HEWLETT
PACKARD

HP 3457A Multimete

**Quick
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Guide**

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PACKARD

HP 3457A Multimeter

Quick Reference Guide

Contents

Syntax Rules

- Command headers must be entered in upper case.

- Parameters can be entered in upper case, lower case, or as a numeric value. Numeric parameters can be in either integer, floating point, or exponential fòrmat. Numbers in floating point format are rounded to the nearest integer if the command requires an integer.

- To default a parameter, either omit it or replace it with -1 (minus 1). From remote only, you can default a parameter by using two commas.

- Use a space or comma delimiter to separate elements in a command string. From remote, you can replace any comma delimiter with a space. When a comma and space(s) are used together (e.g. OUTPUT 722;DCV 3 , .001''), the HP 3457 ignores the space(s) and executes the command as if the spaces did not exist.

- The <CR> (carriage return), <LF> (line feed), or ; (semicolon) delimiters indicate the end of a message to the HP 3457.

- To regain control of the bus and the computer immediately after sending a command, suppress <CR>, <LF>, or both when sending the command. The example below shows how to use image specifiers (#, K) to suppress both <CR> and <LF> when sending the TEST command.

  OUTPUT 722 USING "#,K";"TEST;"

- Multiple commands separated by semicolons (;) can be used in one command string. For example:

  OUTPUT 722;"DCV 3,.0001;NPLC 10;TRIG AUTO"

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NRDGS?
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DELAY?
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TIMER?
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Item	State
ACBAND	20
ARANGE	ON
AZERO	ON
BEEP	ON (RESET), last value (PRESET)
CHAN	None connected
DELAY	Automatic
DISP	ON
EMASK	2047
END	OFF
ERROR register	Self-test results
FIXEDZ	OFF
FSOURCE	ACV
FUNC	DCV
HP-IB ADDRESS	Not changed
INBUF	OFF
LOCK	OFF
MATH	OFF,OFF
Math registers set to 0, except:	
PERC	1
REF	1
RES	50
SCALE	1
DEGREE	20
MEM	OFF
MFORMAT	SREAL
MSIZE	Not changed
NDIG	5

Item	State
NPLC 10	(power-on & RESET), 1 (PRESET)
NRDGS	1,AUTO
OCOMP	OFF
OFORMAT	ASCII
PROGRAM MEMORY	Clear
RANGE	AUTO
READING MEMORY	Clear
RQS	Power-on bit unchanged, the rest cleared
SADV	HOLD
SLIST	Empty list
STATE STORAGE	States 0 - 10 intact (power-on) All states intact (RESET & PRESET)
STATUS register	Power-on bit + self-test results (power-on) Self-test results (RESET & PRESET)
TARM	AUTO
TBUFF	OFF
TERM	FRONT panel
TIMER	1 sec.
TRIG	AUTO (power-on & RESET), SYN (PRESET)

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In the following command summary, command headers are shown in upper case print and parameter names are in italics. Unless otherwise noted, the default value for a parameter is shown in bold print.

ACAL *type*

Performs automatic calibration.

type: **ALL (1)**, AC (2), OHMS (3).

ACBAND *frequency*

Selects the slow or fast AC measurement mode.

frequency: <**400** = slow mode, ≥400 = fast mode.

ACDCI *max. input, % resolution*

Selects AC + DC current measurements, range, and resolution.

max. input: **AUTO** or 0 - 1.

% resolution: percentage of *max. input* (default set by NPLC command).

ACDCV *max. input, % resolution*

Selects AC + DC voltage measurements, range, and resolution.

max. input: **AUTO** or 0 - 300.

% resolution: percentage of *max. input* (default set by NPLC command).

ACI *max. input, % resolution*

Selects AC current measurements, range, and resolution.

max. input: **AUTO** or 0 through 1.

% resolution: percentage of *max. input* (default set by NPLC command).

ACV *max. input, % resolution*

Selects AC voltage measurements, range, and resolution.

max. input: **AUTO** or 0 - 300.

% resolution: percentage of *max. input* (default set by NPLC command).

ADDRESS *value* (local only)

Sets the HP 3457's HP-IB address.

value: 0 through 31 (default = none; parameter required).

ARANGE *control*

Enables or disables autorange.

control: OFF (0), **ON (1)**.

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AUXERR?

Returns the weighted sum of all set bits in the auxiliary error register and clears the register.

Weighted Value	Bit Number	Description
1	0	Isolation error
2	1	Slave processor self-test failure
4	2	Isolation self-test failure
8	3	Integrator convergence error
16	4	Front end zero measurement error
32	5	Current source, gain, input divider failure
64	6	Amps self-test failure
128	7	AC amplifier's DC offset test failure
256	8	AC flatness check
512	9	Ohms precharge failure during autocal
1024	10	32k ROM checksum failure
2048	11	8k ROM checksum failure
4096	12	Non-volatile RAM failure
8192	13	Volatile RAM failure
16384	14	Calibration RAM protection failure

AZERO *control*

Enables or disables the autozero function.

control: OFF (0), **ON (1)**, ONCE (2).

AZERO?

Returns a number indicating the autozero mode: 1 = ON, 0 = OFF or ONCE.

BEEP *control*

Controls the HP 3457's beeper.

control: OFF (0), ON (1), **ONCE (2)**.

CAL

Service related command. Refer to the HP 3457 service manual for details.

CALL *name*

Executes a stored subprogram.

name: **0** - 19.

CALNUM?

Returns a decimal count showing the number of calibrations.

CHAN *channel*

Selects a plug-in card input channel for measurements.

channel: **0** - 13 (HP 44491), **0** - 9 (HP 44492).

CHAN?

Returns the channel number of any presently selected plug-in card input channel (no channels returns -1).

CLOSE *actuator channel*

Closes actuator channel 8 or 9 on the HP 44491 plug-in card.

actuator channel: **8** or 9.

CRESET

Opens all channels on a plug-in card.

CSB

Clears (sets to 0) all bits in the status register.

DCI *max. input, % resolution*

Selects DC current measurements, range, and resolution.

max. input: **AUTO** or 0 - 1.5.

% resolution: percentage of *max. input* (default set by NPLC command).

DCV *max. input, % resolution*

Selects DC voltage measurements, range, and resolution.

max. input: **AUTO** or 0 - 300.

% resolution: percentage of *max. input* (default set by NPLC command).

DELAY *time*

Specifies the time interval inserted before a measurement.

time: 1E-6 through 2100 (seconds). Default *time* = automatic.

DELAY?

Returns the present delay time, in seconds.

DIAGNOSTIC

Service related command. Refer to the HP 3457 service manual for details.

DISP *control,message*

Enables or disables display and can send a message to the display.

control: OFF (0), **ON (1)**, MSG (2).

message: message for display.

EMASK *value*

Designates which error conditions will set the error bit (bit 5) in the status register.

value	Bit Number	Enables Error Condition
1	0	Hardware error
2	1	Error in the CAL or ACAL process
4	2	Trigger too fast
8	3	Syntax error
16	4	Unknown command received
32	5	Unknown parameter received
64	6	Parameter out of range
128	7	Required parameter missing
256	8	Parameter ignored
512	9	Out of calibration
1024	10	Autocal required

(default *value* = 2047—all enabled).

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END *control*

Enables or disables the HP-IB End Or Identify (EOI) function.

control: **OFF (0)**, ALWAYS (2).

ERR?

Returns the weighted sum of all set bits in the error register, clears the register, and shuts off the ERR annunciator.

Weighted Value	Bit Number	Error Conditions
1	0	Hardware error—use AUXERR?
2	1	Error in the CAL or ACAL process
4	2	Trigger too fast
8	3	Syntax error
16	4	Unknown command received
32	5	Unknown parameter received
64	6	Parameter out of range
128	7	Required parameter missing
256	8	Parameter ignored
512	9	Out of calibration
1024	10	Autocal required

(default *value* = 2047—all enabled).

F10 - F58

Select DC voltage, 2-wire ohms, or 4-wire ohms measurements and the measurement range.

Command	Selects Function	Selects Range
F10	DC Voltage	Autorange
F11	DC Voltage	30 mv
F12	DC Voltage	300 mV
F13	DC Voltage	3 V
F14	DC Voltage	30 V
F15	DC Voltage	300 V
F40	2-Wire Ohms	Autorange
F41	2-Wire Ohms	30 Ω
F42	2-Wire Ohms	300 Ω
F43	2-Wire Ohms	3 kΩ
F44	2-Wire Ohms	30 kΩ
F45	2-Wire Ohms	300 kΩ
F46	2-Wire Ohms	3 MΩ
F47	2-Wire Ohms	30 MΩ
F48	2-Wire Ohms	3 GΩ
F50	4-Wire Ohms	Autorange
F51	4-Wire Ohms	30 Ω
F52	4-Wire Ohms	300 Ω
F53	4-Wire Ohms	3 kΩ
F54	4-Wire Ohms	30 kΩ
F55	4-Wire Ohms	300 kΩ
F56	4-Wire Ohms	3 MΩ
F57	4-Wire Ohms	30 MΩ
F58	4-Wire Ohms	3 GΩ

FIXEDZ *control*

Enables or disables the fixed input impedance function for DC voltage measurements.

control: OFF (0), **ON (1)**.

FIXEDZ?

Returns a number indicating whether fixed input impedance is on or off; 1 = ON, 0 = OFF.

FREQ *max. input*

Selects frequency measurements and amplitude range.

max. input:
For AC or AC+DC voltage: **AUTO** or 0 - 300.
For AC or AC+DC current: **AUTO** or 0 - 1.

FSOURCE *source*

Configures the HP 3457 to accept either AC voltage, AC+DC voltage, AC current, or AC+DC current as the input signal for frequency or period measurements.

source: **ACV (2)**, ACDCV (3), ACI (7), ACDCI (8).

FUNC *function,max. input,% resolution*

Selects measurement type (AC voltage, DC current, etc.), range, and resolution.

function: **DCV (1)**, ACV (2), ACDCV (3), OHM (4), OHMF (5), DCI (6), ACI (7), ACDCI (8), FREQ (9), PER (10).

max. input:
For voltage measurements: **AUTO** or 0 - 300.
For AC current measurements: **AUTO** or 0 - 1.
For DC current measurements: **AUTO** or 0 - 1.5.
For ohms measurements: **AUTO** or 0 - 3E9.

% resolution: percentage of *max. input* (default set by the NPLC command).

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ID?

Returns the response "HP3457A".

INBUF *control*

Enables or disables the HP 3457's input buffer.

control: OFF (0), **ON (1)**.

ISCALE?

Returns the scale factor for a particular reading.

LFREQ *value*

Changes the A/D converter's line frequency reference.

value: 50 or 60 (Hz). Default = present value.

LFREQ?

Returns the value of the A/D converter's line frequency reference.

LINE?

Measures and returns the AC line power frequency.

LOCK *control*

Enables or disables the HP 3457's keyboard.

control: OFF (0), **ON (1)**.

MATH *operation a,operation b*

Enables or disables math operations.

operation a/ operation b: **OFF (0)**, CONT (1), CTHRM (3), DB (4), DBM (5), FILTER (6), FTHRM (8), NULL (9), PERC (10), PFAIL (11), RMS (12), SCALE (13), STAT (14).

MATH?

Returns two numbers indicating the enabled math functions. The functions and their numbers are:

OFF = 0, CTHRM = 3, DB = 4, DBM = 5, FILTER = 6, FTHRM = 8, NULL = 9, PERC = 10, PFAIL = 11, RMS = 12, SCALE =13, STAT = 14.

MCOUNT?

Returns the total number of stored readings.

MEM *mode*

Enables or disables reading memory and designates the storage mode.

mode: OFF (0), LIFO (1), **FIFO (2)**, CONT (3).

MFORMAT *format*

Clears reading memory and designates the storage format for new readings.

format	Description
ASCII (1)	ASCII—14 characters followed by <CR> <LF> (16 bytes per reading)
SINT (2)	Single Integer—16 bits 2's complement (2 bytes per reading)
DINT (3)	Double Integer—32 bits 2's complement (4 bytes per reading)
SREAL (4)	Single Real—(IEEE-754) 32 bits (4 bytes per reading)

MSIZE *reading memory,subprogram memory*

Clears reading and subprogram memory and allocates memory for reading, subprogram, and state storage.

reading memory/subprogram memory: the number of bytes of memory you want for each (remaining memory is allocated to state storage). Default reading memory = 1000, subprogram memory = 100.

MSIZE?

Returns reading and subprogram memory sizes.

NDIG *value*

Designates how many digits are shown in the HP 3457's display.

value: 3, 4, 5, 6.

NPLC *power line cycles*

Designates the integration time for the A/D converter.

power line cycles: 0 - .0005, .005, .1, 1, 10, 100.

NPLC?

Returns the present number of power line cycles (PLCs) of integration time used by the A/D converter.

NRDGS *count,event*

Designates the number of readings made per trigger and the event that initiates each reading.

count: 1 - 32767.

event: AUTO (1), EXT (2), SYN (5), TIMER (6).

NRDGS?

Returns the specified number of readings per trigger and the sample event.

OCOMP *control*

Enables or disables the offset compensated ohms function.

control: OFF (0), **ON (1)**.

OCOMP?

Returns a number indicating whether offset compensation is on or off; 1 = ON, 0 = OFF.

OFORMAT *format*

Designates the output format for measured readings.

format	Description
ASCII (1)	ASCII—14 characters followed by <CR><LF> (16 bytes per reading)
SINT (2)	Single Integer—16 bits 2's complement (2 bytes per reading)
DINT (3)	Double Integer—32 bits 2's complement (4 bytes per reading)
SREAL (4)	Single Real—(IEEE-754) 32 bits, (4 bytes per reading)

OHM *max. input,% resolution*

Selects 2-wire ohms measurements, range, and resolution.

max. input: **AUTO** or 0 - 3E9.

% resolution: percentage of *max. input* (default set by the NPLC command).

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OHMF *max. input,% resolution*

Selects 4-wire ohms measurements, range, and resolution.

max. input: **AUTO** or 0 - 3E9.

% resolution: percentage of *max. input* (default set by the NPLC command).

OPEN *actuator channel,control*

Opens actuator channel 8 or 9 on the HP 44491 plug-in card with or without delay.

actuator channel: **8** or 9.

control (controls delay): OFF (0), **ON (1)**.

OPT?

Returns a number representing the type of device in the HP 3457's rear slot. The possible numbers are:

0 = rear terminals or nothing in rear slot
44491 = HP 44491 General Purpose Card
44492 = HP 44492 Multiplexer Card

PAUSE

Suspends subprogram execution. Subprogram execution is resumed when the HP-IB Group Execute Trigger (GET) is received.

PER *max. input*

Selects period measurements and the amplitude range.

max. input:
For AC and AC+DC voltage: **AUTO** or 0 - 300.
For AC or AC+DC current: **AUTO** or 0 - 1.

PRESET

Configures the HP 3457 to a predefined state for remote operation.

R *max. input,% resolution*

Abbreviation of the RANGE command. Refer to RANGE for details.

RANGE *max. input,% resolution*

Selects a measurement range or the autorange mode.

max. input:
For AC or DC voltage measurements: **AUTO** or 0 - 300.
For AC current measurements: **AUTO** or 0 - 1.
For DC current measurements: **AUTO** or 0 - 1.5.
For ohms measurements: **AUTO** or 0 - 3E9.

% resolution: percentage of *max. input* (default set by the NPLC command).

RANGE?

Returns a number representing the present measurement range.

RESET

Sets the HP 3457 to the power-on state.

REV?

Service related command. Refer to the HP 3457 service manual for details.

RMATH *register*

Reads and returns the contents of a math register.

register: **DEGREE** (1), LOWER (2), MAX (3), MEAN (4), MIN (5), NSAMP (6), OFFSET (7), PERC (8), REF (9), RES (10), SCALE (11), SDEV (12), UPPER (13), HIRES (14).

RMEM *first,count,record*

Returns the value of a particular reading or group of readings from reading memory but does not clear the readings.

first: designates the beginning reading (default = 1).

count: designates the number of readings to be recalled, starting with first (default = 1).

record: designates the record from which to recall readings (default = 1).

RQS *value*

Designates which status register conditions will set the SRQ line on the HP-IB bus.

value	Bit Number	Enables Condition
1	0	Program Memory Execution Completed
2	1	Hi or Lo Limit Exceeded
4	2	Front Panel SRQ
8	3	Power-On SRQ
16	4	Ready
32	5	Error (Consult Error Register)
64	6	Service Requested
128	7	Not Used

Default *value* = 0 (no conditions enabled).

RSTATE *name*

Recalls a stored state from memory and configures the HP 3457 to that state.

name: **0**, 1 - 30.

Command Summary

SADV *event*

Designates the event that causes an advance to the next channel in a plug-in card's scan list.

event: HOLD (0), **SGL (1)**, AUTO (2).

SCRATCH

Clears all subprograms from subprogram memory.

SECURE

Service related command. Refer to the HP 3457 service manual for details.

SLIST *channel 1,channel 2, . . . channel n*

Designates a series of plug-in card channels to scan and advances to the first channel in the list.

channel: 0 - 19 (HP 44491), 0 - 9 (HP 44492). Default re-uses the previous list and selects the first channel in that list.

SLIST?

Returns the total number of channels in a scan list when executed from remote or the actual channels in the list when executed from the keyboard.

SMATH *register,number*

Places a number in a math register.

register: **DEGREE (1)**, LOWER (2), MAX (3), MEAN (4), MIN (5), NSAMP (6), OFFSET (7), PERC (8), REF (9), RES (10), SCALE (11), SDEV (12), UPPER (13),HIRES (14).

number: value to place in the register (default = last reading).

SRQ

Sets bit 6 in the HP 3457's status register and sets the HP-IB SRQ line true.

SSTATE *name*

Stores the present state into a numbered memory location.

name: **0**, 1 - 30.

STB?

Returns the weighted sum of all set bits in the status register.

Decimal Weight	Bit Number	Status Register Condition
1	0	Program Memory Execution Completed
2	1	Hi or Lo Limit Exceeded
4	2	Front Panel SRQ
8	3	Power On SRQ
16	4	Ready
32	5	Error (Consult Error Register)
64	6	Service Requested
128	7	Not Used

SUB *name*

Stores a subprogram into a numbered subprogram memory location.

name: **0** - 19.

SUBEND

Signals the end of a subprogram.

T *event*

Abbreviation of the TRIG command. Refer to TRIG for details.

TARM *event,number arms*

Designates the event that enables (arms) the trigger event. Can also be used to perform multiple measurement cycles.

event: **AUTO (1)**, EXT (2), SGL (3), HOLD (4), SYN (5).

number arms: **0**, 1 - 32767.

TARM?

Returns a number representing the trigger arm event. The events and their numbers are:

AUTO = 1	HOLD = 4
EXT = 2	SYN = 5

TBUFF *control*

Disables the TRIGGER TOO FAST error and stores the first external trigger that occurs during a measurement.

control = **OFF(0)**, ON(1)

TERM *source*

Selects the HP 3457's input source for making measurements.

source: OPEN (0), **FRONT (1)**, REAR (2), SCANNER (2).

TERM?

Returns a number representing the selected input terminals. The possible numbers are:

0 = all input terminals disconnected
1 = front terminals
2 = rear terminals or plug-in card

TEST

Performs a series of internal self-tests.

TIMER *time*

Defines the time interval for the TIMER sample event in the NRDGS command.

time: 600E-6 - 2100 (seconds). Default = 1 (second).

TIMER?

Returns the present time interval, in seconds, for the NRDGS timer event.

TONE *frequency,duration*

Generates a tone from the HP 3457's beeper.

frequency: 0 - 3000 (Hz). Default = 2048 (Hz).

duration: 0 - 32767 (ms). Default = 512 (ms).

TRIG *event*

Designates the event that enables a measurement.

event: AUTO (1), EXT (2), **SGL** (3), HOLD (4), SYN (5).

TRIG?

Returns a number representing the trigger event. The events and their numbers are:

AUTO = 1	HOLD = 4
EXT = 2	SYN = 5

?

When the HP 3457 is properly configured the ? command generates a single trigger.

The following commands configure the HP 3457 to accept ?:

```
TARM AUTO
NRDGS 1,AUTO
TRIG HOLD or SGL
```

ABORTIO 7 (IFC)

Clears the HP 3457's interface circuitry.

CLEAR (DCL or SDC)

Clears the HP 3457 preparing it to receive a command.

LOCAL (GTL)

Removes the HP 3457 from the remote state and enables its keyboard (provided the keyboard has not been disabled with the LOCK command from the HP 3457's command set).

LOCAL LOCKOUT (LLO)

Disables the HP 3457's LOCAL key.

REMOTE

Sets the HP-IB REN line true.

SPOLL (Serial Poll)

Returns a number representing the set bits in the status register (status byte). The returned number is the weighted sum of all set bits.
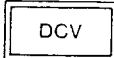
Bit Number	Decimal Weight	Description
0	1	Program memory execution completed
1	2	Hi or lo limit exceeded
2	4	Front panel SRQ key pressed
3	8	Power-on SRQ occurred
4	16	Ready
5	32	Error (consult error register)
6	64	Service requested
7	128	Not used
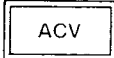
TRIGGER (GET)
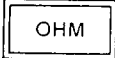
If triggering is armed (see TARM command), the TRIGGER command (Group Execute Trigger) triggers the HP 3457 once, then holds triggering. If subprogram memory execution is suspended by the PAUSE command (HP 3457 command set), the TRIGGER command resumes subprogram execution.
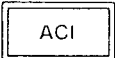
27
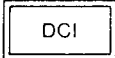
Measurement Function Keys
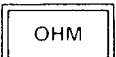
| DCV | Selects DC voltage measurements. |

| ACV | Selects AC voltage measurements. |

| OHM | Selects 2-wire ohms measurements. |

| DCI | Selects DC current measurements. |

| ACI | Selects AC current measurements. |

| FREQ | Selects frequency measurements. |

ACDCV

[ ] [ACV]

Selects AC + DC voltage measurements.

OHMF

[ ] [OHM]

Selects 4-wire ohms measurements.

ACDCI

[ ] [ACI]

Selects AC + DC current measurements.

PER

[ ] [FREQ]

Selects period measurements.

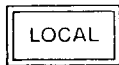|	
⬆	Scrolls to higher range (measurement mode). Scrolls through command and parameter menus (command entry mode).
⬇	Scrolls to lower range (measurement mode). Scrolls through command and parameter menus (command entry mode).
⬅	Scrolls display characters to the right (if more than 12 characters).
➡	Scrolls display characters to the left (if more than 12 characters). Enters a space in command entry mode.
LOCAL	Removes HP 3457 from remote state.
▓	Accesses shifted functions.

AUTO

▓ ⬆

Selects autorange.

HOLD

▓ ⬇

Shuts off autorange, holds present range.

TEST

▓ ⬅

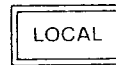Runs a series of internal self-tests.
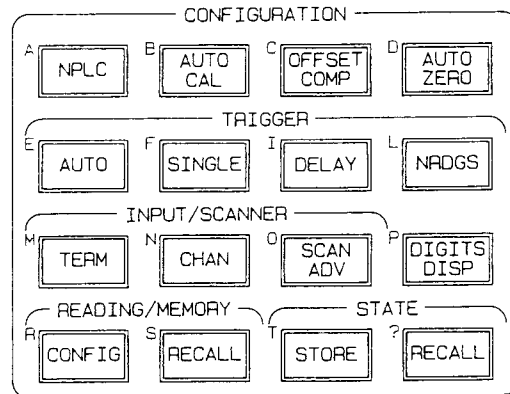
RESET

▓ ➡

Returns the HP 3457 to the power-on state.

ADRS

▓ LOCAL

Displays the present HP-IB device address.

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Configuration & Directory Keys

```
┌─────────── CONFIGURATION ───────────┐
│ A┌──────┐ B┌──────┐ C┌──────┐ D┌──────┐ │
│  │ NPLC │  │ AUTO │  │OFFSET│  │ AUTO │ │
│  └──────┘  │ CAL  │  │ COMP │  │ ZERO │ │
│            └──────┘  └──────┘  └──────┘ │
│  ┌──────────── TRIGGER ────────────┐   │
│ E┌──────┐ F┌──────┐ I┌──────┐ L┌──────┐ │
│  │ AUTO │  │SINGLE│  │DELAY │  │NRDGS │ │
│  └──────┘  └──────┘  └──────┘  └──────┘ │
│  ┌────────── INPUT/SCANNER ─────────┐  │
│ M┌──────┐ N┌──────┐ O┌──────┐ P┌──────┐ │
│  │ TERM │  │ CHAN │  │ SCAN │  │DIGITS│ │
│  └──────┘  └──────┘  │ ADV  │  │ DISP │ │
│            └──────┘  └──────┘          │
│ ┌── READING/MEMORY ──┐┌──── STATE ────┐ │
│ R┌──────┐ S┌──────┐ T┌──────┐ ?┌──────┐ │
│  │CONFIG│  │RECALL│  │STORE │  │RECALL│ │
│  └──────┘  └──────┘  └──────┘  └──────┘ │
└─────────────────────────────────────────┘
```

Directory Contents:

|		
ACAL	FUNC	RESET
ACBAND	ID?	REV?
ADDRESS	INBUF	RMATH
ARANGE	ISCALE?	RMEM
AUXERR?	LFREQ	RQS
AZERO	LINE?	RSTATE
BEEP	LOCK	SADV
CAL	MATH	SECURE
CALNUM?	MCOUNT?	SLIST
CHAN	MEM	SMATH
CLOSE	MFORMAT	SSTATE
CRESET	MSIZE	STB?
CSB	NDIG	T
DELAY	NPLC	TARM
DIAGNOSTIC	NRDGS	TBUFF
DISP	OCOMP	TERM
EMASK	OFORMAT	TEST
END	OPEN	TIMER
ERR?	OPT?	TONE
FIXEDZ	PRESET	TRIG
FSOURCE	RANGE	

Query Commands in the Directory:

AUXERR?
CALNUM?
ERR?
ID?
ISCALE?
LINE?
MCOUNT?
OPT?
REV?
STB?

Queries Made by Appending ?:

AZERO?
CHAN?
DELAY?
FIXEDZ?
LFREQ?
MATH?
MSIZE?
NPLC?
NRDGS?
OCOMP?
RANGE?
SLIST?
TARM?
TERM?
TIMER?
TRIG?

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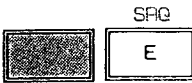# Numeric & Math Keys
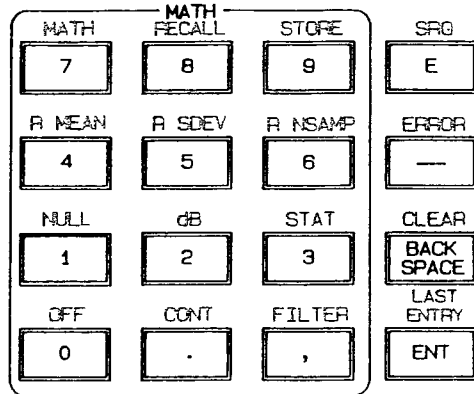
| E | For exponential notation. |

| — | For entering negative values. |

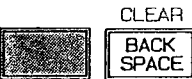| BACK SPACE | Deletes a display character (command entry mode). |

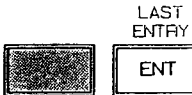| ENT | Executes a command (command entry mode) |

Generates front panel SRQ.

Reads individual error descriptions.

Clears the display (command entry mode).

Recalls last command.

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