



Lucid/Lucid-X Control Panel (LCP) User Manual









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Revision History

Table Document Revision History

Revision	Date	Description	Author
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Acronyms & Abbreviations

Table Acronyms & Abbreviations

Acronym	Description
μs or us	Microseconds
ADC	Analog to Digital Converter
AM	Amplitude Modulation
ASIC	Application-Specific Integrated Circuit
ATE	Automatic Test Equipment
AWG	Arbitrary Waveform Generators
AWT	Arbitrary Waveform Transceiver
BNC	Bayonet Neill–Concelm (coax connector)
BW	Bandwidth
CW	Carrier Wave
DAC	Digital to Analog Converter
dBc	dB/carrier. The power ratio of a signal to a carrier signal, expressed in decibels
dBm	Decibel-Milliwatts. E.g., 0 dBm equals 1.0 mW.
DDC	Digital Down-Converter
DHCP	Dynamic Host Configuration Protocol
DSO	Digital Storage Oscilloscope
DUC	Digital Up-Converter
DUT	Device Under Test
ENoB	Effective Number of Bits
ESD	Electrostatic Discharge
EVM	Error Vector Magnitude
FPGA	Field-Programmable Gate Arrays
FW	Firmware
GHz	Gigahertz
GPIB	General Purpose Interface Bus
GS/s	Giga Samples per Second
GUI	Graphical User Interface
HID	Human Interface Device
HP	Horizontal Pitch (PXIe module horizontal width, 1 HP = 5.08mm)
Hz	Hertz
IF	Intermediate Frequency
1/0	Input / Output
IP	Internet Protocol
IQ	In-phase Quadrature
IVI	Interchangeable Virtual Instrument
JSON	JavaScript Object Notation
kHz	Kilohertz
LCD	Liquid Crystal Display
LO	Local Oscillator
MAC	Media Access Control (address)



	-
Rev. 1	.2

Acronym	Description
MDR	Mini D Ribbon (connector)
MHz	Megahertz
ms	Milliseconds
NCO	Numerically Controlled Oscillator
ns	Nanoseconds
PC	Personal Computer
PCAP	Projected Capacitive Touch Panel
РСВ	Printed Circuit Board
PCI	Peripheral Component Interconnect
PXI	PCI eXtension for Instrumentation
PXIe	PCI Express eXtension for Instrumentation
QC	Quantum Computing
Qubits	Quantum bits
R&D	Research & Development
RF	Radio Frequency
RT-DSO	Real-Time Digital Oscilloscope
S	Seconds
SA	Spectrum Analyzer
SCPI	Standard Commands for Programmable Instruments
SFDR	Spurious Free Dynamic Range
SFP	Software Front Panel
SINAD	Signal-to-Noise-And-Distortion Ratio
SMA	Subminiature version A connector
SMP	Subminiature Push-on connector
SPI	Serial Peripheral Interface
SRAM	Static Random-Access Memory
TFT	Thin Film Transistor
T&M	Test and Measurement
TPS	Test Program Sets
UART	Universal Asynchronous Receiver-Transmitter
USB	Universal Serial Bus
VCP	Virtual COM Port
Vdc	Volts, Direct Current
V р-р	Volts, Peak-to-Peak
VSA	Vector Signal Analyzer
VSG	Vector Signal Generator
WDS	Wave Design Studio



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1 General

The scope of this manual is to describe the setup and operating procedures of the Lucid Control Panel (LCP). It is a software package that can be downloaded from the Tabor web site. It enables full control and programming of your Tabor Electronics Lucid Series of devices via a user-friendly graphical user interface. LCP supports both the legacy Lucid (up to 12 GHz) and the new Lucid-X (up to 40 GHz).

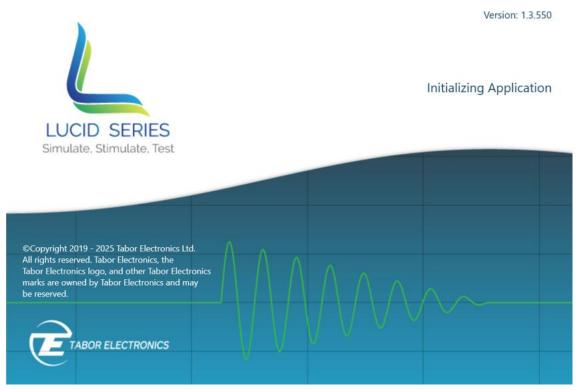


Figure 1.1 Lucid Control Panel Splash Screen

1.1 Lucid Control Panel Software Requirements

The Lucid Control Panel software installation requires the following:

- A PC running Windows 10 or Windows 7.
- A USB port for direct connection of the PC to the Lucid Benchtop, or
- An RJ45 Ethernet port.
- An optional CD device if no Internet connection is available for downloading the SW installation from the Tabor download site.

1.2 Document Conventions

1.2.1 General

Convention	Description	Example
Bold Writing	Indicates an item/message in the User Interface.	Click the On button.
-	Indicates a physical key on the keyboard.	Press <ctrl>+.</ctrl>

Caution!

A Caution indicates instructions, which, if not followed, may result in damage to the equipment or to the loss of data.

Note

A Note provides additional information to help obtain optimal equipment performance.

Idea

An Idea provides an alternate procedure to obtain the same results.

1.3 Related Documentation

- Lucid Programming Manual
- Lucid-X Programming Manual
- TE Update Tool User Manual
- Lucid Benchtop User Manual
- Lucid-X Benchtop User Manual
- Lucid Desktop User Manual
- Lucid-X Desktop User Manual
- Lucid Portable User Manual
- Lucid-X Portable User Manual
- Lucid Rackmount User Manual
- Lucid-X Rackmount User Manual
- Lucid-X PXIe User Manual



2 Installation

The Lucid series instruments are managed by the Lucid Control Panel (LCP) software, a user-friendly program that controls instrument functions and features from a remote computer. The following installation procedure will install both the LCP software and driver that will enable controlling the instrument from remote. You can download the latest LCP from the Tabor Electronics website at https://www.taborelec.com/Downloads.

Note

The driver for the instrument is only installed if no driver is detected on the PC. When updating the LCP software to the newest version steps 12 to 19 will not be performed.

1. Locate the "Lucid Control Panel_x.y.z" installation file in the destination folder to which it was downloaded.

Lucid Control Panel × +				
\leftarrow \rightarrow \land \bigcirc \bigcirc \checkmark \checkmark \cdots	→ ↑ C 📮 > … Jakob > Tabor Electronics > SW > Lucid Control Panel Search Lucid Control F			
\odot New $\overset{\sim}{\sim}$ $\overset{\sim}{\sim}$ $\overset{\sim}{\square}$ $\overset{\sim}{\square}$ $\overset{\sim}{\boxtimes}$ $\overset{\sim}{\boxtimes}$ $\overset{\sim}{\boxtimes}$ Sort $\overset{\sim}{=}$ View $\overset{\sim}{\sim}$ $\overset{\cdots}{\longrightarrow}$				
	Name Date modified Type	Size		
Documents	Lucid Control Panel 1.3.550.exe 27/03/2025 12 Applic	ation 107,339 KB		

Figure 2.1 LCP Setup Installation File

- 2. Double-click the Lucid Control Panel x.y.z installation file.
- 3. A windows User Account Control confirmation window is displayed.

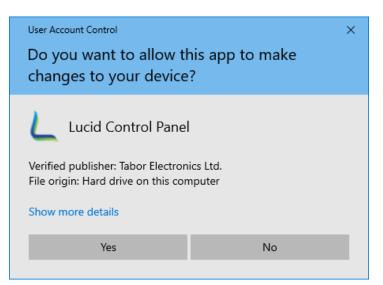


Figure 2.2 User Account Control

- 4. Click the **YES** button.
- 5. The "Welcome to the Prerequisites Setup Wizard" screen is displayed.



Note

The screen is only displayed for a first-time installation and not when updating the LCP.

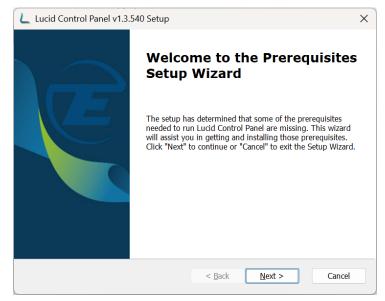


Figure 2.3 Welcome to the Prerequisites Setup Wizard

6. The Prerequisites screen is displayed.

Lucid Control Panel v1.3.540 Setup	×
Prerequisites Select which prerequisites will be installed	
Name NET Framework 4.5.1 Visual C++ Redistributable for Visual Studio 2015-2019 x64	Required Found Action Installed Skip 14.26.2 Must I
< Back	Next > Cancel

Figure 2.4 Prerequisites

7. The "Installing prerequisites for Lucid Control Panel" screen is displayed.



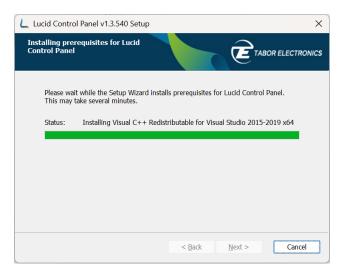


Figure 2.5 Installing prerequisites for Lucid Control Panel

- 8. The "Microsoft Visual C..." screen is displayed.
 - a. Check I agree and click Install.



Figure 2.6 Microsoft Visual C...

9. The "Microsoft Visual C... Setup Successful" screen is displayed.



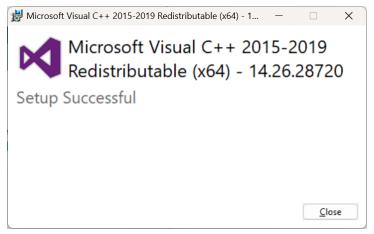


Figure 2.7 Microsoft Visual C... Setup Successful

10. The Welcome screen is displayed.

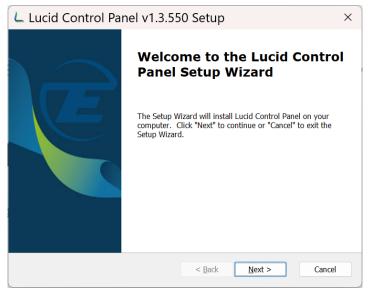


Figure 2.8 Welcome to the Lucid Setup Wizard

11. Click Next.





Figure 2.9 Optional features to install

- 12. Check Select ALL.
- 13. Click Next.

Lucid Control Panel v1.3.540 Setup		_		×
Select Installation Folder This is the folder where Lucid Control Panel will be installed.	E	тавс	DR ELECTI	RONICS
To install in this folder, click "Next". To install to a different folder, "Browse". Folder:	ente	r it bel	low or clic	k
C:\Program Files\Tabor Electronics\Lucid Control Panel\			Br <u>o</u> wse	
< <u>B</u> ack Ne	xt >		Can	cel

Figure 2.10 Select Installation Folder

14. Enter the destination directory for the **Lucid** software or browse to a destination directory by clicking the **Browse** button.

15. Click the **Next** button.

The Ready to Install screen is displayed.



Lucid Control Panel v1.3.540 Setup		×
Ready to Install The Setup Wizard is ready to begin the Lucid Control Panel installation		
Click "Install" to begin the installation. If yo installation settings, click "Back". Click "Can		
	< <u>B</u> ack	Install Cancel

Figure 2.11 Ready to Install

- 16. Click the Install button.
- 17. The **Lucid** software installation starts.

Lucid Control Panel v1.3.540 Setup		×
Installing Lucid Control Panel	ĒTA	BOR ELECTRONICS
Please wait while the Setup Wizard instal several minutes.	ls Lucid Control Panel. This ma	ıy take
Status:		
	< <u>B</u> ack <u>N</u> ext >	Cancel

Figure 2.12 Installing Lucid

- 18. Wait for the installation process to complete.
- 19. The "Welcome to the Tabor Electronics Lucid USB Driver Installer" dialog box is displayed.





Figure 2.13 Welcome to the Tabor Electronics Lucid USB Driver Installer

- 20. Click the **Next** button to start the driver installation process.
- 21. The "License Agreement" dialog box is displayed.

Tabor Electroni	cs USB Driver Installer	
License Ag	reement	Ð
Ŵ	To continue, accept the following license agreement. To read the entire agreement, use the scroll bar or press the Page Down key.	
	END-USER LICENSE AGREEMENT IMPORTANT: READ CAREFULLY BEFORE AGREEING TO TERMS	^
	THIS PRODUCT CONTAINS CERTAIN COMPUTER PROGRAMS AND OTHER THIRD PARTY PROPRIETARY MATERIAL ("LICENSED PRODUCT"), THE USE OF WHICH IS SUBJECT TO THIS END-USER LICENSE AGREEMENT. INDICATING YOUR	~
	I accept this agreement Save As Print I don't accept this agreement I don't accept this agreement	
	< <u>B</u> ack <u>N</u> ext > (Cancel

Figure 2.14 License Agreement

- 22. Check "I accept the agreement" and click the **Next** button.
- 23. The "Completing the Tabor Electronics Lucid USB Driver" dialog box is displayed.



Lucid Control Panel

Tabor Electronics USB Driver	Installer	
		nstallation of the 5 Lucid USB Driver
	The drivers were successfully	rinstalled on this computer.
	You can now connect your d came with instructions, please	evice to this computer. If your device a read them first.
	Driver Name	Status
	✓ Silicon Laboratories Inc.	Ready to use
	< <u>B</u> ack	Finish Cancel

Figure 2.15 Completing the Tabor Electronics Lucid USB Driver

- 24. Click the **Finish** button.
- 25. The "Optional features to install" dialog box is displayed.

Lucid Control Panel v1.3.5	×	
Optional features to install Select the features to be installed		
✓ Lucid Control Panel		
✓ Lucid Driver		
Select All		
	< <u>B</u> ack	<u>N</u> ext > Cancel

Figure 2.16 Optional features to install

- 26. Click the Next button.
- 27. The "Select Installation Folder" dialog box is displayed.



Lucid Control Panel v1.3.550) Setup	-		×
Select Installation Folder This is the folder where Lucid Control Panel will be installed.		E	TABOR ELECTI	RONICS
To install in this folder, dick "Next". To instal "Browse".	l to a different folc	ler, enter	it below or clic	k
Eolder: C:\Program Files\Tabor Electronics\Lucid Cont	rol Danel\		December	
			Browse	•
	< <u>B</u> ack	<u>N</u> ext >	Can	cel

Figure 2.17 Select Installation Folder

28. Click the **Next** button. The "Ready to Install" dialog box is displayed.

Lucid Control Panel v1.3.55	0 Setup ×
Ready to Install The Setup Wizard is ready to begin the Lucid Control Panel installation	
Click "Install" to begin the installation. If you installation settings, click "Back". Click "Cand	
	< <u>B</u> ack Install Cancel

Figure 2.18 Ready to Install

29. Click the "Install" button. The "Installing Lucid Control Panel" dialog box is displayed.



Lucid Control Panel v1.3.550 Setup						
Installing Lucid Control Panel		Етаво	DR ELECTRONICS			
Please wait while the Setup Wizard instal several minutes.	ls Lucid Control P	anel. This may t	ake			
Status: Installing prerequisite softwa	are					
	< <u>B</u> ack	<u>N</u> ext >	Cancel			

Figure 2.19 Installing Lucid Control Panel

30. The "Welcome to the Tabor Electronics Lucid USB Driver Installer" dialog box is displayed.

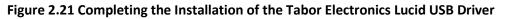


Figure 2.20 Welcome to the Tabor Electronics Lucid USB Driver Installer

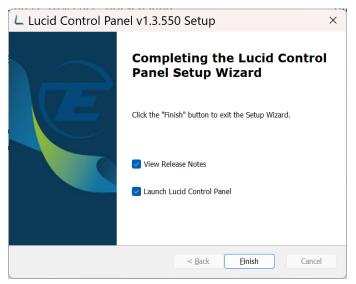
- 31. The "License Agreement" dialog box is displayed. Click "I accept the agreement" and click then the **Next** button.
- 32. The "Completing the Installation of the Tabor Electronics Lucid USB Driver" dialog box is displayed.

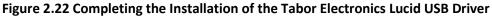


Tabor Electronics U	JSB Driver Installer					
		Completing the Installation of the Tabor Electronics Lucid USB Driver				
	The drivers were success	ully installed on this computer.				
	You can now connect you came with instructions, ple	ir device to this computer. If your device				
	Driver Name	Status				
	✓ Silicon Laboratories I	nc Ready to use				
	< <u>B</u> a	ck Finish Cancel				



- 33. Click the "**Finish**" button.
- 34. The "Completing the Lucid Control Panel Setup Wizard" dialog box is displayed.





- 35. Click the "Finish" button. The driver and software have been installed.
- 36. A Lucid shortcut is installed on the desktop 🔚
- 37. Use the supplied USB cable to connect the Lucid benchtop model to the PC. You can also connect Lucid to a LAN using an RJ45 cable (not supplied) and control it via a PC connected to the same LAN. Refer to <u>3.2 Communication Tab</u>.
- 38. The instrument can now be remotely controlled. For instructions on how to control the instrument with the Lucid software refer to section <u>3.2 Communication Tab</u>.



3 Operation

3.1 Program Start

1. Double-click the Lucid shortcut on the desktop 🖾. The Lucid program is initialized.

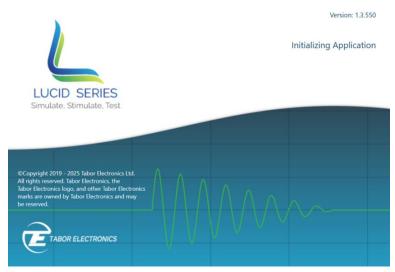


Figure 3.1 Lucid Initializing Application

2. Wait for the Communications tab to display.

3.2 Communication Tab

This is the first screen to be displayed after the software is activated. From here the user establishes communication with all the connected instruments.



L										- 0	×
CW & Modulation	Sweep	List	Commur	nication	Run Mode	System	About				
Automatically detect a	Automatically detect any instruments connected to your PC or network										
Communication Sett											
Auto Detect Manual	Offline										
Models List									Multi Subnets	(Detect	8
Model Name	Model Serial		FW Version	FPGA Version	n HW Version		Options	Interface	Address		
LSX2092B	220707		1.18.50	25102022	E		MOD, PLS, LP, PAT	LAN	192.168.0.3	0	
Communication Only R	eset Model								[🖉 Initialize	•

Figure 3.2 Communication Tab Auto Detect

Following is the menu description:

- **Auto Detect** –Click the button to enable the Lucid software to automatically detect all connected instruments.
 - Multi Subnets Detect devices on LAN subnets.
 - **Detect** Click the button to initialize the detection process. At the end of the process, the following information is displayed:
 - Model Name The ordering information model, e.g., LS1291D.
 - Model Serial The serial number of the device.
 - **FW Version** The embedded MCU firmware version.
 - **FPGA Version** The FPGA firmware version of the device.
 - **HW Version** The device hardware board version
 - **Options** The options included in the device.
 - MOD Modulation package (AM, FM, PM).
 - LP: Low power option -70 dBm.
 - **ELP**: Extended low power range -150 dBm.
 - EPR: Extended power range -130dBm to +20dBm.
 - PLS: Pulse modulation
 - **PAT**: Pattern modulation
 - FS: Fast switching 100 µs
 - EMU: Emulator pack for Keysight, R&S, Anapico & Holzworth
 - Interface Active communication interface.
 - USB
 - **HID** (Lucid Benchtop only)



- LAN (Lucid Benchtop only)
- Address IP or USB physical address. For USB, the following parameters are displayed:
 - vid vendor ID.
 - **pid** product ID.
 - **serial** A unique serial string programmed at the factory and used to distinguish between devices.
- Manual Click this button to enable manually connecting to the generator. After entering the generator's address (IP address or USB address.

L						-		×
CW & Modulation Swee	ep List	Communication	Run Mode	System	About			
Select model and manually er	nter the instru	uments communicatio	on address					
Communication Settings								
Connection Method Auto Detect Manual Offline								
Enter Address								
Enter Port								
Communication Only Reset Model						*	Initialize	3
						_		

Figure 3.3 Communication Tab Manual

• Offline – Click this button to select a model from the drop-down list and simulate as if the software is connected is connected to the generator.



L							-		×
CW & Modulation	Sweep	List	Communication	Run Mode	System	About			
Select model to simul	ate and worl	c offline							
Communication Sett	ings								
Connection Meth Auto Detect Manual									
Select Model	LSX4091B		2						
								- 141 - 11-	
Communication Only F	keset Model						S	nitialize	

Figure 3.4 Communication Tab Offline

By selecting one of the following functions, the user sets the Initialization mode:

- **Communication Only** When the Initialize button is clicked, communication is established, using the currently loaded setup (the last setup used).
- Reset Model When the Initialize button is clicked, communication is established, the generator setup is reset.
- Initialize Click to initialize communication with the selected instrument. Once clicked, other tabs of the screen become available and can be accessed.

Note

For information about options available for the Lucid Series RF Generator, refer to your Lucid device user manual.

3.3 Simultaneous Modulation Combinations

Note

The below warning will be displayed if you use Pulse, Pattern, Frequency Sweep, Power Sweep, and List simultaneously or any combination of them.





Figure 3.5 Setting Conflict

3.4 CW & Modulation Tab

The CW (Carrier Wave) & Modulation tab becomes available after connectivity with the generator is established. From here the user can set the basic output parameters of the generator. The modulation types that are available depend on the installed options.

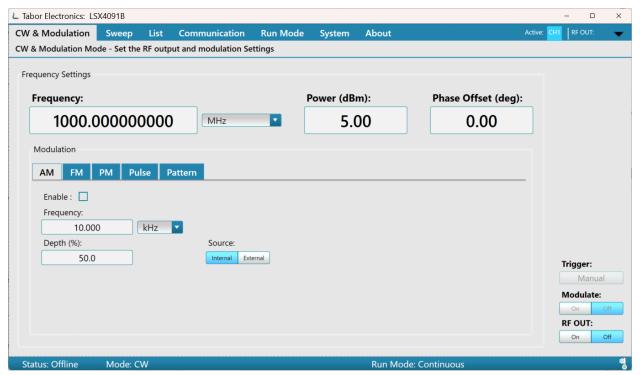


Figure 3.6 CW & Modulation Tab

• Frequency – Sets the generator's carrier wave frequency.

The range of the entered value can be changed by using the drop-down list (Hz, kHz, MHz, GHz). The default frequency is 1000 MHz. Refer to the Lucid Device User Manual section Specifications for valid frequency range.

Idea

The shortcut for selecting the frequency range is *First Letter*. For example, typing the value **5** and pressing *G* results in 5 GHz.

• **Power (dBm):** – Sets the power (amplitude) of the generator's output signal (in dBm). The default value is 5.00 dBm.



- Phase Offset (deg): Sets the phase offset of the signal. Phase offset range is between 0 degrees to 360 degrees. The default value is 0 degrees.
- **Modulation** Sets the signal modulation. Available modulation types depend on the installed options. For information about options available for the Lucid Series RF Generator, refer to your Lucid device user manual.
- Status Bar The bar at the bottom of the screen displays a summary of the system status.
 - Status
 - Offline Not connected to a device.
 - **Online** Connected to a device.
 - **Mode** Shows which modulation is on (press Mode ON/Off in the respective modulation window).
 - CW Carrier wave (default)
 - **AM** Amplitude modulation
 - FM Frequency modulation
 - **PM** Phase modulation
 - **PULSE** Pulse modulation
 - PATT Pattern modulation
 - FRSW Frequency sweep mode is selected
 - PRSW Power sweep mode is selected
 - **LIST** List mode is selected
 - Run Mode:
 - **Continuous** The device will generate a signal when the user clicks the RF OUT On button.
 - **Trigger** The device waits for an external/internal trigger event.
 - Source:
 - Internal The modulation source is the generator.
 - External The modulation source is an external connected source.
 - Thermometer 🕄
 - **Blue** Normal temperature up to 65°C.
 - **Red** Overheated. The device temperature is above 65°C for more than 30s. Turn off the device immediately!

3.4.1 AM – Amplitude Modulation

Select the CW & Modulation tab, and then click the AM button to show the amplitude modulation parameters. You can set the amplitude modulation frequency and the amplitude depth.



- 🗆 X

L	Tabor	Electronics:	LSX4091B

CW & Modulation Sweep	List Com	munication	Run Mode	System	About		Active: CH1 RF OUT:
				System	About		
CW & Modulation Mode - Set the F	kF output and	modulation Se	ttings				
Frequency Settings							
, , , ,							
Frequency:				Power (dBr	n):	Phase Offset (deg):	
1000.000000	000	MHz	-	5.0	00	0.00	
Modulation							
AM FM PM Puls	e Pattern						
							-
Enable : 🔲							
Frequency:							
10.000 k	(Hz 🔽						
Depth (%):		Source:					
50.0		Internal Exte	ernal				Trigger:
							Manual
							Modulate:
							On Off
							RF OUT:
							On Off
Status: Offline Mode: CM	1				Run Mode: Co	ontinuous	લ્

Figure 3.7 AM – Amplitude Modulation

- **Enable**: Enable the modulation. Multiple modulation setups can be enabled. The modulation will be activated when you press the RF OUT button.
- Frequency: Set the modulation frequency (Hz/kHz).
- **Depth (%):** Set the AM modulation in percent of the carrier wave amplitude.
- Source:
 - Internal Use the screen modulation parameters.
 - External Use an AM source connected to the generator's MODULATION IN connector located on the rear panel. The Generator will accept modulating signals between DC and 100 kHz within ±1 V (2 V p-p) amplitude.
- **Trigger** The Manual button is enabled when the instrument Run Mode is set to Trigger in the Run Mode tab, refer to <u>3.7 Run Mode Tab</u>.
 - **Manual** Push the button to send a trigger command to the instrument. The Trigger Source in the Run Mode tab shall be set to Bus, refer to <u>3.7 Run Mode Tab</u>.
- Modulate: Push the On/Off button to start/stop the enabled modulation when setting RF OUT On.
- **RF OUT:** Push the **On** button to generate the RF output signal. If the **Modulate** is **Off** only the carrier wave without modulation is generated.

3.4.2 FM – Frequency Modulation

Select the CW & Modulation tab, and then click the FM button to show the frequency modulation parameters. You can set the modulation frequency and the frequency deviation.



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L	Tabor	Electronics:	LSX4091B

CW & Modulation	Swee	p List	Com	munication	Run Mode	System	About		Active: CH1 RF OUT:
CW & Modulation Mo									
	ac bet		i i par ana		tungs				
Frequency Settings									
F						Dannan (dDa		Dhase Offect (day)	
Frequency:					ſ	Power (dBr	n):	Phase Offset (deg)	·
1000.0	0000	0000	0	MHz		5.0	00	0.00	
)		L				
Modulation									
AM FM	PM	Pulse	Pattern						
									-
Enable : 🔲									
Frequency:			_						
100.00		kHz	V						
Frequency Dev			_	Source:					
1.0000	00	MHz		Internal Exte	ernal				Trigger:
									Manual
									Modulate:
									On Off
									RF OUT:
									On Off
Status: Offline	Mode	e CW					Run Mode [.] (ontinuous	ଖୁ

Figure 3.8 FM – Frequency Modulation

- **Enable**: Enable the modulation. Multiple modulation setups can be enabled. The modulation will be activated when you press the RF OUT button.
- Frequency: Set the modulation frequency (Hz/kHz/MHz).
- Frequency Deviation: Set the frequency deviation of the carrier wave in (Hz/kHz/MHz/GHz).
- Source:
 - Internal Use the screen modulation parameters.
 - External Use an FM source connected to the generator's MODULATION IN connector located on the rear panel. The Generator will accept modulating signals between ±1 V (2 V pp) amplitude.
- **Trigger** The Manual button is enabled when the instrument Run Mode is set to Trigger in the Run Mode tab, refer to <u>3.7 Run Mode Tab</u>.
 - **Manual** Push the button to send a trigger command to the instrument. The Trigger Source in the Run Mode tab shall be set to Bus, refer to <u>3.7 Run Mode Tab</u>.
- **Modulate:** Push the **On/Off** button on the device front panel to start the modulation.
- **RF OUT:** Push the **On** button to generate the RF output signal.

3.4.3 PM – Phase Modulation

Select the CW & Modulation tab, and then click the PM button to show the phase modulation parameters. You can set the phase modulation frequency and the phase deviation.



L Tabor Electronics: LS	X4091B								- 0	×
CW & Modulation	Sweep	List	Communication	Run Mode	System	About		Active: CH	1 RF OUT:	-
CW & Modulation Mo	de - Set the	RF output	t and modulation Se	ttings						
Frequency Settings										
Frequency:					Power (dBi	m):	Phase Offset (deg):		
1000.0	00000	0000	MHz		5.(00	0.00			
Modulation										
AM FM	PM Pu	lse Pat	ttern					_		
Enable : 🔲										
Frequency:										
100.00	00	kHz 🔽								
Phase Deviatio	n:									
0.00		Degree							Trigger:	
									Manua	I
									Modulate:	
									On	Off
									RF OUT:	
									On	Off
Status: Offline	Mode: C	W			Run Mode	: Continuous			몡	

Figure 3.9 PM – Phase Modulation

- **Enable**: Enable the modulation. Multiple modulation setups can be enabled. The modulation will be activated when you press the RF OUT button.
- Frequency: Set the modulation frequency (Hz/kHz/MHz).
- **Phase Deviation:** Set the phase deviation degree of the modulation frequency (0 to 360 degrees).
- **Trigger** The Manual button is enabled when the instrument Run Mode is set to Trigger in the Run Mode tab, refer to <u>3.7 Run Mode Tab</u>.
 - **Manual** Push the button to send a trigger command to the instrument. The Trigger Source in the Run Mode tab shall be set to Bus, refer to <u>3.7 Run Mode Tab</u>.
- **Modulate:** Push the **On/Off** button on the device front panel to start the modulation.
- **RF OUT:** Push the **On** button to generate the RF output signal.

3.4.4 Pulse Modulation

Select the CW & Modulation tab, and then click the Pulse button to show the pulse parameters. You can set the pulse width and repetition rate.



L	Tabor	Electronics:	LSX4091B
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L Tabor Electronics: LS	X4091B										- 0	×
CW & Modulation	Swee	p List	t Comi	munication	Run Mode	System	About			Active: C	H1 RF OUT:	-
CW & Modulation Mod	de - Set	the RF ou	utput and i	modulation Se	ettings							
Frequency Settings												
frequency settings												
Frequency:					c	Power (dBi	n):	Phase	e Offset (deg):		
1000.0	000	0000	0	MHz	•	5.0	00		0.00			
]		l							
Modulation												
AM FM	PM	Pulse	Pattern									
Enable :												
Pulse Width:												
320		ns										
Pulse Repetition	n Rate:			Source:								
1.00000	00	MHz		Internal Ext	ernal						Trigger:	
											Manual	
											Modulate:	
											On	Off
											RF OUT:	
											On	Off
Status: Offline	Mode	e: CW					Run Mode:	Continuo	JS			୶

Figure 3.10 Pulse Definition

- Enable: Enable the modulation. Multiple modulation setups can be enabled. The modulation will be activated when you press the RF OUT button.
- **Pulse Width:** Set the pulse width (ns/µs/ms/s).
- Pulse repetition rate: Set the pulse frequency (Hz/kHz/MHz).
- Source:
 - Internal Use the screen modulation parameters.
 - External Use a pulse source connected to the generator's MODULATION IN connector located on the rear panel. The Generator will accept modulating signals between ±1 V (2 V pp) amplitude.
- Trigger The Manual button is enabled when the instrument Run Mode is set to Trigger in the Run Mode tab, refer to 3.7 Run Mode Tab.
 - Manual Push the button to send a trigger command to the instrument. The Trigger Source in the Run Mode tab shall be set to Bus, refer to 3.7 Run Mode Tab.
- Modulate: Push the On/Off button on the device front panel to start the modulation.
- **RF OUT:** Push the **On** button to generate the RF output signal.

3.4.5 Pattern Sequence

Select the CW & Modulation tab, and then click the PATTERN button to show the pattern sequence parameters. You can set a sequence of pulses according to the list of pulses where each step in the list defines a pulse Time On and Time Off time and the number of step repetitions.



L	Tabor	Electronics:	LSX4091B
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Joi Liectionics.									
& Modulation	Sweep	List	Communication	Run Mode	System	About		Active: CH1	RF OUT:
& Modulation N	ode - Set the	e RF outp	ut and modulation Se	ttings					
equency Settings Frequency: 1000. Modulation	00000	0000	MHz		Power (dB	m): 00	Phase Offset (deg) 0.00	:	
AM FM Enable :		ulse P	attern					-	
Ster	On Time	_	Off Time		Repetitions	Edit Pattern	Pattern File Destination:		
1 78.		us 🔽	78.125	us 🔽	2	New Pattern	PC Internal		
2 10)0 r	ns 🔽	320	ns 🔽	3	Add Step			
3 500	.000 ι	us 🔽	1,000.000	us 🔽	7	Delete Step	Load	1	Trigger:
						Update Pattern	Save		Manual
								_	Modulate:
									On Off
									RF OUT:
								L	On Off
atus: Offline	Mode: 0	W				Run Mode: Co	ontinuous		¢

Figure 3.11 Pattern Sequence

• **Enable**: – Enable the modulation. Multiple modulation setups can be enabled. The modulation will be activated when you press the RF OUT button.

Edit Pattern

Define a pattern according to the steps below.

- 1. **NEW Pattern** Click the button to create a new Pattern.
- 1. Add STEP Click the button to add a new step.
- 2. Enter the duration of the pulse (On Time), the delay for next pulse (Off Time), and the number of loops (Repetitions) of this step.
- 3. **Delete STEP** Click the button to delete the last step.
- 4. Update Pattern Click the button to upload the Pattern to the instrument.

Pattern File

- 1. Destination:
 - a. **PC** Click the button to load or save a file on your PC. The pattern file is in JSON (JavaScript Object Notation) format.
 - b. Internal Click the button to load or save a file to the instrument's SD card.
- 2. LOAD Click the button to select a file to load.
- 3. **SAVE** Click the button to save the pattern.



- **Trigger** The Manual button is enabled when the instrument Run Mode is set to Trigger in the Run Mode tab, refer to <u>3.7 Run Mode Tab</u>.
 - **Manual** Push the button to send a trigger command to the instrument. The Trigger Source in the Run Mode tab shall be set to Bus, refer to <u>3.7 Run Mode Tab</u>.
- **Modulate:** Push the button to start the modulation.
- **RF OUT:** Push the **On** button to generate the RF output signal.

3.5 Sweep Tab

The Sweep Tab menu allows the user to set frequency range and step size, sweep direction, power range and step size, frequency and power dwell time, and triggering.

Following is the menu description:

Two Sweep Types are available:

- **Frequency** based where the signal sweeps from one frequency to the next, maintaining the same amplitude.
- **Power** based where the signal sweeps from one amplitude to the next, maintaining the same frequency.

3.5.1 Frequency Sweep

Select the Sweep tab, and then click the Frequency button in the Select Sweep Type field.



L Tabor Electronics: LSX4	091D						- 0	×
CW & Modulation	Sweep List	Communication	Run Mode	System	About	Active: CH1	RF OUT:	-
Sweep Mode - Create Fre	equency or Powe	r sweep						
Sweep Settings Select Sweep Type Frequency Power Enable : Start Frequency: 1.00000000000 Number of Steps: 11 Dwell Time: Sweep Step 1.000000		Stop Frequency 2.0000000 Step Size: 100.000000	0000 GHz	z V	Direction: Normal Power (dBm): 5.00			
1.000000 Status: Offline	ms 🔻	Export to I	ist		Run Mode: Continuous	(RF OUT:	Dff Dff

Figure 3.12 Frequency Sweep

- **Enable**: Enable the modulation. Multiple modulation setups can be enabled. The modulation will be activated when you press the RF OUT button.
- **Start Frequency** and **Stop Frequency** Sets the frequencies (in Hz, kHz, MHz, or GHz) on which the sweep will start and end. Type the **Start** and **Stop** values in the fields the sweep direction is determined by the Direction field (see below).
- **Direction** Sets the sweep direction. The following options are available:
 - **UpDown** To sweep from Start Frequency to Stop Frequency; then, from Stop Frequency to Start Frequency .
 - Normal To sweep from Start Frequency to Stop Frequency.
- Number of Steps Sets the number of steps in one sweep (including Start and Stop). The value displayed in Step Size changes accordingly.
- **Step Size** Sets the size of each step (in Hz, kHz, MHz, or GHz) in one sweep. The value displayed in **Number of Step** changes accordingly.
- **Power** Sets the amplitude (in dBm) of the signal. The value set here is the same as in the CW & Modulation Tab.

Note

Multiple power levels are not allowed in frequency sweeps. Use the Power-based sweeps for power sweeps. Use the List Tab for combined Power and Frequency sweeps.

Note

Changing the value of the amplitude (Power) in the Sweep Tab will change the Power value in the CW & Modulation Tab.



- Rev. 1.2
- **Dwell Time** Sets the duration of each step in the sweep or the entire sweep, before it continues to the next step or sweep. The following options are available:
 - Sweep Sets the duration of one entire sweep (in µs, ms, or s).
 - Step Sets the duration of each step in the sweep (in µs, ms, or s).
- Export to List This button copies the displayed sweep to the List Tab.

If there is already a list, the Export to List dialog box appears notifying that the current list will be deleted.

- Click Yes to copy thee sweep data to the list table.
- Click No to cancel the action.

Export to List								
•	Please note current list will be deleted.							
-	Do you wish to proceed?							
	Yes No							

Figure 3.13 Export to List

- **Trigger** The Manual button is enabled when the instrument Run Mode is set to Trigger in the Run Mode tab, refer to <u>3.7 Run Mode Tab</u>.
 - **Manual** Push the button to send a trigger command to the instrument. The Trigger Source in the Run Mode tab shall be set to Bus, refer to <u>3.7 Run Mode Tab</u>.
- Modulate: Push the On button to start the modulation.
- **RF OUT:** Push the **On** button to generate the RF output signal.

3.5.2 Power Sweep

Select the Sweep tab, and then click the Power button in the Select Sweep Type field.



L Tabor Electronics: LS	x4091D		-						- 0	×
CW & Modulation	Sweep	List (Communication	Run Mode	System	About		Active: CH1	RF OUT:	-
Sweep Mode - Create	Frequency o	or Power sv	veep							
Sweep Settings Select Sweep Type Frequency Power Enable : _ Start Power (dBm): 			Stop Power (dBr 5.00 Step Size (dBm): 1.00			Direction: Normal Frequency: 1000.000000000	MHz			
1.000000	ms		Export to L	ist				(RF OUT:	Off
Status: Offline	Mode: C	W				Run Mode: Contin	nuous			୍ଷ

Figure 3.14 Power Sweep

- **Enable**: Enable the modulation. Multiple modulation setups can be enabled. The modulation will be activated when you press the RF OUT button.
- **Start Power** and **Stop Power** Sets the amplitudes (in dBm) on which the sweep will start and end. Type the **Start** and **Stop** values in the fields the sweep direction is determined by the Direction field (see below).
- **Direction** Sets the sweeping direction. The following options are available:
 - **UpDown** To sweep from Start Power to Stop Power; then, from Stop Power to Start Power.
 - Normal To sweep from Start Power to Stop Power.
- Number of Steps Sets the number of steps in one sweep (including Start and Stop). The value displayed in Step Size changes accordingly.
- Step Size Sets the size of each step (in dBm) in one sweep. The value displayed in Number of Step changes accordingly.
- Frequency Sets the frequency (in Hz, kHz, MHz, or GHz) of the signal. The value set here is the same as in the CW & Modulation Tab.

Note

Multiple frequencies are not allowed in power sweeps. Use the Frequency-based sweeps for frequency sweeps. Use the List Tab for combined Power and Frequency sweeps.

Note

Changing the value of the frequency in the Sweep Tab will change the Frequency value in the CW & Modulation Tab.



- Rev. 1.2
- **Dwell Time** Sets the duration of each step in the sweep or the entire sweep, before it continues to the next step or sweep. The following options are available:
 - Sweep Sets the duration of one entire sweep (in µs, ms, or s).
 - Step Sets the duration of each step in the sweep (in µs, ms, or s).
- Export to List This button copies the displayed sweep to the List Tab.

If there is already a list, the Export to List dialog box appears notifying that the current list will be deleted.

- Click Yes to copy the sweep data to the list table.
- Click No to cancel the action.

 Export to List
Please note current list will be deleted.
Do you wish to proceed? Yes No

- **Trigger** The Manual button is enabled when the instrument Run Mode is set to Trigger in the Run Mode tab, refer to <u>3.7 Run Mode Tab</u>.
 - **Manual** Push the button to send a trigger command to the instrument. The Trigger Source in the Run Mode tab shall be set to Bus, refer to <u>3.7 Run Mode Tab</u>.
- Modulate: Push the On button to start the modulation.
- **RF OUT:** Push the **On** button to generate the RF output signal.

3.6 List Tab

The List Tab enables the user to create and generate a sequence of signals that can vary in frequency, power, and dwell time.

When selecting the List tab for the first time the list table is empty unless the **Export to List** button was pressed in the Sweep tab in which case it holds the sweep list that was generated from the Sweep tab. Newly added steps are added to the end of the list. In addition, you can load previously saved lists.



LT	abor Eleo	ctronics: LSX4091D								– 🗆 X
C۷	V & Mo	dulation Sweep	List	Communication	Run Mode	System	About		Active:	CH1 RF OUT: 🛛 🚽
Lis	t Mode -	Create a list of frequ	encies to ge	enerate						
L	ist Settin Enable									
	Step	Frequen	су	Power [dBm]		Dwell Time		Adv.	List File	
	1	1,000.000000	kHz 🔽	1.00	10		us 🔽	Run	Destination:	
	2	1,000.00000000	MHz 🔽	2.00	100.000	0000	ms 🔽	Run	Load	
	3	12.0000000000000	GHz 🔽	3.00	12.00000	00000	s 🔻	Run	Save	
	Dwell Step		1000	US ¥					Edit List New List Add Step Delete Step Update List Run List Selection	Trigger: Manual Modulate: On Off RF OUT: On Off
S	Status: C	Offline Mode:	CW				Run M	lode: Contin	uous	

Figure 3.15 List

The List Settings parameters are:

- **Enable**: Enable the modulation. Multiple modulation setups can be enabled. The modulation will be activated when you press the RF OUT button.
- Frequency (in Hz, kHz, MHz, or GHz) Sets the step frequency.
- **Power (dBm)** Sets the step power (dBm).
- **Dwell Time** Sets the duration of the step (in µs, ms, or s).
- Adv. (Advance):
 - **Run**: The following step will be executed after the Dwell Time has elapsed.
 - Wait: This step will be executed when a trigger has been issued.

	Please note the following when using WAIT in list mode
0	 Run mode must be set to trigger. Dwell time setting is ignored for the relevant step.
	3. Internal trigger source and trigger advance Step are not applicable.

Figure 3.16 Important (List)

- List File Destination Affects the entire list.
 - **PC** The list file is stored on the PC running LCP.
 - Internal The list file is stored on the Lucid device.



- Rev. 1.2
- Load Enables the user to replace the current list by another one. The user browses to the location of the previously created file, and loads it, by clicking Open.

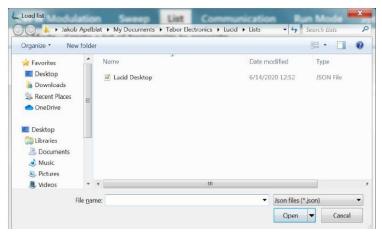


Figure 3.17 Load List

• Save – Enables the user to save the current list as a text file. The user browses to the desired folder; then names the file and clicks Save.

Save list				
	ectronics > Lucid > Lists		< 5 ∨	Search Lists
Organise 👻 New folder				<u> </u> ≡≡ ▼
Desktop 🖈 ^ Name	Date modified	Туре	Size	
Downloads	No items m	atch your search.		
Documents # Dictures #				
Application Note				
Photos				
User Manual				
User Manual				
Desktop				
 OneDrive 				
akob Apelblat				
This PC				
Tibraries Y				
File name:				
Save as type: Json files (*.json)				
Hide Folders				Save Cancel
Hide Folders				Zave

Figure 3.18 Save List

- Edit List Affects the list items (steps)
 - **New** Clears the entire list, enabling the user to start a new one. The following dialog box appears.
 - Click Yes to start a new list.
 - Click **No** to cancel the action.

	Start new list
	Would you like to start a new List?
-	Unsaved data will be lost.
	Yes No

Figure 3.19 Start New List



- Add Step Adds a step to the end of the list. The default values are those set in the RF & Modulations Tab.
- **Delete Step** Select the step and click Delete Step to delete the selected step from the list.
- **Update List** After finishing editing the list, the user must click this button to activate the new parameters.
- **Dwell Time** Sets the duration of each step in the list.
 - Step Dwell time is as set in each step in the list.
 - **Fixed** –Dwell time defined in the list is disabled; will be identical in all steps, as defined here (in μs, ms, or s).
- Run Sets what step will Run.
 - List The entire list will run, one step after the next, in the displayed order. When reaching the end of the list, the run will restart. If the Wait switch is On, the run stops, and waits for a trigger event (as defined in the Run Mode Tab).
 - **Selection** Only the selected step in the list will run.

Note

It is possible to select more than one step, using the same key used for multiple selection in Windows (<Ctrl> and <Shift>).

- **Trigger** The Manual button is enabled when the instrument Run Mode is set to Trigger in the Run Mode tab, refer to <u>3.7 Run Mode Tab</u>.
 - **Manual** Push the button to send a trigger command to the instrument. The Trigger Source in the Run Mode tab shall be set to Bus, refer to <u>3.7 Run Mode Tab</u>.
- Modulate: Push the On button to start the modulation.
- **RF OUT:** Push the **On** button to generate the RF output signal.

3.7 Run Mode Tab

The Run Mode Tab defines how the Lucid Device will generate the RF signal. E.g., to wait for a trigger event before generating signals.



L Tabor Electronics: LS	X4091B								×
CW & Modulation	Sweep	List	Communication	Run Mode	System	About	Active: CH1	RF OUT:	•
Run Mode									
Run Mode Settings									
Run Mode: Continuous Trigger	Gate								
Trigger Parameter	s:								
Trigger Source:	_	SPI	Timer		1.000000	ms			
Trigger Advanc	e:		Once Count	1					
Trigger Slope: Positive Negativ	e								
Trigger Delay:									
0.00000	00	ms					ſ	Trigger: Manual	
							ſ	Modulate:	
							L	RF OUT:	
							[On Off	
Status: Offline	Mode: (CW				Run Mode: Trigger			1

Figure 3.20 Run Mode Internal

L Tabor Electronics: LS	X4091B							– 🗆 ×
CW & Modulation	Sweep	List	Communication	Run Mode	System	About	Active: CH	11 RF OUT: 🚽
Run Mode								
Run Mode Settings Run Mode: Continuous Trigger Trigger Parameter Trigger Source: Internal Externa Trigger Advance Once Step Trigger Slope: Positive Negativ	e:	SPI	Once Count [1				
Trigger Delay: 0.00000	00	ms 🔽	1					Trigger: Manual
								Modulate: On Off RF OUT: On Off
Status: Offline	Mode: C	w				Run Mode: Trigger		ø

Figure 3.21 Run Mode External

The following are the details of the Run Mode menu:

• **Run Mode** – Sets the way in which the signals are generated.



- **Continuous** Enables running the signal continuously, as defined in the other tabs, and regardless of the trigger events. All trigger-oriented parameters are not accessible.
- **Trigger** Enables running the signal when a trigger event is detected.
- **Gate** Gating signal is applied to the trigger input only and output waveforms will be generated only when the External or SPI (only Lucid) gate signal is valid and true.
- Trigger Source Sets the source of the trigger.
 - Internal The software issues triggers according to the following parameters.
 - **Timer** Sets the rate for clocked triggers (in ns, μs, ms, or s).**Trigger** When the trigger source is set to **Bus**, clicking **Manual** issues a trigger.
 - External An external source, connected to the TRIGGER IN port, issues the triggers.
 - **Bus** A trigger is issued when the user clicks the Manual button.
 - SPI A trigger is issued through the SPI interface (Lucid Desktop only) TBD.
- **Trigger Advance** Sets the trigger advance either in steps or as a one-time event.
 - **Once** Sets the number of triggers that will be issued.
 - **Once Count** Sets the number of times a sweep or list will be generated. When the count is set to 0, the device outputs a signal continuously once a trigger is accepted.
 - **Step** For every trigger that is accepted the sweep or list is advanced by 1 step. While the step is being generated, any incoming trigger is ignored.
- Trigger Slope Sets trigger slope.
 - **Positive** Trigger on positive (rising) edge.
 - **Negative** Trigger on negative (falling) edge.
- **Trigger Delay** Defines a delay in units of time (ms, ns, μs, ms, s) between the receiving of the trigger signal and the generation of the output signal.
- Trigger When the trigger source is set to Bus, clicking Manual issues a trigger.
- Modulate: Push the On/Off button to start/stop the enabled modulation when setting RF OUT On.
- **RF OUT:** Push the **On** button to generate the RF output signal. If the **Modulate** is **Off** only the carrier wave without modulation is generated.

3.8 System Tab

The System Tab manages the setup parameters of the entire system. Loading a system file results in the ability to re-use the Modulations, Sweeps and Lists, etc., that were used when the system file was created.



fabor Electronics: 1.SX2092				_	100000 100	- 0
V & Modulation lities	Sweep List	Communication	Run Mode	System Ab	out ^	ctive: CHI RF OUT:
strument State					Log & Command Editor	
Target: RC	Internal				- 🗹 Add errors q	
Source:					Send Command	6
Store Current Se	tup Recall Saved Set	up Clear Saved Setu	Reset to Facto	ory Default	Response	
itch Model	X2092B - 555555					
stem Information						
rstem information	1					100
Model Name	LSX20928	Firmware	1.19.49			
Serial	555555	Hardware	D			
						Trigger:
Option	MOD, PLS, LP, PAT	FPGA	FFFFFFF			Manual
						Modulate:
Calibration	DD/MM/YY HH:MM	Temperature	47.91 °C			On o
	271020					RF OUT:
						On O
tatus: Online	Mode: CW				un Mode: Continuous	

Figure 3.22 System Tab

The following are the details of the System menu:

- Instrument State Enables the user access to the System State file.
 - Target Select where the setup is located.
 - PC The setup is located on a PC connected to the instrument.
 - Internal The setup is located on the instrument.
 - Source:
 - Store Current Setup Saves the current state of the entire system in a file.
 - **Recall Saved Setup** Loads a previously saved System State file. The settings in all the tabs will change accordingly.
 - Clear Saved Setup |
 - Reset to Factory Default resets instrument and tabs to factory default settings.
- Log & Command Editor It enables you to send SCPI commands and queries to the instrument and read the instrument response. It will also autocomplete the command with a list of available commands.

Note

Refer to Lucid or Lucid-X Programming Manual for a list of available SCPI commands.

- Add errors query When checked every command that is sent to the instrument is followed by a :SYST:ERR query.
- Send Command Click the button to send the SCPI command to the instrument.
- Download a text file script with SCPI commands to the instrument.



- Rev. 1.2
- **Play/Pause** Toggle between displaying/not displaying the SCPI commands sent to the device.
- Save ៉ Save the log to a text file (.txt).
- Erase 🖉 Erase the log.
- **Open Log File Location** The log file contains all the SCPI communication between the PC and the device.
- Switch Model Switch between connected models that appear in Figure 3.2 Communication Tab.
- **System Information** Displays the system information
 - **Model Name** The ordering model name.
 - **Serial** The serial number of the generator.
 - **Option** The options installed in the Lucid device.
 - **MOD** Modulation package (AM, FM, PM).
 - **PLS** Pulse generator.
 - **FS** Fast switching.
 - LP Low Power (-90 dBc).
 - **ELP** Extended low power range -150 dBm.
 - **EPR** Extended power range -130dBm to +20dBm.
 - EMU Includes emulators for Keysight, R&S, Anapico, and Holzworth
 - **PAT** Pattern generator.
 - **Calibration** The time stamp of the last calibration.
 - Firmware The Lucid device firmware version.
 - Hardware The hardware board version.
 - FPGA The Lucid device FPGA version.
 - **Temperature** The average temperature at critical locations inside the generator chassis.
- Trigger When the Trigger Source in the Run Mode Tab is set to Bus, clicking Manual issues a trigger.
- **RF OUT** turns On or Off the RF output switch.

3.9 About Tab

The About Tab displays the application version.



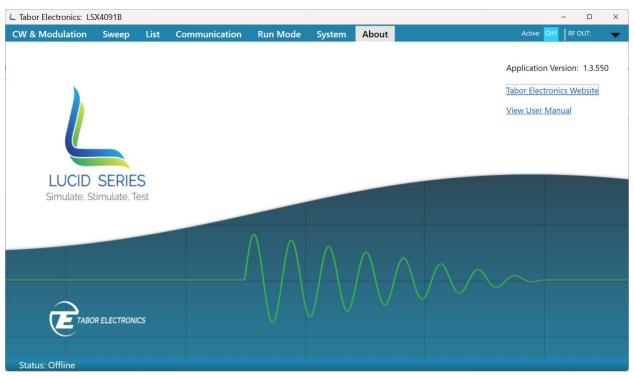


Figure 3.23 About Tab

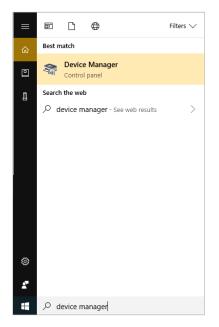
- **Tabor Electronics Website** Click the link to access the website. Click the DOWNLOADS tab to download the latest version of manual, software, and FPGA firmware.
- Help File Displays the Lucid Control Panel user manual (this manual).

4 Troubleshooting

4.1 Manually Installing Instrument Drivers

4.1.1 USB Device Driver Manual Installation (Windows 10)

- 1. Download the latest Lucid series USB device driver from <u>www.taborelec.com/downloads</u>.
- 2. Using the supplied USB cable, connect the Lucid benchtop model to the PC.
- 3. Open the Start menu, and in the search field, type Device Manager.



4. In the search results list, select **Device Manager**. The **Device Manager** window opens.



🛃 Device Manager	_	\times
<u>F</u> ile <u>A</u> ction <u>V</u> iew <u>H</u> elp		
🗸 🚦 Arie-HP850		^
> 💐 Audio inputs and outputs		
> 🦢 Batteries		
> 📓 Biometric devices		
> 🚯 Bluetooth		
> 💻 Computer		
> 🕳 Disk drives		
> 🔙 Display adaptors		
> 📓 Firmware		
> 🐖 Human Interface Devices		
> 🦏 IDE ATA/ATAPI controllers		
> 🚡 Imaging devices		
> 🔤 Keyboards		
> 🥅 Memory technology devices		
> II Mice and other pointing devices		
> 🛄 Monitors		
> 🖵 Network adapters		
✓ ▲ ¹ Other devices		
😰 CP2130 USB-to-SPI Bridge		
> 🚍 Print queues		
> 🔲 Processors		
> 📲 Security devices		
> 📑 Software components		
> Software devices		
> 🐗 Sound, video and game controllers		
Storage controllers		~

5. In the navigation tree, expand **Other devices** and double click on **CP2130 USB-to-SPI Bridge**.



🚠 Device Manager	_	\times
<u>File Action View Help</u>		
🗸 🛃 Arie-HP850		^
Audio inputs and outputs		
> 🧽 Batteries		
> 🗿 Biometric devices		
> 🚯 Bluetooth		
> 💻 Computer		
Disk drives		
> 🔙 Display adaptors		
Firmware		
> 🙀 Human Interface Devices		
> 🧝 IDE ATA/ATAPI controllers		
> 👔 Imaging devices		
> 🥅 Keyboards		
> 🛄 Memory technology devices		
> 📗 Mice and other pointing devices		
> Monitors		
> 🖵 Network adapters		
✓ ▲ ³ Other devices		
🖳 🕼 CP2130 USB-to-SPI Bridge		
> 🖃 Print queues		
> Processors		
> 📭 Security devices		
> 📑 Software components		
> Software devices		
> 🖣 Sound, video and game controllers		
Storage controllers		~

6. The **CP2130 USB-to-SPI Bridge Properties** window opens. Click **Update Driver**.



CP2130 U	ISB-to-S	PI Bridge	e Proper	ties				\times
General	Driver	Details	Events					
2	CP213	0 USB-to-	-SPI Brid	je				
	Device	type:	Other	devices				
	Manufa	acturer:	Unkn	own				
	Locatio	n:	Port_	#0001.Hi	ub_#000	1		
	e status	11 in 1 - i			(O ₂ d ₂	20)	_	
· ·		r this devic				28)	^	
To fir	nd a drive	er for this o	levice, cli	ck Updat	e Driver.			
					<u>L</u>	<u>I</u> pdate Dri	ver	
						OK	Cano	el

7. In the Update Drivers - CP2130 USB-to-SPI Bridge window, select Browse my computer for driver software.

ch automatically for updated driver software ws will search your computer and the Internet for the latest driver software ur device, unless you've disabled this feature in your device installation gs.
rse my computer for driver software and install driver software manually.

8. Browse to the driver software location on PC, select its folder and click **OK**.



÷	Update Drivers - CP2130 USB-to-SPI Bridge	×
	Browse for drivers on your computer	
	Search for drivers in this location:	
	C:\Program Files\Tabor Electronics\Lucid\CP2130_Driver v Browse	
	Include subfolders	
	→ Let me pick from a list of available drivers on my computer This list will show available drivers compatible with the device, and all drivers in the same category as the device.	
	Next	Cancel

9. Driver download begins.

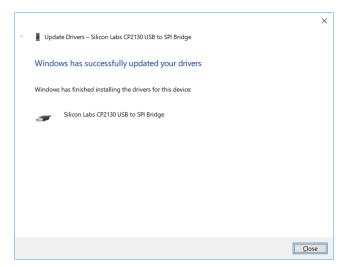
		×	
~	Update Drivers – CP2130 USB-to-SPI Bridge		
	Downloading drivers		
	Car	icel	



10. After the download is complete, the driver installation begins.

	×
Update Drivers – CP2130 USB-to-SPI Bridge	
Installing drivers	

11. After the installation is complete, the following success message is displayed:



12. Click Close to close the Update Drivers window and to proceed.



13. In the CP2130 USB-to-SPI Bridge Properties window the displayed device status should be: The device is working properly.

abs CP21	130 USB t	o SPI Bridge Properties	×
Driver	Details	Events	
Silicon	Labs CP2	2130 USB to SPI Bridge	
Device	type:	Other devices	
Manuf	acturer:	Silicon Labs	
Locatio	on:	Port_#0001.Hub_#0001	
e status device is	working p	roperly.	^
			~
		Oher	Cancel
	Driver Silicon Device Manuf Location	Driver Details Silicon Labs CP2 Device type: Manufacturer: Location:	

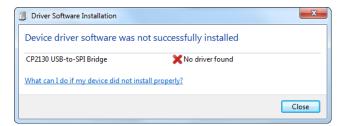
4.1.2 USB Device Driver Manual Installation (Windows 7)

- 1. Download the latest Lucid series USB device driver from the Tabor Electronics Ltd., website. Device drivers are available at www.taborelec.com/downloads
- 2. Connect the Lucid Generator to the PC using the supplied USB Cable.



The Installing Device Driver Software message is displayed at the lower-right part of the screen.

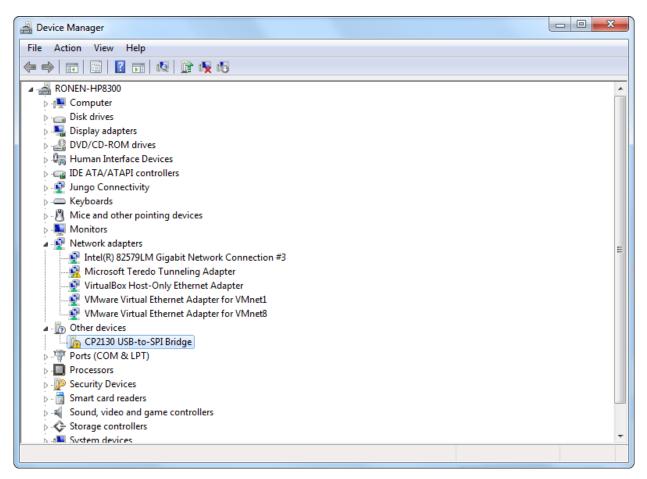
3. Wait for the following messages to appear:



4. Click Close.

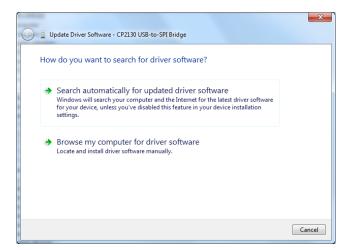


- 5. Open the Start menu, and in the search field, type Device Manager.
- 6. In the search results list, select **Device Manager**. The **Device Manager** window opens.
- 7. In the navigation tree, expand **Other devices** and select **CP2130 USB-to-SPI Bridge**.

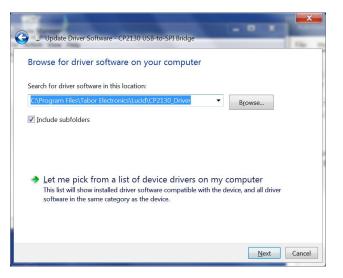


8. In the Update Drivers - CP2130 USB-to-SPI Bridge window, select Browse my computer for driver software.



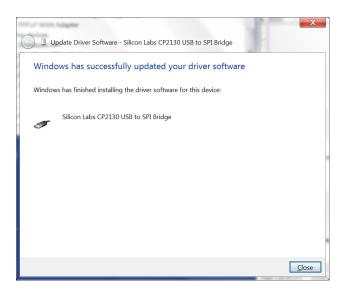


9. Browse to the driver software location on PC, select the folder and click **Next**. Driver installation begins.

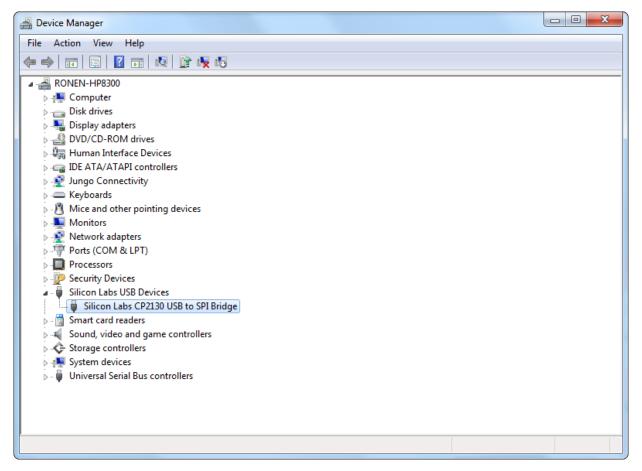


10. After the driver software installation is complete, click **Close**.





11. In the Device Manager, under Silicon Labs USB Devices, click Silicon Labs CP2130 USB to SPI Bridge.



12. In the **CP2130 USB-to-SPI Bridge Properties** window the device status should indicate the device is working properly.



Silicon Labs CP2130 USB to SPI Bridge Properties					
General	Driver Details F	Power Management			
1	Silicon Labs CP2130 USB to SPI Bridge				
	Device type:	Silicon Labs USB Devices			
	Manufacturer:	Silicon Labs			
	Location:	Location 0 (Port_#0003.Hub_#0001)			
Device status This device is working property.					
		ОК	ancel		



5 Appendix Log File

The log file C:\temp\Lucid_x-y-z_x.log provides an LCP log, and the log file TEUpdateTool_ x-y-z_x logs the TE Update Tool operation. If you encounter any issue, include these files when reporting to Tabor support.

Temp × +				
\leftarrow \rightarrow \uparrow \bigcirc \bigcirc \rightarrow This PC	> Local Disk (C:) > Temp			
⊕ New ĭ 🔏 🕫 🗈 🖄	$\widehat{\blacksquare}$ \mathbb{N} Sort $$ \equiv View $$			
合 Home	Name	Date modified	Туре	Size
🖪 Gallery	Lucid_2025-03-04_13.log	04/03/2025 13:36	Text Document	1 KB
	TEUpdateTool_2025-02-26_21.log	26/02/2025 21:59	Text Document	1 KB

Figure 5.1 LCP Log File Folder

Lucid_2021-05-04_20.log - Notepad -		×
ile <u>E</u> dit F <u>o</u> rmat <u>V</u> iew <u>H</u> elp		
4-05-2021 20:17:41 [1] INFO - ***********************************		~
4-05-2021 20:17:41 [1] INFO - Tabor Electronics		
4-05-2021 20:17:50 [1] INFO - Application Version Number: 1.3.200		
4-05-2021 20:46:54 [1] INFO - Model Name: LS1294B		
4-05-2021 20:46:54 [1] INFO		
4-05-2021 20:46:54 [1] INFO - :INST 1;, result: Failure, Error code: -1		
4-05-2021 20:46:54 [1] INFO - :SYST:ERR?;, result: Failure, Error code: -1		
4-05-2021 20:46:54 [1] INFO - :INST?;, result: Failure, Error code: -1		
4-05-2021 20:46:54 [1] INFO - ### Active Model: LS1294B, Serial: N/A ###		
4-05-2021 20:47:40 [1] INFO - :OUTP ON;, result: Failure, Error code: -1		
4-05-2021 20:47:40 [1] INFO - :SYST:ERR?;, result: Failure, Error code: -1		
4-05-2021 20:47:40 [1] INFO - :OUTP?;, result: Failure, Error code: -1		
4-05-2021 20:48:28 [1] INFO - :OUTP OFF;, result: Failure, Error code: -1		
4-05-2021 20:48:28 [1] INFO - :SYST:ERR?;, result: Failure, Error code: -1		
4-05-2021 20:48:28 [1] INFO - :OUTP?;, result: Failure, Error code: -1		
4-05-2021 20:48:29 [1] INFO - :OUTP ON;, result: Failure, Error code: -1		
4-05-2021 20:48:29 [1] INFO - :SYST:ERR?;, result: Failure, Error code: -1		
4-05-2021 20:48:29 [1] INFO - :OUTP?;, result: Failure, Error code: -1		
4-05-2021 20:50:13 [1] INFO - :FM:SOUR EXT;, result: Failure, Error code: -1		
4-05-2021 20:50:13 [1] INFO - :SYST:ERR?;, result: Failure, Error code: -1		
4-05-2021 20:50:13 [1] INFO - :FM:SOUR?;, result: Failure, Error code: -1		
4-05-2021 20:50:15 [1] INFO - :OUTP OFF;, result: Failure, Error code: -1		
4-05-2021 20:50:15 [1] INFO - :SYST:ERR?;, result: Failure, Error code: -1		
4-05-2021 20:50:15 [1] INFO - :OUTP?;, result: Failure, Error code: -1		
4-05-2021 20:50:16 [1] INFO - :OUTP ON;, result: Failure, Error code: -1		
4-05-2021 20:50:16 [1] INFO - :SYST:ERR?;, result: Failure, Error code: -1		
4-05-2021 20:50:16 [1] INFO - :OUTP?;, result: Failure, Error code: -1		
Ln 1, Col 1 100% Windows (CRLF) U	TF-8	
Figure 5-21CD Log File		

Figure 5.2 LCP Log File