**TGP110 10MHz pulse generator with delay**

**An essential instrument**

The TGP110 can generate pulse widths in the range 50ns to 5s. There are eight overlapping decade ranges with vernier control within each range.

The period range is 100ns to 10s, equivalent to a repetition rate range of 10MHz to 0.1Hz. Delay is independently adjustable over the same range as pulse width.

A complement switch inverts the mark-space polarity.

**Squarewave and double pulse**

In square mode, squarewaves are generated at a frequency set by the period controls alone. This provides a convenient means of generating variable period edges where the pulse width is unimportant, for example.

In double pulse mode, a second pulse is generated within every period at a set delay after the start of the first pulse. The delay is independently adjustable.

**Wide pulse range**

- **50ns minimum pulse width; fully variable pulse delay**
- **0.1Hz to 10MHz frequency range**
- **50ns minimum pulse width; fully variable pulse delay**
- **Squarewave, double pulse and delayed pulse modes**
- **Free-run, gated and triggered modes**
- **50Ω output, variable 0.1V to 10V; TTL and sync outputs**

**Pulse modes**

**NORMAL PULSE**

One pulse is generated each period. The delay setting is ignored.

**SQUAREWAVE**

0.1Hz to 10MHz squarewaves, frequency set by the period controls. Pulse width and delay settings ignored.

**MARK : SPACE ratio: 1:1 ±10%**

**PULSE WIDTH**

- Min. pulse width: >30nsec.
- Input Impedance: Typically 10kΩ.

**TRIGGER, GATE**

**RUN**

Normal operational mode in which pulses are generated continuously at 0.1Hz to 10MHz.

**TRIGGERED**

DC to 10MHz pulse train in synchronism with external trigger pulses; pulse width determined by pulse width controls. Trigger can be generated manually from front panel button.

**GATED**

0.1Hz to 10MHz pulse train, parameters set by period and pulse width controls, starts synchronously with leading edge of gate input. Last pulse is completed at the end of gating period. Emitting signal can be generated manually from front panel button.

**PULSE MODES**

**50ns OUTPUT**

- Amplitude: Two switch selectable ranges of 0.1V - 1V and 1V - 10V from 50Ω (50mV to 500mV and 500mV to 5V into 50Ω). Adjustable within ranges by a single turn vernier.
- Rise/Fall Times: Typically 10ns into 50Ω load. Maximum 15ns.
- Aberrations: Typically >5% for output set at >20% of range maximum, into 50Ω.

**SYNC OUTPUT**

- Amplitude: A positive going pulse at CMOS/TTL level.
- Timing: Leading edge starts >20nsec before the TTL/50Ω output transition.
- Duration: Typically 30ns.

**COMPLEMENT SWITCH**

Inverts the AUX and 50Ω outputs.

**GENERAL**

- Power: 230V or 115V AC nominal 50/60Hz, adjustable internally: operating range +14% of nominal, 20VA max.
- Size: 140 x 220 x 230mm (HxWxD)
- Weight: 1.6kg (3.5lb)
- Input Impedance: Typically 10kΩ.
- Rise/Fall Times: Typically 10ns into 50Ω load. Maximum 15ns.
- Aberrations: Typically >5% for output set at >20% of range maximum, into 50Ω.
- Frequency range: DC - 10MHz.
**An essential instrument**

The generation of pulses for the stimulus and control of electronic systems is beyond the capability of all but the most sophisticated of function generators. The architecture of a dedicated pulse generator enables it to generate pulses of a set width regardless of the repetition rate offering duty cycles which can extend down to 1 in 100 million. In addition to continuous operation, single or multiple pulses can be generated in response to trigger or gating signals with precisely defined timing relationships.

A dedicated pulse-waveform output amplifier provides flat top pulses with fast rise and fall times at variable amplitude.

**Variable delay**

The TGP110 offers selectable delay between the sync output and pulse output. In triggered mode this also sets the delay between a trigger signal and the start of the pulse.

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**PULSE MODES**

- **NORMAL PULSE**: One pulse is generated each period. The delay setting is ignored.
- **SQUAREWAVE**: 0.1Hz to 10MHz squarewaves, frequency set by the period controls. Pulse width and delay settings ignored.
- **MARK SPACE RATIO**: 1:1 ±10%.
- **DOUBLE PULSE**: A second pulse is generated after a delay set by the delay controls; the delay is related to the leading edge of the first pulse.
- **DELAYED PULSE**: A pulse is generated after a delay set by the delay controls; the delay is related to rising edge of the trigger signal.
- **TRIGGER, GATE**: Normal operational mode in which pulses are generated continuously at 0.1Hz to 10MHz.
- **TRIGGERED**: DC to 10MHz pulse train in synchronism with external trigger pulses; pulse width determined by pulse width controls. Trigger can be generated manually from front panel button.
- **GATED**: 0.1Hz to 10MHz pulse train, parameters set by period and pulse width controls, starts synchronously with leading edge of gate input. Last pulse is completed at the end of gating period. Timing signal can be generated manually from front panel button.

**Pulse width and delay settings ignored.**

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**Squarewave and double pulse**

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**Wide pulse range**

The TGP110 can generate pulse widths in the range 50ns to 5s. There are eight overlapping decade ranges with vernier control within each range.

- The period range is 100ns to 10s, equivalent to a repetition rate range of 10MHz to 0.1Hz. Delay is independently adjustable over the same range as pulse width.
- A complement switch inverts the mark-space polarity.

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**General**

- **Power**: 230V or 115V AC nominal 50/60Hz, adjustable internally; operating range ±14% of nominal; 20VA max.
- **Size**: 140 x 220 x 230mm (HxWxD)
- **Weight**: 1.6kg (3.5lb)
- **Storage Range**: -40°C to 70°C
- **Operating Range**: +5°C to 40°C, 20-80% RH.
- **Amplitude**: A positive going pulse at CMOS/TTL level.
- **Sync Output**: Two switch selectable ranges of 0.1V - 1.0V and 50mV into 50Ω to 500mV and 500mV to 5V into 50Ω. Adjustable within ranges by a single turn vernier.
- **Rise/Fall Time**: Typically 10μs into 50Ω load. Maximum 15μs.
- **Aberrations**: Typically <5% for output set at >20% of range maximum, into 50Ω.
- **Input Impedance**: Typically 10kΩ.
- **Signal range**: TTL threshold; max. input ±10V.
- **Frequency range**: DC - 10MHz
- **Amplitude range**: Two switch selectable ranges of 0.1V - 1.0V and 50mV into 50Ω to 500mV and 500mV to 5V into 50Ω.
- **Range**: 50ns to 5s, independently adjustable.
- **Pulse width**: 50ns minimum pulse width; fully variable pulse delay.
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- **Pulse width**: 50ns minimum pulse width; fully variable pulse delay.
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**Inputs**

- **GATE/TRIG INPUT**
  - Frequency range: DC - 10MHz
  - Signal input: TTL threshold; max. input ±10V.
  - Input Impedance: Typically 10kΩ.

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**Outputs**

- **50Ω OUTPUT**
  - Amplitude: Two switch selectable ranges of 0.1V - 1.0V and 50mV into 50Ω to 500mV and 500mV to 5V into 50Ω. Adjustable within ranges by a single turn vernier.
  - Rise/Fall Time: Typically 10μs into 50Ω load. Maximum 15μs.
  - Aberrations: Typically <5% for output set at >20% of range maximum, into 50Ω.

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**General**

- **Accuracy**: +/-1% of full scale and 1μV, into 50Ω.
- **Input Impedance**: Typically 10kΩ.
- **Signal range**: TTL threshold; max. input ±10V.
- **Frequency range**: DC - 10MHz
- **Amplitude range**: Two switch selectable ranges of 0.1V - 1.0V and 50mV into 50Ω to 500mV and 500mV to 5V into 50Ω.
- **Range**: 50ns to 5s, independently adjustable.
- **Pulse width**: 50ns minimum pulse width; fully variable pulse delay.
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- **Frequency range**: DC - 10MHz
- **Amplitude range**: Two switch selectable ranges of 0.1V - 1.0V and 50mV into 50Ω to 500mV and 500mV to 5V into 50Ω.
- **Range**: 50ns to 5s, independently adjustable.
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**10MHz pulse generator with delay**

- **0.1Hz to 10MHz frequency range**
- **50ns minimum pulse width; fully variable pulse delay**
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- **50Ω output, variable 0.1V to 10V; TTL and sync outputs**
Product Summary
Laboratory Power Supplies
Bench and system power supplies from 30 watts up to 1200 watts using linear, mixed-mode and PowerFlex regulation technologies.

Waveform Generators
Analog and digital (DDS) function generators, true arbitrary generators, arbitrary/function generators and pulse generators.

Precision Measurement Instruments
Benchtop DMMs, frequency counters, component measurement instruments (LCR), electronic dc loads, current probes.

RF and EMC Test Equipment
Spectrum analyzers, signal generators, frequency counters, power meters, emc measurement instruments.

Company name and product brands
Thurlby Thandar Instruments Ltd. (TTi) is one of Europe’s leading manufacturers of test and measurement instruments.

Products have been sold under two brand names: TTi and Aim.

In the future, however, the full product range will be branded Aim-TTi.

This changeover will be gradual and many products will continue to carry the TTi or Aim brands for some time to come.

Web Addresses (URLs)
The preferred URL for obtaining information concerning Aim-TTi products is:
www.aimtti.com (international customers)
Customers in the UK should use the URL:
www.aimtti.co.uk
Customers in the USA should use the URL:
www.aimtti.us
Note that previous URLs such as www.tti-test.com will continue to operate for the time being.