

3151B Software Compatibility Guide

June 10, 2009

Legacy vs. Modern Command Set

The installed base of the legacy 3151 is enormous. This product was designed in the early 90's and unfortunately it had to be discontinued because of parts obsolescence problem. While replacing such a popular instrument with modern technology presented minimal challenge, supporting the installed base with existing code and tested procedures created compatibility problems that were hard to confront. The real challenge was to design a state-of-the-art product that has all the modern bells and whistles but leave the option to use the 3151B at a level fully compatible with the legacy 3151.

The front panel of the 3151B looks identical to the 3151. So, if you purchase the 3151B to be used as a replacement or to add on existing systems, you most likely will want to use the 3151 legacy code and therefore, the instrument defaults to the legacy 3151-compatible mode. The SCPI commands that are shown in Table 1 list the legacy 3151 command set and marks the areas where the 3151B could not be made identical. Notice however, that it can still use the form:inst mod to be able to use the additional functionality that was built into the new 3151B design but expect that is you do just that, some of the legacy commands will not be compatible anymore.



Due to some differences in waveform resolution and size, waveforms can not be shared across the legacy and modern options. Therefore, as a general rule of thumb, using the form:inst (leg | mod) command is not recommended before you read and fully understand the consequences that may result in your application

In general the legacy 3151B mode modifies modern 3151B performance in the following major areas:

- Maximum sample clock frequency is reduced to 100 MS/s;
- Waveform interlace is set to 2;
- Minimum waveform length is set to 10; and
- Vertical resolution of arbitrary waveforms is reduced to 12 bits.

If you purchase the 3151B, you most likely want to use the 3151 legacy code and therefore, the instrument defaults to the legacy 3151-compatible mode with the above limitations built into the code. These commands are summarized in Table 1.

3151B Legacy Commands

The 3151B is a modern and updated version of the Model 3151 employing the latest technology and component improvements.

Although 100% backwards compatibility was the basis for the new 3151B design, some of the 3151 functionality could not be duplicated exactly. Table 1 lists all of the 3151B SCPI commands and highlights the areas where it differs from the original 3151 design. Commands that are no longer supported are indicated below. When these commands are executed, they will be ignored by the 3151B and no action will be taken and a warning will be generated. This allows existing code to still run, but warns the user that no action was taken.

Table 1: 3151B SCPI Command Summary for 3151 Compatibility

Keyword	Parameter Form	Default	3151
:INSTrument			
:MODE	NORMal FAST	NORM	✓
:INITiate			
[:IMMediately]			✓
:CONTinuous	OFF ON 0 1	1	✓
:TRIGger			
[:IMMediate]			✓
:BURSt			
[:STATe]	OFF ON 0 1	0	✓
:COUNt	1 to 1000000	1	✓
:DELay	0, 10 to 2e6 (even numbers)	0 (0 = OFF)	✓
:GATE			
[:STATe]	OFF ON 0 1	0	✓
:LEVel	-10 to 10	0	✓
:SOURce			
[:ADVance]	EXTernal INTernal TTLTrg<n> ECLTrg1	EXT	✓
:SLOPe	POSitive NEGative	POS	✓
:TIMer	1e-6 to 20	15e-6	✓

Table 1: 3151B SCPI Command Summary for 3151 Compatibility (continued)

Keyword	Parameter Form	Default	3151
:OUTPut			
:ECLTrg<n>	<n> = 0 to 1		
[:STATe]	OFF ON 0 1	0,0	✓
:FILTer			
[:LPASs]			
:FREQuency	20MHz 25MHz 50MHz (20MHz/25MHz = 25M)	20MHz	✓
[:STATe]	OFF ON 0 1	0	✓
[:STATe]	OFF ON 0 1	0	✓
:SYNC			
[:STATe]	OFF ON 0 1	0	✓
:POSition			
[:POINT]	2 to 523288 (even numbers)	2	✓
:SOURce	BIT LCOMplete SSYNc HCLock PULSe	BIT	✓
:WIDTh	2 to 500	2	✓
:TRIGger			
:SOURce	BIT LCOMplete INTernal EXTernal	BIT	✓
:TTLTrg<n>	<n> = 0 to 7		
[:STATe]	OFF ON 0 1	0,0	✓
[:SOURce]			
:FREQuency			
:EXTernal?			✓
[:CW]	10e-3 to 100e6 MINimum MAXimum	1e6	✓
:RASTer	10e-6 to 250e6 MINimum MAXimum	1e6	✓
:SOURce	INTernal EXTernal ECLTrg0	INT	✓
:VOLTage			
[:LEVel]			
[:AMPLitude]	10e-3 to 16 MINimum MAXimum	5	✓
:OFFSet	-7.992 to 7.992	0	✓
:FUNCTion			
:MODE	FIXed USER SEQuence	FIX	✓

Table 1, 3151B SCPI Command Summary for 3151 Emulation (continued)

Keyword	Parameter Form	Default	3151
[:SOURce]			
:SHAPE	SINusoid TRIangle SQUare PULSe RAMP SINC GAUSSian EXPonential NOISe DC	SIN	✓
:SINusoid			
:PHASe	0 to 360	0	✓
:POWer	1 to 9	1	✓
:TRIangle			
:PHASe	0 to 360	0	✓
:POWer	1 to 9	1	✓
:SQUare			
:DCYCLE	0 to 99.9	50	✓
:PULSe			
:DELay	0 to 99.9	10	✓
:WIDth	0 to 99.9	10	✓
:TRANSition			
[:LEADing]	0 to 99.9	10	✓
:TRAILing	0 to 99.9	10	✓
:RAMP			
:DELay	0 to 99.9	10	✓
:TRANSition			
[:LEADing]	0 to 99.9	10	✓
:TRAILing	0 to 99.9	10	✓
:SINC			
:NCYCLE	4 to 100	10	✓
:GAUSSian			
:EXPonent	1 to 200	10	✓
:EXPonential			
:EXPonent	-100 to 100	-10	✓
:DC			
[:VOLTage]	-100 to 100	100	✓

Table 1, 3151B SCPI Command Summary for 3151 Emulation (continued)

Keyword	Parameter Form	Default	3151
:FORMat			
:RESolution	12BIT 16BIT	12BIT	
:INSTrument	LEGacy MODern	LEG	
:BORDer	NORMal SWAPped	NORM	✓
:TRACe			
[:DATA]	<data_array>		✓
:DEFine	<1 to 4096>,<10 to 523288> (<segment_#>,<size>)	1	✓
:DELete			
[:NAME]	1 to 4096		✓
:ALL			✓
:SELEct	1 to 4096	1	✓
:SEGMENT			
[:DATA]	<data_array>		
[:SOURce]			
:APPLy	FREQ,AMPL,OFFS		✓
:SINusoid	FREQ,AMPL,OFFS,PHAS,POW		✓
:TRIangle	FREQ,AMPL,OFFS,PHAS,POW		✓
:SQUare	SQU,FREQ,AMPL,OFFS,DCY		✓
:PULSe	FREQ,AMPL,OFFS,DEL,WID,LEE,TRE		✓
:RAMP	FREQ,AMPL,OFFS,DEL,LEE,TRE		✓
:SINC	FREQ,AMPL,OFFS,CYC		✓
:GAUSSian	FREQ,AMPL,OFFS,EXP		✓
:EXPonential	FREQ,AMPL,OFFS,EXP		✓
:DC	DC_AMPL		✓
:USER	SEG<n>,SCLK,AMPL,OFFS		✓
[:SOURce]			
:SEQUence			
[:DATA]	<data_array>		
:ADVance	AUTOmatic TRIGgered STEP	AUTO	✓
:DEFine	<step>,<seg_#>,<repeat>		✓
:DELete			
[:NAME]	1 to 4096		✓
:ALL			✓

Table 1: 3151B SCPI Command Summary for 3151 Compatibility (continued)

Keyword	Parameter Form	Default	3151
[:SOURce]			
:AM			
:INTErnal			
:FREQuency	10e-3 to 1e6	100	✓
:DEPTh	0 to 100	50	✓
:EXEcute			✓
[:SOURce]			
:PHASe			
:LOCK			
[:STATe]	OFF ON 0 1	0	✓
:ADJust	0 to 360	0	✓
:NULL		Warning, not supported	✓
:SOURce	MASTer SLAVe	MAST	✓

Table 1: 3151B SCPI Command Summary for 3151 Compatibility (continued)

Keyword	Parameter Form	Default	3151
:RESet			✓
:SYSTem			
:ERRor?			✓
:VERsion?			✓
:SMEMory			
:MODE	READ WRITe	WRIT	✓
[:STATe]	OFF ON 0 1	0	✓
:TEST			
[:ALL]?			✓
*CLS			✓
*ESE	1 to 255	1	✓
*OPC			✓
*RST			✓
*SRE	1 to 255	1	✓
*TRG			✓
*ESE?			✓
*ESR?			✓
*IDN?			✓
*OPC?			✓
*OPT?	(0=64k; 1=256k; 2=512k)		✓
*STB?			✓
*TST?			✓