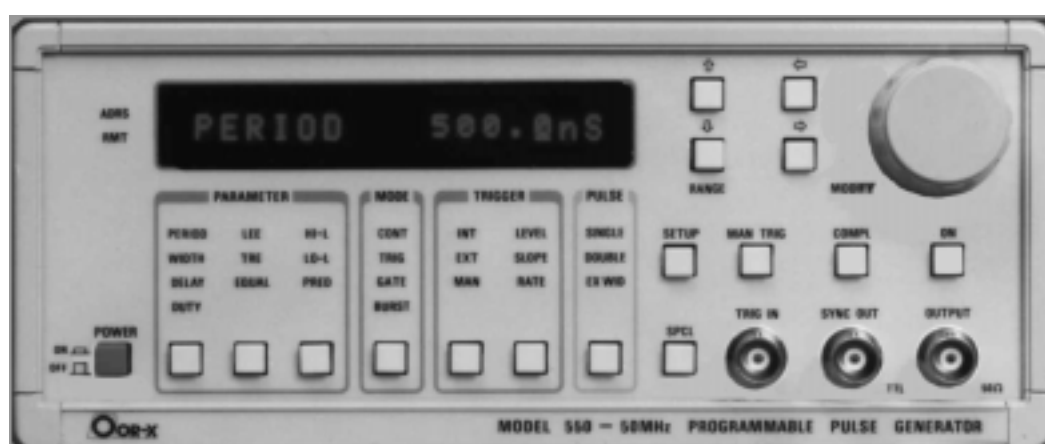




# MODEL 550

## PROGRAMMABLE PULSE GENERATOR

- \* 50MHz Frequency Range
- \* Variable Width and Delay
- \* Variable Transitions
- \* 10Vp-p into 50 ohms Output
- \* Automatic Calibration
- \* IEEE488.2 and SCPI compatible



### Exceptional Versatility, Performance and Precision

#### High Performance Pulses

The Model 550 features variable pulse widths from 10 ns to 10 s, delays from 0 ns to 10 s with up to 6 digits resolution and adjustable output levels from -10V to +10V, with pulse amplitudes from 0.5V to 10Vp-p into 50 ohms load.

The Pulse Generator also features selectable complementary pulse and double pulse, in continuous, triggered, gated and counted burst modes.

The Model 550 allows selection of predefined amplitude and offset for critical stimulus and testing of major semiconductor technologies as TTL, CMOS and ECL.

#### Variable Transitions

To make operation flexible, variable transitions (rise and fall times) can be programmed from 5 ns to 10 ms. With the flexible transition times, various shapes of pulses can be obtained for

applications where parameters such as linearity, switching times or reflection times must be analyzed.

Operational amplifiers slew rate can be measured or thresholds of devices and circuits can be easily tested using programmable rise and fall times.

#### Fast and Easy Operation

To make operation easy, Model 550 interface with the operator in a straightforward manner by which the front panel display always shows the parameter being varied and its value. If a new parameter just entered is not compatible with the existing setup status, the operator is informed via an error message.

Test setups, up to 99 locations, can be stored and recalled. This feature allows simple test sequence development as well as no need for a controller in

repetitive tests, with reduced bus traffic in ATE applications. Last user setup is also retained at power down.

#### Internal Calibration

The Pulse Generator Model 550 is self-calibrating itself by means of internal time and voltage reference.

With no need to open the case, the Pulse Generator benefits of improved accuracy, extended calibration interval and low downtime.

#### GPIB Programming

The Model 550 has been designed for use in ATE systems. All parameters, modes and functions are programmable and fully compatible with IEEE-488.2 and the Standard Commands for Programmable Instruments (SCPI) language.

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## MODEL 550 - SPECIFICATIONS

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### PULSE FUNCTIONS

**Single** - One pulse at each selected period up to 50MHz repetition rate.

**Double** - One pair of pulses at each period up to 25MHz repetition rate. Both pulses have the same selected width; the position of the second pulse set by the delay control.

### OPERATING MODES

**Continuous** - Output continuous at programmed period rate.

**Triggered** - Output quiescent until triggered by an internal, external, GPIB or manual trigger, then generates one cycle at programmed period rate.

**Gated** - Same as triggered mode except pulses are output for the duration of the gated signal. The last cycle started is completed.

**Burst** - Same as triggered mode for programmed number of cycles from 2 to 999,999 as set by the N-BURST function.

**External Width** - Trigger duration and rate sets pulse width and repetition.

### TIMING CHARACTERISTICS

#### PERIOD

**Range:** 20 ns to 10s

(50MHz to 0.1Hz repetition rate).

**Resolution:** Up to 6 digits limited to 0.1 ns.

**Accuracy:**  $\pm 1\%$  of setting  $\pm 1$  ns.

**Jitter:**  $< 0.1\%$  of setting +50 ps, decreasing to

0.01 % on slowest range.

#### WIDTH

**Range:** 10 ns to 9.89999 s limited by 8 ns off time.

**Resolution:** Up to 6 digits limited to 0.1 ns.

**Accuracy:**  $\pm 2\%$  of setting  $\pm 2$  ns.

**Jitter:**  $< 0.1\%$  of setting +50ps, decreasing to 0.005% on slowest range.

#### DELAY

**Range:** 0 ns to 9.80000 s limited by the pulse width and 8 ns off time.

**Resolution:** Up to 6 digits limited to 0.1 ns.

**Accuracy:**  $\pm 2\%$  of setting  $\pm 2$  ns.

**Jitter:**  $< 0.1\%$  of setting +50 ps, decreasing to 0.005% on slowest range.

#### DUTY CYCLE

**Range:** 1 to 99%.

**Resolution:** 3 digits (0.1%).

**Accuracy:** Limited by width and pulse accuracy.

### OUTPUT CHARACTERISTICS

#### AMPLITUDE

**High Level Range:** -9.50V to +10V into 50 ohms load (-19.00V to +20V into open circuit).

**Low Level Range:** -10V to +9.50V into 50 ohms load (-20V to +19.00V into open circuit).

**Amplitude Range:** 0.5V to 10V p-p into 50 ohms load (20V p-p max into open circuit).

**Resolution:** 3 digits limited to 10mV.

**Accuracy:**  $\pm 1\%$  of level setting  $\pm 2\%$  of p-p amplitude  $\pm 50$ mV into 50 ohms load.

**Aberrations:**  $< 5\%$  + 50mV into 50 ohms load, for pulse levels between  $\pm 5$ V.

**Output Resistance:** 50 ohms  $\pm 2.5$  ohms.

#### TRANSITION TIMES

**Range:**  $< 5$  ns to 10 ms variable. Leading and trailing edges settable separately and limited to 20:1 ratio between settings into one of the following ranges:

5ns-100ns; 50ns-1.0us; 500ns-10us;

5.0us-100us; 50us-1.0ms; 500us-10ms.

**Resolution:** 3 digits limited to 0.1 ns.

**Accuracy:**  $\pm 5\%$  of setting  $\pm 2$  ns.

**Linearity:**  $< 5\%$  deviation from a straight line between 10% and 90% points.

#### INTERNAL TRIGGER

**Range:** 100 ns to 99.99 s.

**Resolution:** 4 digits limited to 100 ns.

**Accuracy:** 0.01%  $\pm 1$ ns.

**Jitter:**  $< 0.1\%$  of setting +50 ps.

### INPUTS AND OUTPUTS

#### TRIGGER INPUT

**Sensitivity:** 150mVp-p minimum.

**Minimum Width:** 10ns.

**Maximum Rate:** 50MHz.

**Input Impedance:** 1 Mohms  $\pm 5\%$ .

**Input Protection:**  $\pm 15$ V DC plus peak AC.

**Range:** Selectable from -9.99V to +9.99V.

**Resolution:** 3 digits limited to 10mV.

**Accuracy:**  $\pm 5\%$  of setting  $\pm 25$ mV.

**Slope Selection:** Positive or Negative.

#### SYNC OUTPUT

A ,TTL level pulse at programmed period.

Output impedance 50 ohms, protected against short circuit and up to  $\pm 15$ V accidental input. The high level is  $> 2$ V into 50 ohms and with 3.5 ns typical transition.

### GPIB PROGRAMMING

**Internal:** IEEE-488.2 and SCPI compatible.

**Address:** 0-30 front panel selected.

### GENERAL

**Memory:** Non-volatile stores up to 99 complete panel settings. Last user setup also retained at power down.

**Power Requirements:** 93-128V, 186-256V switch selectable, 48-66 Hz, 130VA maximum.

**Dimensions:** Height 8.9cm (3.5 in); Width 21.3 cm (8.4 in); Length 45.7cm (18 in).

**Weight:** 5.5kg Net.

**Operating Temperature:** 0°C to +50°C.

**Storage Temperature:** -20°C to +60°C.

**Humidity:** 95% RH, 0°C to 30°C, 75% RH to 40°C, 45% RH to 50°C.

**Accessories:** 19' rack mount kit, optional.

### CE Labeled

### NOTES

The specifications describe the instrument performance after 20 minutes warm-up period into a 50 ohms load and providing an internal calibration has been performed at the current operating temperature  $\pm 5^\circ\text{C}$ . All timing characteristics measured at 50% of amplitude with fastest edges. Specifications are verified according to the performance check procedures in the technical manual. Specifications not verified in the manual are either explanatory notes or general performance characteristics only.

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