



IIIT BANGALORE

No: MIIT/42/18

Date: 31 January 2018

Amendment-I

Subject: Supply, Installation, testing & commissioning and on-site support for setting up Embedded Systems Laboratory - I

IIIT Bangalore on be-half of Ministry of External Affairs (MEA) invited sealed tenders for Supply, installation, testing & commissioning and on-site support for setting up of Embedded Systems Laboratory - I for Myanmar Institute of Information and Technology (MIIT) at Mandalay in Myanmar on turnkey basis vide IIIT-B MIIT/40/18 dated 12th January 2018.

2.The following amendments are made in the above mentioned tender document

<i>Name of Work</i>	<i>EMD</i>	<i>Last date bid submission</i>	<i>Date opening of bids</i>
Supply, Installation, testing & commissioning and on-site support of Embedded Systems Laboratory - I	Rs 2 Lac	8 th February 2018 at 1300 hours	8 th February 2018 at 1400 hours

3.The clarifications/responses to the queries listed in the pre-bid meeting are mentioned Annexure I of this amendment.

4. All other terms and conditions remain same.

Registrar IIIT-Bangalore

Annexure I

International Institute of Information Technology (MIIT Mentoring Cell)

Tender Reference: - MIIT/40/18 for supply, installation, testing & commissioning and onsite support for installation and setting up of Embedded Systems Laboratory-I for Myanmar Institute of Information and Technology (MIIT) at Mandalay in Myanmar on turnkey basis.

Following clarifications are issued in response to the queries received from Prospective bidders:

Sl no	Tender Technical Queries	Clause as published in the tender	Remarks/sub mission/Justification	Clarifications/Corrigenda/ Amendment
01	Page 4 , clause 2(g) , ISO	Relevant ISO certificate in laboratory infrastructure	Kindly amend the relevant ISO certificate in Laboratory infrastructure / IT Infrastructure. Please note that the project is for setting up of embedded systems lab, which is part of IT. Even page 25, sl no7, of the tender asks for ISO in IT infrastructure.	
02	Page 4,6, clause 2(i) 4.2, Order copy	The copy of Supply Orders/ Contracts/ Agreements issued by/ signed with Government of India (Ministry/ Department/ Undertaking/ PSU/ Educational Institutions such as IIT's, NIT's, or other such Central Universities/Banking sector/IT-SEZs/Technology parks/ Stock/Commodity exchanges and reputed private organizations including educational institutions in India) for similar work, executed by the bidders in last five years ending December 31st 2017. The bidder should also enclose the completion certificate duly issued by the end user. The bidder should have completed at least ONE similar work not less than Rs. 321 Lakhs OR TWO similar works not less than Rs. 201 Lakhs each OR THREE similar works not	Similar work should mean setup of any scientific lab instead of lab with similar items. This will help in more bidders participating, This definition should be changed wherever its appearing in the tender document. As leading integrator , we have setup labs at ERTL for MNRE for testing of solar panels and also language lab with ICT Infrastructure. Also please note private orders should be allowed as, veracity of the orders can not be checked.	The tender conditions, ask for experience in similar work undertaken by the bidder. Hence scientific laboratories is also part of the similar work already outlined in the tender terms and conditions. As regards to the order value etc, please refer to S. No. 15

		less than 160 Lakhs each. The similar work means supply & installation of all/ most of the items mentioned in this tender document in a single project on turn-key basis in India/abroad.		
03	Page 5, clause 4	Date of submission of bids, and opening of technical bids, last date of submission of bids is 01 st February 2018 upto 1300 hours	Kindly extend the bid submission date by 15 days ie. From 1 st February 2018 to 16 th February 2018.	The last date for submission of bids is now 8 th Feb 2018.
04	Page 12, clause 7, Payment Terms	<p>i. IIIT Bangalore shall release 5% of the payment upon purchase order subject to receipt of the performance bank guarantee as outlined in clause 8 below.</p> <p>ii. IIIT Bangalore shall release 35% of the payment upon dispatch of the tendered items subject to submission of original shipping documents and BL.</p> <p>iii. IIIT Bangalore shall release 30% of the payment upon delivery of the tendered items at MIIT subject to satisfactory certificate of receipt by Embassy of India, Yangon and/or MIIT/IIITBangalore.</p> <p>iv. Payment of 30% of the purchase order value will be made after physical verification by a Project Monitoring Committee (PMC).</p> <p>v. In case of foreign bidders who quoted in US \$, letter of credit(LC) will be opened and payment would be released as per 7(1), 7(2), 7(3) and 7(4).</p>	<p>Request to change the payment terms as following.</p> <p>i.IIIT Bangalore shall release 5% of the payment upon purchase order subject to receipt of the performance bank guarantee as outlined in clause 8, below.</p> <p>ii.IIIT Bangalore shall release 75% of payment upon dispatch of the tendered items subject to submission of original shipping documents BL/AWB.</p> <p>iii.Payment of 20%, of the purchase order value, will be made after physical verification by a Project Monitoring Committee (PMC)</p>	The current payment terms are already in effect for the other tenders being administered for this project. The change is not accepted.
05	Page 4, clause 2(h) , Manufacturer Authorized Format (MAF)	Only the authorised distributors/ resellers are allowed to bid for the items mentioned in the tender document. The specific authorisation letter from	The items asked in the tender, are available in the open market and hence MAF is not required. For example most of the items are from Raspberry and Piface. Both are a	The change is partially accepted. MAF is not required for Raspberry and PiFace. However since the tender also asks for support and warranty for these products, the bidder needs to clearly outline the support/warranty plan for these products

		Principal/s clearly indicating that the bidder is competent to sell & provide services for the items mentioned in the Scope of Supply given in this tender document should be enclosed.	charity/foundation and does not work for a profit, Their products available freely in the market.	as well to adequately cover these products as well.
06	Page7, Clause(4.4)	Bidders should be authorized distributors/resellers for all the items as mentioned in the tender document.	Bidder should be authorized distributor/reseller of IT and ICT products as the lab setup is for embedded systems.	The query is already answered in #5 above.
07	Section 1 Clause No 2.d,	Self-Attested copy of VAT/ CST, Service Tax Number/ Registration certificate, GST as applicable	Please delete VAT / CST No & Service Tax Number as GST is now in place	The change is accepted.
08	Section 1 Clause No 2.g	Relevant ISO certificate in Laboratory Infrastructure	Please allow Relevant ISO Certificate in Laboratory / IT Infrastructure.	The query has already been answered elsewhere in the document
09	Section 1 Clause No 2.i	The copy of Supply Orders/ Contracts/ Agreements issued by/ signed with Government of India (Ministry/ Department/ Undertaking/ PSU/ Educational Institutions such as IIT's, NIT's, or other such Central Universities/Banking sector/IT-SEZs/Technology parks/ Stock/Commodity exchanges and reputed private organizations including educational institutions in India) for similar work, executed by the bidders in last five years ending December 31st 2017. The bidder should also enclose the completion certificate duly issued by the end user. The bidder should have completed at least ONE similar work not less than Rs. 321 Lakhs OR TWO similar works not less than Rs. 201 Lakhs each OR THREE similar works not less than 160 Lakhs each. The similar work means supply & installation of all/ most of the items mentioned in this tender document in a single	Please remove Private orders as there is no way authenticity of order can be checked.	The change is not accepted. No change. As regards to the order value etc, please refer to S.No. 15

		project on turn-key basis in India/abroad.		
10	Section 2 Clause No 4 Sub clause 4.4	Bidder should be authorised distributors/ resellers for all the items as mentioned in the tender document.	Please allow bidder should be authorized reseller / distributor of IT/ICT products .	The query is already answered in #5 above.
11	Section 3 Clause No 7	<p>IIIT Bangalore shall release 5% of the payment upon purchase order subject to receipt of the performance bank guarantee as outlined in clause 8 below.</p> <p>ii. IIIT Bangalore shall release 35% of the payment upon dispatch of the tendered items subject to submission of original shipping documents and BL.</p> <p>iii. IIIT Bangalore shall release 30% of the payment upon delivery of the tendered items at MIIT subject to satisfactory certificate of receipt by Embassy of India, Yangon and/or MIIT/IIITBangalore.</p> <p>iv. Payment of 30% of the purchase order value will be made after physical verification by a Project Monitoring Committee (PMC).</p> <p>v. In case of foreign bidders who quoted in US \$, letter of credit(LC) will be opened and payment would be released as per 7(1), 7(2), 7(3) and 7(4).</p>	Please allow 70% payment on dispatch against submission of Original Invoice, Packing List, Copy of Bill of Lading / AWB & Copy of Insurance & Balance 30% against Installation, testing, Commissioning duly signed by Embassy of India and /or MIIT/IIIT-Bangalore.	The current payment terms are already in effect for the other tenders being administered for this project. The change is not accepted.
12	Section 3 Clause No 6	Warranty: All the items covered in the schedule of requirements, shall carry minimum 2 (two) years on site comprehensive warranty from the date of its installation & commissioning. The bidder must undertake to provide the installation and warranty service in Myanmar. The repairing/	Please clarify Warranty required is 2 year or 1 year as per MAF Format on page no 22.	The warranty required is for 2 years as already outlined in the document

		<p>rectification/ replacement/ configuration required, if any, must be done at site only. During the warranty, all complaints should be rectified within 7 days from the time of complaint. In case the rectification of fault involves replacement of some hardware the same should be carried out within 21 days from the date of intimation. Failure to do so would result in the invoking of the PBG. The PBG will be released by IIIT Bangalore only after the submission of satisfactory performance certificate issued by MIIT / Indian Mission & end-user after the completion of warranty period. The Purchaser reserves the right to reject any set of equipment found defective within 30 days after the date of acceptance of equipment. The cost towards replacement will have to be borne by the supplier.</p>		
13	MAF Format – Page No 22	Manufacturer Authorized Format	Please allow MAF as per Original Equipment Format.	The MAF format has been specified in the tender document. No change
14	Page 5, clause 4	Date of submission of bids, and opening of technical bids, last date of submission of bids is 01 st February 2018 upto 1300 hours	Kindly extend the bid submission dated 21 st February 2018	The bid submission last date has now been extended to 8 th Feb 2018.
15	Section II- 4.2 Para	The copy of Supply Orders for similar work, executed by the bidders in last five years ending December 31 st 2017.	Order value for similar work is too high, as the same you need to ensure the credibility of a company. Anyway, if you would like to ensure this, you can evaluate the company and its work by turnover. We are requesting you to keep this value may be Rs. 50 Lakhs average for last three year, also accept order from overseas partners as well. There should be some relaxation to the companies who has an experience to execute the project at your MIIT, Mandalay, Myanmar	<p>Given the change in the EMD amount specified earlier in the document, the revised text for Section I, Para 2(i) and Section II Para 4.2 would read as</p> <p>The copy of Supply Orders/ Contracts/ Agreements issued by/ signed with Government of India (Ministry/ Department/ Undertaking/ PSU/ Educational Institutions such as IIT's, NIT's, or other such Central Universities/Banking sector/IT-SEZs/Technology parks/ Stock/Commodity exchanges and reputed private organizations including educational institutions in India) for similar work, executed by the bidders in last five years ending December 31st 2017. The bidder</p>

				should also enclose the completion certificate duly issued by the end user. The bidder should have completed at least ONE similar work not less than Rs. 80 Lakhs OR TWO similar works not less than Rs. 50 Lakhs each OR THREE similar works not less than 40 Lakhs each. The similar work means supply & installation of all/ most of the items mentioned in this tender document in a single project on turn-key basis in India/abroad
16	Section II – 4.3	Average Turnover 1.2Cr.	We are requesting you to evaluate worth and credibility of a company based on its average annual turnover at least for last three years.	Section I, Para 2(e) would now read as A certificate by the auditor/ CA/ CS indicating the turnover of the firm should be enclosed. The bidder should have minimum average turnover of Rs 30 Lakhs in last three financial years
17	Point no 01 on page no 26	Delivery	As the site is in Mandalay, Myanmar, delivery period should be 90 days.	No change, the delivery timelines remain unchanged.
18	Page No. 15 / S.No. 01	Raspberry Pi 3 Specifications: SoC: Broadcom BCM2837 CPU: 4× ARM Cortex-A53, 1.2GHz GPU: Broadcom VideoCore IV RAM: 1GB LPDDR2 (900 MHz) Networking: 10/100 Ethernet, 2.4GHz 802.11n wireless Bluetooth: Bluetooth 4.1 Classic, Bluetooth Low Energy Storage: microSD GPIO: 40- pin header, populated Ports: HDMI, 3.5mm analogue audio-video jack, 4× USB 2.0, Ethernet, Camera Serial Interface (CSI), Display Serial Interface (DSI)	To run or power on this module user must required power supply of 5VDC/2A, microSD card with OS (minimum 8GB), HDMI to VGA converter for display and keyboard & mouse to operate. Details of these items are not mentioned in the tender. The same is required or its already there with your end. Please clarify so that we can quote accordingly. From the tender specifications, it seems that these are some ready modules which come in open form. As it will be used by students and will be used in an open environment, we are suggesting you to buy the same in some housing which ensure its protection, life of the product etc. If you would like to buy Power Supply as well with this board, we are suggesting you our TechBook (an innovative housing) which will include this board, power supply, peripherals so that instead of separate board and power supply it will be complete Solutions which helps students for in depth learning and it is easy to handle and keep product in lab. Please refer the attached	Please see the revised specifications appended below in Annexure II

			note on benefits of TechBook for your ready reference.	
19	Page No. 15 / S.No. 2 & 3	2. Raspberry Pi Camera Board & 3. Pi NoIR Infrared Camera	As per our suggestion these two cameras are almost similar (S.No. 3 is better). Instead of buying two types of cameras you can buy any one of them & buy some other module which will be useful for other applications. (i.e. Data acquisition card for Sensors interface. This we can also interface with Raspberry pi, PC and other modules. As Raspberry pi doesn't have internal ADC so user cannot interface any analog sensor directly. This will also help in developing IoT based applications. So it is better instead of S.No. 2 or S.No. 3 you can buy DAQ Card with following specifications Analog Inputs : 8 Nos. (24 Bit resolution) Analog Output : 2 Nos. Digital Input : 8 Nos. Digital Output : 8 Nos. Unity gain amplifier : 2 (0- 5 V) UART and USB Interface with data logging.	Please see the revised specifications appended below in Annexure II
19	Page No. 16 / S.No. 6	Raspberry Pi Wireless Inventors Kit Specifications: Comes with plug in wires and a solderless breadboard. 4Gb SD card image (saves you lots of Pi configuration). Examples use LLAP to drive the devices (LLAP devices can be mixed with our out the box wireless devices). Made in the UK. • 1 x Ciseco Slice of Radio. 1 x Ciseco XinoRF development board. 1 x 4Gb SD card with Pi OS and sample software. 1 x USB cable. 1 x Small breadboard. 5 x Red LED. 5 x Yellow LED. 5 x Green LED. 1 x Blue LED. 1 x Transistor. 1 x Diode. • 1 x Variable resistor (potentiometer). 10 x 10K Resistor. 20 x 470R Resistor. 1 x Light Dependant Resistor (light sensor). 1 x Thermistor	nstead of this wireless Kit, student or user should learn Zigbee wireless module, which will be useful in learning of wireless sensor technology and also will useful for making Internet of Thing (IoT) node. Our suggested model is compatible with your tender item given on Page No. 17, S. No. 10 whereas there is no compatibility of these both the items with the given specifications mentioned in your tender documents. These are for your information and decide accordingly.	Please see the revised specifications appended below in Annexure II

		(temperature sensor). 1 x Piezo sounder. 3 x Push buttons. 25 x Jump wire (assorted colors). • Length of hook up wire. Downloads		
20	Page No. 17 / S.No. 11	Three-output DC power supply 2 X 0-30V/3A, 1 X 4-6 V/3 A	The most popular power supplies coming with following specifications: Multiple DC Power Supply 0 - 32V / 2A, 15V / 1A Tracking, 5V / 5A As many IITs, NITs, IIITs are using Power Supplies with these specifications and configuration.	Please see the revised specifications appended below in Annexure II
21	Page No. 17 / S.No. 12	Digital Storage Oscilloscope Bandwidth: 70 MHz Real Time Sample Rate: 1 GSa/s Analog channels: 2 Record length: 2.5 points Trigger Modes: Edge, Pulse Width, Video, Slope, etc. Math Functions: +, -, *, /, and FFT Automatic Measurements: 32 Display: 7" Color, WVGA (800 x 480) Configuration ports: USB, RS232, Pass/Fail output	For the given Bandwidth and Sample rate standard Memory Depth should be 12Mpts. Automatic Measurements should be minimum 25 numbers. In Embedded Lab 4 Channel DSO is more useful and preferable than 02 Channel DSO. RS232 has obsolete port as these days no computers are coming and available with RS232. Rather it should have LAN interface which is more common and available now a days.	Please see the revised specifications appended below in Annexure II
22	Page No. 17 / S.No. 13	Arbitrary Waveform Generator Display: 4.3" LCD Analog Channels: 2 Frequency range: 1µHz to 60 MHz for sine, 5 MHz for ramp, 30 MHz for all others. Sampling rate: 300 MSa/s Vertical Resolution: 14- Bit Types of waveforms: Sine, square, ramp, pulse, noise and 45 other built-in, 5 user-defined Amplitude: 1 mVpp – 10 Vpp into 50-Ohm load Modulation: FM, AM, PM, PWM, Sum, FSK, BPSK, SUM. Built-in Frequency Counter: 350MHz Software For Arbitrary Waveform Editing Standard Interface: USB Host, USB Device and RS-232 Warranty: 1 year or more	The common display size with 60MHz AWFG is 3.4" LCD. Standard frequency range available with 60 MHz AWFG are: Sine: 60 MHz, Square and Pulse: 25MHz, Harmonic and Arbitrary Waveform: 20MHz, Noise: 60MHz Bandwidth. Built-in Frequency Counter should be of 200MHz. Modulation should be AM, FM, PM, ASK, FSK, PSK and PWM. RS232 has obsolete port as these days no computers are coming and available with RS232. Rather it should have LAN interface which is more common and available now a days.	Please see the revised specifications appended below in Annexure II

Annexure II

Revised Technical Specification (The changes are outlined in Red)

S. No.	Item details	Quantity
1	Raspberry Pi 3 Specifications: SoC: Broadcom BCM2837 CPU: 4× ARM Cortex-A53, 1.2GHz GPU: Broadcom VideoCore IV RAM: 1GB LPDDR2 (900 MHz) Networking: 10/100 Ethernet, 2.4GHz 802.11n wireless Bluetooth: Bluetooth 4.1 Classic, Bluetooth Low Energy Storage: microSD GPIO: 40-pin header, populated Ports: HDMI, 3.5mm analogue audio-video jack, 4× USB 2.0, Ethernet, Camera Serial Interface (CSI), Display Serial Interface (DSI)	100
2	Raspberry Pi Camera Board Specifications: Weight 3g Still resolution 8 Megapixels Video modes 1080p30, 720p60 and 640 × 480p60/90 Linux integration V4L2 driver available C programming API OpenMAX IL and others available Sensor Sony IMX219 Sensor resolution 3280 × 2464 pixels Sensor image area 3.68 x 2.76 mm (4.6 mm diagonal) Pixel size 1.12 μm x 1.12 μm Optical size 1/4" Focal length 3.04 mm Horizontal field of view 62.2 degrees Vertical field of view 48.8 degrees Focal ratio (F-Stop) 2.0	100
3	Pi NoIR Infrared Camera Specifications: <ul style="list-style-type: none">• Improved Resolution<ul style="list-style-type: none">o 8 megapixel native resolution high quality Sony IMX219 image sensoro Cameras are capable of 3280 x 2464 pixel static images• Remaining High Quality	100

	<ul style="list-style-type: none"> o Capture video at 1080p30, 720p60 and 640x480p90 resolutions o All software is supported within the latest version of Raspbian Operating System o No Infrared filter making it perfect for taking Infrared photographs or photographing objects in low light (twilight) conditions o 1.4 μm X 1.4 μm pixel with OmniBSI technology for high performance (high sensitivity, low crosstalk, low noise) o Optical size of 1/4" 	
4	<p>PiFace Digital</p> <p>Specifications:</p> <p>PiFace Digital is designed to plug on to the GPIO of your Raspberry Pi, allowing you to sense and control the real world. With PiFace Digital you can detect the state of a switch, for example from a door sensor, a pressure pad or any number of other switch types. Once this state has been detected, you can write your own software for Raspberry Pi that determines how to respond to that switch state. You can drive outputs to power motors, actuators, LEDs or anything you can imagine.</p> <ul style="list-style-type: none"> • 2 Changeover Relays • 4 Tactile Switches • 8 Digital Inputs • 8 Open-Collector Outputs • 8 LED Indicators • Graphical Emulator • Easy to program in Python 3 and 2, Scratch and C • Support for interrupts 	100
5	<p>Sense HAT packs an 8x8 colour LED matrix</p> <p>Specifications:</p> <ul style="list-style-type: none"> • Gyroscope – angular rate sensor: +/-245/500/2000dps • Accelerometer - Linear acceleration sensor: +/-2/4/8/16 g • Magnetometer - Magnetic Sensor: +/- 4/8/12/16 gauss • Barometer: 260 – 1260 hPa absolute range (accuracy depends on the temperature and pressure, +/- 0.1 hPa under normal conditions) • Temperature sensor (Temperature accurate to +/- 2 degC in the 0-65 degC range) • Relative Humidity sensor (accurate to +/- 4.5% in the 20-80%rH range, accurate to +/- 0.5 degC in 15-40 degC range) • 8x8 LED matrix display • Small 5 button joystick • Product Dimensions: 65.1mm x 56.6mm x 13.9mm / 2.6" x 2.2" x 0.5" • Product Weight: 20.4g / 0.7oz 	100
6	<p>Raspberry Pi Wireless Inventors Kit</p> <p>Specifications:</p>	100

	<p>Comes with plug in wires and a solderless breadboard. 4Gb SD card image (saves you lots of Pi configuration). Examples use LLAP to drive the devices (LLAP devices can be mixed with our out the box wireless devices). Made in the UK.</p> <ul style="list-style-type: none"> • 1 x Ciseco Slice of Radio. 1 x Ciseco XinoRF development board. 1 x 4Gb SD card with Pi OS and sample software. 1 x USB cable. 1 x Small breadboard. 5 x Red LED. 5 x Yellow LED. 5 x Green LED. 1 x Blue LED. 1 x Transistor. 1 x Diode. • 1 x Variable resistor (potentiometer). 10 x 10K Resistor. 20 x 470R Resistor. 1 x Light Dependant Resistor (light sensor). 1 x Thermistor (temperature sensor). 1 x Piezo sounder. 3 x Push buttons. 25 x Jump wire (assorted colors). • Length of hook up wire. Downloads. 	
7	<p>MotoZero - Motor control module</p> <p>Specifications:</p> <ul style="list-style-type: none"> • MotoZero PCB • 40-pin GPIO header • 2x Motor driver chips • 2x Motor driver sockets • 5x Terminal blocks • 1x capacitor 	100
8	<p>RaZberry</p> <p>Specifications:</p> <p>A Sigma Designs ZM5202 Z-Wave transceiver module (a so called 5th generation Z-Wave module, an external 32 K SPI flash for network data and a PCBA antenna. Two LEDs to indicate certain status of the Z-Wave controller chip. Beside the PCBA antenna there is an option to solder a whip antenna and a IPEX connector.</p> <p>The power consumption of the board is typically 18 mA @ 3.3 V but can peak at 40 mA when the chip is transmitting.</p>	100
9	<p>Unicorn HAT (LED square 8x8 matrix display)</p> <p>Specifications:</p> <ul style="list-style-type: none"> • 64 RGB LEDs (WS2812B) • Python API • Compatible with Raspberry Pi B+ • EEPROM with Raspberry Pi HAT configuration details • LED data driven via DMA over PWM 	100
10	<p>Arduino Uno Rev 3</p> <p>Specifications:</p> <p>Microcontroller-ATmega328P Operating Voltage-5V Input Voltage (recommended)-7-12V Input Voltage (limit)-6-20V</p>	100

	<p>Digital I/O Pins-14 (of which 6 provide PWM output) PWM Digital I/O Pins-6 Analog Input Pins-6 DC Current per I/O Pin-20 mA DC Current for 3.3V Pin-50 mA Flash Memory-32 KB (ATmega328P) of which 0.5 KB used by bootloader SRAM-2 KB (ATmega328P) EEPROM-1 KB (ATmega328P) Clock Speed-16 MHz LED_BUILTIN-13 Length-68.6 mm Width-53.4 mm Weight-25 g</p>	
11	<p>Three-output DC power supply 0 - 30V / 2A, ±15V / 1A Tracking, 5V/2A</p>	40
12	<p>Digital Storage Oscilloscope Bandwidth: 70 MHz Real Time Sample Rate: 1 GSa/s Memory depth: 12 Mpts Analog channels: 2 Record length: 2.5 points Trigger Modes: Edge, Pulse Width, Video, Slope, etc. Math Functions: +, -, *, /, and FFT Automatic Measurements: 32 Display: 7" Color, WVGA (800 x 480) Configuration ports: USB, RS232 or LAN, Pass/Fail output</p>	50
13	<p>Arbitrary Waveform Generator Display: 3.4" or larger LCD Analog Channels: 2 Frequency ranges: 1µHz to 60 MHz for sine, 25 MHz for square and pulse, 20 MHz for all others. Sampling rate: 300 MSa/s Vertical Resolution: 14-Bit Types of waveforms: Sine, square, ramp, pulse, noise and 45 other built-in, 5 user-defined Amplitude: 1 mVpp – 10 Vpp into 50-Ohm load Modulation: FM, AM, PM, PWM, FSK, BPSK, ASK. Built-in Frequency Counter: 200MHz Software For Arbitrary Waveform Editing Standard Interface: USB Host, USB Device and LAN Warranty: 1 year or more</p>	50

14	Power Supply Adapter Charger 5V 3A AC 100-240V DC 15W micro for USB Raspberry pi	100
15	DAQ Card Specifications: Analog Inputs: 8 Channels (16 Bit resolution) Max Sampling Rate: 100 kS/s Analog Output: 2 Channels Digital Input: 8 Channels Digital Output: 8 Channels Unity gain amplifier : 2 (0- 5 V) UART and USB Interface with data logging.	20