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Find the *Teledyne / LeCroy DDA-120* at our website: *Click HERE*

A Appendix: Specifications

Acquisition System

> ***Note:*** *Specifications are liable to change without notice. For the most up-to-date information, consult the latest product data sheets, available from LeCroy offices.*

Bandwidth (-3 dB):
DDA-120: @ 50 Ω: DC to 1 GHz (2 mV/div: DC to 200 MHz, 5 mV/div: DC to 600 MHz);@ 1 MΩ DC: DC to 500 MHz typical at PP005 probe tip; DC to 1 GHz at optional AP020 1 GHz FET probe tip.
DDA-125: @ 50 Ω: DC to 1.5 GHz (2 mV/div: DC to 200 MHz, 5 mV/div: DC to 600 MHz); @ 1 MΩ: DC to 1.5 GHz at optional AP022 2.5 GHz FET probe tip.
Number of Channels: four
Number of Digitizers: four
Max. Sample Rate Window:

- **DDA-120:** 62.5 µs at 8 GS/s
- **DDA-125:** 2 ms @ 8 GS/s

Sensitivity: DDA-120: 2 mV/div to 1 V/div, 50 Ω, fully variable; 2 mV/div to 10 V/div, 1 MΩ, fully variable. **DDA-125:** 2 mV/div to 1 V/div, 50 Ω, fully variable; 2 mV/div to 2 V/div, 1 MΩ, fully variable
Offset Range: ±20 V across the whole sensitivity range when using the AP020/AP022 active probe.

DDA-120: 2.00 to 4.99 mV/div: ±400 mV
5.00 to 99 mV/div: ±1 V
0.1 to 1.0 V/div: ±10 V
1.0 to 10 V/div: ±100 V (1 MΩ only)
DDA-125: 2.00 to 4.99 mV/div: ±400 mV
5.0 to 99 mV/div: ±1.0 V, 50 Ω only
0.1 to 1.0 V/div: ±10 V, 50 Ω only
5.0 to 100 mV/div: ±1.0 V, 50 MΩ only
102 mV to 2.0 V/div (1 MΩ only): ±20 V

Scale Factors: Wide range of probe attenuation factors available
DC Accuracy: ±(2% full-scale + 1% offset value) at gain ≥10 mV/div
Vertical Resolution: 8 bits
Bandwidth Limiter: 25 MHz and 200 MHz typical
Input Coupling: AC (>10 Hz typical), DC, GND
Input Impedance: 10 MΩ//11 pF (system capacitance using PP005). **DDA-120:** 50 Ω ±1%, DDA-125: 50 Ω ±1.25%
Max. Input: DDA-120: 50 Ω: ±5 V DC (500 mW) or 5 V rms; 1 MΩ: 400 V max (DC + peak AC ≤10 kHz). **DDA-125:** 1 MΩ: 100 V (DC + peak AC @ 10 kHz)

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SMARTMemory: A total memory management system that dynamically manages acquisition memory to guarantee that signals are always sampled at the highest possible sample rate and that system RAM and microprocessor resources are always optimally employed.
System Random Access Memory: 64 M

Maximum Sample Rate and Acquisition Memories

Channels Used	Max Sample Rate	Memory per Channel (in Points)	Active Channels
Any Channel			
DDA-120	2 GS/s	4 M	ALL
DDA-125	4 GS/s		
Paired Channels			
DDA-120 & DDA-125	4 GS/s	8 M	CH 2 & CH 3
All Channels Combined			
DDA-120 DDA-125 (by PP096 Adapter)	8 GS/s	16 M	ONE

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Acquisition Modes

Random Interleaved Sampling (RIS): For repetitive signals from 200 ps/div to 1 µs/div
Single Shot: For transient and repetitive signals from 500 ps/div (1 channel), 1 ns/div (2 channels), 2 ns/div (4 channels)
Sequence: Stores multiple events, each time-stamped, in segmented acquisition memories.
Dead Time between Segments: Typically 30 µs, maximum 65 µs
Number of Segments Available: 2 to 6000

Timebase System

Timebases: Main and up to four Zoom Traces
Time/Div Range: 500 ps/div at 8 GS/s
1 ns/div at 4 GHz
2 ns/div at 2 GHz
Clock Accuracy: ≤10 ppm. **DDA-125:** <10 ppm
Interpolator Resolution: 10 ps; **DDA-125:** 5 ps
Roll Mode: Ranges from 500 ms to 1000 s/div.
External Clock: 50 to 500 MHz rear panel, fixed frequency clock input (DC to 500 MHz (⌸ 20 ns rise/fall time)
External Reference: 10 MHz rear panel input

Triggering System

Modes: NORMAL, AUTO, SINGLE, and STOP
Sources: CH1, CH2, CH3, CH4, Line, Ext, Ext/5. Slope, Level, and Coupling are unique to each source.
Slope: Positive, Negative, Bi-Slope (Window in and out)
Coupling: AC, DC, HF, LFREJ, HFREJ
Pre-trigger Recording: 0 to 100% of full scale (adjustable in 1% increments)
Post-trigger Delay: 0 to 10 000 divisions (adjustable in 0.1 div increments)
Hold-off by Time: 2 ns to 20 s
Holdoff by Events: 0 to 99 999 999
Internal Trigger Range: ±5 screen divisions
EXT Trigger Max Input: DDA-120: 10 MΩ/11 pF at probe tip (PP005): 400 V (DC + peak AC ≤10 kHz); 50 Ω ± 1%; ±5 V DC (500 mW) or 5 V rms. **DDA-125:** 10 MΩ//11 pF at probe tip (PP005): 100 V (DC + peak AC ≤10 kHz); 50 Ω ±3%: ±5 V DC (500 mW) or 5 V rms
EXT Trigger Range: ±0.5 V; ±2.5 V with EXT/5

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Trigger Timing: Trigger Date and Time are listed in the "Memory Status" Menu
Trigger Comparator: Optional ECL rear panel output. Alternatively, the calibrator output can provide a trigger output or a PASS/FAIL test output.

SMART Trigger Types

Pattern: Trigger on the logic combination of five inputs — CH 1, CH 2, CH 3, CH 4, and EXT Trigger, where each source can be defined as "High," "Low," or "Don't Care." The Trigger can be defined as the beginning or end of the specified pattern.
Signal or Pattern Width: Trigger on glitches as short as 600 ps or on pulse widths 600 ps to 20 s.
Signal or Pattern Interval: Trigger on interval between two limits; able to be selected from 2 ns to 20 s.
Dropout: Trigger if the input signal drops out for longer than a time-out from 2 ns to 20 s.
Qualified: Trigger on any source only if a given state (or transition) has occurred on another source (the delay between these events can be defined as a number of events on the trigger channel or as a time interval).
TV: Allows selection of up to 1500 lines and odd or even fields synchronized for PAL, SECAM, NTSC, or nonstandard video.
Runt: Trigger on positive or negative runts between two limits able to be selected from 600 ps to 20 s.
Slew Rate: Trigger on rising or falling edges between 600 ps and 20 s.
Exclusion Triggering: Can be performed in Glitch, Interval, Runt, and Slew-Rate Trigger modes (triggers on intermittent faults by specifying the normal width, period, level or slew of a signal). The DDA will trigger only on aberrations shorter or longer than normal.

DISK Trigger Types

Sector Pulse: Trigger on the n^{th} sector pulse (1 to 50) after Index, which can be defined individually as positive or negative polarity.
Servo Gate: Trigger on the n^{th} servo gate after Index, and on every m^{th} thereafter; Servo Gate and Index can be individually defined as positive or negative polarity.
PES Window: Trigger on Position Error Signal (PES) exceeding a selected voltage window; servo gate can be selected as an additional criterion before a PES window may occur.

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Read Gate: Can trigger on any Read Gate longer than a specified Sector ID field length, adjustable from 100 ns to 50 µs

Autosetup

Automatically sets sensitivity, vertical offset and timebase on all display channels.
Autosetup Time: Two to three seconds
Vertical Find: Automatically sets sensitivity and offset for selected channel.

Probes

One PP005 Passive Probe per channel: DC to 500 MHz typical at probe tip, 500 V max.
Passive Probe calibration: Max. 1 V into 1 MΩ; 500 mV into 50 Ω; frequency and amplitude able to be programmed; pulse or square wave able to be selected; rise and fall time 1 ns typical



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Display

Screen Type: DDA-120: Color 10-inch Raster Scan CRT, 0.26 mm dot pitch. **DDA-125:** 10.4" TFT-LCD
Resolution: 640 x 480 points
Display Area: DDA-120: 170 mm x 125 mm. **DDA-125:** 212 mm X 160 mm. **Controls:** Rear panel presets for position, brightness and contrast; Front panel menu controls for brightness and color selection
Grid Styles: Single, Dual, Quad, Octal, XY, Single + XY, Dual + XY, and Full Screen — an enlarged view of each grid style
Graticules: Internally generated; separate intensity control for grids and waveforms; selectable blending of grid with displayed traces
Waveform Style: Dot Join with optional sample point highlight or Dots only
Persistence Modes: Color Graded and Analog Persistence, infinite or variable with decay over time
Trace Display: Opaque or transparent mode, with overlap management
Number of Traces: Eight (any mix of channels, memories or Math functions)
Real-time Clock: Date, hours, minutes, seconds.
External Monitor: Rear panel 15-pin socket for VGA compatible monitor
Vertical Zoom: Up to five times vertical expansion (50 times with averaging, up to 40 µV/div sensitivity)
Horizontal Zoom: up to 0.4 points/division

Processing System

Microprocessor: 192 MHz PowerPC 603e
System RAM: 64 Mbytes
Video Memory: 1 Mbyte
Cache Memory: 32 kbytes
Persistence Data Map Memory: 16 bits per displayed pixel (64 000 levels)

Waveform Processing

Up to four processing functions may be performed at the same time. Standard functions available are: Add, Subtract, Multiply, Divide, Negate, Identity, Summation Averaging and (Sine x)/x. The source information for a math function trace can be data from an acquisition channel or from another math function trace. This allows display of traces that 'daisy chain' math functions.

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Average: Up to 10^6 averages possible
Extrema: Roof, Floor, or Envelope values from 1 to 10^6 sweeps.
ERES: Six low-pass digital filters provide up to 11-bit vertical resolution. Sampled data is always available, even when a trace is turned off.
FFT: Spectrum Analysis with five windowing functions and FFT averaging
Resample: Deskew feature that allows a signal to be resampled and adjusted in time relative to another signal.
Statistical Diagnostics: Permits in-depth diagnostics on waveform parameters. Live histogramming of any waveform parameter measurement is possible. The histogram can be autoscaled to display the center and width of the distribution. Any of these processes can be invoked without losing the data. Trending is also standard.

Internal Memory

Waveform Memory: Up to four 16-bit memories (M1, M2, M3, M4), whose length corresponds to the length of the channel acquisition memory
Zoom and Math Memory: Up to four 16-bit waveform processing memories (A, B, C, D), whose length corresponds to the length of the channel acquisition memory
Setup Memory: Four non-volatile memories (Optional Memory Cards, Flash Disks, or removable Hard Disks may also be used for high-capacity waveform and setup storage.)

Cursor Measurements

Relative Time: A pair of arrow cursors measure time differences and voltage differences relative to each other
Relative Voltage: A pair of line cursors measure voltage differences
Absolute Time: A cross-hair marker measures time relative to the trigger, and voltage with respect to ground
Absolute Voltage: Reference bar measures voltage with respect to ground

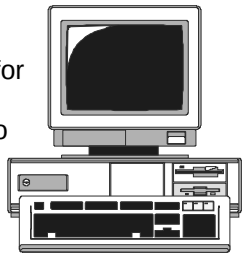
Automatic Measurements

A wide range of pulse parameter measurements are available. These are categorized for ease of use. The categories include Pulse, Horizontal, and Vertical parameters. Basic statistical measurements, included as standard, (average, highest, lowest, and standard deviation) can be made on these parameter measurements in order to understand their distribution. Pass/Fail Testing and Waveform Limit testing, using masks, can be

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performed. Test conditions can be expressed as either waveform parameter limits, waveform shape limits (mask) or a combination of both. Any failure can cause preprogrammed actions such as Hardcopy, Save, GPIB service request, logic pulse out, audible beep, or any combination of the above.

Interfacing



Remote Control: By GPIB and RS-232-C for all front panel controls and internal functions
RS-232-C Port: Asynchronous up to 115.2 Kb/s for computer or terminal control, or printer or plotter connection
GPIB Port: (IEEE-488.1) Configurable as transmitter/receiver for computer control and fast data transfer; command language compliant with IEEE-488.2



Centronics Port: Hardcopy interface
PC Card (PCMCIA I/II/III Ports): Optional for memory cards, flash cards, and removable hard disks
Floppy Disk: High density 3.5-inch floppy disk drive (DOS format)
VGA Compatible Display: 15-pin D-type VGA compatible connector for external color display. You may experience flickering if you connect an LCD projector to the VGA output.
Hardcopy: TIFF and BMP formats available for import to Desktop Publishing programs; HPGL protocol for vector screen files
Printers and Plotters

- **B/W:** HP LaserJet, HP DeskJet 500, Epson FX
- **Color:** HP DeskJet 550C; Epson Stylus; Canon 200, 600, 800 Series
- **Plotters:** HP7470, HP7550
- Internal, high resolution graphics printer standard; stripchart output format with two meters per division also available

Output Formats: Binary, or ASCII waveform output compatible with spreadsheets, MATLAB, MathCad



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General

Auto-calibration: Ensures specified DC and timing accuracy
Temperature: 5 to 40 °C (41 to 104 °F)
Humidity: 80% for temperatures up to 31 °C, decreasing linearly to 50% relative humidity at 40 °C
Altitude: <4600 m (15 090 ft)
Shock and Vibration: Conforms to selected sections of MIL-PRF-28800F, Class 3
Power Requirements: 90 to 132 V AC, or 180 to 250 V AC; 45 to 66 Hz; automatic AC voltage selection;
Power dissipation: 400 W max. **DDA-125:** 350 W max.
Battery Backup: Front panel settings maintained for two years
Dimensions: (HWD) 10.4 x 15.65 x 17.85 inches (264 x 397 x 453 mm)
Weight: DDA-120: 20 kg (44 lb.) net, 28 kg (61.6 lb.) shipping. **DDA-125:** 35 lb. (16 kg) net, 53 lb. (24 kg) shipping
Warranty: Three years

Conformity

CE Declaration of Conformity: The oscilloscope meets requirements of EMC Directive 89/336/EEC for Electromagnetic Compatibility and Low Voltage Directive 73/23/EEC for Product Safety.

- **EMC:** Conforms to EN 50081-1: 1992 (Emissions), EN 50082-1: 1997 (Immunity)
  See Declaration of Conformity Certificate for details.
- **Low Voltage Directive:** Conforms to EN 61010-1: 1993 + Amd. 2: 1995, Safety requirements for electrical equipment for measurement, control, and laboratory use.
  The DDA has been qualified to the following EN 61010-1 category:
  Installation (Overvoltage) Category II
  Pollution Degree 2

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