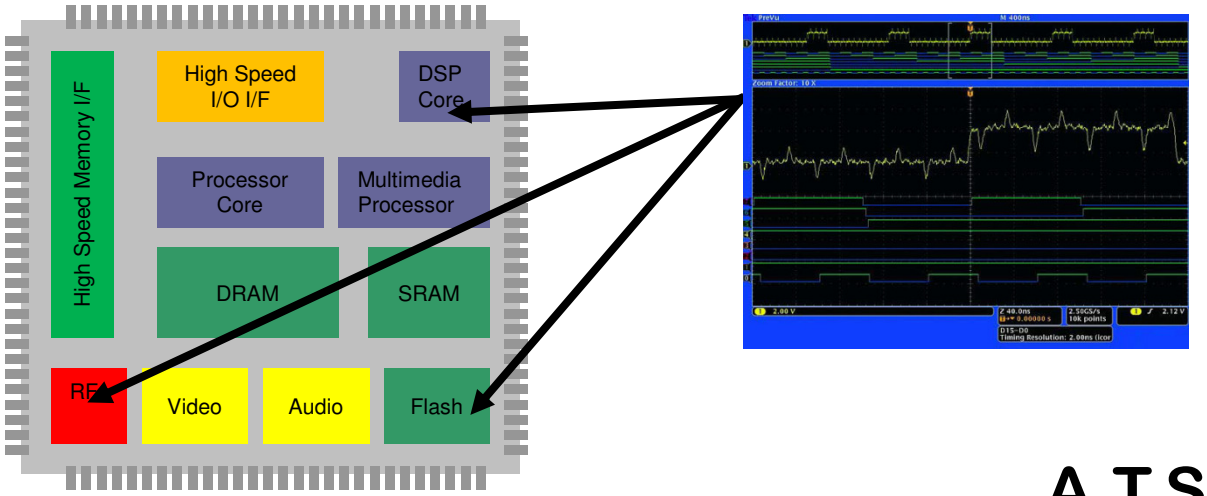
CloudTesting™ Service
Revolutionary New Concept
For Post-Silicon Validation



A.T.Sivaram

Silicon Development Flow

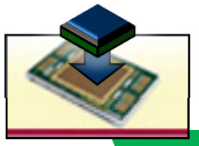
Cloud Testing Service

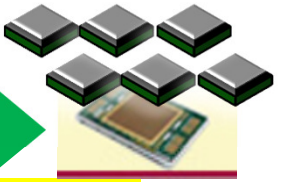
Design and Verification Environment

Automated Test Equipment

Probe Card Evaluation Board

Test Resources/Conversion





Pre-Silicon

Post-Silicon

Production

Highest Cost in Bug Fixing

- Logical Bugs
- Circuit Bugs

- Logical Bugs
- Circuit Bugs
- Environment Variations
- Process Variations
- DC/AC Characterizations, …

- Productivity
- Yield Analysis

Verification Technologies
-Formal verification
-Assertion-based verification
-Clock domain crossing check
-Logic Simulation/Emulation
-STA, SSTA, ……

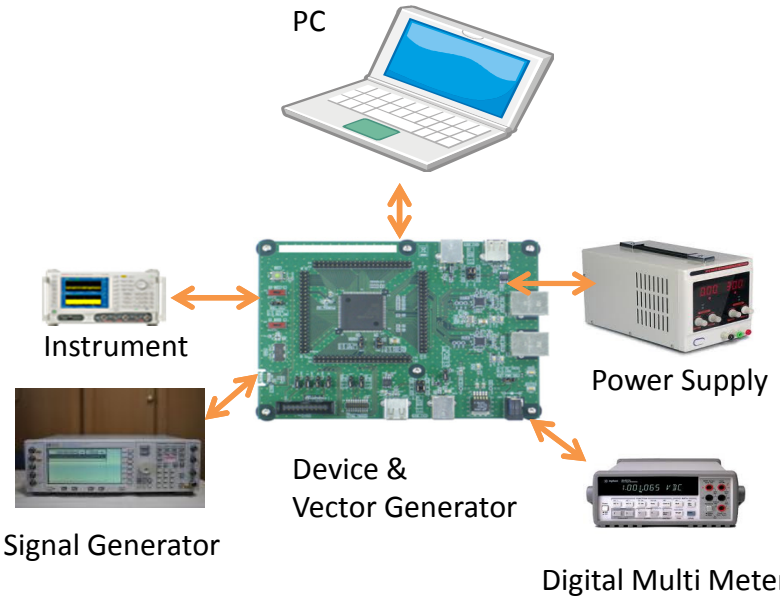
LSI Test Technologies
-DFT,SCAN,ATPG,BIST
-Functional Test
-Fault Simulation/Diagnostics, ….

Verification, Validation & Test

	Pre-Silicon Verification	**Post-Silicon Validation**	**Production Test**
Goal	Are There Bugs In Design? **"Are We Building it Right?"**	Does The Device Work As Designed? **"Are We Building The Right Thing?"**	Is the Device Manufactured Correctly?
Time Spent	Months	Days/Weeks	Seconds/Minutes
Platform	SW Test Bench	HW Bench /System/ATE	ATE/SLT
Tools	DFT/BIST/ATPG/	Logic Analyzer /Scope/ATE Patterns	Prober/Handler
Unit Volume		Low	Each Device

Post Silicon Validation

ATE & Bench Setup Are Essential for Post Silicon Validation



- Shmoo Plots
- ATPG Validation
- Built In Self Test

- Run End User Applications
- Interoperability Conditions
- Insitu Testing

Drawbacks ATE & Bench

ATE

- Footprint.
- Flexibility.
- Ease of use.
- Reuse.

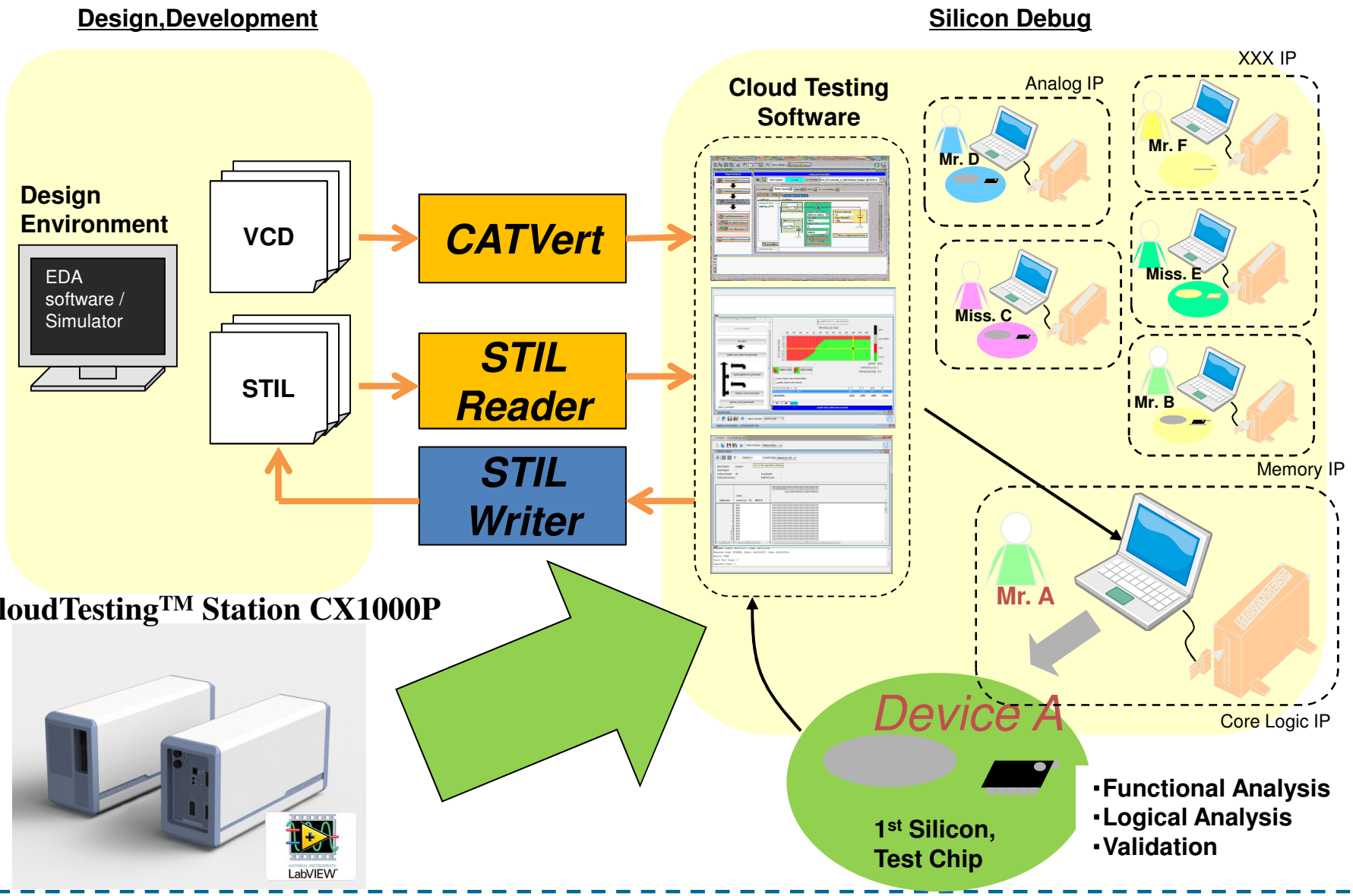
Bench Setup

- Complicated.
- Cluttered by many instruments.
- Complex and time consuming set up.

And Both

- … co$t $$$.

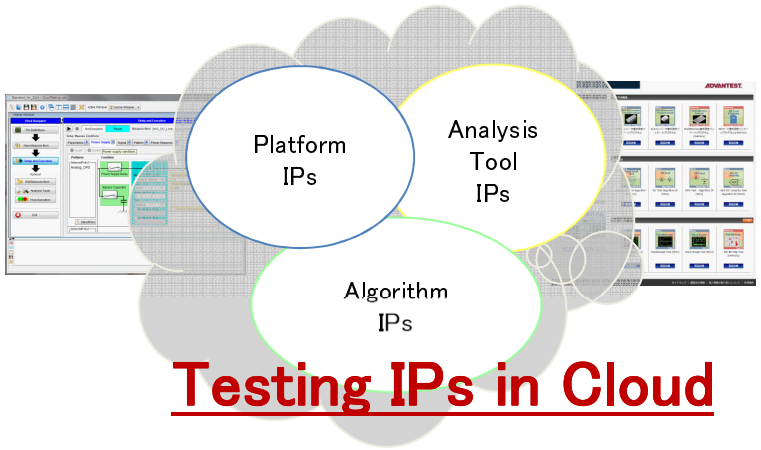
Concept – Design To Test Solution



Feature – Our Solution:

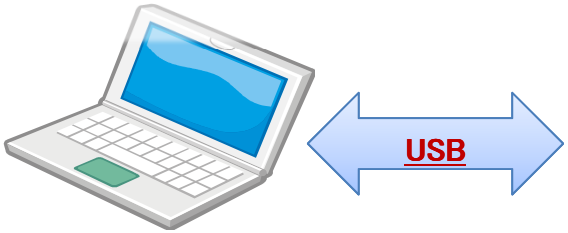
Available whenever, wherever, whoever needs it, and easy to use!

CloudTesting™ Service



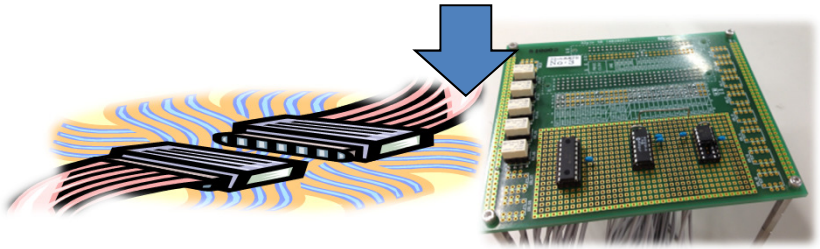
Testing IPs in Cloud

Download IPs to your PC



HW is rental contract

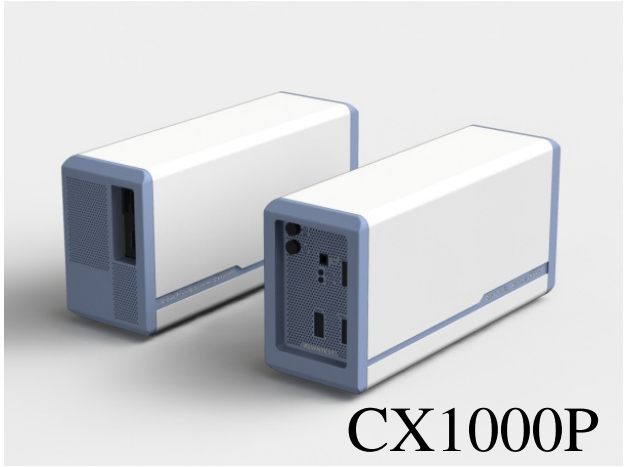
Purchase cables & the socket board on E-commerce site



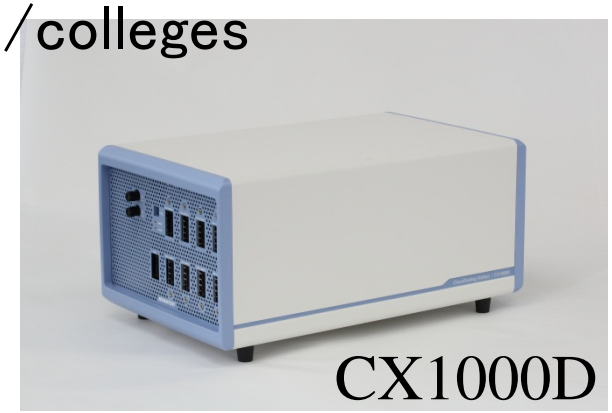
Feature – Portable Stations

H/W: CloudTesting™ Station

1. Small footprint
   W107mm H198mm D400mm 6Kg
   W4.2in H7.8in D15.7in 13lb
2. Office power outlet
   100V-240V

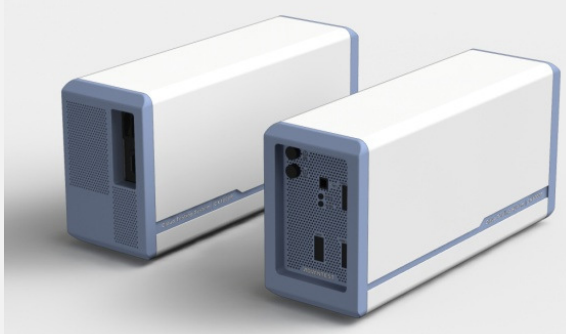

CX1000P

3. Configurable architecture for various testing scenarios.
   - Measure passive/active semiconductor components
   - Design Verification of Logic Circuits.
   - Teaching Testing Classes at universities/colleges
   - For use in R&D of test circuits.


CX1000D

Feature - How we resolve:

CX1000P



I/O: 32ch
DPS: 2ch
PMU: 1ch
AWG: 1ch
DGT: 1ch
RVS: 2ch

CX1000D

I/O: 128ch
DPS: 8ch
PMU: 4ch
AWG: 4ch
DGT: 4ch
RVS: 8ch

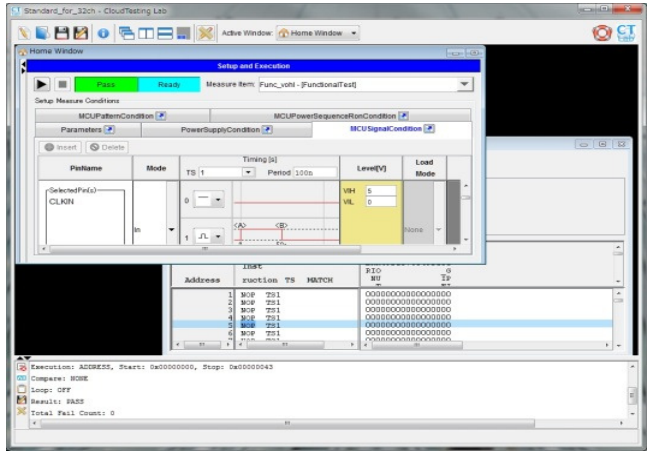
CX1000D S2-LINK

I/O: 256ch
DPS: 16ch
PMU: 8ch
AWG: 8ch
DGT: 8ch
RVS: 16ch

Feature – SW Model

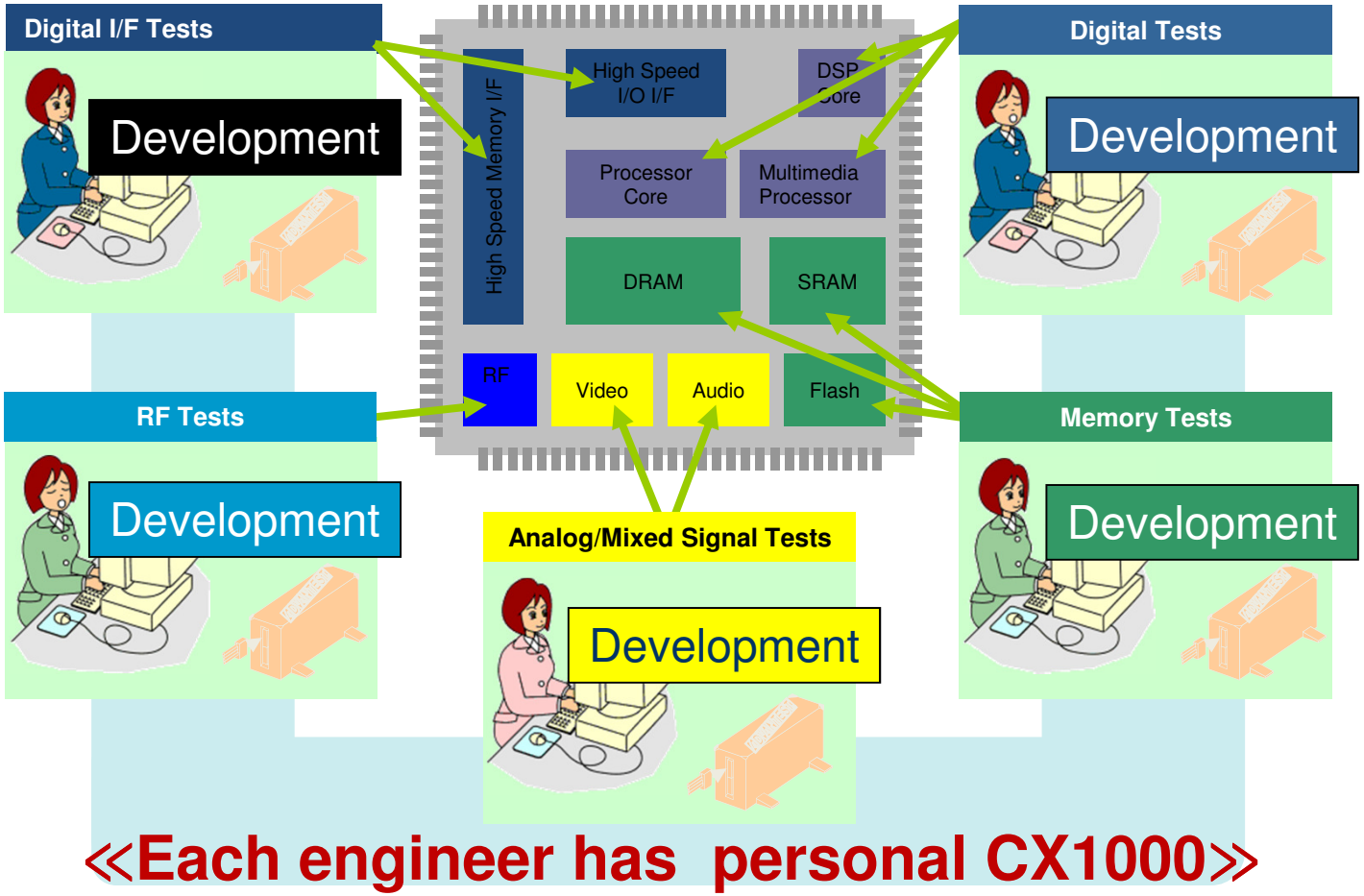
S/W： CloudTesting™ Lab

1. GUI & CSV
   - Specify the test conditions by using GUI.
   - Set the test conditions by importing CSV.
   - No dedicated/specific programming language.
2. Plug-In architecture
   Testing/Tool IP work as plug-in.
3. EDA Linkage
   Support STIL (STILReader/Writer) and VCD/eVCD.



Reduce TAT For SI Development

- Personal use model.
- No Timesharing like ATE.

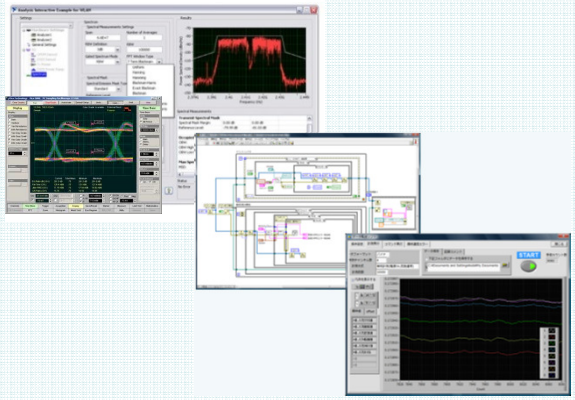


«Each engineer has personal CX1000»

CX1000 & External Power Supply

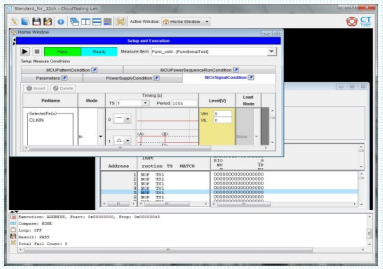
Control PC

LabVIEW



Control

Cloud Testing Lab



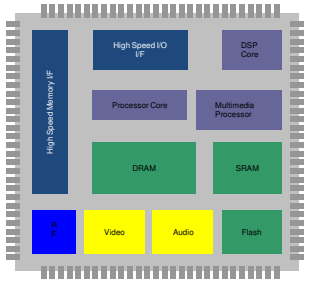
USB←→GPIB Cable

National Instruments (GPIB-USB-HS)

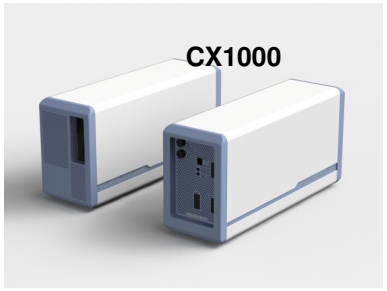
External Power Supply (Agilent E3648A)

Power Supply Voltage

Target Application



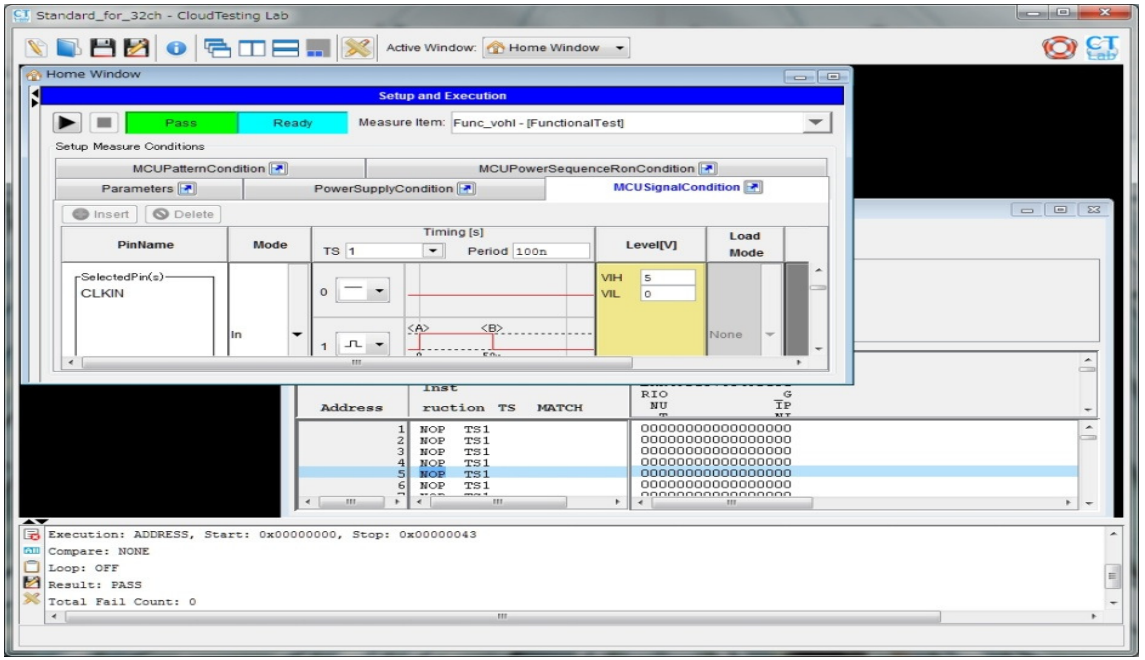
USB



Digital I/O
AWG/DGT
Reference Voltage

System Requirements

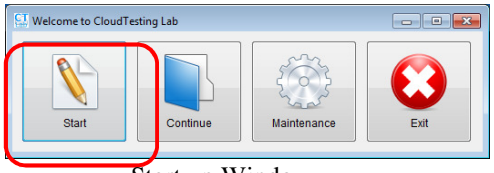
OS	**Windows 7 Professional 64bit** **CPU: 1GHz x64 Processor (EM64T)** **Mem: 4GB** **HDD: More than 30GB empty space** **USB 2.0**



CTLab Operation (Supports CSV)

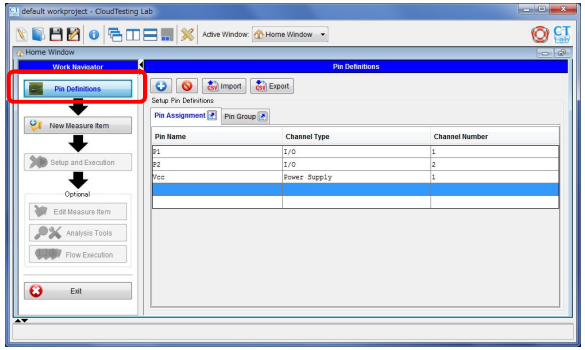
Cloud Testing Service

Execute DC Test/FT Test by only 4 steps!



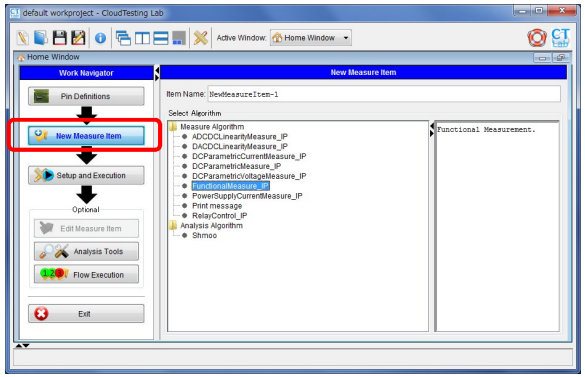
Start up Window

1



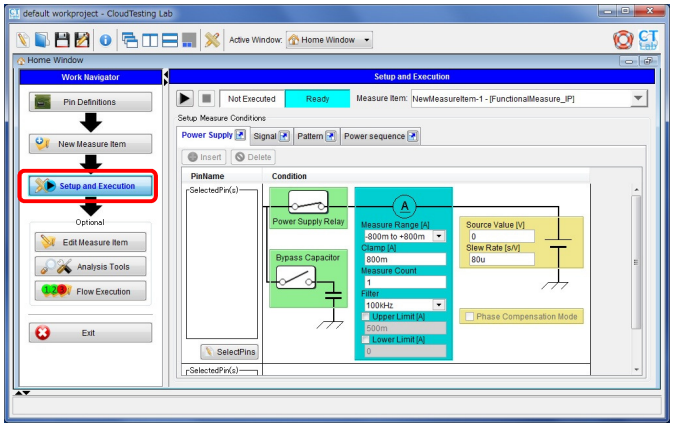
Specify Pin Definitions

2



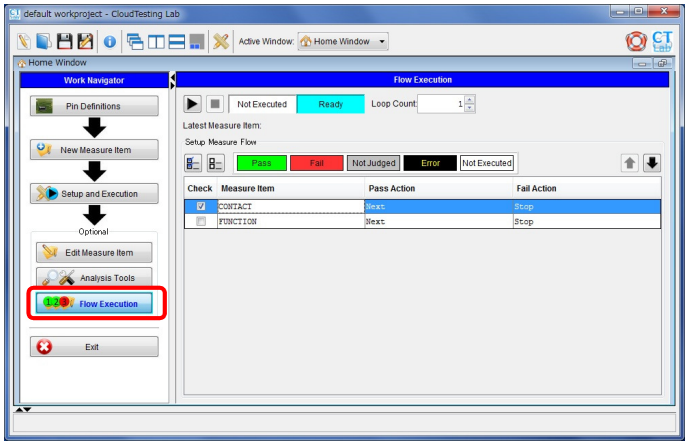
Select New Measure Item (IP)

3



Specify Setup and Execution

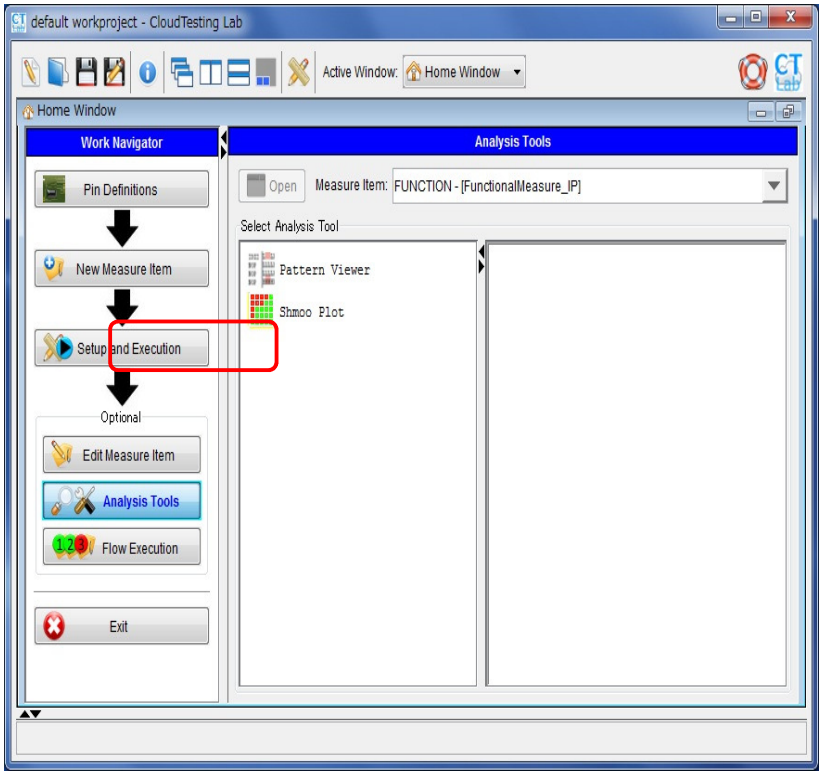
4



Specify Flow Execution

2013/10/28

CTLab Operations (Tools)

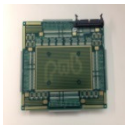
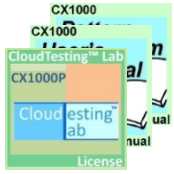
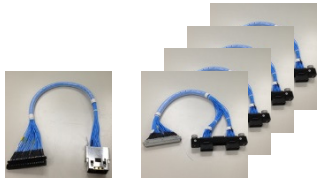
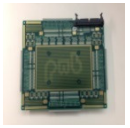
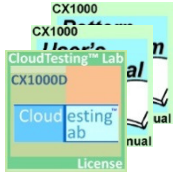
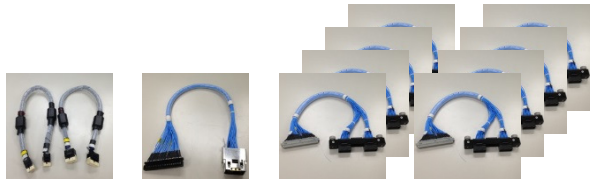
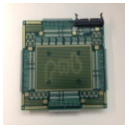
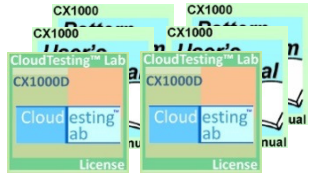


Analysis Tools

Shmoo Plot Tool

2013/10/28

CTS Cost of Use Model

System	Cable - **One Time**	Board- **Per DUT**	OS – **Monthly***
CX1000P 	**$1,370** (CONT Cable x1, FUNC Cable x1) 	**from $190 …** Universal  or Customize Existing Board	**$550** (CX1000P License x1) 
CX1000D 	**$4,400** (CONT Cable x1, FUNC Cable x4) 	**from $350 …** Universal  or Customize Existing Board	**$1,320** (CX1000D License x1) 
CX1000D x 2 	**$8,990** (S2-Link Cable x1 , CONT Cable x1, FUNC Cable x8) 	**from $540 …** Universal  or Customize Existing Board	**$2,640** (CX1000D License x2) 

Additional monthly charges apply for each IP used .

* These are special colors for the exhibition.