

Modem

PRODUCT CODE (ASICC)	:	78307
QUALITY AND STANDARDS	:	N.A.
PRODUCTION CAPACITY	:	Qty. : 3000 Nos. (per annum) Value : Rs. 1,05,00,000
YEAR OF PREPARATION	:	2002–2003
PREPARED AND UPDATED BY	:	Small Industries Service Institute Kurla Andheri Road, Sakinaka, Mumbai And Office of the Development Commissioner (Small Scale Industries), Electronics and Electrical Division, 7th Floor, Nirman Bhavan, New Delhi-110011

INTRODUCTION

Modem is a device which converts digital signals to audio frequency tones and vice versa. The frequency of these signals is within the frequency range of telephone lines. Through telephone lines, these signals are transmitted and then converted back to digital information. The term 'MODEM' is a contraction of modulator-demodulator. Modems allow two computers/terminals to communicate and to send serial data over long distance using telephone line i.e. they are basically used as interface between the telephone lines and the computer for transmitting and receiving data. They are therefore being called as Data Modems also. Early nineties low speed modems with data rate of 2400/4800 bps were being used. However, with the advancement of technology in

communications, modems with a speed of 56.6 kbps are now in use for receiving and transmitting voice, data and FAX.

MARKET POTENTIAL

Modems are generally required by almost every PC users these days for internet connection. The demand for personal computers (PCs) continues to grow and will continue to account for a large share of the total computer and peripherals spending in India. According to the Manufacturers Association of Information Technology (MAIT), during 2000-01, more than 1.88 million desktops were sold in India, registering a 34 per cent increase over the previous year. Further with unleashing of Internet revolution per year, the market for Data Modems is bound to grow proportionately. There are presently 10-

12 units manufacturing modems in the country.

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 Mumbai. 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 components and materials are inspected for any defects, before they are released for production. In the production line, the components are shaped and formed using appropriate tools and assembled an PCB and soldered. The assembled PCB are tested individually for desired performance on the Modem test set up (Network analyzer).

The PCBs, display are fixed in an enclosure and inter-connected as per design. The complete unit is then tested for desired performance. The tested unit are then packed well for despatch to the customer.

Quality Control and Standards

1. All the incoming raw material and components shall be inspected for any defect before assembly.
2. The components that are used to control the functioning of the equipment shall be fixed in such a way that it should not cause any strain to the operator and shall be clearly accessible to the operator.

3. The functioning of each control knob shall be clearly indicated on the control panels. The control panel requires maximum attention and careful design since they form the main inter-action point.
4. The enclosures shall have accessibility for assembly, maintenance and service etc.

Quality Specification

3-in-1 Voice/Data/Fax Integrated modem for Internet/Internet Access (56.6 kbps Voice/Data/Fax)

DTE Data rate upto 115.2 kbps

G3 Fax-send and receive rates up to 14400 bps.

Production Capacity (per annum)

Quantity	Value (Rs.)
3000 Nos.	1,05,00,00

Motive Power 5 KVA.

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, Per Chloroethylene 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. mts.
Office, Stores	50 Sq. Mts.
Assembly and testing	100 Sq. Mts.
Rent payable (per annum)	Rs. 1,20,000

(ii) Machinery and Equipments

Sl. No.	Description	Ind./ Imp.	Qty.	Value (Rs.)
1.	Oscilloscope (0-100 MHz)	Ind.	1	80,000
2.	LCR-Q Meter	Ind.	1	15,000

Sl. No.	Description	Ind./ Imp.	Qty.	Value (Rs.)
3.	Power Supplies (30V,2 A)	Ind.	2	9,000
4.	Digital Multimeter (4 ½ Digit)	Ind.	1	8,500
5.	Environment Chamber (Heating/ cooling cycle)	Ind.	1	36,000
6.	Modem Test set (Network Analyzer)	Ind.	1 set	2,41,500
	Total			3,90,000
(iii) Other Fixed Assets				
7.	Electrification charges @ 10% of the cost of machinery and equipment			39,000
8.	Office equipments, furniture and working table etc.			40,000
9.	Tools, jigs and fixtures, soldering iron/station etc.			10,000
10.	Moulds			1,50,000
(iv) Pre-operative Expenses				10,000
	Total			2,49,000
Total Fixed Capital				6,39,000

B. Working Capital (per month)

(i) Staff and Labour

Sl. No.	Designation	No.	Salary/ month (Rs.)	Total (Rs.)
1.	Manager	1	7,000	7,000
2.	Sales and Service Engineer	1	4,000	4,000
3.	Accountant	1	2,000	2,000
4.	Clerk/Typist	1	1,500	1,500
5.	Peon	1	1,000	1,000
6.	Watchman	1	1,000	1,000
7.	Skilled Workers	4	2,500	10,000
8.	Un-skilled workers	2	2,000	4,000
	Total			30,500
<i>Add Perquisites @ 15% of salary</i>				4575
	Total			35,075
or Say				35,000

(ii) Raw Material Requirement (per month)

Sl. No.	Particulars	Ind./ Imp.	Value/ Imp unit (Rs.)
1.	Modem chip set (A set of 2 chips Intel/Rockwell)	Imp.	
2.	Microprocessor	Imp.	
3.	Other integrated circuits	Imp.	
4.	IC's Timer, Regulator etc.	Ind.	
5.	Line matching transformer	Ind.	
6.	Resistors, capacitors, Presets Transistors, Diodes, LEDs, cermet trimpots, connectors and microswitches etc.	Ind.	2,300
7.	PCB	Ind.	
8.	Enclosure (Plastic Housing)	Ind.	
9.	Hardware and consumables	Ind.	
	Total		2,300

Total Cost of Raw Materials for 250 units (per month) Rs. 5,75,000

(iii) Utilities (per month)		(Rs.)
Power		4,700
Water		300
Total		5,000

(iv) Other Contingent Expenses (per month)(Rs.)

1.	Rent	10,000
2.	Postage and stationery	1,000
3.	Telephone/Telex/Fax charges	2,000
4.	Repair and maintenance	800
5.	Transport and conveyance charges	2,000
6.	Advertisement/publicity/ marketing	38,000
7.	Insurance and taxes	1000
8.	Miscellaneous expenditure	1,000
	Total	56,000

(v) Total Recurring Expenditure (per month) (i + ii + iii + iv) Rs. 6,71,000

C. Total Capital Investment

(i) Fixed Capital	Rs. 6,39,000
(ii) Working Capital on 3 months basis	Rs. 20,13,000
Total	Rs. 26,52,000

FINANCIAL ANALYSIS

(1) Cost of Production (per annum) (Rs.)	
Total recurring expenditure	20,13,000
Depreciation on machinery and equipment @ 10 %	39,000
Depreciation on tools, jigs and fixtures @ 25%	40,000
Depreciation on office equipment, furniture @ 20%	8,000
Interest on total capital investment @ 16%	4,24,320
Total	25,24,320

(2) Turnover (per annum)

Item	Qty. (Nos.)	Rate/Unit (Rs.)	Total (Rs.)
Modem	3000	3500	1,05,00,000

(3) Profit (per annum) (Before Taxes) Rs. 19,37,000

(4) Net Profit Ratio

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

$$= \frac{19,37,000 \times 100}{1,05,00,000}$$

$$= 18.45 \%$$

(5) Rate of Return

$$= \frac{\text{Profit per annum} \times 100}{\text{Total capital investment}}$$

$$= \frac{19,37,000 \times 100}{26,52,000}$$

$$= 73.04 \%$$

(6) Break-even Point

Fixed Cost (per annum) (Rs.)	
Rent	1,20,000
Depreciation on machinery and equipment @ 10 %	39,000
Depreciation on tools, jigs and fixtures @ 25%	40,000
Depreciation on office equipment, furniture @ 20%	8,000
Interest on total capital investment @ 16%	4,24,320
Insurance and Taxes	12,000

Fixed Cost (per annum) (Rs.)	
40% of Salaries and wages	1,68,000
40% of other contingent expenses and utilities (excluding rent and insurance)	2,40,000
Total	10,51,320
or Say	10,51,000

B.E.P.

$$= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$$

$$= \frac{10,51,000 \times 100}{10,51,000 + 19,37,000}$$

$$= 35.17 \%$$

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.

- (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, Testing Equipment and Raw Material/Component Suppliers

Machine/Tools

1. M/s. International Machine / Tools Corporation
5, Bank Street,
Behind State Bank,
Fort,
Mumbai-400 023
2. M/s. Machinery and Spares
30, Apollo Street,
Fort,
Mumbai-23
3. M/s. Shubh Machinery Corporation Pvt. Ltd.
15, Bank Street,
Mumbai-23
4. M/s. HMT Ltd.
9, N.S. Patkar Marg,
Mumbai-63

Testing Equipments

1. M/s. Applied Electronics Ltd.
A-5 Wagle Ind. Estate.
Thane, Mumbai-4
2. M/s. Peico Electronics and Electrical Ltd.
Shivasagar Estate,
Block-A,
Dr. Annie Basant Road,
Mumbai-12

3. M/s. Agronic Instruments (P) Ltd.
221, Shiv Shakti Indl. Estate,
Mumbai - 400 086
4. M/s. Systronica
89-92 Indl. Area,
Naroda - 382 330
5. M/s. Noble Electronics
354, Lajpat Rai Market,
Delhi - 110006
6. M/s. Maco Instruments Pvt. Ltd.
Bharat Industrial Estate,
T. J. Road, Sewree
Mumbai - 400 015

Soldering Equipment and Circuit Aids

1. M/s. Syeco Associates
30/106, (New No. 234)
11th Main, Melleswaram,
Bangalore-3
2. M/s. Navanidhi Electronics (P) Ltd.
1-60/1, Shehapuri,
Nacharam,
Hyderabad-7
3. M/s. India Associates
16, Rest House, Crescent Off.
Church St.,
Bangalore-1
4. M/s. Bergen Associates Pvt. Ltd.
1082, Sector 27B,
Chandigarh-19
5. M/s. Techtronics
B-70, End Cross, 1 Stage,
Peanya Indl. Estate,
Bangalore-560 058
6. M/s. Sumitron Marketing
A-46, Naraina Indl. Area,
Phase-1, P. O. Box- 10227,
New Delhi-110028
7. M/s. Scientific Mea-Technik Pvt. Ltd.
B-114, Indl. Estate, Pologround,
Indore-452 003

Raw Material and Component Suppliers

1. M/s. Electronics Trade and Technology Dev. Corpn, Ltd.
15/48, Malcha Marg,
Chanakyapuri,
New Delhi-21
2. M/s. Amar Radio Corpn.
11/1 Thiglar Poriyanna Lane,
SPP Road,
Bangalore-560 002
3. M/s. Bharat Electronics Ltd.
Jalaballi Post,
Bangalore-560 013
4. M/s. Southern Electronics
No. 113, Sadarpatrapa Road,
Bangalore-110002
5. M/s. Continental Devices India Ltd.
C-120, Naraina Indl. Area,
New Delhi-110028
6. M/s. Biprint Corporation
29, New Okhla Indl. Complex,
Phase-1,
New Delhi-110020
7. M/s. Precision Electronics Ltd.
Unit 1, 1-9E DLF Indl. Area,
Faridabad -121 003
8. M/s. Saini Electronics
Pushpadant Nivas,
3, Chuman Lane,
Dr. D. Bhadkamkar Marg,
Mumbai -400 007
9. M/s. Interco Ltd.
456, Alexandra Road,
14.00, NOL Bldg.,
Singapore
10. M/s. General Electronics
19, 5th Floor,
Tardeo Air Conditioned Market,
Mumbai-400 034
11. M/s. Bakumbhai Ambalal
Electronics Dept.
Kaiser-I-Hind.,
Ballard Estate,
Mumbai-400 038
12. M/s. Shilpa International
107, Parklane,
Secunderbad-3