

TestStation Version 6.3.0 Features-At-A-Glance

The following new features and capabilities are available in Teradyne's 6.3.0 TestStation Software.

Support for TS Duo Test System

The TestStation Duo is a concurrent in-circuit test system that has recently been added to the TestStation product family. It is a true concurrent tester that is specifically designed to meet the fast test times and low test cost requirements of today's high volume manufacturers. The TestStation Duo has two independent test modules configured inside one standard size TestStation system. The system has two PC controllers, one for each test module, two fixed supplies, and a single shared printer and common alliance power supplies. Each computer has its own version of Windows XP and Navigate software that controls each independent test module.

The master computer located on the top of the computer bay controls the power supplies and strip printer. Each computer controls the tester hardware using the PCI-MXI-2 interface while a network hub connects each of these computers together.

Each test module supports up to twelve UltraII style or Analog Only 121 pin cards for a total of 1536 test pins. The ICA instrument, DC Reference/PIO, system controller, and an accessory slot for an optional AFTM or CFB are also available in each test module.

TestStation Duo can lower manufacturing costs and increase manufacturing flexibility in the following ways:

- Lower capital equipment costs (a Duo system costs less than buying two testers)
- Fewer test fixtures (one test fixture instead of two)
- Less floor space (one tester and one test cell instead of two)
- Fewer test operators (one test operator instead of two)
- Faster test throughput (potentially doubles throughput of single tester)
- Supports single or dual module test operation
- Supports standard, half-size, or small TestStation fixtures
- Supports panelized or single board PCBs



Please contact your Teradyne Sales representative for more information and refer to the TestStation Duo System documentation and product literature available at Teradyne's web site.

Support for new UltraPinII Technology Pin Boards

TestStation Software version 6.3.0 supports Teradyne's new UltraPinII Driver/Sensor technology. With the UltraPinII, Teradyne has combined custom pin electronics with an innovative design to produce an affordable high performance pin. This unique combination allows Teradyne to offer new pin boards at a lower cost per pin, without compromising pin performance or features.

The UltraPinII pin technology has all the same SafeTest Protection Technology features as the UltraPin, and includes enhanced Drive and Sense accuracy and backdrive detection capabilities that ensure safe, accurate, and reliable testing of Ultra low voltage technologies. The table below compares the key specifications of the two pin technologies.

Parameter	TestStation UltraPin	TestStation UltraPin II
Digital Pin Architecture		
	Pure Pin and Muxed	Pure Pin and Muxed
Driver		
Voltage Compliance	-2.5V to +5.5V	-2.5V to +5.5V
Slew Rate	50 to 300V/usec	100 to 300V/usec
Max Vector Rate	5Mhz	5Mhz
Output Current	+/- 600mA minimum	+/-600mA minimum
Max. Initial Offset Error	+/-45mV	< +/-15mV
Typical Initial Offset Error	+/-16mV	+/-3mV
Path Impedance	< 0.6 Ohm Typ.	< 0.6 Ohm
Max Backdrive IR error @ 500mA	300mV	300mV
Programming Resolution	8mV	2.3mV
Backdrive Detection Range	+/- 50mA to 600mA	+/- 15mA to 500mA
Sensor		
Voltage Compliance	-2.5V to +5.5V	-2.5V to +5.5V
Max Initial Offset Error	+/- 40mV	< +/- 15mV
Typical Initial Offset Error	+/-16mV	+/-6mV
Single/Dual threshold	Dual	Dual
Input Impedance	100K	100K
Programming Resolution	8mV	2.3mV
Load Circuits		
Voltage Compliance	-2.5V to +5.5V	-2.5V to +5.5V
Pullup / Pulldown	Yes	Yes
Current	+/- 5mA	+/-2.7mA
Load Resistance	2.1K	3.3K
Programming Resolution	8mV	2.3mV

The UltraPinII has been designed to be compatible with UltraPin. This means that programs and fixtures developed to run on UltraPin test systems can be run on UltraII systems. Developers only need to re-learn any CRC values and re-translate the test program.

The UltraPinII technology is available on new UltraII 121, UltraII 124, UltraII 128L and UltraII 124L pin boards. The UltraII 121 is a non-multiplexed pin board with 128 all-real digital pins and a non-blocking analog relay matrix that ensures that there will be no resource conflicts as you move programs and fixtures to TestStation 121 test systems. The UltraII 124 is a multiplexed pin board that multiplexes 32 real D/S to 128 test pins (2:8 Multiplex ratio). The UltraII 128L is a high-density multiplexed pin board that multiplexes 32 real D/S to 256 test pins (2:16 Multiplex ratio). The UltraII 124L is a high-density multiplexed pin board that multiplexes 64 real D/S to 256 test pins (2:8 Multiplex ratio).

TestStation systems equipped with UltraII 124 and/or 128L pin boards can support running any existing programs or fixtures that were developed for older systems configured with Combo1,

Combo2, Ultra128, and Ultra124 pin boards. TestStation systems with UltraII 128L pin boards can support running any existing programs or fixtures programs that were developed for older systems configured with HDC1 and Ultra128L pin boards. TestStation systems with UltraII 124L pin boards can support running any existing programs or fixtures programs that were developed for older systems configured with HDC2 and Ultra124L pin boards.

TestStation Software version 6.3.0 also supports a new Ana121 pure analog pin board. The Ana121 pin card has 128 analog pin resources with access to an 8-channel analog bus. A 4-wire non-blocking relay matrix is used to assure non-multiplexed operation of all 4-wire analog tests. With the UltraPinII 121 and Ana121 pin boards, Teradyne TestStation systems can be configured with pure pin analog or digital capabilities or combined together within the same tester to create unparalleled system and test scalability.

TestStation Pin Board Family

Total flexibility to match pin count, technology, and budget requirements...

Pin Board Type	Analog Test	Digital Test	Pure Pin	High Density	Pin Board Mix	Real Pin Ratio
Analog 121	✓	✗	✓	✗	Yes, with Ultra II 121	0/128
UltraII 121	✓	✓	✓	✗	Yes, with Analog 121	128/128
UltraII 124	✓	✓	✗	✗	Yes, with Ultra II 128L	32/128
UltraII 128L	✓	✓	✗	✓	Yes, with Ultra II 124	32/256
UltraII124L	✓	✓	✗	✓	No	64/256

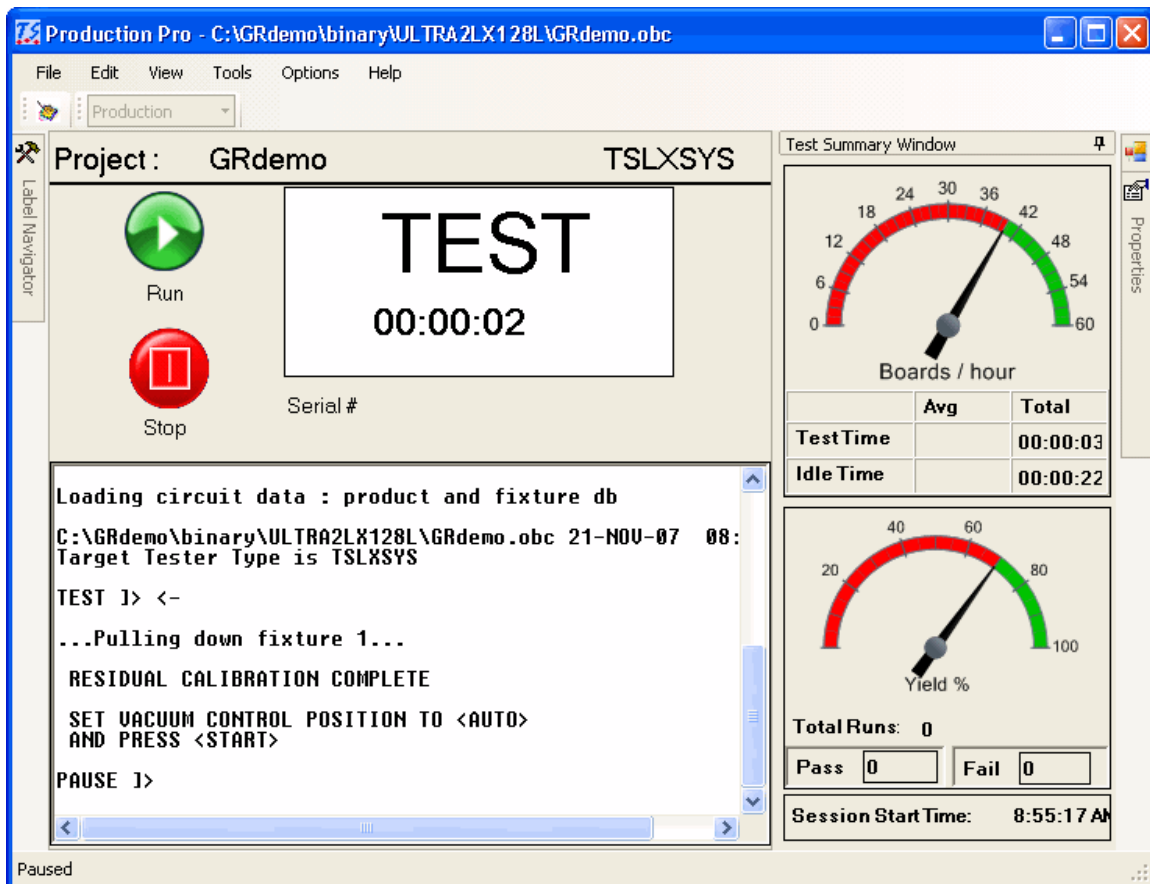
TestStation LH systems configured with UltraII 121 and Ana121, or UltraII 124 pin cards can support a maximum of 2048 real pins, while the larger TestStation systems can be configured to support a maximum of 3840 real pins. TestStation LH and TestStation LX systems also can be configured with high-density UltraII 124L and UltraII 128L pin boards to increase the total pin capacity to 4096 or 7680 pins.

Please note that UltraPin and UltraPinII pin boards can not be mixed in the same test system (the tester must contain all UltraPin or all UltraPinII pin boards). Test programs and fixtures developed for UltraPin systems can be run on UltraPinII testers by simply re-translating the test program.

New Run-Time Production User Interface (*TestStation Production Pro*)

Software version 6.3.0 supports a new run-time user interface, called **TestStation Production Pro**, for running production test. The new user interface is based on the simple and intuitive design of the **TestStation Debug Pro** user interface that was introduced in software version 6.2.0. Production Pro provides production test operators with a modern interactive environment for accessing all the powerful production test capabilities of the TestStation test systems.

Below is a screenshot of the TestStation Production Pro operator window:



Key elements of TestStation Production Pro include:

- A **Test Flow Display** that displays all the tests in the program, identifies test types, and clearly indicates the Pass/Fail status of each test.
- A scrollable **Test Results Pane** that displays operator messages and test measurement results. The window keeps a history of test results so that operators can quickly scroll through the test results to review previous test measurement results.
- A **Status Display** panel that shows the final test results and test times for each Unit Under Test.
- **Performance Meters** that can be displayed to show overall board test throughput and test yield.
- **Component** and **Property Information** panes that can be used to quickly select and view information about board components, values, tolerances, pins, nets, and nails.
- A customizable **Tool Bar** that provides operators with quick access to powerful tools

like board and schematic viewers and data collection charts.

- A selectable **Production Test Limit Mode** that prevents test operators from making unauthorized changes to the production test programs.

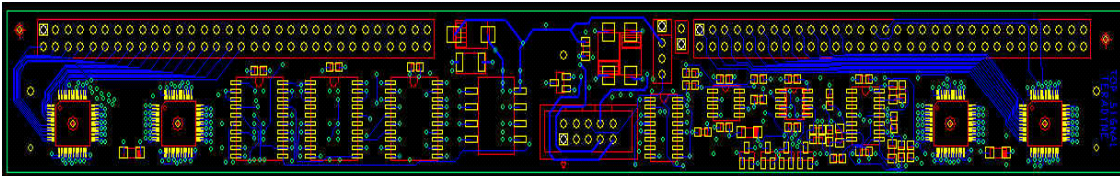
See the *TestStation Operator's Guide* and the On-line Help for more details on the TestStation Production Pro user interface.

FrameScan FX Version 2.0

Version 6.3.0 software contains software enhancements to the FrameScan threshold setting algorithms that will result in more accurate settings of measurement thresholds, less chance of false pass pin measurements, better fault coverage of low magnitude signals, and better immunity to noisy manufacturing environments.

The new algorithm first calculates the environmental noise component and the distribution of the measurement values using standard deviation. It then sets the base threshold as high as possible, adjusting for the measured noise and variation factors. This new algorithm maximizes fault coverage and minimizes the opportunities for false pass and false fail pin diagnostics.

In addition to the software enhancements, Teradyne has developed a new FrameScan multiplexer board that has an improved signal path gain of greater than 6dbV, a lower noise floor of 20dbV, and improved noise filtering compared with the previous FrameScan multiplexer board.



The new multiplexer hardware, coupled with the new intelligent threshold setting algorithms, and automatic frequency selection, will improve test coverage on the smallest package technologies and provide measurement capabilities all the way down to 0.4 fem to Farads (0.0004pF).

For compatibility purposes, the new FrameScan algorithm will only be used by the software if the user creates a new Pin Opens Database file (POD). If the test set files contain an existing POD file that was created using the old algorithm, then the run time software will continue to use the existing POD file and older algorithm. This makes it possible to have a common POD file at manufacturing sites that have test programs that must run on older test systems (with older software) and new TestStation test systems running the most recent software.

To take advantage of the new algorithms, the user must remove the older POD file first and then do a new POLEARN to create a new POD file or enter the POLEARN command with the /CLR option to remove the older measurement thresholds from the POD file.

If the user wants to continue using the original FrameScan / Opens Xpress learn algorithms, they can enter the POLEARN command with the /ORIG and /CLR options. One final thing to mention about the differences between the original and new algorithms is that the default for the high threshold option in the original algorithm is ON; while the default for the new algorithm is OFF. This was done to increase fault coverage of pins on certain packages that exhibit different capacitance profiles between pins. The user can enable high-threshold testing with the new POLEARN /HT high threshold option.

In-System Programming (ISP Tool) Enhancements

The version 6.3.0 ISP tool has been enhanced to support the new Lattice SVF Plus data format produced by the Lattice ispVM software tool. The SVF Plus data format contains additional keywords that allow the tester to perform polling operations during the programming process that can significantly reduce the total programming times.

As an example the programming time for a Lattice LCMX01200C flash based microcontroller device was reduced from 58 seconds to 5 seconds on the TestStation by using Teradyne's ISP tool with the Lattice SVF Plus data format. This was a total test time reduction of 53 seconds – or 12 times faster than using the standard SVF data format.

In addition, a new entry of 64K was added to the ISP Tool Burst Depth Setting menu option. This new setting can be used to generate programming Bursts that utilize the additional pin memory that is available on Teradyne's new UltraPinII pin boards. Setting this option to 64K will tell the ISP tool to increase the number of programming vectors allowed per Burst from 14K or 32K to 64K. Generating with the 64K option should result in fewer device programming Bursts, smaller test programs, and faster test times.

Tutorials Menu

The Tutorials menu is now available and displays the TS Debug Pro Tutorial and the Guide to Sharing Test Programs tutorial.

Miscellaneous Bug Fixes and Product Enhancements

The TestStation version 6.3.0 software includes miscellaneous bug fixes and product enhancements that have been implemented by a dedicated project team.