

Electronic Industrial Timers

PRODUCT CODE (ASICC)	: 77552
QUALITY AND STANDARDS	: Type of Clock: Crystal Controlled Time range:0.1 Sec. to 999.9 Sec. and 0.1 minutes to 999.0 Minutes
PRODUCTION CAPACITY	: Qty. : 3000 Nos. (per annum) Value : Rs. 30,00,000
YEAR OF PREPARATION	: 2002–2003
PREPARED AND UPDATED BY	: Small Industries Service Institute Bamunimaidan, Industrial Area, Guwahati-21 (Assam). And Office of the Development Commissioner (Small Scale Industries), Electronics and Electrical Division, 7th Floor, Nirman Bhavan, New Delhi-110011

INTRODUCTION

The Electronic Industrial Timers are used in the industries to control the process/operation with specified time interval of repetitive nature. It is basically a time-clock with an arrangement for on/off operation/process at a pre-determined specified time-intervals. They find applications in the control of sequential functions of industrial machinery at varying time intervals for plastic industries, pharmaceutical industries, petro-chemical industries, steel industries, power plants etc. Electronics timers are manufactured today to meet the complex function of industries.

The Electronic timer consists of a crystal controlled stable oscillator, sequencing logic circuits, driving

circuits and a digital display system with a facility depends on the application for connecting the output to individual machinery/system to control the operation at pre-determined time interval. Simple timer with an on/off arrangement to sophisticated electronic timers are manufactured today to meet the specification of the industry.

MARKET POTENTIAL

The Control, Instrumentation and Industrial Electronics sector of the Electronics industry plays a vital role in the modernization through instrumentation and automation in India's manufacturing, public utility services and infrastructure sector. The major manufacturing industries like Petrochemical; Cement; Steel; Fertilisers;

Chemicals; Textiles are some of the manufacturing sectors which are the beneficiaries of this technology for production improvement, cost efficiency, safety, quality control etc. Over the last few years, Indian industry in this sector has established its base, as such it is felt that the demand of industrial timers bound to grow faster in the coming years.

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 2nd year of operation the capacity utilisation is 60% and 80% respectively. The unit is expected to achieve full capacity utilisation from the 3rd year onwards.
- iii) The salaries and wages, cost of raw-materials, utilities, cost of land and rents etc. are based on the prevailing rates in and around Guwahati (Assam). 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 the 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:

Sl. No.	Name of Activity	Period in Months (Estimated)
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

Sl. No.	Name of Activity	Period in Months (Estimated)
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 electronics assembly and electro-mechanical hardware assembly. In electronic assembly the components viz. ICs, transistors, crystal, diodes, capacitors, resistors, transformers, coils, preset potentiometers on a printed circuit board as per the layout design of electronic circuit. The oscillator assembly should be well shielded from other circuits for stability. The assembled PCB is then tested for performance before going into the final assembly. The electro-mechanical components such as connectors, sockets, switches, terminal and LED or LCD display indicators are assembled as per the design on the front panel of the equipments. Subsequently the electronic assembly and electro-mechanical assembly are further assembled to form a compact unit and

encased in a metallic or plastic case. The product is then calibrated and tested as per the relevant design specification.

It is essential to inspect all the raw material and components for quality before the assembly of the equipments.

Quality Control and Standards

Type of clock	Crystal controlled
Time range	0.1 Sec to 999.9 Sec and 0.1 minutes to 999.9 minute
Setting accuracy	0.1%
Repeat accuracy	0.1%
Display	3 digit (LED)

Production Capacity (per annum)

Quantity	Value (Rs.)
3000 Nos.	30,00,000

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	
Built-up area	150 sq. mtrs
Office, store etc.	50 sq. mtrs.
Factory	100 sq. mtrs.
Rent per month	Rs. 4000

(ii) Machinery and Testing Equipments

Sl. No.	Description	Ind./ Imp.	Qty Nos.	Total (Rs.)
<i>(a) Machinery</i>				
1.	Bench Drilling Machine (1/2")	Ind.	1	5000
2.	Portable Grinder	Ind.	1	7000
<i>(b) Testing equipments</i>				
1.	Oscilloscope DC 20 MHz	Ind.	1	20,000
2.	Power Supply 0-30V, 2A	"	4	12,000
3.	Digital Multimeters (3 1/2 Digits)	"	1	3500
4.	Counter (1 MHz)	"	1	10000
5.	LCR Meter (Digital)	"	1	15000
6.	I.C. Tester	"	1	20000
7.	Transistor Tester	"	1	15000
Total				107500
c)	Tools, Fixtures, Jigs, Soldering Iron etc.	"	LS	5,000
d)	Electrification and Installation Charges @ 10% of Cost of Machine and Equipments	"	LS	10000
e)	Office Equipments and Furniture	"	LS	20000
(iii) Pre-operative Expenses			"	LS 10,000
Total				45000
Total Fixed Capital				152500

B. Working Capital (per month)

(i) Personnel

Sl. No.	Designation	No.	Salary (Rs.)	Total (Rs.)
<i>(a) Administrative and Supervisory</i>				
1.	Accountant	1	2500	2500
2.	Marketing Assistant	1	2800	2800
3.	Steno typist/clerk	1	2500	2500
4.	Peon/watchman	1	2000	2000
<i>(b) Technical</i>				
1.	Manager	1	5500	5500
2.	Engineer	1	3500	3500

Sl. No.	Designation	No.	Salary (Rs.)	Total (Rs.)
3.	Production Supervisor	1	3000	3000
4.	Sales Engineer	1	3000	3000
<i>(c) Direct Workers</i>				
1.	Skilled workers	2	3500	7000
2.	Semi-skilled workers	2	3000	6000
Total				37800
Add perquisites @ 15% of salaries				5670
Total				43470
Say				43000

(ii) Raw Materials (per month)

Sl. No.	Particulars	Ind./ Imp	Requirement/ unit (Rs.)	Price/ month for 250 Nos.
1.	Integrated circuits (5 Nos)	Imp.	100	25,000
2.	LED Display (3 Nos)	Imp.	60	15,000
3.	Resistors (20 Nos.)	Ind.	5	1,250
4.	Capacitors (8 Nos.) Relay	Ind.	15	3,750
5.	Transformer and Relay	Imp./ Ind.	75	18,750
6.	Pre-sets (2 Nos.)	Ind.	5	1,250
7.	Printed circuit Board (2 Nos.)	Ind.	20	5,000
8.	Thumb wheel Switches (3 Nos.)	Imp.	180	45,000
9.	Connectors, Terminal, Strips, Sockets	Ind.	30	7,500
10.	Casing and Mechanical Hardware	Ind.	90	22,500
11.	Packing and consumables	Ind.	20	5,000
Total				1,50,000

Note: The raw materials requirement vary with design and specification of equipment.

(iii) Utilities (per month)	(Rs.)
Power	1650
Water	250
Total	1900

(iv) Other Contingent Expenses (per month) (Rs.)	
Rent	4000
Postage and stationery	1,000
Repair and maintenance	500
Transport charges	2500
Telephone	1,000
Consumable stores	2,000
Advertisement and publicity	3,000
Insurance	400
Miscellaneous expenditure	1,000
Total	15400

(v) Total Recurring Expenditure (per month) Rs. 210300

(vi) Total Working Capital (3 Month Basis) Rs. 630900

C. Total Capital Investment

(i) Fixed capital	Rs. 152500
(ii) Working capital	Rs. 630900
Total	Rs. 783400

FINANCIAL ANALYSIS

(1) Cost of Production (per year)	(Rs)
Total recurring cost	2523600
Depreciation on machinery and equipments @ 10%	10750
Depreciation on tools/jigs/fixtures @ 20%	1000
Depreciation on office equipments and furniture @ 20%	4000
Interest on total investment @ 16%	125344
Total	2664694
Or Say	2665000

(2) Turnover (per year)

Item	Qty.	Rate	Total (Rs.)
Electronic Industrial timer	3000	1000	30,00,000

Note: The rate/unit vary with design and specification.

(3) Net Profit (per year) Rs. 3,35,000
(Before Income Tax)

(4) Net Profit Ratio = $\frac{\text{Net profit per year} \times 100}{\text{Turnover per year}}$
= 11%

(5) Rate of Return = $\frac{\text{Net profit per year} \times 100}{\text{Total investment}}$
= 42.76%

(6) Break-even Point

Fixed Cost	(Rs.)
a) Depreciation (on Machines and equipments, tools, fixtures and office equipments)	15750
b) Rent	4800
c) Interest on total investment	125344
d) Insurance	4800
e) 40% of salary and wages	206400
f) 40% of other contingent expenses and other (excluding rent and insurance)	83040
Total	483334
Or Say	483000

B.E.P. = $\frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost} + \text{Profit}}$
= $\frac{483000 \times 100}{483000 + 335000}$
= 59%

Additional Information

(a) 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.

(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, keep 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 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.
- (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.

Addresses of Machinery and Equipment Suppliers

Machinery

1. M/s. Quality Machine Tools
24 J.C. Road,
VISL Building,
Bangalore-560002.
2. M/s. Swastic Machine Tools
4, Lata Chambers,
Nashik-422002.

Testing Equipments

1. M/s. Applied Electronics Ltd.
A-5, Wagle Industrial Estate,
Thane,
Mumbai-400604

2. M/s. BPL (India) Ltd.
84, MG Road,
Bangalore-560001
3. M/s. Peico Electronics and Electrical Ltd.
Shivasagar Estate,
Block 'A1',
Dr. Annie Besant Road,
Mumbai-18.
4. M/s. Agronic Instruments (P) Ltd.
201, Shiva Shakti Indl. Estate,
Mumbai-400080.
5. M/s. Systronics
89-91, Industrial Area,
Naroda-382330.
6. M/s. Electronics Trade and Technology Dev. Corporation Ltd.
15/48, Malcha Marg,
New Delhi-110021.

Addresses of Raw Material Suppliers

Raw Material/Components

1. M/s. Electronics Trade and Technology Dev. Corporation Ltd.
15/48, Malcha Marg,
New Delhi-110021.
2. M/s. Peico Electronics and Electricals Limited
Shivasagar Estate,
Block - A
Dr. Annie Besant Road,
Mumbai-12
3. M/s. OEN Connectors Ltd.
Vytila, Post Box No. 2,
Cochin-682019.
4. M/s. Micropack Ltd.
Plot No. 16,
Jigani Industrial Area,
Anekal Taluk,
Bangalore -562106.

5. M/s. Amar Radio Corporation
1 1/1, Thiglar Periyanna Lane,
SJP Road,
Bangalore-560002.
6. M/s. Globe Industries
69, Saddar Patrappa Road,
Behind SJP Road,
Bangalore-560002.

Imported Components

1. M/s. Intraco Ltd.
456, Alexandra Road,
14, NOL Bldg.,
Singapore-0511.
2. M/s. Rosemount Inc
P.O. Box 35129,

Minneapolis,
MN 55435 (612) 941-5560, USA.

3. M/s. General Electronics
19, 5th Floor,
Tardeo Air Conditioned Market,
Mumbai-400034.
4. M/s. Bakubhai Ambalal
(Electronics Dept.)
Kaiser-1, Hind Building,
Ballard Estate,
Mumbai-400038.
5. M/s. Kelly Electronics (P) Ltd.
1413, Dalmal Tower,
Nariman Point,
Mumbai-400021.