

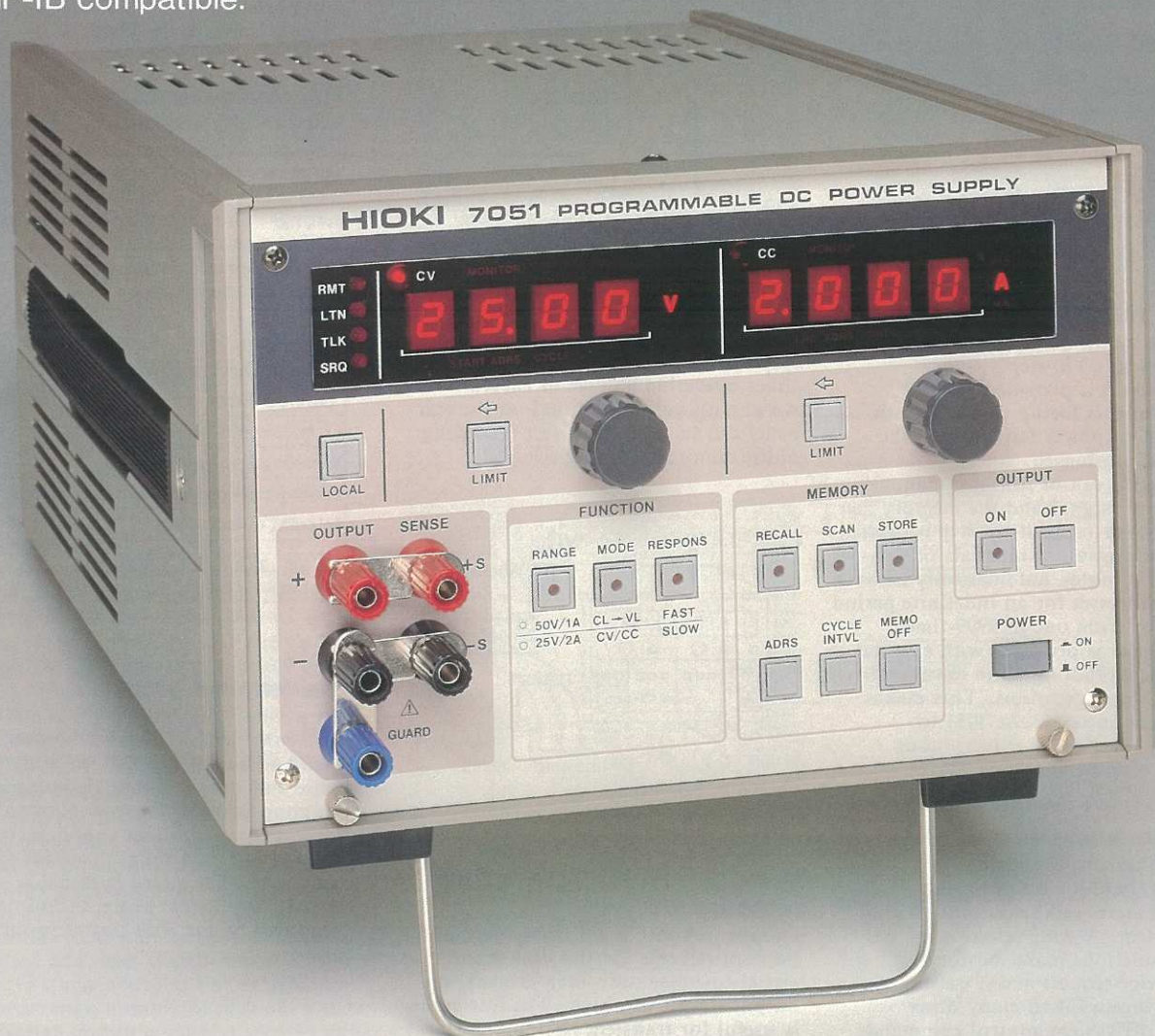
PROGRAMMABLE DC POWER SUPPLY

7051

GP-IB compatible

50-Watt Programmable DC Power Supply

- DC 50V-1A or DC 25V-2A (60V max.)
- $\pm 0.05\%$ accuracy.
- Three output modes:
Auto crossover, voltage and current limiter operation.
- FAST-SLOW selectable output.
170-step versatile memory function.
- Separate voltage and current displays. Annunciators report settings, operational status, device errors, etc.
- Analog monitor output, I/O terminals for external control of memory function.
- GP-IB compatible.



High-power DC 50V-1A/25V-2A for automated measurement systems, energy-conservation programs.

Highly accurate power supply for use on production lines and in R & D labs.

Description

The 7051 is a high-power (50-watt) power supply designed to provide highly accurate output of both voltage and current. Having dual setting dials and displays, the desired output and limiter values can be set independent of one another. This feature also allows one display to be used for output value, while the other is used as an operating current (or voltage) monitor.

Three selectable modes are provided: CV (constant voltage) and CC

(constant current) featuring automatic crossover, and independently-selectable CL (current limiter) and VL (voltage limiter) modes. Output response also has a fast and slow mode, selectable depending on applications.

Other functions designed to make operations easier include the 170-step memory that allows all setting conditions to be stored for later recall, and external terminals for analog output and for accessing the memory function. For system applications, the

7051-01 mod comes with a GP-IB interface for direct connection to an automated measurement system. The 7051 is ideally suited for use on production lines, and in high-tech research. Specific applications include the testing and aging of electrical devices and components. It can also be used in automated measurement systems, and in energy-conservation programs.

50-watts of power

Combination voltage/current output settings totaling 50-watts are possible with the 7051. High stability and distortion-free output make it an optimum signal source or power supply for use in component or instrument testing, or for device characterization testing.

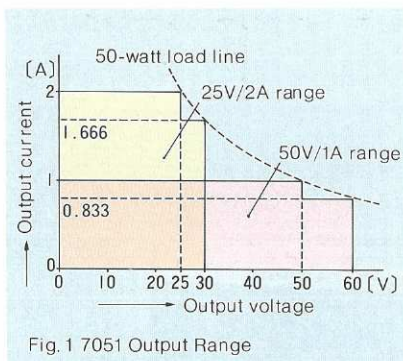


Fig. 1 7051 Output Range

±0.05% accuracy

Basic instrument accuracy is ±0.05% of reading, ±1 digit. And combined with high accuracy, output stability makes the 7051 ideal for instrument and meter calibration, or for use in testing and characterization of devices where high measurement accuracy is required.

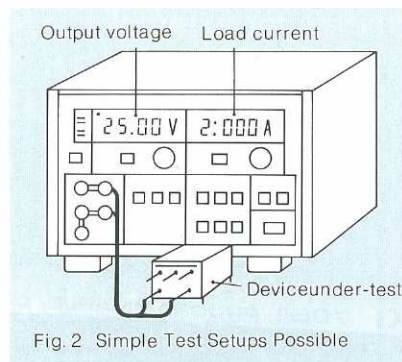


Fig. 2 Simple Test Setups Possible

Versatile output modes

Three output modes are available for use depending on application. The CV/CC auto crossover mode switches between constant voltage and constant current as load conditions dictate. With the current limiter (CL) mode, output is cut off whenever the prescribed limiting value is exceeded. Similarly, output is cut off when voltage limiting value is exceeded in the voltage limiter (VL) mode. When used as a standard power supply, limiter modes can be set to prevent accidental damage to the component or instrument under test.

Full display function

The two display panels, in addition to showing output and monitor values, report units, mode, and memory function parameters based on front panel switch settings. Should a malfunction occur during use, output will be cut off and the appropriate device error code will appear in the display.

170-step memory function

All setting conditions can be stored in the instrument's 170-step memory. Battery backup is provided to hold memory contents for up to one month in the event of power failure, or if the line cord is unplugged.

Memory recall can be initiated manually, or by external signal, and the memory can be accessed for readout by step between any two addresses, in intervals of 0.1~99 seconds or minutes, automatically between any two addresses for an indefinite period of time, or from one to 9999-times.

The rear panel is provided with external I/O terminals that function to control recall and scan operations. This makes it possible to interface the 7051 to external devices, or for synchronous operation of more than one 7051.

GP-IB interface (-01 mod)

Using the 7051-01, all setting conditions, monitor output values, and device states can be output to a GP-IB system. A wide selection of interface functions make memory access, service request mask, setting condition inquiry, and many other useful GP-IB system control commands possible.

Monitor function

When output is activated, one side of the display functions as a monitor indicating either operating voltage or current value. An analog output terminal on the rear panel can be used for direct recording of the monitor-side signal.

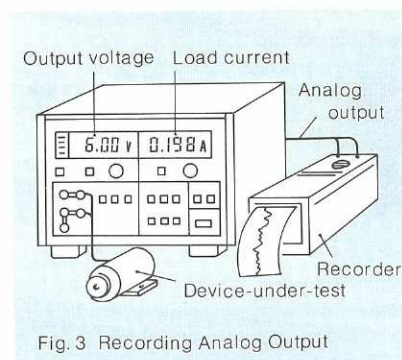


Fig. 3 Recording Analog Output

Table 1 Device Error Codes

Device Error	Display Code
CL mode-current limiter actuated	1 1 1 1
VL mode-voltage limiter actuated	2 2 2 2
Power supply line malfunction	3 3 3 3
Internal overheating	4 4 4 4
Internal circuit fuse blown	5 5 5 5
Memory error	9 9 9 9

Five-terminal output

Where load current is high, combined with considerable distance between the load and power supply, isolating the sense and output terminals and making the connection to the load terminals assures correct voltage supply to the by eliminating the voltage drop due to line resistance. The guard terminal is useful in reducing system noise, including that produced by the 7051 power supply.

Selectable FAST-SLOW output response

Output response is selectable depending on requirements. In the slow mode, signal-to-noise ratio is increased, and output stability is high. The fast mode is useful for transient response testing and similar applications.

±0.05% accuracy

Applications include device testing and aging, instrument calibration.

Output voltage display

<input checked="" type="radio"/> CV	Voltage mode
MONITOR	Operating voltage, voltage, value limiter monitor

Output current display

<input checked="" type="radio"/> CC	Current mode
MONITOR	Operating current, current limiter monitor

GP-IB interface connector
(7051-01 mod)

Range selector

Mode	CV	CC
<input checked="" type="radio"/>	50V 1A	
<input type="radio"/>	25V 2A	

Mode selector

	CV	CC
<input checked="" type="radio"/>	CV/CL	CC/VL
<input type="radio"/>	CV/CC	

Response selector

<input checked="" type="radio"/>	FAST
<input type="radio"/>	SLOW

Memory control
For memory store and recall operations.

Output and limiter value settings

<input type="checkbox"/> LIMIT	Moves the flashing setting digit column.		
<input type="checkbox"/>	Digital setting dial (decrements or increments the flashing digit)		

	MONITOR	25.00V
CW		25.10→25.20→25.3...
CCW		24.99→24.98→24.7...

- Memory function external control terminal
 - T₁: Scan completion signal
 - T₂: Scan start
 - T₃: Recall operations
 - T₄: Ground (GND)
- Analog output terminal
 - T₅: Load voltage monitor (60V:6V)
 - T₆: Load current monitor (2A:2V)
 - T₇: Ground (GND)

Memory function

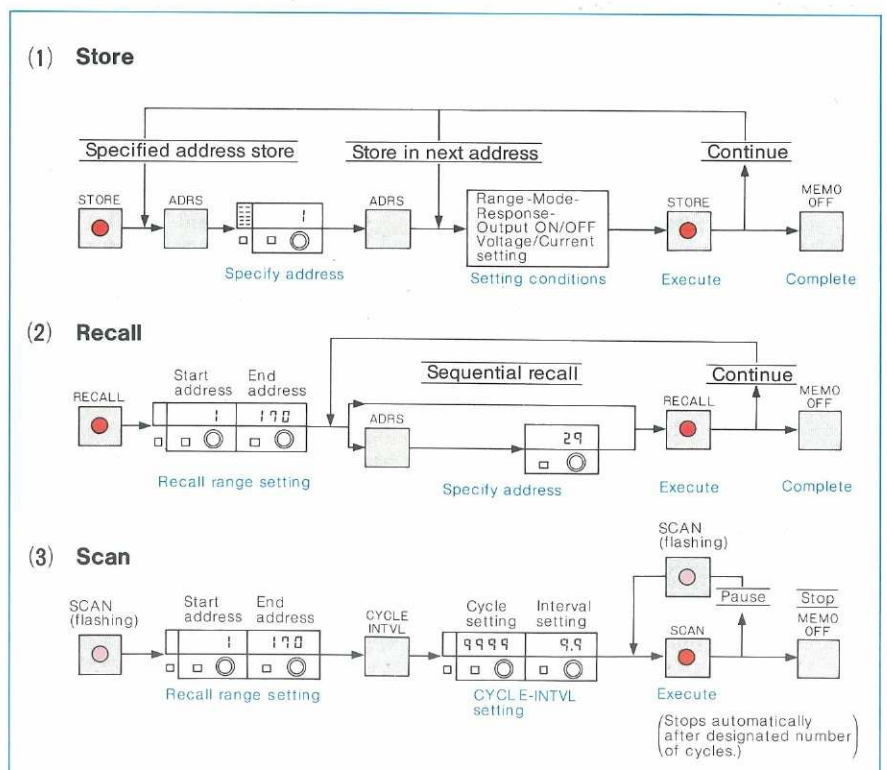
The 7051 has a 170-step memory, with stored settings protected by a Ni-Cd battery backup system. Memory contents will be held for at least one month.

● Memory store

Two store methods can be used. Settings can be stored in sequential addresses starting from a designated address, or an address can be specified each time store is required. Store is accomplished by setting range, operating mode, response, voltage/current output value, and output ON/OFF using the panel controls, followed by pressing the STORE button.

● Memory recall

Two recall methods can be used. Sequential recall is initiated by pressing the RECALL button, with automatic recall initiated using the SCAN button. When using the RECALL button, sequential recall can be between two specified addresses (recall range setting), or for a single address. For SCAN, the address range, number of cycles (1~9999, indefinite), and interval (0.1 sec~99 min) is set for recall.



Specifications

Accuracy specified for 23°C ± 3°C, < 85% RH, following warm-up period of 30 minutes.)

	Range	Output range	Resolution	Accuracy	Max. output	Output resistance	Temperature coefficient/°C
Voltage (CV)	25V/2A	0~30V	10mV	±0.05% ± 10mV	Approx. 2A	Approx. 2mΩ	0.005% ± 0.5mV
	50V/1A	0~60V	10mV	±0.05% ± 10mV	Approx. 1A	Approx. 4mΩ	0.005% ± 0.5mV
Current (CC)	2A/25V	0~ 2 A	1mA	±0.05% ± 1 mA	Approx. 25V	Approx. 60kΩ	0.008% ± 0.1mA
	1A/50V	0~ 1 A	1mA	±0.05% ± 1 mA	Approx. 50V	Approx. 60kΩ	0.008% ± 0.1mA

Output display: Voltage, max. reading of 6000; Current, max. reading of 2000; LED display.

Output setting: Setting dials with digit column shift switch, MSD can be raised or lowered.

Unit indicators: V, A, sec, min.

Memory function: 170-step internal memory, one month battery backup.

Calibration period: Three months.

Warm-up time: 30 minutes or more.

Output modes: CV/CC auto crossover between constant voltage and constant current.

CV/CL constant voltage, current limiter.

CC/VL constant current, voltage limiter.

Load fluctuation:

Constant voltage (CV) mode, ±0.01% ± 5mV

Constant current (CC) mode, ±0.02% ± 1mA

Power supply voltage fluctuation (at ±10% of rated supply voltage):

Constant voltage (CV) mode, ±0.01% ± 5mV

Constant current (CC) mode, ±0.01% ± 1mA

Output ripple:

Constant voltage (CV) mode, ±0.02% ± 5mV rms

Constant current (CC) mode, 2mA rms

Output stability (8-hour drift following 30 minute warm-up):

Constant voltage (CV) mode, ±0.02% ± 5mV

Constant current (CC) mode, ±0.03% ± 2mA

Monitor display accuracy: Voltage; ± 6 counts, Current; ± 6 counts temperature coefficient, ± 0.01%/°C

Monitor output accuracy:

Voltage (5V/50V), ±0.05% ± 3mV

Current (2V/2A), ±0.05% ± 2mV

Output response: Fast mode

(CV mode, no load); up, 2ms-down, 2ms (approx)

(CV mode, full load); up, 65ms-down, 2ms (approx)

(CC mode, no load); up, 65ms-down, 65ms (approx)

(CC mode, full load); up, 65ms-down, 65ms (approx)

Slow mode

(CV and CC mode); up and down, 200ms (approx)

Output terminal: 5-terminal w/guard (front/rear panel parallel output)

Operating temperature/humidity: 0~ +40°C, < 85% RH

Storage temperature: -10°C~ +50°C

Dielectric strength: Power source-to-case, 100MΩ at DC 500V; AC 1500V for one minute.

Guard-to-case, 100MΩ at DC 500V; AC 250V for one minute.

Power source: AC 100, 120, 220, 240V ± 10%, 50/60Hz (specify one with order)

Power consumption: 150VA max.

Dimensions: 149H × 228W × 363D (mm) (approx)

Weight: 8.1kg (approx)

Accessories provided: Power cord, 1; Fuse, 1 (internal)

GP-IB Interface Option (7051-01)

When using 7051-01, with the exception of power switch operations, all instrument controls and settings can be made under remote-control from the GP-IB system controller.

(1) Applicable standard: IEEE 488-1978

(2) Interface functions: SH1, AH1, T6, L4, SR1, RL1, PPO, DC1, DT1, CO, E1

(3) Listener functions:

- Basic programming codes for output: Mode (M), Range (R), Response (RP), Output (O), Voltage setting (V), Current setting (A)

- Programming codes for memory access: Store (ST), Recall (RC), Scan (SC, SX), Cycle (CY), Interval (IT)

- Programming code used to set SRQ send mode: SRQ mask (SM)

- Programming code used to control the external output terminal (TI): TI output (OT)

- Programming codes used to inquire about memory contents, setting status, and operational status: Store data (QST), Recall address (QRC),

Scan address (QSC), Cycle-interval (QCI), SRQ mask (QSM), Memory error (QER)

(4) Talker functions:

- Basic output data format

```
aa_bb_Vcc.cc Ad.ddd : eeeee
 ① ② ③ ④ ⑤
CRLF(EOI)
 ⑥
```

1 Output status: ON, output ON; OF, output OFF; DE, device error

2 Modes: CV, constant voltage mode; CC, constant current mode

3 Voltage setting value

4 Current setting value

5 Monitor value:

Ae. eee, current monitor value

Vee. ee, voltage monitor value

6 Delimiters: CR and LF sent, EOI going active with LF.

- Other contents output depending on inquiry code.

(5) Status bytes: The below listed status bytes are output in

response to serial poll from controller. However, when "0" is used to represent SRQ mask, that bit will be output as "0".

```
BIT7 BIT6 BIT5 BIT4 BIT3
 0 SRQ 0 SC TI
BIT2 BIT1 BIT0
MC DE SE
```

SRQ: Service request active; SC: Scan completion; TI: Trigger input (T2 terminal low); MC: Mode change (CV/CC change, limiter activated); DE: Device error; SE: Setting error

Optional accessories

9151-01 GP-IB Connector Cable(1 meter)

9151-02 GP-IB Connector Cable(2 meters)

9151-04 GP-IB Connector Cable(4 meters)

9402 Full-width Rack Mounting Fixtures with L Bars

9404 Half-width Blank Panel

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