

# PG3A Digital Pattern Generators

## Frequently Asked Questions (FAQ)

### 1. What are the differences between the PG3A series digital pattern generator and the Tektronix TLA7PG2 digital pattern generator?

There are many new features on the PG3A series. Some of the key differences between the two product series are shown in the table below

Feature/specification	Digital Pattern Generator Products	
	PG3A Series	TLA7PG2
Maximum Clock Speed	300 MHz w/option for 600Mbps DDR operation	268 MHz in half-channel mode or 134 MHz in full-channel mode
Memory Depth	32 MVectors	256 KVectors or 1 MVectors with memory option
Data Outputs	64 data, 4 strobes, 8 inhibits	64 data, 4 strobes, 4 inhibits
Module Merging	Up to 4 modules can be merged to form 256-channel instrument	Up to 5 modules could be merged to form 320-channel instrument
Multiple Module Control	Multiple instances of PGApp per TLA/PC	One instance of Tek PG application per TLA. One instance per multiple modules.
Standalone Operation	PG3ACAB runs in a standalone mode with its external cabinet	Tek PG module needed to be plugged into TLA
Control and pattern download	Via USB 2.0 interface	Via TLA backplane
Minimum Block Size	4 vectors	40 vectors
Input / Output Signals	TrigIn and TrigOut 10 MHz ref in, ref out Four TLA backplane signals are used on the PG3AMOD	Four TLA backplane signals
Delay Adjustments	Input clock delay and eight output data delay adjustments (per byte)	Input clock delay (skew adjustment), no data delay except in variable probe

The code for PGApp originated from the Tektronix Pattern Generator application, TLAPG, and has an almost identical user interface and look-and-feel. The PGApp will load saved legacy single-module systems from the Tektronix Pattern Generator application.

More details on the differences between the PG3A series and the TLA7PG2 pattern generators can be found in the “PG3A User’s Manual.”

**2. What are the key differences/applications for the PG3A series digital pattern generators vs. the Tektronix DTG logic signal sources?**

The DTG5000 products are intended to produce digital signals with precise edge placement and amplitudes in order to fully characterize semiconductor devices and compliance testing of high speed serial data signals. The PG3A series products are intended to perform functional testing of digital devices. While there are several examples of specifications where the DTG can outperform the PG3A, such as a 3.35 Gb/s max data rate. However, many customers may not require the full performance level of the DTG instruments and may prefer the functionality of the PG3A for use with a TLA. Also the PG3A can provide more channels in a single cost effective unit.

**3. What is the "TekLink" and "Ethernet" used for? We see no mention of it in your Information Sheet.**

Currently, these connectors are non-functional in the PG3A.

**If I buy the cabinet version of the PG3A, the PG3ACAB, can I swap the unit in and out of the chassis easily? Can I use it as a TLA module?**

No. If the cabinet version of the PG3A is ordered, the pattern generator assembly is built into the cabinet and is shipped as one unit. Once the module is assembled into the cabinet, it cannot be removed by the user.

If the customer has a PG3AMOD product and decided later that they want the pattern generator in an external cabinet, they must return the module to TMPC for it to be installed in the cabinet.

**4. Can the cabinet for the PG3ACAB be used for other TLA modules?**

No. The external cabinet is suitable for the PG3A module only. It cannot be used for other TLA modules.

**5. What is the USB connection on the front of the PG3A used for? If I install the module in a TLA mainframe, do I need to use it?**

The USB connection is used to control the PG3ACAB and PG3AMOD products and is always necessary. When the PG3AMOD module is installed in a TLA mainframe, it still needs USB. No data is transferred to the PG3AMOD via the TLA backplane.

**6. How long does it take to download a pattern?**

PGApp, version 2.0.000 to 2.0.007, software takes about 20 seconds per million vectors to download via USB. The newer PGApp, version 2.0.008 and greater, takes approximately 6 seconds per million vectors to download. All customers can upgrade to this version of software directly from the TMPC website. With the new version, a full load of 32M vectors takes about approximately 3 minutes.

**7. Does the PGApp software allow me to change part of a pattern without re-loading the entire pattern?**

The software currently does not support partial reload of a vector set. However, if the number of vectors and branch locations did not change, it is theoretically possible for the software to detect this condition and allow an "overwrite" of a vector. Additions and

deletions in the middle of the vector set are problematic due of the way the compiler/linker works.

**8. Can I restore a Saved System from my old Tek TLA7PG2 into a PG3A?**

Yes. For a single PG3A module in a system corresponding to a single Tek TLA7PG2 module, the saved system can be restored.

**9. Can I import the other Tek TLA PG2-supported file formats into the PG3A?**

Yes. The file formats supported by the Tek TLA7PG2 are supported by the PG3A.

**10. Can I capture a set of data on a logic analyzer and download the data into the PG3A for play-back?**

Yes. A few simple steps enable users to import data from a Tektronix TLA into the PG3A. Detailed instructions for doing the import can be found in the "PG3A User's Manual."

**11. Can the PGApp, application software, run stand-alone so that I can develop patterns without a PG3A pattern generator present?**

Yes. The PGApp can be run in off-line mode.

**12. What is the data timing between the clock and data out of the probes?**

Data comes out on every rising clock edge. The data alignment to the clock edge (native) is almost perfectly aligned (+/- 200pS). So the data changes when the clock falls and holds until the next clock falling edge. This puts the rising edge of the clock right in the center of the data window.

In addition, each set of 8 data bits can have their timing adjusted relative to the clock over an entire clock period. So, provided the user can use one set of clock/data as a reference, all the other data bits (in groups of 8) are fully adjustable.

Finally, if you are feeding a external clock to the PG3A, a "user clock," the timing of the probe to this clock is also fully variable (on 8 bit boundaries). There is no need to sacrifice a clock for a reference time mark. (provided the user is not using the probe clock, just the probe data).

**13. Can the per-byte delay adjustment be adjusted in real-time?**

Yes. The delay lines can be changed in real-time. This enables device testing to happen at a very high rate, without having to start and stop the PG3A each time.

**14. When adjusting the per-byte delay adjustment in real-time, is it glitch-free?**

Because the changes to the delay lines are asynchronous to the data contained in the delay line (imagine a long piece of wire with a movable tap point), it is possible to cross through a clock edge and generate a glitch. We have found that our delay lines do generate glitches sometimes. However, there are still some cases in which this is usable. Contact Scott Silver at TMPC to discuss critical applications.

**15. When I first plug the unit it, the red ERROR LED comes on. Should I be concerned?**

No. The unit requires the USB link to be running and the PGApp GUI to operate normally. Until the GUI (or some other control program) communicates with the unit, the ERROR LED is lit.

**16. My computer crashed and now when I run PGApp it says that my PG is “in use” but I am sure it is not. Now what?**

A semaphore lock file was created when the PGApp is started. If the application exists abnormally, this file does not get deleted. Close PGApp. Look in the directory where PGApp is executed from and delete a file of the form “PGSemaxxxx” where xxxx is the last 4 digits of the unit serial number. Now restart PGApp.

**17. I want to control the PG via my own software, bypassing the PGApp GUI. Is this possible?**

Yes. We provide a set of .dlls and a rich set of calls by which you can control your PG.