

Digital Pattern Generator – Terms & other types of generators



<p>Pulse Pattern Generator</p>	<p><i>This type of instrument is able to produce arbitrary kinds of digital waveforms.</i></p> <p><i>With a pulse-pattern generator, you'll be able to change the analog characteristics of the generated digital waveform, such as the voltages, the waveform rise and fall times, insert asynchronous delays or even specific jitter.</i></p> <p><i>Such tools can be used to characterize an I/O buffer electrically by exploring its response to arbitrary forms of digital signals.</i></p> <p><i>Usually, a pulse-pattern generator only features a few channels (typically 2 to 4). This can be a serious limitation if this equipment must be used for functional testing, as a source of digital data.</i></p>
<p>Data Timing Generator</p>	<p><i>This term seems to be used exclusively by the company Tektronix for a kind of digital pattern generator with the abilities of a pulse pattern generator. This type of equipment is characterized by a higher number of channels (16, 32, 64, 128).</i></p>
<p>Data Logic Generator or Logic Generator or Data Word Generator or Logic Word Generator</p>	<p><i>These terms are sometimes used to designate a digital pattern generator.</i></p>
<p>GPIO</p>	<p><i>'GPIO' is often used - mistakenly according to us - for instruments able to generate digital patterns at a relative low speed (a few kHz to 1 MHz). The most common description of a 'GPIO' is a kind of microcontroller peripheral able to set arbitrary logic levels to some I/Os by software. Because it is controlled with a software, it is usually not possible to guarantee the timing between each transition (no real time operation).</i></p> <p><i>Some manufacturers sometimes use 'high-speed GPIO' to actually refer to a digital pattern generator. We think this can be confusing, as these types of equipment do not always allow to read logic levels as the 'I' in GPIO would suggest.</i></p> <p><i>There seems to be a tacit consensus to leave the letters 'GPIO' to relatively slow equipments with no real-time kind of operation.</i></p>
<p>High-speed Digital I/O or Digital I/O</p>	<p><i>This refers to a piece of equipment which bears both an output connector and an input connector. On the output connector, it behaves like a digital pattern generator; on the input connector, it behaves like a logic analyzer or sometimes like a data logger.</i></p> <p><i>On some devices, the I/Os are configurable - the user is able to reserve an arbitrary number of I/Os for inputs and the rest for output. The prefix 'High-speed' is mostly a matter of appreciation and marketing.</i></p>

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Digital Waveform Generator	<i>This is sometimes - and rarely - used to designate a digital pattern generator. The term is somewhat confusing (Byte Paradigm has called its Xpress series digital pattern generator 'Wave Generator Xpress' - which seems to be a bad choice for proper understanding. We promise we won't do it again - for the time being, you can call it 'WG Xpress').</i>
Waveform Generator or Arbitrary Waveform Generator	<i>This type of equipment is a source of analog waveforms. It is able to generate signals such as sine waves, square waves or arbitrary waveforms. In this last case, this is primarily a source of samples at a defined rate, each sample being defined by its amplitude (voltage). Of course, there is a limitation to the sample-to-sample step, as the whole output is filtered anyway (at least by the wirings).</i>
Function Generator	<i>A 'function generator' is usually a limited kind of waveform generator, where the output can only be chosen out of an embedded library of conventional waveforms functions, such as sine, square, sawtooth, and so on...</i>