

Electronic Weighing Scales

PRODUCT CODE (ASICC)	: 7532
QUALITY AND STANDARDS	: IS 9281:1981
PRODUCTION CAPACITY	: Qty. : 1200 Nos. (per annum) Value : Rs. 1,14,00,000
YEAR OF PREPARATION	: 2002–2003
PREPARED AND UPDATED BY	: Small Industries Service Institute 65/1 GST Road, Guindy, Chennai And Office of the Development Commissioner, (Small Scale Industries), Electronics and Electrical Division, 7th Floor, Nirman Bhavan, New Delhi-110 011.

INTRODUCTION

Electronic weighing systems are used in industries and business establishments for weighing and segregating materials accurately for process sales. The main advantages of an electronic weighing system when compared with mechanical weighing systems are:

- (a) Compactness and small size independent of capacity.
- (b) Ruggedness and high dependability.
- (c) High speed of response and rapid weighing.
- (d) Good accuracy.
- (e) Excellent flexibility to monitor multiple loads.
- (f) Analog and digital with print-out-facility remote indication and parallel display.
- (g) Online processing through computer.

The electronic weighing system comprises the basic load cell, suitable signal conditioners and output recorders/ indicators giving both the analog and digital output for further processing. The signals from the load cell are amplified and fed to analog/digital converter, which provide an output in the digital format for display/printing/processing etc. The strain gauge based load cell is the most popular weight transducer used in the electronic weighing system.

MARKET POTENTIAL

The total production in industrial electronic and control instrumentation is showing growth rate every year. This product requires a good marketing set up duly backed by after sales service facilities. If the price of the weighing scales is brought down and good after-sales facility made available, there will be sufficient demand for this item.

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 onwards.
- (iii) The salaries and wages, cost of raw materials, utilities, rents, etc. are based on the prevailing rates in and around Chennai. These cost factors are likely to vary with time and location.
- (iv) Interest on term loan and working capital loan has been taken at the rate of 16% on an average. 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 test equipment required for the project have been indicated. The unit may also

utilize common test facilities available at Electronics Test and Development Centres (ETDCs) and Electronic Regional Test Laboratories (ERTLs) set up by the State Governments and STQC Directorate of the Department of Information Technology, Ministry of Communication and Information Technology, to manufacture products conforming to Bureau of Indian Standards.

IMPLEMENTATION SCHEDULE

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

<i>Sl. No.</i>	<i>Name of Activity</i>	<i>Period in Months (Estimated)</i>
1.	Preparation of project report	1
2.	Registration and other formalities	1
3.	Sanction of loan by financial institutions	3
4.	Plant and 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 materials	2
6.	Recruitment of Technical Personnel etc.	2
7.	Trial production	11
8.	Commercial production	12

Notes

1. Many of the above activities shall be initiated concurrently.

- 2 Procurement of raw materials commences from the 8th month onwards.
3. When imported plant and machinery are required, the implementation period of project may vary from 12 months to 15 months.

TECHNICAL ASPECTS

Process of Manufacture

The manufacturing process involves the assembly of load cell, electronic circuits and electro mechanical hardware. Subsequently, the electronics assembly-the ICs, transistor, diodes, resistors, capacitors transformer, coils, relays, potentiometers are assembled on PCBs as per design.

The assembled PCBs are tested for performance. Subsequently the electronics assembly along with electro-mechanical assembly, hardware such as connectors/switches, terminals display, meters are assembled and housed in a metallic / fibre / plastic case with an appealing front panel. Finally the assembled unit is calibrated and tested as per the design specification.

Quality Control and Standards

Weighing range	Upto 10 kgs.
Accuracy	0.02%
Output	Digital display (Fluorescent)
Power supply	230V, AC, 50 Hz

Production Capacity (per annum)

Quantity	Value (Rs.)
1200 Nos.	1,14,00,000

Motive Power 5 KVA (approx.)

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 Chlorofluoro Carbon (CFC), Carbon Tetrachloride, Halons and Methyl Chloroform etc. need to be phased out immediately with alternative chemicals/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 19th 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 environment 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 opposed to the traditional 15-35% solids.
- (ii) Electronic industry uses CFC, 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 Ketones and Alcohols are effective in removing both solder fluxes and many polar contaminants.

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 18th August 2001, which provides for efficient use of energy, its conservation and 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 systems, QC and testing equipments 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 desoldering stations.
- 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.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building

1. Built up area	200 sq. meters
2. Office/stores	50 sq. meters
3. Factory	150 sq. meters
4. Rent (per month)	Rs. 5000

(ii) Machinery and Equipments

Sl. No.	Description	Qty.	Rate (Rs.)	Amount (Rs.)
1.	Bench Drilling machine 1/2"	1	5,000	5,000
2.	Digital Multi Meter (3 1/2 digits)	3	3,000	9,000
3.	Oscilloscope (0-20 MHz)	1	20,000	20,000
4.	IC Tester/EPROM Programmer	1	25,000	25,000
5.	Digital LCR Meter	1	15,000	15,000
6.	Load Cell Simulator (Imported)	1	30,000	30,000
7.	Portable Grinder	1	7,000	7,000
8.	Power Supply (0-30V, 2A)	2	3,000	6,000
9.	Standard Weights Brass	LS	LS	10,000
10.	Multimeter (Analog)	1	3,000	3,000
11.	UV Eraser	1	3,000	3,000
12.	Variacs (4A) Ind.	2	3,000	6,000
13.	Installation and electrification @10% on machinery and equipments			13900
14.	Office Furniture and Equipments			25,000
15.	Tools, Dies and Equipments			20,000
(iii) Pre-operative Expenses				10,000
Total Fixed Capital				2,07,900
or Say				2,08,000

B. Working Capital (per month)

(i) Salaries and Wages

Sl. Description No.	Qty.	Rate (Rs.)	Amount (Rs.)
1. Accountant	1	3000	3000
2. Engineer	1	4500	4500
3. Manager	1	6000	5500
4. Marketing Asstt.	1	3000	3000
5. Peon	1	2000	2000
6. Semi skilled workers	2	3000	6000
7. skilled workers	3	3500	10,500
8. Steno/typist	1	2500	2500
9. Watchman	1	2000	2000
	Total		39000
	<i>Perquisites@ 15%</i>		58500
	Total		44850
	or Say		45000

(ii) Raw Material

Sl. Description No.	Qty.	Rate	Amount (Rs.)
1. Cabinet/Housing (Metal)	100	300	30,000
2. Capacitors+	100	150	15,000
3. Fluorescent display (Imp.)	100	1000	1,00,000
4. Integrated circuits (Imp)	100	1000	1,00,000
5. Load cell (strain gauge)(Imp)	100	3000	3,00,000
6. Mechanical hardware	100	400	40,000
7. Noise Filter (Imp)	100	150	15,000
8. PCB	100	300	30,000
9. Rectifier (Imp)	100	110	11,000
10. Resistors (Diodes and switches)	100	200	20,000
11. Transformer	100	100	10,000
12. Transistors	200	100	20,000
13. Wires and cables. Connectors, consumables, Packing materials, etc.	100	250	25,000
	Total		7,16,000

(iii) Utilities (per month)

Sl. Description No.	Amount (Rs.)	
1. Power	4,000	
2. Water	500	
	Total	4,500

(iv) Other Contingent Expenses (per month)

Sl. Description No.	Amount (Rs.)	
1. Advertisement	10,000	
2. Conveyance expenses	5,000	
3. Transport and packaging	8,000	
4. Misc. expenses	4,000	
5. Postage and stationery	2,000	
6. Rent	5,000	
7. Repair and maintenance	1000	
8. Insurance and taxes	1000	
	Total	36,000

(v) Working Capital (per month)

(i+ii+iii+iv) Rs 8,01,500

(vi) Working Capital (for 3 Months) 24,04,500

C. Total Capital Investment

(i) Fixed capital	Rs. 2,08,000	
(ii) Working capital for 3 months	Rs. 24,04,500	
	Total	Rs. 26,12,500

FINANCIAL ANALYSIS

(1) Cost of Production (per annum)

Sl. Description No.	Amount (Rs.)	
(i) Depreciation on machinery and equipment @ 10%	13,900	
(ii) Depreciation on office furniture @ 20%	5,000	
(iii) Depreciation on tools @ 25%	5,000	
(iv) Recurring expenditure	96,18,000	
(v) Interest on capital investment @ 16%	4,18,000	
	Total	1,00,59,900

(2) Turnover (per annum)

1200 Nos. of Electronic weighing scales upto 10 kgs @ Rs. 9500 each = Rs. 1,14,00,000

(3) Profit (*Before Taxes*) Rs. 13,40,100

$$\begin{aligned} \text{(4) Net Profit Ratio} &= \frac{\text{Profit (per annum)} \times 100}{\text{Sales (per annum)}} \\ &= \frac{1340100 \times 100}{11400000} \\ &= 11.75\% \end{aligned}$$

$$\begin{aligned} \text{(5) Rate of Return} &= \frac{\text{Profit (per annum)} \times 100}{\text{Total capital investment}} \\ &= \frac{1340100 \times 100}{2612500} \\ &= 51.29\% \end{aligned}$$

(6) Break-even Point

Fixed Cost (per annum)	(Rs.)
Rent	60000
Depreciation on machinery and equipment @ 10 %	13900
Depreciation on tools, jigs and fixtures @ 25%	5000
Depreciation on office furniture @ 20%	5000
Interest on total capital investment @ 16%	418000
Insurance and Taxes	12000
40% Salaries and wages	216000
40% other contingent expenses and utilities (excluding rent and insurance)	165600
Total	895500

Break-even Point

$$\begin{aligned} &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\ &= \frac{895500 \times 100}{895500 + 1340100} \\ &= 40\% \end{aligned}$$

Additional Information

- The Project Profile may be modified/tailored to suit the individual entrepreneurship qualities/capacity, production programme and also to suit the locational characteristics, wherever applicable.
- 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, keep abreast with the new technologies in order to keep them in pace with the developments for global competition.

- 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 Systems and ISO 14001 defines standards for Environmental Management System for acceptability at international level. The unit may therefore adopt these standards for global competition.
- 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.

Addresses of Machinery and Equipment Suppliers

- M/s. Agronic Instrument (P) Ltd.
201, Shiva-Shakti Industrial Estate,
Mumbai-86.
- M/s. Bergen Associates Pvt. Ltd.
1082, Sector 27-B,
Chandigarh-19.
- M/s. BPL (India) Ltd.
84, M. G. Road,
Bangalore-560001.
- M/s. Circuit Aids
Inc.No. 5,
Ranganathapura Magadi Road,
Bangalore-79.

5. M/s. Navanidhi Electronics(P)Ltd.
1-60/1 Snehapuri, Nacharaam,
Hyderabad-7
6. M/s. Noble Electronics
354,Lajpat Rai Market,
Delhi-6.
7. M/s. Peico Electronics and Electrical
Ltd.
Shivasagar, Estate, Block-A,
Dr. Annie Besant Road,
Mumbai-12.
8. M/s. Quality Machine Tools
34, J.C. Road, VISL Building,
Bangalore-2.
9. M/s. Swastic Machine Tools
4, Lata Chambers,
Nashik-422 002.
10. M/s. Sysco Associates
30/106 (New No.234)
11th Main, Malleswaram,
Bangalore-3
7. M/s. Inde Associates
16, Rest House Crescent,
Off Church Street,
Bangalore-1.
8. M/s. Interco Ltd.
456,Alexandra Road,
14.00NOL Bldg.
Singapore-0511.
9. M/s. Jairamadas and Sons P.Ltd.
Mittal Towers, M.G.Road,
Bangalore.
10. M/s. Micropack Ltd.
Plot 16,Jigami Indl.Area,
Anekal Taluk,
Bangalore District-560 002.
11. M/s. Namtech Systems(P)Ltd.
35, Dacosta Square,
St.Thomas Town, Bangalore-84.
12. M/s. OEN Connectors Ltd.
Vyattila, PB No.2, Cochin-19.
13. M/s. Rosemound Ine
P.O. Box 35129, Minneapolis,
MN 56435(612) 941-5560, USA
(For scissors)

Addresses of Raw Material Suppliers

1. M/s. Amar Radio Corpn.
11/1,Thiglar Periyanna Lane,
SJP Road, Bangalore-2.
2. M/s. Applied Electronics Ltd.
A-5,Wagle Industrial Estate,
Thane-4,
(Mumbai)
3. M/s. Bakumbhai Ambalal
Electronics Dept.
Kaiser-T-Hind Building,
Ballard Estate, Mumbai-38.
4. M/s. Bangalore Electronics
No.124, Sadarpatrappa Road,
Bangalore-2.
5. M/s. Electronics Trade and
Technology Dev.
15/48,Malcha Marg,
New Delhi-21.
6. M/s. General Electronics
19,5th Floor, Tardeo Air
Conditioned Market, Mumbai-34.
14. M/s. Saini Electronics
Pushapadant Nivas,
3, Chuman Lane,
Dr. D. Bhadkamkar Marg.
Mumbai-7.
15. M/s. Southern Electronics
No.113,Sadarpatrappa Road,
Bangalore-2.
16. M/s. Systronics
202-1206, Harsha House, Near
Milan Cinema, Karampura Road,
New Delhi-110015.
17. M/s.Tomson Electronics
Pulickkal Buildings,
Pallimukku, MG Road,
Cochin
18. M/s. Shilpa International
107, Parklane,
Secunderabad-3.