

# FUTURA's

Testing Equipments and the Automobile/Component Industry.....Great Friendships, sometimes reappear.

Henry Ford and Thomas Alva Edison, were great friends for more than 30 years.

Henry Ford is regarded as the father of the modern car. Edison, the man who knew the most about electricity, was Ford's constant inspiration and a true friend.

Between them they always exchanged ideas. The ideas which made human life easier with electricity and mobility.

Now after 100 years, Futura's cable harness testers and automatic test equipments have inherited the same spirit of design and innovation.



Futura range has

- made testing easy by deskilling it.
- increased the confidence of harness and allied component manufacturers.
- has reduced assembly line faults in the automobile sector.

**FUTURA**  
**APSOL PVT. LTD.**  
APT SOLUTIONS

## ARCHIVES

Girish S. Ranade - Founder of 'Futura' completed his B.E. (Electronics) from M.S. University Baroda in 1984. The same year, he pursued the diploma in electronic design and technology, from the Indian Institute of Science, Bangalore.

From 1986 to 1988, he worked as an R & D engineer at Aplab, Mumbai - Brainchild of the veteran P.S. Deodhar (former scientific advisor to the Prime Minister). In the year 1988, he started his electronic design development and consulting under the name Futura electro designers.

By 1991, 'Futura' developed and produced a range of Automatic testing equipments (ATEs) for OEMs and other industrial applications.

Amongst the other successful ATEs, Futura's Cable harness tester became it's flagship product. This is a standard A.T.E. for cable harness and assemblies in vehicles, consumer electronic goods etc. Very soon it had > 60% market share in India, for Harness Testers. The success story still continues.

In 1998, Futura Systems was established to manufacture printer sharer/data switches - an import substitute in those times. Mrs. Anagha G. Ranade led this organization.

From 1998 to 2004, Futura's growth exceeded the industry norms. It achieved almost hundred percent market share in the Harness Testers' market in two wheeler sector. Futura expanded it's design intelligence to unconventional applications like 'Electronic Scare crow' for the agricultural crop protection. Accolades came from the farming sector.

On November 25th 2004, Futura Apsol Pvt. Ltd. - a fully functional private limited was established. All the design, manufacturing and applications of Futura Electrodesigners and Futura Systems are now integrated under the name and style, 'Futura Apsol Pvt. Ltd.'

Girish Ranade is an active member of Entrepreneurs Club Pune, and a trustee at Entrepreneurs International Pune ([www.eipune.org](http://www.eipune.org)).

## OUR DESIGN CENTRE

Adjacent to our corporate office, is our design centre, where all our ideas and innovations turn into reality. The 750 Sq.ft. centre has all the latest development tools.

We have an in house PCB design facility aided by a documentation-cum-CAD station. 100% power back up is installed. The design engineers, working here augment the design efforts and intelligence of the director, Girish Ranade. In all, this design centre hosts five development stations.



## OUR MANUFACTURING SET-UP

After the design aspect is completed, and final specifications are decided, it's time to move over to our manufacturing set-up. This is 1000 sq.ft. of space which hosts a basic necessary mechanical workshop, and test stations.

It also has the necessary assembly stations.

In addition to this, FUTURA has got a steady and reliable base of outsourced vendors for functions like wiring, mechanical assembly etc.... so, there is no 'limit' to the quantities we can manufacture.



## OUR TECHNICAL TEAM

**Mr. Girish Ranade** : Director, B.E. Electronics, P.G. Diploma in Electronics Design and Technology, CEDT, IISc.

**Mrs. Rashmi Apte** : Design Manager, M.E. (Electronics)

**Mr. Nilesh Chimankar** : Design Executive, M.Sc. (Electronics)

**Mr. Niraj Shelodkar** : Design Executive, M.Sc. (Electronics)

## E. LABEL DATA STORAGE AND PRINTING UNIT - LDSP

LDSP is unique device which prints on a label printer without a PC. It can print variable data. It can be connected to any parallel port printer including all label printers. It has built in RTC. It can store four different label data.



Trigger is a no-potential contact. Label data is defined by user.

It has become mandatory to print on line labels after testing is found OK. The label is useful for traceability and confirms that the component has been tested.

Test equipments already in use do not have facility of label printing hence normally labels are printed offline and then put on the component, which has chances of putting label on a faulty piece. For Poka-yoke purpose, only one label should be printed after passing a test and the label can have variable data such as date and time of testing, serial number etc.

LDSP conforms to all these requirements.

## F. DATA COLLECTORS / CONVERTORS

### GAUGE LINK

These instruments facilitate the connection of measuring instruments / gauges such as vernier calipers, micrometers etc directly to PCs.

Collects data in any windows based application. Connects to PC through serial port. Easy installation and use.

Kit includes footswitch, interfacing unit, serial cable and software CD.



### RF TO RS 232 CONVERTOR

Edison's Menlo Park laboratory in Greenfield village.

Ford re-built this lab for Edison's convenience near their residences. Edison said the only thing Ford got wrong in it was our floors were never so clean.



## OUR INNOVATIVE INSTALLATION...

### Disaster Management System at IGCAR, Kalpakkam.

Post-tsunami, disaster alarm systems which can 'cover the last mile' and inform about the disaster at community level were sought.

FUTURA as an OEM, recently designed and installed such a system at Indira Gandhi Centre for Atomic Research, Kalpakkam.

The system is truly wireless in terms of power and signals. It is solar powered and uses RF for signalling. A manually operated system with no possibilities of 'false alarms'.

We completed this innovative installation of ours in June 2005. The system is fully functional now.

Indian industries and institutions have explicitly expressed their keen interest for this system.



# FUTURA PRODUCTS AN OVERVIEW

The FUTURA product line, can be broadly classified as under :

- A. Product related to cable harnesses
- B. Switch testing equipments
- C. Dashboard (electronic) testing equipments
- D. Electrical test system for automobiles (ETSA)
- E. Label data storage and printing Unit (LDSP)
- F. Data collectors / convertors

From automobiles to white goods sector, all these products are serving their precise applications.

They have saved our customer's time, their user friendliness has de-skilled the testing functions and they are backed by our prompt, value driven back up services.

## A. PRODUCTS RELATED TO CABLE HARNESSSES

### TESTERS FOR CABLE/ WIRING HARNESSSES

Three models, HTM 320, HTM 640, and HTM 960 are presently developed, depending on number of points to be tested. e.g. HTM 640 tests 640 points, from 64 points, in a step of 64 points.



Features :

- They can be connected to PC.
- On line labels with date/time of testing and harness data can be printed.
- Test mode can be circuit by circuit, or all circuits.
- All points act as inputs, as well as outputs no 'from' and 'to concept'. Wiring of boards is easier.
- Adaptable to any existing boards-same board can be used for existing, as well as Futura testers.
- All I/O cards are same - simply plugging in a card increases capacity by 64 points.
- Data can be loaded in the Harness Tester by 'self learning' either from a good harness or from a PC.
- They can find out faults like open and short, and most importantly a mislocation i.e. interchange. Tester display directly indicates points which are interchanged.
- They have a relay output on "PASS"- a buzzer with tone and volume control.
- The built in board checker facilitates a 'check' and finding faults on rigs, connecting cables, and I/O cards.
- They have EEPROM type memory - more reliable than the battery backed memory.
- Naming, bar code reading, matching of the harnesses is possible.

### HARNESS ASSEMBLY AID (HAA)

This tool simplifies and augments Harness assembly/subassembly.

Assembling harnesses is a stepwise process.Each step involves picking up either a crimped cable, or cable assembly or a grommet from a tray. In the next step, terminals are inserted in the housing at the proper points.

HAA guides the operator at each step, to pick up the right parts from the proper tray by glowing corresponding LEDs.

It then glows the LED at the first point where terminal is to be inserted, and blinks the LED at a point of next terminal insertion.

Upon correct insertion, the blinking stops and HAA then moves on to the next step.

When all steps are over, HAA gives an audio signal along with a relay output. It also gives a visual signal at this juncture.

Only when prior assembly is removed, HAA starts assembly of a new component.

Each step is programmable for the tray, and the points of choice. Complete system includes HAA,a set of trays with LED on each tray(along with numbers),and a fixture with LED at each point along with numbers.

HAA comes in two models: HAA 64 (64 I/Os and 48 Trays)  
HAAP 96 (96 I/Os and 64 trays)



### ONE TO ONE CONTINUITY TESTER CT 121

This equipment tests point to point continuity of a circuit. Application can be a fixture with limit switches, a connector or a coupler with open ends. It does not check mid-joints. Models include 6, 32, 48, 96 circuits testers. CT121-48 and CT121-96 have a facility of parts counter.

## OTHER HARNESS RELATED PRODUCTS/ACCESSORIES

### SOLID STATE FLOPPY

Transfers data from PC to Futura's harness tester, or from Futura's harness tester to PC in offline mode (i.e. when PC and harness tester are not interconnected.) This data can be harness data, label data, harness name, barcode, or date/time.

### HARNESS TESTING RIG/ BOARD

### PC BASED HARNESS ASSEMBLY TESTING

## B. SWITCH TESTING EQUIPMENTS

In today's global manufacturing practices, automobile and even other industries put the responsibility of testing components like harnesses and switches **TOTALLY** on the vendor. FUTURA's range of switch testing equipments increase the confidence of such vendors, who are our customers. With this equipment, they can carry out the testing of 100% of units, such testing also reduces assembly line faults for the OEMs and generates the data for analysis of faults.

FUTURA has introduced switch assembly testing equipment, for different applications.

- Routine tests are carried out, with associated harness's testing.
- Routine tests of individual switches in a switch assembly, at a specified load current are performed.
- Type/ Endurance testing of switches by applying 'near real' load, can be done.

**All the models, have some common features, such as :**

- Connections to rigs/ fixtures are simple.
- Same tester equipment can test different types of switch assemblies.
- These equipments are programmable at user's end, where in programming can be done by using an editor like 'Notepad' and a serial utility.
- They have a PC connectivity via a serial port.
- A printer can be attached, for printing on line labels on 'pass' with date and time of testing.
- They have 16-digit alphanumeric LCD display and 4 keys.
- Data can be stored and downloaded to a PC.
- They have shop-floor compatible enclosure and design.

**At present three types of out testing equipments serve different requirements.**

### SWITCH HARNESS ASSEMBLY TEST EQUIPMENT

Tests the assembly of switch and harness for the correct operation of switches.

It accommodates data 25 different switch assemblies.

### SWITCH ASSEMBLY TEST EQUIPMENT (on load)

The equipment tests a switch by passing a specific load current and by measuring the drop across the switch, in millivolts.

It records the results by comparing the drop either automatically or manually.

### SWITCH ASSEMBLY ENDURANCE TEST EQUIPMENT

Components like switches need to be tested for their endurance with a specified load. Number of times the switch can be operated is specified.

FUTURA has developed such a test equipment in a novel way. The load in this system is near real load, originating from an inbuilt power supply as the source. Certain characteristics of the load with which the switch needs to be tested are simulated in the load of the system. This ensures that the switch is tested to near real load conditions, consistent with actual load characteristics.

It also has a waveform programmer. Once the wave form of the actual test component is captured, it is recorded, it is recorded in the system and can be used for subsequent testings, instead of actual test component.

Edison reenacting the light bulb experiment with Henry Ford - October 21 1929, celebrating 50 years of light bulb.

It emphasized the need of continual testing in Ford's mind.



## C. DASHBOARD (ELECTRONIC) TESTING EQUIPMENT

### NON VISION BASED

A Dashboard display on the vehicle is an instrument cluster which has tachometer i.e. rpm, speedometer (either digital or analog), Odometer, tripmeter, various indicators (such as high beam, left hand turn, right hand turn, temperatures, pressures fuel gauge) etc. A faulty dashboard simply results in getting the vehicle rejected on the assembly line with the onus on the dashboard manufacturer.

### FUTURA'S NON VISION BASED SYSTEM - DTE 107

Performs the testing by applying various signals to the unit and a manual, visual checking is done for the correct display.

For testing, various signals are to be applied to the unit and manually visually checked for correct display. This dashboard tester has facility to generate input signals and check current for each step. It is programmable at user's end including delay for each step and current limits.

The tester has relay outputs and NPN digital outputs for indicators, square wave outputs for tachometer and speedometer (i.e. odometer, tripmeter can be checked). Tests can be carried out in steps, programmable through a PC.



### VISION BASED SYSTEMS

Vision based test equipments are treated as projects and are designed as per customized requirements.

### FUTURA'S VISION BASED DASHBOARD TESTER DTE107

Tests a completely assembled (electronic) dashboard for its full functionality. It takes the required decisions for such a testing in a programmed and automatic manner. Only loading /unloading the dashboard is manual. It tests the dashboard unit in a minimal time for all the required parameters.

The equipment ensures any faulty unit being dispatched to the customer.

During testing, the equipment identifies faults and confirms that the faulty part is placed in the fail bin by the operator. This is as per Poka-yoke-the standard Japanese practice of ensuring total mistake proofing.

The equipment logs and stores the data generated, as per the required format. This is useful for future references and traceability.

It has facility to generate input signals and check current for each step. It is programmable at user's end including delay for each step and current limits. The tester has relay outputs and NPN digital outputs for indicators, square wave outputs for tachometer and speedometer (i.e. odometer, tripmeter can be checked).

Tests can be carried out in steps, programmable through a PC. It is possible to take a photo.



## D. ELECTRICAL TEST SYSTEM FOR AUTOMOBILES -ETSA

ETSA is an Automatic Test System to test all the electrical parameter or parts working on battery in an automobile. It can be used by automobile manufacturers as a final inspection station or at a service station.

ETSA measures DC current of each part one by one and checks if it is within specified limits and informs the results accordingly. To measure DC current, current clamp is used and hence measurement is done without disconnecting any wires. Connecting the system to the vehicle is very easy. The system is completely programmable at the Users end, and can be used for different vehicles.

It is a standalone system. It is easy to calibrate. Enclosed in rugged enclosure.



Edison with an early Ford car - 1928.

**“Young man, that’s the thing! You have it!  
Your car is self-contained and carries  
it’s own power-plant!”  
- Ford never forgot these words of inspiration.**

## FUTURA .....

### THE CORE PROPOSAL AND BENEFITS

In the new millennium Automobile and other core industries world-over, are viewing India as THE component manufacturing hub.

For the component manufacturers need of fast, reliable, offline and online testing is also on the rise. User friendliness, customization and de-skilling are few other parameters in testing, which have gained importance.

FUTURA offers unparalleled benefits through it's core proposal and work methodology for all these testing requirements.

#### ■ Close customer contact and interaction.

Frequent upgradations of our products are a result of this interaction. This is of great help in designing FUTURA products and knowing what the customers need.

#### ■ Customised product range, as a result of this interaction.

Increases the confidence of our customers and saves on their time. Our products serve their precise application.

#### ■ FUTURA products achieve de-skilling of testing jobs.

A vital input, as operator training time is greatly reduced. For contracted labour/ workers, replacement becomes easier. Logistics of manual testing gets reduced.

#### ■ At the core, is the design intelligence of FUTURA.

From circuits to enclosures' level, this intelligence imbibes quality, during design phase itself.

#### ■ Easiest of product assembly and maintenance on the field.

Enhances the trust and morale of operators, maintenance personnel and Q.A./production/PED departments.

#### ■ Universal nature of working.

Yet another feature. Instead of dedicated, stand alone softwares and accessories, FUTURA products are designed for working with the customer's set up. It offers adaptability and flexibility in terms of working conditions. **Existent manufacturing set ups can easily incorporate FUTURA products.**

Ford confiding with Edison - 1925.

Henry Ford invented and used the first wire harness in his automobile in 1906. He also pioneered use of assembly line in car manufacturing.



Ford and Edison on the 50th anniversary of incandescent bulb - 29th October, 1929.

It was always a friendship of two giants of innovations. Our customers have inspired us in a similar manner.

## ONGOING INNOVATIONS AT FUTURA

- Cable Harness Tester, increased productivity, upto 2000 points.
- Cable Harness Tester with R and C measurements.
- Cable Harness Tester with HV testing capability.
- Complete harness testing system including fixtures and boards.

## AN INDICATIVE LIST OF OUR CUSTOMERS

### Motherson Sumi Systems Ltd.

Pune, Bangalore, Gurgaon, Noida, Delhi

### Tyco Electronics (AMP)

Pune, Bangalore

### Otis Elevator Co. India Ltd.

Bangalore

### Tata Yazaki Autocomp Ltd.

Pune

### Bajaj Auto Ltd.

Pune, Aurangabad

### Godrej India Ltd.

Mumbai

### Progressive Engg. Co.

Jamshedpur

### Vision Cables

Daman

### General Industrial Controls

Pune

### Whirlpool (I) Ltd.

Pune

### Mahindra & Mahindra Ltd.

Nasik

### TVS Motor Company

Hosur

### Napino Auto & Electronics Ltd.

Gurgaon, Manesar

### Varroc Engineering Pvt. Ltd.

Aurangabad, Pune.

### Minda SAI Limited

NOIDA, Pune, Chennai.

### Molex India Limited

Bangalore, Gandhinagar, Pune

### Dhoot Transmission Pvt. Ltd.

Aurangabad, Pune

### ECI Technology Limited

Gandhinagar

### Viney Auto Pvt. Ltd.

Gurgaon, Pune

### Srinisons Wiring Systems (P) Ltd.

Manesar



# FUTURA

## APSOL PVT. LTD.

A P T SOLUTIONS

ISO 9001:2000 CERTIFIED



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