

## **Bode using LAN**

### October 13, 2022

Many SIGLENT SDS oscilloscopes, including the SDS6000A series, can perform automated Bode plotting to provide frequency response for <u>power supply stability</u>, <u>filters</u>, and more. This integrated approach simplifies testing and delivers results much more quickly than building your own system, integrating separate instruments with software and an external controlling computer.

In the examples above, we used USB to connect the controlling oscilloscope to the external function generator.

In this operating tip, we show how to connect a SIGLENT SDS6000A oscilloscope and an SDG1000X series arbitrary waveform generator using a direct LAN connection for use with the SIGLENT Bode application.

1.Connect the LAN port of the scope to the LAN port of the SIGLENT SDG generator:



Straight-through Ethernet Cable

2. Set the full IP address, Subnet mask, and Gateway for the SDG by entering the Interface menu (SDG1000X Press Utility > Arrow over to page 2/2 > Interface > LAN state ON and press LAN Setup):



	IP Address	192	. 168 .	1	. 2			
	055	055	~	_				
	Subnet Mask:				U	. •		
	Gateway:	192	. 168 .	1	. 1			
				0.11.00		_		
PI موجودهای ا	IP Subnet De		ault	DHC	,	Acc	ept	Cancel
Auuress	IMASK	Gate	way	Off				

3. Set the full IP address, Subnet mask, and Gateway for the SDS scope (SDS6000A Press Utility > I/O > LAN Config):

錢 Utility	🖵 Display	iîî Acquire	🏲 Trigger	🗱 Cursors	📐 Measure	🕅 Math	दे Analysis		<b>SIGLENT</b> f(C1) < 2.0	Auto Hz	📋 I/O SETTING
								LAN Config			LAN Config
								IP Config			Web Server
								IP Address : 1 Subnet Mask : 2	255.255.0.0		Net Storage
								Gateway : 1	92.168.1.1		Emulation Tektronix None
								DNS 1 1	92.168.1.1		LXI
C1}								VNC Config	5900		S Return
									OK Cancel		
C1 DC 1X 1.00	1M DV/								Timebase 0.00s 1.00us/div	Trigger Auto	C1 DC 业品
FULL 0.0	0V								50.0kpts 5.00GSa/s	Edge	Rising 2022/10/12

NOTE: The Gateway and Subnet Mask values for both instruments need to be identical. The first three triplets of the IP address must also be the same. If they are not, the connection will fail.



4. Set the function generator IP address in the Bode II application by opening the Bode menu. On the SDS6000A, press Analysis > Bode.



That will open the Bode menu as shown:

Select Configure> Set the interface as LAN and set the IP address of the generator into the text box:



Bode Plot											🗒 BOI	DE PLOT
Configure								360(°)			Bode Plot	
DUT Input: C1	DUT Output 2:	None 🗸 o	thannel Gain:	Set IP: 192.	168.1.2	Save					on	
DUT Output 1: C2	DUT Output 3:	None V	Auto Hold I	nterface: LAN	~	Test		- 315			Configure	
Sween Type	Simple V	Sween/Meas:	Continue					- 270			Operation	
	emple .	encepinicaei	oon in the									off
Frequency Mode:	Linear 🗸							- 225			Display	>
Frequency(Center,Span):	10kHz	•	10kHz	•								
Points:	50	•						- 180			Data	>
Amplitude: $\vee$	2.00V	•										
Offset: 🗸	0.00V	•						- 135			Measure	
Amplitude Unit:	Vpp 🗸											
Load:	50Ω	•						- 90			Print	>
-2								- 45				
51	kHz			10kHz			1	5kHz				
Measure P1: Value	P2:	P3:	P4: P	5:								
C1 DC1M 1X 1.00V/ FULL 0.00V								Timebase 0.00s 50.0kpts	1.00us/div 5.00GSa/s	<b>Trigger</b> Auto Edge	C1 DC 0.00V Rising	∲品 22:31:16 2022/10/12

Here is the generator LAN configuration page, for reference:

	IP Address: Subnet Mask:			. 168 .	1	2			
				. 255 .	0	0			
	Gateway:	192	. 168 .	1	1				
IP Address	Subnet Mask	Def Gate	ault way	DHC	2	Acce	pt	Cance	1

5. Test the connection by pressing Test:



Bode Plot									🗒 BODI	E PLOT
5(d5	З)						360(°)		Bode Plot	
									on	
	Configure								Configure	
	DUT Input: C1	DUT Output 2:	None 🗸	Channel Gain:	Set IP:	192.168.1.2	Save		Operation	
	DUT Output 1: C2	V DUT Output 3:	None 🗸	Auto Hold	Interface:	LAN	√ Test		Operation	off
	Sweep Type:	Simple V	Sweep/Meas	s: Continue V					Display	>
	Frequency Mode:	Linear V	• •	10kHz					Data	>
	Points:	50	•						Measure	
	Amplitude: 🗸	2.00V 0.00V	<ul><li>▼</li><li>▲</li></ul>						Print	>
	Amplitude Unit:	Vpp 🗸								
	Load:	50Ω	•							
	5447	AWG	connecte	ed successfi			15kH7			
Measure P1: Value	P2: P3:	P4:	P5:		iny.		LUNIZ			
C1 DC1M 1X 1.00V/ FULL 0.00V							Timebase 0.00s 50.0kpts	1.00us/div Auto 5.00GSa/s Edge	C1 DC 0.00V Rising	₽ 品 22:31:35 2022/10/12

Once you have the connection working, you can configure your Bode plot and start taking data.

The most common problems center around cabling. Are they connected to the proper instruments? Proper ports? Are the cables ok?

Other issues tend to center around the LAN settings. Check them again before contacting support for additional help.

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