

Features

- 4 delay and width outputs
- 1 picosecond resolution
- Up to 1000 seconds delay
- 25 nanosecond insertion delay
- Less than 10 picoseconds RMS typical jitter
- 10 MHz rep rate
- Programmable trigger threshold
- Adjustable output levels
- Optional Ethernet
- Onboard help



The P400 is a benchtop digital delay and pulse generator that generates four separately programmable delay-and-width outputs. The P400 can generate delays up to 1000 seconds in 1 picosecond increments, and is capable of a high repetition rate of 10 MHz. Applications for the P400 include laser timing, ICCD camera systems, ATE systems, and radar testing.

Triggering - P400 triggers include internal, external, remote, or line. The internal DDS rate generator may be programmed from 0.01 Hz to 10 MHz in 0.01 Hz steps. The external trigger features selectable trigger level, slope, and termination impedance. Line trigger is enabled via an external AC line adaptor. The P400 may also be triggered manually or from the remote RS-232 or Ethernet interfaces. Trigger gating and burst facilities are standard.

Timebase - The standard P400 timebase is a precision TCXO temperature-compensated crystal oscillator. An optional ovenized oscillator is available for applications requiring extreme accuracy and lowest jitter. Multiple P400s may be synchronized to each other, or locked to an external 10 MHz source.

Onboard Help - An extensive help system explains each pushbutton, input, output, and setting on the 4-line front-panel display.

Menus - Each function of the P400 has a dedicated single-level control menu invoked by an associated pushbutton. Data entry may be via numeric keys or by the spinner knob.

Remote Control - All P400 parameters may be programmed remotely using standard RS-232 or optional Ethernet interfaces.

Specifications : P400 digital delay and pulse generator

FUNCTION	Four-channel digital delay and pulse generator Independently programmable delay/pulse width/polarity/high level/low level on all four delay outputs A, B, C, and D
CHANNELS	Four outputs of programmable delay, pulse width, polarity, and voltage levels
TRIGGER SOURCES	Internal DDS synthesizer, external source, AC line with external transformer adaptor, remote command, and manual pushbutton
TRIGGER RATE	10 MHz maximum
EXTERNAL TRIGGER INPUT	Programmable threshold -2.4 to +4.6 V Programmable slope Programmable termination: 50 Ω or 1 M Ω Minimum pulse width: 2 ns at 0 to 2 V (25 ns in burst mode)
PULSE OUTPUTS (A TO D AND T0)	V _{OH} programmable -4.3 to +11.8 V, V _{OL} programmable -5.0 to +4.1 V 0.1 V steps, 50 Ω source impedance, 4 V/ns slew rate
INSERTION DELAY	25.0 ns \pm 500 ps
DELAY RESOLUTION	1 ps, delay or width of A,B,C,D outputs
DELAY RANGE	999.999999999999 seconds, delay or width of A, B, C, D outputs, total delay + width not to exceed 999.999999999999 seconds A to D timings are relative to T0 rising edge
DELAY ACCURACY	T0, rises 25 ns \pm 500 ps after trigger A to D outputs, \pm 400 ps \pm timebase error A to D delay and width edges are monotonic to 50 ps
JITTER	T0, 20 ps RMS max from external trigger A to D outputs (25 ps RMS + timebase jitter) max, either edge from external trigger or any other output
DDS OUTPUT	Sine wave, 4 V p-p typical, 50 Ω source impedance
COMMUNICATIONS	Standard RS-232 with SCPI-like command set Optional Ethernet using Telnet mode Command set identical to RS-232 mode
INDICATORS	20-character by 4-line, alphanumeric display LEDs indicate selected channel, activity, triggers, communications, and errors
TIMEBASE	Standard TCXO: Initial calibration \pm 0.25 PPM, Drift <2 PPM/year Temperature coefficient below 50 ppb/ $^{\circ}$ C Jitter below 4 ns per second of delay Optional OCXO: Initial calibration \pm 0.1 PPM, Drift <1 PPM/year Temperature coefficient below 3.6 ppb/ $^{\circ}$ C Jitter below 400 ps per second of delay Either oscillator can be phase-locked to an external 10 MHz source
PACKAGING	8" (W) x 12" (L) x 4.5" (H), exclusive of external power module Weight: 8 lbs
POWER	100 to 240 VAC, 47 to 63 Hz, 60 W max using AC adaptor furnished Operable from +24 VDC, 2.5 amps max via 2.5 mm x 5 mm female connector
OPTIONS	Rear-panel transformer-isolated 5 to 50 V programmable high-voltage pulse outputs 10BASE-T and 100Base-T Ethernet Ovenized oscillator timebase (OCXO) Single/dual rackmount adaptors OEM versions
CONFORMANCE	Designed to meet UL/FCC/CE requirements