LeCroy CAMAC Instrument Mainframes
Models: 8013A, 1434A, and 8025

General Information

Using This Manual

This operator's manual addresses LeCroy CAMAC instrument mainframes. Each mainframe type is discussed separately as follows:

Section 1: Model 8013A Mainframe	Section 1 details installation and operation of the Model 8013A Benchtop Mainframe. A Functional Description and Specifications are also included.
Section 2: 1434A Mainframe	Section 2 details installation and operation of the Model 1434A Rackmount Mainframe. A Functional Description and Specifications are also included.
Section 3: Model 8025 Mainframe	Section 3 details installation and operation of the Model 8025 Rackmount Mainframe. A Functional Description and Specifications are also included.

Warranty

LeCroy warrants operation under normal use for a period of one year from the date of shipment. Replacement parts and repairs are warranted for 90 days. Accessory products not manufactured by LeCroy are covered by the original equipment manufacturers' warranties.

In exercising this warranty, LeCroy will repair or, at its option, replace any product returned to the factory or an authorized service facility within the warranty period only if the warrantor's examination discloses that the product is defective due to workmanship or materials and has not been caused by misuse, neglect, accident, or abnormal conditions or operations.

The purchaser is responsible for transportation and insurance charges. LeCroy will return all in-warranty products with transportation prepaid.

This warranty is in lieu of all other warranties, express or implied, including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. LeCroy Corporation shall not be liable for any special, incidental, or consequential damages, whether in contract, or otherwise.

Service Procedure

If the unit requires service, first contact your regional LeCroy service office. Be prepared to describe the problem in detail.

If the product is under warranty, LeCroy will, at its option, repair or replace the unit at no charge. For repairs *after* the warranty period, the customer must provide a Purchase Order Number before the service engineer can initiate repairs. The customer will be billed for the parts, labor, and shipping.

Shipping Guidelines

First, attach a tag to the instrument which indicates:

Purchase Order Number
Owner's name and complete address
The service required including detailed operational problems
Person to contact for confirmation (include phone number)

The 8013A is shipped as a single unit. However, prior to shipping the 1434A or 8025, detach the power supply from the mainframe and tag both units. Then, package each separately as follows:

Ship the unit in its original packaging. If not possible, provide a 275 lb. strength double wall corrugated cardboard box with inside dimensions at least eight inches greater than the unit. The extra space will ensure room for cushioning. Protect the finish by carefully wrapping the unit in polyethylene sheeting.

Place adequate dunnage or urethane foam in the container (approximately 4 inch depth) and place the wrapped unit on it. Allow approximately four inches of space on all four sides and the top of the unit.

Adequately cushion the unit on all four sides and the top using dunnage and/or urethane foam. Fasten the container with packaging tape and/or industrial staples. Address the container to LeCroy's service location and include your return address.

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Section 1: Model 8013A Mainframe

Product Description

The LeCroy Model 8013A benchtop series mainframe integrates up to eleven IEEE-583 Standard (CAMAC) instrument modules and one mainframe controller module. (LeCroy and other instrument companies manufacture many different CAMAC instrument modules.) The 8013A mainframe efficiently delivers up to 400 Watts of clean regulated power to support all LeCroy waveform digitizer, amplifier, attenuator, function generator, clock generator, counter, memory, fiber optic, and interface IEEE-583 Standard Modules.

As you slide the module into the mainframe, ensure that its instrument rails correctly align with the card cage. Tighten (clockwise) the thumbscrew on the module's lower front panel to draw its interface connectors into the mainframe's backplane. Pressing with an upward motion against the module's upper front panel will slightly raise the module and ease finger tightening. Conversely, loosening the thumbscrew retracts the module's interface connectors from the backplane.

DO NOT OVERTIGHTEN. Be careful when using a screwdriver. Excessive screwdriver force can damage the thumbscrew threads.

Ensure that the mainframe has sufficient overhead clearance to permit adequate airflow. DO NOT OBSTRUCT VENTILLATION. Blank front panels (Model BFP-1, BFP-2) can be installed in adjacent slot locations to prevent airflow from bypassing the modular instruments.

Overload and Short Circuit Protection

Overload protection is provided by a current-limiting circuit that prevents excessive current from being drawn from the DC supplies.

Power Indicator

When lit, the front panel power LED indicates that all four voltages (+6 V, +24 V, –6 V, –24 V are present).

Adjustments

There are no user-accessible adjustments on the 8013A.

Maintenance

Fuses

The 8013A uses three fuses. There is a main line fuse on the rear panel and one line fuse in each of the power supply assemblies inside the module housing. The rear panel fuse should be a slow-blow 250 V type with a current rating of 12 A for 115 V line voltage and 7 A for 220 V line voltage. The fuses on the power supply modules inside the housing should be 4 A, 250 V, fast-blow types.

Housing Disassembly

NOTE: a standard screwdriver with a long shaft (approximately 12 inch length) is required to loosen the captive screws.

The top half of the housing assembly is removed by loosening four captive screws that bolt upwards into the side walls from the bottom. Turn the housing upside down, loosen the screws, carefully turn the housing upright again, and lift the top off.

Specifications

Model 8013A CAMAC Benchtop Mainframe

Module Capacity	11 single-width plus one dual-width controller (13 slots total).
Dimensions	14" H x 11.5" W x 18.7" D
Cooling	Plug-in compartment thermally isolated from power supply. Two fans provide bottom to top positive airflow. Unit should be operated on a flat surface to prevent blockage of air inlets for fans.

Power Available

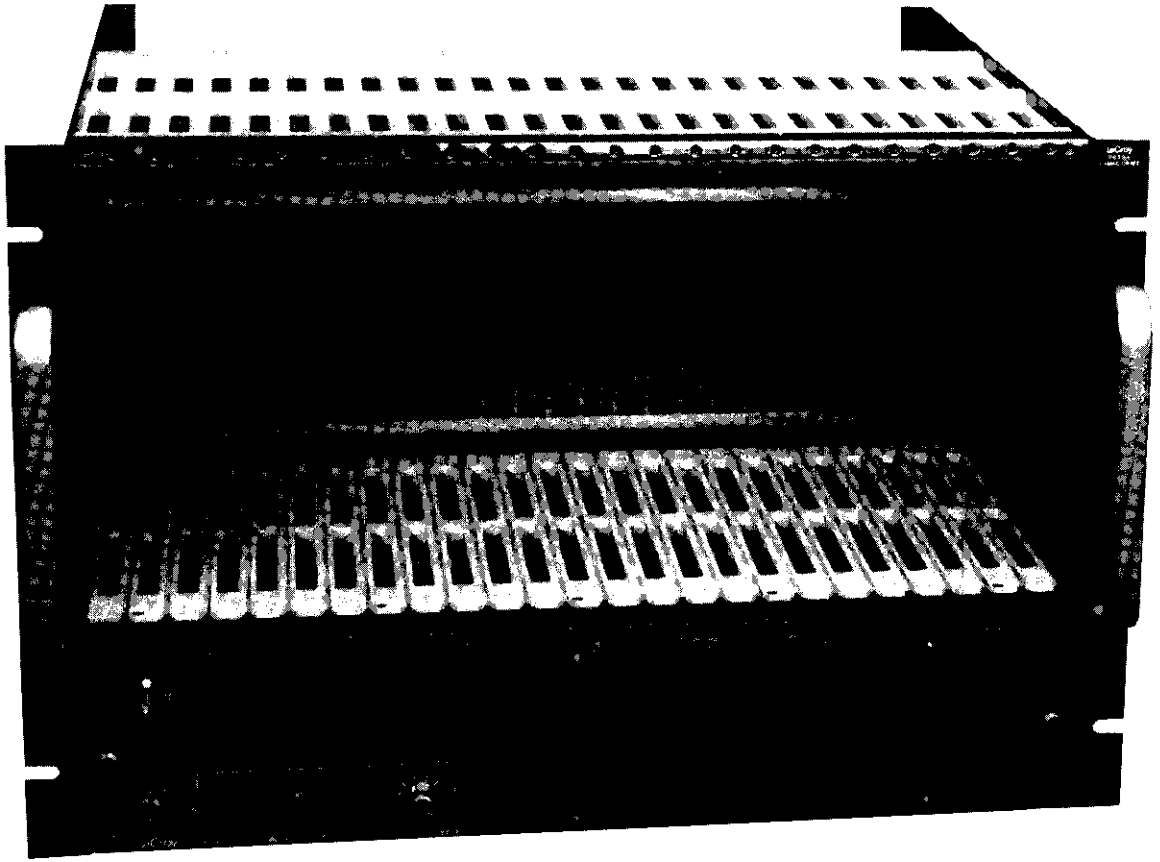
	+6 V	−6 V	+12 V	−12 V	+24 V	−24 V
8013A:	23 A	23 A	—	—	2.5 A	2.5 A

Total Power	400 W max, ±6, ±24 V combined, all supplies independent.

Performance (DC Output Voltages)

Line Regulation	±0.5% for line changes within operating limits.
Load Regulation	±0.5% for no load to full load changes (±24V). < ±2% for no load to full load changes (±6 V).
Ripple	< 50 mV p-p (50 MHz bandwidth).
Temperature Coefficient	< 100 ppm/degrees C.
Long Term Stability	< 0.1%/8 hour constant load and temperature after one hour.
Response Time	Settles to within 1% of final value in less than 500 μsec for 50% – 100% load change.

Section 2: Model 1434A Mainframe



Product Description

The LeCroy Model 1434A rackmount Instrument Mainframe integrates up to twenty-three IEEE-583 Standard (CAMAC) instrument modules and one mainframe controller module. (LeCroy and other instrument companies manufacture many different CAMAC instrument modules.) The 1434A mainframe efficiently delivers up to 650 Watts of clean regulated power to support all LeCroy waveform digitizer, amplifier, attenuator, function generator, clock generator, counter, memory, fiber optic, and interface IEEE-583 Standard Modules.

IV. Secure the power supply to the mainframe.

1. Align the power supply with the guide pins on the mainframe as shown in Figure 2-1. Push the units together.
2. Install the four captive slotted screws to fasten the power supply to the mainframe. The captive screws can be started by hand, but should be tightened using a flat head screwdriver.
3. Re-install the fan tray to mate with the power supply. Once mated, tighten the thumbscrews.

CAUTION: *Misalignment of the the fan power connectors and the D connectors can cause damage to the contacts. Ensure proper alignment before mating.*

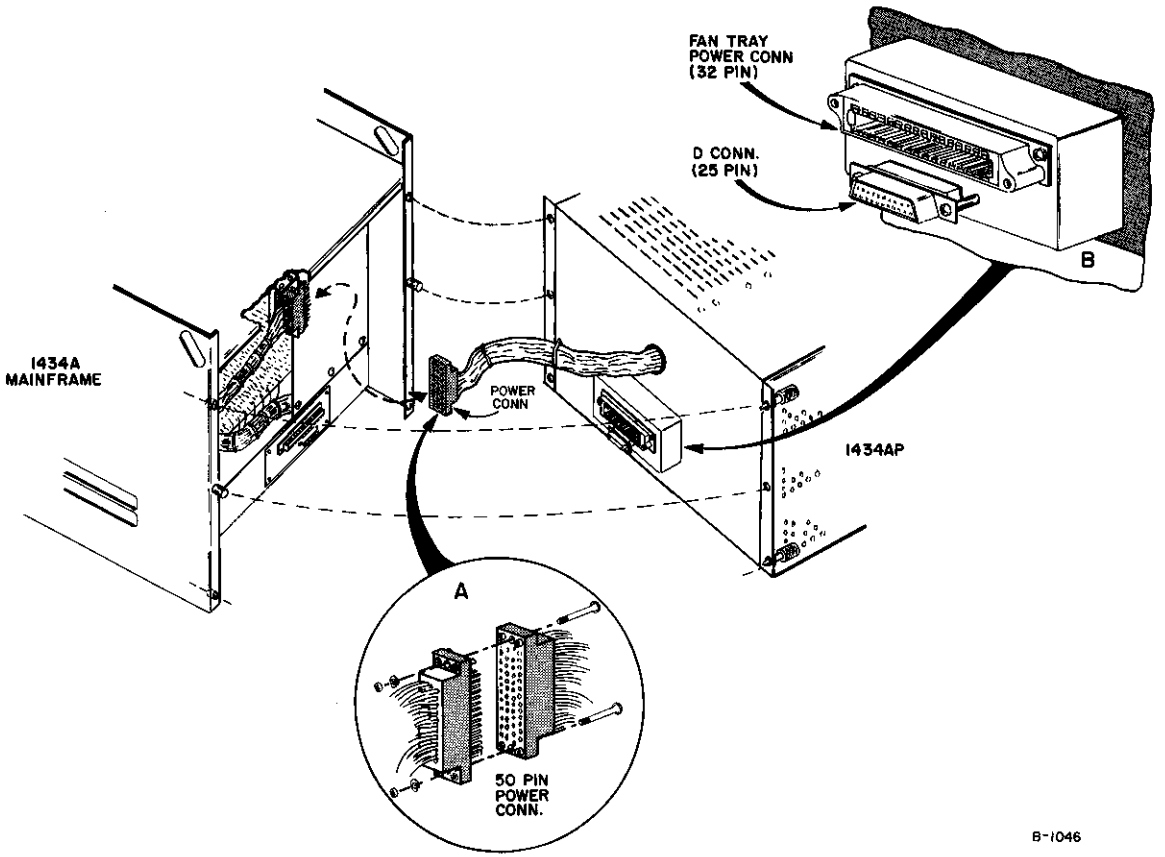


Figure 2.1: Mount 1434AP to 1434A Mainframe

Module Installation

WARNING: Inserting or removing a plug-in module when the 1434A Mainframe is powered ON may damage the module. This damage is due to temporary misalignment of the contacts on the circuit board fingers.

LeCroy's Model 8901A Mainframe Controller module requires the two rightmost slots; LeCroy's Model 6010 Mainframe Controller module requires the three rightmost slots. (For details concerning optimal slot locations for LeCroy waveform digitizer modules, refer to the desired module's Operation Manual.)

With the power OFF, slide a plug-in module into the mainframe. Ensure that its instrument rails correctly align with the card cage.

Tighten (clockwise) the thumbscrew on the module's lower front panel to draw its interface connectors into the mainframe's backplane. Conversely, loosening the thumbscrew retracts the module's interface connectors from the backplane. DO NOT OVERTIGHTEN. Excessive screw driver force can damage the thumbscrew threads.

Operation

The 1434A is a Safety Class 1 instrument (instrument with an exposed metal chassis that is directly connected to earth via the detachable AC line cord connector).

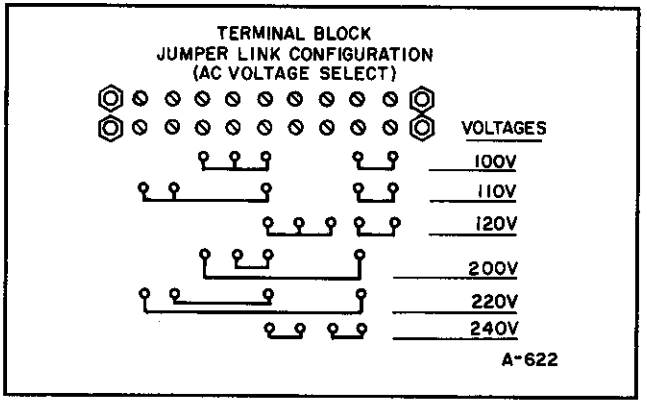
WARNING: Before energizing the 1434A, ensure that the instrument chassis is properly grounded. This precaution reduces the risk of electrical shock which can result if the protective ground is defeated. When the 1434A's 3-prong power cable is connected to an appropriate AC power receptacle, it provides a ground for the instrument chassis. DO NOT DEFEAT THE PROTECTIVE GROUND of this instrument by connecting adapters to the attachment plug or receptacle.

Selecting the AC Supply Voltage

The power supply can be set to operate from 100, 110, 120, 200, 220 or 240 V AC (all ±10%). It is shipped set to the most common supply voltage at its destination. Most supplies are factory set to operate on 110 V AC. If the supply has been set for a different operating voltage, a sticker on the front panel indicates the setting.

WARNING: Be sure AC line plug is disconnected from the AC power source before making these changes.

The operating voltage can be modified via three jumper links in the fan tray. To modify the setting, change the positions of the links according to the following table:



+/– 6 V Line Current Change

The factory set line current is 60 A at –6 V and 45 A at +6 V. To change it to 60 A at +6 V and 45 A at –6 V, refer to the following illustration:

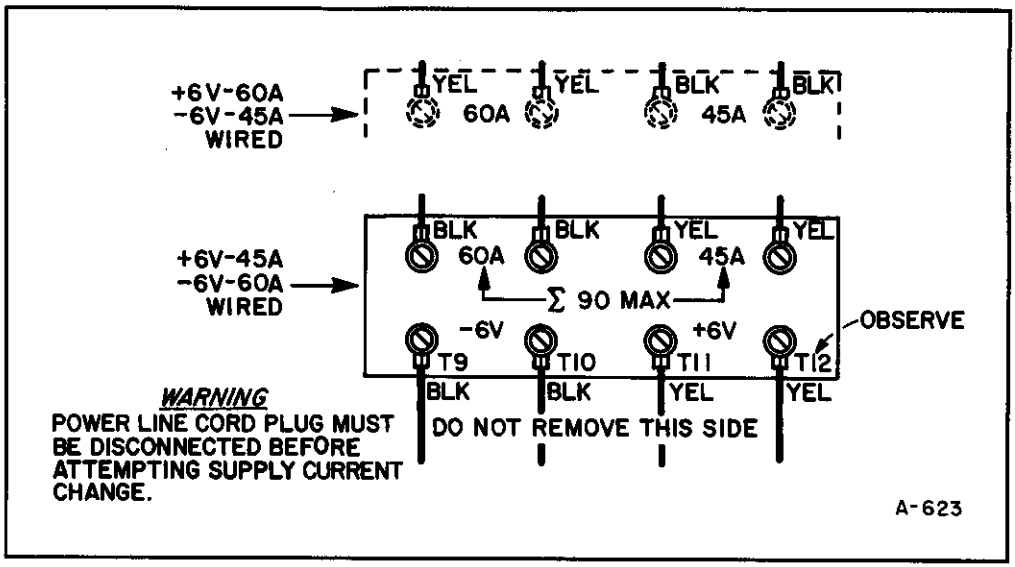


Figure 2.5: +/- 6 V Line Current Configuration

Output Monitoring

The front panel digital meter displays the output voltage or current of the supply selected using the meter switch.

WARNING: Connecting the DC power and inserting/removing modules from the mainframe should be done only when the AC Power Switch is "OFF".

Circuits for monitoring the current outputs of the ± 6, ±12 V, and ±24 V supplies are calibrated at the factory to an accuracy of ±2% of full scale. The voltage and current calibration are preset at the factory.

A connector located adjacent to the AC receptacle provides a convenient means of monitoring the four standard output voltages, i.e., ±24 V and ±6 V. Test points are also located on the front control panel.

Maintenance

Adjustments

The voltage adjustments are located on the printed circuit board inside the 1434AP power supply but are accessible through holes in the top cover of the power supply.

Fuse Replacement

To ensure the safe operation, this supply must be fitted with appropriate AC fuses.

Size	1/4" X 1 1/4"
Type	SLOW BLOW
Voltage Rating	125 V and 250 V
Current Rating	15 A for 200, 220, 240 V AC 25 A for 100, 110, 120 V AC

Recommended Types

LITTLEFUSE	326 025 (25 A)
BUSS TYPE SPT	MDA15 (15 A)

Filter

Inspection regularly. Remove the filter assembly from the front panel and run water through the foam element. Dry thoroughly before reinstalling.

Voltage Regulators +/- 6 V

The main transformer, rectifiers, and reservoir capacitor bank provides a nominal 16 V output. It is stabilized by positive and negative series pass regulators to provide the plus and minus 6 V supplies.

The positive and negative regulators are identical except for the reversed polarity of all the semiconductor devices used. Each series regulator comprises two parallel high current transistors (Q2P, Q2N). They are situated on two separate heat sinks to share the thermal load equally. Resistors (R1P, R2P, R1N, R2N) act to share the current equally between the two transistors. The resistors also provide a voltage drop that enables the load current to be measured.

The bases of the series regulator transistors are driven by a Darlington transistor (Q1P). This stage permits the output voltage to be controlled by an input of a few mA. This current comes from a current source (Q2P, on the control board 1434AP-1). The drive voltage to Q1P on the heat sink and hence the output voltages are controlled by draining a variable amount of current through Q1P on the regulator board. Since this transistor has an emitter resistor and sees a collector resistance made up of the input resistance of the output stages in parallel with R28, it acts as a voltage amplifier. Its collector voltage, and hence the output voltage, is limited by the zener diode (CR9).

Q1P on the regulator board is driven by a low drift amplifier (U2) which compares the reference voltage with a fraction of the output voltage. C11 ensures the AC stability of the supplies under normal operating conditions.

Protection against excess load current is provided by a foldback current limiter Q3P which clamps the output current to a maximum of 60 A and reduces the load current to about 30 A under short circuit conditions. Neither of the conditions should damage the power supply. To avoid damage to the equipment driven by the supply, however, an overcurrent detector, optocoupler, U6, causes the entire supply's AC power to be cut off within 20 msec of an overcurrent or short current. Transient overloads of less than a millisecond should not trigger a shutdown.

If a short-circuit failure of either of the series pass transistors occurs, the output voltage is clamped to 7.5 V by a TranZorb. This creates an overload current which triggers the shutdown circuit.

If both series pass transistors failed to open circuit, the control amplifier would shut off Q1P in an attempt to restore the output voltage. This condition is also detected and is used to shut off the supply's AC power.

Specifications

Model 1434A High Power CAMAC Mainframe

CAMAC Module Capacity	23 single-width plus one dual-width controller (25 slots total).
Dimensions	19" rackmount 12 1/4" height (plus space for exhaust air) 22 1/2" depth.
Weight	47 lb. (21.5 kg)
Voltage Meter	3 1/2 digit meter provides monitoring of all output currents and voltages. Accuracy ±1% of full scale voltage; ±2% of full scale current. Resolution better than 0.5%.
Cooling	Six high capacity fans *NOTE: The Model 1434A must be mounted such that the air circulation through the mainframe is not impeded. See page 2-6.*

Model 1434AP Power Supply Included In The Model 1434A

CONDITIONS: Line voltage 110 V, transformer wired for 110 V, ambient temperature 25 degrees C.

Power Available

Total Power	650 W maximum ±6 V, ±12 V, ±24 V combined.
± 6 V	Up to 60 A from either supply. 90 A maximum combined sum. Factory set: 45 A maximum from +6 V, 60 A maximum from –6 V. Reversible by user. See graph 1 for load conditions.
± 24 V	6 A maximum each. Subtract current drawn by ±12 V load.

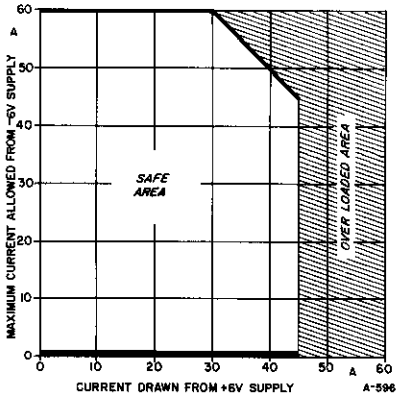
power is restored after an AC power failure related shutdown. This function can be defeated if desired. Consult the factory.

Operating Range Full 650 W output from 0 degrees C to 40 degrees C ambient temperature. Derate at –10 W/degrees C. above 40 degrees C. Maximum ambient temperature 50 degrees C. See graph 2.

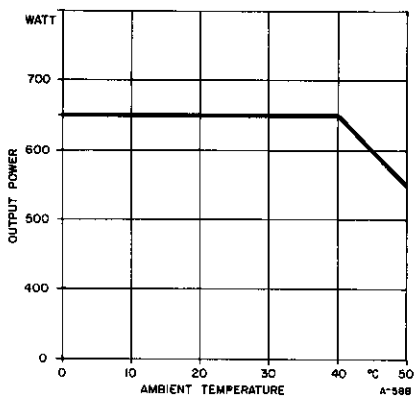
Line Voltage Field Selectable: 100/110/120/200/220/240 V AC ±10%, 47 to 65 Hz. Factory set to 110 V. 220 V operation recommended if full output power is permanently needed.

Line Current 18 A at 110 V and full output power, 9 A at 220 V.

Weight 53 lb. (24.1 kg)



GRAPH 1



GRAPH 2

Additional Specifications Of 1434A Subassemblies

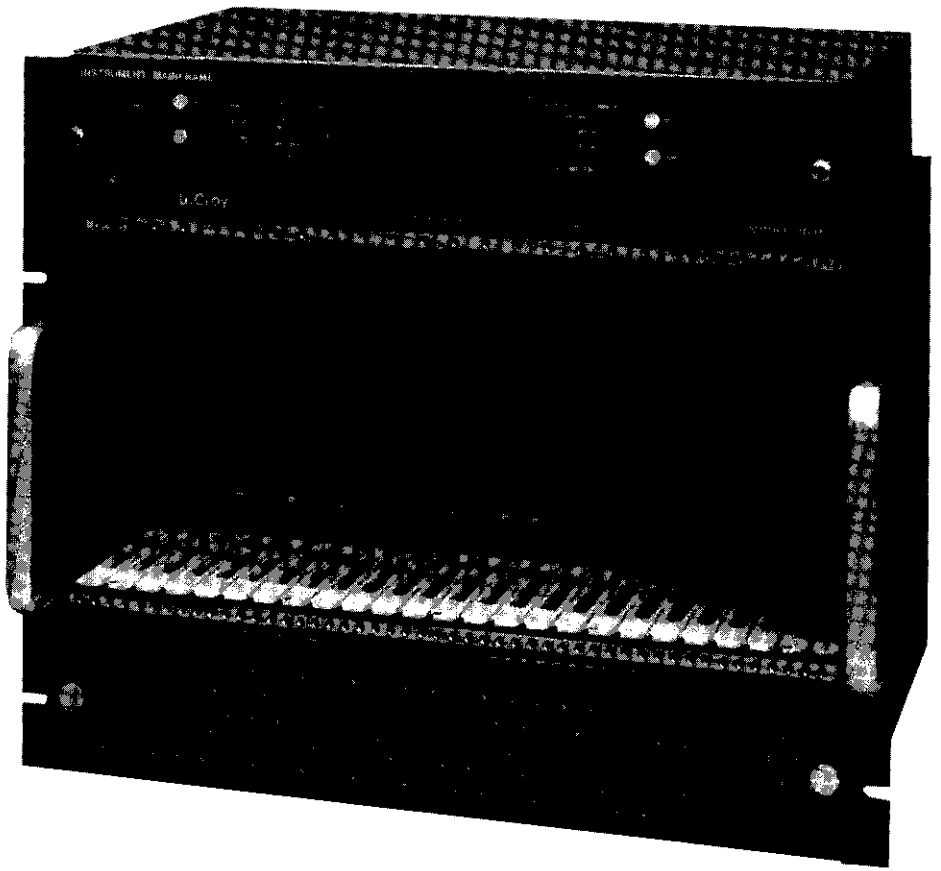
The 1434A CAMAC Power system consists of the Model 1434A Mainframe, the Model 1434AF Fan Unit and the Model 1434AP Power Supply. The Model 1434A Mainframe uses the Berkeley approved Dataway, low insertion force connectors and precision cast runners for 25 module positions. Two guide pins and four captive screws are provided for mounting the 1434P Power Supply onto the crate. A 50-pin connector at the end of a 12 inch cable supplies power to the crate.

Input Current for 110 V AC (650 W output):
Average 12.6 A
RMS 17.8 A
Peak 37 A

1434A MOD 100

The 1434A MOD 100 has vents in the base of the fan tray to provide vertical air flow for use in externally cooled rack systems. Its front-panel air intake on the fan tray is blocked off.

Section 3: Model 8025 Mainframe



Product Description

The LeCroy Model 8025 high-power Instrument Mainframe integrates up to twenty-three IEEE-583 Standard (CAMAC) instrument modules and one mainframe controller module. (LeCroy and other instrument companies manufacture many different CAMAC instrument modules.) The 8025 mainframe supplies up to 1000 Watts of clean regulated power to support all LeCroy waveform digitizer, amplifier, attenuator, function generator, clock generator, counter, memory, fiber optic, and interface IEEE-583 Standard modules.

connector head into the connector, applying just enough downward pressure to seat the connector pins.

CAUTION: Place your fingers in the opening only as far as necessary to properly seat the connector. Avoid contacting other internal components.

2. While pressing down on the connector head, snap the connector's locking tabs into place.

IV. Connect the fan power cable (three position connector with two wires). See Figure 3.1, callout B.

1. Place the Fan Power Cable through the rectangular window. Insert the connecter head into the connecter applying just enough downward pressure to force the cable's locking tabs to grab the locking ramp on the PC board connector.

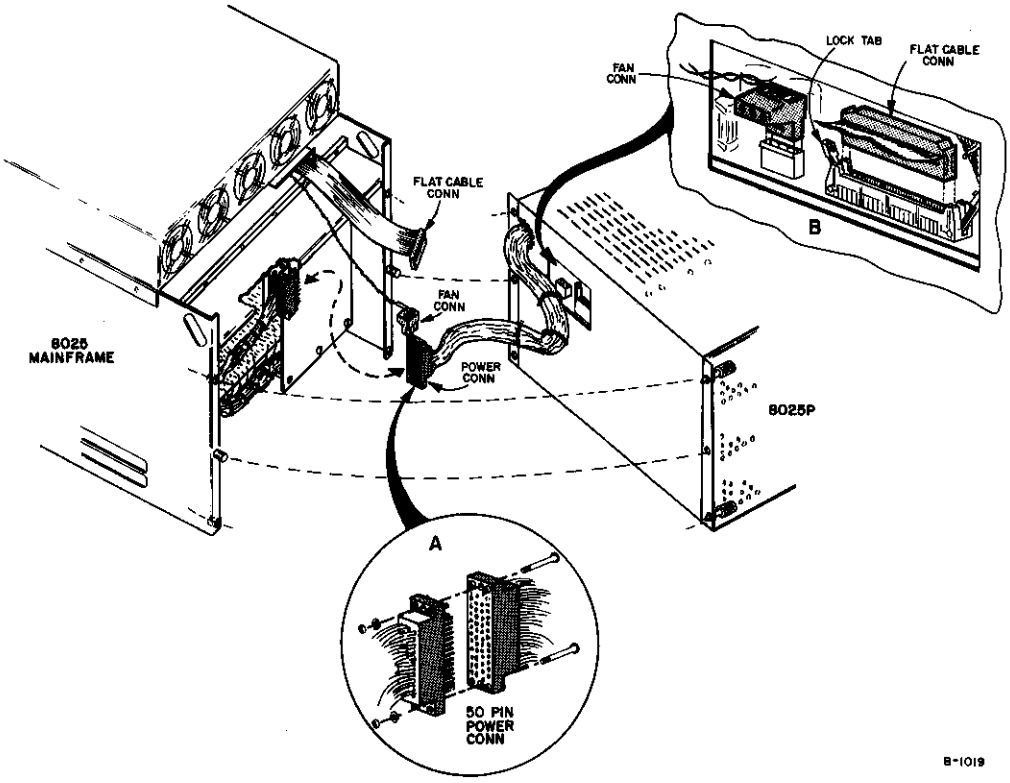


Figure 3.1: Mount 8025P to 8025 Mainframe

VIII. Insert the attachment plug end of the line cord into an AC power source compatible with the power supply's AC power configuration (110 VAC/20A or 220 VAC/10A).

IX. In the ON (1) position, the power supply's rear panel ON/OFF switch supplies AC power to the mainframe and DC power to the plug-in modules. Once the power supply's rear panel power switch is turned ON (1), DC power to the plug-in modules can be switched OFF/ON using the mainframe front panel's LOAD OFF/ON pushbuttons. The DC power LED will light green to indicate DC power ON.

The mainframe is now assembled and ready for operation.

Rackmounting

The 8025 mounts in a 19" standard EIA rack size. WITH THE LINE CORD DISCONNECTED, place the unit on a shelf as shown in Figure 3.2. Fasten the 8025 ears to the front cabinet members using four 10-32 mounting screws. (If the cabinet member holes are not threaded, use Tinnerman clips.)

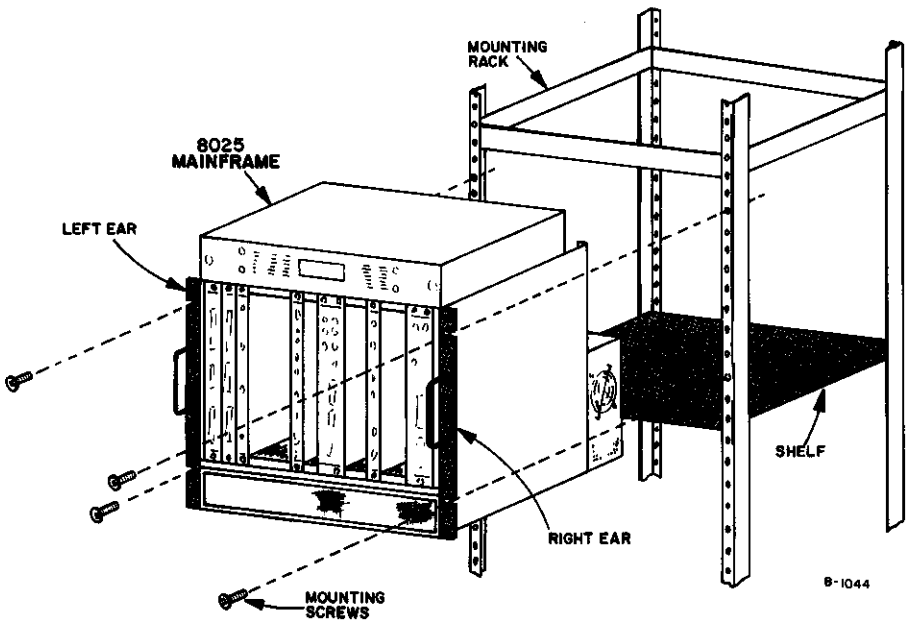


Figure 3.3: Rackmounting the 8025

Proper Airflow

DO NOT OBSTRUCT VENTILATION (see Figure 3.3). Blank front panels (Model BFP-1, BFP-2) can be installed in unused slot locations to prevent airflow from bypassing the modular instruments.

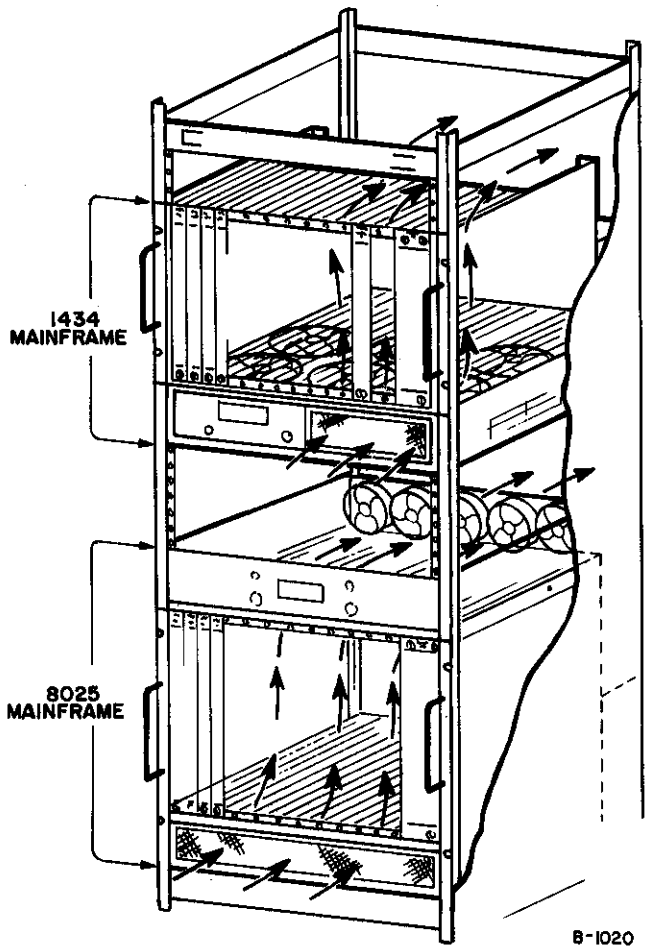


Figure 3.4: Airflow Path of the Model 8025 and 1434A Mainframes

Power Output

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

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. In the event of an overvoltage condition on any DC output, the appropriate DC/DC converter will shut down. The watchdog circuits will detect an undervoltage on that output and then shutdown all DC outputs. The appropriate FAULT LED will remain lit to indicate the faulty output.

The 8025 produces up to 60 Amperes simultaneously on each of the +6V and -6V outputs. It also produces up to 7 Amperes maximum on the sum of the +12V and +24V outputs, and 7 Amperes maximum on the sum of the –12V and 24V 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 milliseconds, even at full load current.

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.

Status Indicators

Front-panel status indicators provide a complete picture of the 8025 operating conditions. A 3 1/2 digit

Output Monitoring

The front panel digital meter displays the output voltage or current of the DC output selected using the meter select UP/DOWN pushbuttosns. When the 8025 is intially turned ON via the rear-panel ON/OFF switch, the front panel meter will be RESET to read the +6V output's current.

Maintenance

DC Output Voltage Adjustment

The voltages of the six DC outputs can be user-adjusted ±2% minimum. These adjustments can be made via access holes located around the power supply cooling fan in the 8025 power supply enclosure. Each access hole is appropriately labeled.

Fuse Replacement

For continued protection against fire, replace AC input fuses only with the types listed below. Before attempting to check or replace fuses, be sure that the AC power cord is disconnected from any AC power source receptacle.

115 VAC Nominal Source

Size:	1/4" x 11/4"
Type:	SLOW BLOW
Voltage Rating:	250 VAC
Current Rating:	20 A
Approvals:	UL approved

230 VAC Nominal Source

Size:	1/4" x 11/4"
Type:	SLOW BLOW
Voltage Rating:	250 VAC
Current Rating:	10 A
Approvals:	UL approved

happens, all DC outputs will be turned OFF (all DC/DC converters will be inhibited), and the appropriate LED will be lit.

NOTE: During this type of fault shutdown, the 300 VDC supply is still fully charged and operating. Only the outputs of the DC/DC converter modules have been inhibited.

The monitoring circuitry or "watchdog" circuitry also continues to function independently of the outputs it monitors. Just as is the case for the bulk supply, the watchdog supply is functional whenever the rear ON/OFF switch is in the ON position and the 8025 is connected to an appropriate AC power source. This watchdog circuitry also initiates an orderly power-up sequence because it will not enable the DC outputs of the DC/DC converters until the approprate conditions exist. AC line voltage and watchdog supply voltages must be normal. Upon initial power-up, there is a period of approximately 1 second during which detected faults are ignored. This delay time is required to permit the outputs to stabilize. No damage can occur to the 8025 power supply due to real faults which may occur during this delay time. The power supply will merely shutdown at the end of this delay time.

The front panel LOAD ON/OFF pushbuttons act to inhibit or enable the DC outputs of the DC/DC converters, thereby enabling or disabling DC power to the installed CAMAC modules in the mainframe. Control functions are initiated via the front control panel which connects to the 8025 power supply through a flat cable, as illustrated in the installation section of this manual. The mainframe's cooling fan's –24 VDC power is delivered to these fans via a twisted wire pair and 3–position connector, also discussed in the Installation section of this manual.

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% / degree C maximum over 0 to +50 degree C

Hold-up Time

16 msec minimum at 115 VAC rms or (230 VAC rms) 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 0.5V total voltage drop from supply to connection points of the remote sense leads to loads. Accidental removal of the sense leads will not damage the supply. 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 to ±1% within 1 msec for ±6 V supplies.
Peak output deviation < ±5%

Output Dependency of Noise, AC Voltage, and Current

Total Output Power:	850W*	1000W*
OUTPUT RIPPLE AND NOISE ON THE +/- 6.0V SUPPLY:		
DC to 130 Hz	20 mV pp max	25 mV pp max
130 Hz to 50 MHz		
(Iout < 4A)	250 mV pp max**	250 mV pp max**
(4A < Iout < 60A)	100 mV pp max	120 mV pp max
OUTPUT RIPPLE AND NOISE ON THE +/- 24 AND +/- 12 V SUPPLIES:		
DC to 50MHz	15 mV pp max	15 mv pp max
INPUT AC VOLTAGE:		
Single Phase***		
Low V range	90 - 129 VAC	105 - 129 VAC
High V range	180 -258 VAC	210 - 258 VAC
Frequency	47 to 63 Hz	47 to 63 Hz
INPUT AC CURRENT:		
Line at 110 VAC rms	14.5A rms max	17.5A rms max
Line at 105 VAC rms	15A rms max	19.0A rms max
Line at 90 VAC rms	19A rms max	
Line at 220 VAC rms	7.5A rms max	9.0A rms max
Line at 210 VAC rms	8.0A rms max	10.0A rms max
Line at 180 VAC rms	10.0A rms max	

*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.

**Measured under worst case conditions of high line (129 VAC). Noise drops to 115 mVpp @ 115 VAC.

***Consult factory for 400 Hz operation or DC input option.

Procedures used to determine product specifications are discussed in other sections of this manual.

Protection

Fault detection Max fault duration before shutdown: 40 ms.

Watchdog supply failure
+15 V supply: less than +9 V.
–15 V supply: more positive than –9 V.

Resolution	3 1/2 digits (0 – 1999)	
Accuracy	±2.5% of full scale	
	NOTE: Current for Fans: +24 V current includes current for power supply cooling fans. -24 V current 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 shutdown exists (power not applied to installed modules), or thermal warning exists (power applied to installed modules)
	Thermal warning (yellow):	Heatsink temperature within 15 degrees 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.	
Calculated MTBF	Greater than 50,000 hours.	

MEASUREMENT: To accurately measure output ripple and noise, use a low inductance test point assembly to eliminate the effects of scope probe ground lead inductance and noise pickup:

Tektronix part number 131-2766-01 (collar)
136-0352-02 (probe tip receptacle)
AMP INC. 50462-7 (probe tip receptacle)

This assembly enables a true accessment of output ripple and noise as seen by installed CAMAC modules.

2. The 8025 mainframe power supply employs a full-wave capacitive doubler circuit to operate on 115 VAC nominal mains and a full-wave bridge circuit to operate on 230 VAC nominal mains. Both these circuits require that high AC line currents be delivered near the peaks of the AC line voltage waveform (positive and negative crests). Typical peak currents are approximately ±33 A at 115 VAC, and full load. The reservoir capacitors charge up to this line voltage waveform's peak voltage. To operate properly, the supply requires that peak voltage on the reservoir capacitors reach at least 245 V. The crest voltage for a 180 VAC rms nominal main is 254 V. Similarly, the crest voltage for a 90 VAC rms nominal main is 127 V, and when doubled, becomes 254V. This allows for a drop of 10V due to bridge rectifier diodes and AC line source impedance. This impedance should be limited to 0.2 ohm maximum, by restricting the use of extension cords or power-taps on the AC line input. This will reduce the likelyhood of an undervoltage condition on the AC line input.

From the AC input, the 8025 supply appears as a constant-power device. As input voltage drops, input current increases proportionally. Therefore, the highest AC rms line input current occurs at the lowest value of AC input voltage. (See also note 3 concerning "power factor."

3. To correctly measure the 8025's power efficiency, the "power factor" concept must be included. If AC rms current flowing in the 8025 mainframe supply's line input were measured and multiplied by the AC rms voltage seen at the 8025 line cord's input, one might expect the product to represent the 8025 supply's input power. This is not the case. The real input power is this product multiplied by the power factor which is approximately 0.75.

(For a purely resistive system, the power factor is 1, and the simple V-I product represents the real power.) To more accurately measure the real input power directly, use a power meter suited to the task.

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