



**Effective & systemic way of enhancing
 Productivity, Efficiency and Integrity of the Transformer Testing Process**

- Prolific's Intelligent Transformer Testing and Reporting Laboratory (ITTRL) is a versatile, PC based system with Transformer Test Pro, an intelligent transformer testing software, at its heart. ITTRL - A comprehensive hardware-software suite that consists of fully interfaced test instruments and an integrated test bench catering to multiple transformers, testing instruments, and standards while encompassing the entire testing process.
- ITTRL is devised for testing of transformers, acquiring on-line data from test instruments, and printing reports that are compliant with all national and international standards such as IS-2026, IEC-60076, ANSI-C57, IS-11171 CBID & SABS, etc.
- ITTRL is suitable for testing of all types of transformers including Power Transformer, Distribution Transformer, Furnace Transformer, Dry type, Cast Resin type, Rectifier Transformer, Generator Transformer, and Locomotive Transformer.
- ITTRL can be used for testing transformers of all ratings up to 1200 kV. It is already in use at several locations for testing transformers upto 750 MVA.
- ITTRL has following components,
 - Transformer Test Pro - An Intelligent Transformer Testing & Reporting Software
 - Transformer Test Bench
 - Test Instruments
 - Transformer Power Panel
 - HV Tester / MG Set / SFC / Capacitor Bank / Voltage Regulator / CTs & PTs

ITTRL is a modular system that is available as a complete system or in modules as given below

Product	Max Transformer Ratings/ Voltage Class				
	630 KVA / 36 KV	10 MVA / 66KV	50MVA / 132KV	315MVA / 400 KV	750 MVA / 1200KV
Transformer Test Bench	✓	✓	✓	✓	✓
Transformer Test Bench with PLC + HMI	✓	✓	✓	✓	✓
Transformer Power Panel	✓	✓	✓		
HV Tester	✓	✓	✓	✓	✓
MG Set / Static Frequency Converter	✓	✓	✓	✓	✓
Transformer Auto Test	✓				
Transformer Test Pro Software	✓	✓	✓	✓	✓
TDPro - Transformer Design Software	✓	✓			

Transformer Test Pro (TTP) software - Versatile, Comprehensive and User friendly

- TTP software's versatility provides for multiple, user defined permutations and combinations based on the type of a transformer, type of phase, type of winding, type of cooling, various rated capacities, various vector connections, and tap changers.
- TTP software has features for different types of inspections such as final, internal, after-short-circuit, before short-circuit, and customer witness inspection.

Benefits of TTP software

- TTP software has in-built instrument drivers that are compatible with almost all makes and models of test instruments in vogue. The availability of most of the instrument drivers makes the application independent of the instrument being used for the test measurement.
- TTP software's in-built feature of automated online data acquisition from test instruments reduces the testing time and ensures error free data logging in the computer.
- TTP software's data analysis capability ensures error-free complex calculations.
- TTP software ensures error-free transformer test reports with print-on-demand facility.
- TTP software provides for easy storage and retrieval of test reports.
- TTP software has the facility of manual data entry too.
- TTP software generates auto indexing and page numbering of test reports according to the selected test sequence. It has the facility of printing test reports on A4 size blank sheets or on letter-heads.
- TTP software has simple but intuitive graphical user interface.

Along with the detailed report format, TTP has the short report facility which gives the report of the routine test.

- The short report format is used to reduce the number of pages for test reports
- TTP software has the database backup facility to take the backup of database in the hard drive.
- TTP software has the facility of printing formulae sheet on demand.
- TTP software provides the facility of generating MIS reports by selecting a specific period, customer, MVA, impedance and the inspection type.

Names and makes of the instruments presently supported by the Transformer Test Pro are given in the table below. This list is being continuously expanded to include more instruments.

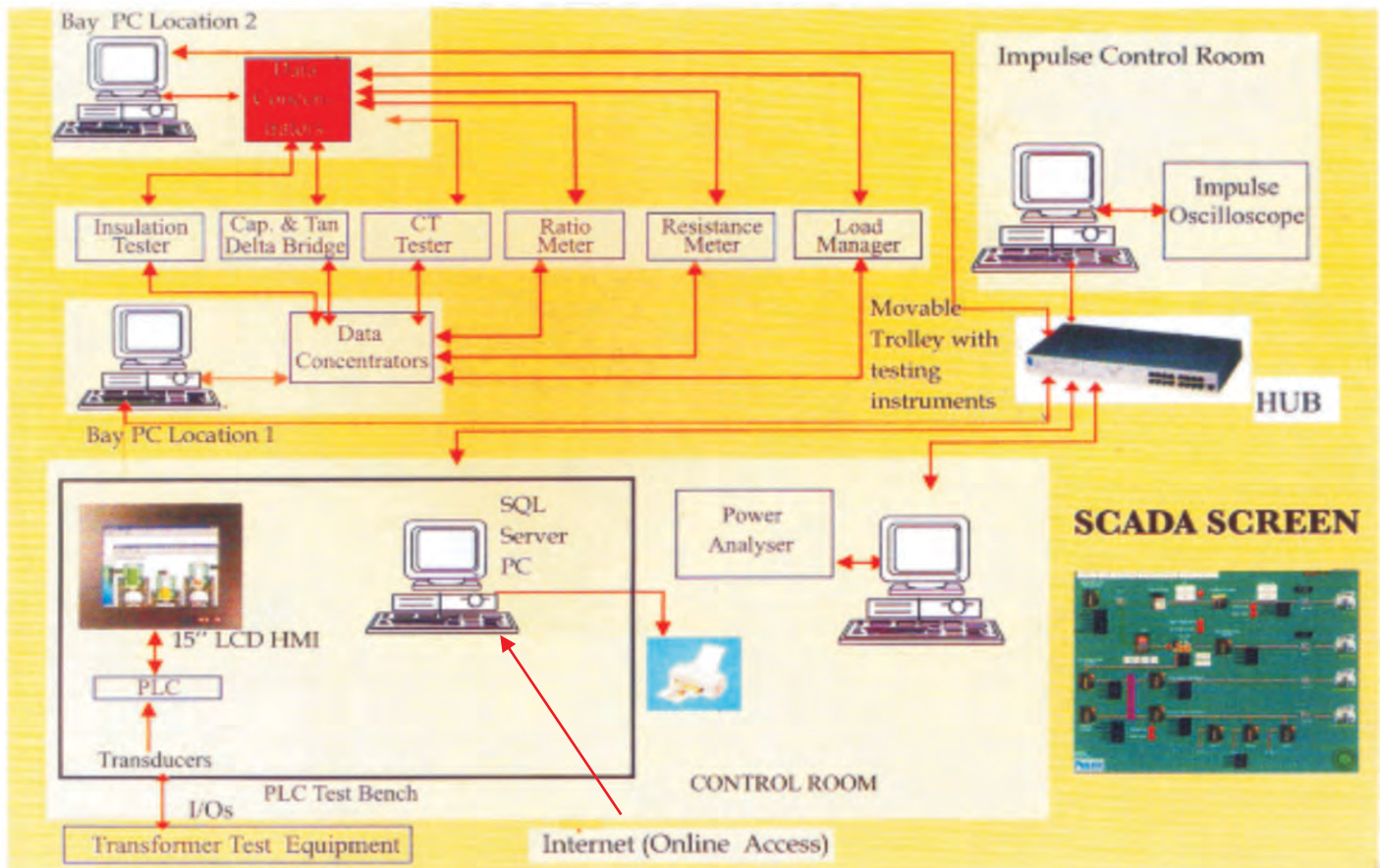
SN	Instrument	Make	SN	Instrument	Make
1	Loss Measurement System	Measurement International	7	PD Meter	Omicron
2	Power Analyser	Yokogawa/AV Power/Norma	8	Cap & Tan Delta Bridge	Omicron/Eltel
3	Insulation Meter	Avo/Megger/Phenix/Megabras/Sivananda/ Metral	9	Impulse Oscilloscope	Lecroy/Hafely/Fanke
4	Resistance Meter	Tinsley/Raytech/Scope/Prestige/Sivananda / Tettex / Motwane	10	Load Manager	Krycard/Schneider/ Rishabh
5	Ratio Meter	Tinsley/Raytech/Sivananda / Tettex			
6	CT Tester	Omicron / Amber			

Transformer Test Bench - The Transformer Test Bench is a desk type panel interface provided by Prolific for transformer testing. It houses test instruments, selector switches, PBs, indicators, meters and computers. The test engineer can exercise control through the test bench and can monitor various parameters related to testing equipment such as HV Tester, MG Set, Isolators, Breakers and many more.

The above functionality is made more sophisticated with the use of a PLC and LCD touch screen based HMI. When the PLC and HMI are used; discrete indicators, meters, SS and PBs become redundant. SLD of the whole power circuit then can be visualized and controlled through the HMI.



SYSTEM SCHEMATIC



TTP SOFTWARE COVERS FOLLOWING TESTS

SN	Test	SN	Test
1.	Measurement of voltage ratio and check of phase displacement	25.	Measurement of capacitance and dissipation factor
2.	Measurement of winding resistance	26.	Measurement of harmonics
3.	Measurement of insulation resistance (winding, CTS /tank, busing test tap /tank)	27.	Measurement of acoustic noise level
4.	Measurement of no load loss and no load current	28.	Measurement of power taken by cooler circuit
5.	Test to prove overfluxing capability / oil soaking test	29.	Measurement of zero phase sequence impedance
6.	Measurement of load loss and impedance voltage	30.	RSO test
7.	Three winding losses of three phase transformer	31.	Lightening impulse voltage withstand test
8.	Measurement of impedance voltage	32.	Lightening impulse voltage withstand test for neutral winding
9.	Measurement of single phase impedance	33.	Measurement of transferred surge voltage
10.	Calculation of efficiency and regulation	34.	Temperature rise test for overloading cycle
11.	Separate source voltage withstand test /Applied voltage test /High voltage test	35.	DGA test on oil before and after temperature rise test
12.	Induced over voltage withstand test / Double voltage double frequency	36.	Oil BDV test
13.	Induced over voltage withstand test with partial discharge	37.	Water content test
14.	Magnetic balance and magnetising current test	38.	Measurement of vibration of transformer at rated excitation
15.	Measurement of no load loss & no load current at low voltage	39.	Functional checks of control panels
16.	Measurement of load loss and imped. Voltage with spill current	40.	Switching impulse voltage withstand test
17.	Measurement of load loss and impedance voltage at low voltage	41.	Oil leakage test
18.	Measurement of single phase / three phase short circuit impedance	42.	Pressure deflection test
19.	Magnetic circuit test	43.	Vacuum deflection test
20.	Check of ct ratio and polarity	44.	Test on pressure relief device
21.	Check of ct knee point voltage	45.	Jacking test
22.	Check of ct dc resistance	46.	Measurement of oil quantity for first oil filling
23.	Tests on ON - load tap changer (OLTC)	47.	Visual inspection and dimensional test on assembled transformer
24.	Temperature rise test	48.	Calibration of WTI & OTI
		49.	Swept frequency response analyser
		50.	Thermal imaging
		51.	Dew point measurement
		52.	Low voltage excitation
		53.	Short duration Temperature rise test
		54.	OLTC motor current measurement

Transformer Power Panel - It houses contactors for I/P ACB, MCCBs, CT ratio selection contactors, other contactors, Busbars, and may other instruments.

HV Tester (High pot test) and Motor Generator Set/ SFC (Induced over voltage test) - This is offered by Prolific as part of the ITTRL package.

Web enabled testing - ITTRL enables you to offer customers a convenient and cost saving option of viewing on-line test data over internet from their location. This ensures real time customer participation in the entire testing process and simultaneously obviates the need to be present at site during testing.

ITTRL can also be integrated with ERP (SAP/ BAAN etc) for exchange of design, order, and test information seamlessly.

We also provide:

1. Reactor Test System with Linearity Test Setup
2. Transformer Design Software-TDPro
3. CT/PT Auto Test
4. Intelligent Capacitor Testing & Reporting System
5. Cable Auto Test
6. Motor Auto Test

Our Clientele for Intelligent Transformer Testing & Reporting System and Transformer AutoTest in India

- | | | | |
|-------------------------------------------------------------------|-----------------|---------------------------------------------------------|-------------------------------------|
| 1. Aditya Vidyut Appliances Ltd, Thane | (Up to 315 MVA) | 25. Skipper Electricals Ltd , Bhiwadi | (Up to 50 MVA) |
| 2. Alfa Transformers Ltd, Vadodara | (Up to 50 MVA) | 26. Sree Rama Elect & Electronics Pvt Ltd., Nakrekal | (Up to 100MVA) |
| 3. Areva T&D Ltd, Allahabad & Vadodara (Now Alstom and Schneider) | (Up to 315 MVA) | 27. Sudhir Genset Ltd., Gurgaon | |
| 4. Bharat Bijlee Ltd., Mumbai | (Up to 315 MVA) | 28. Sudhir. Intra Vidyut Limited, Gurgaon | (Up to 25 MVA) |
| 5. BHEL, Bhopal | (Up to 315 MVA) | 29. Sudhir Tesar Ltd., Gurgaon | |
| 6. Crompton Greaves Limited, Mandideep & Mumbai | (Up to 800 MVA) | 30. Sudhir Transformer Ltd., Silvassa | |
| 7. Danish Private Ltd., Jaipur | (Up to 5MVA) | 31. Tarapur Transformer Ltd., Pali | (Upto 150MVA) |
| 8. Emco Limited, Thane & Jalgaon | (Up to 315MVA) | 32. Technical, Associates Ltd., Sitarganj & Lucknow | (Up to 100 MVA) |
| 9. ERDA, Vadodara | (Up to 500KVA) | 33. Transfab Power India Pvt. Limited, Pune | (Up to 20 MVA) |
| 10. Global Transformer Ltd, Wada | (Up to 100MVA) | 34. Vijai Electricals Ltd., Hyderabad | (Upto 315MVA) |
| 11. Hind Rectifier Ltd., Deharadun | (Up to 50 MVA) | 35. Actom Distribution Transformers, South Africa | (Up to 2.5MVA and 630 KVA) |
| 12. IMP Power Ltd. | (upto 150MVA) | 36. CG Power Systems Ireland & Belgium NV. | (up to 5MVA) |
| 13. Indcoil Transformers Pvt. Ltd., | (upto 5MVA) | 37. Emirates Tranformer, Dubai | |
| 14. Indian Transformer Ltd, Gurgaon | (up to 7.5MVA) | 38. Federal Transformers Co. LLC, | (Up to 5MVA) for Ghana |
| 15. Intra Vidyut Limited, Bangalore | (Up to 25 MVA) | 39. LTL Transformer Pvt. Ltd., Sri Lanka | (Up to 7.5 MVA) |
| 16. Jain Electricals, Indi | (Up to 250KVA) | 40. Nepal Electricity Board, Kathmandu & Hetauda, Nepal | (up to 10MVA, 33KV) |
| 17. Kanohar Electricals Ltd., | (Upto 150 MVA) | 41. Pennsylvania Transformer Technology, INC, USA | (for 315MVA) |
| 18. Mahati Electrics,Pune | (Up to 150 MVA) | 42. PT CG Power System, Indonesia | (Up to 700 MVA) |
| 19. Nissar Transformers Pvt. Ltd., Pune | (up to 15MVA) | 43. Runthala Engineering Pvt. Ltd | (up to 5MVA) for South Africa plant |
| 20. PETE Transfrontier, Hyderabad | | 44. TSS Transformer, South Africa | (Upto 100MVA) |
| 21. Raychem RPG Ltd., Pune & Nalagadh | (Up to 7.5 MVA) | 45. Voltamp Transformers Oman LLC | (Upto 5MVA) |
| 22. Satyam (Fab) industries pvt, ltd., Bhopal | (up to 10 MVA) | 46. Chamundeswari Electric Supply Co., Mysore | (Upto 300 KVA) |
| 23. Serwel Electronics Limited, Hyderabad | (Up to 5MVA) | 47. Prolec GE, Chennai | (1 MVA) |
| 24. Siemens Ltd , New Mumbai | (Up to 315 MVA) | | |

Prolific's ITTRL - Long term sustainable benefits to all stakeholders

Truly, Prolific's ITTRL brings about the positive and permanent change in the way transformers are tested on the test floor and provides long lasting benefits to all stake holders involved in the process, the manufacturer, the customer, and the last but not the least; brings back the smile on the face of that Testing Engineer.

PROLIFIC SYSTEMS & TECHNOLOGIES PVT LTD.

An ISO 9001 & ISO 14001 Certified Company

Visit us at: www.prolificindia.com / www.prolifictraining.com

INDIA'S LARGEST TURN KEY SYSTEM INTEGRATOR & INDUSTRIAL TECHNOLOGY TRAINING COMPANY

Plot No. A-267, Road No. 16A, Opp.ESIS Hospital, Wagle Industrial Estate, Thane (West), Maharashtra, India-400 604

Office No. (+91 22) 6124 5000/6124 5015/16 Mobile No. +91 9167234243 / 52

E-mail: testingsolutions@prolificindia.com