# Technical Article SigCon Architect: the Keys to Your High-speed Design



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When you walk into a car dealer's showroom, it's hard not to be impressed by the new cars, spotless and gleaming under flattering lights. Yet no amount of fancy showmanship substitutes for the experience of sitting behind the wheel and driving the car yourself. Only then will you feel comfortable making a purchasing decision.

TI's high-speed signal conditioning products are in some ways just like new cars. Our high-speed redrivers and retimers offer advanced signal conditioning and support for many standard protocols. Many of these products require SMBus communication to unlock the full potential of the device's performance controls. But without a graphical user interface (GUI) to evaluate integrated circuit (IC) functionality, the first impression of TI's high-speed conditioning products may feel like being in a car showroom where the dealer can't find the keys for a test drive.

# SigCon Architect

SigCon Architect is an easy-to-use software interface that can control TI's high-speed signal conditioning products. This LabVIEW-based GUI features several levels of pages for each device that allow efficient IC evaluation and testing.

• **High Level Page:** The main device controls are available on a simplified block diagram of the channel design. You can modify key signal-conditioning parameters and monitor important status indicators. Figure 1 and Figure 2 are examples of the high-level control page.

SigCon Architect		ACCRETISTICAL STREET, NO. 10		
File Script Device Help	Sig	Con Architect	🗖 Demo Mode	
Selection  Configuration  Configuration  Configuration  Cuevel Page  Eye Monitor Page  DS1258R820  Configuration  Configuratio	Update Time (in_ms) 5000 Apply to Channel Select Channel 4  Channel 4	Load From File		
C COM LEVEL Page	RECEIVER	TRANSMITTER  UD_DB Level VOD_DB Level VOD_VID Ratio 101  0x5	Channel 0 Lost Channel 1 Lost Channel 2 Lost Channel 3 Lost OUT- Channel 4 Detected Channel 6 Lost Channel 6 Lost Channel 7 Lost Chann	
			Auto RX-Detect infinitely Input is 50 Ohms	
Idle		Version:2.0.0.0	CONNECTED 🌵 TEXAS INSTRUMENTS	



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# Figure 2. LMH1218 Cable Driver High Level Page

• Low-Level Page: You can engage in more advanced bit-by-bit register device control, as shown in Figure 3.

SigCon Architect File Script Device Help	and the second second	-	_					10.00			
SigCon Architect											
Selection ^	Register Map										
♦ LMH1218	Block / Register Name	Address	Default	Mode	Size	Data	^	Overset 4 dataset	Mask Register Data		Mask Value
-      Low Level Page	General							Current Address	7 Reserved[3]		× FF
- 🔷 High level Page	Observation	0x00	0x00	R/W	8	0x00		× 15	6 Reserved[2]		
Service A Ser	PWDN Channels	0x01	0x00	R/W	8	0x00		Data	5 V Reserved[1]		
♦ DS125BR820	Override PWDN, PRSNT Contr	0x02	0x00	R/W	8	0x00		Data	4 Reserved[0]		
<ul> <li>Configuration</li> <li>Repeater Page</li> </ul>	Slave Register Control	0x06	0x10	R/W	8	0x18	Ξ	× 8	3 7 RXDET[1]		
-      Low Level Page	Digital Reset and Control	0x07	0x01	R/W	8	0x01		Maite Desister	2 V RXDETI0		
EEPROM Page	Override PIN Control	80x0	0x00	R/W	8	0x00		write Register	1 Reserved[1]		
-	Signal Detect Monitor	OXUA	0x00	R	8	UXEF		Dead Desister	0 Reserved[0]		
	Signal Detect Control	0x28	0x4C	R/W	8	0x4C		Read Register			
	Version and Device ID	UX51	0x85	R	l 8	0x85	-	Boad All			
	Channel U	0.05	0.00	DAW		0.00		Redu All	Field Description		
		0x0E	0:00	DAN	18	0x00			Field Name	Access	Description
		0x10		R/W				Penet Device	Reserved[7:4]	RM	Set hits to 0
	CH0 - CHB0 VOD DB	011	0002	RM	1	0,00		Reset Device	BYDET(2:2)	DAM	00'h = Inputic Hi 7 impedance
	CH0 - CHB0 SD TH	0x12	0x00	RAW	le le	0x00		Load Config	RADE [[3.2]	IVII	01'h = Auto RX-Detect
	Channel 1	0012			ľ			Load Coning			outputs test every 12 ms for 600
	CH1 - CHB1 RXDET	0x15	0x00	R/W	8	0x08		Save Config			ms (50 times) then stops;
	CH1 - CHB1 EQ	0x16	0x2F	R/W	8	0x00		Save coming			termination is Hi-Z until detection;
	CH1 - CHB1 VOD	0x17	0xAD	R/W	8	0xAD		Note: Load Config			once detected input termination is
	CH1 - CHB1 VOD DB	0x18	0x02	R/W	8	0x00		will Overwrite all			50 Ohms
	CH1 - CHB1 SD TH	0x19	0x00	R/W	8	0x00		Registers.			10'b = Auto RX-Detect,
	Channel 2										outputs test every 12 ms until
	CH2 - CHB2 RXDET	0x1C	0x00	R/W	8	0x08					detection occurs; termination is
	CH2 - CHB2 EQ	0x1D	0x2F	R/W	8	0x00					detected input termination is
	CH2 - CHB2 VOD	0x1E	0xAD	R/W	8	0xAD					50 Ohms
	CH2 - CHB2 VOD_DB	0x1F	0x02	R/W	8	0x00					11'b = Input is 50 Ohms
	CH2 - CHB2 SD_TH	0x20	0x00	R/W	8	0x00					Note: Override RXDET Pin and
	Channel 3	1									enable register control via Reg
	CH3 - CHB3 RXDET	0x23	0x00	R/W	8	0x08					0x08[3]
	CH3 - CHB3 EQ	0x24	0x2F	R/W	8	0x00			Reserved[1:0]	R/W	Set bits to 0
	CH3 - CHB3 VOD	0x25	0xAD	R/W	8	0xAD					
	CH3 - CHB3 VOD_DB	0x26	0x02	R/W	8	0x00	Ŧ				
*											
T-II-							_		Version:2.0.0.0		
Idle									version.2.0.0.0	CONNECT	IEXAS INSTRUMEN

#### Figure 3. DS125BR820 Low Level Page

• Additional pages (may vary): You can access device-specific functions such as an Eye Monitor Page to view an internal eye diagram in real time or an electrically erasable programmable read-only memory (EEPROM) Page to generate EEPROM hex files. See Figure 4 and Figure 5.













## How to Get Started

SigCon Architect can control many high-speed signal conditioning devices and is available for download on TI.com. The software is free and installs on Windows 7 platforms. The required supporting software (LabVIEW Run-Time Engine, USB2ANY firmware and Python) is self-contained in the installer.

To use SigCon Architect with TI redrivers and retimers, connect either a DPS-DONGLE-EVM or USB2ANY dongle [i] (please see the SigCon Architect Installation and Starter's Guide, page 14, for more information) to your PC, and use jumper wires to connect the SDA, SCL and GND pins to the IC pins, as shown in Figure 6, Figure 7 and Figure 8.



Figure 6. DPS-DONGLE-EVM Controller Board



Figure 7. USB2ANY Bundle with miniUSB Cable Connection to a PC



Figure 8. Example of SMBus Connections to the DS125BR401AEVM

With SigCon Architect, getting started with TI's high-speed signal conditioning products has never been easier. The software enables you to configure TI devices in real time, thereby improving device optimization and expediting overall system bring-up. The keys are here. Why not give a few of our devices a test drive?

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# **Additional Resources**

- Find out about TI's signal-conditioning portfolio.
- Read more about EEPROM hex file generation with "Understanding EEPROM Programming for High Speed Repeaters and Mux Buffers."
- Get started with the "SigCon Architect Installation and Starter's Guide."
- Design and simulate redriver and retimer performance with WEBENCH® Interface Designer.

[i] Contact your local TI sales representative to get more information or to purchase these dongles.

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