

Keysight i1000D Series In-Circuit Test System

Software Release v3.60pa

Supported products:

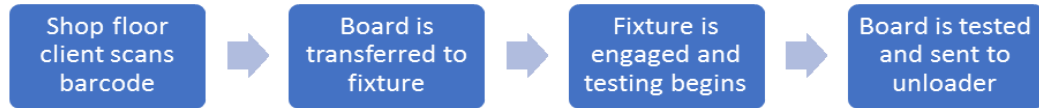
- U9401B – Keysight i1000D Press Down ICT System
- U9403A – Keysight Mini ICT System
- U9405A – Keysight i1000D Small Foot Print ICT System (Inline/Offline)

What's New in v3.60pa

- i1000_Abort and SF_Abort commands
These commands interrupt the test process upon encountering errors.
- INST mode
This mode allows users to execute commands to control instruments that are connected to the tester.
- Multiple board versions
This feature allows users to add and select multiple board versions in a single test program.
- Board sampling functionality
This feature enables users to skip some tests and improve throughput when a board reaches a high FPY.
- Card diagnostics enhancement
New functions are added, such as Break, Rescan, and a new Diagnostic Report.
- Support for Keysight nanoVTEP
Keysight nanoVTEP technology can be used with the i1000D systems. Setup, debugging, and operation are the same as VTEP.
- Multiple system types
From mid-2016, the i1000D systems support multiple conveyor configurations.
- Support for Windows 10
Windows 10 (64-bit) is fully supported.
- Golden sample board verification
- Exclude Post Test from report
- More detailed descriptions in SFP Offline IO window
- Critical enhancements
- Fixes for critical and serious defects

i1000_Abort and SF_Abort Commands

The normal testing process is as follows:



The i1000_Abort and SF_Abort commands interrupt the test process upon encountering errors.

i1000_Abort Command

The i1000_Abort command is generated by the shop floor client application to abort the i1000 test process.

1. Shop floor client encounters an error.
2. Shop floor client generates i1000_Abort.txt and sends it to i1000 system.
3. i1000 system receives i1000_Abort.txt, and executes abort function.

Example: The shop floor client scans a DUT barcode and sends it to the shop floor server for validation. If the shop floor server finds the barcode to be invalid, the shop floor client will generate i1000_Abort.txt to inform the i1000 system to abort the process.

SF_Abort Command

The SF_Abort command is generated by the i1000D to reset the shop floor client.

1. i1000 system encounters an error.
2. i1000 system generates SF_Abort.txt and sends it to shop floor client.
3. Shop floor client receives SF_Abort.txt, and resets itself.

Example: When the board arrives at the stopper, the conveyor drops down. If the board is distorted upon arrival, the i1000 system generates SF_Abort.txt and sends it to the shop floor client to reset itself.

INST Mode

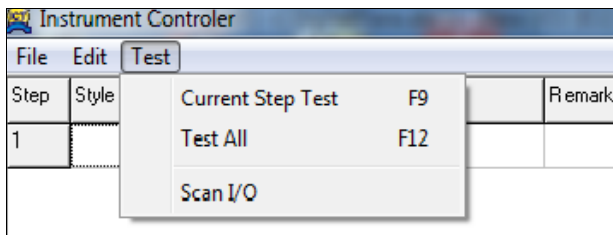
The INST mode is provided in the Functions page and allows users to execute commands to control instruments that are connected to the tester via a USB/COM/GPIB/LAN cable. The instruments can be controlled in the same INST step or separate INST steps.

This mode allows commands to be sent and parameters read to determine a PASS/FAIL condition.

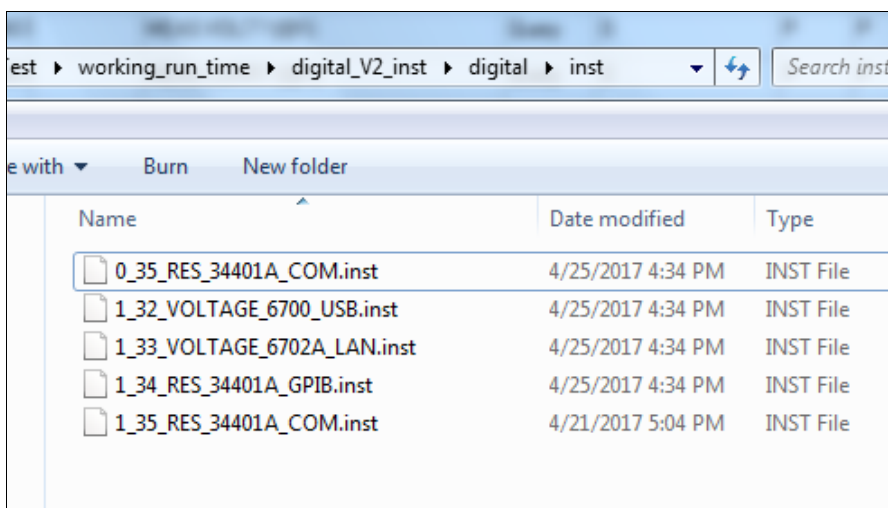
No nail number entry is required. Set the mode, then double-click the StdVal column to launch the Instrument Controller interface.

1	31	32	P	NULL	VOLTAGE_6700_USB	A1	QINST	*	P	P	INST	1
1	32	33	P	NULL	VOLTAGE_6702A_LAN	A1	0	*	P	P	INST	1
1	33	34	P	NULL	RES_34401A_GPIB	A1	*	*	P	P	INST	1
0	34	35	MP	NULL	RES_34401A_COM	A1	0	*	P	P	INST	1

Each instrument must be configured with a unique ID address which can be detected by the tester during a scan from the Instrument Controller. From the **Test** menu, select **Scan I/O** to initiate the scan.



Perform the scan before editing the command. Each INST mode step can be saved to a .inst file, which can be found in the `/user_program/digital/inst` folder.

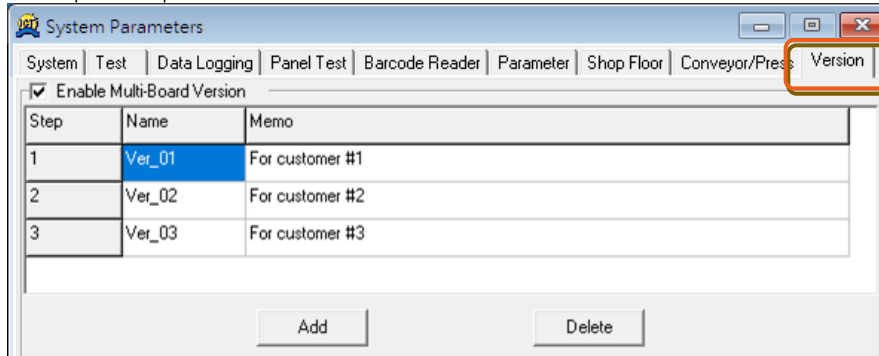


Multiple Board Versions

This software release allows users to add and select multiple board versions in one test program, as well as add notes in the memo.

Example: Board versions 1 to 6 are added in the test program debug page. Component test steps need to be duplicated and added to the board versions as well. When the setup is completed, reload the test program to display and allow selection of the different board versions.

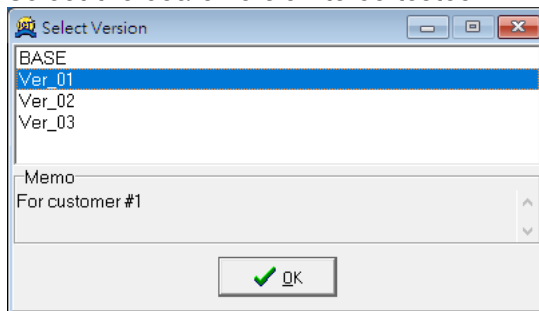
1. Set up multiple board versions from the **Version** tab.



2. In the Test Editor page, add test steps to the board versions by duplicating the test steps and selecting the board version from the Version column.

Board	Total	Step	Style	Part	Remark	LC	Version	Sampling	ActVal	StdVal	HL	LL	Mode	Range	Delay	Average	A	B	EA	EB
1	5	5		R23	R23	A1	BASE	0	11o	8o	10%	P	CC	1	0	0	5076	5068	0	0
1	6	39		R23	R23	A1	Ver_01	0	11o	8o	10%	P	CC	1	0	0	5076	5068	0	0
1	7	41		R23	R23	A1	Ver_02	0	100o	100o	5%	5%	CC	1	0	0	5076	5068	0	0
1	8	42		R23	R23	A1	Ver_03	0	220o	220o	5%	5%	CC	1	0	0	5076	5068	0	0
1	9	6	KP	F1	F1	A1	BASE	0	*	*	10%	10%	CC	1	0	0	0	0	0	0
1	10	7		FB1	FB1	A1	BASE	0	10o	8o	10%	P	CC	1	0	0	5116	5128	0	0
1	11	8	KP	FB2	FB2	A1	BASE	0	*	*	10%	10%	CC	1	0	0	5114	0	0	0
1	12	9	KP	L1	L1	A1	BASE	0	10o	10o	10%	10%	CC	1	0	0	5122	0	0	0
1	13	10		FB1	FB1	A1	BASE	0	8o	8o	10%	P	CC	1	0	0	5116	5128	0	0
1	14	11	KP	FB2	FB2	A1	BASE	0	*	*	10%	10%	CC	1	0	0	5114	0	0	0

3. Configure the test steps as required for each board version.
4. Select the board version to be tested.



Only the selected board version and the BASE version will be tested.

Board Sampling Functionality

The standard test process for the i1000D follows this order:

- Discharge
- Open/short
- Component test
- Function test

The new board sampling functionality enables users to skip tests and improve throughput when boards reach a high FPY.

Users can set the parameters for sampling (Figure 1), which are:

- Three FPY levels that will determine how components are skipped.
Example: Level 1 is set as 95%, Level 2 is set as 97% and Level 3 is set as 98.2%.
The level for each component is then selected as shown in Figure 2.
 - The default Level of 0 indicates the component must always be tested.
 - When the sampling FPY reaches Level 1, components set at Level 1 (e.g. R21) will be skipped in subsequent testing; similarly for Levels 2 and 3.
- Qualifier Count
Qualifier count refers to the number of PCBs that will run a full test before triggering a sampling test. A setting of 10 will put 10 PCBs through a full test before triggering the sampling test.
- Sampling Period
Sampling Period refers to the number of PCBs that will run a sampling test. A setting of 50 will put 50 PCBs through a sampling test.

Figure 1 Sampling parameters

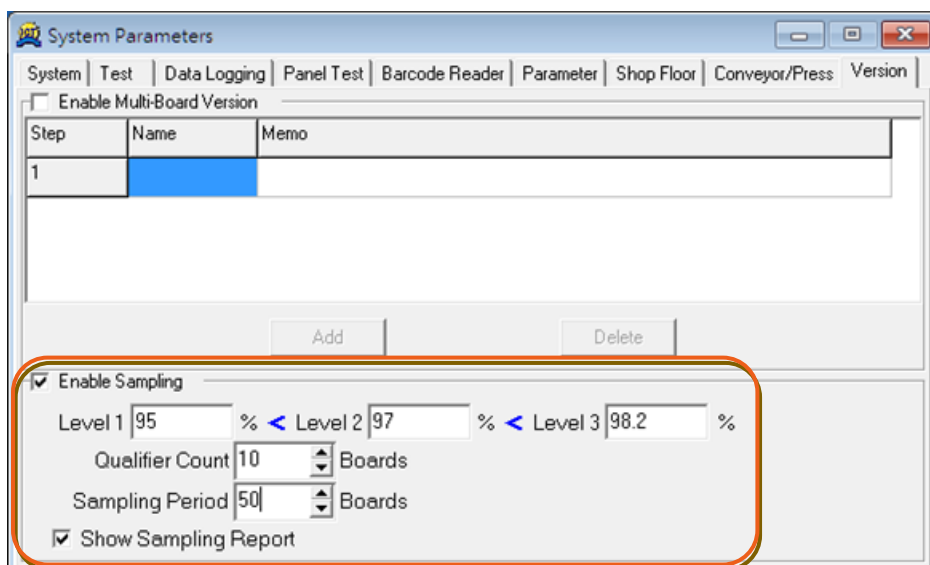


Figure 2

Test Editor		IC Editor		Shorts Editor		Pins Test Editor		Skip Pin Editor		Nails	
Resistor		Inductor		Capacitor		Jumper		Transistor		Others VTEP v2.0	
Board	Total	Step	Style	Part	Remark	LC	Version	Sampling	ActVal		
1	15	19		R20	R20	A1	BASE	0	37o		
1	16	20		R21	R21	A1	BASE	1	37o		
1	17	22		R17	R17	A1	BASE	2	33o		
1	18	23		R1	R1	A1	BASE	3	220o		
1	19	24	KP	R2	R2	A1	BASE	0	220o		

Help						
Key	F1	F2	F4	F5	F6	F7
Command	Help	Skip	Return to Test	Exchange /	Test Editor	Save
Key	Ctrl+S	Ctrl+H	Ctrl+F	Alt+L	Alt+C	Alt+A
Command	Save	Histogram	Find	Set Block	Copy Block	IC

Memo	
Level 0	Must test
Level 1	95 %
Level 2	97 %
Level 3	98.2 %
Qualifier Count	10 Boards
Sampling Period	50 Boards

Sampling process

1. Run Qualifier phase and capture FPY data.
2. Start Sampling phase.
 - a. After each board, recalculate FPY.
 - b. Select components to be tested based on FPY result:
 - For each component, if FPY result is lower than preset sampling Level, full test will be run.
 - If FPY result is equal to or higher than preset sampling Level, the test will be skipped.
3. Clear sampling report at the end of sampling phase.
4. Repeat steps 1 to 3 until the end of the production shift.

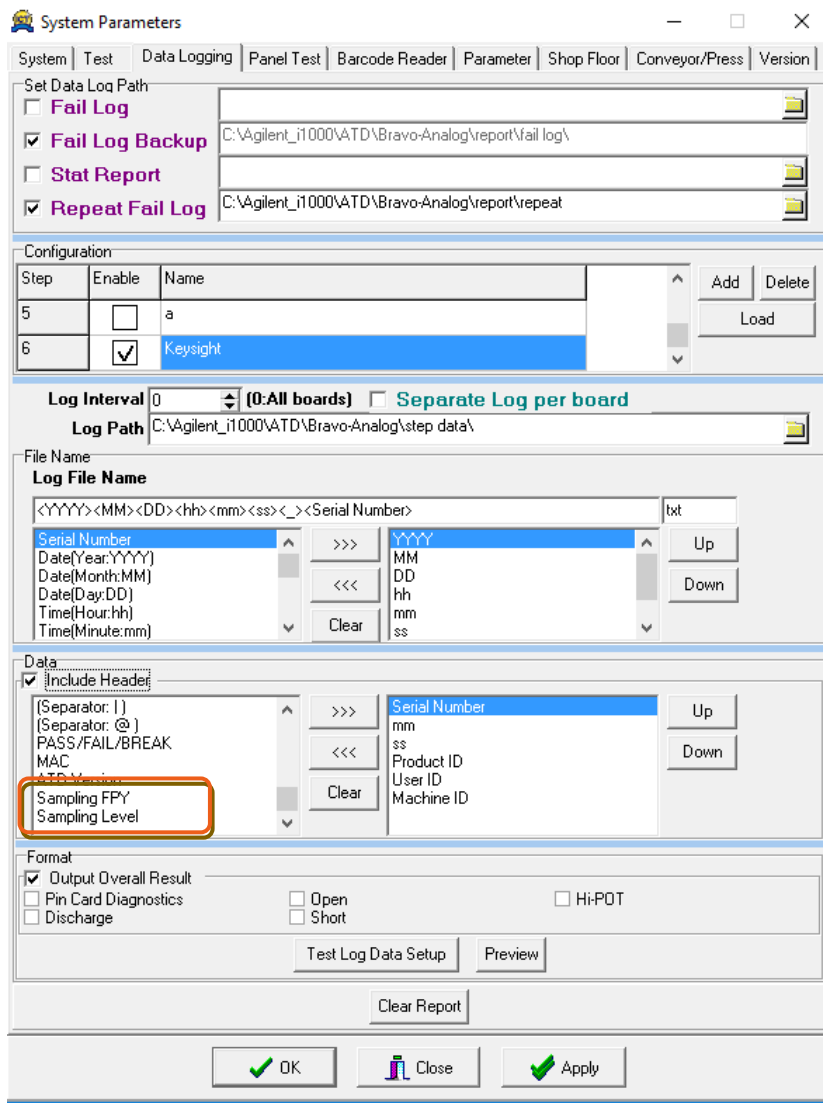
Break Sampling Test

There are three ways to interrupt the sampling test run:

- Click the STOP button in the i1000D software.
- Press the Emergency button on the i1000D tester.
- Reload the test program (ATD) or relaunch the i1000D software.

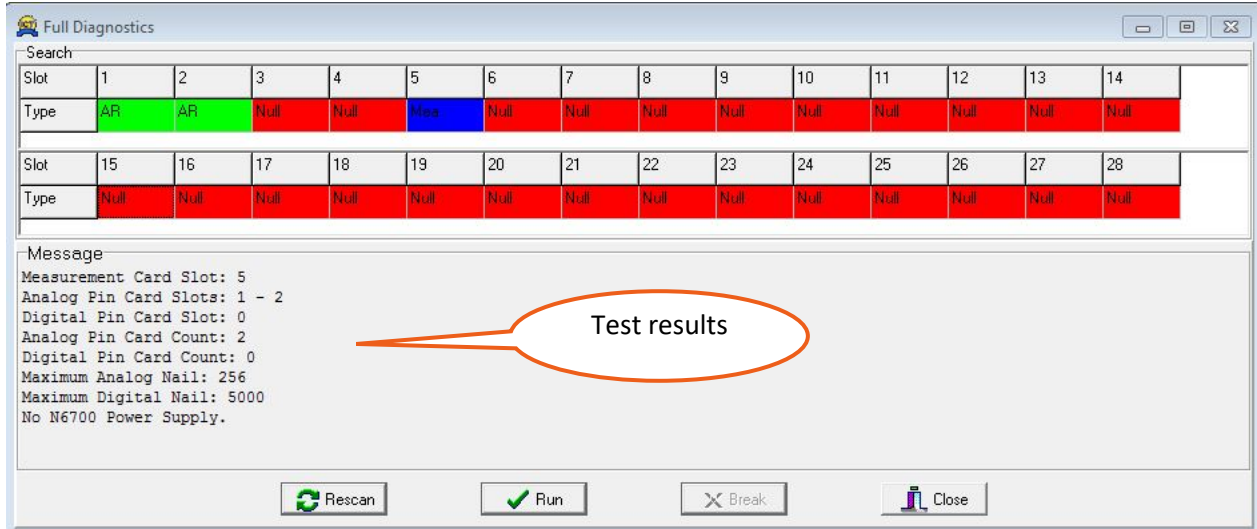
Data logging for Sampling test

The Sampling FPY and Sampling Level are new options that can be included in the data logging header file.



Card Diagnostics Enhancement

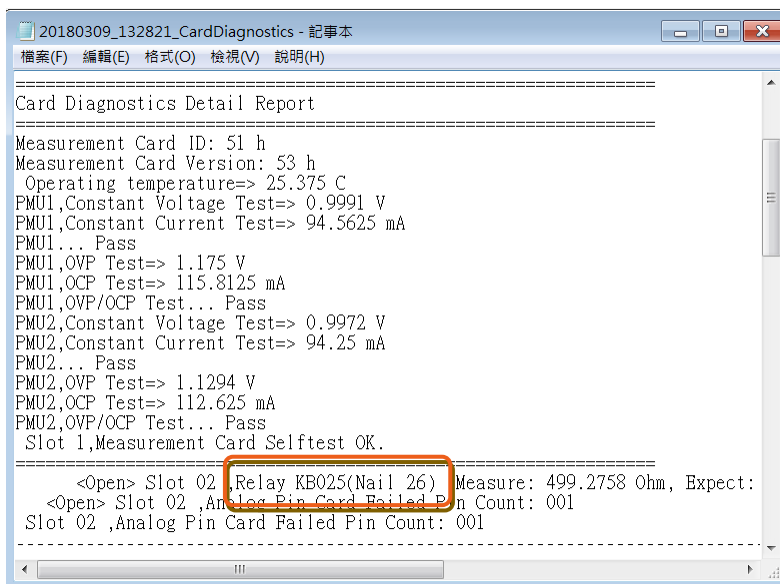
The Diagnostics interface adds new functions such as Break and Rescan, and the Diagnostic Report shows the nail numbers to map defect relays.



The button functions are:

- Rescan – Update the system configuration after any hardware change.
- Run – Execute the diagnostics tests.
- Break – Stop the diagnostics test manually.
- Close – Close the Diagnostics window.

The Diagnostic report now shows nail number mapping to relay locations:



Multiple System Types

i1000D systems from mid-2016 support multiple conveyor configurations:

- Left-in, Right-out
- Left-in, Left-out
- Right-in, Left-out.

It takes less than an hour to complete the on-site conveyor exchange.

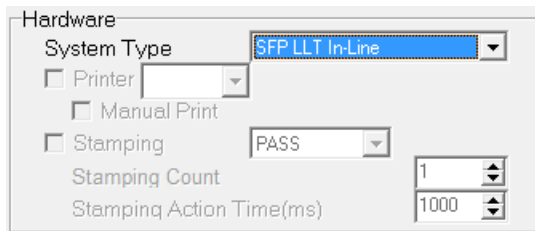
Older SFP systems will need to be returned to the factory for modification of the conveyor configuration.

Hardware Adjustments After Conveyor Exchange

The following hardware adjustments are required each time a conveyor exchange is done.

1. Move the Slow Down sensor to the opposite side. For example, if changing direction from Left-in, Right-out to Right-in, Left-out, then the Slow Down sensor needs to be moved to the right side.
2. Move the Front/Rear Stopper to the opposite side (e.g. if changing direction from Left-in, Right-out to Right-in, Left-out, then the stopper needs to be moved to the right side.
3. Swap signals in the fixture control card to match the new direction.
4. Adjust the conveyor motor and controller to match the new direction.

After the hardware adjustments are done, select the correct system type in the software.



Hardware

System Type: SFP LLT In-Line

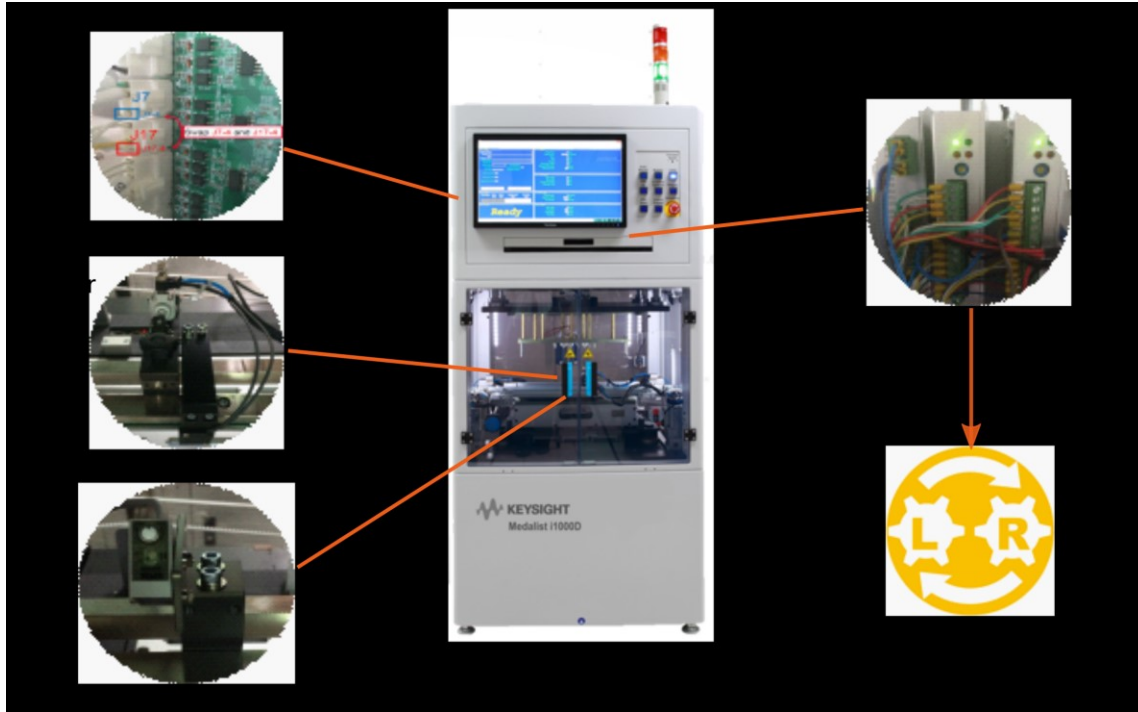
Printer

Manual Print

Stamping: PASS

Stamping Count: 1

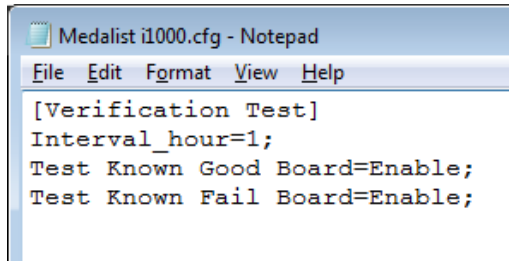
Stamping Action Time(ms): 1000



Golden Sample Board Verification

This feature provides Known Good Board and Known Fail Board verification.

To enable the verification test, open **C:\Agilent_i1000\Medalist i1000.cfg** and locate the section **[Verification Test]**:



```
Medalist i1000.cfg - Notepad
File Edit Format View Help
[Verification Test]
Interval_hour=1;
Test Known Good Board=Enable;
Test Known Fail Board=Enable;
```

The parameters are as follows:

Interval_hour	Verification test interval, in hours.
Test Known Good Board	Enable or disable verification of known good board.
Test Known Fail Board	Enable or disable verification of known fail board.

If the verification feature is enabled, the user will be prompted to load a known good/fail sample board for verification at the following times:

- whenever the i1000D software is launched
- at the specified verification intervals
- whenever a test program is loaded

Scan the sample board serial number and load the board for testing. When the verification test passes, the user will be prompted to load a production board to begin production testing.

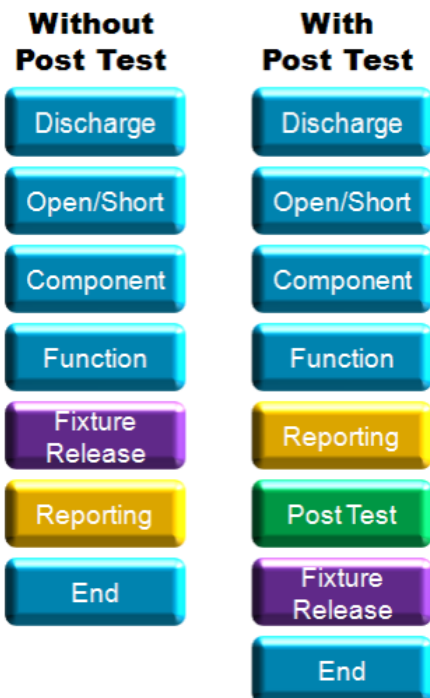
The verification log files can be found in **C:\Agilent_i1000\ATD\<board>\step_data**.

Exclude Post Test from Test Report

Prior to this change, the test report log files were generated after all the tests had been completed. These included all ICT related tests and Post Test, if enabled in the program.

Starting from release 3.60pa, the test report log files will be generated after completion of all the ICT related tests, but before Post Test. Post Test testing will continue but those test results will not be included in the test report log files.

The following chart shows the test sequences with and without Post Test.



More Detailed Descriptions in SFP Offline IO Window

Functions in the SFP Offline IO window are now shown with full descriptions instead of abbreviations, similar to the SFP Inline IO window.

SFP Press Down

Read Write

One			Two			Three		
Function	ON	OFF	Function	ON	OFF	Function	ON	OFF
Fixture Position Sensor	1	1	Fixture Unlock Strobe	1	1	Door Sensor	1	1
Fixture Unlock Sensor	2	2	Fixture lock Strobe	2	2	Back Door Sensor Error	2	2
Fixture Lock Sensor	3	3	Press UP Strobe	3	3			
Press Up Sensor	4	4	Press DOWN Strobe	4	4			
Press Middle Sensor	5	5						
	6	6						
Press Down Sensor	7	7						
Emergency button	8	8						
Fixture engage button	9	9						
RETEST button status	10	10						
UP Button	11	11						
Left DOWN Button	12	12						
Right DOWN Button	13	13						
Board Alignment Sensor	14	14						
Safety Sensor Status	15	15						
Safety Sensor Error	16	16						

Critical Enhancements

- Support for Windows 10 (64-bit).
- New multiple board version feature.
- New “Universal Barcode Reader” setup for user to add new barcode reader.
- When saving the DGN “Full diag” and “Calibration” logs, append instead of overwrite.
- Show NET Name on nail numbers using tooltip.
- Create Testability Report in TPG.
- Enhancements for i1000D Diagnostics window:
 - Auto detect system configuration.
 - Add “Break” button.
 - Add log file for keeping the report history.
- The “INST” mode interface can insert new line now.
- New “Clear Report” feature to delete data in “report” and “step_data” folders.
- Add “Nail Number” in Card Diagnostics Report.
- Users can specify the path for “Repeat fail log”.
- Add new “T” style:
 - [Debug Phase]: The “Delay” column setting is the normal delay time.
 - [Run Time phase]: The “Delay” column setting is the “Timeout” time. (Retry until “Delay” column setting, for improving the test throughput.)

Note: “T” style is not applicable to VTEP, clamping diode, PCS, capacitor “DC” test mode, and all Function tests.
- New “Auto conveyor width adjustment” for Parallel Tester.
- Add a new “Re-Test” SCPI command for Parallel Tester.
- Add a new “Self-Test” SCPI command for Parallel Tester.
- Add socket-based SCPI command support.
- Add board sampling test option in i1000D software.
- Enhancements for sampling feature.
- Add detailed function descriptions in SFP Offline IO window.
- Add golden sample board test.

- “Post Test” results now not included in report log file.
- Add i1000D software support for HV power card.

Fixes for Critical and Serious Defects

- [Fixed]: Remove System frequency 20 MHz setting.
- [Fixed]: Short test cannot capture failure when Safe mode is disabled.
- [Fixed]: Once PD mode is enabled in pre-test page, PD will not be reset.
- [Fixed]: Nail locator not able to find the last nail of the test program.
- [Fixed]: Calibration report uses wrong Header for Measured Values.
- [Fixed]: 1PYE: ver.7.3 CPK distribution freezes because some CPK values are "N.A."
- [Fixed]: Changing PCS Mode will change the ActVal and StdVal.
- [Fixed]: 1PYE cannot run on Windows 7 x32.
- [Fixed]: CET assign disabling pin needs to be skipped before CET learning.
- [Fixed]: Parallel Tester SW reports wrong Slot information.
- [Fixed]: The "INST" mode reports wrong device type.
- [Fixed]: If the "Board alignment error limit" and "Barcode error limit" have been set, "SF_abort.txt" is created just one time at beginning.
- [Fixed]: 1PYE cannot run on Windows 7 x32.
- [Fixed]: 1PYE: ver.7.3 CPK distribution freezes.
- [Fixed]: ver.B524 log missing "Component test" data.
- [Fixed]: Digital test failed but no error details reported.
- [Fixed]: In Left-in, Left-out mode, conveyor did NOT stop when issued "i1000_Abort" command.
- [Fixed]: Slot 28 card diag always fails.
- [Fixed]: Jabil - i1000 SFP inline: Add an extra monitor for pin find.
- [Fixed]: SFP inline: If "Panel test, Enable Multi serial number" is enabled, the system does not work when barcode is scanned.
- [Fixed]: Alt-E does not work.
- [Fixed]: All page and Debug All page bugs.
- [Fixed]: Change "Report Integrity Fail(CET/ETOG)" to "Turn On Integrity Test for CET/ETOG"

