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TECHNICAL DATA

LeCroy

8025 RACKMOUNT MAINFRAME

- Houses IEEE-583 Standard (CAMAC) Instrument Modules
- 1000 W Power Output
- 110 or 220 VAC Line Input
- Thermal, Over-Current, Over-Voltage, and Fan Stall Protection
- Complete Self-Diagnostics
- Current and Voltage Readout

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INSTRUMENT HOUSINGS FOR CAMAC PLUG-INS

The LeCroy Model 8025 mainframe houses up to 25 instrument and interface modules. Clean, regulated power of 1000 W support all LeCroy waveform digitizer, amplifier, attenuator, clock generator, counter, memory, fiber optic, and GPIB interface IEEE-583 Standard modules.

The 8025 high-power instrument mainframe complements the Model 8007 benchtop mainframe. The 8007 provides 7 instrument module bays (slots).

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The Model 8025 Instrument Mainframe powers up to 23 IEEE-583 Standard (CAMAC) instrument modules and one GPIB-to-CAMAC interface module. LeCroy and other instrument companies manufacture many different CAMAC instrument modules.

POWER OUTPUT

The 8025 mainframe efficiently delivers up to 1000 W of clean regulated power to installed modules. The highly efficient (70%) power supply minimizes line current (16.5 A typical on 115 VAC mains at full power). A soft circuit limits inrush current to 40 A maximum. The 8025 operates over wide ambient temperature and line voltage ranges.

The 8025 produces up to 60 A on both the +6 V and -6 V outputs. It also produces up to 7 A maximum on the sum of the +12 V and +24 V outputs, and 7 A maximum on the sum of the -12 V and -24 V outputs. Outstanding line regulation, load regulation, and long term stability assure trouble-free operation. The 8025 provides smooth output during short power dropouts lasting up to 16 msec, even at full load current.

Line voltage conversion is simple. An internal jumper change converts from 90-129 VAC operation to 180-258 VAC operation.

DC fans minimize acoustic noise and efficiently cool installed instruments and the supply. One fan cools the power supply and five others pull air past installed instrument and interface CAMAC modules.

FAULT DIAGNOSIS AND SELF-PROTECTION

The 8025 contains a complete set of over-temperature, over-current, and over-voltage detection and shutdown "watchdog" circuits. These watchdogs ensure accurate measurements from installed modules and prevent damage to the 8025 power supply. The watchdog circuits monitor for internal failures and for improper operating conditions such as excessive current flow from a short on an installed CAMAC module, low AC line voltage, insufficient power supply ventilation, or a jammed power supply cooling fan.

To accomplish shutdown, circuits monitor for low output voltage on each of the six supplies, low or absent AC line voltage, high temperature on the power supply main heat sink, power supply fan stalling, and even for failure of the watchdog power supply itself. If a faulty condition is detected, then the 8025 shuts down all power supply DC outputs and lights an LED status indicator.

STATUS INDICATORS

Front-panel status indicators provide a complete picture of the 8025 operating conditions. A 3 1/2 digit multimeter displays the voltage or current being delivered from each supply (+6 V, -6 V, +12 V, -12 V, +24 V, -24 V). Push-button switches allow the user to scroll through the twelve voltage and current parameters. A corresponding LED lights to indicate the selected parameter.

If a fault generates a shutdown, the 8025 lights an appropriate fault indication LED. It remains lit until the power switch is turned off for at least two seconds. An independent supply powers the monitoring and indicator circuitry, so the watchdog functions continue to operate even during a self-protection shutdown.

CONTROLS

The back panel ON/OFF switch applies AC power to the mainframe power supplies. In turn, if no fault conditions exist, power is then applied to the loads. When toggled to the ON position, the mainframe can be turned on remotely simply by applying AC power to it.

The DC outputs to CAMAC loads can be turned off to achieve a shutdown condition via a front-panel "Load Off" button. AC power will still be applied to the mainframe, but the power supply outputs will be shut off. The "Load Off" button is convenient for removing or installing modules or other quick supply disconnect applications. The "Load On" button can restart the mainframe after either a user-initiated shutdown ("Load-Off" button) or a fault initiated shutdown. The mainframe will restart only when the fault condition disappears.

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SPECIFICATIONS 8025

MECHANICAL

CAMAC Module Capacity: 25 slots.
Dimensions: 15.6 inches high, 21.7 inch depth, 19 inch (rack mount) width.
Weight: 72 lbs (approximate).

ENVIRONMENTAL

Ambient Operating Temperature: 0 to +50°C at 850 W output, 0 to +40°C at 1000 W output.
Storage Temperature: -10 to +85°C.

POWER AVAILABLE

DC Outputs:
+6.0 V up to 60.0 A (360 W)
-6.0 V up to 60.0 A (360 W)
+12.0 V up to 7.0 A (84 W)
-12.0 V up to 7.0 A (84 W)
+24.0 V up to 7.0 A (168 W)
-24.0 V up to 7.0 A (168 W)
The combined +24 V and +12 V current cannot exceed 7.0 A. The combined -24 V and -12 V current cannot exceed 7.0 A.
Voltage Adjustability: Independent for each supply, ±2.0% typical via screwdriver access at rear.

REGULATION AND STABILITY

Regulation Line and Load: For no load to full load, and for full range of input line voltage:
±6.0 V: ±0.5% max, within 24 hour test period
±12.0 V: ±0.5% max, within 24 hour test period
±24.0 V: ±0.2% max, within 24 hour test period
Temperature Coefficient: +0.2%/°C maximum over 0 to +50°C.
Hold-up Time: 16 msec minimum at 115 VAC R.M.S. or 230 VAC R.M.S. line voltage. All outputs will remain in regulation after the loss of AC power for the hold-up time. Hold-up time is measured under full output load. Hold-up time decreases for lower AC line voltage.
Long Term: After 24 hour warm-up under constant line load and ambient temperature, and for a 6 month duration:
±6.0 V: ±0.5% maximum drift
±12.0 V: ±0.5% maximum drift
±24.0 V: ±0.3% maximum drift
Remote Sensing: All outputs are remotely sensed at the IEEE-583 backplane. Remote sensing compensates for up to 0.5 V total voltage drop from supply to connection points of the remote sense leads to loads. The voltage accuracy specifications are measured at the points where the remote sense leads attach to the loads (slot 13).

TRANSIENT BEHAVIOR

For Any Change in Line Voltage: Recover to 0.2% within 1 msec for ±12 V, ±24 V supplies. Recover up to ±1% within 1 msec for ±6 V supplies. Peak output deviation < ±5%.
For 50% Change in Load Current: Recover to 0.2% within 1 msec for ±12 V, ±24 V supplies. Recover to ±1% within 1 msec for ±6 V supplies. Peak output deviation < ±5%.
For AC Line Turn-on: DC voltage stable to < ±5% within 1 sec. DC voltage stable to < ±1.0% within 60 sec. No DC voltage overshoot during turn-on or turn-off.
Turn-on Tracking: ±12 V outputs track within 10%, ±24 V outputs track within 10%.

PROTECTION

Fault Detection: Maximum fault duration before shutdown is 40 msec.
Watchdog Supply Failure: +15 V supply - less than +9 V; -15 V supply - more positive than -9 V.

OUTPUT PROTECTION

Overcurrent: Straight line limiting beginning at 8 A typical on +12 V/+24 V combined and -12 V/-24 V combined. Straight line limiting beginning at 70 A typical on +6 VDC and on -6 VDC.
DC Output Over-voltage: +25% above nominal, for all outputs.
DC Output Under-voltage Faults:
+6 V supply: less than +5.7 V ±0.1 V
-6 V supply: more positive than -5.7 V ±0.1 V
+12 V supply: less than +11.5 V ±0.2 V
-12 V supply: more positive than -11.5 V ±0.2 V
+24 V supply: less than +23.0 V ±0.4 V
-24 V supply: more positive than -23.0 V ±0.4 V
Thermal Fault: Main heat sink extrusion temperature 82°C ±4°C.
Thermal Warning: Main heat sink extrusion temperature 71°C ±4°C.
AC Line Input Undervoltage Fault: 120 V peak in 90-129 VAC R.M.S. mode; 240 V peak in 180-258 VAC R.M.S. mode (line source impedance must be < 0.2 Ω).

INPUT PROTECTION

Overcurrent: Fuse protected in both line and neutral conductors.
Fuse Rating: 115 VAC 20 A Slow Blow, 220 VAC 10 A Slow Blow (accepts either 3AG North American or 5 mm x 20 mm European fuse types).
Soft Start: Inrush current is limited to 40 A peak during first 500 msec after turn on.

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MULTIMETER

Monitor Points: +6 V, -6 V, +12 V, -12 V, +24 V, -24 V, voltage or current.
Resolution: 3 1/2 digits (0-1999).
Accuracy: ±2.5% of full scale.
Note: +24 V current readout includes current for power supply cooling fans, -24 V current readout includes current for crate cooling fans.

STATUS INDICATORS

Line (Green):	Power switch ON.
Load (Green):	Power applied to installed modules.
Status (Green):	No fault conditions.
Status (Red):	Fault or user initiated shut-down exists (power not applied to installed modules), or thermal warning exists (power applied to installed modules).
Thermal Warning (Yellow):	Heatsink temperature within 15°C of thermal shutdown.
Thermal Shutdown (Red):	Power supply temperature too high (supply shutdown).
Fan Failure (Red):	Power supply fan not rotating (supply shutdown).
Undervoltage (Red):	Any of six supply voltages out of tolerance from abnormal loading (e.g., module shorts) or supply failure (supply shutdown).
Low AC Line (Red):	Line voltage dropped below operational level (supply shutdown).
Monitor (Red):	Watchdog monitor supply voltage too low for operation (supply shutdown).

Efficiency: 70% minimum.
Safety: Designed to meet the requirements of UL 1244 and IEC 348 standards.
Emissions: Designed to meet FCC Part 15 and VDE 0871 Class "A" requirements.

OUTPUT CHARACTERISTICS

Total Output Power: 1000 W (Actual output power can be calculated by multiplying the current and voltage (read on the 8025 digital panel meter) on each supply output and summing.
Output Ripple and Noise on the ±6.0 V Supply:

DC to 130 Hz	25 mV pp max.
130 Hz to 50 MHz:	
(I_{out} < 4 A)	250 mV pp max.*
(4 A < I_{out} < 60 A)	120 mV pp max.

* Measured under worst case conditions of high line (129 VAC). Noise drops to 155 mV pp at 115 VAC.
Output Ripple and Noise on the ±24 V and ±12 V Supplies†: DC to 50 MHz - 15 mV pp max.

INPUT AC VOLTAGE

Single Phase**

Low V Range	105 - 129 VAC
High V Range	210 - 258 VAC
Frequency	47 - 63 Hz

** Consult factory for 400 Hz operation or DC input option. For procedures used to determine product specifications, please see the 8025 Operator's Manual.

INPUT AC CURRENT

Line at 100 VAC R.M.S.	17.5 A R.M.S. max.
Line at 105 VAC R.M.S.	19.0 A R.M.S. max.
Line at 220 VAC R.M.S.	9.0 A R.M.S. max.
Line at 210 VAC R.M.S.	10.0 A R.M.S. max.

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† Note: For 12 V and 24 V supplies, the stated specification is measured at ≥ 10 A load on the ±6 V supplies. Lower loads will exhibit greater noise.

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