

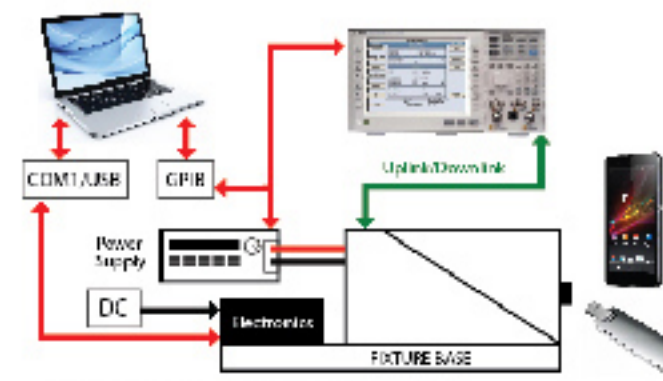


***Your Test Solution Partner, Expert in Development and
Customized Engineering Solutions
for Automation Test***

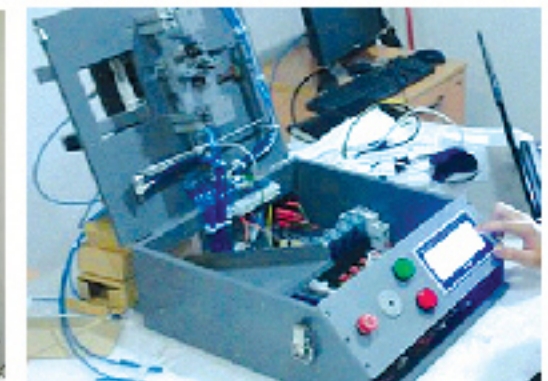
TEST DEVELOPMENT

Develop production Test Methods & Automation solution in combination of Software, Electronics and Fixtures. Customer's Test Specification is strictly followed.

Our designed solutions have successfully been deployed into Multi National Companies factories and Local Design companies.



Mobile Phone, 3G Dongle
test – 2G/3G RF, Acoustic, Gang Flash programming, Functional test



SwitchTester (PLC)
test – Switch Contact, AC lamp, Screws

PROJECT EXPERIENCES

Production

- RF Test System
- FCT Test System
- Smart Meter Test System
- Infotainment Test System

Design House

- Engineering Prototype Test System

SKILLS

- Combined development experience of 25 years launching 5 products to High Volume sites
- RF products, BlueTooth products, Logic products
- Smart-meter test measurement
- Flash programming: JTAG Atmel, Teridean
- C++, C# & Labview
- PLC Integration (Autonics)
- Test sequencer: TestStand, TestExecSL, Saab TM, Indx TM
- Meas Instruments: Agilent, R&S, NI, Keithley, Fluke, Tektronix
- Best practice: Generic Test platform for Modular Test Methods re-use



Agilent Technologies



ROHDE & SCHWARZ



KEITHLEY



TEKTRONIX



FLUKE

TEST DEVELOPMENT (VISION)

Develop vision test solution for monochrome LCD pattern recognition, Keypad characters, screws presence & orientation, etc.



Detect dot missing



Detect screw orientation



PROJECT EXPERIENCES

Production

- Vision system for Mobile Phone with different Keypad variants.
- Vision system for Monochrome LCD test in Metering device such as Smart meter, Calculator, Counters, etc.
- Vision system for Mounting screw detection.

Our designed solutions have successfully passed strenuous regression test to avoid HW and SW instability issues.

SKILLS

- Self developed vision test algorithm using camera.
- Low cost test system.
- Test time optimization. Grouping & cropping
- Backlight optimization
- Slanting Dut Capture vs Template. Adapting within allowable angle, instead of hard fail.
- Smart-meter LCD test



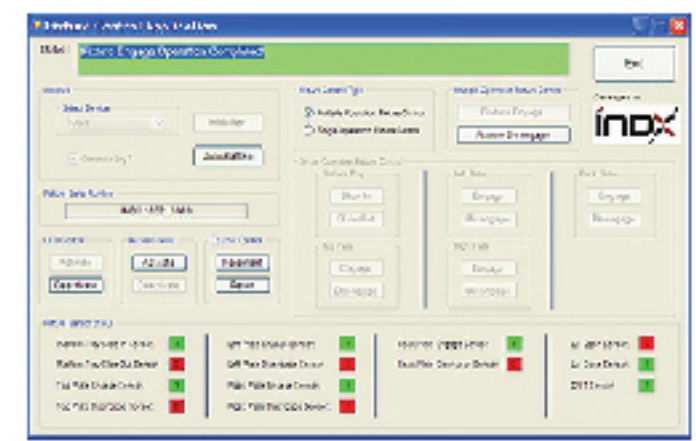
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SOFTWARE DESIGN

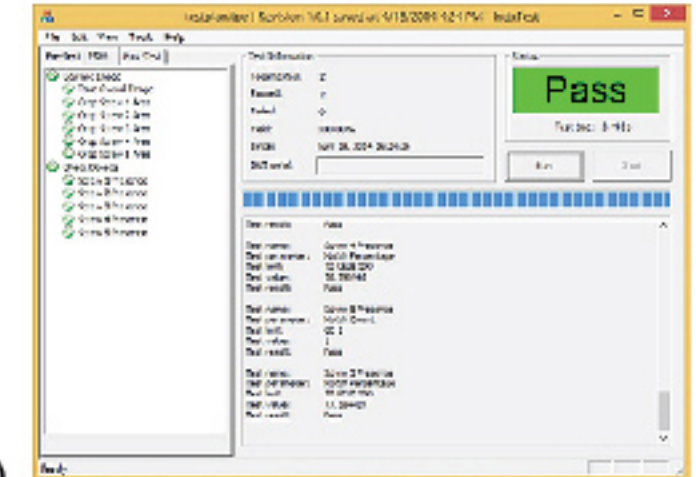
Develop standalone PC software EXE or GUI to run through a set of scripts or functions.
Develop modular software driver DLL that maps and export all possible functions of a hardware.
Develop embedded SW for micro controllers.

In addition, we can develop mobile apps for Android base devices that retrieves data from a home server.

We have developed software interface driver between Client (test-system) & Server (shop floor system) for factory test data uplink & downlink, etc.



Fixture Control



INDX Test Sequencer

PROJECT EXPERIENCES

Production

- Operator Terminal GUI
- Trouble-shooting Station GUI
- Tester & Server Interface Software

System Integration

- Modular drivers for Test Instruments
- Modular drivers for Automated Fixture
- Modular drivers for Electronic-Interface

Database

- Asset tracking, Project Utilization hour, etc
- Delivery tracking

SKILLS

- C++, C#, COM objects, ASP.Net, PHP, Ajax, JSon
- MSSQL, MYSQL
- SCPI commands
- Stand alone software (MFC Dialog)
- DLL that maps and export all possible functions of a hardware (eg. USB device, Test Instruments)
- Interface driver between Client (test-system) & Server (shop floor system) for factory test data uplink & downlink.
- Embedded software for micro-controllers (eg. FTDI, MicroChip, etc)
- Android Mobile Apps that transceive data with a remote server

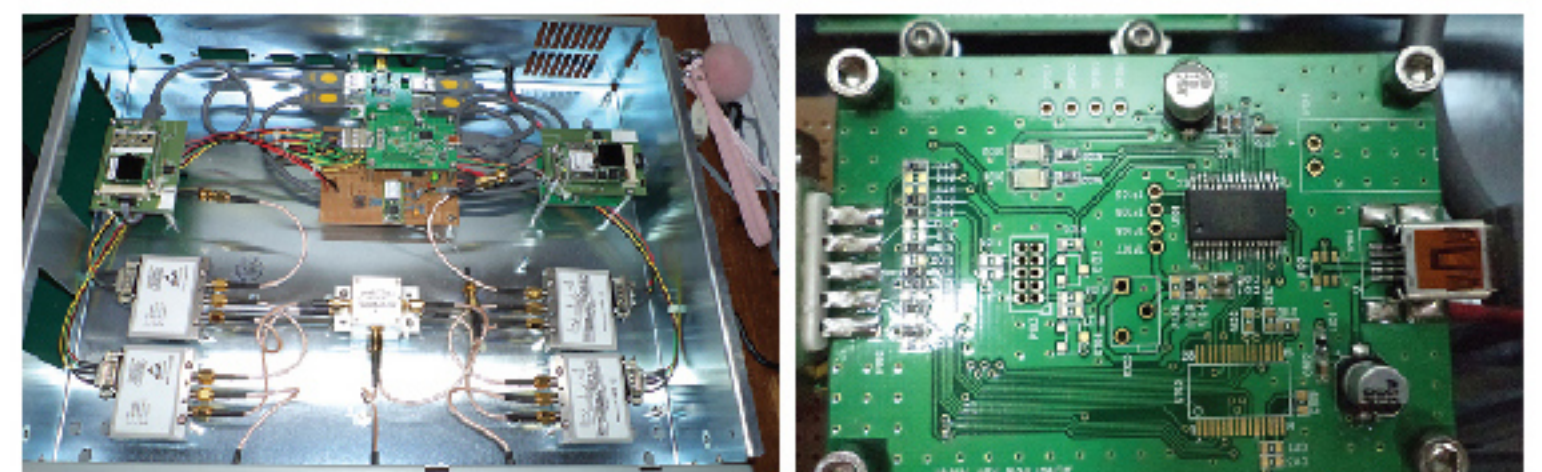


ELECTRONIC DESIGN

Develop Electronics using micro controllers to control automation/pneumatics I/Os or to measure a set of basic DC measurements.

Also can develop external PCBs to integrate with standard PLC from Autonics.

We can also provide basic Go/NoGo functional tester for WiFi, ZigBee, Bluetooth, InfraRed, FM, GSM2 in your Product.



WiFi /Bluetooth tester

PROJECT EXPERIENCES

Production

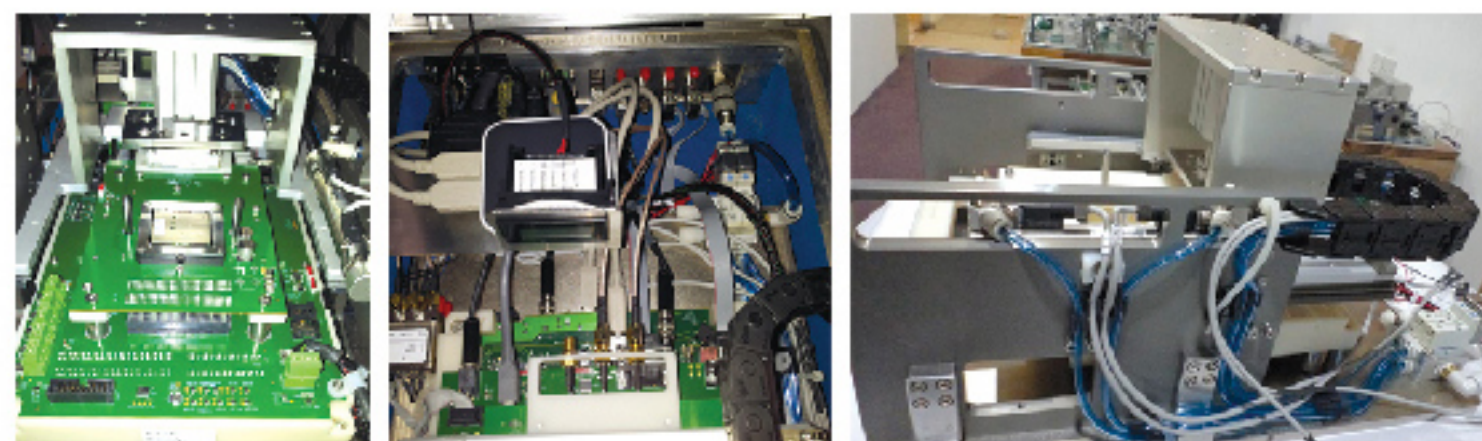
- Automation Electronics module for
 - Fixture
 - Conveyor
 - Robotics
- Low cost Customized Test Measurement module (Volt, Amp, Resistance, Capacitance, diode, etc).
- Fixture DUT Interface PCBA with critical Impedance matching (USB, RF).
- Go/NoGo functional tester for WiFi, ZigBee, Bluetooth, InfraRed, FM, GSM2.

SKILLS

- Embedded software for micro-controllers (eg. FTDI, MicroChip, etc)
- I2C, SPI communication
- USB 2.0 compliance design
- Bluetooth, WiFi circuit design
- Circuit for Power, I/Os, ADC, DAC, Comm level shifters for data transceiver
- Integration with Arduino, Raspberry PI modules
- Orcad software

FIXTURE DESIGN

Our semi-Automated RF Test Fixture comes from our long experience in Fixture development for High Volume production. Manual assembly fixture and Semi-auto fixture are used depending on process complexity, cost, cycle time and shielding requirements



M2M RF

PROJECT EXPERIENCES

Production

- M2M, AirCard RF Pneumatic Fixture
- FCT Test Fixture
- Manual Soldering jig & Assembly jig
- Acoustic shielded jig
- Air Flow testing Fixture

Design House

- Engineering Prototype Build Fixture

SKILLS

- Semi-auto Pneumatic RF Fixture design, 6-side probing (50-60 dB suppression)
- Design for Repeatability, Robustness, Shielding sensitivity, Production & Maintenance friendly and Cost.
- For customer whose multiple projects having similarities, we can adopt Base fixture and Unique parts concept
- 2UP – 10UP concept to save cycle time
- 50, 75, 100 mils probe pitch
- Robotic fingers with X-Y Stepper control
- Material selection for ESD, Heat, Anti-Scratch requirement
- Stack Up tolerance analysis
- Maintenance instruction documentation
- Design verification with Regression test

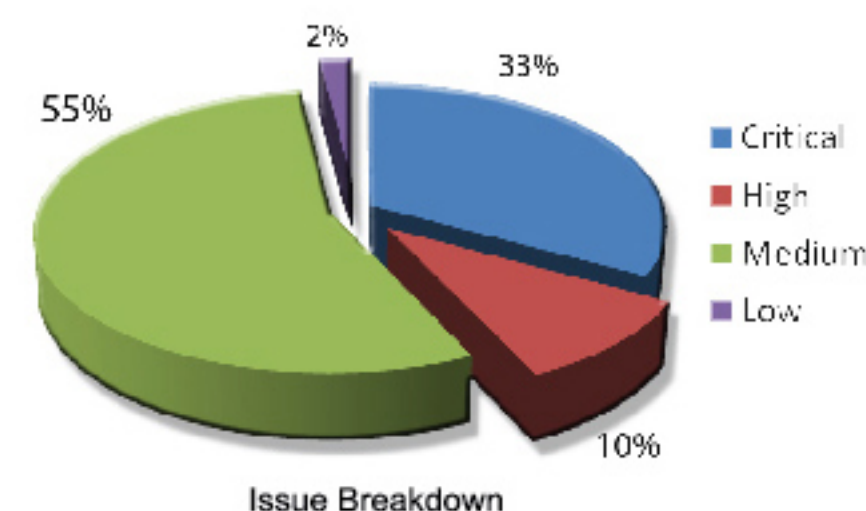
DFM PCBA

INDX can provide Value Add Service to perform DFM report (design for manufacturing) on Customer's Gerber files.

If we were to perform DFM on PCBA during Concept stage, we can avoid issues such as;

- Surface mount issues (SMA, SMT)
- Component interference
- Bridging, etc

We use Standard Design rules to match existing SMA machine.



PROJECT EXPERIENCES

Production

- Mobile Phone – PCBA (0201)
- Consumer Electronics – PCBA
- Industrial products – PCBA

Design House

- Engineering Prototype PCBA

No	DFM Issue	Violation Consequences	Suggested Solution	Priority	No of Issues	Status
1	Wrong part or footprint	Part could not be placed properly	Please refer to the datasheet attached, if the part is wrong, please pick the right part else if the footprint is wrong please use the right footprint	Critical	1	Open
2	Breakaway Tab too close to component and toepoint	Wrong de-paneling method can cause component and solder joint cracks, as well as PCB de-lamination.	Use punching or routing to de-panel the PCB's, Mousebites breakout and V-Scoring can be use with caution with certain products.	Critical	1	Open
3	Unknown slots/hole in the board	Could cause assembly problem. Found hole under U15	Please define what is the use of the slots, if it is for the shield please load the shield part	Critical	1	Open
4	Toe for the pin is long due to soldermask opening	It has been determined that there is too much solder pad area from the toe of the component. This can cause the solder not to form a proper fillet. Also the toe length can be reduced to save some board space.	Reduce the toe distance from the pad area based on the recommended value	Critical	1	Open