

## PROJECT PROFILE ON SOLAR LIGHT SYSTEMS

### 1. PRODUCT CODE

- (i) ASICC : 79103
- (ii) NIC : 29307
- (iii) ITC(HS) (8 digit) :

**2. QUANTITY AND STANDARD :** MNES Specification

### 3. PRODUCT CAPACITY :

- SOLAR LANTERN : 24000 P.A. @ Rs. 2500/- apprx.
- SOLAR STREET LIGHT SYSTEM : 24000 P.A. @ Rs. 6500/- apprx.
- SOLAR HOME LIGHT SYSTEM : 24000 P.A. @ Rs.18500/-apprx.

: Value : Rs 66,00,00,000/-

**4. YEAR OF PREPARATION :** 2010 – 2011

**5. PREPARED AND UPDATED BY :** Electrical Division  
MSME-Development Institute  
Ministry of MSME  
Government of India  
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## **1. Introduction**

A Solar lantern is a simple application of solar photovoltaic technology, which has found good acceptance in rural regions where the power supply is irregular and scarce. Even in the urban areas people prefer a solar lantern as an alternative during power cuts because of its simple mechanism.

Home lighting System is powered by solar energy using solar cells that convert solar energy (sunlight) directly to electricity. The electricity is stored in batteries and used for the purpose of lighting whenever required. These systems are useful in non-electrified rural areas and as reliable emergency lighting system for important domestic, commercial and industrial applications. The SPV systems have found important application in the dairy industry for lighting milk collection/chilling centers mostly located in rural areas.

Solar Street Light system is designed for outdoor application in un-electrified remote rural areas. This system is an ideal application for campus and village street lighting. The system is provided with battery storage backup sufficient to operate the light for 10-11 hours daily. The system is provided with automatic ON/OFF time switch for dusk to dawn operation and overcharge / deep discharge prevention cut-off with LED indicators.

## **2. Market Potential**

The demand of Solar Light Systems is day by day increasing due to it works on consumption of NATURAL SOURCE OF ENERGY i.e. SUN LIGHT. Use of Electric Power is decreasing and people are shifting towards use of Solar Power. Many subsidies are also being given by Indian Government on use of Solar Power.

## **3. Basis and presumptions**

- i) The basis for calculation of production capacity has been taken on single shift basis on 75% efficiency.
- ii) The maximum capacity utilization on single shift basis for 300 days a year. During first year and second year of operations the capacity utilization is 60% and 80% respectively. The unit is expected to achieve full capacity utilization from the third year onward.

- iii) The salary and wages, cost of raw materials, utilities, rent, etc. are base on the prevailing rates in and around Agra. These cost factors are likely to vary with time and location.
- iv) Interest on term loan and working capital loan must be preferably current rate. Otherwise, the rate of interest on an average may be taken as 13%. This rate may vary depending upon the policy of the financial institutions/agencies from time to time.
- v) The cost of machinery and equipments refer to a particular make / model and prices are approximate.
- vi) The break even point percentage indicated is of full capacity utilization.
- vii) The project preparation cost etc. whenever required could be considered under pre-operative expenses.
- viii) The essential production machinery and equipment required for the project have been indicated. The unit may also utilize common test facilities available at MNES, Solar Energy Centre

#### **4. Implementation schedule**

The major activity in the implementation of the project has been listed and the average time for implementation of the project is estimated at 12 months:

	Period (in months) (suggestive)
1. Preparation of project report	1
2. Registration and other formalities	1
3. Sanction of loan by financial institutions	3
4. Plant & machinery	
a) Placement of orders	1
b) Procurement	2
c) Power connection/ Electrification	2
d) Installation/Erection of machinery/ Test Equipment	2
5. Procurement of raw material	2
6. Recruitment of Technical Personnel etc.	2
7. Trial production	11
8. Commercial production	12

Note

- 1. Many of the above activities shall be initiated concurrently
- 2. Procurement of raw materials commences of the 8<sup>th</sup> month onwards.
- 3. When imported plant and machinery are required, the implementation period of project may vary from 12<sup>th</sup> to 15 months.

## **5. TECHNICAL ASPECTS**

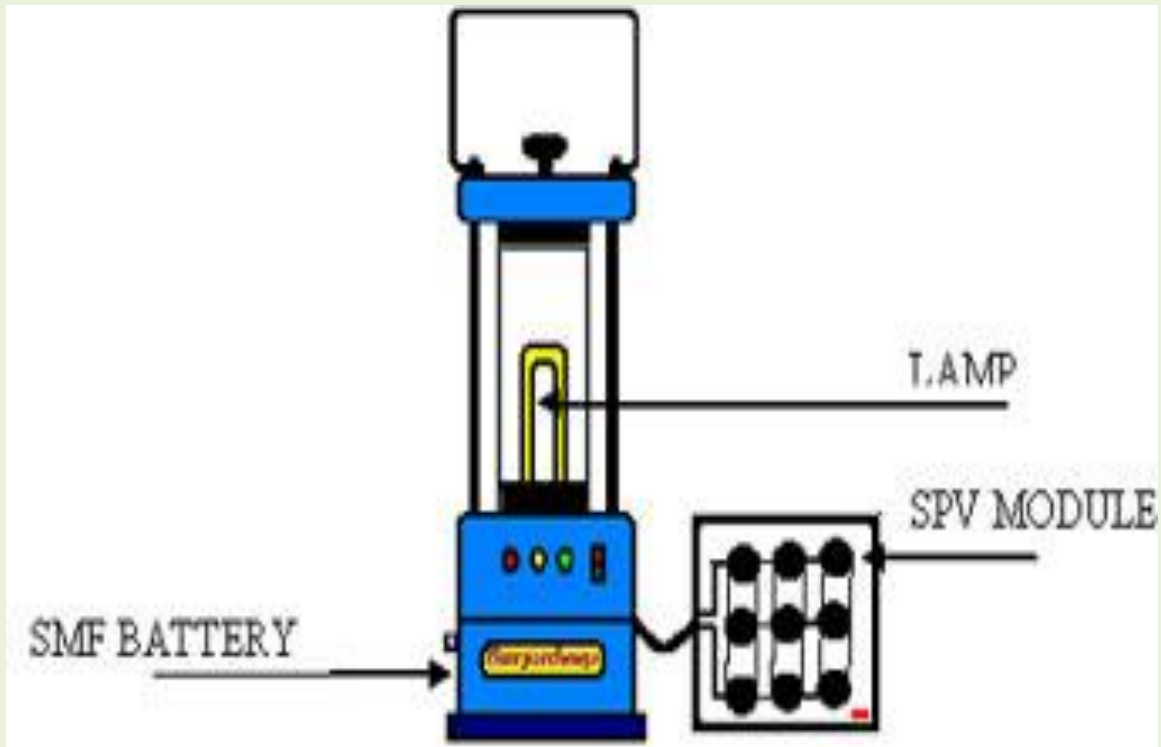
### **I. Process of Manufacture**

#### **MAJOR COMPONENTS:**

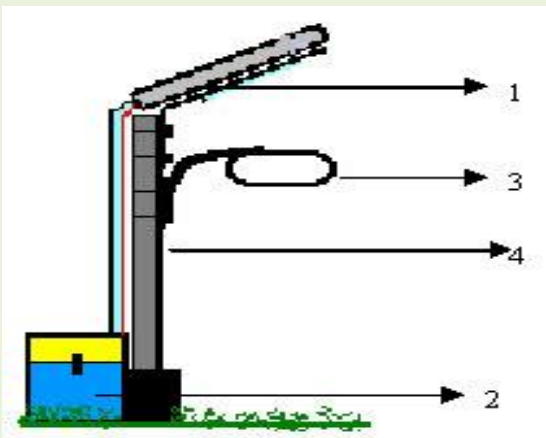
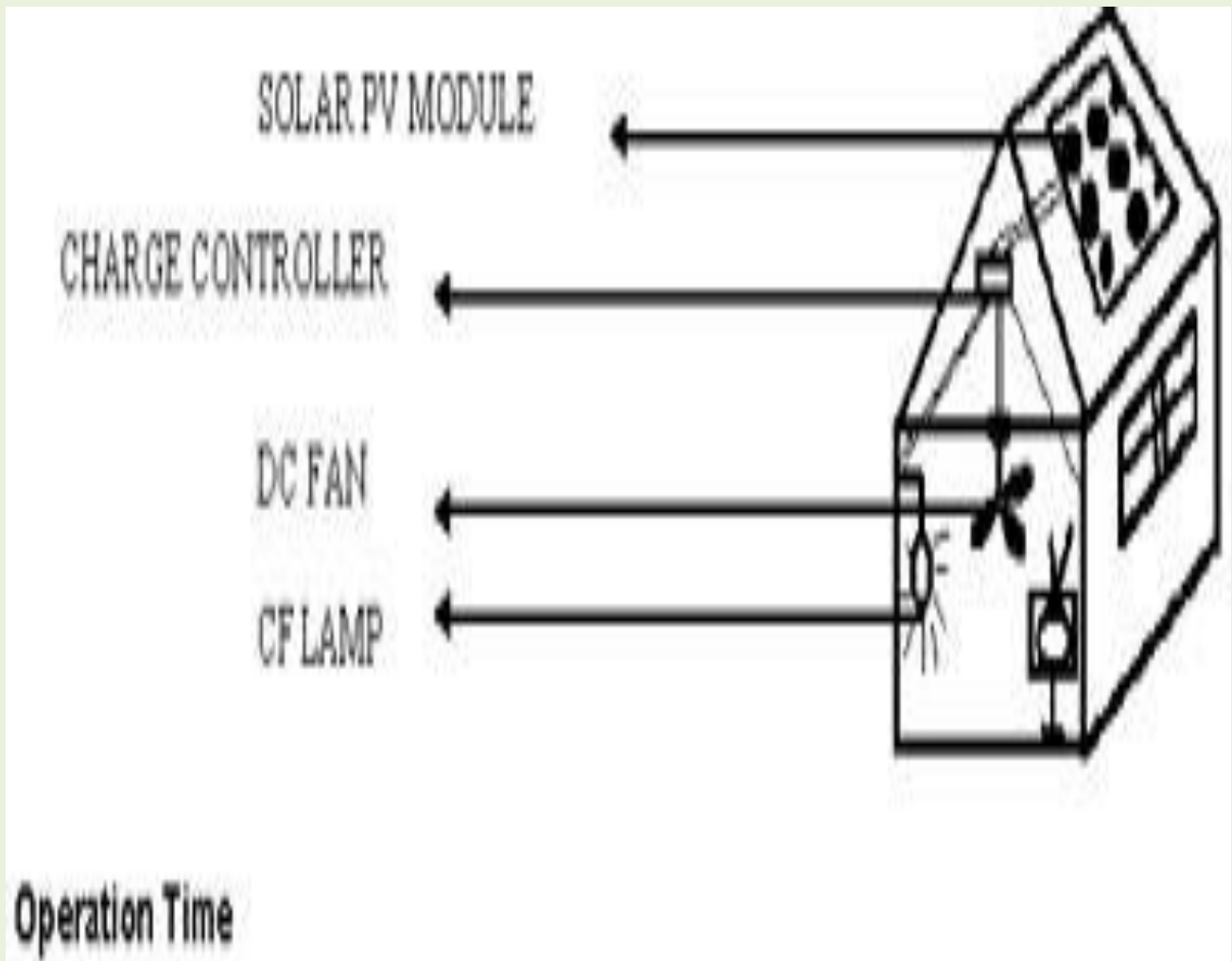
1. SOLAR PHOTOVOLTAIC MODULE.
2. BATTERY.
3. BATTERY BOX.
4. CHARGE CONTROLLER.
5. ELECTRONIC CIRCUIT & CONNECTING WIRES.
6. CF LAMP.
7. DC FAN.

#### **BRIEF DESCRIPTION OF ASSEMBLY PROCESS:**

ALL THE MAJOR COMPONENTS ARE CONNECTED AS PER BELOW GIVEN DIAGRAM. After Assembly all products are tested as per MNES Specifications.



**SOLAR STREET LIGHT SYSTEM**



1. SPV Module
  2. Battery Box
  3. Lamp with charge controller
  4. Lamp Post
- SOLAR STREET LIGHT SYSTEM**

## **II. Quality Control and Standards**

MNES SPECIFICATION 2006-2007

## **III. Production Capacity Per Annum**

- a. Qty : 24000 pieces each
- b. Value : Rs 66,00,00,000/- (Of All Three)

**IV. Motive Power Required : 5 KVA (Approx.)**

## **V. Pollution Control**

The Govt. accords utmost importance to control environmental pollution. The small-scale entrepreneurs should have an environmental friendly attitude and adopt pollution control measures by process modification and technology substitution.

India having acceded to the Montreal Protocol in sept. 1992, the production and use of Ozone Depleting Substances (ODS) like Chlorofluore Carbon (CFCs), Carbon Tetrachloride, Halons and methyl Chloroform etc. need to be phased out immediately with alternative chemical/solvents. A notification for detailed Rules to regulate ODS phase out under the Environment Protection Act, 1986 have been put in place with effect from 19<sup>th</sup> July 2000.

The following steps are suggested which may help to control pollution in electronics industry wherever applicable:

- i) In electronic industry fumes and gases are released during hand soldering / wave soldering/Dip soldering, which are harmful to people as well as environmental and the end products. Alternate technologies may be used to phase out the existing polluting technologies. Numerous new fluxes have been developed containing 2-10% solids as apposed to the traditional 15-35% solids.
- ii) Electronic industry uses CFCs, Carbon Tetrachloride and Methyl Chloroform for cleaning of printed circuit boards after assembly to remove flux residues left after soldering, and various kinds of foams for packaging.

Many alternative solvents could replace CFC-113 and methyl Chloroform in electronics cleaning. Other Chlorinated solvents such as trichloroethylene, perchloroethylene and methylene chloride have been used as effective cleaners in electronics industry for many years. Other organic solvents such as ketenes and Alcohols are effective in removing both solder fluxes and many polar contaminants.

## **VI. Energy conservation**

With the growing energy needs and shortage coupled with rising energy cost, a greater thrust in energy efficiency in industrial sector has been given by the Govt. of India since 1980s. The energy conservation Act 2001 has been enacted on 18<sup>th</sup> August 2001, which provides for efficient use of energy, its conservation & capacity building of Bureau of Energy Efficiency created under the Act.

The following steps may help for conservation of electrical energy:

- i) Adoption of energy conserving technologies, production Aids and testing facilities.
- ii) Efficient management of process/manufacturing machineries and system, QC and testing equipment for yielding maximum energy conservation.
- iii) Optimum use of electrical energy for heating during soldering process can be obtained by using efficient temperature controlled soldering and disordering station.
- iv) Periodical maintenance of motors compressors etc.
- v) Use of power factor correction capacitors. Proper selection and layout of lighting system; timely switching on-off of the lights; use of compact fluorescent lamps wherever possible etc.

## **6. FINANCIAL ASPECTS**

### **A. Fixed Capital**

#### **(i) Land and Building**

Built up area	1000 sq ft
Office	150 Sq ft
Stores	200 sq ft
Workshop	500 sq ft



Testing	150 sq ft
Rent payable/annum	Rs 1,20,000/-

**(ii) Machinery and Equipment**

S.No.	Description	Ind./Imp.	Qty.	Value (Rs)
1.	Painting Booth with Paint Gun	Indian	1	18000
2.	Oven	Indian	1	12000
3.	Bench Drilling Machine	Indian	1	7000
4.	30 MHZ Oscilloscope	Indian	1	25000
5.	HM 5027 Harmonic Distortion Meter	Indian	1	14000
6.	Frequency Meter	Indian	1	900
7.	Volt Meter	Indian	1	500
8.	Ampere Meter	Indian	1	900
9.	Power Factor Meter	Indian	1	2000
10.	Watt Meter	Indian	1	2500
11.	High Voltage Tester	Indian	1	6000
12.	Earthing Terminal Tester	Indian	1	4000
13.	DC Insulation Resistance Tester	Indian	1	2000
14.	Leakage Current Tester	Indian	1	900
15.	Digital Clamp Meter	Indian	1	1000
			<b>Total</b>	<b>96700</b>
	Other Fixed Assets			<b>60000</b>
	Electrification Charges @10% cost of machinery and equipment			<b>9670</b>
	Office equipments, furniture and working table etc.			<b>120000</b>
	Tools, Jigs & Fixtures etc.			<b>35000</b>
	Pre-operative expenses			<b>20000</b>
			<b>Total</b>	<b>244670</b>
<b>Total Fixed Capital (I + II)</b>				<b>341370</b>

## B. Working Capital Per Month :

### (i) Staff & Labour

Sl. No.	Designation	No. of persons	Salary/Month (Rs.)	Total salary per Month (Rs.)
1.	Skilled Workers	5	4500	22500
2.	Unskilled Workers	2	3000	6000
3.	Watchman/Peon	2	2200	4400
4.	Other Staff	3	8000	24000
	+ Perquisites @ 15% of salary			8535
			<b>Total</b>	<b>65435</b>

### (ii) Raw material per month

S.No.	Description	Ind./Imp.	Qty. For All three	Value (Rs)
1	Indicating lamps	Indian	6000 Nos.	90000
2	Charge Controller Circuit	Indian	6000 Nos.	600000
3	Inverter Circuit	Indian	6000 Nos.	9000000
4	Connecting cords & plugs	Indian	6000 Nos	240000
5	Coils	Indian	6000 Nos	60000
6	Diodes	Indian	6000 set.	90000
7	Poles & Fixtures	Indian	4000 Nos	1000000
8	Hardware, solder etc.	Indian	6000 Nos	40000
9	Knobs, switches & sockets	Indian	6000 set	198000
10	Batteries	Indian	6000 Nos.	6000000
11	DC Fans	Indian	2000 Nos.	90000
12	CFL's	Indian	6000 Nos.	1000000
13	PV Modules	Indian	6000 Nos.	25000000
15	Cabinets	Indian	6000 Nos.	900000
			<b>Total</b>	<b>44308000</b>

### **(iii) Utilities and Power**

Power	5KW	4000.00
Water		500.00
<b>Total</b>		<b>4500.00</b>

### **(iv) Other Contingent Expenses Per Month**

1.	Rent	10000
2.	Potage & Stationary	900
3.	Telephone/Telex/Fax charge	2500
4.	Repair and maintenance	1000
5.	Transport and conveyance charges	2500
6.	Advt. and publicity	1500
7.	Insurance and taxes	2200
8.	Miscellaneous expenditure	10000
<b>Total</b>		<b>30600</b>

**Total recurring expenditure per month (i + ii + iii + iv )**

**=Rs 4,44,08,535/-**

### **C. TOTAL CAPITAL INVESTMENT**

Fixed Capital	341370
Working Capital on 3 months basis	133225605
<b>Total</b>	<b>13,35,66,975</b>

### **D. FINANCIAL ANALYSIS**

#### **(I) COST OF PRODUCTION PER ANNUM**

Total recurring expenditure	532902420
Depreciation on machinery and equipment @ 10%	9670
Depreciation on tools, jigs, and fixtures @ 25%	8750

Depreciation on office equipment, furniture @ 20%	24000
Interest on total capital investment @ 16%	21370716
<b>Total</b>	<b>55,43,15,556</b>

## (II) TERNOVER PER ANNUM

Item	Qty. (Nos)	Rate/Unit	Total Sales
Solar Lantern	24000	Rs. 2500/- each	60000000
Solar Street Light System	24000	Rs. 6500/- each	156000000
Solar Home Light System	24000	Rs. 18500/- each	444000000
		<b>Total</b>	<b>66,00,00,000</b>

## (III) PROFIT PER ANNUM (BEFORE TAXES)=

(Turn over per annum - Cost of production per annum )

$$= 660000000 - 554315556$$

$$= \text{Rs. } 105684444/-$$

**Profit ratio**

$$= \frac{(\text{Profit/annum}) \times 100}{(\text{Sales} / \text{annum})}$$

$$= \frac{105684444 \times 100}{660000000}$$

$$= 16.01 \%$$

**Rate of return**

$$= \frac{\text{Profit/annum} \times 100}{\text{Total Capital investment}}$$

$$= \frac{105684444 \times 100}{133566975}$$

$$= 79.12 \%$$

## D. Break Even Point

### Fixed Cost per annum

Rent	120000
Depreciation on machinery and equipment @ 10%	9670
Depreciation on tools, jigs, and fixtures @ 25%	5000
Depreciation on office equipment, furniture @ 20%	24000
Interest on total capital investment @ 16%	21370716
Insurance	12000
40% salaries & wages	314088
40% other contingent & utilities (including rent & insurance)	146880
<b>Total Fixed cost</b>	<b>22002354</b>

$$\begin{aligned}\text{Break Even Point} &= \frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost} + \text{Profit}} \\ &= \frac{22002354 \times 100}{127686798} \\ &= 17.23 \%\end{aligned}$$

### Additional Information

a. The project profile may be modified/ tailored to suit the individual entrepreneurship qualities/capacity, production programme and also to suit the location characteristics, wherever applicable.

b. The Electronics Technology is undergoing rapid strides of change and there is need for regular monitoring of the national and international technology scenario .The unit may , therefore ,abreast with the new technologies in order to keep them in pace with the developments for global competition .

c. Quality today is not only confined to the product or service alone. It also extends to the process and environment in which they are generated. The ISO 9000 defines standards for quality Management System and ISO 14001 defines standards for Environmental Management System for acceptability at environment level. The unit may therefore adopt these standards for global competition.

d. The margin money recommended is 25% of the working capital requirement at an average .However the percentage of margin money may vary as per bank's discretion.

## **Name and address of Machinery & Equipment Suppliers**

1. M/s Atlas Engineering works  
8, Devan Hall  
Chandi Chowk , Delhi - 6
2. M/s Automatic Electric Ltd  
Rectifier House ,  
P B No. 7103  
Mumbai-400031
3. M/s Bergen Associates Pvt Ltd  
1082, Sector 27-B  
Chandigarh-19
4. M/s Eastern Industries  
203, Shree Ram Industrial Estate  
Naigaon Road , Madala  
Mumbai
5. M/s Eigi Equipment (P) Ltd  
India House , Trichy Road,  
Coimbatore - 1
6. M/s EM Electronics Pvt Ltd  
158,III Main Industrial Town  
Rajaji Nagar, Bangalore-560004
7. Hinditron Computers (P) Ltd  
Eros Cinema Building ,5<sup>th</sup> Floor  
42,Maharshi Karve Road,  
Church Gate, Mumbai-400020
8. M/s HMT Ltd  
31, Choringhee,  
Kolkata-700016
9. Jaymes Engg. Co. Pvt. Ltd  
M- Block, Connaught Place,  
New Delhi

10. M/s Lamp Machinery & Components Mfg Co.  
25, Bake Bihari Bose Road  
Ram Kristopur, P. B. No. 27  
Howrah-711010
11. M/s NGDR Ltd  
Byappanahalli  
Bangalore - 560001
12. M/s Pelco Electronics and Electricals Ltd  
66, Shivaji Marg  
New Delhi-110105
13. M/s Perfect Machines Tools Co. Pvt Ltd  
17, Kharvel Nagar  
Bhubaneshwar-1
14. M/s Prem Engineering Works  
Okhala Industrial Estate  
New Delhi
15. M/s Quality Machines Tools  
N. R. Road  
Bangalore-560002
16. M/s R. H. Windsor (India) Ltd  
Plot E-16 V Road  
Industrial Estate,  
Thane
17. M/s Super Cable Machines (I) Pvt Ltd  
Chandhery Villa,  
1, Shastri Nagar  
Ajmer-305001
18. M/s Swastic Machine Tools  
4, Lata Chambers  
Nasik-422002
19. M/s Sysco Associates,



234, 11<sup>th</sup> Main, Malleswaram  
Bangalore-3

20. M/s Toshniwal Brothers (Delhi) Pvt Ltd  
3E/8, Jhandewalan, Extn  
New Delhi-110055
21. M/s Traub India Ltd , Bombay  
Pune Road,  
Pune-411 018
22. M/s Wipro Computers (P) Ltd  
No. 10, Victoria Road,  
Bangalore

**Name and address of Raw material suppliers**

1. M/s Electronics Trade and Technology Dev. Corp. Ltd  
New Delhi-21
2. M/s Amar Radio Corp.  
11/1, Thiglar Poriyanna Lane,  
SSP Road , Bangalore-560002
3. M/s Southern Electronics  
113, Sadarpatrappa Road  
Bangalore-2
4. M/s Bharat Electronics Ltd  
Jalahalli Post  
Bangalore-560013
5. M/s Contental Devices India Ltd  
C-120, Naraina Industrial Area  
New Delhi-28
6. M/s Hiprint Corporation  
29, New Okhala Industrial Complex  
Phase-1, New Delhi-20
7. M/s Precision Electronics Ltd  
Unit-1, 1-9E,DLF Industrial Area,  
Faridabad-1210