the data sheets, user manual and any other documentation that the bidder considers relevant are included.

The offer must include the delivery and warranty specifications as described in sections 4. Delivery time and 5. Warranty.

3.2 Samples

At the time of submitting the offer, three (3) samples of each product offered must be delivered to *Centro Ceibal*. They must be presented with a label in a visible place (label on the front) indicating the supplier and model in each individual packing and package.

In exceptional cases and when there are justified reasons on the part of the bidder in the opinion of *Ceibal*, the latter may defer the delivery of the samples for a reasonable period of time.

The samples will NOT be returned.

Centro *Ceibal* may request the collaboration of the bidder (s) in the testing of the product offered during the bid evaluation process. This collaboration will not represent any additional cost for Centro *Ceibal*.

4. DELIVERY TIME

It will be valued that the bidder delivers 50% of the awarded lot in 30 calendar days after the adjudication resolution. The remaining 50% may be delivered within 30 calendar days after the delivery of the first batch.

In case the bidder has a different delivery proposal, it must specify the delivery terms.

The bidder must quote air and sea shipping. See contribution tables of Annex II.

5. WARRANTY

5.1 General specifications

The bidder guarantees that in case of adjudication the products to be supplied will be new, complete, without use and of the model offered. That they will be free from defects attributable to design, materials, manufacture, storage conditions (packaging, appropriate temperature and humidity), transfer or any act or omission of the bidder or manufacturer that may be manifested on the occasion of the normal use of the goods in the prevailing conditions in the country.

The bidder must specify the guarantee period, which must be at least 12 (twelve) months from the date on which the products were received by *Centro Ceibal*. In case the bidder does not specify the guarantee term, it will be assumed that it is 12 (twelve) months. The guarantee must include all the components of the products offered.

The bidder must indicate the procedures for the execution of the guarantee and the replacement periods for the products.

In case of offering other guarantee conditions, they must be specified in the technical offer and quoted separately.

ANNEX I – SPECIFICATIONS COMPLIANCE CHECK LIST

2.1 Robotic kits TYPE I

COMPLIANCE CHECK LIST		TO BE COMPLETED BY THE BIDDER		
		In each specification mark with a cross (X) the corresponding option		
A- Mandatory Specifications for the item 2.1		COMPLIES		
# Spec.	Description	YES	NO	Observations and /or specifications
A.2.1.1	The kit must be programmable through some functional tool in LTS versions of Ubuntu 14.04 and 16.04, at the time of arrival of the first batch awarded.			
A.2.1.2	At least 1 DC motor with adjustable speed and at least 2 sensors that in total offer at least 2 different functionalities. The kit must allow engines and sensors to be used simultaneously.			
A.2.1.3	All motors and sensors must be able to connect to a single piece (controller) that provides an interface for the control and / or reading of them.			
A.2.1.4	Connection USB and / or Bluetooth and / or Wifi for communication between controller and computer. Through this communication it must be possible to obtain readings from the sensors and control motors from the computer.			
A.2.1.5	The kit must have parts that allow the assembly of various mechanisms, including wheels, axles and gears. It is of			

	particular interest that the kit provides quantity and diversity of pieces that allow ample assembly possibilities.			
A.2.1.6	Cables, connectors and adapters that allow the interconnection of all the parts of the kit.			
A.2.1.7	Rechargeable batteries for the complete use of compatible kits and chargers. The connector of the charger to the 220V supply must be Europlug (CEE 7/16) and the pines for connection to the electrical network must have insulation in the base (see photo).			
A.2.1.8	Container boxes that allow to store and organize all the elements corresponding to the kit in optimal conditions. They should be opened, closed and transported easily.			

B- Desirable specifications for the item 2.1		COMPLIES		
# Spec.	Description	YES	NO	Observations and /or specifications
B.2.1.1	It will be valued that the device is multiplatform (Linux, Windows, Android and IOS)			
B.2.1.2	It will be valued that the controller of point A.2.1.2 has the option of including SD memory to store multiple programs in it.			
B.2.1.3	It will be valued that the engines offer step-by-step control.			
B.2.1.4	It will be valued that the communication protocols of the controller with sensors and motors are open and there is documentation detailing them.			
B.2.1.5	The presentation of extensions of the offered kits will be valued (set of additional pieces that allow to expand the possibilities of assembly).			
B2.1.6	The delivery of user manuals, technical specifications or other documents that contribute to the knowledge of the technical characteristics and features of the product will be valued. Likewise, it is desirable that these materials be available in Spanish.			

2.2 Robotic kits, TYPE II

COMPLIANCE CHECK LIST		TO BE COMPLETED BY THE BIDDER		
		In each specification mark with a cross (X) the corresponding option		
A- Mandatory Specifications for the item 2.2		**COMPLIES**		
# Spec.	Description	YES	NO	Observations and /or specifications
A.2.2.1	At least 3 sensors and 1 motor.			
A.2.2.2	All motors and sensors must be assembled or already assembled to a controller simultaneously forming a single robot.			
A.2.2.3	Possibility of performing different challenges and / or games proposed by the same robot by block programming.			
A.2.2.4	Connection USB and / or Bluetooth and / or Wifi for communication with other devices. Through this communication it should be possible to obtain readings of the sensors and control of the engines, as well as the compilation of the program carried out.			
A.2.2.5	Rechargeable batteries for the complete use of compatible kits and chargers. The connector of the charger to the 220V supply must be Europlug (CEE 7/16) and the pines for connection to the electrical network must have insulation in the base (see photo).			
A.2.2.6	In case the operation of the kit is subject to any type of accessory for the interconnection of all its parts, these should be part of the kit (cables, connectors, adapters, etc.).			
A.2.2.7	Container boxes that allow to store and organize all the elements corresponding to the kit in optimal conditions. They should be opened, closed and transported easily.			
B- Desirable specifications for the item 2.2		**COMPLIES**		
# Spec.	Description	YES	NO	Observations and/or specifications
B.2.2.1	It will be valued that the device is multiplatform (Linux, Windows, Android and IOS)			
B.2.2.2	It will be valued that the programming interface is in Spanish.			

B.2.2.3	The inclusion of a curriculum and / or pack of activities / challenges / games to be performed will be valued.			
B2.2.4	The delivery of user manuals, technical specifications or other documents that contribute to the knowledge of the technical characteristics and features of the product will be valued. Likewise, it is desirable that these materials be available in Spanish.			

2.3.1 Microcontrollers: Wearables

COMPLIANCE CHECK LIST		TO BE COMPLETED BY THE BIDDER		
		In each specification mark with a cross (X) the corresponding option		
A- Mandatory Specifications for the item 2.3		COMPLIES		
# Spec.	Description	YES	NO	Observations and/or specifications
A.2.3.1	Microcontroller with: minimum 8 programmable leds motion sensor temperature sensor light sensor sound sensor mini buzzer minimum 2 push buttons Slide switch (on / off) Infrared receiver and transmitter minimum 7 input / output pins I2C minimum 8 pins of analog inputs with at least 4 PWM outputs minimum 6 pads led indicator light Reset button Processor with minimum clock speed of 45 MHz minimum 2 MB SPI flash storage Micro USB port			
A.2.3.2	The kit must have all the parts that are detailed as a minimum: 1 micro USB cable. Thin conductor wire of at least 25 m more than 10 needles more than 30 snaps (button type) Magnetic pin back Conductive copper tape, 6mm x 15m more than 10 crocodile cables. More than 5 crocodile cables with pin male connector 1 micro servo 4 RGB smart neopixel 5 multicolor led Battery extender cable JST 50 cm			

		YES	NO	
B	Battery holder for 3 AAA batteries with JST connector with on / off switch Battery holder for 3 AA batteries with JST connector with on / off switch 3 AAA rechargeable batteries with charger, 3 rechargeable AA batteries with charger. The connector of each charger to the 220V supply must be Europlug (CEE 7/16) and the pines for connection to the electrical network must have insulation in the base (see photo).			
A.2.3.3	Container boxes that allow to store and organize all the elements corresponding to the kit in optimal conditions. They should be easily opened, closed and transported.			

B- Desirable specifications for the item 2.3		COMPLIES		
# Spec.	Description	YES	NO	Observations and/or specifications
B.2.3.1	It will be valued that the device is multiplatform (Linux, Windows, Android and IOS)			
B.2.3.2	Compatible with the following software: Makecode CircuitPython, Arduino IDE			

2.3.2 Microcontrollers: Educational Robotic

COMPLIANCE CHECK LIST		TO BE COMPLETED BY THE BIDDER	
		In each specification mark with a cross (X) the corresponding option	
A- Mandatory Specifications for the item 2.3		COMPLIES	
# Spec.	Description	YES	NO	Observations and /or specifications
A.2.3.1	Microcontroller with: Accelerometer and integrated gyroscope USB to computer connection Bluetooth connection I / O pins (analog):> 5 I / O pins (digital):> 10 Flash Memory:> 190 kb SRAM. 9V battery and corresponding charger. The connector of the charger to the 220V supply must be Europlug (CEE 7/16) and the pines for connection to the electrical network must have insulation in the base (see photo).			
A.2.3.2	Accessories. Minimum: 1 USB cable for connection to computer 1 Cable connecting the board to the 9V battery			

	1 Protoboard 830 pins 30 jumper cables male / male 2 10-wire flat cables (male / male, female / female) 3 LDR 3 Potentiometers 10 Kilohm 5 Push buttons 1 Temperature sensor 1 Tilt Sensor 1 Alphanumeric LCD display (16x2 characters) 3 white LEDs 3 RGB LEDs 3 red LEDs 3 green LEDs 3 yellow LEDs 3 blue LEDs 2 6V or 9V DC motors 2 Micro Servo motors 1 Piece element (passive buzzer) 1 H bridge motor driver 1 H bridge optocoupler 1 Transistor 1 Mosfet transistor 1 100nF x 50v capacitor 1 Rectifier diode 1000V / 1A 1 Male contacts strip (40x1) 10 Resistors 220 ohm 5 Resistors 560 ohm 5 Resistors 1 Kilohm 5 Resistors 4.7 Kilohm 10 Resistors 10 Kilohm 10 Resistances 330 Ohm 1 Gyroscopic sensor 2 Stepper motors 5V 2 Ultrasound sensor modules 1 Joystick module PS2 1 Relay module 1 Infrared sensor			
A.2.3.3	Software: Multiplatform (Linux, Windows) that includes IDE of programming by blocks			
A.2.3.4	Container boxes that allow to store and organize all the elements corresponding to the kit in optimal conditions. They should be opened, closed and transported easily.			

B- Desirable specifications for the item 2.3		COMPLIES		
# Spec.	Description	YES	NO	Observations and /or specifications
B.2.3.1	WiFi connection Ethernet connection			

ANNEX II – PRICE TABLE

PRICE TABLE Product 2.1		TO BE COMPLETED BY THE BIDDER					
		Quoted product			Unit Price in USD		
Product	Description	Shipping methods	Brand	Model	1 to 50 units	51 to 100 units	101 or more units
2.1	Robotic kits TYPE I	CIF					
		CIP					

PRICE TABLE Product 2.2		TO BE COMPLETED BY THE BIDDER					
		Quoted product			Unit Price in USD		
Product	Description	Shipping methods	Brand	Model	1 to 50 units	51 to 100 units	101 or more units
2.1	Robotic kits TYPE II	CIF					
		CIP					

PRICE TABLE Product 2.3.1		TO BE COMPLETED BY THE BIDDER					
		Quoted product			Unit Price in USD		
Product	Description	Shipping methods	Brand	Model	1 to 50 units	51 to 100 units	101 or more units
2.1	Microcontroller: Wearables	CIF					
		CIP					

PRICE TABLE Product 2.3.2		TO BE COMPLETED BY THE BIDDER					
		Quoted product			Unit Price in USD		
Product	Description	Shipping methods	Brand	Model	1 to 50 units	51 to 100 units	101 or more units
2.1	Microcontroller: Educational Robotic	CIF					
		CIP					

The awarded bidder / s must deliver to *Centro Ceibal* all the necessary documentation for the import / dispatch of the merchandise without affecting the committed delivery deadlines.