Comparing N3300A Series Electronic Loads with Earlier Models

Introduction

The Agilent N3300A Series Electronic Loads are compatible in many ways with the previous HP/Agilent 6050B, 60501B, 60502B, 60503B, 60504B, 60507B Electronic Loads. This means that in most cases, programs written for earlier electronic loads will run on the N3300A Series Electronic Loads. However, be aware that there are also many differences between the previous version and the N3300A Series loads that will require you to modify previous electronic load programs.

If you are using Agilent N3300A Series Electronic Loads in test systems or with software designed for 6050B, 6050B

It is not the intent of this table to provide an exhaustive list of all the differences between previous version electronic loads and the N3300A Series loads or all possible solutions to problems with previously written software. This table only highlights the areas that affect the behavior of the instrument in normal use.

Table 1: Examples of Operating Differences

Table 1. Examples of operating binoreness					
Difference Noticed	Possible Reason (see table D-2)				
Values read back on the display and over the bus are slightly different than on previous electronic load units.	#1, #2, #3, #4				
Values read back on the display and over the bus are significantly different than on previous electronic load units.	#1, #4, #7, #9				
Values on front panel display fluctuate more than on previous electronic load units.	#2, #3, #4				
Unit unexpectedly turns off; Prot annunciator is on.	#11, #19				
Response to analog programming input is different than on previous electronic load units.	#15, #16				
Err annunciator comes on when program is run.	#8, #9, #10, #13				
Unit under test occasionally behaves unexpectedly.	#1, #7				

Table 2: Reasons for Differences

Item	HP/Agilent Series 6050x Agilent Series N3300A				
1. Command	70 milliseconds (typical)	5 milliseconds (typical)			
Execution Time	If external equipment is connected to the load, the decreased command				
	execution time of the N3300A Series loads may not allow sufficient settling				
		ou may need to insert wait statements in			
		r test requires a certain amount of settling			
	time after a load change before a me	•			
2. Voltage	1 range (model dependent): 2 ranges (model dependent):				
Programming and	0-60 volts or	0-6, 0-60 volts or			
Readback Range	0-150 volts or	0-15, 0-150 volts or			
	0-240 volts	0-24, 0-240 volts			
	The addition of voltage programming	and readback ranges provides 16-bit			
	accuracy with the N3300A Series loads. Existing programs may need to be				
	modified to take advantage of the improved accuracy provided with the				
	additional ranges.				
3. Current Readback	1 range (model dependent):	2 ranges (model dependent):			
Range	0-10 amps or	0-1, 0-10 amps or			
	0-30 amps or	0-3, 0-30 amps or			
	0-60 amps or	0-6, 0-60 amps or			
	0-120 amps	0-12, 0-120 amps			
	The addition of current readback ran	ges provides greater accuracy with the			
	N3300A Series loads. Existing progr	rams may need to be modified to take			
	advantage of the improved accuracy	provided with the additional ranges.			
4. Measurement Mode	Single measurement occurs at	Multiple measurements at command			
	command execution.	execution. Average value is returned.			
		Number of samples and time interval			
	between samples is programmable.				
	This feature provides greater accuracy and noise immunity when making				
	•	make measurements with the N3300A			
		depending on the type of measurement			
	specified. The default measurement settings on the N3300A Series loads are				
	faster than measurements on previous electronic loads.				
5. Programming	Voltage (60V) = 0.1% +50mV	Voltage (60V) = 0.1% +8mV			
Accuracy	Current (60A) = 0.1% +75mA	Current (60A) = 0.1% +12mA			
(300W model shown)	Resistance (1 Ω) = 0.8% +8m Ω	Resistance $(2\Omega) = 0.4\% + 12m\Omega$			
	Resistance $(100\Omega) = 0.3\% +8mS$ Resistance $(10k\Omega) = 0.3\% +8mS$	Resistance $(20\Omega) = XX\% + XXm\Omega$			
	Resistance ($10k12$) = 0.5% +61115	Resistance $(200\Omega) = XX\% + XXm\Omega$			
	This feature provides greater acquire	Resistance $(2k\Omega) = XX\% + XXm\Omega$			
	programs may need to be modified to	cy with the N3300A Series loads. Existing			
	programming accuracy provided with				
6. Programming	Voltage (60V) = 16mV	Voltage (60V) = 1mV			
Resolution	Current (60A) = 16mA	Current (60A) = 1mA			
(300W model shown)	Resistance $(1\Omega) = 0.27 \text{m}\Omega$	Resistance $(2\Omega) = 0.02 \text{m}\Omega$			
(SOUVE THOUGH SHOWIT)	Resistance $(100\Omega) = 0.27$ mS	Resistance $(20\Omega) = XXm\Omega$			
	Resistance ($10k\Omega$) = 0.027mS	Resistance $(200\Omega) = XXm\Omega$			
	,	` ,			
	This feature provides greater accuracy with the N3300A Series loads. Existing programs may need to be modified to take advantage of the improved				
	programming resolution.				
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Table2: Differences (continued)

Item	HP/Agilent Series 6050x Agilent Series N3300A				
7. Mode/Range	Input turns off between mode and	Input stays on between mode and range			
Change Performance	range changes.	changes.			
	This feature keeps the input on when	modes and ranges change. This will			
	affect the behavior of the device under test, since the input of N3300A Series				
	loads no longer turns off as was the case with previous electronic loads.				
8. Calibration	Calibration procedure for previous	Refer to the calibration procedure in the			
	loads is documented in the	N3300A Series User's Guide.			
	Operating manual.				
	Existing programs must be modified to correctly calibrate the N3300A Series				
	loads.				
9. Resistance Ranges	3 ranges: $0-1\Omega$, $1-1k\Omega$, $10-10k\Omega$	5 ranges: 0-2 Ω , 1-20 Ω , 10-200 Ω ,			
(300W model shown)		100-2kΩ			
	•	in some cases. For example if you are			
		ious electronic loads), the command will			
	•	in the N3300A Series loads. You can only			
	transition within a specific resistanc	• ,			
10. Resistance Slew	1Ω range slew rate uses the value	Slew rates are programmed in ohms/			
Rate	programmed for the voltage slew.	second. Each resistance range has its			
	1 k Ω and 10 k Ω range slew rate	own slew rate. Refer to Appendix A in			
	uses the values programmed for	the N3300A Series User's Guide.			
	the current slew.				
	The addition of resistance slew rates				
	programming input resistance. Existi	• . •			
44 LIND Ctatus	correctly program resistance slew ra				
11. UNR Status	Applied in constant current mode	Applies in all operating modes and			
Reporting	and in $1k\Omega$ and the $10k\Omega$ resistance mode.	ranges.			
		ensive status reporting. Programs that use			
	the UNR status reporting to generate				
		operating modes and ranges that may			
	cause an unregulated status condition				
12. *SAV 0 Storage	Module settings are saved in	All module settings are saved in the			
Location	individual modules.	mainframe.			
	This feature saves all power up settings in the mainframe, not the module. This				
	·	cording to the settings stored in each			
	mainframe when swapped. Previous				
	N3300A Series mainframes. N3300A	Series modules cannot be installed in			
	previous mainframes.				
13. Error Messages	Error messages for previous loads	Refer to the error message table in the			
	are documented in the Operating	N3300A Series User's Guide.			
	manual.				
	This feature adds more error message	,			
	modified to trap the additional error r				
14. Query Response	*IDN? and *RDT? = Hewlett-	*IDN? and *RDT? = Agilent Technologies and N3300A Series model			
	Packard and earlier model				
	numbers.	numbers; query number formats may			
	also be different.				
	This changes the company name and model numbers. Existing programs				
	may need to be modified if the *IDN? and *RDT? queries are used.				

Table 2: Differences (continued)

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Item	HP/Agilent Series 6050x Current (60A) = 4.5% +75mA		Agilent Series N3300A			
15. CC and CV Analog	` '			endix A in the N3300A		
Programming		= 0.8% +200mV	Series User's			
Accuracy				in both constant current		
(300W model shown)	and in constant voltage mode. Existing programs may need to be modified to					
	take advantage of the improved analog programming accuracy.					
16. CR Analog	Not available		A 0-to-10V signal at the analog			
Programming			programming input corresponds to the			
	minimum to full scale input resistanc			-		
				ed resistance range.		
		This feature adds analog programming in constant resistance mode. Existing				
	programs will need to be modified to use the analog programming available in constant resistance mode.					
17. List Programming	Not available		Lists containing up to 50 steps can be			
				and downloaded to each		
			electronic load module. They can be			
				ously in response to an		
			external trigge			
	This feature ad	ds list programming to	the current, vo	oltage, resistance,		
				need to be modified to use		
		ne N3300A Series Use				
18. Front Panel	Deleted keys		Added keys			
	Range	Short on/off	Ident	Sense		
	Tran Level	Tran on/off	Channel	Protect		
	Slew	Freq	▲ ▼ Step	πθ		
	Dcycl	Mode	List	Trigger		
			Func	Trigger Control		
	This feature ad	ds additional keys and	d menus to the	front panel. This results in		
				en previous and N3300A		
	Series loads. R	efer to the N3300A Se	eries User's Gui	de for more information.		
19. Reverse Voltage	Available on in	out terminals	Available on i	nput and sense terminals		
Protection	This feature ad	ds reverse voltage pro	tection on the s	sense terminals. Load		
	modules will sh	ut down with reverse	voltage on remo	ote sense terminals.		
20. Mainframe RS-232	Not available		An RS-232 co	onnector is available on the		
Connector			2-pin user-pro	ogrammable digital output		
				ole on the back of the		
			mainframe.			
	Existing progra	ms must be modified	to use the digita	al port on the mainframe.		
21. Mainframe Digital	Not available			orogrammable digital		
Port				available on the back of		
			the mainframe			
	Existing progra	ms must be modified	I .	al port on the mainframe.		
22. Module		including ac line		e with no ac line		
Interconnections	distribution.	3	distribution.			
		nodules cannot be ins		A Series mainframes.		
	Previous load modules cannot be installed in N3300A Series mainframes. N3300A Series modules cannot be installed in previous mainframes.					
23. Line Voltage		via internal switches	No switching required.			
Selection	on the mainfrar					
	This feature eliminates manual line voltage selection. The line input of the					
	N3300A Series mainframe is rated from 85 - 264 Vac.					
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