Development of a concept to combine and simplify different existing automatic test systems and subsequent implementation of a new test system software

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Outline
- Motivation
- Original State
- Analysis
- Implementation
- Outlook
Motivation
Identify
Redundancies
Motivation

Create

Concept
Motivation

Increase Efficiency
Analysis
Alignment

Test Box
Keithley 2015P

Power Supply
Agilent 6632B
Keithley 2306

Multimeter
Agilent E4421B

Windows
PC

RF Generator
Agilent E4406A
Final

- Windows PC
- Power Supply: Agilent 6632B
- BT-Tester: Anritsu MT8852B
- TBSU
- Power Supply: Agilent 6632B
- Radio Comm. Tester: Rohde&Schwarz CMU200
- Test Box
- Multimeter: Keithley 2015P
- Switch Unit: Custom Relay Card
- Switch Unit: RF-Switch
<table>
<thead>
<tr>
<th>Component</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows PC</td>
<td></td>
</tr>
<tr>
<td>Power Supply</td>
<td>Agilent 6632B</td>
</tr>
<tr>
<td>BT-Tester</td>
<td>Anritsu MT8852B</td>
</tr>
<tr>
<td>TBSU</td>
<td></td>
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<tr>
<td>Power Supply</td>
<td>Agilent 6632B</td>
</tr>
<tr>
<td>Radio Comm. Tester</td>
<td>Rohde&amp;Scharz CMU200</td>
</tr>
<tr>
<td>Climatic Chamber</td>
<td></td>
</tr>
<tr>
<td>Multimeter</td>
<td>Keithley 2015P</td>
</tr>
<tr>
<td>Switch Unit</td>
<td></td>
</tr>
<tr>
<td>Switch Unit</td>
<td>RF-Switch</td>
</tr>
<tr>
<td>Custom Relay Card</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ECT</td>
</tr>
<tr>
<td>----------</td>
<td>-----</td>
</tr>
<tr>
<td>PS</td>
<td>X</td>
</tr>
<tr>
<td>DMM</td>
<td>X</td>
</tr>
<tr>
<td>CC</td>
<td>X</td>
</tr>
<tr>
<td>SU</td>
<td>X</td>
</tr>
<tr>
<td>CMU</td>
<td>X</td>
</tr>
<tr>
<td>BT</td>
<td>X</td>
</tr>
<tr>
<td>Printer</td>
<td></td>
</tr>
<tr>
<td>Carbox/TBSU</td>
<td>X</td>
</tr>
<tr>
<td>Barcode</td>
<td></td>
</tr>
</tbody>
</table>
# Test-Combinations

<table>
<thead>
<tr>
<th>Final</th>
<th>ECT</th>
<th>PV</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>90%</td>
<td>87%</td>
<td>78%</td>
</tr>
</tbody>
</table>
TestStand + Established - Cost & Complexity
Vee + Graphical Cost & Complexity
novero Tester
+
C++ & free!

Implement. Effort
Recap

combine ECT, PV, Final

usin novero Tester

g implement PV
Driver Framework

Vee | TestStand | novero Tester
---|---|---

Teststeps in TestCase DLL

Driver Framework

CMU Class/DLL | Power Supply Class/DLL | Multimeter Class/DLL | BT-Tester Class/DLL
---|---|---|---
Switch Unit Class/DLL | DUT Comm. Class/DLL | ... Class/DLL
Driver Framework

Connect GPIB 9

Query „*IDN?“

Which Device?

Device X

Connect Device X

Device Y

Connect Device Y
Sample

GPIB Address from .ini

Connect Device

Log Result
Sample
ACTION ( "Connect to Power Supply", PowerSupply->Connect ( Config->GetIntVal("GPIB","PowerSupply",0) ) );
Sample NUMERIC ( "Measure DC Voltage", DMM-> MeasureVoltDC ( &g_doubleResult ) , "V", 12.0, 14.0 );
Sample

STRING ( "Get Version String",
    PXA->
    GetVersionString ( &g_stringResult )
    , "v3" );
Sample GUI
### Sample HTML

**Product Validation Gemini - Report**

<table>
<thead>
<tr>
<th>DUT</th>
<th>Title</th>
<th>Comment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
<td>Connect to Power Supply</td>
<td>(12 [V] &lt;= ) 13.2 [V] ( &lt;= 14 [V])</td>
<td>Passed</td>
</tr>
<tr>
<td>001</td>
<td>Measure DC Voltage</td>
<td></td>
<td>Passed</td>
</tr>
<tr>
<td>002</td>
<td>Get Version String</td>
<td>(&quot;v3&quot; in ) &quot;v3.4&quot;</td>
<td>Passed</td>
</tr>
</tbody>
</table>
Sample DVLOG

[testcases]
#<!--TestCasesStart-->#
Connect to Power Supply; ; ; ; ;
Measure DC Voltage; V; 12; 14; ; ;
Get Version String; ; ; v3; ; ;
#<!--TestCasesEnd-->#

[testresult_header]
line_number; date; time; cycle; dut; temperature;
humidity; testname; verdict; meas_result; meas_unit; additional_info
[testresults]
0; 02.11.2011; 11:47:52; 1; 1; ; ; ; ; ; ; Connect to Power Supply; PASS; ; ; ;
1; 02.11.2011; 11:47:52; 1; 1; ; ; ; ; ; ; Measure DC Voltage; PASS; 13.2; V; ;
2; 02.11.2011; 11:47:52; 1; 1; ; ; ; ; ; ; Get Version String; PASS; v3.4; ; ;
Results

Driver Framework working
Results

PV Tester implemented
Results

Teststeps

portable
Future
Use
Teststeps for other stations
Future

Add Teststeps for other stations
Future
Replace
existing SW solutions
Questions?
thanks!