

CORRIGENDUM- 1

Tender Reference no : EE/SARA/051/2022/ELECTROKIT

Name of the Item : Electronic Kit

Corrigendum details : Extension of Bid Submission Date & Addendum to existing technical specification

Extension of Bid Submission Date:

The due date for the submission of bids has been extended to 10/11/2022 @ 3 PM
& the bid opening is 11/11/2022 @ 3 PM

Tender Specification – Technical Part
Scope, Technical Specifications and Construction Details

I. Scope of support:

The Trainer Kit shall support to provide hands-on experience in conducting the Practical Lab sessions in the area of “Basic Electronics and Applications” to the School Students (IX, X, XI and XII).

(Note: See the views of the trainer kits given in Appendix 1 & 2)

II. Technical Specifications:

S. No	Block level description	Remarks	Compliance (Yes/No)	Reference Page No
(1)	<p>Main experimental blocks:</p> <p>Basics of Electric circuits Basics of Electronic devices Diode and Transistor circuits</p> <p>Basics OP-Amp circuits and Timer circuits Basics of Digital Electronics</p> <p>Sensors, Solar and their applications</p> <p>Arduino uno R3 programmer based experiments</p>	Refer Appendix 2 to locate different blocks		
(2)	DSO 138 Oscilloscope board or equivalent	To be mounted on the inner side of the top cover.		
(3)	Low cost DMM: (3 1/2 digit LCD display)	To be provided along with kit		
(4)	<p>Solder board with pre-mounted tinned lugs:</p> <p>To provide hands on training on soldering to mount selected components/ devices</p>	Size 4*8 cm shall be provided along with trainer kit		

<p>(5)</p>	<p>(i) DC Power Supply (SMPS): 220 V AC powered SMPS shall be built-in to provide +5 V (1 A), + 12 V (0.5 A), – 12 V (0.1 A),</p> <p>There shall be a Power ON switch, power indicator, fuse, power receptacle and a detachable 1 m power cord.</p> <p>(ii) Variable DC power supply (0-12V) / 100mA</p> <p>For (i) and (ii) :Power supply terminals shall be brought out to the corresponding sockets to the top of Main PCB.</p> <p>(iii) Additional transformer (step down): It shall be 2 VA, Pri 220 V, Secondary 6V-0-6 V, 100 mA Secondary terminals alone shall be brought out to the terminals on the top of Main PCB.</p>	<p>It shall be provided as separately at the bottom of the kit(i.e. PCB or readymade module)</p>		
<p>(6)</p>	<p>Simple Function Generator (20 Hz –10 kHz): It shall provide sine wave (10 Vp-p), square/ rectangular wave of variable duty cycle (10Vp-p) and pulse o/p (TTL)</p>			

III. Other technical requirements:

<p>(1)</p> <p>(2)</p>	<p>Important Specs including work environment:</p> <p>(i) AC Mains input: Single phase, 160 to 260V, 50 Hz or universal AC power input.</p> <p>(ii) Power consumption @ 220 V: 10 W max</p> <p>(iii) Ambient temperature: 40 deg C max.</p> <p>(iv) Shall have test approvals as applicable for safety compliance, thermal, vibration and drop tests conducted on the product.</p> <p>(v) Size: 320 mm X 260 mm X 90 mm (Approx.)</p> <p>(vi) Weight: 2.5 kg (max)</p> <p>Warranty: Two years.</p>			
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IV. Other features:

S.No	Description	Compliance (Yes/No)	Reference Page No
1	The kit shall work well under the low and fluctuating AC mains power conditions in the rural environment.		
2	It shall be compact (mini briefcase type) and robust with smooth finish.		
3	The material used shall be of good quality PVC or other light weight material.		
4	Top cover shall have IIT Madras Emblem firmly fixed as shown in the Appendix 1.		
5	Upper half of the inside area of the top cover shall be used to mount the DSO.		
6	Leads of resistors/capacitors used must be of good quality and corrosion free.		

V. List of other supporting items: (Refer Appendix 4)

S. No	Requirements	Remarks	Compliance (Yes/No)	Reference Page No
(1)	A minimum set of supporting tools required (like simple wire gage, minisoldering iron) shall be a part of the Trainer Kit	To determine the SWG of a given wire, to make simple wire joints and connect a three pin 5 A top with 1 meter AC power cord; and to provide soldering practices on the selected components/devices		
(2)	Simple center zero DC milli ammeter (50mA)	Shall be provided along with the kit		
(3)	Set of connecting leads and Jumpers	20 Nos of male to female - 10cm and 20cm each 20 Nos female to female - 10cm and 20cm each		
		Jumper caps - 25 Nos		

VI. Important instructions to the bidders:

S. No	Description	Compliance (Yes/No)	Reference Page No
1	As on now, 2500 Trainer Kits are planned to begin with.		
2	Suppliers shall quote separately as given below along with the details of different taxes payable for the following. (i) Trainer kit without oscilloscope (ii) Trainer kit with oscilloscope		

3	Supplier shall be required to provide their planning and time schedule in their bids, for executing the order in the given time frame by IIT Madras.		
4	Technical as well as commercial bids will be evaluated after the closing date.		
5	On the basis of the quotes received from the different suppliers, single supplier or more than one supplier will be selected to execute the order in a given time.		
6	NDA shall be signed by the supplier/s, before the receipt of P.O.		
7	P.O will be released to the selected bidder/s along with the Terms and Conditions of IIT Madras.		
8	Suppliers shall be required to submit five prototype samples for review and quality testing as per the requirements including the reliability and robustness.		
9	After the approval of the samples by IIT Madras, the suppliers can commence the large scale production and submission of random samples in parallel, as and when required and complete the delivery.		

I. List of Appendices:

Appendix 1- Photographic Views of the Trainer Kit with approx dimensions

Appendix 2 - Top view of PCB layout

Appendix 3 - List of components for Main PCB

Appendix 4 - List of other items for Trainer kit

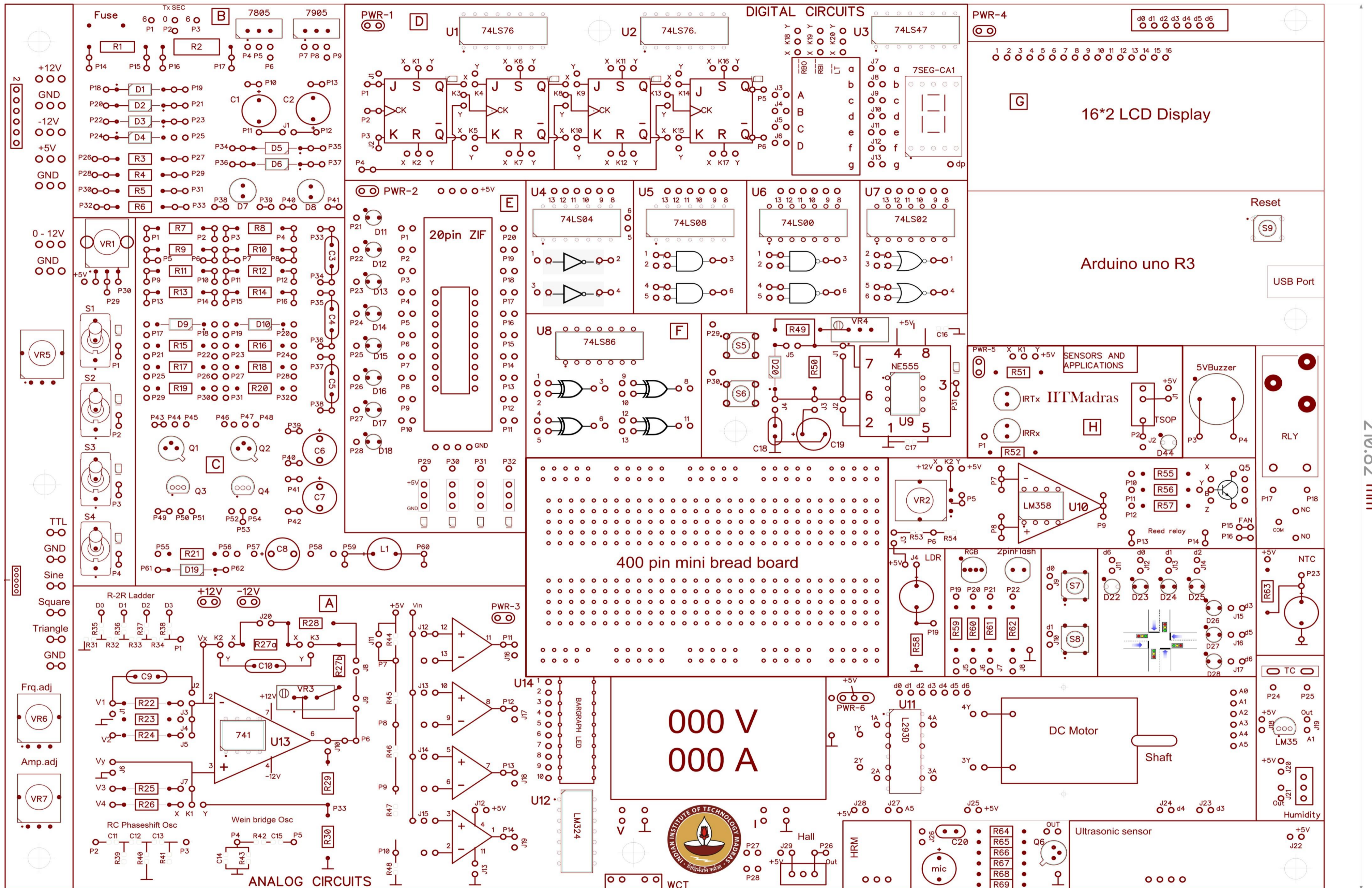
Appendix 5 - Special components modules picture

Trainer Kit View



Trainer Kit Dimension = Length -310mm, Width -260mm, Height-90mm (Top to Bottom)

Appendix - 2 (Updated)



210.82 mm

295.91 mm

Appendix - 3 (Updated)

Components list for main PCB (Double sided PCB - 29.5 * 21 cm)

Component list							
Components Name	Specs	Package	Qty/Kit	Total Qty	Picture Refer In Appendix -5	Compliance (Yes/No)	Reference Page No
Resettable Fuse	200mA	Through hole	1	2500	1		
ON/OFF switch with LED indicator	5A	Through hole	1	2500	-		
Transformer	6-0-6V/200mA	Through hole	1	2500	-		
Resistors - 0.25W -CFR	68Ω	Through hole	3	7500	-		
	100Ω	Through hole	3	7500	-		
	220Ω	Through hole	1	2500	-		
	470 Ω	Through hole	3	7500	-		
	560Ω	Through hole	3	7500	-		
	4.7kΩ	Through hole	1	2500	-		
	1 kΩ	Through hole	2	5000	-		
	10 kΩ	Through hole	11	27500	-		
	12 kΩ	Through hole	1	2500	-		
	15 kΩ	Through hole	1	2500	-		
	20 kΩ	Through hole	3	7500	-		
	22 kΩ	Through hole	2	5000	-		
	100 kΩ	Through hole	6	15000	-		
	120 kΩ	Through hole	1	2500	-		
	180 kΩ	Through hole	1	2500	-		
	470 kΩ	Through hole	1	2500	-		
1MΩ	Through hole	1	2500	-			
Resistors - 0.25W -MFR	1 kΩ	Through hole	4	10000	-		
Resistors - 0.5W -CFR	120Ω	Through hole	1	2500	-		
Resistors - 1W -CFR	56Ω	Through hole	1	2500	-		
Resistors - SMD -0805 package	1 kΩ	SMD -0805	54	135000	-		
	10kΩ	SMD -0805	5	12500	-		
	20kΩ	SMD -0805	5	12500	-		
Capacitors - Electrolytic	10uF /25V	Through hole	3	7500	-		
	100uF /25V	Through hole	1	2500	-		
	330uF /25V	Through hole	2	5000	-		
Capacitors - Polyester	0.1uF /60V	Through hole	2	5000	-		
Capacitors - Ceramic	0.1uF /60V	Through hole	4	10000	-		
	1nF /60V	Through hole	1	2500	-		
Capacitors - SMD- Polyester	0.1uF /60V	SMD -0805	5	12500	-		
Capacitors - SMD- Tantalum	1uF/25V	SMD -0805	2	5000	-		
Capacitors - SMD- Ceramic	0.1uF /60V	SMD -0805	14	35000	-		
	0.01uF /60V	SMD -0805	1	2500	-		
Inductor - Ferrite bead	10mH	Through hole	1	2500	-		

Diodes	1N4007	Through hole - DO-41	4	10000	-	
	1N4148	Through hole - DO-41	5	12500	-	
	3.3V Zener	Through hole - DO-41	1	2500	-	
Transistors	BC107	Through hole - TO-18	3	7500	-	
	BD139	Through hole - SOT-32	1	2500	-	
	BC557	Through hole - TO-92	1	2500	-	
MOSFET	2N7000	Through hole - TO-92	1	2500	-	
Potentiometer	10kΩ	Through hole	2	5000	-	
Trimpot - 10 turns	10kΩ	Through hole - 3296	1	2500	-	
	100kΩ	Through hole - 3296	1	2500	-	
Red LED	3 mm LED	Through hole	7	17500	-	
Green LED	3 mm LED	Through hole	6	15000	-	
Yellow LED	3 mm LED	Through hole	2	5000	-	
Blue LED	3 mm LED	Through hole	1	2500	-	
White LED	5 mm LED	Through hole	2	5000	-	
RED LED	-	SMD -0805	9	22500	-	
Yellow LED	-	SMD -0805	4	10000	-	
Mini SPDT	-	Through hole	4	10000	2	
Push button switch	6*6 mm	Through hole	4	10000	3	
2 pin Flash LED	5mm	Through hole	1	2500	-	
RGB LED	Common cathode	Through hole	1	2500	-	
Bar graph LED	-	Through hole	1	2500	-	
7 segment LED	Common Anode	Through hole	1	2500	-	
IR Emitter	5mm	Through hole	1	2500	-	
IR Detector	5mm	Through hole	1	2500	-	
LDR	5 mm	Through hole	1	2500	-	
NTC	10kΩ	Through hole	1	2500	-	
TSOP -1738	-	Through hole - TO -92	1	2500	-	
Mini Microphone	9*7 mm	Through hole	1	2500	-	
5V Buzzer	-	Through hole	1	2500	6	
12V Transparent Relay	12V	Through hole	1	2500	8	
Hall sensor - A3144	-	Through hole - TO -92	1	2500	-	
Ultrasonic sensor	Module	Through hole	1	2500	10	
Smoke detector sensor	MQ-2	Through hole	1	2500	12	
LM35 sensor	TO -92	Through hole	1	2500	-	
Humidity sensor	Module	Through hole	1	2500	11	
Thermocouple	K Type	Through hole	1	2500	7	
Heart rate monitor	Module	Through hole	1	2500	13	

sensor						
Solar cell	6V/100mA	Through hole	1	2500	15	
DC Fan	5V- 0.2A	Through hole	1	2500	16	
DC Motor	3V-0.15A	Through hole	1	2500	17	
Mini Speaker	8Ω ,0.5W	Through hole	1	2500	4	
20 Pin ZIF socket	-	Through hole	1	2500	-	
Bread board	400 Pin	Through hole	1	2500	-	
16*2 LCD	Alphanumeric	Through hole	1	2500	-	

Arduino uno R3	To be incorporated in Main PCB		1	2500	-	
Digital panel meter	100V/10A	Through hole	1	2500	5	
8 Pin DIP base	Machine mount	Through hole	3	7500	-	
14 Pin DIP base	Machine mount	Through hole	6	15000	-	
16 Pin DIP base	Machine mount	Through hole	4	10000	-	
LM7805	DIP	Through hole	1	2500	-	
LM7905	DIP	Through hole	1	2500	-	
LM741	DIP	Through hole	1	2500	-	
NE555	DIP	Through hole	1	2500	-	
LM324	DIP	Through hole	1	2500	-	
L293D	DIP	Through hole	1	2500	-	
74LS08	DIP	Through hole	1	2500	-	
74LS02	DIP	Through hole	1	2500	-	
74LS04	DIP	Through hole	1	2500	-	
74LS00	DIP	Through hole	1	2500	-	
74LS86	DIP	Through hole	1	2500	-	
74LS47	DIP	Through hole	1	2500	-	
74LS76	DIP	Through hole	2	5000	-	

List of other items for Trainer kit

To be placed at Top left side				Compliance (Yes/No)	Reference Page No
DSO 138 Digital Oscilloscope with probes	-	1	2500		

Components in the Top right pouch					
Components name	Specs	Qty/Kit	Total Qty	Compliance (Yes/No)	Reference Page No
Solar cell	6V-100mA	1	2500		
4*3 Membrane keypad (Picture Ref. in Appendix 5)	-	1	2500		
Nichrome wire with bobbin	30 cm	1	2500		
Simple center zero DC milli ammeter	50mA	1	2500		
Connecting wires Male to Female	10cm	20	50000		
Connecting wires Male to Female	20cm	20	50000		
Connecting wires Female to Female	10cm	20	50000		
Connecting wires Female to Female	20cm	20	50000		
Holding Jumpers (Picture Ref. in Appendix 5)	With holding cap	25	62500		
Digital multimeter with probes	3 1/2 LCD display	1	2500		
mini screw driver	For trimpot adjust	1	2500		
SWG Scale	-	1	2500		
Different SWG Copper wire	5cm	1	2500		
Soldering iron with flux	8W	1	2500		
Soldering Lead	One role	1	2500		
Solder board with pre-mounted tinned lugs (For soldering practice)	4*8cm	1	2500		

To be placed at the bottom PCB					
SMPS	+12 V (0.5 A)	1	2500		
	- 12 V (0.1 A)				
	+5 V (1 A)				
	0-12V (0.5A)				
Function Generator 10kHz, 10Vp-p) (0-	Sine	1	2500		
	Square				
	Triangle				
	Pulse				
	TTL pulse				

PVC Enclosure for the kit	L = 310mm		
	W = 260mm		
	H=90mm		

Appendix -5 (Additional)

Special components - Modules pictures

Picture -01

Resettable fuse 0.4A



Picture -02

SPDT Mini toggle switch
6A, 125V



Picture -03

6 X 6 mm miniature push button switch



Picture -04

8 ohms, 0.5W Mini Speaker



Picture -05

100V, 10A Digital panel meter
(Dual LED, 0.28" Display)



Picture -06

5V Buzzer



Picture -07

K type Thermocouple



Picture -08

12V DC Glass Relay (SPDT)



Picture -09

Holding Jumper



Picture -10

HC-SR04- Ultrasonic Distance sensor



Picture -11

DHT-11 Temp and Humidity Sensor



Picture -12

Smoke sensor MQ2



Picture -13

Heart rate detector



Picture -14

4 X 3 Matrix membrane key –



Picture -15

6V 100mA Solar Cell



Picture -16

DC 5V, 0.2A Cooling fan



Picture -17

3V DC Toy motor

