

INTRODUCTION

The 8520A Quick Reference Guide is designed to provide the operator with an easy-to-use overview of the 8520A Digital Multimeter's operational features. The Guide can be used in such a way that both experienced and non-experienced operators alike can learn and use the 8520A's full capabilities.

This quick reference is divided into the following sections:

- | | |
|--|---------|
| 1) Front Panel Operation | Page 2 |
| 2) Math Programs and Examples | Page 6 |
| 3) Burst operation and correlation chart | Page 19 |
| 4) IEEE-488 System Programming | Page 22 |

FRONT PANEL CONTROLS		
Group	Name	Function
Power	On/Off	Controls application of line power.
Function	VDC	Selects volts DC mode.
	VAC	Selects volts AC mode.
	VDC + VAC	Selects volts AC + DC for combined measurements by depressing both keys simultaneously.
	Ω 2 Wire Ω 4 Wire nS	Selects 2 wire ohm measurement. Selects 4 wire ohm measurement. Selects conductance measurement on fixed nS range.
NOTE:		Selecting any of the above functions causes the 8520A to default to the auto range mode, a reading rate of 2 r/s and the 500 msec filter settling time (with the exception of nanosiemens which has a fixed range).
Range	Auto Δ ∇	Toggle Action— LED ON: Autorange active on all functions (except nS) when LED on. Fixed range when LED off. LED OFF: Manual ranging mode steps up/down next higher/lower range takes 8520A out of Auto. Has no effect at top/bottom of range.
Reading Rate	Δ ∇	Increases/decreases one step in reading rate per depression, automatically selecting optimum filter settling time. No effect at top/bottom of range.
Filter	Δ ∇	Increases/decreases filter settling time one step per depression. No effect at top/bottom range.

FRONT PANEL CONTROLS

Group	Name	Function
Trigger	Ext/Auto	Toggle Action— LED ON: External trigger mode on (trigger from IEEE bus, manual, or if armed the rear BNC). LED OFF: (Internal) Automatic trigger mode.
	ARM BNC	Toggle Action— LED ON: BNC rear input trigger armed, will initiate trigger if appropriate level transition or switch closure occurs on BNC. LED OFF: BNC rear input disarmed.
	Manual	Shift LED OFF, ext/auto LED ON DMM will take readings per burst size setting. In red shift LED ON, triggers one reading, but does not store in burst location.
Control	Local	Puts the 8520A local (unless in local lockout mode).
	Remote	LED is ON if instrument on IEEE bus under remote control. LED if OFF if in local. (Note: Cannot re-enter remote from front panel.)
Miscellaneous Controls		
	Shift	Toggle Action— LED ON: Dual function keys on second level operation. LED OFF: DMM mode.
	Status/Menu	With shift LED OFF, displays the current Status (function, range, reading rate and filter settling time) of the 8520A.
	Status/Menu	Shift LED ON, displays the Menu of available programs.

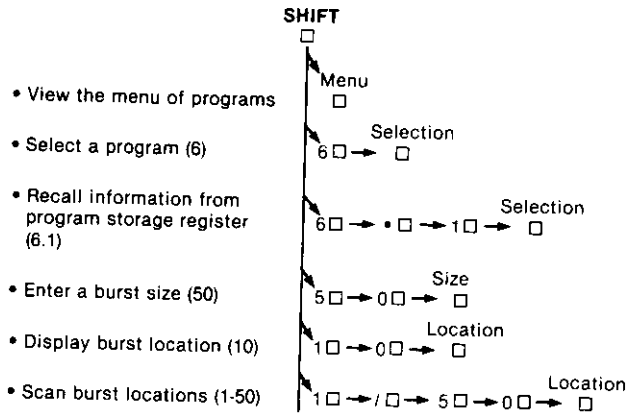
FRONT PANEL CONTROLS

Miscellaneous Controls	Function
Reset	Single Push: Clears <i>all</i> program data accumulation registers, retains all programmed constants, exits to DMM mode. Double Push: When pressed in quick succession clears program data registers, retains programmed constants, selects 100 Vdc range, 2 reading/sec, 500 msec filter settling time, internal trigger, exits to DMM mode.
Programs IN USE/OFF	Toggle Action— LED ON: Turns on selected math programs. LED OFF: Turns off selected math programs.
CE (Clear Entry)	Shift LED off, no effect. Shift LED on, clears last entry/numeric.
Input	Key depressed for connection via rear connector block. Key out for normal front panel connections.
Guard	Key depressed for external guard. Key out for guard tied to source and input low. Note: In normal two wire operation this switch is always out.

FRONT PANEL CONTROLS

Group	Name	Function
SPECIAL CONTROLS		
Burst	Size	Shift LED OFF, displays current burst size setting selected, default = 1. Shift LED ON, sets burst size to number entered on numerics, n where $-999 \leq n \leq 999$. Exits to DMM mode with shift LED off.
	Location	Shift LED OFF, key has no effect. Shift LED ON, when depressed will cause 8520A to display data stored in selected location. Each key depression will step to the next burst location. Can be used in conjunction with numerics to select a particular location; Shift, n, Location or used to scan through a particular segment of memory. Shift, n, /, m, Location
Program	Selection	Shift LED OFF, when depressed will cause 8520A to display current program(s) selected. Shift LED ON, when used in conjunction with numerics allows the selection of up to 3 programs at a time for use. Shift.a.b.c.selection Note: Programs 0 & 1 may not be stacked, in addition only one of programs 11, 12, 13, 14 may be selected while stacking programs.
Program	Data	Shift LED OFF, key has no effect. Shift LED ON, key is used to enter data as a program constant. Prompts help user determine the destination of the data. After entry by pressing data the 8520A either advances to the next prompt or exits to DMM mode.

The real key to the power of the 8520A, the shift key, accesses math programs, burst operation, numeric key functions and a menu of the instrument's available programs.

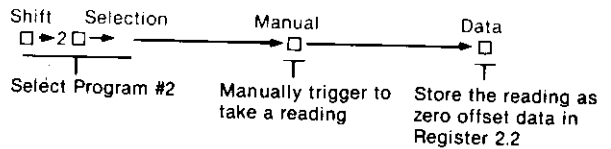


PROGRAM EXAMPLES

Program #2 (Zero)

In the ohms function the Zero program can be used to eliminate the effects of test lead resistance which will hamper low ohm measurements.

1. Enter the desired ohms range or auto range and short the test leads.
2. Use the following push button sequence:

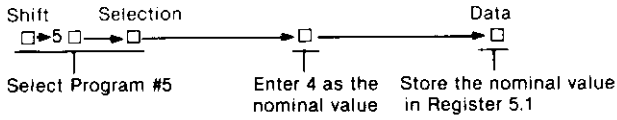


3. Toggle on the programs in use button. The stored reading is now subtracted from subsequent measurements.

Program #5 (ΔPCT)

The delta percent program is used to measure the deviation (in %) of the input with respect to a nominal value entered by the operator from the keyboard, an external source or from a burst memory location.

1. Use the following push button sequence to select the program and enter 4 (volts) as the nominal value:

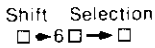


2. Toggle on the programs in use button. Subsequent measurement will be converted to and displayed in percent deviation (ΔPCT) from the stored nominal value.

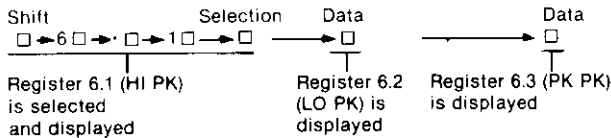
Program #6 (Peak)

The peak program when in use continually stores and updates the high and low peak of the applied input. These values are stored in registers 6.1 and 6.2.

1. Use the following push button sequence to select the peak storage program:



2. Toggle on the "Programs In Use" pushbutton to begin storing the high and low peaks.
3. To recall the high and low peaks monitored during program operation, use this sequence:



4. To clear the program storage registers and begin accumulating new data, push the "Reset" button once.

Note: In the following program descriptions

- S = is the input signal for the program in use.
- X = the value passed to the next stacked program.
- = a programmable constant can be entered in this register if desired.

PROGRAM DESCRIPTIONS			
Program Or Reg. Number	Name Displayed	Description/ Equations	Power On Value
r0.1	DOPT	Display Option Register— Allows the operator to display any accumulation register of the program currently in use. NOTE: After selecting a program, <u>select</u> r0.1, and enter the program register number as <u>Data</u> .	
P1	Test	Program to run 4 diagnostic tests on the 8520A.	
	Test 1	Analog Tests— 16 tests with set limits, program executes on each test on a Pass (PS) Fail (FL) basis. NOTE: For local operation, if any test fails program execution halts, but can be continued by depressing the DATA key.	
	Test 2	Digital Tests— 3 digital tests which execute on a Pass/Fail basis. 1) ROM checksum test Fail display = Err 14 ROM 2) RAM read/write test Fail display = Err 15 RAM 3) Guard crossing circuit test Fail display = Err 17 HDWR If all tests pass, PASS DGTL is displayed.	

Program Or Reg. Number	Name Displayed	Description/ Equations	Power On Value
	Test 3	Keyswitch & LED Tests— Each key lights two corresponding LED segments. (SEE CHART IN INSTRUCTION MANUAL) Reset key initiates LED test which exercises all LED's in sequence. Shift key allows exit from Test 3 at any time.	
	Test 4	Trouble Shooting Test— Used to trouble-shoot digital circuitry, sends a 40 (hex) across the guard crossing. Exit test by pushing any key.	
P2	ZERO	Zero— Used to apply either a VDC or OHM offset to measurement.	
r2.0		Display Register— $X = r2.0 = S/r2.n$ where $n = 1$ or $n = 2$	
*r2.1	DZRO	DC Zero Register— Programmable constant for off-setting DC level.	0
*r2.2	OZRO	OHM Zero Register Programmable constant for zeroing lead resistance	0
P3	XREF	External Reference: Makes a measurement and compares reading to external reference.	

Program Or Reg. Number	Name Displayed	Description/ Equations	Power On Value
r3.0	XREF	External Reference Register $X = r3.0 = S/r3.1$	0
r3.1	VSRF	External Reference Voltage— $r3.1 = r3.2 - r3.3$ If $r3.1 < .5V$, "urVXRF" is displayed and the short status is set to 09 indicating an underrange condition exists.	1
r3.2	XRFH	External Reference High— $r3.2$ is voltage measured at the EXT REF HI terminal.	1
r3.3	XRFL	External Reference Low— $r3.3$ is voltage measured at the EXT REF LO terminal. NOTE: If a voltage $> 16.5V$ is present on either EXT REF LO or HI "or VXRF" is display on the front panel and the short status is set to 08, indicating an over range on the External Reference Input exists.	0
P4	OSR	Offset, Scale and Ratio Provides a method for scaling the input signal to user's expectations.	
r4.0		OSR Display Register— $X = r4.0 = \frac{(S-r4.1) \times r4.2}{r4.3}$	0
*r4.1	OFST	Offset— Programmable constant value to be subtracted.	0
*r4.2	SCAL	Scale— Programmable Multiplication Constant.	1
*r4.3	RATO	Ratio— Programmable Division Constant.	1

Program Or Reg. Number	Name Displayed	Description/ Equations	Power On Value
P5	Δ PCT	Percent Deviation— Computes percent deviation from programmed nominal value.	
r5.0	Δ PCT	Percent Deviation Output Register $X = r5.0 = (S - r5.1) \times 100/r5.1$	0
*r5.1	NOM	Nominal Value— Programmable constant entered by user.	1
P6	PEAK	Peaks— Program to determine Hi Peak, Low Peak, and Peak to Peak value of an input signal.	
r6.0		Reading— $X = r6.0 = S$	0
r6.1	HIPK	High Peak (Upper Peak)— When displayed will represent the highest excursion of the input signal. Initially set at very low value. $r6.1 = \max(S)$	-10^{18}
r6.2	LOPK	Lower Peak— When displayed represents lowest excursion of input signal $r6.2 = \min(S)$	$+10^{18}$
r6.3	PKPK	Peak to Peak— Display peak to peak excursion of input signal $r6.3 = r6.1 - r6.2$	0
P7	LIM	Limits— Program which tests reading against operator programmable limits, displays HIGH, PASS, or LOW	
r7.0		Limits Output Register— $X = S$ $r7.0 = \text{HIGH, PASS or LOW on display.}$ $r7.0 = +2, +1, -1$ over IEEE bus.	PASS

Program Or Reg. Number	Name Displayed	Description/ Equations	Power On Value
*r7.1	ULMT	Upper Limit— Programmable constant selected by user.	0
*r7.2	LLMT	Lower Limit— Programmable constant selected by user.	0
r7.3	NHI	Number of HIGH Readings—	0
r7.4	NLO	Number of LOW Readings—	0
r7.5	NPAS	Number of Pass Readings—	0
r7.6	NTTL	Number of Total Readings—	0
P8	STAT	Statistics— Program computes statistical data including mean, variance and standard deviation of all readings taken since the registers were reset.	
r8.0		Statistics Output Register— $X = r8.0 = S$	0
r8.1	NUM	Number of Readings— $r8.1 = n; n < 2^{23}$.	0
r8.2	AVE	Average of Readings— $r8.2 = \text{sum}(S)/n$	0
r8.3	STDV	Standard Deviation of Readings— $r8.3 = r8.4$	0
r8.4	VAR	Variance of Readings— $r8.4 = \text{sum}(S - b)^2 - \text{sum}(S/b)^2/n/n1$	0
r8.5	SUM	Sum of Readings— $r8.5 = \text{sum}(S)$	0
r8.6	SMSQ	Sum of Squares of Readings— $r8.6 = \text{sum}(S - b)^2$	0
r8.7	BIAS	Bias = first reading For improved computation of r8.3 and r8.4 $r8.7 = b$ (= first reading)	0

Program Name #	Display Prompt	Reg. #	"Data" To Be Entered
1	TEST		Test Number Desired (i.e. 1, 2, 3, or 4)
2	ZERO	(2.1)	Offset Value for DC Zero
(If in OHMS)		(2.2)	Offset Value for Ohms Zero
4	OSR	(4.1)	Offset Constant
		(4.2)	Scaling Constant
		(4.3)	Ratio Constant
5	ΔPCT	(5.1)	Nominal Value
7	LIM	(7.1)	Upper Limit Value
		(7.2)	Lower Limit Value
10	dB	(10.1)	Voltage Reference
		(10.2)	Input Resistance
		(10.3)	Load Resistance
		(10.4)	Power Reference
11	RTD	(11.3)	Resistance at 0°
		(11.4)	Parameter Alpha
		(11.5)	Parameter Delta
		(11.6)	Parameter Beta
	NOTE:		These are default values for the most common RTD probes including the Fluke Y2025. The operator may alter these values if they do not accurately describe the probe he wishes to use.
14	THMS	(14.3)	Parameter (A0)
		(14.4)	Parameter (A1)
		(14.5)	Parameter (A2)
		(14.6)	Parameter (A3)
	NOTE:		These are default values which match nominal characteristics of the YSI 44007, FENWALL UUA35J1, OMEGA UUA35J3 or equivalent. The operator may alter these values to match the thermister he wishes to use.

RESPONSES		
Error Codes		
Error	Name	Explanation
00		No errors
01	HV	High voltage present on an ohms measurement
02		SYNTAX ERROR
03	NOVR	Overflow of registers or numeric overflow
03	RTD	The RTD math program failed to converge
04	KEY	Invalid keystroke
05	FLTR	Async. reading rate, filter cannot be changed
06	ZERO	Can't use P2 (zero) with VAC or VA + D
07	IEEE	IEEE input buffer overflow
08	or VXRF	External reference overrange
09	ur VXRF	External reference underrange
10	+ HHH.HH VDC	Normal input overrange
11	HDWR	8048 didn't properly echo a command
12	rrtoo FAST	Reading rate too fast for current math & filter
14	ROM	ROM checksum error
15	RAM	RAM test failed
16	LINE	Could not determine line frequency of power up
17	HDWR	Could not synchronize with 8048
18	OPEn INPT	Input not open during analog test program (PI)
22	HDWR	Error while measuring volts for ohms change
23	HDWR	Time out error, 8048 didn't respond as expected
24	HDWR	Resynchronization error
25	HDWR	Ohms reference error
30	UART	Guard crossing uart timeout
31	UART	Parity
32	UART	Overrun
33	UART	Overrun + parity
34	UART	Framing
35	UART	Framing + parity
36	UART	Framing + overrun
37	UART	Framing + overrun + parity
A1	GARD	8048 interrupt error
A3	GARD	8048 analog interrupt error
A5	GARD	8048 uart error
A7	GARD	8048 command error

BURST OPERATION

Concepts

NOTE: For simplicity this will be written to describe operation with option --010 installed (400 memory locations).

1. The last 400 readings are always being stored even if no burst size has been set (Burst size = 1).
2. When the burst size = 1, memory locations are filled with data in logical order 1, -1, -2, -3, -4, ... -399, with the most recent reading stored in location #1 and the oldest reading in location -399.
3. The memory is circular in structure (i.e., location #1 is adjacent to #400), see figure 1, which allows new data to be written over (replace) previously stored data. The largest valid burst size is 999 which adds two interesting sub-concepts:

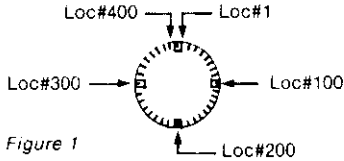
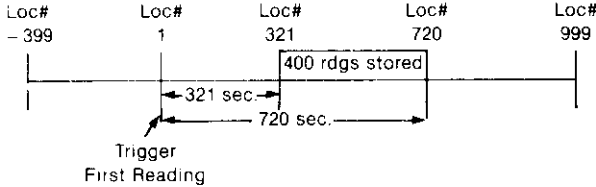


Figure 1

a) The time frame associated with a burst of readings can be delayed by a time factor equal to the burst size x the reading rate. See figure 2 below:



Burst size = 720 $720 \times 1 = 720 \text{ sec.} = 12 \text{ min.}$
 Reading rate = 1 rdg/sec.

Figure 2

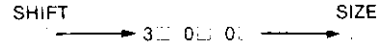
b) Due to the wrap around caused when the burst size exceeds 400, each memory cell has more than one address. That is locations 1, 401, and 801 address the same memory cell.

BURST OPERATION

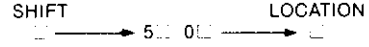
Push Button Examples

NOTE: By selecting external trigger a starting point is established. When ready to take data a push of the manual trigger button initiates the burst. When the burst size is reached, triggering will stop.

1. Set a burst size of 300.

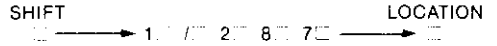


2. Recall location 50 and display the data stored in this location.



To increment through the locations in a forward direction (i.e., 51, 52, 53, etc.) push the location button repeatedly; to reverse the direction, push the change sign (+/-) button. Now pushing the location button will cause the locations to be displayed in descending order (53, 52, 51, etc.).

3. Scan locations 1 through 287.



The scan rate is determined by the selected reading rate. To stop the scan push the location button. The memory can be scanned in reverse order by entering the larger number first.

NOTE: Readings stored in burst memory can be subjected to and/or modified by math programs by selecting up to three programs simultaneously, activating the "programs in use" button, and recalling the readings as described above. The unmodified readings are still available in their original locations.

CORRELATION CHART

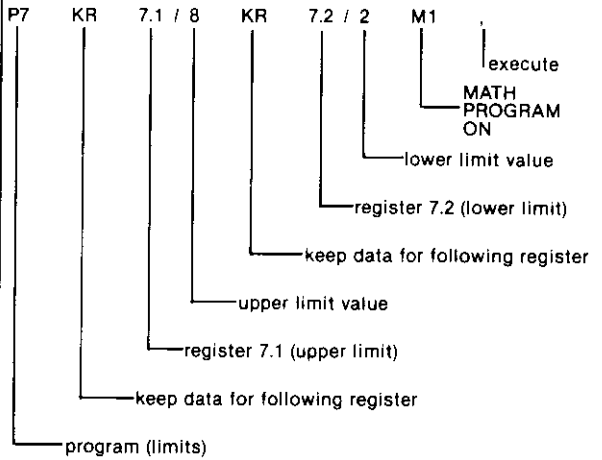
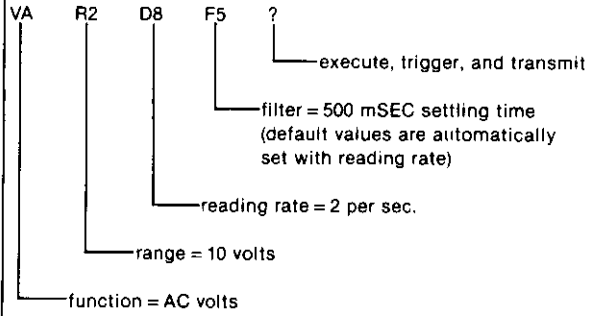
Burst/Trigger/Readings

	Burst Size	Ext/Auto	Arm BNC	BNC Trigger	Manual	Internal	Last Reading Location	Previous Readings
+ 1	Auto	Off			X	1	-1,-2,-3,...	1 reading per trigger does not stop
+ 1	Ext	On	X			1	-1,-2,-3,...	1 reading per BNC trigger does not disarm
+ N	Auto	Off			X	N	N-1,N-2,...	1 reading per trigger does not stop
+ N	Ext	Off	X			N	N-1,N-2,...	Starts after manual trigger takes n readings and stops
+ N	Ext	On	X			N	N-1,N-2,...	Starts after BNC trigger takes N readings, disarms & stops
-N	Auto	Off			X	N *	N -1, N -2,...	1 reading per trigger does not terminate
-N	Ext	Off	X			N *	N -1, N -2,...	1 reading per manual trigger does not terminate
-N	Ext	On	X			N *	N -1, N -2,...	1 reading per BNC trigger disarms after N triggers

*|N|—Denotes absolute value of N

PROGRAMMING FORMAT

Typical Command Strings



NOTE: The following state is assumed at power on or following an IEEE* (reset) command; V R3 D8 F5 T0 M0 PO B1 S0000 N1 N2 N3 N4 N5 N6 N7

IEEE COMMAND CHARACTERS	
Code	Function Commands
V	DC Volts.
VA	AC Volts.
VC	AC + DC Volts.
Z2	2 Terminal Ohms.
Z3	Nanosiemens.
Z4	4 Terminal Ohms.
RANGE COMMANDS	
R0	100 mVDC; 10 Ω ; AUTO VAC, VA + D.
R1	1 volt; 100 Ω .
R2	10 volts; 1000 Ω .
R3	100 volts; 10K Ω .
R4	650 VAC/VA + D; 1000 VDC; 100K Ω , 100nS.
R5	Auto volts; 1M Ω .
R6	Auto volts; 10M Ω .
R7	Autorange.
R8	Exit autorange. Remains in present range.

READING RATE COMMANDS					
CODE		LINE FREQUENCIES			DEFAULT
		400 Hz	60Hz	50Hz	FILTER CODE
		READINGS PER SECOND			
*LOW OHMS & DC	D0 (ASYNC)	—	200	—	F0
	D1	228	240	200	F0
	D2	114	120	100	F0
	D3	57	60	50	F1
	D4	38	40	40	F1
	D5	19	20	20	F2
	D6	9.5	10	10	F3
ALL FUNCTIONS & RANGES	D7	4.8	5	5	F4
	D8	1.9	2	2	F5
	D9	1.0	1	1	F6
			READINGS PER MIN.		
	D10	30	30	30	F6
	D11	12	12	12	F6
	D12	6	6	6	F6
	D13	2	2	2	F6
	D14	1	1	1	F6
		READINGS PER HOUR			
	D15	30	30	30	F6
	D16	12	12	12	F6
	D17	6	6	6	F6
	D18	2	2	2	F6
	D19	1	1	1	F6

*Low Ohms = 10 Ω – 10k Ω
 Hi Ohms = 100k Ω – 10M Ω

DATA BUS FORMATS

Format	Use																																	
ASCII Floating Point	Readings, results of math on reading, and registers. <table border="1"> <thead> <tr> <th>Range</th> <th>Format</th> <th>Maximum Value</th> </tr> </thead> <tbody> <tr> <td>100mV</td> <td>+199.999</td> <td>E - 3</td> </tr> <tr> <td>1V</td> <td>+1.99999</td> <td>E + 00</td> </tr> <tr> <td>10V or 10Ω</td> <td>+19.9999</td> <td>E + 00</td> </tr> <tr> <td>100V or 100Ω</td> <td>+199.999</td> <td>E + 00</td> </tr> <tr> <td>1000V or 1000Ω</td> <td>+1999.99</td> <td>E + 00</td> </tr> <tr> <td>10kΩ</td> <td>+19.9999</td> <td>E + 03</td> </tr> <tr> <td>100kΩ</td> <td>+199.999</td> <td>E + 03</td> </tr> <tr> <td>1MΩ</td> <td>+1.99999</td> <td>E + 6</td> </tr> <tr> <td>10MΩ</td> <td>+019.999</td> <td>E + 6</td> </tr> <tr> <td>100nS</td> <td>+0199.99</td> <td>E - 9</td> </tr> </tbody> </table>	Range	Format	Maximum Value	100mV	+199.999	E - 3	1V	+1.99999	E + 00	10V or 10Ω	+19.9999	E + 00	100V or 100Ω	+199.999	E + 00	1000V or 1000Ω	+1999.99	E + 00	10kΩ	+19.9999	E + 03	100kΩ	+199.999	E + 03	1MΩ	+1.99999	E + 6	10MΩ	+019.999	E + 6	100nS	+0199.99	E - 9
	Range	Format	Maximum Value																															
	100mV	+199.999	E - 3																															
	1V	+1.99999	E + 00																															
	10V or 10Ω	+19.9999	E + 00																															
	100V or 100Ω	+199.999	E + 00																															
	1000V or 1000Ω	+1999.99	E + 00																															
	10kΩ	+19.9999	E + 03																															
	100kΩ	+199.999	E + 03																															
	1MΩ	+1.99999	E + 6																															
	10MΩ	+019.999	E + 6																															
	100nS	+0199.99	E - 9																															
Binary Floating Point	Note: Sent over bus with <CR> and an optional <LF> (N3/I3)																																	
	Readings, results of math on readings, and registers. <table border="1"> <thead> <tr> <th>Byte 1</th> <th>Byte 2</th> <th>Byte 3</th> <th>Byte 4</th> </tr> </thead> <tbody> <tr> <td>EEEEEEEE</td> <td>S.MMMMMMM</td> <td>MMMMMMMM</td> <td>MMMMMMMM</td> </tr> </tbody> </table> <p style="text-align: center;">↑ implied binary point</p> <p>E = 2's complement exponent M = signed magnitude mantissa S = sign of mantissa (1 = negative)</p>	Byte 1	Byte 2	Byte 3	Byte 4	EEEEEEEE	S.MMMMMMM	MMMMMMMM	MMMMMMMM																									
Byte 1	Byte 2	Byte 3	Byte 4																															
EEEEEEEE	S.MMMMMMM	MMMMMMMM	MMMMMMMM																															
High Speed Mode	High speed readings in 2 byte binary. <table border="1"> <thead> <tr> <th>Byte 2</th> <th>Byte 1</th> </tr> </thead> <tbody> <tr> <td>SFFFF.FFF</td> <td>FFFFFFFE</td> </tr> </tbody> </table> <p style="text-align: center;">↑ implied binary point</p> <p>S = 2's complement sign F = 2's complement number E = 1 if an error condition exists E = 0 if no error exists</p>	Byte 2	Byte 1	SFFFF.FFF	FFFFFFFE																													
	Byte 2	Byte 1																																
SFFFF.FFF	FFFFFFFE																																	
Special Cases	Display option register m.n <CR> <LF> m = math program number n = the register number P7 "Limits" format +2 <CR> <LF> High +1 <CR> <LF> Pass -1 <CR> <LF> Low																																	

REAR PANEL SWITCHES

IEEE Selection Switches	
Address	Binary codes from 0 thru 30. (Up = 1, down = 0)
Trigger	When set to 1, trigger occurs on rising edge; when set to 0, trigger on falling edge.
Talk Only	When set to 1, 8520A operates in talk only mode; 0, 8520A operates as a Talker/Listener.
Shield	When set to 1, 8520A IEEE cable shield tied to ground; 0, 8520A IEEE cable shield floating.

POWER ON OR DOUBLE RESET STATUS

A power up or double push of the reset selects the following states:	
Function	= VDC
Range	= 100
Reading Rate	= 2rdgs/sec
Filter	= 500 msec
Trigger	= Auto
Note: A double reset does not change the programmable constants in registers. The double reset does reset accumulating registers to default values.	
Power on resets all registers to defaults as listed below.	
V	R3 D8 F5 TO M0 P0 B1
N1	N2 N3 N4 N5 N6 N7 S0000

Digital Multimeter

Quick Reference Guide

