TABOR ELECTRONICS

LUCID SERIES

Lucid Series RF Analog Signal Generator Programming Manual

Rev. 1.1

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Revision History

Table Document Revision History

Revision	Date	Description	Author
1.1	08-Sep-2024	• Release supporting Lucid Control Panel Ver. 1.3.470 and TE Update Tool Ver. 1.1.212, LS4091M SPI_SCPI Commands Rev 1.0, TESG SPI_SCPI Commands Rev 1.18, and Lucid FPGA version 1.18.50. • Updated formatting. • 1 Introduction – New. • Table 2.98 Query Temperature Lucid – Query length changed from 2 to 3 bytes; response length changed from 1 to 2 bytes.	Jakob Apelblat
1.0	09-Feb-2021	• Release supporting Lucid SW Ver. 1.8.15, FPGA Ver. 18111215 for HW Ver. D, 221220 for HW Ver. E and Ver. 221220 for HW Ver. F, and SPI & SCPI Commands List Summary Rev. 1.17. • Numerous changes, main changes are: ○ Minimum and Maximum Power changed from "-90 to +15" to "-100 dBm to +20dBm". ○ Minimum frequency changed from 100e3 to 9e3 (100 kHz to 9 kHz). • Table 4.1 Channel and Group Control Commands – New table. • Table 4.2 Run Mode Commands – New command GATE • Table 4.7 System Mode Commands – New commands EMULator, SCPIrevision, COMMunicate and BATtery. • Table 4.8 SCPI Common Mode Commands – Added missing mandatory common commands.	
0.9	30-Jul-2020	• Original release in Lucid device user manual supporting SPI & SCPI Commands List Summary Rev. 1.14	Jakob Apelblat

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
HP	Horizontal Pitch (PXIe module horizontal width, 1 HP = 5.08mm)
Hz	Hertz
IF	Intermediate Frequency
I/O	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)
MDR	Mini D Ribbon (connector)
MHz	Megahertz

Acronym	Description
ms	Milliseconds
NCO	Numerically Controlled Oscillator
ns	Nanoseconds
PC	Personal Computer
PCAP	Projected Capacitive Touch Panel
PCB	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 p-p	Volts, Peak-to-Peak
VSA	Vector Signal Analyzer
VSG	Vector Signal Generator
WDS	Wave Design Studio

Contents

Tables

1 Introduction

This manual lists and describes the set of SPI (Serial Peripheral Interface) and SCPI-compatible (Standard Commands for Programmable Instruments) remote commands used to operate the Lucid series RF analog signal generators (up to 12 GHz). Refer to the Lucid user manuals for a description of the functionality of the devices. The complete listing of all commands used for programming the Lucid are given in chapters 2 SPI Programming and 4 SCPI Commands List Summary.

Note
Refer to the Lucid-X Programming Manual for information about the Lucid-X (up to 40 GHz).

2 SPI Programming

Use the following instructions to control the device from your own PC application using the Lucid desktop SPI interface.

Notes

- Only Lucid desktop supports SPI programming.
- The set and query code values are in hexadecimal notation.

2.1 SPI Programming Example Lucid

The following example explains how to set the basic frequency of the generator to 1000.123456789 MHz, see Table 2.3 Set Frequency for a description of the command.

1. The command is 7 bytes long, so start with 0x00 00 00 00 00 00 00 using hexadecimal notation.
2. The set code is 0x01, so the command value becomes 0x01 00 00 00 00 00 00.
3. Set the frequency to 1000.123456789 MHz, which is E8DC00DD15, so the command value becomes 0x01 00 E8 DC 00 DD 15.
4. Write the value 0x01 00 E8 DC 00 DD 15 to the SPI bus.

Idea

- Use the MS Windows' Calculator in Programmer view to convert from decimal to hexadecimal values.

2.2 CW Mode Commands

2.2.1 RF Output

Sets the RF output On or Off.

Table 2.1 Set RF Output

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set RF Output	2	1	15:8	04	1	7:0	0 – Off, default 1 – On

Table 2.2 Query RF Output

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query RF Output	2	1	15:8	84	1	7:0	1	1	7:1	Don't Care
									0	0 – Off, default 1 – On

2.2.2 Frequency

Sets the basic frequency of the generator.

Table 2.3 Set Frequency

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Frequency	7	1	55:48	01	6	47:0	Units of 1 mHz

Resolution:..... 1 mHz

Min Value: ..... 9 kHz

Max Value Lucid: ..... 12 GHz

Default:..... 1 GHz

Table 2.4 Query Frequency

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Frequency	7	1	55:48	81	6	47:0	7	1	55:48	Don't Care
								6	47:0	Units of 1 mHz

2.2.3 Power

Sets the power (intensity) of the generator's output signal (in dBm).

Table 2.5 Set Output Power

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set output power	3	1	23:16	03	2	15:0	Power in units of 0.01 dBm

Resolution:..... Units of 0.01 dBm

Min Value: ..... -100 dBm

Max Value: ..... +20 dBm

Default:..... 5 dBm

Table 2.6 Query Output Power

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query output power	3	1	23:16	83	2	15:0	2	1	23:16	Don't Care
								2	15:0	Power in units of 0.01 dBm

2.2.4 Phase

Sets the phase offset of the signal. Phase Offset range is between **0 degrees** to **360 degrees**.

Table 2.7 Set Phase

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Phase in Degrees	3	1	23:16	02	2	15:0	Phase in units of 0.01 Degrees

Resolution:..... 0.01 Degrees

Min Value: ..... 0 Degrees

Max Value: ..... 360 Degrees

Default:..... 0 Degrees

Table 2.8 Query Phase

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Phase in Degrees	3	1	23:16	82	2	15:0	2	1	23:16	Don't Care
								2	15:0	Phase in units of 0.01 Degrees

2.3 Run Mode Commands

For software interface, see Lucid Control Panel User Manual.

2.3.1 Run Mode

Sets the Run Mode to Continuous or Trigger.

Table 2.9 Set Run Mode

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Run Mode	2	1	15:8	22	1	7:0	0 – Trigger 1 – Continuous 2 – Gate

Default:..... Continuous

Table 2.10 Query Run Mode

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Run Mode	2	1	15:8	A2	1	7:2	1	1	7:1	Don't Care
0										0 – Trigger 1 – Continuous 2 – Gate

2.3.2 Trigger Source

Sets the Trigger Source to External, Bus, or Timer.

Table 2.11 Set Trigger Source

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Trigger Source	2	1	15:8	23	1	7:0	0 – External 1 – Bus 2 – Timer 3 – SPI

Default:..... External

Table 2.12 Query Trigger Source

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Trigger Source	2	1	15:8	A3	1	7:0	1	1	7:2	Don't Care
									1:0	0 – External 1 – Bus 2 – Timer 3 – SPI

2.3.3 Trigger Edge

Sets whether a trigger is valid on the rising edge or falling edge

Table 2.13 Set Trigger Edge

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Trigger Edge	2	1	15:8	20	1	7:0	0 – Positive, default. 1 – Negative

Table 2.14 Query Trigger Edge

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Trigger Edge	2	1	15:8	A0	1	7:0	1	1	7:2	Don't Care
									1:0	0 – Positive 1 – Negative

2.3.4 Trigger Advance

Sets trigger advance mode to Once or Step

Table 2.15 Set Trigger Advance

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Trigger Advance	2	1	15:8	21	1	7:0	0 – Once, default 1 – Step

Table 2.16 Query Trigger Advance

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Trigger Advance	2	1	15:8	A1	1	7:0	1	1	7:1	Don't Care
									0	0 – Once 1 – Step

2.3.5 Trigger Count

Sets the number of triggers to generate.

Table 2.17 Set Number of Triggers

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Number of Triggers	4	1	31:24	24	3	23:0	Number of repeats.

Resolution:..... 1

Min Value: 1

Max Value: ..... 2^24-1

Default:..... 1

Table 2.18 Query Number of Triggers

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Number of Triggers	4	1	31:24	A4	3	23:0	3	3	23:0	Number of repeats.

2.3.6 Trigger Delay

Sets a delay in units of time between the receiving of the trigger signal and the generation of the output signal.

Table 2.19 Set Trigger Delay

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Trigger Delay	6	1	47:40	31	5	39:0	Time in units of 6.4/8 ns

Lucid

Resolution Lucid: ..... 6.4 ns

Min Value: 0

Max Value Lucid: ..... 2^40-1 (7036 s)

Default:.....0

Table 2.20 Query Trigger Delay

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Trigger Delay	6	1	47:40	B1	5	39:0	3	5	39:0	Time in units of 6.4/8 ns

2.3.7 Trigger Timer

Sets the timer to generate the triggers.

Table 2.21 Set Trigger Timer

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Trigger Timer	6	1	47:40	25	5	39:0	Time in units of 6.4/8 ns

Lucid

Resolution Lucid: ..... 6.4 ns

Min Value Lucid: ..... 156 (1 µs)

Max Value Lucid: ..... 2^40-1 (7036 s)

Default Lucid:..... 156,250 (1 ms)

Table 2.22 Query Trigger Timer

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Trigger Timer	6	1	47:40	A5	5	39:0	5	5	39:0	Time in units of 6.4/8 ns

2.3.8 Trigger

Sets off a Trigger.

For use when the Trigger source is the computer (Bus).

Table 2.23 Set Trigger Function

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Trigger Function	2	1	15:8	26	1	7:0	Don't Care

2.4 Modulations Mode Commands

Refer to the "Lucid Control Panel User Manual" for the PC application.

2.4.1 Amplitude Modulation

Sets AM modulation On/Off.

Table 2.24 Set AM Modulation

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set AM Mod. On/Off	2	1	15:8	0D	1	7:0	0 – Off 1 – On

Default:..... Off

Table 2.25 Query AM Modulation State

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query AM Mod. State	2	1	15:8	8D	1	7:0	1	1	7:1	Don't Care
									0	0 – Off 1 – On

2.4.2 Amplitude Modulation Source

Sets the source of the AM signal.

Table 2.26 Set Amplitude Modulation Source

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set AM. Mod. Source	2	1	15:8	0E	1	7:0	0 – Internal 1 – External

Default:..... Internal

Table 2.27 Query Amplitude Modulation Source

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query AM. Mod. Source	2	1	15:8	8E	1	7:0	1	1	7:1	Don't Care
									0	0 – Internal 1 – External

2.4.3 Amplitude Modulation Frequency

Sets the AM modulation frequency.

Table 2.28 Set Modulation Frequency

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Mod. Frequency	4	1	31:24	0F	3	23:0	Units of 1 Hz

Resolution:..... 1 Hz

Min Value: ..... 0 Hz

Max Value: ..... 100 kHz

Default:..... 10 kHz

Table 2.29 Query Modulation Frequency

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Mod. Frequency	4	1	31:24	8F	3	23:0	3	3	23:0	Units of 1 Hz

2.4.4 Amplitude Modulation Depth

Sets the AM Modulation depth in percent.

Table 2.30 Set AM Depth

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set AM Depth	3	1	23:16	10	2	15:0	Units of 0.1%

Resolution:..... 0.1%

Min Value: 0 (0%)

Max Value: 1000 (100%)

Default:..... 500 (50%)

Table 2.31 Query AM Depth

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query AM Depth	3	1	23:16	90	2	31:0	2	2	15:0	Units of 0.1%

2.4.5 Frequency Modulation

Sets the FM modulation On/Off.

Table 2.32 Set FM Modulation

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set FM Mod. On/Off	2	1	15:8	09	1	7:1	Don't care
						0	0 – Off, default 1 – On

Table 2.33 Query FM Modulation State

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query FM Mod. State	2	1	15:8	89	1	7:0	1	1	7:1	Don't Care
									0	0 – Off 1 – On

2.4.6 Frequency Modulation Source

Sets the FM source Internal or External.

Table 2.34 Set FM Modulation Source

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set FM Mod. Source	2	1	15:8	0A	1	7:1	Don't Care
						0	0 – Internal, default 1 – External

Table 2.35 Query FM Modulation Source

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query FM Mod. Source	2	1	15:8	8A	1	7:0	1	1	7:1	Don't Care
									0	0 – Internal 1 – External

2.4.7 Frequency Modulation Frequency

Sets the FM frequency.

Table 2.36 Set Modulation Frequency

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Mod. Frequency	4	1	31:24	0B	3	23:0	Units of 1 Hz

Resolution:..... 1 Hz

Min Value: ..... 1 Hz

Max Value: ..... 1 MHz

Default: ..... 100 kHz

Table 2.37 Query Modulation Frequency

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Mod. Frequency	4	1	31:24	8B	3	23:0	3	3	23:0	Units of 1 Hz

2.4.8 Frequency Modulation Deviation

Sets the FM deviation.

Table 2.38 Set FM Deviation

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set FM Deviation	5	1	39:32	0C	4	31:24	Don't care
						23:0	Units of 1 Hz

Resolution: ..... 1 Hz

Min Value: ..... 1 Hz

Default: ..... 1 MHz

Max Value: ..... 5 MHz

Table 2.39 Query FM Deviation

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query FM Deviation	5	1	39:32	8C	1	31:24	4	1	31:24	Don't care
								3	23:0	Units of 1 Hz

2.4.9 Phase Modulation

Sets the Phase modulation On/Off.

Table 2.40 Set Phase Modulation

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Phase Mod.	2	1	15:8	5F	1	7:1	Don't care
						0	0 – Off, default 1 – On

Table 2.41 Query Phase Modulation

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Phase Mod.	2	1	15:8	DF	1	7:0	1	1	7:1	Don't Care
									0	0 – Off 1 – On

2.4.10 Phase Modulation Frequency

Sets the Phase Modulation frequency.

Table 2.42 Set Phase Modulation Frequency

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Phase Mod. Freq.	4	1	31:24	5E	3	23:0	Units of 1 Hz

Resolution:..... 1 Hz

Min Value: ..... 1 Hz

Max Value: ..... 1 MHz

Default:..... 100 kHz

Table 2.43 Query Phase Modulation Frequency

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Phase Mod. Freq.	4	1	31:24	DE	3	23:0	3	3	23:0	Units of 1 Hz

2.4.11 Phase modulation Deviation

Sets the Phase modulation deviation.

Table 2.44 Set Phase Modulation Deviation

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Phase Mod. Dev.	3	1	23:16	5D	2	15:0	Units of 0.01 degrees

Resolution:..... 0.01 Degrees

Min Value: ..... 0 Degrees

Default:..... 0 Degrees

Max Value: ..... 360 Degrees

Table 2.45 Query Phase Modulation Deviation

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Phase Mod. Dev.	3	1	23:16	DD	2	31:0	2	2	15:0	Units of 0.01 degrees

2.4.12 Pulse Modulation

Sets the Pulse Modulation On or Off.

Table 2.46 Set Pulse Modulation

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Pulse Modulation On/Off	2	1	15:8	05	1	7:0	0 – Off 1 – On

Default:..... Off

Table 2.47 Query Pulse Modulation Status

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Pulse Modulation Status	2	1	15:8	85	1	7:0	1	1	7:1	Don't Care
									0	0 – Off 1 – On

2.4.13 Pulse Modulation Source

Sets the Pulse Modulation source to Internal or External.

Table 2.48 Set Pulse Modulation Source

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Pulse Modulation Source	2	1	15:8	06	1	7:0	0 – Internal, default 1 – External

Table 2.49 Query Pulse Modulation Source

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Pulse Modulation Source	2	1	15:8	86	1	7:0	1	1	7:1	Don't Care
									0	0 – Internal 1 – External

2.4.14 Pulse Modulation Frequency

Sets the Pulse repetition frequency.

Table 2.50 Set Pulse Modulation Frequency

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Pulse Mod. Freq.	4	1	31:24	07	3	23:0	Units of 1 Hz

Resolution:..... Units of 1 Hz

Min Value: ..... 1 Hz

Max Value: ..... 10 MHz

Default:..... 1 MHz

Table 2.51 Query Pulse Modulation Frequency

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Pulse Mod. Freq.	4	1	31:24	87	3	23:0	3	3	23:0	Units of 1 Hz

2.4.15 Pulse Modulation Width

Sets the width of the pulse.

Table 2.52 Set Pulse Modulation Width

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Pulse Mod. Width	5	1	39:32	08	4	31:0	Units of 6.4 ns

Lucid

Resolution:..... Units of 6.4 ns

Min Value: ..... 5 (32 ns)

Max Value: ..... 2^24-1 (0.107 s)

Default:..... 50 (320 ns)

Table 2.53 Query Pulse Modulation Width

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Pulse Mod. Width	5	1	39:32	88	4	31:0	4	4	31:0	Units of 6.4/8 ns

2.4.16 Pulse Pattern

Sets the pulse pattern state On or Off.

Table 2.54 Set Pattern Modulation

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Pattern Modulation	2	1	15:8	59	1	7:0	0 – Off 1 – On

Default:..... Off

Table 2.55 Query Pattern Modulation Status

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Pattern modulation status	2	1	15:8	D9	1	7:0	1	1	7:1	Don't Care
									0	0 – Off 1 – On

2.4.17 Pulse Pattern Repetitions

Sets the number of repetitions of current step. When set to 0 enables editing of a previously defined step.

Table 2.56 Set Number of Repetitions for Pattern Step

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Number of Repetitions for Pattern Step	3	1	23:16	5A	2	15:0	Repetitions count

Resolution:..... 1

Min Value (edit step):0

Min Value: ..... 1 repetition

Max Value: ..... 65535 repetitions

Default:..... 1

Table 2.57 Query Number of Repetitions for Pattern Step

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Number of Repetitions for Pattern Step	3	1	23:16	DA	2	15:0	2	2	15:0	Repetitions count

2.4.18 Pulse Pattern On Time

Sets the On Time of the current pulse step. To edit a previously defined step, set pulse repetitions and pulse off time to 0, then with the pulse On Time command send the value of the step to edit. The maximum number of steps is 2048.

Table 2.58 Set Pulse On Time/ Set Pattern Step to Edit

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Pulse On Time/ Set Pattern Step to Edit	7	1	55:48	5B	6	47:0	Units of 6.4 ns

Lucid

Resolution:..... Units of 6.4 ns

Min Value (step#): 1

Max Value (step#): ... 2048

Min Value (On Time): 5 (32 ns)

Max Value(On Time): 2^48-1 (20.8 days)

Default:..... 78,125 (500 ns)

Table 2.59 Query Pulse On Time

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Pulse On Time	7	1	55:48	D7	3	47:0	6	6	47:0	Units of 6.4 ns

2.4.19 Pulse Pattern Off Time

Sets the Off Time of the current pulse step. When set to 0 enables edition of previously defined step

Table 2.60 Set Pulse Off Time

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Pulse Off Time	7	1	55:48	5C	6	47:0	Units of 6.4/8 ns

Lucid

Resolution:..... Units of 6.4 ns

Min Value (edit step):0

Min Value: ..... 5 (32 ns)

Max Value: ..... 2^48-1 (20.8 days)

Default:..... 78,125 (500 ns)

Table 2.61 Query Pulse Off Time

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Pulse Off Time	7	1	55:48	D8	6	47:0	6	6	47:0	Units of 6.4/8 ns

2.5 Sweep Mode Commands

For software interface, see “Lucid Control Panel User Manual”.

2.5.1 Frequency Sweep

Table 2.62 Set Frequency Sweep

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Frequency Sweep	2	1	15:8	11	1	7:0	Don’t Care.
						0	0 – Off, default 1 – On

Table 2.63 Query Frequency Sweep

Description	Command Length (Bytes)	Command					Response			
		Header			Don’t Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Frequency Sweep	2	1	15:8	91	1	7:0	1	1	7:1	Don’t Care
									0	0 – Off 1 – On

2.5.2 Frequency Sweep Start

Sets the start frequency of the sweep.

Table 2.64 Set Sweep Start Frequency

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Sweep Start Freq.	7	1	55:48	12	6	47:0	Units of 1 mHz

Resolution:..... 1 mHz

Min Value: ..... 9 kHz

Max Value Lucid: ..... 12 GHz

Default:..... 1 GHz

Table 2.65 Query Sweep Start Frequency

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Sweep Start Freq.	7	1	55:48	92	6	47:0	6	6	47:0	Units of 1 mHz

2.5.3 Frequency Sweep Stop

Sets the stop frequency of the sweep.

Table 2.66 Set Sweep Stop Frequency

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Sweep Stop Freq.	7	1	55:48	13	6	47:0	Units of 1 mHz

Resolution:..... 1 mHz

Min Value: ..... 9 kHz

Max Value Lucid: ..... 12 GHz

Default:..... 2 GHz

Table 2.67 Query Sweep Stop Frequency

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Sweep Stop Freq.	7	1	55:48	93	6	47:0	7	6	47:0	Units of 1 mHz

2.5.4 Frequency Sweep Steps

Sets the number of steps in the sweep.

Table 2.68 Set Number of Steps

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set number of steps	3	1	23:16	14	2	15:0	Number of Steps

Resolution:..... 1 Step

Min Value: ..... 2 Steps

Max Value: ..... 65535 Steps

Default:..... 1000 Steps

Table 2.69 Query Number of Steps

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query number of steps	3	1	23:16	94	2	15:0	7	2	15:0	Units of 1 steps

2.5.5 Frequency Sweep Step Time

Sets the duration (dwell) of the step in 6.4/8 ns units.

Table 2.70 Set Frequency Sweep Step Time

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Freq. Sweep Step Time.	6	1	47:40	15	5	39:0	Time in units of 6.4/8 ns

Lucid

Resolution:..... 6.4 ns

Min Value: ..... 15,625 (100 µs)

Max Value: ..... 2^40-1 (7036 s)

Default:..... 156,250 (1 ms)

Table 2.71 Query Frequency Sweep Step Time

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Freq. Sweep Step Time.	6	1	47:40	95	6	39:0	5	5	39:0	Time in units of 6.4/8 ns

2.5.6 Frequency Sweep Direction

Table 2.72 Set Sweep Direction

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Sweep Direction	2	1	15:8	16	1	7:1	Don't Care
						0	0 – Normal (goes from start to stop), default 1 – UpDown (goes from start to stop and back to start)

Table 2.73 Query Sweep Direction

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Sweep Direction	2	1	15:8	96	1	7:0	1	1	7:1	Don't Care
									0	0 – Normal 1 – UpDown

2.5.7 Power Sweep

Turns Power Sweep On or Off.

Table 2.74 Set Power Sweep

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Power Sweep	2	1	15:8	17	1	7:1	Don't Care
						0	0 – Off, default 1 – On

Table 2.75 Query Power Sweep

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Set Code	Bytes	Bits				
Query Power Sweep	2	1	15:8	97	1	7:0	1	1	7:1	Don't Care
									0	0 – Off 1 – On

2.5.8 Power Sweep Start

Sets the start power of the sweep.

Table 2.76 Set Sweep Start Power

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Sweep Start Power	3	1	23:16	18	3	15:0	Sweep Start power in units of 0.01 dBm

Resolution:..... Units of 0.01 dBm

Min Value: ..... -100 dBm

Max Value: ..... +20 dBm

Default:..... -5 dBm

Table 2.77 Query Sweep Start Power

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Sweep Start power	3	1	23:16	98	2	15:0	2	2	15:0	Sweep Start power in units of 0.01 dBm

2.5.9 Power Sweep Stop

Sets the stop power of the sweep.

Table 2.78 Set Sweep Stop Power

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Sweep Stop Power	3	1	23:16	19	2	15:0	Sweep stop power in units of 0.01 dBm

Resolution:..... Units of 0.01 dBm

Min Value: ..... -100 dBm

Max Value: ..... +20 dBm

Default:..... 5 dBm

Table 2.79 Query Sweep Stop Power

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Sweep Stop Power	3	1	23:16	99	2	15:0	2	2	15:0	Sweep stop power in units of 0.01 dBm

2.5.10 Power Sweep Steps

Sets the number of steps in the sweep.

Table 2.80 Set Power Sweep Steps

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Power Sweep Steps	4	1	31:24	1A	3	23:0	Number of steps

Resolution:..... 1 Step

Min Value: ..... 2 Steps

Max Value: ..... 16,777,215 Steps

Default:..... 10 Steps

Table 2.81 Query Power Sweep Steps

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Power Sweep Steps	4	1	31:24	9A	3	23:0	3	3	23:0	Number of steps

2.5.11 Power Sweep Step Time

Sets the duration of the step in 6.4 ns units.

Table 2.82 Set Power Sweep Step Time

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Power Sweep Step Time	6	1	47:40	1B	5	39:0	Time in units of 6.4/8 ns

Lucid

Resolution:..... 6.4 ns

Min Value: ..... 15,625 (100 µs)

Max Value: ..... 2^40-1 (7036 s)

Default:..... 156,250 (1 ms)

Table 2.83 Query Power Sweep Time

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Power Sweep Time	6	1	47:40	9B	5	39:0	5	5	39:0	Time in units of 6.4/8 ns

2.5.12 Power Sweep Direction

Sets the sweep direction.

Table 2.84 Set Power Sweep Direction

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Power Sweep Direction	2	1	15:8	1C	1	7:1	Don't Care
						0	0 – Normal, default 1 – UpDown

Table 2.85 Query Power Sweep Direction

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Set Code	Bytes	Bits				
Query Power Sweep Direction	2	1	15:8	9C	1	7:0	1	1	7:2	Don't Care
									1:0	0 = Normal 1 = UpDown

2.6 List Mode Commands

For software interface, see “Lucid Control Panel User Manual”.

2.6.1 List

Sets the list of frequencies and power to generate.

Table 2.86 Set List of Frequencies and Power to Generate

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set List of Freq. and Power to Generate	16	1	127: 120	1F	15	119:88	Dwell time in units of 1 µs
						87:82	Don’t Care
						81	0 – Advance False, default 1 – Advance True
						80	0 – Last Entry False, default 1 – Last Entry True
						79:64	Power in units of 0.01 dBm
						63:16	Frequency in units of 1 mHz
						15:0	Step Number

Step Number

Resolution:..... 1

Min Value: 2

Max Value: 4096

Frequency

See 2.2.2 Frequency, page 16.

Power

See 2.2.3 Power, page 16.

Dwell time

Resolution:..... 1 µs

Min Value: 100

Max Value: ..... 2^32-1

Table 2.87 Query List of Frequencies and Power to Generate

Description	Command Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query List of Freq. and Power to Generate	16	1	127:120	9F	15	119:0	15	4	119:88	Dwell time in units of 1 µs
								1	87:82	Don 't Care
									81	0 – Advance False 1 – Advance True
									80	0 –Last Entry False 1 – Last Entry True
								2	79:64	Power in units of 0.01 dBm
								6	63:16	Frequency in units of 1 mHz
								2	15:0	Step Number

2.6.2 List Enable

Sets the List function On or Off.

Table 2.88 Set List Function

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set List Function	2	1	15:8	1D	1	7:1	Don't Care
						0	0 – Off, default 1 – On

Table 2.89 Query List Function

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query List Function	2	1	15:8	9D	1	7:0	1	1	7:1	Don't Care
									0	0 – Off 1 – On

2.6.3 Delete List

Deletes the list of frequencies.

Table 2.90 Delete List Function

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Delete List Function	2	1	15:8	1E	1	7:1	Don't Care
						0	0 – Off 1 – On

2.7 System Commands

For software interface, see Lucid Control Panel User Manual.

2.7.1 Save Setup

Saves a numbered setup file to the Signal Generator. Refer to the Lucid Control Panel User Manual section “System Tab”.

Table 2.91 Set Save Setup

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Save Setup	2	1	15:8	28	1	7:0	Save the numbered setup file 1 to 5

2.7.2 Erase Setup

Deletes a numbered setup file in the Signal Generator.

Table 2.92 Set Erase Setup

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Erase Setup	2	1	15:8	27	1	7:0	Erases the numbered setup file 1 to 5

2.7.3 Recall Setup

Recalls a numbered setup file from the Signal Generator.

Table 2.93 Set Recall Setup

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Recall Setup	2	1	15:8	29	1	7:0	Recall the numbered setup file 1 to 5

2.7.4 Powerup

Sets the numbered setup file that the Signal Generator loads when powering up.

Table 2.94 Set Power-Up Setup File

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set Power-Up Setup File	2	1	15:8	2A	1	7:0	Set the numbered setup file loaded on power-up. 0 – Factory setup file. 1..5 – User setup files.

Default: ..... 0 (factory default)

Table 2.95 Query Power-Up Setup File

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Power-Up Setup File	2	1	15:8	AA	1	7:0	1	1	7:0	Query numbered setup file loaded on power-up; 0 to 5

2.7.5 Reset

Resets all the parameters to factory default.

Table 2.96 Reset

Description	Command Length (Bytes)	Header			Parameters		
		Bytes	Bits	Set Code	Bytes	Bits	Value
Set reset	2	1	15:8	2B	1	7:0	Don't Care

2.7.6 System Information

Can only be used as a query. Its response is the full system information of the instrument including model ID, options, model name, serial number, calibration date and HW revision.

Table 2.97 Query System Information

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query System Information	2	1	15:8	D2	1	7:0	24	1	3:0	Model ID and Options. Frequency options Lucid: 3 | 6 | 12 Frequency options
									4	1 – Modulation Package (AM, FM, PM)
									5	1 – Pulse Generator
									6	1 – Fast Switching
									7	1 – Low Power (-90 dBc)
								2	8	1 – Emulator Pack
									9	1 – Pattern Generator
									15:10	N/A
								3:9	71:16	Model Name (ASCII value)
								10:17	135:72	Serial Number. Byte for each digit.
								18:23	183:136	Calibration Date: Day('DD') Month('MM') Year('YY') Hour('HH') Minutes('mm') Second('SS')
								24	191:184	HW version (ASCII Value)

2.7.7 Temperature

Can only be used as a query. Its response is the temperature (°C) of the Lucid signal generator.

Table 2.98 Query Temperature Lucid

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Temperature	3	1	23:16	B4	2	15:0	2	2	15:0	Temperature

2.7.8 Firmware

Can only be used as a query. Its response is the number of the currently installed firmware version.

Table 2.99 Query Firmware

Description	Query Length (Bytes)	Command					Response			
		Header			Don't Care		Response Length (Bytes)	Bytes	Bits	Value
		Bytes	Bits	Query Code	Bytes	Bits				
Query Firmware	2	1	15:8	EC	1	7:0	1	1	7:0	FW version number

3 SCPI Introduction

This manual lists and describes the set of SCPI-compatible (Standard Commands for Programmable Instruments) remote commands used to operate the Tabor Lucid series RF analog signal generator. Refer to the Lucid User Manual for a description of the functionality of the device. The complete listing of all commands used for programming the Lucid is given in chapter 4 SCPI Commands List Summary, page 48. Refer to Lucid User Manual to find additional information about the SCPI parameters.

3.1 SCPI Syntax and Styles

Where possible, the syntax and styles used in this section follow those defined by the SCPI consortium. The commands on the following pages are broken into three columns; the Keyword, the Parameter Form, Default and HS command equivalent.

The Keyword column provides the name of the command. The actual command consists of one or more keywords, since SCPI commands are based on a hierarchical structure, also known as the tree system. Square brackets ([ ]) are used to enclose a keyword that is optional when programming the command. Therefore, the device will process the command to have the same effect whether the optional node is omitted by the programmer, or not. Letter case in tables is used to differentiate between the accepted short form (upper case) and the long form (upper and lower case).

The Parameter Form column indicates the number and order of a parameter in a command and their legal value. Parameter types are distinguished by enclosing the type in angle brackets (< >). If parameter form is enclosed by square brackets ([ ]) these are then optional (pay attention to be sure that optional parameters are consistent with the intention of the associated keywords). The vertical bar (|) can be read as "or" and is used to separate alternative parameter options.

Table 3.1 SCPI Syntax and Styles

Convention	Description	Example
{}	Braces indicate that parameters may be used in the command once, or several times, or not at all.	:LIST:POWer <val>{,<val>} a single power listing: LIST:POWer 5 a series of power listings: LIST:POWer 5,10,15,20
<>	Angle brackets indicate that their contents are not to be used literally in the command. They represent the required parameters.	:FREQuency:STARt <val><unit> In this command, the words <val> and <unit> should be replaced by the actual frequency and unit. :FREQuency:STARt 2.5GHZ
[]	Square brackets indicate that the enclosed keywords or parameters are optional when composing the command. The commands will be executed even if they are omitted.	:FREQuency[:CW]? SOURce and CW are optional items.
|	A vertical stroke between keywords or parameters indicates alterative choices. For parameters, the effect of the command varies depending on the choice.	:AM:MOD DEEP|NORMal DEEP or NORMal are the choices.

3.2 IEEE-STD-488.2 Common Commands and Queries

Since most instruments and devices in an ATE (Automatic Test Equipment) system use similar commands that perform similar functions, the IEEE-STD-488.2 document has specified a common set of commands and queries that all compatible devices must use. This avoids situations where devices from various manufacturers use different sets of commands to enable functions and report status.

The IEEE-STD-488.2 treats common commands and queries as device dependent commands. For example, *TRG is sent over the bus to trigger the instrument. Some common commands and queries are optional, but most of them are mandatory. Refer to Table 4.8 SCPI Common Mode Commands, page 56.

3.3 SCPI Parameter Type

The SCPI language defines four different parameter types to be used in program messages and response messages: numeric, discrete, Boolean, binary block.

3.3.1 Numeric Parameters

Commands that require numeric parameters will accept all commonly used decimal representations of numbers including optional signs, decimal points, and scientific notation. Special values for numeric parameters like MINimum and MAXimum are also accepted.

Engineering units using numeric parameters (e.g., MHz or kHz) can also be sent. If only specific numeric values are accepted, the function generator will ignore values which are not allowed and will generate an error message. The following command is an example of a command that uses a numeric parameter:

```
VOLT:AMPL <amplitude>
```

3.3.2 Discrete Parameters

Discrete parameters are used to program settings that have a limited number of values (i.e., FIXed, USER and SEQuence). They have short and long form command keywords. Upper and lowercase letters can be mixed. Query responses always return the short form in all uppercase letters. The following command uses discrete parameters:

```
SOUR:FUNC:MODE {FIXed | USER | SEQuence}Examples
```

3.3.3 Boolean Parameters

Boolean parameters represent a single binary condition that is either true or false. The generator accepts "OFF" or "0" for a false condition. The generator accepts "ON" or "1" for a true condition. The instrument always returns "0" or "1" when a boolean setting is queried. The following command uses a boolean parameter:

```
OUTP:FILT { OFF | ON }
```

The same command can also be written as follows:

```
OUTP:FILT {0 | 1 }
```

3.3.4 Binary Block Parameters

Binary block parameters are used for transferring data blocks to the generator, for example, waveforms, segment table, sequence table etc. The binary block parameter format is

#<header><binary data>

Where the header, holds the data size, followed by the data itself. For example, the following command uses the binary block parameter `#42048<binary data>` to transfer a 1024 points waveform to the generator

`TRAC:DATA#42048<binary_block>`

Information on commands using binary blocks is given later in this chapter.

4 SCPI Commands List Summary

4.1 Channel and Group Control Commands

Table 4.1 Channel and Group Control Commands

Keyword	Parameter Form	Default	Notes
:INSTrument			
[:SELect]	CH1 | CH2 | CH3 | CH4 | 1 | 2 | 3 | 4	1	Set the active channel, only Lucid Benchtop.
:COUPle			
:STATe	OFF | ON | 0 | 1	1	Set or queries the couple state of the synchronized channels.

4.2 Run Mode Commands

Table 4.2 Run Mode Commands

Keyword	Parameter Form	Default	Notes
:INITiate			
:CONTinuous			
[:STATe]	OFF | ON | 0 | 1	1	
:GATE			
[:STATe]	OFF | ON | 0 | 1	0	
:TRIGger			Applies to trigger input
:SOURce	EXTernal | BUS | TIMer | SPI	EXT	Selects trigger source
:EDGe	POSitive | NEGative	POS	
:ADVance	ONCe | STEP | 0 | 1	ONCe	
:COUNt	1 to 16,777,215	1	Counted bursts
:DELay	0 to 7036	0	
:TIMer			
:TIME	6.4e-9 to 7036	1e-3	

4.3 CW Mode Commands

Table 4.3 CW Mode Commands

Keyword	Parameter Form	Default	Notes
:OUTPut			
[:STATe]	OFF | ON | 0 | 1	0	Toggles output on/off.
[:SOURce]			
:FREQuency	Lucid: 9e3 to 12e9	1e9	Set the frequency of the signal in Hz.
:POWer	-100.00 to 20.00	5	Set or query the power of the generated signal in units of dBm.
:PHASe	0 to 360.00	0	Set or query the phase of the generated signal in units of degrees.
:ROSCillator			
:SOURce	INTernal | EXTernal	INT	Use an internal or external reference clock.
[:EXTernal]			
:FREQuency	10e6 | 100e6	10e6	Set the external reference clock to 10 MHz or 100 MHz.

4.4 List Mode Commands

Table 4.4 List Mode Commands

Keyword	Parameter Form	Default	Notes
[:SOURce]			
:LIST			
[:STATe]	OFF | ON | 0 | 1	0	Set or query the state of the list mode of the Lucid unit.
:DATA	#<header><binary_block>		Download list data to the Lucid unit.
:DEFine	<step>,<frequency>,<power>,<last_entry>,<advance>, <dwell>		Define an entry in the list table.
:DELete			
[:NAME]	1 to 4,096	1	Delete specified step from the list.
:ALL			Delete all predefined list steps and clear the entire list.

4.5 Modulation Mode Commands

Table 4.5 Modulation Mode Commands

Keyword	Parameter Form	Default	Notes
[:SOURce]			
:AM			
[:STATe]	OFF | ON | 0 | 1	0	Set or query the state of the amplitude modulation mode in the Lucid unit
:SOURce	INTernal | EXTernal	INT	
:INTernal			
:FREQuency	0 to 100e3	10e3	Set or query the internal amplitude modulation frequency of the Lucid unit
:DEPTh	0 to 100	50	Set or query the internal amplitude modulation in percent of the carrier wave amplitude
:FM			
[:STATe]	OFF | ON | 0 | 1	0	Set or query the state of the frequency modulation mode.
:SOURce	INTernal | EXTernal	INT	Set or query the source of the frequency modulation.
:INTernal			
:FREQuency	1 to 1e6	100e3	Set or query the internal modulation frequency (Hz).
:DEViation	1 to 5e6	1e6	Set or query the deviation of the frequency modulation.
:PM			
[:STATe]	OFF | ON | 0 | 1	0	Set or query the state of the phase modulation mode.
:SOURce	INTernal | EXTernal	INT	Set or query the source of the phase modulation.

Keyword	Parameter Form	Default	Notes
:INTernal			
:FREQuency	1 to 10e6	1e6	Set or query the modulation frequency of the phase modulation.
:DEViation	0 to 36000 units of 0.01 deg	0	Set or query the deviation of the internal phase modulation.
:PULSe			Pulse Modulation
[:STATe]	OFF | ON | 0 | 1	0	Set Pulse Mod. on/off
:SOURce	INTernal | EXTernal	INT	Set or query the source of the pulse modulation.
:FREQuency	1 to 10e6	1e6	Set or query the internal pulse modulation frequency.
:WIDTh	32e-9 to 100e-3	320 e-9	Set or query the pulse width of the internal pulse modulation.
:PATTern			Pulse pattern
[:STATe]	OFF | ON | 0 | 1	0	Set or query the state of the pattern mode.
:DATA	#<header><binary_block>		Download pattern data to the Lucid unit.
:DEFine	<step>,<ontime>,<offtime>, <repetitions>,<last_entry>		Define an entry in the pattern table.
:DELete			
[:NAME]	1 to 2047		Delete specified step from the pattern.
:ALL			Delete all predefined pattern steps and clear the entire pattern.

4.6 Sweep Mode Commands

Table 4.6 Sweep Mode Commands

Keyword	Parameter Form	Default	Notes
[:SOURce]			
:FRSWeep			Frequency Sweep

Keyword	Parameter Form	Default	Notes
[:STATe]	OFF | ON | 0 | 1	0	Set or query the state of the frequency sweep mode
:STARt	Lucid: 9e3 to 12e9	1e9	Set or query the start frequency of the frequency sweep.
:STEPs	2 to 65535	1000	Set or query the number of steps in the frequency sweep.
:STOP	Lucid: 9e3 to 12e9	2e9	Set or query the stop frequency of the frequency sweep.
:TIME	10e-6 to 7036	1e-3	Set or query the sweep time of each step of the frequency sweep.
:DIRection	NORMAL | UPDOWN | 0 | 1	NORMAL	Set or query the direction of the frequency sweep mode.
:PRSWeep			Power sweep
[:STATe]	OFF | ON | 0 | 1	0	Set or query the state of the power sweep mode.
:STARt	-100 to 20	-5	Set or query the start power of the power sweep.
:STEPs	2 to 16,777,215	10	Set or query the number of steps in the power sweep.
:STOP	-100 to 20	5	Set or query the stop power of the power sweep.
:TIME	100e-6 to 7036	1e-3	Set or query the sweep time of each step of the power sweep.
:DIRection	NORMAL | UPDOWN | 0 | 1	NORMAL	Set or query the direction of the power sweep mode.

4.7 System Commands

Table 4.7 System Mode Commands

Keyword	Parameter Form	Default	Notes
:SYSTem			
:STORe			
:TARGet	INTernal | USB	INT	Select the target of the store operation.
:SETup	1 to 5		Save the setup in specified setup file.
:CLEar			
:TARGet	INTernal | USB	INT	Select the target of the clear operation.
:SETup	1 to 5		Clear specified setup file.
:RECall			
:TARGet	INTernal | USB	INT	Select the target of the recall operation.
:SETup	1 to 5		Recall the setup file #.
:POWerup			
:SETup	(Default) 0 to 5	0	Specify the setup file to be used at power-up.
:EMULator			
:MODel	<TABOR | ANAPICO | KEYSIGHT | R&S | HOLZWORTH>	TABOR	Select the 3rd party signal generator SCPI commands to emulate.
:ERRor?			Query the device error list.
:TEMPerature?			Query the device temperature.
:INFormation			
:CALibration?			Query the calibration date.
:MODel?			Query the model.
:SERial?			Query the serial number.
:HARDware?			Query the hardware board version.
:FIRMware?			Query the FPGA firmware version.
:SCPIrevision	xx.xx.xx		Query the Tabor SCPI version.
:COMMunicate			

Keyword	Parameter Form	Default	Notes
:LAN			
:DHCP	OFF|ON|0|1		Enable DHCP (not for Lucid Desktop)
:IPADdress	<address>		Set the IPv4 address.
:MASK	<mask>		Set the network mask.
:GATeway	<address>		Set the gateway.
:HOSTname	<name>		Set the Lucid device host name.
:DNS[{1|2}]	<address>		Set the DNS server, 1 or 2, IP address.
:PORT	<port_number> 0 to 65535	10000	Set the TCP/IP port for the SCPI service.
:BATtery?	0 to 100		Query the battery charging status, %. Only Lucid Portable.

4.8 Common Commands

Table 4.8 SCPI Common Mode Commands

Keyword	Notes
*CLS	The Clear Status command clears the Status Byte Register, the Data Questionable Event Register, the Standard Event Status Register, the Standard Operation Status Register and any other registers that are summarized in the status byte.
*ESE	Standard event status enable command.
*ESE?	Standard Event Status enable query.
*ESR?	Standard event status register query.
*IDN?	The Identification query outputs an identifying string. The response will show the following information: <company name>, <model number>, <serial number>, <firmware revision>
*OPC	The Operation Complete command sets bit 0 in the Standard Event Status Register when all pending operations have finished.
*OPC?	Returns the ASCII character "1" to the output buffer after all the previous commands have been executed. The command is used for synchronization between a controller and the instrument using the MAV bit in the Status Byte or a read of the Output Queue. Reading the response to the *OPC? query has the advantage of removing the complication of dealing with service requests and multiple polls to the instrument. However, both the system bus and the controller handshake are in a temporary hold-off state while the controller is waiting to read the *OPC? query response.
*OPT?	The options query returns a comma-separated list of all of the instrument options currently installed on the signal generator.
*RST	Reset Command.
*SRE	Service request enable command.
*SRE?	Service request enable query.
*STB?	Query the status byte summary register. The *STB? command is similar to a serial poll but is processed like any other instrument command. The *STB? command returns the same result as a serial poll, but the "request service" bit (bit 6) is not cleared if a serial poll has occurred.
*TRG	Triggers the generator from the remote interface. This command affects the generator if it is first placed in the Trigger or Burst mode of operation and the trigger source is set to "BUS". If BUS is not the selected trigger source, then the command is ignored.
*TST?	The Self-Test query initiates the internal self-test and returns one of the following results:

Keyword	Notes
	0 – All tests passed. 1 – One or more tests failed.
*WAI	Wait-to-Continue Command.

5 Channel and Group Control Commands

5.1 :INSTrument[:SELect] < CH1 | CH2 | CH3 | CH4 | 1 | 2 | 3 | 4 >(?)

Description

This command will set the active channel (for a given module) or device (for standalone devices) for future programming command sequences. Subsequent commands affect the selected channel only.

Parameters

Range	Type	Default	Description
1 to 4	Discrete	1	Sets the active channel for programming.

Response

The Lucid unit will return 1 to 4 depending on the present active module setting.

Example

Command **:INST 4**

Query **:INST?**

5.2 :INSTrument:COUPle:STATe < OFF | ON | 0 | 1>(?)

Description

Sets or queries the couple state of the synchronized channels. Use this Command to cause all four channels to synchronize.

Parameters

Range	Type	Default	Description
0 - 1	Discrete	1	Sets the couple mode on and off.

Response

Lucid unit returns return 1 if the couple state is ON, or 0 if the couple state is OFF.

Example

Command :INST:COUPle:STATe ON

Query :INST:COUPle:STATe**?**

6 Run Mode Commands

6.1 :INITiate:CONTinuous[:STATe]

Command

:INITiate:CONTinuous[:STATe]{OFF/ON/0/1}(?)

Description

Use this command to set or query the run mode status.

Parameters

Range	Type	Default	Description
0 - 1	Discrete	1	"0" disables the continuous operation and forces the triggered run mode. Trigger signal is applied to the trigger input only and output waveforms will be generated only when the trigger signal is valid and true. "1 selects the continuous run mode.

Response

Lucid unit returns 1 or 0 depending on the current run mode setting.

Example

Command **:INIT:CONT OFF**

Query **:INIT:CONT?**

6.2 :INITiate:GATE[:STATe] < OFF/ON/0/1 >(?)

Command

:INITiate:GATE[:STATe] **{OFF/ON/0/1}(?)**

Description

Use this command to set or query the gated run mode status.

Parameters

Range	Type	Default	Description
0 - 1	Discrete	1	"0" forces the continuous run mode. "1" selects the gated run mode. Gating signal is applied to the trigger input only and output waveforms will be generated only when the gate signal is valid and true. The slope and level of the gating entry are programmable.

Response

Lucid unit returns 1 or 0, depending on the current run mode setting

Example

Command **:INIT:GATE OFF**

Query **:INIT:GATE?**

6.3 :TRIGger:SOURce

Command

:TRIGger:SOURce {EXTernal/BUS/TIMer/SPI}(?)

Description

Use this command to set or query the source of the trigger event that will stimulate the Lucid to generate waveforms. The source advance command will affect the generator only after it has been programmed to operate in the Trigger Run mode. Modify the Lucid to trigger run mode using the *init:cont off* command.

Parameters

Name	Type	Default	Description
<EXT>	String	EXT	Selects the TRIG 2 IN connector as the input source. All other inputs are ignored.
<BUS>	String		Selects the reception of the *TRIGger* (or the common **TRG*) command as the source.
<TIM>	String		Internally generated trigger
<SPI>	String		Selects the SPI connector as the input source, only for Lucid Desktop.

Response

Lucid returns EXT, BUS, TIM or SPI, depending on the selected trigger source setting.

Example

Command **:TRIG:SOUR BUS**

Query **:TRIG:SOUR?**

6.4 :TRIGger:EDGe

Command

`TRIGger:EDGe{POSitive/NEGative}(?)`

Description

Use this command to define or query the valid edge for the Lucid trigger input. The selection is between positive (up) and negative (down) independently for each trigger input.

Parameters

Name	Type	Default	Description
<POSitive>	String	POS	Selects the positive (up) slope for trigger.
<NEGative>	String		Selects the negative (down) slope for trigger.

Response

Lucid returns the current selection for the valid trigger slope.

Example

Command **`:TRIG:EDG NEG`**

Query **`:TRIG:EDG?`**

6.5 :TRIGger: ADVance

Command

`:TRIGger:ADV{ONCe/STEP/0/1}(?)`

Description

Use this command to define or query the trigger advance mode. In the ONCE mode whenever a valid trigger is received, the entire waveform is generated. When the STEP mode is selected, each trigger advances through the waveform sequence generating the current step.

Parameters

Name	Type	Default	Description
<ONCe>	String	ONCe	Selects the once advance mode. Every trigger generates the entire sweep or list.
<STEP>	String		Selects the step advance mode. Every trigger generates the current step and advances to the next step in the sweep or list.

Response

Lucid returns the current selection for the trigger advance mode.

Example

Command **`:TRIG:ADV STEP`**

Query **`:TRIG:EDG?`**

6.6 :TRIGger:COUNt

Command

:TRIGger:COUNt<burst>(?)

Description

Use this command to set or query the burst counter setting. This command is effective only when the Lucid unit is programmed to operate in triggered run mode (*init:cont 0*) and in trigger advance mode once (trig:adv onc).

Parameters

Name	Range	Type	Default	Description
<burst>	0 to 16,777,215	Numeric(int)	1	Programs the burst count. Following a valid trigger signal, the Lucid generates a pre-programmed number of cycles, and then resumes an idle state. The counted burst can be initiated using one of the following remote command such as **trg*, or a transition at any of the trigger input connectors.

Response

Lucid returns the present burst count value.

Example

Command **:TRIG:COUN 1000**

Query **:TRIG:COUN?**

6.7 :TRIGger:DELay

Command

:TRIGger:DELay<interval>(?)

Description

Use this command to set or query the trigger delay setting for a given trigger. The trigger delay parameter defines the interval that will elapse from a valid trigger signal to the initiation of the first output waveform. Trigger delay is turned off using the *trig:del 0* command. The trigger delay command affects the generator unit, only after it has been programmed to operate in triggered run mode. Modify the Lucid unit to triggered run mode using the *init:cont 0* command. The delay interval is programmed in time.

Parameters

Name	Range	Type	Default	Description
<interval>	0 to 7036	Numeric(int)	0	"0" turns OFF the delayed trigger function. Delay is programmed in time increments. The delay resolution is 6.4 ns. The programmed value will be rounded to the nearest multiple of 6.4 ns.

Response

Lucid returns the current trigger delay interval value.

Example

Command `:TRIG:DEL 1000`

Query `:TRIG:DEL?`

6.8 :TRIGger:TIMer:TIME

Command

`:TRIGger:TIMer<time>(?)`

Description

Use this command to set or query the period of the internal timed trigger generator. This value is associated with the internal trigger run mode only and has no effect on other trigger modes. The internal trigger generator is a free-running oscillator, asynchronous with the frequency of the output waveform. The timer intervals are measured from waveform start to waveform start.

Parameters

Name	Range	Type	Default	Description
<time>	6.4E-9 to 7036	Numeric	01e-03	Time is programmed in time increments. The time resolution is 6.4 ns. The programmed value will be rounded to the nearest multiple of 6.4 ns.

Response

Lucid returns the current internal timed trigger period value in units of seconds.

Example

Command `:TRIG:TIM 100e-06`

Query `:TRIG:TIM?`

To set a trigger refer to 3.2 IEEE-STD-488.2 Common Commands and Queries.

7 CW Mode Commands

7.1 :OUTPut[:STATe] {OFF|ON|0|1}(?)

Description

This command will set or query the output state of the Lucid unit. For safety considerations, the output is always set to off by default, even if the last instrument setting before power down was set to on.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Sets the outputs to on or off.

Response

Lucid returns 1 if the output is on, or 0 if the output is off.

Example

Command **:OUTP ON**

Query **:OUTP?**

7.2 [:SOURce]:FREQuency {<frequency>}(?)

Description

The command sets the frequency of the signal in Hertz. The frequency command can be programmed with resolutions up to 1mHz.

Parameters

Name	Range	Type	Default	Description
< frequency >	Lucid: 9e3 to 12e9	Numeric	1e9	The frequency of the signal in Hertz. The frequency command can be programmed with resolutions up to 1 mHz.

Response

Lucid returns the current signal frequency value. The returned value will be in standard scientific format (for example: 1 GHz would be returned as 1e9 – positive numbers are unsigned).

Example

Command **:FREQ 5.0e9**

Query **:FREQ?**

7.3 [:SOURce]:POWer {<power>}(?)

Description

Use this command to set or query the power of the generated signal in units of dBm.

Parameters

Name	Range	Type	Default	Description
< power >	-100 to 20	Numeric	5	Sets the power of the signal in decibels. The power command can be programmed with a resolutions of 0.01 dBm.

Response

Lucid returns the current signal power value.

Example

Command `:POW 5`

Query `:POW?`

7.4 [:SOURce]:PHASe{ <phase>}(?)

Description

Use this command to set or query the phase of the generated signal in units of degrees.

Parameters

Name	Range	Type	Default	Description
< phase >	0 to 360	Numeric	0	Sets the phase of the signal in degrees. The phase command can be programmed with resolutions up to 0.01 degrees.

Response

Lucid returns the current phase of the signal.

Example

Command `:PHAS 120`

Query `:PHAS?`

7.5 :ROSCillator:SOURce{< INTernal | EXTernal>}(?)

Description

This command sets the use of an internal or external reference clock.

Parameters

Name	Type	Default	Description
INTernal	Discrete	INT	Set the use of an internal reference clock.
EXTernal	Discrete	INT	Set the use of an internal reference clock.

Response

Lucid returns INT/EXT if an internal/external reference clock is used.

Example

Command **:ROSC:SOUR EXT**

Query **:ROSC:SOUR?**

7.6 :ROSCillator[:EXTernal]:FREQuency{ <10e6 | 100e6>}(?)

Description

Use this command to set the external reference clock to 10 MHz or 100 MHz.

Parameters

Value	Discrete	Type	Default	Description
< 10e6 | 100e6>	10e6 to 100e6	Numeric	10e6	Set the external reference clock to 10 MHz or 100 MHz.

Response

Lucid returns the frequency of the external reference clock.

Example

Command **:ROSC:SOUR:FREQ 100e6**

Query **:ROSC:SOUR:FREQ?**

8 List Mode Commands

8.1 [:SOURCE]:LIST[:STATe]{< OFF|ON|0|1>}(?)

Description

This command will set or query the state of the list mode in the Lucid unit.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Sets the list state on and off.

Response

Lucid returns 1 if the list is being generated, or 0 if it is off.

Example

Command `:LIST ON`

Query `:LIST?`

8.2 [:SOURCE]:LIST:DATA{ #<header><binary block>}(?)

Description

This command will download list data to the Lucid unit. List data is loaded to the Lucid unit using high-speed binary data transfer. High-speed binary data transfer allows any number of 8-bit bytes to be transmitted in a message. This command is particularly useful for sending large quantities of data. As an example, the next command will download to the generator a block of list-related data of 40 entries:

LIST:DATA #3600<binary_block>

This command causes the transfer of 600 bytes of data (40 list entries). The <header> is interpreted this way:

- The ASCII "#" ($23) designates the start of the binary data block.
- "3" designates the number of digits that follow representing the binary data block size in bytes.
- "600" is the number of bytes to follow.
- <binary_block> represents list-related data. Each entry in the list is represented by 15 bytes as follows:

Bit	Value
119:88	Dwell time in units of 1 µsec
87:82	N/A
81	Advance 0 –False 1 – True
80	Last Entry 0 – False 1 – True
79:64	Power in units of 0.01 dBm
63:16	Frequency in units of 1 mHz
15:0	Step number

Parameters

Name	Type	Description
< header >	Discrete	Contains information on the size of the binary block that follows.
< binary_block >	Binary	Block of binary data that contains list-related data, as explained above.

Example

Command **`:LIST:DATA #3600<binary_block>`**

8.3 [:SOURCE]:LIST:DEFine{<step>,<frequency>,<power>,<last_entry>,<advance>,<dwell>}(?)

Description

Use this command to fully define an entry in the list table.

Parameters

Name	Range	Type	Default	Description
< step >	2 to 4096	Numeric	-	Set the list step #.
<frequency>	9e3 to 12e9	Numeric	1e9	Frequency of the signal to be generated in the current step
<power>	-100 to 20	Numeric(int)	5	Power of signal to be generated in the current step.
<last_entry>	0 or 1	Discrete	0	Define whether this is the last step in the list.
<advance>	0 or 1	Discrete	0	Define the behavior of the step with respect to trigger. 0 – Step is generated and advances automatically to the next step. 1 – Current step is generated only when a valid trigger is received.
<dwell>	100e-6 to 4295	Numeric	1e-3	Specify the amount of time to generate the current signal.

Response

Lucid returns the state of all parameters for the current step.

Example

Command `:LIST:DEF 1, 2e9, 0, 0, 1e-3`

Query `:LIST:DEF?`

8.4 [:SOURCE]:LIST:DELete[:NAME]{ <step_#>}

Description

This command will delete specified step from the list.

Parameters

Name	Range	Type	Description
< step >	1 to 4096	Numeric(int)	Selects the step number that will be deleted.

Example

Command `:LIST:DEL 1`

8.5 [:SOURCE]:LIST:DELete:ALL

Description

This command will delete all predefined list steps and clear the entire list. This command is particularly useful in case you want to start defining a new list from scratch.

Example

Command `:LIST:DEL ALL`

9 Modulation Mode Commands

9.1 [:SOURCE]:AM:[STATe]{< OFF|ON|0|1>}(?)

Description

This command will set or query the state of the amplitude modulation mode in the Lucid unit.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Set the AM state on or off.

Response

Lucid returns 1 if the AM is being generated or 0 if it is off.

Example

Command **`:AM ON`**

Query **`:AM?`**

9.2 [:SOURCE]:AM:SOURce{< INTernal/EXTernal>}(?)

Description

This command will set or query the source of the amplitude modulation in the Lucid unit.

Parameters

Name	Type	Default	Description
<INT>	string	INT	Sets the AM source to internal.
<EXT>	string		Sets the AM source to external.

Response

The Lucid will return INT or EXT depending on the selected source of the amplitude modulation.

Example

Command **`:AM:SOUR EXT`**

Query **`:AM:SOUR?`**

9.3 [:SOURCE]:AM:INTernal:FREQuency{< frequency>}(?)

Description

This command will set or query the internal amplitude modulation frequency of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
<frequency>	1 to 100e3	Numeric(int)	10e3	Sets the internal amplitude modulation frequency (Hz).

Response

The Lucid will return the value of the internal amplitude modulation frequency.

Example

Command **`:AM:INT:FREQ 1e3`**

Query **`:AM:INT:FREQ?`**

9.4 [:SOURCE]:AM:DEPTh{< depth>}(?)

Description

This command will set or query the internal amplitude modulation in percent of the carrier wave amplitude.

Parameters

Name	Range	Type	Default	Description
< depth >	0 to 100	Numeric(int)	50	Sets the internal amplitude modulation depth.

Response

The Lucid will return the value of the internal amplitude modulation depth.

Example

Command **`:AM:DEPT 100`**

Query **`:AM:DEPT?`**

9.5 [:SOURCE]:FM[:STATe]]{< OFF|ON|0|1>}(?)

Description

This command will set or query the state of the frequency modulation mode in the Lucid unit.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Sets the FM state on and off.

Response

Lucid returns 1 if the FM is being generated, or 0 if it is off.

Example

Command **:FM ON**

Query **:FM?**

9.6 [:SOURCE]:FM:SOURce{< INTernal|EXTernal>}(?)

Description

This command will set or query the source of the frequency modulation in the Lucid unit.

Parameters

Name	Type	Default	Description
<INT>	string	INT	Sets the FM source to internal.
<EXT>	string		Sets the FM source to external.

Response

The Lucid will return INT or EXT depending on the selected source of the frequency modulation.

Example

Command **:FM:SOUR EXT**

Query **:FM:SOUR?**

9.7 [:SOURCE]:FM:INTernal:FREQuency{< frequency>}(?)

Description

This command will set or query the modulation frequency (Hz).

Parameters

Name	Range	Type	Default	Description
< frequency >	1 to 1e6	Numeric(int)	100e3	Set the modulation frequency (Hz).

Response

The Lucid will return the value of the internal modulation frequency.

Example

Command `:FM:INT:FREQ 1e3`

Query `:FM:INT:FREQ?`

9.8 [:SOURCE]:FM:DEViation{< deviation>}(?)

Description

Set or query the frequency deviation of the carrier wave in (Hz).

This command will set or query the deviation of the internal frequency modulation of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< deviation >	1 to 5e6	Numeric(int)	1e6	Sets the deviation frequency of the internal frequency modulation.

Response

The Lucid will return the value of the deviation of the internal frequency modulation.

Example

Command `:FM:DEV 10000`

Query `:FM:DEV?`

9.9 [:SOURCE]:PM[:STATe]{< OFF|ON|0|1>}(?)

Description

This command will set or query the state of the phase modulation mode.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Sets the PM state on and off.

Response

Lucid returns 1 if the PM is being generated, or 0 if it is off.

Example

Command **:PM ON**

Query **:PM?**

9.10 [:SOURCE]:PM:SOURce{< INTernal/EXTernal>}(?)

Description

Set or query the source of the phase modulation.

Parameters

Name	Type	Default	Description
<INT>	string	INT	Sets the PM source to internal.
<EXT>	string		Sets the PM source to external.

Response

The Lucid will return INT or EXT depending on the selected source of the phase modulation.

Example

Command **:PM:SOUR EXT**

Query **:PM:SOUR?**

9.11 [:SOURCE]:PM:INTernal:FREQuency{< frequency>}(?)

Description

Set or query the modulation frequency of the phase modulation.

Parameters

Name	Range	Type	Default	Description
< frequency >	1 to 10e6	Numeric(int)	1e6	Sets the internal modulating frequency of the phase modulation.

Response

The Lucid will return the value of the internal modulating frequency.

Example

Command **:PM:INT:FREQ 1e3**

Query **:PM:INT:FREQ?**

9.12 [:SOURCE]:PM:DEViation{< deviation>(?)}

Description

Set or query the deviation of the internal phase modulation.

Parameters

Name	Range	Type	Default	Description
< deviation >	0 to 36000 units 0.01 deg.	Numeric(int)	0	Sets the deviation of the internal phase modulation in degrees.

Response

The Lucid will return the value of the deviation of the internal phase modulation.

Example

Command **:PM:DEV 100**

Query **:PM:DEV?**

9.13 [:SOURCE]:PULSe[:STATe]{ <OFF|ON|0|1>}(?)

Description

This command will set or query the state of the pulse modulation mode in the Lucid unit.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Sets the pulse modulation state on or off.

Response

Lucid returns 1 if the pulse modulation is being generated, or 0 if it is off.

Example

Command `:PULS ON`

Query `:PULS?`

9.14 [:SOURCE]:PULSe:SOURce{< INTernal/EXTernal>}(?)

Description

Set or query the source of the pulse modulation.

Parameters

Range	Type	Default	Description
<INT>	string	INT	Sets the pulse modulation source to internal.
<EXT>	string		Sets the pulse modulation source to external.

Response

The Lucid will return INT or EXT depending on the selected source of the pulse modulation.

Example

Command `:PULS:SOUR EXT`

Query `:PULS:SOUR?`

9.15 [:SOURCE]:PULSe:FREQuency{< frequency>}(?)

Description

Set or query the internal pulse modulation frequency.

Parameters

Name	Range	Type	Default	Description
< frequency >	1 to 10e6	Numeric(int)	1e6	Sets the internal pulse modulation frequency in Hz.

Response

The Lucid will return the value of the internal amplitude modulation frequency.

Example

Command `:PULS:FREQ 1e3`

Query `:PULS:FREQ?`

9.16 [:SOURCE]:PULSe:WIDTh{< width>}(?)

Description

Set or query the pulse width of the internal pulse modulation.

Parameters

Name	Range	Type	Default	Description
< width >	32e-9 to 100e-3	Numeric(int)	320 e-9	Sets the width of the pulse.

Response

The Lucid will return the value of the pulse width of the internal pulse modulation.

Example

Command `:PULS:WIDT 100e-6`

Query `:PULS:WIDT?`

9.17 [:SOURCE]:PATTern[:STATe]{< OFF|ON|0|1>}(?)

Description

Set or query the state of the pattern mode.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Sets the pattern state on and off.

Response

Lucid returns 1 if the pattern is being generated, or 0 if it is off.

Example

Command **`:PATT ON`**

Query **`:PATT?`**

9.18 [:SOURCE]:PATTern:DATA{#< header><binary block>}(?)

Description

This command will download pattern data to the Lucid unit. Pattern data is loaded to the Lucid unit using high-speed binary data transfer. High-speed binary data transfer allows any number of 8-bit bytes to be transmitted in a message. This command is particularly useful for sending large quantities of data. As an example, the next command will download to the generator a block of pattern-related data of 40 entries:

LIST:DATA#3640<binary_block>

This command causes the transfer of 680 bytes of data (40 pattern entries). The <header> is interpreted this way:

- The ASCII "#" ($23) designates the start of the binary data block.
- "3" designates the number of digits that follow representing the binary data block size in bytes.
- "560" is the number of bytes to follow.
- <binary_block> represents pattern-related data. Each entry in the pattern is represented by 14 bytes as follows:

Bytes	Bits	Value
16	127:80	On Time
	79:32	Off Time
	31:16	Number of repetitions
	15:0	Number of steps

Parameters

Name	Type	Description
< header >	Discrete	Contains information on the size of the binary block that follows.
< binary_block >	Binary	Block of binary data that contains pattern-related data, as explained above.

Example

Command `:PATT:DATA#3640<binary_block>`

9.19 [:SOURCE]:PATTern:DEFine{<step>,<ontime>,<offtime>,<repetitions>,<last_entry>}(?)

Description

Define an entry in the pattern table.

Parameters

Name	Range	Type	Default	Description
< step >	1 to 2048	Numeric	1	Will set the pattern step #.
<ontime>	32e-9 to 1.8e6	Numeric	0.5e-3	Sets the on time of the pulse to be generated in the current step
<offtime>	32e-9 to 1.8e6	Numeric(int)	0.5e-3	Sets the off time of the pulse to be generated in the current step
<repetitions>	1 to 65535	Numeric	1	Sets the number of repetitions of the pulse to be generated in the current step
<last_entry>	0 or 1	Discrete	0	Defines whether this is the last step in the pattern.

Response

Lucid returns the state of all parameters for the current step.

Example

Command `:PATT:DEF 1, 2e-3, 100e-6, 1, 0`

Query `:PATT:DEF?`

9.20 [:SOURCE]:PATTern:DELete[:NAME]{<step_#>}

Description

Delete specified step from the pattern.

Parameters

Name	Range	Type	Description
< step >	1 to 2047	Numeric(int)	Selects the step number that will be deleted.

Example

Command **:PATT:DEL 1**

9.21 [:SOURCE]:PATTern:DELete:ALL

Description

Delete all predefined pattern steps and clear the entire pattern. This command is particularly useful in case you want to start defining a new pattern from scratch.

Example

Command **:PATTERN:DEL ALL**

10 Sweep Mode Commands

10.1 [:SOURCE]:FRSWeep[:STATe]{< OFF|ON|0|1>}(?)

Description

Set or query the state of the frequency sweep mode.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Sets the frequency sweep state on or off.

Response

Lucid returns 1 if the frequency sweep is being generated, or 0 if it is off.

Example

Command **:FRSW ON**

Query **:FRSW?**

10.2 [:SOURCE]:FRSWeep:STARt{< start_frequency>}(?)

Description

This command will set or query the start frequency of the frequency sweep of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< start_frequency >	Lucid: 9e3 to 12e9	Numeric(int)	1e9	Sets the start frequency of the frequency sweep.

Response

The Lucid will return the frequency of the first step in the frequency sweep.

Example

Command **:FRSW:STAR 100e6**

Query **:FRSW:STAR?**

10.3 [:SOURCE]:FRSWeep:STEPs{< steps>}(?)

Description

This command will set or query the number of steps in the frequency sweep of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< steps >	2 to 65535	Numeric(int)	1000	Sets the number of steps in the frequency sweep.

Response

The Lucid will return the frequency of steps in the frequency sweep.

Example

Command `:FRSW:STEP 100`

Query `:FRSW:STEP?`

10.4 [:SOURCE]:FRSWeep:STOP{< stop_frequency>(?)}

Description

This command will set or query the stop frequency of the frequency sweep of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< stop_frequency >	Lucid: 9e3 to 12e9	Numeric(int)	2e9	Sets the stop frequency of the frequency sweep.

Response

The Lucid will return the frequency of the last step in the frequency sweep.

Example

Command `:FRSW:STOP 10e9`

Query `:FRSW:STOP?`

10.5 [:SOURCE]:FRSWeep:TIME{< sweep_time>}(?)

Description

This command will set or query the sweep time of each step of the frequency sweep of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< sweep_time >	100e-6 to 7036	Numeric(int)	1e-3	Sets the sweep time of the frequency sweep.

Response

The Lucid will return the sweep time of the frequency sweep.

Example

Command `:FRSW:TIM 10e-3`

Query `:FRSW:TIM?`

10.6 [:SOURCE]:FRSWeep:DIRection{< NORmal|UPDOWN|0|1>}(?)

Description

This command will set or query the direction of the frequency sweep mode in the Lucid unit.

Parameters

Range	Type	Default	Description
<NORMal>	Discrete	NORMal	Sets the frequency sweep direction from start frequency to stop frequency.
<UPDOWN>	Discrete		Sets the frequency sweep direction from start frequency to stop frequency and back to start frequency.

Response

The Lucid will return NORMal, UPDOWN depending on the selected direction of the frequency sweep.

Example

Command **:FRSW:DIR UPDOWN**

Query **:FRSW:DIR?**

10.7 [:SOURCE]:PRSWeep[:STATe]{< OFF|ON|0|1>}(?)

Description

This command will set or query the state of the power sweep mode in the Lucid unit.

Parameters

Range	Type	Default	Description
0-1	Discrete	0	Sets the power sweep state on and off.

Response

Lucid returns 1 if the power sweep is being generated, or 0 if it is off.

Example

Command **:PRSW ON**

Query **:PRSW?**

10.8 [:SOURCE]:PRSWeep:STARt{< start_power>}(?)

Description

This command will set or query the start power of the power sweep of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< start_power >	-100 to 20	Numeric(int)	-5	Sets the start power of the power sweep.

Response

The Lucid will return the power of the first step in the power sweep.

Example

Command **`:PRSW:STAR 10`**

Query **`:PRSW:STAR?`**

10.9 [:SOURCE]:PRSWeep:STEPs{< steps>}(?)

Description

This command will set or query the number of steps in the power sweep of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< steps >	2 to 16,777,215	Numeric(int)	10	Sets the number of steps in the power sweep.

Response

The Lucid will return the frequency of steps in the power sweep.

Example

Command **`:PRSW:STEP 100`**

Query **`:PRSW:STEP?`**

10.10 [:SOURCE]:PRSWeep:STOP{< stop_power>}(?)

Description

This command will set or query the stop power of the power sweep of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< stop_power >	-100 to 20	Numeric(int)	5	Sets the stop power of the power sweep.

Response

The Lucid will return the frequency of the last step in the power sweep.

Example

Command **:PRSW:STOP 10**

Query **:PRSW:STOP?**

10.11 [:SOURCE]:PRSWeep:TIMe{< sweep_time>}(?)

Description

This command will set or query the sweep time of each step of the power sweep of the Lucid unit.

Parameters

Name	Range	Type	Default	Description
< sweep_time >	100e-6 to 7036	Numeric(int)	1e-3	Sets the sweep time of the power sweep.

Response

The Lucid will return the sweep time of the power sweep.

Example

Command **:PRSW:TIM 10e-3**

Query **:PRSW:TIM?**

10.12 [:SOURCE]:PRSWeep:DIRection{< NORMal|UPDOWN|0|1>}(?)

Description

This command will set or query the direction of the power sweep mode in the Lucid unit.

Parameters

Range	Type	Default	Description
<NORMAL>	Discrete	NORMAL	Sets the power sweep direction from start power to stop power.
<UPDOWN>	Discrete		Sets the power sweep direction from start power to stop power and back to start power.

Response

The Lucid will return NORMAL, UPDOWN depending on the selected direction of the power sweep.

Example

Command **:PRSW:DIR UPDOWN**

Query **:PRSW:DIR?**

11 System Commands

11.1 :SYSTem:STORe:TARGet{< INTernal|USB>}(?)

Description

User may store up to 5 different setups of the Lucid unit. Use this command to select the target of your store operation. You may select between an internal flash memory and disk-on-key flash that you can attach to the front panel input (valid only for Lucid Benchtop/rackmount models).

Parameters

Name	Type	Default	Description
INTernal	Discrete	INT	Selects the internal flash memory as the target for the store operation.
USB	Discrete		Selects the front panel USB input as the target for the store operation.

Response

The Lucid unit will return INT or USB, depending on the current store target setting.

Example

Command **:SYST:STOR:TARG INT**

Query **:SYST:STOR:TARG?**

11.2 :SYSTem:STORe:SETup{< setup_number>}(?)

Description

This command stores the current setup of the Lucid unit in the specified setup number.

Parameters

Name	Type	Type	Description
<setup_number>	1 to 5	Numeric (integer only)	Stores the current setup of the Lucid unit in the specified setup number.

Response

The Lucid unit will return the active setup value.

Example

Command **:SYST:STOR:SET 2**

Query **:SYST:STOR:SET?**

11.3 :SYSTem:CLEar:TARGet{< INTernal | USB>}(?)

Description

Use this command to select the target of the clear operation. Select between an internal flash memory and disk-on-key flash that you can attach to the device (valid only for Lucid Benchtop/Rackmount models).

Parameters

Name	Type	Type	Description
<INTernal>	Discrete	INT	Selects the internal flash memory as the target for the clear operation.
USB	Discrete		Selects the front panel USB input as the target for the clear operation.

Response

The Lucid unit will return INT or USB, depending on the current clear target setting.

Example

Command **`:SYST:CLE:TARG INT`**

Query **`:SYST:CLE:TARG?`**

11.4 :SYSTem:CLEar:SETup{< setup_number>}(?)

Description

Use this command to clear specified setup file.

Parameters

Name	Type	Type	Description
<setup_number>	1 to 5	Numeric (integer only)	Clear specified setup file.

Response

The Lucid unit will return the active setup value.

Example

Command **`:SYST:CLE:SET 5`**

Query **`:SYST:CLE:SET?`**

11.5 :SYSTem:RECall:TARGet{< INTernal|USB>}(?)

Description

It is possible to recall up to 5 different setups of the Lucid unit. Use this command to select the target of your recall operation. You may select between an internal flash memory and disk-on-key flash that you can attach to the front panel input (valid only for Lucid Benchtop/Rackmount models).

Parameters

Name	Type	Type	Description
<INTernal>	Discrete	INT	Selects the internal flash memory as the target for the recall operation.
USB	Discrete		Selects the device USB input as the target for the recall operation.

Response

The Lucid unit will return INT or USB, depending on the current recall target setting.

Example

Command **`:SYST:REC:TARG INT`**

Query **`:SYST:REC:TARG?`**

11.6 :SYSTem:RECall:SETup{< setup_number>}(?)

Description

This command recalls the specified setup of the Lucid unit.

Parameters

Name	Type	Type	Description
<setup_number>	1 to 5	Numeric (integer only)	Recalls the specified setup of the Lucid unit.

Response

The Lucid unit returns the active setup value.

Example

Command **`:SYST:REC:SET 2`**

Query **`:SYST:REC:SET?`**

11.7 :SYSTem:POWer:SETup{< setup_number>}(?)

Description

This command specify the setup file to be used at power-up of the device. From internal memory only.

Parameters

Name	Type	Type	Default	Description
<setup_number>	0 to 5	Numeric (integer only)	0	Recalls the specified setup from internal memory when the Lucid unit is powered up. 0 is the factory default setup.

Response

The Lucid unit returns the active power-up setup value.

Example

Command **:SYST:POW:SET 2**

Query **:SYST:POW:SET?**

11.8 :SYSTem:EMULator:MODel {<TABOR | ANAPICO | KEYSIGHT | R&S | HOLZWORTH>}(?)

Description

This command selects the 3rd party signal generator SCPI commands to emulate.

Parameters

Name	Type	Default	Description
TABOR >	Discrete	TABOR	Select the native Tabor SCPI command set.
ANAPICO	Discrete		
KEYSIGHT	Discrete		
R&S	Discrete		
HOLZWORTH	Discrete		

Response

The Lucid unit returns the selected SCPI emulator.

Example

Command **:SYST:**EMUL:MOD ANAPICO

Query **:SYST:**EMUL:MOD**?**

11.9 :SYSTem:ERRor?

Description

Query only. This query will interrogate the Lucid unit for programming errors.

Response

The Lucid will return error code. Error messages are listed below. TBD.

Example

Query `:SYST:ERR?`

11.10 :SYSTem:TEMPerature?

Description

:Query the Lucid unit for the internal temperature.

Response

The Lucid will return error code. Error messages are listed below. TBD.

Example

Query `:SYST:TEMP?`

11.11 :SYSTem:INFormation:CALibration?

Description

Query the instrument for its last calibration date.

Response

The Lucid unit will return the last calibration date in a format similar to the following: 24 Sep 2010 (10 characters maximum).

Example

Query `:SYST:INF:CAL?`

11.12 :SYSTem:INFormation:MODel?

Description

Query the instrument for its model number in a format similar to the following: LSxxxxx. The model number is programmed to a secure location in the flash memory and cannot be modified by the user.

Response

The Lucid unit will return its model number LSxxxxx

Example

Query `:SYST:INF:MOD?`

11.13 :SYSTem:INFormation:SERial?

Description

Query the instrument for its serial number. The serial number is programmed to a secure location in the flash memory and cannot be modified by the user.

Response

The generator will return its serial number in a format similar to the following: 2xxxxx

Example

Query `:SYST:INF:SER?`

11.14 :SYSTem:INFormation:HARDware?

Description

Query the instrument for its hardware revision level. The hardware revision includes the PCB revision. It is programmed to a secure location in the flash memory and cannot be modified by the user.

Response

The generator will return its hardware revisions in a format similar to the following: D

Example

Query `:SYST:INF:HARD?`

11.15 :SYSTem:INFormation:FIRMware?

Description

Query the instrument for its firmware revision level. It is programmed to a secure location in the flash memory and cannot be modified by the user.

Response

The generator will return its firmware revisions in a format stating date (DDMMYY) and revision number (VV) similar to the following: DDMMYYVV

Example

Query `:SYST:INF:FIRM?`

11.16 :SYSTem:INFormation:SCPirevision?

Description

Query the instrument for its Tabor SCPI commands revision. It is programmed to a secure location in the flash memory and cannot be modified by the user.

Response

The generator will return its SCPI revision in a format similar to the following: xx.xx.xx

Example

Query `:SYST:INF:FIRM?`

11.17 :SYSTem:COMMunicate:LAN:DHCP{< OFF|ON|0|1>}(?)

Description

This command enables DHCP service for the Lucid device.

Parameters

Range	Type	Default	Description
0 - 1 >	Discrete	1	DHCP service. 0 – Disable DHCP. 1 – Enable DHCP.

Response

The Lucid unit returns 1 if the DHCP service is enabled.

Example

Command **:SYST:**COMM:LAN:DHCP 1

Query **:SYST:**COMM:LAN:DHCP**?**

11.18 :SYSTem:COMMunicate:LAN: IPADdress{< address>}(?)

Description

This command sets the IPv4 address for the Lucid device.

Parameters

Name	Range	Type	Description
< address>	0 – 255	Dot-decimal notation	IPv4 address.

Response

The Lucid unit returns its IP address.

Example

Command **:SYST:COMM:LAN:IPAD 10.0.0.9**

Query **:SYST:COMM:LAN:IPAD?**

11.19 :SYSTem:COMMunicate:LAN:MASK{< mask>}(?)

Description

This command sets the subnet mask for the Lucid device.

Parameters

Name	Range	Type	Description
< mask>	0 – 255	Dot-decimal notation	IPv4 subnet mask.

Response

The Lucid unit returns its subnet mask.

Example

Command `:SYST:COMM:LAN:MASK 255.255.255.0`

Query `:SYST:COMM:LAN:MASK?`

11.20 :SYSTem:COMMunicate:LAN:GATeway{< address>}(?)

Description

This command sets the gateway for the Lucid device.

Parameters

Name	Range	Type	Description
< address>	0 – 255	Dot-decimal notation	IPv4 gateway.

Response

The Lucid unit returns its gateway.

Example

Command `:SYST:COMM:LAN:GAT 10.0.0.138`

Query `:SYST:COMM:LAN:GAT?`

11.21 :SYSTem:COMMunicate:LAN:HOSTname{< name>}(?)

Description

This command sets the host name for the Lucid device.

Parameters

Name	Range	Type	Description
< name>	0 – 253	ASCII	Host name.

Response

The Lucid unit returns its host name.

Example

Command **:SYST:COMM:LAN:HOST Lucid_Benchtop**

Query **:SYST:COMM:LAN:HOST?**

11.22 :SYSTem:COMMunicate:LAN:DNS[{1|2}]{< address>}(?)

Description

This command sets the DNS server for the Lucid device.

Parameters

Name	Range	Type	Description
< address>	0 – 255	Dot-decimal notation	IPv4 DNS address.

Response

The Lucid unit returns its DNS server.

Example

Command **:SYST:**COMM:LAN:DNS 10.0.0.138

Query **:SYST:**COMM:LAN:DNS**?**

11.23 :SYSTem:COMMunicate:LAN:PORT{< port_number>}(?)

Description

This command sets the port number for the Lucid device SCPI port.

Parameters

Name	Range	Type	Description
< port_number>	0 to 65535	Integer	Lucid device SCPI port.

Response

The Lucid unit returns its SCPI communication port.

Example

Command **:SYST:COMM:LAN:PORT 10000**

Query **:SYST:COMM:LAN:PORT?**

11.24 :SYSTem:BATtery?

Description

Query the Lucid unit for the battery charging status. Only for Lucid Portable.

Response

The Lucid will return the Lucid battery charging status.

Example

Query `:SYST:BAT?`